ENGINE (DIAGNOSTICS)(H4DOTC)

EN(H4DOTC)(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Work Support
12. All Readiness Diagnostic Code(s)
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. Diagnostics with Phenomenon
16. General Scan Tool

PROCEDURE

1. CHECK ENGINE START FAILURE.

1. Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Check List for Interview>CHECK.
2. Start the engine.

Does the engine start?

Yes — Go to 2.

No — Check "Diagnostics with Phenomenon". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon.

2. CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.

Check the illumination status of malfunction indicator light. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Warning Light Illumination Pattern>PROCEDURE.

Does the malfunction indicator light illuminate?

Yes — Go to 3.

No — Check "Warning Light Illumination Pattern". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Warning Light Illumination Pattern.

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 operation procedures, refer to "Help" of application.
- **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 — Perform the inspection according to "Basic Diagnostic Procedure" of LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

4. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Engine] displayed? (Current code)

Yes — Save DTC and freeze frame data, then repair the trouble cause. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.
After repair, go to the next step.
Go to 5.

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)>Warning Light Illumination Pattern.

5. FINAL CHECK.

1. Connect all connectors.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Read the readiness code of [Engine] using Subaru Select Monitor and check that the concerned self-diagnosis is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>All Readiness Diagnostic Code(s).
5. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Engine] displayed? (Current code)

Yes	Check the connection of connector. If there is no faulty connector, perform the diagnosis for the displayed DTCs. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

CHECK

1. CHECK LIST NO. 1

- Inspect the following items regarding the vehicle's state.
- Print out below for use.

Customer's name		Engine No.	
Date of purchase	Year Month Date	Fuel type	
Date of repair	Year Month Date	Odometer reading	km
V.I.N.			miles
Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Various/Others:		
Ambient air temperature	°C (°F)		
	❑ Hot ❑ Warm ❑ Cool ❑ Cold		
Place	❑ Highway ❑ Suburbs ❑ Inner city ❑ Uphill ❑ Downhill ❑ Rough road ❑ Other:		
Engine temperature	❑ Cold ❑ Warming-up ❑ After warming-up ❑ Any temperature ❑ Other:		
Engine speed	rpm		
Vehicle speed	km/h (MPH)		
Driving conditions	❑ Not affected ❑ At starting ❑ While idling ❑ At racing ❑ While accelerating ❑ While cruising ❑ While decelerating ❑ While turning (RH/LH)		
Headlight	❑ ON/❑ OFF	Rear defogger	❑ ON/❑ OFF
Blower	❑ ON/❑ OFF	Audio	❑ ON/❑ OFF
A/C compressor	❑ ON/❑ OFF	Rear entertainment system	❑ ON/❑ OFF
Radiator fan	❑ ON/❑ OFF	Car phone	❑ ON/❑ OFF
Front wiper	❑ ON/❑ OFF	Wireless device	❑ ON/❑ OFF
Rear wiper	❑ ON/❑ OFF		
Engine oil type			
• Grade: • Viscosity:			
Use of additives (engine oil): ❑ Yes/ ❑ No			
• Part name:			
Wrong fuel filled: ❑ Yes / ❑ No			
• Date of filling: • Fuel type:			
Use a service station different from a usual one: ❑ Yes / ❑ No			
• Date of filling: • Fuel type:			
Use of additives (fuel): ❑ Yes/ ❑ No			
• Part name:			

2. CHECK LIST NO. 2

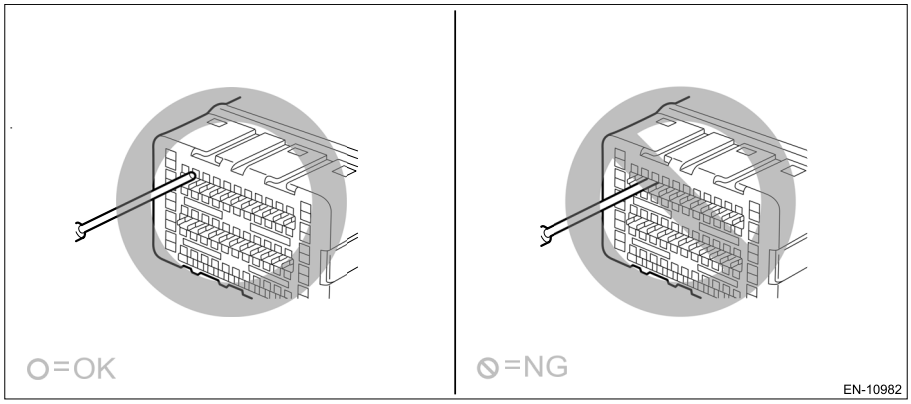
- Check the following item about the vehicle’s state when the malfunction indicator light turns on.
- Print out below for use.

a) Other warning lights or indicators illuminate: ❑ Yes / ❑ No
❑ Fuel level warning light ❑ Charge warning light ❑ Engine coolant temperature warning light ❑ Oil pressure warning light ❑ ATF temperature warning light or Sport indicator light ❑ Driver’s control center differential indicator light ❑ ABS warning light ❑ VDC warning light ❑ Cruise indicator light ❑ SI-CRUISE warning light ❑ EyeSight warning light ❑ Immobilizer indicator light ❑ STEERING warning light ❑ Electronic parking brake warning light ❑ Glow indicator light ❑ Sedimenter warning light ❑ Auto Start Stop indicator light ❑ Auto Start Stop OFF indicator light ❑ Hybrid fail lamp ❑ GPF warning light ❑ Exhaust system warning display ❑ Other:
b) Fuel level
• Lack of fuel: ❑ Yes / ❑ No • Indicator position of fuel gauge: • Experienced running out of fuel: ❑ Yes / ❑ No
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: ❑ Yes / ❑ No
• Part name:
d) Intentional connecting or disconnecting of hoses: ❑ Yes / ❑ No
• Part name:
e) Installing of other parts except genuine parts: ❑ Yes / ❑ No
• Part name: • Where:
f) Occurrence of noise: ❑ Yes / ❑ 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
j) Check of control operation history Is there a control operation history?: ❑ Yes / ❑ No Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Work Support>OPERATION.

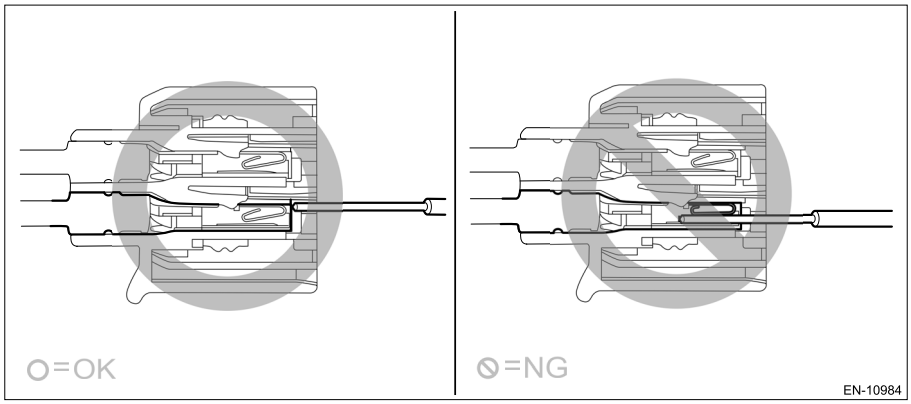
CAUTION

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. After connecting the battery terminals, wait for at least 10 seconds before tuning the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
5. When disconnecting the connectors of the electrical components, always be sure to turn the ignition switch to OFF. Clear the memory after connecting the connectors. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
6. 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.



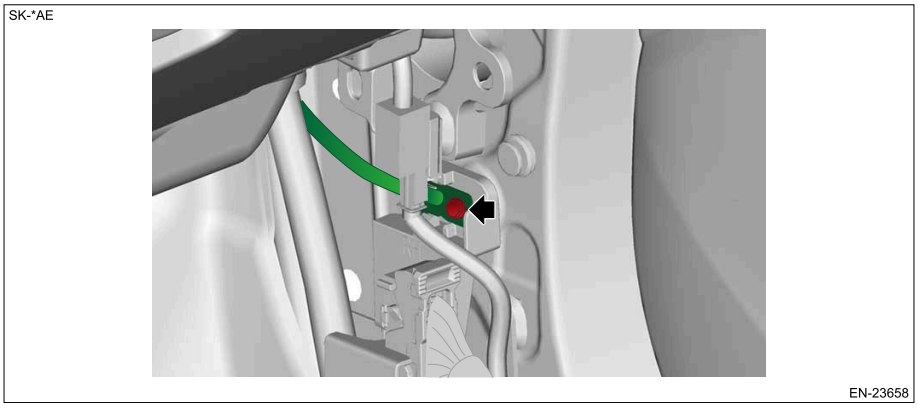
Never insert the tapered pin into the terminal because it deforms inside which may lead to a malfunction.



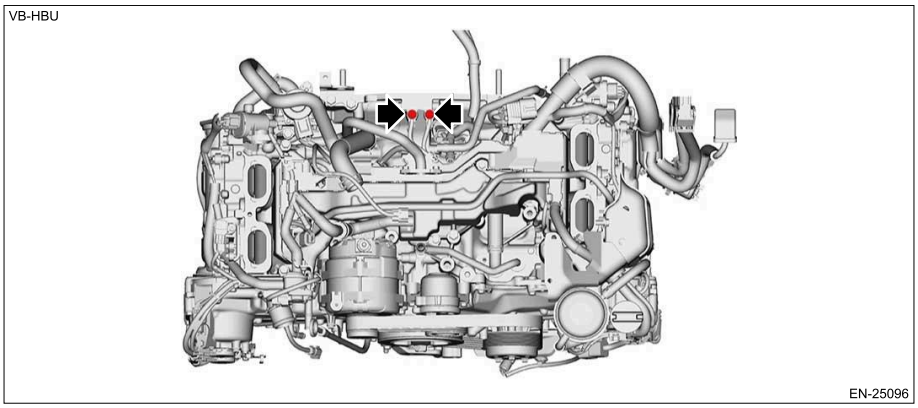
Caution:
When replacing the ECM, be careful not to use the ECM of wrong specification to avoid any damage on the fuel injection system.

Note:
When replacing the ECM of the models with immobilizer, immobilizer system must be registered. For detailed operation procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".

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 body ground terminal 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. 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.**
- **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.**

12. When disconnecting the fuel tube, release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
13. 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. After the completion of diagnosis for engine control system, perform the clear memory of [Brake Control] using the Subaru Select Monitor. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

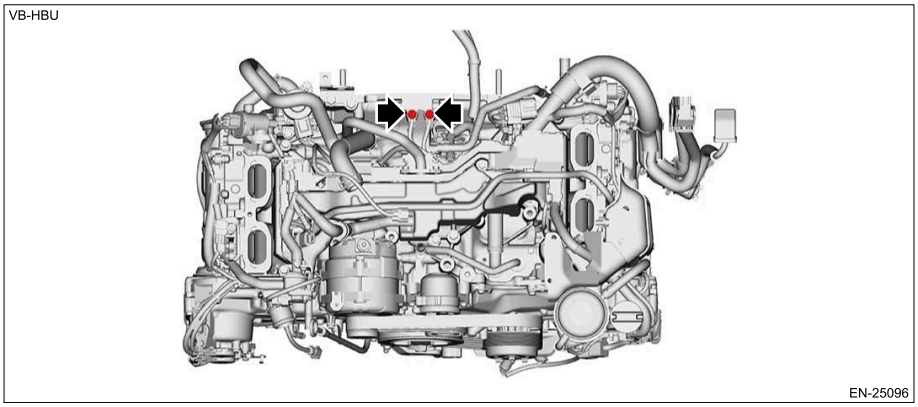
ENGINE (DIAGNOSTICS)(H4DOTC) > General Description

INSPECTION

Before performing diagnostics, check the following item which might affect engine problems.

1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.
2. Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.
3. Make sure that the engine ground terminal has no contamination, corrosion or looseness and is properly connected to the engine.



2. CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS

1. Using the Subaru Select Monitor, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Perform the reproduction test.
3. Perform visual inspection of the connectors and the respective terminals and check the connection.
4. Check that excessive force is not applied to the wiring harness and connector.

ENGINE (DIAGNOSTICS)(H4DOTC) > General Description

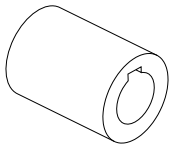
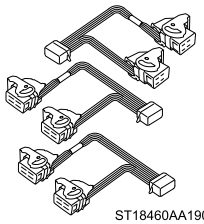
NOTE

- 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 failsafe 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.
- When the ignition is turned ON or the engine is started immediately after replacing the battery or connecting the terminals, DTCs may be detected. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
  Confirm this by asking the user.

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**
 ST18252AA000	18252AA000	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 ST18460AA190	18460AA190	CHECK BOARD	Used for measuring voltage and resistance of ECM terminals.

2. OTHER

	REMARKS
Oscilloscope	Used for measuring the sensor.
General scan tool (SAE J1978)	Used for troubleshooting the electrical system.
Circuit tester	Used for measuring resistance, voltage and current.

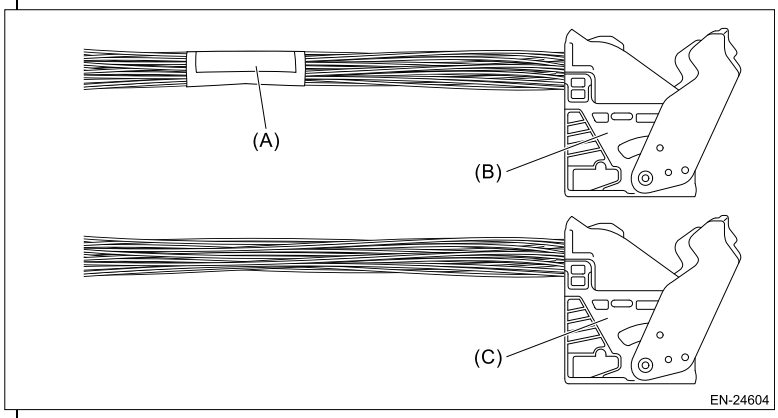
3. HOW TO USE CHECK BOARD

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM)>REMOVAL.

   Caution:
   Make sure that the lock is released before moving the lever in order to avoid damaging the connector.
3. Connect the ECM connector to the check board.
4. Connect the ECM connector (C) to ECM.

Caution:

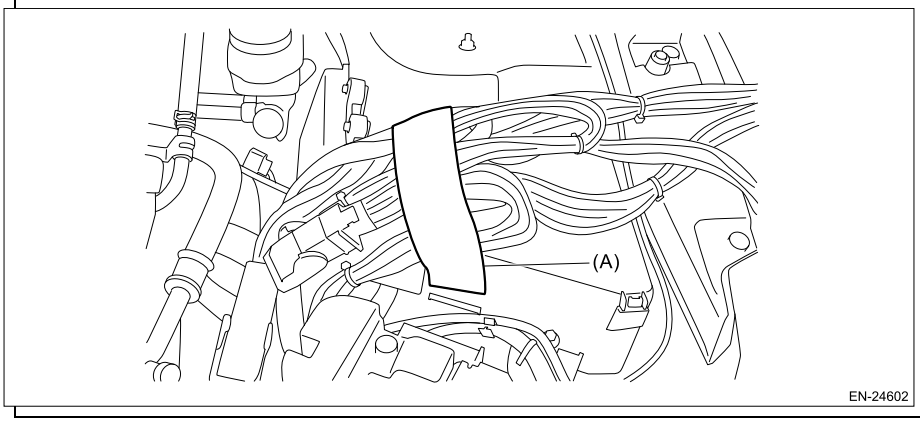
Use the measurement connector (B) with part label (A) when measuring the voltage, current and resistance. If you insert a taper pin for measurement into the ECM connector (C) by mistake, do not use the check board again, otherwise a malfunction (poor contact, etc.) may occur on the vehicle.



(A) Part label (B) Measurement connector (C) ECM connector

Caution:

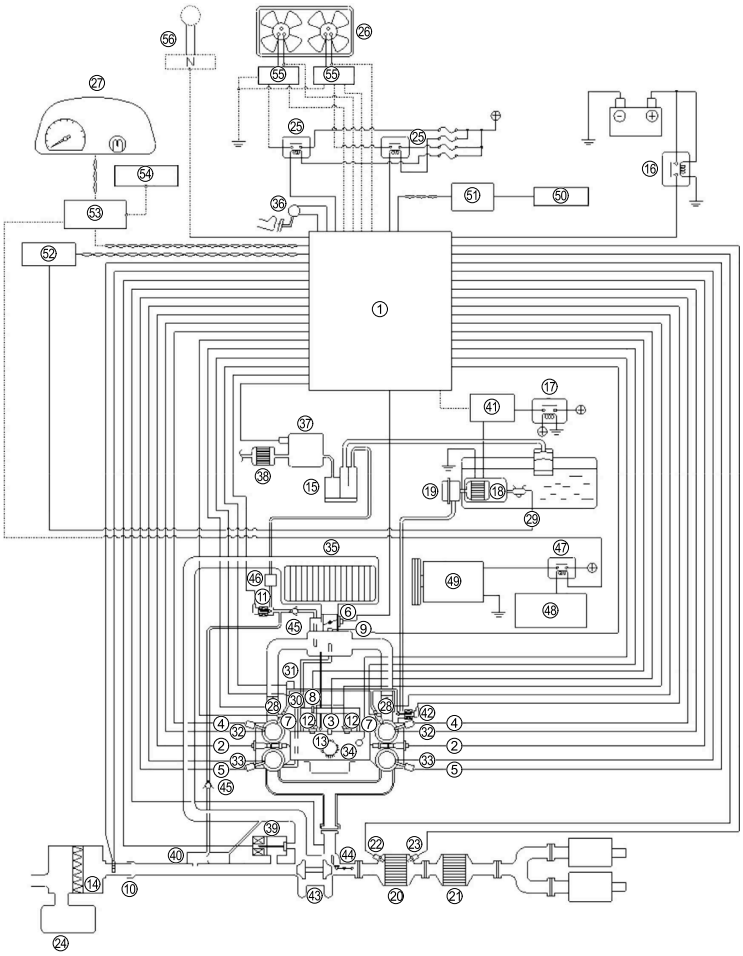
- **To prevent damage to the connector, when connecting the connector to ECM, insert the connector straight in until it stops, and while maintaining the position, lock the lever. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).**
- **Affix the check board the using tape (A) so that it may not contact the vibrating portion such as engine.**



ENGINE (DIAGNOSTICS)(H4DOTC) > General Description

SYSTEM BLOCK DIAGRAM

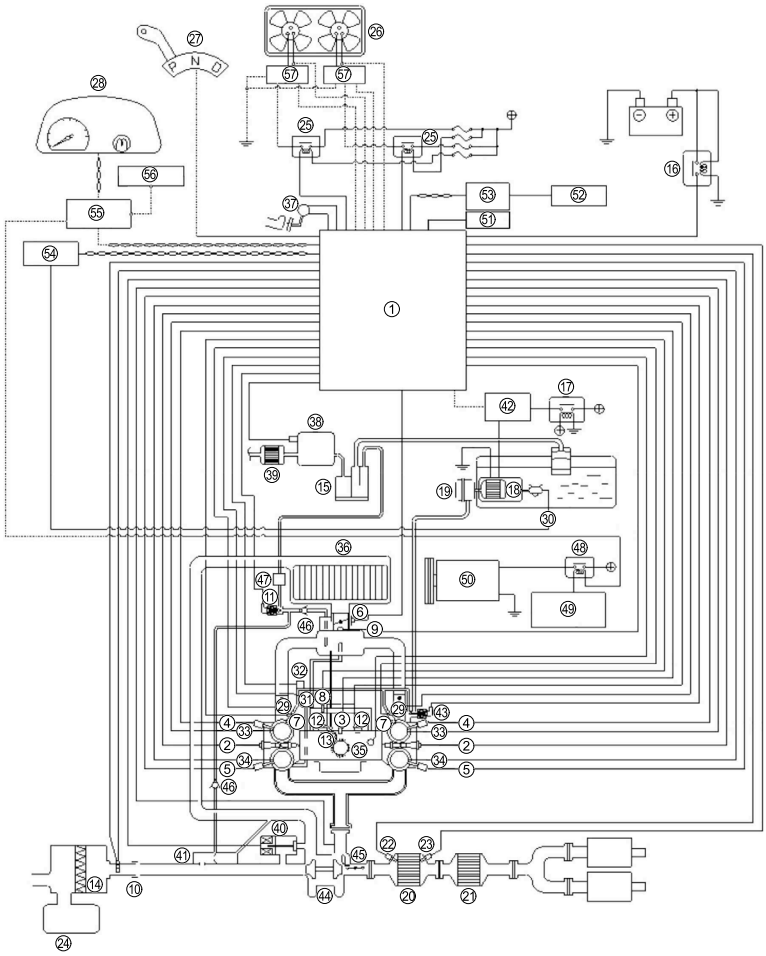
- MT model



EN-25097

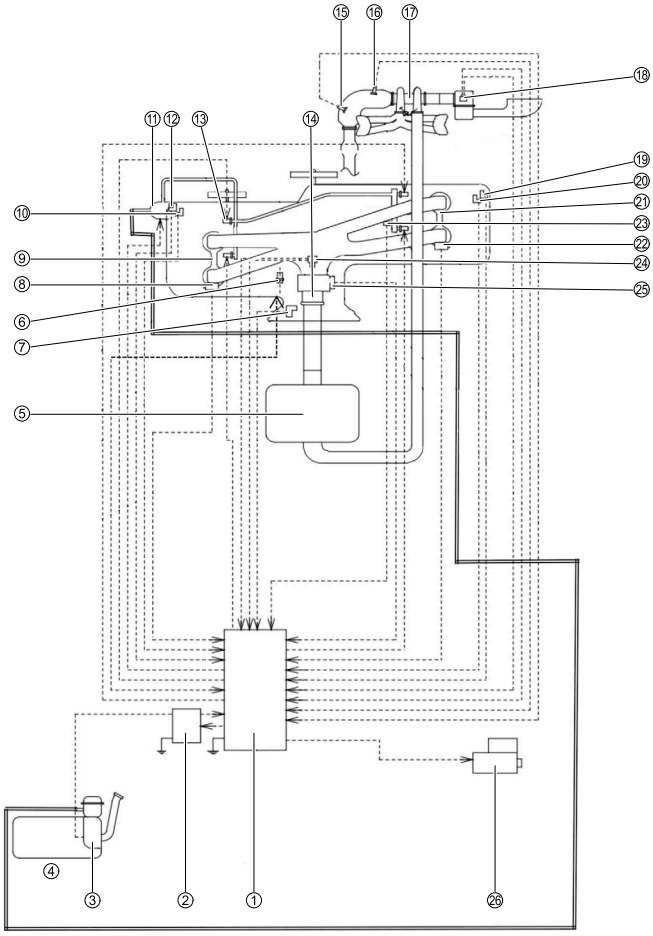
(1) Engine control module (ECM)	(20) Front catalytic converter	(39) Electronic air by-pass valve
(2) Ignition coil	(21) Rear catalytic converter	(40) Ejector
(3) Crankshaft position sensor	(22) Front oxygen (A/F) sensor	(41) Fuel pump CM
(4) Intake camshaft position sensor	(23) Rear oxygen sensor	(42) High-pressure fuel pump
(5) Exhaust camshaft position sensor	(24) Resonator chamber	(43) Turbocharger
(6) Electronic throttle control	(25) Radiator fan relay	(44) Electronic wastegate valve
(7) Fuel injector	(26) Radiator fan	(45) Check valve
(8) Engine coolant temperature sensor	(27) Combination meter	(46) CPC pressure sensor
(9) Manifold absolute pressure and intake air temperature sensor	(28) Tumble generator valve actuator	(47) A/C relay
(10) Mass air flow and intake air temperature sensor	(29) Fuel level sensor	(48) A/C control module
(11) Purge control solenoid valve	(30) EGR control valve	(49) A/C compressor
(12) Knock sensor	(31) Fuel pressure sensor	(50) ABS wheel speed sensor
(13) PCV valve	(32) Intake oil control solenoid	(51) VDC control module and hydraulic control unit (VDCCM&H/U)
(14) Air cleaner	(33) Exhaust oil control solenoid	(52) Body integrated unit
(15) Canister	(34) Engine oil temperature sensor	(53) Central gateway
(16) Main relay	(35) Intercooler	(54) Data link connector
(17) Fuel pump relay	(36) Accelerator pedal position sensor	(55) Radiator fan CM
(18) Fuel filter	(37) Leak check valve ASSY	(56) Neutral position switch
(19) Fuel pump	(38) Drain filter	

- CVT model



EN-25098

(1) Engine control module (ECM)
(2) Ignition coil
(3) Crankshaft position sensor
(4) Intake camshaft position sensor
(5) Exhaust camshaft position sensor
(6) Electronic throttle control
(7) Fuel injector
(8) Engine coolant temperature sensor
(9) Manifold absolute pressure and intake air temperature sensor
(10) Mass air flow and intake air temperature sensor
(11) Purge control solenoid valve
(12) Knock sensor
(13) PCV valve
(14) Air cleaner
(15) Canister
(16) Main relay
(17) Fuel pump relay
(18) Fuel filter
(19) Fuel pump
(20) Front catalytic converter
(21) Rear catalytic converter
(22) Front oxygen (A/F) sensor
(23) Rear oxygen sensor
(24) Resonator chamber
(25) Radiator fan relay
(26) Radiator fan
(27) Inhibitor switch
(28) Combination meter
(29) Tumble generator valve actuator
(30) Fuel level sensor
(31) EGR control valve
(32) Fuel pressure sensor
(33) Intake oil control solenoid
(34) Exhaust oil control solenoid
(35) Engine oil temperature sensor
(36) Intercooler
(37) Accelerator pedal position sensor
(38) Leak check valve ASSY
(39) Drain filter
(40) Electronic air by-pass valve
(41) Ejector
(42) Fuel pump CM
(43) High-pressure fuel pump
(44) Turbocharger
(45) Electronic wastegate valve
(46) Check valve
(47) CPC pressure sensor
(48) A/C relay
(49) A/C control module
(50) A/C compressor
(51) Transmission control module (TCM)
(52) ABS wheel speed sensor
(53) VDC control module and hydraulic control unit (VDCCM&H/U)
(54) Body integrated unit
(55) Central gateway
(56) Data link connector
(57) Radiator fan CM

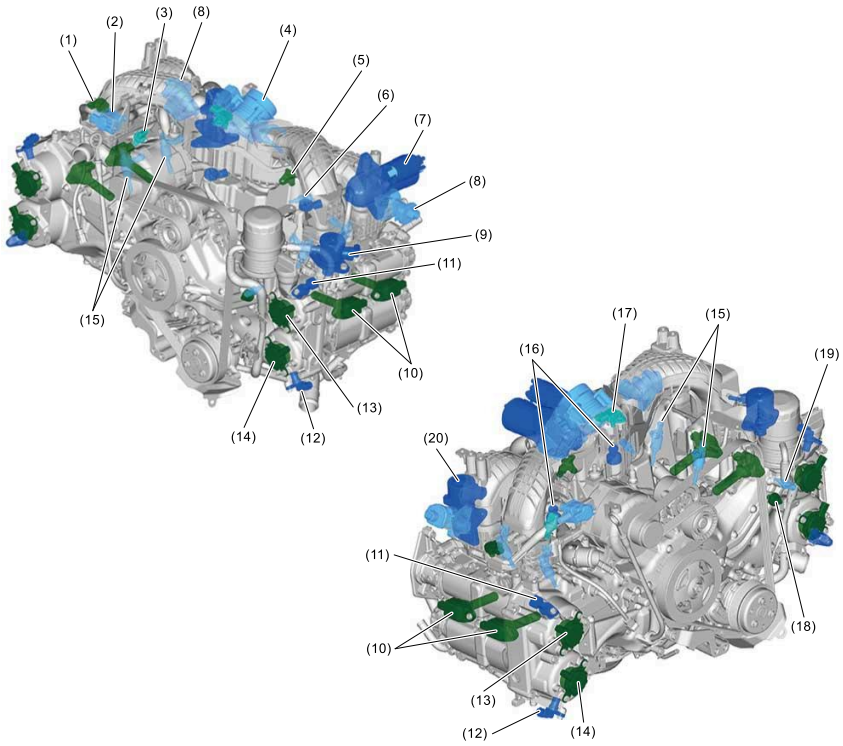


EN-25099

(1) Engine control module (ECM)
(2) Fuel pump CM
(3) Fuel pump
(4) Fuel tank
(5) Intercooler
(6) Engine coolant temperature sensor
(7) Crankshaft position sensor
(8) Tumble generator valve LH
(9) Tumble generator valve actuator LH
(10) Intake camshaft position sensor LH
(11) High-pressure fuel pump
(12) Exhaust camshaft position sensor LH
(13) Fuel injector
(14) Electronic throttle control
(15) Rear oxygen sensor
(16) Front oxygen (A/F) sensor
(17) Turbocharger
(18) Mass air flow and intake air temperature sensor
(19) Exhaust camshaft position sensor RH
(20) Intake camshaft position sensor RH
(21) Tumble generator valve actuator RH
(22) Tumble generator valve RH
(23) Fuel pressure sensor
(24) Manifold absolute pressure and intake air temperature sensor
(25) Throttle position sensor
(26) Starter

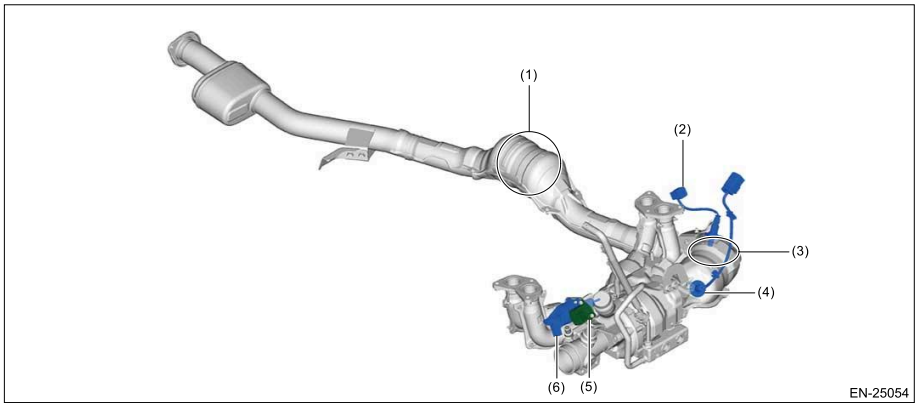
LOCATION

1. ENGINE UNIT



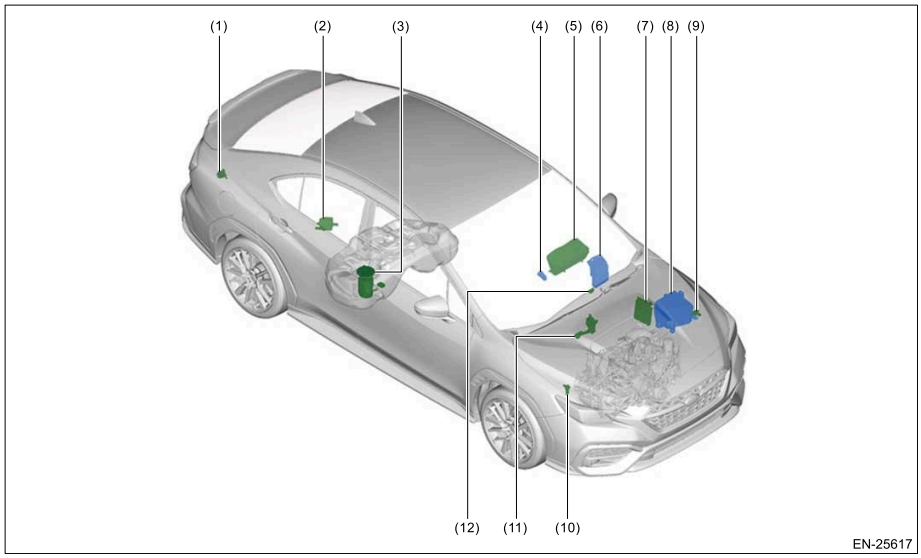
EN-25053

(1) CPC pressure sensor	(8) Tumble generator valve actuator	(15) Fuel injector
(2) Purge control solenoid valve	(9) High-pressure fuel pump	(16) Knock sensor
(3) Fuel pressure sensor	(10) Ignition coil	(17) Manifold absolute pressure and intake air temperature sensor
(4) Electronic throttle control	(11) Intake camshaft position sensor	(18) Oil pressure switch
(5) Crankshaft position sensor	(12) Exhaust camshaft position sensor	(19) Engine oil temperature sensor
(6) Engine coolant temperature sensor	(13) Intake oil control solenoid	(20) EGR control valve
(7) Starter motor	(14) Exhaust oil control solenoid	



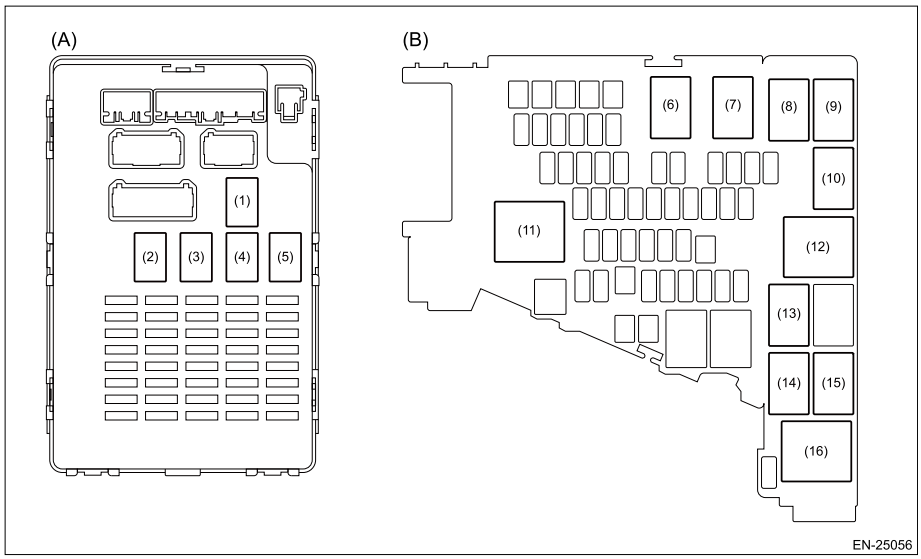
(1) Rear catalytic converter
(2) Rear oxygen sensor
(3) Front catalytic converter
(4) Front oxygen (A/F) sensor
(5) Electronic air by-pass valve
(6) Electronic wastegate valve

2. BODY



(1) Fuel pump CM
(2) Leak check valve ASSY
(3) Fuel pump
(4) Push button ignition switch
(5) Combination meter
(6) F/B
(7) Engine control module (ECM)
(8) M/B
(9) Battery sensor
(10) Mass air flow and intake air temperature sensor
(11) Accelerator pedal position sensor
(12) Data link connector

3. FUSE AND RELAY



(A) F/B

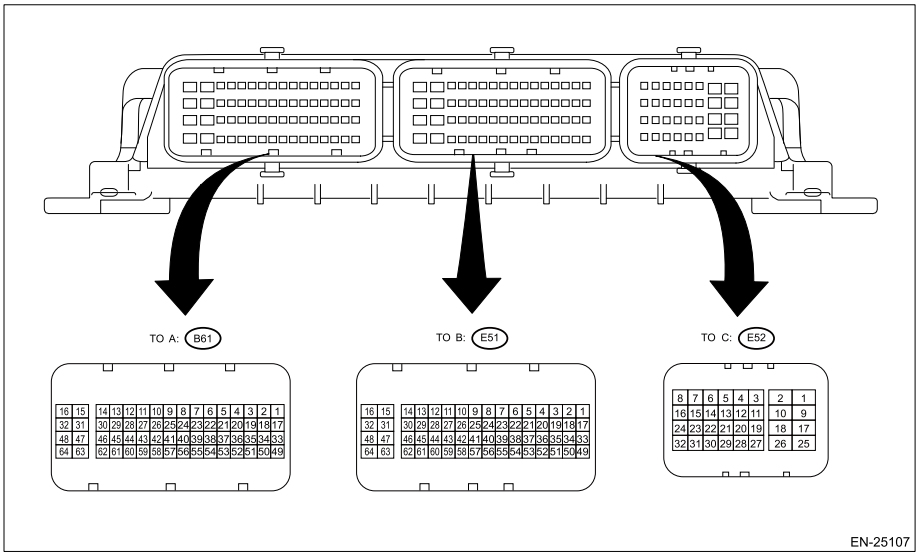
(B) M/B

(1) IG 1 relay
(2) IG 2 relay
(3) —
(4) —
(5) —
(6) —
(7) MB-IG relay
(8) Electronic throttle control relay
(9) Fuel pump relay
(10) —
(11) Main relay
(12) Sub fan relay
(13) -
(14) Starter relay
(15) Starter cut relay
(16) Main fan relay

Note:

Only shows parts required for engine diagnosis.

ELECTRICAL SPECIFICATION



Description		Connector 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	Power supply	E52	30	5	5	—
	Signal	E52	4	0 or 5	0 or 5	Waveforms 1 and 8
	Ground	E52	5	0	0	—
Intake camshaft position sensor	RH	E51	56	0 or 5	0 or 5	Waveform 1
	LH	E51	57	0 or 5	0 or 5	Waveform 1
Exhaust camshaft position sensor	RH	E51	24	0 or 5	0 or 5	Waveform 1
	LH	E51	40	0 or 5	0 or 5	Waveform 1
Camshaft position sensor ground		E51	41	0	0	—
Front oxygen (A/F) sensor	IP (+) signal	E51	52	0 — battery voltage	2 — 4	• Waveform 2 • When the ignition switch is turned to ON and after engine is warmed up (engine is OFF), voltage varies depending on the sensor temperature.
	VS (+) signal	E51	51	0 — battery voltage	3 — 5	• Waveform 2 • When the ignition switch is turned to ON and after engine is warmed up (engine is OFF), voltage varies depending on the sensor temperature.
	COM signal	E51	53	0 — battery voltage	3 — 4	When the ignition switch is turned to ON and after engine is warmed up (engine is OFF), voltage varies

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
						depending on the sensor temperature.
	Heater signal	B61	32	Battery voltage	0 or battery voltage	Waveform 4
Rear oxygen sensor	(+) signal	E51	5	2 — 3	2 — 3	Waveform 3
	(−) signal	E51	4	2 — 3	2 — 3	—
	Heater signal	E52	3	Battery voltage	0 or battery voltage	Waveform 4
Air flow sensor signal		B61	62	0 or 5	0 or 5	Waveform 13
Intake air temperature sensor (Integrated with air flow sensor)		B61	34	2 — 3	2 — 3	—
Engine coolant temperature sensor		E51	49	1 — 3	1 — 3	—
Engine oil temperature sensor		E51	36	1 — 3	1 — 3	—
Manifold absolute pressure sensor		E51	35	2	1	—
Intake air temperature sensor (Integrated with manifold absolute pressure sensor)		E51	34	2 — 3	2 — 3	—
Fuel pressure sensor	Main signal	E51	22	1 — 1.6	1	—
	Sub signal	E51	54	3 — 3.6	3 — 3.6	—
CPC pressure sensor		E51	50	1 — 4	1 — 4	—
Knock sensor	RH	E51	3	2.5	2.5	—
	LH	E51	2	2.5	2.5	—
Accelerator pedal position sensor	Main power supply	B61	51	5	5	—
	Main signal	B61	35	Fully closed: 0.4 — 1 Fully open: 2.4 — 3.7	Fully closed: 0.4 — 1 Fully open: 2.4 — 3.7	Waveforms 2, 3, 5 and 6
	Main ground	B61	19	0	0	—
	Sub power supply	B61	49	5	5	—
	Sub signal	B61	33	Fully closed: 0.4 — 1 Fully open: 2.4 — 3.7	Fully closed: 0.4 — 1 Fully open: 2.4 — 3.7	—
	Sub ground	B61	17	0	0	—
Tumble generator valve actuator RH	Position signal	E51	38	1	1	Fully closed: 1 Fully opened: 3 Waveform 5
	Motor open	E51	44	0	0	When in operation: Waveform 5
	Motor closed	E51	43	0	0	When in operation: Waveform 5
Tumble generator valve actuator LH	Position signal	E51	6	1	1	Fully closed: 1 Fully opened: 3 Waveform 6
	Motor open	E51	46	0	0	When in operation: Waveform 6

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
	Motor closed	E51	45	0	0	When in operation: Waveform 6
Intake oil control solenoid	RH	E51	14	Battery voltage	0 or battery voltage	Drive frequency: 125 Hz Waveform 7
	LH	E51	13	Battery voltage	0 or battery voltage	Drive frequency: 125 Hz Waveform 7
Exhaust oil control solenoid	RH	E51	12	Battery voltage	0 or battery voltage	Drive frequency: 125 Hz Waveform 7
	LH	E51	11	Battery voltage	0 or battery voltage	Drive frequency: 125 Hz Waveform 7
Purge control solenoid valve		E52	19	Battery voltage	Battery voltage	When in operation: 0 or battery voltage
Ignition coil	#1	E51	10	0	0 or 5	Waveform 8
	#2	E51	26	0	0 or 5	Waveform 8
	#3	E51	42	0	0 or 5	Waveform 8
	#4	E51	58	0	0 or 5	Waveform 8
EGR control valve	A (+)	E51	62	0 or battery voltage	0 or battery voltage	—
	A (−)	E51	60	0 or battery voltage	0 or battery voltage	—
	B (+)	E51	61	0 or battery voltage	0 or battery voltage	—
	B (−)	E51	59	0 or battery voltage	0 or battery voltage	—
Leak check valve assembly	Switching valve	B61	13	Battery voltage	Battery voltage	Operating: 0
	Vacuum pump	B61	30	Battery voltage	Battery voltage	Operating: 0
	Pressure sensor	B61	2	1 — 4	1 — 4	When ignition switch is turned to ON: atmospheric pressure
Fuel pump control	Control signal	B61	11	ON: 0 or battery voltage OFF: 0	0 or battery voltage	Waveform 9
	Diagnostic signal	B61	36	ON: Battery voltage OFF: 0	Battery voltage	—
High-pressure fuel pump	HI	E52	1	—	—	Measurement prohibited
	LO	E52	9	—	—	Measurement prohibited
Fuel injector	Power supply	B61	16	Battery voltage	Battery voltage	—
	#1 (+)	E51	16	0	—	Measurement prohibited while the engine is running
	#1 (−)	E51	15	0	—	
	#2 (+)	E51	32	0	—	
	#2 (−)	E51	31	0	—	
	#3 (+)	E51	48	0	—	
	#3 (−)	E51	47	0	—	
	#4 (+)	E51	64	0	—	
	#4 (−)	E51	63	0	—	
Electronic throttle control	Power supply	E52	22	5	5	—
	Main signal	E52	31	Fully closed: Approx. 0.7	Fully closed: Approx. 0.7	—

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
				Fully open: Approx. 3.9	Fully open: Approx. 3.9	
	Sub signal	E52	15	Fully closed: Approx. 4.4 Fully open: 1.1	Fully closed: Approx. 4.4 Fully open: 1.1	—
	Ground	E52	23	0	0	—
	Motor (+)	E51	30	0 or battery voltage	0 or battery voltage	Drive frequency: 10 kHz
	Motor (−)	E51	29	0 or battery voltage	0 or battery voltage	Drive frequency: 10 kHz
Electronic throttle control motor power supply		B61	64	Battery voltage	Battery voltage	—
Electronic throttle control relay control		B61	60	0	0	—
Electronic wastegate valve	Position signal	E51	37	1 — 1.4	1 — 1.4	—
	Motor (+)	E52	18	0 or battery voltage	0 or battery voltage	—
	Motor (−)	E52	26	0 or battery voltage	0 or battery voltage	—
Electronic air by-pass valve		E51	9	Battery voltage	Battery voltage	—
Radiator main fan	Control signal	B61	59	0 or battery voltage	0 or battery voltage	ON
	Diagnostic signal	B61	9	0 or battery voltage	0 or battery voltage	—
Main fan relay control		B61	46	0	0	—
Radiator sub fan	Control signal	B61	27	0 or battery voltage	0 or battery voltage	ON
	Diagnostic signal	B61	41	0 or battery voltage	0 or battery voltage	—
Sub fan relay control		B61	45	0	0	—
Self-shutoff relay control		B61	29	0	0	—
Starter relay control		B61	12	Battery voltage	Battery voltage	Models without push button start: Waveform 10 Models with push button start: Waveform 12
Starter cut relay control		B61	44	Battery voltage	Battery voltage	Models without push button start: Waveform 10 Models with push button start: Waveform 11 and 12
Starter switch		B61	55	0	0	Models without push button start: Waveform 10 Models with push button start: Waveform 11
Starter switch 2		B61	53	0	0	Models without push button start: Waveform 10 Models with push button start: Waveform 11
Accessory cut request		B61	43	Battery voltage	Battery voltage	Models with push button start: Waveform 11

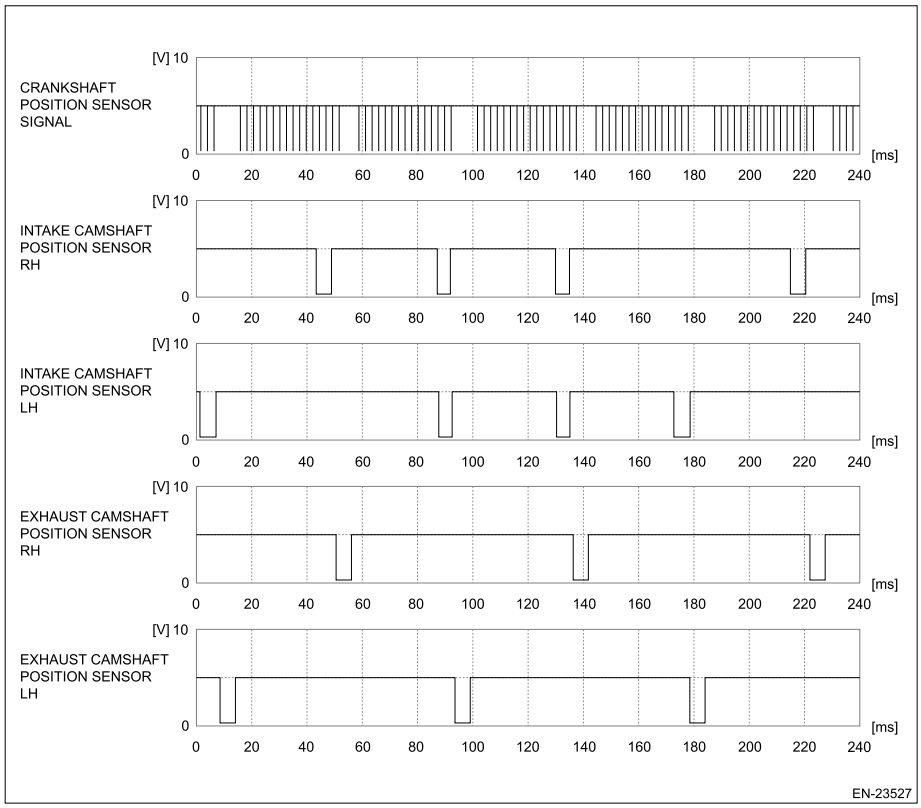
Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
Clutch start switch		B61	56	When clutch pedal is depressed: Battery voltage When clutch pedal is released: 0	When clutch pedal is depressed: Battery voltage When clutch pedal is released: 0	MT model
Clutch switch		B61	24	When clutch pedal is depressed: 0 When clutch pedal is released: Battery voltage	When clutch pedal is depressed: 0 When clutch pedal is released: Battery voltage	MT model
Brake switch 1 (Brake switch)		B61	8	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)		B61	39	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		B61	52	ON: 0 OFF: 5	ON: 0 OFF: 5	Model without EyeSight
Cruise control command switch		B61	1	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
Neutral position switch	Signal	E52	12	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	—
	Ground	E52	13	0	0	—
Oil level switch		E51	23	0	0	Oil level LOW: 5
Ignition switch		B61	54	Battery voltage	Battery voltage	Models with push button start: Waveform 12
Delivery mode switch		B61	37	Battery voltage	Battery voltage	When the fuse is installed: 0
Blow-by leak diagnosis		E51	39	0	0	At the time of open circuit (fault): 5
CAN communication (P/U1 CAN)	HI	B61	6	—	—	—
	LO	B61	5	—	—	—
CAN communication ((I)_P/U2 CAN)	HI	B61	22	—	—	—
	LO	B61	21	—	—	—
LIN communication		B61	20	—	—	—
Immobilizer communication		B61	4	—	—	—
Control module power supply		B61	15	Battery voltage	Battery voltage	—
		B61	31	Battery voltage	Battery voltage	—
Backup power supply		B61	14	Battery voltage	Battery voltage	—
Sensor power supply		B61	50	5	5	—
		E51	1	5	5	—

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
		E51	17	5	5	—
Ground	Sensor	B61	61	0	0	—
		E51	33	0	0	—
	Engine 1	B61	48	0	0	—
	Engine 2	B61	47	0	0	—
	Engine 3	B61	63	0	0	—
	Engine 4	E52	10	0	0	—
	Engine 5	E52	2	0	0	—

Note:

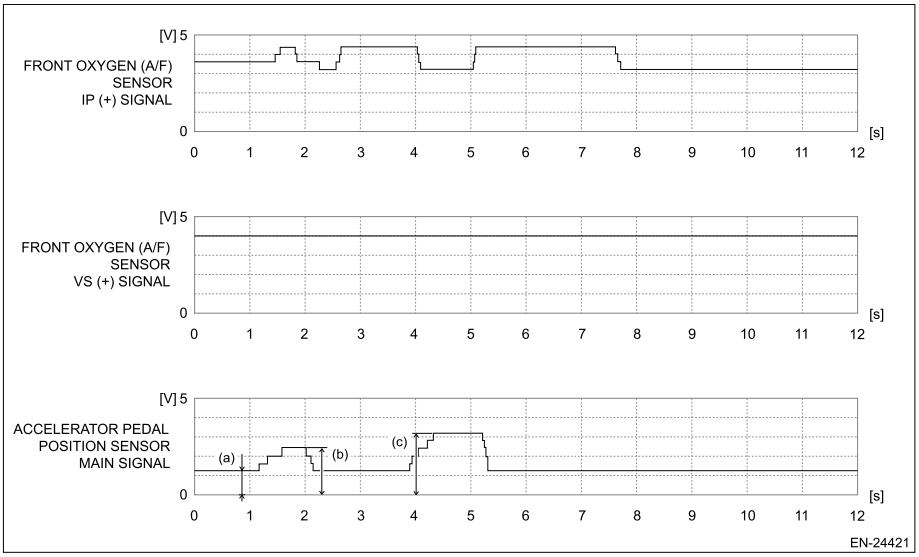
- **After engine is warmed up, attach the check board for measurement.**
- **Set the select lever in "P" range or "N" range, or the shift lever in neutral.**
- **Turn the A/C to OFF.**
- **Turn all the accessory switches to OFF.**
- **Waveforms vary depending on a measurement environment and vehicle condition.**
- **Oscilloscope waveform illustrated here is an example for reference. Noise and chattering in waveform are omitted.**

1. Waveform 1



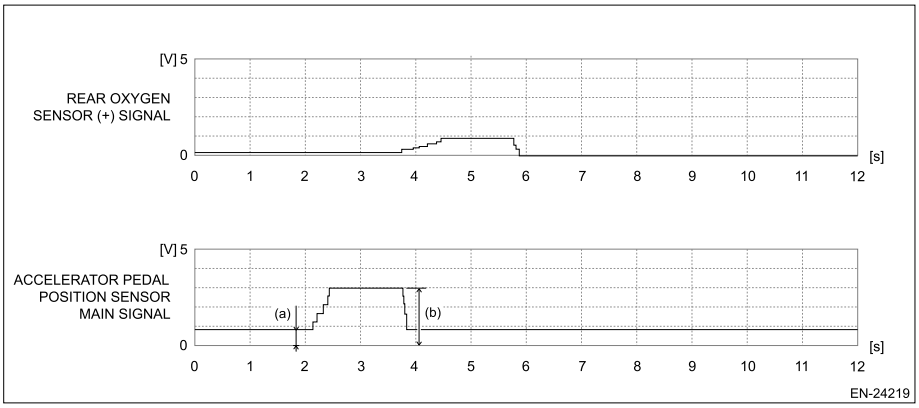
Measured terminal	Crankshaft position sensor signal (E52) No. 4 (+) — Engine ground 3 (B61) No. 63 (−):
	Intake camshaft position sensor RH (E51) No. 56 (+) — Engine ground 3 (B61) No. 63 (−):
	Intake camshaft position sensor LH (E51) No. 57 (+) — Engine ground 3 (B61) No. 63 (−):
	Exhaust camshaft position sensor RH (E51) No. 24 (+) — Engine ground 3 (B61) No. 63 (−):
	Exhaust camshaft position sensor LH (E51) No. 40 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	While engine idling

2. Waveform 2



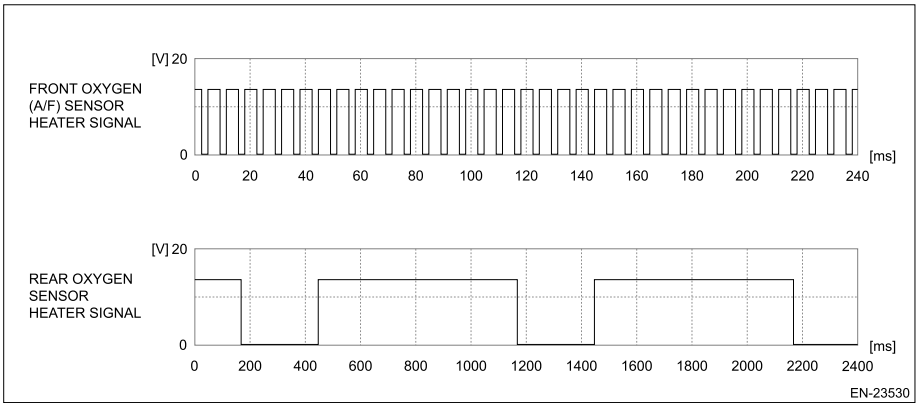
Measured terminal	Front oxygen (A/F) sensor IP (+) signal (E51) No. 52 (+) — Engine ground 3 (B61) No. 63 (−):
	Front oxygen (A/F) sensor VS (+) signal (E51) No. 51 (+) — Engine ground 3 (B61) No. 63 (−):
	Accelerator pedal position sensor main signal (B61) No. 35 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	(a) accelerator pedal fully closed (b) accelerator pedal half open (c) accelerator pedal fully opened

3. Waveform 3



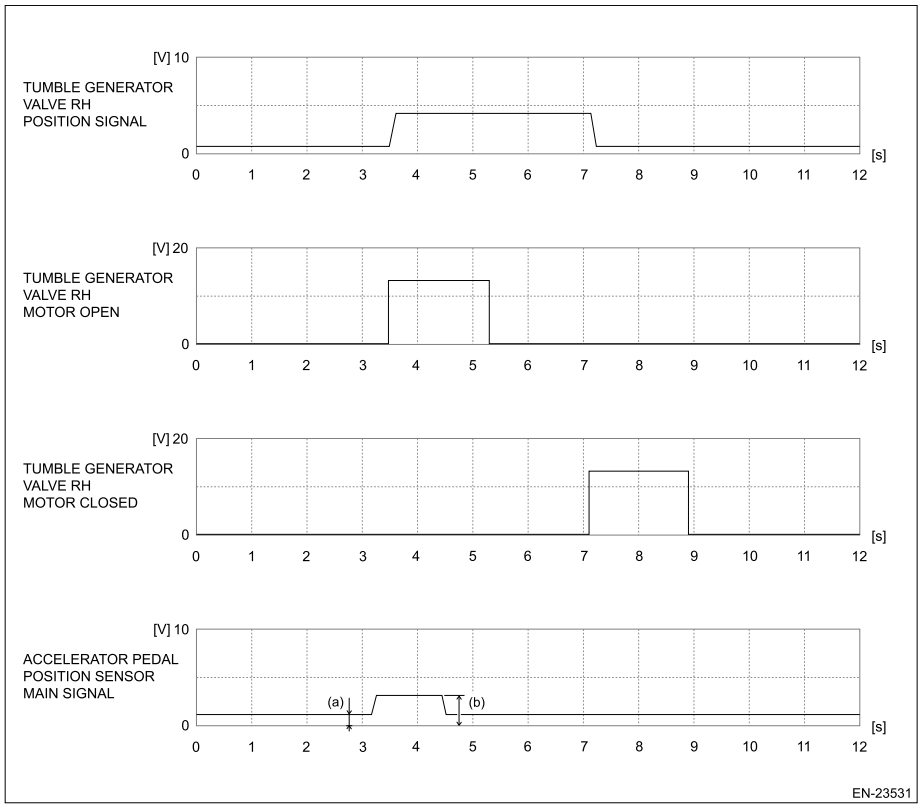
Measured terminal	Rear oxygen sensor (+) signal (E51) No. 5 (+) — Rear oxygen sensor (−) signal (E51) No. 4 (−):
	Accelerator pedal position sensor main signal (B61) No. 35 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	(a) Accelerator pedal fully closed (b) Accelerator pedal fully opened

4. Waveform 4



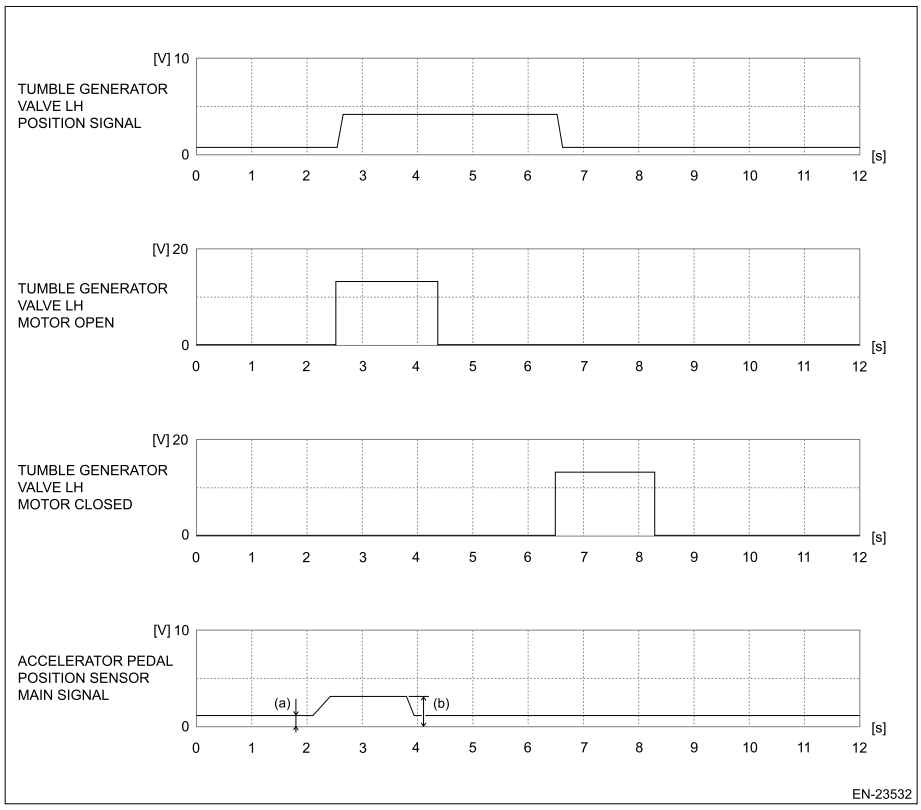
Measured terminal	Front oxygen (A/F) sensor heater signal (B61) No. 32 (+) — Engine ground 3 (B61) No. 63 (−):
	Rear oxygen sensor heater signal (E52) No. 3 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	While engine idling

5. Waveform 5



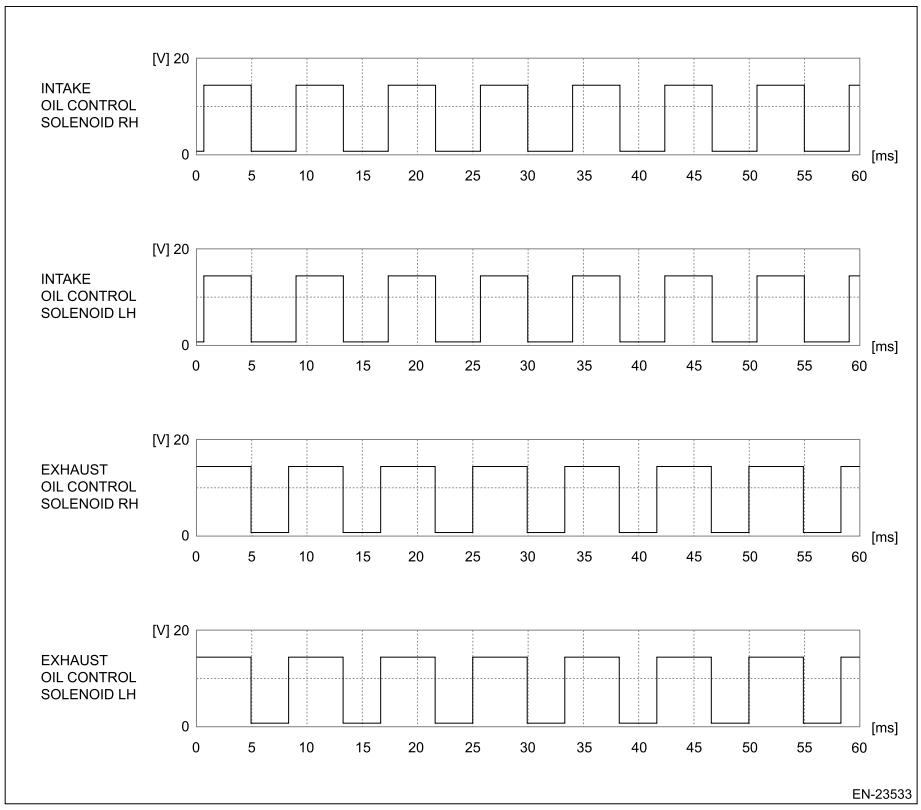
Measured terminal	Tumble generator valve actuator RH position signal (E51) No. 38 (+) — Engine ground 3 (B61) No. 63 (−):
	Tumble generator valve actuator RH motor open (E51) No. 44 (+) — Engine ground 3 (B61) No. 63 (−):
	Tumble generator valve actuator RH motor closed (E51) No. 43 (+) — Engine ground 3 (B61) No. 63 (−):
	Accelerator pedal position sensor main signal (B61) No. 35 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	(a) Accelerator pedal fully closed (b) Accelerator pedal fully opened

6. Waveform 6



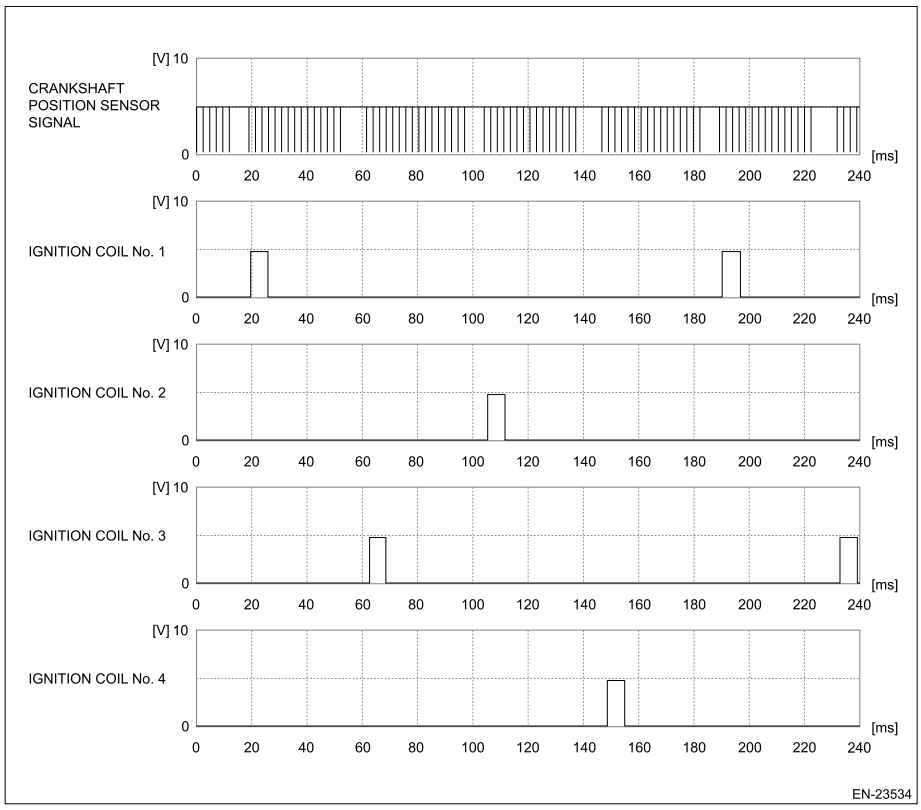
Measured terminal	Tumble generator valve actuator LH position signal (E51) No. 6 (+) — Engine ground 3 (B61) No. 63 (−):
	Tumble generator valve actuator LH motor open (E51) No. 46 (+) — Engine ground 3 (B61) No. 63 (−):
	Tumble generator valve actuator LH motor closed (E51) No. 45 (+) — Engine ground 3 (B61) No. 63 (−):
	Accelerator pedal position sensor main signal (B61) No. 35 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	(a) Accelerator pedal fully closed (b) Accelerator pedal fully opened

7. Waveform 7



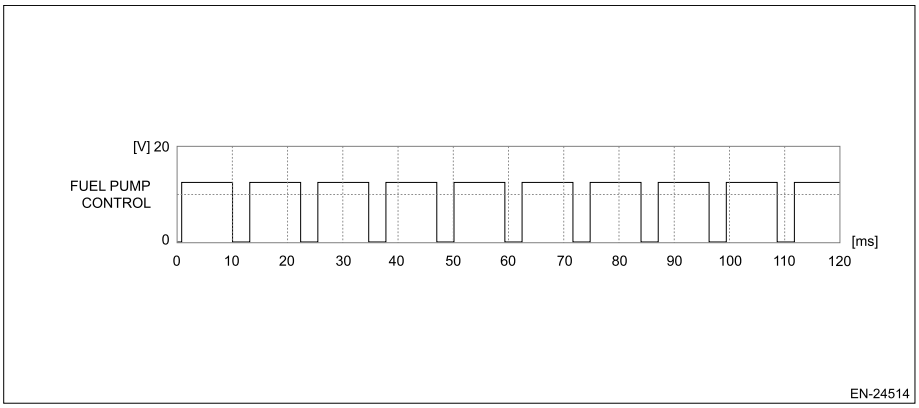
Measured terminal	Intake oil control solenoid RH (E51) No. 14 (+) — Engine ground 3 (B61) No. 63 (−):
	Intake oil control solenoid LH (E51) No. 13 (+) — Engine ground 3 (B61) No. 63 (−):
	Exhaust oil control solenoid RH (E51) No. 12 (+) — Engine ground 3 (B61) No. 63 (−):
	Exhaust oil control solenoid LH (E51) No. 11 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	While engine idling

8. Waveform 8



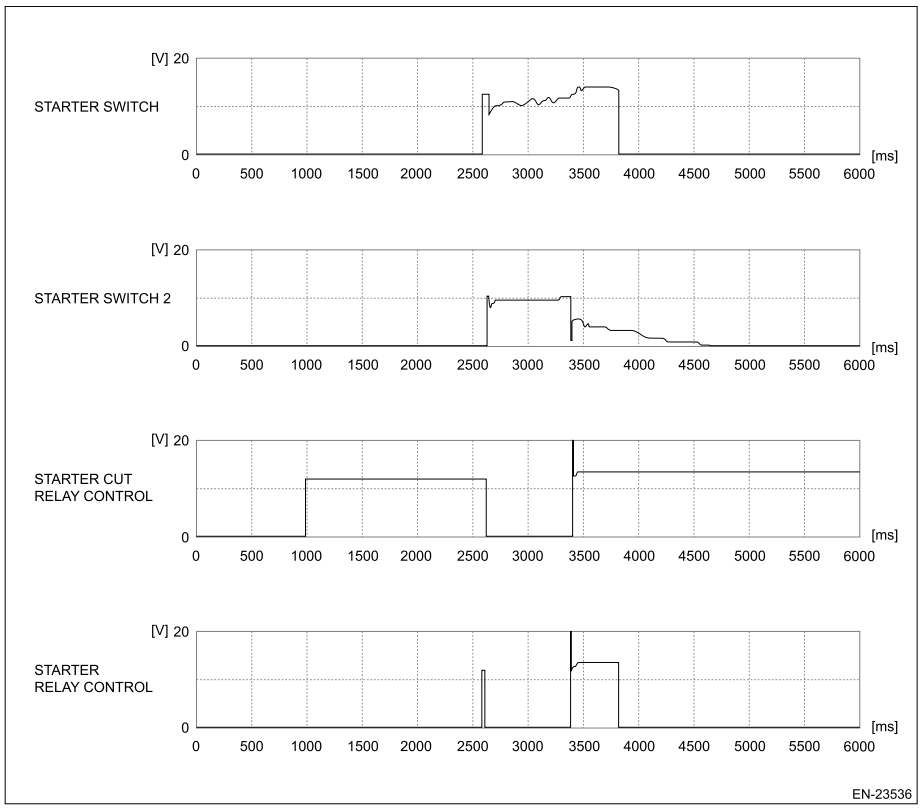
Measured terminal	Crankshaft position sensor signal (E52) No. 4 (+) — Engine ground 3 (B61) No. 63 (−):
	Ignition coil #1 (E51) No. 10 (+) — Engine ground 3 (B61) No. 63 (−):
	Ignition coil #2 (E51) No. 26 (+) — Engine ground 3 (B61) No. 63 (−):
	Ignition coil #3 (E51) No. 42 (+) — Engine ground 3 (B61) No. 63 (−):
	Ignition coil #4 (E51) No. 58 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	While engine idling

9. Waveform 9



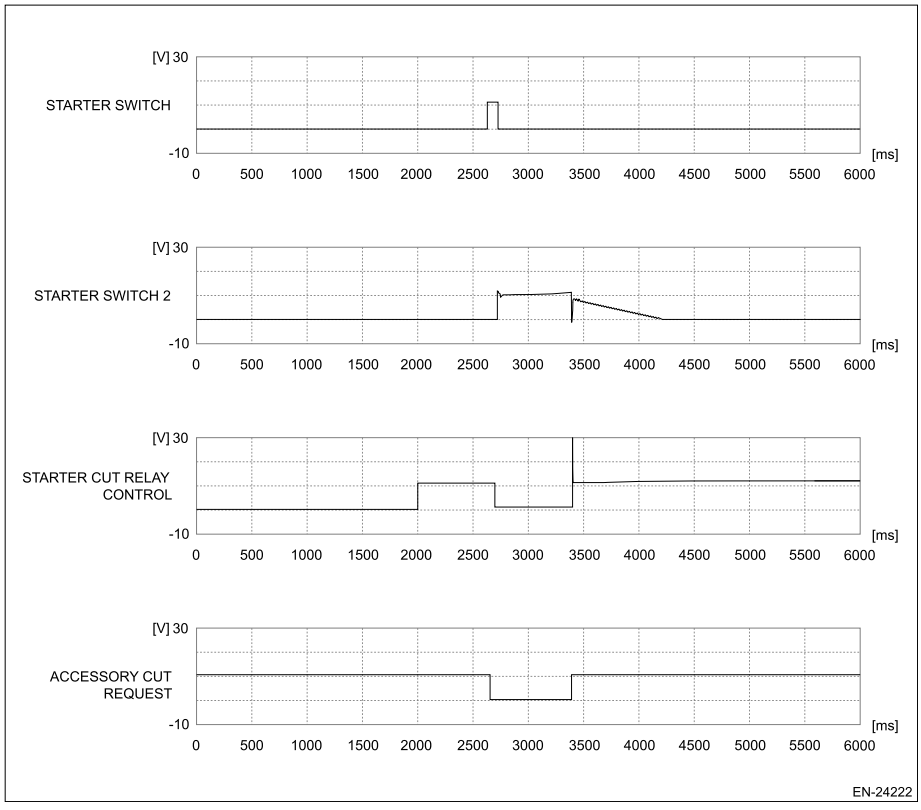
Measured terminal	Fuel pump control (B61) No. 11 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	While engine idling

10. Waveform 10



Measured terminal	Starter switch (B61) No. 55 (+) — Engine ground 3 (B61) No. 63 (−):
	Starter switch 2 (B61) No. 53 (+) — Engine ground 3 (B61) No. 63 (−):
	Starter cut relay control (B61) No. 44 (+) — Engine ground 3 (B61) No. 63 (−):
	Starter relay control (B61) No. 12 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	When engine is started

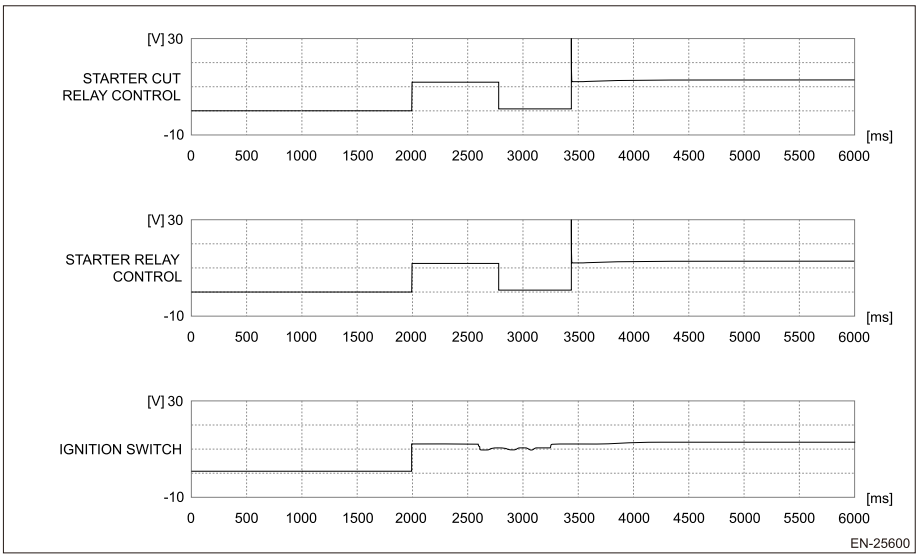
11. Waveform 11



Measured terminal	Starter switch (B61) No. 55 (+) — Engine ground 3 (B61) No. 63 (−):

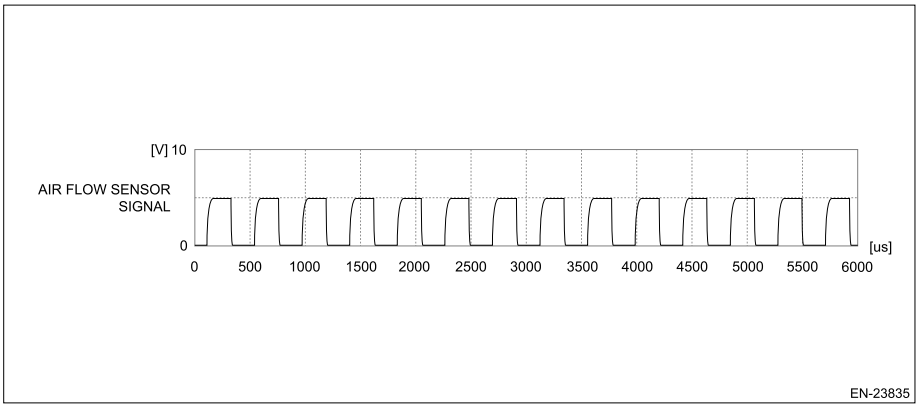
	Starter switch 2 (B61) No. 53 (+) — Engine ground 3 (B61) No. 63 (−):
	Starter cut relay control (B61) No. 44 (+) — Engine ground 3 (B61) No. 63 (−):
	Accessory cut request (B61) No. 43 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	When engine is started

12. Waveform 12

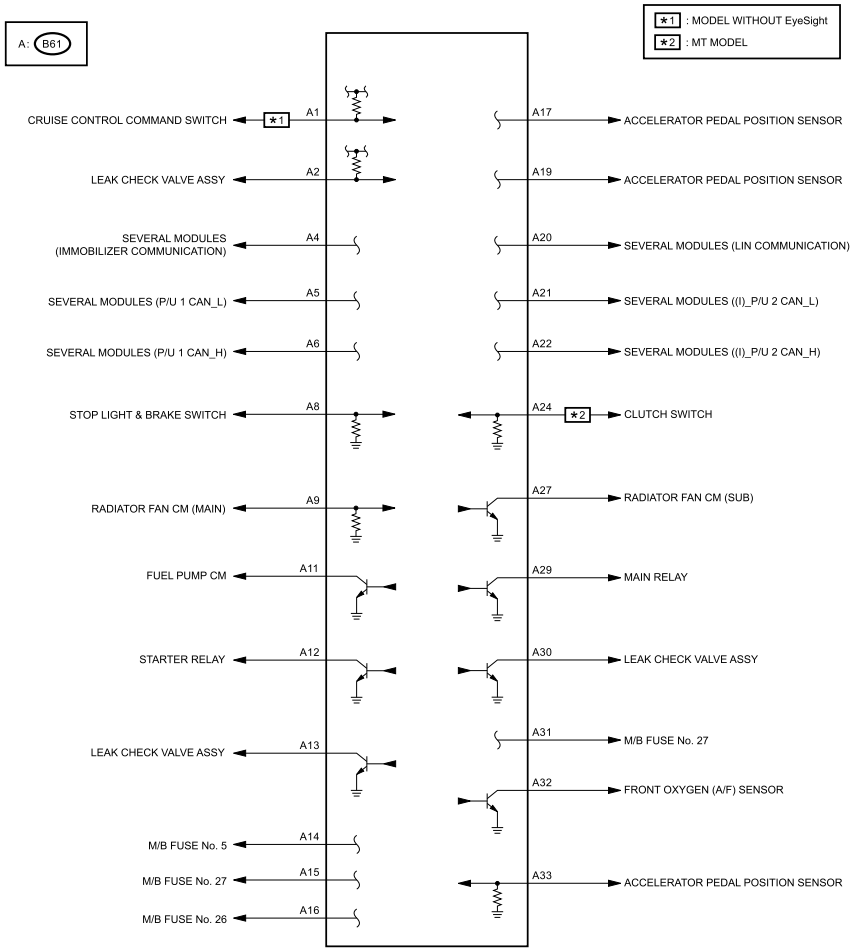


Measured terminal	Starter cut relay control (B61) No. 44 (+) — Engine ground 3 (B61) No. 63 (−):
	Starter relay control (B61) No. 12 (+) — Engine ground 3 (B61) No. 63 (−):
	Ignition switch (B61) No. 54 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	When engine is started

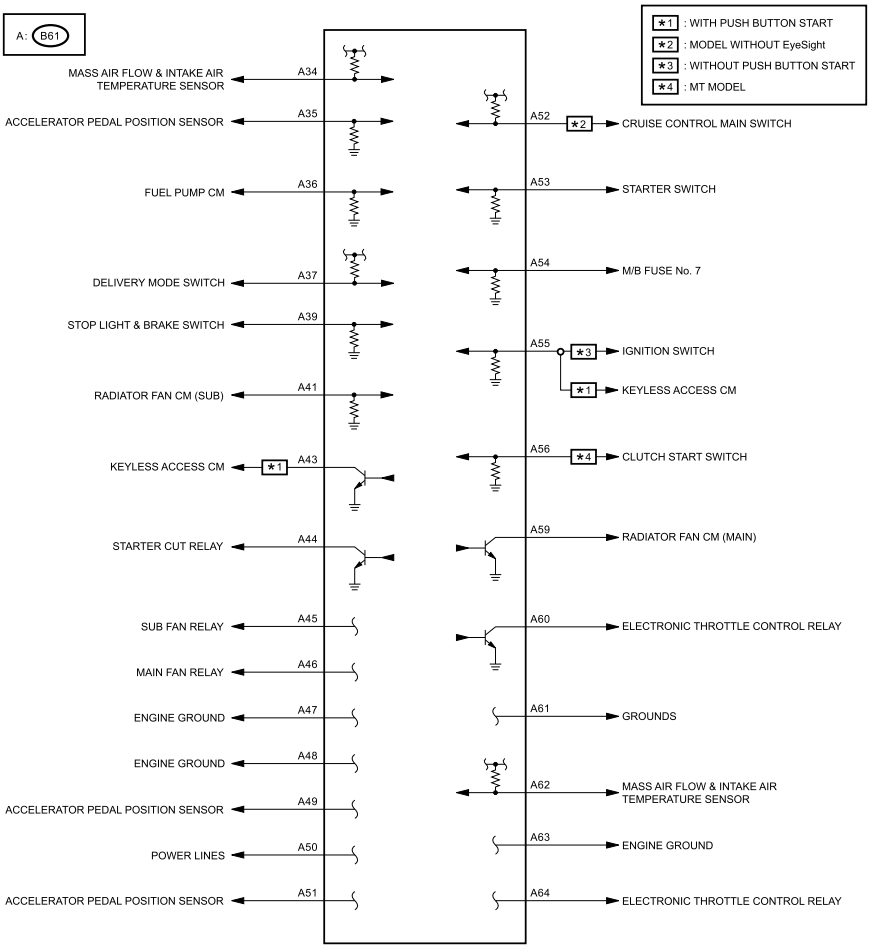
13. Waveform 13



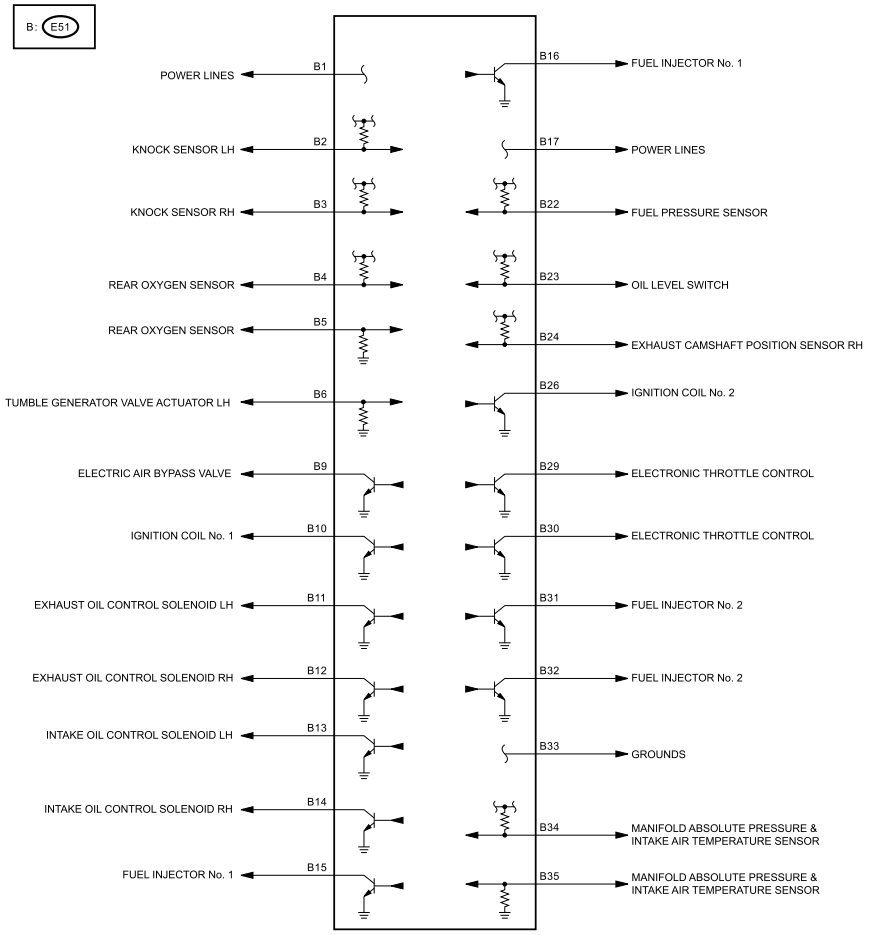
Measured terminal	Air flow sensor signal (B61) No. 62 (+) — Engine ground 3 (B61) No. 63 (−):
Measuring condition	While engine idling


A: B61
*1 : MODEL WITHOUT EyeSight
*2 : MT MODEL
CRUISE CONTROL COMMAND SWITCH
*1
A1
LEAK CHECK VALVE ASSY
A2
SEVERAL MODULES (IMMOBILIZER COMMUNICATION)
A4
SEVERAL MODULES (P/U 1 CAN_L)
A5
SEVERAL MODULES (P/U 1 CAN_H)
A6
STOP LIGHT & BRAKE SWITCH
A8
RADIATOR FAN CM (MAIN)
A9
FUEL PUMP CM
A11
STARTER RELAY
A12
LEAK CHECK VALVE ASSY
A13
M/B FUSE No. 5
A14
M/B FUSE No. 27
A15
M/B FUSE No. 26
A16
A17
ACCELERATOR PEDAL POSITION SENSOR
A19
ACCELERATOR PEDAL POSITION SENSOR
A20
SEVERAL MODULES (LIN COMMUNICATION)
A21
SEVERAL MODULES ((I)_P/U 2 CAN_L)
A22
SEVERAL MODULES ((I)_P/U 2 CAN_H)
A24
*2
CLUTCH SWITCH
A27
RADIATOR FAN CM (SUB)
A29
MAIN RELAY
A30
LEAK CHECK VALVE ASSY
A31
M/B FUSE No. 27
A32
FRONT OXYGEN (A/F) SENSOR
A33
ACCELERATOR PEDAL POSITION SENSOR

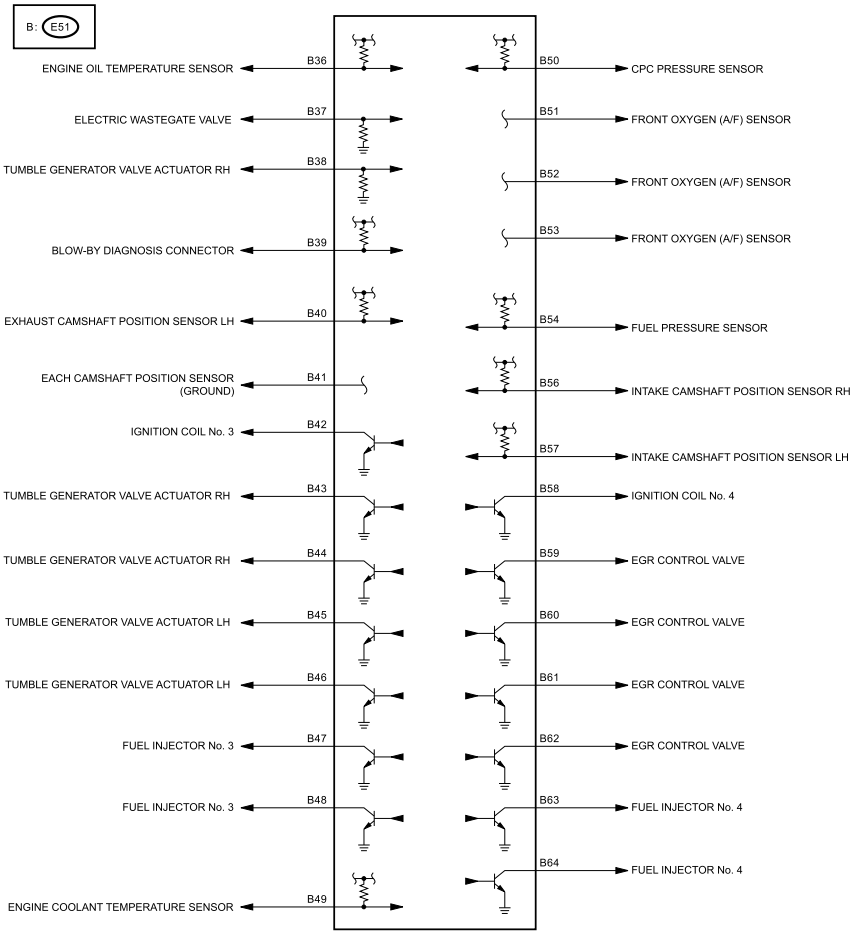
EN-25103


A: B61
*1 : WITH PUSH BUTTON START
*2 : MODEL WITHOUT EyeSight
*3 : WITHOUT PUSH BUTTON START
*4 : MT MODEL
MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR
A34
ACCELERATOR PEDAL POSITION SENSOR
A35
FUEL PUMP CM
A36
DELIVERY MODE SWITCH
A37
STOP LIGHT & BRAKE SWITCH
A39
RADIATOR FAN CM (SUB)
A41
KEYLESS ACCESS CM
*1
A43
STARTER CUT RELAY
A44
SUB FAN RELAY
A45
MAIN FAN RELAY
A46
ENGINE GROUND
A47
ENGINE GROUND
A48
ACCELERATOR PEDAL POSITION SENSOR
A49
POWER LINES
A50
ACCELERATOR PEDAL POSITION SENSOR
A51
A52
*2
CRUISE CONTROL MAIN SWITCH
A53
STARTER SWITCH
A54
M/B FUSE No. 7
A55
*3
IGNITION SWITCH
*1
KEYLESS ACCESS CM
A56
*4
CLUTCH START SWITCH
A59
RADIATOR FAN CM (MAIN)
A60
ELECTRONIC THROTTLE CONTROL RELAY
A61
GROUNDS
A62
MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR
A63
ENGINE GROUND
A64
ELECTRONIC THROTTLE CONTROL RELAY

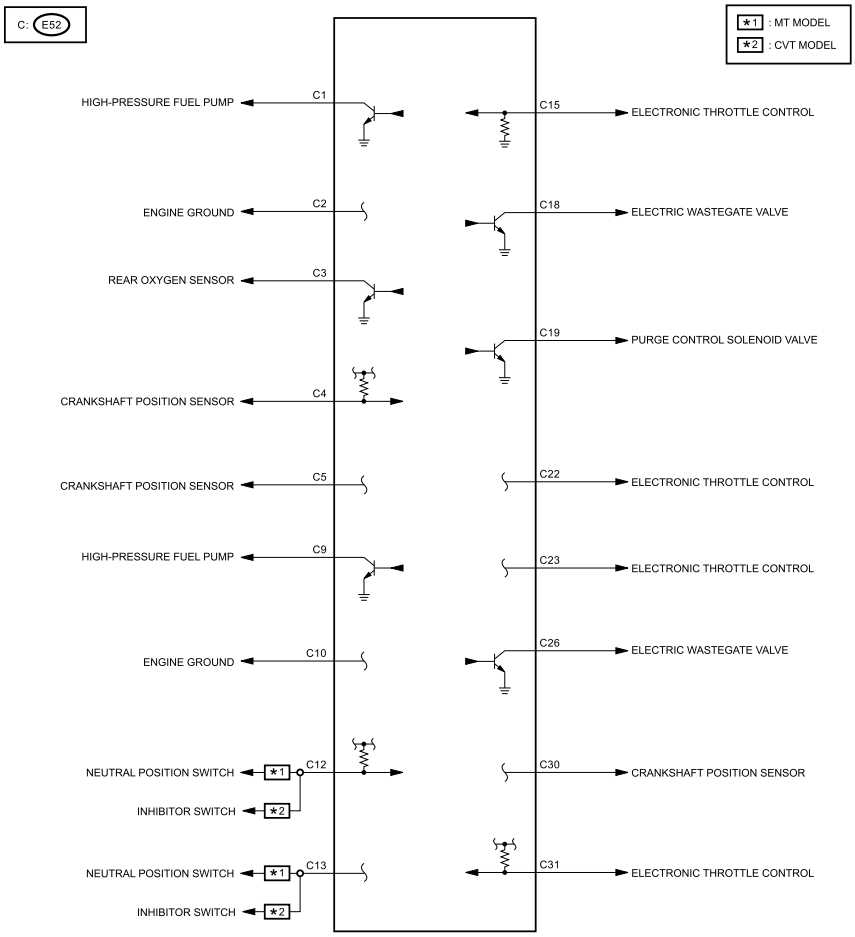
EN-25618


B: E51
POWER LINES
B1
KNOCK SENSOR LH
B2
KNOCK SENSOR RH
B3
REAR OXYGEN SENSOR
B4
REAR OXYGEN SENSOR
B5
TUMBLE GENERATOR VALVE ACTUATOR LH
B6
ELECTRIC AIR BYPASS VALVE
B9
IGNITION COIL No. 1
B10
EXHAUST OIL CONTROL SOLENOID LH
B11
EXHAUST OIL CONTROL SOLENOID RH
B12
INTAKE OIL CONTROL SOLENOID LH
B13
INTAKE OIL CONTROL SOLENOID RH
B14
FUEL INJECTOR No. 1
B15
B16
FUEL INJECTOR No. 1
B17
POWER LINES
B22
FUEL PRESSURE SENSOR
B23
OIL LEVEL SWITCH
B24
EXHAUST CAMSHAFT POSITION SENSOR RH
B26
IGNITION COIL No. 2
B29
ELECTRONIC THROTTLE CONTROL
B30
ELECTRONIC THROTTLE CONTROL
B31
FUEL INJECTOR No. 2
B32
FUEL INJECTOR No. 2
B33
GROUNDS
B34
MANIFOLD ABSOLUTE PRESSURE &
INTAKE AIR TEMPERATURE SENSOR
B35
MANIFOLD ABSOLUTE PRESSURE &
INTAKE AIR TEMPERATURE SENSOR

EN-25105


B: E51
ENGINE OIL TEMPERATURE SENSOR
B36
ELECTRIC WASTEGATE VALVE
B37
TUMBLE GENERATOR VALVE ACTUATOR RH
B38
BLOW-BY DIAGNOSIS CONNECTOR
B39
EXHAUST CAMSHAFT POSITION SENSOR LH
B40
EACH CAMSHAFT POSITION SENSOR (GROUND)
B41
IGNITION COIL No. 3
B42
TUMBLE GENERATOR VALVE ACTUATOR RH
B43
TUMBLE GENERATOR VALVE ACTUATOR RH
B44
TUMBLE GENERATOR VALVE ACTUATOR LH
B45
TUMBLE GENERATOR VALVE ACTUATOR LH
B46
FUEL INJECTOR No. 3
B47
FUEL INJECTOR No. 3
B48
ENGINE COOLANT TEMPERATURE SENSOR
B49
B50
CPC PRESSURE SENSOR
B51
FRONT OXYGEN (A/F) SENSOR
B52
FRONT OXYGEN (A/F) SENSOR
B53
FRONT OXYGEN (A/F) SENSOR
B54
FUEL PRESSURE SENSOR
B56
INTAKE CAMSHAFT POSITION SENSOR RH
B57
INTAKE CAMSHAFT POSITION SENSOR LH
B58
IGNITION COIL No. 4
B59
EGR CONTROL VALVE
B60
EGR CONTROL VALVE
B61
EGR CONTROL VALVE
B62
FUEL INJECTOR No. 4
B63
FUEL INJECTOR No. 4
B64

EN-25106


C: E52
*1 : MT MODEL
*2 : CVT MODEL
HIGH-PRESSURE FUEL PUMP
C1
ENGINE GROUND
C2
REAR OXYGEN SENSOR
C3
CRANKSHAFT POSITION SENSOR
C4
CRANKSHAFT POSITION SENSOR
C5
HIGH-PRESSURE FUEL PUMP
C9
ENGINE GROUND
C10
NEUTRAL POSITION SWITCH
*1
C12
INHIBITOR SWITCH
*2
NEUTRAL POSITION SWITCH
*1
C13
INHIBITOR SWITCH
*2
C15
ELECTRONIC THROTTLE CONTROL
C18
ELECTRIC WASTEGATE VALVE
C19
PURGE CONTROL SOLENOID VALVE
C22
ELECTRONIC THROTTLE CONTROL
C23
ELECTRONIC THROTTLE CONTROL
C26
ELECTRIC WASTEGATE VALVE
C30
CRANKSHAFT POSITION SENSOR
C31
ELECTRONIC THROTTLE CONTROL

EN-25144

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	Description & trouble part	Condition	Number of driving cycles on the detecting condition
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	—	—
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	—	—
B1576	ECM EEPROM	—	—
B1577	IMMOBILIZER CM EEPROM	—	—
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—	1
P0013	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—	1
P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—	1
P0023	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—	1
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	—	1
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	—	1
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	—	2
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	—	2
P003A	TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" POSITION EXCEEDED LEARNING LIMIT	—	2
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW	—	1
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	—	1
P0097	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW BANK 1	—	1
P0098	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT HIGH BANK 1	—	1
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	—	1
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	—	1
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	—	1
P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	—	1
P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	—	1
P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	—	1
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	—	1
P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	—	1
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	—	1
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	—	1

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	—	1
P0132	A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1	—	1
P0191	FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1	—	2
P0192	FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1	—	1
P0193	FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1	—	1
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	—	1
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	—	1
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	—	1
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	—	1
P0230	FUEL PUMP PRIMARY CIRCUIT	—	2
P023F	FUEL PUMP SECONDARY CIRCUIT/OPEN	—	1
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	—	1
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	—	1
P0332	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2	—	1
P0333	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2	—	1
P0335	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	—	1
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—	2
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR	—	1
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	—	1
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	—	1
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	—	1
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0365	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1	—	1
P0366	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1	—	1
P0390	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2	—	1
P0391	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2	—	1
P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	—	2
P0480	FAN 1 CONTROL CIRCUIT	—	2
P0481	FAN 2 CONTROL CIRCUIT	—	2
P04DB	CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED	—	1
P0512	STARTER (SWITCH) REQUEST CIRCUIT	—	1
P0560	SYSTEM VOLTAGE	—	1
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	—	1
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	—	1
P0606	CONTROL MODULE PROCESSOR	—	1

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	—	1
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	—	1
P0616	STARTER RELAY "A" CIRCUIT LOW	—	1
P0617	STARTER RELAY "A" CIRCUIT HIGH	—	1
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	—	1
P065A	GENERATOR/ALTERNATOR SYSTEM PERFORMANCE	—	1
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	—	2
P06B1	SENSOR POWER SUPPLY "A" CIRCUIT LOW	—	1
P06B2	SENSOR POWER SUPPLY "A" CIRCUIT HIGH	—	1
P06B4	SENSOR POWER SUPPLY "B" CIRCUIT LOW	—	1
P06B5	SENSOR POWER SUPPLY "B" CIRCUIT HIGH	—	1
P081A	STARTER DISABLE CIRCUIT LOW	—	1
P0A3B	GENERATOR/ALTERNATOR OVER TEMPERATURE	—	1
P1134	A/F / O2 SENSOR BANK1 SENSOR1 SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION	—	1
P1160	THROTTLE RETURN SPRING	—	1
P1192	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW	—	1
P1193	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH	—	1
P1236	FUEL INJECTOR DRIVER SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION	—	1
P1C00	BATTERY MONITOR MODULE "A" PERFORMANCE	—	1
P1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	—	—
P2009	TGV CONTROL CIRCUIT LOW BANK 1	—	1
P2012	TGV CONTROL CIRCUIT LOW BANK 2	—	1
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	—	1
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	—	1
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	—	1
P2022	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2	—	1
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	—	1
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	—	1
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	—	1
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	—	1
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	—	1
P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW	—	1
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	—	1
P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	—	1
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	—	1
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION	—	1
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	—	1

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P2146	FUEL INJECTOR GROUP "A" SUPPLY VOLTAGE CIRCUIT/OPEN	—	1
P2226	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT	—	1
P2228	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT LOW	—	1
P2229	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT HIGH	—	1
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	—	1
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW	—	1
P24BA	EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT LOW	—	1
P24BB	EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT HIGH	—	1
P24D7	EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW	—	1
P24D8	EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT HIGH	—	1
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—	1
P2564	TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT LOW	—	1
P2565	TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT HIGH	—	1
U0073	CONTROL MODULE COMMUNICATION BUS OFF	—	1
U0077	LIN COMMUNICATION BUS "ECM/PCM" OFF	—	1
U007B	CONTROL MODULE COMMUNICATION BUS "I" OFF	—	1
U0101	LOST COMMUNICATION WITH TCM	—	1
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—	1
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	—	1
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	—	1
U0146	LOST COMMUNICATION WITH SERIAL DATA GATEWAY MODULE "A"	—	1
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	—	1
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—	1
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	—	1
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	—	1
U0402	INVALID DATA RECEIVED FROM TCM	—	1
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—	1
U0420	INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE	—	1
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	—	1
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—	1
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	—	1
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	—	1
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	—	1

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
U1129	LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE PU-CAN	—	1
U1235	LOST COMMUNICATION WITH EyeSight	—	1
U1418	INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-CAN	—	1
U1433	INVALID DATA RECEIVED FROM EyeSight	—	1
U1712	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE	—	1
U171F	LOST LIN COMMUNICATION WITH GENERATOR	—	1
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	—	1
U1C08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	—	1
U1C0C	INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS	—	1
U1D00	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	—	1
U1D08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	—	1
U1D0C	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS	—	1
U1E00	LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS	—	1
U1E08	LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS	—	1
U1E0C	LOST COMMUNICATION OF AUTHENTICATION DATA WITH EYESIGHT PU-BUS	—	1

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Start the engine, and let it idle for 10 seconds or more.
4. Read the readiness code of [Engine] using Subaru Select Monitor and check that the concerned self-diagnosis is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>All Readiness Diagnostic Code(s).
5. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

2. INSPECTION MODE A

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Complete diagnosis with inspection mode B as well.	1
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Complete diagnosis with inspection mode B as well.	1
P0128	COOLANT THERMOSTAT (COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	—	2
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—	2
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—	2
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	—	2
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—	2

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—	2
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—	2
P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—	2
P0171	SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode B as well.	2
P0172	SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode B as well.	2
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Complete diagnosis with inspection mode B as well.	2
P0301	CYLINDER 1 MISFIRE DETECTED	Complete diagnosis with inspection mode B as well.	2
P0302	CYLINDER 2 MISFIRE DETECTED	Complete diagnosis with inspection mode B as well.	2
P0303	CYLINDER 3 MISFIRE DETECTED	Complete diagnosis with inspection mode B as well.	2
P0304	CYLINDER 4 MISFIRE DETECTED	Complete diagnosis with inspection mode B as well.	2
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	—	2
P0562	SYSTEM VOLTAGE LOW	—	1
P0563	SYSTEM VOLTAGE HIGH	—	1
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode B as well.	2
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode B as well.	2
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1	—	2
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1	—	2
P2227	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—	2
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	—	2
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	—	2

Warning:
When performing inspection mode A on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive for 20 minutes or more at a constant speed of 80 km/h (50 MPH) or more.
4. Stop the vehicle and idle for one minute.
5. Read the readiness code of [Engine] using Subaru Select Monitor and check that the concerned self-diagnosis is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>All Readiness Diagnostic Code(s).
6. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

3. INSPECTION MODE B

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Complete diagnosis with inspection mode A as well.	1
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Complete diagnosis with inspection mode A as well.	1
P0130	A/F / O2 SENSOR CIRCUIT BANK 1 SENSOR 1	—	1
P0137	O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2	—	2
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	—	2
P0140	O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 2	—	2
P0171	SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode A as well.	2
P0172	SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode A as well.	2
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Complete diagnosis with inspection mode A as well.	2
P0301	CYLINDER 1 MISFIRE DETECTED	Complete diagnosis with inspection mode A as well.	2
P0302	CYLINDER 2 MISFIRE DETECTED	Complete diagnosis with inspection mode A as well.	2
P0303	CYLINDER 3 MISFIRE DETECTED	Complete diagnosis with inspection mode A as well.	2
P0304	CYLINDER 4 MISFIRE DETECTED	Complete diagnosis with inspection mode A as well.	2
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—	1
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	—	2
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	—	2
P062D	FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1	—	1

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	—	1
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	CVT model	2
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	CVT model	2
P1261	CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P1262	CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P1263	CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P1264	CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P162A	STARTER INTERLOCK INTERNAL CIRCUIT	—	—
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode A as well.	2
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode A as well.	2

Warning:
When performing inspection mode B on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive at 10 km/h (6 MPH) or more.
4. Stop the vehicle and idle for ten minutes.
5. Read the readiness code of [Engine] using Subaru Select Monitor and check that the concerned self-diagnosis is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>All Readiness Diagnostic Code(s).
6. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

4. INSPECTION MODE H

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	• 6 hours or more 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.	2
P0096	INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE BANK 1		2
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1		2
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE		2
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE		2
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	—	2
P050B	COLD START IGNITION TIMING PERFORMANCE	—	2
P24B9	EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE	60 seconds or more have elapsed since ignition switch is OFF.	2

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P24D6	EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE	—	2
P2B08	COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE	—	2
P2B09	COLD START CYLINDER 2 INJECTION PULSE PERFORMANCE	—	2
P2B0A	COLD START CYLINDER 3 INJECTION PULSE PERFORMANCE	—	2
P2B0B	COLD START CYLINDER 4 INJECTION PULSE PERFORMANCE	—	2

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. With the ignition switch ON (engine stopped), read the values in [Coolant Temp.] and [IAT Sensor #11]. Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
4. If the values from step 3) 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.**
   - **For CVT models, hold the select lever to "P" range or "N" range at idling, and for MT models, the gear shift lever in the neutral position at idling.**
5. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

5. INSPECTION MODE J

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	—	2

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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. Idle the engine for 15 minutes or more.
3. Turn the ignition switch to OFF.
4. After at least 10 hours passed from the start of step 3), read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

6. INSPECTION MODE N

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	[Coolant Temp.]: 80°C (176°F) or more	2
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A		2

Warning:
When performing inspection mode N on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

4. While the conditions in the list are satisfied, race the engine at the speed of approx. 2500 rpm for 40 seconds or more.
5. Start to move the vehicle, then accelerate the vehicle to vehicle speed 50 km/h (31.1 MPH) or more.
6. When the vehicle 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.

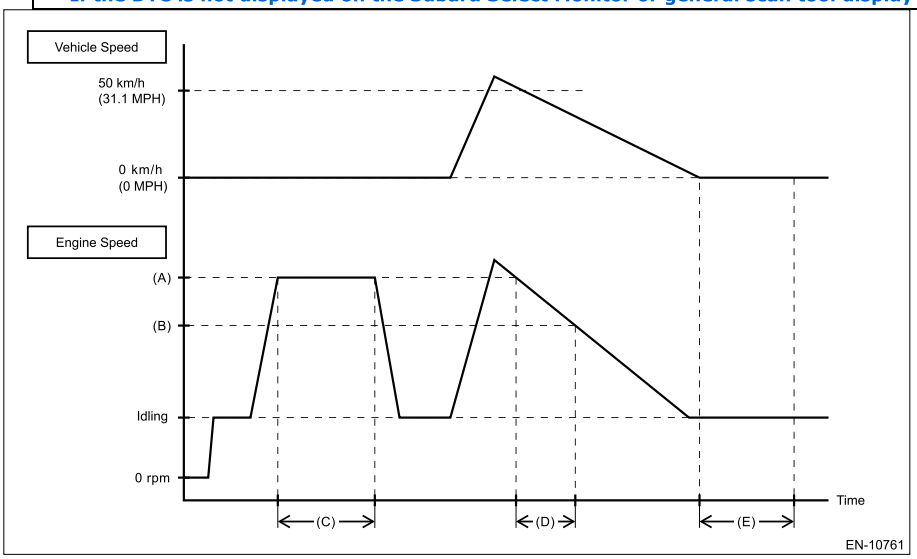
Note:
- **The vehicle speed does not matter so long as the engine speed can maintain from 2500 rpm to 1900 rpm for 5 seconds or more.**
  Example: On a downhill grade, it can be performed with a low speed gear and at a low vehicle speed.
- **When it is performed with the electrical load such as the air 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.**

7. 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.

8. Read the readiness code of [Engine] using Subaru Select Monitor and check that the concerned self-diagnosis is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>All Readiness Diagnostic Code(s).
9. With the vehicle idling, read the pending code of DTC using Subaru Select Monitor or general scan tool.

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **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

7. INSPECTION MODE O

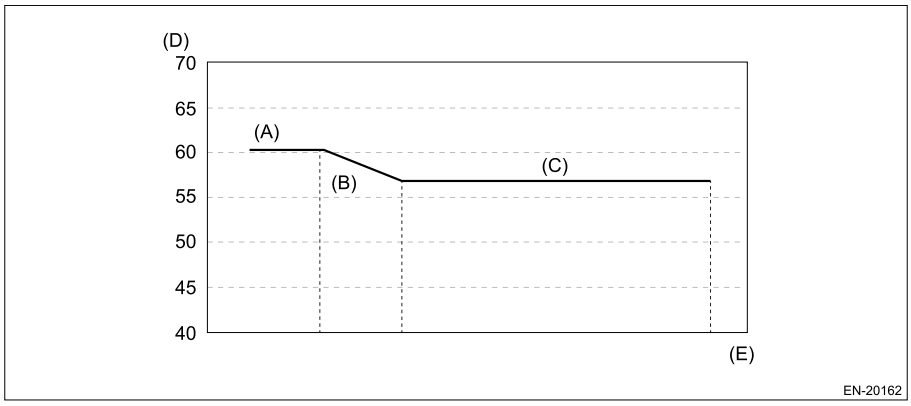
DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	—	2
P04F1	EVAP SYSTEM LOW PRESSURE PURGE LINE PERFORMANCE	—	2

Warning:
When performing inspection mode O on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

3. Drive according to the drive pattern described below.



(A) Drive the vehicle at a vehicle speed of 60 km/h (37 MPH) or more 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.

4. Park the vehicle on a safe place.

Note:
Driving method while vehicle is driven to a stop at safe place is not restricted.

5. With the vehicle idling, read the pending code of DTC using Subaru Select Monitor or general scan tool.

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **If the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.**

8. INSPECTION MODE Q

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0017	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B	[Coolant Temp.]: 80°C (176°F) or more	2
P0019	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B	[Coolant Temp.]: 80°C (176°F) or more	2

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Idle the engine for at least one minute.
4. Read the pending code of DTC using the Subaru Select Monitor or general scan tool.

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **If the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.**

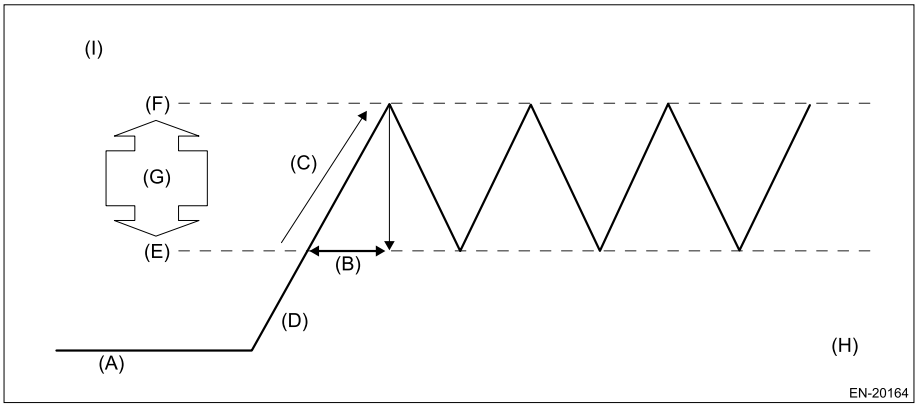
9. INSPECTION MODE R

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P219A	BANK 1 AIR-FUEL RATIO IMBALANCE	—	2

Warning:
When performing inspection mode R on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Keep the engine at idle for at least 30 seconds in a fully warm-up condition.
4. Start the driving.
5. With the gear position in the 4th in the manual mode for CVT model, and in the 4th for MT model, take 10 seconds to accelerate from 1500 rpm to 4000 rpm.
6. Decelerate to 1500 rpm in the 4th gear position. (There is no restrictions to the deceleration duration and how to use the brake.)
7. Repeat steps 5) and 6) 10 times. (End when the pending code is acquired.)



(A) Idle the engine for at least 30 seconds in a fully warm-up condition.
(B) 10 seconds
(C) Accelerating
(D) Engine speed
(E) 1500 rpm
(F) 4000 rpm
(G) Accelerate and decelerate in the 4th gear position in the manual mode.
(H) Time
(I) Accelerating and decelerating

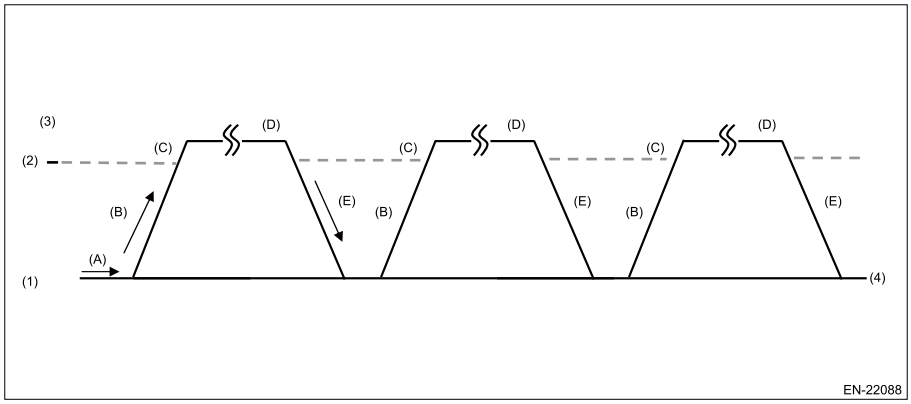
10. INSPECTION MODE S

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0033	TURBOCHARGER/SUPERCHARGER BYPASS VALVE "A" CONTROL CIRCUIT	—	1
P1378	PRE-IGNITION DETECTED	—	1
P2B00	CYLINDER 1 INJECTION PULSE PERFORMANCE	—	2
P2B01	CYLINDER 2 INJECTION PULSE PERFORMANCE	—	2
P2B02	CYLINDER 3 INJECTION PULSE PERFORMANCE	—	2
P2B03	CYLINDER 4 INJECTION PULSE PERFORMANCE	—	2

Warning:
When performing inspection mode S on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h (0 MPH)
(2) 65 km/h (40.4 MPH)
(3) Vehicle speed
(4) Time
(A) Idle the engine for five seconds or more.
(B) Accelerating
(C) Vehicle speed exceeds 65 km/h (40.4 MPH).
(D) Driving time (There is no restriction for driving time.)
(E) Deceleration (There is no specified deceleration method.)

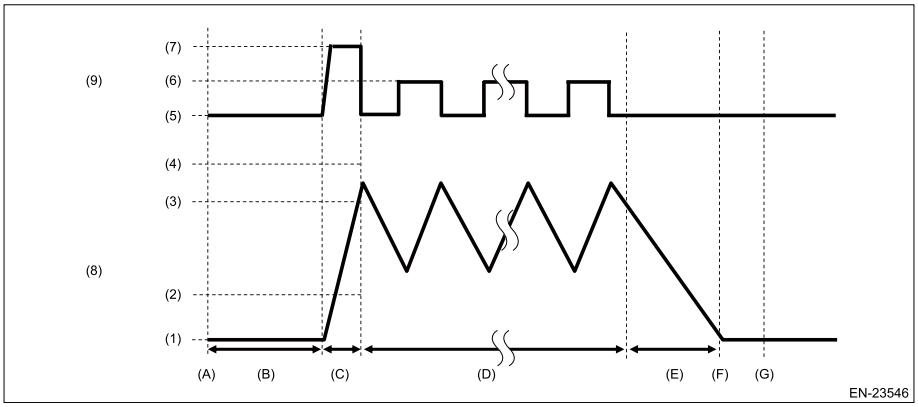
4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

11. INSPECTION MODE T

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	[Coolant Temp.]: 70°C (158°F) or more	2
P000B	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 1		2
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2		2
P000D	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 2		2
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1		2
P0014	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1		2
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2		2
P0024	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2		2
P0045	TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT/OPEN		1
P0047	TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT LOW		1

Warning:
When performing inspection mode T on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h (0 MPH)
(2) 20 km/h (12.4 MPH)
(3) 60 km/h (37.3 MPH)
(4) 80 km/h (49.7 MPH)
(5) 0%
(6) 20%
(7) 30 — 60 %
(8) Vehicle speed
(9) Accelerator pedal opening angle

(A) Start the engine.
(B) Idle the engine for at least three minutes.
(C) Accelerate the vehicle to 60 km/h (37.3 MPH).
(D) While maintaining vehicle speed at 60 km/h (37.3 MPH) as a reference, repeat the accelerator opening 0% (5 seconds) ←→ 20% (5 seconds) for 20 minutes or more.
(E) Fully release the accelerator pedal to decelerate the vehicle for at least 5 seconds.
(F) Stop the vehicle. (Driving method while vehicle is driven to a stop at safe place is not restricted)
(G) Stop the engine.

Note:
In pattern (D), it is acceptable to stop the vehicle depending on the traffic conditions. Drive the vehicle with the accelerator opening angle of 0% (5 seconds) ←→ 20% (5 seconds) for an accumulated duration of 20 minutes or more.

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

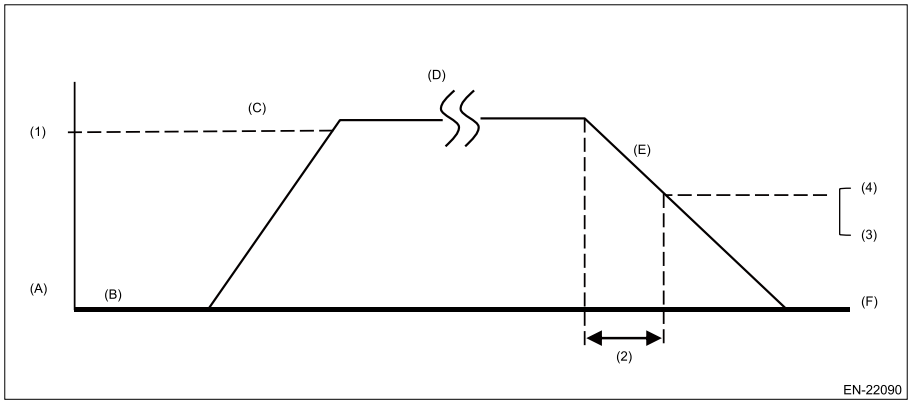
12. INSPECTION MODE U

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0401	EGR ABNORMAL (EGR AMOUNT TOO SMALL)	—	2
P0402	EGR "A" FLOW EXCESSIVE DETECTED	—	2

Warning:
When performing inspection mode U on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) Vehicle speed 60 km/h (37.3 MPH)
(2) Deceleration for 10 seconds or more (There is no restriction to the driving operation)
(3) Vehicle speed 40 km/h (24.9 MPH)
(4) Engine speed 1300 rpm or more

(A) Start the engine.
(B) Idle the engine for 20 seconds or more.
(C) Accelerate the vehicle to 60 km/h (37.3 MPH). (There is no restriction to the driving operation.)
(D) Drive at a constant speed. (Step (D) may be omitted according to road conditions.)
(E) With the accelerator pedal fully closed, decelerate the vehicle speed while taking at least 10 seconds and maintaining the vehicle speed at 40 km/h (24.9 MPH) or more as well as the engine speed 1300 rpm or more.
(F) Park the vehicle and stop the engine. (Driving method while vehicle is driven to a stop at safe place is not restricted.)

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

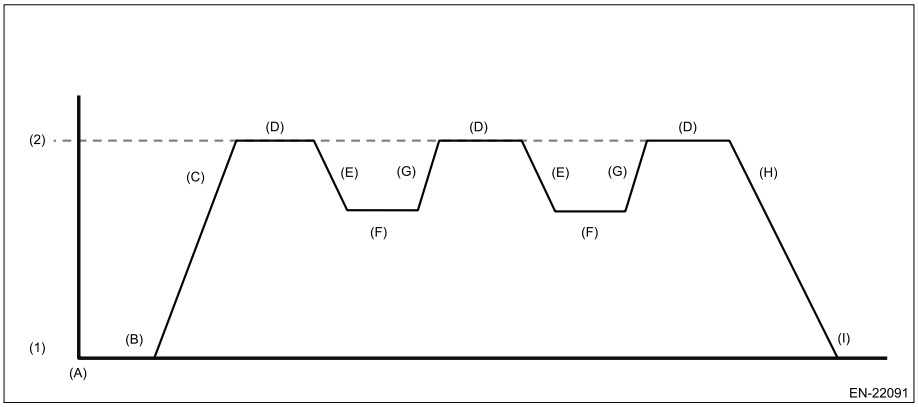
13. INSPECTION MODE V

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	—	2

Warning:
When performing inspection mode V on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) Vehicle speed 0 km/h (0 MPH)
(2) Vehicle speed 60 km/h (37 MPH)

(A) Start the engine.
(B) Idle the engine for at least five minutes.
(C) Accelerate the vehicle to 60 km/h (37 MPH).
(D) Using the Subaru Select Monitor, check the [Catalyst Temperature #11] value and drive at a constant speed of 60 km/h (37 MPH) until 475°C (887°F) or more is reached.
(E) From the state where [Catalyst Temperature #11] value is 475°C (887°F) or more and the vehicle speed is 60 km/h (37 MPH), change the accelerator opening angle to 0% to perform fuel cut for at least 5 seconds.
(F) Drive the vehicle with 10 to 20 % of the accelerator opening angle for at least 10 seconds.
(G) Accelerate the vehicle to 60 km/h (37 MPH).
(H) From the state where [Catalyst Temperature #11] value is 475°C (887°F) or more and the vehicle speed is 60 km/h (37 MPH), change the accelerator opening angle to 0% to stop the vehicle with fuel cut for at least 5 seconds.
(I) Idle the engine for 20 seconds or more.

Note:
- **The condition of acceleration or constant driving can be changed according to different traffic conditions.**
- **If diagnostic values have not been input after driving, repeat the cycle from step (C) without stopping the engine.**

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

14. INSPECTION MODE W

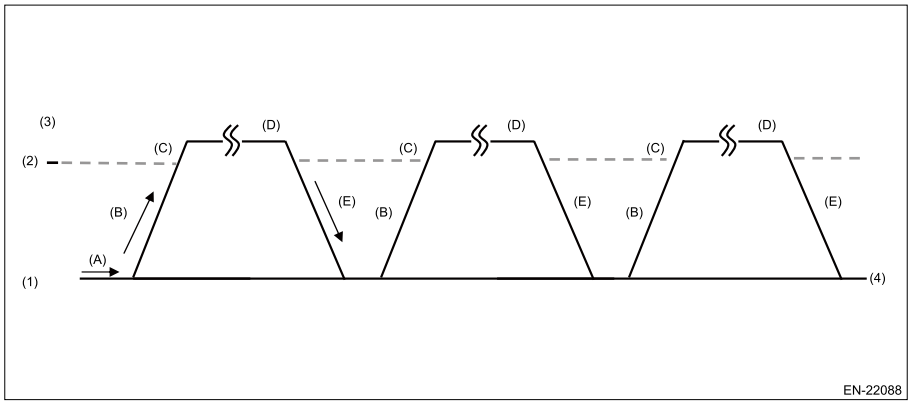
DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	—	1
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	—	1
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	—	1
P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	—	1
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	—	1
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	—	1
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	—	1
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	—	1
P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	—	1

Warning:
When performing inspection mode W on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h (0 MPH)
(2) 45 km/h (27 MPH)
(3) Vehicle speed
(4) Time
(A) Idle the engine for five seconds or more.
(B) Accelerating
(C) Vehicle speed exceeds 45 km/h (27 MPH).
(D) Driving time (There is no restriction for the time)
(E) Deceleration (There is no specified deceleration method)

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

15. INSPECTION MODE X

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P2004	TGV CONTROL STUCK OPEN BANK 1	—	1
P2005	TGV CONTROL STUCK OPEN BANK 2	—	1
P2006	TGV CONTROL STUCK CLOSED BANK 1	—	1
P2007	TGV CONTROL STUCK CLOSED BANK 2	—	1

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Start the engine.
4. Shift the select lever to "P" range (CVT model), or the gear shift lever to the neutral position (MT model), and race the engine for 10 seconds or more.

Note:
Keep Engine speed at 3500 rpm or more.

5. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

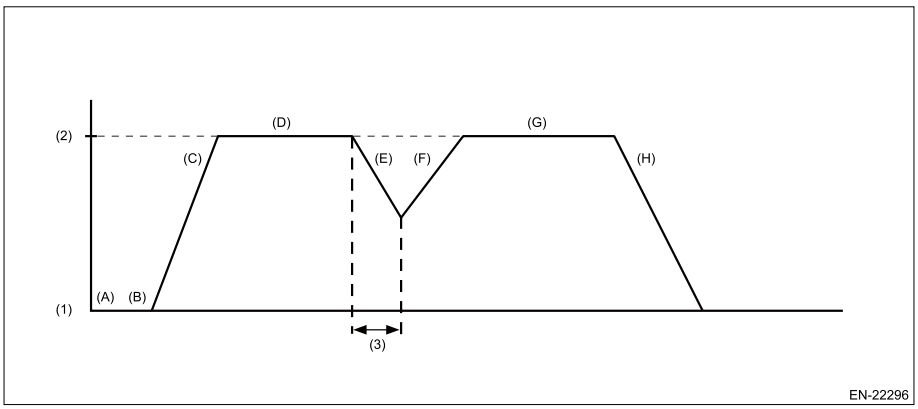
16. INSPECTION MODE Y

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—	2
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—	2

Warning:
When performing inspection mode Y on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) Vehicle speed 0 km/h (0 MPH)
(2) Vehicle speed 60 km/h (37 MPH)
(3) 10 seconds
(A) Start the engine.
(B) Idle the engine for at least five minutes.
(C) Accelerate the vehicle to 60 km/h (37 MPH).
(D) Drive the vehicle at a constant speed of 60 km/h (37 MPH).
(E) From the state where the vehicle speed is 60 km/h (37 MPH), change the accelerator opening angle to 0% to perform fuel cut for 10 seconds.
(F) Accelerate the vehicle to 60 km/h (37 MPH).
(G) Drive the vehicle at a constant speed of 60 km/h (37 MPH).
(H) Slow down and stop the vehicle.

Note:
- **The condition of acceleration or constant driving can be changed according to different traffic conditions.**
- **If diagnostic values have not been input after driving, repeat the cycle from step (C) without stopping the engine.**
- **Cruise control should not be used.**

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

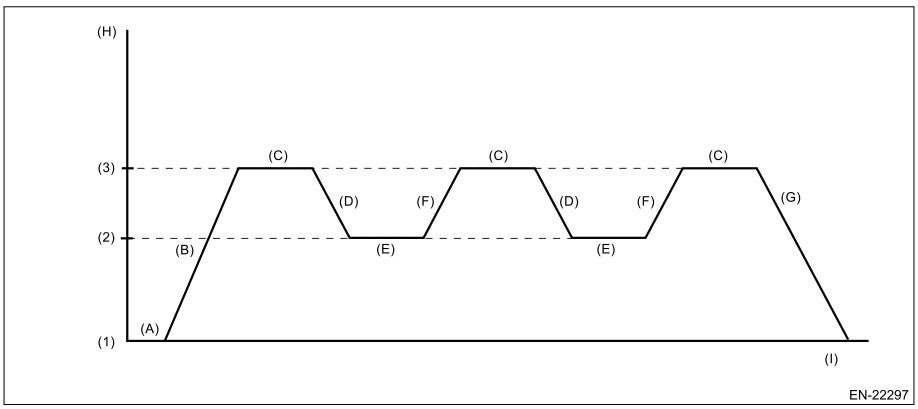
17. INSPECTION MODE Z

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	—	2
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	—	2
P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—	2
P0244	TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE	—	2
P04F0	EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE	During acceleration, depress the pedal with the accelerator opening angle of 50% as a reference.	2

Warning:
When performing inspection mode Z on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1)	0 km/h (0 MPH)	(2)	60 km/h (37 MPH)	(3)	88 km/h (55 MPH)
(A)	Shift the select lever to "P" range, and let the engine idle for 10 seconds or more. (CVT model) Place the gear shift lever in neutral position, and let the engine idle for 10 seconds or more. (MT model)	(D)	Decelerate the vehicle speed to 60 km/h (37 MPH) with fully closed throttle.	(G)	Stop vehicle with the throttle fully closed.
(B)	Accelerate with the throttle half-open to 88 km/h (55 MPH) or more.	(E)	Drive for 20 seconds or more at 60 km/h (37 MPH) or less.	(H)	Vehicle speed
(C)	Drive for 20 seconds or more at 88 km/h (55 MPH) or more.	(F)	Accelerate with the throttle half-open to 88 km/h (55 MPH) or more.	(I)	Sec.

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

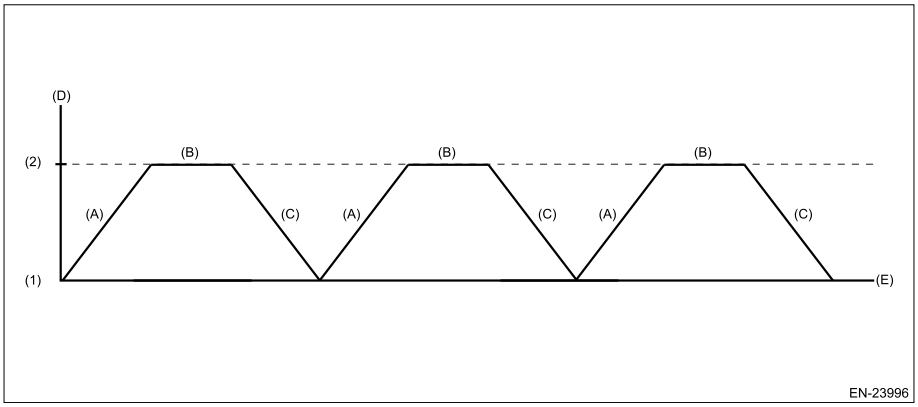
18. INSPECTION MODE AA

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	—	2

Warning:
When performing inspection mode AA on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h (0 MPH)
(2) 60 km/h (37 MPH)
(A) Accelerate the vehicle to 60 km/h (37 MPH). (Sudden acceleration prohibited)
(B) Drive the vehicle at a constant speed for 3 minutes.
(C) Decelerating
(D) Vehicle speed
(E) Driving duration

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

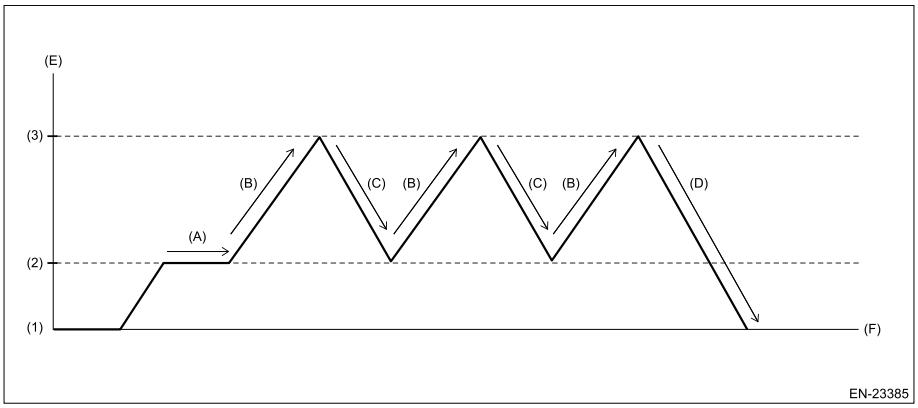
19. INSPECTION MODE AB

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0234	TURBOCHARGER/SUPERCHARGER "A" OVERBOOST CONDITION	—	2
P0299	TURBOCHARGER/SUPERCHARGER "A" UNDERBOOST CONDITION	—	2
P226B	TURBOCHARGER/SUPERCHARGER BOOST PRESSURE TOO HIGH - MECHANICAL	—	1

Warning:
When performing inspection mode AB on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h (0 MPH)
(2) 30 km/h (18.6 MPH)
(3) 80 km/h (50 MPH)
(A) Accelerate and drive at a constant speed of 30 km/h
(C) Decrease the speed to 30 km/h (18.6 MPH) while
(E) Vehicle speed

(18.6 MPH) with the gear in 3rd speed.
(For CVT models, keep the gear in 3rd speed of the manual mode)

(B) Accelerate with fully open throttle to 80 km/h (50 MPH) without shifting.

(D) Slow down and stop the vehicle.

holding the gear in 3rd speed.

(F) Driving duration

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

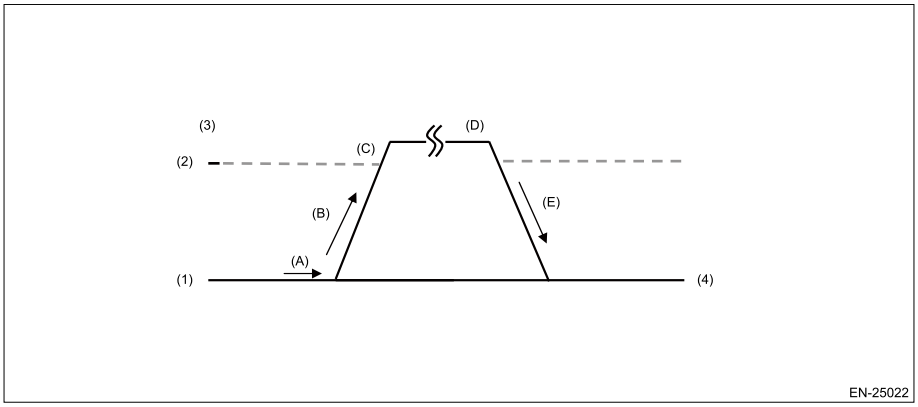
20. INSPECTION MODE AX

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	MT model	2
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	MT model	2

Warning:
When performing inspection mode AX on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Note:
Perform the inspection mode after warming up the engine except that the engine coolant temperature at engine start is specified.

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, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h (0 MPH)
(2) 65 km/h (40 MPH)

(3) Vehicle speed

(4) Time

(A) Idle the engine for five seconds or more.

(B) Acceleration (Keep in the 5th gear position or higher with the vehicle speed up to 60 km/h (37.2 MPH) as a reference.)

(C) Vehicle speed exceeds 65 km/h (40.4 MPH).

(D) Driving time (There is no restriction for driving time.)

(E) Deceleration (There is no specified deceleration method.)

4. Read the pending code using the Subaru Select Monitor or general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

21. INSPECTION MODE AY

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	• [Coolant Temp.] 5 — 45 °C (41	2

DTC	Description & trouble part	Condition	Number of driving cycles on the detecting condition
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)	— 113 °F) • [Intake Air Temperature]: 5 — 50 °C (41 — 122 °F)	2
P04AE	EVAP SYSTEM PURGE CONTROL VALVE "B" PERFORMANCE/STUCK OPEN		2
P1451	EVAP SYSTEM CLOG DETECTED (PIPE)		2
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH		1
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE		2
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH		1

Warning:
When performing inspection mode AY on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

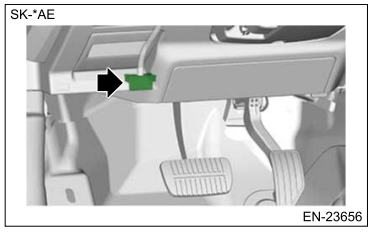
Caution:
Be careful of the state of the battery when performing the inspection mode AY consecutively. Performing the inspection mode AY consecutively without the engine running may cause a low battery voltage and battery discharge.

Note:
- **If it is necessary to perform inspection mode AY consecutively, drive the vehicle under the following conditions to release accumulated evaporating gas. Performing the inspection mode AY consecutively without starting the engine causes a large amount of evaporating gas to accumulate in the canister, which hinders an accurate diagnosis.**
  - **After warming-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 inspection mode AY. 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 inspection mode AY. 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 inspection mode AY. 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.**

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. Prepare PC with Subaru Select Monitor installed.
3. Connect the USB cable to the interface for Subaru Select Monitor (such as DST-i and DST-010) 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 the interface for Subaru Select Monitor (such as DST-i and DST-010).
5. Connect the interface for Subaru Select Monitor (such as DST-i and DST-010) 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 [Start] screen, select [Generic OBDII].
9. On [Select System] screen, select [Evaporative System Leak Test].
10. On [Evaporative System Leak Test] screen, select [Evaporative System Leak Test].
11. On [Evaporative System Leak Test is running. Press Cancel to exit this function.] screen, click the [OK] button to perform evaporative system leak test.
12. 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] screen is displayed, use the Subaru Select Monitor to check that the values of [Coolant Temp.] and [Intake Air Temp.] meet the criteria. If the conditions are satisfied, clear the memory. Ref. to COMMON (DIAGNOSTICS)>Clear memory.**

13. After 30 minutes passed from the start of step 12), click the [OK] button to return to the [Evaporative System Leak Test] display.
14. Return to the [OBD System] screen, and select [OBD Mode test results].
15. Check TID $C1 — $CA of MID $3C and TID $EC of MID $3D in [OBD Mode test results].

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.

16. 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 COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:
- **Perform MODE $07 when using a general scan tool.**
- **The pending code will be cleared by turning ignition switch to OFF.**

ENGINE (DIAGNOSTICS)(H4DOTC) > Warning Light Illumination Pattern

PROCEDURE

1. Activation of malfunction indicator light Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Warning Light Illumination Pattern>ACTIVATION OF MALFUNCTION INDICATOR LIGHT.
↓
2. Malfunction indicator light does not come on Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Warning Light Illumination Pattern>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.
↓
3. Malfunction indicator light does not go off Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Warning Light Illumination Pattern>MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF.

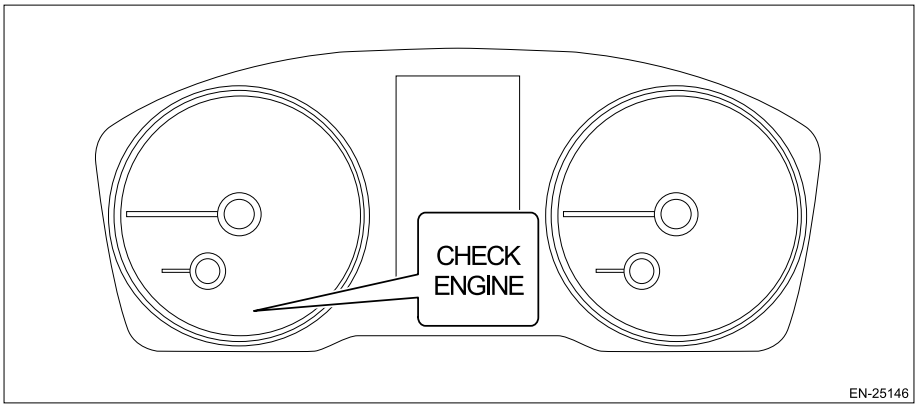
ENGINE (DIAGNOSTICS)(H4DOTC) > Warning Light Illumination Pattern

ACTIVATION OF MALFUNCTION INDICATOR LIGHT

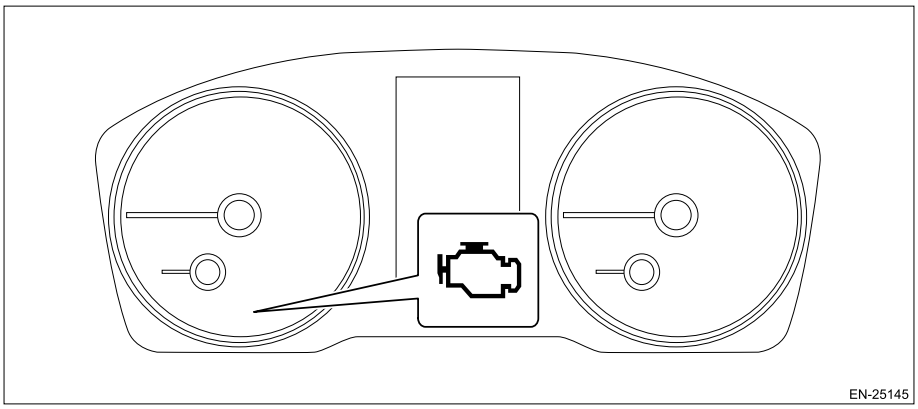
1. When the ignition switch is turned to ON (engine OFF), the malfunction indicator light in the combination meter illuminates.

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)>Warning Light Illumination Pattern>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.

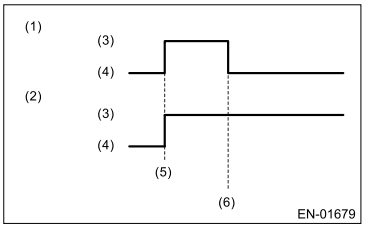
- For U4



- For C0

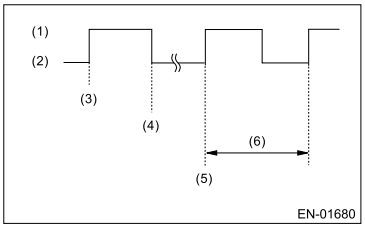


2. After starting the engine, the malfunction indicator light goes out. If it does not go off, any of the engine and emission control system has malfunction.



(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)(H4DOTC) > Warning Light Illumination Pattern

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)(H4DOTC) > Warning Light Illumination Pattern

MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

Diagnosis:
The malfunction indicator light circuit is shorted.
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.

Read the DTC of [Engine] and LAN system using the Subaru Select Monitor or a general scan tool. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Engine] or LAN system displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the combination meter system. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

OPERATION

Note:
- **For detailed operation procedures, refer to "Common (Diagnostics)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Data Monitor>LIST.**

LIST

Note:
Some items are not displayed according to the specifications.

Item	Contents	Note (at idling)	Unit
Engine Speed	Value calculated from crankshaft position sensor output value.	707	rpm
Mass Air Flow	Value calculated from air flow sensor output value.	3.8 or 0.5	g/s or lb/min
Mass Air Flow Average	Value calculated from air flow sensor output value.	3.8 or 0.5	g/s or lb/min
Vehicle Speed	Value calculated from vehicle speed sensor output value.	0	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	14	%
Accel. Opening Angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	0	%
A/F Sensor #1	Actual lambda value calculated from the front oxygen (A/F) sensor output value.	0.99	—
Ignition timing adv. #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.	−3	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	91 or 196	°C or °F
Fuel Injection #1 Pulse	Control value of fuel injection time for the RH bank by ECM.	1.54	ms
Short term fuel trim B1	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	0	%
Long term fuel trim B1	Air fuel ratio learning control value for the front oxygen (A/F) sensor.	−7	%
Learned Ignition Timing	Ignition timing learning value. Advance angle amount or retard angle amount when knocking occurs.	0	deg
Oxygen sensor #12	Rear oxygen sensor output voltage value.	0.74	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	0	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
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	0	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
Exh. VVT Retard Ang. R	AVCS retard angle amount for the RH bank on the exhaust side.	0	deg

Item	Contents	Note (at idling)	Unit
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 AVCS retard angle amount R to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	0	deg
Exh. VVT Retard Ang. L	AVCS retard angle amount for the LH bank on the exhaust side.	0	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 AVCS retard angle amount L to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	0	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.	79.3	°CA
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.	83.1	°CA
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.	109.5	°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.	108.3	°CA
Number of Cleaning Executions for VVT Self-recovery	Number of times that the intake AVCS oil control valve cleaning is performed.	—	Time
Number of Cleaning Executions for Ex VVT Self-recovery	Number of times that the exhaust AVCS oil control valve cleaning is performed.	—	Time
Control module voltage	ECM input power supply voltage.	14.176	V
Target engine speed	ECM target engine speed.	700	rpm
Target Equivalence Ratio	Target air fuel ratio (lambda). It usually becomes 1 aiming at a theoretical air fuel ratio.	0.998	—
Oil Temperature	Value calculated from the engine oil temperature sensor output value.	96 or 205	°C or °F
IAT Sensor #11	Value calculated from the intake air temperature sensor output value of the air flow sensor.	74 or 165	°C or °F
IAT Sensor #12	Value calculated from the intake air temperature sensor output value of the manifold pressure sensor.	75 or 167	°C or °F
Ambient Temperature	Value that ECM estimates by using input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	40 or 104	°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%.	36.1	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine.	23.1	%

Item	Contents	Note (at idling)	Unit
	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.		
Atmosphere Pressure	Value calculated from atmospheric pressure sensor output value.	99, 742.7, 29.2, 14.4 or 397.4	kPa, mmHg, inHg, psi or inH2O
Mani. Relative Pressure	Value calculated from manifold pressure sensor output value. (Absolute value) (Intake manifold absolute pressure – Atmospheric pressure)	−62, −465.1, −18.3, −9 or −248.9	kPa, mmHg, inHg, psi or inH2O
Electric Waste Gate Valve Position Sensor Learning Value at the Full-closed Position	Learning value of actual stroke value of electronic wastegate valve for diagnosis.	0.2	mm
Electric Waste Gate Valve Request Position Value	Electronic wastegate valve stroke command value. Request value for desired stroke position (mm) of electronic wastegate valve.	15	mm
Electric Waste Gate Valve Actual Position Value	Electronic wastegate valve current stroke position. Value in which stroke sensor value (voltage) is converted to mm.	15.032	mm
Electric Air Bypass Valve Status	Electronic air by-pass valve open/close command value.	Close	—
Target Throttle Opening Angle	Target throttle opening angle calculated by ECM.	4	deg
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	4	deg
Target Throttle Opening Angle	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.	5.9	%
Relative Throttle Pos.	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.	3.9	%
Throttle Motor Voltage	Power supply voltage of the throttle motor. Input value to ECM.	13.8	V
Main-Throttle Sensor	Voltage value of the main throttle position sensor. Input value to ECM.	0.7	V
Sub-Throttle Sensor	Voltage value of the sub throttle position sensor. Input value to ECM.	0.7	V
Throttle Motor Duty	Throttle motor control duty ratio. ECM output value.	−26	%
Main-Accelerator Sensor	Voltage value of the main accelerator pedal position sensor. Input value to ECM.	0.68	V
Sub-Accelerator Sensor	Voltage value of the sub accelerator pedal position sensor. Input value to ECM.	0.68	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.	5.1 or 0.7	g/s or lb/min

Item	Contents	Note (at idling)	Unit
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	0.1 or 0.01	g/s or lb/min
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.	0.3 or 0.04	g/s or lb/min
Idle A/C load correct	Air volume correction value 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	g/s or lb/min
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 or lb/min
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.	0.2 or 0.03	g/s or lb/min
Fuel Rail Pressure A	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	2290, 17179.3, 676.3, 332 or 9193.2	kPa, mmHg, inHg, psi or inH2O
Fuel Rail Pressure B	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	2490, 18679.7, 735.4, 361 or 9996.1	kPa, mmHg, inHg, psi or inH2O
Commanded Fuel Rail Pressure A	Target fuel pressure for high pressure fuel line calculated by ECM.	2470, 18529.6, 729.5, 358.1 or 9915.8	kPa, mmHg, inHg, psi or inH2O
Commanded Fuel Rail Pressure B	Target fuel pressure for high pressure fuel line calculated by ECM.	2490, 18679.7, 735.4, 361 or 9996.1	kPa, mmHg, inHg, psi or inH2O
Fuel Level	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	20	%
Fuel level resistance	Fuel level sensor resistance value. Input value to ECM.	337.5	ohm
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.	75	%
Fuel Increase 1 at the High Temperature Restart	Fuel injection compensation coefficient at restarting with high coolant temperature.	0	—
Commanded Evap 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	%
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister.	0	%

Item	Contents	Note (at idling)	Unit
	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.		
Purge Line Pressure	Pressure physical value read by CPC pressure sensor. Input signal from CPC pressure sensor. CPC pressure sensor output A/D value converted to physical value.	97.66 , 732.63, 28.84, 14.16 or 392.05	kPa, mmHg, inHg, psi or inH2O
ALT Duty	Value of duty ratio converted from command voltage value sent from ECM to generator.	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 [Smart]: Mode that inhibits the excessive charging while retaining target SOC	High, Mid or Smart	—
Battery Terminal Voltage	Voltage value between battery terminals input from the battery sensor.	14	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.	3.6	A
Estimated Battery Temperature	Battery temperature input from the battery sensor.	45 or 113	°C or °F
Remaining Battery Capacity	Remaining amount of battery estimated by ECM.	89	%
Knocking Correction	Retard angle amount when knocking occurs. Partially learning value of ignition timing learning value.	0	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	mA
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	155	ohm
A/F Correction #3	Sub correction value of A/F feedback control.	−1.56	%
Front O2 Heater #1	Current value controlling the front oxygen (A/F) sensor heater. ECM output value.	0	A
Rear O2 Heater Current	Current value controlling the rear oxygen sensor heater. ECM output value.	0	A
Rear O2 Sensor Input Voltage	Rear oxygen sensor (+) output voltage value. Input value to ECM.	2.74	V
Rear O2 Sensor Offset Voltage	Rear oxygen sensor (−) output voltage value. Input value to ECM.	1.995	V

Item	Contents	Note (at idling)	Unit
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	0	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.	1.12	V
TGV Position Sensor L	Tumble generator valve position sensor LH output value. Input value to ECM.	1.04	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.	OFF	—
TGV Drive	Tumble generator valve drive status. Set to [Open] when the tumble generator valve is open. ECM control status.	Close	—
OCV Duty R	Control duty ratio of the intake side oil control solenoid on the RH bank. ECM output value.	40 — 60	%
OCV Duty L	Control duty ratio of the intake side oil control solenoid on the LH bank. ECM output value.	40 — 60	%
OCV Current R	Actual current value of the intake side oil control solenoid on the RH bank. Input value to ECM.	550 — 850	mA
OCV Current L	Actual current value of the intake side oil control solenoid on the LH bank. Input value to ECM.	550 — 850	mA
Exh. OCV Duty R	Control duty ratio of the exhaust side oil control solenoid on the RH bank. ECM output value.	30 — 50	%
Exh. OCV Duty L	Control duty ratio of the exhaust side oil control solenoid on the LH bank. ECM output value.	30 — 50	%
Exh. OCV Current R	Actual current value of the exhaust side oil control solenoid on the RH bank. Input value to ECM.	400 — 700	mA
Exh. OCV Current L	Actual current value of the exhaust side oil control solenoid on the LH bank. Input value to ECM.	400 — 700	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.	711.25	rpm

Item	Contents	Note (at idling)	Unit
	If the rotation speed is low compared to monitor values of other cylinders, it means that the 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.	711.5	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.	711.25	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.	710	rpm
Completed Flag of Cylinder Discrimination	Flag for completion of cylinder judgment. If this flag is not ON, it is possible to judge that the crankshaft position sensor and camshaft position sensor are faulty.	Completed	—
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.	5770	Time
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned to ON. Master central gateway CM 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.	628500	ms
Time Since Engine Start	Elapsed time after starting the engine.	628	sec
Elapsed Time After Engine Run	Elapsed time after starting the engine. This value is used for control.	627	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.	627	sec
Initial Engine Oil Temp.	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	90 or 194	°C or °F
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the engine coolant temperature sensor.	90 or 194	°C or °F
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	51 or 123.8	°C or °F
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	670	ms

Item	Contents	Note (at idling)	Unit
Engine Startup Mode	Mode at engine starting. 00 = Initial start, 01 = Normal restart, 02 = Short term engine stall restart, 03 = Auto Start Stop restart, 04 = Change mind restart	0	—
IG OFF Elapsed Time	The time the vehicle has been left since the engine stopped. This value can be used to check how long the vehicle has been left with the ignition switch ON after the engine stopped.	10	sec
Meter since DTC(s) cleared	Travel distance after DTC clear.	86 or 53.4	km or mile
Time while MIL lighted	Engine operating time from when the malfunction indicator light illuminated till when it went off.	0	min
Time since DTC(s) cleared	Elapsed time after DTC clear.	183	min
Number of warm-ups	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.)	1	Time
Lighted MI lamp history	Travel distance after the warning light illuminated.	0	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.	9312 or 5786	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
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 or lb/min
Number of Misfire detection caused by out of Fuel	Number of the occurrences of fuel run-out judgment.	0	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 or mile
Engine Speed at the time of Detection to avoid Preignition caused by out of Fuel	Engine speed at the time of pre-ignition avoidance judgment when the fuel runs out.	0	rpm
Intake Air Mass at the time of Detection to avoid Preignition caused by out of Fuel	Amount of air at the time of pre-ignition avoidance judgment when the fuel runs out.	0	g/s or lb/min
Number of Preignition Detection caused by out of Fuel	Number of the occurrences of pre-ignition avoidance judgment when the fuel runs out.	0	Time
Estimated Total Mileage at the time of first Detection to	Estimated cumulative travel distance at the time of the first pre-ignition avoidance judgment when the fuel runs out.	0	km or mile

Item	Contents	Note (at idling)	Unit
avoid Preignition caused by out of Fuel			
Status of Control to avoid Pre-Ignition caused by Continuous Knocking	Operation judgment of pre-ignition countermeasure control due to continuous knocking occurrence.	OFF	—
Pre-Ignition Control (Detection) Operating Status	Operation judgment of countermeasure control at pre-ignition detection.	OFF	—
Estimated Total Mileage of Detection to avoid Pre-Ignition caused by Continuous Knocking	Travel distance during a pre-ignition countermeasure control operation due to continuous knocking occurrence.	0	km or mile
Estimated Total Mileage Since Pre-Ignition Control (Detection) Operating	Estimated cumulative travel distance at pre-ignition detection.	0	km or mile
Number of Pre-Ignition Control (Prediction) Operating	Operation count of pre-ignition prediction control.	0	Time
Number of Pre-Ignition Control (Detection) Operating	Operation count of pre-ignition detection control.	0	Time
Number of Pre-Ignition Control (Continuous Knock) Operation	Operation count of pre-ignition countermeasure control due to continuous knocking occurrence.	0	Time
Number of Pre-Ignition Control (LSPI) Operation	Operation count of torque guard at low speed pre-ignition detection.	0	Time
Cruise Control System Setting Condition	Cruise control set status.	OFF	—
Cruise Control System Request Torque	Torque request by cruise control.	0	Nm
Driver Request Torque	Torque request by accelerator pedal operation.	15.775	Nm
Fuel Cut Elapsed Time	Elapsed time after experienced high rotation speed.	0	sec
Memorized Cruise Speed	Cruise control system target vehicle speed. (Set speed)	0	km/h or MPH
Catalyst Temperature #11	Estimated temperature of the front catalytic converter.	501.5 or 934.7	°C or °F
Type of fuel	Fuel information recorded in the ECM. Not the fuel information currently used.	GAS	—
AT drive status	Neutral condition. (CVT model) Information input from the inhibitor switch.	NEUT	—
MT gear status	Neutral condition. (MT model) Information input from the neutral switch.	NEUT	—
Absolute Evap System Vapor Pressure	Evaporative emission control system pressure value. Pressure sensor output value.	98.69, 740.4, 29.1, 14.3 or 396.2	kPa, mmHg, inHg, psi or inH2O
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. P or N range signal for AT. Input value to ECM.	Neutral	—

Item	Contents	Note (at idling)	Unit
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. (MT model) Set to [ON] when the clutch switch is ON. Input value to ECM.	OFF	—
Clutch Start SW	Clutch start switch status. (MT model) [ON] = Clutch depressed status [OFF] = Clutch not depressed status	OFF	—
Stop Light Switch	Stop light switch signal. Set to [ON] when the stop light illuminates. Input value to ECM.	OFF	—
Brake Switch	Brake switch signal. Set to [ON] when the brake pedal is depressed. Input value to ECM.	OFF	—
Idle Switch Signal	Idle signal. Set to [Idle] while idling.	Idle	—
Ignition Switch	Ignition switch signal. Set to [ON] when the ignition switch is ON.	ON	—
A/C Compressor Signal	A/C compressor drive signal. Set to [ON] when the drive signal is output. ECM output value.	OFF	—
Radiator Fan Control	Duty ratio used for the radiator fan duty control. ECM output value.	99	%
Radiator Fan1 Monitor Duty	Output duty of radiator fan motor 1. Input value to ECM.	100	%
Radiator Fan2 Monitor Duty	Output duty of radiator fan motor 2. Input value to ECM.	100	%
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	—
Variable Load Compressor Torque Value	Load value of the variable capacity air compressor. The value that the air conditioner CM estimates and outputs.	0	Nm
Starter Switch	Starter switch signal. Set to [ON] when the starter is ON. Input value to ECM.	OFF	—
Rear Defogger SW	Rear defogger switch input signal. Set to [ON] when the switch is ON. Input value to ECM.	OFF	—
Blower Fan SW	Blower fan switch input signal. Set to [ON] when the switch is ON. Input value to ECM.	OFF	—
Light Switch	Light switch input signal. Set to [ON] when the switch is ON. Input value to ECM.	OFF	—
Wiper Switch	Wiper switch input signal. Set to [ON] when the switch is ON. Input value to ECM.	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.	OFF	—

Item	Contents	Note (at idling)	Unit
	Input value to ECM.		
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.	OFF	—
Torque Permission Signal	Torque down permission notification signal to the transmission control module. (CVT model) Set to [ON] when the permission signal is output. ECM output value.	ON	—
SET/COAST Switch	Cruise control system SET/COAST SW signal. Set to [ON] when the switch is operated. Input value to ECM.	OFF	—
RESUME/ACCEL Switch	Cruise control system RESUME/ACCEL SW signal. Set to [ON] when the switch is operated. Input value to ECM.	OFF	—
Main Switch	Cruise control system main switch signal. Set to [ON] when the switch is operated. Input value to ECM.	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	—
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. (CVT model) 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. (CVT model)	681	rpm

Item	Contents	Note (at idling)	Unit
	Turbine rotation speed is input from the transmission CM via CAN.		
Lock up status	Lock-up status of the transmission. (CVT model) Lock up status is input from the transmission CM via CAN.	OPEN	—
Current Gear Position	Gear status. 00 = P, N range 14 = R range 13 = Auto neutral status 06 = 6th 05 = 5th 04 = 4th 03 = 3rd 02 = 2nd 01 = 1st	0	—
P/N Signal	P/N status of the transmission. (CVT model) P/N range status is input from the transmission CM via CAN.	ON	—
Blow-by leak Connector	PCV hose assembly diagnosis signal.	Connect	—
Starter Relay	Starter relay control flag.	OFF	—
Starter cut Relay	Starter cut relay control flag. [ON] = Starter cut is active [OFF] = Starter cut is not active	ON	—
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.	31	—
Alternator control check 1	Detailed status of charge control.	91	—
Alternator control check 2	Detailed status of charge control.	90.1	—
Alternator control check 3	Detailed status of charge control.	10.35	—
Alternator control check 4	Detailed status of charge control.	8.97	—
Alternator control check 6	Detailed status of charge control.	0	—
Alternator control check 7	Detailed status of charge control.	14.2	—
Alternator control check 8	Detailed status of charge control.	64	—
Alternator control check 9	Detailed status of charge control.	0	—
Alternator control check 10	Detailed status of charge control.	2	—
Alternator Control Check 11	Detailed status of charge control.	—	—
Alternator Control Check 12	Detailed status of charge control.	—	—
Alternator Control Check 13	Detailed status of charge control.	2.71	—
Alternator Control Check 14	Detailed status of charge control.	9552	—
Alternator Mechanical Error Status	Status where alternator is judged as having mechanical trouble.	OFF	—
Alternator Electrical Output Error Status	Status where alternator is judged as having electric abnormality.	OFF	—
Alternator High Temperature Error Status	Status where alternator is judged as having high temperature malfunction.	OFF	—
Alternator Communication Error Status	Status where alternator is judged as having communication failure.	OFF	—
Regulator Temperature	Generator regulator temperature value.	—	°C or °F

Item	Contents	Note (at idling)	Unit
Analytical Engine Speed	Data for analysis	933	rpm
Analytical Load Value 2	Data for analysis	39	—
Analytical Engine Coolant Temperature	Data for analysis	91 or 195.8	°C or °F
Analytical Ambient Temperature	Data for analysis	37.5 or 99.5	°C or °F
Analytical Barometric Pressure	Data for analysis	101, 757.7, 29.8, 14.6 or 405.5	kPa, mmHg, inHg, psi or inH2O
Analytical Manifold Relative Pressure	Data for analysis	−44, −330.1, −13, −6.4 or −176.6	kPa, mmHg, inHg, psi or inH2O
Analytical Ignition Timing Advance for #1 Cylinder	Data for analysis	−0.5	°CA
Analytical Vehicle Speed	Data for analysis	0	km/h or MPH
Analytical Estimated Total Mileage	Data for analysis	12 or 7.5	km or mile
Analytical A/C Compressor Signal	Data for analysis	OFF	—
Analytical Maximum Number of Ignition Timing Advance	Data for analysis	0	Time
Analytical Number of Ignition Timing Advance	Data for analysis	0	Time
Analytical Minimum Manifold Negative Pressure	Data for analysis	11, 82.5, 3.2, 1.6 or 44.2	kPa, mmHg, inHg, psi or inH2O
Analytical Number of Brake Booster Pressure	Data for analysis	255	Time
Analytical Ignition Control Check 2	Data for analysis	0.31	—
Analytical Ignition Control Check 1	Data for analysis	0	—
Analytical Knocking Correction	Data for analysis	0	deg
Analytical Intake Air Temperature	Data for analysis	55 or 131	°C or °F
Analytical ISC Learning Value	Data for analysis	0	g/s or lb/min
Analytical Idle dirty throttle correct	Data for analysis	0	g/s or lb/min
Analytical VVT Advance Angle Amount R	Data for analysis	−1	°CA
Analytical Exhaust VVT Retard Angle R	Data for analysis	−1	°CA
Analytical TGV Drive	Data for analysis	Close	—
Analytical Idle Mass Air Flow	Data for analysis	12.4 or 1.6	g/s or lb/min
Analytical Brake Booster Relative Pressure	Data for analysis	11, 82.5, 3.2, 1.6 or 44.2	kPa, mmHg, inHg, psi or inH2O
Analytical Fuel Rail Pressure	Data for analysis	2390, 17929.5, 705.9, 346.5 or 9594.6	kPa, mmHg, inHg, psi or inH2O
Analytical A/F Sensor #1	Data for analysis	0.99	—

Item	Contents	Note (at idling)	Unit
ETC Functional Safety Check 1	ETC malfunction information memory 1	0	—
ETC Functional Safety Check 2	ETC malfunction information memory 2	0	—
ETC Functional Safety Check 3	ETC malfunction information memory 3	127	—
Functional Safety Check 1	Function safety/malfunction information memory 1	253	—
Functional Safety Check 2	Function safety/malfunction information memory 2	0	—
Functional Safety Check 3	Function safety/malfunction information memory 3	0	—
Functional Safety Check 4	Function safety/malfunction information memory 4	119	—
Functional Safety Check 5	Function safety/malfunction information memory 5	0	—
Functional Safety Check 6	Function safety/malfunction information memory 6	255	—
Functional Safety Check 7	Function safety/malfunction information memory 7	0	—
Robust Check 1	Execution judgment for engine stall avoidance control.	OFF	—
Robust Check 2	Operation count of engine stall avoidance control.	0	Time
Robust Check 3	Success count of engine stall avoidance control.	0	Time
Crush Detection Signal	Collision detection signal input value to ECM. [ON] = Collision detected [OFF] = Collision not detected	OFF	—
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 Diag. Code:	The number of trouble codes recorded in the ECM.	0	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	Supported	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	Supported	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	0	%
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	0.996	—
A/F Sensor #11	Front oxygen (A/F) sensor output voltage.	2.242	V
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	0.996	—
A/F Sensor #11	Front oxygen (A/F) sensor current value.	−0.05	mA
Absolute Throttle Pos.#2	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	14.1	%
Accelerator Pedal Pos.#1	Shows the main accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	13.7	%
Accelerator Pedal Pos.#2	Shows the sub accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	14.1	%
Relative Accelerator Pos.	Accelerator opening angle with a full close point learning value taken into consideration.	0	%
Misfire monitoring(Supp)	Support status of the misfire diagnosis.	YES	—
Misfire monitoring(Rdy)	Status of the misfire diagnosis. [YES] or [N/A]: Diagnosis is completed or not supported.	YES	—

Item	Contents	Note (at idling)	Unit
	[NO]: Diagnosis is not completed.		
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	—
Component monitoring(Supp)	Support status of the component diagnosis.	YES	—
Component monitoring(Rdy)	Status of the component diagnosis. [YES] or [N/A]: Diagnosis is completed or not supported. [NO]: Diagnosis is not completed.	YES	—
Catalyst Diagnosis(Supp)	Support status of the catalyst diagnosis.	YES	—
Catalyst Diagnosis(Rdy)	Status of the catalyst diagnosis. [YES] or [N/A]: Diagnosis is completed or not supported. [NO]: Diagnosis is not completed.	YES	—
Heated catalyst(Supp)	Support status of the heated catalyst diagnosis.	NO	—
Heated catalyst(Rdy)	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.	YES	—
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.	NO	—
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(Supp)	Support status of the 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)	Support status of the 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.	YES	—

Item	Contents	Note (at idling)	Unit
Misfire monitoring(Enable)	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(Comp)	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. [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	—
Component monitoring(Enable)	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	—
Component monitoring(Comp)	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 Diagnosis(Enable)	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 Diagnosis(Comp)	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(Enable)	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(Comp)	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.	NO	—
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.	NO	—
Secondary air system(Enable)	Shows whether or not the execution condition of the secondary air system diagnosis is met. [YES]: Diagnosis can be executed.	N/A	—

Item	Contents	Note (at idling)	Unit
	[NO] or [N/A]: Diagnosis cannot be executed or is not supported.		
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(Enable)	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(Comp)	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 completed. [YES] or [N/A]: Diagnosis is completed or not supported. [NO]: Diagnosis is not completed.	NO	—
OBD System	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	—
Target Wastegate A Position	Target opening angle of the electronic wastegate valve calculated by ECM.	100	%
Wastegate A Position	Actual opening angle calculated based on the opening angle sensor voltage of the electronic wastegate valve.	100	%
#1 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #1 cylinder.	OFF	—
#2 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #2 cylinder.	OFF	—

Item	Contents	Note (at idling)	Unit
#3 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #3 cylinder.	OFF	—
#4 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #4 cylinder.	OFF	—
#1 Cylinder Parameter For Preignition Detection	For analysis.	0	—
#2 Cylinder Parameter For Preignition Detection	For analysis.	0	—
#3 Cylinder Parameter For Preignition Detection	For analysis.	0	—
#4 Cylinder Parameter For Preignition Detection	For analysis.	0	—
Engine rpm Total Time	When the engine speed is out of standard, the count-up is performed.	0	ms
Vehicle Speed Total Time	When the vehicle speed is out of standard, the count-up is performed.	0	ms
Boost Pressure Total Time	When the boost pressure is out of standard, the count-up is performed.	0	ms
Mani. Absolute Pressure	Value calculated from manifold pressure sensor output value.	37, 277.6, 10.9, 5.4 or 148.5	kPa, mmHg, inHg, psi or inH2O

*: For the relationship between user selection results of the drive select mode, Subaru Select Monitor 4 indication, and control, refer to the following table.

User selection	Comfort	Normal	Sport	Sport+	Individual
Subaru Select Monitor indication (engine)	I	I	S	S#	I, S or S#
Engine control	I	I	S	S	I or S

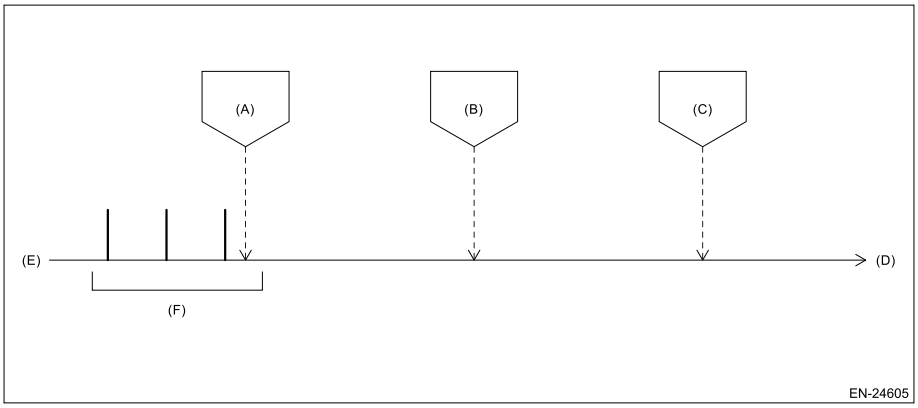
NOTE

1. FREEZE FRAME DATA

ECM records the engine status at detection when it detects DTCs. (Freeze frame data)
Freeze frame data is recorded on up to a second detected DTC, and not recorded on a third detected DTC and later.

Note:

- **As the freeze frame data is recorded with DTC detected, permanent monitoring cannot be performed.**
- **For the first detected DTC, time series freeze frame data is recorded. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Freeze Frame Data>NOTE > TIME SERIES FREEZE FRAME DATA.**
- **When performing diagnosis, you can utilize the freeze frame data to guess the vehicle status when the DTC was detected.**
- **For detailed operation procedures, refer to "Common (Diagnostics)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**



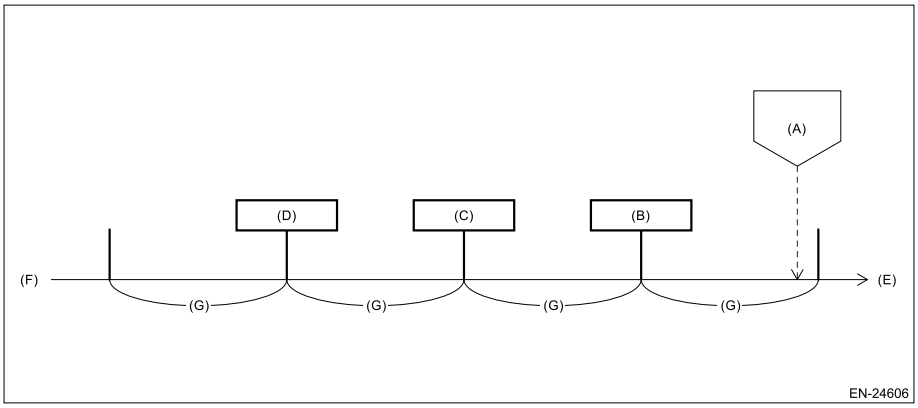
(A) First detected DTC
(B) Second detected DTC
(C) Third detected DTC or later
(D) Current
(E) Past
(F) Time series freeze frame data

2. TIME SERIES FREEZE FRAME DATA

ECM obtains freeze frame data every 0.5 seconds. When DTC is detected, freeze frame data of [Detect], [1 before], [History2] and [History3] is saved. (Time series freeze frame data)

Note:

- **You can utilize the time series freeze frame data for diagnosis by checking the status of data changes three times earlier than the DTC was detected.**
- **For detailed operation procedures, refer to "Common (Diagnostics)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**



(A) [Detect]
(B) [1 before]
(C) [History2]
(D) [History3]
(E) Current
(F) Past
(G) 0.5 sec.

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Freeze Frame Data>LIST.**
- **For the number of storing counts, see the reference. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Freeze Frame Data>NOTE.**

LIST

Note:
Some items are not displayed according to the specifications.

Item	Contents	Unit
Engine Speed	Value calculated from crankshaft position sensor output value.	rpm
Mass Air Flow	Value calculated from air flow sensor output value.	g/s or lb/min
Mass Air Flow Average	Value calculated from air flow sensor output value.	g/s or lb/min
Vehicle Speed	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.	%
Accel. Opening Angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	%
A/F Sensor #1	Actual lambda value calculated from the front oxygen (A/F) sensor output value.	—
Ignition timing adv. #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
Fuel Injection #1 Pulse	Control value of fuel injection time for the RH bank by ECM.	ms
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.	%
Oxygen sensor #12	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 properly. Response delays during the transition time.	deg
Exh. VVT Retard Ang. R	AVCS 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 AVCS retard angle amount R to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	deg
Exh. VVT Retard Ang. L	AVCS 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 AVCS retard angle amount L to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	deg
Number of Cleaning Executions for VVT Self-recovery	Number of times that the intake AVCS oil control valve cleaning is performed.	Time

Item	Contents	Unit
Number of Cleaning Executions for Ex VVT Self-recovery	Number of times that the exhaust AVCS oil control valve cleaning is performed.	Time
Control module voltage	ECM input power supply voltage.	V
Target Equivalence Ratio	Target air fuel ratio (lambda). It usually becomes 1 aiming at a theoretical air fuel ratio.	—
Oil Temperature	Value calculated from the engine oil temperature sensor output value.	°C or °F
IAT Sensor #11	Value calculated from the intake air temperature sensor output value of the air flow sensor.	°C or °F
IAT Sensor #12	Value calculated from the intake air temperature sensor output value of the manifold pressure sensor.	°C or °F
Ambient 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%.	%
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.	%
Atmosphere Pressure	Value calculated from atmospheric pressure sensor output value.	kPa, mmHg, inHg, psi or inH2O
Electric Waste Gate Valve Position Sensor Learning Value at the Full-closed Position	Learning value of actual stroke value of electronic wastegate valve for diagnosis.	mm
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	deg
Target Throttle Opening Angle	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 Pos.	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 or lb/min
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	g/s or lb/min
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 or lb/min
Idle A/C load correct	Air volume correction value 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 or lb/min
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 or lb/min
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction	g/s or lb/min

Item	Contents	Unit
	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.	
Fuel Rail Pressure A	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	kPa, mmHg, inHg, psi or inH2O
Fuel Rail Pressure B	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	kPa, mmHg, inHg, psi or inH2O
Commanded Fuel Rail Pressure A	Target fuel pressure for high pressure fuel line calculated by ECM.	kPa, mmHg, inHg, psi or inH2O
Commanded Fuel Rail Pressure B	Target fuel pressure for high pressure fuel line calculated by ECM.	kPa, mmHg, inHg, psi or inH2O
Fuel Level	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.	ohm
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.	%
Fuel Increase 1 at the High Temperature Restart	Fuel injection compensation coefficient at restarting with high coolant temperature.	—
Commanded Evap 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.	%
Purge Line Pressure	Pressure physical value read by CPC pressure sensor. Input signal from CPC pressure sensor. CPC pressure sensor output A/D value converted to physical value.	kPa, mmHg, inHg, psi or inH2O
ALT Duty	Value of duty ratio converted from command voltage value sent from ECM to generator.	%
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 inhibits the excessive charging while retaining target SOC	—
Battery Terminal Voltage	Voltage value between battery terminals input from the battery sensor.	V

Item	Contents	Unit
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.	A
Estimated Battery Temperature	Battery temperature input from the battery sensor.	°C or °F
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	—
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	ohm
Rear O2 Sensor Input Voltage	Rear oxygen sensor (+) output voltage value. Input value to ECM.	V
Rear O2 Sensor Offset Voltage	Rear oxygen sensor (−) output voltage value. Input value to ECM.	V
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	STEP
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.	%
TGV Drive	Tumble generator valve drive status. Set to [Open] when the tumble generator valve is open. ECM control status.	—
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
Completed Flag of Cylinder Discrimination	Flag for completion of cylinder judgment. If this flag is not ON, it is possible to judge that the crankshaft position sensor and camshaft position sensor are faulty.	—
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

Item	Contents	Unit
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned to ON. Master central gateway CM 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.	°C or °F
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the engine coolant temperature sensor.	°C or °F
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	°C or °F
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	ms
Engine Startup Mode	Mode at engine starting. 00 = initial start 01 = Normal restart 02 = Short term engine stall restart 03 = Idling stop restart 04 = Change mind restart	—
IG OFF Elapsed Time	The time the vehicle has been left since the engine stopped. This value can be used to check how long the vehicle has been left with the ignition switch ON after the engine stopped.	sec
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.	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.	g/s or lb/min
Number of Misfire detection caused by out of Fuel	Number of the occurrences of fuel run-out judgment.	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.	km or mile
Engine Speed at the time of Detection to avoid Preignition caused by out of Fuel	Engine speed at the time of pre-ignition avoidance judgment when the fuel runs out.	rpm
Intake Air Mass at the time of Detection to avoid Preignition caused by out of Fuel	Amount of air at the time of pre-ignition avoidance judgment when the fuel runs out.	g/s or lb/min
Number of Preignition Detection caused by out of Fuel	Number of the occurrences of pre-ignition avoidance judgment when the fuel runs out.	Time
Estimated Total Mileage at the time of first Detection to avoid Preignition caused by out of Fuel	Estimated cumulative travel distance at the time of the first pre-ignition avoidance judgment when the fuel runs out.	km or mile
Status of Control to avoid Pre-Ignition caused by Continuous Knocking	Operation judgment of pre-ignition countermeasure control due to continuous knocking occurrence.	—

Item	Contents	Unit
Pre-Ignition Control (Detection) Operating Status	Operation judgment of countermeasure control at pre-ignition detection.	—
Estimated Total Mileage of Detection to avoid Pre-Ignition caused by Continuous Knocking	Travel distance during a pre-ignition countermeasure control operation due to continuous knocking occurrence.	km or mile
Estimated Total Mileage Since Pre-Ignition Control (Detection) Operating	Estimated cumulative travel distance at pre-ignition detection.	km or mile
Number of Pre-Ignition Control (Prediction) Operating	Operation count of pre-ignition prediction control.	Time
Number of Pre-Ignition Control (Detection) Operating	Operation count of pre-ignition detection control.	Time
Number of Pre-Ignition Control (Continuous Knock) Operation	Operation count of pre-ignition countermeasure control due to continuous knocking occurrence.	Time
Number of Pre-Ignition Control (LSPI) Operation	Operation count of torque guard at low speed pre-ignition detection.	Time
Cruise Control System Setting Condition	Cruise control set status.	—
Cruise Control System Request Torque	Torque request by cruise control.	Nm
Driver Request Torque	Torque request by accelerator pedal operation.	Nm
Fuel Cut Elapsed Time	Elapsed time after experienced high rotation speed.	sec
Catalyst Temperature #11	Estimated temperature of the front catalytic converter.	°C or °F
AT drive status	Neutral condition. (CVT model) Information input from the inhibitor switch.	—
MT gear status	Neutral condition. (MT model) Information input from the neutral switch.	—
SI Drive mode(Display)	SI-DRIVE mode status. ECM output value. Displayed only on models with SI-DRIVE.	—
Clutch Switch	Clutch switch signal. (MT model) Set to [ON] when the clutch switch is ON. Input value to ECM.	—
Clutch Start SW	Clutch start switch status. (MT model) [ON] = Clutch depressed status [OFF] = Clutch not depressed status	—
Stop Light Switch	Stop light switch signal. Set to [ON] when the stop light illuminates. Input value to ECM.	—
Idle Switch Signal	Idle signal. Set to [Idle] while idling.	—
Ignition Switch	Ignition switch signal. Set to [ON] when the ignition switch is ON.	—
A/C Compressor Signal	A/C compressor drive signal. Set to [ON] when the drive signal is output. ECM output value.	—
Radiator Fan1 Monitor Duty	Output duty of radiator fan motor 1. Input value to ECM.	%
Radiator Fan2 Monitor Duty	Output duty of radiator fan motor 2. Input value to ECM.	%
Variable Load Compressor Torque Value	Load value of the variable capacity air compressor. The value that the air conditioner CM estimates and outputs.	Nm
Starter Switch	Starter switch signal. Set to [ON] when the starter is ON. Input value to ECM.	—
AT turbine speed	Turbine rotation speed of the transmission. (CVT model)	rpm

Item	Contents	Unit
	Turbine rotation speed is input from the transmission CM via CAN.	
Lock up status	Lock-up status of the transmission. (CVT model) Lock up status is input from the transmission CM via CAN.	—
Current Gear Position	Gear status. 00 = P, N range 14 = R range 13 = Auto neutral status 06 = 6th 05 = 5th 04 = 4th 03 = 3rd 02 = 2nd 01 = 1st	—
P/N Signal	P/N status of the transmission. (CVT model) P/N range status is input from the transmission CM via CAN.	—
Alternator Control Check 13	Detailed status of charge control.	—
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	Generator regulator temperature value.	°C or °F
Robust Check 1	Execution judgment for engine stall avoidance control.	—
Robust Check 2	Operation count of engine stall avoidance control.	Time
Robust Check 3	Success count of engine stall avoidance control.	Time
Crush Detection Signal	Collision detection signal input value to ECM. [ON] = Collision detected [OFF] = Collision not detected	—
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.	%
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	—
A/F Sensor #11	Front oxygen (A/F) sensor output voltage.	V
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	—
A/F Sensor #11	Front oxygen (A/F) sensor current value.	mA
Absolute Throttle Pos.#2	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Pos.#1	Shows the main accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Pos.#2	Shows the sub accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Target Wastegate A Position	Target opening angle of the electronic wastegate valve calculated by ECM.	%
Wastegate A Position	Actual opening angle calculated based on the opening angle sensor voltage of the electronic wastegate valve.	%
#1 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #1 cylinder.	—
#2 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #2 cylinder.	—
#3 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #3 cylinder.	—
#4 Cylinder Preignition Detection	Operation judgment of pre-ignition countermeasure control (detection) for #4 cylinder.	—
#1 Cylinder Parameter For Preignition Detection	For analysis.	—

Item	Contents	Unit
#2 Cylinder Parameter For Preignition Detection	For analysis.	—
#3 Cylinder Parameter For Preignition Detection	For analysis.	—
#4 Cylinder Parameter For Preignition Detection	For analysis.	—
Mani. Absolute Pressure	Value calculated from manifold pressure sensor output value.	kPa, mmHg, inHg, psi or inH2O

ENGINE (DIAGNOSTICS)(H4DOTC) > Active Test

OPERATION

Caution:
After executing the active test, perform the memory clear. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

Note:
For detailed operation procedures, refer to "Help" of application.

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, enter vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Engine] and select [Next].
5. On [Select Function] screen, select [Active Test].

ENGINE (DIAGNOSTICS)(H4DOTC) > Active Test

LIST

Active test item	Contents	Execution condition
Fuel Pump Relay	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.	
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 according to engine speed.	Idling
Idle Speed Control	Idle speed can be set.	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.	Idling
EGR Valve Control (Step)	STEP number of the EGR control valve can be set.	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 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	Idling
Compression monitor	Compression can be measured.	• Ignition switch ON (engine OFF) • Accelerator pedal is fully depressed
Electric Air Bypass Valve Control	Electronic air by-pass valve can be set to ON/OFF.	Idling
Electric Waste Gate Valve Control	Electronic wastegate valve can be opened/closed.	Idling

*: Instruction voltage is the same as in High mode.

ENGINE (DIAGNOSTICS)(H4DOTC) > Work Support

OPERATION

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, enter vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Engine] and select [Next].
5. On [Select Function] screen, select [Work Support].
6. On [Work Support] screen, select an appropriate function.
7. Perform the procedures shown on the display screen.

Note:
For detailed operation procedures, refer to "Help" of application.

ENGINE (DIAGNOSTICS)(H4DOTC) > Work Support

LIST

Work Support item	Contents	Remarks
Simple Roughness Monitor	Engine speed and misfiring counter for each cylinder can be displayed.	• Calculates in range of engine speed (300 rpm to 2000 rpm) • Interval of data update is 60 ms at minimum (at 2000 rpm)
High-Grade Roughness Monitor (without harness)	Standard deviation, engine speed, etc. can be calculated based on the pulse data of crankshaft position sensor and camshaft position sensor, and the value and graph can also be displayed.	• Calculates in range of engine speed (300 rpm to 2000 rpm) • Interval of data update is 60 ms at minimum (at 2000 rpm)
Entry VIN	V.I.N can be registered.	Ignition switch ON (engine OFF)
Control Operation History	If the maximum vehicle speed, the maximum engine speed, and the maximum boost pressure are out of standard, the history data that consists of the latest data and top three data (four data in total) of each item can be displayed. (Up to 12 data) The following 20 items are to be saved. • Front and Back G • Right and Left G • Engine Speed • Vehicle Speed • Accel. Opening Angle • Coolant Temp. • Mani. Absolute Pressure • Oil Temperature • Intake Air Temperature • Trip Count • Count • Time Count • Neutral Position Switch • Clutch Switch • Brake Switch • Current Gear Position • Vehicle Odometer Reading • Engine rpm Total Time • Vehicle Speed Total Time • Boost Pressure Total Time **Note:** **The cumulative time that exceeded the threshold value in the past is recorded in the latest time counter.**	• Data of [Detect] is saved and data of [1 before], [History2], and [History3] are saved every 0.5 seconds. **Note:** **Depending on the timing, displayed values of [1 before], [History2], and [History3] may be higher than that of [Detect].** • To delete the history, click the operation history clear button. (Not deleted by battery removal or DTC memory clear.) **Note:** **If Control Operation History is recorded, perform inspection referring to the following table.**

If Control Operation History is recorded

History	Part	Main symptoms	Main faulty parts	Main factors
Maximum engine speed	Engine	Rough idle and engine stall Low output, hesitation and poor acceleration	Crankshaft bearing	Improper shift operation Vehicle modification
			Connecting rod bearing	
			Piston	
			Valve	
			Valve spring	
			Cylinder head	
			Camshaft	
			Cylinder block	
	CVT	Noise Poor acceleration Slipping Vibration	Torque converter	
			Oil pump	
			Clutch	
			Variator (chain, pulley)	
			Gear	
			Bearing	
	MT	Noise Vibration Hard to shift, or does not shift. Jumps to next gear.	Gear	
			Bearing	
			Synchronizer ring set	
			Shift key spring	
	Clutch	Slipping Noise Vibration Improper disengagement	Clutch disc	
			Clutch cover	
			Flywheel	
	Diff.	Noise Vibration	Gear	
			Bearing	
Maximum boost pressure	Engine	White smoke Rough idle and engine stall Low output, hesitation and poor acceleration Surging Start failure Over-heating Noise, vibration Odor Illumination of malfunction indicator light	Intake duct	Vehicle modification Vehicle malfunction
			Turbocharger	
			Head gasket	
			Spark plug	
			Cylinder head	
			Cylinder block	
			Piston	
			Valve	
			Exhaust manifold	
			Catalytic converter	
			Crankshaft bearing	
			Connecting rod bearing	
	CVT	Noise Poor acceleration Slipping Vibration	Torque converter	
			Oil pump	
			Clutch	
			Variator (chain, pulley)	
			Gear	
			Bearing	
	MT	Noise Vibration Hard to shift, or does not shift. Jumps to next gear.	Gear	
			Bearing	
			Synchronizer ring set	
			Shift key spring	
	Clutch	Slipping Noise Vibration Improper disengagement	Clutch disc	
			Clutch cover	
			Flywheel	
	Diff.	Noise Vibration	Gear	
			Bearing	
Maximum vehicle speed	CVT	Noise Poor acceleration Slipping Vibration	Torque converter	Vehicle modification Vehicle malfunction
			Oil pump	
			Clutch	
			Variator (chain, pulley)	
			Gear	
			Bearing	
	MT	Noise	Gear	

History	Part	Main symptoms	Main faulty parts	Main factors
		Vibration Hard to shift, or does not shift. Jumps to next gear.	Bearing	
			Synchronizer ring set	
			Shift key spring	
	Clutch	Slipping Noise Vibration Improper disengagement	Clutch disc	
			Clutch cover	
			Flywheel	
	Diff.	Noise Vibration	Gear	
			Bearing	

OPERATION

Note:

- **The readiness code shows self-diagnosis status of each DTC. The DTCs displayed here are either not yet self-diagnosed or self-diagnosed but not 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, 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. Perform the inspection mode again.**
- **For detailed operation procedures, refer to "Help" of application.**

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, input the target vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Engine], and then select [Next].
5. On [Select Function] screen, select [DTC].
6. On [DTC] screen, select [All Readiness Diagnostic Code(s)].

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.**
- **Up to 11 DTCs are stored. When malfunctions exceeding the maximum number are detected, they are stored based on the priority order described in the table below.**

Priority	Diagnosis type	MIL output	GST output	Confirmed malfunction/Temporary malfunction
1	Misfire, fuel system, sub F/B correction amount diagnosis	ON	Yes	Confirmed malfunction
2				Temporary malfunction
3	Other than above	ON	Yes	Confirmed malfunction
4				Temporary malfunction
5		OFF	Yes	Confirmed malfunction
6				Temporary malfunction
7		OFF	No	Confirmed malfunction
8				Temporary malfunction

- **DTCs are cleared if the battery is removed.**

LIST

DTC	Description & trouble part	Reference
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO 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	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.
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.
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.

DTC	Description & trouble part	Reference
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	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0032

DTC	Description & trouble part	Reference
	SENSOR 1	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1.
P0033	TURBOCHARGER/SUPERCHARGER BYPASS VALVE "A" CONTROL CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0033 TURBOCHARGER/SUPERCHARGER BYPASS VALVE "A" CONTROL CIRCUIT.
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.
P003A	TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" POSITION EXCEEDED LEARNING LIMIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P003A TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" POSITION EXCEEDED LEARNING LIMIT.
P0045	TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0045 TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT/OPEN.
P0047	TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0047 TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT LOW.
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 CIRCUIT "A" LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>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)(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

DTC	Description & trouble part	Reference
		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 (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 HIGH VOLTAGE BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>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)(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.

DTC	Description & trouble part	Reference
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.
P0140	O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED 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.

DTC	Description & trouble part	Reference
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.
P0234	TURBOCHARGER/SUPERCHARGER "A" OVERBOOST CONDITION	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0234 TURBOCHARGER/SUPERCHARGER "A" OVERBOOST CONDITION.
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.
P0299	TURBOCHARGER/SUPERCHARGER "A" UNDERBOOST CONDITION	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0299 TURBOCHARGER/SUPERCHARGER "A" UNDERBOOST CONDITION.
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 SENSOR "A" CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0336

DTC	Description & trouble part	Reference
	RANGE/PERFORMANCE	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.
P0401	EGR ABNORMAL (EGR AMOUNT TOO SMALL)	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0401 EGR ABNORMAL (EGR AMOUNT TOO SMALL).
P0402	EGR "A" FLOW EXCESSIVE DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0402 EGR "A" FLOW EXCESSIVE DETECTED.
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.
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.

DTC	Description & trouble part	Reference
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.
P0480	FAN 1 CONTROL CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0480 FAN 1 CONTROL CIRCUIT.
P0481	FAN 2 CONTROL CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0481 FAN 2 CONTROL CIRCUIT.
P04AE	EVAP SYSTEM PURGE CONTROL VALVE "B" PERFORMANCE/STUCK OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04AE EVAP SYSTEM PURGE CONTROL VALVE "B" PERFORMANCE/STUCK OPEN.
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.
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.
P04F1	EVAP SYSTEM LOW PRESSURE PURGE LINE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04F1 EVAP SYSTEM LOW PRESSURE PURGE LINE 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.
P0560	SYSTEM VOLTAGE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0560 SYSTEM VOLTAGE.
P0562	SYSTEM VOLTAGE LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0562 SYSTEM VOLTAGE LOW.
P0563	SYSTEM VOLTAGE HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>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)(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

DTC	Description & trouble part	Reference
		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.
P065A	GENERATOR/ALTERNATOR SYSTEM PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P065A GENERATOR/ALTERNATOR SYSTEM PERFORMANCE.
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.
P06B1	SENSOR POWER SUPPLY "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
P06B2	SENSOR POWER SUPPLY "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
P06B4	SENSOR POWER SUPPLY "B" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
P06B5	SENSOR POWER SUPPLY "B" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
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.
P0A3B	GENERATOR/ALTERNATOR OVER TEMPERATURE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0A3B GENERATOR/ALTERNATOR OVER TEMPERATURE.
P100A	AVCS SYSTEM STUCK	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P100A AVCS SYSTEM STUCK.
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.
P1192	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1192 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW.

DTC	Description & trouble part	Reference
P1193	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1193 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH.
P1236	FUEL INJECTOR DRIVER SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1236 FUEL INJECTOR DRIVER SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION.
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.
P1378	PRE-IGNITION DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1378 PRE-IGNITION DETECTED.
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.
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.
P162A	STARTER INTERLOCK INTERNAL CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT.
P1C00	BATTERY MONITOR MODULE "A" PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1C00 BATTERY MONITOR MODULE "A" PERFORMANCE.

DTC	Description & trouble part	Reference
P1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.
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 POSITION SENSOR/SWITCH "D" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>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)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH.

DTC	Description & trouble part	Reference
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.
P2226	BAROMETRIC PRESSURE SENSOR "A" CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2226 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT .
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.
P226B	TURBOCHARGER/SUPERCHARGER BOOST PRESSURE TOO HIGH - MECHANICAL	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P226B TURBOCHARGER/SUPERCHARGER BOOST PRESSURE TOO HIGH - MECHANICAL.
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	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2404

DTC	Description & trouble part	Reference
	CIRCUIT RANGE/PERFORMANCE	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.
P24B9	EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P24B9 EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE.
P24BA	EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P24BA EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT LOW.
P24BB	EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P24BB EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT HIGH.
P24D6	EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P24D6 EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE.
P24D7	EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P24D7 EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW.
P24D8	EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P24D8 EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" 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.
P2564	TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2564 TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT LOW.
P2565	TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2565 TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT HIGH.
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.
P2B00	CYLINDER 1 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B00 CYLINDER 1 INJECTION PULSE PERFORMANCE.
P2B01	CYLINDER 2 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B01 CYLINDER 2 INJECTION PULSE PERFORMANCE.
P2B02	CYLINDER 3 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B02 CYLINDER 3 INJECTION PULSE PERFORMANCE.
P2B03	CYLINDER 4 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B03 CYLINDER 4 INJECTION PULSE PERFORMANCE.
P2B08	COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B08 COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE.
P2B09	COLD START CYLINDER 2 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B09 COLD START CYLINDER 2 INJECTION PULSE PERFORMANCE.

DTC	Description & trouble part	Reference
P2B0A	COLD START CYLINDER 3 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B0A COLD START CYLINDER 3 INJECTION PULSE PERFORMANCE.
P2B0B	COLD START CYLINDER 4 INJECTION PULSE PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B0B COLD START CYLINDER 4 INJECTION PULSE PERFORMANCE.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0077	LIN COMMUNICATION BUS "ECM/PCM" OFF	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0077 LIN COMMUNICATION BUS "ECM/PCM" OFF.
U007B	CONTROL MODULE COMMUNICATION BUS "I" OFF	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U007B CONTROL MODULE COMMUNICATION BUS "I" 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 CONTROL MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL 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 WITH BODY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0146	LOST COMMUNICATION WITH SERIAL DATA GATEWAY MODULE "A"	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0146 LOST COMMUNICATION WITH SERIAL DATA GATEWAY MODULE "A".
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL 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	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC 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.
U0420	INVALID DATA RECEIVED FROM POWER STEERING CONTROL 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	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	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423

DTC	Description & trouble part	Reference
		INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1129	LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE PU-CAN	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1129 LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE PU-CAN.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1418	INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-CAN	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1418 INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-CAN.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1712	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1712 LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE.
U171F	LOST LIN COMMUNICATION WITH GENERATOR	Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U171F LOST LIN COMMUNICATION WITH GENERATOR.
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1C08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C08 INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS.
U1C0C	INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C0C INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS.
U1D00	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1D00 CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1D08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1D08 INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS.
U1D0C	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1D0C CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS.
U1E00	LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E00 LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS.
U1E08	LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E08 LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS.

DTC	Description & trouble part	Reference
U1E0C	LOST COMMUNICATION OF AUTHENTICATION DATA WITH EYESIGHT PU-BUS	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E0C LOST COMMUNICATION OF AUTHENTICATION DATA WITH EYESIGHT PU-BUS.

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

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	10.9 V or more
AVCS control	In operation
|Target timing advance change amount (per 80 ms)|	Less than 4°CA
|VVT target angle|	12.5 °CA or more
Ambient air temperature	7°C (44.6°F) or more

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously while AVCS is operating.

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
Σ(Target position − Actual position)	More than 4000°CA Or, Less than −4000°CA

Time needed for diagnosis: 25 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

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

Detect the exhaust AVCS system malfunction.
Judge NG when the amount of exhaust AVCS actual timing advance does not approach the amount of exhaust AVCS target timing advance.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Exhaust AVCS control	In operation
|Target timing advance change amount (per 80 ms)|	Less than 4°CA
|VVT target angle|	14°CA or more
Ambient air temperature	7°C (44.6°F) or more

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously while exhaust AVCS is operating.

4. DIAGNOSTIC METHOD

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
Σ(Target position − Actual position)	More than 4500°CA

Malfunction Criteria	Threshold Value
	Or, Less than −4500°CA

Time needed for diagnosis: 25 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 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.**
- **For the detection standard, refer to 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)

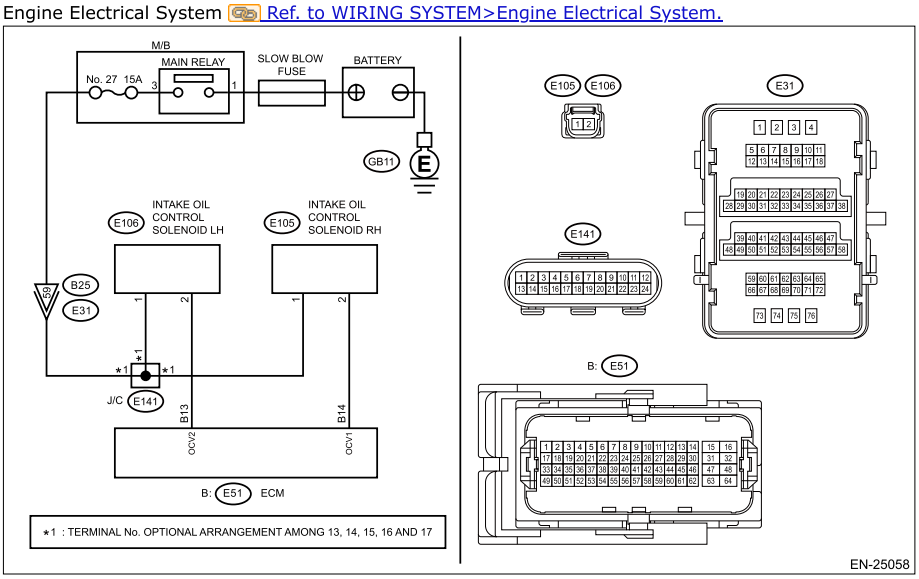
DTC P000D "B" CAMSHAFT POSITION SLOW RESPONSE BANK 2

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.**
- **For the detection standard, refer to DTC P000B. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1.**

DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1

1. —

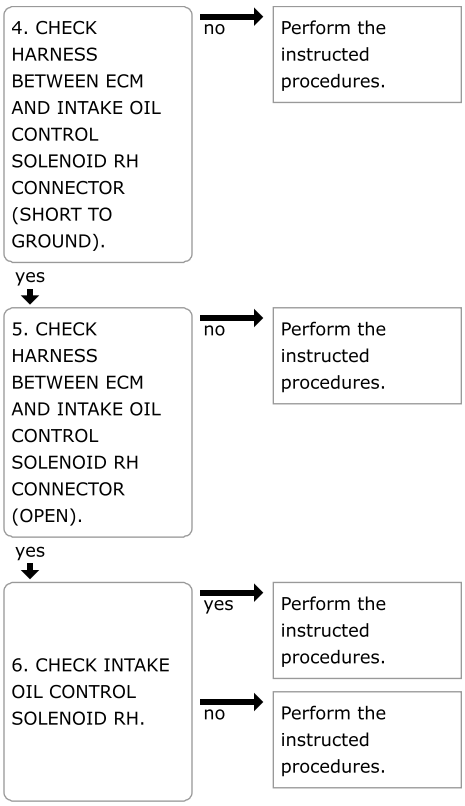
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK OUTPUT SIGNAL OF ECM.	yes	Go to 3.
	no	Go to 2.
2. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.	yes	Go to 4.
	no	Perform the instructed procedures.
3. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID CONNECTOR RH (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 6.



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
   (E51) No. 14 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 3.

No — Go to 2.

2. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.

Measure the voltage between intake oil control solenoid RH connector and engine ground.
Connector & terminal
(E105) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.

- Open circuit or short circuit to ground in harness between M/B and intake oil control solenoid RH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID CONNECTOR RH (SHORT TO POWER SUPPLY).

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. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 14 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and intake oil control solenoid RH connector.
No	Go to 6.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).

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 engine ground.

Connector & terminal

(E105) 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 (OPEN).

Measure the resistance of harness between ECM connector and intake oil control solenoid RH connector.

Connector & terminal

(E51) No. 14 — (E105) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

6. 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 check result OK?

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.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Oil control solenoid control duty	94.9% or more

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Oil control solenoid control duty	Less than 12.3%

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Oil control solenoid control current	Less than 0.306 A

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Oil control solenoid control current	Exceeds 0.306 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

1. —

DTC detecting condition:

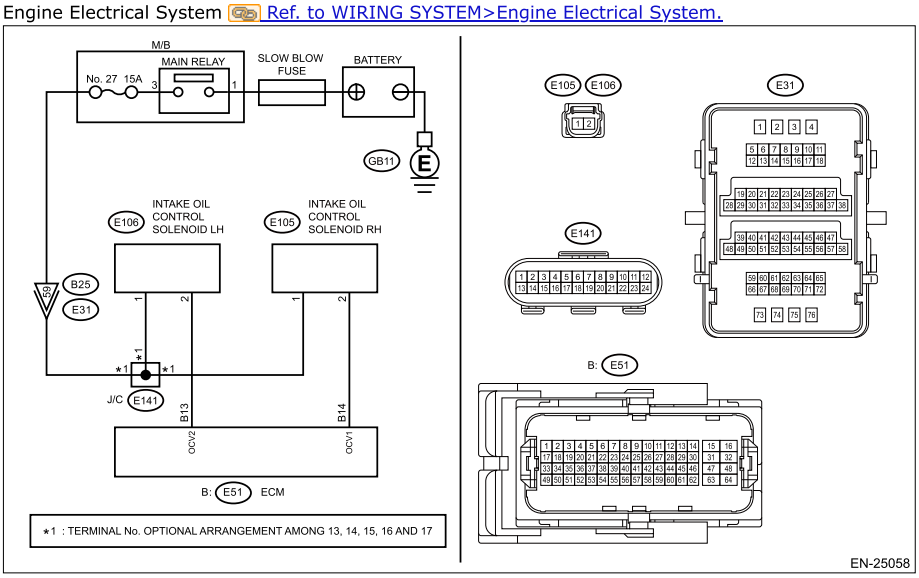
Detected when two consecutive driving cycles with fault occur.

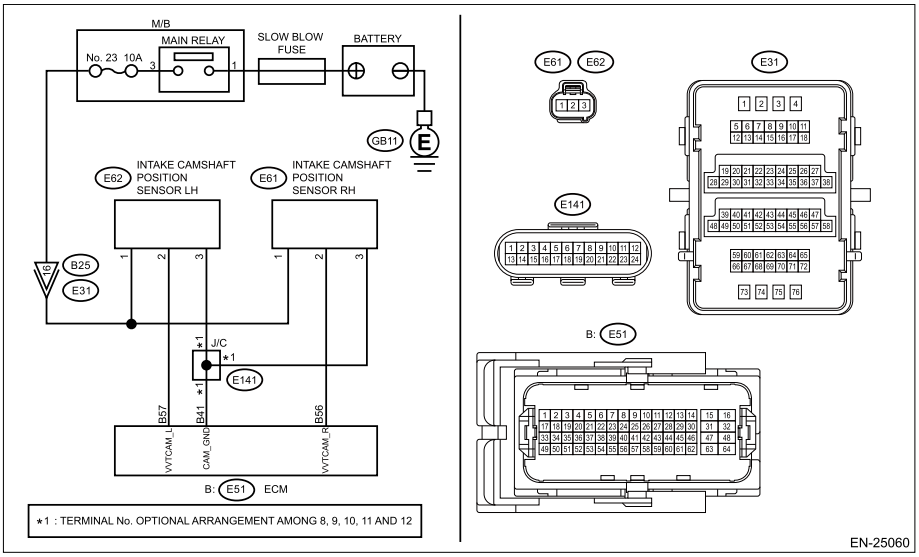
Trouble symptom:

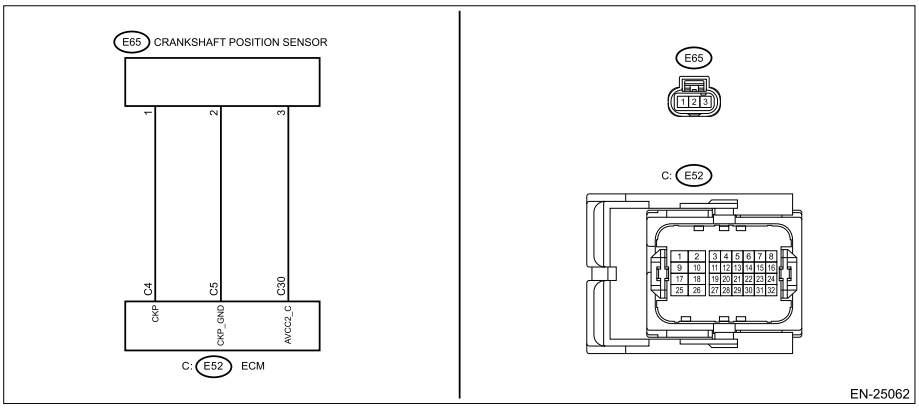
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK OUTPUT SIGNAL OF ECM.	no	Go to 4.
yes		
3. CHECK FOR POOR CONTACT.	yes	Go to 5.
	no	Perform the instructed procedures.
4. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.	no	Perform the instructed procedures.

yes

5. CHECK ENGINE OIL CONDITION.

no → Go to 6.

yes

6. CHECK ON-BOARD MONITOR TEST RESULT.

yes → Go to 8.

no → Go to 7.

7. CHECK ON-BOARD MONITOR TEST RESULT.

no → Go to 17.

yes

8. CHECK HARNESS AND CONNECTOR.

no → Go to 9.

yes

9. CHECK HARNESS AND CONNECTOR (OPEN).

no → Go to 17.

yes

10. CHECK HARNESS AND CONNECTOR (OPEN).

no → Go to 17.

yes

11. CHECK HARNESS AND CONNECTOR (OPEN).

no → Go to 17.

yes

12. CHECK ENGINE OIL PRESSURE.

yes → Go to 14.

no → Go to 13.

13. CHECK OIL STRAINER.

no → Go to 15.

yes

14. CHECK OIL PATH OF CHAIN COVER.

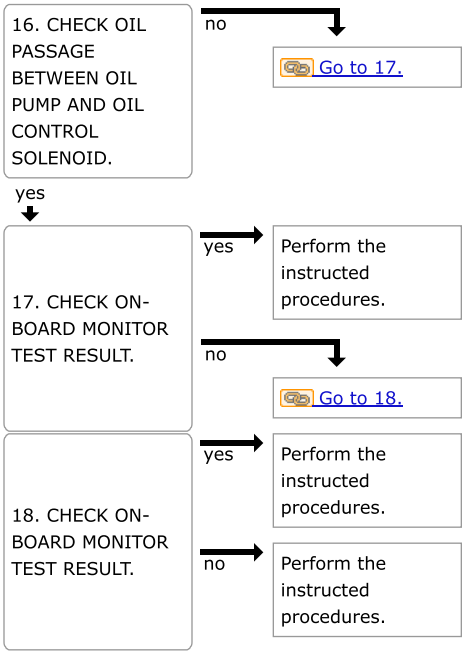
no → Go to 15.

yes

15. CHECK CAMSHAFT.

no → Go to 16.

yes



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than P000A and P0011 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data. Go to 2.

2. CHECK OUTPUT SIGNAL OF ECM.

Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 14 (+) — 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?

Yes	Go to 5.
No	Repair or replace faulty parts.

4. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.

Measure the voltage between intake oil control solenoid RH connector and engine ground.

Connector & terminal

(E105) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B and intake oil control solenoid RH connector • Blown out of fuse • Poor contact of coupling connector • Poor contact of J/C

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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter. Go to 6.

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Turn the ignition switch to OFF.
2. Replace the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Oil Control Solenoid.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
6. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

7. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 1] for 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 (the 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

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).
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.
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 in harness between intake oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E51) No. 14 — (E105) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.
Go to 17.

10. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the intake camshaft position sensor RH.
2. Measure the resistance in harness between the intake camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E51) No. 56 — (E61) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 11.

No — Repair the open circuit in the harness between ECM connector and intake camshaft position sensor RH connector.
Go to 17.

11. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 12.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.
Go to 17.

12. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 14.

No — Go to 13.

13. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 15.

14. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes

Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 17.

No

Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 17.

17. CHECK ON-BOARD MONITOR TEST RESULT.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

   Warning:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
5. Record the read values of [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 ON-BOARD MONITOR TEST RESULT.

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 (the 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.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Normal

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
AVCS control	In operation
|VVT target angle|	More than 10°CA
Ambient air temperature	7°C (44.6°F) or more

Intermediate lock

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine speed	500 rpm or more
Elapsed time after starting the engine	500 ms or more and Value of Map or less

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	3.5	2.8	2.8

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)	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8

GENERAL DRIVING CYCLE

Perform the diagnosis continuously while AVCS is operating. (Normal)
Perform the diagnosis when the AVCS is carrying out the intermediate lock control at the engine start. (Intermediate lock)

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 (normal)

Malfunction Criteria	Threshold Value
|(Target position − Actual position)|	More than 10°CA

Judgment value (intermediate lock)

Malfunction Criteria	Threshold Value
|(Target position − Actual position)|	More than 10°CA

Time needed for diagnosis

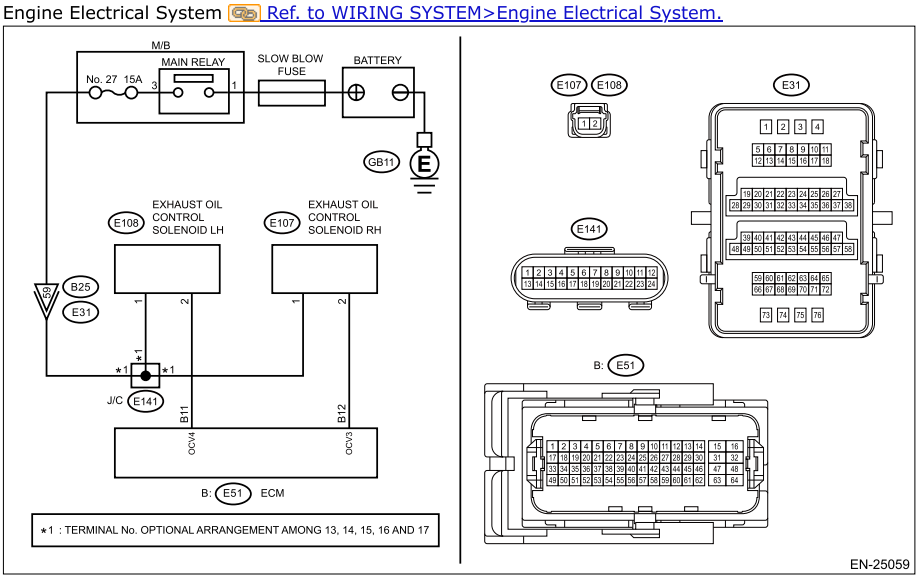
Normal: 5000 ms
Intermediate lock: 2000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK OUTPUT SIGNAL OF ECM.	yes	Go to 3.
	no	Go to 2.
2. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.	yes	Go to 4.
	no	Perform the instructed procedures.
3. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 6.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).
→ no → Perform the instructed procedures.
yes ↓

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (OPEN).
→ no → Perform the instructed procedures.
yes ↓

6. CHECK EXHAUST OIL CONTROL SOLENOID RH.
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

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
   (E51) No. 12 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 3.

No — Go to 2.

2. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.

Measure the voltage between exhaust oil control solenoid RH connector and engine ground.
Connector & terminal
(E107) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.
- Open circuit or short circuit to ground in harness between M/B and exhaust oil control solenoid RH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH (SHORT TO POWER SUPPLY).

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. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E51) No. 12 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and exhaust oil control solenoid RH connector.
No	Go to 6.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).

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 engine ground.
   Connector & terminal
   (E107) 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 exhaust oil control solenoid RH connector.

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (OPEN).

Measure the resistance of harness between ECM connector and exhaust oil control solenoid RH connector.
Connector & terminal
(E51) No. 12 — (E107) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.

6. 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 check result OK?

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.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION
Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Oil control solenoid control duty	94.9 % or more

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Oil control solenoid control duty	Less than 12.3 %

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Oil control solenoid control current	Less than 0.306 A

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Oil control solenoid control current	Exceeds 0.306 A

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1

1. —

DTC detecting condition:

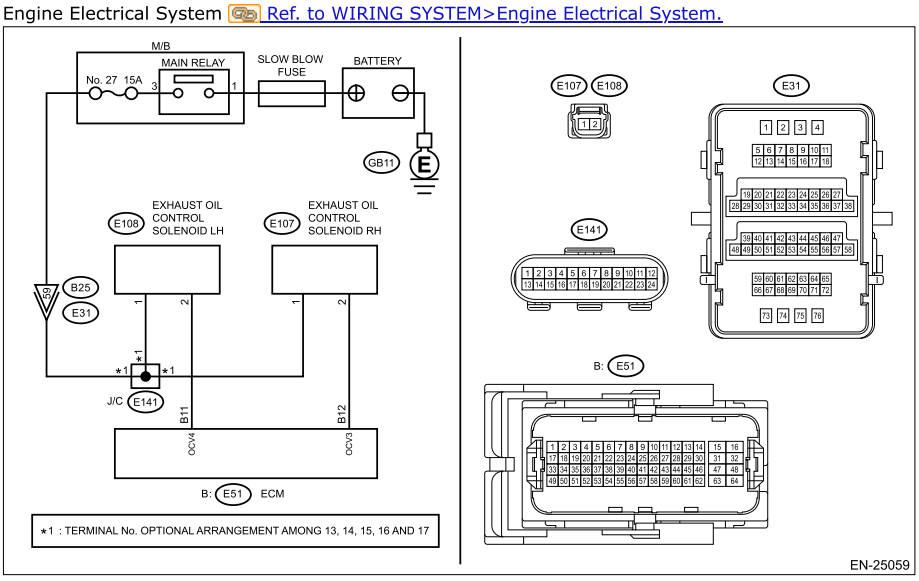
Detected when two consecutive driving cycles with fault occur.

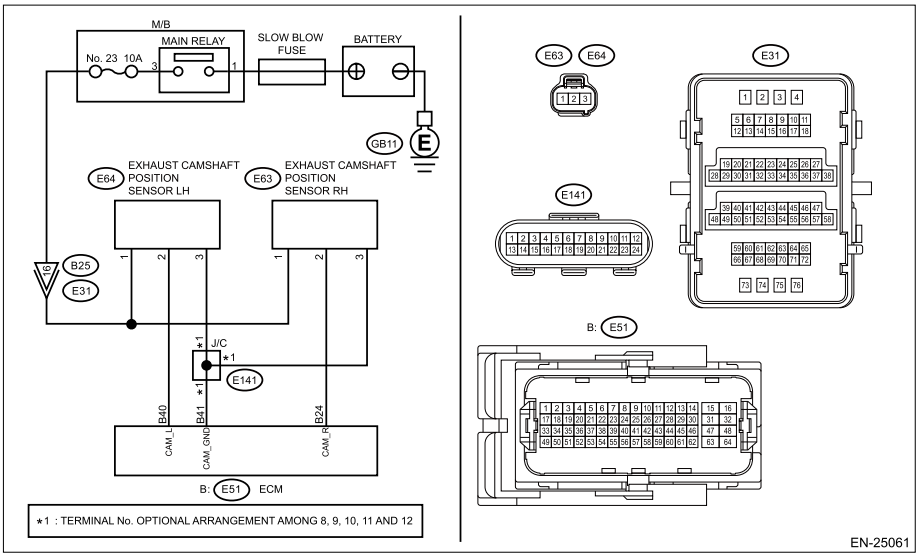
Trouble symptom:

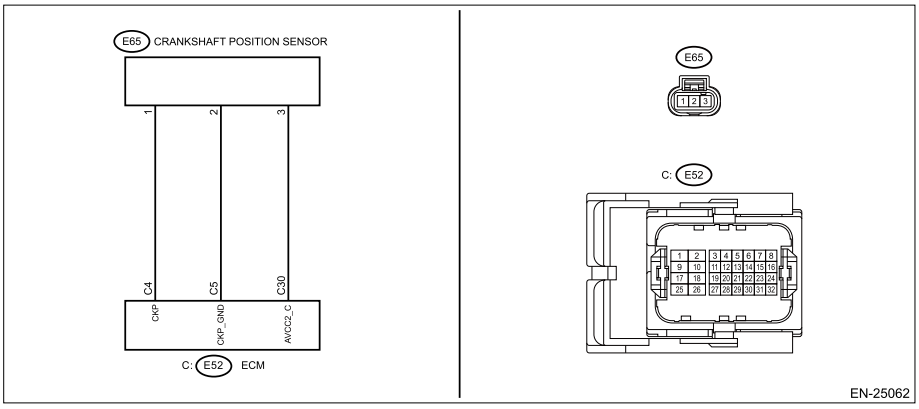
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







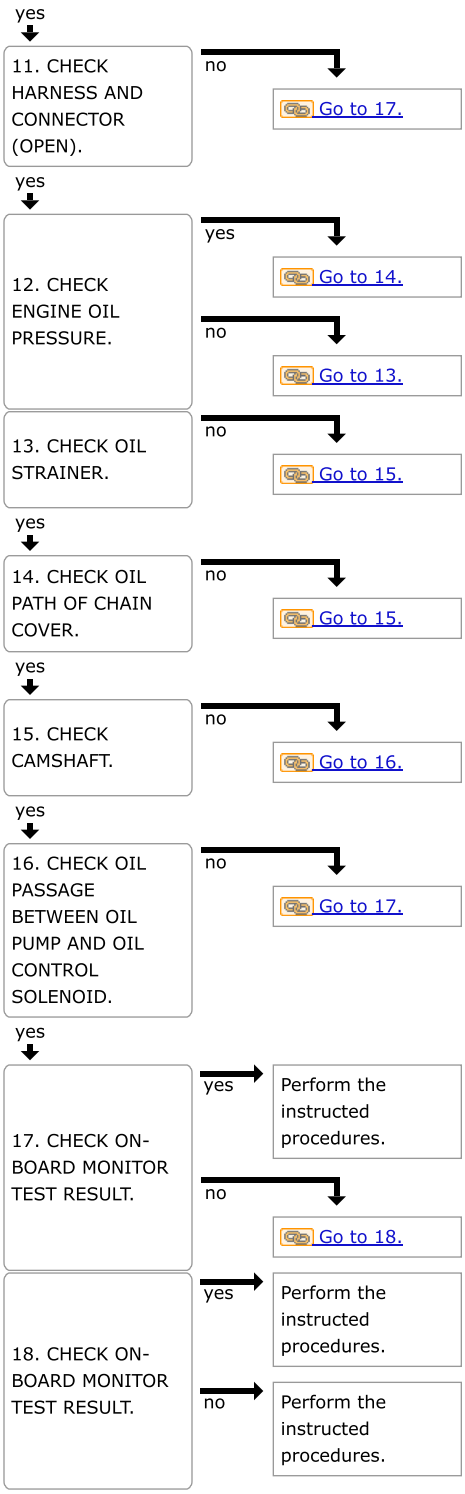
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK OUTPUT SIGNAL OF ECM.
   - no → Go to 4.
   - yes ↓
3. CHECK FOR POOR CONTACT.
   - yes → Go to 5.
   - no → Perform the instructed procedures.
4. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK ENGINE OIL CONDITION.
   - no → Go to 6.
   - yes ↓
6. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 8.
   - no → Go to 7.
7. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 17.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR.
   - no → Go to 9.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 17.
   - yes ↓
10. CHECK HARNESS AND CONNECTOR (OPEN).
    - no → Go to 17.


yes
11. CHECK HARNESS AND CONNECTOR (OPEN).
no
Go to 17.
yes
12. CHECK ENGINE OIL PRESSURE.
yes
Go to 14.
no
Go to 13.
13. CHECK OIL STRAINER.
no
Go to 15.
yes
14. CHECK OIL PATH OF CHAIN COVER.
no
Go to 15.
yes
15. CHECK CAMSHAFT.
no
Go to 16.
yes
16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.
no
Go to 17.
yes
17. CHECK ON-BOARD MONITOR TEST RESULT.
yes
Perform the instructed procedures.
no
Go to 18.
18. CHECK ON-BOARD MONITOR TEST RESULT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than P000B and P0014 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.
Go to 2.

2. CHECK OUTPUT SIGNAL OF ECM.

Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 12 (+) — 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?

Yes — Go to 5.

No — Repair or replace faulty parts.

4. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.

Measure the voltage between exhaust oil control solenoid RH connector and engine ground.

Connector & terminal

(E107) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 5.

No — Repair the following item.
- Open circuit or short circuit to ground in harness between M/B and exhaust oil control solenoid RH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 6.

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Turn the ignition switch to OFF.
2. Replace the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Oil Control Solenoid.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
6. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

   Warning:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
7. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 1] for 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 (the 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

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).
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.
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 in harness between exhaust oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E51) No. 12 — (E107) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.
Go to 17.

10. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the exhaust camshaft position sensor RH.
2. Measure the resistance in harness between the exhaust camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E51) No. 24 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 11.

No — Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor RH connector.
Go to 17.

11. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 12.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.
Go to 17.

12. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 14.

No — Go to 13.

13. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 15.

14. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes — Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 17.

No — Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 17.

17. CHECK ON-BOARD MONITOR TEST RESULT.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the read values of [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 ON-BOARD MONITOR TEST RESULT.

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 (the 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.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Exhaust AVCS control	In operation
|VVT target angle|	More than 10°CA
Ambient air temperature	7°C (44.6°F) or more

GENERAL DRIVING CYCLE

Perform the diagnosis continuously while exhaust AVCS is operating.

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)|	More than 10°CA

Time needed for diagnosis: 5000 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A

1. —

DTC detecting condition:

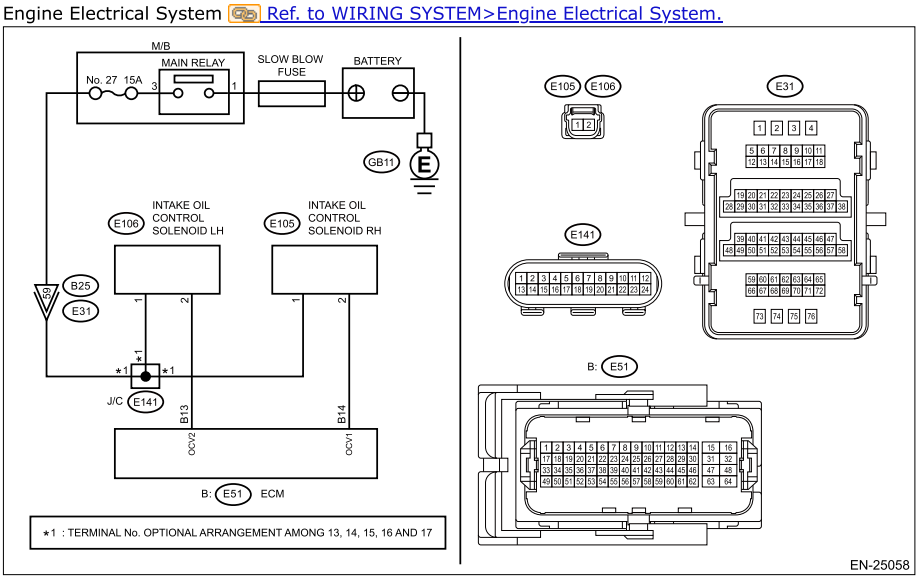
Detected when two consecutive driving cycles with fault occur.

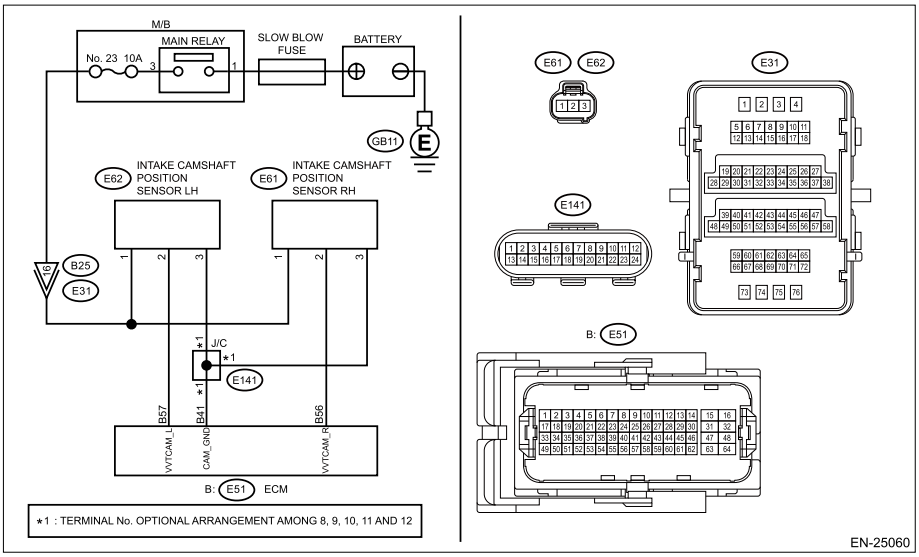
Trouble symptom:

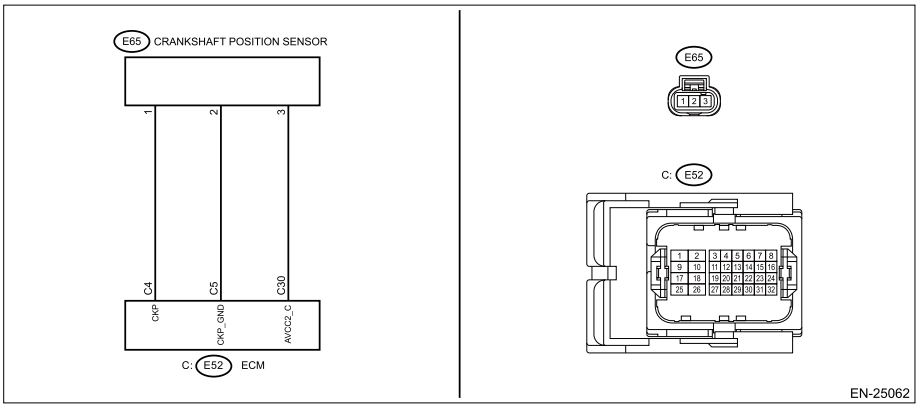
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







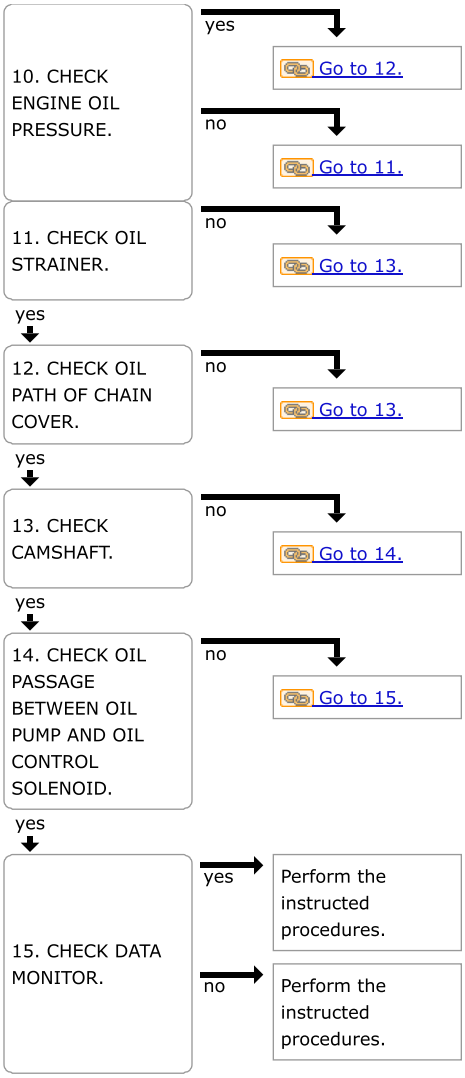
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ENGINE OIL CONDITION.
   - no → Go to 3.
   - yes ↓
3. CHECK TIMING CHAIN.
   - yes → Go to 15.
   - no → Go to 4.
4. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 6.
   - no → Go to 5.
5. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 15.
   - yes ↓
6. CHECK HARNESS AND CONNECTOR.
   - no → Go to 7.
   - yes ↓
7. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0016 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 3.

3. CHECK TIMING CHAIN.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Disconnect the connector of the intake oil control solenoid RH. (DTC will be set but this will not affect the inspection)
5. Turn the ignition switch to ON.
6. Start monitoring of [VVT Adv. Ang. Amount R] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

7. Start the engine.
8. Read the value of [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 or more elapse since the engine was started.

9. Record the readings [VVT Adv. Ang. Amount R].
10. 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. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
5. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

6. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 1] for 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 (the 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

Is the check result OK?

Yes — Go to 7.

No — Repair or replace faulty parts.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
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.
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 in harness between intake oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E51) No. 14 — (E105) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 8.

No — Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.
Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the intake camshaft position sensor RH.
2. Measure the resistance in harness between the intake camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E51) No. 56 — (E61) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — Repair the open circuit in the harness between ECM connector and intake camshaft position sensor RH connector.
Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

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.
Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes — Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 15.

No — Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 15.

15. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Using the Subaru Select Monitor, read the value in [VVT Initial Position Learning Value #1].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
4. 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:
65.2 — 95.2

Yes — ECM is good; finish the diagnosis.

No — Replace the ECM and perform the corresponding inspection mode. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM). Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode. When DTC is not displayed, end the diagnosis.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the AVCS system malfunction.
Judge as NG when standard timing advance amount is far from learning angle.

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 chain derails suddenly in process or because wrong assembly occurs during servicing.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
AVCS position learning	In operation

GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting engine and while AVCS is not operating.

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.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
|Crankshaft position when camshaft position sensor signal is input − Learning value|	More than 16.9°CA

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Camshaft position sensor signal input position (bank 1)	Less than 50.8 °CA Or, More than 109.9 °CA
Camshaft position sensor signal input position (bank 2)	Less than 52.3 °CA Or, More than 110.4 °CA

Time needed for diagnosis: 1000 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B

1. —

DTC detecting condition:

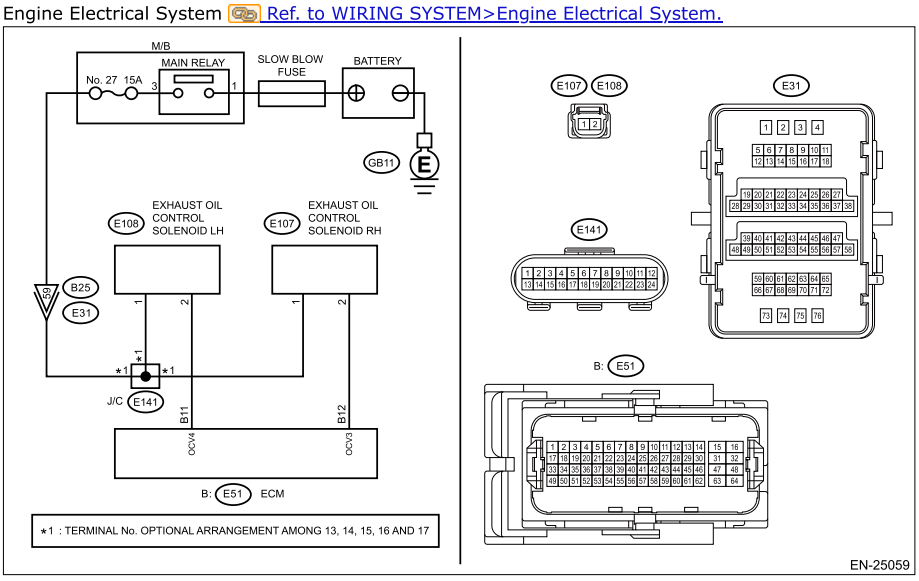
Detected when two consecutive driving cycles with fault occur.

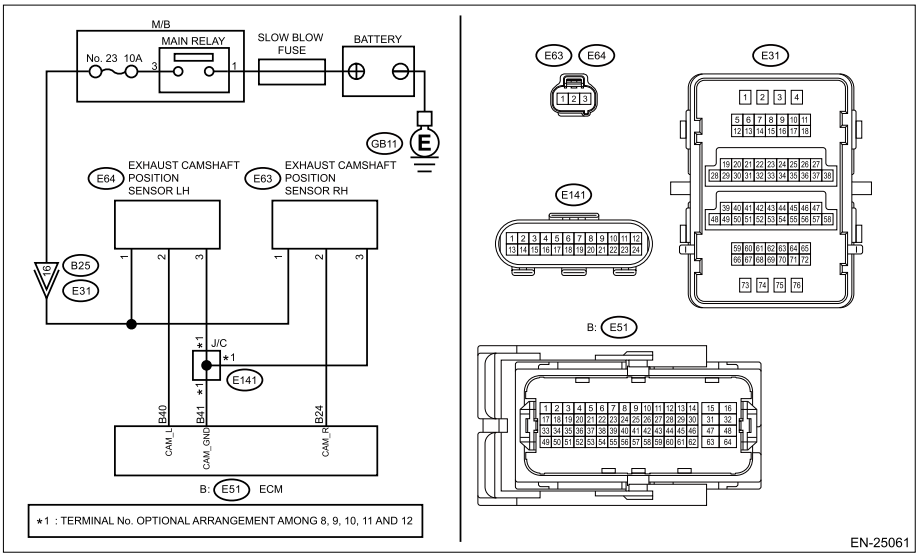
Trouble symptom:

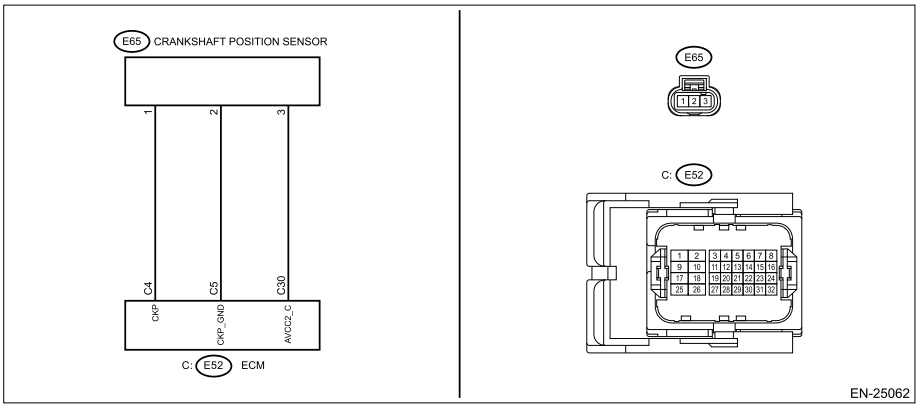
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







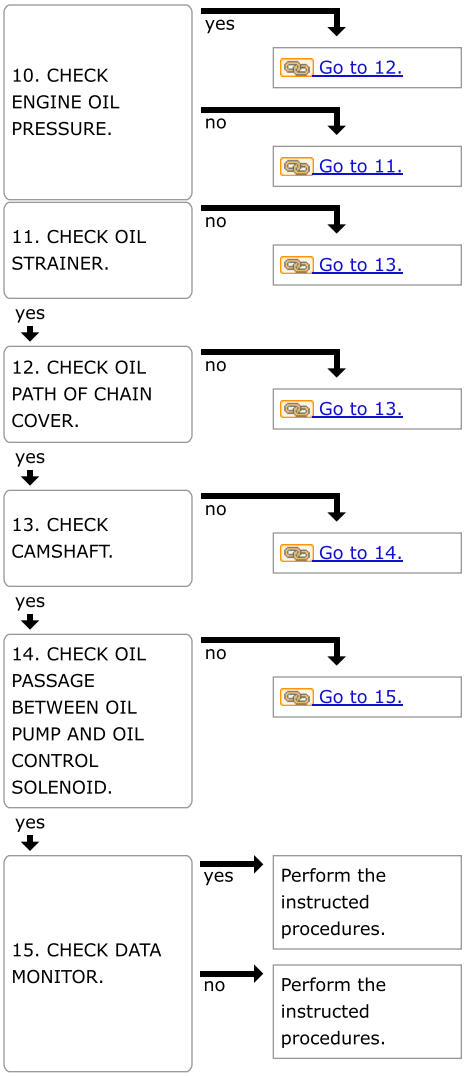
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ENGINE OIL CONDITION.
   - no → Go to 3.
   - yes ↓
3. CHECK TIMING CHAIN.
   - yes → Go to 15.
   - no → Go to 4.
4. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 6.
   - no → Go to 5.
5. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 15.
   - yes ↓
6. CHECK HARNESS AND CONNECTOR.
   - no → Go to 7.
   - yes ↓
7. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0017 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 3.

3. CHECK TIMING CHAIN.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Disconnect the connector of the exhaust oil control solenoid RH. (DTC will be set but this will not affect the inspection)
5. Turn the ignition switch to ON.
6. Start monitoring of [Exh. VVT Retard Ang. R] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

7. Start the engine.
8. Read the value of [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 or more elapse since the engine was started.

9. Record the readings [Exh. VVT Retard Ang. R].
10. 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. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
5. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

6. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 1] for 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 (the 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

Is the check result OK?

Yes — Go to 7.

No — Repair or replace faulty parts.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
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.
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 in harness between exhaust oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E51) No. 12 — (E107) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 8.

No — Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.
Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the exhaust camshaft position sensor RH.
2. Measure the resistance in harness between the exhaust camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E51) No. 24 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor RH connector.
Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

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.
Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes — Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 15.

No — Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 15.

15. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Using the Subaru Select Monitor, read the value in [VVT Ex Initial Position Learning Value #1].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
4. 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:
93 — 124

Yes — ECM is good; finish the diagnosis.

No — Replace the ECM and perform the corresponding inspection mode. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM). Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode. When DTC is not displayed, end the diagnosis.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the exhaust AVCS system malfunction.
Judge as NG when standard timing advance amount is far from learning angle.

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 chain derails suddenly in process or because wrong assembly occurs during servicing.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Exhaust AVCS position learning	In operation

GENERAL DRIVING CYCLE

Perform the diagnosis continuously while the exhaust AVCS is not operating after warming up.

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.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
|Crankshaft position when camshaft position sensor signal is input − Learning value|	More than 16.9°CA

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Camshaft position sensor signal input position (bank 1)	Less than 81.5 °CA Or, More than 138.3 °CA
Camshaft position sensor signal input position (bank 2)	Less than 79.7 °CA Or, More than 137.4 °CA

Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A

1. —

DTC detecting condition:

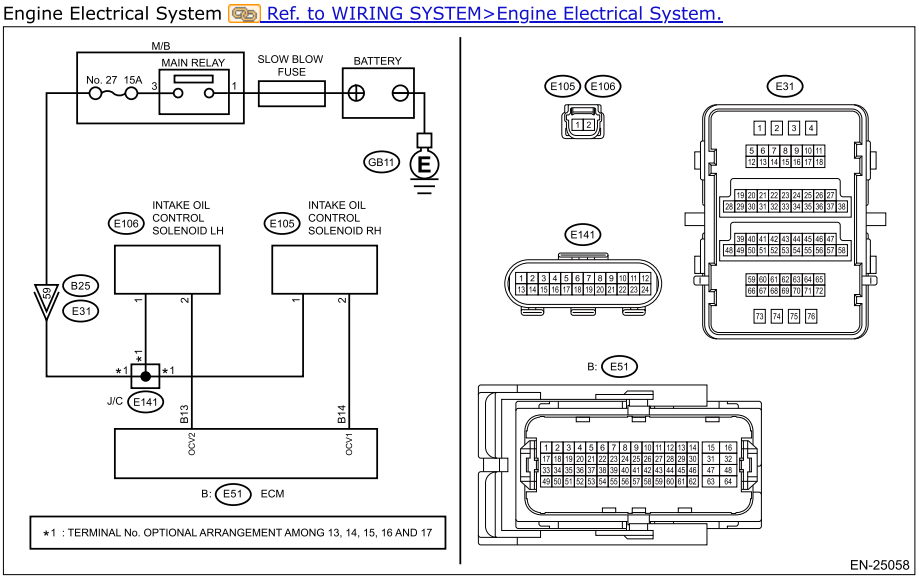
Detected when two consecutive driving cycles with fault occur.

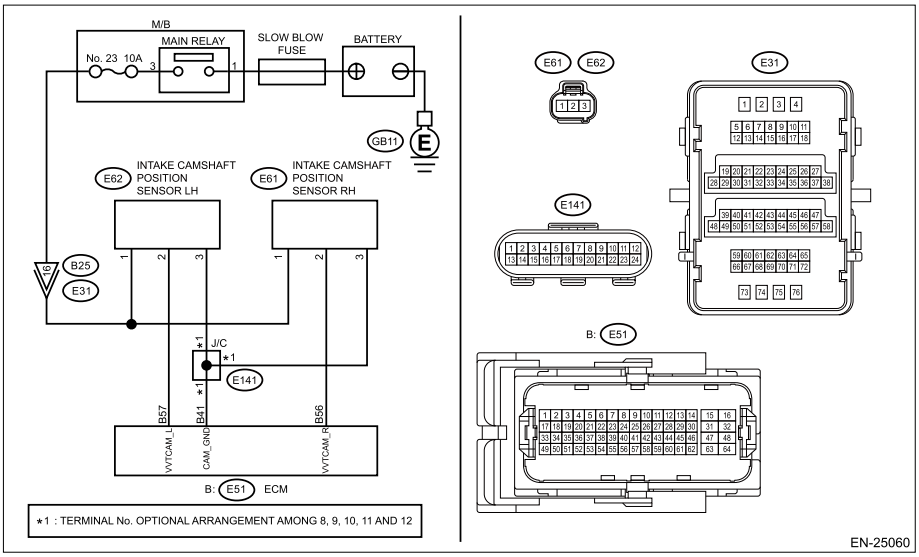
Trouble symptom:

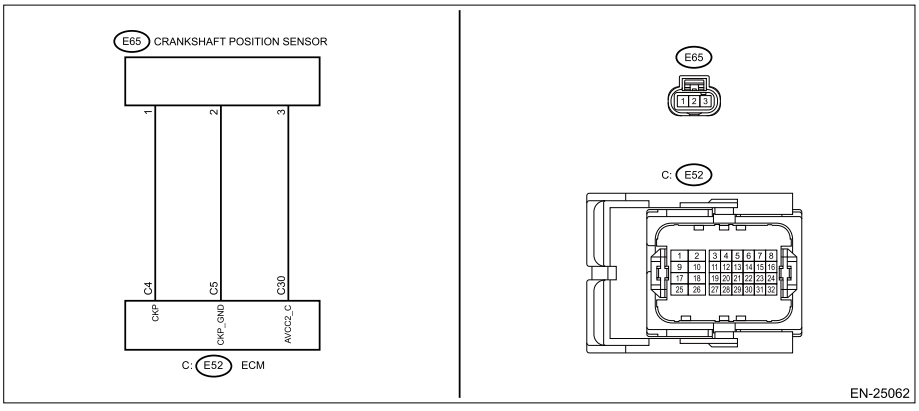
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







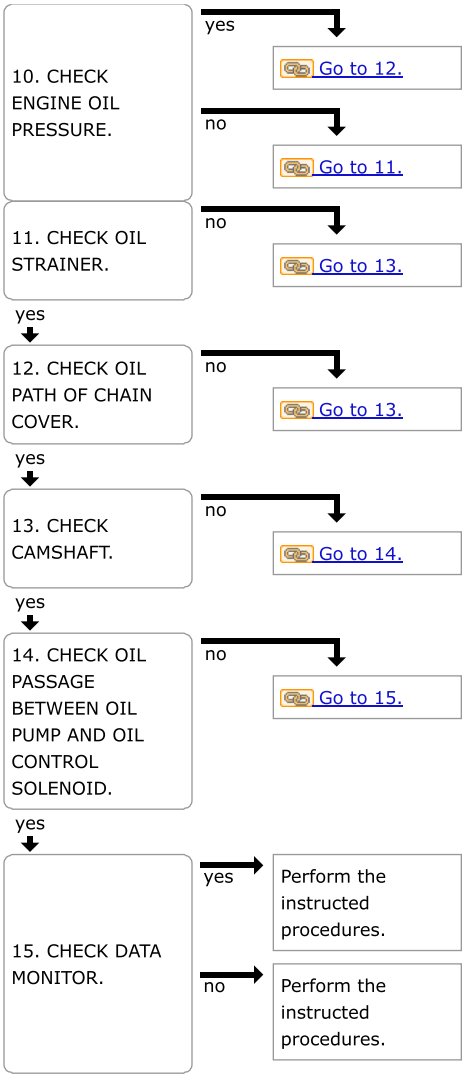
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ENGINE OIL CONDITION.
   - no → Go to 3.
   - yes ↓
3. CHECK TIMING CHAIN.
   - yes → Go to 15.
   - no → Go to 4.
4. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 6.
   - no → Go to 5.
5. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 15.
   - yes ↓
6. CHECK HARNESS AND CONNECTOR.
   - no → Go to 7.
   - yes ↓
7. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0018 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 3.

3. CHECK TIMING CHAIN.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Disconnect the connector of the intake oil control solenoid LH. (DTC will be set but this will not affect the inspection)
5. Turn the ignition switch to ON.
6. Start monitoring of [VVT Adv. Ang. Amount L] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

7. Start the engine.
8. Read the value of [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.

9. Record the readings [VVT Adv. Ang. Amount L].
10. 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. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
5. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

6. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 2] for 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 (the 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

Is the check result OK?

Yes — Go to 7.

No — Repair or replace faulty parts.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
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.
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 in harness between intake oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E51) No. 13 — (E106) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 8.

No — Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.
Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from intake camshaft position sensor LH.
2. Measure the resistance in harness between the intake camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E51) No. 57 — (E62) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — Repair the open circuit in the harness between ECM connector and intake camshaft position sensor LH connector.
Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

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.
Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes — Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 15.

No — Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 15.

15. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Using the Subaru Select Monitor, read the value in [VVT Initial Position Learning Value #2].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
4. 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:
65.2 — 95.2

Yes — ECM is good; finish the diagnosis.

No — Replace the ECM and perform the corresponding inspection mode. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM). Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode. When DTC is not displayed, end the diagnosis.

GENERAL DESCRIPTION

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.

DTC P0019 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B

1. —

DTC detecting condition:

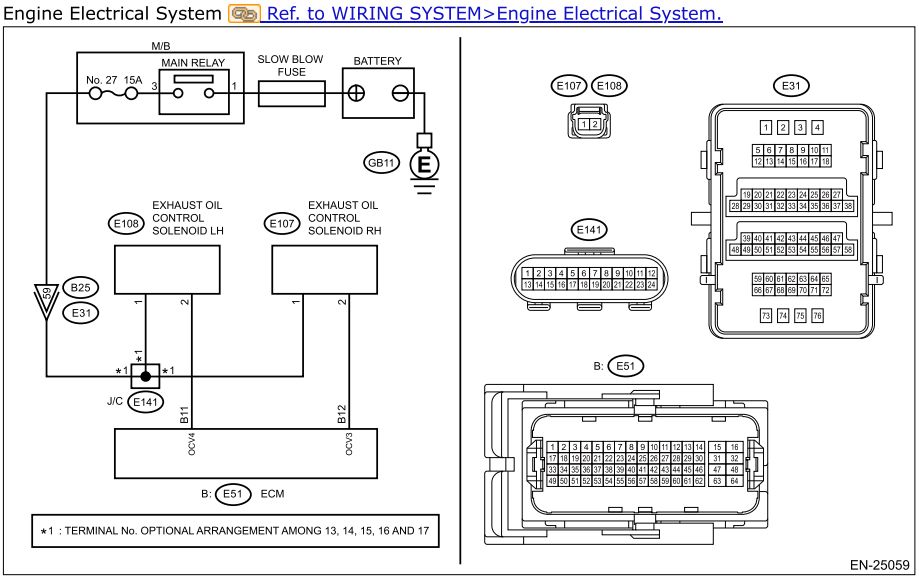
Detected when two consecutive driving cycles with fault occur.

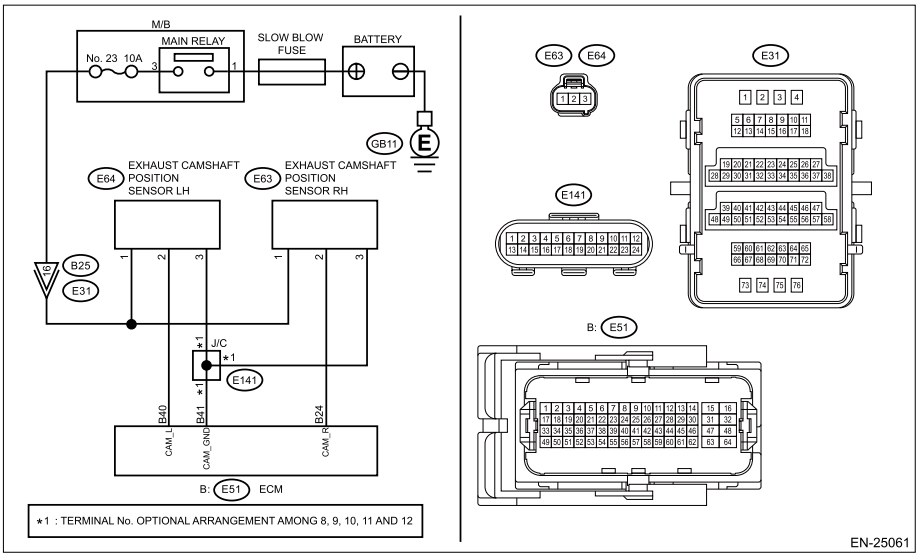
Trouble symptom:

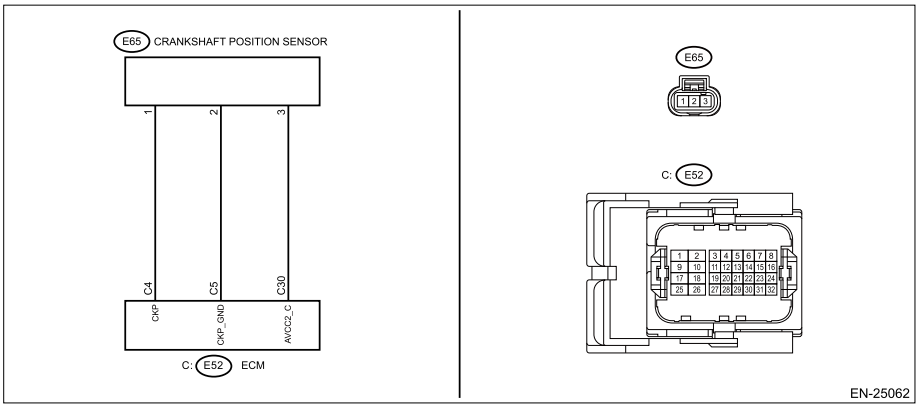
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







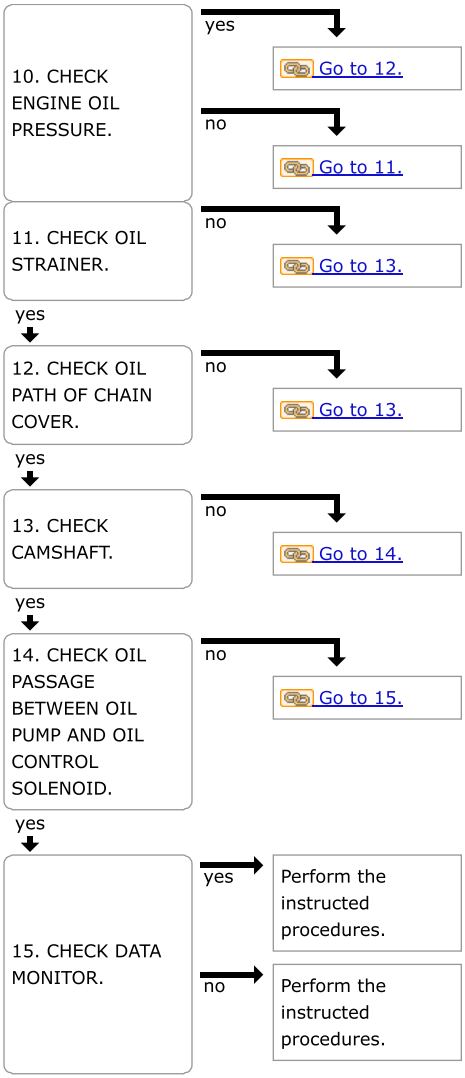
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ENGINE OIL CONDITION.
   - no → Go to 3.
   - yes ↓
3. CHECK TIMING CHAIN.
   - yes → Go to 15.
   - no → Go to 4.
4. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 6.
   - no → Go to 5.
5. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 15.
   - yes ↓
6. CHECK HARNESS AND CONNECTOR.
   - no → Go to 7.
   - yes ↓
7. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 15.
   - yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0019 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 3.

3. CHECK TIMING CHAIN.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Disconnect the connector of the exhaust oil control solenoid LH. (DTC will be set but this will not affect the inspection)
5. Turn the ignition switch to ON.
6. Start monitoring of [Exh. VVT Retard Ang. L] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

7. Start the engine.
8. Read the value of [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.

9. Record the readings [Exh. VVT Retard Ang. L].
10. 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. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
5. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

6. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 2] for 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 (the 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

Is the check result OK?

Yes — Go to 7.

No — Repair or replace faulty parts.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
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.
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 in harness between exhaust oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E51) No. 11 — (E108) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 8.

No — Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.
Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from exhaust camshaft position sensor LH.
2. Measure the resistance in harness between the exhaust camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E51) No. 40 — (E64) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor LH connector.
Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

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.
Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes

Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes

Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 15.

No

Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 15.

15. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Using the Subaru Select Monitor, read the value in [VVT Ex Initial Position Learning Value #2].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
4. 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:
93 — 124

Yes

ECM is good; finish the diagnosis.

No

Replace the ECM and perform the corresponding inspection mode. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM). Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode. When DTC is not displayed, end the diagnosis.

GENERAL DESCRIPTION

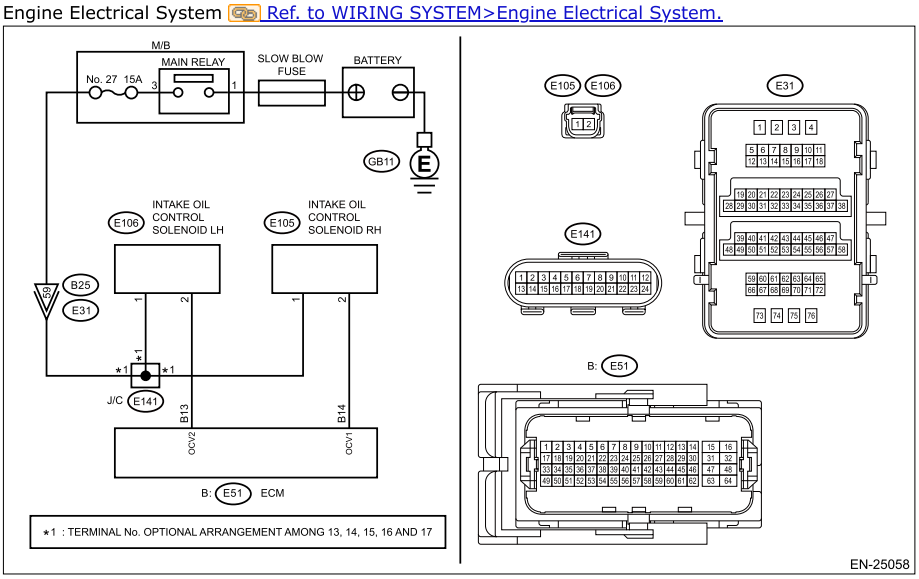
OUTLINE OF DIAGNOSIS

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.

DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2

1. —

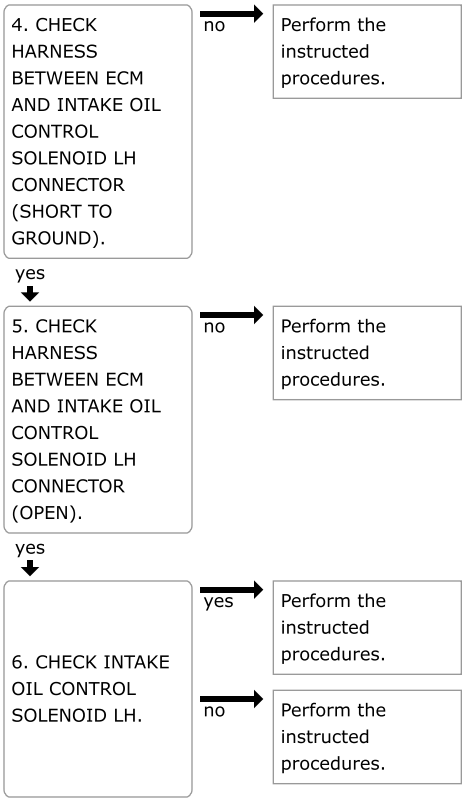
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK OUTPUT SIGNAL OF ECM.	yes	Go to 3.
	no	Go to 2.
2. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.	yes	Go to 4.
	no	Perform the instructed procedures.
3. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 6.



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
   (E51) No. 13 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 3.

No — Go to 2.

2. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.

Measure the voltage between intake oil control solenoid LH connector and engine ground.
Connector & terminal
(E106) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.

- Open circuit or short circuit to ground in harness between M/B and intake oil control solenoid LH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO POWER SUPPLY).

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. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 13 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and intake oil control solenoid LH connector.
No	Go to 6.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

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 engine ground.

Connector & terminal

(E106) 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 (OPEN).

Measure the resistance of harness between ECM connector and intake oil control solenoid LH connector.

Connector & terminal

(E51) No. 13 — (E106) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

6. 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 check result OK?

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.

GENERAL DESCRIPTION

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.

DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2

1. —

DTC detecting condition:

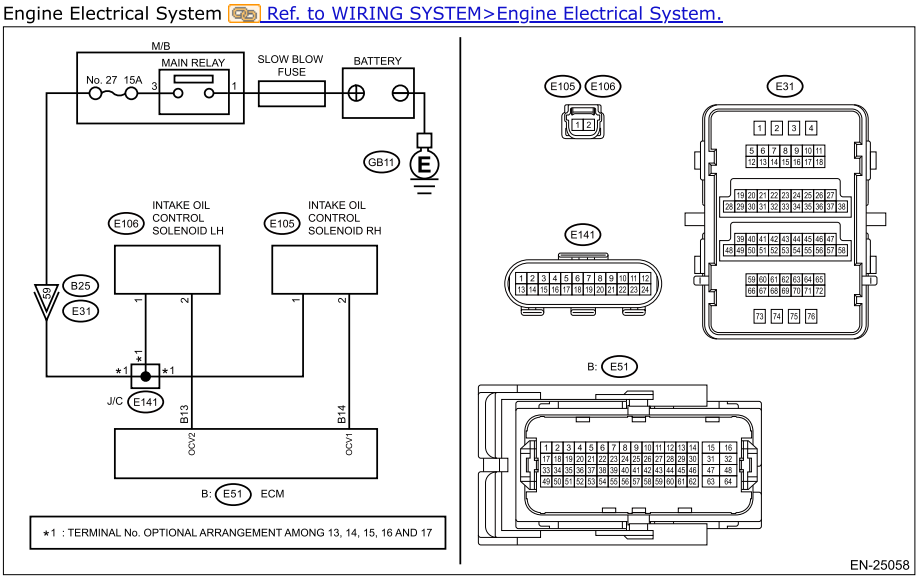
Detected when two consecutive driving cycles with fault occur.

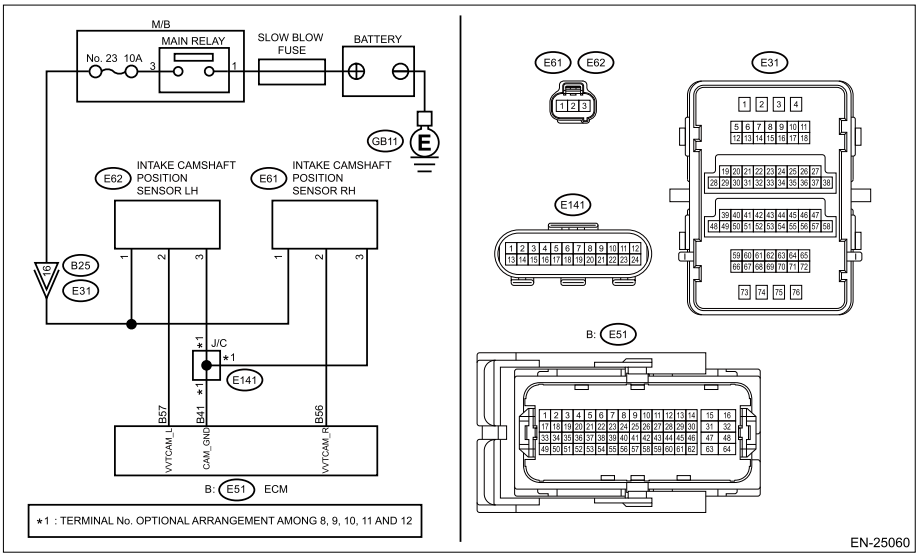
Trouble symptom:

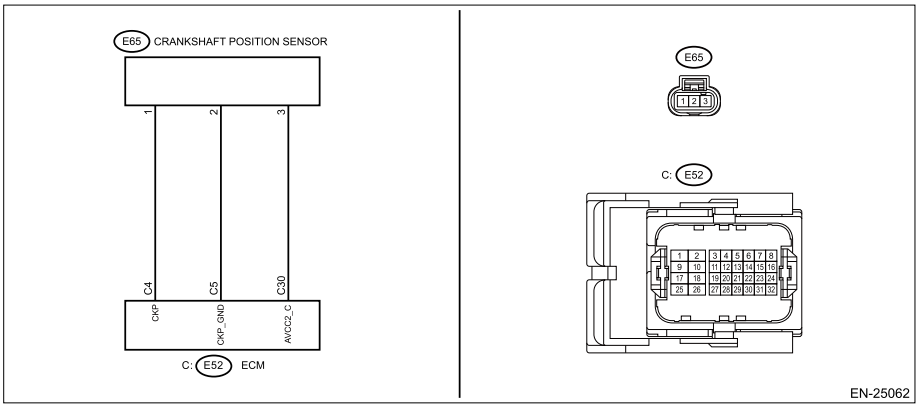
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







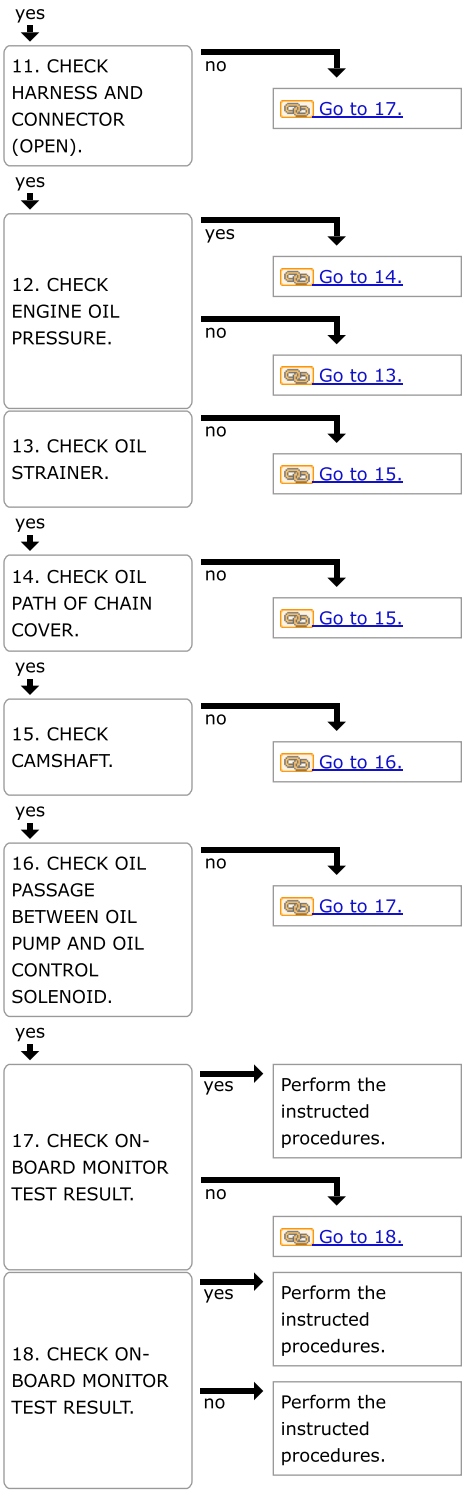
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK OUTPUT SIGNAL OF ECM.
   - no → Go to 4.
   - yes ↓
3. CHECK FOR POOR CONTACT.
   - yes → Go to 5.
   - no → Perform the instructed procedures.
4. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK ENGINE OIL CONDITION.
   - no → Go to 6.
   - yes ↓
6. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 8.
   - no → Go to 7.
7. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 17.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR.
   - no → Go to 9.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 17.
   - yes ↓
10. CHECK HARNESS AND CONNECTOR (OPEN).
    - no → Go to 17.


yes
11. CHECK HARNESS AND CONNECTOR (OPEN).
no
Go to 17.
yes
12. CHECK ENGINE OIL PRESSURE.
yes
Go to 14.
no
Go to 13.
13. CHECK OIL STRAINER.
no
Go to 15.
yes
14. CHECK OIL PATH OF CHAIN COVER.
no
Go to 15.
yes
15. CHECK CAMSHAFT.
no
Go to 16.
yes
16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.
no
Go to 17.
yes
17. CHECK ON-BOARD MONITOR TEST RESULT.
yes
Perform the instructed procedures.
no
Go to 18.
18. CHECK ON-BOARD MONITOR TEST RESULT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than P000C and P0021 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.
Go to 2.

2. CHECK OUTPUT SIGNAL OF ECM.

Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 13 (+) — 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?

Yes — Go to 5.

No — Repair or replace faulty parts.

4. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.

Measure the voltage between intake oil control solenoid LH connector and engine ground.

Connector & terminal

(E106) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 5.

No — Repair the following item.
- Open circuit or short circuit to ground in harness between M/B and intake oil control solenoid LH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 6.

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Turn the ignition switch to OFF.
2. Replace the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Oil Control Solenoid.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
6. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

   Warning:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
7. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 2] for 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 (the value of [VVT Monitor Bank 1] × 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

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).
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.
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 in harness between intake oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E51) No. 13 — (E106) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.
Go to 17.

10. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from intake camshaft position sensor LH.
2. Measure the resistance in harness between the intake camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E51) No. 57 — (E62) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 11.

No — Repair the open circuit in the harness between ECM connector and intake camshaft position sensor LH connector.
Go to 17.

11. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 12.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.
Go to 17.

12. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 14.

No — Go to 13.

13. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 15.

14. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes — Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 17.

No — Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 17.

17. CHECK ON-BOARD MONITOR TEST RESULT.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the read values of [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 ON-BOARD MONITOR TEST RESULT.

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 (the 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)(H4DOTC)>Engine Control Module (ECM).
No	End.

GENERAL DESCRIPTION

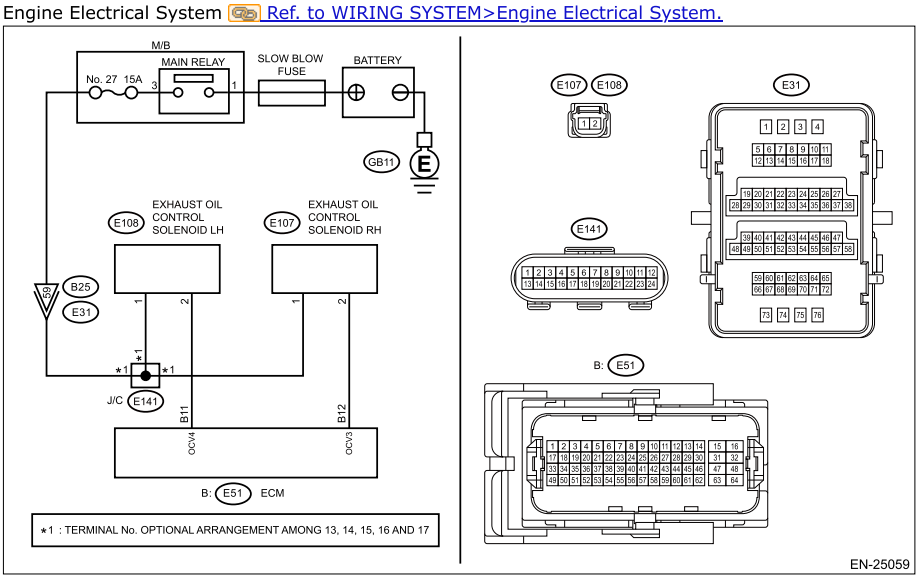
OUTLINE OF DIAGNOSIS

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.

DTC P0023 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK OUTPUT SIGNAL OF ECM.	yes	Go to 3.
	no	Go to 2.
2. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.	yes	Go to 4.
	no	Perform the instructed procedures.
3. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 6.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND). → no → Perform the instructed procedures.

yes ↓

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (OPEN). → no → Perform the instructed procedures.

yes ↓

6. CHECK EXHAUST OIL CONTROL SOLENOID LH. → yes → Perform the instructed procedures.

→ no → Perform the instructed procedures.

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
   (E51) No. 11 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 3.

No — Go to 2.

2. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.

Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E108) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.

- Open circuit or short circuit to ground in harness between M/B and exhaust oil control solenoid LH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO POWER SUPPLY).

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. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 11 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and exhaust oil control solenoid LH connector.
No	Go to 6.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

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 engine ground.

Connector & terminal

(E108) 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 exhaust oil control solenoid LH connector.

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (OPEN).

Measure the resistance of harness between ECM connector and exhaust oil control solenoid LH connector.

Connector & terminal

(E51) No. 11 — (E108) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.

6. 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 check result OK?

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.

GENERAL DESCRIPTION

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.

DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2

1. —

DTC detecting condition:

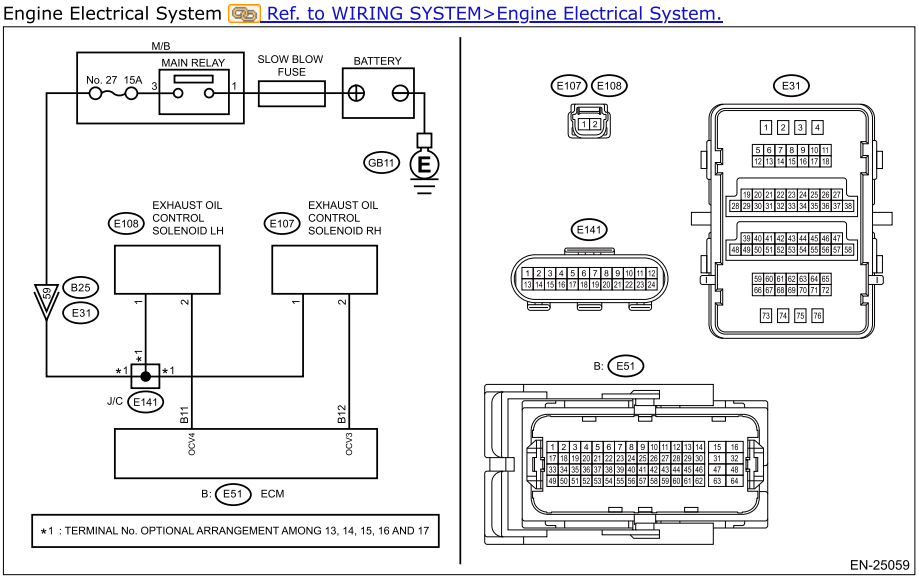
Detected when two consecutive driving cycles with fault occur.

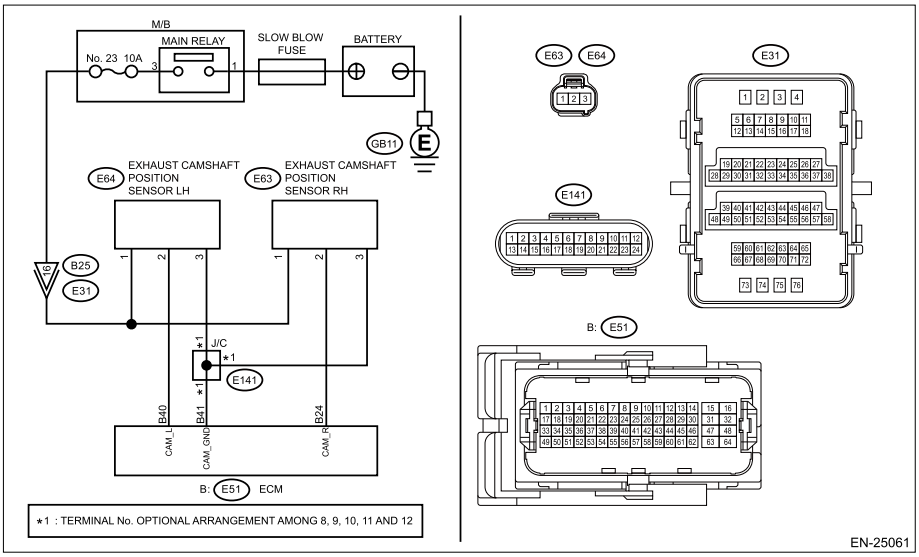
Trouble symptom:

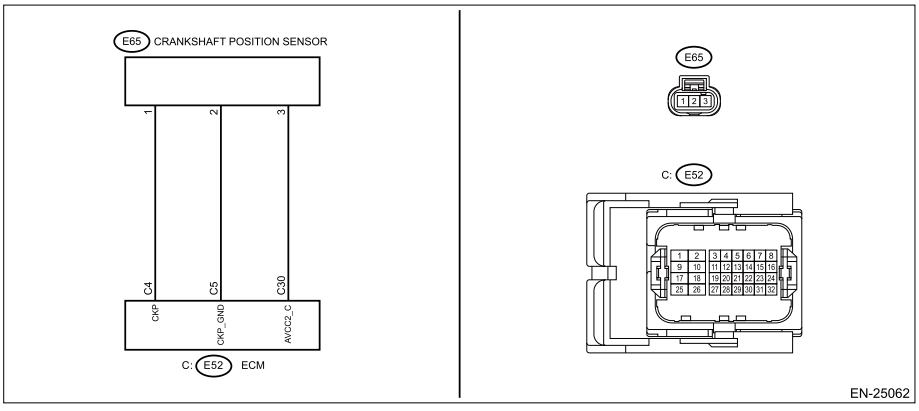
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







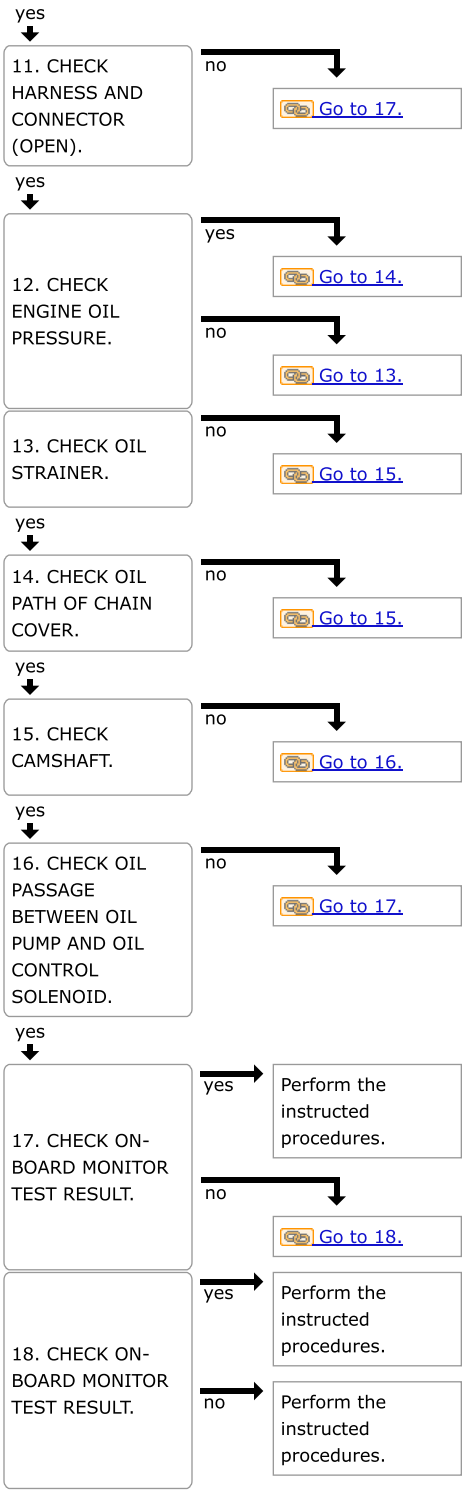
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK OUTPUT SIGNAL OF ECM.
   - no → Go to 4.
   - yes ↓
3. CHECK FOR POOR CONTACT.
   - yes → Go to 5.
   - no → Perform the instructed procedures.
4. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK ENGINE OIL CONDITION.
   - no → Go to 6.
   - yes ↓
6. CHECK ON-BOARD MONITOR TEST RESULT.
   - yes → Go to 8.
   - no → Go to 7.
7. CHECK ON-BOARD MONITOR TEST RESULT.
   - no → Go to 17.
   - yes ↓
8. CHECK HARNESS AND CONNECTOR.
   - no → Go to 9.
   - yes ↓
9. CHECK HARNESS AND CONNECTOR (OPEN).
   - no → Go to 17.
   - yes ↓
10. CHECK HARNESS AND CONNECTOR (OPEN).
    - no → Go to 17.


yes
11. CHECK HARNESS AND CONNECTOR (OPEN).
no
Go to 17.
yes
12. CHECK ENGINE OIL PRESSURE.
yes
Go to 14.
no
Go to 13.
13. CHECK OIL STRAINER.
no
Go to 15.
yes
14. CHECK OIL PATH OF CHAIN COVER.
no
Go to 15.
yes
15. CHECK CAMSHAFT.
no
Go to 16.
yes
16. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.
no
Go to 17.
yes
17. CHECK ON-BOARD MONITOR TEST RESULT.
yes
Perform the instructed procedures.
no
Go to 18.
18. CHECK ON-BOARD MONITOR TEST RESULT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than P000D and P0024 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Save the freeze frame data. Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data. Go to 2.

2. CHECK OUTPUT SIGNAL OF ECM.

Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 11 (+) — 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?

Yes	Go to 5.
No	Repair or replace faulty parts.

4. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.

Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E108) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B and exhaust oil control solenoid LH connector • Blown out of fuse • Poor contact of coupling connector • Poor contact of J/C

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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
Go to 6.

6. CHECK ON-BOARD MONITOR TEST RESULT.

1. Turn the ignition switch to OFF.
2. Replace the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Oil Control Solenoid.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
6. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

   Warning:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
7. Record the read values of [VVT Monitor Bank 1] and [VVT Monitor Bank 2].

Is the value of [VVT Monitor Bank 2] for 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 (the value of [VVT Monitor Bank 1] × 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(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.
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.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.**

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).
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.
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 in harness between exhaust oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E51) No. 11 — (E108) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.
Go to 17.

10. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from exhaust camshaft position sensor LH.
2. Measure the resistance in harness between the exhaust camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E51) No. 40 — (E64) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 11.

No — Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor LH connector.
Go to 17.

11. CHECK HARNESS AND CONNECTOR (OPEN).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance in harness between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E52) No. 4 — (E65) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 12.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.
Go to 17.

12. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DOTC)>Engine Oil Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 14.

No — Go to 13.

13. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes — Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DOTC)>Oil Pan.
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.

Go to 15.

14. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine unit from the vehicle. Ref. to MECHANICAL(H4DOTC)>Engine Assembly.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DOTC)>Chain Cover.

Note:
Check the following item and repair or replace if necessary.
- **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 CAMSHAFT.

1. Remove the timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
2. Rotate the camshaft by hand to compare the rotational resistances of the four shafts.

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 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 cam sprocket and the end of camshaft when the cam sprocket is removed

Note:
Refer to the removal procedure of the cam carrier in the service manual. Ref. to MECHANICAL(H4DOTC)>Cam Carrier.

Is the check result OK?

Yes — Replace the cam 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Go to 17.

No — Remove foreign matter, and 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.**
- **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not push in excessively.) Ref. to MECHANICAL(H4DOTC)>Cam Carrier.**

Note:
After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

Go to 17.

17. CHECK ON-BOARD MONITOR TEST RESULT.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Read the values in [VVT Monitor Bank 1] and [VVT Monitor Bank 2] according to the reading out procedure of MODE $06 using the Subaru Select Monitor or general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Scan Tool>OPERATION > MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS).

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

Note:
- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**

5. Record the read values of [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 ON-BOARD MONITOR TEST RESULT.

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 (the 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)(H4DOTC)>Engine Control Module (ECM).
No	End.

GENERAL DESCRIPTION

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.

DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1

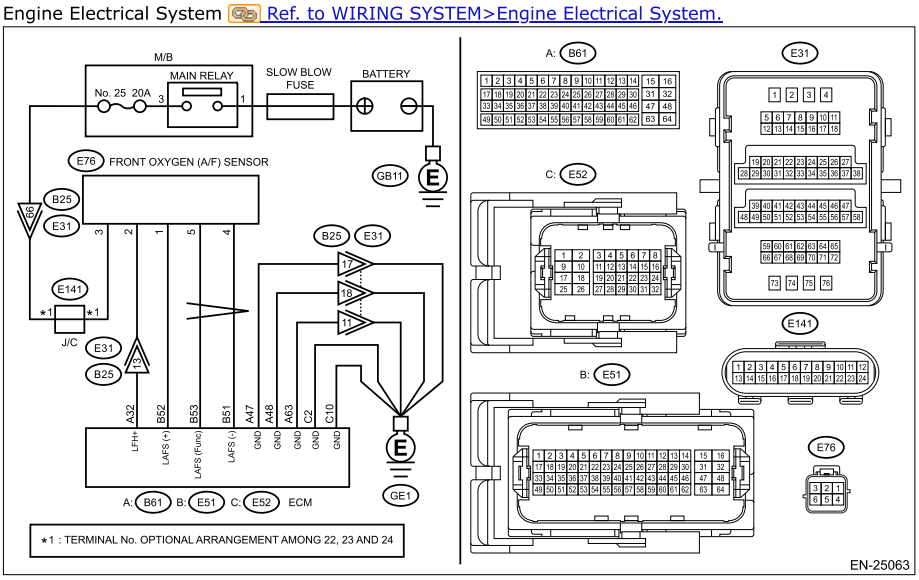
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
2. CHECK FRONT OXYGEN (A/F) SENSOR.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

1. Start and warm up the engine.
2. Turn the ignition switch to OFF.
3. Disconnect the connector from ECM.
4. Disconnect the connector from the front oxygen (A/F) sensor.
5. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.
   Connector & terminal
   (E51) No. 52 — (E76) No. 1:
   (B61) No. 32 — (E76) No. 2:
   (E51) No. 51 — (E76) No. 4:
   (E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	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.

Check the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor>INSPECTION.

Is the check result OK?

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?

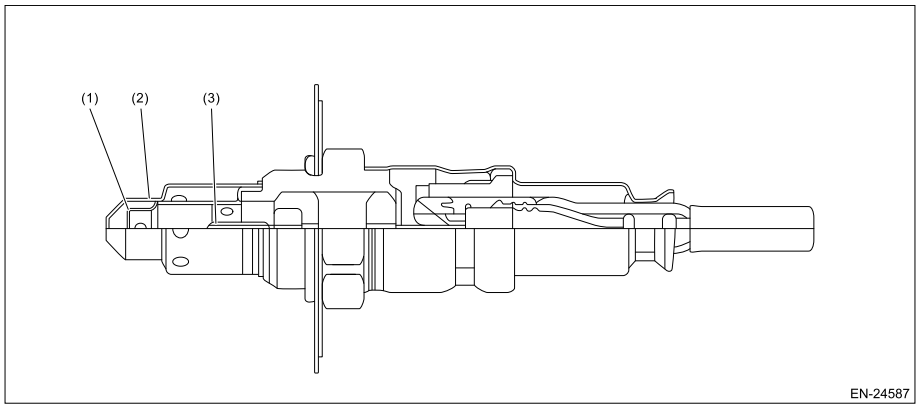
Yes	Repair the poor contact of ECM or front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Element cover (inner) (2) Element cover (outer) (3) Sensor element

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
A/F sensor heater control duty	More than 10%

GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

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	More than 206 Ω

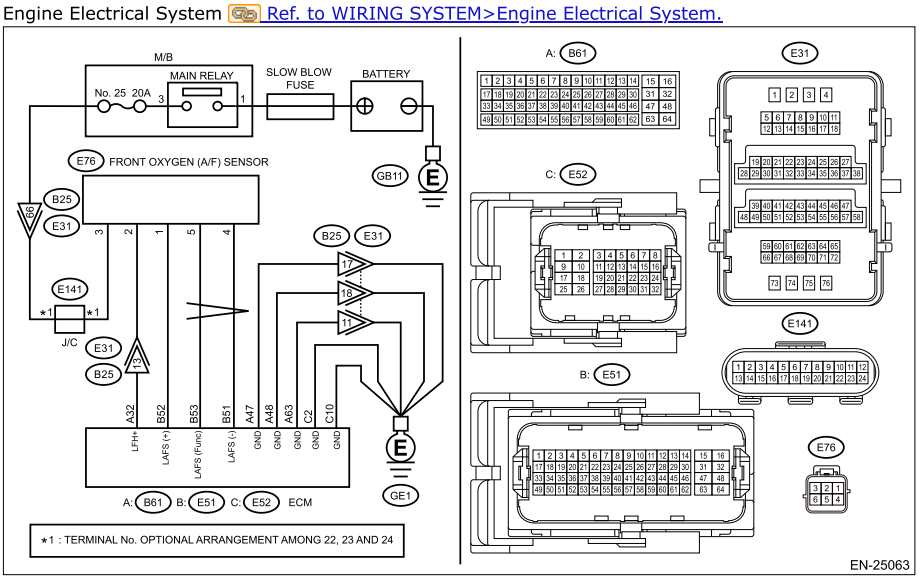
Time needed for diagnosis: 25 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK POWER SUPPLY OF FRONT OXYGEN (A/F) SENSOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK FRONT OXYGEN (A/F) SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK POWER SUPPLY OF FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the 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
   (E76) No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair the following item.
- Open circuit in harness between M/B and front oxygen (A/F) sensor connector
- Poor contact of J/C
- Poor contact of coupling connector
- Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

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
   (B61) No. 32 — (E76) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — 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 (OPEN CIRCUIT).

Measure the resistance of harness between ECM connector and engine ground.
Connector & terminal
(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 4.

No — 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.

Check the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor>INSPECTION.

Is the check result OK?

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit in the front oxygen (A/F) sensor heater.
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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Front oxygen (A/F) sensor heater control duty	80% or less

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

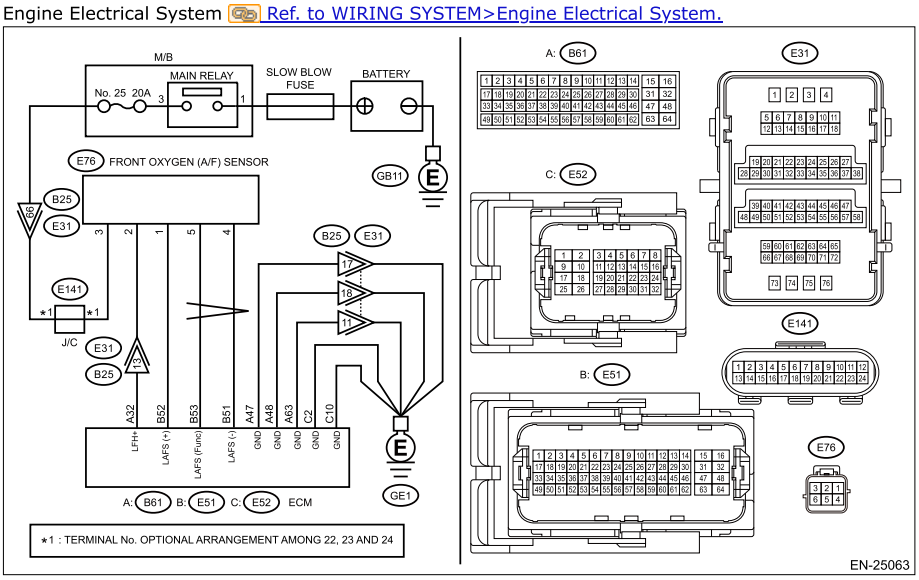
Malfunction Criteria	Threshold Value
Output voltage	1.9 V or less
Or,	
Output voltage Output current	More than 2.3 V Less than 0.03 mA

Time needed for diagnosis: 1000 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 32 (+) — Engine 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 (OPEN CIRCUIT).

1. Disconnect the connector from ECM.
2. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 47 — Engine ground:
   (B61) No. 48 — Engine ground:
   (B61) No. 63 — Engine ground:
   (E52) No. 2 — Engine ground:
   (E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Repair the poor contact of ECM connector.
No	Repair the following item. • Open circuit of harness between ECM connector and engine ground • Poor contact of coupling connector

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit in the front oxygen (A/F) sensor heater.
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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Front oxygen (A/F) sensor heater control duty	20% or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	15.2 A or more

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 P0033 TURBOCHARGER/SUPERCHARGER BYPASS VALVE "A" CONTROL CIRCUIT

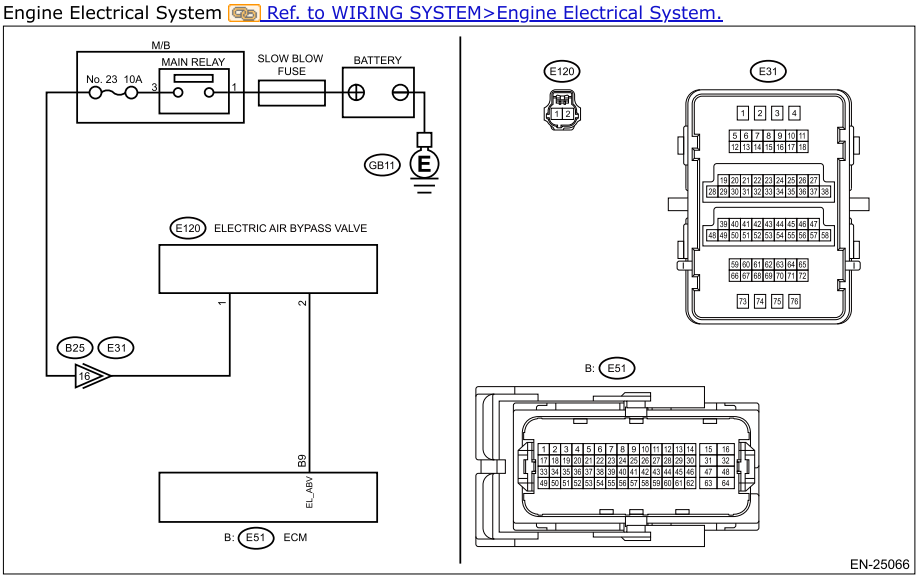
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Poor driving performance
- Poor acceleration

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK POWER SUPPLY OF ELECTRONIC AIR BY-PASS VALVE.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC AIR BY-PASS VALVE CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC AIR BY-PASS VALVE CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK POWER SUPPLY OF ELECTRONIC AIR BY-PASS VALVE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from electronic air by-pass valve.
3. Turn the ignition switch to ON.
4. Measure the voltage between electronic air by-pass valve connector and engine ground.
   Connector & terminal
   (E120) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair the following item.
- Open circuit or short circuit to ground of harness between M/B and electronic air by-pass valve connector
- Blown out of fuse
- Poor contact of coupling connector

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC AIR BY-PASS VALVE CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic air by-pass valve connector and engine ground.
   Connector & terminal
   (E120) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Repair the ground short circuit of harness between ECM connector and electronic air by-pass valve connector.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC AIR BY-PASS VALVE CONNECTOR (OPEN).

Measure the resistance of harness between ECM connector and electronic air by-pass valve connector.
Connector & terminal
(E51) No. 9 — (E120) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and electronic air by-pass valve connector.

4. CHECK FOR POOR CONTACT.

Check for poor contact in ECM and electronic air by-pass valve connector.

Is there poor contact in ECM or electronic air by-pass valve connector?

Yes — Repair the poor contact of ECM or electronic air by-pass valve connector.

No — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit of electronic air by-pass valve motor.
Judge as NG when the overcurrent signal is sent from IC after electronic air by-pass valve driving IC diagnosis.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Electronic air by-pass valve command	ON

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 electronic air by-pass valve driving IC	ON

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2

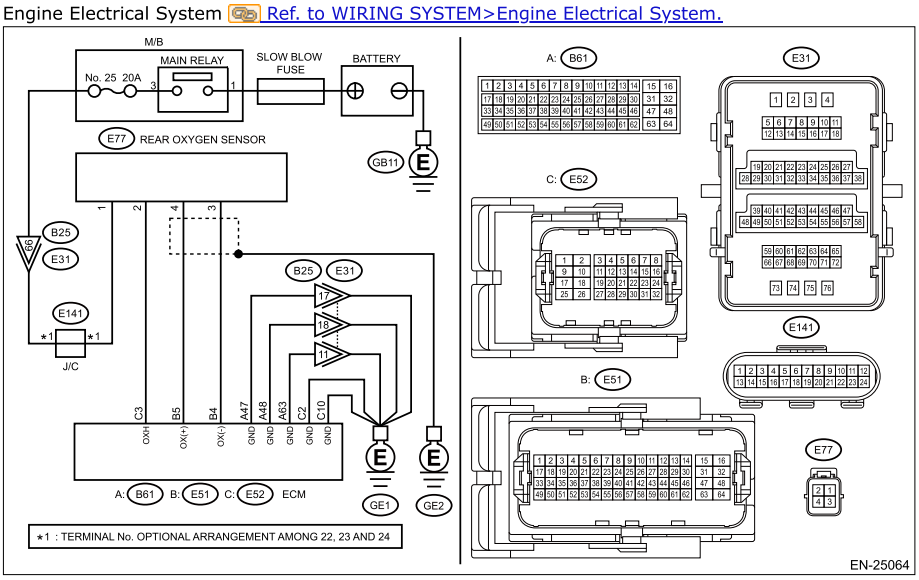
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK REAR OXYGEN SENSOR POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK REAR OXYGEN SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK REAR OXYGEN SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the rear oxygen sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between rear oxygen sensor connector and engine ground.
   Connector & terminal
   (E77) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair the following item.
- Open circuit in harness between M/B and rear oxygen sensor connector
- Poor contact of J/C
- Poor contact of coupling connector
- Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E52) No. 3 — (E77) No. 2:

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 GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

Measure the resistance of harness between ECM connector and engine ground.
Connector & terminal
(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 4.

No — Repair the following item.
- Open circuit of harness between ECM connector and engine ground
- Poor contact of coupling connector

4. CHECK REAR OXYGEN SENSOR.

Check the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor>INSPECTION.

Is the check result OK?

Yes — Repair the poor contact of ECM connector.

No — Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open circuit or short circuit in the rear oxygen sensor heater.
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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor heater control duty	96% or less

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 V or less
Or,	
Output voltage	More than 2.3 V
Output current	Less than 0.03 mA

Time needed for diagnosis: 2500 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2

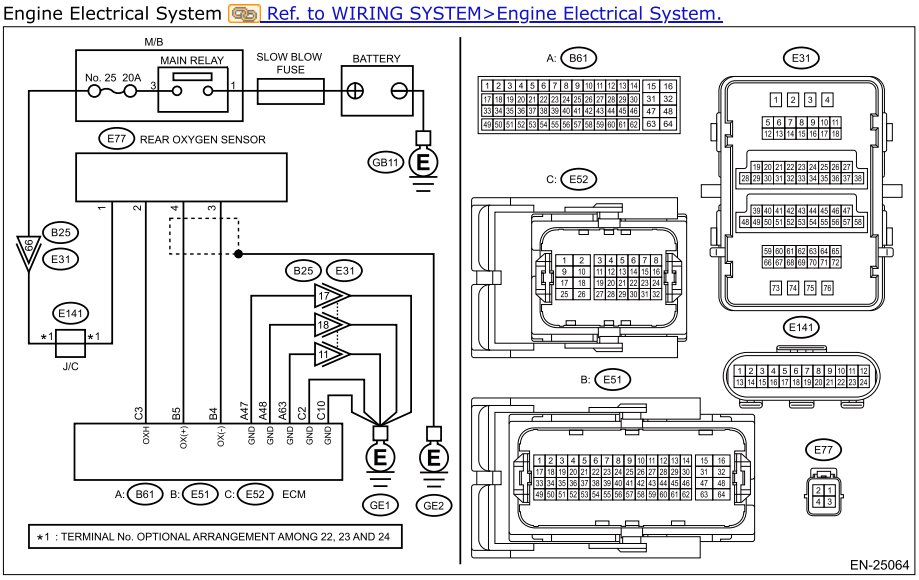
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E52) No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and rear oxygen sensor connector.
No	Go to 2.

2. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

1. Disconnect the connector from ECM.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Repair the poor contact of ECM connector.
No	Repair the following item. • Open circuit of harness between ECM connector and engine ground • Poor contact of coupling connector

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit in the rear oxygen sensor heater.
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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor heater control duty	4% or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	15.2 A or more

Time needed for diagnosis: 2500 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P003A TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" POSITION EXCEEDED LEARNING LIMIT

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

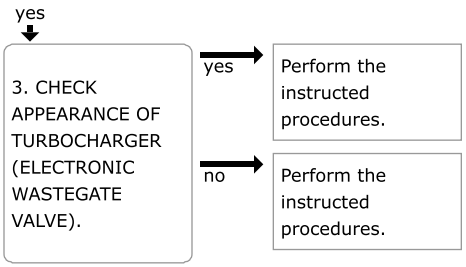
Trouble symptom:

- Poor driving performance
- Poor acceleration

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DATA MONITOR.	no	Perform the instructed procedures.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P003A displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read the value in [Electric Waste Gate Valve Position Sensor Learning Value at the Full-closed Position].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value in [Electric Waste Gate Valve Position Sensor Learning Value at the Full-closed Position] less than −3 [mm] (−0.12 in) or more than 4.3 [mm] (0.17 in)?

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 or temporary contamination and clogging at the valve port may be the cause.

3. CHECK APPEARANCE OF TURBOCHARGER (ELECTRONIC WASTEGATE VALVE).

1. Turn the ignition switch to OFF.
2. Remove the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.
3. Check the appearance of turbocharger to make sure that there is no foreign matter pinched in the electronic wastegate valve.

Caution:
Do not remove the electronic air by-pass valve and electronic wastegate valve since they are non-disassembled parts.

Is the check result OK?

Yes — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

No — Remove the foreign matters from the turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when full close point learning has an abnormal value.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Secondary parameters	Execution condition
Execution time of electronic wastegate valve fully closed command	1500 ms or more

GENERAL DRIVING CYCLE

Perform the diagnosis at full closed point learning.

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
Fully closed position learning value	Less than −3 mm (−0.12 in) Or, More than 4.3 mm (0.17 in)

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0045 TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT/OPEN

1. —

DTC detecting condition:

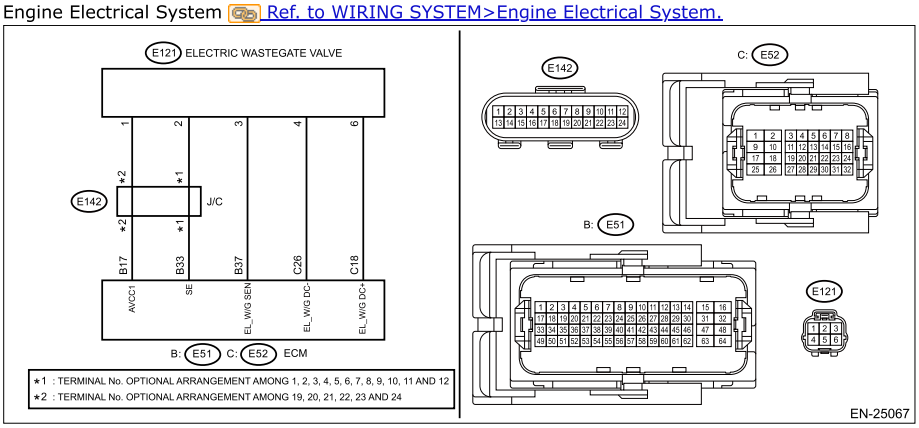
Immediately at fault recognition

Trouble symptom:

- Poor driving performance
- Poor acceleration

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK FOR POOR CONTACT.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from electronic wastegate valve.
3. Disconnect the connector from ECM.
4. Measure the resistance of harness between ECM connector and electronic wastegate valve connector.
   Connector & terminal
   (E52) No. 26 — (E121) No. 4:
   (E52) No. 18 — (E121) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit in harness between ECM connector and electronic wastegate valve connector.

2. CHECK FOR POOR CONTACT.

Check for poor contact in ECM and electronic wastegate valve connector.

Is there poor contact in ECM or electronic wastegate valve connector?

Yes	Repair the poor contact of ECM or electronic wastegate valve connector.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open circuit of electronic wastegate valve motor.
Judge as NG when the output voltage remains High while the electronic wastegate valve motor is not energized.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Electronic wastegate valve control duty	100% or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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 wastegate valve voltage	Less than 0.128 V

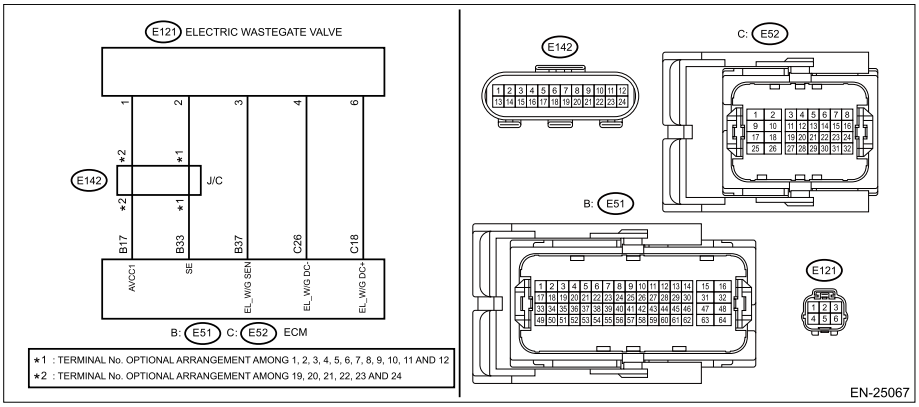
Time needed for diagnosis: 2500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0047 TURBOCHARGER/SUPERCHARGER BOOST CONTROL "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
	yes ↓	
3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORTED BETWEEN LINES).	no →	Perform the instructed procedures.
	yes ↓	
4. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from electronic wastegate valve.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E52) No. 18 (+) — Engine ground (−):
(E52) No. 26 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the power supply short circuit of harness between ECM connector and electronic wastegate valve connector.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E52) No. 18 (+) — Engine ground (−):
(E52) No. 26 (+) — Engine ground (−):

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the ground short circuit of harness between ECM connector and electronic wastegate valve connector.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORTED BETWEEN LINES).

Measure the resistance between ECM connectors.

Connector & terminal

(E52) No. 18 (+) — (E52) No. 26 (−):

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short between lines in harness between ECM connector and electronic wastegate valve connector.

4. CHECK FOR POOR CONTACT.

Check for poor contact in ECM and electronic wastegate valve connector.

Is there poor contact in ECM or electronic wastegate valve connector?

Yes	Repair the poor contact of ECM or electronic wastegate valve connector.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

Note:
The electronic air by-pass valve and the electronic wastegate valve cannot be disassembled.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of electronic wastegate valve motor.

Judge as NG when the overcurrent signal is sent from IC after electronic wastegate valve driving IC diagnosis.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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
Defective operation signal from electronic wastegate valve driving IC	ON

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK AIR INTAKE SYSTEM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. 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 2.

2. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up until the engine coolant temperature exceeds 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, read the value in [Mani. Absolute Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mani. Absolute Pressure] 73.3 — 106.6 [kPa] (550 — 800 mmHg, 21.6 — 31.5 inHg, 10.6 — 15.5 psi) at ignition ON, and 20 — 46.7 [kPa] (150 — 350 mmHg, 5.91 — 13.79 inHg, 2.9 — 6.8 psi) at idling?

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.

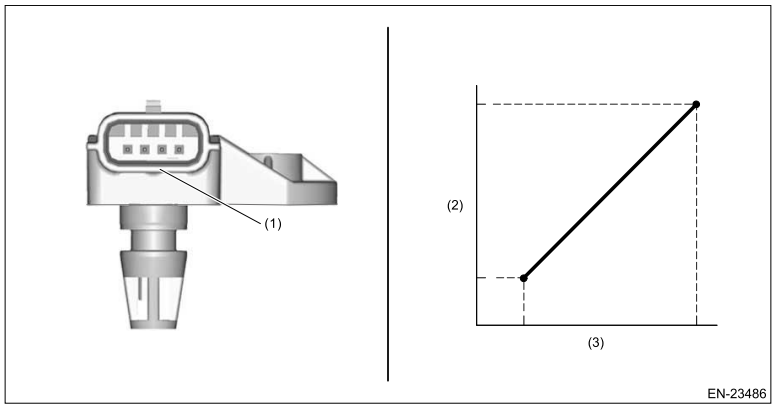
GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect problems in the manifold absolute pressure sensor output properties.

Judge as NG when the intake manifold 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.

COMPONENT DESCRIPTION



(1) Manifold absolute pressure sensor (2) Voltage (V) (3) Absolute pressure (kPa)

EXECUTION CONDITION

Low

Secondary parameters	Execution condition
Engine speed	Less than 3500 rpm
Charging efficiency (with atmospheric pressure compensation)	60 air mass % or more
Throttle position	13.6% or more

High

Secondary parameters	Execution condition
Engine speed	475 rpm — 3000 rpm
Charging efficiency (with atmospheric pressure compensation)	23 air mass % or less
Throttle position	Less than 13.1%
Elapsed time after EGR monitor status OFF	1.5 s or more

GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

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 (Low)

Malfunction Criteria	Threshold Value
Intake manifold pressure (absolute pressure)	Less than 57.5 kPa (431.4 mmHg, 17 inHg)

Judgment value (High)

Malfunction Criteria	Threshold Value
Intake manifold pressure (absolute pressure)	57.5 kPa (431.4 mmHg, 17 inHg) or more

Time needed for diagnosis: 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DATA MONITOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0071 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, read the value in [Ambient Air Temperature] for [Air Conditioner].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
2. Read the change of the value in [Ambient Air Temperature] while heating and cooling the ambient sensor using a hair dryer.

   Warning:
   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 AIR CONDITIONER>Ambient Sensor.

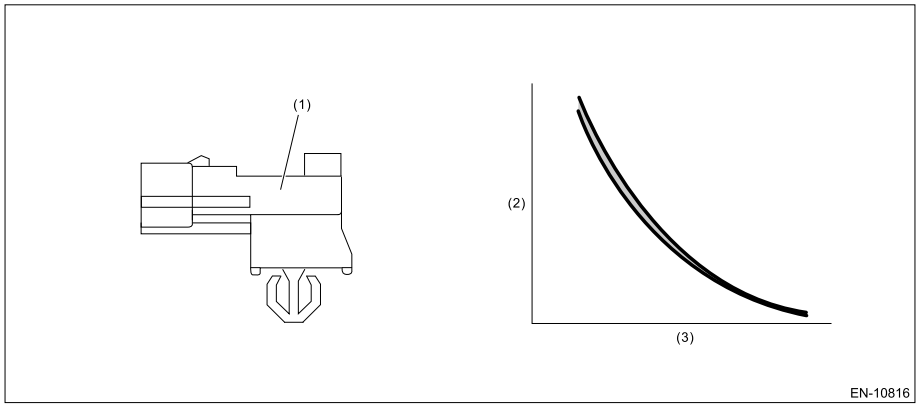
GENERAL DESCRIPTION

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.

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))

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600 s or more
Block heater judgment	Completed
Use of block heater	Not detected

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
|Ambient air temperature 21 sec. after first engine start − Intake air temperature 21 sec. after first engine start|	More than value of Map
|Ambient air temperature at first engine start − Engine coolant temperature at first engine start|	More than 25°C (45°F)

Map

Intake air temperature (°C (°F))	**−30 (−22)**	**45 (113)**	**60 (140)**	**80 (176)**
|Ambient air temperature 21 sec. after first engine start − Intake air temperature 21 sec. after first engine start| (°C (°F))	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 s

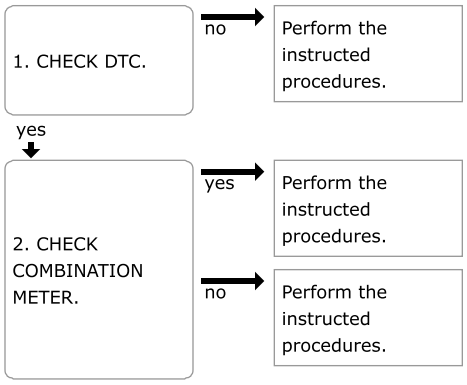
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0072 or P0073 displayed? (Current code)

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.

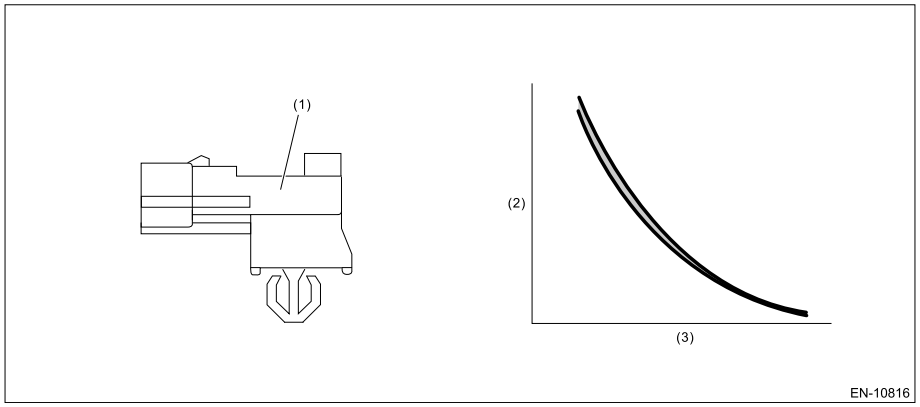
Is the check result OK?

Yes	Repair the poor contact of ECM connector.
No	Repair the combination meter system.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit of ambient temperature sensor.
Judge as NG if out of specification.

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))

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

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	More than 87.7 °C (189.9 °F)

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 P0073 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH

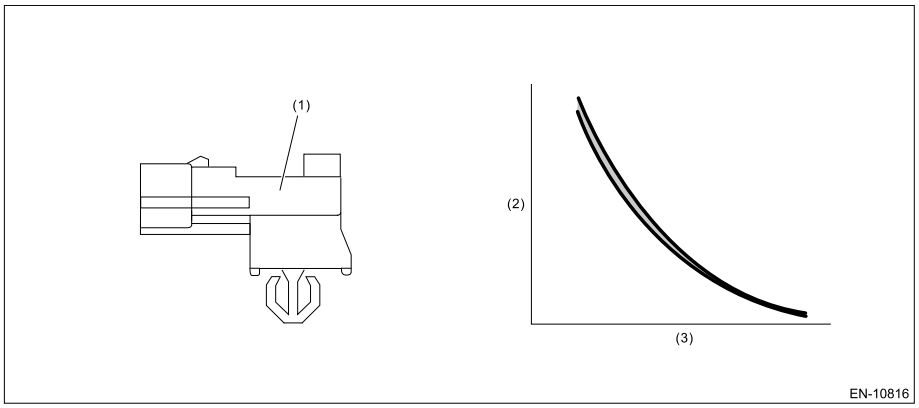
Note:
For the diagnostic procedure, refer to DTC P0072. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.

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))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

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
Ambient air temperature	Less than −44.3 °C (−47.7 °F)

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0087 FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1

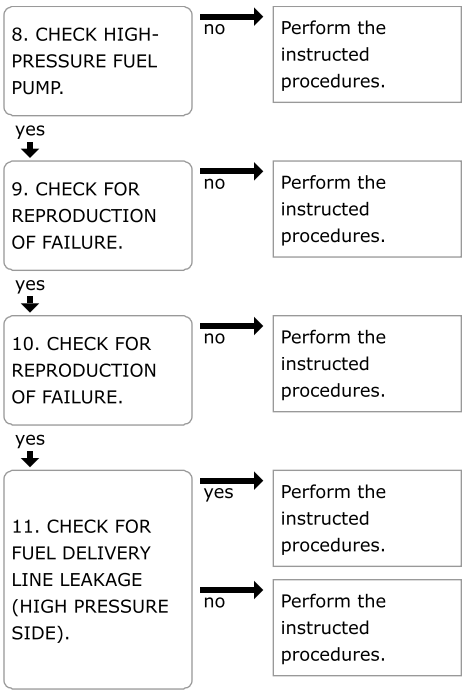
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Poor acceleration

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FOR FUEL DELIVERY LINE LEAKAGE.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK EXPERIENCE OF RUNNING OUT OF FUEL.	yes	Perform the instructed procedures.
	no	Go to 4.
4. CHECK FUEL PRESSURE.	choice	Go to 5.
	choice	Go to 7.
	choice	Perform the instructed procedures.
5. CHECK OF FUEL PUMP.	no	Perform the instructed procedures.
	yes	
6. CHECK FUEL PRESSURE.	no	Perform the instructed procedures.
	yes	
7. CHECK FOR FUEL DELIVERY LINE LEAKAGE (HIGH PRESSURE SIDE).	no	Go to 9.
	yes	



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 DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0087 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

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.

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 value of [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A] when racing the engine.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

If the value of [Fuel Rail Pressure A] is synchronized with that of [Commanded Fuel Rail Pressure A], go to A.
If the value in [Fuel Rail Pressure A] does not increase, go to B.
If the value in [Fuel Rail Pressure A] does not change, go to C.

A	Go to 5.
B	Go to 7.
C	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)
2. Using the Subaru Select Monitor, select [Fuel Pump Relay] of [Active Test].

Note:
For detailed operation procedures, refer to "Help" of application.

3. Check for operating sound in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes	Go to 6.
No	Check fuel pump circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

6. CHECK FUEL PRESSURE.

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 7.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines>INSPECTION.

7. 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 Rail Pressure A] 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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**

Does the value of [Fuel Rail Pressure A] 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 check result OK?

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. 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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0087 displayed? (Current code)

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 "CHECK FOR FUEL DELIVERY LINE LEAKAGE (HIGH PRESSURE SIDE)" without replacing the high-pressure fuel pump. Go to 11.

No — End.

10. CHECK FOR REPRODUCTION OF FAILURE.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0087 displayed? (Current code)

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 Rail Pressure A] 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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**

Does the value of [Fuel Rail Pressure A] decrease rapidly?

Yes	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.
No	Repair the poor contact of ECM connector.

GENERAL DESCRIPTION

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.

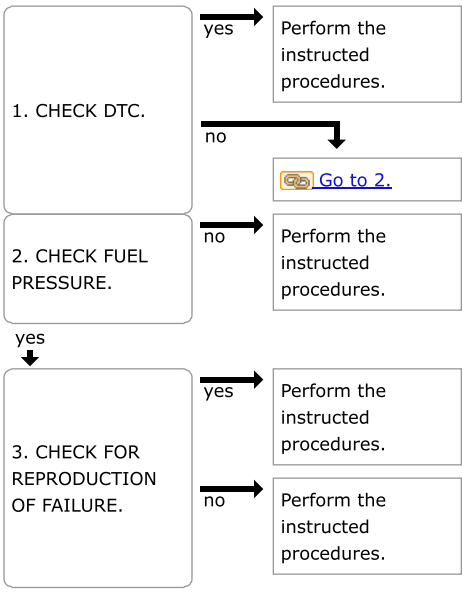
DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Poor driving performance
- Poor acceleration

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0088 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK FUEL PRESSURE.

1. Start the engine.
2. Using Subaru Select Monitor, read the values of [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A] while the vehicle is accelerated from the parked state to 60 km/h (37.3 MPH) and stops again.

Warning:
- **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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**

Is the value of [Fuel Rail Pressure A] synchronized with that of [Commanded Fuel Rail Pressure A]?

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. 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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0088 displayed? (Current code)

Yes	Repair the poor contact of ECM connector.
No	End.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of high pressure fuel system function.
Judge as NG when actual pressure is not close to target pressure.

EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after starting the engine	10 s or more
Continuous time after fuel cut	5 s or more
(Target pressure change in every 10 ms	1000 kPa (7501.9 mmHg, 295.3 inHg) or less
duration)	1500 ms or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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
Actual fuel pressure − Target fuel pressure	Less than −15100 kPa (−113278.3 mmHg, −4459.8 inHg)	P0087
Actual fuel pressure − Target fuel pressure	More than 14800 kPa (111027.8 mmHg, 4371.2 inHg)	P0088

Time needed for diagnosis: 10 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

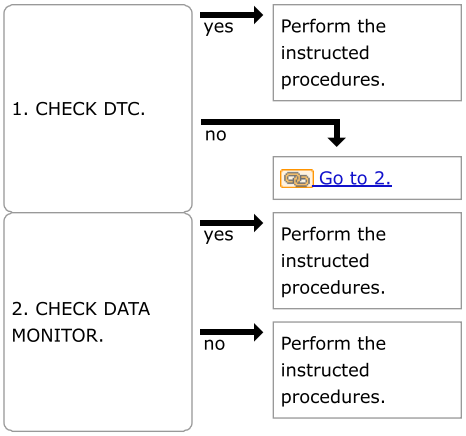
DTC P0096 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT RANGE/PERFORMANCE BANK 1

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:

- Improper idling
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0096 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, read the value in [IAT Sensor #12].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
2. Read the change of the value in [IAT Sensor #12] while heating and cooling the manifold absolute pressure and intake air temperature sensor using a hair dryer.

   Warning:
   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 [IAT Sensor #12] change between heating and cooling?

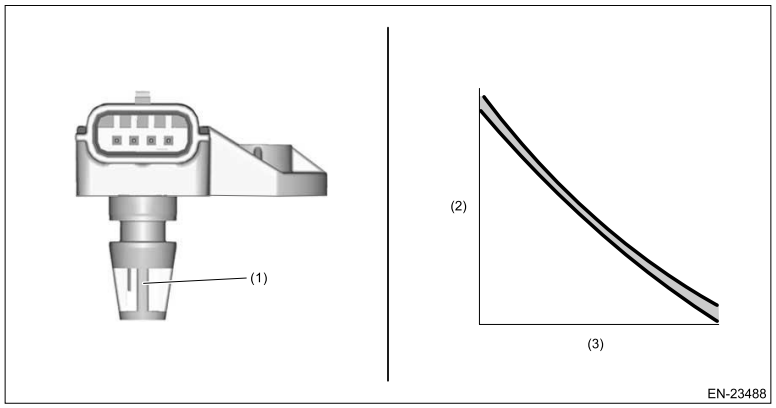
Yes	Repair the poor contact of ECM connector.
No	Replace the manifold absolute pressure and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Manifold Absolute Pressure and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of the intake air temperature sensor (integrated with manifold absolute pressure sensor) output properties.
After the engine starts for the first time 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.

COMPONENT DESCRIPTION



(1) Intake air temperature sensor (2) Resistance value (Ω) (3) Intake air temperature (°C (°F))

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600 s or more
Block heater judgment	Completed
Use of block heater	Not detected

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the first engine start after a certain period of soaking time.

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 air temperature (manifold absolute pressure sensor) 21 sec. after the first engine start − Engine coolant temperature at the first engine start|	More than value of Map1
|Intake air temperature (manifold absolute pressure sensor) 21 sec. after the first engine start − Ambient air temperature 21 sec. after the first engine start|	More than value of Map2

Map1

Ambient temperature (°C (°F))	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Intake air temperature (manifold absolute pressure sensor) 21 sec. after the first engine start − Engine coolant temperature at the first engine start| (°C (°F))	11 (19.8)	11 (19.8)	11 (19.8)	11 (19.8)

Map2

Ambient temperature (°C (°F))	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Intake air temperature (manifold absolute pressure sensor) 21 sec. after the first engine start − Ambient air temperature 21 sec. after the first engine start| (°C (°F))	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

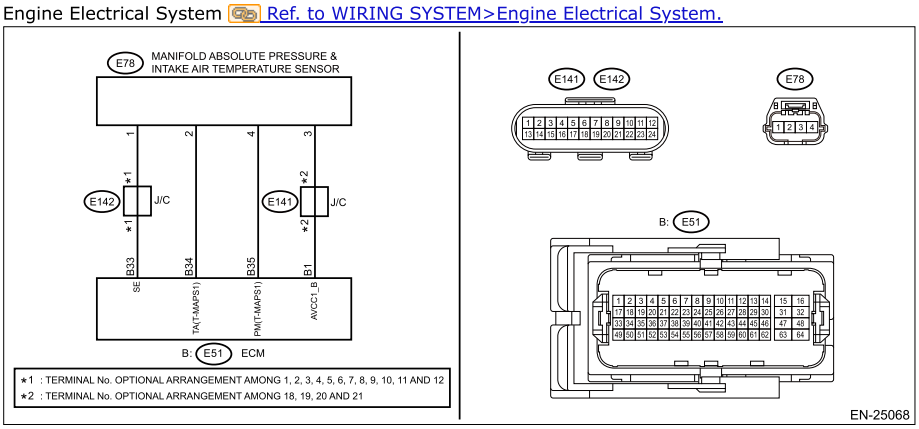
DTC P0097 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT LOW BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [IAT Sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [IAT Sensor #12] 120[°C] (248°F) or more?

Yes	Go to 4.
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.**

4. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (E51) No. 34 — Engine ground:

Is the resistance 1 MΩ or more?

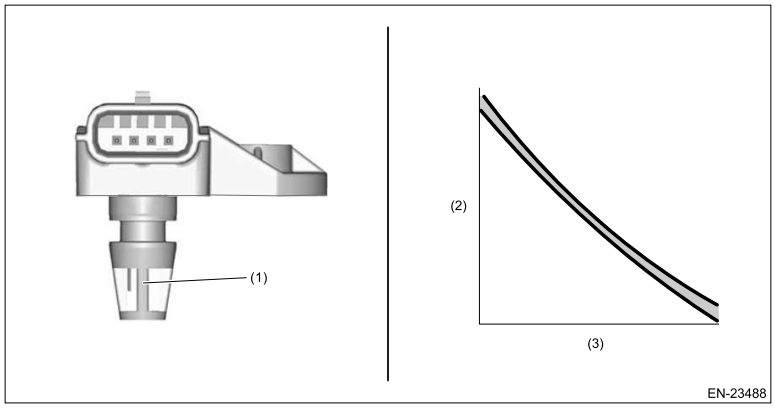
Yes	Replace the manifold absolute pressure and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Manifold Absolute Pressure and Intake Air Temperature Sensor.
No	Repair the ground short circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect short circuit of the intake air temperature sensor (integrated with manifold absolute pressure sensor).
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Intake air temperature sensor (2) Resistance value (kΩ) (3) Intake air temperature (°C (°F))

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.365 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

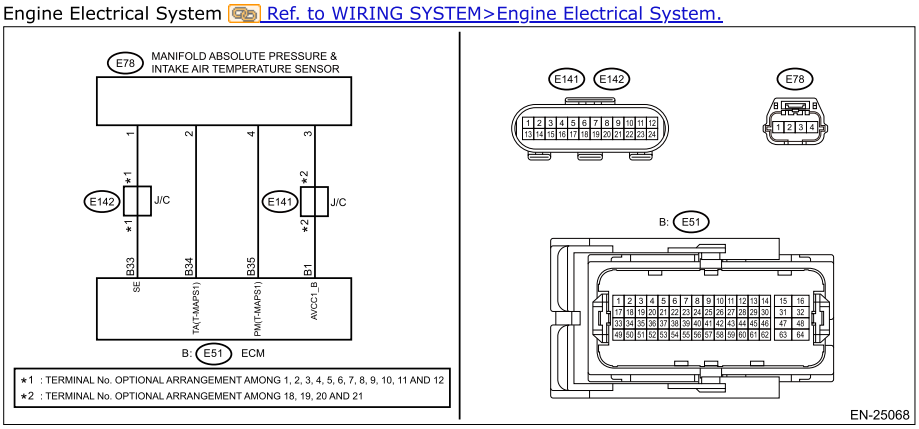
DTC P0098 INTAKE AIR TEMPERATURE SENSOR 2 CIRCUIT HIGH BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

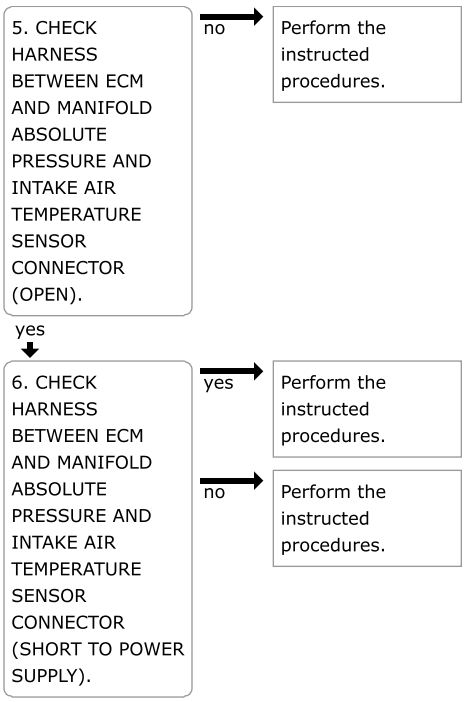
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Go to 5.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [IAT Sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [IAT Sensor #12] less than −40[°C] (−40°F)?

Yes — Go to 4.

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.

4. 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 5.

5. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
4. Measure the resistance of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector.
   Connector & terminal
   (E51) No. 33 — (E78) No. 1:
   (E51) No. 34 — (E78) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector
- Poor contact of J/C

6. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E51) No. 34 (+) — Engine ground (−):

Is the voltage 5 V or more?

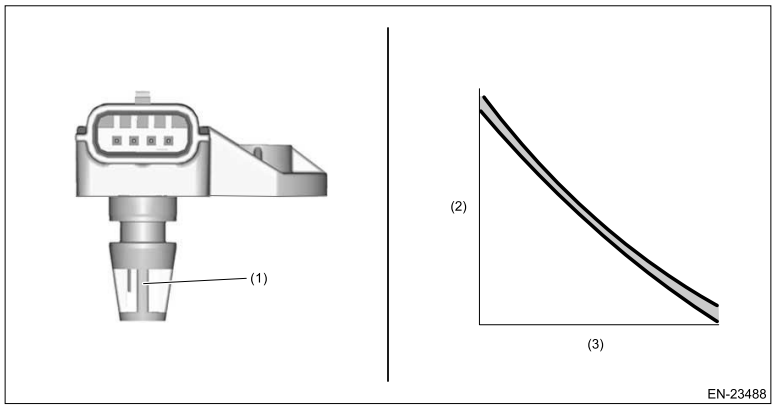
Yes	Repair the short circuit to power in harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector.
No	Replace the manifold absolute pressure and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Manifold Absolute Pressure and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Intake air temperature sensor (2) Resistance value (kΩ) (3) Intake air temperature (°C (°F))

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 0.469 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

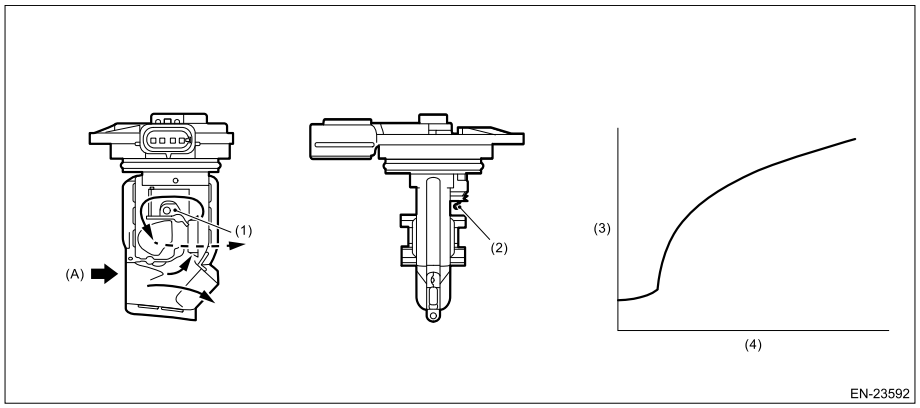
Is DTC other than P0101 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.

GENERAL DESCRIPTION

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 as NG when the low side or high side becomes NG.

COMPONENT DESCRIPTION



(A) Air
(1) Air flow sensor
(2) Intake air temperature sensor
(3) Frequency (kHz)
(4) Amount of intake air (kg (lb)/s)

EXECUTION CONDITION

Low

Secondary parameters	Execution condition
Engine speed	1600 rpm or more
Throttle position	13.1% or more
Intake manifold pressure (with atmospheric pressure compensation)	96 kPa (720.2 mmHg, 28.4 inHg) or more

High

Secondary parameters	Execution condition
Engine speed	475 rpm — 1800 rpm
Throttle position	Less than 13.6%
Intake manifold pressure (with atmospheric pressure compensation)	Less than 40 kPa (300.1 mmHg, 11.8 inHg)
Elapsed time after EGR monitor status OFF	1.5 s or more

GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

DIAGNOSTIC METHOD

Judge as NG when low side or high side is established.

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (Low)

Malfunction Criteria	Threshold Value
Airflow amount	Less than 18.9 g/s (0.7 oz/s)

Judgment value (High)

Malfunction Criteria	Threshold Value
Airflow amount	18.9 g/s (0.7 oz/s) or more

Time needed for diagnosis: 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

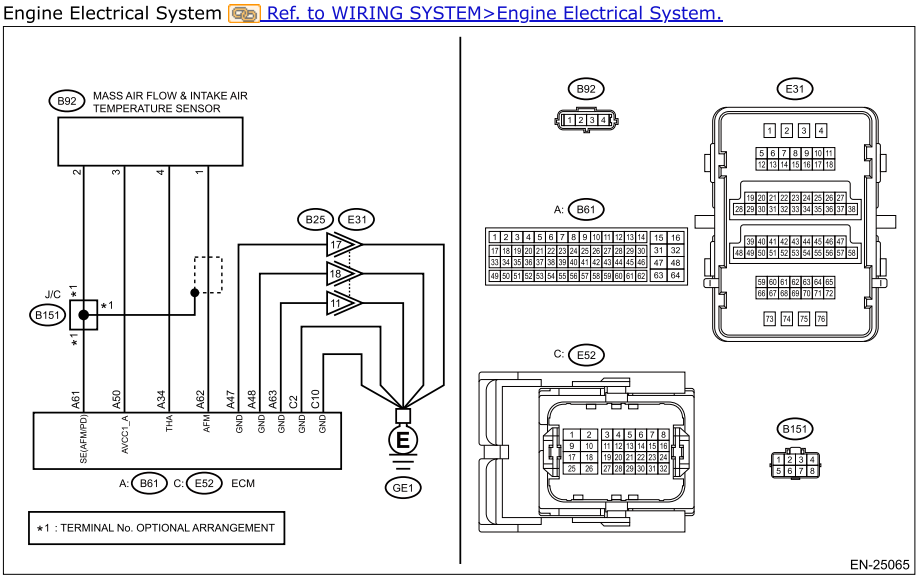
DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
	yes ↓	
4. CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.	no →	Perform the instructed procedures.

yes

5. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes

6. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

7. CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (SHORT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 8.

8. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (OPEN).

no → Perform the instructed procedures.

yes

9. CHECK FOR POOR CONTACT.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes — Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.

No — Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 0 [g/s] (0 lb/min)?

Yes — Go to 4.

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.

4. 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
   (B92) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 5.

No — Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

5. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

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
   (B61) No. 62 — (B92) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

6. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(B61) No. 62 — 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 the mass air flow and intake air temperature sensor connector.

7. CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 62 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and the mass air flow and intake air temperature sensor connector.
No	Go to 8.

8. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Connect the connector to ECM.
3. Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground.
   Connector & terminal
   (B92) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 9.
No	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 J/C

9. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

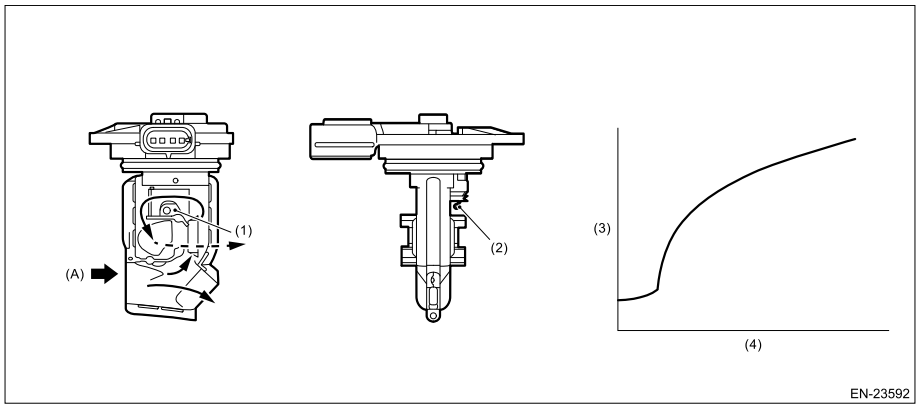
Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect open or short circuits of the air flow sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Frequency (kHz)

(4) Amount of intake air (kg (lb)/s)

EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after engine cranking or starting	520 ms or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 frequency	Less than 1.000 kHz

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

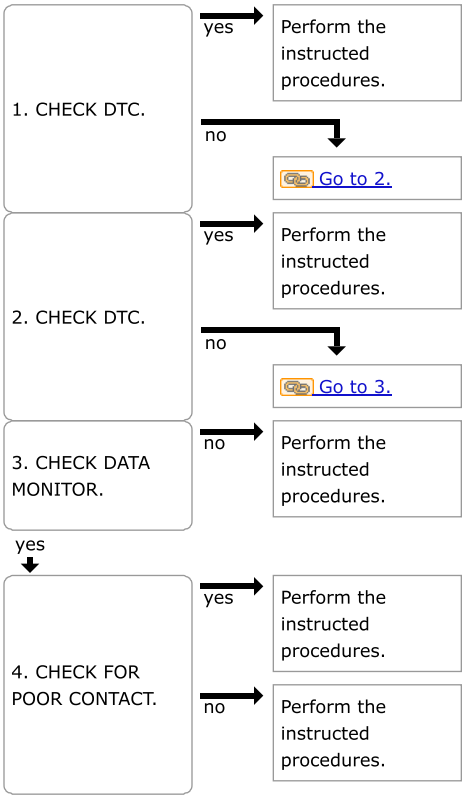
DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 232.32 g/s (30.74 lb/min) or more?

Yes — Go to 4.

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.

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.

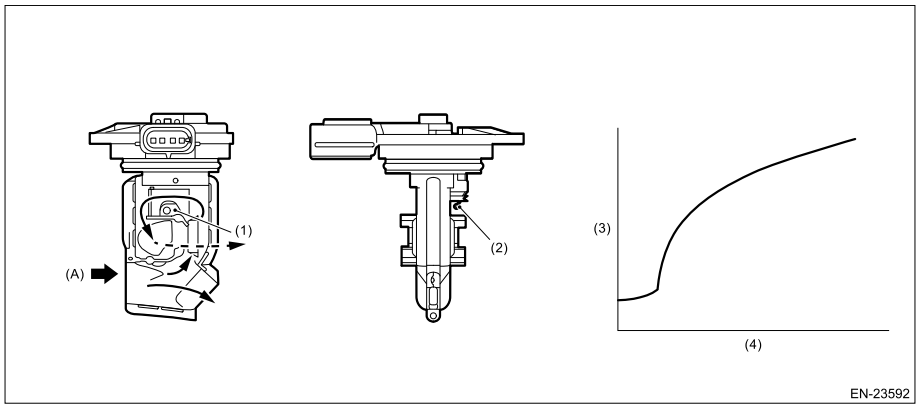
No — Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the out-of-range malfunction of air flow sensor.

COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Frequency (kHz)

(4) Amount of intake air (kg (lb)/s)

EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after engine cranking or starting	520 ms or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 frequency	More than 10.021 kHz

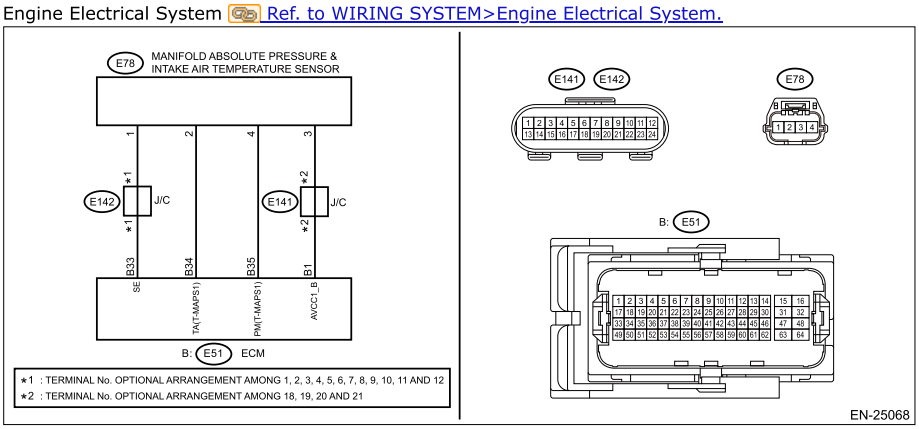
Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW

1. —

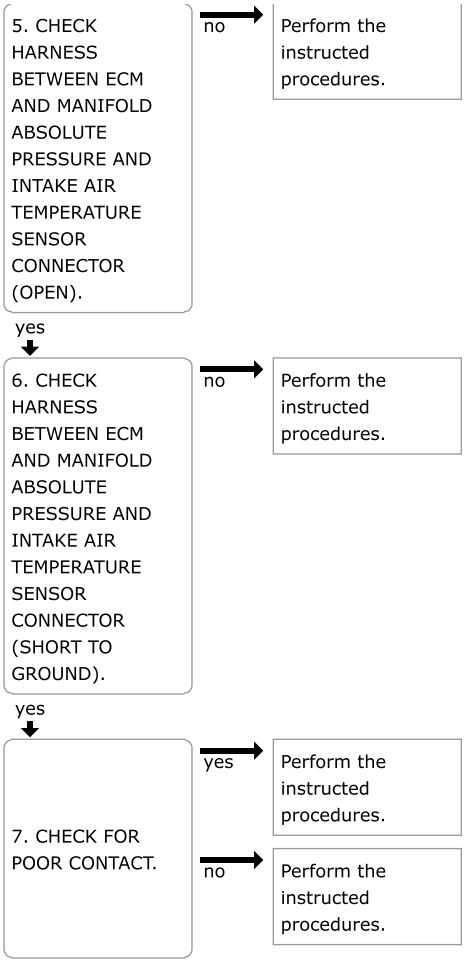
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK DATA MONITOR.	no	Perform the instructed procedures.
	yes ↓	
4. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY.	no	Perform the instructed procedures.
	yes ↓	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Mani. Absolute Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mani. Absolute Pressure] less than 13.3 [kPa] (100 mmHg, 3.94 inHg)?

Yes — Go to 4.

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.

4. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR POWER SUPPLY.

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
   (E78) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 5.

No — Repair the following item.
- Open circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector
- Poor contact of ECM connector
- Poor contact of J/C

5. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector.
   Connector & terminal
   (E51) No. 35 — (E78) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of the harness between the ECM connector and the manifold absolute pressure & intake air temperature sensor connector.

6. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 35 — 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 the manifold absolute pressure and intake air temperature sensor connector.

7. 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?

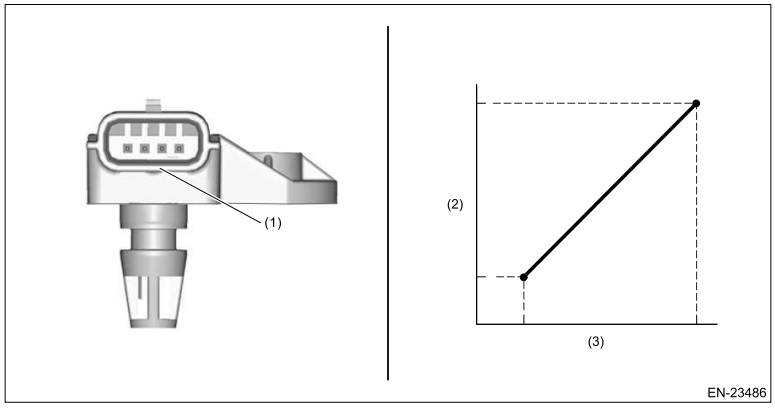
Yes	Repair the poor contact of ECM or manifold absolute pressure and intake air temperature sensor connector.
No	Replace the manifold absolute pressure and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Manifold Absolute Pressure and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of manifold pressure sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Manifold absolute pressure sensor (2) Voltage (V) (3) Absolute pressure (kPa)

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

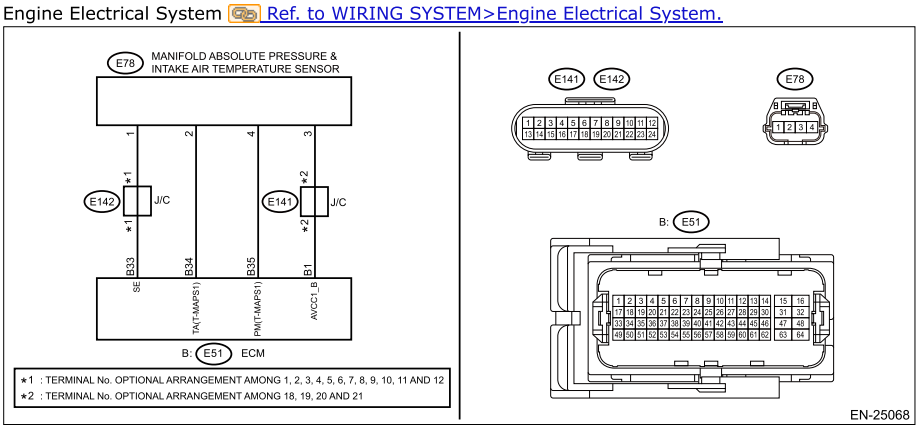
Malfunction Criteria	Threshold Value
Output voltage	Less than 0.296 V

Time needed for diagnosis: 2 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).
   - yes → Perform the instructed procedures.
   - no → Go to 3.
3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Mani. Absolute Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mani. Absolute Pressure] 256 [kPa] (1920.5 mmHg, 75.6 inHg, 37.1 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.

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 (SHORT TO POWER SUPPLY).

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, read the value in [Mani. Absolute Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mani. Absolute Pressure] 256 [kPa] (1920.5 mmHg, 75.6 inHg, 37.1 psi) or more?

Yes — Repair the short circuit to power in harness between ECM connector 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 (OPEN).

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
   (E78) No. 1 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 4.

No — Repair the following item.
- Open circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector
- Poor contact of ECM connector
- Poor contact of J/C

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?

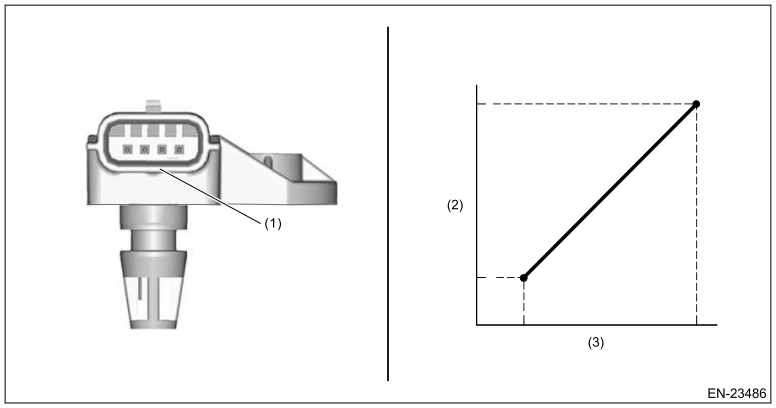
Yes	Repair the poor contact of the manifold absolute pressure and intake air temperature sensor connector.
No	Replace the manifold absolute pressure and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DOTC)>Manifold Absolute Pressure and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of manifold absolute pressure sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Manifold absolute pressure sensor (2) Voltage (V) (3) Absolute pressure (kPa)

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 3.662 V

Time needed for diagnosis: 2 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:

- Improper idling
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DATA MONITOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0111 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

2. Read the change of the value in [IAT Sensor #11] while heating and cooling the mass air flow and intake air temperature sensor using a hair dryer.

Warning:
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 [IAT Sensor #11] change between heating and cooling?

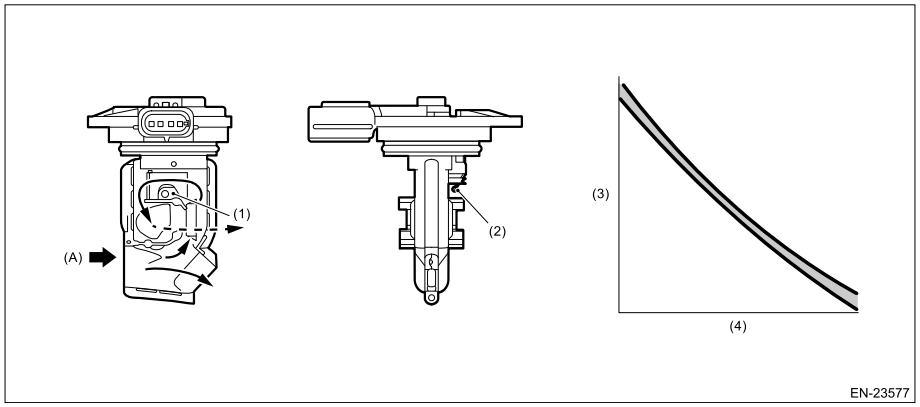
Yes	Repair the poor contact of ECM connector.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the malfunction of the intake air temperature sensor (integrated with air flow sensor) output properties.

After the engine starts for the first time 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.

COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Resistance value (Ω)

(4) Intake air temperature (°C (°F))

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600 s or more
Block heater judgment	Completed
Use of block heater	Not detected

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the first engine start after a certain period of soaking time.

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 air temperature (air flow sensor) 21 sec. after the first engine start − Engine coolant temperature at the first engine start|	More than value of Map1
|Intake air temperature (air flow sensor) 21 sec. after the first engine start − Ambient air temperature 21 sec. after the first engine start|	More than value of Map2

Map1

Ambient temperature (°C (°F))	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Intake air temperature (air flow sensor) 21 sec. after the first engine start − Engine coolant temperature at the first engine start| (°C (°F))	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Map2

Ambient temperature (°C (°F))	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Intake air temperature (air flow sensor) 21 sec. after the first engine start − Ambient air temperature 21 sec. after the first engine start| (°C (°F))	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

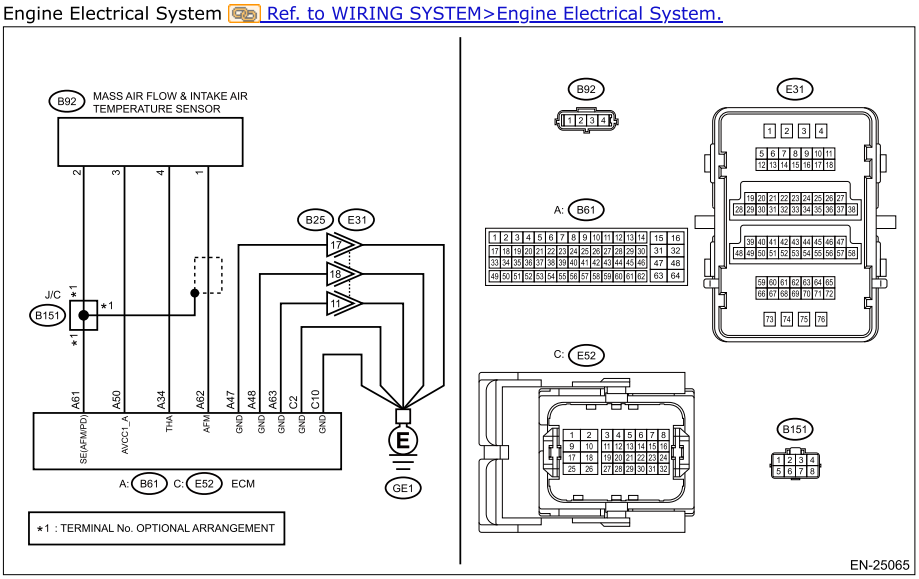
DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [IAT 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 (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 34 — Engine ground:

Is the resistance 1 MΩ or more?

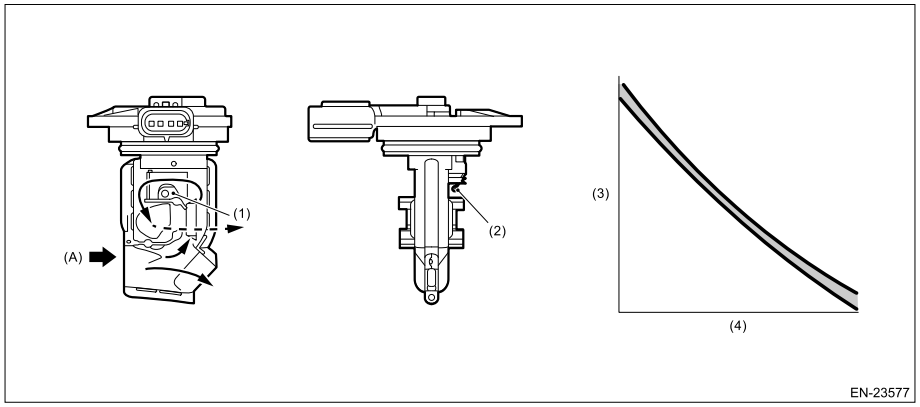
Yes	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.
No	Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit in the intake air temperature sensor (integrated with air flow sensor).
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Air
(1) Air flow sensor
(2) Intake air temperature sensor
(3) Resistance value (Ω)
(4) Intake air temperature (°C (°F))

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.240 V

Time needed for diagnosis: 520 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

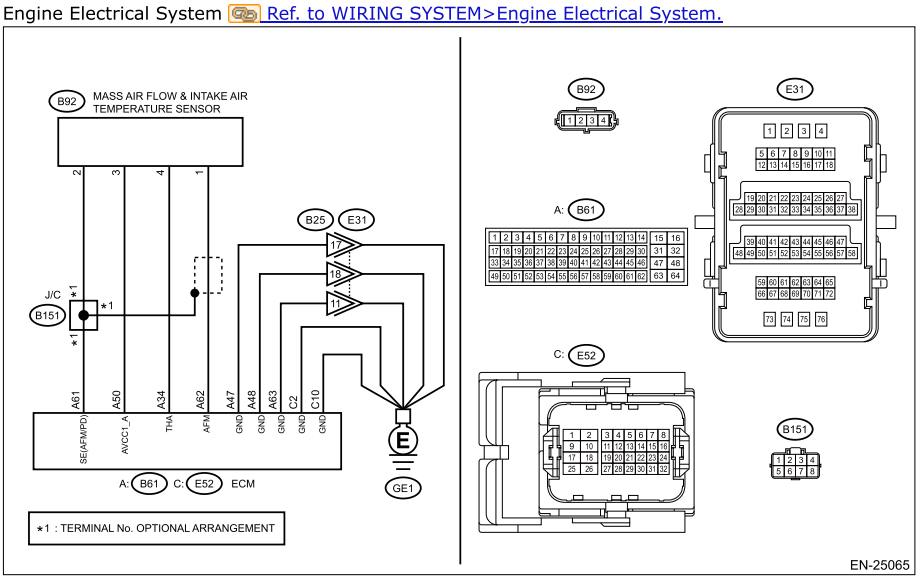
DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		

4. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [IAT 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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.
   Connector & terminal
   (B61) No. 61 — (B92) No. 2:
   (B61) No. 34 — (B92) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — 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 J/C

4. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 34 (+) — Engine ground (−):

Is the voltage 5 V or more?

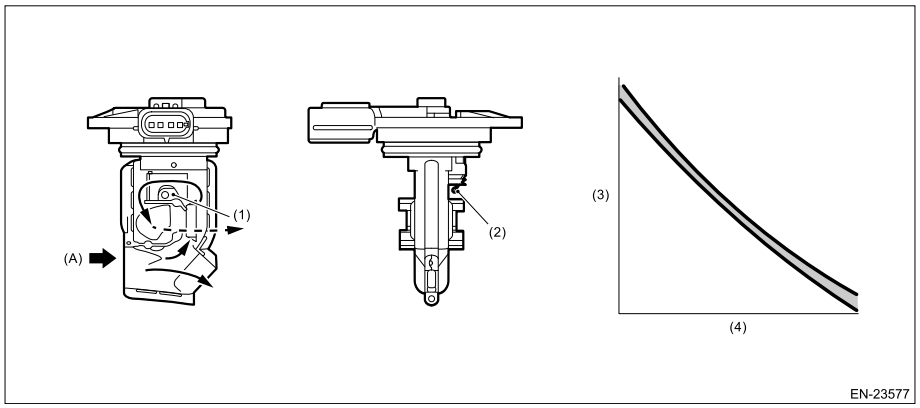
Yes	Repair the short circuit to power supply in harness between ECM connector and the mass air flow and intake air temperature sensor connector.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Resistance value (Ω)

(4) Intake air temperature (°C (°F))

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.723 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:

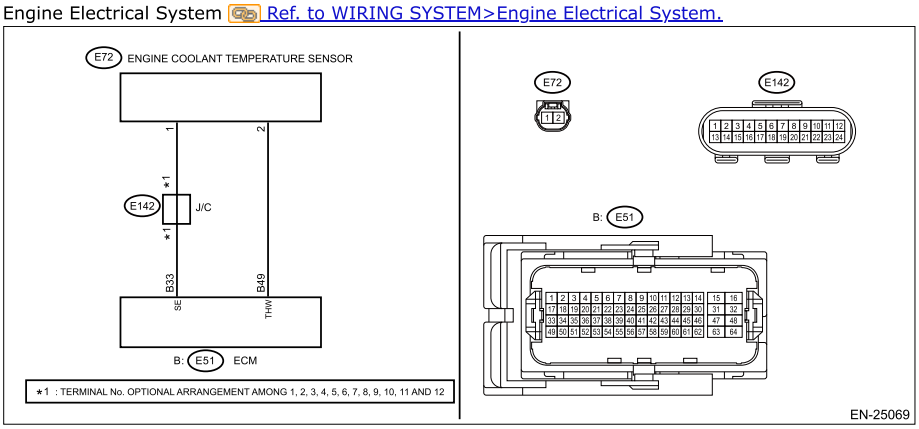
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK ENGINE COOLANT TEMPERATURE SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0116 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine coolant temperature sensor.
3. 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?

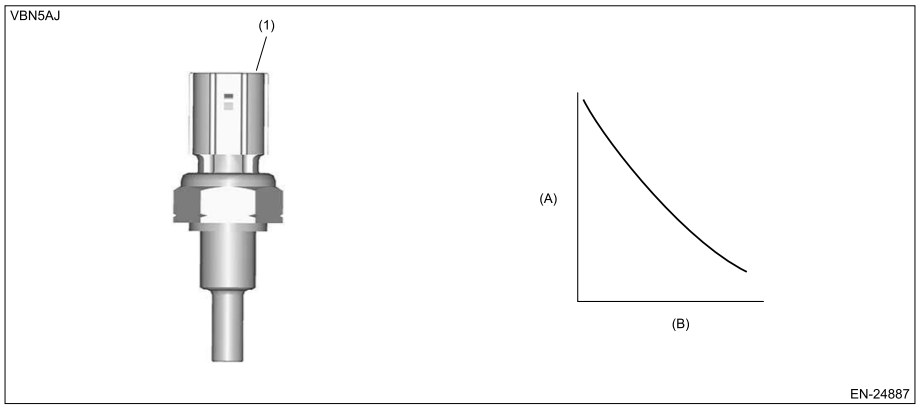
Yes	Repair the poor contact of ECM connector.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature (°C (°F))
(1) Engine coolant temperature sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600 s or more
Block heater judgment	Completed
Use of block heater	Not detected

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
|Engine coolant temperature at first engine start − Intake air temperature 21 sec. after first engine start|	More than value of Map
|Engine coolant temperature at first engine start − Ambient air temperature at first engine start|	More than 25°C (45°F)

Map

Ambient temperature (°C (°F))	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Engine coolant temperature at first engine start − Intake air temperature 21 sec. after first engine start| (°C (°F))	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

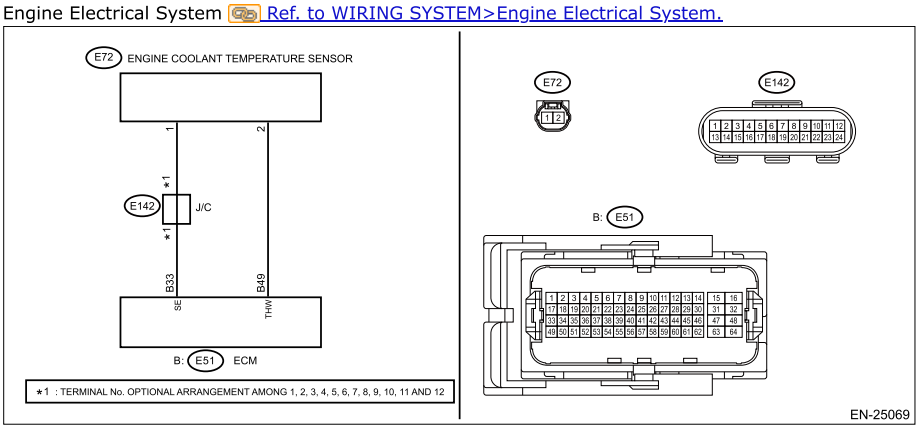
DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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 (SHORT CIRCUIT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal
(E51) No. 49 — Engine ground:

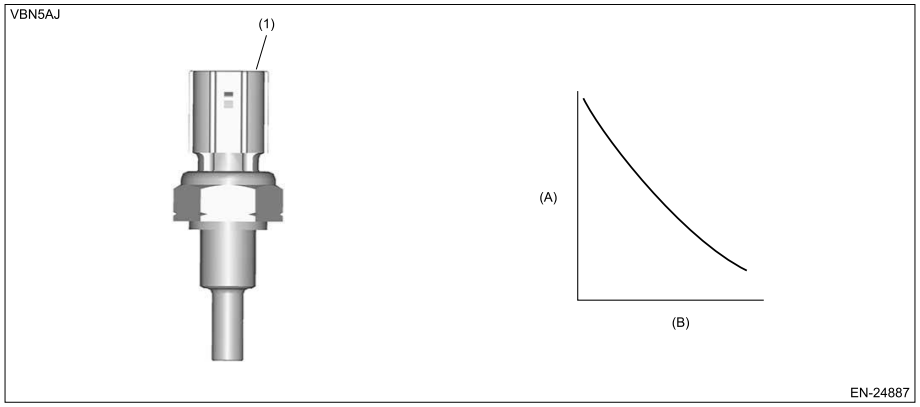
Is the resistance 1 MΩ or more?

Yes	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.
No	Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature (°C (°F))
(1) Engine coolant temperature sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.325 V

Time needed for diagnosis: 500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

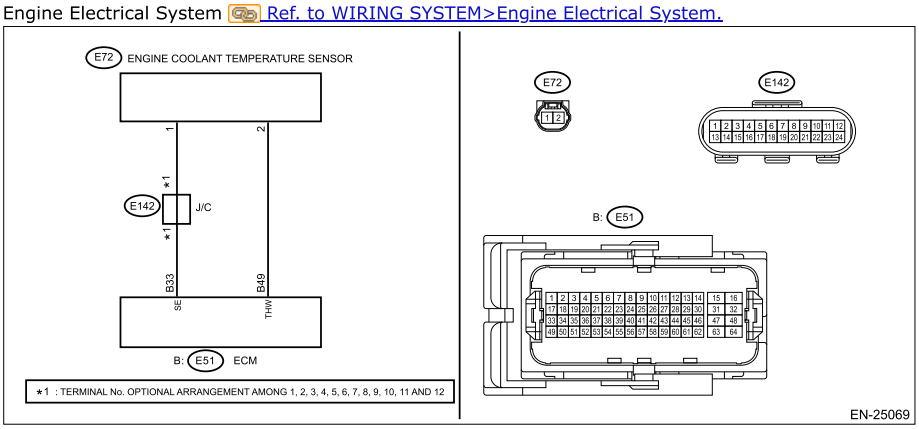
DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FOR POOR CONTACT.
   - yes → Perform the instructed procedures.
   - no → Go to 3.
3. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.
   Connector & terminal
   (E51) No. 33 — (E72) No. 1:
   (E51) No. 49 — (E72) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the following item.
- Open circuit in harness between ECM connector and engine coolant temperature sensor connector
- Poor contact of J/C

4. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E51) No. 49 (+) — Engine ground (−):

Is the voltage 5 V or more?

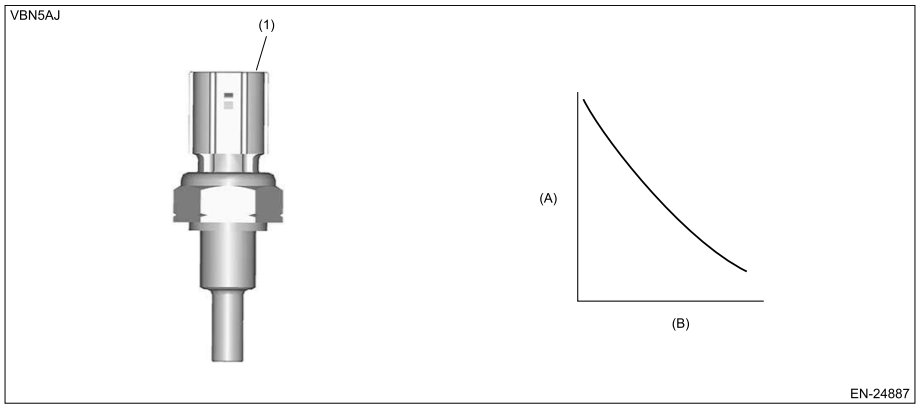
Yes	Repair the short circuit of harness to power supply between ECM connector and engine coolant temperature sensor connector.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature (°C (°F))

(1) Engine coolant temperature sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.71 V

Time needed for diagnosis: 500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

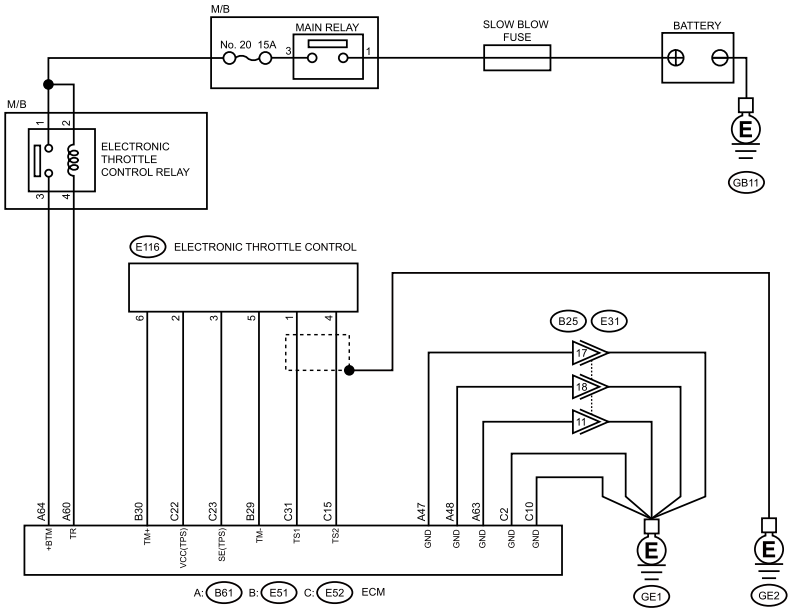
DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW

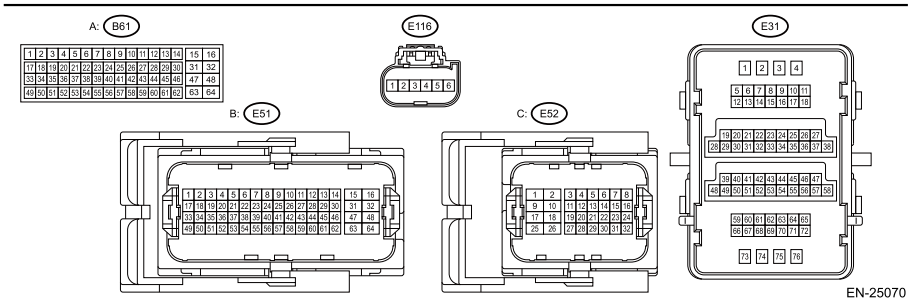
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

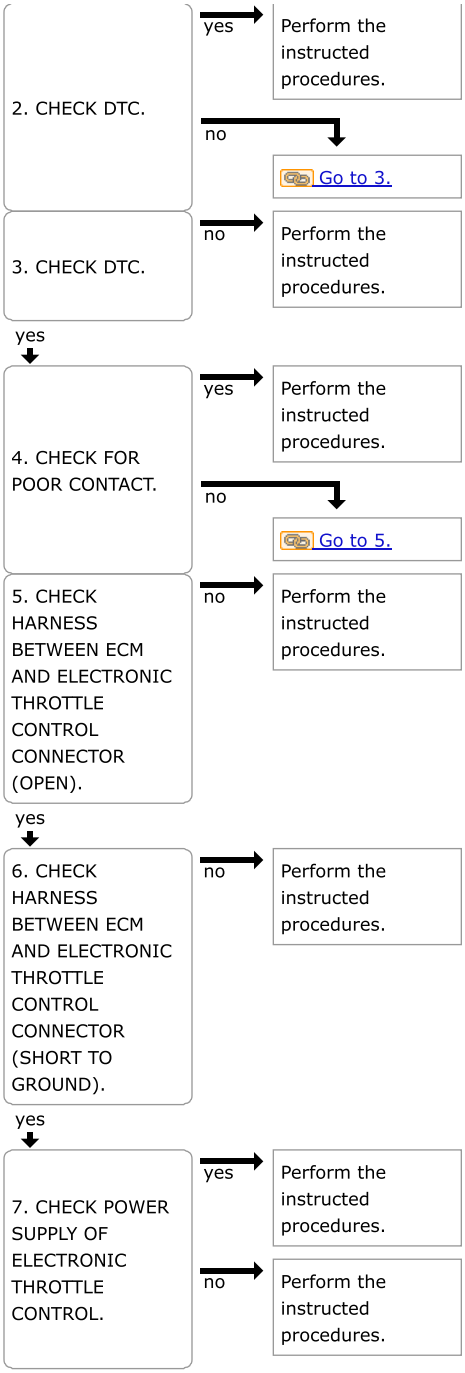




Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0122 displayed? (Current code)

Yes	Go to 4.
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.

4. CHECK FOR POOR CONTACT.

1. Turn the ignition switch to OFF.
2. Check for poor contact of ECM and electronic throttle control connector.

Is there poor contact in ECM or electronic throttle control connector?

Yes	Repair the poor contact of ECM or electronic throttle control connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connectors from electronic throttle control.
3. Measure the resistance of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E52) No. 31 — (E116) No. 1:
   (E52) No. 22 — (E116) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E52) No. 31 — Engine ground:
(E52) No. 22 — 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 electronic throttle control connector.

7. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL.

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
   (E116) No. 2 — Engine ground:

Is the voltage 4.5 — 5.5 V?

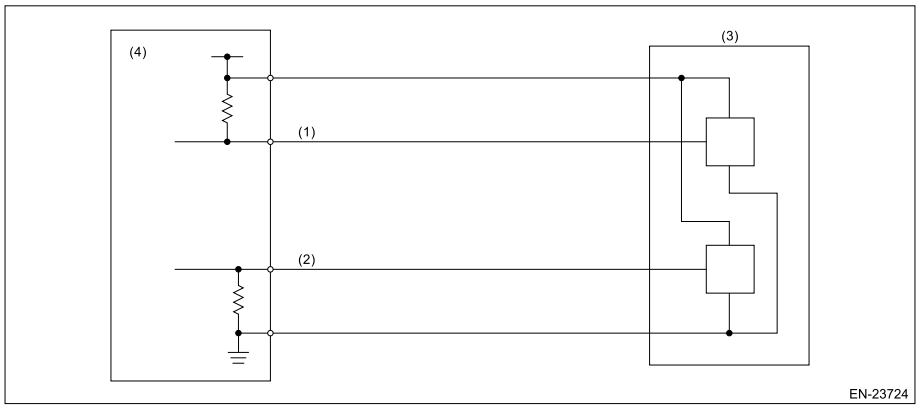
Yes — Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.

No — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit of throttle position sensor 1.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	Less than 0.294 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

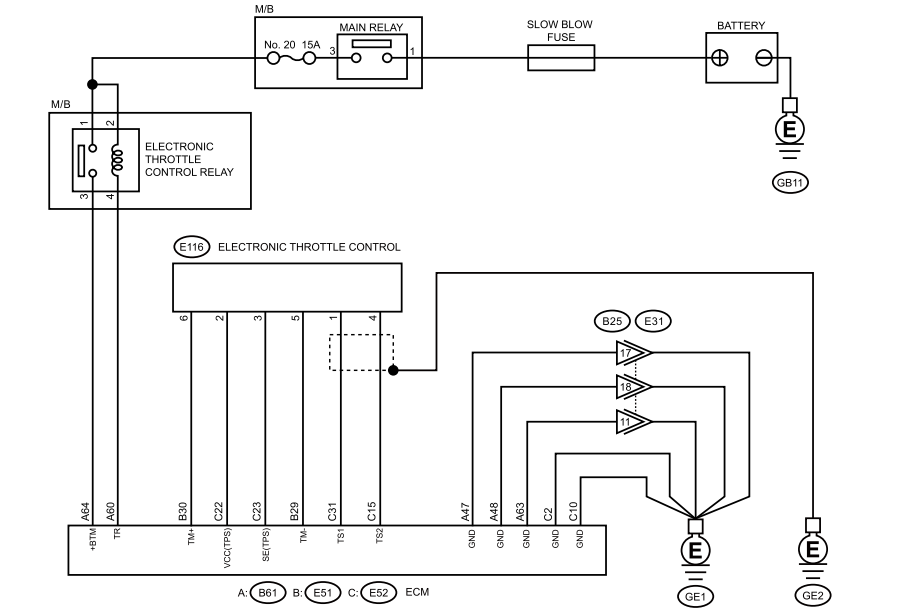
DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH

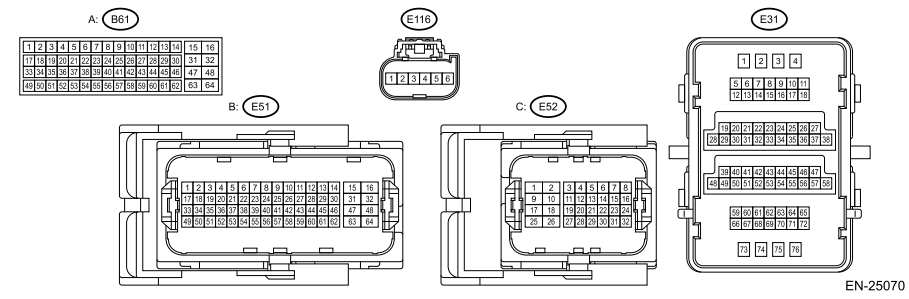
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

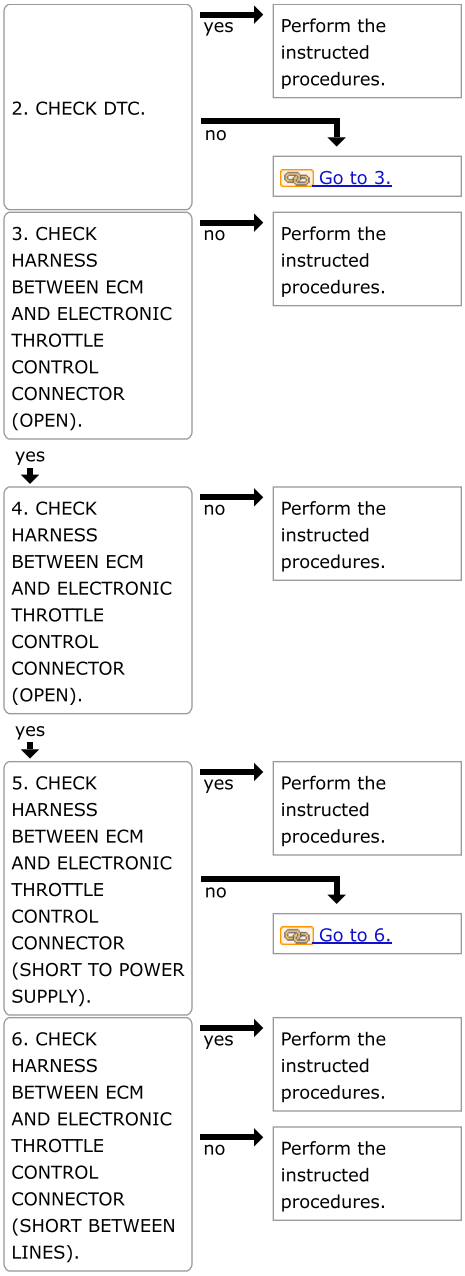




Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

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 of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E52) No. 31 — (E116) No. 1:
(E52) No. 23 — (E116) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E116) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 5.

No — Repair the following item.

- Open circuit of harness between ECM connector and engine ground
- Poor contact of ECM connector

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E116) No. 1 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply 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 (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E52) No. 22 — (E52) No. 31:

Is the resistance 1 MΩ or more?

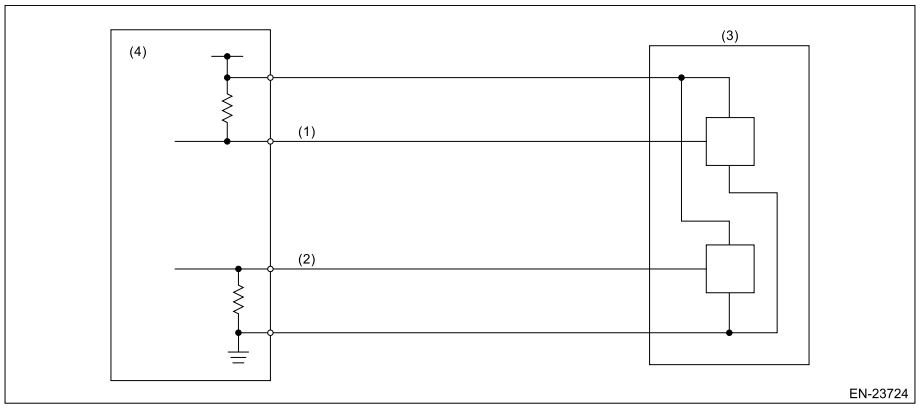
Yes	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.
No	Repair the line-to-line short circuit between ECM connector and electronic throttle control connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.753 V

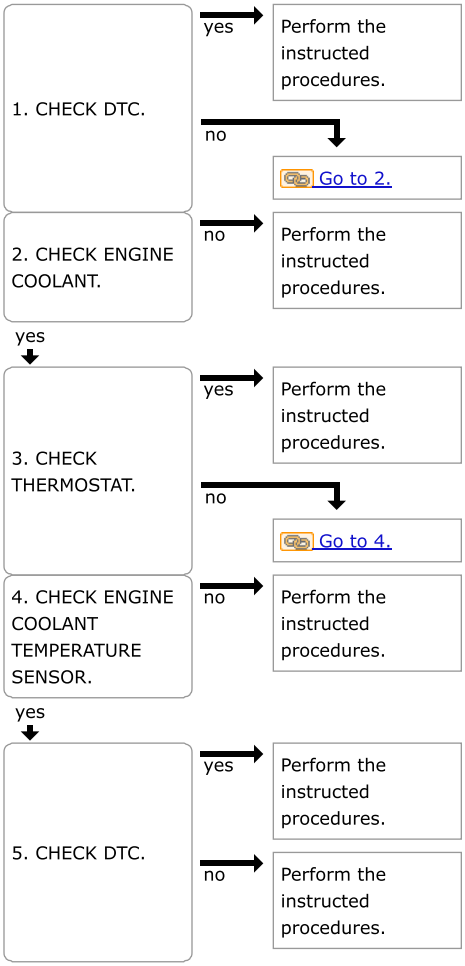
Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Engine does not return to idle.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0125 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK ENGINE COOLANT.

Check the following items:
- Amount of engine coolant
- Engine coolant freeze
- Contamination of engine coolant

Is the check result OK?

Yes	Go to 3.
No	Fill or replace the engine coolant. Ref. to COOLING(H4DOTC)>Engine Coolant.

3. CHECK THERMOSTAT.

Check the engine side thermostat. Ref. to COOLING(H4DOTC)>Thermostat>INSPECTION.

Does the thermostat remain opened?

Yes	Replace the engine side thermostat. Ref. to COOLING(H4DOTC)>Thermostat.
No	Go to 4.

4. 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 check result OK?

Yes	Go to 5.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

5. CHECK DTC.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Engine] displayed? (Current code)

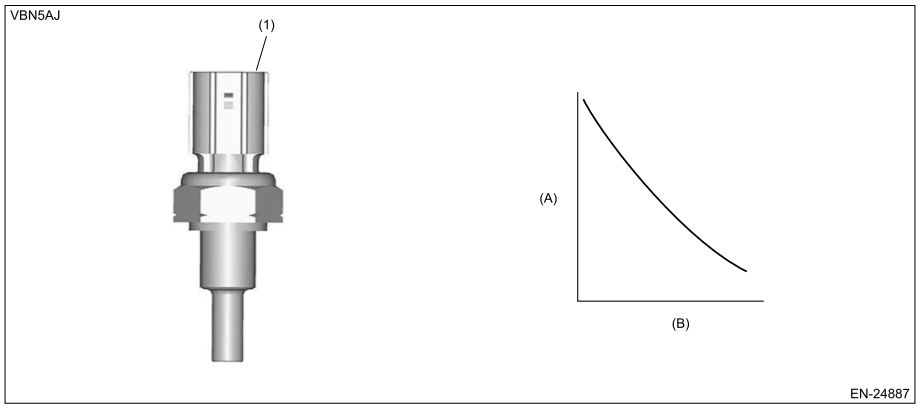
Yes	Check the connection of connector. If there is no faulty connector, perform the diagnosis for the displayed DTCs. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST. **Note:** **After the concerned inspection step is performed, the final check in Basic Diagnostic Procedure is not necessary.**
No	Finish the diagnosis. **Note:** **After the concerned inspection step is performed, the final check in Basic Diagnostic Procedure is not necessary.**

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of engine coolant temperature sensor output property.
Judge as NG when the actual engine coolant temperature does not reach the predetermined value and Σ(Estimated engine coolant temperature − Actual engine coolant temperature) exceeded the predetermined value.

COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature (°C (°F))

(1) Engine coolant temperature sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine speed	475 rpm or more
Estimated coolant temperature	0°C (32°F) or more
Engine coolant temperature after first engine start	Less than 0°C (32°F)

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the first engine start from cold condition.

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 coolant temperature	Less than 0°C (32°F)
Σ(Estimated engine coolant temperature − Actual engine coolant temperature)	More than 1387.5 °C (2529.5°F)

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

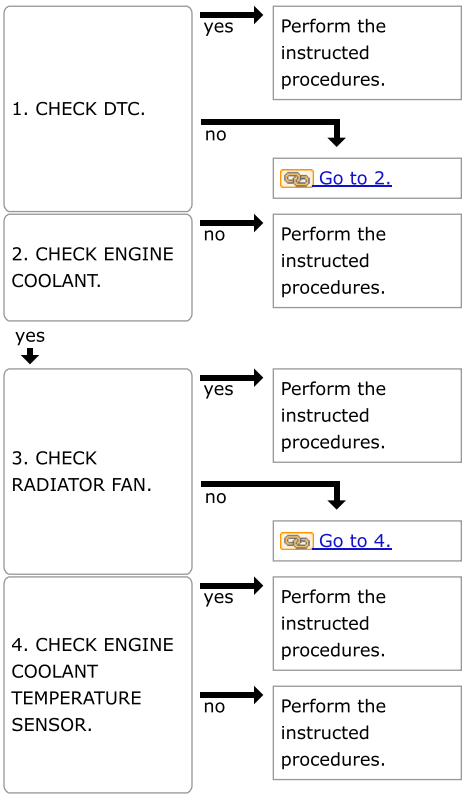
DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:

- Thermostat remains open.
- Coolant temperature rises slowly.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0128 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK ENGINE COOLANT.

Check the engine coolant. Ref. to COOLING(H4DOTC)>Engine Coolant>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Refill the engine coolant. Ref. to COOLING(H4DOTC)>Engine Coolant.

3. CHECK RADIATOR FAN.

1. Start the engine.
2. While keeping idling for approx. 3 minutes (with accelerator OFF), check the operation of the radiator fan.

Does the radiator fan continuously rotate for 3 minutes or more during idling?

Yes	Repair the radiator fan system. Ref. to COOLING(H4DOTC)>Radiator Fan System.
No	Go to 4.

4. 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 check result OK?

Yes	Replace the engine side thermostat. Ref. to COOLING(H4DOTC)>Thermostat.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

GENERAL DESCRIPTION

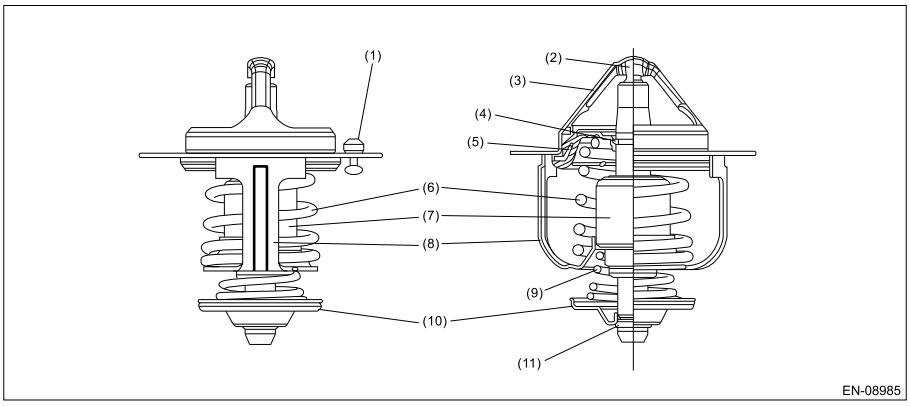
OUTLINE OF DIAGNOSIS

Detect malfunctions of the thermostat function.

Judge as NG when any one of the following conditions is established.

- When the actual engine coolant temperature does not reach the maximum temperature necessary to perform other OBDII diagnosis and Σ(Estimated engine coolant temperature − Actual engine coolant temperature) exceeded the predetermined value. (Diagnosis 1)
- When the actual engine coolant temperature does not reach the range within −11.1°C (−19.98°F) from the regulated temperature and Σ(Estimated engine coolant temperature − Actual engine coolant temperature) exceeded the predetermined value. (Diagnosis 2)
- When the actual engine coolant temperature reaches −11.1°C (−19.98°F) from the regulated temperature and then becomes less than the predetermined value. (Diagnosis 3)

COMPONENT DESCRIPTION



(1) Jiggle valve
(2) Piston
(3) Flange
(4) Stop ring
(5) Dust seal
(6) Main spring
(7) Wax element
(8) Frame
(9) Bypass spring
(10) Bypass valve
(11) Stop ring

EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Ambient air temperature	−7°C (19.4°F) or more
Engine coolant temperature at engine start	Less than 60°C (140°F)

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Ambient air temperature	−7°C (19.4°F) or more
Engine coolant temperature at engine start	Less than 60°C (140°F)

Diagnosis 3

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Ambient air temperature	−7°C (19.4°F) or more
Actual engine coolant temperature	Value of Map1 or more (experienced)
Diagnosis mask condition	Not established

Map1

Ambient temperature (°C (°F))	−7 (19.4)	8 (46.4)	60 (140)
Actual engine coolant temperature (°C (°F))	70.8 (159.4)	79.4 (174.9)	79.4 (174.9)

GENERAL DRIVING CYCLE

Diagnosis 1 and Diagnosis 2: Perform the diagnosis only once after starting the engine.
Diagnosis 3: Always perform the diagnosis after starting the engine.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Actual engine coolant temperature	Less than 50°C (122°F)
Σ(Estimated engine coolant temperature − Actual engine coolant temperature)	More than 1387.5°C (2497.5°F)
Estimated coolant temperature	More than 50°C (122°F)

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Actual engine coolant temperature	Less than value of Map1

Malfunction Criteria	Threshold Value
Σ(Estimated engine coolant temperature − Actual engine coolant temperature)	More than 1387.5°C (2497.5°F)
Estimated coolant temperature	More than Map2

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value
Actual engine coolant temperature	Less than 50°C (122°F)

Map1

Ambient temperature (°C (°F))	**−7 (19.4)**	**8 (46.4)**	**60 (140)**
Actual engine coolant temperature (°C (°F))	70.8 (159.4)	79.4 (174.9)	79.4 (174.9)

Map2

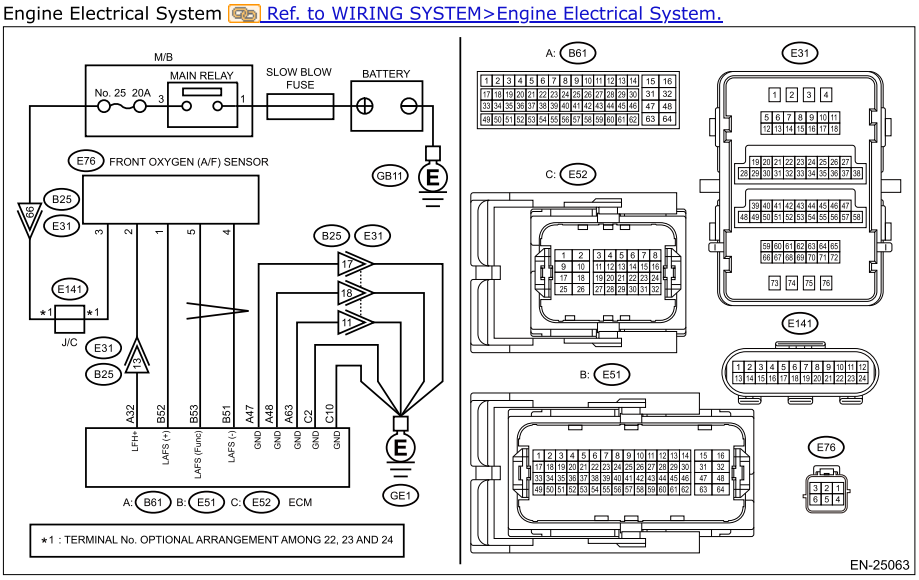
Ambient temperature (°C (°F))	**−7 (19.4)**	**8 (46.4)**	**60 (140)**
Estimated engine coolant temperature (°C (°F))	70.8 (159.4)	79.4 (174.9)	79.4 (174.9)

Time needed for diagnosis
Diagnosis 1: Less than 1 s
Diagnosis 2: Less than 1 s
Diagnosis 3: 10 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0130 A/F / O2 SENSOR CIRCUIT BANK 1 SENSOR 1

1. —

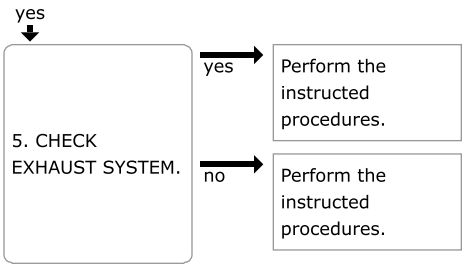
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FRONT OXYGEN (A/F) SENSOR DATA.
   - no → Go to 3.
   - yes ↓
2. CHECK FRONT OXYGEN (A/F) SENSOR DATA.
   - yes → Go to 5.
   - no → Go to 3.
3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).
   - no → Perform the instructed procedures.



1. CHECK FRONT OXYGEN (A/F) SENSOR DATA.

1. Start the engine and warm up until the engine coolant temperature exceeds 75°C (167°F).
2. Idle the engine for one minute or more.
3. Using the Subaru Select Monitor, read the value in [A/F Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [A/F Sensor #11] 1.2 — 3 [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 3000 rpm. (Five times in total)
2. Using the Subaru Select Monitor, read the value of [A/F Sensor #11] during racing.

Note:
- **Slowly depress the accelerator pedal to increase engine speed up to 3000 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.**
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**

Is the value of [A/F Sensor #11] 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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.
   Connector & terminal
   (E51) No. 52 — (E76) No. 1:
   (E51) No. 51 — (E76) No. 4:
   (E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 52 — Engine ground:
(E51) No. 51 — Engine ground:
(E51) No. 53 — 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 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**
- **Loose or improperly attached front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

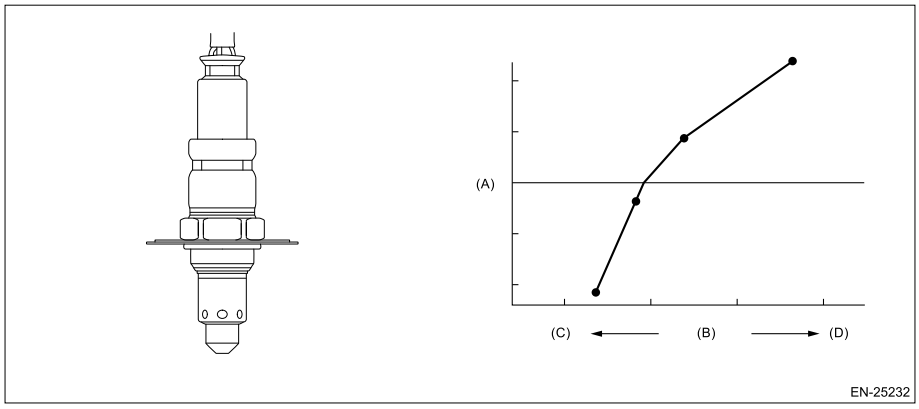
Yes	Repair or replace faulty parts.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG, while the element impedance is low with the element current out of the range.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Front oxygen (A/F) sensor impedance	403 Ω or less

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than −45 μA

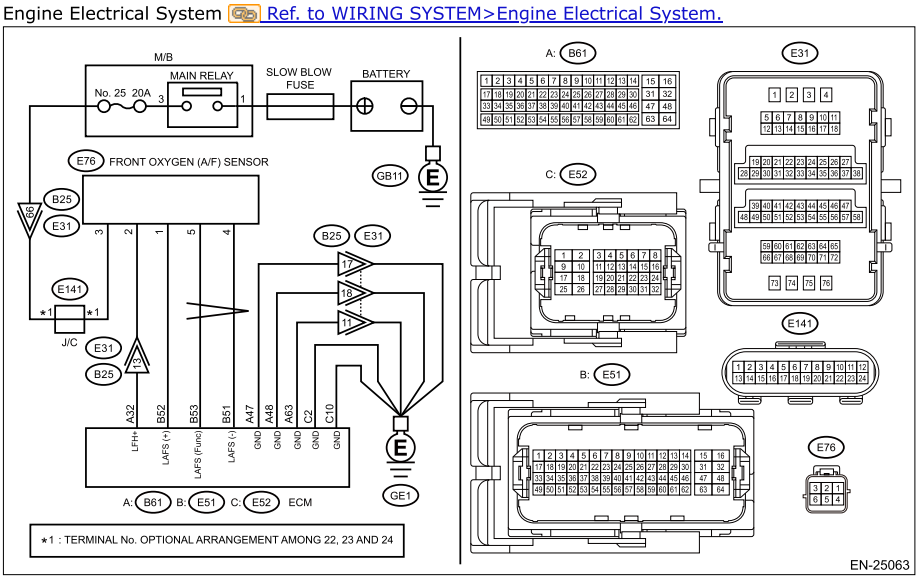
Malfunction Criteria	Threshold Value
	Or, More than 45 μA

Time needed for diagnosis: 3040 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Check the 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 (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the front oxygen (A/F) sensor.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — 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 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?

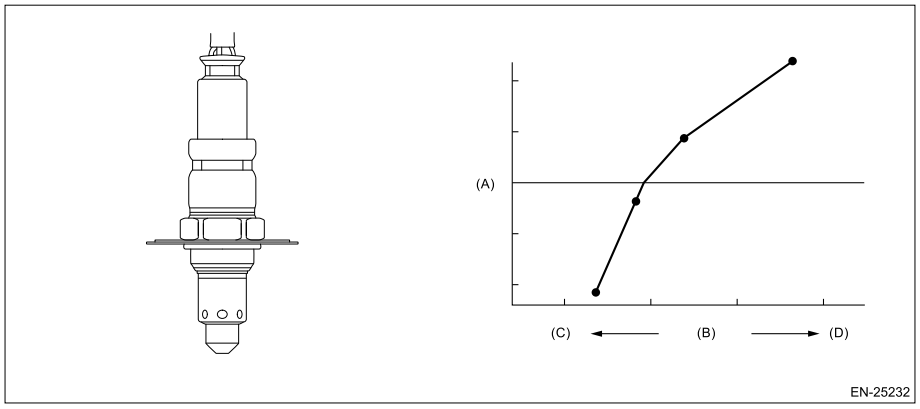
Yes	Repair the poor contact of front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit in the front oxygen (A/F) sensor.
Judge as NG, when the element voltage is out of the specified range.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 (+)	1 V or less
Or,	
Input voltage (−)	1 V or less
Or,	
Sensor reference voltage	1 V or less

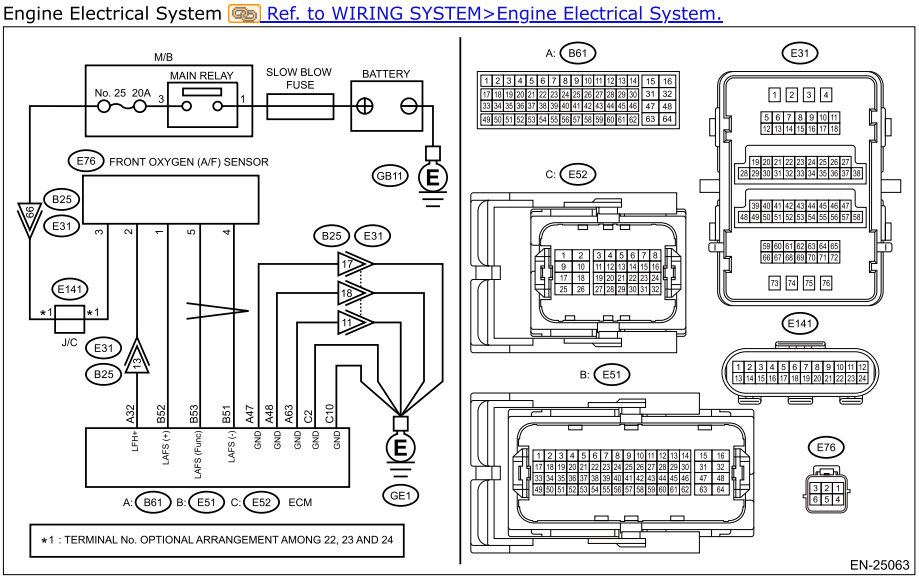
Time needed for diagnosis: 560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

Check the 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 (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 51 (+) — Engine ground (−):
(E51) No. 52 (+) — Engine ground (−):
(E51) No. 53 (+) — Engine ground (−):

Is the voltage 8 V or more?

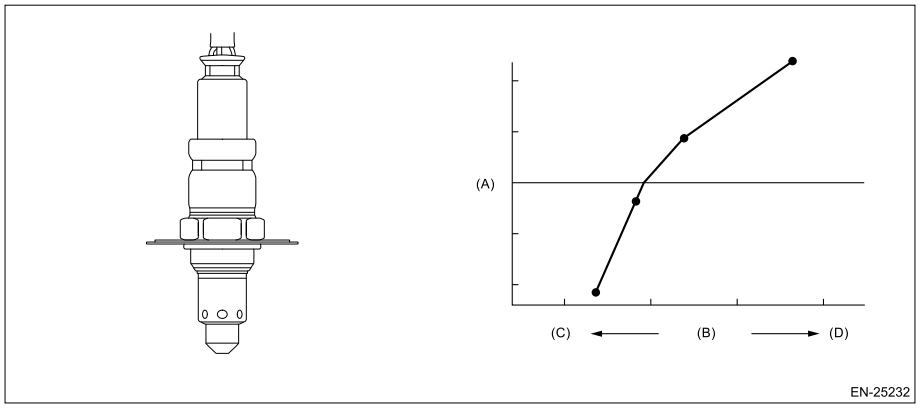
Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit in the front oxygen (A/F) sensor.
Judge as NG, when the element voltage is out of the specified range.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

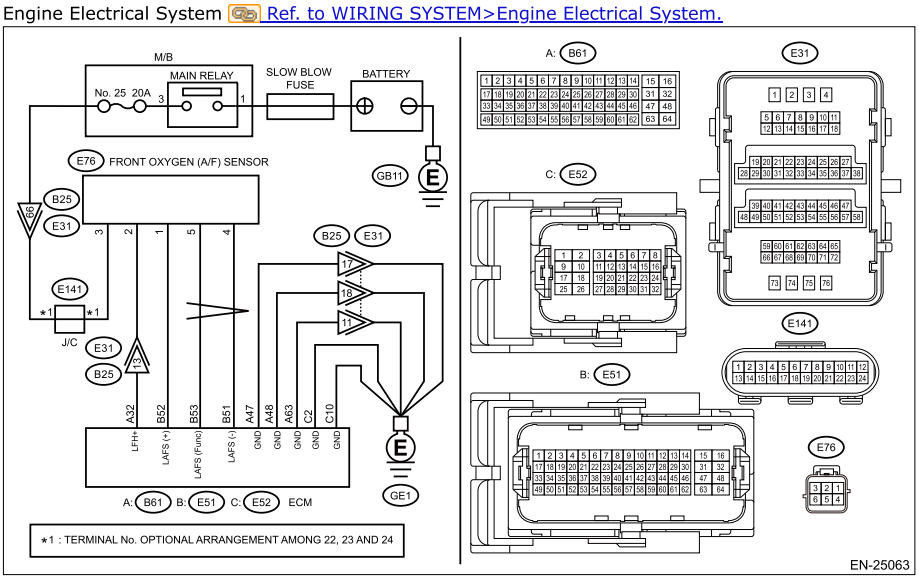
Malfunction Criteria	Threshold Value
Input voltage (+) Or, Input voltage (−) Or, Sensor reference voltage	Battery voltage − 1 V or more Battery voltage − 1 V or more 6.5 V or more

Time needed for diagnosis: 560 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
2. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E51) No. 52 — (E76) No. 1:
(E51) No. 51 — (E76) No. 4:
(E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector 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?

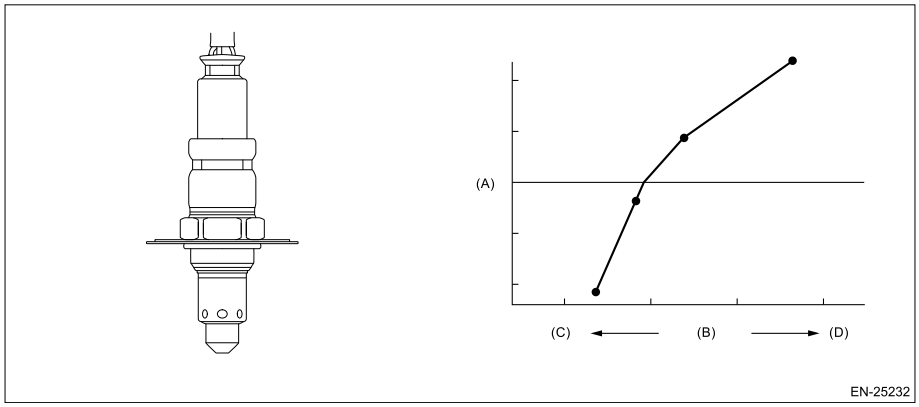
Yes	Repair the poor contact of ECM or front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open circuit in the front oxygen (A/F) sensor.
Judge as NG when the element voltage is out of range, or when the malfunction signal is received from the front oxygen (A/F) sensor IC, or when the element current gets stuck.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Front oxygen (A/F) sensor impedance	More than 403 Ω

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 (+)	More than 2.65 V

Malfunction Criteria	Threshold Value
Or, Sensor reference voltage Or, Input current	 3.6 V or less −45 μA or more and 45 μA or less

Time needed for diagnosis
Input voltage (+): 30 seconds
Sensor reference voltage: 2 seconds
Input current: 2 seconds
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2

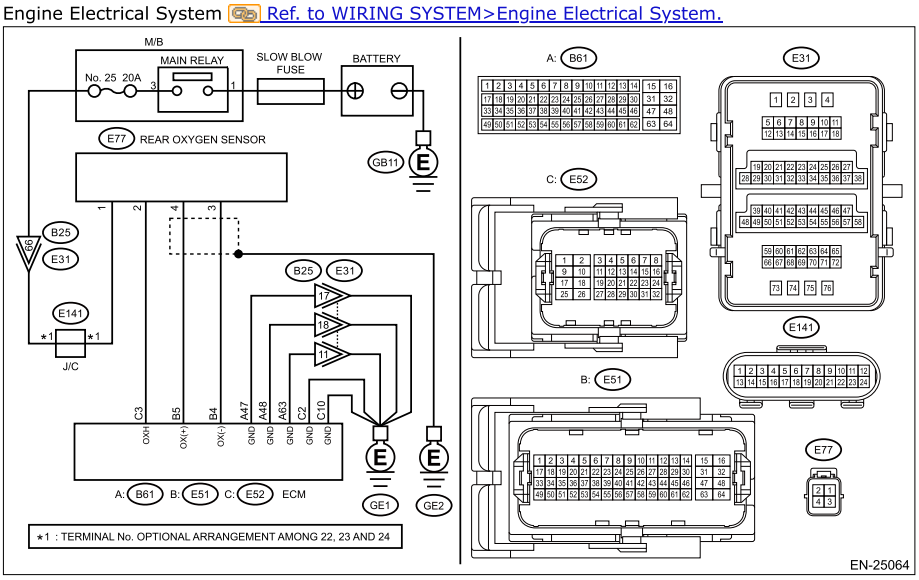
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

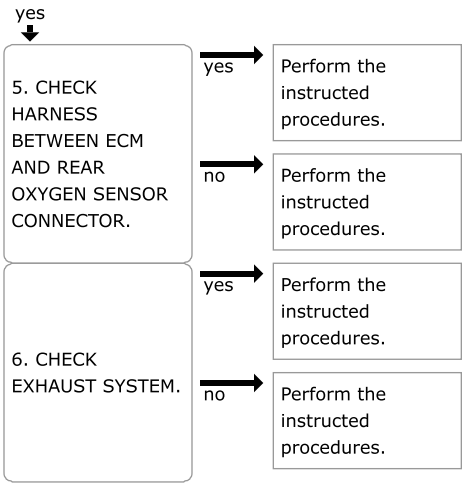
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK REAR OXYGEN SENSOR DATA.	yes	Go to 6.
	no	Go to 2.
2. CHECK REAR OXYGEN SENSOR CONNECTOR.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).	no	Perform the instructed procedures.
4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (SHORT TO GROUND).	no	Perform the instructed procedures.

yes



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, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.49 [V] or more?

Yes — Go to 6.

No — Go to 2.

2. CHECK REAR OXYGEN SENSOR CONNECTOR.

Check the 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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 4 — (E77) No. 3:
   (E51) No. 5 — (E77) 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 (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(E51) No. 4 — Engine ground

(E51) No. 5 — 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 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

(E77) 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.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

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 or improperly attached 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.

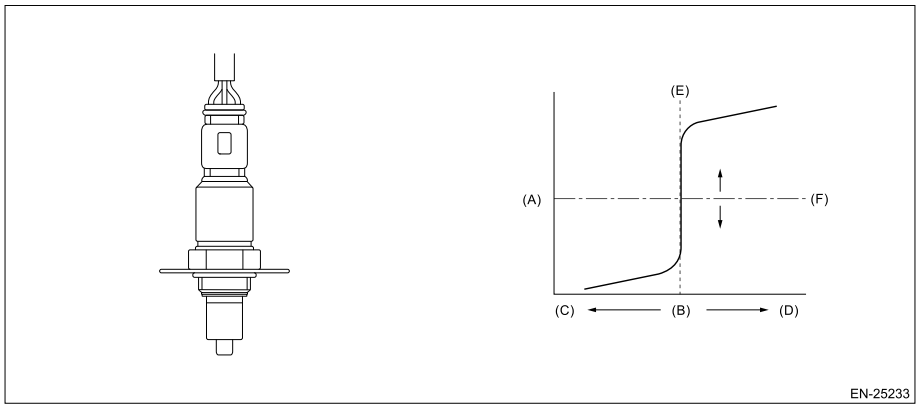
GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of rear oxygen sensor.

Judge as NG when the rear oxygen sensor output voltage is out of possible range.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

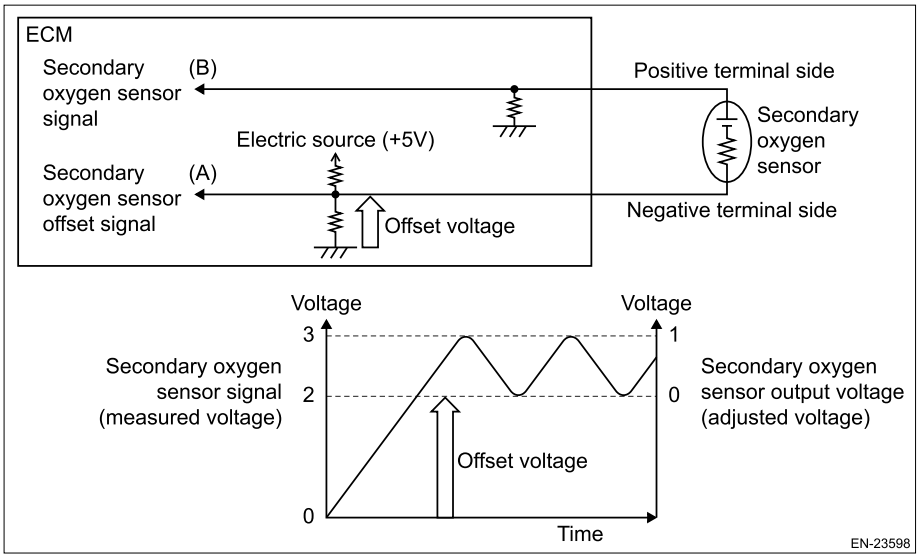
Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more
Cumulative duty ratio of the rear oxygen sensor heater after engine starting	54400% or more
Rear oxygen sensor offset signal	More than 1.8 V and Less than 2.2 V

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

DIAGNOSTIC METHOD



If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Rear oxygen sensor signal (A)	Less than 1.8 V

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor {(B) − (A)}	Less than −0.22 V

Malfunction Criteria	Threshold Value
Rear oxygen sensor signal (B)	0.517 V or more
Or,	
Rear oxygen sensor signal (B)	0.517 V or more and Less than 1.7 V

Time needed for diagnosis: 1000 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2

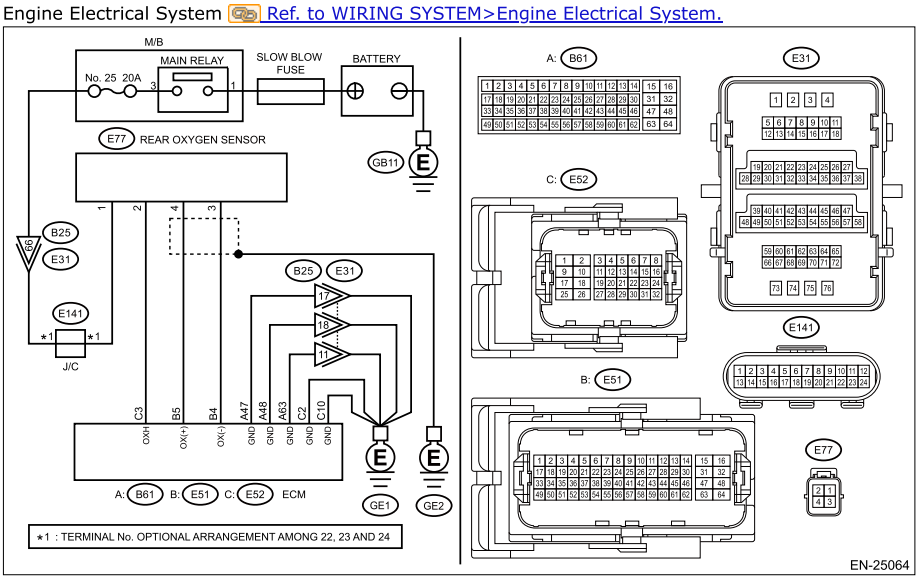
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK REAR OXYGEN SENSOR DATA.	yes	Go to 5.
	no	Go to 2.
2. CHECK REAR OXYGEN SENSOR CONNECTOR.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).	no	Perform the instructed procedures.
4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

5. CHECK EXHAUST SYSTEM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 3000 rpm.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.25 [V] or less?

Yes — Go to 5.

No — Go to 2.

2. CHECK REAR OXYGEN SENSOR CONNECTOR.

Check the 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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

Connector & terminal
(E51) No. 4 — (E77) No. 3:
(E51) No. 5 — (E77) 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.

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

(E77) No. 3 (+) — Engine ground (−):

Is the voltage 2.2 V or less?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

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 or improperly attached front oxygen (A/F) sensor and rear oxygen sensor**

Is there any fault in exhaust system?

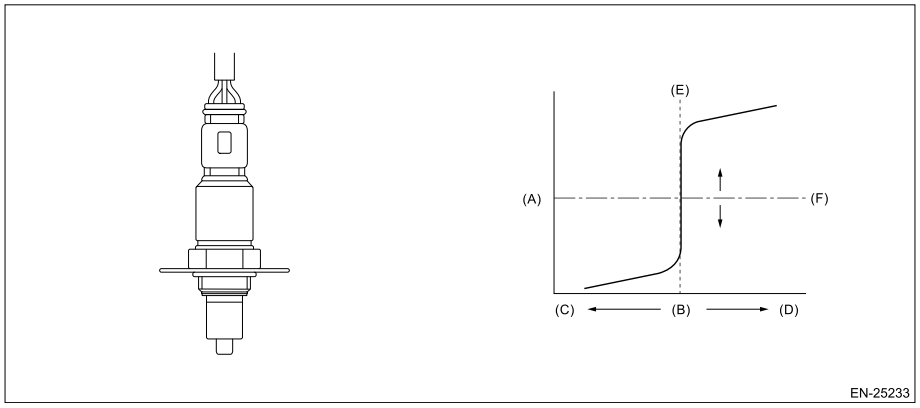
Yes	Repair or replace faulty parts.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor short circuit.
Judge as NG when the rear oxygen sensor output voltage is out of possible range.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

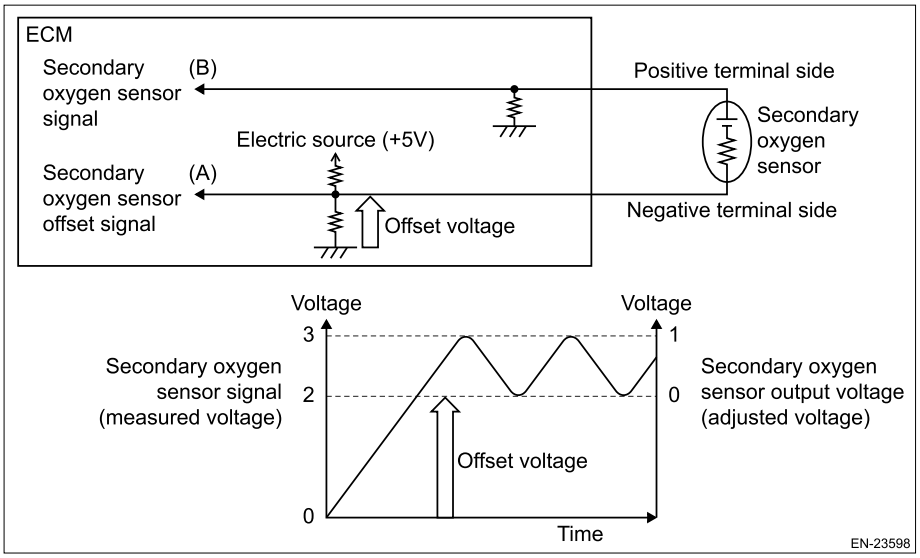
EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

DIAGNOSTIC METHOD



If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Rear oxygen sensor offset signal (A)	More than 2.2 V

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Rear oxygen sensor signal (B)	More than 3.25 V

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor {(B) − (A)}	More than 1.2 V

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

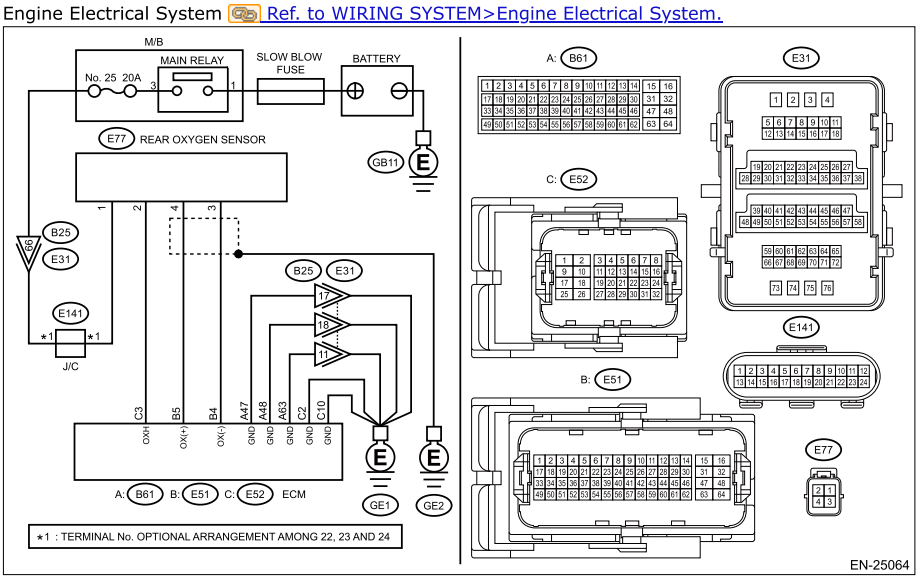
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		

4. CHECK REAR OXYGEN SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P013A, P013B, P013E or P013F displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 5 — (E77) 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 (SHORT TO GROUND).

Measure the resistance between rear oxygen sensor connector and engine ground.
Connector & terminal
(E77) No. 4 — Engine 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 rear oxygen sensor connector.

4. 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.

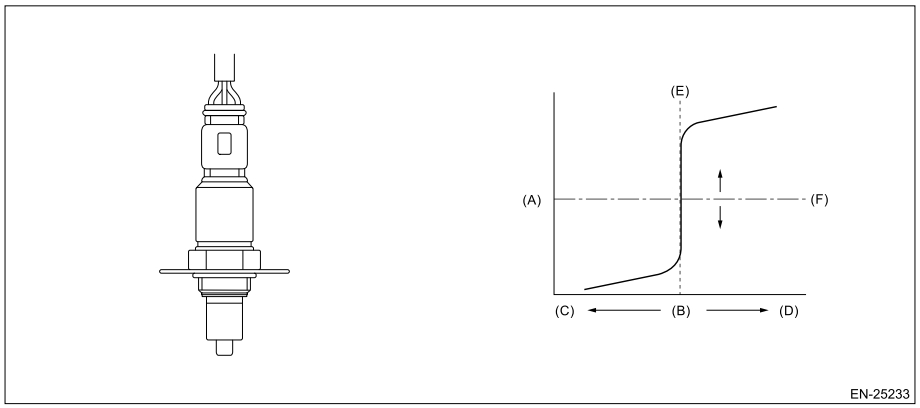
Note:
In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

EXECUTION CONDITION

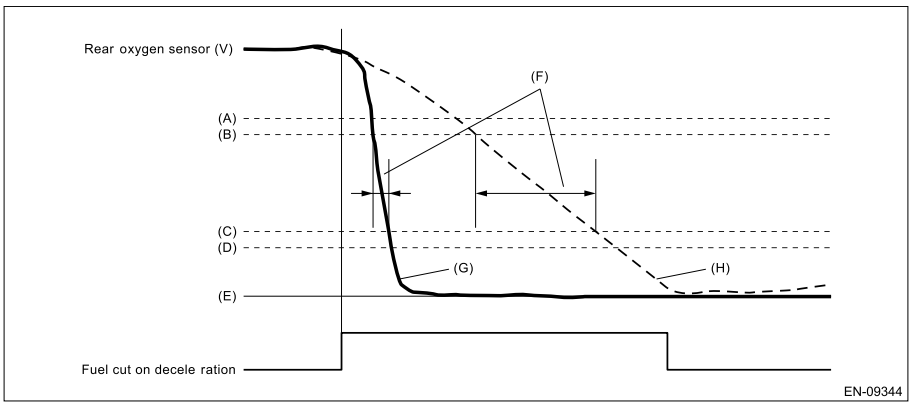
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor voltage when fuel cut starts	0.55 V or more
Time while the fuel shut-off function is in operation	5000 ms or more
Estimated temperature of rear oxygen sensor element when fuel cut starts	450°C (842°F) or more

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.

DIAGNOSTIC METHOD

Detect a malfunction by measuring the rear oxygen sensor response time during fuel cut.



(A) 0.55 V
(B) 0.5 V
(C) 0.2 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	More than 2 s

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

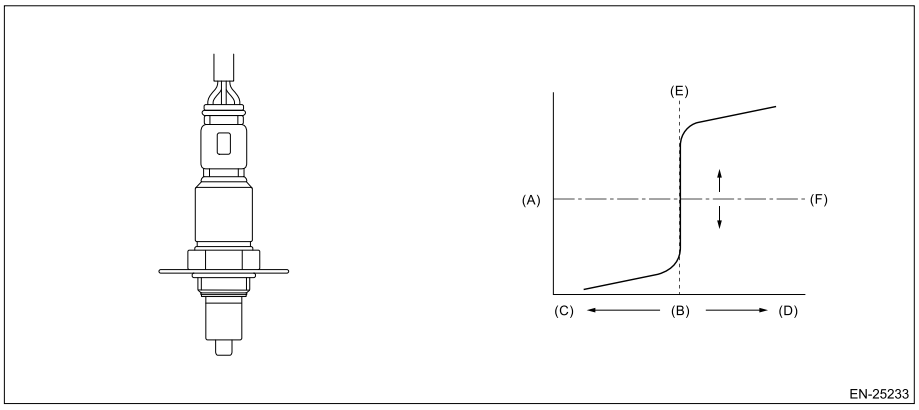
DTC P013B O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

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 recovered, 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 rear oxygen sensor output voltage is less than the threshold value when the response time is more than the threshold value.

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
Battery voltage	10.9 V or more
Main feedback	In operation
(Time while the fuel shut-off function is in operation	3000 ms or more

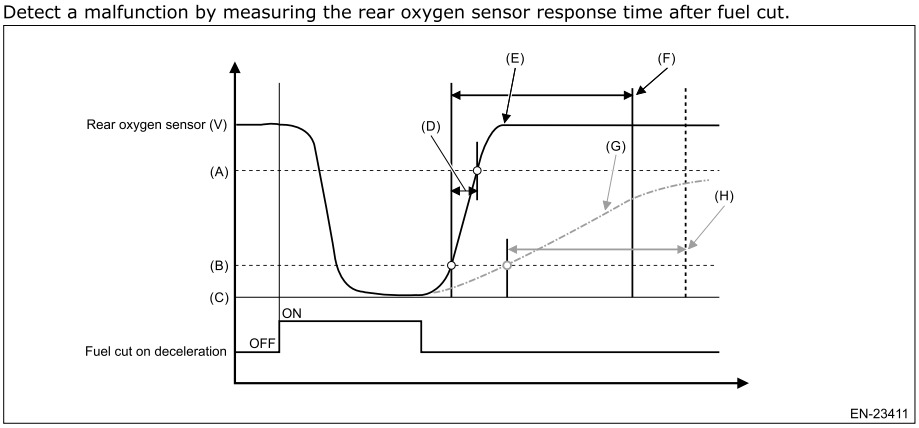
Secondary parameters	Execution condition
Fuel shut-off function after experienced above)	Not in operation
Output voltage of rear oxygen sensor	0.2 V or more
Compensation to rich	Rich
Amount of intake air	20 g/s (0.7 oz/s) or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more

4. GENERAL DRIVING CYCLE

Perform diagnosis only once after recovering from a deceleration fuel cut continued for more than predetermined time.

5. DIAGNOSTIC METHOD

Detect a malfunction by measuring the rear oxygen sensor response time after fuel cut.



(A) 0.5 V
(B) 0.2 V
(C) 0 V
(D) Diagnostic parameter
(E) Voltage at normal condition
(F) Response time at normal condition
(G) Voltage at abnormal condition
(H) Response time at abnormal condition

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage value of rear oxygen sensor	Less than 0.5 V
Elapsed time	More than 3 s

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

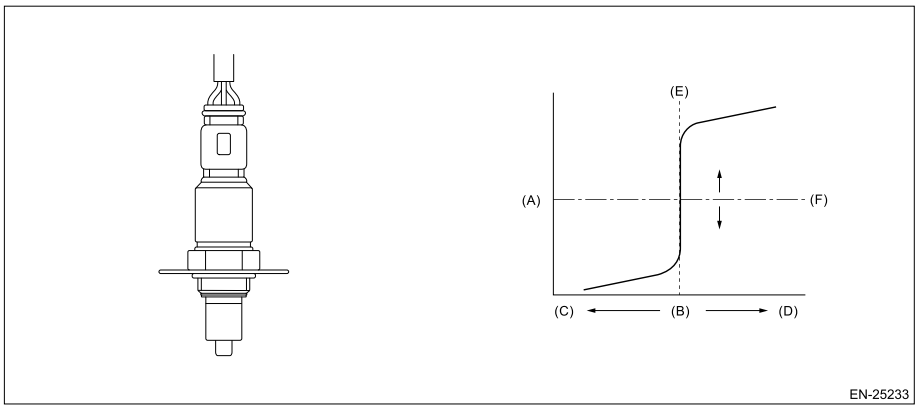
DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

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



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

3. EXECUTION CONDITION

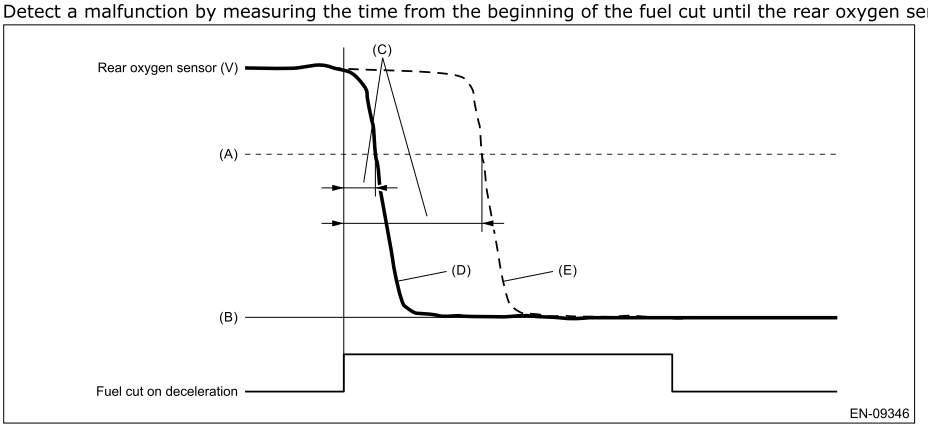
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor voltage when fuel cut starts	More than 0.55 V
(Time while the fuel shut-off function is in operation	More than 5 s
Fuel shut-off function after experienced above)	Not in operation
Estimated temperature of the rear oxygen sensor element	More than 450°C (842°F)

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 a malfunction by measuring the time from the beginning of the fuel cut until the rear oxygen sensor voltage starts 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	More than 4000 ms

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

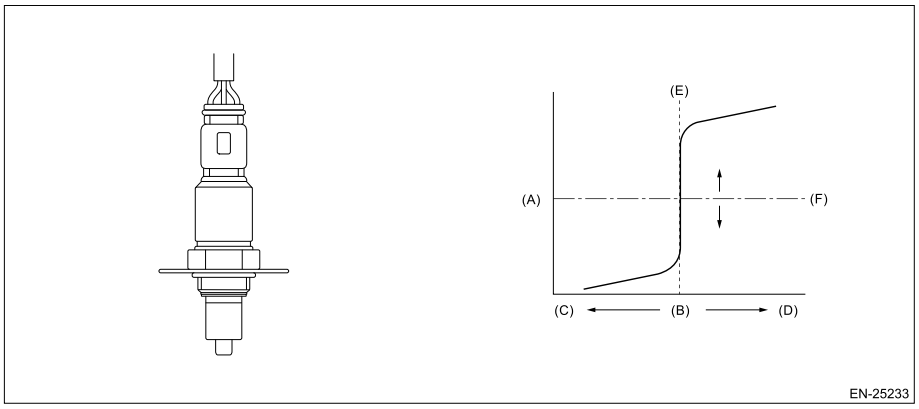
Note:

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



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

3. EXECUTION CONDITION

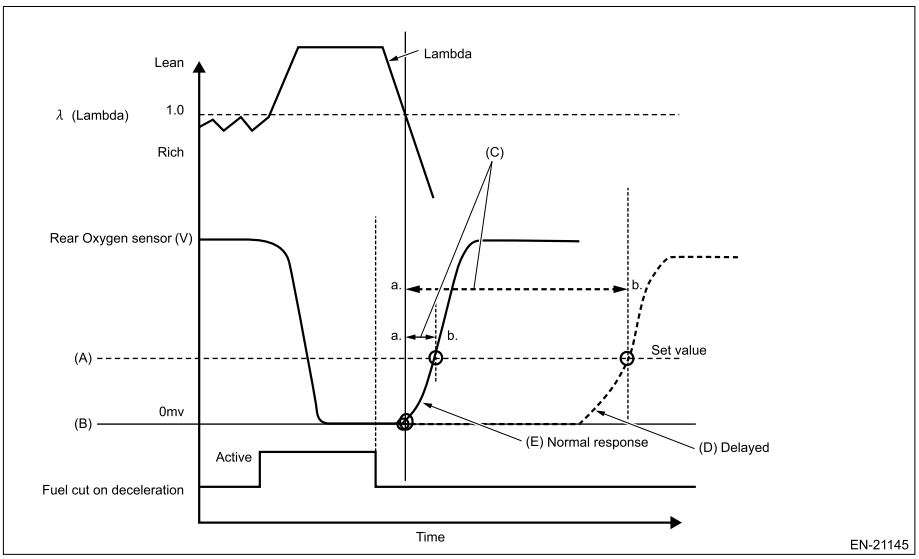
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Main feedback	In operation
Rear oxygen sensor voltage when fuel cut has completed	Less than 0.15 V
(Time while the fuel shut-off function is in operation Fuel shut-off function after experienced above)	More than 3 s Not in operation
Estimated temperature of the rear oxygen sensor element	More than 450°C (842°F)
Compensation to rich	Rich
Amount of intake air	25 g/s (0.88 oz/s) or more

4. GENERAL DRIVING CYCLE

Perform diagnosis only once when recovering from the deceleration fuel cut continued for more than predetermined time with the rear oxygen sensor warmed up sufficiently.

5. DIAGNOSTIC METHOD

Detect a malfunction by measuring the time from fuel cut completed until the rear oxygen sensor voltage begins to rise.



(A) 0.3 V
(B) 0 V
(C) Diagnostic parameter
(D) Malfunction
(E) Normal

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage value of rear oxygen sensor	Less than 0.2 V
Elapsed time*	More than value of Map

*: The time since the λ became less than 1 after the end of fuel cut

Map

Average value of intake air amount (g/s (oz/s))	**24 (0.85)**	**25 (0.88)**	**45 (1.6)**
Elapsed time (s)	4.32	4.30	4.30

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

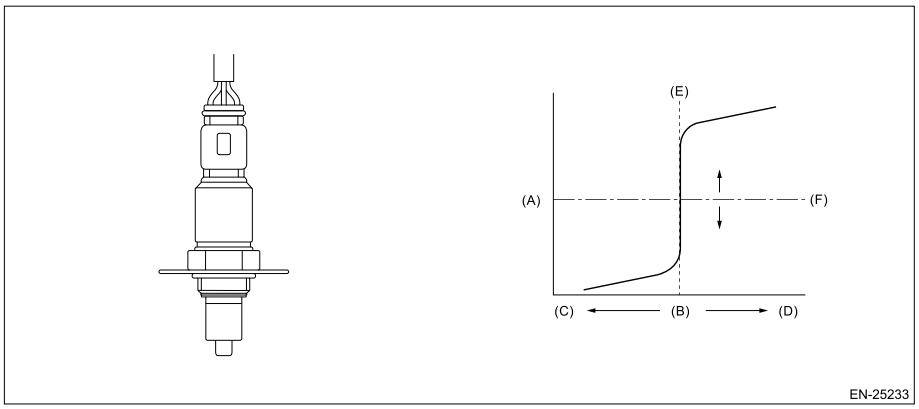
DTC P0140 O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 2

Note:
For the diagnostic procedure, refer to DTC P0137. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the open circuit in the rear oxygen sensor.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

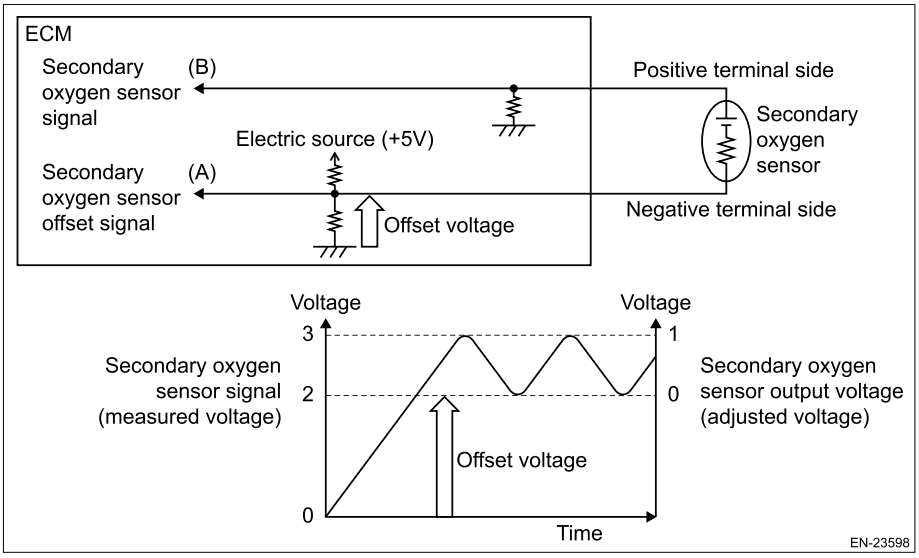
3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more
Cumulative duty ratio of the rear oxygen sensor heater after engine starting	54400% or more
Rear oxygen sensor offset signal	More than 1.8 V and Less than 2.2 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
Rear oxygen sensor signal (B)	Less than 0.517 V

Time needed for diagnosis: 1000 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 P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2

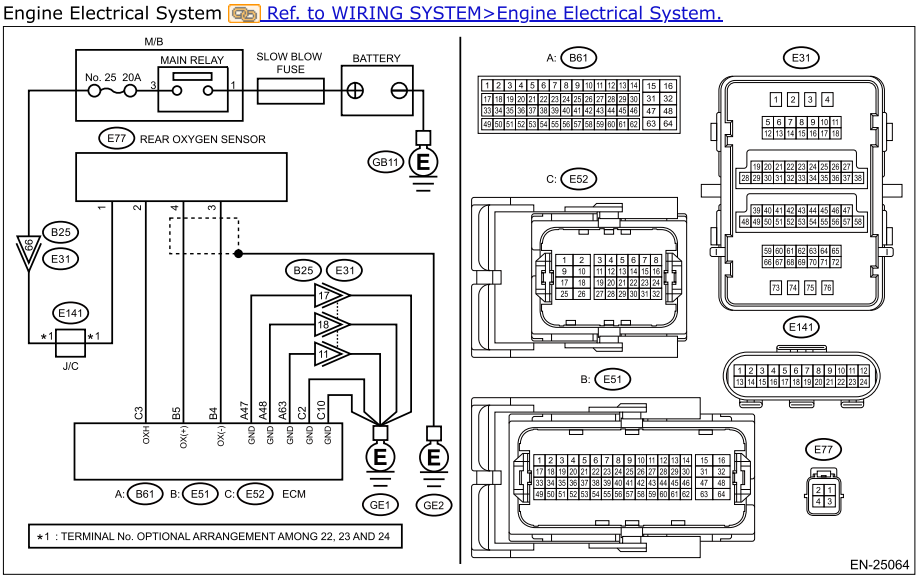
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK REAR OXYGEN SENSOR POWER SUPPLY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK GROUND CIRCUIT FOR ECM.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK REAR OXYGEN SENSOR.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

1. CHECK REAR OXYGEN SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the rear oxygen sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between rear oxygen sensor connector and engine ground.
   Connector & terminal
   (E77) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair the following item.
- Open circuit in harness between M/B and rear oxygen sensor connector
- Poor contact of J/C
- Poor contact of coupling connector
- Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E77) No. 2 — (E52) No. 3:

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 GROUND CIRCUIT FOR ECM.

Measure the resistance of harness between ECM connector and engine ground.
Connector & terminal
(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 4.

No — Repair the following item.
- Open circuit of harness between ECM connector and engine ground
- Poor contact of coupling connector

4. CHECK REAR OXYGEN SENSOR.

Check the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor>INSPECTION.

Is the check result OK?

Yes — Repair the poor contact of ECM connector.

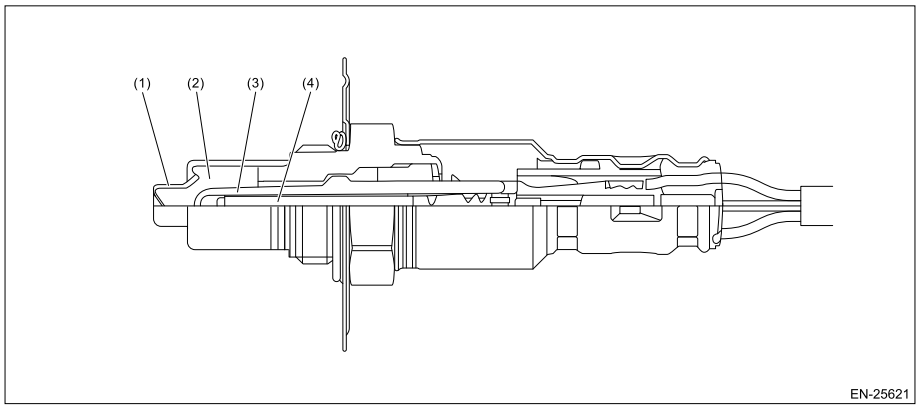
No — Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Element cover (outer)
(2) Element cover (inner)
(3) Sensor element
(4) Ceramic heater

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor heater control duty	4% or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than value of Map

Map

Battery voltage (V)	10.9	12	13	14	15	16
Threshold value (mA)	330	358	385	413	440	468

Time needed for diagnosis: 10 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK EXHAUST SYSTEM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0031, P0032, P0131, P0132, or P0134 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK EXHAUST SYSTEM.

Check the 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?

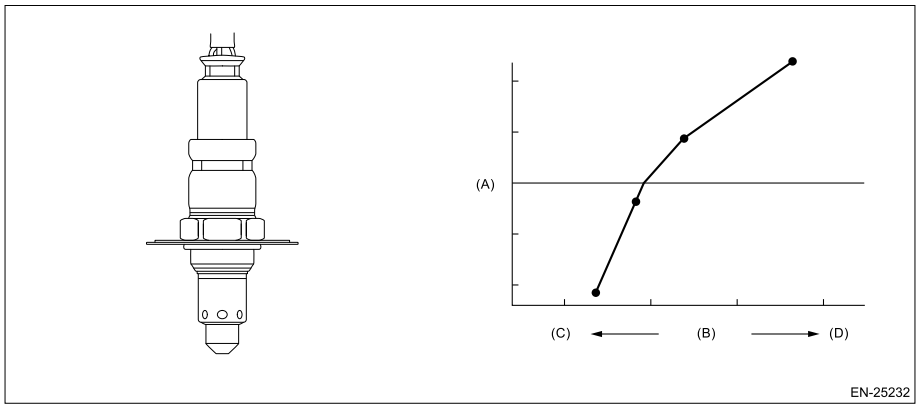
Yes	Repair the exhaust system.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the delayed response of the 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.

COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich
(D) Lean

EXECUTION CONDITION

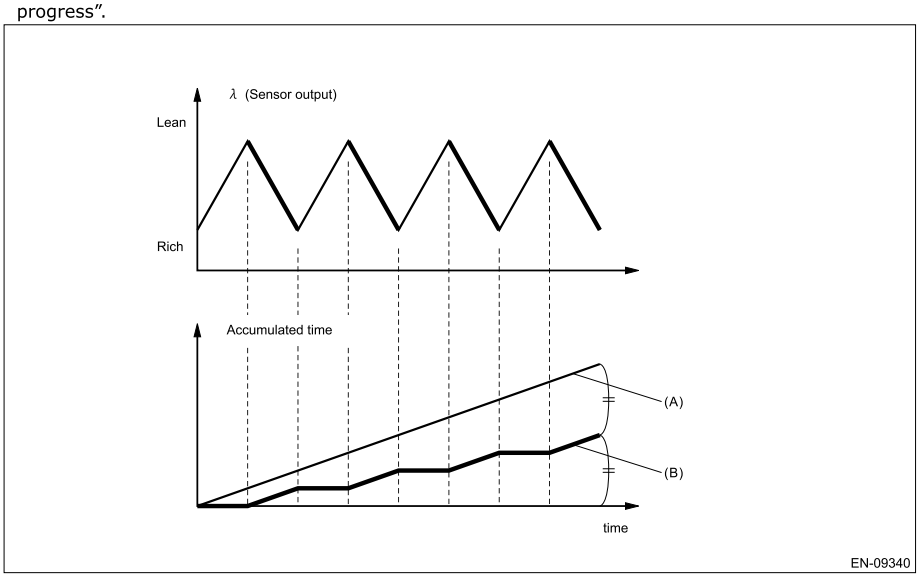
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Operation time of main feedback	5000 ms or more
Engine speed	1000 rpm or more
Amount of intake air	10 g/s (0.35 oz/s) or more

GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

DIAGNOSIS 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".



(A) Time during which diagnosis is in progress (B) Cumulative value of time when λ changes from lean → rich

Judge as NG when the following conditions are established.

Judgment value (P014C)

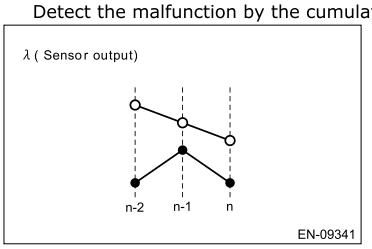
Malfunction Criteria	Threshold Value
(Cumulative value of time when λ changes from lean → rich) / (Time during which diagnosis is in progress)	Less than 0.4
and	
Average value of time necessary for λ to inverse the air fuel ratio to Lean → Rich → Lean	More than 10 ms

Judgment value (P014D)

Malfunction Criteria	Threshold Value
(Cumulative value of time when λ changes from lean → rich) / (Time during which diagnosis is in progress) and	More than 0.6
Average value of time necessary for λ to inverse the air fuel ratio to Lean → Rich → Lean	More than 10 ms

Time needed for diagnosis: 120 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DIAGNOSIS 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
Cumulative value obtained from the amount of variation in λ change	Less than value of Map

Map

Cumulative value obtained from the amount of variation in λ	**0**	**3**	**9**
Cumulative value obtained from the amount of variation in λ change	0	2.5	2.5

Time needed for diagnosis: 120 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 P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:
For the diagnostic procedure and 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)

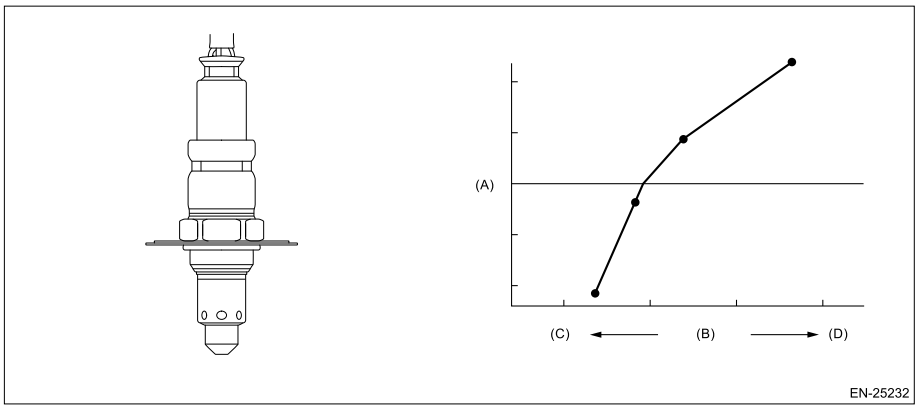
DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

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 delayed response of the 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

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Operation time of main feedback	5000 ms or more
Engine speed	1000 rpm or more
Amount of intake air	10 g/s (0.35 oz/s) or more

Diagnosis 2

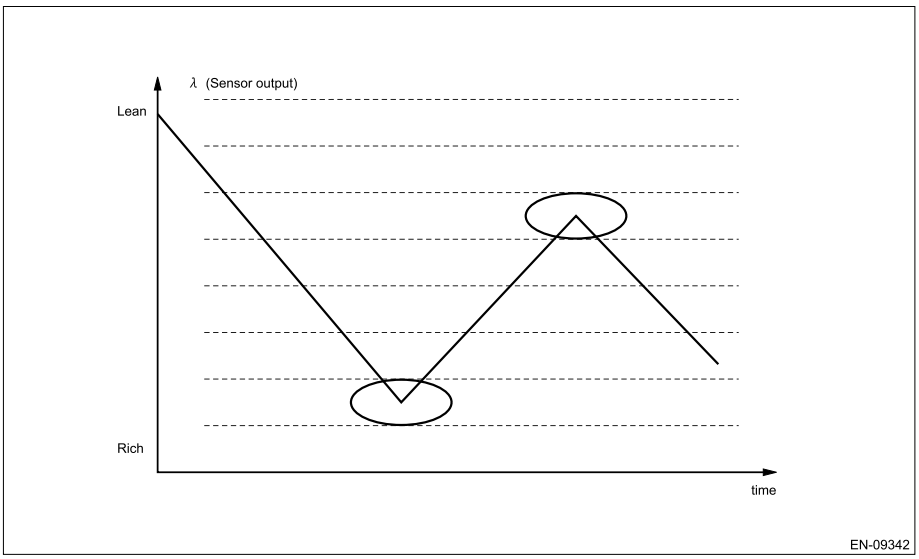
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Main feedback	In operation
Engine speed	1000 rpm or more
Amount of intake air	20 g/s (0.7 oz/s) or more and Less than 100 g/s (3.5 oz/s)
Change amount of intake air (CVT model)	0.5 g/s (0.02 oz/s) or more
| Change amount of intake air | (MT model)	1 g/s (0.04 oz/s) or less

4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSIS 1

Detect the malfunction depending on the average value of time necessary for λ to inverse the air fuel ratio from “Lean → Rich → Lean” to “Rich → Lean → Rich”.



Judge as NG when the following conditions are established.

Judgment value (P015A)

Malfunction Criteria	Threshold Value
Average value of time necessary for λ to inverse the air fuel ratio to Lean → Rich → Lean and Average value when λ is lean	More than 550 ms More than 600 ms

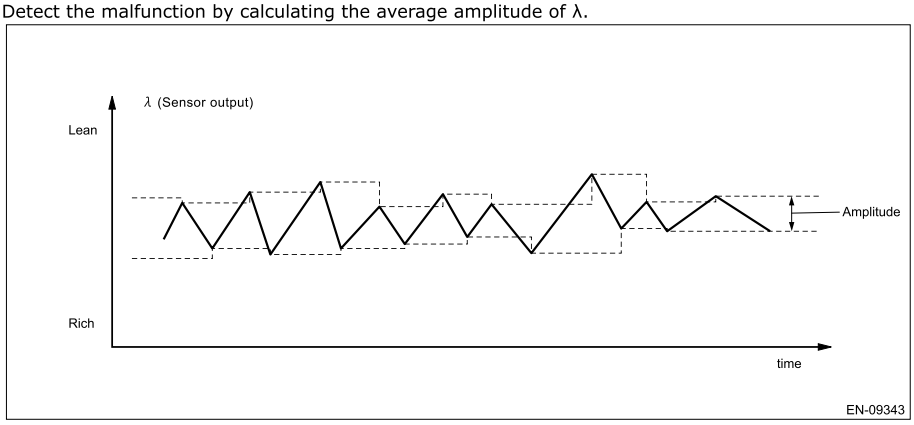
Judgment value (P015B)

Malfunction Criteria	Threshold Value
Average value of time necessary for λ to inverse the air fuel ratio to Rich → Lean → Rich and Average value when λ is rich	More than 550 ms More than 750 ms

Time needed for diagnosis: 120 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. DIAGNOSIS 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
Average value for λ amplitude	More than 0.085

Time needed for diagnosis: 120 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

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.**
- **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.
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

Perform the diagnosis continuously during main feedback.

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
Diagnostic value {[Short term fuel trim B1] + [Long term fuel trim B1] + ([A/F Sensor #1] − [Target Equivalence Ratio]) × 100}	More than 1.35

Time needed for diagnosis: 10 s × 3 times
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0172 SYSTEM TOO RICH BANK 1

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

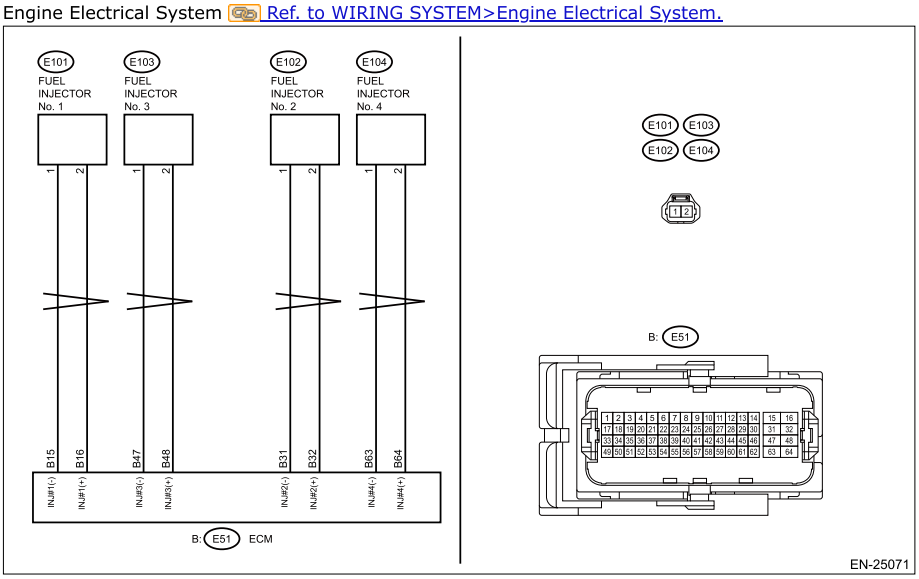
When a short period (distance) driving from the engine start to stop is repeated, engine warm-up followed may cause detection of P0172 due to gasoline evaporation within the engine oil and blow-by gas increase.

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

- **After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.**
- **When a short period (distance) driving from the engine start to stop is repeated, engine warm-up followed may cause detection of P0172 due to gasoline evaporation within the engine oil and blow-by gas increase.**

1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.	yes	Go to 3.
	no	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.
3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.	yes	Go to 5.
	no	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

5. CHECK EXHAUST SYSTEM.
- yes → Perform the instructed procedures.
- no → Go to 6.

6. CHECK AIR INTAKE SYSTEM.
- yes → Perform the instructed procedures.
- no → Go to 7.

7. CHECK FUEL PRESSURE.
- no → Perform the instructed procedures.
- yes ↓

8. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

9. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

11. CHECK FUEL INJECTOR.
- no → Perform the instructed procedures.
- yes ↓

12. CHECK PCV HOSE.
- no → Perform the instructed procedures.
- yes ↓

13. CHECK CONDITION OF PCV PIPE AND INTAKE DUCT NO. 1 CONNECTION.
- no → Perform the instructed procedures.
- yes ↓

14. CHECK ECM CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 (E51) No. 15 — (E51) No. 16:
#2 (E51) No. 31 — (E51) No. 32:
#3 (E51) No. 47 — (E51) No. 48:
#4 (E51) No. 63 — (E51) No. 64:

Is the resistance 1.5 Ω (at 23°C (73°F))?

Yes — Go to 3.

No — Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

1. Disconnect the connector from fuel injector.
2. Measure the resistance of harness between ECM connector and defective fuel injector connector.

Connector & terminal

#1 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) 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 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 5.

No — Go to 4.

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

1. Disconnect the connector from fuel injector.
2. Measure the resistance between ECM connector and engine ground on defective fuel injectors.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — 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.

Check the 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.

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 FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 8.

No — Check the fuel pump and fuel delivery line.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>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, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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 until the engine coolant temperature exceeds 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, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 2 — 5 [g/s] (0.26 — 0.66 lb/min)?

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 until the engine coolant temperature exceeds 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, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Subtract ambient temperature from [IAT Sensor #11]. 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>INSPECTION.

11. CHECK FUEL INJECTOR.

Check fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

12. CHECK PCV HOSE.

Check the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose>INSPECTION.

Is the check result OK?

Yes — Go to 13.

No — Repair or replace the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose.

13. CHECK CONDITION OF PCV PIPE AND INTAKE DUCT NO. 1 CONNECTION.

Check for disconnection between the PCV pipe and the intake duct No. 1. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Pipe.

Is the check result OK?

Yes — Go to 14.

No — Connect the PCV pipe and the intake duct No. 1. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Pipe.

14. CHECK ECM CONNECTOR.

Check the ECM connector.

Is there poor contact of ECM connector?

Yes — Repair the poor contact of ECM connector.

No — Check the following two items, and when either one matches, replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DOTC)>Engine Oil. Ref. to LUBRICATION(H4DOTC)>Oil Filter.

- It is assumed that the user tends to repeat short period (distance) driving from the engine start to stop, and also tends to drive before full engine warmed-up.
- Compared to other engines of the same type, there is a lot stronger gasoline odor from the engine oil filler neck.

After the replacement, perform the clear memory of [Engine] using the Subaru Select Monitor or a general scan tool (Ref. to COMMON (DIAGNOSTICS)>Clear memory.), and warm up the engine completely.
After the engine is fully warmed up, perform a no-load idling operation for at least 10 minutes. And then check that the value of the data monitor item, [Short term fuel trim B1] + [Long term fuel trim B1], is −20 — 20 %.

Note:
When a short period (distance) driving from the engine start to stop is repeated, engine warm-up followed may cause detection of P0172 due to gasoline evaporation within the engine oil and blow-by gas increase.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Main feedback	In operation

GENERAL DRIVING CYCLE
Perform the diagnosis continuously after idling.

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
Diagnostic value {[Short term fuel trim B1] + [Long term fuel trim B1] + ([A/F Sensor #1] − [Target Equivalence Ratio]) × 100}	Less than value of Map

Map

Warm-up increase compensation coefficient	0	0.05	0.1	0.14	0.2	0.25
Threshold Value	0.65	0.6	0.56	0.51	0.47	0.44

Warm-up increase compensation coefficient	0.3	0.35	0.39	0.45	0.5	0.55	0.6
Threshold Value	0.41	0.36	0.34	0.31	0.29	0.27	0.24

Time needed for diagnosis: 10 s × 3 times
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

Note:
When a short period (distance) driving from the engine start to stop is repeated, engine warm-up followed may cause detection of P0172 due to gasoline evaporation within the engine oil and blow-by gas increase.

DTC P0191 FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1

1. —

DTC detecting condition:

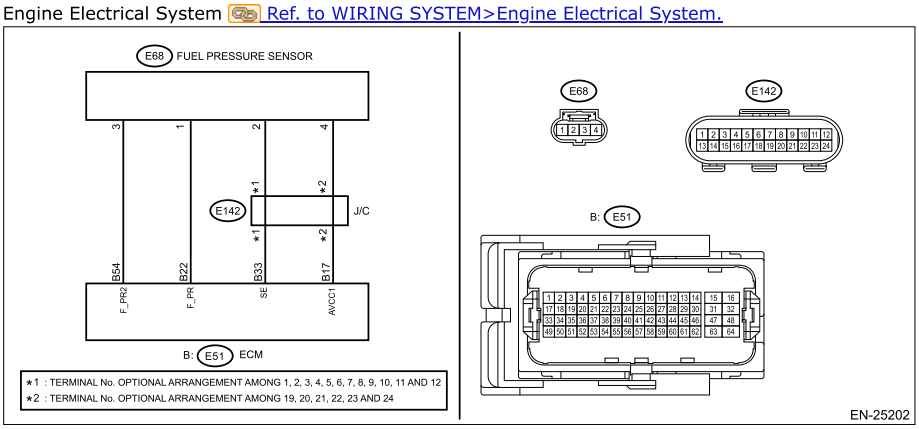
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FUEL PRESSURE SENSOR POWER SUPPLY.
   - no → Go to 5.
   - yes ↓
3. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).
→ no: Perform the instructed procedures.
yes ↓

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).
→ yes: Perform the instructed procedures.
→ no: Perform the instructed procedures.

1. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Start the engine.
5. Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Fuel Rail Pressure B].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the difference of the values between [Fuel Rail Pressure A] and [Fuel Rail Pressure B] 2.24 MPa (16804 mmHg, 662 inHg) or more?

Yes — Go to 2.

No — Refer to "Check non-permanent occurrence malfunctions". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

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
   (E68) No. 4 (+) — Engine ground (−):

Is the voltage 4.5 — 5.5 V?

Yes — Go to 3.

No — Go to 5.

3. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).

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
   (E51) No. 22 — (E68) No. 1:
   (E51) No. 33 — (E68) No. 2:
   (E51) No. 54 — (E68) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the following item.
- Open circuit in harness between ECM connector and fuel pressure sensor connector
- Poor contact of J/C

4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between ECM connector and fuel pressure sensor connector and engine ground.
Connector & terminal
(E51) No. 22 — Engine ground:
(E51) No. 54 — 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.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).

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
   (E51) No. 17 — (E68) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and fuel pressure sensor connector
- Poor contact of J/C

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between ECM connector and fuel pressure sensor connector and engine ground.
Connector & terminal
(E51) No. 17 — 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.

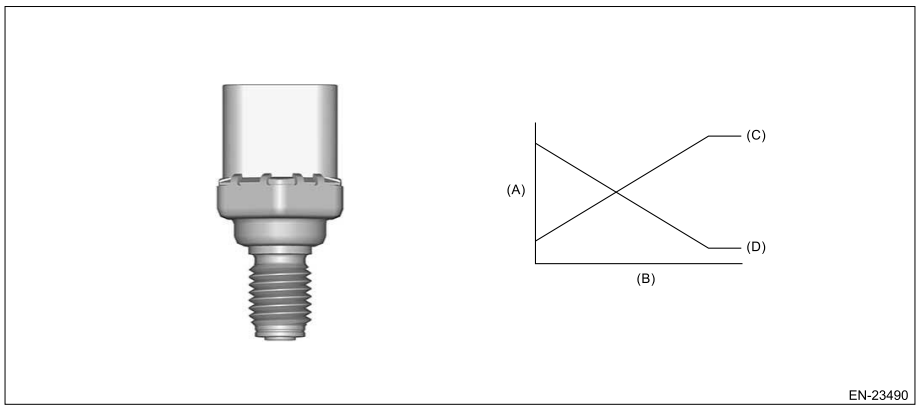
No — Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the difference of values between fuel pressure sensor main signal and sub signal is equal to or more than the predetermined value.

COMPONENT DESCRIPTION



(A) Output voltage
(B) Absolute pressure
(C) Main signal
(D) Sub signal

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
|Main fuel pressure − Sub fuel pressure|	2.24 MPa (16804 mmHg, 662 inHg) or more

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

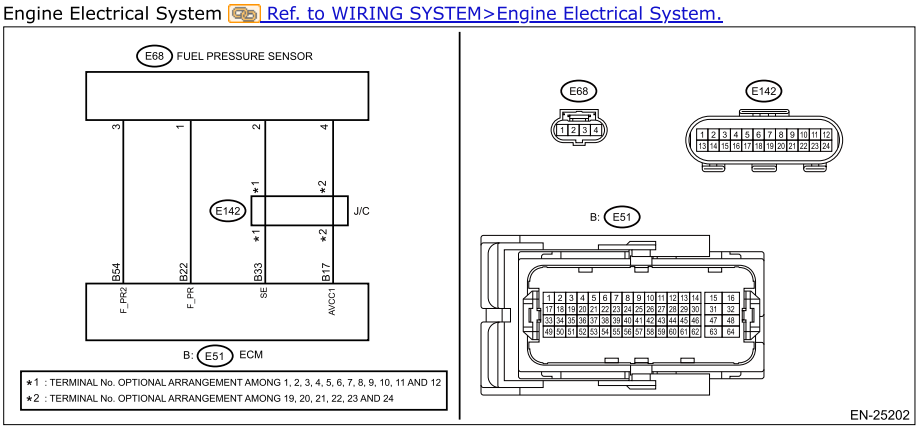
DTC P0192 FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Start the engine.
5. Using the Subaru Select Monitor, read the value in [Fuel Rail Pressure A].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Fuel Rail Pressure A] approx. 0 [kPa] (0 psi)?

Yes	Go to 4.
No	Refer to "Check non-permanent occurrence malfunctions". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

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 between the ECM connector and engine ground.
   Connector & terminal
   (E51) No. 22 — Engine ground:

Is the resistance 1 MΩ or more?

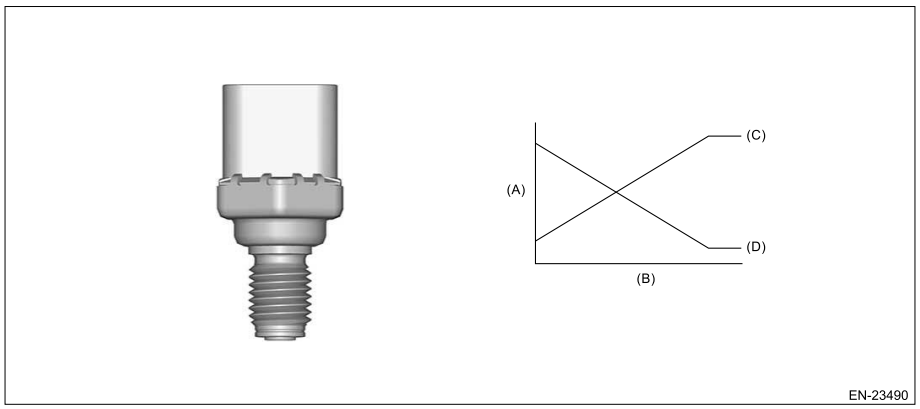
Yes	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pressure Sensor.
No	Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit in the fuel pressure sensor main signal.

Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Output voltage
(B) Absolute pressure
(C) Main signal
(D) Sub signal

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.263 V

Time needed for diagnosis: 2400 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

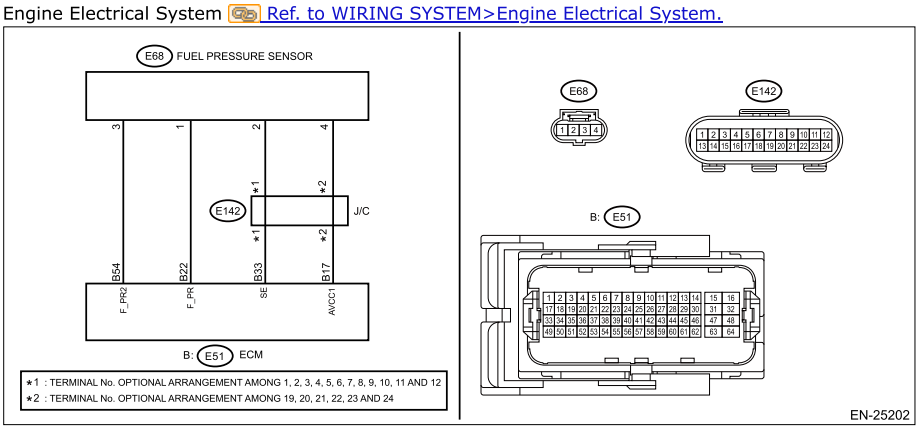
DTC P0193 FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK FUEL PRESSURE SENSOR POWER SUPPLY.	no →	Go to 7.
yes ↓		

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).
→ no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

7. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).
→ no → Perform the instructed procedures.

yes ↓

8. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes — Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.

No — Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Fuel Rail Pressure A].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Fuel Rail Pressure A] 30000 [kPa] (4350 psi) or more?

Yes — Go to 4.

No — Refer to "Check non-permanent occurrence malfunctions". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

4. 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
   (E68) No. 4 (+) — Engine ground (−):

Is the voltage 4.5 — 5.5 V?

Yes — Go to 5.

No — Go to 7.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).

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
   (E51) No. 22 — (E68) No. 1:
   (E51) No. 33 — (E68) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and fuel pressure sensor connector
- Poor contact of J/C

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E51) No. 22 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power in the harness between ECM connector and fuel pressure sensor connector.

No — Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pressure Sensor.

7. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).

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
   (E51) No. 17 — (E68) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair the following item. • Open circuit in harness between ECM connector and fuel pressure sensor connector • Poor contact of J/C

8. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between fuel pressure sensor connector and engine ground.
Connector & terminal
(E68) No. 4 — Engine ground:

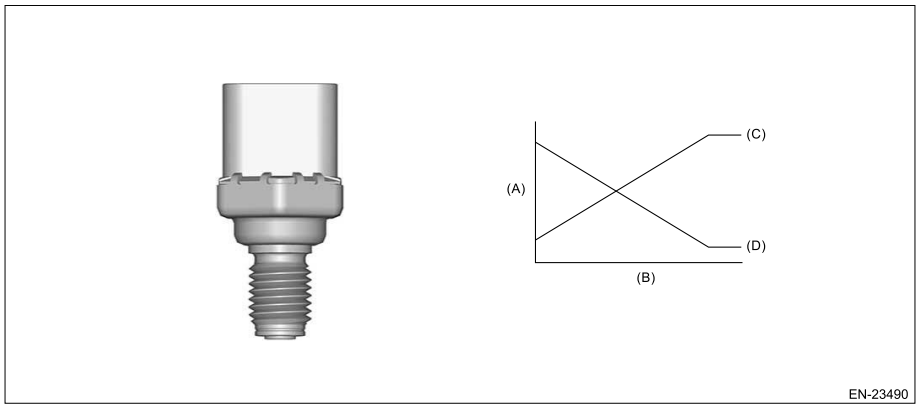
Is the resistance 1 MΩ or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
No	Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit in main signal of the fuel pressure sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Output voltage (C) Main signal (D) Sub signal
(B) Absolute pressure

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	More than 4.362 V

Time needed for diagnosis: 2400 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE

1. —

DTC detecting condition:

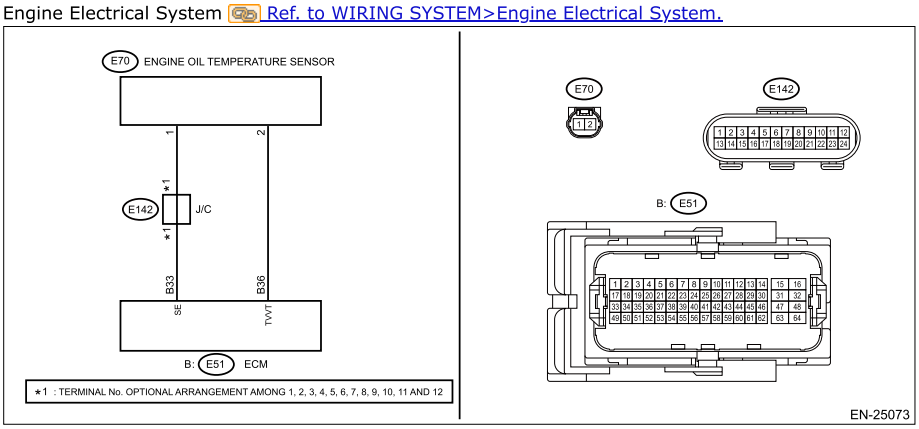
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK ENGINE OIL TEMPERATURE SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0196 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK ENGINE OIL TEMPERATURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the engine oil temperature sensor.
3. 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?

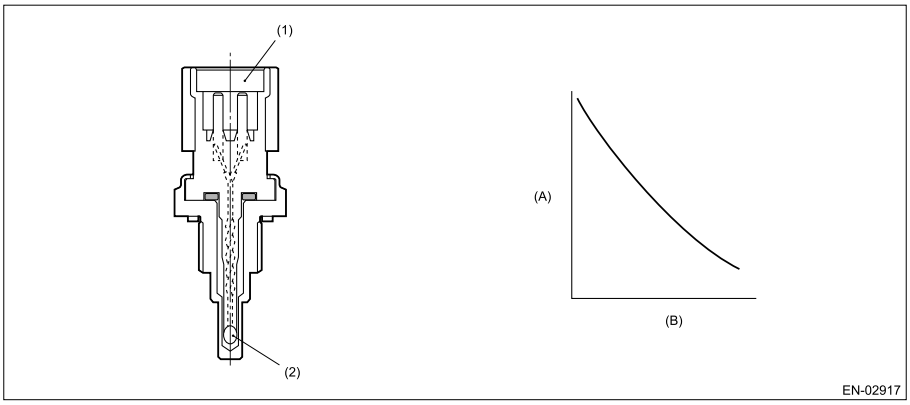
Yes	Repair the poor contact of ECM connector.
No	Replace the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Oil Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine oil temperature sensor output properties.
After the engine starts for the first time 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.
(Correlation diagnosis)

COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature (°C (°F))
(1) Connector
(2) Thermistor element

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600 s or more
Block heater judgment	Completed
Use of block heater	Not detected

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the first engine start after a certain period of soaking time.

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 temperature 21 sec. after the first engine start − Engine coolant temperature at the first engine start|	More than 10°C (18°F)
|Oil temperature 21 sec. after the first engine start − Intake air temperature 21 sec. after the first engine start|	More than value of Map

Map

Ambient temperature (°C (°F))	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Engine oil temperature at first engine start − Intake air temperature 21 sec. after first engine start| (°C (°F))	10 (18)	10 (18)	22 (39.6)	22 (39.6)

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

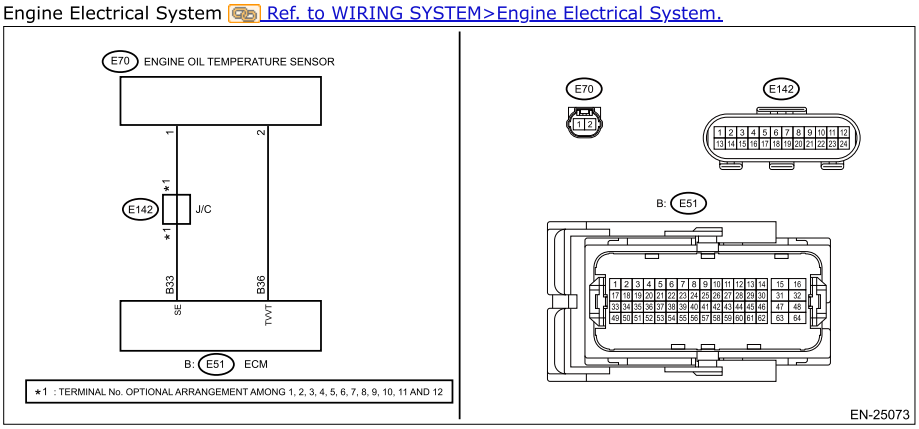
DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Oil Temperature].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [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 (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine oil temperature sensor.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 36 — Engine ground:

Is the resistance 1 MΩ or more?

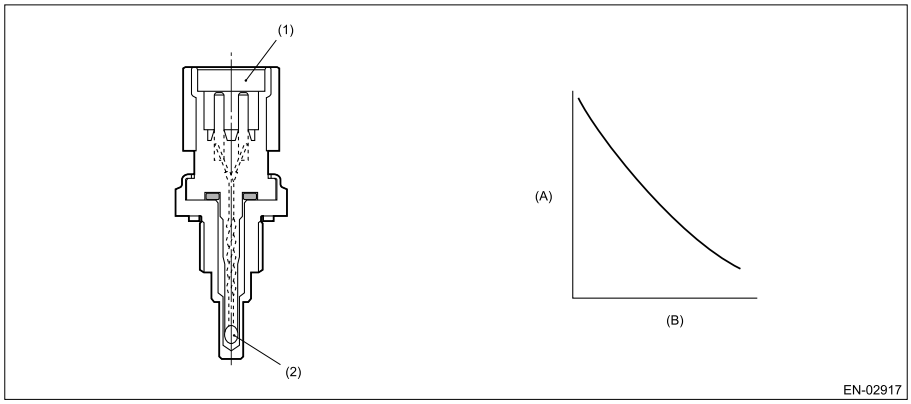
Yes	Replace the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Oil Temperature Sensor.
No	Repair the short circuit to ground in the harness between the ECM connector and engine oil temperature sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of the engine oil temperature sensor.
Judge as NG when outside of the judgment value.

COMPONENT DESCRIPTION



(A) Resistance value (kΩ) (B) Temperature (°C (°F))

(1) Connector (2) Thermistor element

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.18 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

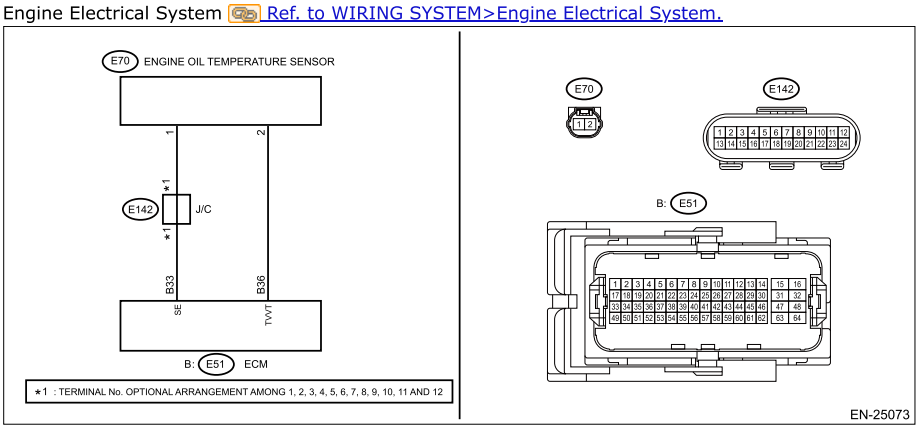
DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Oil Temperature].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine oil temperature sensor.
4. Measure the resistance of the harness between the ECM connector and engine oil temperature sensor connector.

Connector & terminal
(E51) No. 33 — (E70) No. 1:
(E51) No. 36 — (E70) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the following item.
- Open circuit in harness between ECM connector and engine oil temperature sensor connector
- Poor contact of J/C

4. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.

Connector & terminal
(E51) No. 36 (+) — Engine 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.

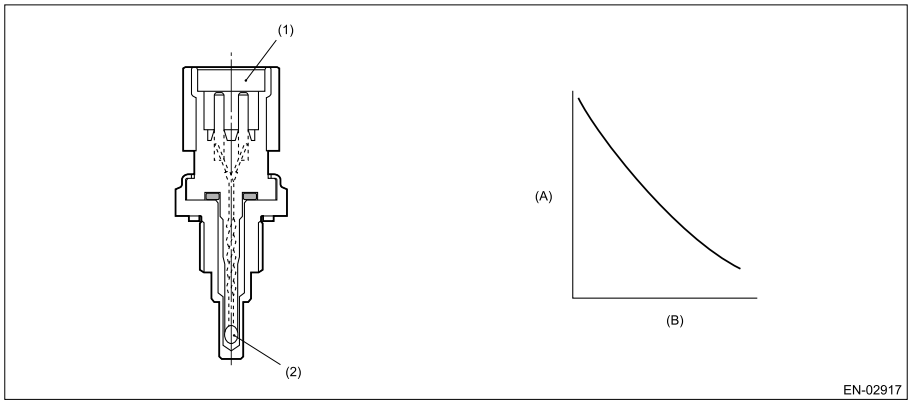
No — Replace the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Oil Temperature Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine oil temperature sensor.
Judge as NG when outside of the judgment value.

COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature (°C (°F))
(1) Connector
(2) Thermistor element

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.71 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

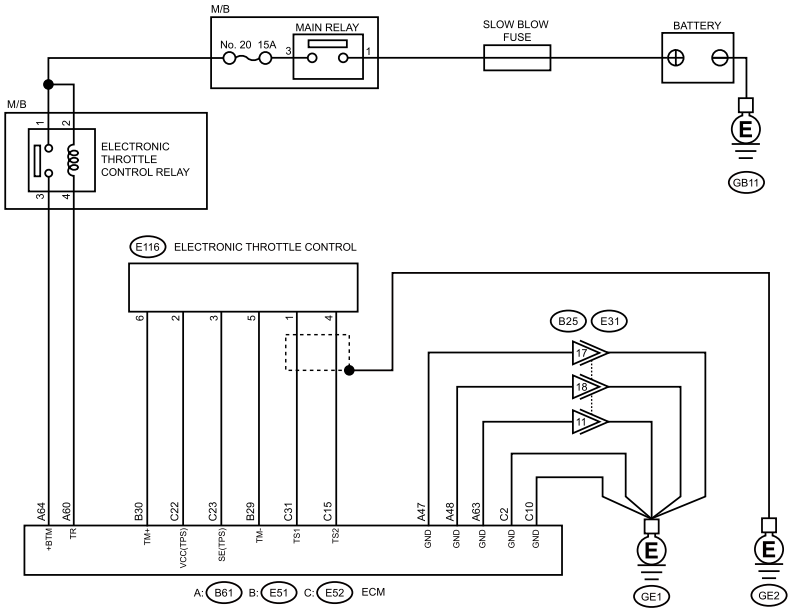
DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW

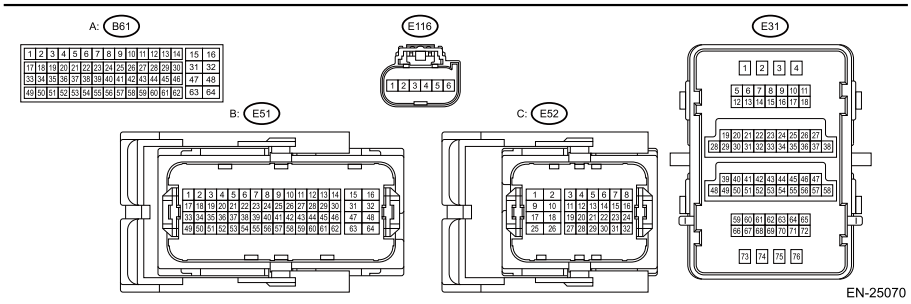
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

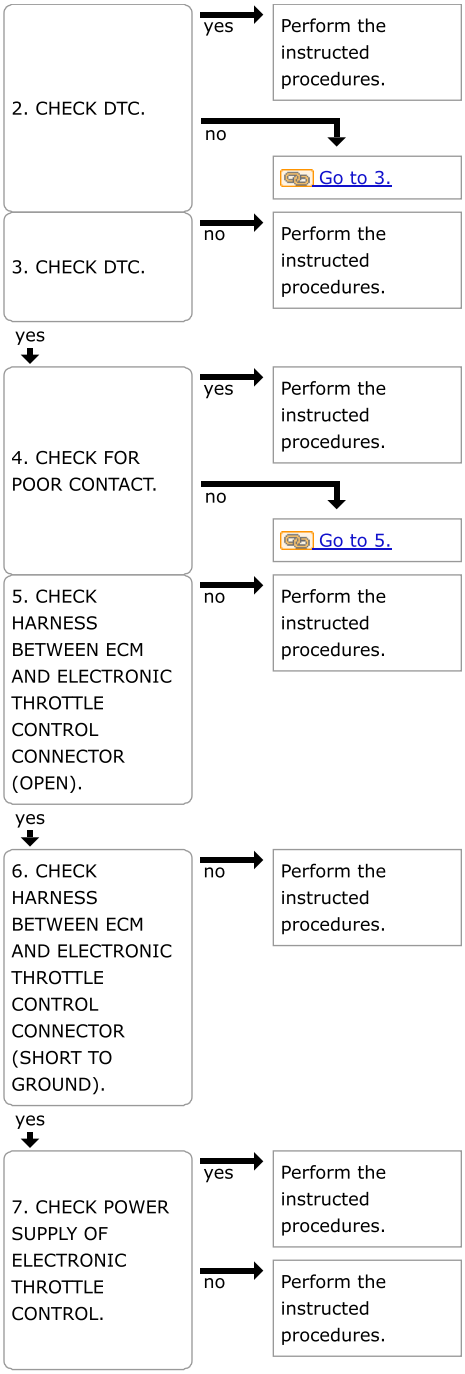




Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0222 displayed? (Current code)

Yes	Go to 4.
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.

4. CHECK FOR POOR CONTACT.

1. Turn the ignition switch to OFF.
2. Check for poor contact of ECM and electronic throttle control connector.

Is there poor contact in ECM or electronic throttle control connector?

Yes	Repair the poor contact of ECM or electronic throttle control connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connectors from electronic throttle control.
3. Measure the resistance of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E52) No. 22 — (E116) No. 2:
   (E52) No. 15 — (E116) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E52) No. 22 — Engine ground:
(E52) No. 15 — 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 electronic throttle control connector.

7. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL.

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
   (E116) No. 2 — Engine ground:

Is the voltage 4.5 — 5.5 V?

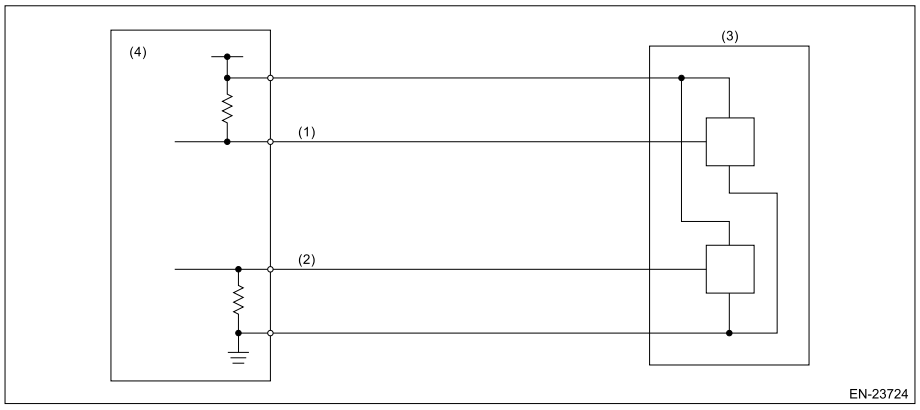
Yes — Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.

No — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit of throttle position sensor 2.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	Less than 0.185 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

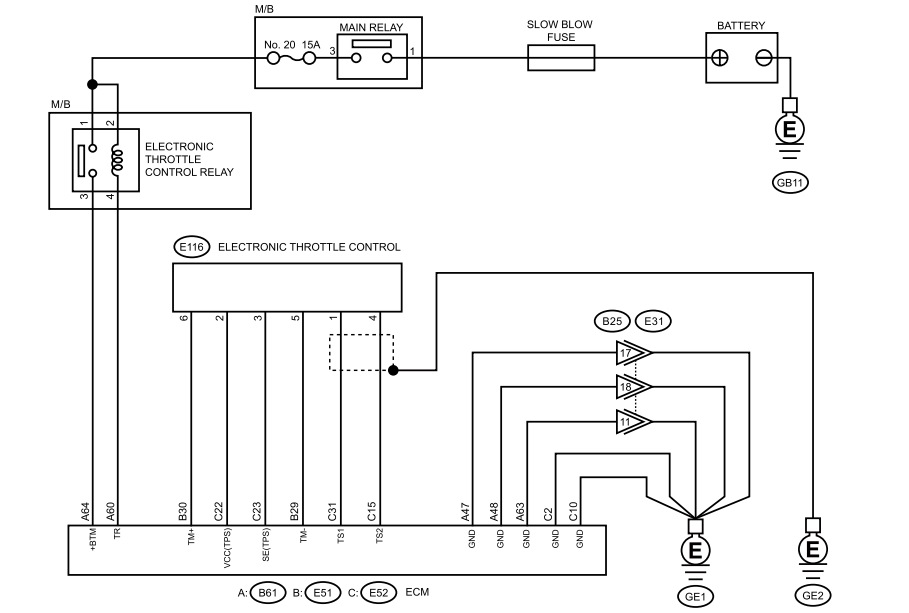
DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH

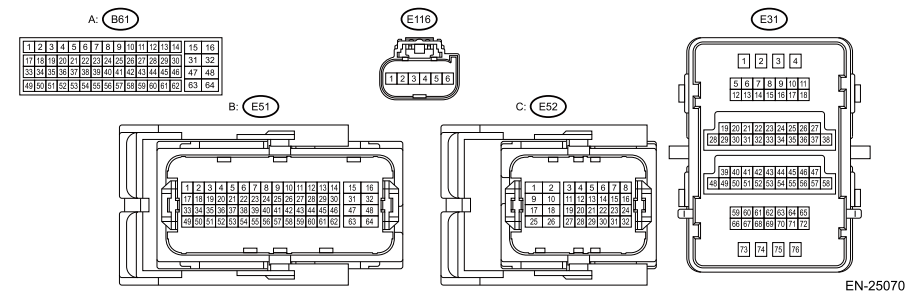
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

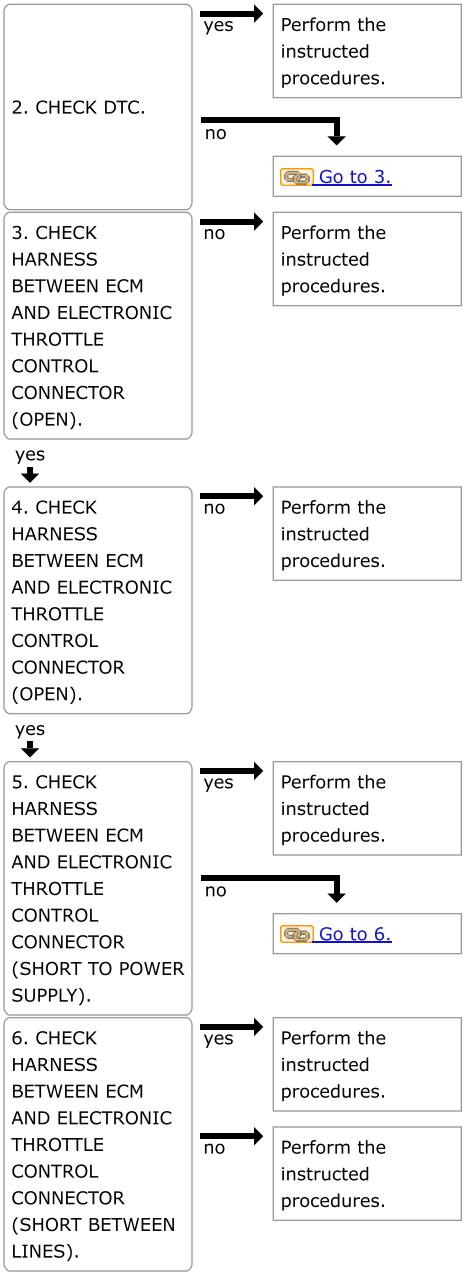




Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

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 of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E52) No. 23 — (E116) No. 3:

(E52) No. 15 — (E116) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E116) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 5.

No — Repair the following item.

- Open circuit of harness between ECM connector and engine ground
- Poor contact of ECM connector

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.

Connector & terminal

(E116) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply 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 (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E52) No. 22 — (E52) No. 15:

Is the resistance 1 MΩ or more?

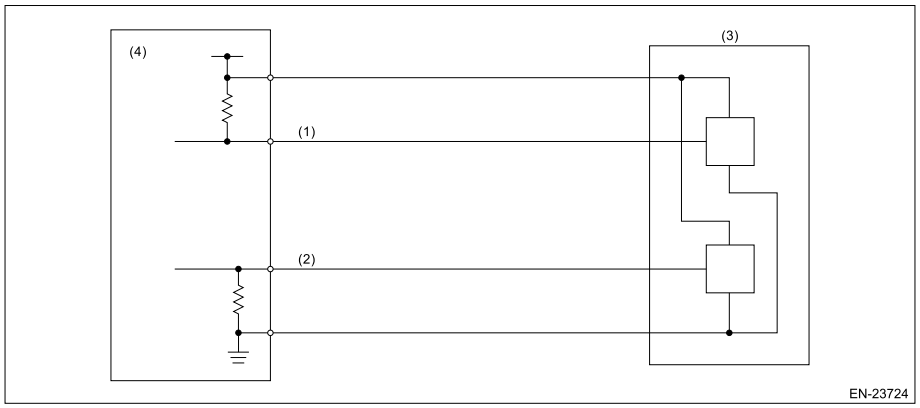
Yes	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.
No	Repair the line-to-line short circuit between ECM connector and electronic throttle control connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.631 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0230 FUEL PUMP PRIMARY CIRCUIT

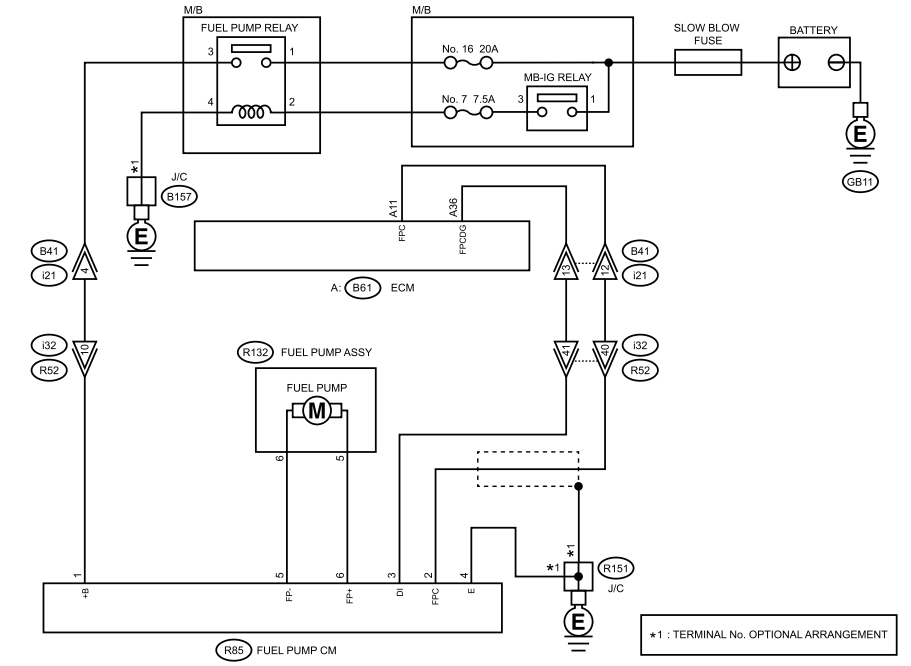
1. —

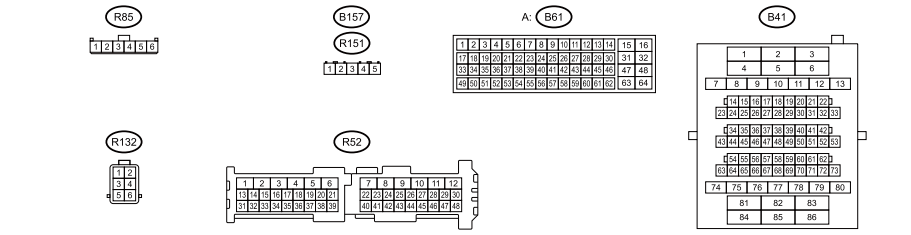
DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





EN-25074

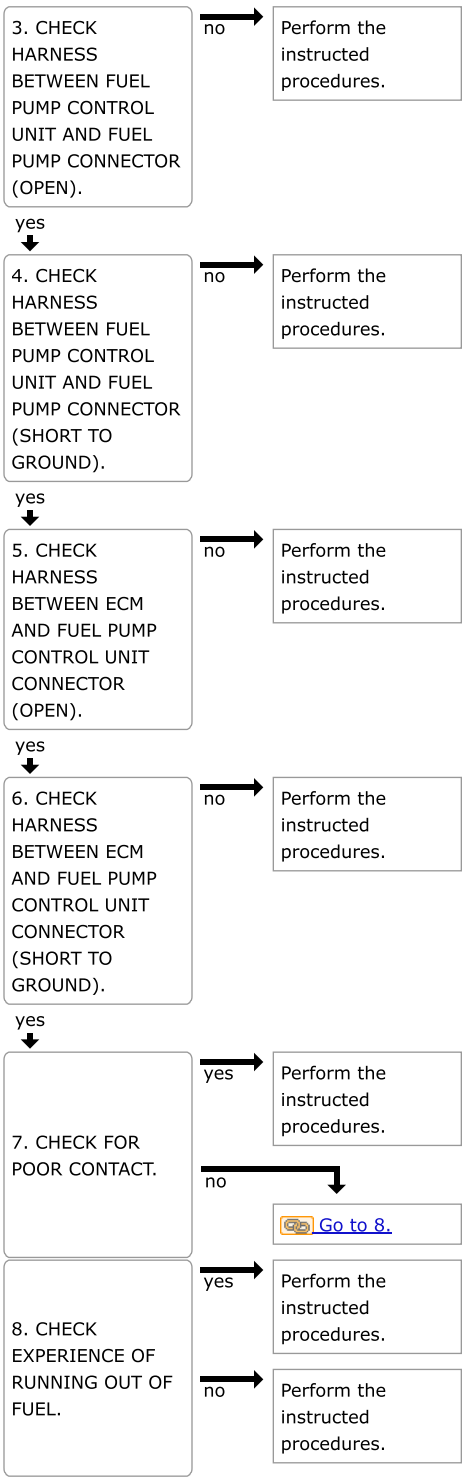
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FUEL PUMP CONTROL UNIT POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT (OPEN).	no →	Perform the instructed procedures.
yes ↓		


3. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
4. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
5. CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
6. CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
7. CHECK FOR POOR CONTACT.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK EXPERIENCE OF RUNNING OUT OF FUEL.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK FUEL PUMP CONTROL UNIT POWER SUPPLY.

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 chassis ground.
   Connector & terminal
   (R85) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — 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 relay connector
- Poor contact of coupling connector
- Defective fuel pump relay
- Blown out of fuse

2. CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between fuel pump control unit connector and chassis ground.
   Connector & terminal
   (R85) No. 4 — Chassis ground:

Is the resistance less than 5 Ω?

Yes — Go to 3.

No — Repair the following item.
- Open circuit between fuel pump control unit connector and chassis ground
- Poor contact of J/C

3. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR (OPEN).

1. Disconnect the connector from fuel pump.
2. Measure the resistance of harness between fuel pump control unit and fuel pump connector.
   Connector & terminal
   (R85) No. 5 — (R132) No. 6:
   (R85) No. 6 — (R132) No. 5:

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 (SHORT TO GROUND).

Measure the resistance between fuel pump control unit connector and chassis ground.
Connector & terminal
(R85) No. 5 — Chassis ground:
(R85) No. 6 — Chassis ground:

Is the resistance 1 MΩ 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 (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and fuel pump control unit connector.

Connector & terminal
(B61) No. 11 — (R85) No. 2:
(B61) No. 36 — (R85) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and fuel pump control unit connector
- Poor contact of coupling connector

6. CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT CONNECTOR (SHORT TO GROUND).

Measure the resistance between fuel pump control unit connector and chassis ground.

Connector & terminal
(R85) No. 2 — Chassis ground:
(R85) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit to ground in harness between ECM connector 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.

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.

Has the vehicle experienced running out of fuel?

Yes — Finish the diagnosis.

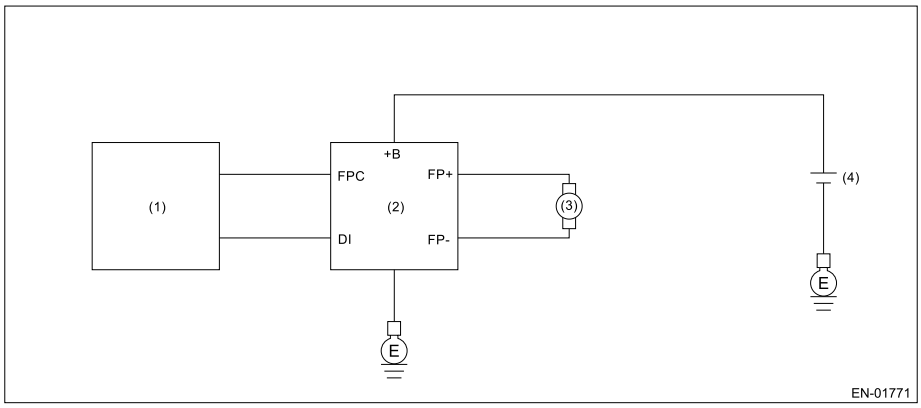
Note:
DTC may be recorded as a result of fuel pump idling while running out of fuel.

No — Replace the fuel pump control unit. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Control Unit.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Engine control module (ECM) (3) Fuel pump (4) Battery
(2) Fuel pump control unit

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Fuel pump control	ON

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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 voltage	Less than 1.5 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)

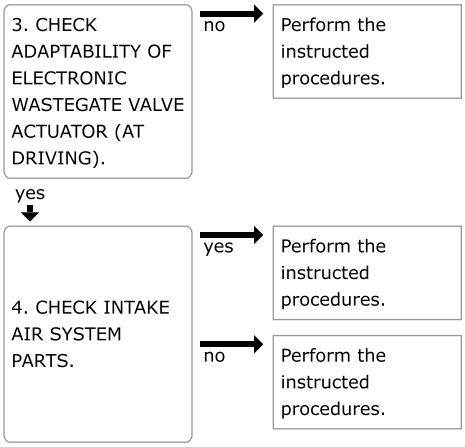
DTC P0234 TURBOCHARGER/SUPERCHARGER "A" OVERBOOST CONDITION

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT IDLING).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than P0234 and P0244 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT IDLING).

1. Turn the A/C switch to OFF.
2. Turn all the accessory switches to OFF.
3. Using the Subaru Select Monitor, select [Electric Waste Gate Valve Control] of [Active Test].

Note:
- **For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.**
- **Electronic wastegate valve actuator repeats open and closed every 3 seconds with [Electric Waste Gate Valve Control] selected.**

4. Record the values of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] (except immediately after the change) 6.4 mm (0.25 in) or less?

Yes	Go to 3.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

3. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT DRIVING).

1. Start monitoring of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

2. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

3. Record the values of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] (except immediately after the change) 6.4 [mm] (0.25 in) or less?

Yes	Go to 4.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

4. CHECK INTAKE AIR SYSTEM PARTS.

Check the intake air system parts.
Check the following items.
- Intercooler Ref. to INTAKE (INDUCTION)(H4DOTC)>Intercooler>INSPECTION.
- Intake duct Ref. to INTAKE (INDUCTION)(H4DOTC)>Intake Duct>INSPECTION.
- Intake manifold Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Intake Manifold Assembly>INSPECTION.
- Air cleaner element Ref. to INTAKE (INDUCTION)(H4DOTC)>Air Cleaner Element>INSPECTION.
- Electronic throttle control Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body>INSPECTION.
- Turbocharger Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger>INSPECTION.

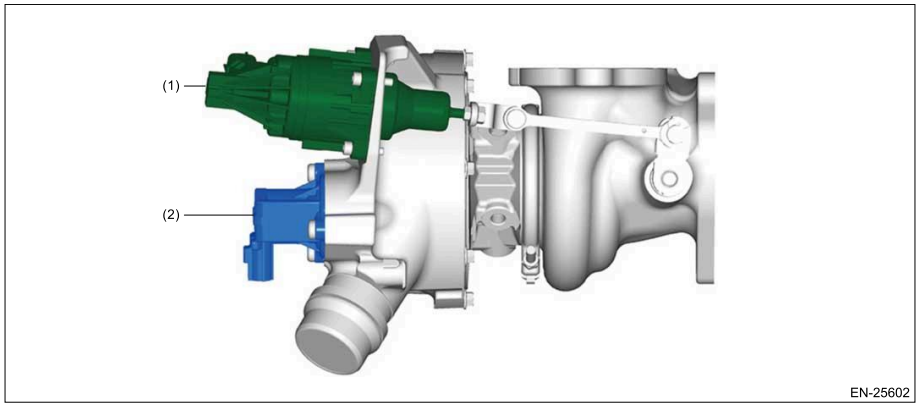
Is the check result OK?

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 or replace faulty parts.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect malfunction of electronic wastegate valve actuator function and boost pressure control.
Judge as NG when the difference shows a large value when the boost pressure calculated in the ECM is compared with the actual intake pressure outputted from the intake pressure sensor.

COMPONENT DESCRIPTION



(1) Electronic wastegate valve (2) Electronic air by-pass valve

EXECUTION CONDITION
P0234

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Intake air temperature	0°C (32°F) or more and Less than 70°C (158°F)
Boost pressure feedback	In operation
Target boost pressure	Value of Map1 or more
Fuel shut-off function	Not in operation
Throttle position	More than 64%

P0299

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Intake air temperature	−10°C (14°F) or more and Less than 70°C (158°F)
Boost pressure feedback	In operation
Engine speed	2500 rpm or more
Target boost pressure	Value of Map2 or more
Throttle position	More than 64%
Fuel shut-off function	Not in operation

Map1

Engine speed (rpm)	1200	1600	2000	2400	2800	3200	3600
Target boost pressure (kPa (mmHg, inHg))	103.3 (774.9, 30.5)	108.6 (814.7, 32.1)	111.3 (835, 32.9)	116.3 (872.5, 34.3)	120.4 (903.2, 35.6)	131.2 (984.2, 38.7)	141 (1057.8, 41.6)

Engine speed (rpm)	4000	4400	4800	5200	5600	6000
Target boost pressure (kPa (mmHg, inHg))	140.9 (1057, 41.6)	143.2 (1074.3, 42.3)	149.3 (1120, 44.1)	149.5 (1121.5, 44.2)	150.1 (1126, 44.3)	150.7 (1130.5, 44.5)

Map2

Engine speed (rpm)	2500	2800	3200	3600	4000
Target boost pressure (kPa (mmHg, inHg))	120.6 (904.7, 35.6)	120.2 (901.7, 35.5)	124.2 (931.7, 36.7)	127 (952.7, 37.5)	130 (975.2, 38.4)

Engine speed (rpm)	4400	4800	5200	5600	6000
Target boost pressure (kPa (mmHg, inHg))	131 (982.7, 38.7)	129 (967.7, 38.1)	131.2 (984.2, 38.7)	129.2 (969.2, 38.2)	123.2 (924.2, 36.4)

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (P0234)

Malfunction Criteria	Threshold Value
(Target intake absolute pressure − Actual intake absolute pressure)	−33.3 kPa (−249.8 mmHg, −9.8 inHg) or less

Judgment value (P0299)

Malfunction Criteria	Threshold Value
(Target intake absolute pressure − Actual intake absolute pressure)	37.5 kPa (281.3 mmHg, 11.1 inHg) or more

Time needed for diagnosis

P0234: 1.9 s
P0299: Map3
Map3

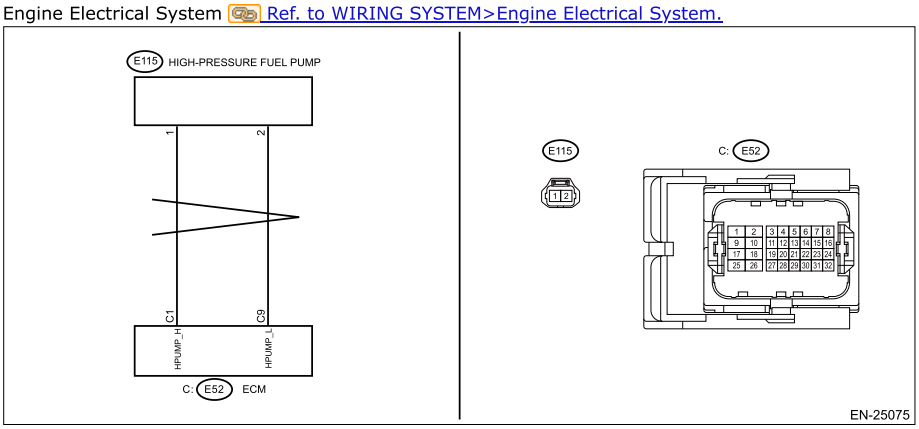
Atmospheric pressure (kPa (mmHg, inHg))	**75.06 (563.1, 22.2)**	**96.73 (725.7, 28.6)**	**112 (840.2, 33.1)**
Time needed for diagnosis (s)	5	2	2

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P023F FUEL PUMP SECONDARY CIRCUIT/OPEN

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HIGH-PRESSURE FUEL PUMP.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (SHORTED BETWEEN LINES).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		

5. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 check result OK?

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 (SHORTED BETWEEN LINES).

1. Disconnect the connector from ECM.
2. Disconnect the connector from high-pressure fuel pump.
3. Measure the resistance of harness between ECM connectors.

Connector & terminal

(E52) No. 1 — (E52) No. 9:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short between lines in harness between ECM connector and high-pressure fuel pump connector.

3. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (OPEN).

Measure the resistance of harness between ECM connector and high-pressure fuel pump connector.

Connector & terminal

(E52) No. 1 — (E115) No. 1:

(E52) No. 9 — (E115) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in harness between ECM connector and high-pressure fuel pump connector.

4. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (SHORT TO GROUND).

Measure the resistance between high-pressure fuel pump connector and engine ground.

Connector & terminal

(E115) No. 1 — Engine ground:

(E115) 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 high-pressure fuel pump connector.

5. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage of harness between ECM connector and engine ground.

Connector & terminal

(E52) No. 1 (+) — Engine ground (−):

(E52) No. 9 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Repair the short circuit to power supply in harness between ECM connector and high-pressure fuel pump connector.

No — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Diagnosis 1 (power supply short)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status A

Diagnosis 2 (ground short)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status B

Diagnosis 3 (open circuit)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status A (condition 1) Status B (condition 2)

Diagnosis 4 (short circuit, overcurrent)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status C

FET and SW statuses

Condition	FET1	FET2	SW1	SW2
Status A	OFF	OFF	OFF	ON
Status B	OFF	OFF	ON	OFF
Status C	ON	ON	OFF	OFF

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Diagnosis 1 (power supply short)

Malfunction Criteria	Threshold Value
High-pressure fuel pump supply voltage − High-pressure fuel pump terminal voltage (+)	2 V or less

Diagnosis 2 (ground short)

Malfunction Criteria	Threshold Value
High-pressure fuel pump terminal voltage (−) − Ground	2 V or less

Diagnosis 3 (open circuit)

Malfunction Criteria	Threshold Value
Condition 1 and condition 2 are continuously detected	
Condition 1:	
High-pressure fuel pump supply voltage − High-pressure fuel pump terminal voltage (+)	2 V or less
Condition 2:	
High-pressure fuel pump terminal voltage (−) − Ground	2 V or less

Diagnosis 4 (short circuit, overcurrent)

Malfunction Criteria	Threshold Value
High-pressure fuel pump current 4 µs after driving IC command ON	3 A or more

Time needed for diagnosis: 75 times

Map

Engine speed (rpm)	Time needed for 75 times of diagnosis (sec)
500	4.5
2000	1.125
4000	0.5625
6000	0.375

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0244 TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID "A" RANGE/PERFORMANCE

1. —

DTC detecting condition:

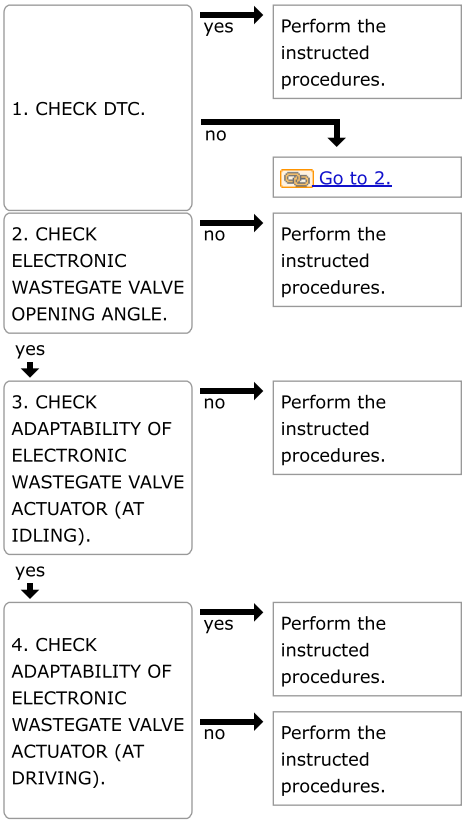
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Poor driving performance
- Poor acceleration

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0244 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK ELECTRONIC WASTEGATE VALVE OPENING ANGLE.

1. Turn the A/C switch to OFF.
2. Turn all the accessory switches to OFF.
3. Using the Subaru Select Monitor, read the values in [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] 6.4 [mm] (0.25 in) or less?

Yes — Go to 3.

No — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

3. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT IDLING).

1. Using the Subaru Select Monitor, select [Electric Waste Gate Valve Control] of [Active Test].

Note:
- **For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.**
- **Electronic wastegate valve actuator repeats open and closed every 3 seconds with [Electric Waste Gate Valve Control] selected.**

2. Record the values of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] (except immediately after the change) 6.4 mm (0.25 in) or less?

Yes — Go to 4.

No — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

4. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT DRIVING).

1. Start monitoring of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

2. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Warning:
- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**

3. Record the values of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] (except immediately after the change) 6.4 [mm] (0.25 in) or less?

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.

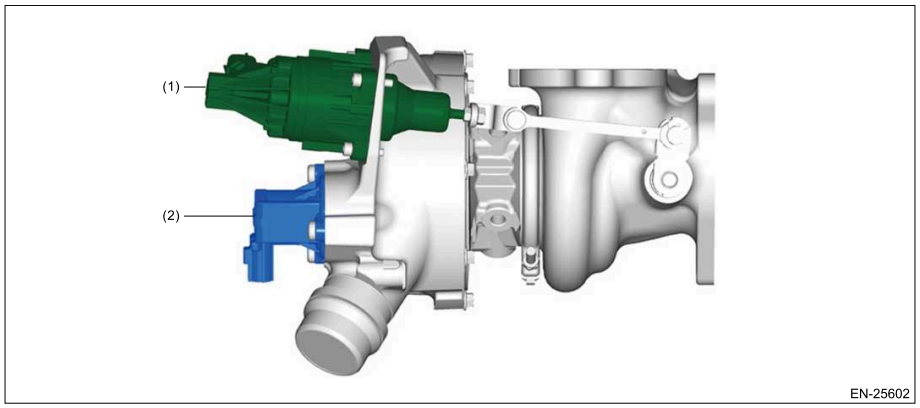
No — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect malfunction of electronic wastegate valve actuator function.
Judge as NG when the difference shows a large value when the wastegate valve request stroke value calculated in the ECM is compared with the actual wastegate valve stroke value outputted from the sensor.

COMPONENT DESCRIPTION



(1) Electronic wastegate valve (2) Electronic air by-pass valve

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Shaft position feedback	Experienced
Elapsed time after change of target shaft position	Value of Map or more
Note: **When the target shaft position change amount* is less than 2 mm (0.08 in), status of the elapsed time becomes invalid.**	

*: Target shaft position change amount (mm) = Target shaft position − Target shaft position 10 ms before

Map

Target shaft position change amount (mm (in))	**−15 (−0.59)**	**−3 (−0.12)**	**−2 (−0.08)**	**0 (0)**	**2 (0.08)**	**3 (0.12)**	**14 (0.55)**	**15 (0.59)**
Elapsed time after change of target shaft position (ms)	330	132	112	0	112	132	313	330

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 shaft position − Actual shaft position	Less than −6.4 mm (−0.25 in) Or, 6.4 mm (0.25 in) or more

Time needed for diagnosis: 5000 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 P0299 TURBOCHARGER/SUPERCHARGER "A" UNDERBOOST CONDITION

1. —

DTC detecting condition:

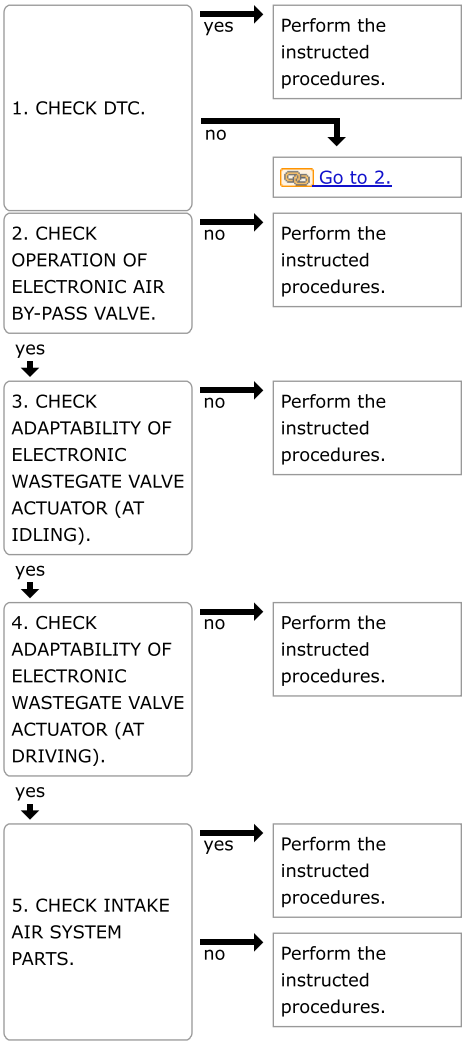
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Poor acceleration

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than P0244 and P0299 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK OPERATION OF ELECTRONIC AIR BY-PASS VALVE.

1. Turn the A/C switch to OFF.
2. Turn all the accessory switches to OFF.
3. Using the Subaru Select Monitor, select [Electric Air Bypass Valve Control] of [Active Test].

   Note:
   For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.
4. Check if operating sound (clatter) occurs in the electronic air by-pass valve according to ON/OFF switching operation of [Electric Air Bypass Valve Status].

Is the check result OK?

Yes	Go to 3.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

3. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT IDLING).

1. Using the Subaru Select Monitor, select [Electric Waste Gate Valve Control] of [Active Test].

   Note:
   - **For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.**
   - **Electronic wastegate valve actuator repeats open and closed every 3 seconds with [Electric Waste Gate Valve Control] selected.**
2. Record the values of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] (except immediately after the change) 6.4 mm (0.25 in) or less?

Yes	Go to 4.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

4. CHECK ADAPTABILITY OF ELECTRONIC WASTEGATE VALVE ACTUATOR (AT DRIVING).

1. Start monitoring of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] using Subaru Select Monitor.

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
2. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

   Warning:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.**
3. Record the values of [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value].

Is the difference between [Electric Waste Gate Valve Request Position Value] and [Electric Waste Gate Valve Actual Position Value] (except immediately after the change) 6.4 [mm] (0.25 in) or less?

Yes	Go to 5.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

5. CHECK INTAKE AIR SYSTEM PARTS.

Check the intake air system parts.
Check the following items.

- Intercooler Ref. to INTAKE (INDUCTION)(H4DOTC)>Intercooler>INSPECTION.
- Intake duct Ref. to INTAKE (INDUCTION)(H4DOTC)>Intake Duct>INSPECTION.
- Intake manifold Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Intake Manifold Assembly>INSPECTION.
- Air cleaner element Ref. to INTAKE (INDUCTION)(H4DOTC)>Air Cleaner Element>INSPECTION.
- Electronic throttle control Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body>INSPECTION.
- Turbocharger Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger>INSPECTION.

Is the check result OK?

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 or replace faulty parts.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0234. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0234 TURBOCHARGER/SUPERCHARGER "A" OVERBOOST CONDITION.

DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

1. —

DTC detecting condition:

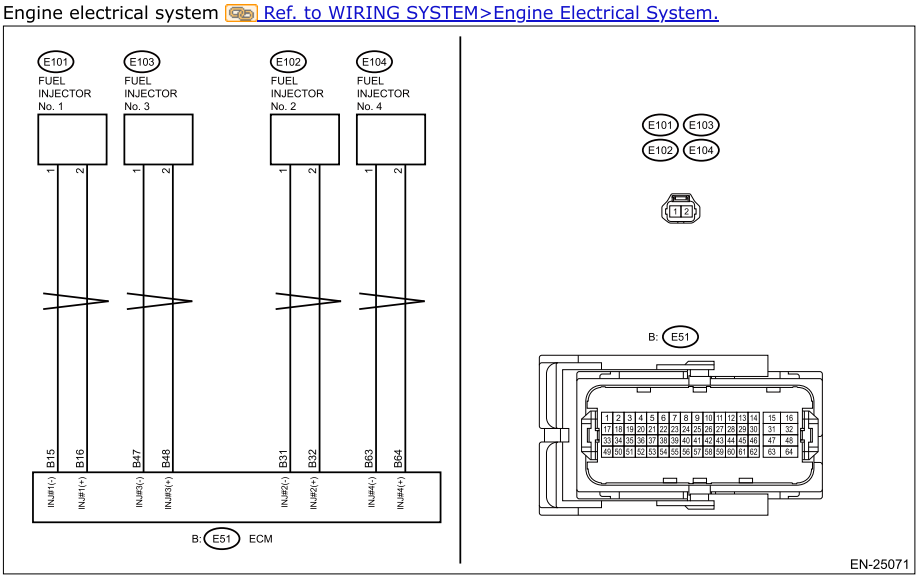
- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stall
- Improper idling
- Rough driving

Wiring diagram:

Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK PCV HOSE.	no →	Perform the instructed procedures.

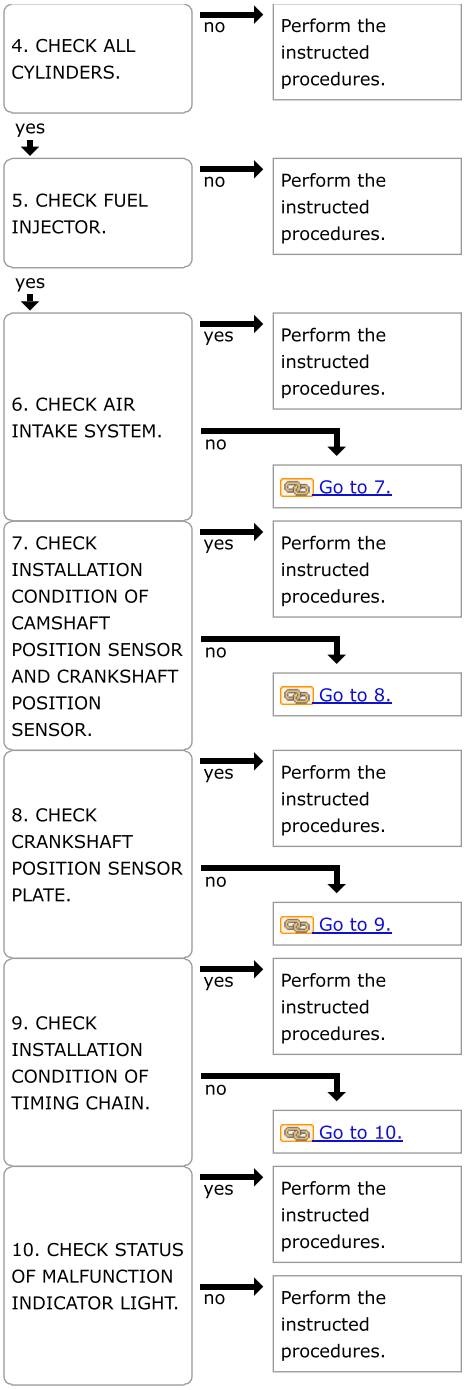
yes ↓

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.

yes ↓

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.

yes ↓



1. CHECK PCV HOSE.

Check the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Repair or replace the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from all fuel injectors.
4. Measure the resistance between all fuel injector connectors and engine ground.

Connector & terminal

#1 (E101) No. 1 — Engine ground:
#1 (E101) No. 2 — Engine ground:
#2 (E102) No. 1 — Engine ground:
#2 (E102) No. 2 — Engine ground:
#3 (E103) No. 1 — Engine ground:
#3 (E103) No. 2 — Engine ground:
#4 (E104) No. 1 — Engine ground:
#4 (E104) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Repair the short circuit to ground in harness between ECM and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on all cylinders.

Connector & terminal

#1 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of the harness between the ECM connector and fuel injector connector.

4. CHECK ALL CYLINDERS.

Check the following items for cylinder.

- Spark plug
- Ignition coil
- Fuel injector
- Compression pressure
- Skipping timing chain teeth

Is there a fault in any cylinder?

Yes — Repair or replace the faulty part of the faulty cylinder.
Go to 5.

No — Check for DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

5. CHECK FUEL INJECTOR.

Check all fuel injectors. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

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 INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and 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.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

No — Go to 8.

8. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate>INSPECTION.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes — Replace the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate.

No — Go to 9.

9. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using the Subaru ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

Subaru 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 10.

10. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Start the engine, and drive the vehicle at 60 km/h (37.3 MPH) or more for 10 minutes or more.

Warning:
Observe the traffic law on the public road and prioritize safety driving.

Note:
Refill the fuel before driving so that the fuel level meter indicates above "Lower" level.

Does the malfunction indicator light illuminate or blink?

Yes — Repair the following item.
- Poor contact of ignition coil connector
- Poor contact of fuel injector connector on faulty cylinders
- Poor contact of ECM connector

No — Finish the diagnosis.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0301 CYLINDER 1 MISFIRE DETECTED

Note:
For the diagnostic procedure and detection standard, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0302 CYLINDER 2 MISFIRE DETECTED

Note:
For the diagnostic procedure and detection standard, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0303 CYLINDER 3 MISFIRE DETECTED

Note:
For the diagnostic procedure and detection standard, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

DTC P0304 CYLINDER 4 MISFIRE DETECTED

1. —

DTC detecting condition:

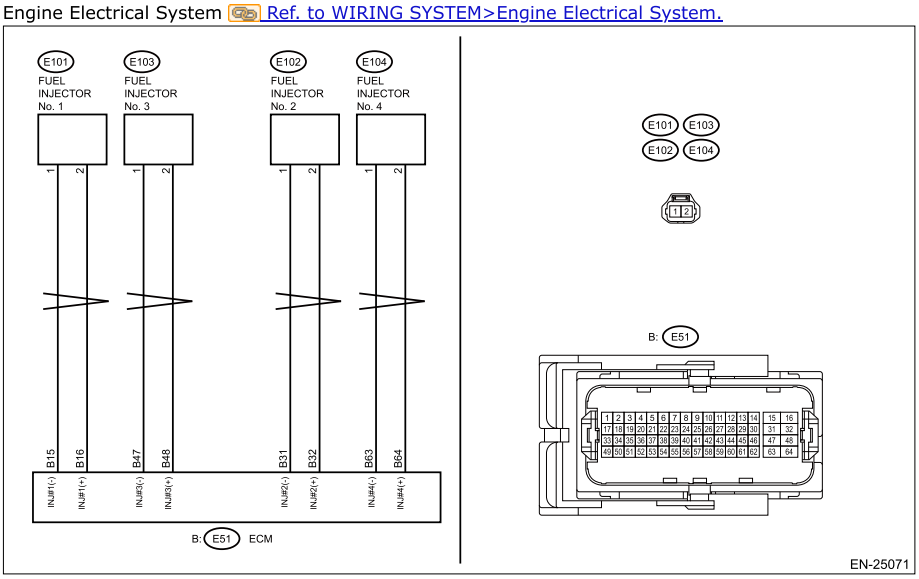
- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stall
- Improper idling
- Rough driving

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



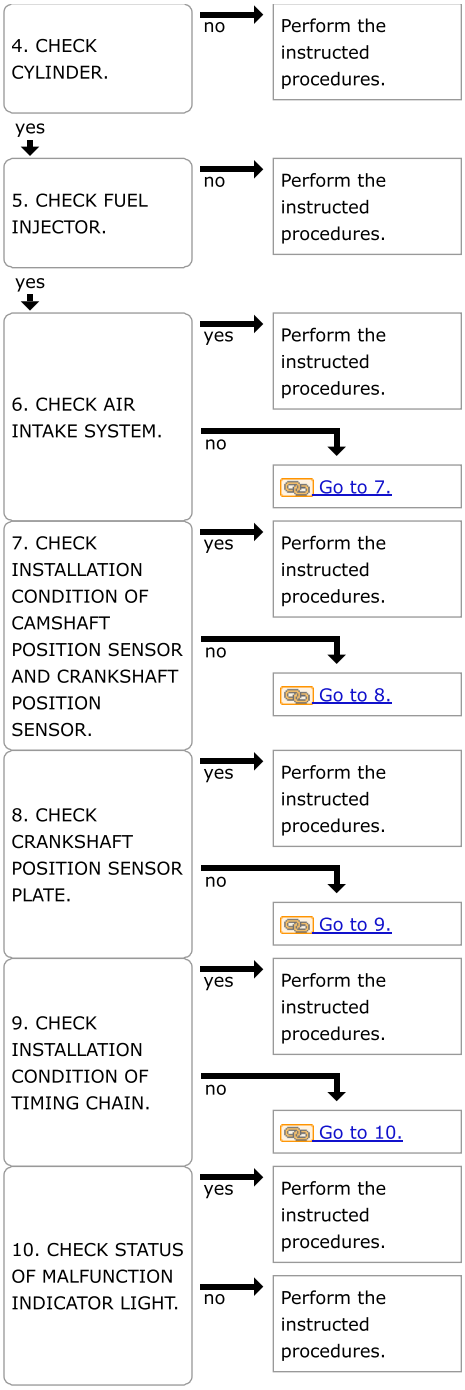
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK PCV HOSE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK PCV HOSE.

Check the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Repair or replace the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector on faulty cylinders.
4. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

#1 (E101) No. 1 — Engine ground:
#1 (E101) No. 2 — Engine ground:
#2 (E102) No. 1 — Engine ground:
#2 (E102) No. 2 — Engine ground:
#3 (E103) No. 1 — Engine ground:
#3 (E103) No. 2 — Engine ground:
#4 (E104) No. 1 — Engine ground:
#4 (E104) No. 2 — 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 (OPEN).

Measure the resistance of harness between ECM connector and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of the harness between the ECM connector and fuel injector connector.

4. CHECK CYLINDER.

Check the following items for cylinder.

- Spark plug
- Ignition coil
- Fuel injector
- Compression pressure
- Skipping timing chain teeth

Is there any fault in the cylinder?

Yes — Repair or replace faulty parts.
Go to 5.

No — Check for DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

5. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 6.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

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 INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and 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. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.
No	Go to 8.

8. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate>INSPECTION.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes	Replace the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate.
No	Go to 9.

9. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using the Subaru ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

Subaru 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 10.

10. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Start the engine, and drive the vehicle at 60 km/h (37.3 MPH) or more for 10 minutes or more.

Warning:
Use special care with the traffic condition on the public road and prioritize safety driving.

Note:
Refill the fuel before driving so that the fuel level meter indicates above "Lower" level.

Does the malfunction indicator light illuminate or blink?

Yes — Repair the following item.
- Poor contact of ignition coil connector
- Poor contact of fuel injector connector on faulty cylinders
- Poor contact of ECM connector

No — Finish the diagnosis.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the presence of misfire occurrence. (Revolution fluctuation method)
Monitoring misfire which influences exhaust deterioration (exhaust gas misfire) and catalyst damage is made obligatory by the law. Misfire affecting these two has two patterns below:

- Intermittent misfire (a single cylinder misfires at random times, or different cylinders misfire at random): Exhaust gas misfire
- Every time misfire (a single cylinder misfires every time): Exhaust gas misfire, catalyst damaging misfire

The following detecting methods are adopted for these detection.

1. Intermittent misfire: Exhaust gas misfire
   - 180° Interval Difference Method
   - 360° Interval Difference Method
   - 720° Interval Difference Method
2. Every time misfire: Exhaust gas misfire, catalyst damaging misfire
   - 180° Interval Difference Method
   - 360° Interval Difference Method

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Fuel shut-off function	Not in operation
Engine speed	400 rpm — 6041 rpm
Intake manifold pressure	
• Normal ignition (Changes based on the engine speed and atmospheric pressure.)	17.7 kPa (132.8 mmHg, 5.2 inHg) — 42.7 kPa (320.3 mmHg, 12.6 inHg)
• Idle ignition (Changes based on the engine speed and atmospheric pressure.)	19.7 kPa (147.8 mmHg, 5.8 inHg) — 44.7 kPa (335.3 mmHg, 13.2 inHg)
Elapsed time after first engine start	2 crankshaft rotations or more
Following condition A or B is met	
A: Engine coolant temperature at engine start	More than −7°C (19.4°F)
B: Following conditions (b1) and (b2) are met	
(b1) Engine coolant temperature at engine starting	−7°C (19.4°F) or less
(b2) Engine coolant temperature	21°C (69.8°F) or more

GENERAL DRIVING CYCLE

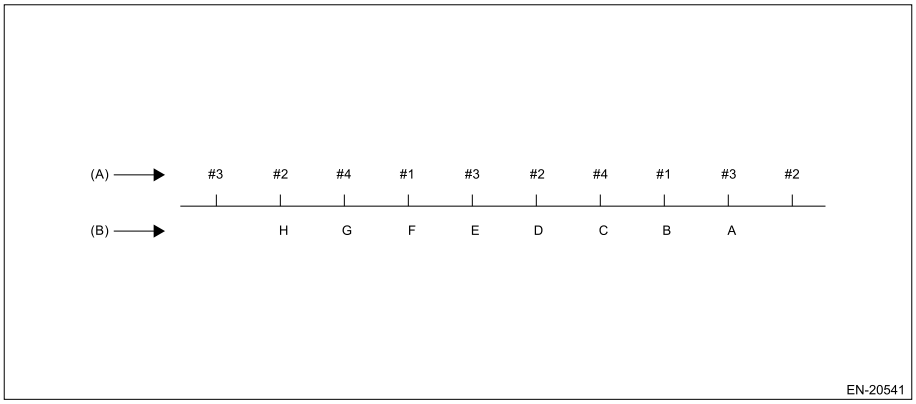
- If conditions are met, it is possible to detect the misfires from idling to high engine speed. However, in case any engine load or breakage occurs, perform with the engine at idle.
- Perform the diagnosis continuously.

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 in 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)
	• 180 Degree Interval Difference Method • 360 Degree Interval Difference Method • 720 Degree Interval Difference Method	• NG judgment for exhaust gas misfire • NG judgment for catalyst-damaging misfire

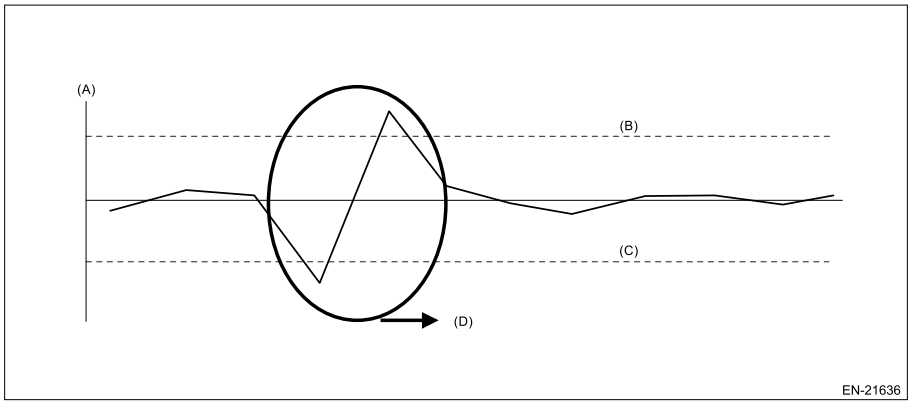
As shown in the following figure, pick a cylinder as the standard and name it A. And the former crankshaft position speed is named B, the second former crankshaft position speed is named C, the third is named D •••, etc.



(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. • 180 degree interval difference ≥ Judgment value of positive side • 180 degree interval difference ≤ Judgment value of negative side (Diagnostic value before 180°CA)	

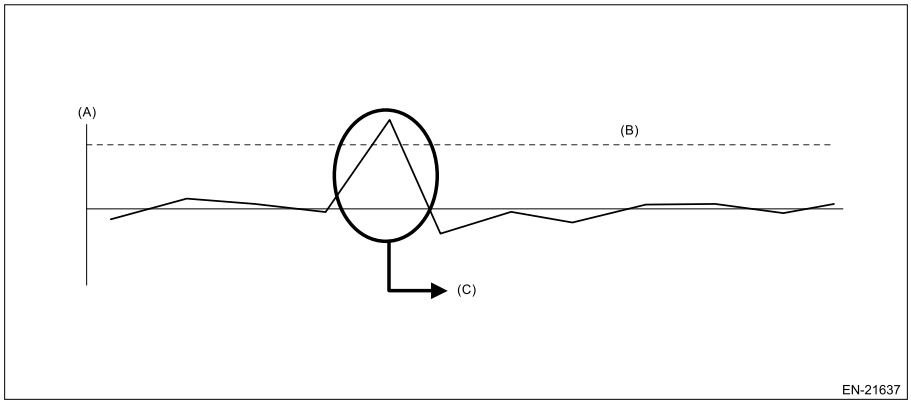


(A) 180 degree interval difference (C) Threshold valve (negative number) (D) Judged as misfire.

(B) Threshold valve (positive number)

<360° Interval Difference Method>

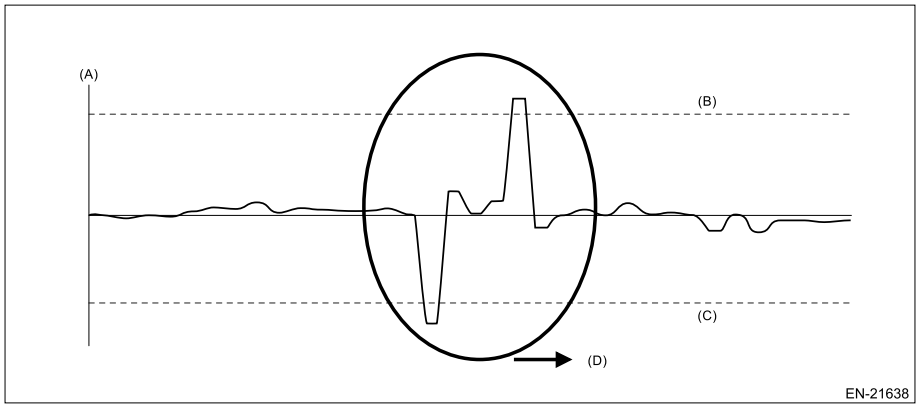
Diagnostic value	360 degree interval difference = (B − A) − (D − C)
Misfire judgment	360 degree interval difference > Judgment value → Judged as misfire



(A) 360 degree interval difference (B) Threshold valve (C) Judged as misfire.

<720° Interval Difference Method>

Diagnostic value	**720 degree interval difference = (A − B) − (E − F)**
Judge as a misfire in the following cases. • 720 degree interval difference ≥ Judgment value of positive side • 720 degree interval difference ≤ Judgment value of negative side (Diagnostic value before 720°CA)	



(A) 720 degree interval difference (C) Threshold valve (negative number) (D) Judged as misfire.

(B) Threshold valve (positive number)

<Exhaust gas 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**
Diagnostic value of exhaust gas misfire	3% or more 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 or more

Map

Percentage (%)		**Charging efficiency (%)**											
		15	**30**	**45**	**60**	**75**	**90**	**105**	**120**	**135**	**150**	**165**	**180**
Engine speed (rpm)	700	20	20	20	20	20	20	20	20	20	20	20	20
	1000	20	20	20	20	20	20	20	20	20	20	20	20
	1500	20	20	20	20	16.5	16.5	14.25	14.25	12.5	12.5	12.5	12.5
	2000	20	20	20	20	16.5	14.25	11	10	9	9	9	9

Percentage (%)		Charging efficiency (%)											
		15	**30**	**45**	**60**	**75**	**90**	**105**	**120**	**135**	**150**	**165**	**180**
	2500	20	20	20	16.5	14.25	12.5	10	9	9	9	9	9
	3000	20	20	20	16.5	12.5	11	9	8.25	9	9	9	9
	3500	20	16.5	16.5	12.5	10	9	8.25	8.25	8.25	8.25	8.25	8.25
	4000	20	16.5	16.5	11	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	4500	20	16.5	14.25	11	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	5000	20	16.5	12.5	10	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	5500	20	16.5	12.5	10	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	6000	20	16.5	12.5	10	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
	6100	20	16.5	12.5	10	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5

Time needed for diagnosis: 200 engine revs.
Malfunction indicator light illumination: Blinks as soon as a malfunction occurs.

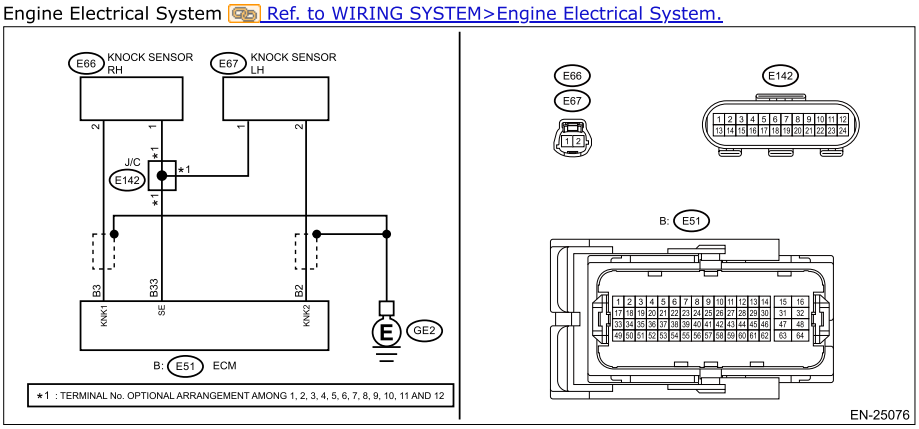
DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Poor driving performance
- Knocking occurs

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.
   - no → Go to 3.
   - yes ↓

2. CHECK KNOCK SENSOR.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

3. CHECK INPUT SIGNAL OF ECM.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

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
   (E51) No. 3 — (E51) No. 33:

Is the resistance less than 500 kΩ?

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 kΩ?

Yes — Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Knock Sensor.

No — Repair the short circuit between lines in the harness between the 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 ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E51) No. 3 (+) — 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 connector and knock sensor connector.

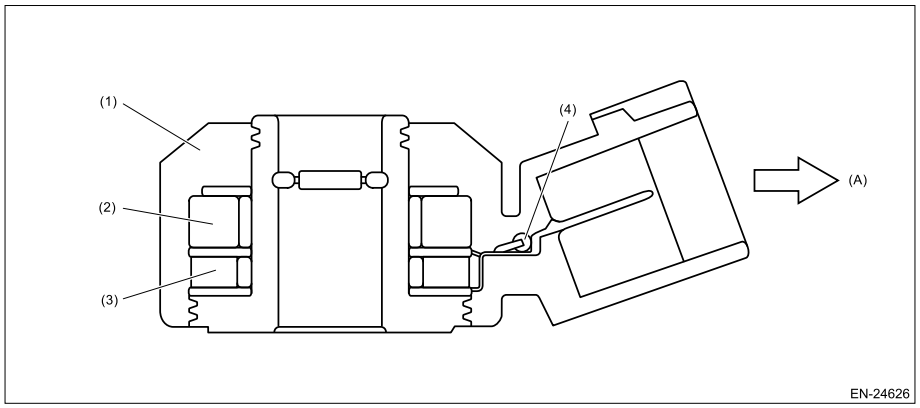
Note:
The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of knock sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case
(2) Weight
(3) Piezoelectric element
(4) Resistance

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.17 V

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

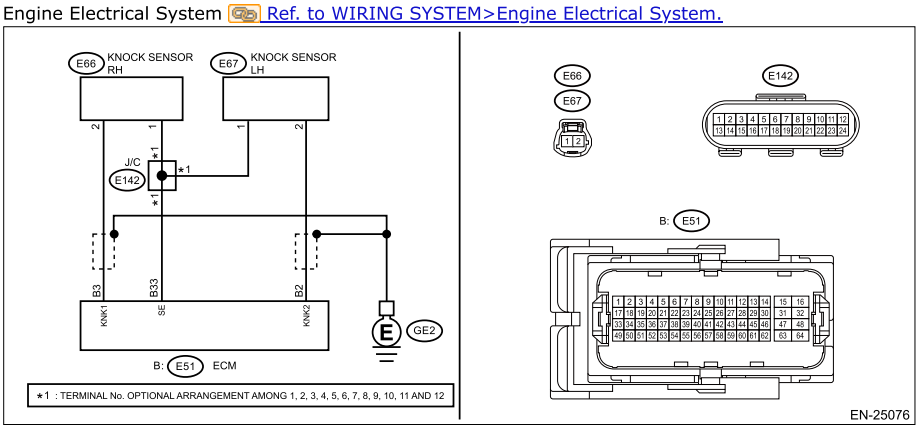
DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Poor driving performance
- Knocking occurs

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK KNOCK SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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
   (E51) No. 3 — (E51) No. 33:

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?

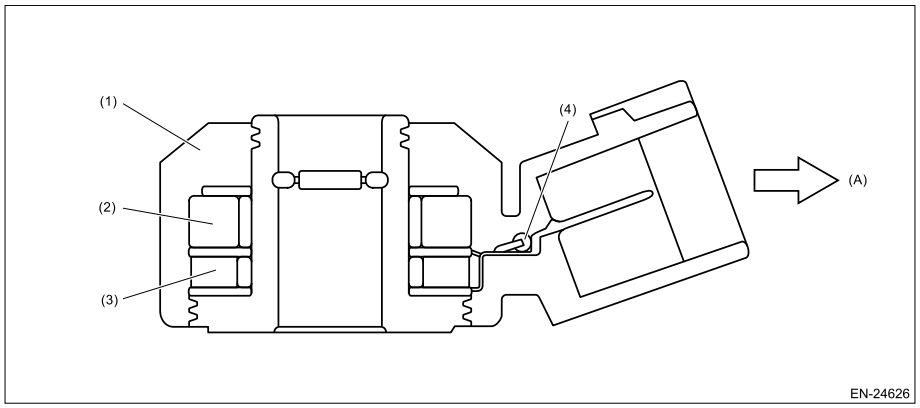
Yes	Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Knock Sensor.
No	Repair the following item. • Open circuit in harness between ECM connector and knock sensor connector • Poor contact of J/C

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case
(2) Weight
(3) Piezoelectric element
(4) Resistance

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.63 V

Time needed for diagnosis: 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

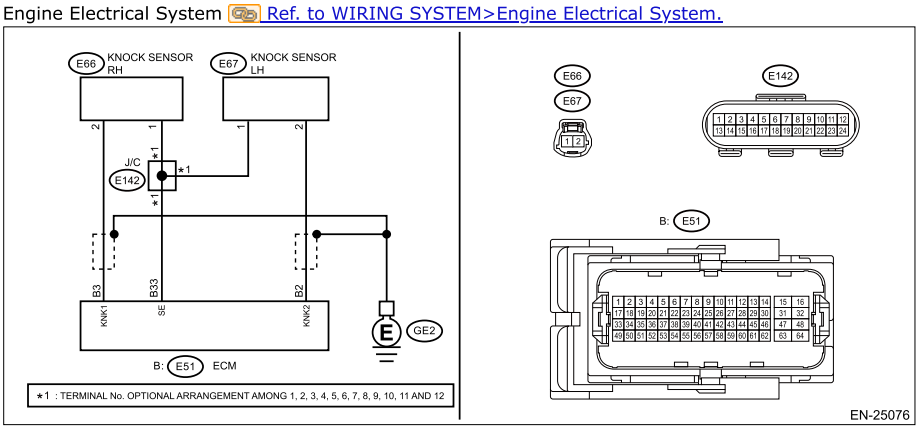
DTC P0332 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Driving performance problem
- Knocking occurs

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.
   - no → Go to 3.
   - yes ↓

2. CHECK KNOCK SENSOR.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

3. CHECK INPUT SIGNAL OF ECM.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

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
   (E51) No. 2 — (E51) No. 33:

Is the resistance less than 500 kΩ?

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 kΩ?

Yes	Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Knock Sensor.
No	Repair the short circuit between lines in the harness between the 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 ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E51) No. 2 (+) — 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 connector and knock sensor connector. **Note:** **The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.**

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0327. 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.

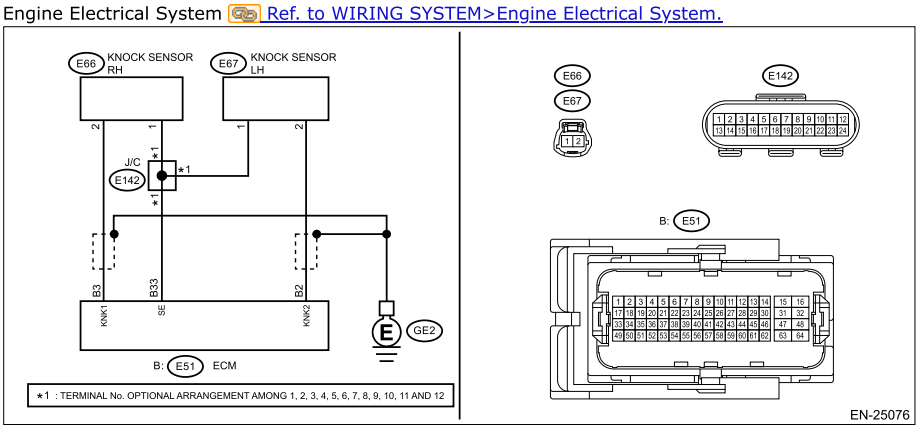
DTC P0333 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Driving performance problem
- Knocking occurs

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK KNOCK SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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
   (E51) No. 2 — (E51) No. 33:

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 following item. • Open circuit in harness between ECM connector and knock sensor connector • Poor contact of J/C

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0328. 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.

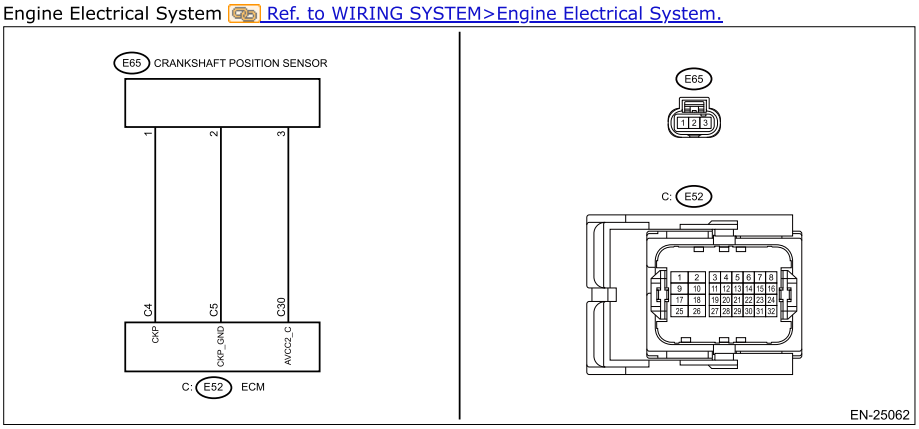
DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine stall
- Failure of engine to start

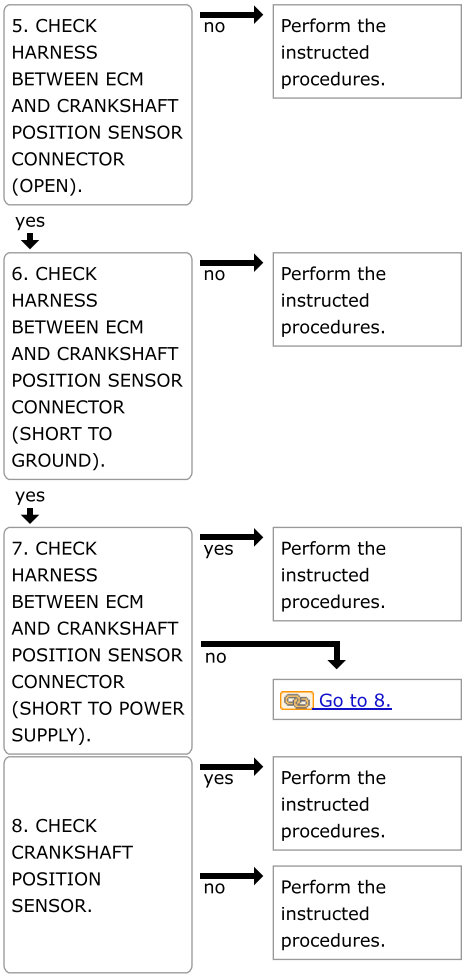
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.	no	Perform the instructed procedures.
	yes ↓	
4. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.	no	Perform the instructed procedures.
	yes ↓	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installation bolt tightened securely?

Yes	Go to 4.
No	Tighten the crankshaft position sensor installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

4. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.

1. Disconnect the connector from the crankshaft position sensor.
2. Turn the ignition switch to ON.
3. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E65) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit in harness between ECM connector and crankshaft position sensor connector • Poor contact of ECM connector

5. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).

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
   (E52) No. 4 — (E65) No. 1:
   (E52) No. 5 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

6. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.
Connector & terminal
(E65) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

7. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E65) 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 crankshaft position sensor connector.
No	Go to 8.

8. CHECK CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Check waveform of crankshaft position sensor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Control Module I/O Signal.

Is there any abnormality in waveform?

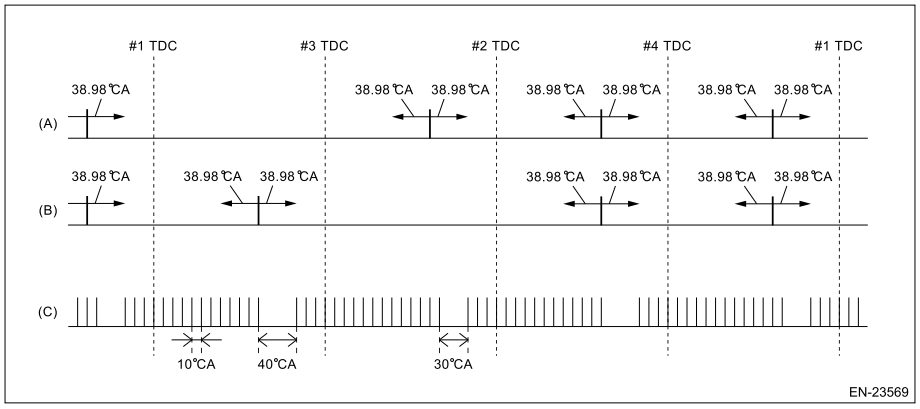
Yes	Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of crankshaft position sensor connector

GENERAL DESCRIPTION

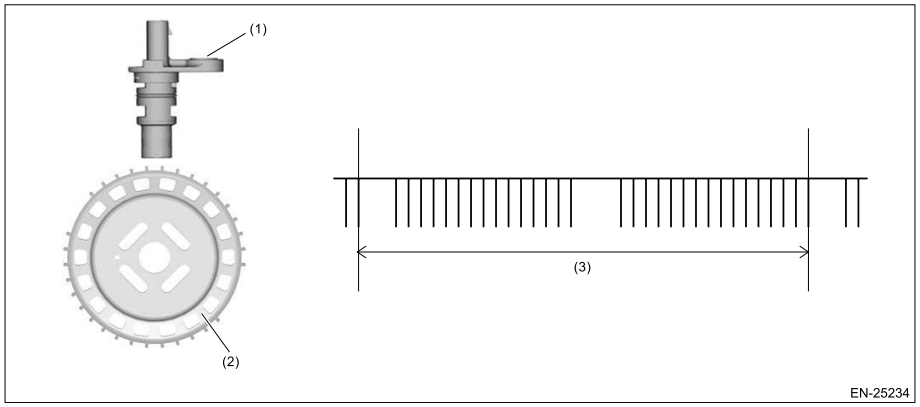
OUTLINE OF DIAGNOSIS

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.

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) 1 crankshaft rotation

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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: 3 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

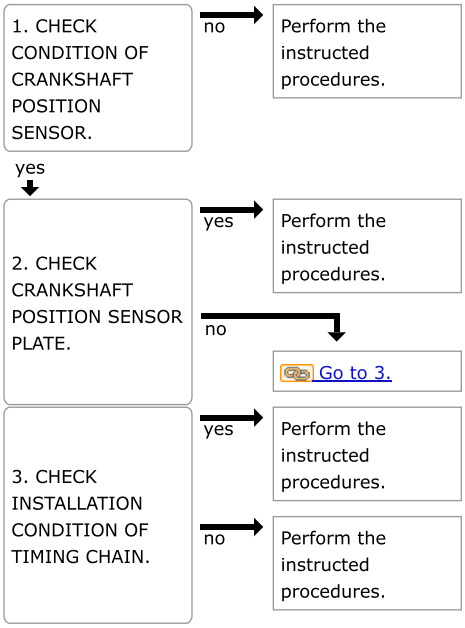
DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:

- Engine stall
- Failure of engine to start

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the 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)(H4DOTC)>Crankshaft Position Sensor.

2. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate>INSPECTION.

Is there crack or damage in the crankshaft position sensor plate teeth?

Yes — Replace the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate.

No — Go to 3.

3. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using the Subaru ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

Subaru ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

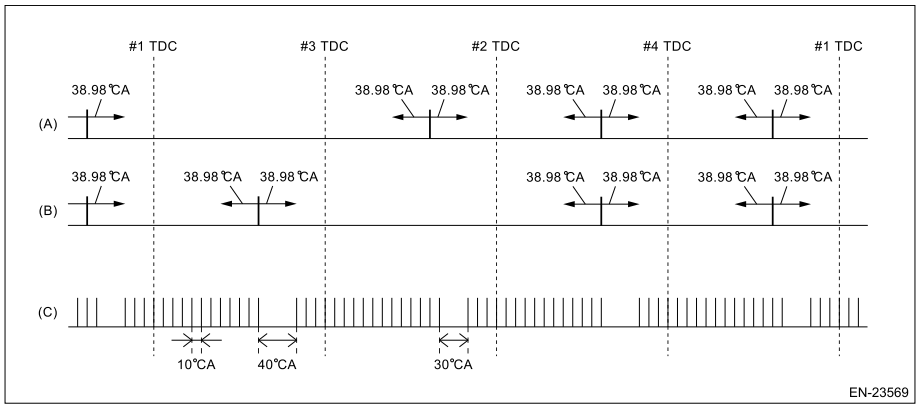
Yes	Correct the installation condition of timing chain. Ref. to MECHANICAL(H4DOTC)>Timing Chain Assembly.
No	Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

GENERAL DESCRIPTION

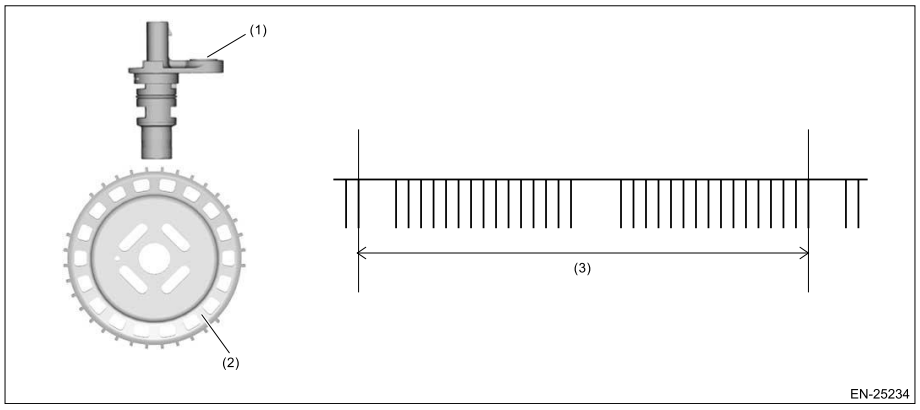
OUTLINE OF DIAGNOSIS

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.

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) 1 crankshaft rotation

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Amount of crankshaft position sensor signals during 0.5 revs of crankshaft	Less than 13 Or, 19 or more

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
|(Present value of diagnosis 1) − (Previous value of diagnosis 1)|	Not equal to 1

Time needed for diagnosis: 10 crankshaft rotations
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR

1. —

DTC detecting condition:

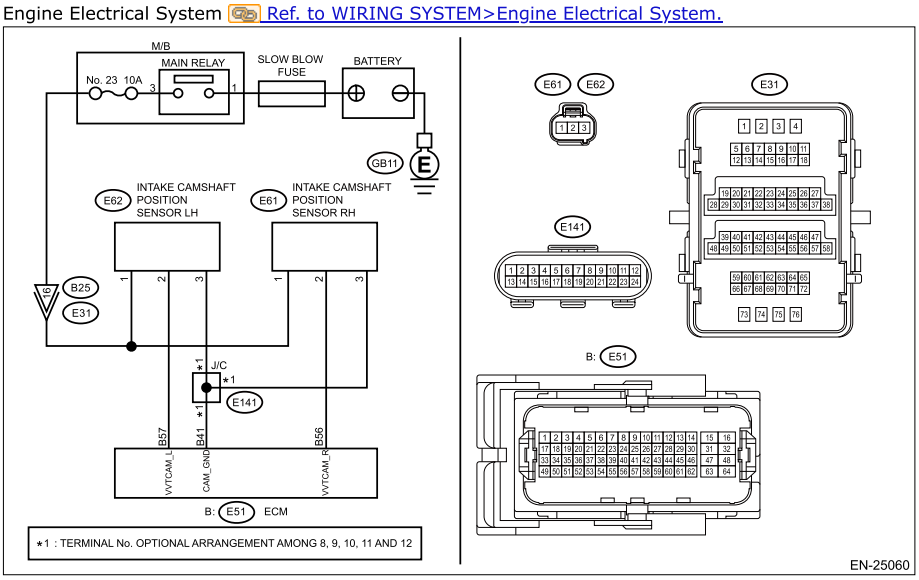
Immediately at fault recognition

Trouble symptom:

- Engine stall
- Failure of engine to start

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



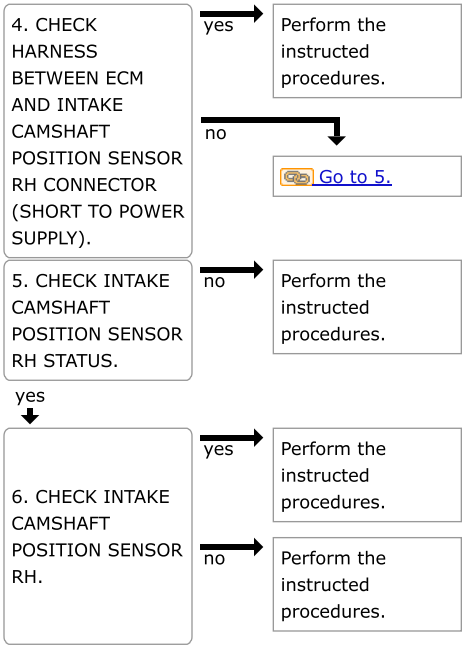
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INTAKE CAMSHAFT POSITION SENSOR RH POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR RH CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR RH CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK INTAKE CAMSHAFT POSITION SENSOR RH POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor RH connector and engine ground.
   Connector & terminal
   (E61) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair the following item.
- Open circuit or short circuit to ground in harness between M/B and intake camshaft position sensor RH connector
- Poor contact of coupling connector
- Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR RH CONNECTOR (OPEN).

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 RH connector.
   Connector & terminal
   (E51) No. 56 — (E61) No. 2:
   (E51) No. 41 — (E61) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Repair the following item.
- Open circuit in harness between ECM connector and intake camshaft position sensor RH connector
- Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR RH CONNECTOR (SHORT TO GROUND).

Measure the resistance between intake camshaft position sensor RH connector and engine ground.

Connector & terminal

(E61) No. 2 — Engine 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 intake camshaft position sensor RH connector.

4. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR RH CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between intake camshaft position sensor RH connector and engine ground.

Connector & terminal

(E61) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and intake camshaft position sensor RH connector.
No	Go to 5.

5. CHECK INTAKE CAMSHAFT POSITION SENSOR RH STATUS.

Check the installation condition of the intake camshaft position sensor RH.

Is the mounting bolt of the intake camshaft position sensor RH tightened securely?

Yes	Go to 6.
No	Securely tighten the mounting bolt of the intake camshaft position sensor RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

6. CHECK INTAKE CAMSHAFT POSITION SENSOR RH.

Check the waveform of the intake camshaft position sensor RH. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Control Module I/O Signal.

Is there any abnormality in waveform?

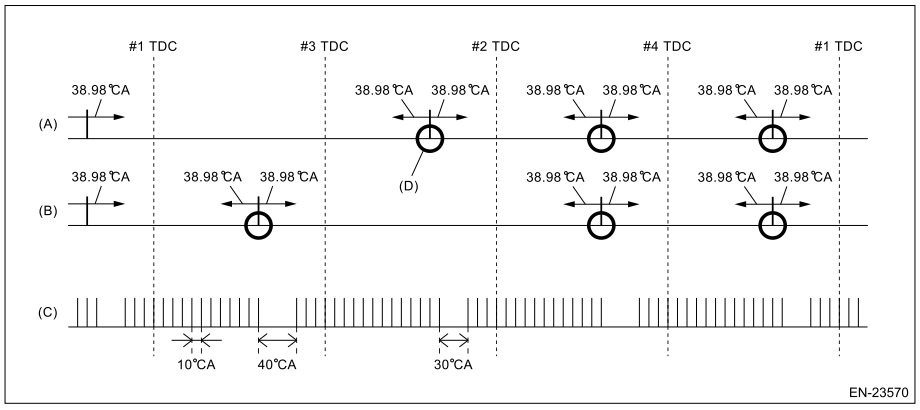
Yes	Replace the camshaft position sensor RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of intake camshaft position sensor RH connector • Poor contact of coupling connector • Poor contact of J/C

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Intake cam signal RH (B) Intake cam signal LH (C) Crankshaft signal

(D) Camshaft position signal: When normal, there will be three camshaft position signals for every two crankshaft revolutions.

EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	8 V or more

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	8 V or more
Elapsed time after starting the engine	200 ms or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when no input status of camshaft position sensor signal continues for 3000 ms during cranking.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Number of camshaft position sensor signals during cranking	0

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Amount of camshaft position sensor signals during 1.5 revs of crankshaft	0

Time needed for diagnosis

Diagnosis 1: 3 s

Diagnosis 2: 6 crankshaft rotations

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

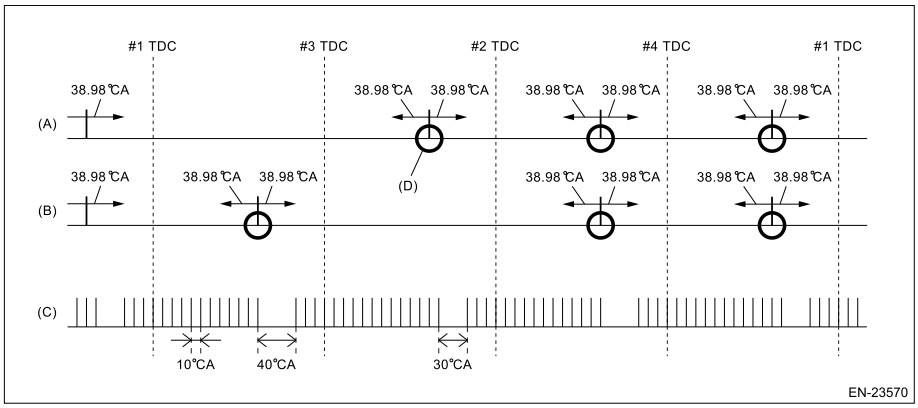
DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR

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



(A) Intake cam signal RH
(B) Intake cam signal LH
(C) Crankshaft signal
(D) Camshaft position signal: When normal, there will be three camshaft position signals for every two crankshaft revolutions.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more

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 sensor signal during 2 revs of crankshaft	Not equal to 3 times

Time needed for diagnosis: 8 crankshaft rotations
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

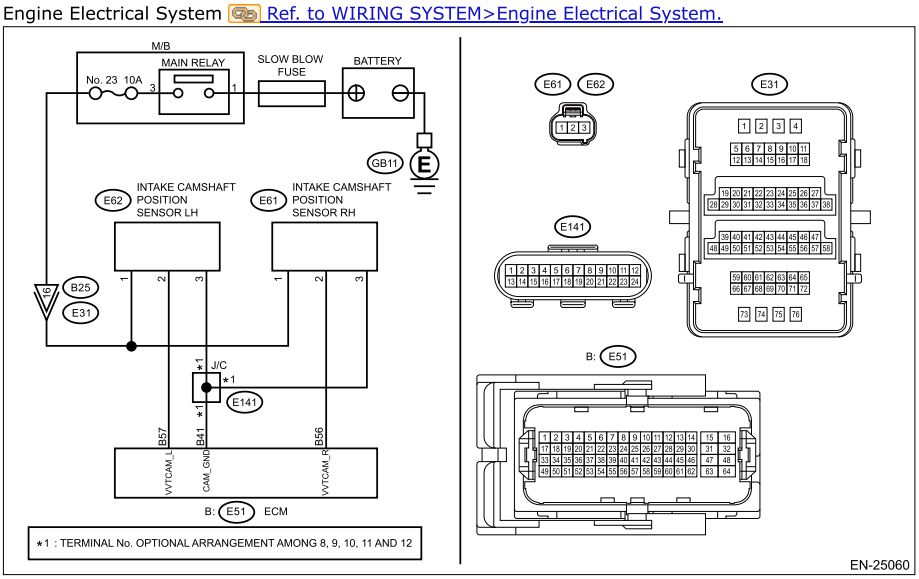
DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine stall
- Failure of engine to start

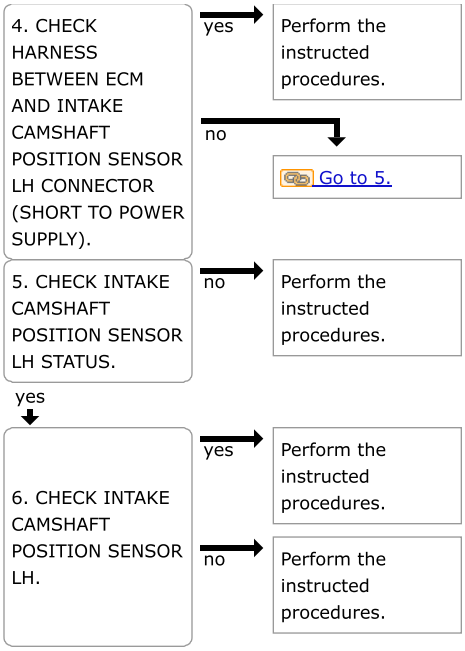
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INTAKE CAMSHAFT POSITION SENSOR LH POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR LH CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR LH CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK INTAKE CAMSHAFT POSITION SENSOR LH POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from intake camshaft position sensor LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor LH 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 following item.
- Open circuit or short circuit to ground in harness between M/B and intake camshaft position sensor LH connector
- Poor contact of coupling connector
- Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR LH CONNECTOR (OPEN).

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 LH connector.
   Connector & terminal
   (E51) No. 57 — (E62) No. 2:
   (E51) No. 41 — (E62) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Repair the following item.
- Open circuit in harness between ECM connector and intake camshaft position sensor LH connector
- Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR LH CONNECTOR (SHORT TO GROUND).

Measure the resistance between intake camshaft position sensor LH connector and engine ground.

Connector & terminal

(E62) No. 2 — Engine 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 intake camshaft position sensor LH connector.

4. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR LH CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between intake camshaft position sensor LH 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 supply in harness between ECM connector and intake camshaft position sensor LH connector.
No	Go to 5.

5. CHECK INTAKE CAMSHAFT POSITION SENSOR LH STATUS.

Check the installation condition of the intake camshaft position sensor LH.

Is the mounting bolt of the intake camshaft position sensor LH tightened securely?

Yes	Go to 6.
No	Securely tighten the mounting bolt of the intake camshaft position sensor LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

6. CHECK INTAKE CAMSHAFT POSITION SENSOR LH.

Check the waveform of the intake camshaft position sensor LH. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Control Module I/O Signal.

Is there any abnormality in waveform?

Yes	Replace the intake camshaft position sensor LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of intake camshaft position sensor LH connector • Poor contact of coupling connector • Poor contact of J/C

GENERAL DESCRIPTION

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.

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.**
- **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.**

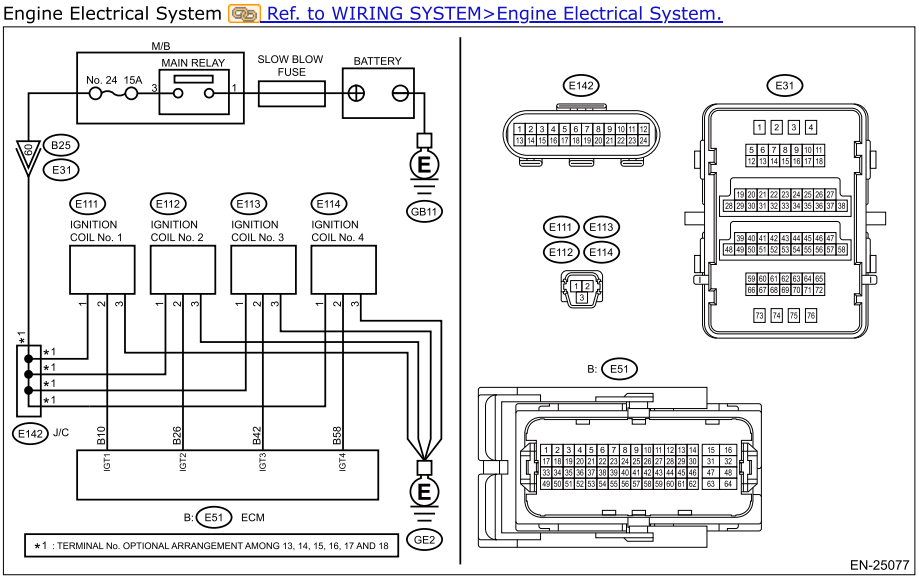
DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

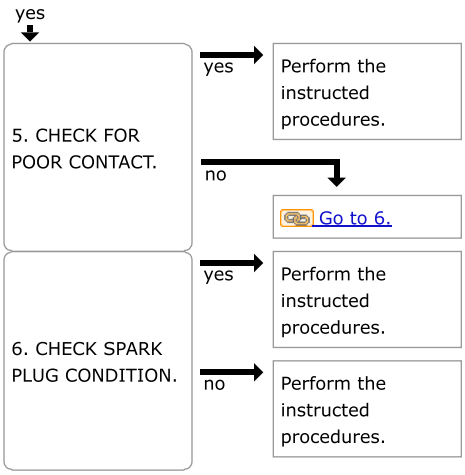
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK IGNITION COIL POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (OPEN).	no →	Perform the instructed procedures.



1. CHECK IGNITION COIL POWER SUPPLY.

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; (E111) No. 1 (+) — Engine ground (−):
DTC P0352; (E112) No. 1 (+) — Engine ground (−):
DTC P0353; (E113) No. 1 (+) — Engine ground (−):
DTC P0354; (E114) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair the following item.

- Open circuit or short circuit to ground in harness between M/B and ignition coil connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

2. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E111) No. 3 — Engine ground:
DTC P0352; (E112) No. 3 — Engine ground:
DTC P0353; (E113) No. 3 — Engine ground:
DTC P0354; (E114) No. 3 — 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 ground terminal.

3. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Measure the resistance between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E111) No. 2 — Engine ground:
DTC P0352; (E112) No. 2 — Engine ground:
DTC P0353; (E113) No. 2 — Engine ground:
DTC P0354; (E114) No. 2 — Engine ground:

Is the resistance 1 MΩ 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 (OPEN).

Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

DTC P0351; (E51) No. 10 — (E111) No. 2:
DTC P0352; (E51) No. 26 — (E112) No. 2:
DTC P0353; (E51) No. 42 — (E113) No. 2:
DTC P0354; (E51) No. 58 — (E114) No. 2:

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.
2. Check the spark plug condition. Ref. to IGNITION(H4DOTC)>Spark Plug>INSPECTION.

Is the check result OK?

Yes	Replace the ignition coil. Ref. to IGNITION(H4DOTC)>Ignition Coil.
No	Replace the spark plug. Ref. to IGNITION(H4DOTC)>Spark Plug.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Secondary parameters	Execution condition
Engine speed	More than 0 rpm

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction 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 and 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 and 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 and 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.

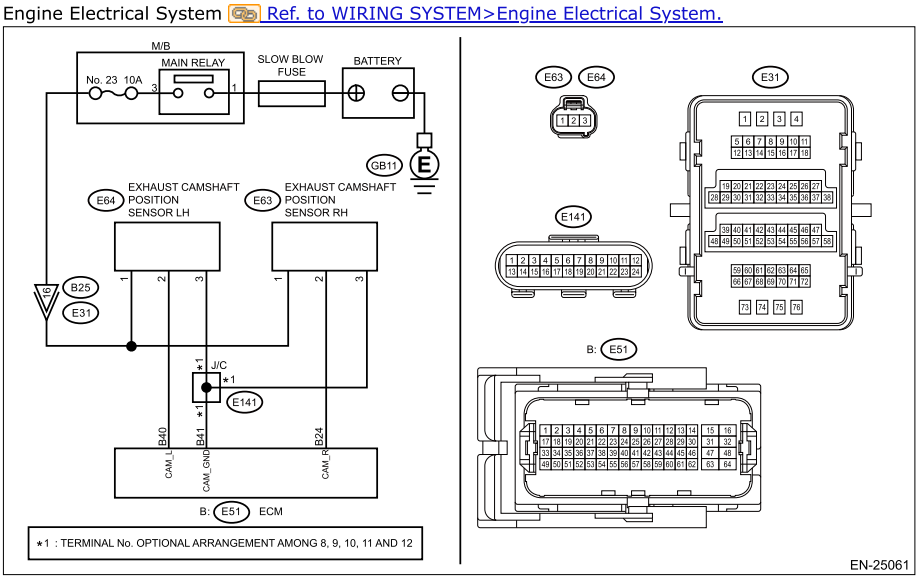
DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine stall
- Failure of engine to start

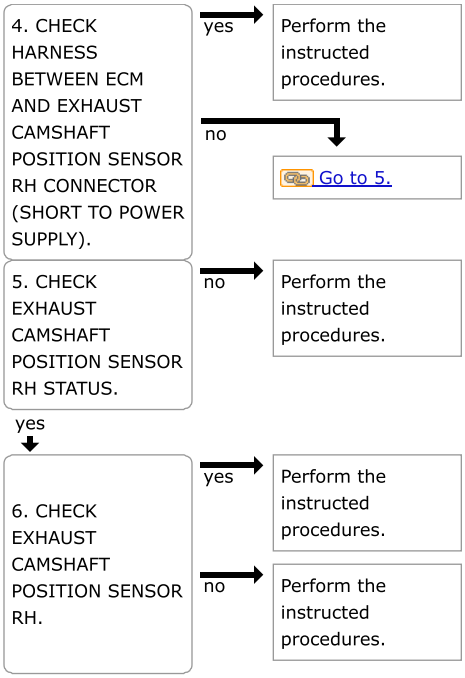
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK EXHAUST CAMSHAFT POSITION SENSOR RH POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR RH CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR RH CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK EXHAUST CAMSHAFT POSITION SENSOR RH POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust camshaft position sensor RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust camshaft position sensor RH connector and engine ground.
   Connector & terminal
   (E63) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the following item. • Open circuit in harness between M/B and exhaust camshaft position sensor RH connector • Poor contact of coupling connector • Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR RH CONNECTOR (OPEN).

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 RH connector.
   Connector & terminal
   (E51) No. 24 — (E63) No. 2:
   (E51) No. 41 — (E63) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the following item. • Open circuit in harness between ECM connector and exhaust camshaft position sensor RH connector • Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR RH CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust camshaft position sensor RH connector and engine ground.

Connector & terminal

(E63) No. 2 — Engine 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 exhaust camshaft position sensor RH connector.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR RH CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between exhaust camshaft position sensor RH connector and engine ground.

Connector & terminal

(E63) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and exhaust camshaft position sensor RH connector.
No	Go to 5.

5. CHECK EXHAUST CAMSHAFT POSITION SENSOR RH STATUS.

Check the installation condition of the exhaust camshaft position sensor RH.

Is the mounting bolt of the exhaust camshaft position sensor RH tightened securely?

Yes	Go to 6.
No	Securely tighten the mounting bolt of the exhaust camshaft position sensor RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

6. CHECK EXHAUST CAMSHAFT POSITION SENSOR RH.

Check the waveform of the exhaust camshaft position sensor RH. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Control Module I/O Signal.

Is there any abnormality in waveform?

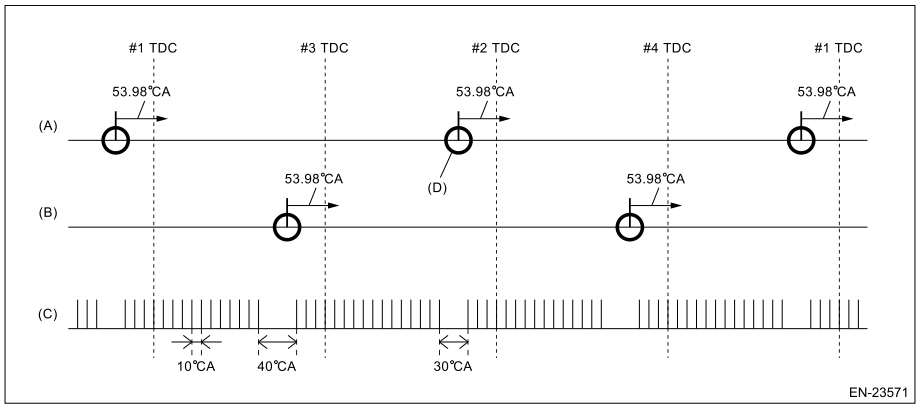
Yes	Replace the exhaust camshaft position sensor RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of exhaust camshaft position sensor RH connector • Poor contact of coupling connector • Poor contact of J/C

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Exhaust cam signal RH

(B) Exhaust cam signal LH

(C) Crankshaft signal

(D) Camshaft position signal: When normal, there will be two camshaft position signals for every two crankshaft revolutions.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Elapsed time after starting the engine	200 ms or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 of crankshaft	0

Time needed for diagnosis: 6 crankshaft rotations

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

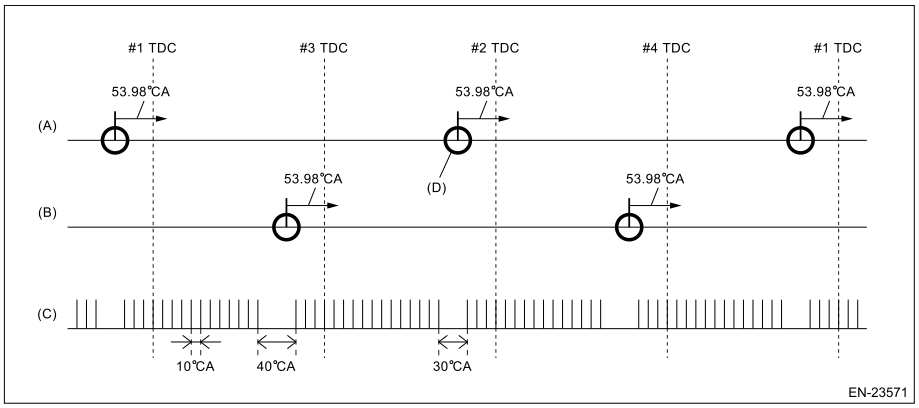
DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1

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 two camshaft position signals for every two crankshaft revolutions.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

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 sensor signal during 2 revs of crankshaft	Not equal to 2 times

Time needed for diagnosis: 8 crankshaft rotations
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

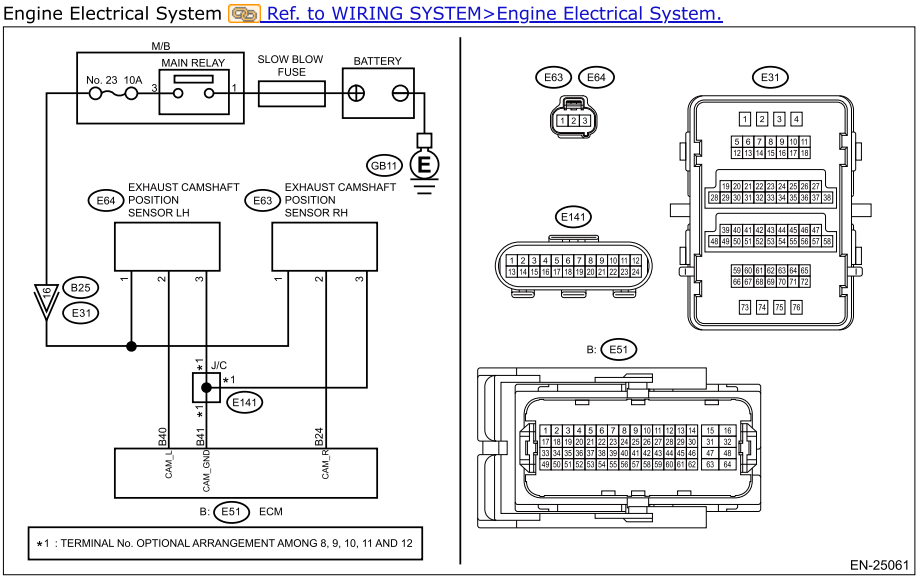
DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine stall
- Failure of engine to start

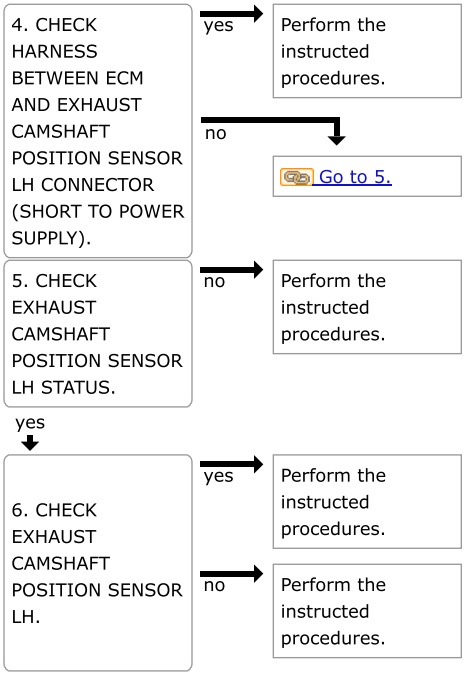
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK EXHAUST CAMSHAFT POSITION SENSOR LH POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR LH CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR LH CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK EXHAUST CAMSHAFT POSITION SENSOR LH POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from exhaust camshaft position sensor LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust camshaft position sensor LH connector and engine ground.
   Connector & terminal
   (E64) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B and exhaust camshaft position sensor LH connector • Poor contact of coupling connector • Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR LH CONNECTOR (OPEN).

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 LH connector.
   Connector & terminal
   (E51) No. 40 — (E64) No. 2:
   (E51) No. 41 — (E64) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the following item. • Open circuit in harness between ECM connector and exhaust camshaft position sensor LH connector • Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR LH CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust camshaft position sensor LH connector and engine ground.

Connector & terminal

(E64) No. 2 — Engine 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 exhaust camshaft position sensor LH connector.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR LH CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between exhaust camshaft position sensor LH connector and engine ground.

Connector & terminal

(E64) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply in harness between ECM connector and exhaust camshaft position sensor LH connector.

No — Go to 5.

5. CHECK EXHAUST CAMSHAFT POSITION SENSOR LH STATUS.

Check the installation condition of the exhaust camshaft position sensor LH.

Is the mounting bolt of the exhaust camshaft position sensor LH tightened securely?

Yes — Go to 6.

No — Securely tighten the mounting bolt of the exhaust camshaft position sensor LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

6. CHECK EXHAUST CAMSHAFT POSITION SENSOR LH.

Check the waveform of the exhaust camshaft position sensor LH. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Control Module I/O Signal.

Is there any abnormality in waveform?

Yes — Replace the exhaust camshaft position sensor LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

No — Repair the following item.

- Poor contact of ECM connector
- Poor contact of exhaust camshaft position sensor LH connector
- Poor contact of coupling connector
- Poor contact of J/C

GENERAL DESCRIPTION

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.

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.**
- **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.**

DTC P0401 EGR ABNORMAL (EGR AMOUNT TOO SMALL)

1. —

DTC detecting condition:

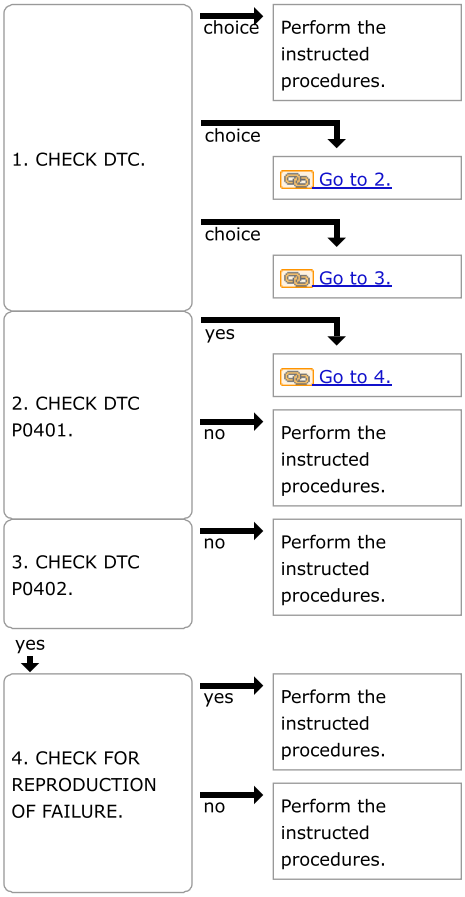
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Infrequent knocking (P0401)
- Improper idling (P0402)
- Movement performance problem (P0402)

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

When a code other than DTC P0401 (current code) or P0402 (current code) is displayed, go to A.
When DTC P0401 (current code) is displayed, go to B.
When DTC P0402 (current code) is displayed, go to C.

A	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
B	Go to 2.
C	Go to 3.

2. CHECK DTC P0401.

1. Turn the ignition switch to OFF.
2. Check for clogging in the pipes consisting of EGR system.

Note:
Check the following items.
- **Throttle valve**
- **EGR cooler**
- **EGR control valve**
- **EGR pipe**
- **EGR pipe adapter**

Is the check result OK?

Yes	Go to 4.
No	Clean and replace the faulty parts.

3. CHECK DTC P0402.

1. Turn the ignition switch to OFF.
2. Check for leakage in the pipes consisting of the EGR system.

Note:
Check the following items.
- **Looseness of each flange connection**
- **Improper installation of the electronic throttle control**
- **Improper installation of manifold absolute pressure and intake air temperature sensor**
- **Foreign matter attached to EGR valve**

Is the check result OK?

Yes	Go to 4.
No	Clean and replace the faulty parts.

4. CHECK FOR REPRODUCTION OF FAILURE.

Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Does the malfunction indicator light illuminate?

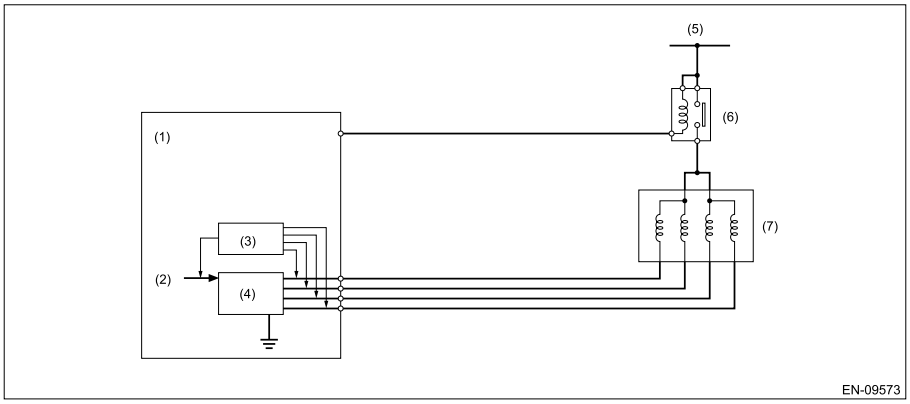
Yes	Replace the EGR control valve and manifold absolute pressure and intake air temperature sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>EGR Control Valve. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Manifold Absolute Pressure and Intake Air Temperature Sensor.
No	End.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of EGR system.
Intake manifold 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.
The ECM compares the difference between the intake manifold pressure assumed at the time of EGR control valve opening or closing command and the actually measured intake manifold pressure to judge whether the EGR system is normal/over flow rate/under flow rate.

COMPONENT DESCRIPTION



(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

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Ambient air temperature	7°C (44.6°F) or more
Engine speed	Value of 1200 rpm — 2800 rpm
Vehicle speed	32 km/h (19.9 MPH) or more
Neutral switch	OFF
Time while the fuel shut-off function is in operation	3000 ms or more
Compulsory drive of EGR valve open delay time (low flow rate monitor only)	800 ms or more

GENERAL DRIVING CYCLE

During deceleration fuel cut from 32 km/h (19.9 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 become out of condition due to deceleration.)

DIAGNOSTIC METHOD

The assumed intake manifold pressure (reference pressure) is calculated from engine speed, throttle opening angle and atmospheric pressure when the execution condition is established.

1. When the execution condition is satisfied and the EGR valve sends the opening command (57 steps), EGR under flow rate (P0401) is detected when the difference between the measured intake manifold pressure and the reference pressure (for 57 steps) is equal to or more than the judgment value.
2. When the execution condition is satisfied and the EGR valve sends the closing command (0 step), EGR over flow rate (P0402) is detected when the difference between the measured intake manifold pressure and the reference pressure (for 0 step) is equal to or more than the judgment value.
3. Both P0401 and P0402 are detected if both judgment values are exceeded.

If the 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
<Low flow rate monitor> Intake manifold absolute pressure for reference − Average value of intake manifold absolute pressure	More than value of Map1	P0401
<High flow rate monitor> Average value of intake manifold absolute pressure − Intake manifold absolute pressure for reference	More than value of Map2	P0402

Map1

		Engine speed (rpm)								
		1200	1400	1600	1800	2000	2200	2400	2600	2800
Barometric pressure (kPa (mmHg, inHg))	75.06 (563.1, 22.2)	26.5 (198.8, 7.8)	22.5 (168.8, 6.6)	19.5 (146.3, 5.8)	17.5 (131.3, 5.2)	15.5 (116.3, 4.6)	14 (105, 4.1)	13 (97.5, 3.8)	12 (90, 3.5)	11 (82.5, 3.2)
	80 (600.2, 23.6)	30 (225.1, 8.9)	26 (195, 7.7)	23 (172.5, 6.8)	21 (157.5, 6.2)	19 (142.5, 5.6)	17 (127.5, 5)	15.5 (116.3, 4.6)	13.5 (101.3, 4)	12 (90, 3.5)
	90 (675.2, 26.6)	33.5 (251.3, 9.9)	28.5 (213.8, 8.4)	25 (187.5, 7.4)	22 (165, 6.5)	20 (150, 5.9)	18.5 (138.8, 5.5)	16.5 (123.8, 4.9)	14.5 (108.8, 4.3)	13 (97.5, 3.8)
	101.33 (760.2, 22.2)	41.9 (314.3, 7.8)	35.3 (264.8, 6.6)	30.3 (227.3, 5.8)	26.5 (198.8, 5.2)	23.7 (177.8, 4.6)	21.6 (162, 4.1)	19.8 (148.5, 3.8)	18.2 (136.5, 3.5)	16.3 (122.3, 3.2)
(kPa (mmHg, inHg))										

Map2

		Engine speed (rpm)								
		1200	1400	1600	1800	2000	2200	2400	2600	2800
Barometric pressure (kPa (mmHg, inHg))	75.06 (563.1, 22.2)	12 (90, 3.5)	9 (67.5, 2.7)	7.3 (54.8, 2.2)	6 (45, 1.8)	5.6 (42, 1.7)	5 (37.5, 1.5)	4.8 (36, 1.4)	4.6 (34.5, 1.4)	4.4 (33, 1.3)
	80 (600.2, 23.6)	13.5 (101.3, 4)	10 (75, 3)	8.2 (61.5, 2.4)	7 (52.5, 2.1)	6.3 (47.3, 1.9)	5.6 (42, 1.7)	5.2 (39, 1.5)	5 (37.5, 1.5)	4.8 (36, 1.4)
	90 (675.2, 26.6)	15 (112.5, 4.4)	12 (90, 3.5)	10 (75, 3)	8.2 (61.5, 2.4)	7.2 (54, 2.1)	6.4 (48, 1.9)	5.8 (43.5, 1.7)	5.6 (42, 1.7)	5.4 (40.5, 1.6)
	101.33 (760.2, 22.2)	17 (127.5, 3.5)	13.5 (101.3, 2.7)	11 (82.5, 2.2)	9.2 (69, 1.8)	8 (60, 1.7)	7.2 (54, 1.5)	6.4 (48, 1.4)	6.2 (46.5, 1.4)	6 (45, 1.3)
(kPa (mmHg, inHg))										

Time needed for diagnosis: 3200 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 P0402 EGR "A" FLOW EXCESSIVE DETECTED

Note:

For the diagnostic procedure and detection standard, refer to DTC P0401. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0401 EGR ABNORMAL (EGR AMOUNT TOO SMALL).

DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Idle mixture is out of specifications

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC AND FREEZE FRAME DATA.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK ENGINE OIL CONSUMPTION.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK EGR SYSTEM.	no	Perform the instructed procedures.
4. CHECK EXHAUST SYSTEM.	yes	Perform the instructed procedures.
	no	Go to 5.
5. CHECK FRONT OXYGEN (A/F) SENSOR.	no	Go to 7.
6. CHECK FRONT OXYGEN (A/F) SENSOR.	yes	Perform the instructed procedures.
	no	Go to 7.
7. CHECK CATALYTIC CONVERTER.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK DTC AND FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
3. Read the freeze frame data.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

4. Save the displayed DTC and freeze frame data.

Is DTC other than P0420 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK ENGINE OIL CONSUMPTION.

Check the engine oil amount. Ref. to LUBRICATION(H4DOTC)>Engine Oil.

Is white smoke emitted from the muffler?

Yes — Check the engine, and repair the defective part. Ref. to MECHANICAL(H4DOTC)>Symptoms and causes.
After repairing the engine, replace all the catalytic converters.
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 3.

3. CHECK EGR SYSTEM.

Check for leakage in the pipes consisting of the EGR system.

Note:
Check the following items.
- **Looseness of each flange connection**
- **Improper installation of the electronic throttle control**
- **Improper installation of manifold absolute pressure and intake air temperature sensor**
- **Foreign matter adhering to EGR control valve**

Is the check result OK?

Yes — Go to 4.

No — Repair or replace faulty parts.

4. CHECK EXHAUST SYSTEM.

Check the following items regarding exhaust system.
- Loose or detached nut and bolt
- Exhaust gas leakage
- Air suction
- Hole on exhaust pipe

Is there any trouble?

Yes — Repair or replace the exhaust system. Ref. to EXHAUST(H4DOTC)>General Description.

No — Go to 5.

5. CHECK FRONT OXYGEN (A/F) SENSOR.

Visually check the front oxygen (A/F) sensor and the vicinity of front oxygen (A/F) sensor.

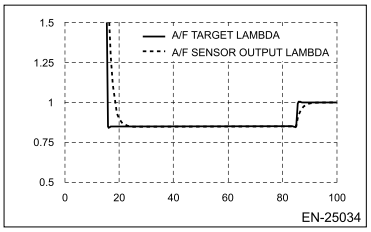
Is there any trace of oil on the front oxygen (A/F) sensor or in the vicinity of the front oxygen (A/F) sensor?

Yes — Go to 6.

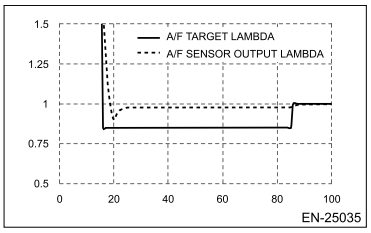
No — Go to 7.

6. CHECK FRONT OXYGEN (A/F) SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, decelerate by accelerator OFF from driving at a constant speed of 60 km/h (37.3 MPH), and read the waveform data of [A/F Sensor #1] and [Target Equivalence Ratio] while the vehicle is stopped.
   - At normal condition



   - In malfunction



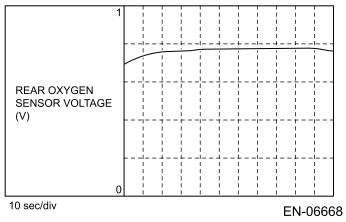
Is an abnormal waveform displayed?

Yes — Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Front Oxygen (A/F) Sensor.

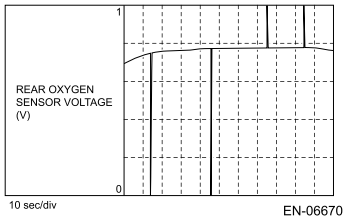
No — Go to 7.

7. CHECK CATALYTIC CONVERTER.

1. Start the engine and warm up completely.
2. Read the waveform data of rear oxygen sensor during idling using an oscilloscope.
3. Check the waveform by waggling the connector between ECM and rear oxygen sensor.
   - At normal condition



   - At abnormal condition 2 (noise input)



Is an abnormal waveform displayed?

Yes

Connect the connector after checking the following items, and check the waveform again while waggling.
- Check the contact point of the connector that caused disturbed waveform. If faulty, repair or replace it.
- If any problem is not found, it is possible that a temporary poor contact occurs in the connector.

No

Replace all the catalytic converters.
Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Front Catalytic Converter.
Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Rear Catalytic Converter.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

To confirm the performance of Three-way Catalytic Converter (TWC), measure Oxygen Storage Capacity (OSC) using A/F sensor and rear oxygen sensor.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Amount of intake air	Less than 8.5 g/s (0.3 oz/s)
Accelerator pedal position	While idling
Rear oxygen sensor output voltage after fuel cut	0.15 V or less
Estimated catalyst temperature	475°C (887°F) or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more
(Integrated intake air amount during fuel cut	More than 19.3 g/s (0.7 oz/s)
Fuel shut-off function thereafter)	Not in operation
A/F element impedance	206 Ω or less

GENERAL DRIVING CYCLE

When the TWC, the A/F sensor, and the rear oxygen sensor are fully warmed up, perform diagnosis if the following operations are experienced once respectively: a 10-second idling after the deceleration fuel cut for the predetermined time or longer, and a 10-second driving with the accelerator ON after the deceleration fuel cut for the predetermined time or longer.

DIAGNOSTIC METHOD

When TWC performance degrade, OSC performance also degrades. A malfunction is detected by diagnosis that estimates OSC performance based on the time and air volume required from the deceleration fuel cut for the predetermined time or longer until the start of increase in the rear oxygen sensor voltage.

Judgment value

Malfunction Criteria	Threshold Value
Oxygen Storage Capacity (OSC) of Catalytic	Less than 0.15 g (0.005 oz)

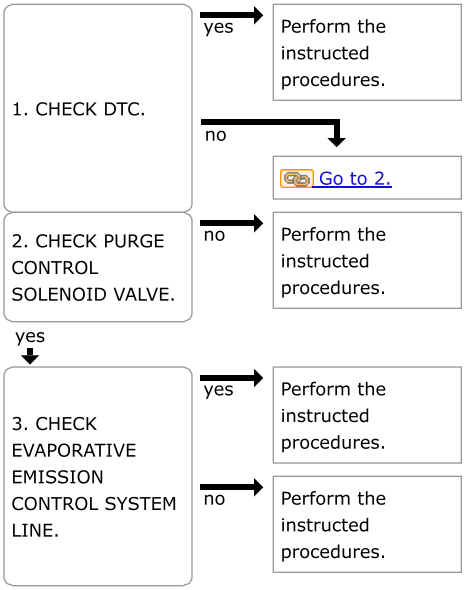
Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Improper idling

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0441 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK PURGE CONTROL SOLENOID VALVE.

Select [CPC Solenoid Valve] in [Active Test] to operate the purge control solenoid valve using the Subaru Select Monitor.

Note:
For detailed operation procedures, refer to the "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.

1. Turn the ignition switch to OFF.
2. Check the evaporative emission control system line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines>INSPECTION.

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect purge flow malfunction before and after purge induction according to a change of the output value of the pressure sensor in the leak check valve assembly.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Integrated purge gas amount since engine starting	23.8 g (0.84 oz)* or more
(Duration of purge control duty ratio = 0% Purge control duty ratio from above)	4000 ms or more Not equal to 0%
Ambient air temperature	More than 4.4 °C (40°F)
Time when the switching valve in the leak check valve assembly is closed	Less than 20 s

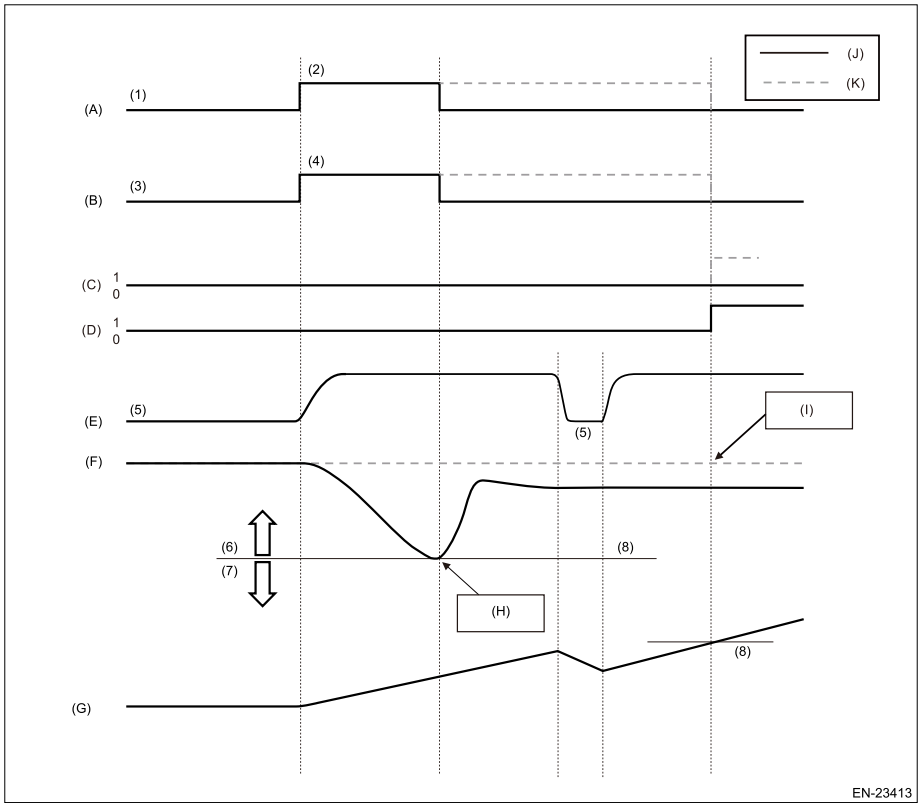
*: It is approximately 2 sec per the integration of purge to reach 1 g (0.04 oz) at vehicle speed of 64.4 km/h (40 MPH).

GENERAL DRIVING CYCLE

Perform the diagnosis only once during ordinary driving.

DIAGNOSTIC METHOD

Close the switching valve in the leak check valve assembly, and close the fuel tank completely, and perform the forced purging. If pressure change amount is 667 Pa (5 mmHg, 0.2 inHg) or less, judge as malfunction of purge flow.



(1) Disable
(2) Enable
(3) Open
(4) Close
(5) 0%
(6) Fail
(7) Pass
(8) Threshold

(A) Monitoring
(B) Evaporative leak system switching valve
(C) Malfunction flag
(D) Molecule
(E) Purge control duty ratio
(F) Evaporative leak system pressure (gauge)
(G) Sum value (Purge gas − Generated evaporating gas)
(H) Pass judgment
(I) Abnormality judgment
(J) Normal
(K) Trouble

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Evaporative leak system pressure (gauge)	More than −400 Pa (3 mmHg, 0.1 inHg)
Integrated purge gas amount	3 g (0.11 oz)* or more

*: It is approximately 2 sec per the integration of purge to reach 1 g (0.04 oz) at vehicle speed of 64.4 km/h (40 MPH).

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Fuel odor
- There is a hole of more than 1 mm (0.04 in) dia. in evaporation system or fuel tank.
- Fuel filler cap loose or lost

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FUEL FILLER CAP.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FUEL FILLER CAP.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK FUEL FILLER CAP.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK PURGE CONTROL SOLENOID VALVE.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.
   - yes → Perform the instructed procedures.
   - no → Go to 6.
6. CHECK CANISTER.
   - yes → Perform the instructed procedures.
   - no → Go to 7.
7. CHECK LEAK CHECK VALVE ASSEMBLY.
   - yes → Perform the instructed procedures.
   - no → Go to 8.

8. CHECK FUEL TANK.	yes →	Perform the instructed procedures.
	no →	Go to 9.
9. CHECK STATUS OF EVAPORATIVE EMISSION CONTROL SYSTEM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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?

Yes	Go to 2.
No	Tighten fuel filler cap securely.

2. CHECK FUEL FILLER CAP.

Check the fuel filler cap.

Is the fuel filler cap genuine?

Yes	Go to 3.
No	Replace with a genuine fuel filler cap.

3. CHECK FUEL FILLER CAP.

Check the gasket of fuel filler cap.

Does the gasket of fuel filler cap have any damage?

Yes	Replace the fuel filler cap. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Filler Cap.
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 check result 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.

Check the evaporative emission control system line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines>INSPECTION.

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.

Check the canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Canister>INSPECTION.

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.

Check the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly>INSPECTION.

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.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

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 STATUS OF EVAPORATIVE EMISSION CONTROL SYSTEM.

Check the condition of evaporative emission control system for other mechanical defects.

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

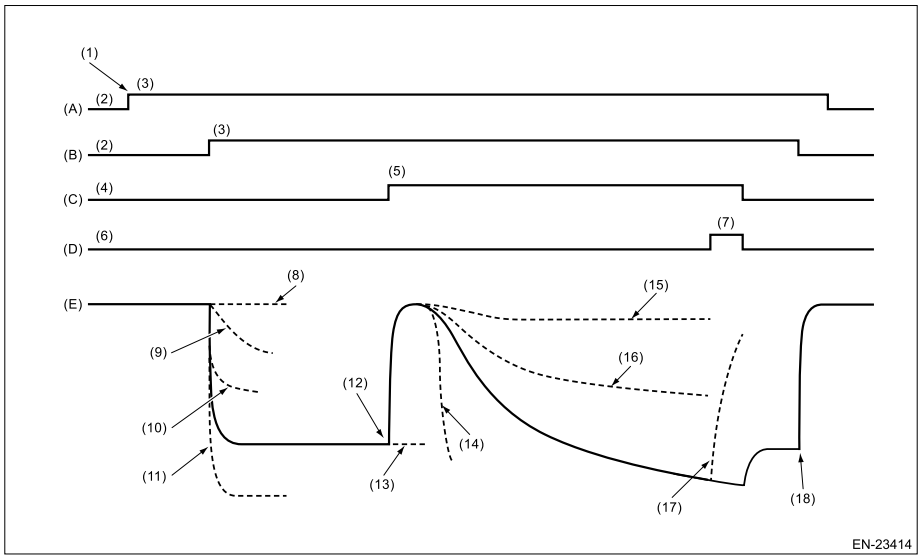
This diagnosis judges whether the leak check valve assembly operation is normal or not, and whether the evaporative emission system has leak and clogging or not.

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, 7 or 9.5 hours passed, ECM is activated by soaking timer, and the leak check starts.
Judges whether the leak check valve assembly 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, diagnosis is performed at elapsed time of 7 hours. When the test conditions are not met in 7 hours, diagnosis is performed 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 • 0.04 inch leak • Fuel cap loose • Fuel cap off • System malfunction
	Very small leak • 0.02 inch leak
Clogging of pipe	—
Check valve	Check valve open stuck

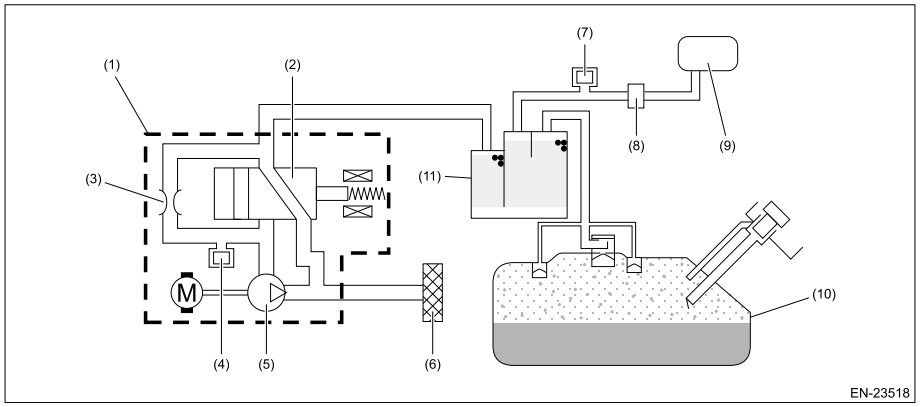
OUTLINE OF DIAGNOSIS



(A) ECM	(C) Switching Valve	(E) ELCM Pressure
(B) Vacuum Pump	(D) Solenoid valve for secondary purge	
(1) 5 hours after ignition switch turned	(7) Open	(13) Vent valve stuck open
(2) OFF	(8) Leak detection pump stuck	(14) Pipe clogging
(3) ON	(9) Vent valve stuck close	(15) Large leak
(4) OFF: Open orifice side	(10) Reference orifice high flow	(16) Very small leak
(5) ON: Close Evap. side	(11) Reference orifice low flow	(17) Check valve stuck open
(6) Close	(12) Pref	(18) Reference pressure (Pref)

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
(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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Activation of soaking timer	Completed
Intake air temperature	4.4 °C (39.9°F) or more
Engine oil temperature	4.4 °C (39.9°F) or more
Engine coolant temperature	4.4 °C (39.9°F) or more and Less than 45°C (113°F)
Accumulated purge amount during previous driving cycle	Value of Map1 or more

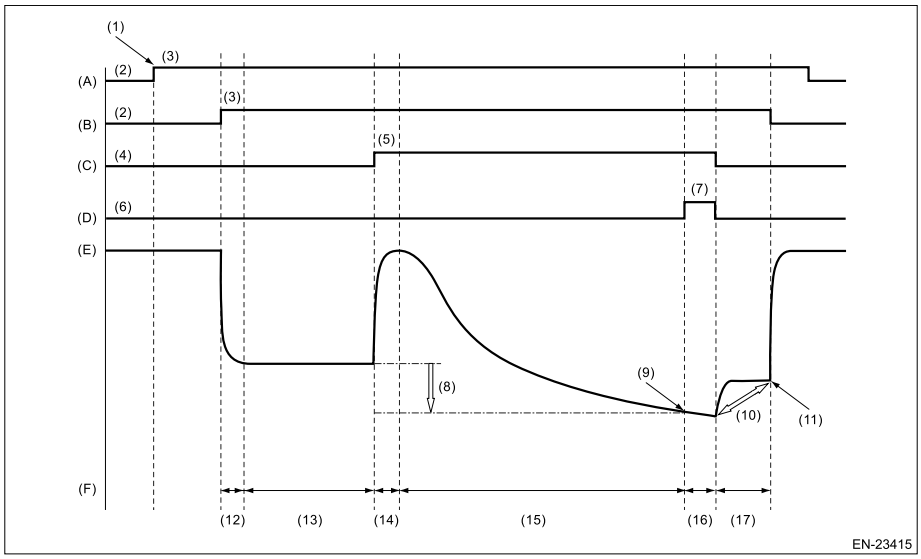
Map1

Engine coolant temperature when ECM is activated after soak time (°C (°F))	**0 (32)**	**25 (77)**	**30 (86)**	**35 (95)**	**40 (104)**	**45 (113)**
Accumulated purge amount during previous driving cycle (g (oz))	160.8 (5.7)	160.8 (5.7)	389.6 (13.7)	618.3 (21.8)	1198.8 (42.3)	1779.3 (62.8)

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)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)>General description>OUTLINE OF DIAGNOSIS.

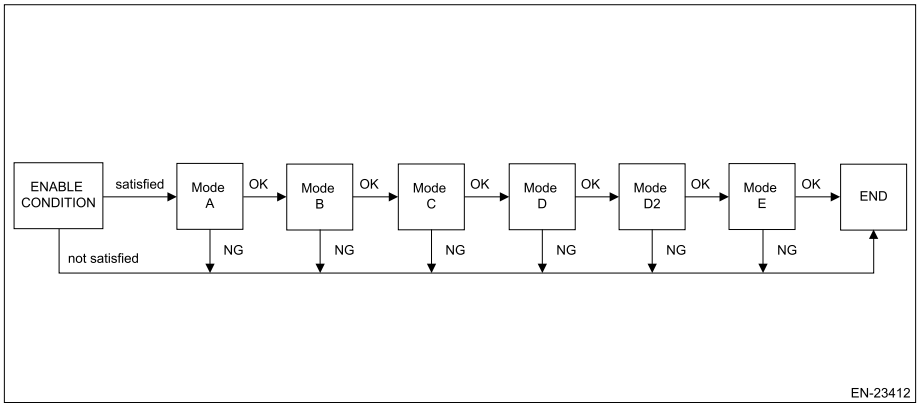
DIAGNOSTIC METHOD



(A) ECM
(B) Vacuum Pump
(C) Switching Valve
(D) Solenoid valve for secondary purge
(E) Pressure Sensor
(F) Mode

(1) Activated by soak timer
(2) OFF
(3) ON
(4) OFF: Open orifice side
(5) ON: Close Evap. side
(6) Close
(7) Open
(8) Evap. System target pressure calculation
(9) Tank pressure (P tank)
(10) Judge the leak is occurred or not by comparing the pressures.
(11) Reference pressure (P ref)
(12) Mode A
(13) Mode B
(14) Mode C
(15) Mode D
(16) Mode D2
(17) Mode E

Mode	Explanation of Mode	DTC	Diagnosis period
A	Vacuum pump operation confirmation and characteristics stability	P2404	7 s or less
B	Measurement of reference pressure for setting the target negative pressure	P2404	350 s or less
C	Switching valve operation confirmation	P2404	12 s or less
D	Clogging of pipe diagnosis and leak pressure measurement	P1451	1100 s or less
D2	Check valve open stuck	P04AE	30 s or less
E	0.04 inch leak pressure measurement	P0455	50 s or less
	0.02 inch leak pressure measurement	P0456	
	Reference pressure measurement for judgment	P2401	



<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	More than −0.22 kPa (−1.7 mmHg, −0.1 inHg)	P2404

<Mode B (measurement of reference pressure for setting the target negative pressure)>

Diagnosis 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value	DTC
|Pressure sensor maximum output value − Pressure sensor minimum output value|	More than 0.49 kPa (3.7 mmHg, 0.1 inHg)	P2404

Diagnosis 2 and 3

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 (diagnosis 2)

Malfunction Criteria	Threshold Value	DTC
Reference pressure for setting the target negative pressure	Less than value of Map2	P2404

Map2

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))	−3.97 (−30, −1.2)	−4.08 (−31, −1.2)	−4.19 (−31, −1.2)	−4.29 (−32, −1.3)

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value	DTC
Reference pressure for judgment	More than value of Map3	P2404

Map3

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))	−0.94 (−7.1, −0.3)	−1.05 (−7.9, −0.3)	−1.16 (−8.7, −0.3)	−1.26 (−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	Less than 0.22 kPa (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 (clogging of pipe and leak pressure measurement)

Malfunction Criteria	Threshold Value	DTC
Time required to reach to the target negative pressure	31 s or less	P1451

Judgment value (check valve open stuck)

Malfunction Criteria	Threshold Value	DTC
Reference pressure for judgment of the target negative pressure	More than −0.18 kPa (−1.4 mmHg, −0.1 inHg)	P04AE

Judgment value (large leak)

Malfunction Criteria	Threshold Value	DTC
Leak pressure	Value of Map4 or more	P0455

Judgment value (very small leak)

Malfunction Criteria	Threshold Value	DTC
Leak pressure	More than 0.018 inch reference pressure and Less than value of Map4	P0456

Map4

Reference pressure (Pa)	**−4856**	**−4000**	**−2750**	**−1500**	**−824**
Threshold Value (Pa)	−1785	−1463	−991	−520	−265

Formula for threshold value = Reference pressure × 0.377 − 0.341

<Mode E (Measurement of reference pressure for judgment)>

Diagnosis 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value	DTC
|Pressure sensor maximum output value − Pressure sensor minimum output value|	More than 0.49 kPa (3.7 mmHg, 0.1 inHg)	P2404

Diagnosis 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 value (diagnosis 2)

Malfunction Criteria	Threshold Value	DTC
Reference pressure for judgment	Less than value of Map5 Or, More than value of Map6	P2404

Map5

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))	−4.54 (−34.1, −1.3)	−4.64 (−34.8, −1.4)	−4.75 (−35.6, −1.4)	−4.86 (−36.5, −1.4)

Map6

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))	−0.82 (−6.15, −0.2)	−0.93 (−6.98, −0.3)	−1.04 (−7.8, −0.3)	−1.14 (−8.55, −0.3)

Diagnosis 3

Purpose: Judge the presence of evaporative emission system leak.

Judge as NG when the following conditions are established.

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value	DTC
|Reference pressure for setting the target negative pressure − Reference pressure for judgment|	More than 0.94 kPa (7.1 mmHg, 0.3 inHg)	P2404

Time needed for diagnosis: 27 min

Confirm the malfunction at next engine start.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)

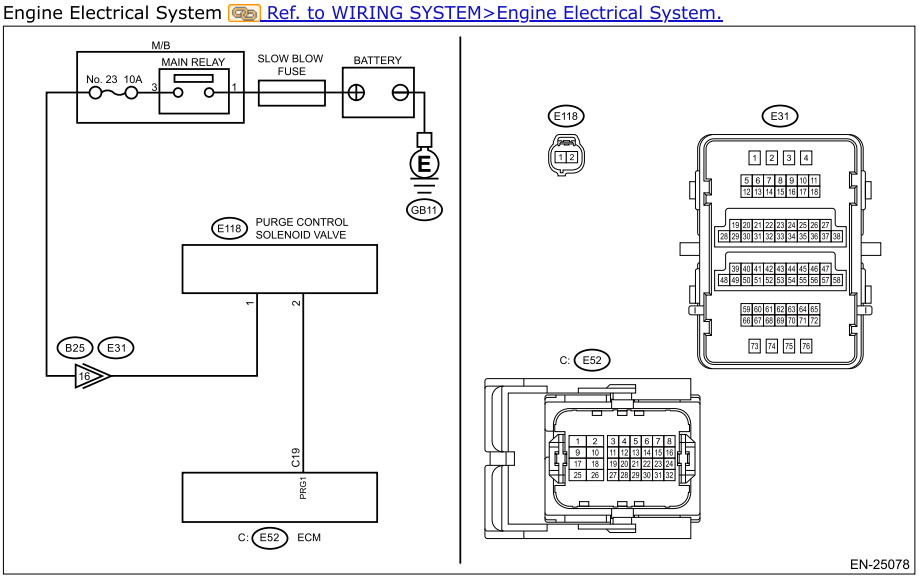
Note:

For the diagnostic procedure and 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).

DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK OUTPUT SIGNAL OF ECM.	no	Go to 3.
yes ↓		
2. CHECK FOR POOR CONTACT.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.
3. CHECK POWER SUPPLY FOR PURGE CONTROL SOLENOID VALVE CONNECTOR.	no	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (SHORT TO GROUND).	no	Perform the instructed procedures.

yes

5. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes

6. CHECK PURGE CONTROL SOLENOID VALVE.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

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
   (E52) No. 19 (+) — 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 FOR PURGE CONTROL SOLENOID VALVE CONNECTOR.

Measure the voltage between purge control solenoid valve connector and engine ground.
Connector & terminal
(E118) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the following item. • Open circuit or short circuit to ground of harness between M/B and purge control solenoid valve connector • Poor contact of coupling connector • Blown out of fuse

4. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the purge control solenoid valve.
4. Measure the resistance between the purge control solenoid valve connector and engine ground.
   Connector & terminal
   (E118) 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 purge control solenoid valve connector.

5. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (OPEN).

Measure the resistance of harness between ECM connector and purge control solenoid valve connector.
Connector & terminal
(E52) No. 19 — (E118) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and purge control solenoid valve connector.

6. CHECK PURGE CONTROL SOLENOID VALVE.

1. Remove the purge control solenoid valve.
2. Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve>INSPECTION.

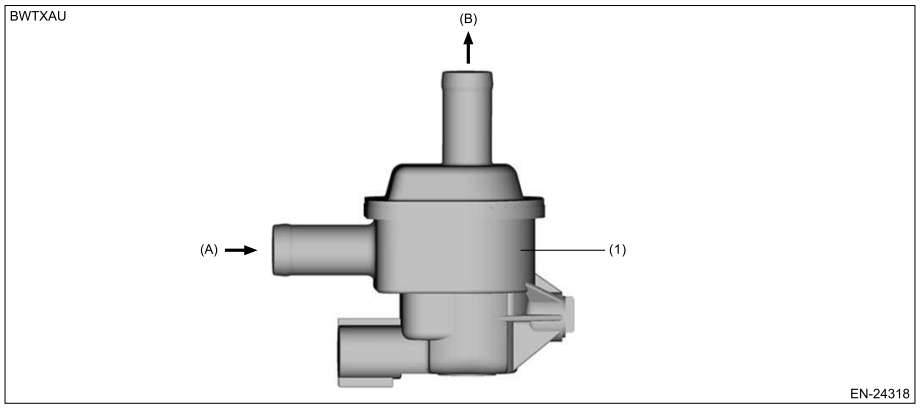
Is the check result OK?

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)(H4DOTC)>Purge Control Solenoid Valve.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) IN (B) OUT

(1) Purge control solenoid valve

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Purge control solenoid valve control duty	80% or less

GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

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 V or less
Or,	
Output voltage Output current	More than 2.3 V Less than 0.03 mA

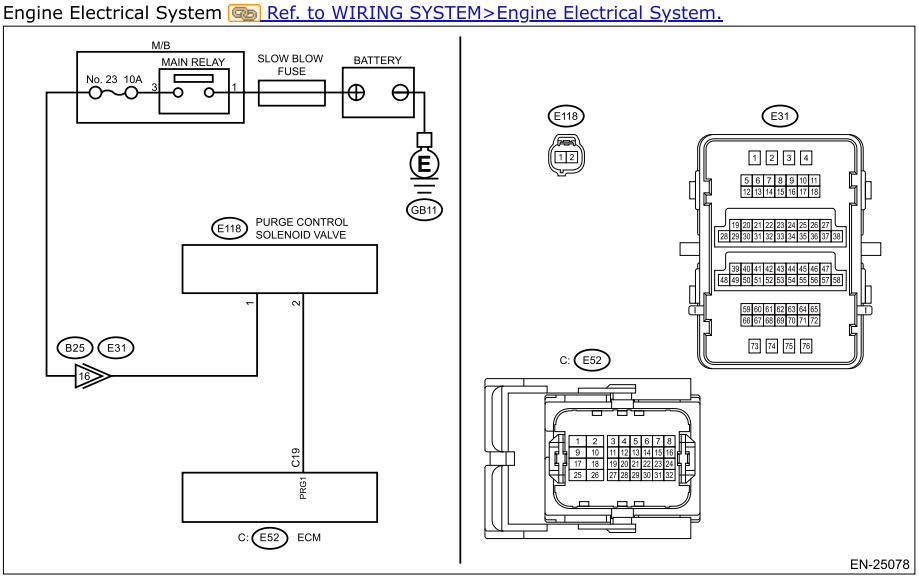
Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK PURGE CONTROL SOLENOID VALVE.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the purge control solenoid valve.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E52) No. 19 (+) — Engine 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. Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

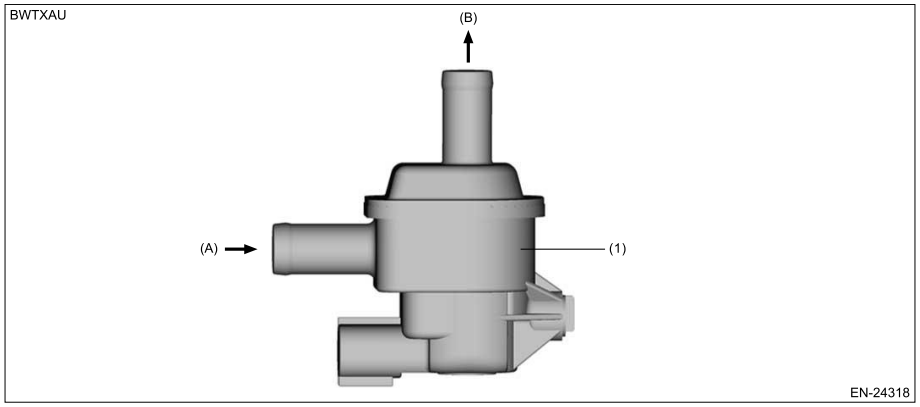
Yes	Repair the poor contact of ECM connector.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of purge control solenoid valve.
Judge as NG when the ECM output level differs from the actual terminal level.

COMPONENT DESCRIPTION



(A) IN (B) OUT

(1) Purge control solenoid valve

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Purge control solenoid valve control duty	20% or more

GENERAL DRIVING CYCLE

Always perform the diagnosis after starting the engine.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

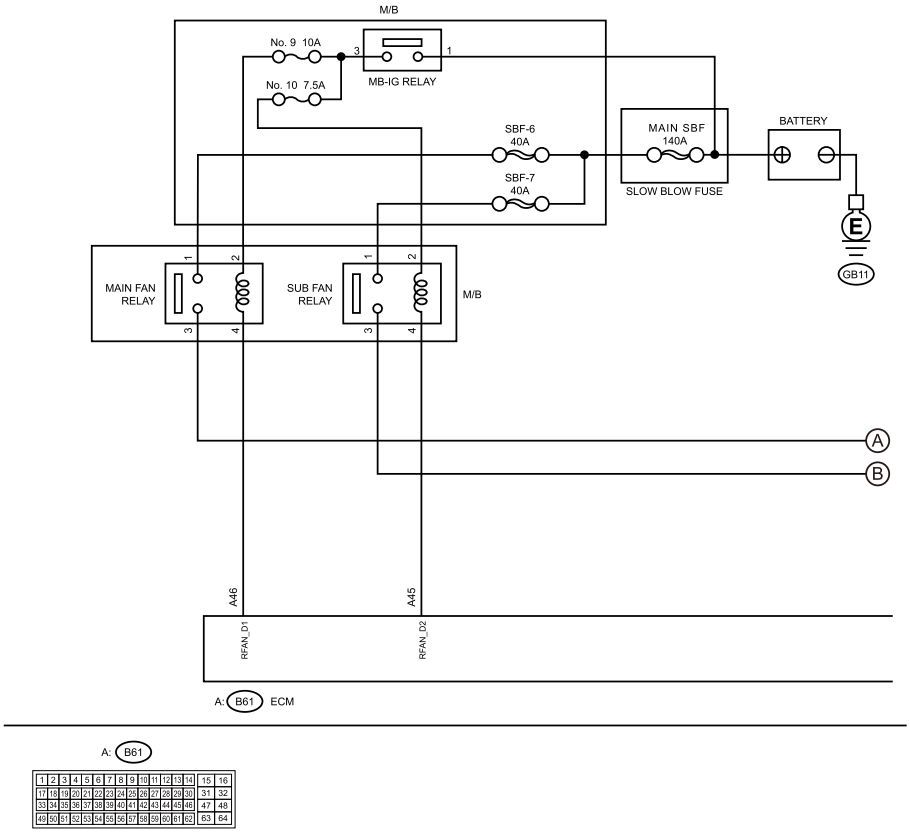
Malfunction Criteria	Threshold Value
Output current	15.2 A or more

Time needed for diagnosis: 220 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

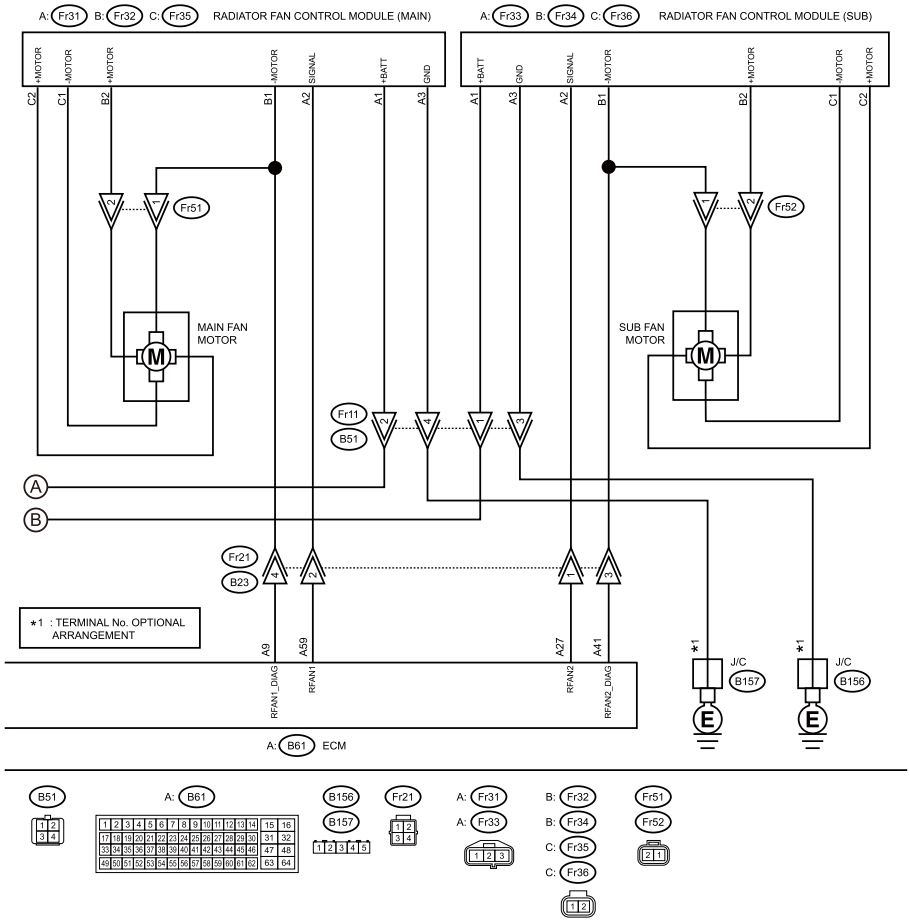
DTC P0480 FAN 1 CONTROL CIRCUIT

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
The radiator fan keeps rotating.
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



EN-25079



EN-25080

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS OF RADIATOR MAIN FAN DIAGNOSTIC SIGNAL (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK HARNESS OF RADIATOR MAIN FAN DIAGNOSTIC SIGNAL (SHORT TO GROUND).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK MAIN FAN RELAY.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL MODULE (MAIN).
→ no → Perform the instructed procedures.

yes ↓

5. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL MODULE (MAIN).
→ no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS OF ECM AND RADIATOR FAN CONTROL UNIT (MAIN) (SHORT TO POWER SUPPLY).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK HARNESS OF RADIATOR MAIN FAN DIAGNOSTIC SIGNAL (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the main fan motor.
4. Disconnect the connector from radiator fan control module (main).
5. Measure the resistance between ECM connector and main fan motor connector.
   Connector & terminal
   (B61) No. 9 — (Fr51) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 2.

No — Repair the following item.
- Open circuit in harness between ECM connector and main fan motor connector
- Poor contact of coupling connector

2. CHECK HARNESS OF RADIATOR MAIN FAN DIAGNOSTIC SIGNAL (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(B61) No. 9 (+) — 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 fan motor or radiator fan control module (main) connector.

3. CHECK MAIN FAN RELAY.

1. Remove the main fan relay from M/B.
2. Check the main fan relay. Ref. to COOLING(H4DOTC)>Radiator Fan Relay>INSPECTION.

Is the check result OK?

Yes	Go to 4.
No	Replace the main fan relay. Ref. to COOLING(H4DOTC)>Radiator Fan Relay.

4. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL MODULE (MAIN).

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between the main fan relay and engine ground.
   Terminals
   No. 1 (+) — Engine ground (−):
   No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B and main fan relay • Blown out of fuse • Poor contact of MB-IG relay

5. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL MODULE (MAIN).

1. Turn the ignition switch to OFF.
2. Install the main fan relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between radiator fan control module (main) connector and engine ground.
   Connector & terminal
   (Fr32) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Repair the following item. • Open circuit or short circuit to ground in harness between the main fan relay and radiator fan control module (main) connector • Open circuit or short circuit to ground in harness between the main fan relay and ECM connector • Poor contact of coupling connector • Poor contact of main fan relay

6. CHECK HARNESS OF ECM AND RADIATOR FAN CONTROL UNIT (MAIN) (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 59 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the power supply short circuit of harness between ECM and radiator fan control unit (main) connector.
No	Replace the radiator fan control module (main). Ref. to COOLING(H4DOTC)>Radiator Fan Control Unit.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the radiator fan ON stuck malfunction when the radiator fan command duty is 0% or when the actual duty equal to or more than predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
(Radiator fan command time)	OFF 5 s or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

DIAGNOSTIC METHOD
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value

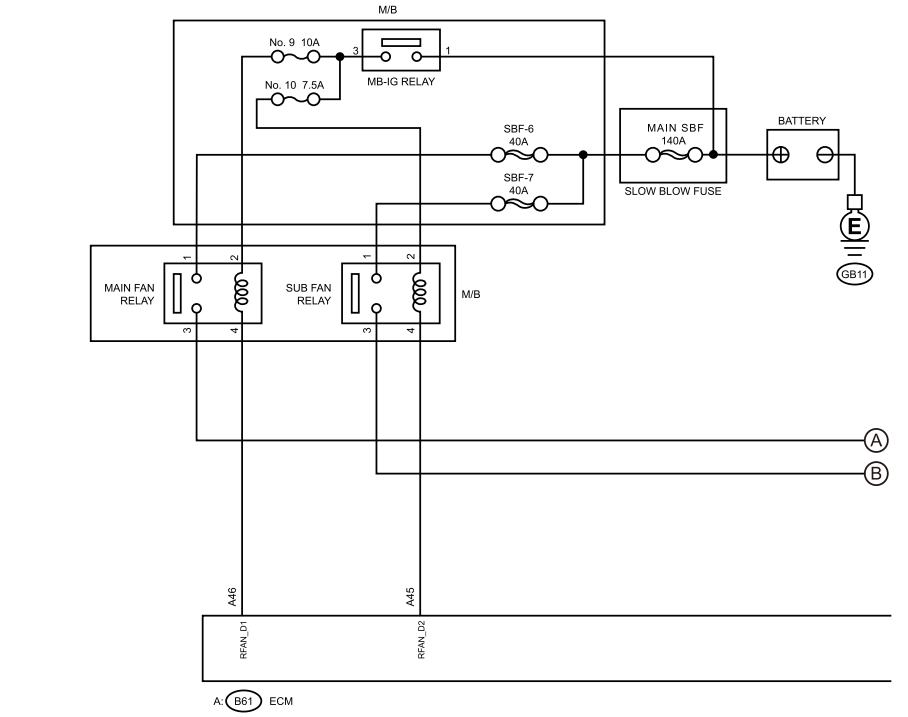
Malfunction Criteria	Threshold Value
Radiator fan duty monitor	1% or more

Time needed for diagnosis: 2520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0481 FAN 2 CONTROL CIRCUIT

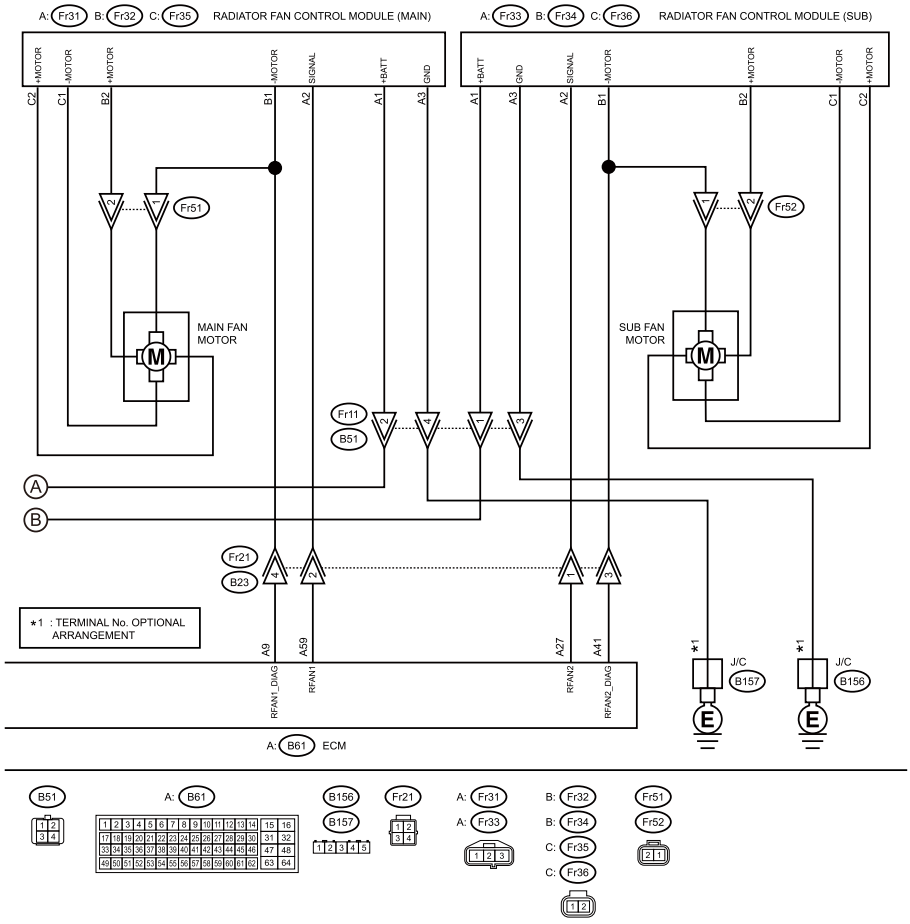
1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
The radiator fan keeps rotating.
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



A: B61

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
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64



EN-25080

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS OF RADIATOR SUB FAN DIAGNOSTIC SIGNAL (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK HARNESS OF RADIATOR SUB FAN DIAGNOSTIC SIGNAL (SHORT TO GROUND).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK SUB FAN RELAY.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL UNIT (SUB). → no → Perform the instructed procedures.

yes ↓

5. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL UNIT (SUB). → no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS OF ECM AND RADIATOR FAN CONTROL UNIT (SUB) (SHORT TO POWER SUPPLY).
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK HARNESS OF RADIATOR SUB FAN DIAGNOSTIC SIGNAL (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the sub fan motor.
4. Disconnect the connector from radiator fan control module (sub).
5. Measure the resistance between ECM connector and sub fan motor connector.

Connector & terminal

(B61) No. 41 — (Fr52) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 2.

No — Repair the following item.
- Open circuit in harness between ECM connector and sub fan motor connector
- Poor contact of coupling connector

2. CHECK HARNESS OF RADIATOR SUB FAN DIAGNOSTIC SIGNAL (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 41 (+) — 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 sub fan motor or radiator fan control unit (sub) connector.

3. CHECK SUB FAN RELAY.

1. Remove the sub fan relay from M/B.
2. Check the sub fan relay. Ref. to COOLING(H4DOTC)>Radiator Fan Relay>INSPECTION.

Is the check result OK?

Yes	Go to 4.
No	Replace the sub fan relay. Ref. to COOLING(H4DOTC)>Radiator Fan Relay.

4. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL UNIT (SUB).

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between the sub fan relay and engine ground.
   Terminals
   No. 1 (+) — Engine ground (−):
   No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B and sub fan relay • Blown out of fuse • Poor contact of MB-IG relay

5. CHECK POWER SUPPLY FOR RADIATOR FAN CONTROL UNIT (SUB).

1. Turn the ignition switch to OFF.
2. Install the sub fan relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between radiator fan control unit (sub) connector and engine ground.
   Connector & terminal
   (Fr33) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Repair the following item. • Open circuit or short circuit to ground in harness between the sub fan relay and radiator fan control module (sub) connector • Open circuit or short circuit to ground in harness between the sub fan relay and ECM connector • Poor contact of coupling connector • Poor contact of sub fan relay

6. CHECK HARNESS OF ECM AND RADIATOR FAN CONTROL UNIT (SUB) (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 27 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the power supply short circuit of harness between ECM and radiator fan control unit (sub) connector.
No	Replace the radiator fan control module (sub). Ref. to COOLING(H4DOTC)>Radiator Fan Control Unit.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0480. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0480 FAN 1 CONTROL CIRCUIT.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P04AE EVAP SYSTEM PURGE CONTROL VALVE "B" PERFORMANCE/STUCK OPEN

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:

- Improper idling
- Fuel odor

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FUEL FILLER CAP.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK FUEL FILLER CAP.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK FUEL FILLER CAP.	yes →	Perform the instructed procedures.
	no ↓	Go to 4.
4. CHECK CHECK VALVE 1 AND 2.	no →	Perform the instructed procedures.
yes ↓		
5. CHECK PIPES.	no →	Perform the instructed procedures.
yes ↓		

6. CHECK PURGE CONTROL SOLENOID VALVE.
→ no → Perform the instructed procedures.
yes ↓

7. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.
→ yes → Perform the instructed procedures.
↓ no → Go to 8.

8. CHECK CANISTER.
→ yes → Perform the instructed procedures.
↓ no → Go to 9.

9. CHECK LEAK CHECK VALVE ASSEMBLY.
→ yes → Perform the instructed procedures.
↓ no → Go to 10.

10. CHECK FUEL TANK.
→ yes → Perform the instructed procedures.
↓ no → Go to 11.

11. CHECK STATUS OF EVAPORATIVE EMISSION CONTROL SYSTEM.
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

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?

Yes	Go to 2.
No	Tighten fuel filler cap securely.

2. CHECK FUEL FILLER CAP.

Check the fuel filler cap.

Is the fuel filler cap genuine?

Yes	Go to 3.
No	Replace with a genuine fuel filler cap.

3. CHECK FUEL FILLER CAP.

Check the gasket of fuel filler cap.

Does the gasket of fuel filler cap have any damage?

Yes	Replace the fuel filler cap. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Filler Cap.
No	Go to 4.

4. CHECK CHECK VALVE 1 AND 2.

Check the check valve 1 and 2. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve>INSPECTION.

Is the check result OK?

Yes	Go to 5.
No	Replace the defective check valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

5. CHECK PIPES.

Check that there is no dislocation and damage in the pipes between purge control solenoid valve and check valve 1 and between purge control solenoid valve and check valve 2. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT.

Is the check result OK?

Yes	Go to 6.
No	Repair or replace faulty parts. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

6. 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 check result OK?

Yes	Go to 7.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

7. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Check the evaporative emission control system line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines.

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 8.

8. CHECK CANISTER.

Check the canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Canister>INSPECTION.

Are there holes on the canister?

Yes — Replace the canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Canister.

No — Go to 9.

9. CHECK LEAK CHECK VALVE ASSEMBLY.

Check the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly>INSPECTION.

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 10.

10. CHECK FUEL TANK.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

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 11.

11. CHECK STATUS OF EVAPORATIVE EMISSION CONTROL SYSTEM.

Check the condition of evaporative emission control system for other mechanical defects.

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

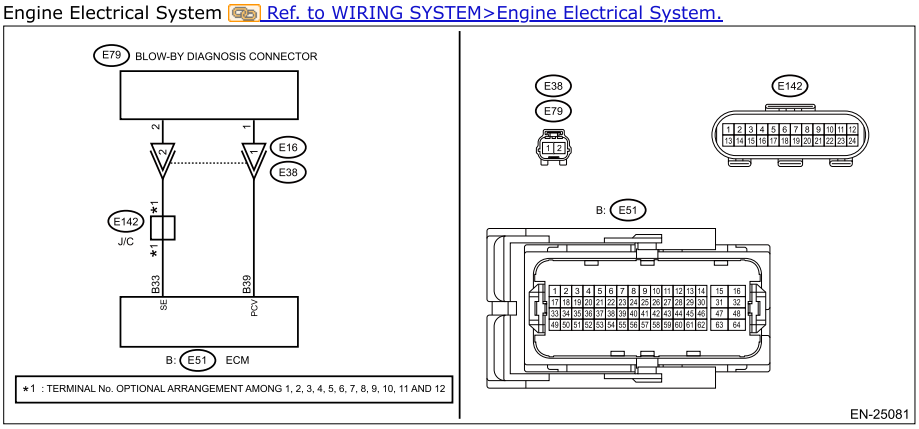
Note:

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).

DTC P04DB CRANKCASE VENTILATION SYSTEM (PCV) DISCONNECTED

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK BLOW-BY HOSE.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND BLOW-BY DIAGNOSIS CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND BLOW-BY DIAGNOSIS CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK PCV HOSE ASSEMBLY.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK BLOW-BY HOSE.

Check the blow-by hose condition.

Is there any disconnection or crack in blow-by hose?

Yes	Install or replace the blow-by hose.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND BLOW-BY DIAGNOSIS CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from blow-by diagnosis connector.
4. Measure the resistance of harness between ECM connector and blow-by diagnosis connector.

Connector & terminal

(E51) No. 39 — (E79) No. 1:

(E51) No. 33 — (E79) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the following item. • Open circuit in harness between ECM connector and blow-by diagnosis connector • Poor contact of coupling connector • Poor contact of J/C

3. CHECK HARNESS BETWEEN ECM AND BLOW-BY DIAGNOSIS CONNECTOR (SHORT TO GROUND).

Measure the resistance between the blow-by diagnosis connector and engine ground.

Connector & terminal

(E51) No. 33 — Engine ground:

(E51) No. 39 — Engine 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 blow-by diagnosis connector.

4. CHECK PCV HOSE ASSEMBLY.

Measure the resistance between blow-by diagnosis connector terminals.

Terminals

No. 1 — No. 2:

Is the resistance less than 1 Ω?

Yes	Repair the poor contact of ECM and blow-by diagnosis connector.
No	Replace the PCV hose assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose Assembly.

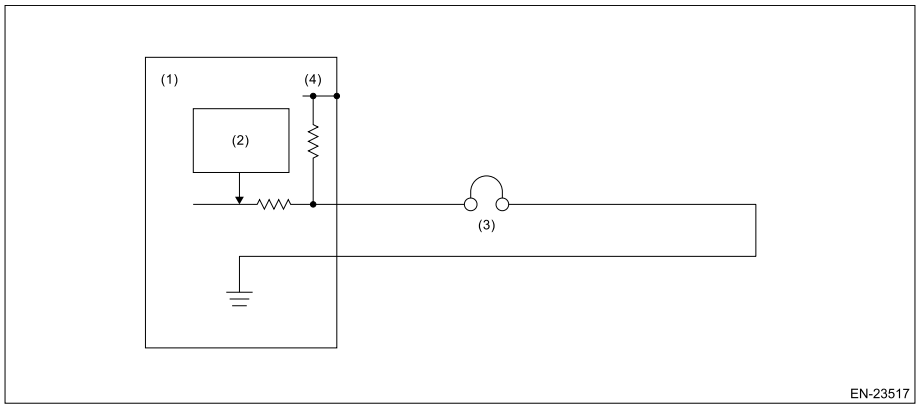
GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the blow-by hose disconnection abnormality.

Judge as NG when the diagnosis terminal voltage is high.

COMPONENT DESCRIPTION



(1) Engine control module (ECM) (3) Blow-by diagnosis connector (4) 5 V
(2) Detecting circuit

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	3.59 V or more

Time needed for diagnosis: 2500 ms

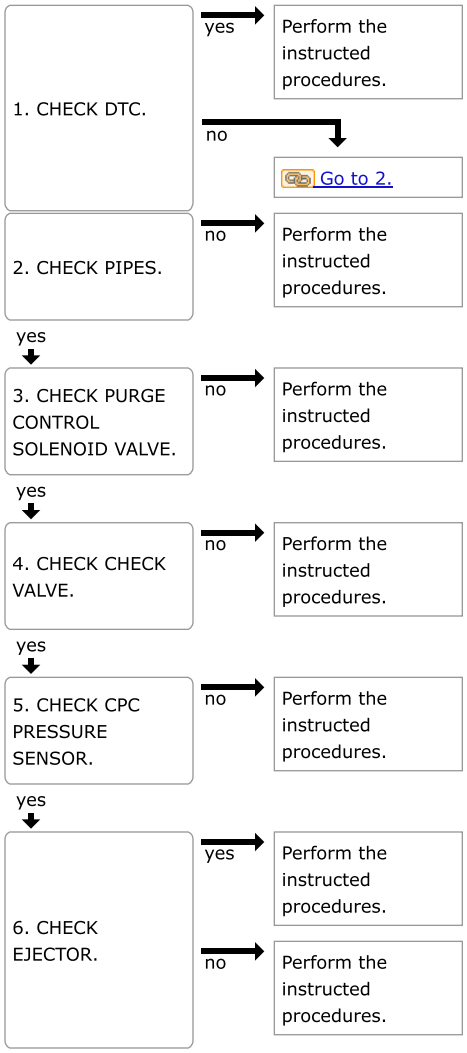
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P04F0 EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Fuel odor

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P04F0 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PIPES.

1. Turn the ignition switch to OFF.
2. Check for disconnection or damage in the following pipes. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT.
   - Between leak check valve assembly and purge control solenoid valve
   - Between purge control solenoid valve and check valve No. 2
   - Between check valve No. 2 and intake duct No. 1

Is the check result OK?

Yes	Go to 3.
No	Repair or replace faulty parts. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

3. CHECK PURGE CONTROL SOLENOID VALVE.

Check that the purge control solenoid valve has no open or close stuck. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

Is the check result OK?

Yes	Go to 4.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

4. CHECK CHECK VALVE.

Check the check valves No. 1 and No. 2 for stuck. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

Is the check result OK?

Yes	Go to 5.
No	Replace the check valve No. 1 or No. 2. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

5. CHECK CPC PRESSURE SENSOR.

Check the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC Pressure Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 6.
No	Replace the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC Pressure Sensor.

6. CHECK EJECTOR.

Check the ejector mechanism of the intake duct No. 1 for clogging and breakage. Ref. to INTAKE (INDUCTION)(H4DOTC)>Intake Duct.

Is the check result OK?

Yes	End.
No	Replace the intake duct No. 1 with ejector. Ref. to INTAKE (INDUCTION)(H4DOTC)>Intake Duct.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

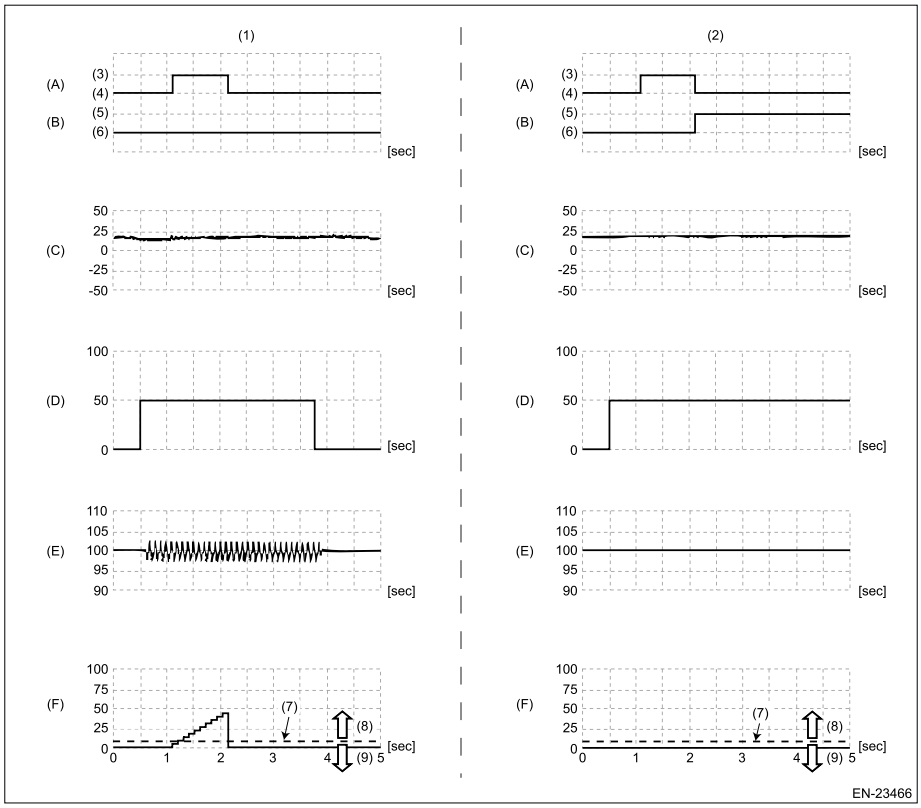
When a negative pressure is generated in the ejector mechanism of the intake manifold or the intake duct No. 1, the purge control solenoid valve performs opening/closing operation.

As a result, pressure pulsation occurs in the CPC pressure sensor area.

If pressure pulsation does not occur and the monitoring value (integral of pressure fluctuation) has not reached the threshold value, ECM judges that it is malfunctioning.

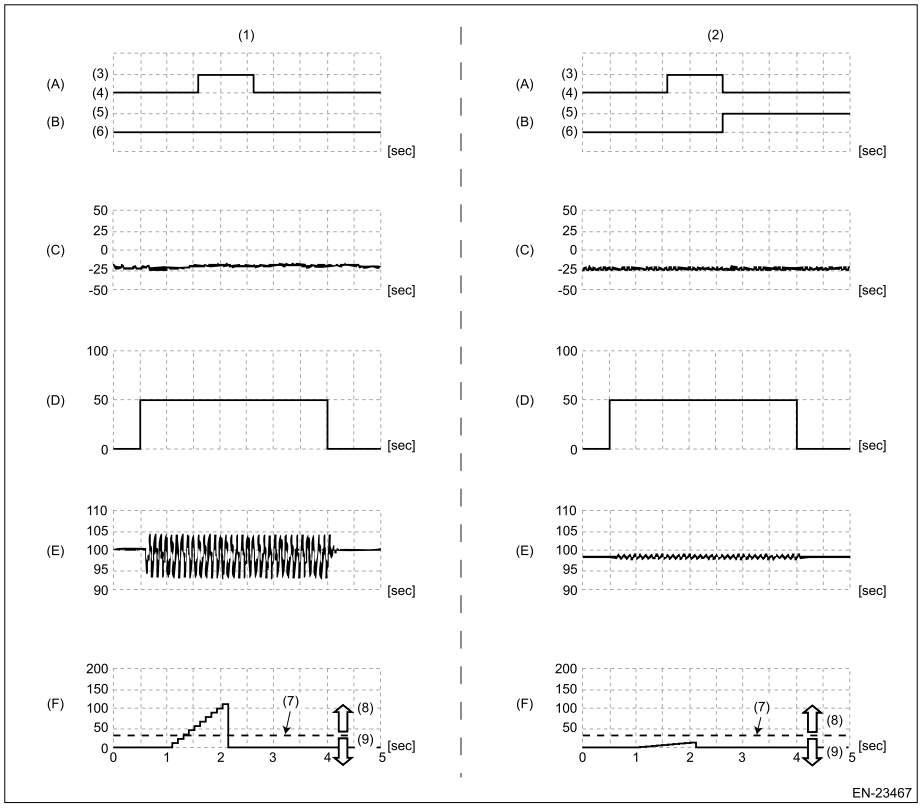
The monitor of P04F1 is executed when the intake manifold is at negative pressure, and when the pressure rises and the ejector mechanism functions, the monitoring of P04F0 is executed.

High pressure side pressure system (P04F0)



(A) Monitor	(C) Intake manifold gauge pressure (kPa)	(E) Purge line pressure (kPa)
(B) Fail flag	(D) Purge control valve commanded DUTY (%)	(F) Monitoring value (integration of pressure variation)
(1) Normal Condition	(4) Disable	(7) Threshold
(2) Malfunction Condition	(5) Malfunction not detected	(8) Pass
(3) Enable	(6) Malfunction detected	(9) Fail

Low pressure side pressure system (P04F1)



(A) Monitor
(B) Fail flag
(C) Intake manifold gauge pressure (kPa)
(D) Purge control valve commanded DUTY (%)
(E) Purge line pressure (kPa)
(F) Monitoring value (integration of pressure variation)

(1) Normal Condition
(2) Malfunction Condition
(3) Enable
(4) Disable
(5) Malfunction not detected
(6) Malfunction detected
(7) Threshold
(8) Pass
(9) Fail

EXECUTION CONDITION

P04F0

Secondary parameters	Execution condition
<High pressure side pressure system>	
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Intake manifold absolute pressure − Barometric pressure	30.05 kPa (225.4 mmHg, 8.9 inHg) or more
Ambient air temperature	More than 4.4 °C (39.9°F)
Purge control duty ratio	40% or more
Elapsed time after the switching valve in the leak check valve assembly opened	4 s or more

P04F1

Secondary parameters	Execution condition
<Low pressure side pressure system>	
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Barometric pressure − Intake manifold absolute pressure	25.05 kPa (187.9 mmHg, 7.4 inHg) or more
Estimated ejector generation negative pressure	1.5 kPa (11.3 mmHg, 0.4 inHg) or less
Ambient air temperature	More than 4.4 °C (39.9°F)
Purge control duty ratio	40% or more
Elapsed time after the switching valve in the leak check valve assembly opened	4 s or more

GENERAL DRIVING CYCLE

Perform the diagnosis only once after starting the engine.

DIAGNOSTIC METHOD

When the purge control solenoid valve is duty controlled in the boost region where negative pressure is generated in the intake manifold, negative pressure reaches the CPC pressure sensor as pulsation.

ECM integrates the amount of change of the pulsation, judges as OK when it is equal to or more than the predetermined value, and judges as NG when it is less than the predetermined value.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
<High pressure side pressure system> Pressure pulsation valve	Less than value of Map1	P04F0
<Low pressure side pressure system> Pressure pulsation valve	Less than value of Map2	P04F1

Map1

Atmospheric pressure (kPa (mmHg, inHg))	70 (525.1, 20.7)	80 (600.2, 23.6)	90 (675.2, 26.6)	100 (750.2, 29.5)	110 (825.2, 32.5)
Purge pulsation pressure (kPa (mmHg, inHg))	5.31 (39.8, 1.6)	6.38 (47.9, 1.9)	7.44 (55.8, 2.2)	8.5 (63.8, 2.5)	8.5 (63.8, 2.5)

Map2

Atmospheric pressure (kPa (mmHg, inHg))	70 (525.1, 20.7)	80 (600.2, 23.6)	90 (675.2, 26.6)	100 (750.2, 29.5)	110 (825.2, 32.5)
Purge pulsation pressure (kPa (mmHg, inHg))	25.05 (187.9, 7.4)	26.7 (200.3, 7.9)	28.35 (212.7, 8.4)	30 (225.1, 8.9)	30 (225.1, 8.9)

Time needed for diagnosis: 1620 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P04F1 EVAP SYSTEM LOW PRESSURE PURGE LINE PERFORMANCE

1. —

DTC detecting condition:

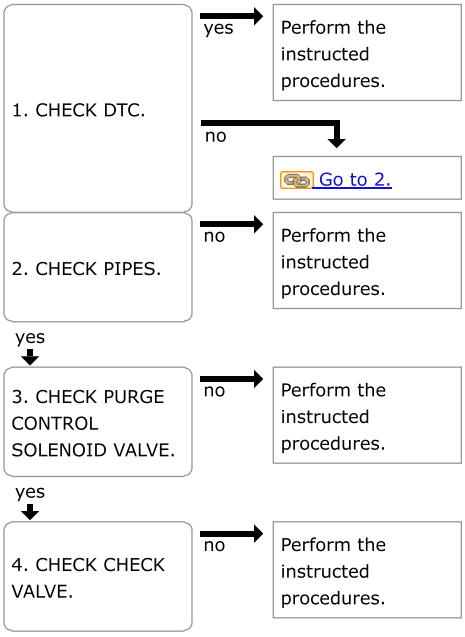
Detected when two consecutive driving cycles with fault occur.

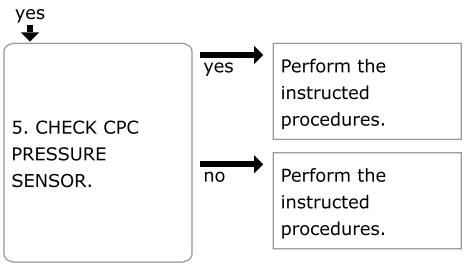
Trouble symptom:

Fuel odor

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.





1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P04F1 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PIPES.

1. Turn the ignition switch to OFF.
2. Check for disconnection or damage in the following pipes. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT.
   - Between leak check valve assembly and purge control solenoid valve
   - Between purge control solenoid valve and check valve No. 1
   - Between check valve No. 2 and intake manifold

Is the check result OK?

Yes	Go to 3.
No	Repair or replace faulty parts. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

3. CHECK PURGE CONTROL SOLENOID VALVE.

Check that the purge control solenoid valve has no open or close stuck. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

Is the check result OK?

Yes	Go to 4.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

4. CHECK CHECK VALVE.

Check the check valve No. 1 for close stuck. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

Is the check result OK?

Yes	Go to 5.
No	Replace the check valve No. 1. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Check Valve.

5. CHECK CPC PRESSURE SENSOR.

Check the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC Pressure Sensor>INSPECTION.

Is the check result OK?

Yes	End.
No	Replace the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC Pressure Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P04F0. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P04F0 EVAP SYSTEM HIGH PRESSURE PURGE LINE (CPC2) PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC OF Brake Control.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC OF Brake Control.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Brake Control] displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Repair the poor contact of ECM connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Judge as NG when outside of the judgment value.

Judge NG when the received data from VDC control module and hydraulic control unit is abnormal vehicle speed, and the vehicle speed data is impossible.

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

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
Speed of front wheels received from VDC control module & hydraulic control unit	300 km/h (186.4 MPH) or more

Time needed for diagnosis: 2560 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED

1. —

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 stall

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK AIR CLEANER ELEMENT.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK ELECTRONIC THROTTLE CONTROL.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0506 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.
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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0507. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED.

DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Engine keeps running at higher speed than specified idle speed.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK AIR INTAKE SYSTEM.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK ELECTRONIC THROTTLE CONTROL.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0507 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK AIR INTAKE SYSTEM.

1. Start and idle the engine.
2. Check the following items. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT.
   - Loose installation of intake manifold and electronic throttle control
   - Cracks of intake manifold gasket and electronic throttle control 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.
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.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Lambda value (left and right)	0.85 or more and Less than 1.15
Vehicle speed	0 km/h (0 MPH)
Elapsed time after gear position change (P ←→ D or N ←→ D)	5000 ms or more
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

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
Actual engine speed − Target engine speed	Less than −100 rpm	P0506
Actual engine speed − Target engine speed	More than 200 rpm	P0507

Time needed for diagnosis: 15 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE

1. —

DTC detecting condition:

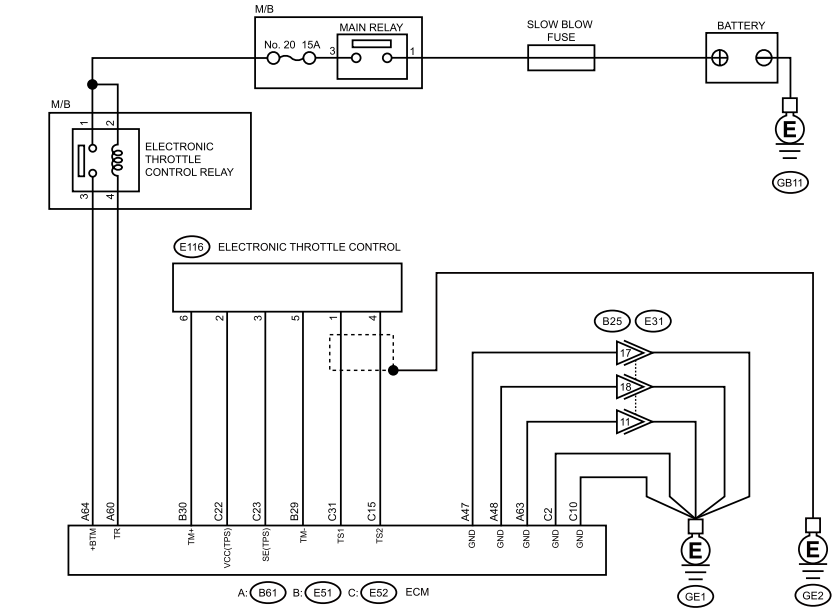
Detected when two consecutive driving cycles with fault occur.

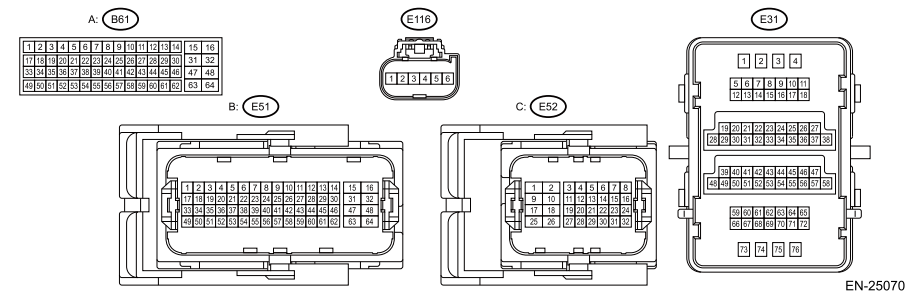
Trouble symptom:

- Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- Engine stall

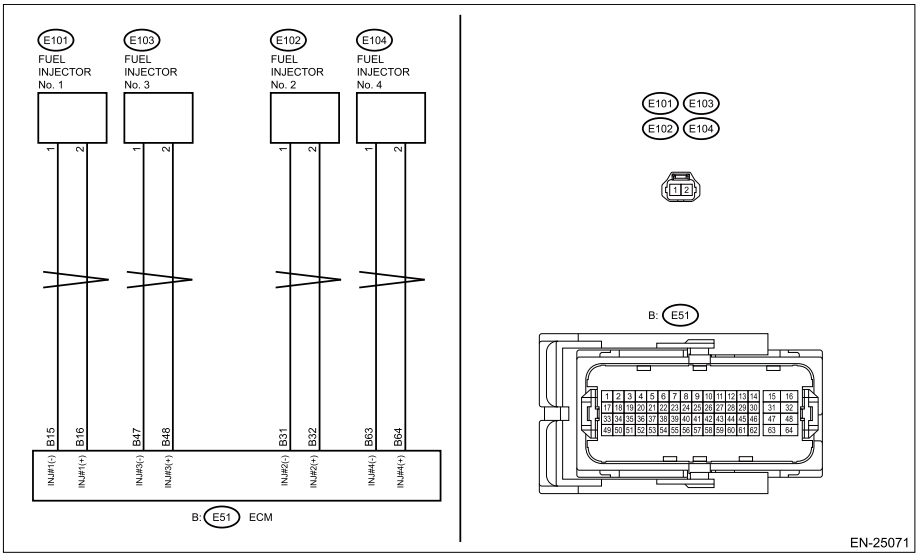
Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





EN-25070



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ENGINE OIL.
   - no → Perform the instructed procedures.

   yes ↓
3. CHECK EXHAUST SYSTEM.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK AIR INTAKE SYSTEM.
   - yes → Perform the instructed procedures.
   - no → Go to 5.
5. CHECK FUEL PRESSURE.
   - no → Perform the instructed procedures.

   yes ↓
6. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
   - no → Perform the instructed procedures.

   yes ↓

7. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no → Perform the instructed procedures.
yes ↓

8. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no → Perform the instructed procedures.
yes ↓

9. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
no → Perform the instructed procedures.
yes ↓

10. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
no → Perform the instructed procedures.
yes ↓

11. CHECK FUEL INJECTOR.
no → Perform the instructed procedures.
yes ↓

12. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.
yes → Perform the instructed procedures.
no ↓ Go to 13.

13. CHECK CRANKSHAFT POSITION SENSOR PLATE.
yes → Perform the instructed procedures.
no ↓ Go to 14.

14. CHECK INSTALLATION CONDITION OF TIMING CHAIN.
yes → Perform the instructed procedures.
no ↓ Go to 15.

15. CHECK ELECTRONIC THROTTLE CONTROL RELAY.
no → Perform the instructed procedures.

yes

16. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.

no → Perform the instructed procedures.

yes

17. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 18.

18. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

19. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (OPEN).

no → Perform the instructed procedures.

yes

20. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

21. CHECK SHORT CIRCUIT INSIDE ECM.

no → Perform the instructed procedures.

yes

22. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes

23. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).
no → Perform the instructed procedures.
yes ↓

24. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).
yes → Perform the instructed procedures.
no → Go to 25.

25. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).
no → Perform the instructed procedures.
yes ↓

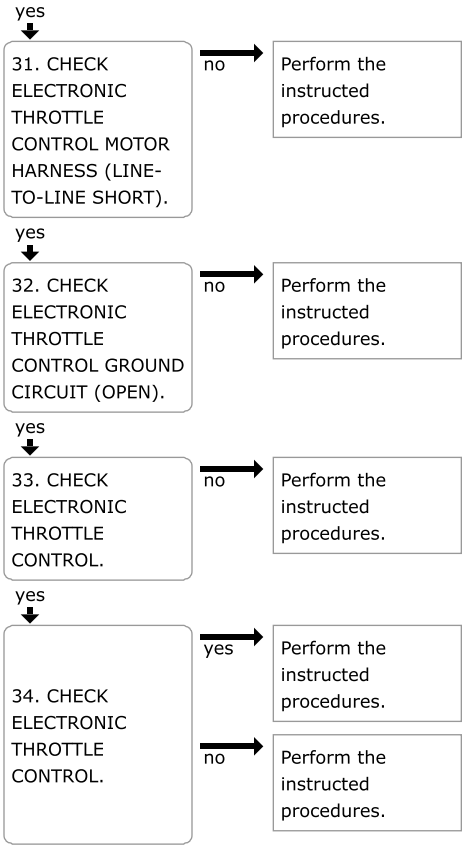
26. CHECK SENSOR OUTPUT.
no → Perform the instructed procedures.
yes ↓

27. CHECK SENSOR OUTPUT.
no → Perform the instructed procedures.
yes ↓

28. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR (OPEN).
no → Perform the instructed procedures.
yes ↓

29. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR (SHORT TO POWER SUPPLY).
yes → Perform the instructed procedures.
no → Go to 30.

30. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR (SHORT TO GROUND).
no → Perform the instructed procedures.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P050A displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK ENGINE OIL.

1. Turn the ignition switch to OFF.
2. Check the engine oil. Ref. to LUBRICATION(H4DOTC)>Engine Oil>INSPECTION.

Is there a proper amount of engine oil?

Yes	Go to 3.
No	Replace engine oil. Ref. to LUBRICATION(H4DOTC)>Engine Oil.

3. CHECK EXHAUST SYSTEM.

Check the 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.

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 5.

5. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 6.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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. Warm up the 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, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 2 — 5 [g/s] (0.26 — 0.66 lb/min)?

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 until the engine coolant temperature exceeds 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, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Subtract ambient temperature from [IAT Sensor #11]. Is the obtained value −10 — 50 [°C] (−18 — 90 °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>INSPECTION.

9. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector on faulty cylinders.
4. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

#1 (E101) No. 1 — Engine ground:
#1 (E101) No. 2 — Engine ground:
#2 (E102) No. 1 — Engine ground:
#2 (E102) No. 2 — Engine ground:
#3 (E103) No. 1 — Engine ground:
#3 (E103) No. 2 — Engine ground:
#4 (E104) No. 1 — Engine ground:
#4 (E104) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 10.

No — Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

10. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 11.

No — Repair the open circuit of the harness between the ECM connector 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.

Is the check result 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 AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and 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.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

No — Go to 13.

13. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate>INSPECTION.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes — Replace the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate.

No — Go to 14.

14. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using the Subaru ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

Subaru 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 15.

15. CHECK ELECTRONIC THROTTLE CONTROL RELAY.

1. Remove the electronic throttle control relay.
2. Connect the battery to terminals No. 2 and No. 4 of electronic throttle control relay.
3. Measure the resistance between electronic throttle control relay terminals.

Terminals

No. 1 — No. 3:

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 M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 17.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B (fuse) and M/B (electronic throttle control relay) • Blown out of fuse

17. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 4 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and M/B (electronic throttle control relay).
No	Go to 18.

18. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Measure the resistance between M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 3 — Engine ground:
No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 19.

No — Repair the short circuit to ground in the harness between ECM connector and M/B (electronic throttle control relay).

19. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (OPEN).

Measure the resistance between ECM connector and M/B (electronic throttle control relay) terminal.

Connector & terminal

(B61) No. 64 — No. 3:
(B61) No. 60 — No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 20.

No — Repair the open circuit in harness between ECM connector and M/B (electronic throttle control relay).

20. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

1. Disconnect the connectors from electronic throttle control.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E52) No. 15 — Engine ground:
(E52) No. 22 — Engine ground:
(E52) No. 31 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 21.

No — Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

21. CHECK SHORT CIRCUIT INSIDE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E116) No. 1 — Engine ground:
(E116) No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 22.

No — Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. When there is no defect in the harness, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

22. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E52) No. 31 — (E116) No. 1:
   (E52) No. 23 — (E116) No. 3:
   (E52) No. 15 — (E116) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 23.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

23. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 24.

No — Repair the following item.
- Open circuit of harness between ECM connector and engine ground
- Poor contact of ECM connector

24. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 1 (+) — Engine ground (−):
   (E116) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply in the harness between ECM connector and electronic throttle control connector.

No — Go to 25.

25. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E52) No. 22 — (E52) No. 15:
   (E52) No. 22 — (E52) No. 31:

Is the resistance 1 MΩ or more?

Yes — Go to 26.

No — Repair the line-to-line short circuit between ECM connector 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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Main-Throttle Sensor] 0.6 — 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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Sub-Throttle Sensor] 0.6 — 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 (OPEN).

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
   (E51) No. 29 — (E116) No. 5:
   (E51) No. 30 — (E116) No. 6:

Is the resistance less than 1 Ω?

Yes — Go to 29.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

29. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR (SHORT TO POWER SUPPLY).

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
   (E116) No. 5 (+) — Engine ground (−):
   (E116) No. 6 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply in the harness between ECM connector and electronic throttle control connector.

No — Go to 30.

30. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL MOTOR (SHORT TO GROUND).

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

(E116) No. 5 — Engine ground:
(E116) No. 6 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 31.

No — Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

31. CHECK ELECTRONIC THROTTLE CONTROL MOTOR HARNESS (LINE-TO-LINE SHORT).

Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E116) No. 5 — (E116) No. 6:

Is the resistance 1 MΩ or more?

Yes — Go to 32.

No — Repair the short circuit in harness between ECM connector and electronic throttle control connector.

32. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT (OPEN).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 33.

No — Repair the following item.

- Open circuit of harness between ECM connector 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.

1. Move the throttle valve to the fully opened and fully closed positions with fingers.
2. Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position?
Specification:
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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
When cold, the abnormality in the control of target engine speed increase is detected. (DTC 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. (DTC 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.

EXECUTION CONDITION
<Idle speed diagnosis>

Secondary parameters	Execution condition	DTC
Battery voltage	10.9 V or more	P050A
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more	
Vehicle speed	1.9 km/h (1.2 MPH) or less	
Throttle position	Less than 0.21%	
Integrated value of intake air amount	Less than value of Map1	
Time when the parking/neutral position switch does not change	3000 ms or more	
Elapsed time after starting the engine	2000 ms or more	

<Final ignition timing diagnosis: Idle>

Secondary parameters	Execution condition	DTC
Battery voltage	10.9 V or more	P050B
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more	
Throttle position	Less than 0.21%	
Integrated value of intake air amount	Less than value of Map1	
Time when the parking/neutral position switch does not change	3000 ms or more	
Target retard amount (N range)	8.5 °CA or more	
Target retard amount (D range)	8.5 °CA or more	

<Final ignition timing diagnosis: Non-idle>

Secondary parameters	Execution condition	DTC
Battery voltage	10.9 V or more	P050B
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more	
Integrated value of intake air amount	Less than value of Map2	
Target retard amount	8.5 °CA or more	

Map1

Engine coolant temperature at first engine start (°C (°F))	−40 (−40)	−30 (−22)	−20 (−4)	−10 (−14)	0 (32)
Integrated value of intake air amount (g (oz))	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)

Engine coolant temperature at first engine start (°C (°F))	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)
Integrated value of intake air amount (g (oz))	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)

Engine coolant temperature at first engine start (°C (°F))	60 (140)	70 (158)	75 (167)	100 (212)	110 (230)
Integrated value of intake air amount (g (oz))	843 (29.7)	500 (17.64)	250 (8.82)	0 (0)	0 (0)

Map2

Engine coolant temperature at first engine start (°C (°F))	−40 (−40)	−30 (−22)	−20 (−4)	−10 (−14)	0 (32)
Integrated value of intake air amount (g (oz))	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)

Engine coolant temperature at first engine start (°C (°F))	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)
Integrated value of intake air amount (g (oz))	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)	843 (29.7)

Engine coolant temperature at first engine start (°C (°F))	60 (140)	70 (158)	75 (167)	100 (212)	110 (230)
Integrated value of intake air amount (g (oz))	843 (29.7)	500 (17.64)	250 (8.82)	0 (0)	0 (0)

GENERAL DRIVING CYCLE

Perform the diagnosis at cold start.

DIAGNOSTIC METHOD

<Idle speed diagnosis>

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Actual engine speed − Target engine speed	Less than −300 rpm	P050A

<Final ignition timing diagnosis: Idle>

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
<N range> Final ignition timing − Ignition timing during CSERS* <D range> Final ignition timing − Ignition timing during CSERS*	More than 8.5 °CA More than 8.5 °CA	P050B

*: Ignition timing during CSERS (Cold Start Emission Reduction Strategy) = Base ignition timing − Retard amount

<Final ignition timing diagnosis: Non-idle>

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Final ignition timing − Ignition timing during CSERS*	More than 8.5 °CA	P050B

*: Ignition timing during CSERS (Cold Start Emission Reduction Strategy) = Base ignition timing − Retard amount
Time needed for diagnosis: 7000 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

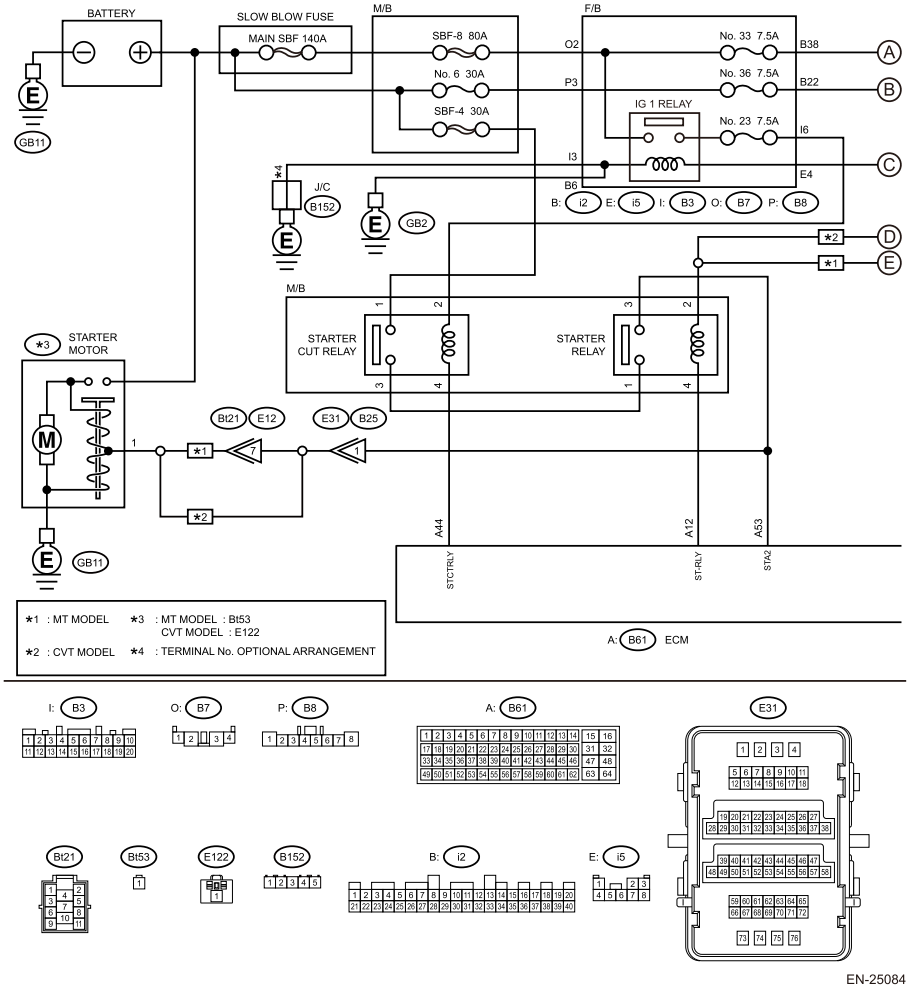
DTC P050B COLD START IGNITION TIMING PERFORMANCE

Note:
For the diagnostic procedure and 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.

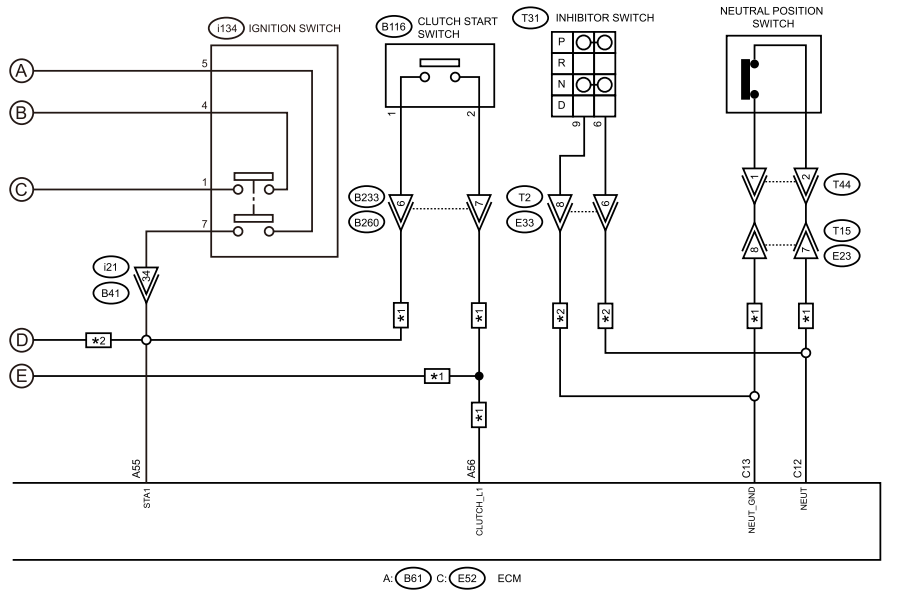
DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT

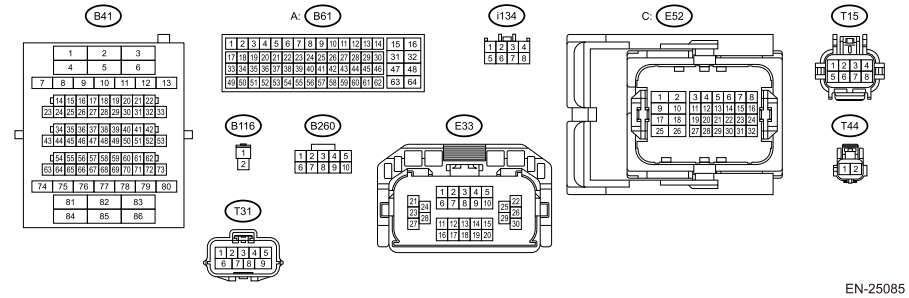
1. MODEL WITHOUT PUSH BUTTON START

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Failure of engine to start
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-25084





EN-25085

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Start and idle the engine for three minutes or more.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0512 displayed? (Current code)

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. In this case, a malfunction may be detected by continuously holding the ignition key at START position.

2. CHECK HARNESS BETWEEN ECM AND IGNITION SWITCH (SHORT TO POWER SUPPLY).

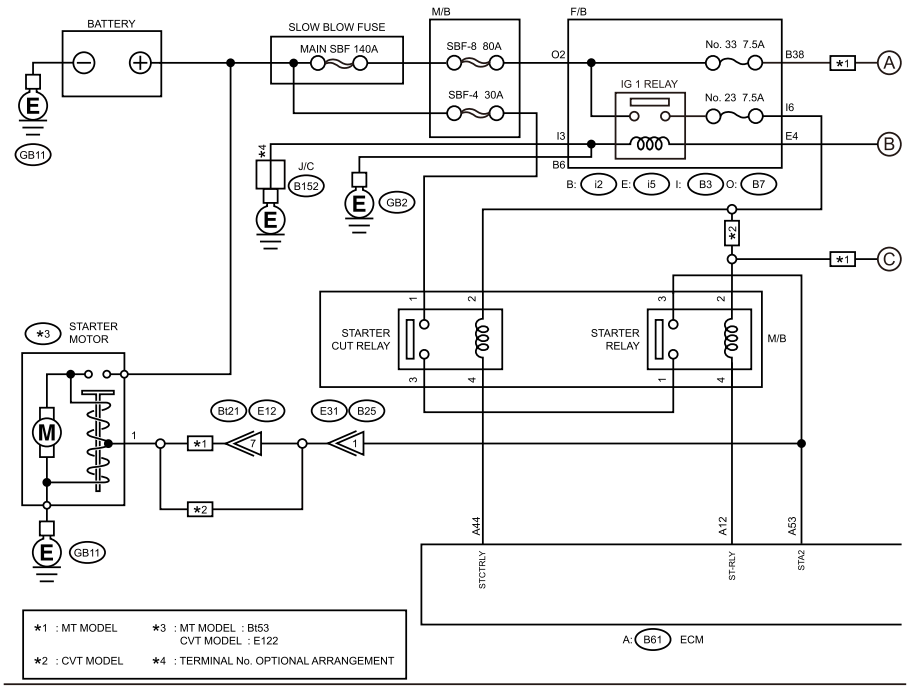
1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 55 (+) — Engine ground (−):

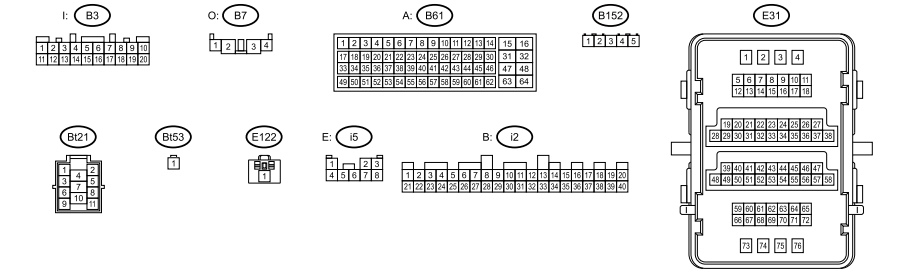
Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and ignition switch connector.
No	Repair the poor contact of ECM connector.

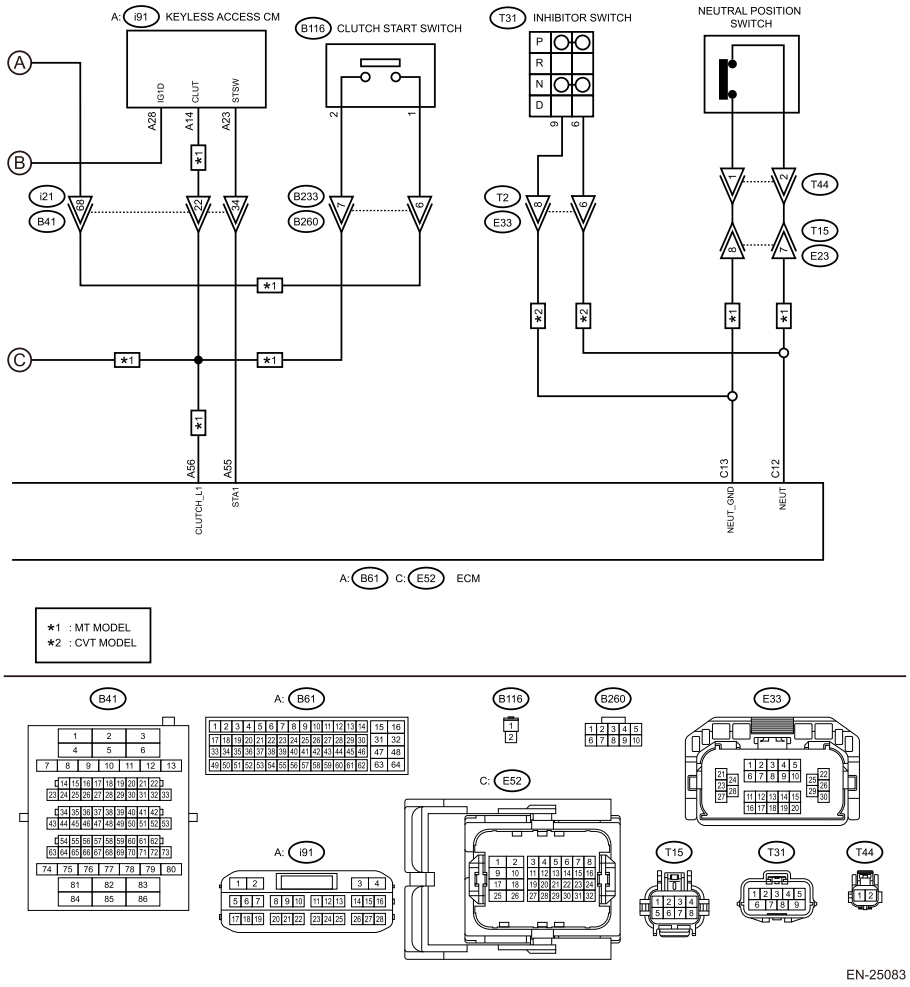
2. MODEL WITH PUSH BUTTON START

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Failure of engine to start
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.


BATTERY
SLOW BLOW FUSE
MAIN SBF 140A
M/B
SBF-8 80A
SBF-4 30A
F/B
O2
No. 33 7.5A
B38
IG 1 RELAY
No. 23 7.5A
I6
I3
E4
B6
B: i2 E: i5 I: B3 O: B7
GB11
J/C
B152
GB2
*1
*2
*3
*4
STARTER MOTOR
STARTER CUT RELAY
STARTER RELAY
M/B
Bt21 E12
E31 B25
A44
A12
A53
STCTRLY
ST-RLY
STA2
A: B61 ECM
*1 : MT MODEL
*2 : CVT MODEL
*3 : MT MODEL : Bt53
CVT MODEL : E122
*4 : TERMINAL No. OPTIONAL ARRANGEMENT


I: B3
O: B7
A: B61
B152
E31
Bt21
Bt53
E122
E: i5
B: i2

EN-25082



EN-25083

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK PUSH BUTTON IGNITION SWITCH.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK DTC.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK PUSH BUTTON IGNITION SWITCH.

Check the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

2. CHECK DTC.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Start and idle the engine for three minutes or more.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0512 displayed? (Current code)

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 (SHORT TO POWER SUPPLY).

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 engine ground.
   Connector & terminal
   (B61) No. 55 (+) — Engine 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 connector.
No	Repair the poor contact of ECM connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect abnormal continuity in the starter SW.
Judge as ON NG when the starter SW signal remains ON.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Engine speed	475 rpm or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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 SW voltage	6 V or more

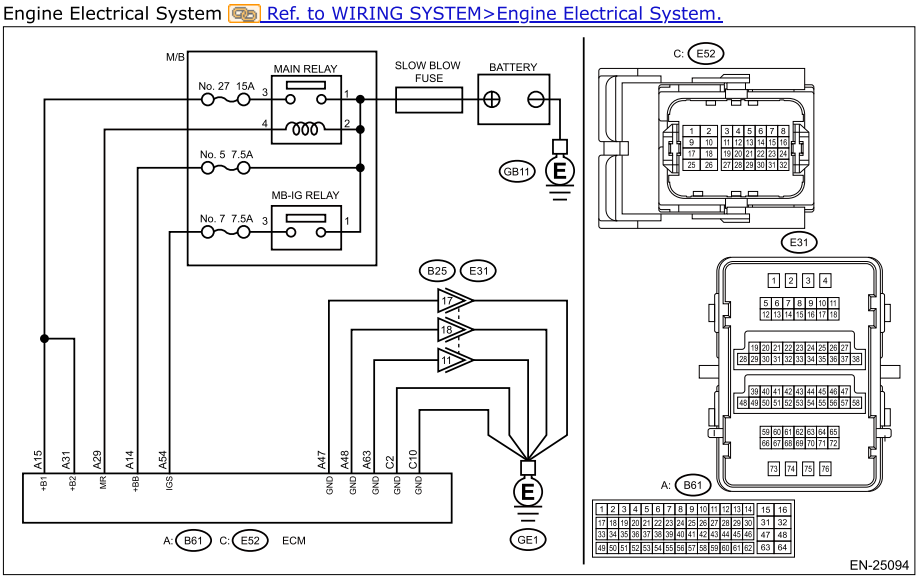
Time needed for diagnosis: 30 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0560 SYSTEM VOLTAGE

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INPUT SIGNAL OF ECM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK FUSE (MAIN FUSE BOX).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 14 (+) — 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 MAIN FUSE BOX (SHORT TO GROUND).

1. Remove the fuse No. 5.
2. Disconnect the connector from ECM.
3. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 14 — 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 fuse box.

3. CHECK FUSE (MAIN FUSE BOX).

Check the fuse No. 5. Ref. to WIRING SYSTEM>Engine Electrical System.

Is the fuse blown out?

Yes	Replace the fuse.
No	Repair the following item. • Open circuit in harness between ECM connector and battery • Poor contact of ECM connector • Poor contact of battery terminal

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open/short circuit of back-up power supply circuit.
Judge as NG when the backup power voltage is low.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE
Perform the diagnosis after starting the engine.

DIAGNOSTIC METHOD
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value

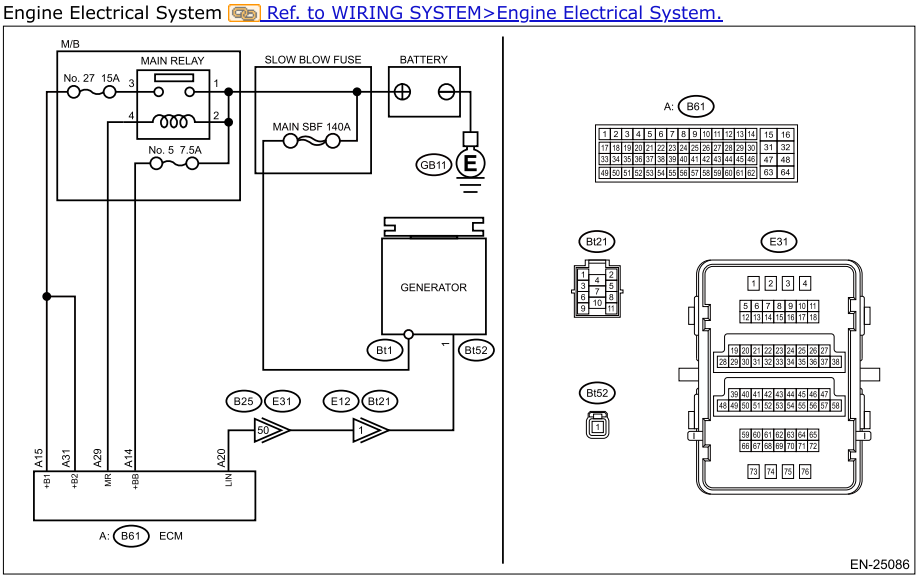
Malfunction Criteria	Threshold Value
Voltage of back-up power supply	Less than 6 V

Time needed for diagnosis: 2560 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0562 SYSTEM VOLTAGE LOW

1. —

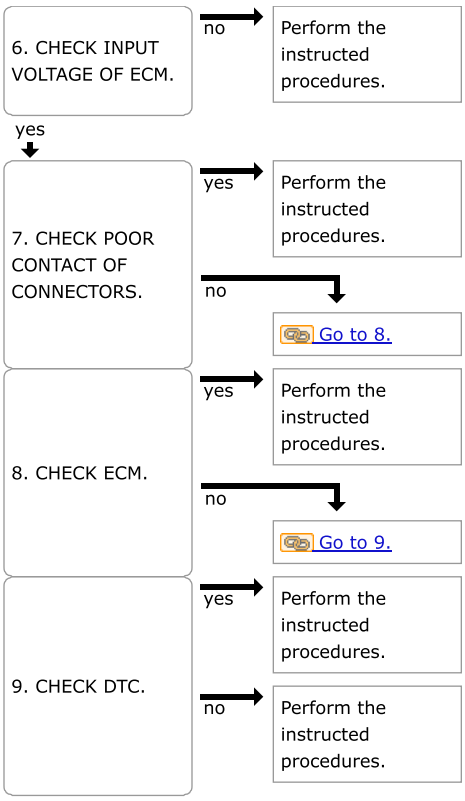
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Charge warning light illuminates.
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK GENERATOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK GENERATOR.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK GENERATOR TERMINAL B.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK CONTINUITY BETWEEN GENERATOR AND ENGINE GROUND.	no →	Perform the instructed procedures.
yes ↓		
5. CHECK BATTERY TERMINAL.	no →	Perform the instructed procedures.
yes ↓		



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 engine ground.
   Terminals
   Generator terminal B (+) — Engine ground (−):

Is the voltage 10.8 V or more?

Yes	Go to 2.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.

2. CHECK GENERATOR.

1. Run the engine at 3,000 rpm.
2. Measure the voltage between generator terminal B and engine ground.
   Terminals
   Generator terminal B (+) — Engine ground (−):

Is the voltage 10.8 V or more?

Yes	Go to 3.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.

3. CHECK GENERATOR TERMINAL B.

1. Turn the ignition switch to OFF.
2. Measure the battery voltage.
3. Measure the voltage of the generator terminal B.

Are the battery voltage and generator terminal B voltage the same?

Yes	Go to 4.
No	Check the generator terminal B harness and fuse.

4. CHECK CONTINUITY BETWEEN GENERATOR AND ENGINE GROUND.

Check continuity between generator main body and engine ground.

Is there continuity?

Yes	Go to 5.
No	Check and repair the installation condition of the generator and engine ground.

5. CHECK BATTERY TERMINAL.

Check the battery terminals.

Are the positive and negative battery terminals installed tightly?

Yes	Go to 6.
No	Tighten the clamp of terminal.

6. CHECK INPUT VOLTAGE OF ECM.

1. Run the engine at idle.
2. Measure the voltage between ECM and engine ground.
   Connector & terminal
   (B61) No. 15 (+) — Engine ground (−):
   (B61) No. 31 (+) — Engine ground (−):

Is the voltage 10.8 V or more?

Yes	Go to 7.
No	Repair the harness connector between the ECM, battery and main relay.

7. CHECK POOR CONTACT OF CONNECTORS.

Check the following connectors.
- ECM to Battery
- Generator to ECM
- Battery to Generator

Is there poor contact of connectors between ECM, generator or battery?

Yes	Repair the connector.
No	Go to 8.

8. CHECK ECM.

1. Connect all connectors.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0562 displayed? (Current code)

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.
No	Go to 9.

9. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0562 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.**

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of the charging system (generator, battery, pulleys, harnesses, V-belt, etc).
Judge as NG when the battery voltage is below the predetermined value in a possible driving condition under which the generator should generate electricity.

EXECUTION CONDITION

Secondary parameters	Execution condition
Engine speed	1500 rpm or more
Final output duty of generator power generation control	50% or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

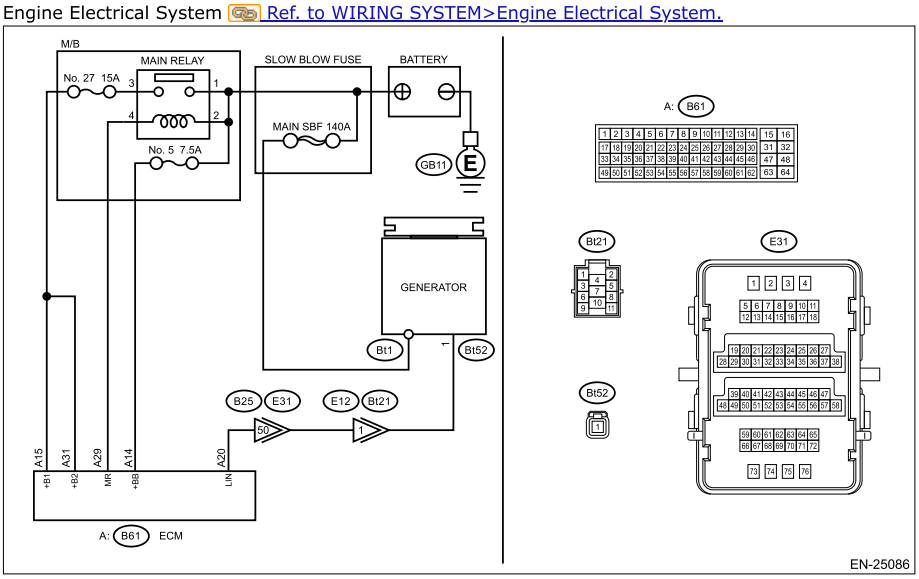
Malfunction Criteria	Threshold Value
Battery voltage	Less than 10.8 V

Time needed for diagnosis: 30 s
Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

DTC P0563 SYSTEM VOLTAGE HIGH

1. —

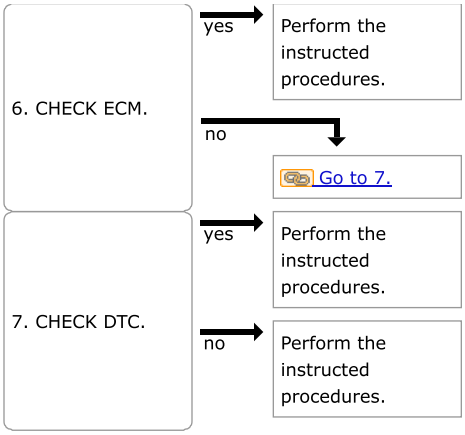
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Charge warning light illuminates.
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK GENERATOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK GENERATOR.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK BATTERY TERMINAL.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK INPUT VOLTAGE OF ECM.	no →	Perform the instructed procedures.
yes ↓		
5. CHECK POOR CONTACT OF CONNECTORS.	yes →	Perform the instructed procedures.
	no ↓	Go to 6.



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 engine ground.
   Terminals
   Generator terminal B (+) — Engine ground (−):

Is the voltage less than 16.2 V?

Yes	Go to 2.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.

2. CHECK GENERATOR.

1. Run the engine at 3,000 rpm.
2. Measure the voltage between generator terminal B and engine ground.
   Terminals
   Generator terminal B (+) — Engine ground (−):

Is the voltage less than 16.2 V?

Yes	Go to 3.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.

3. CHECK BATTERY TERMINAL.

1. Turn the ignition switch to OFF.
2. Check the battery terminals.

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 and engine ground.
   Connector & terminal
   (B61) No. 15 (+) — Engine ground (−):
   (B61) No. 31 (+) — Engine 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.

1. Turn the ignition switch to OFF.
2. Check the following connectors.
   - ECM to Battery
   - Generator to ECM
   - Battery to Generator

Is there poor contact of connectors between ECM, generator or battery?

Yes	Repair the connector.
No	Go to 6.

6. CHECK ECM.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0563 displayed? (Current code)

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.
No	Go to 7.

7. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0563 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.**

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of the charging system (generator, battery, pulleys, harnesses, V-belt, etc).

Judge as NG when the battery voltage is the predetermined value or more in a possible driving condition under which the generator should generate electricity.

EXECUTION CONDITION

Secondary parameters	Execution condition
Engine speed	1500 rpm or more
Final output duty of generator power generation control	50% or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Battery voltage	16.2 V or more

Time needed for diagnosis: 30 s

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine does not start.
- Engine stall

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0604 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the malfunction of microcomputer RAM.
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.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Perform the diagnosis immediately after ignition switch ON.

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: 2 times
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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
None	

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: 2 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

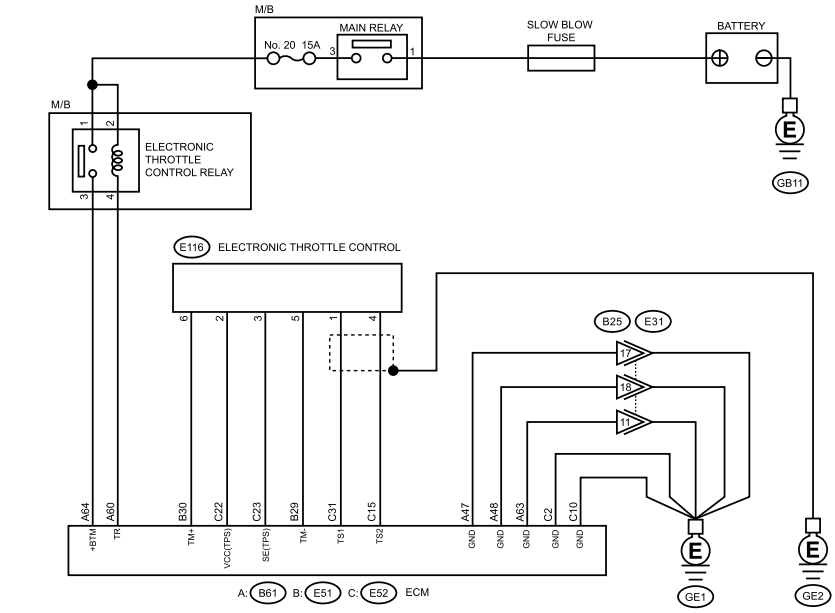
DTC P0606 CONTROL MODULE PROCESSOR

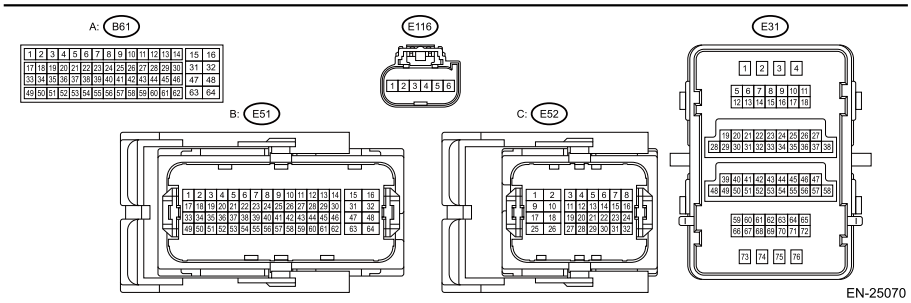
1. —

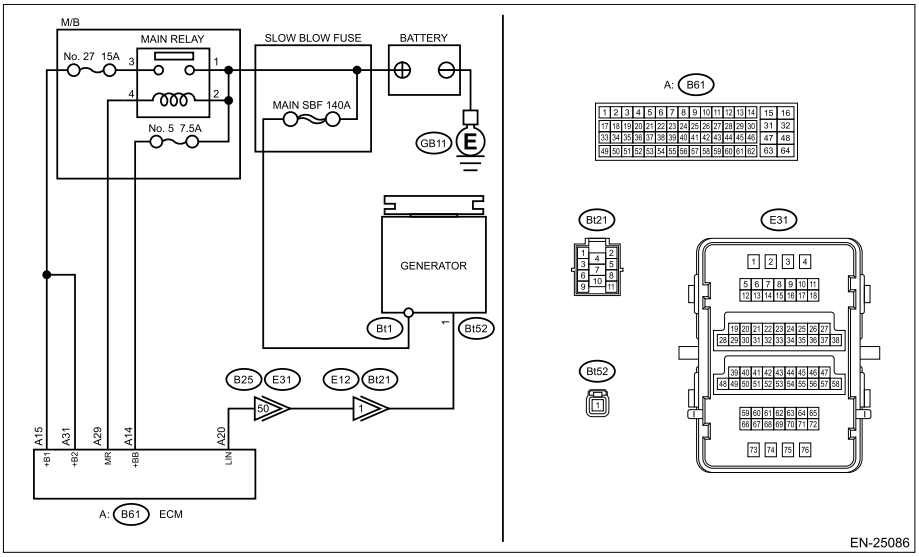
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INPUT VOLTAGE OF ECM.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK INPUT VOLTAGE OF ECM.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK ECM GROUND HARNESS.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 15 (+) — Engine ground (−):
   (B61) No. 31 (+) — 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 connector and engine ground.
   Connector & terminal
   (B61) No. 15 (+) — Engine ground (−):
   (B61) No. 31 (+) — 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 (OPEN).

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 of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E52) No. 22 — (E116) No. 2:
   (E52) No. 23 — (E116) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK ECM GROUND HARNESS.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — 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 following item. • Open circuit in ground circuit • Loose engine ground terminal • Poor contact of coupling connector

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when any one of the followings is established.
Diagnosis 1: When the input amplifier circuit operation of throttle position sensor 1 is abnormal
Diagnosis 2: When the learning value of backup RAM is incorrect
Diagnosis 3: When SUM value of backup RAM is outside the standard value
Diagnosis 4: When the communication between main CPU and sub CPU is abnormal
Diagnosis 5: If the CPU operation is abnormal
Diagnosis 6: If the CPU operation is abnormal (Lock-step check)
Diagnosis 7: If the CPU operation is abnormal (torque monitor)

EXECUTION CONDITION

Diagnosis 1 and 3

Secondary parameters	Execution condition
ECM initialization	Execution

Diagnosis 2

Secondary parameters	Execution condition
None	

Diagnosis 4, 5 and 6

Secondary parameters	Execution condition
Battery voltage	6 V or more

Diagnosis 7

Secondary parameters	Execution condition
Time elapsed after engine start	500 ms or more
(Actual engine output change amount − Target engine output change amount)	Value of Map or more

Map

Vehicle speed (km/h (MPH))	0 (0)	8 (5)	16 (10)	24 (15)	32 (20)	48 (30)
Engine output (kw (PS))	10 (14)	15 (20)	15 (20)	20 (27)	20 (27)	35 (48)

Vehicle speed (km/h (MPH))	64 (40)	80 (50)	97 (60)	113 (70)	129 (80)
Engine output (kw (PS))	40 (54)	60 (82)	70 (95)	80 (109)	100 (136)

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Throttle minimum stop position	2.22 V or more

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Accelerator pedal position learning value in backup RAM area 1	Not equal to accelerator pedal position learning value in backup RAM area 2

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value
Total of backup RAM (ECM shutdown)	Not equal to total of backup RAM (ECM startup)

Judgment value (diagnosis 4)

Malfunction Criteria	Threshold Value
Communication status between CPU and power supply IC	Malfunction

Judgment value (diagnosis 5)

Malfunction Criteria	Threshold Value
Throttle control calculation data by CPU	Not equal to throttle control calculation data by power supply IC

Judgment value (diagnosis 6)

Malfunction Criteria	Threshold Value
Calculation data by CPU	Not equal to calculation data by Lock-step

Judgment value (diagnosis 7)

Malfunction Criteria	Threshold Value
Actual engine output − Target engine output	More than 20 kw (27 PS)

Time needed for diagnosis:
Diagnosis 1: Less than 1 s
Diagnosis 2: Less than 1 s
Diagnosis 3: Less than 1 s
Diagnosis 4: Less than 1 s
Diagnosis 5: Less than 1 s
Diagnosis 6: Less than 1 s
Diagnosis 7: 500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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 the following conditions are established.
Judgment value

Malfunction Criteria	Threshold Value
Communication status between CPU and power supply IC	Malfunction

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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	6 V or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.
Judgment value

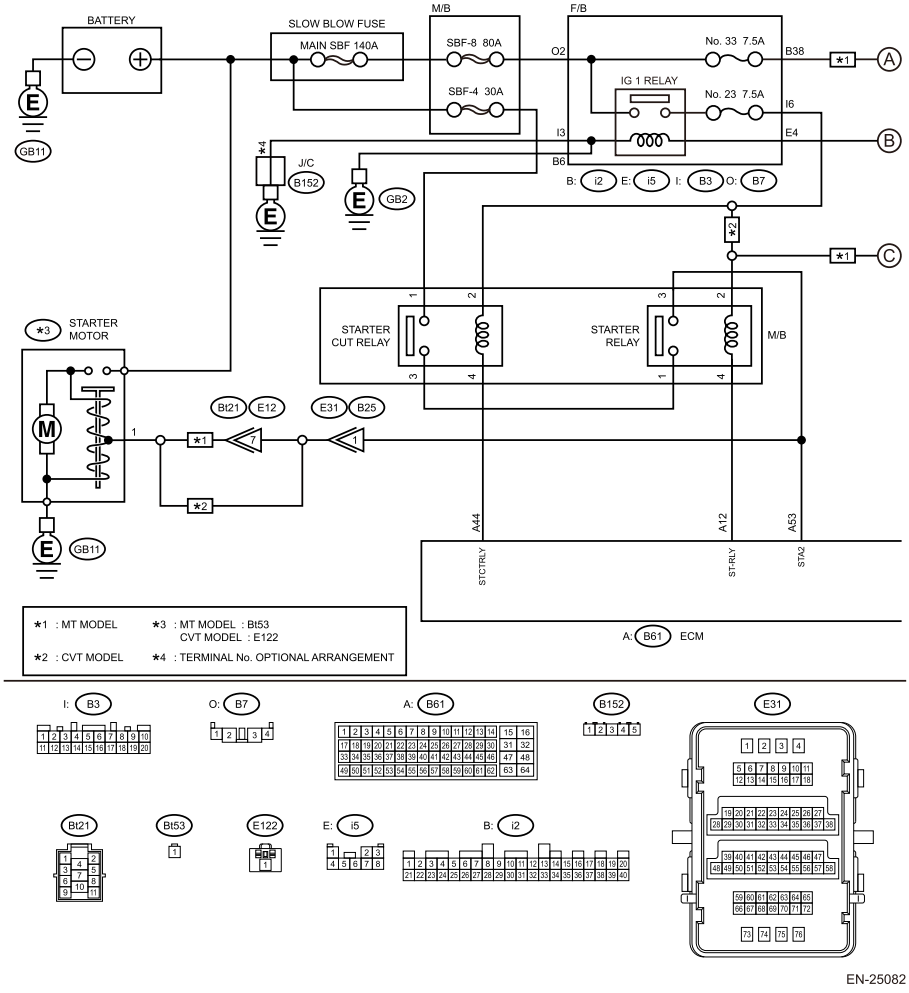
Malfunction Criteria	Threshold Value
AD conversion results	Malfunction

Time needed for diagnosis: 200 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

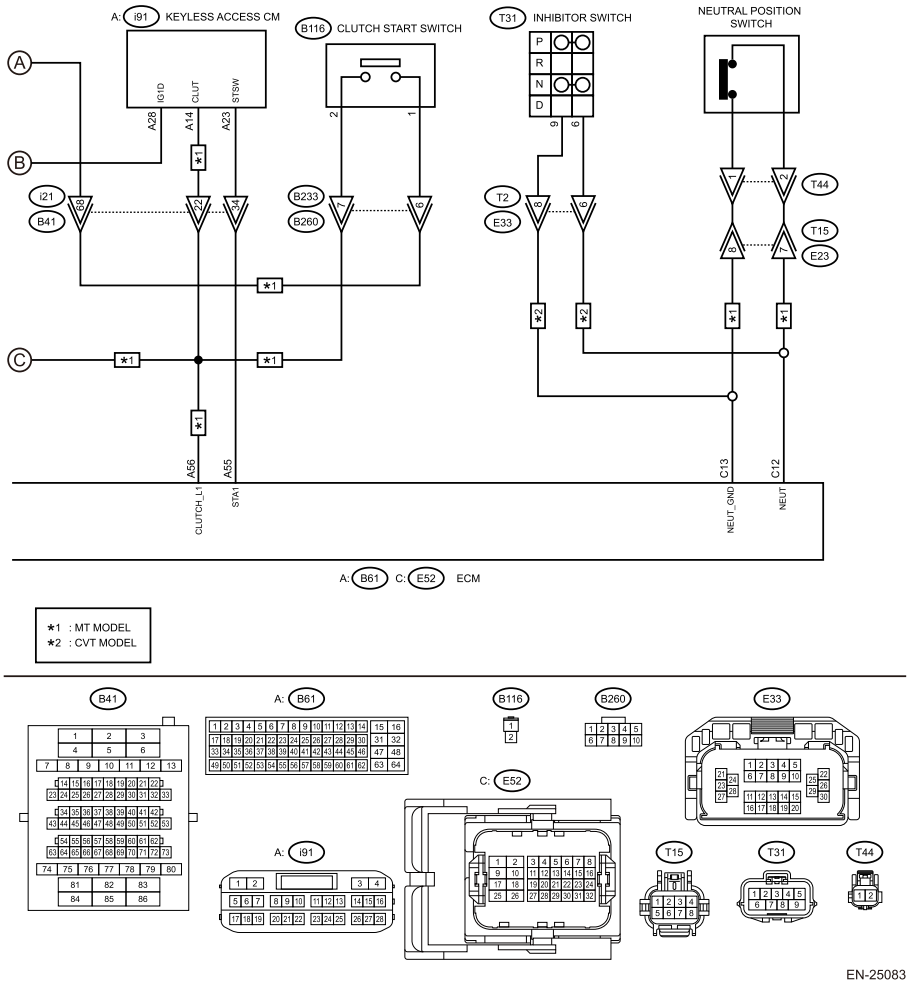
DTC P0616 STARTER RELAY "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Failure of engine to start
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



EN-25082



EN-25083

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (OPEN).	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Remove the starter relay.
4. Measure the resistance of harness between ECM connector and M/B (starter relay) terminal.
   Connector & terminal
   (B61) No. 53 — No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and M/B (starter relay).

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (SHORT TO GROUND).

1. Disconnect the connector from starter motor.
2. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 53 — 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 connector and M/B (starter relay).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect abnormal continuity in the starter SW 2.
Judge as OFF NG when the starter SW 2 signal remains OFF.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Engine speed	More than 0 rpm to 500 rpm
Vehicle speed	Less than 1 km/h (0.6 MPH)
Starter relay command	ON

GENERAL DRIVING CYCLE
Perform the diagnosis continuously after starting the engine.

DIAGNOSTIC METHOD
Judge as OFF NG when the following conditions are established.
Judgment value

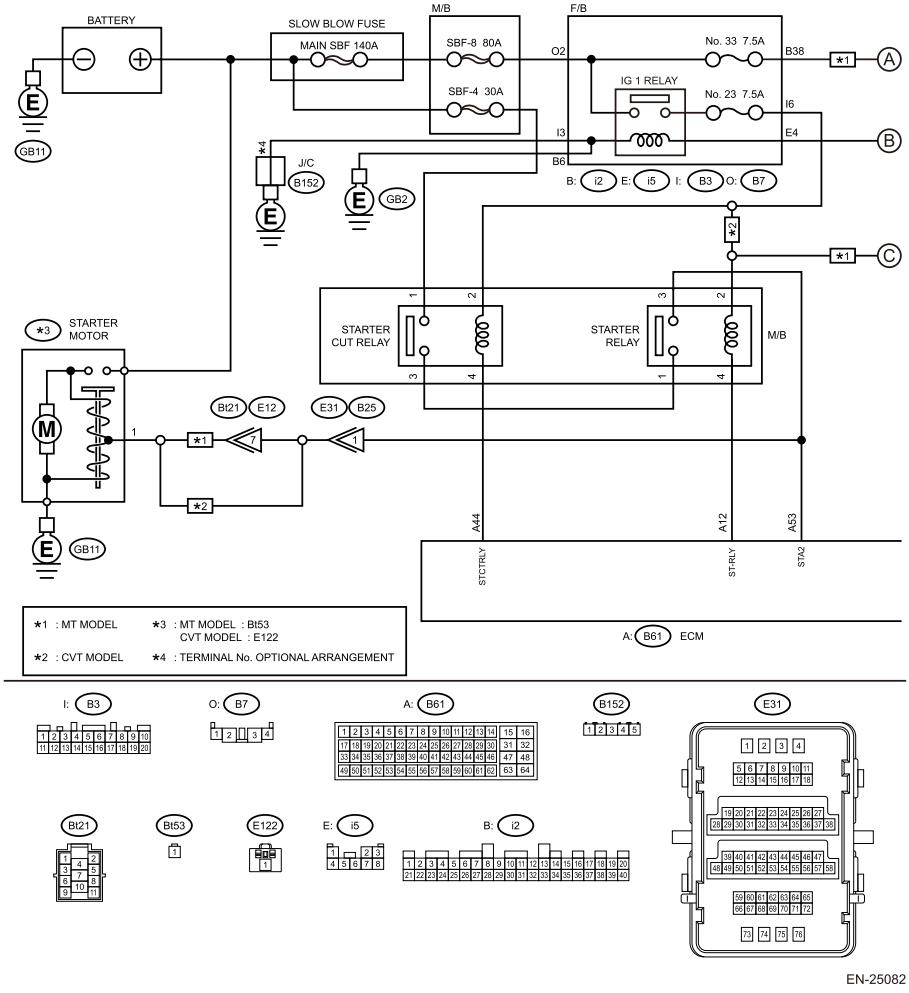
Malfunction Criteria	Threshold Value
Starter SW2 signal of 6 V or more	Not detected

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

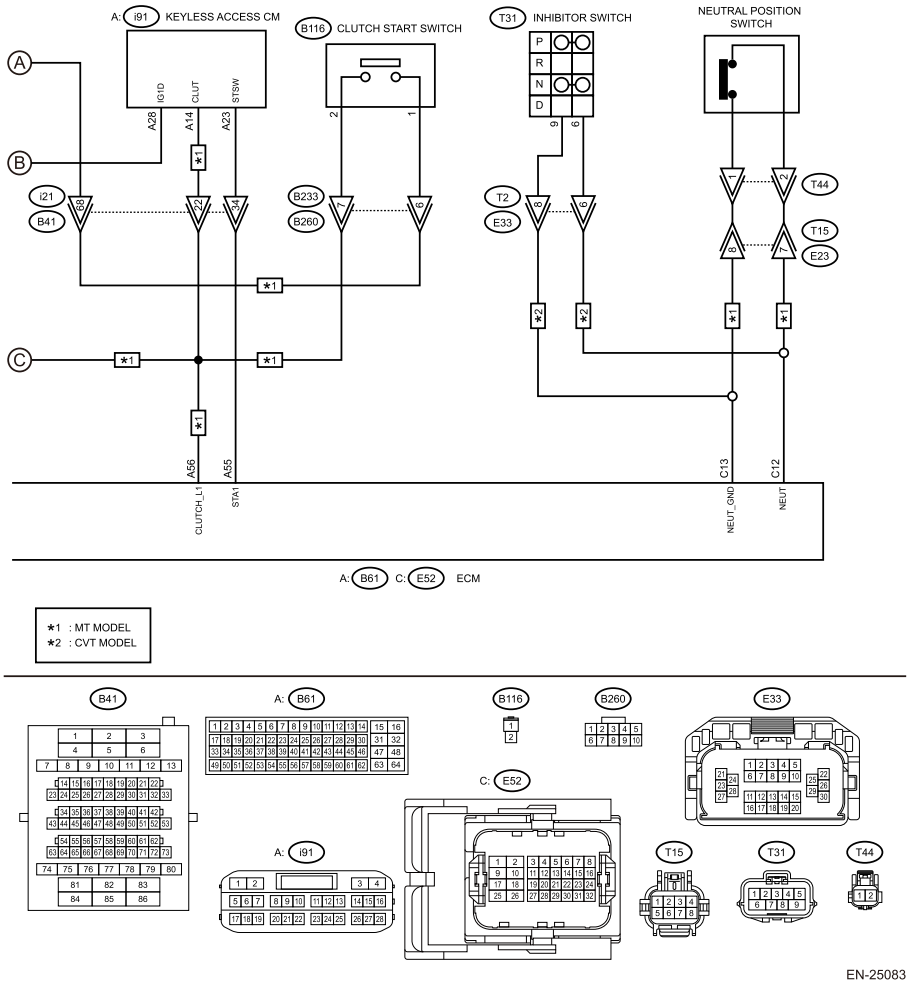
DTC P0617 STARTER RELAY "A" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Failure of engine to start
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



EN-25082



EN-25083

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK HARNESS BETWEEN ECM, STARTER RELAY AND STARTER MOTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0617 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK HARNESS BETWEEN ECM, STARTER RELAY AND STARTER MOTOR (SHORT TO POWER SUPPLY).

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 engine ground.
   Connector & terminal
   (B61) No. 53 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Repair the following item.
- Short circuit to power supply in harness between ECM connector and M/B (starter relay)
- Short circuit to power supply in harness between ECM connector and starter motor

No — Repair the poor contact of ECM connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect abnormal continuity in the starter SW 2.
Judge as ON NG when the starter SW2 signal remains ON.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Engine speed	475 rpm or more
Starter relay command	OFF

GENERAL DRIVING CYCLE
Perform the diagnosis continuously after starting the engine.

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	6 V or more

Time needed for diagnosis: 2000 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P062D FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine does not start
- Engine stall

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P062D displayed? (Current code)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the malfunction of fuel injector circuit function.
Judge as NG when the fuel injector current is low.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses:	
FET1	ON
FET2	ON
FET3	ON
SW1	OFF
SW2	OFF

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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 injector current 250 μs after the injection command	4 A or less

Time needed for diagnosis: 50 times
Map

Engine speed (rpm)	Time needed for 50 times of diagnosis (sec)
500	3

Engine speed (rpm)	Time needed for 50 times of diagnosis (sec)
2000	0.75
4000	0.375
6000	0.25

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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

Diagnosis 1: Judge as NG when the EEPROM operation is abnormal.
Diagnosis 2: Judge as NG when the EEPROM value is abnormal during CRC check.

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 (diagnosis 1)

Malfunction Criteria	Threshold Value
Writing result to EEPROM	Malfunction

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
CRC check error	Detected

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P065A GENERATOR/ALTERNATOR SYSTEM PERFORMANCE

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Charge warning light illuminates.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK V-BELT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK V-BELT.

Check the V-belt. Ref. to MECHANICAL(H4DOTC)>V-belt>INSPECTION.

Is the V-belt broken?

Yes	Replace the V-belt. Ref. to MECHANICAL(H4DOTC)>V-belt.
No	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Judge as NG when detecting no rotation of the generator (mechanical malfunction such as belt breakage), or internal electrical malfunction.

COMPONENT DESCRIPTION
To secure the vehicle power supply, the generator varies the generation amount according to EGI command.

EXECUTION CONDITION

Secondary parameters	Execution condition
LIN communication schedule	Normal schedule

GENERAL DRIVING CYCLE
Perform the diagnosis continuously after the enable conditions have been established.

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
<Mechanical malfunction warning>	
Internal malfunction flag of generator (mechanical malfunction warning) Generator revolution speed	ON More than 1300 rpm
<Electrical malfunction warning>	
Internal malfunction flag of generator (electrical malfunction warning)	ON

Time needed for diagnosis:
Mechanical malfunction warning: 10 sec. or more
Electrical malfunction warning: 10 sec. or more
Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P0685 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.**

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION
The main relay controls current of coils by receiving instructions from the ignition switch and leak check valve assembly to switch ECM to ON/OFF.

EXECUTION CONDITION

Secondary parameters	Execution condition
Main relay command	OFF

GENERAL DRIVING CYCLE
Perform the diagnosis if execution conditions are met when the ignition switch is turned from OFF to ON.

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: 2500 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

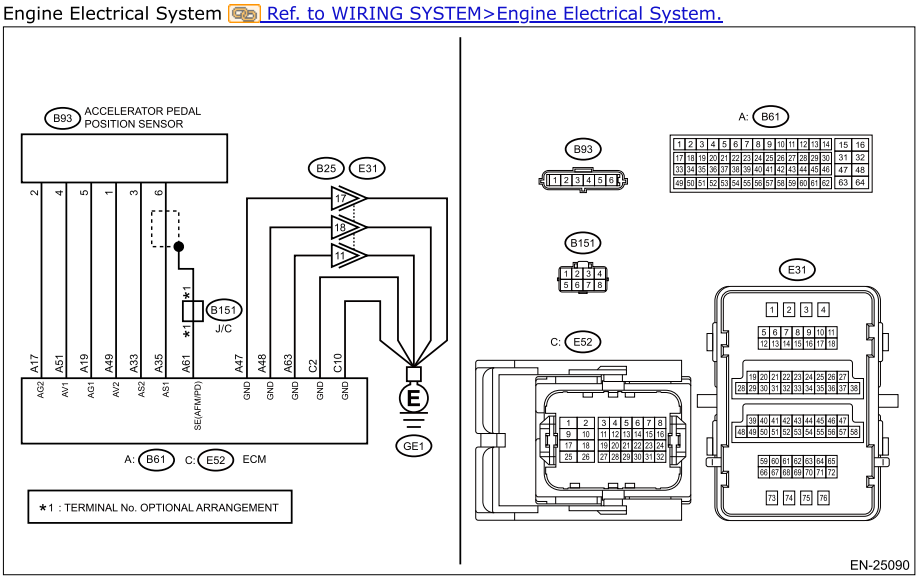
DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW

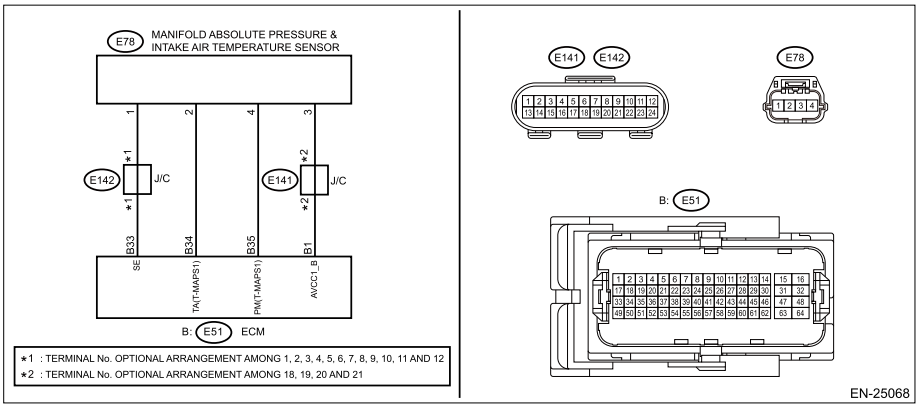
1. —

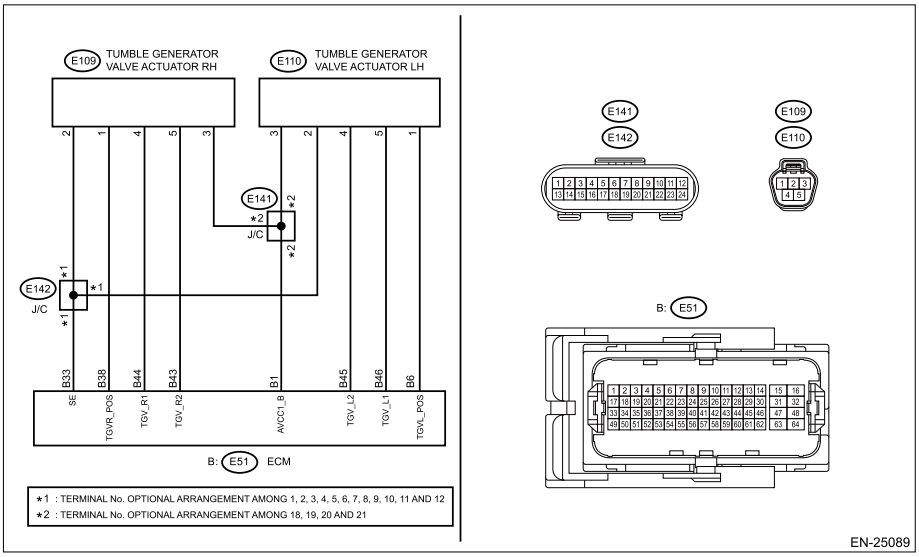
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





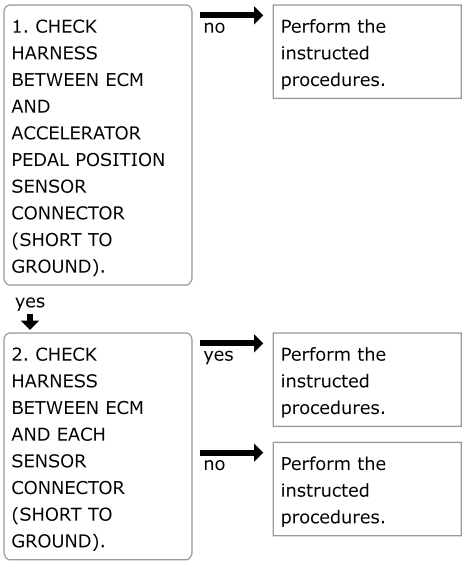


Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 51 — Engine 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 HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO GROUND).

1. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Disconnect the connector from tumble generator valve actuator LH.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 1 — Engine ground:

Is the resistance 1 MΩ 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 the ECM connector and the following sensor connector. • Manifold absolute pressure and intake air temperature sensor • Tumble generator valve actuator RH • Tumble generator valve actuator LH

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the power supply voltage of the sensor is abnormal.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 power supply	Less than 4.48 V

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH

1. —

DTC detecting condition:

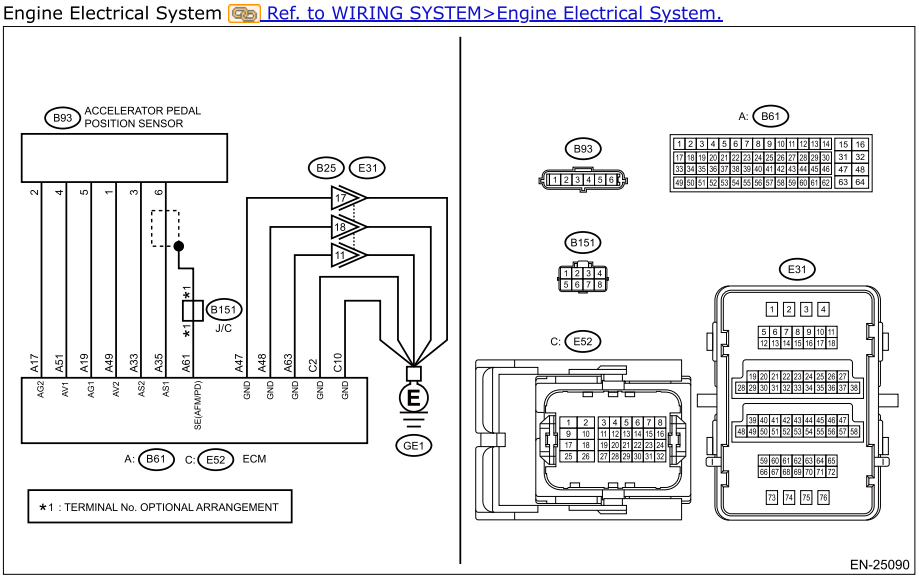
Immediately at fault recognition

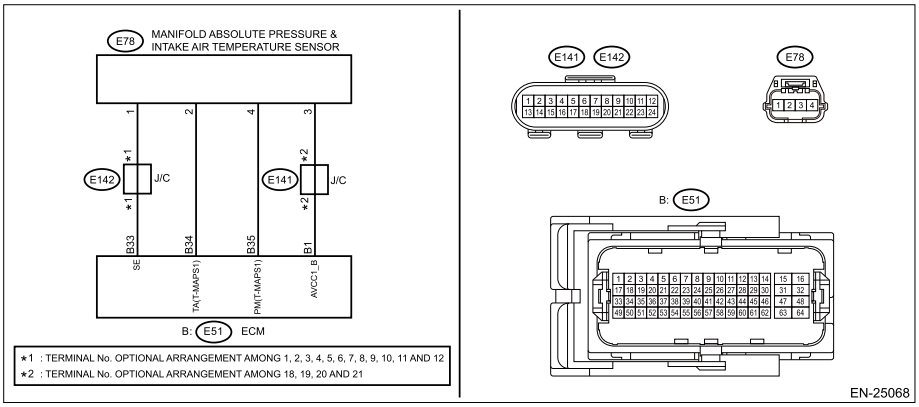
Trouble symptom:

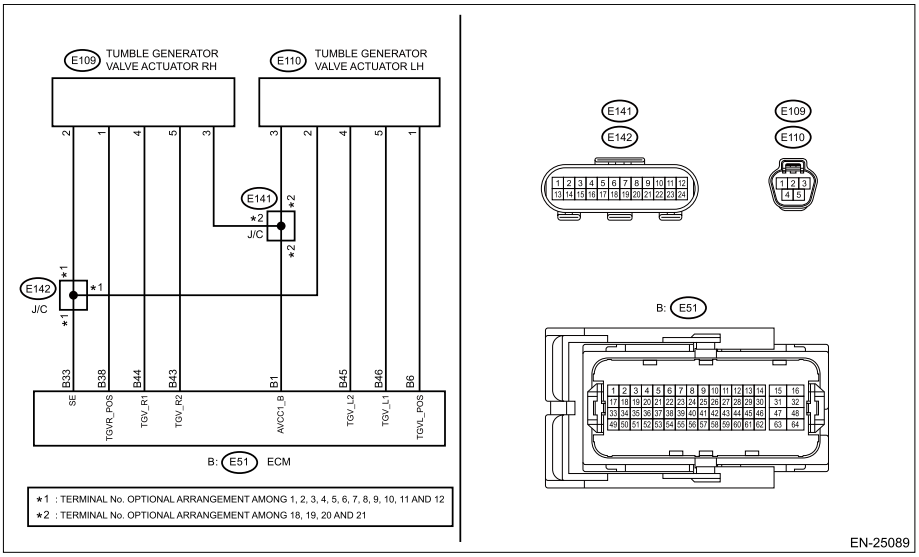
Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 51 (+) — Engine ground (−):

Is the voltage 10 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 2.

2. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Repair the short circuit to power in harness between the ECM connector and the following sensor connector.

- Manifold absolute pressure and intake air temperature sensor
- Tumble generator valve actuator RH
- Tumble generator valve actuator LH

No — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the power supply voltage of the sensor is abnormal.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 power supply	More than 5.55 V

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW

1. —

DTC detecting condition:

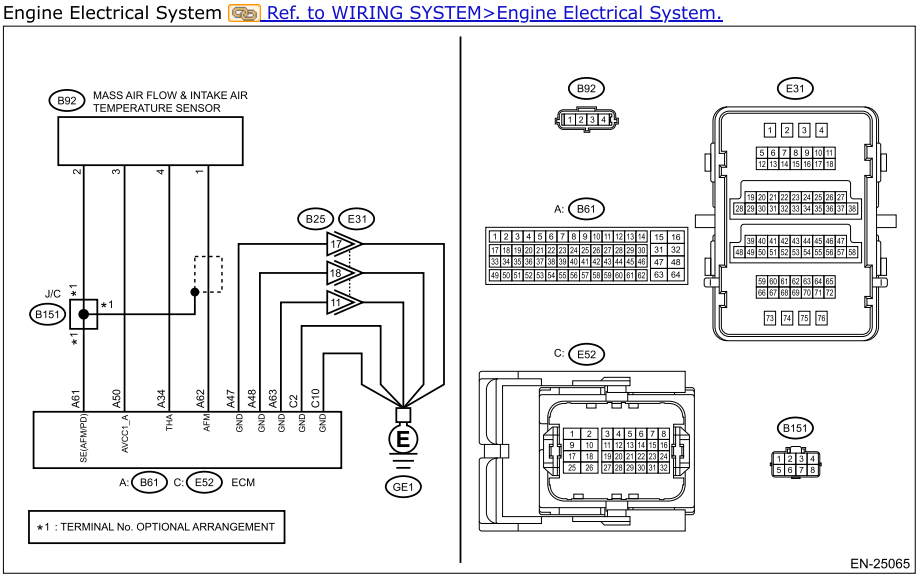
Immediately at fault recognition

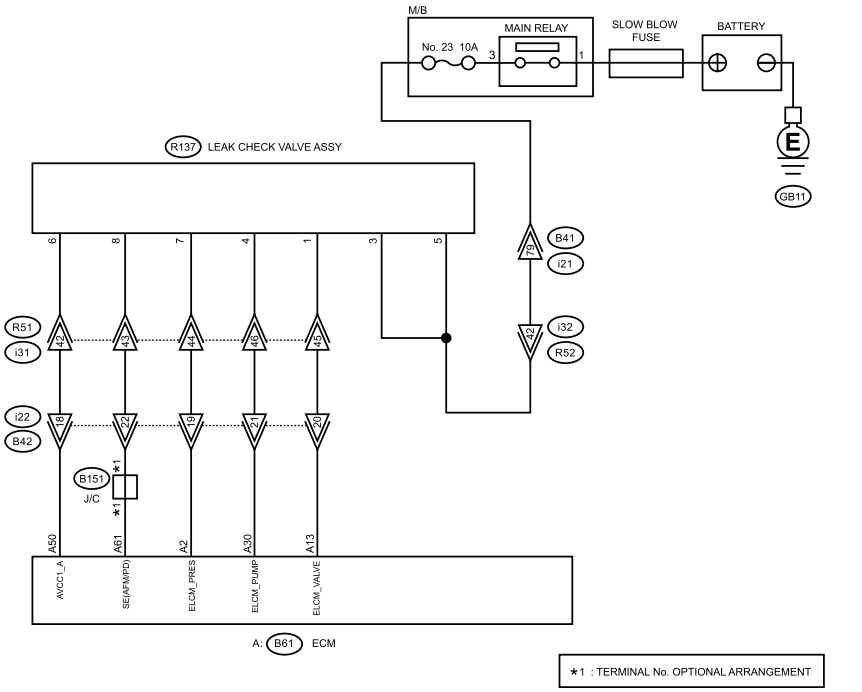
Trouble symptom:

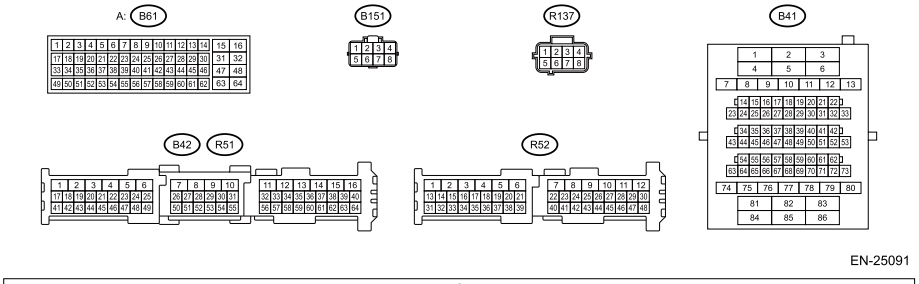
Improper idling

Wiring diagram:

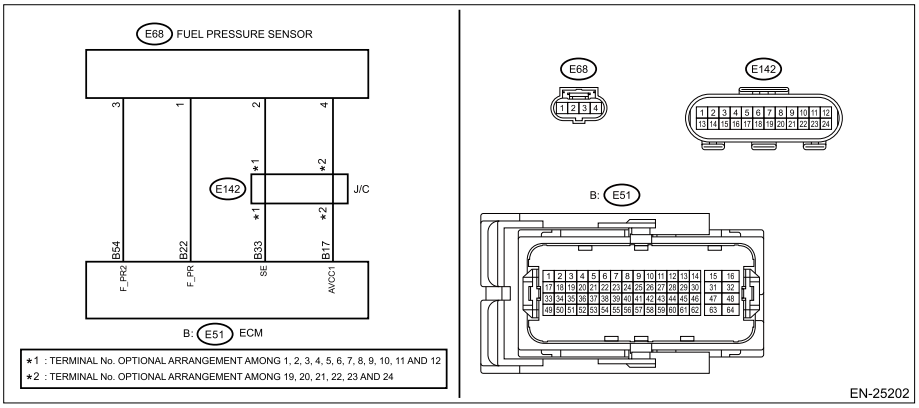
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



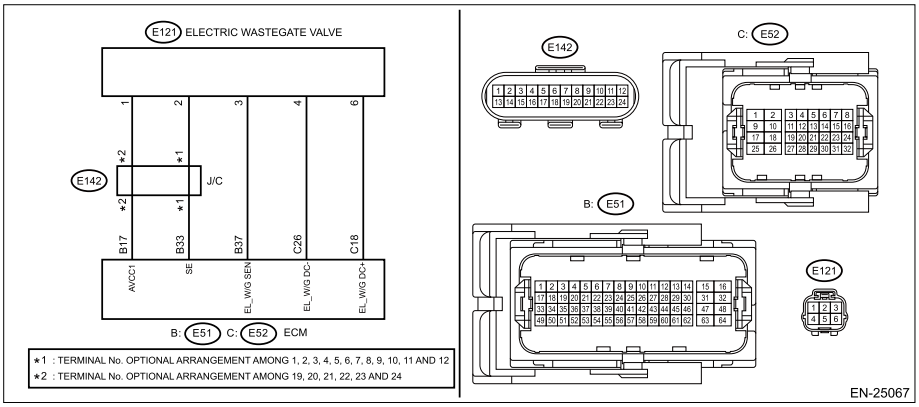




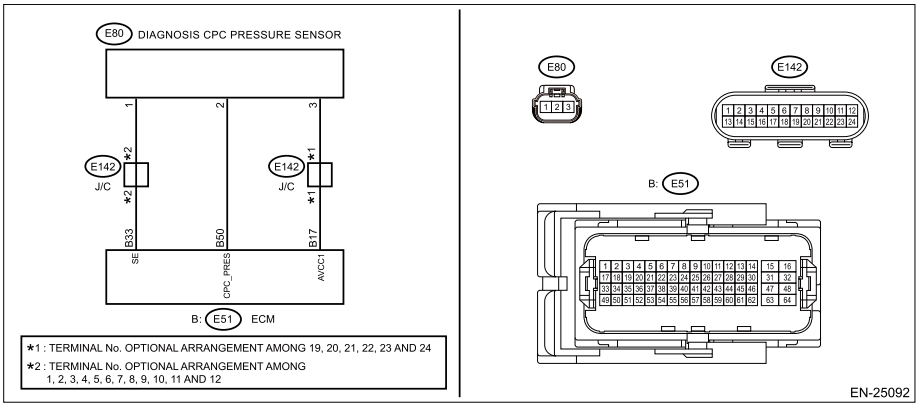
EN-25091



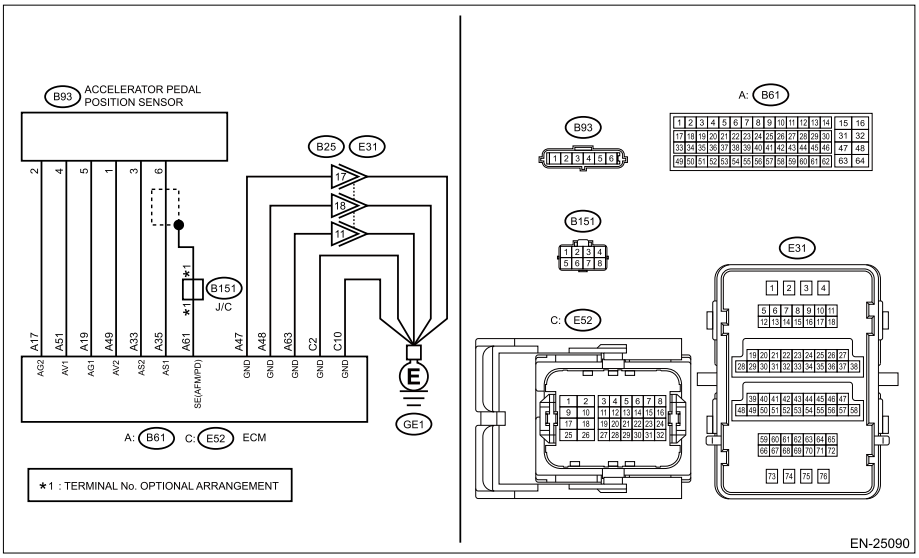
EN-25202



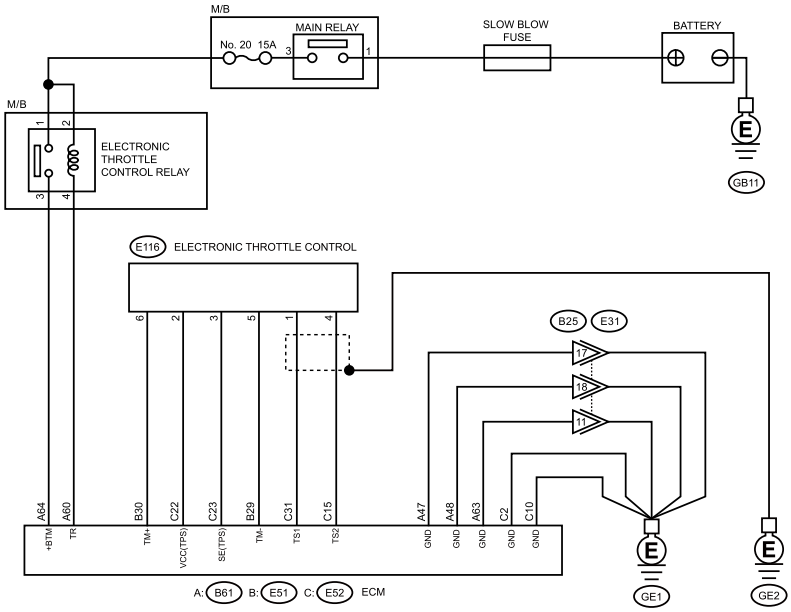
EN-25067

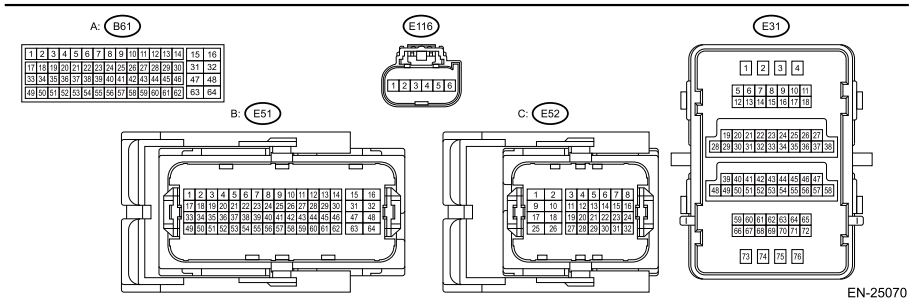


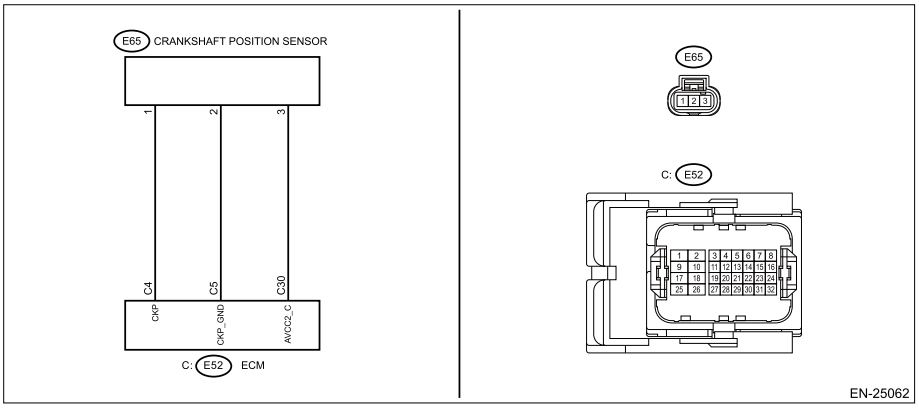
EN-25092



EN-25090







Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.

yes ↓

2. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO GROUND).
→ no: Perform the instructed procedures.
↓ yes

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO GROUND).
→ no: Perform the instructed procedures.
↓ yes

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).
→ no: Perform the instructed procedures.
↓ yes

5. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
→ yes: Perform the instructed procedures.
→ no: Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from the leak check valve assembly.
5. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 50 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 2.

No — Repair the short circuit to ground in harness between the ECM connector and the following sensor connector.

- Mass air flow and intake air temperature sensor
- Leak check valve assembly

2. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO GROUND).

1. Disconnect the connector from the fuel pressure sensor.
2. Disconnect the connector from electronic wastegate valve.
3. Disconnect the connector from CPC pressure sensor.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 17 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Repair the short circuit to ground in harness between the ECM connector and the following sensor connector.
- Fuel pressure sensor
- Electronic wastegate valve
- CPC pressure sensor

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO GROUND).

1. Disconnect the connector from the accelerator pedal position sensor.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 49 — Engine 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 accelerator pedal position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

1. Disconnect the connectors from electronic throttle control.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E52) No. 22 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 5.

No — Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

5. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

1. Disconnect the connector from the crankshaft position sensor.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E52) No. 30 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

No — Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

GENERAL DESCRIPTION

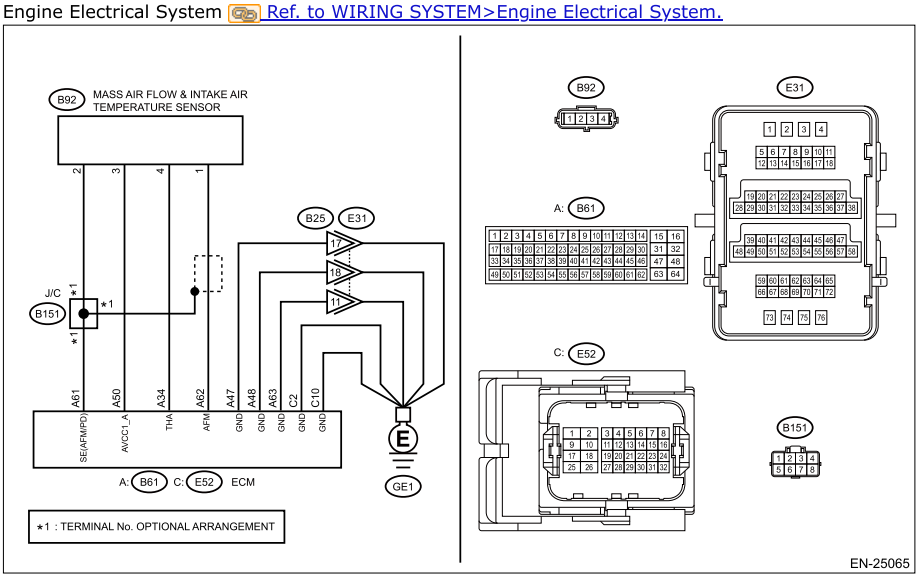
OUTLINE OF DIAGNOSIS

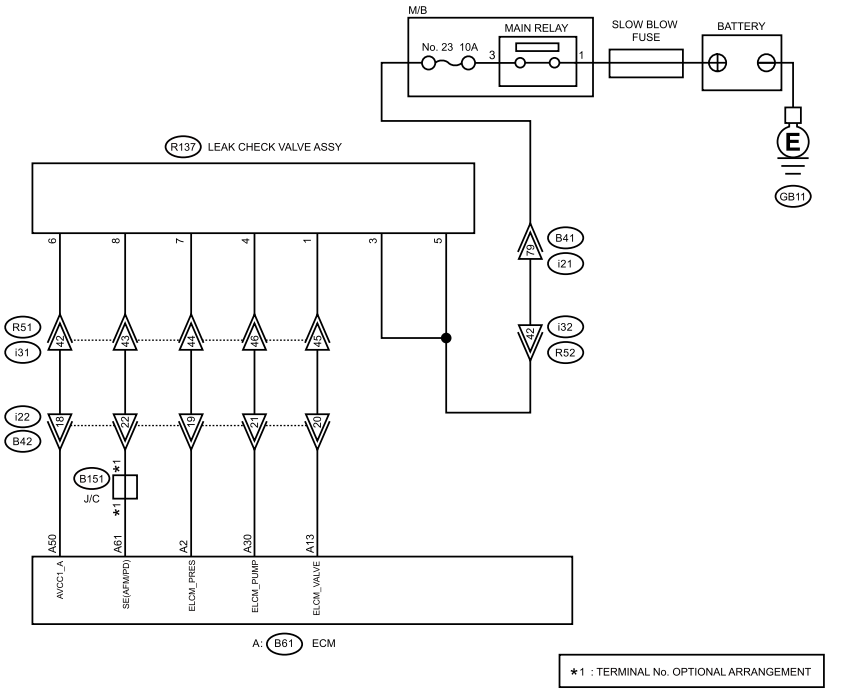
Note:
For the detection standard, refer to DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.

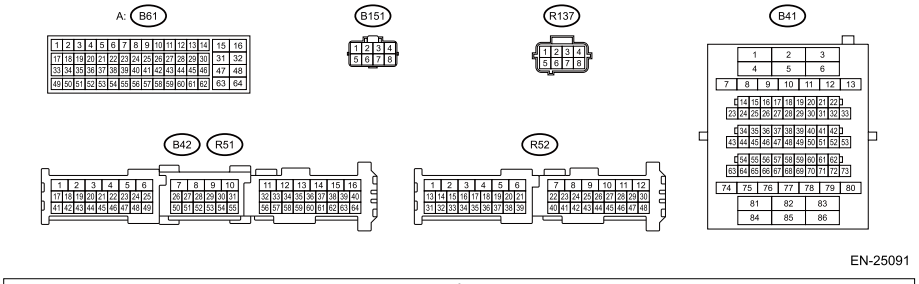
DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH

1. —

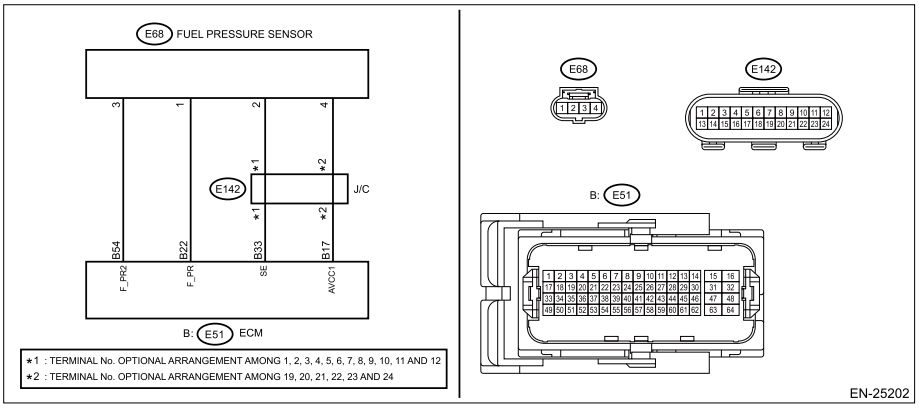
DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



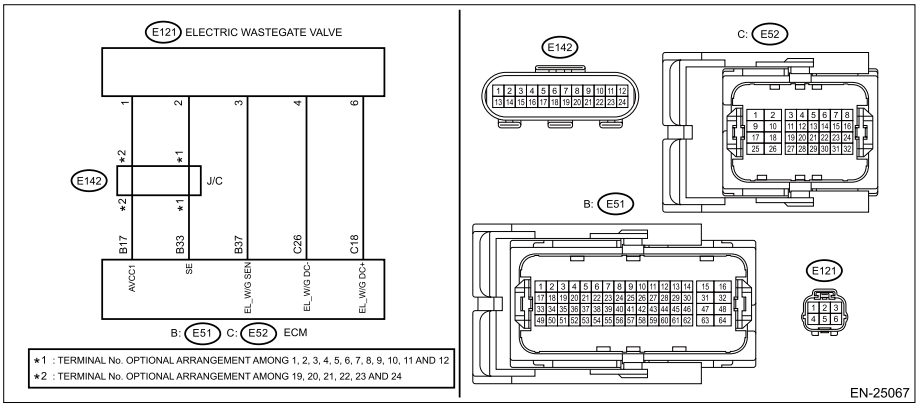




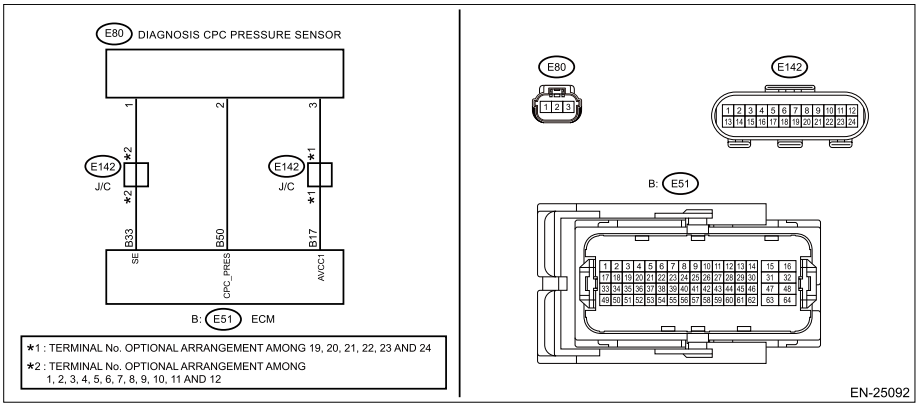
EN-25091



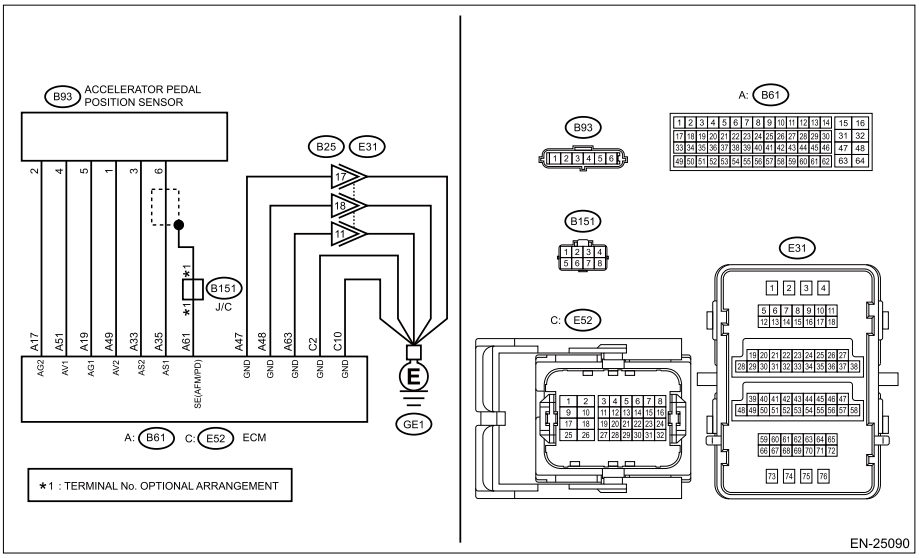
EN-25202



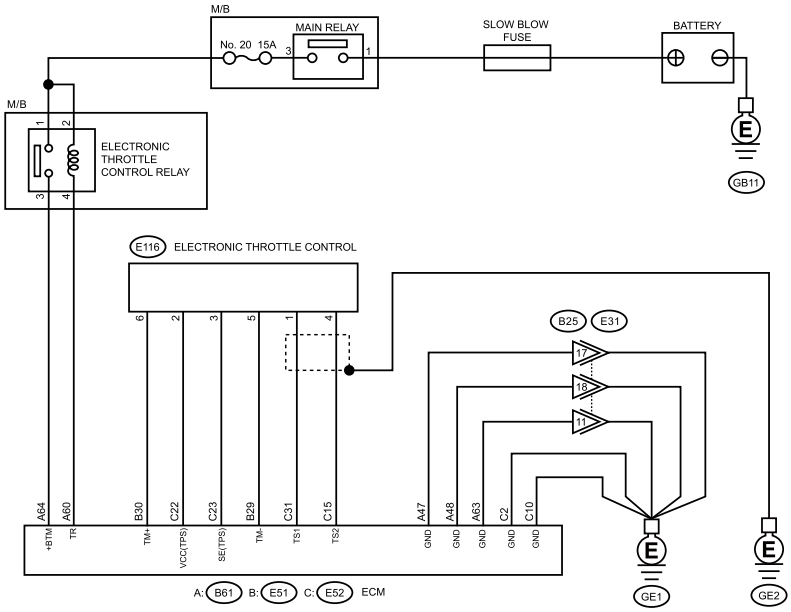
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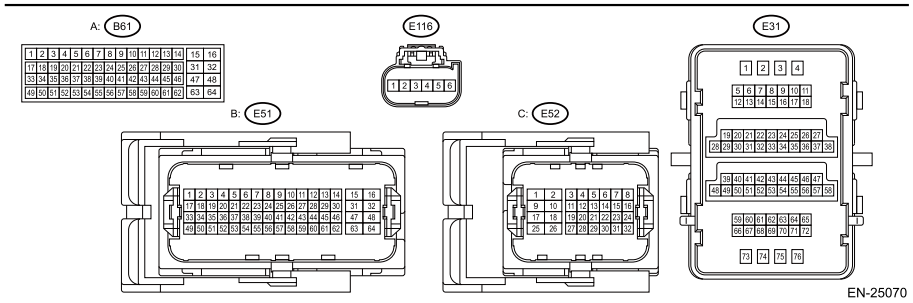


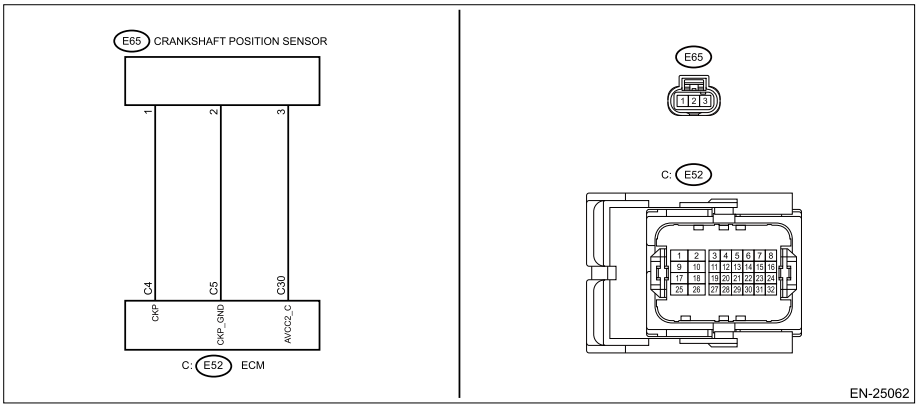
EN-25092



EN-25090







Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 4.
4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 5.
5. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 50 — Engine ground:

Is the voltage 10 V or more?

Yes — Repair the short circuit to power in harness between the ECM connector and the following sensor connector.
- Mass air flow and intake air temperature sensor
- Leak check valve assembly

No — Go to 2.

2. CHECK HARNESS BETWEEN ECM AND EACH SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between ECM connector and engine ground.
Connector & terminal
(E51) No. 17 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Repair the short circuit to power in harness between the ECM connector and the following sensor connector.
- Fuel pressure sensor
- Electronic wastegate valve
- CPC pressure sensor

No — Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between ECM connector and engine ground.
Connector & terminal
(B61) No. 49 (+) — Engine ground (−):

Is the voltage 10 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 ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between ECM connector and engine ground.
Connector & terminal
(E52) No. 22 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Repair the short circuit to power supply in the harness between ECM connector and electronic throttle control connector.

No — Go to 5.

5. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between ECM connector and engine ground.
Connector & terminal
(E52) No. 30 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Repair the short circuit to power in the harness between ECM connector and crankshaft position sensor connector.

No — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

Note:
For the detection standard, refer to DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.

DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

Note:
For the diagnostic procedure, refer to "TRANSMISSION (DIAGNOSTICS)". 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 or more

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	ON

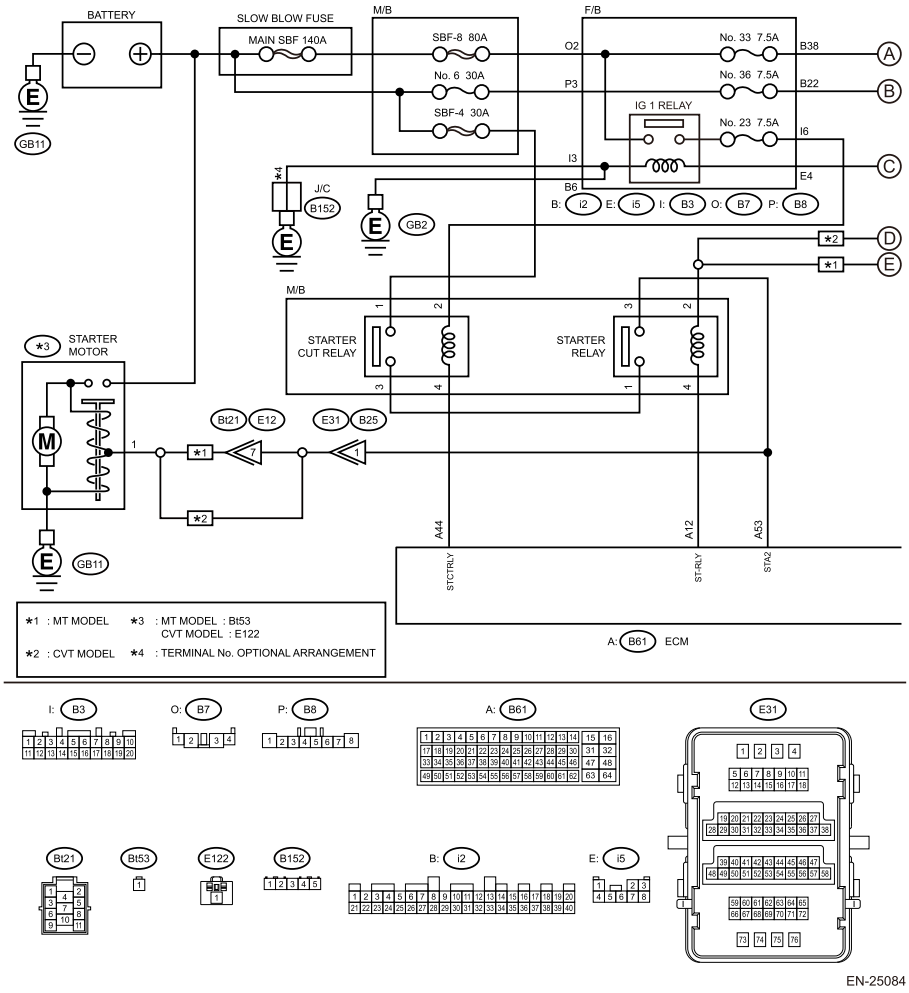
Time needed for diagnosis: 2560 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

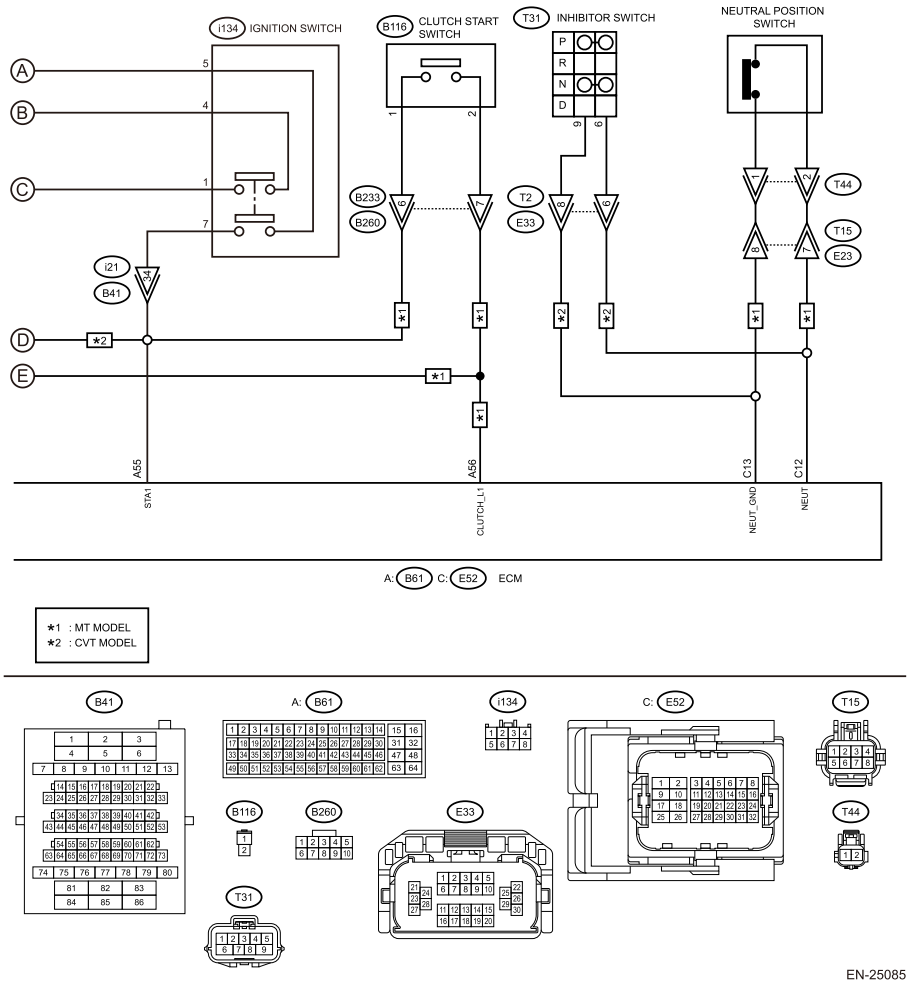
DTC P081A STARTER DISABLE CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Failure of engine to start
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

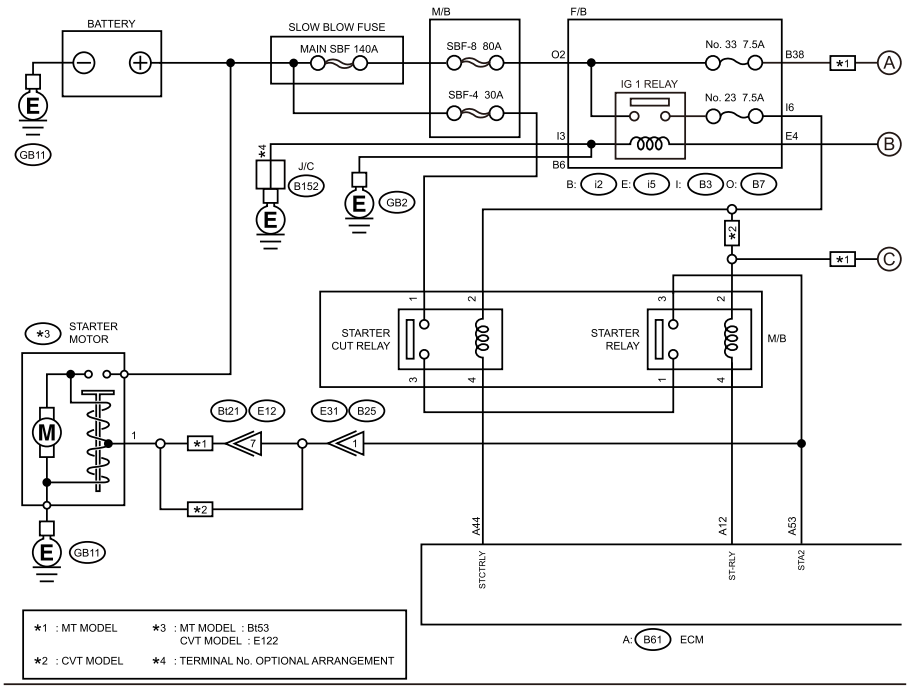
- Model without push button start

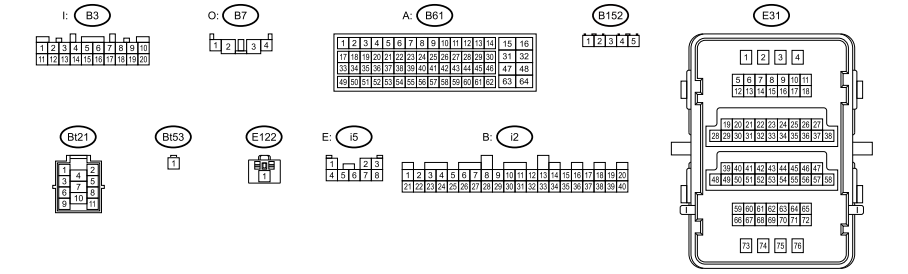




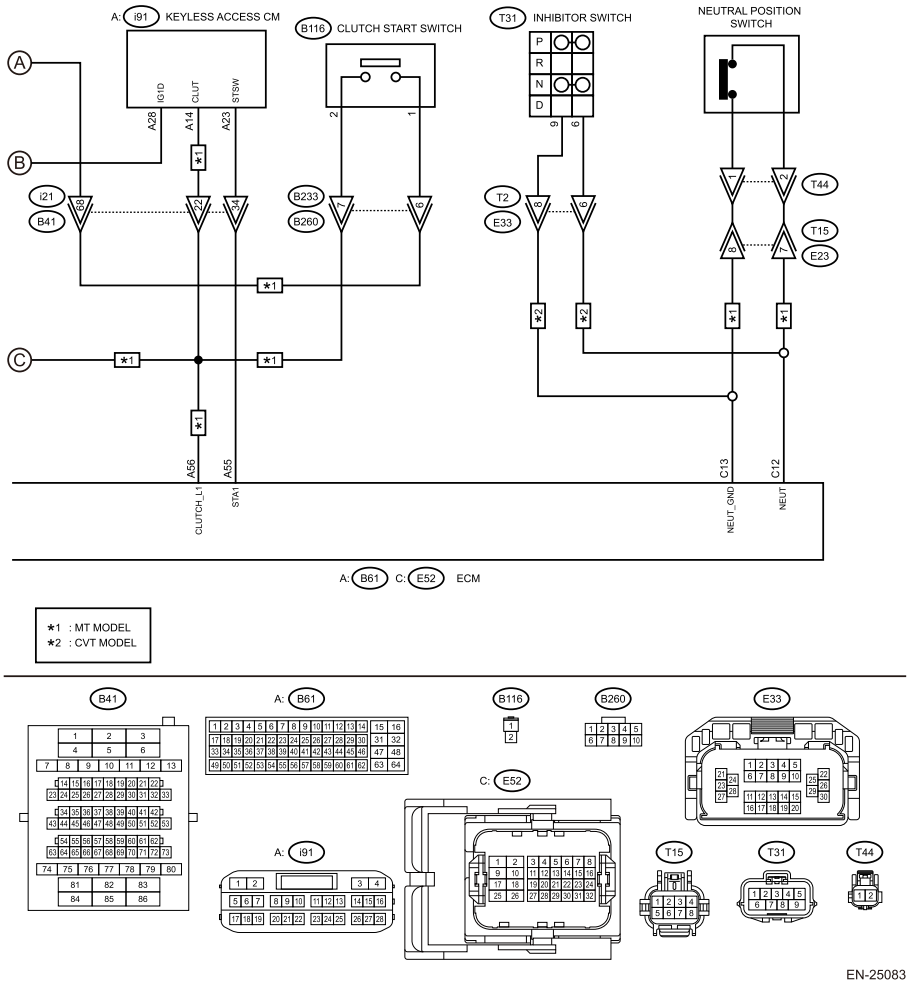
EN-25085

- Model with push button start


BATTERY
SLOW BLOW FUSE
MAIN SBF 140A
M/B
SBF-8 80A
SBF-4 30A
F/B
O2
No. 33 7.5A
B38
IG 1 RELAY
No. 23 7.5A
I6
I3
E4
B6
B: i2 E: i5 I: B3 O: B7
GB11
J/C
B152
GB2
*1
*2
*3
*4
STARTER MOTOR
STARTER CUT RELAY
STARTER RELAY
M/B
Bt21 E12
E31 B25
A44
A12
A53
STCTRLY
ST-RLY
STA2
A: B61 ECM
*1 : MT MODEL
*2 : CVT MODEL
*3 : MT MODEL : Bt53
CVT MODEL : E122
*4 : TERMINAL No. OPTIONAL ARRANGEMENT


I: B3
O: B7
A: B61
B152
E31
Bt21
Bt53
E122
E: i5
B: i2

EN-25082



EN-25083

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM CONNECTOR AND M/B (STARTER CUT RELAY) (SHORT TO GROUND).
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK HARNESS BETWEEN ECM CONNECTOR AND M/B (STARTER CUT RELAY) (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK STARTER CUT RELAY.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM CONNECTOR AND M/B (STARTER CUT RELAY) (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Remove the starter cut relay.
4. Measure the resistance between the ECM connector and engine ground.
   Terminals
   (B61) No. 44 — Engine 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 M/B (starter cut relay).

2. CHECK HARNESS BETWEEN ECM CONNECTOR AND M/B (STARTER CUT RELAY) (OPEN).

Measure the resistance of harness between ECM connector and M/B (starter cut relay) terminal.
Connector & terminal
(B61) No. 44 — No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Repair the open circuit of harness between ECM connector and M/B (starter cut relay).

3. CHECK STARTER CUT RELAY.

Check the starter cut relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay>INSPECTION.

Is the check result OK?

Yes — Repair the poor contact of ECM connector.

No — Replace the starter cut relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect abnormal continuity in the starter cut relay.
Judge as NG when the starter cut relay output line is open.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8 V or more
Starter cut relay	OFF

GENERAL DRIVING CYCLE
Perform the diagnosis when the engine condition is turned from before starting to after starting.

DIAGNOSTIC METHOD
Judge as NG when the following conditions are established.
Judgment value

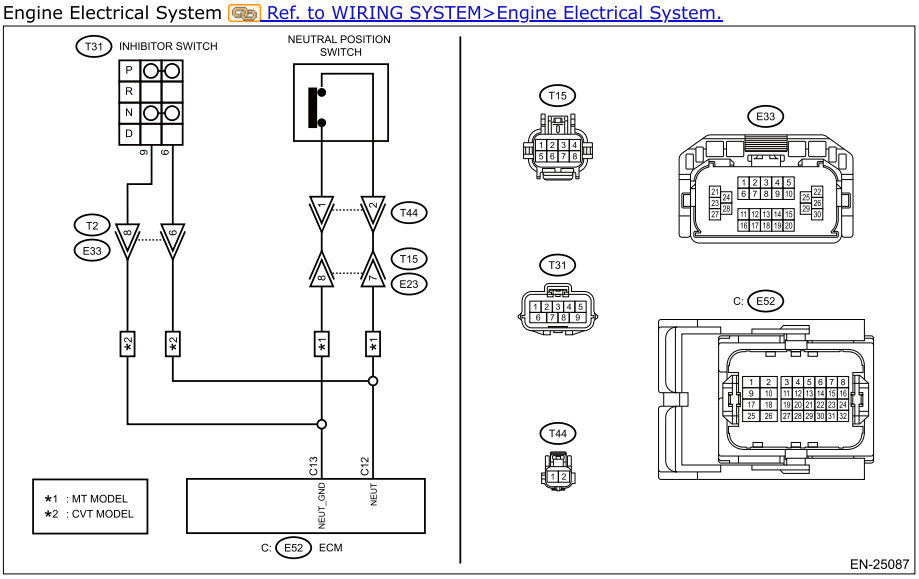
Malfunction Criteria	Threshold Value
Starter cut relay control voltage	Less than 1 V

Time needed for diagnosis: 640 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW

1. CVT MODEL

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK SELECT CABLE.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK INPUT SIGNAL OF ECM.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH (SHORT TO GROUND).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK SELECT CABLE.

Check the select cable. Ref. to CONTROL SYSTEMS>Select Cable>INSPECTION.

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 connector and engine ground.

Connector & terminal

(E52) No. 12 (+) — 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 INHIBITOR SWITCH (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from inhibitor switch.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E52) No. 12 — Engine ground:

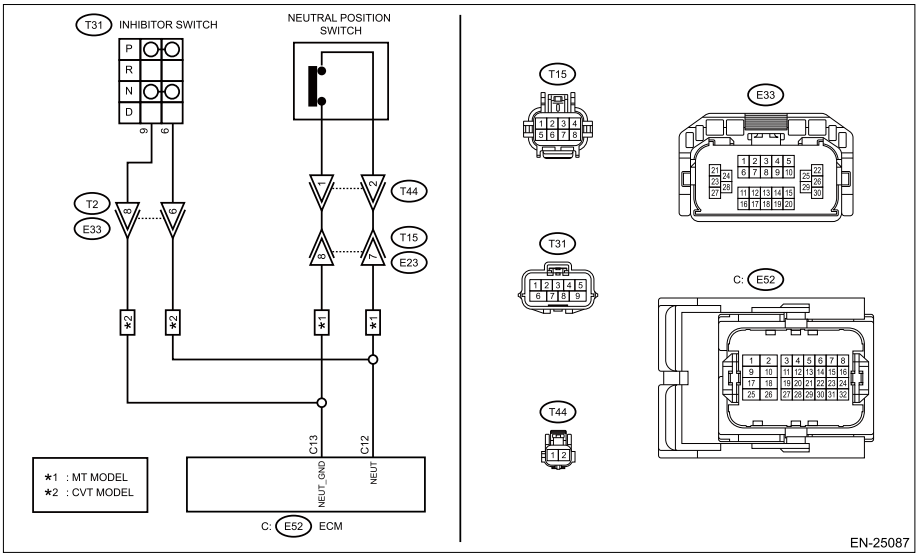
Is the resistance 1 MΩ or more?

Yes	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Inhibitor Switch.
No	Repair the short circuit to ground in harness between ECM connector and inhibitor switch connector.

2. MT MODEL

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INPUT SIGNAL OF ECM.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR (SHORT TO GROUND).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

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 engine ground.
   Connector & terminal
   (E52) No. 12 (+) — 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 NEUTRAL POSITION SWITCH CONNECTOR (SHORT TO GROUND).

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 between the ECM connector and engine ground.
   Connector & terminal
   (E52) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Check the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(TY75)>Switches and Harness>INSPECTION > NEUTRAL POSITION SWITCH.

No — Repair the following item.
- Short circuit to ground in the harness between ECM connector and neutral position switch connector
- Poor contact of coupling connector

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS (CVT MODEL)
Detect the short circuit of neutral SW.
Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

EXECUTION CONDITION (CVT MODEL)

Secondary parameters	Execution condition
Starter relay feedback voltage	Less than 1.5 V
Battery voltage	10.9 V or more
Data received from TCM	Not equal to “P” range/“N” range

GENERAL DRIVING CYCLE (CVT MODEL)
Perform the diagnosis continuously in 2 seconds after starting the engine.

DIAGNOSTIC METHOD (CVT 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
Voltage of the neutral position switch signal	1 V or less

Time needed for diagnosis: 6.4 s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

OUTLINE OF DIAGNOSIS (MT MODEL)
Detect the open or short circuit of neutral position SW.
Judge as NG when there is no change in the neutral position SW even if the driving shift was applied. (There is neutral position SW ON/OFF inversion from the vehicle speed and engine speed.)

EXECUTION CONDITION (MT MODEL)

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
The number of changes from driving condition a) to b)	1 time
a)	
Vehicle speed	0 km/h (0 MPH) or less
and	
Engine speed	600 rpm — 900 rpm
b)	
Vehicle speed	64 km/h (39.8 MPH) or less
and	
Engine speed	1350 rpm — 2120 rpm

GENERAL DRIVING CYCLE (MT MODEL)
Perform the diagnosis continuously after the enable conditions have been established.

METHOD OF DIAGNOSIS (MT MODEL)
Judge NG when the malfunction criteria below are completed determined times or more after the neutral position SW change.
Judgment value

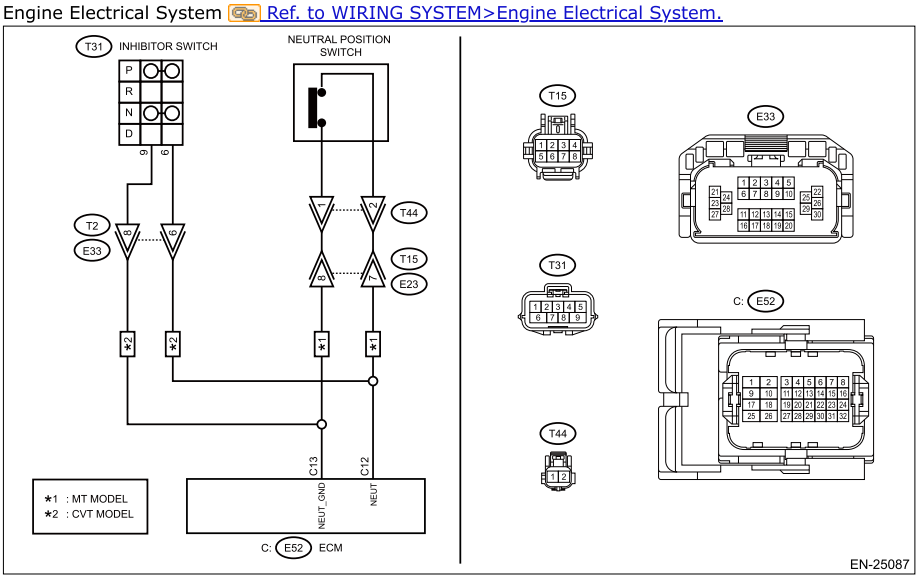
Malfunction Criteria	Threshold Value
Voltage of the neutral position switch signal **Note:** **The condition above is established between the driving conditions a) and b).**	1 V or less

Time needed for diagnosis: 1 time
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH

1. CVT MODEL

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK SELECT CABLE.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK INPUT SIGNAL OF ECM.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH (OPEN).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK SELECT CABLE.

Check the select cable. Ref. to CONTROL SYSTEMS>Select Cable>INSPECTION.

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 "P" range and "N" range.
3. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E52) No. 12 (+) — 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 (OPEN).

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

(E52) No. 12 — (T31) No. 6:

(E52) No. 13 — (T31) No. 9:

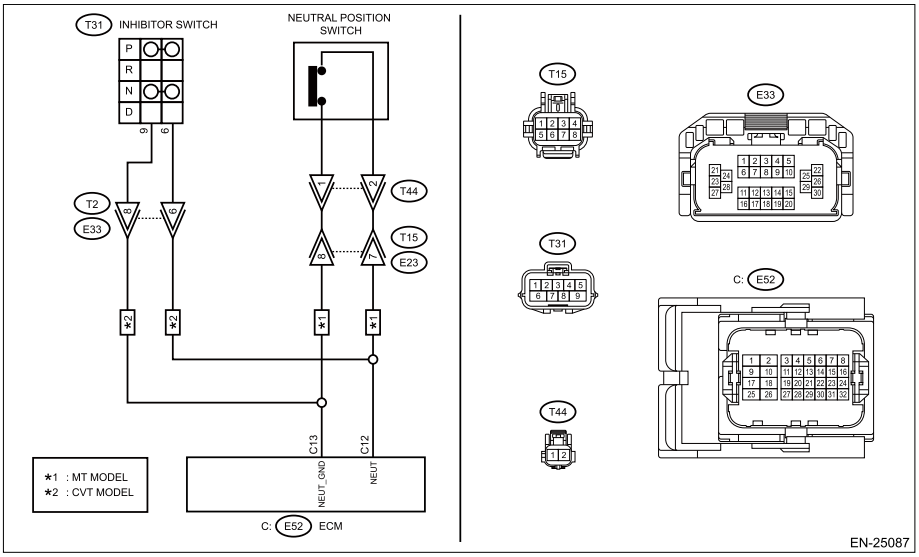
Is the resistance less than 1 Ω?

Yes	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Inhibitor Switch.
No	Repair the following item. • Open circuit in harness between ECM connector and inhibitor switch connector • Poor contact of coupling connector

2. MT MODEL

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INPUT SIGNAL OF ECM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR (OPEN).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 engine ground.

Connector & terminal

(E52) No. 12 (+) — Engine 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 (OPEN).

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

(E52) No. 13 — (T44) No. 1:

(E52) No. 12 — (T44) No. 2:

Is the resistance less than 1 Ω?

Yes — Check the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(TY75)>Switches and Harness>INSPECTION > NEUTRAL POSITION SWITCH.

No — Repair the following item.

- Open circuit in harness between ECM connector and neutral position switch connector
- Poor contact of coupling connector

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS (CVT MODEL)

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.

EXECUTION CONDITION (CVT MODEL)

Secondary parameters	Execution condition
Starter relay feedback voltage	Less than 1.5 V
Battery voltage	10.9 V or more
Data received from TCM	"P" range/"N" range

GENERAL DRIVING CYCLE (CVT MODEL)

Perform the diagnosis continuously in 2 seconds after starting the engine.

DIAGNOSTIC METHOD (CVT 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
Voltage of the neutral position switch signal	6.6 V or more

Time needed for diagnosis: 6.4 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

OUTLINE OF DIAGNOSIS (MT MODEL)

Detect the open or short circuit of neutral position SW.

Judge as NG when there is no change in the neutral position SW even if the driving shift was applied. (There is neutral position SW ON/OFF inversion from the vehicle speed and engine speed.)

EXECUTION CONDITION (MT MODEL)

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
The number of changes from driving condition a) to b)	1 time
a)	
Vehicle speed	0 km/h (0 MPH) or less
and	
Engine speed	600 rpm — 900 rpm
b)	
Vehicle speed	64 km/h (39.8 MPH) or less
and	
Engine speed	1350 rpm — 2120 rpm

GENERAL DRIVING CYCLE (MT MODEL)

Perform the diagnosis continuously after the enable conditions have been established.

METHOD OF DIAGNOSIS (MT MODEL)

Judge NG when the malfunction criteria below are completed determined times or more after the neutral position SW change.

Judgment value

Malfunction Criteria	Threshold Value
Voltage of the neutral position switch signal **Note:** **The condition above is established between the driving conditions a) and b).**	6.6 V or more

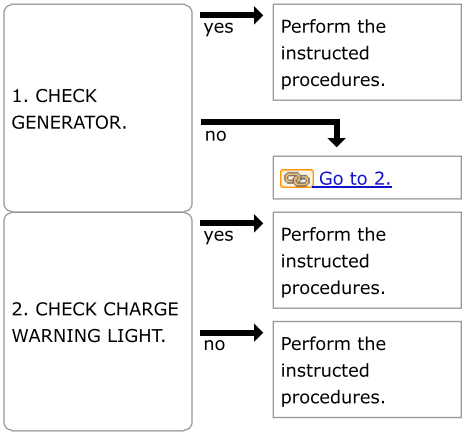
Time needed for diagnosis: 1 time
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0A3B GENERATOR/ALTERNATOR OVER TEMPERATURE

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Charge warning light illuminates.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK GENERATOR.

Check the generator vent window. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator>INSPECTION.

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.

1. Turn the ignition switch to OFF and wait for at least 20 minutes.
2. Start the engine and check the charge warning light.

Does the charge warning light remain on?

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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.

GENERAL DESCRIPTION

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 and charge warning light will be lit.

COMPONENT DESCRIPTION
To secure the vehicle power supply, the generator varies the generation amount according to EGI command.

EXECUTION CONDITION

Secondary parameters	Execution condition
LIN communication schedule	Normal schedule

GENERAL DRIVING CYCLE
Perform the diagnosis continuously after the enable conditions have been established.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Internal malfunction flag of generator (high temperature malfunction warning)	ON
Monitor value of generator internal temperature	More than 168°C (334°F)

Time needed for diagnosis: 10 s or more

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

DTC P100A AVCS SYSTEM STUCK

1. —

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stall
- Improper idling
- Poor acceleration

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Go to 4.
	no	Go to 3.
3. CHECK DTC.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.
4. CHECK DATA MONITOR.	yes	Perform the instructed procedures.
	no	Go to 5.
5. CHECK DATA MONITOR.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P000A, P000B, P000C, P000D, P0011, P0014, P0021 or P0024 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK DTC.

1. Start the engine and warm up fully until the engine oil temperature reaches 80°C (176°F) or more.
2. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Warning:
When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P100A displayed? (Current code)

Yes — Go to 4.

No — Go to 3.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P000A, P000B, P000C, P000D, P0011, P0014, P0021 or P0024 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — End.

4. CHECK DATA MONITOR.

1. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Warning:
When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

2. Using the Subaru Select Monitor, read the value described below.
   - Intake side RH: [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount R]
   - Intake side LH: [VVT Advance Target Angle Amount L], [VVT Adv. Ang. Amount L]
   - Exhaust side RH: [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. R]
   - Exhaust side LH: [Ex VVT Retard Target Angle L], [Exh. VVT Retard Ang. L]

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **Use of the data storage function of Subaru Select Monitor allows the data during driving to be stored. The stored data can be checked after the driving.**

Compare the VVT Advance Target Angle Amount (Ex VVT Retard Target Angle) value and the VVT Adv. Ang. Amount (Exh. VVT Retard Angle) value. Are there any banks that have a difference of 10 degrees or more for 3 seconds or more?

Yes

Perform the diagnosis for the bank that does not synchronize.
- Intake side RH: 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.
- Intake side LH: 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.
- Exhaust side RH: 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.
- Exhaust side LH: 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.

No

Go to 5.

5. CHECK DATA MONITOR.

Read the data saved in step 4.
- Intake side RH: [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount R]
- Intake side LH: [VVT Advance Target Angle Amount L], [VVT Adv. Ang. Amount L]
- Exhaust side RH: [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. R]
- Exhaust side LH: [Ex VVT Retard Target Angle L], [Exh. VVT Retard Ang. L]

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Are there any banks whose VVT Adv. Ang. Amount (Exh. VVT Retard Angle) value have a difference of 10 degrees or more against the VVT Advance Target Angle Amount (Ex VVT Retard Target Angle) value?

Yes

Perform the diagnosis for the banks that have a difference.
- Intake side RH: 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.
- Intake side LH: 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.
- Exhaust side RH: 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.
- Exhaust side LH: 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.

No

End.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.
Judge as NG when the condition during which the difference between AVCS target timing advance amount (AVCS target retard angle amount) and AVCS actual timing advance amount (AVCS actual retard angle amount) is large continues.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Secondary parameters	Execution condition
AVCS control	In operation
|Target timing advance change amount (per 80 ms)|	Less than 4°CA
|VVT target angle|	12.5 °CA or more
Ambient air temperature	Less than 7°C (45°F)

GENERAL DRIVING CYCLE

Perform the diagnosis continuously while AVCS is operating.

DIAGNOSTIC METHOD

For the diagnostic method and judgment value, refer to the following.

- Intake side target error: 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.
- Exhaust side target error: 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.
- Intake side slow response: Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.
- Exhaust side slow response: Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1.

Time needed for diagnosis:

Intake side: 25 sec.

Exhaust side: 25 sec.

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1134 A/F / O2 SENSOR BANK1 SENSOR1 SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION

1. —

DTC detecting condition:

Immediately at fault recognition

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P1134 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the A/F sensor microcomputer operation is abnormal.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Communication data between CPU and front oxygen (A/F) sensor IC	Different from expected value

Time needed for diagnosis: 80 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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%	0 ms

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 position	More than 21.6 %

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

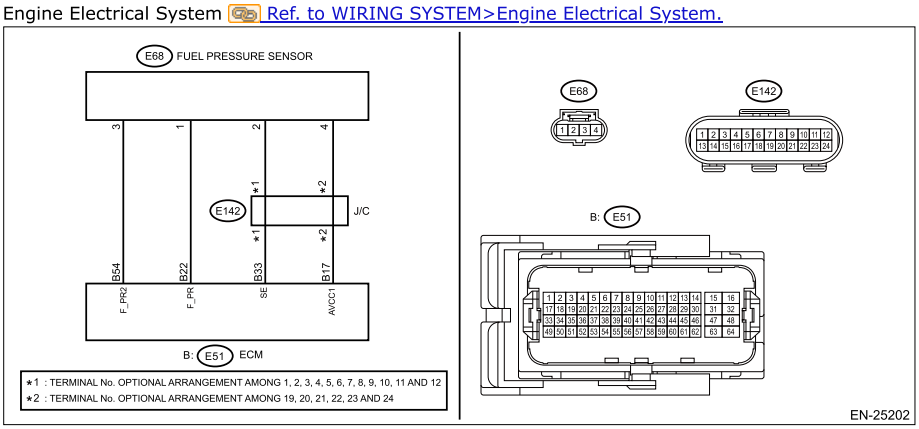
DTC P1192 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Turn the ignition switch to OFF.
4. Start the engine.
5. Using the Subaru Select Monitor, read the value in [Fuel Rail Pressure B].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Fuel Rail Pressure B] approx. 30000 [kPa] (4350 psi) or more?

Yes	Go to 4.
No	Refer to "Check non-permanent occurrence malfunctions". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

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 between the ECM connector and engine ground.
   Connector & terminal
   (E51) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

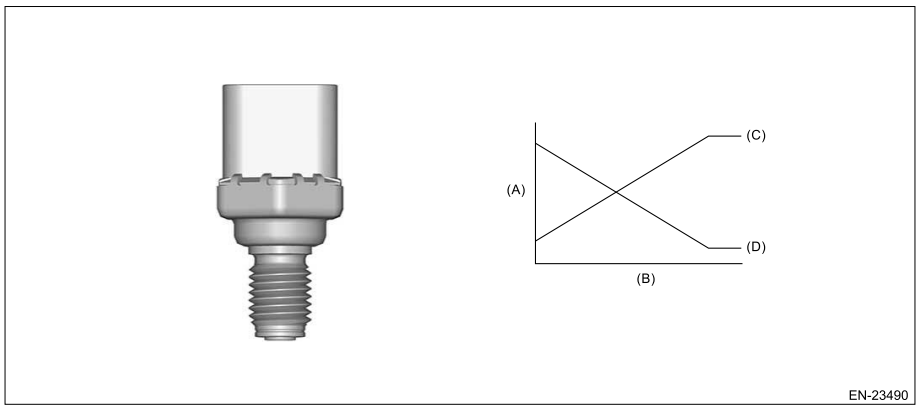
Yes	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pressure Sensor.
No	Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the short circuit in the fuel pressure sensor sub signal.

Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Output voltage
(B) Absolute pressure
(C) Main signal
(D) Sub signal

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.486 V

Time needed for diagnosis: 2400 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

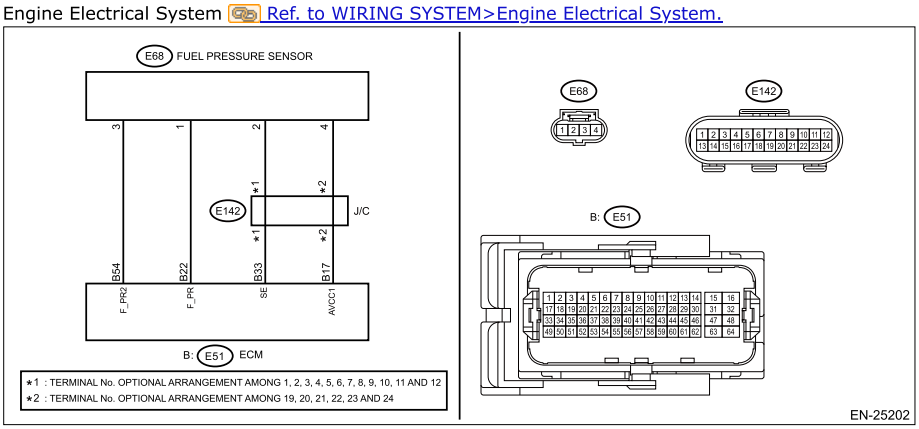
DTC P1193 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK DATA MONITOR.	no	Perform the instructed procedures.
	yes	
4. CHECK FUEL PRESSURE SENSOR POWER SUPPLY.	no	Go to 7.
	yes	

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).
→ no: Perform the instructed procedures.
yes ↓

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).
→ yes: Perform the instructed procedures.
→ no: Perform the instructed procedures.

7. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).
→ no: Perform the instructed procedures.
yes ↓

8. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).
→ yes: Perform the instructed procedures.
→ no: Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes — Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.

No — Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Fuel Rail Pressure B].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Fuel Rail Pressure B] 0 [kPa] (0 psi)?

Yes	Go to 4.
No	Refer to "Check non-permanent occurrence malfunctions". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

4. 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
   (E68) No. 4 (+) — Engine ground (−):

Is the voltage 4.5 — 5.5 V?

Yes	Go to 5.
No	Go to 7.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).

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
   (E51) No. 33 — (E68) No. 2:
   (E51) No. 54 — (E68) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the following item. • Open circuit in harness between ECM connector and fuel pressure sensor connector • Poor contact of J/C

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and fuel pressure sensor connector and engine ground.
   Connector & terminal
   (E51) No. 54 (+) — Engine ground (−):
   (E68) No. 3 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and fuel pressure sensor connector.
No	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pressure Sensor.

7. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (OPEN).

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
   (E51) No. 17 — (E68) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair the following item. • Open circuit in harness between ECM connector and fuel pressure sensor connector • Poor contact of J/C

8. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between ECM connector and fuel pressure sensor connector and engine ground.
Connector & terminal
(E51) No. 17 — Engine ground:
(E68) No. 4 — Engine ground:

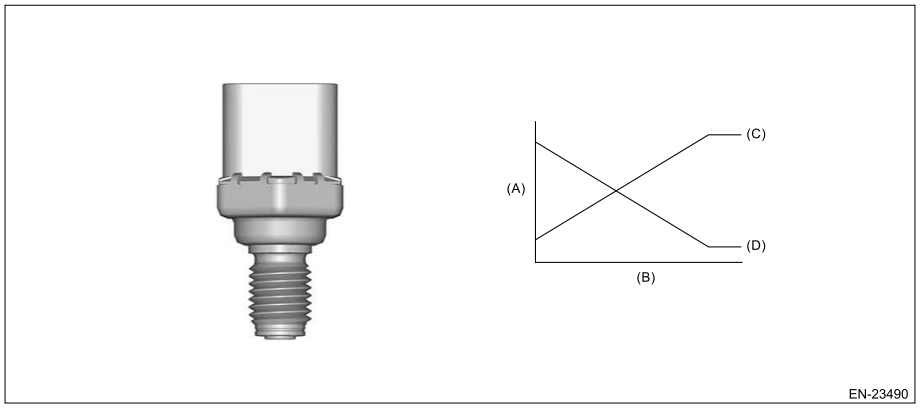
Is the resistance 1 MΩ or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
No	Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit in sub signal of the fuel pressure sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(A) Output voltage
(B) Absolute pressure
(C) Main signal
(D) Sub signal

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	More than 4.783 V

Time needed for diagnosis: 2400 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P1236 FUEL INJECTOR DRIVER SERIAL PERIPHERAL INTERFACE (SPI) COMMUNICATION

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P1236 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Judge as NG if communication between CPU and the injector driving IC is abnormal.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	9.44 V

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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
Communication data between CPU and the injector driving IC	Different from expected value

Time needed for diagnosis: 65 times

Map

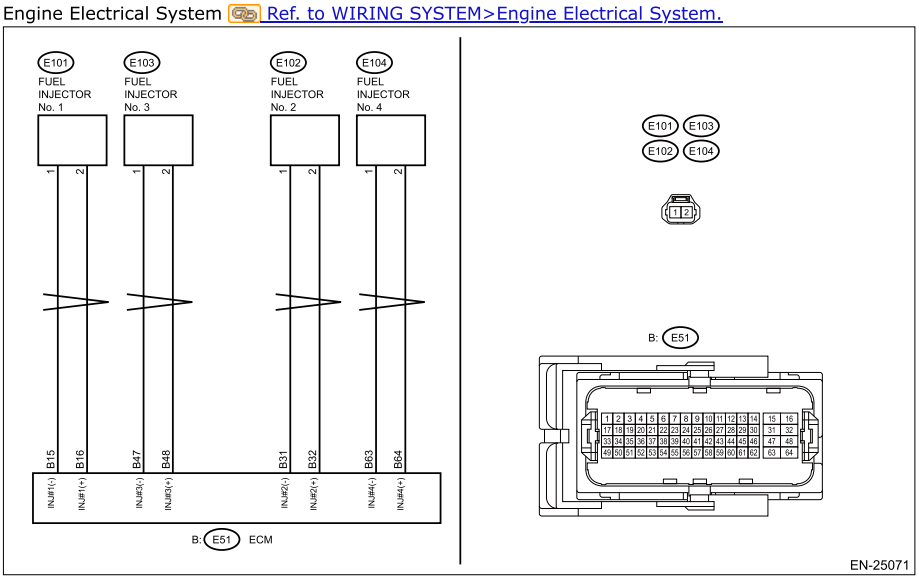
Engine speed (rpm)	Time needed for 65 times of diagnosis (sec)
500	3.9
2000	0.975
4000	0.4875
6000	0.325

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR.
   - no → Go to 3.
   - yes ↓
2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
   - yes → Go to 4.
   - no → Perform the instructed procedures.
3. CHECK FUEL INJECTOR.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 (E51) No. 15 — (E51) No. 16:
#2 (E51) No. 31 — (E51) No. 32:
#3 (E51) No. 47 — (E51) No. 48:
#4 (E51) No. 63 — (E51) No. 64:

Is the resistance 1.5 Ω (at 23°C (73°F))?

Yes — Go to 2.

No — Go to 3.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between ECM and engine ground on faulty injectors.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — Engine 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 fuel injector connector.

3. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes — Repair the open circuit or short between lines in harness between ECM connector and fuel injector connector.

No — Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

4. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between ECM and engine ground on defective fuel injectors.

Connector & terminal

#1 (E51) No. 15 (+) — Engine ground (−):
#1 (E51) No. 16 (+) — Engine ground (−):
#2 (E51) No. 31 (+) — Engine ground (−):
#2 (E51) No. 32 (+) — Engine ground (−):
#3 (E51) No. 47 (+) — Engine ground (−):
#3 (E51) No. 48 (+) — Engine ground (−):
#4 (E51) No. 63 (+) — Engine ground (−):
#4 (E51) No. 64 (+) — Engine 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 — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Diagnosis 1 (power supply short)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status A

Diagnosis 2 (ground short)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status B

Diagnosis 3 (open circuit)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status A (condition 1) Status B (condition 2)

Diagnosis 4 (short circuit, overcurrent)

Secondary parameters	Execution condition
Battery voltage	9.44 V or more
FET and SW statuses	Status C

FET and SW statuses

Condition	FET1	FET2	FET3	SW1	SW2
Status A	OFF	OFF	OFF	OFF	ON
Status B	OFF	OFF	OFF	ON	OFF
Status C	ON	ON	ON	OFF	OFF

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value

Diagnosis 1 (power supply short)

Malfunction Criteria	Threshold Value
Fuel injector supply voltage − Fuel injector terminal voltage (+)	2 V or less

Diagnosis 2 (ground short)

Malfunction Criteria	Threshold Value
Fuel injector terminal voltage (−) − Ground	2 V or less

Diagnosis 3 (open circuit)

Malfunction Criteria	Threshold Value
Condition 1 and condition 2 are continuously detected	
Condition 1:	
Fuel injector supply voltage − Fuel injector terminal voltage (+)	2 V or less
Condition 2:	
Fuel injector terminal voltage (−) − Ground	2 V or less

Diagnosis 4 (short circuit, overcurrent)

Malfunction Criteria	Threshold Value
Fuel injector current 3.5 μs after the injection command	3 A or more

Time needed for diagnosis:
Diagnosis 1, 2 and 3: 50 times
Diagnosis 4: 25 times

Map

Engine speed (rpm)	Time needed for 50 times of diagnosis (sec)	Time needed for 25 times of diagnosis (sec)
500	3	1.5
2000	0.75	0.375
4000	0.375	0.1875
6000	0.25	0.125

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 and 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 and 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)

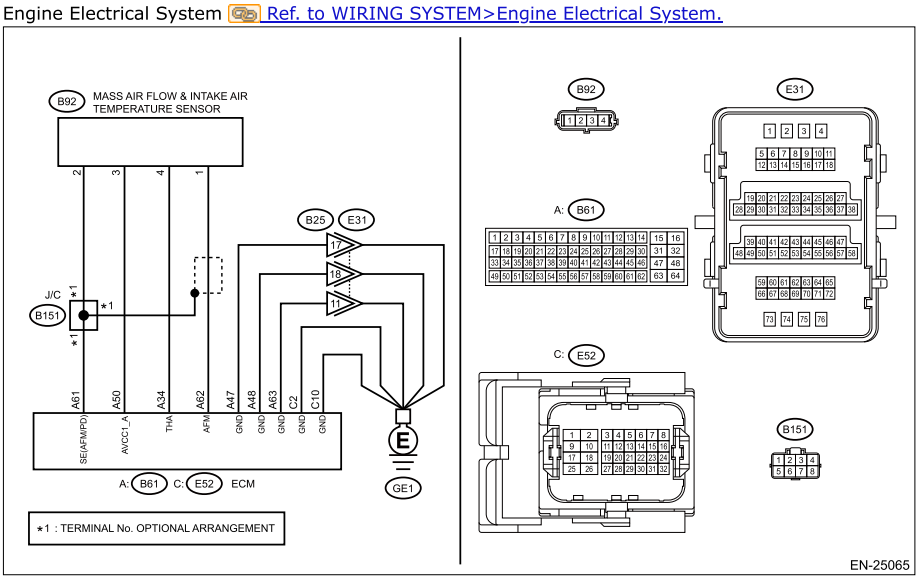
DTC P1264 CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN

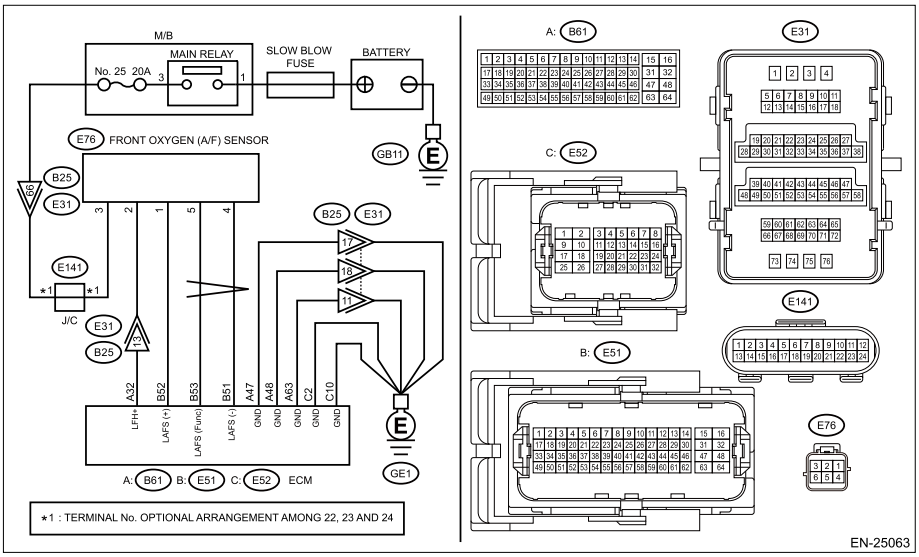
Note:
For the diagnostic procedure and detection standard, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

DTC P1378 PRE-IGNITION DETECTED

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

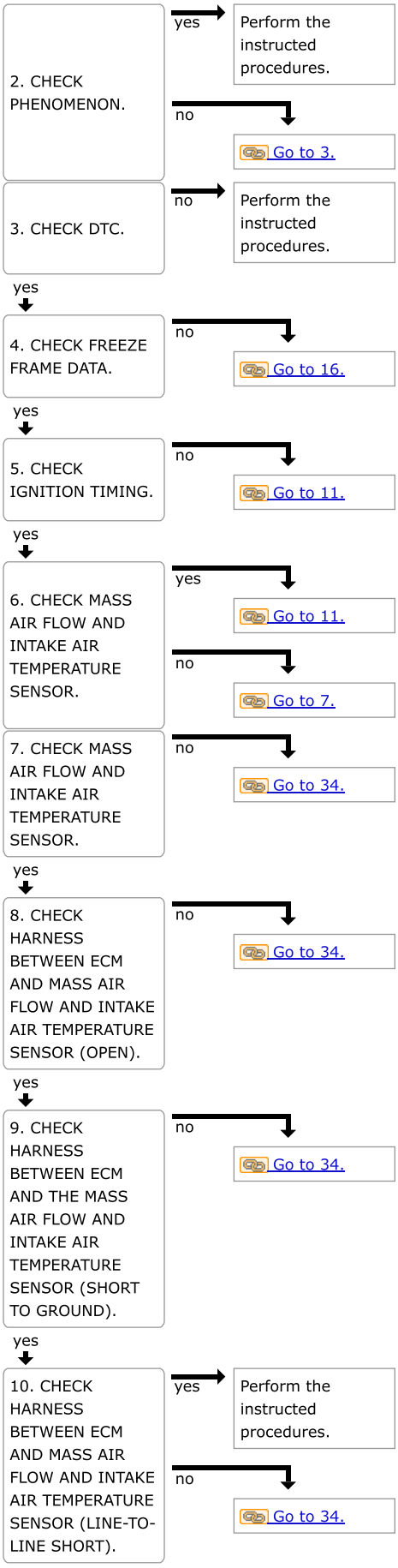


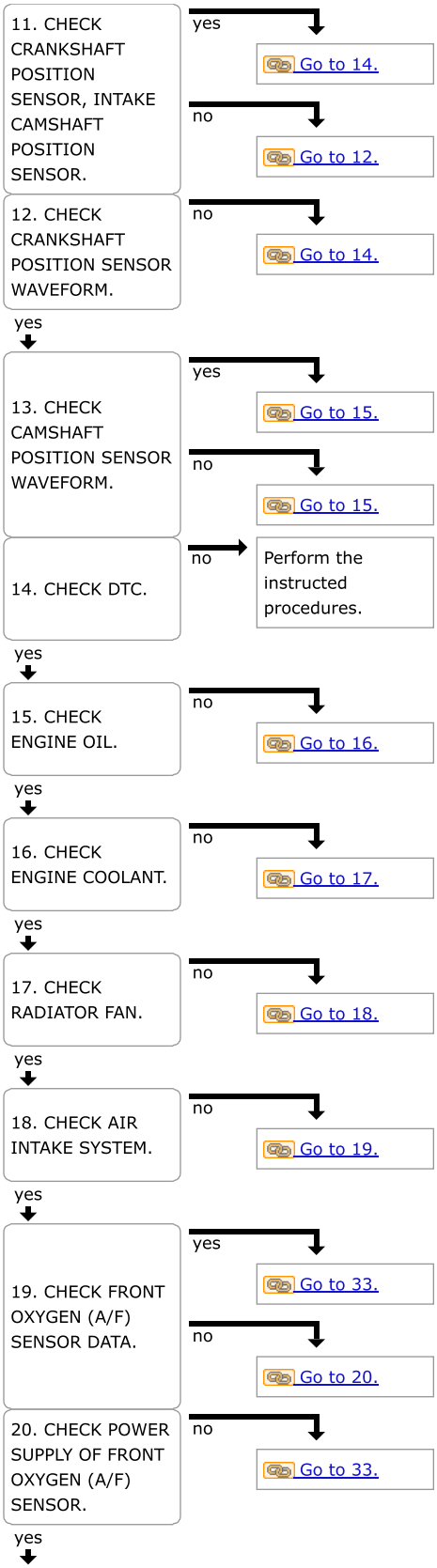


Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

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. Ref. to COMMON (DIAGNOSTICS)>Clear memory.**
- **After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.


2. CHECK PHENOMENON.
yes
Perform the instructed procedures.
no
Go to 3.
3. CHECK DTC.
no
Perform the instructed procedures.
yes
4. CHECK FREEZE FRAME DATA.
no
Go to 16.
yes
5. CHECK IGNITION TIMING.
no
Go to 11.
yes
6. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
yes
Go to 11.
no
Go to 7.
7. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Go to 34.
yes
8. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (OPEN).
no
Go to 34.
yes
9. CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (SHORT TO GROUND).
no
Go to 34.
yes
10. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (LINE-TO-LINE SHORT).
yes
Perform the instructed procedures.
no
Go to 34.


11. CHECK CRANKSHAFT POSITION SENSOR, INTAKE CAMSHAFT POSITION SENSOR.
yes
Go to 14.
no
Go to 12.
12. CHECK CRANKSHAFT POSITION SENSOR WAVEFORM.
no
Go to 14.
yes
13. CHECK CAMSHAFT POSITION SENSOR WAVEFORM.
yes
Go to 15.
no
Go to 15.
14. CHECK DTC.
no
Perform the instructed procedures.
yes
15. CHECK ENGINE OIL.
no
Go to 16.
yes
16. CHECK ENGINE COOLANT.
no
Go to 17.
yes
17. CHECK RADIATOR FAN.
no
Go to 18.
yes
18. CHECK AIR INTAKE SYSTEM.
no
Go to 19.
yes
19. CHECK FRONT OXYGEN (A/F) SENSOR DATA.
yes
Go to 33.
no
Go to 20.
20. CHECK POWER SUPPLY OF FRONT OXYGEN (A/F) SENSOR.
no
Go to 33.
yes

21. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).
- no → Go to 33.
- yes ↓

22. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).
- no → Go to 33.
- yes ↓

23. CHECK FUEL PRESSURE.
- yes → Go to 26.
- no → Go to 24.

24. CHECK OF FUEL PUMP.
- yes → Go to 26.
- no → Go to 25.

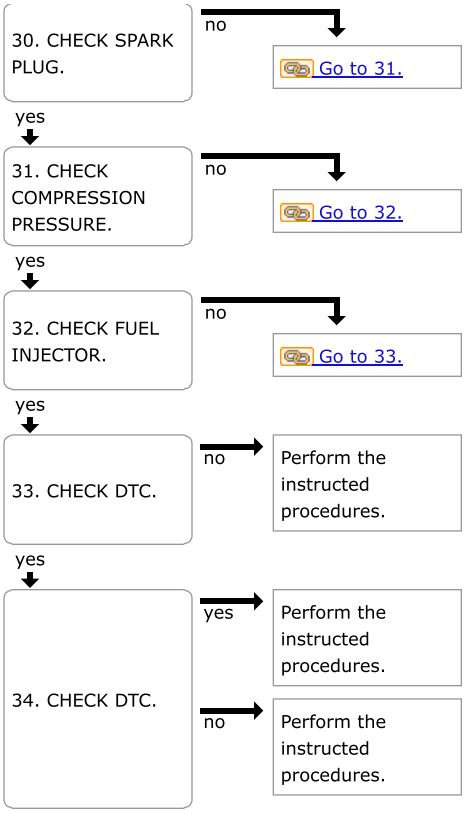
25. CHECK OF FUEL PUMP.
- no → Go to 26.
- yes ↓

26. CHECK FUEL TANK.
- yes → Go to 33.
- no → Go to 27.

27. CHECK FREEZE FRAME DATA.
- no → Go to 33.
- yes ↓

28. CHECK KNOCK SENSOR.
- no → Go to 30.
- yes ↓

29. CHECK KNOCK SENSOR.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P1378 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PHENOMENON.

For the result of the interview, check the problem of the following symptoms.

- Engine startability
- Rough idling
- Misfire or insufficient power
- Other symptom

Can the malfunction symptom be confirmed?

Yes	Perform the diagnosis according to the phenomenon.
No	Go to 3.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1378 displayed? (Current code)

Yes — Go to 4.

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.

4. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Number of Pre-Ignition Control (Detection) Operating].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is [Number of Pre-Ignition Control (Detection) Operating] 1 or more?

Yes — Go to 5.

No — Go to 16.

5. CHECK IGNITION TIMING.

1. Warm up the engine.
2. Fix the ignition timing to BTDC 10° by selecting the [Fixed Idle Ignition Timing] in [Active Test] using Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.
3. Using the timing light, check the actual ignition timing at BTDC 10°.

Does the ignition timing match?

Yes — Go to 6.

No — Go to 11.

6. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Turn the ignition switch to OFF.
2. Remove the mass air flow and intake air temperature sensor from the vehicle, and cool down to the compartment temperature. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.
3. Connect the mass air flow and intake air temperature sensor.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read the value in [IAT Sensor #11].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Do the compartment temperature and the temperature displayed in the data monitor match?

Yes — Go to 11.

No — Go to 7.

7. 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 check result OK?

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.
Go to 34.

8. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.
   Connector & terminal
   (B61) No. 61 — (B92) No. 2:
   (B61) No. 34 — (B92) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — 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 J/C

Go to 34.

9. CHECK HARNESS BETWEEN ECM AND THE MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(B61) No. 34 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 10.

No — Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.
Go to 34.

10. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR (LINE-TO-LINE SHORT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.
   Connector & terminal
   (B92) No. 2 — (B92) No. 4:

Is the resistance 1 MΩ or more?

Yes — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

No — Repair the line-to-line short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.
Go to 34.

11. CHECK CRANKSHAFT POSITION SENSOR, INTAKE CAMSHAFT POSITION SENSOR.

1. Using an oscilloscope, measure waveform of crankshaft position sensor and camshaft position sensor.
2. Check if "Number of signals for every two crankshaft revolutions", "Phase difference of the crankshaft position sensor and intake camshaft position sensor signals", "Signal waveform" match according to the sample waveform described in the manual. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Control Module I/O Signal.

Is the check result OK?

Yes — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
Go to 14.

No — Correct the displacement of the timing chain.
Go to 12.

12. CHECK CRANKSHAFT POSITION SENSOR WAVEFORM.

Check the number of signals and presence/absence of noise with waveform of the crankshaft position sensor.

Is the check result OK?

Yes — Go to 13.

No — Check for DTC P0335. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
Go to 14.

13. CHECK CAMSHAFT POSITION SENSOR WAVEFORM.

Check the number of signals and presence/absence of noise with waveform of the camshaft position sensor.

Is the check result OK?

Yes — Go to 15.

No — Check for DTC P0340 and P0345.
Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.
Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.
Go to 15.

14. CHECK DTC.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the reproduction test.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1378 displayed? (Current code)

Yes	Go to 15.
No	Currently, it is normal.

15. CHECK ENGINE OIL.

Check the engine oil. Ref. to LUBRICATION(H4DOTC)>Engine Oil>INSPECTION.

Is the check result OK?

Yes	Go to 16.
No	Replace engine oil. Ref. to LUBRICATION(H4DOTC)>Engine Oil. Go to 16.

16. CHECK ENGINE COOLANT.

Check the engine coolant. Ref. to COOLING(H4DOTC)>Engine Coolant>INSPECTION.

Is the check result OK?

Yes	Go to 17.
No	Perform replacement and bleeding of the engine coolant. Ref. to COOLING(H4DOTC)>Engine Coolant. Go to 17.

17. CHECK RADIATOR FAN.

1. Using the Subaru Select Monitor, select [Radiator Fan Relay] of [Active Test].

   Note:
   For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.
2. Check operation/stop of the radiator fan according to ON/OFF switching operation.

Is the check result OK?

Yes	Go to 18.
No	Check the radiator fan operation. Ref. to COOLING(H4DOTC)>Radiator Fan System. Go to 18.

18. 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 or replace the air intake system.
Go to 19.

No — Go to 19.

19. 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 the Subaru Select Monitor, 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)(H4DOTC)>Active Test.**
- **The value of [A/F Sensor #1] will change to 0.93 or 1.17 when [Injection Quantity Control] in [Active Test] is changed between −12% — +12% with [Long term fuel trim B1] at −5%.**

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 33.

No — Go to 20.

20. CHECK POWER SUPPLY OF FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the 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
(E76) No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 21.

No — Repair or replace the power supply circuit. Go to 33.

Note:
In this case, repair the following item:
- **Open circuit in harness between M/B and front oxygen (A/F) sensor connector**
- **Poor contact of J/C**
- **Poor contact of coupling connector**
- **Blown out of fuse**

21. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

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
   (E51) No. 52 — (E76) No. 1:
   (E51) No. 51 — (E76) No. 4:
   (E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 22.

No — Repair the open circuit of harness or replace the harness between ECM connector and front oxygen (A/F) sensor connector.
Go to 33.

22. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E51) No. 51 (+) — Engine ground (−):
(E51) No. 52 (+) — Engine ground (−):
(E51) No. 53 (+) — Engine ground (−):

Is the resistance 1 MΩ or more?

Yes — Go to 23.

No — Repair the short circuit to ground in harness or replace the harness between ECM connector and front oxygen (A/F) sensor connector.
Go to 33.

23. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Note:
If the indication of the fuel pressure gauge is not stable, read the mean value of the indication.

Is the check result OK?

Yes — Go to 26.

No — Check the fuel delivery line.
Go to 24.

24. CHECK OF FUEL PUMP.

Using the Subaru Select Monitor, select [Fuel Pump Relay] of [Active Test] to operate the fuel pump.

Note:
For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.

Does the fuel pump emit operating sound?

Yes — Go to 26.

No — Go to 25.

25. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes — Repair the wiring malfunction of the fuel pump.
Go to 26.

No — Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.
Go to 26.

26. CHECK FUEL TANK.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Check if any foreign matters such as iron powder exist in the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Tank.

Is there any foreign matter in the fuel tank?

Yes — Remove foreign matter from the fuel tank.
Go to 33.

No — Go to 27.

27. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 28.

No — Check the high-pressure fuel pump, and if any fault is found, replace the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>High Pressure Fuel Pump.
Go to 33.

28. CHECK KNOCK SENSOR.

1. Warm up and then idle the engine.
2. Using the Subaru Select Monitor, read the value in [Knocking Signal].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Knocking Signal] [ON]?

Yes — Go to 29.

No — Go to 30.

29. CHECK KNOCK SENSOR.

Check the knock sensor signals using oscilloscope.

Does noise occur in the knocking sensor signals?

Yes	Repair the noise cause.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

30. CHECK SPARK PLUG.

Check the spark plug. Ref. to IGNITION(H4DOTC)>Spark Plug>INSPECTION.

Is the check result OK?

Yes	Go to 31.
No	Replace all spark plugs on all cylinders. Ref. to IGNITION(H4DOTC)>Spark Plug. Go to 31.

31. CHECK COMPRESSION PRESSURE.

Check the compression pressure. Ref. to MECHANICAL(H4DOTC)>Compression>INSPECTION.

Is the check result OK?

Yes	Go to 32.
No	Check compression failure of the engine unit. Go to 32.

32. CHECK FUEL INJECTOR.

1. Remove the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.
2. Check fuel injector.

Is there any deposit in the tip of fuel injector?

Yes	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector. Remove foreign objects such as carbon adhered inside the combustion chamber. Go to 33.
No	Go to 33.

33. CHECK DTC.

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 COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the reproduction test.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1378 displayed? (Current code)

Yes	Go to 34.
No	Currently, it is normal.

34. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Replace the entire fuel.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Perform the reproduction test.
6. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1378 displayed? (Current code)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
No	Currently, it is normal.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the pressure difference is equal to or more than the predetermined value by using fuel which does not match the standard.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

<Pre-ignition detection control>

Malfunction Criteria	Threshold Value
Delay value from the before top dead center 70 deg until the pre-ignition analysis starts and Delay value from the ignition timing until the pre-ignition analysis ends and Analyzed pressure change value	0.277 or more Value of Map1 or less Value of Map2 or more

Map1

Diagnostic value		Crankshaft angle (deg)							
		50	60	70	80	90	100	110	120
Engine speed (rpm)	800	16.9	18.05	19.2	20.35	21.5	21.64	21.64	21.64
	1200	15.89	17.04	18.19	19.34	20.49	21.64	21.64	21.64
	1600	19.48	19.48	19.48	19.48	19.48	19.48	20.104	20.728
	2000	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44
	2400	20.7	21.2	21.2	21.2	21.2	21.2	21.2	21.2
	2800	20.8	21.1	21.1	21.6	21.6	22.12	22.12	22.12
	3200	20.8	21.3	21.8	22.3	22.5	22.5	23.03	23.03
	3600	20.8	21.3	21.8	22.3	22.8	22.8	23.51	23.51
	4000	20.8	21.3	21.8	22.3	22.84	22.84	22.84	22.84
	4400	18.4	19.4	20.4	21.4	22.4	23.4	24.57	24.57
	4800	18.4	19.4	20.4	21.4	22.4	24.95	24.95	24.95
	5200	18.4	19.4	20.4	21.4	22.4	24.33	24.33	24.33
	5600	18.4	19.4	20.4	21.4	22.4	22.55	22.55	22.55
	6000	18.4	19.4	20.4	21.4	22.4	22.55	22.55	22.55
	6400	18.4	19.4	20.4	21.4	22.4	22.55	22.55	22.55
	6800	18.4	19.4	20.4	21.4	22.4	22.55	22.55	22.55

Diagnostic value	Crankshaft angle (deg)							
	130	140	150	160	170	180	190	200

Engine speed (rpm)	800	21.64	21.64	21.64	21.64	21.64	21.64	21.64	21.64
	1200	21.64	21.64	21.64	21.64	21.64	21.64	21.64	21.64
	1600	20.728	20.728	20.728	20.728	20.728	20.728	20.728	20.728
	2000	20.44	20.44	20.44	20.44	20.44	20.44	20.44	20.44
	2400	20.77	20.34	20.2	20.06	20.06	20.06	20.06	20.06
	2800	21.83	21.54	21.54	21.54	21.54	21.54	21.54	21.54
	3200	22.985	22.94	22.795	22.65	22.455	22.26	22.065	21.87
	3600	23.51	23.51	23.51	23.51	22.79	22.07	22.07	22.07
	4000	22.84	22.84	22.84	22.84	22.84	22.84	22.84	22.84
	4400	24.57	24.57	24.28	23.99	22.935	21.88	21.88	21.88
	4800	24.665	24.38	24.38	24.38	23.59	22.8	22.8	22.8
	5200	24.565	24.8	24.8	24.8	24.39	23.2	23.2	23.2
	5600	23.225	23.9	23.9	23.9	23.2	22.5	22.5	22.5
	6000	23.225	23.9	23.9	23.9	23.2	22.5	22.5	22.5
	6400	23.225	23.9	23.9	23.9	23.2	22.5	22.5	22.5
	6800	23.225	23.9	23.9	23.9	23.2	22.5	22.5	22.5

Map2

Diagnostic value		Crankshaft angle (deg)							
		90	100	110	120	130	140	160	180
Engine speed (rpm)	800	10000	2000	2000	2000	2000	2000	2000	2000
	1200	10000	2000	2000	2000	2000	2000	2000	2000
	1600	10000	2000	2000	2000	2000	2000	2000	2000
	2000	10000	2000	2000	2000	2000	2000	2000	2000
	2400	10000	2000	2000	2000	2000	2000	2000	2000
	2800	10000	2000	2000	2000	2000	2300	2300	2300
	3200	10000	2000	2000	2000	3100	2500	2500	2500
	3600	10000	2500	2500	2500	3200	2800	2800	2800
	4000	10000	2800	2800	3200	4500	3500	3500	3500
	4400	10000	4000	4000	4400	5600	4400	4400	4400
	4800	10000	4600	4600	4600	5300	4400	4400	4400
	5200	10000	4700	4700	4700	7200	5500	5500	5500
	5600	10000	5600	5600	5600	8500	6400	6400	6400
	6000	10000	6600	6600	6600	10000	7300	7300	7300
	6400	10000	7700	7700	7700	10000	8200	8200	8200
	6800	10000	10000	10000	10000	10000	10000	10000	10000

<Control with non-standard fuel supplied>

Malfunction Criteria	Threshold Value
Knocking compensation (DKNK) and Accumulation value of number of knocking cylinder	−12 deg or less 186 times or more
Knocking compensation (PCMP) and Accumulation value of number of knocking cylinder	−9.8 deg or less 186 times or more

Time needed for diagnosis: Less than 1 s
Malfunction indicator light illumination: Does not illuminate.

DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER)

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DRAIN TUBE AND DRAIN PIPE BETWEEN LEAK CHECK VALVE ASSEMBLY AND DRAIN FILTER.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DRAIN FILTER.	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK LEAK CHECK VALVE ASSEMBLY (PRESSURE SENSOR).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P1449 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DRAIN TUBE AND DRAIN PIPE BETWEEN LEAK CHECK VALVE ASSEMBLY AND DRAIN FILTER.

1. Turn the ignition switch to OFF.
2. Check the drain tube and the drain pipe between leak check valve assembly and drain filter.

Is the drain tube or the drain pipe between leak check valve assembly and drain filter clogged?

Yes	Replace the drain tube or the drain pipe between leak check valve assembly and drain filter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Drain Filter.
No	Go to 3.

3. CHECK DRAIN FILTER.

Check the drain filter.

Is the drain filter clogged?

Yes	Replace the drain filter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Drain Filter.
No	Go to 4.

4. CHECK LEAK CHECK VALVE ASSEMBLY (PRESSURE SENSOR).

1. Turn the ignition switch to ON.
2. Start monitoring of [Evap System Absolute Pressure] using [Generic OBDII] of Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "Help" of application.

3. Check the value of [Evap System Absolute Pressure] by shaking the harness and connector between leak check valve assembly and ECM.

Does the value of [Evap System Absolute Pressure] change?

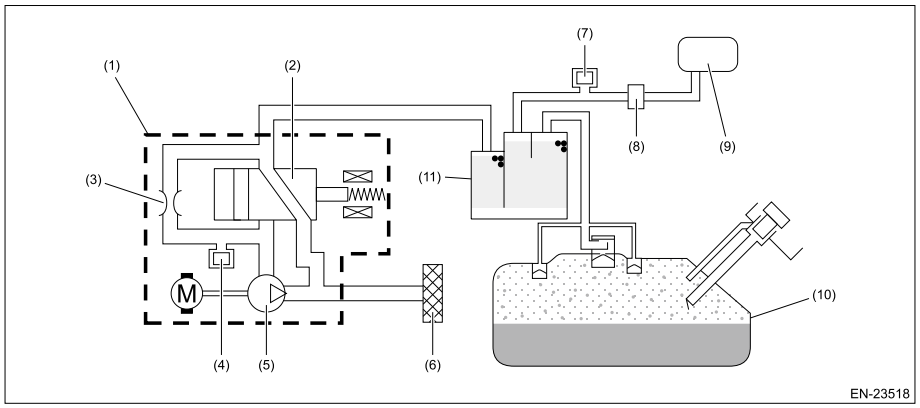
Yes	Repair the following item. • Open circuit in harness between ECM connector and the leak check valve assembly connector • Poor contact of coupling connector • Poor contact of J/C
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

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.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

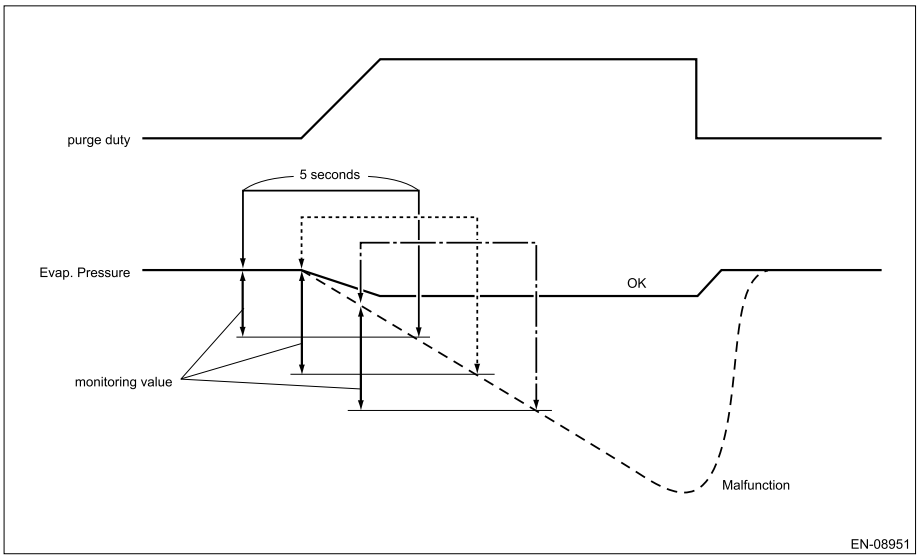
EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Elapsed time after ignition switch is turned to ON	20 s or more
Vacuum pump in the leak check valve assembly	Not in operation
Switching valve in leak check valve assembly	Open

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously when purging is performed after 20 seconds have passed since the engine started.

DIAGNOSTIC METHOD



Calculate the difference between the pressure sensor output value in the leak check valve assembly as of 5 seconds ago and the current one, and if the value is greater than judgment value, detect and judge as filter clogging trouble.
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|	More than value of Map

Map

Vehicle speed (km/h (MPH))	0 (0)	100 (62.1)	110 (68.4)	120 (74.6)

|Pressure sensor output value as of 5 seconds ago − Current pressure sensor output value| (kPa (mmHg, inHg))	1.23 (9.2, 0.4)	1.23 (9.2, 0.4)	1.29 (9.7, 0.4)	1.35 (10.1, 0.4)

Time needed for diagnosis: 1000 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE)

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DRAIN TUBE BETWEEN CANISTER AND LEAK CHECK VALVE ASSEMBLY.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HOSE AND TUBE BETWEEN CANISTER AND FUEL TANK.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DRAIN TUBE BETWEEN CANISTER AND LEAK CHECK VALVE ASSEMBLY.

Check the drain tube between the 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)>Canister.
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.

Check the hose and tube between the 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.
Go to 3.

3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

1. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1451 displayed? (Current code)

Yes	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.
No	End.

GENERAL DESCRIPTION

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 and 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 P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH

Note:
For the diagnostic procedure and 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 and 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 and 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 and 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 and 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.

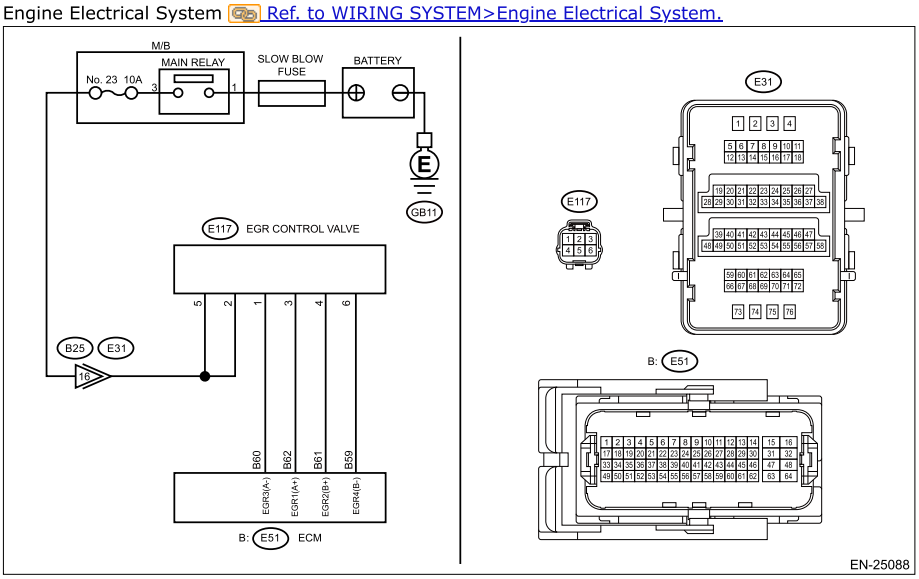
DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Engine breathing

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK EGR CONTROL VALVE POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		

4. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK EGR CONTROL VALVE POWER SUPPLY.

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

(E117) No. 2 (+) — Engine ground (−):
(E117) No. 5 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the following item. • Open circuit in harness between EGR control valve and M/B • Poor contact of coupling connector • Blown out of fuse

2. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR (OPEN).

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; (E51) No. 62 — (E117) No. 3:
DTC P1494; (E51) No. 60 — (E117) No. 1:
DTC P1496; (E51) No. 61 — (E117) No. 4:
DTC P1498; (E51) No. 59 — (E117) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between the ECM connector and EGR control valve connector.

3. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

DTC P1492; (E51) No. 62 — Engine ground:
DTC P1494; (E51) No. 60 — Engine ground:
DTC P1496; (E51) No. 61 — Engine ground:
DTC P1498; (E51) No. 59 — Engine ground:

Is the resistance 1 MΩ 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?

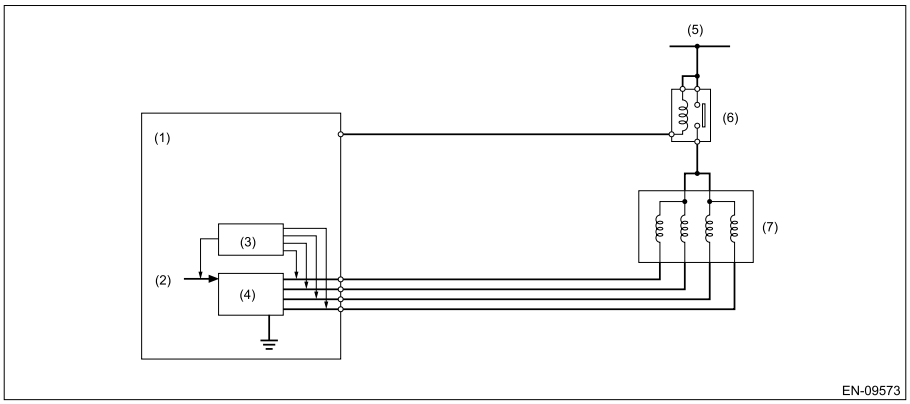
Yes	Repair the poor contact of ECM or EGR control valve connector.
No	Replace EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>EGR Control Valve.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect open or short circuit of EGR.
Judge as NG when the ECM output level differs from the actual terminal level.

COMPONENT DESCRIPTION



(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

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
EGR control signal	OFF

GENERAL DRIVING CYCLE

Perform diagnosis continuously during EGR operation.

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 Terminal current	More than 2.3 V Less than 0.03 mA
Or,	
Terminal voltage	1.9 V or less

Time needed for diagnosis: 2500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

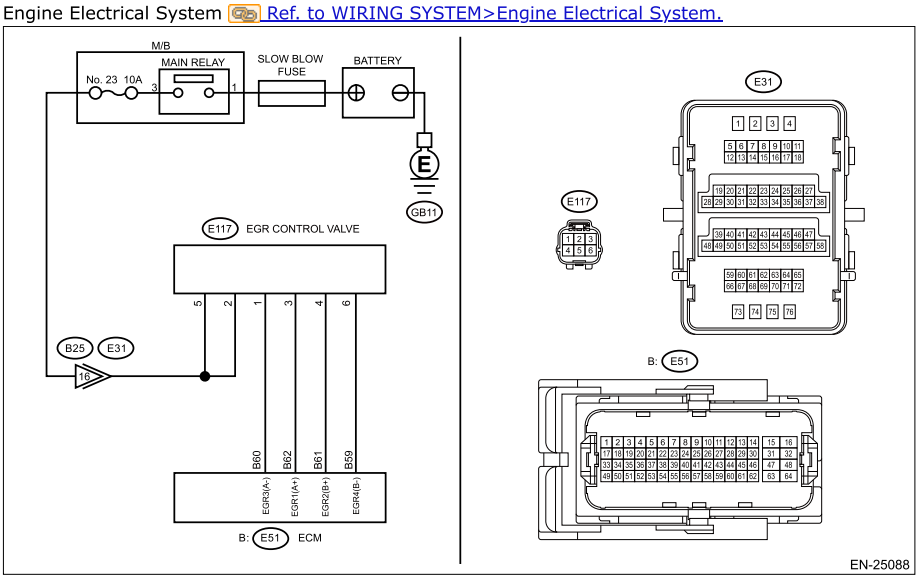
DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Engine breathing

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK EGR CONTROL VALVE.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the EGR control valve.
4. Turn the ignition switch to ON.
5. Measure the voltage between defective ECM connector and engine ground.

Connector & terminal

DTC P1493; (E51) No. 62 (+) — Engine ground (−):
DTC P1495; (E51) No. 60 (+) — Engine ground (−):
DTC P1497; (E51) No. 61 (+) — Engine ground (−):
DTC P1499; (E51) No. 59 (+) — Engine 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.

Check the EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>EGR Control Valve>INSPECTION.

Is the check result OK?

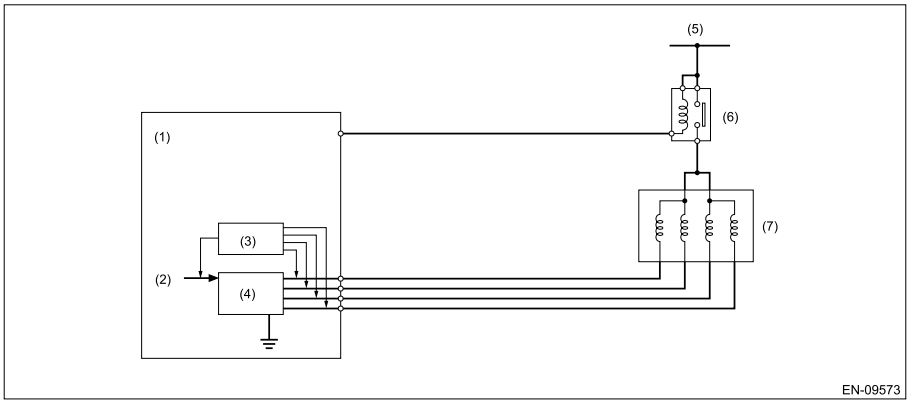
Yes	Repair the poor contact of ECM connector.
No	Replace EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>EGR Control Valve.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of EGR.
Judge as NG when the ECM output level differs from the actual terminal level.

COMPONENT DESCRIPTION



(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

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
EGR control signal	ON

GENERAL DRIVING CYCLE

Perform diagnosis continuously during EGR operation.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

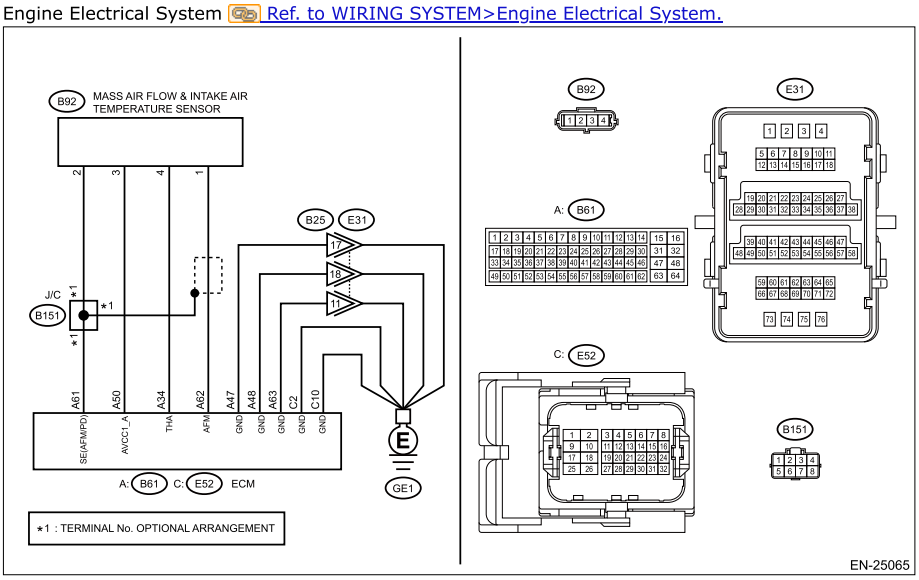
Malfunction Criteria	Threshold Value
EGR terminal current	5 A or more

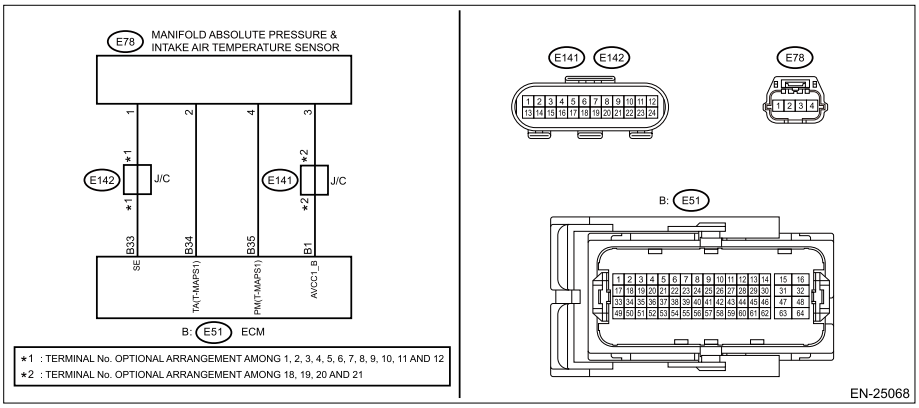
Time needed for diagnosis: 220 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

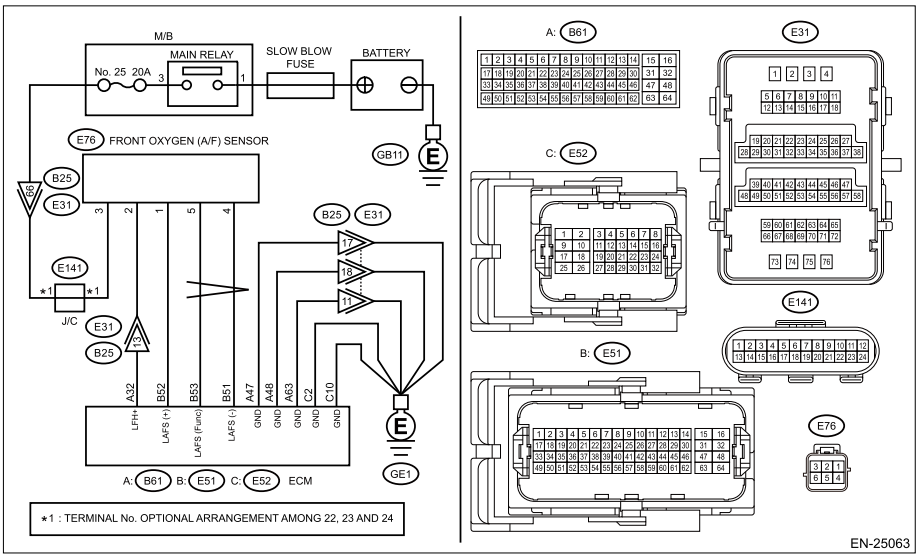
DTC P1603 ENGINE STALL HISTORY

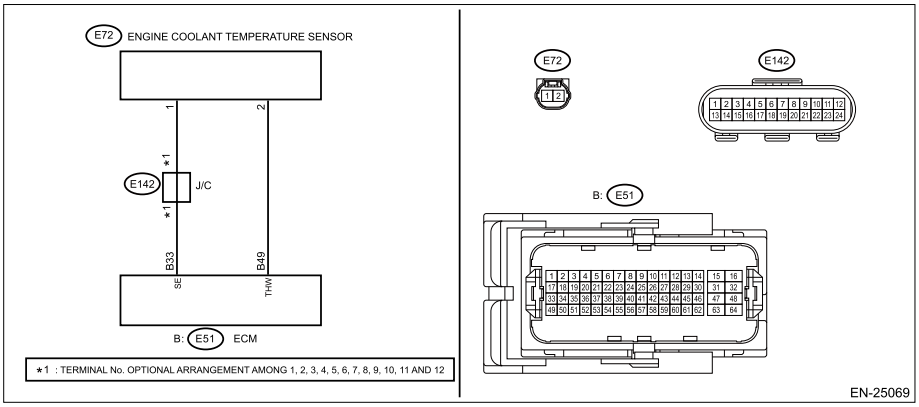
1. —

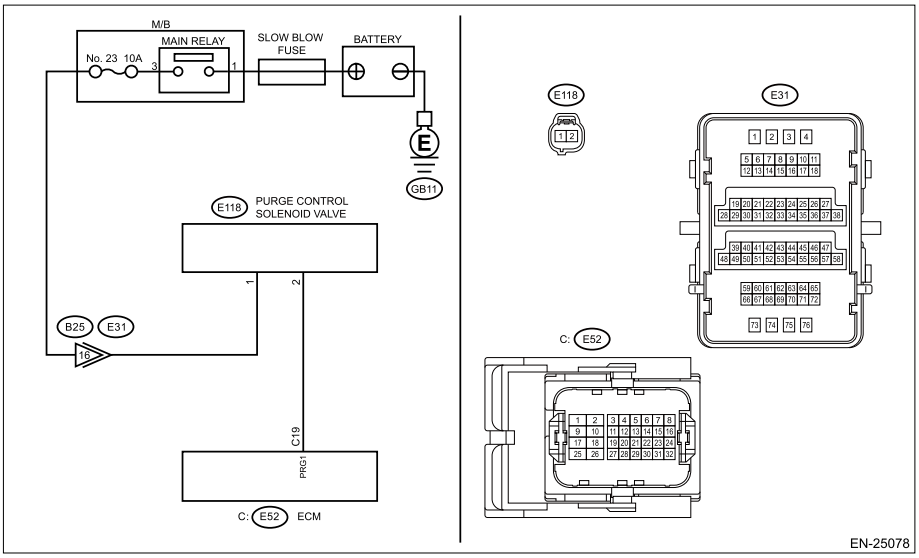
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

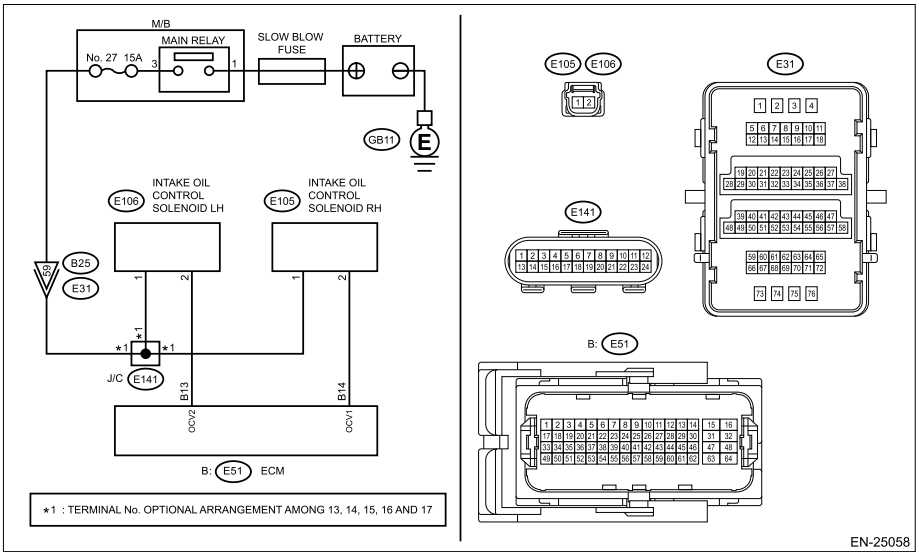


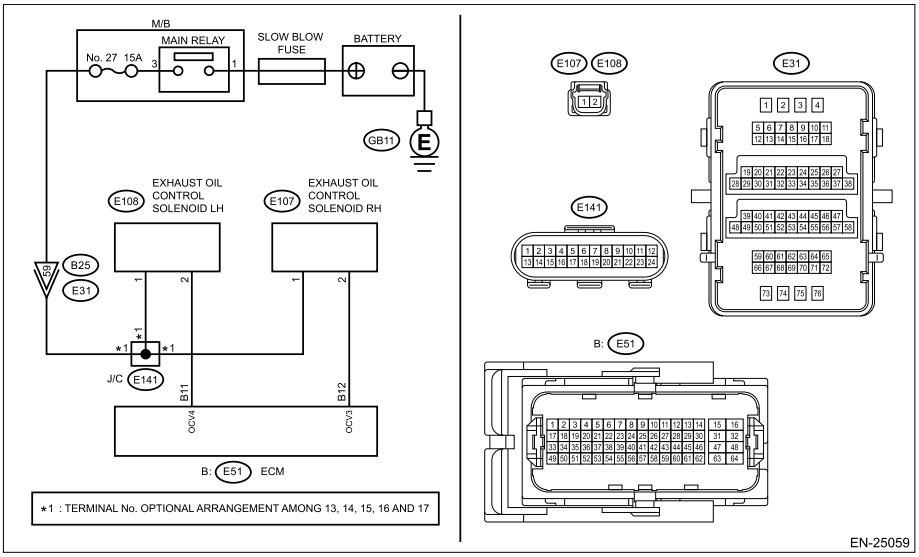


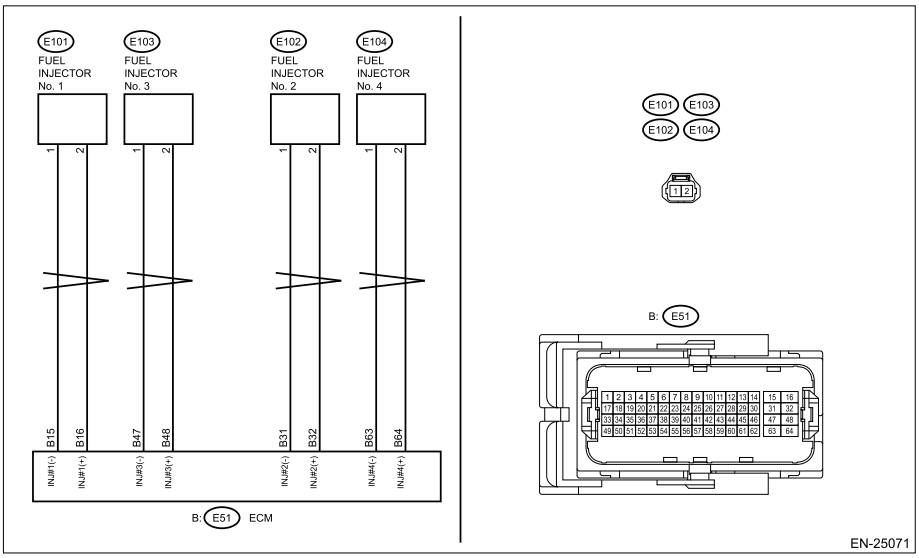



E72 ENGINE COOLANT TEMPERATURE SENSOR
1
2
∗1
E142 J/C
∗1
B33
B49
SE
THW
B: E51 ECM
∗1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 AND 12
E72
E142
B: E51
EN-25069


M/B
MAIN RELAY
No. 23 10A
SLOW BLOW FUSE
BATTERY
GB11
E118 PURGE CONTROL SOLENOID VALVE
B25
E31
16
C19
PRG1
C: E52 ECM
E118
E31
C: E52
EN-25078


M/B
MAIN RELAY
No. 27 15A
SLOW BLOW FUSE
BATTERY
GB11
E106 INTAKE OIL CONTROL SOLENOID LH
E105 INTAKE OIL CONTROL SOLENOID RH
B25
E31
∗1
∗1
J/C E141
B13
B14
OCV2
OCV1
B: E51 ECM
∗1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 13, 14, 15, 16 AND 17
E105
E106
E31
E141
B: E51
EN-25058





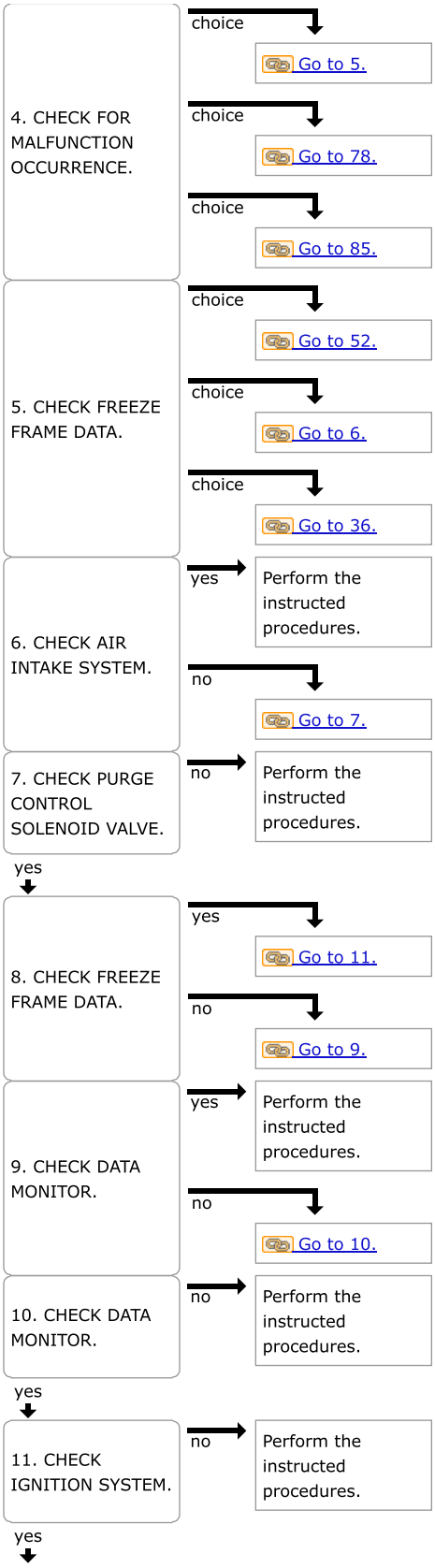
Caution:

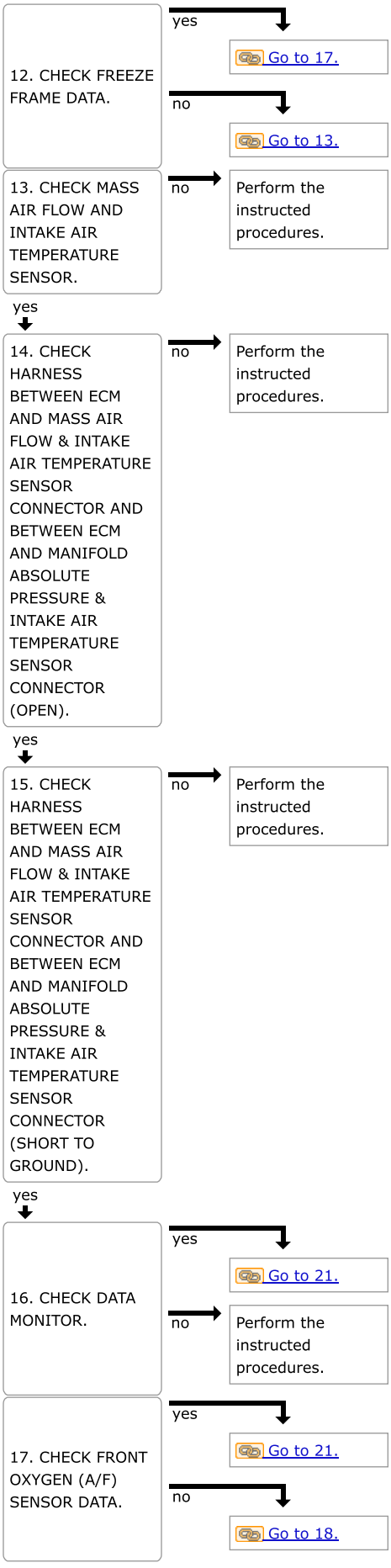
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

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. Ref. to COMMON (DIAGNOSTICS)>Clear memory.**
- **After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK FREEZE FRAME DATA.	no →	Go to 3.
yes ↓		
3. CHECK FREEZE FRAME DATA.	no →	Perform the instructed procedures.
yes ↓		


4. CHECK FOR MALFUNCTION OCCURRENCE.
choice
Go to 5.
choice
Go to 78.
choice
Go to 85.
5. CHECK FREEZE FRAME DATA.
choice
Go to 52.
choice
Go to 6.
choice
Go to 36.
6. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK PURGE CONTROL SOLENOID VALVE.
no
Perform the instructed procedures.
yes
8. CHECK FREEZE FRAME DATA.
yes
Go to 11.
no
Go to 9.
9. CHECK DATA MONITOR.
yes
Perform the instructed procedures.
no
Go to 10.
10. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
11. CHECK IGNITION SYSTEM.
no
Perform the instructed procedures.
yes


12. CHECK FREEZE FRAME DATA.
yes
Go to 17.
no
Go to 13.
13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
14. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
15. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
16. CHECK DATA MONITOR.
yes
Go to 21.
no
Perform the instructed procedures.
17. CHECK FRONT OXYGEN (A/F) SENSOR DATA.
yes
Go to 21.
no
Go to 18.

18. CHECK POWER SUPPLY OF FRONT OXYGEN (A/F) SENSOR.
- no → Perform the instructed procedures.
- yes ↓

19. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

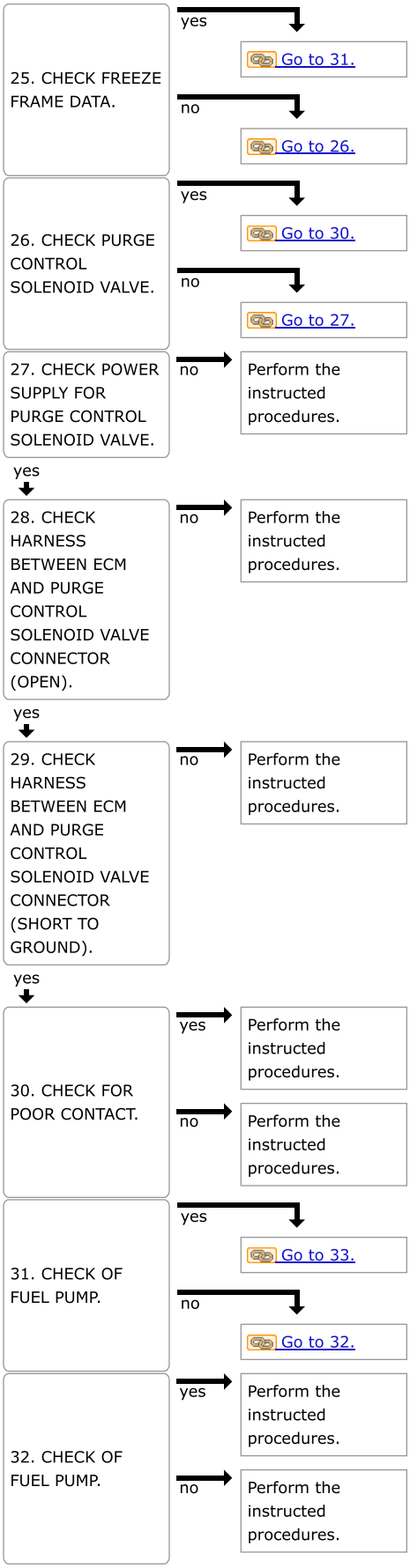
20. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

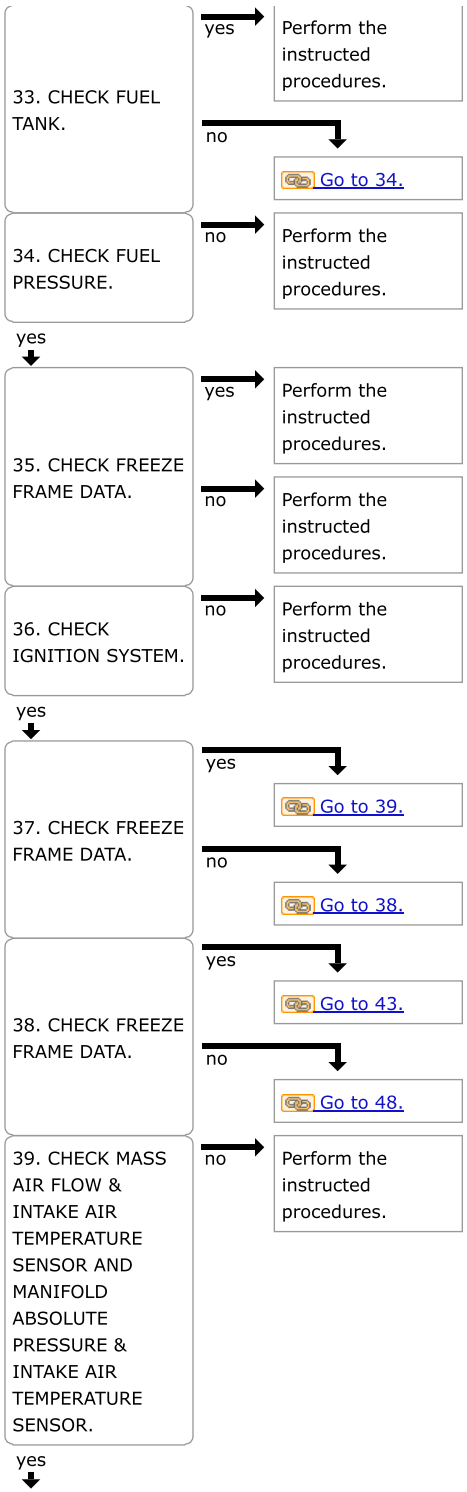
21. CHECK FREEZE FRAME DATA.
- no → Go to 25.
- yes ↓

22. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

23. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

24. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓


25. CHECK FREEZE FRAME DATA.
yes
Go to 31.
no
Go to 26.
26. CHECK PURGE CONTROL SOLENOID VALVE.
yes
Go to 30.
no
Go to 27.
27. CHECK POWER SUPPLY FOR PURGE CONTROL SOLENOID VALVE.
no
Perform the instructed procedures.
yes
28. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
29. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
30. CHECK FOR POOR CONTACT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
31. CHECK OF FUEL PUMP.
yes
Go to 33.
no
Go to 32.
32. CHECK OF FUEL PUMP.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.


33. CHECK FUEL TANK.
yes
Perform the instructed procedures.
no
Go to 34.
34. CHECK FUEL PRESSURE.
no
Perform the instructed procedures.
yes
35. CHECK FREEZE FRAME DATA.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
36. CHECK IGNITION SYSTEM.
no
Perform the instructed procedures.
yes
37. CHECK FREEZE FRAME DATA.
yes
Go to 39.
no
Go to 38.
38. CHECK FREEZE FRAME DATA.
yes
Go to 43.
no
Go to 48.
39. CHECK MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes

40. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes ↓

41. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes ↓

42. CHECK DATA MONITOR.

no → Perform the instructed procedures.

yes ↓

43. CHECK DATA MONITOR.

yes → Go to 48.

no → Go to 44.

44. CHECK FREEZE FRAME DATA.

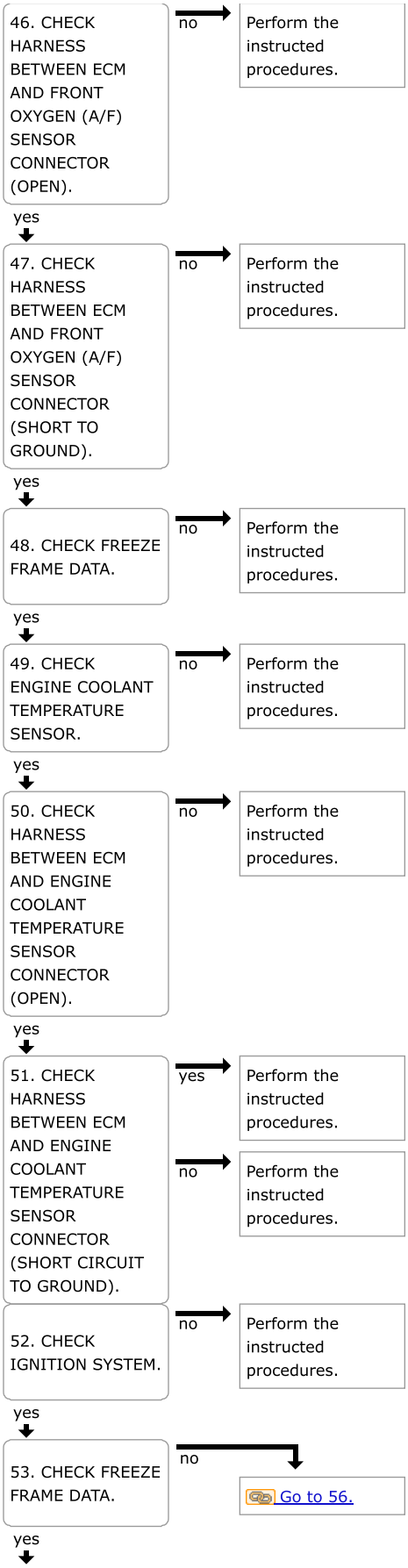
yes → Perform the instructed procedures.

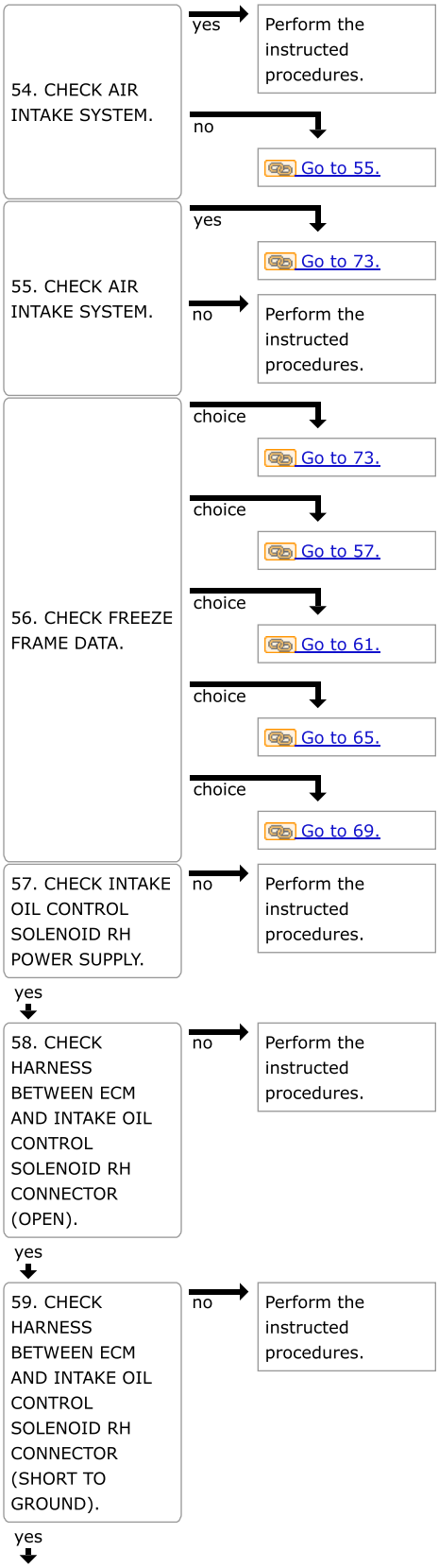
no → Go to 45.

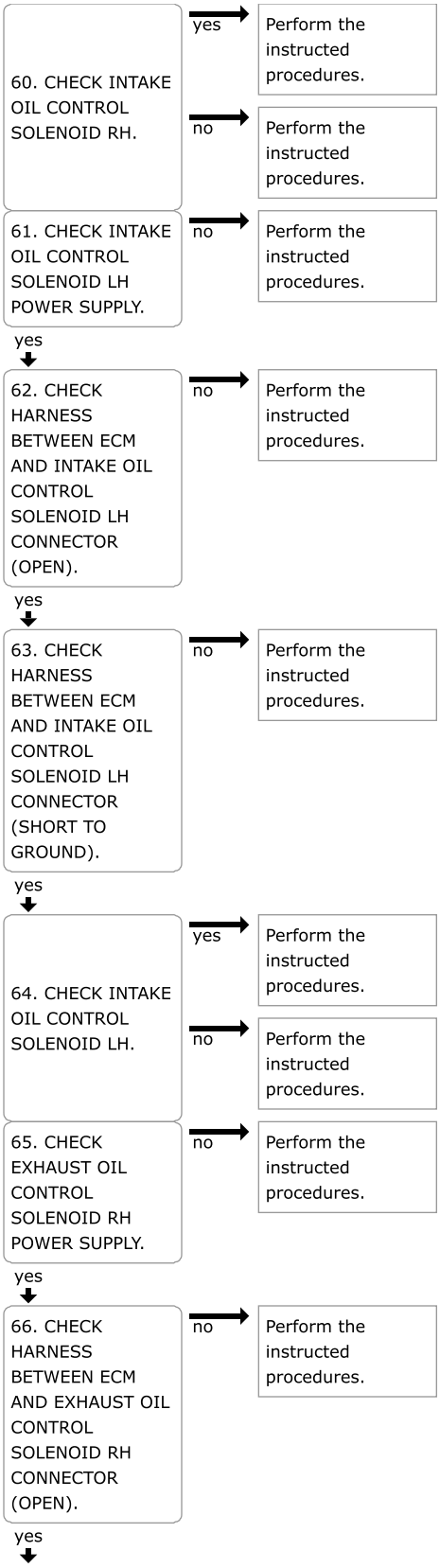
45. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR POWER SUPPLY.

no → Perform the instructed procedures.

yes ↓


46. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
47. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
48. CHECK FREEZE FRAME DATA.
no
Perform the instructed procedures.
yes
49. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
50. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
51. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
52. CHECK IGNITION SYSTEM.
no
Perform the instructed procedures.
yes
53. CHECK FREEZE FRAME DATA.
no
Go to 56.
yes


54. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 55.
55. CHECK AIR INTAKE SYSTEM.
yes
Go to 73.
no
Perform the instructed procedures.
56. CHECK FREEZE FRAME DATA.
choice
Go to 73.
choice
Go to 57.
choice
Go to 61.
choice
Go to 65.
choice
Go to 69.
57. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.
no
Perform the instructed procedures.
yes
58. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
59. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes


60. CHECK INTAKE OIL CONTROL SOLENOID RH.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
61. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.
no
Perform the instructed procedures.
yes
62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
64. CHECK INTAKE OIL CONTROL SOLENOID LH.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
65. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.
no
Perform the instructed procedures.
yes
66. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes

67. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

68. CHECK EXHAUST OIL CONTROL SOLENOID RH.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

69. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.
- no → Perform the instructed procedures.
- yes ↓

70. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

71. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

72. CHECK EXHAUST OIL CONTROL SOLENOID LH.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

73. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

74. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

75. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

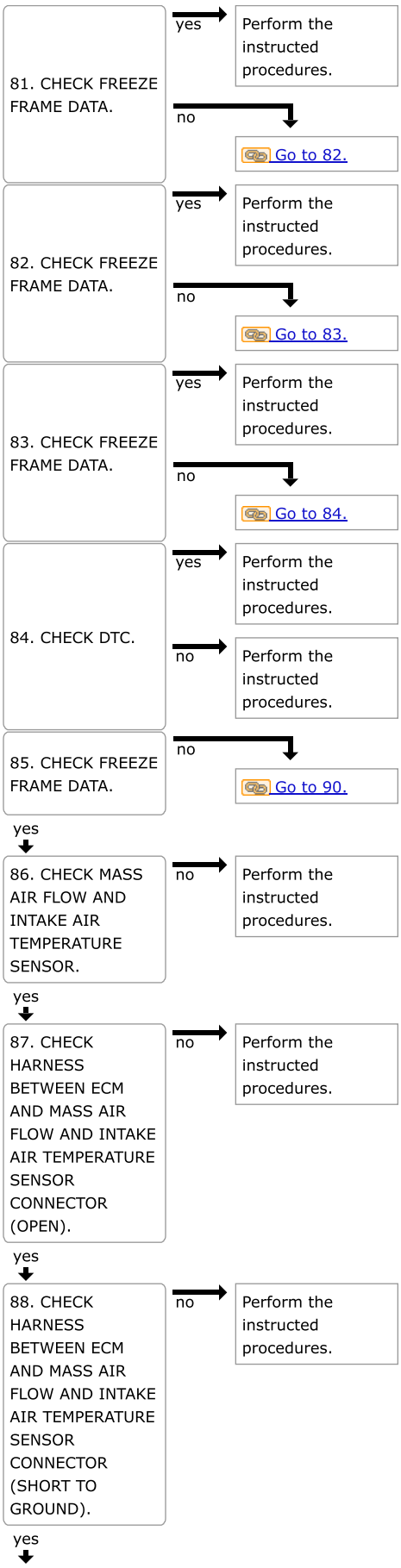
76. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

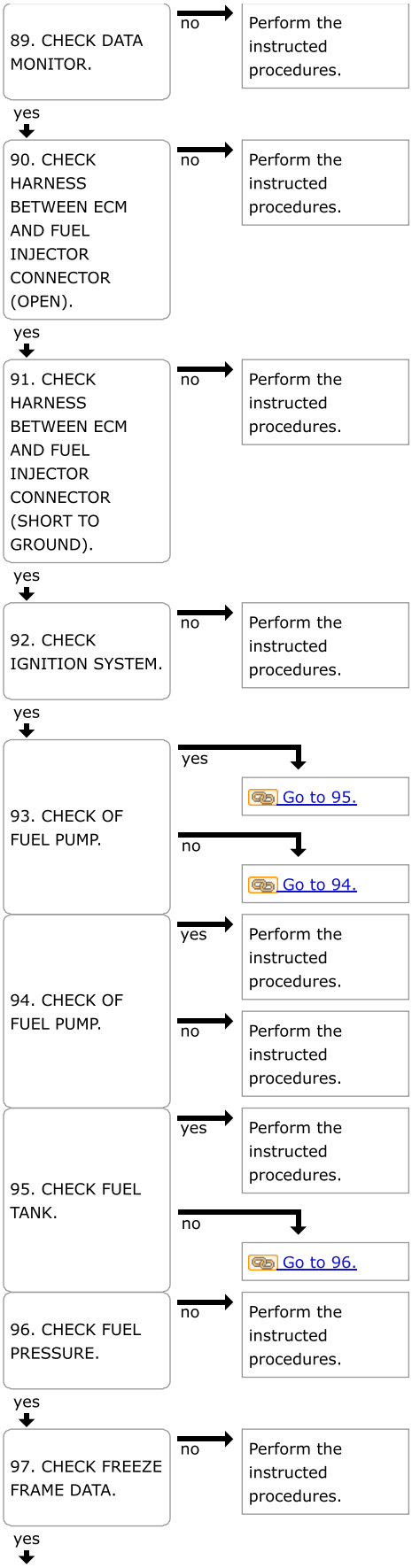
77. CHECK MANIFOLD ABSOLUTE PRESSURE AND INTAKE AIR TEMPERATURE SENSOR.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

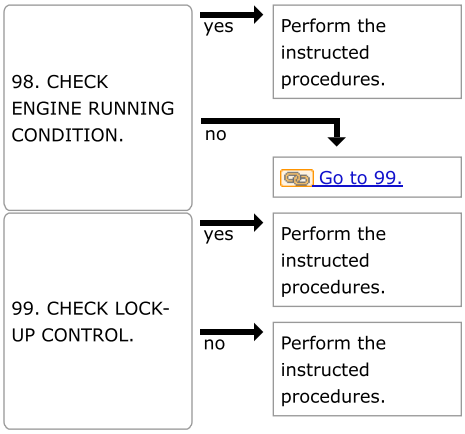
78. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

79. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

80. CHECK IGNITION SYSTEM.
- no → Perform the instructed procedures.
- yes ↓


81. CHECK FREEZE FRAME DATA.
yes
Perform the instructed procedures.
no
Go to 82.
82. CHECK FREEZE FRAME DATA.
yes
Perform the instructed procedures.
no
Go to 83.
83. CHECK FREEZE FRAME DATA.
yes
Perform the instructed procedures.
no
Go to 84.
84. CHECK DTC.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
85. CHECK FREEZE FRAME DATA.
no
Go to 90.
yes
86. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
87. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
88. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes


89. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
90. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
91. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
92. CHECK IGNITION SYSTEM.
no
Perform the instructed procedures.
yes
93. CHECK OF FUEL PUMP.
yes
Go to 95.
no
Go to 94.
94. CHECK OF FUEL PUMP.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
95. CHECK FUEL TANK.
yes
Perform the instructed procedures.
no
Go to 96.
96. CHECK FUEL PRESSURE.
no
Perform the instructed procedures.
yes
97. CHECK FREEZE FRAME DATA.
no
Perform the instructed procedures.
yes



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of the following systems. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   - Engine
   - Transmission

Is DTC other than P1603 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Fuel Level].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [Fuel Level] 16.4 [%] or more?

Yes	Go to 3.
No	Fuel may 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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(H4DOTC)>Battery>INSPECTION. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator>INSPECTION.

4. CHECK FOR MALFUNCTION OCCURRENCE.

Ask the customer about the driving condition and engine speed status when fault occurred.

If the engine speed dropped slowly and then the engine stalled during idling or deceleration, go to A.
If the engine speed dropped rapidly and then the engine stalled during idling or deceleration, go to B.
If the engine stalled during standing start, acceleration, or constant speed driving, go to C.

A	Go to 5.
B	Go to 78.
C	Go to 85.

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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.

If the sum value of [Short term fuel trim B1] and [Long term fuel trim B1] is within ±15[%] in each freeze frame data, go to A.
If more than 15% in each freeze frame data, go to B.
If less than −15% in any one of freeze frame data, go to C.

A	Go to 52.
B	Go to 6.
C	Go to 36.

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 the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 8.
No	Replace the 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 DATA MONITOR.

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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 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 B1] and [Long term fuel trim B1] using the Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 ±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 with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes — Go to 12.

No — Repair the ignition system. Ref. to IGNITION(H4DOTC)>General Description.

12. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [A/F Sensor #1].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [A/F Sensor #1] 1 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 check result OK?

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 MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
5. Measure the resistance of harness between ECM connector and mass air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure & intake air temperature sensor connector.

Connector & terminal

(B61) No. 62 — (B92) No. 1:
(B61) No. 61 — (B92) No. 2:
(B61) No. 50 — (B92) No. 3:
(B61) No. 34 — (B92) No. 4:
(E51) No. 33 — (E78) No. 1:
(E51) No. 34 — (E78) No. 2:
(E51) No. 1 — (E78) No. 3:
(E51) No. 35 — (E78) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 15.

No — Repair the following item.

- Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Open circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector
- Poor contact of J/C

15. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(B61) No. 34 — Engine ground:
(B61) No. 50 — Engine ground:
(B61) No. 62 — Engine ground:
(E51) No. 1 — Engine ground:
(E51) No. 34 — Engine ground:
(E51) No. 35 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 16.

No — Repair the following item.
- Short circuit to ground in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Ground short circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector

16. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Run the engine at idle.
3. Using the Subaru Select Monitor, read the value in [Calculated load value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

4. Compare with the reference value (at idling) of [Calculated load value], listed under the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Data Monitor>LIST.

Note:
The value of [Calculated load value] changes depending on how the engine internal parts settle in. If the value is out of threshold value below, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.

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 INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.

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. 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)(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 OF FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the 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

(E76) No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 19.

No — Repair the following item.

- Open circuit in harness between M/B and front oxygen (A/F) sensor connector
- Poor contact of coupling connector
- Poor contact of J/C
- Blown out of fuse

19. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

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

(E51) No. 52 — (E76) No. 1:
(B61) No. 32 — (E76) No. 2:
(E51) No. 51 — (E76) No. 4:
(E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 20.

No — Repair the following item.

- Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector
- Poor contact of coupling connector

20. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(B61) No. 32 — Engine ground:
(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — 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 front oxygen (A/F) sensor connector.

21. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Coolant Temp.] and [Ambient Temperature].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [Coolant Temp.] 120[°C] (248°F) or more? Or is the value of [Coolant Temp.] 15[°C] (27°F) or more lower than that of [Ambient 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 check result OK?

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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal
(E51) No. 33 — (E72) No. 1:
(E51) No. 49 — (E72) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 24.

No — Repair the following item.
- Open circuit in harness between ECM connector and engine coolant temperature sensor connector
- Poor contact of J/C

24. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E51) No. 49 — Engine ground:

Is the resistance 1 MΩ 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.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [Evap Purge Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [Evap Purge Flow] 0[%] in all freeze frame data?

Yes — Go to 31.

No — Go to 26.

26. CHECK PURGE CONTROL SOLENOID VALVE.

1. Using the Subaru Select Monitor, select [CPC Solenoid Valve] of [Active Test].

Note:
For detailed operation procedures, refer to the "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 change correctly?

Yes — Go to 30.

No — Go to 27.

27. CHECK POWER SUPPLY FOR PURGE CONTROL SOLENOID VALVE.

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
   (E118) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 28.

No — Repair the following item.
- Open circuit of harness between M/B and purge control solenoid valve connector
- Poor contact of coupling connector
- Blown out of fuse

28. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (OPEN).

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
   (E52) No. 19 — (E118) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 29.

No — Repair the open circuit in harness between ECM connector and purge control solenoid valve connector.

29. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE CONNECTOR (SHORT TO GROUND).

Measure the resistance between the purge control solenoid valve connector and engine ground.
Connector & terminal
(E118) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 30.

No — Repair the short circuit to ground in harness between ECM connector and purge control solenoid valve connector.

30. 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).

31. CHECK OF FUEL PUMP.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, select [Fuel Pump Relay] of [Active Test].
   Note:
   For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.
3. 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 33.

No — Go to 32.

32. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes — Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

No — Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

33. CHECK FUEL TANK.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Check if any foreign matters such as iron powder exist in the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Tank.

Is there any foreign matter in the fuel tank?

Yes — Remove foreign matter from the fuel tank.

No — Go to 34.

34. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 35.

No — Check the fuel pump and fuel delivery line.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines>INSPECTION.

35. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 COMMON (DIAGNOSTICS)>Clear memory.

No — Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>High Pressure Fuel Pump>INSPECTION.

36. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes — Go to 37.

No — Repair the ignition system. Ref. to IGNITION(H4DOTC)>General Description.

37. CHECK FREEZE FRAME DATA.

1. Start the engine and warm up completely.
2. Run the engine at idle.
3. Using the Subaru Select Monitor, read the value in [Calculated load value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

4. Compare with the reference value (at idling) of [Calculated load value], listed under the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Data Monitor>LIST.

Note:
The value of [Calculated load value] changes depending on how the engine internal parts settle in. If the value is out of threshold value below, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.

Is the value of [Calculated load value] 110[%] or more of the value described in the list?

Yes — Go to 39.

No — Go to 38.

38. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [A/F Sensor #1].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [A/F Sensor #1] less than 1?

Yes — Go to 43.

No — Go to 48.

39. CHECK MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR.

Check mass 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.

Is the check result OK?

Yes — Go to 40.

No — Replace mass 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.

40. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
5. Measure the resistance of harness between ECM connector and mass air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure & intake air temperature sensor connector.
   Connector & terminal
   (B61) No. 62 — (B92) No. 1:
   (B61) No. 61 — (B92) No. 2:
   (B61) No. 50 — (B92) No. 3:
   (B61) No. 34 — (B92) No. 4:
   (E51) No. 33 — (E78) No. 1:
   (E51) No. 34 — (E78) No. 2:
   (E51) No. 1 — (E78) No. 3:
   (E51) No. 35 — (E78) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 41.

No — Repair the following item.
- Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Open circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector
- Poor contact of J/C

41. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(B61) No. 34 — Engine ground:
(B61) No. 50 — Engine ground:
(B61) No. 62 — Engine ground:
(E51) No. 1 — Engine ground:
(E51) No. 34 — Engine ground:
(E51) No. 35 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 42.

No — Repair the following item.
- Short circuit to ground in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Ground short circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector

42. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Run the engine at idle.
3. Using the Subaru Select Monitor, read the value in [Calculated load value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

4. Compare with the reference value (at idling) of [Calculated load value], listed under the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Data Monitor>LIST.

Note:
The value of [Calculated load value] changes depending on how the engine internal parts settle in. If the value is out of threshold value below, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.

Does the value of [Calculated load value] fall between 90 — 110 [%] of the value described in the list?

Yes — Go to 43.

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.

43. 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)(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 48.

No — Go to 44.

44. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [A/F Sensor #1 Resistance] 500 [ohm] 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 45.

45. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the 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
   (E76) No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 46.

No — Repair the following item.
- Open circuit in harness between M/B and front oxygen (A/F) sensor connector
- Poor contact of coupling connector
- Poor contact of J/C

46. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

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
   (E51) No. 52 — (E76) No. 1:
   (B61) No. 32 — (E76) No. 2:
   (E51) No. 51 — (E76) No. 4:
   (E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 47.

No — Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

47. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(B61) No. 32 — Engine ground:
(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 48.

No — Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

48. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Coolant Temp.] and [Ambient Temperature].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [Coolant Temp.] 120[°C] (248°F) or more? Or is the value of [Coolant Temp.] 15[°C] (27°F) or more lower than that of [Ambient Temperature]?

Yes — Go to 49.

No — Clear the memory to complete. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

49. 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 check result OK?

Yes — Go to 50.

No — Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

50. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal
(E51) No. 33 — (E72) No. 1:
(E51) No. 49 — (E72) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 51.

No — Repair the following item.
- Open circuit in harness between ECM connector and engine coolant temperature sensor connector
- Poor contact of J/C

51. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E51) No. 49 — 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.

52. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes — Go to 53.

No — Repair the ignition system. Ref. to IGNITION(H4DOTC)>General Description.

53. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.
3. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].
4. Start the engine and warm up completely.
5. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
6. 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 data monitor?

Yes — Go to 54.

No — Go to 56.

54. 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 55.

55. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.
- Brake booster: Ref. to BRAKE>Brake Booster.
- Mass air flow and intake air temperature sensor: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor.
- PCV pipe: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Pipe.
- PCV connector: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose Assembly.
- PCV hose: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose.
- PCV hose assembly: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Hose Assembly.
- PCV valve: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>PCV Valve.
- Purge control solenoid valve: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

Is the check result OK?

Yes	Go to 73.
No	Replace the parts if defective.

56. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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].

If all of the advance angle amount and retard angle amount synchronize with their target values, go to A.
If the advance angle amount of the intake oil control solenoid RH does not synchronize with its target value, go to B.
If the advance angle amount of the intake oil control solenoid LH does not synchronize with its target value, go to C.
If the retard angle amount of the exhaust oil control solenoid RH does not synchronize with its target value, go to D.
If the retard angle amount of the exhaust oil control solenoid LH does not synchronize with its target value, go to E.

A	Go to 73.
B	Go to 57.
C	Go to 61.
D	Go to 65.
E	Go to 69.

57. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.

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
   (E105) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 58.

No — Repair the following item.
- Open circuit in harness between M/B and intake oil control solenoid RH connector
- Poor contact of coupling connector
- Poor contact of J/C

58. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 14 — (E105) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 59.

No — Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

59. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid RH connector and engine ground.
Connector & terminal
(E105) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 60.

No — Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

60. 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 check result OK?

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.

61. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.

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
   (E106) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 62.
No	Repair the following item. • Open circuit in harness between M/B and intake oil control solenoid LH connector • Poor contact of coupling connector • Poor contact of J/C

62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 13 — (E106) 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 LH connector.

63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid LH connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E106) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 64.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

64. 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 check result OK?

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.

65. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.

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
   (E107) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 66.

No — Repair the following item.
- Open circuit in harness between M/B and exhaust oil control solenoid RH connector
- Poor contact of coupling connector
- Poor contact of J/C

66. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 12 — (E107) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 67.

No — Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.

67. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid RH connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E107) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 68.

No — Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid RH connector.

68. 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 check result OK?

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.

69. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.

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
   (E108) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 70.

No — Repair the following item.
- Open circuit in harness between M/B and exhaust oil control solenoid LH connector
- Poor contact of coupling connector
- Poor contact of J/C

70. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 11 — (E108) 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 LH connector.

71. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid LH connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E108) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 72.

No — Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

72. 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 check result OK?

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.

73. 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 check result OK?

Yes	Go to 74.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

74. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E51) No. 33 — (E72) No. 1:

(E51) No. 49 — (E72) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 75.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

75. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(E51) No. 49 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 76.
No	Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

76. 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 check result OK?

Yes	Go to 77.
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.

77. 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 check result OK?

Yes — Clear the memory to complete. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

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.

78. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

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 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 79.

No — Repair the open circuit of the harness between the ECM connector and fuel injector connector.

79. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 80.

No — Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

80. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes — Go to 81.

No — Repair the ignition system. Ref. to IGNITION(H4DOTC)>General Description.

81. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Does the value of [A/C Compressor Signal] indicate [ON], and does the value of [Idle A/C load correct] increase?

Yes — Check the air conditioner. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

No — Go to 82.

82. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [Electric Load Feedback Val].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

3. Compare the value of [Electric Load Feedback Val] with the reference value (at idling) of [Idle Mass Air Flow], listed under the "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Data Monitor>LIST.

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 (power steering).
Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator>INSPECTION.
Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.

No — Go to 83.

83. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Vehicle Speed], [Engine Speed] and [AT turbine speed].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is there any freeze frame data indicating that the value of [Vehicle Speed] 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 84.

84. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Transmission] displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to TRANSMISSION (DIAGNOSTICS)>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.

85. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Calculated load value] and [Relative Throttle Pos.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

Is the value of [Calculated load value] decreasing while that of [Relative Throttle Pos.] is increasing?

Yes — Go to 86.

No — Go to 90.

86. 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 check result OK?

Yes — Go to 87.

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.

87. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

Connector & terminal
(B61) No. 62 — (B92) No. 1:
(B61) No. 61 — (B92) No. 2:
(B61) No. 50 — (B92) No. 3:
(B61) No. 34 — (B92) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 88.

No — Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

88. CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(B61) No. 34 — Engine ground:
(B61) No. 50 — Engine ground:
(B61) No. 62 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 89.

No — Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

89. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Run the engine at idle.
3. Using the Subaru Select Monitor, read the value in [Calculated load value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

4. Compare with the reference value (at idling) of [Calculated load value], listed under the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Data Monitor>LIST.

Note:
The value of [Calculated load value] changes depending on how the engine internal parts settle in. If the value is out of threshold value below, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.

Does the value of [Calculated load value] fall between 90 — 110 [%] of the value described in the list?

Yes — Go to 90.

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.

90. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

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 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 91.

No — Repair the open circuit of the harness between the ECM connector and fuel injector connector.

91. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 92.
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

92. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 93.
No	Repair the ignition system. Ref. to IGNITION(H4DOTC)>General Description.

93. CHECK OF FUEL PUMP.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, select [Fuel Pump Relay] of [Active Test].

Note:
For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.

3. 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 95.
No	Go to 94.

94. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

95. CHECK FUEL TANK.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Check if any foreign matters such as iron powder exist in the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Tank.

Is there any foreign matter in the fuel tank?

Yes	Remove foreign matter from the fuel tank.
No	Go to 96.

96. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 97.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines>INSPECTION.

97. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 98.
No	Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>High Pressure Fuel Pump>INSPECTION.

98. CHECK ENGINE RUNNING CONDITION.

Check the engine running condition using [High-Grade Roughness Monitor (without harness)] in the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Work Support.

Note:
For detailed operation procedures, refer to "Help" of application.

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	Go to 99.

99. CHECK LOCK-UP CONTROL.

Perform the diagnosis for DTC P2758 from step 2. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON.

Is the check result OK?

Yes	Clear the memory to complete. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
No	Repair the defective part.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the engine stops except by operating the ignition switch after starting the engine.

EXECUTION CONDITION

Secondary parameters	Execution condition
Engine condition	After engine starting

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

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 or less

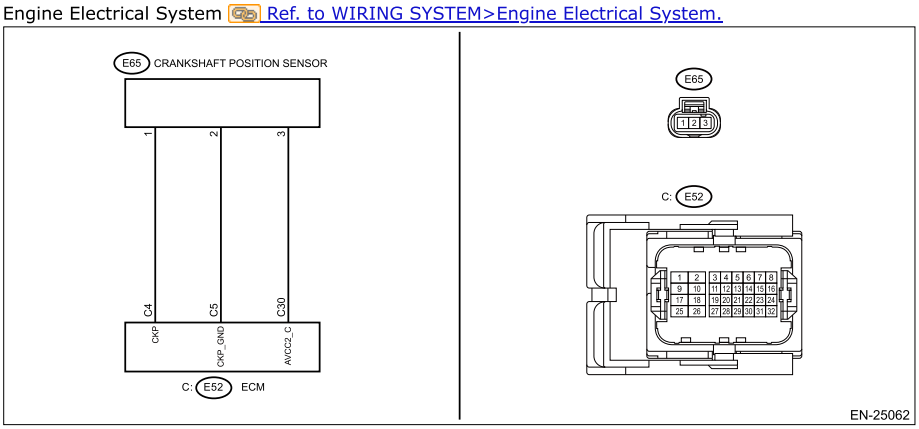
Time needed for diagnosis: 60 ms

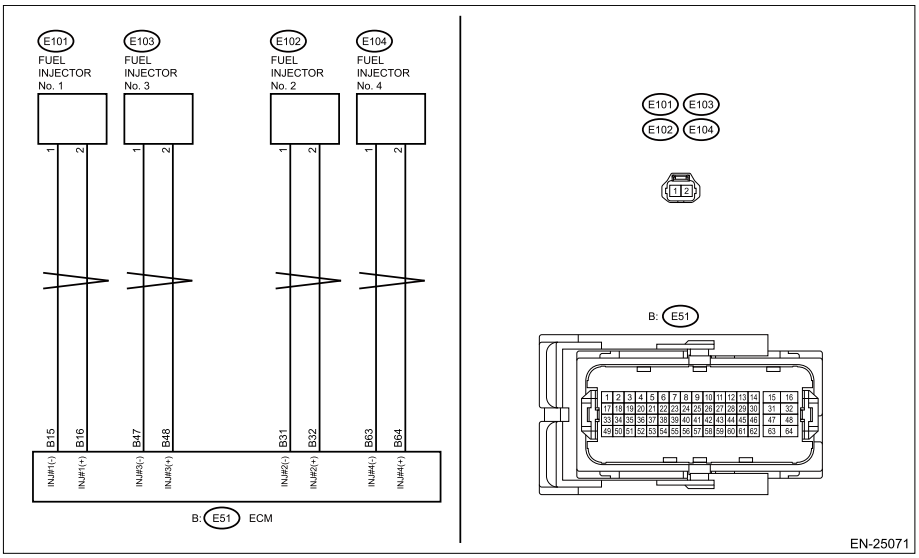
Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

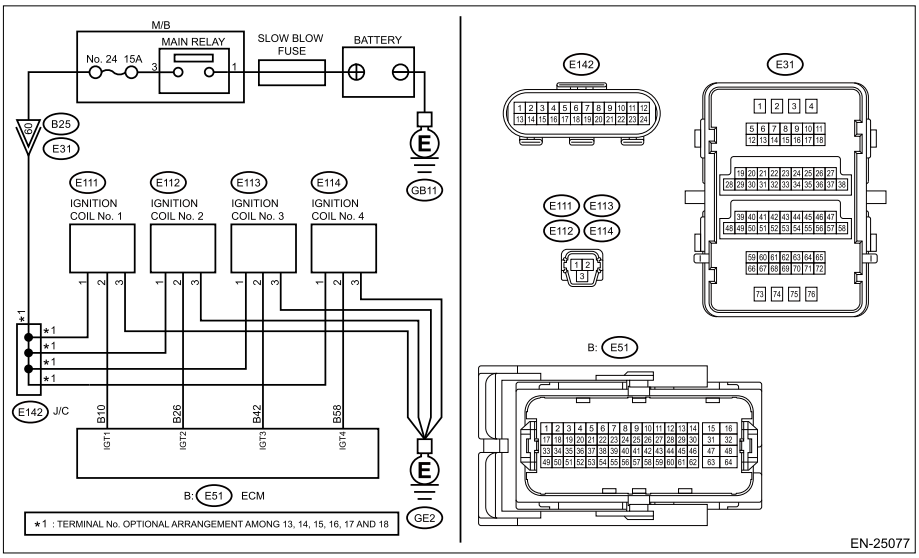
DTC P1604 STARTABILITY MALFUNCTION

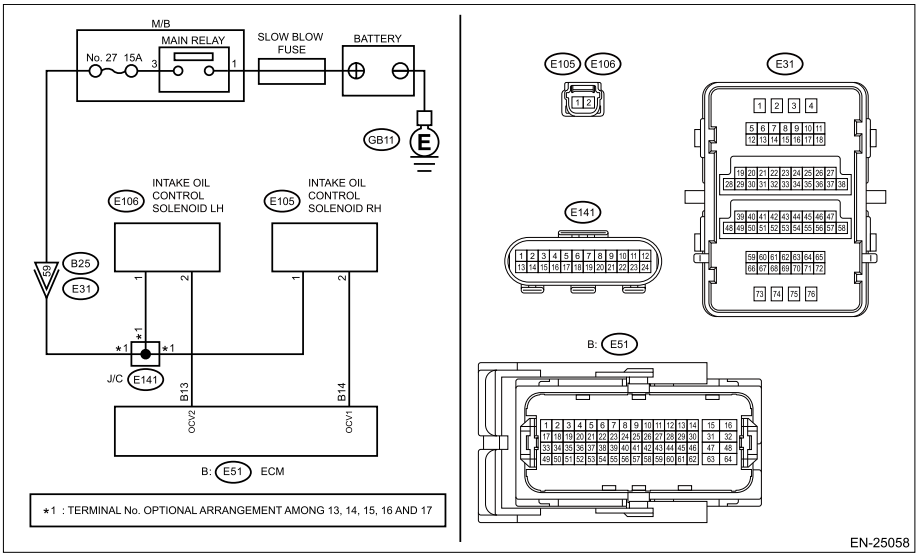
1. —

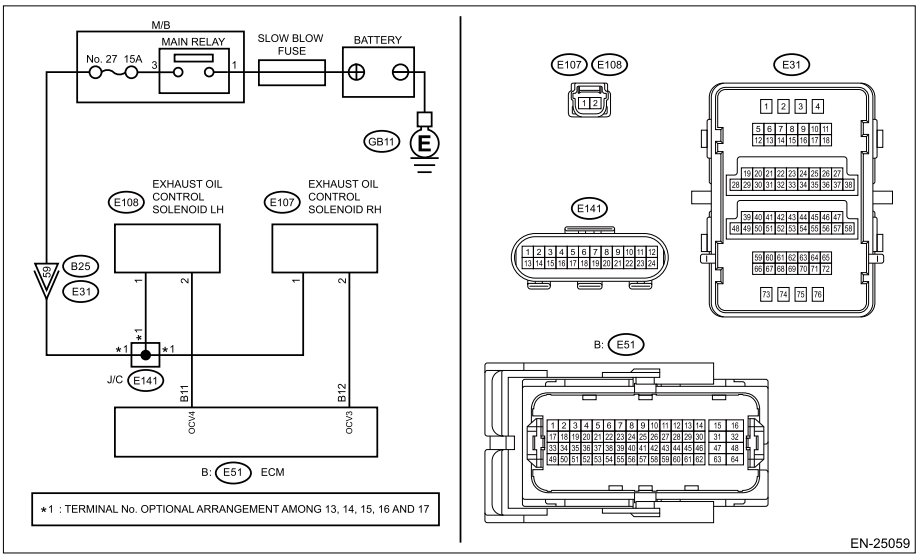
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

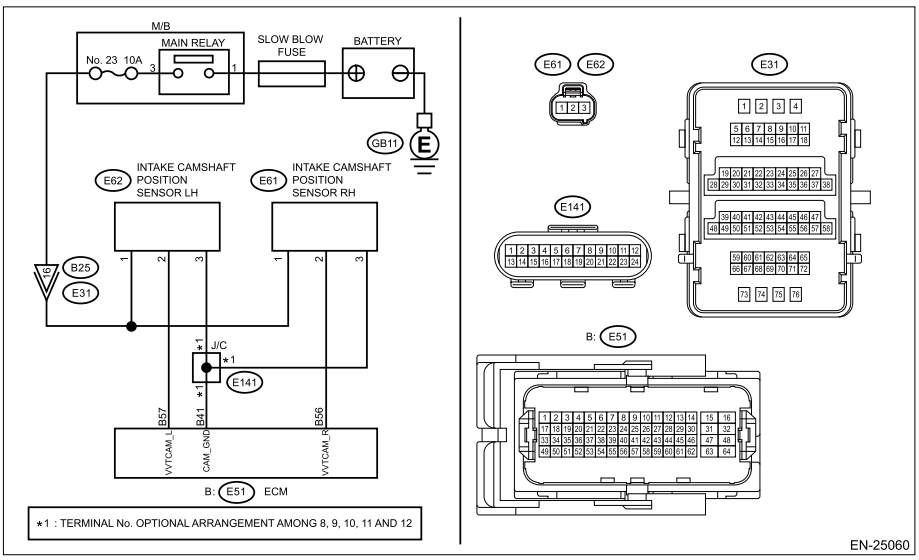


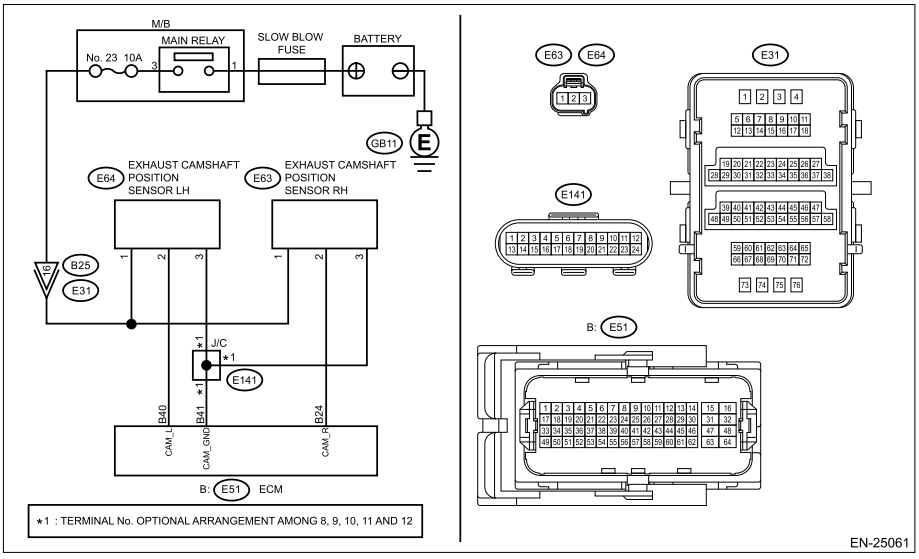




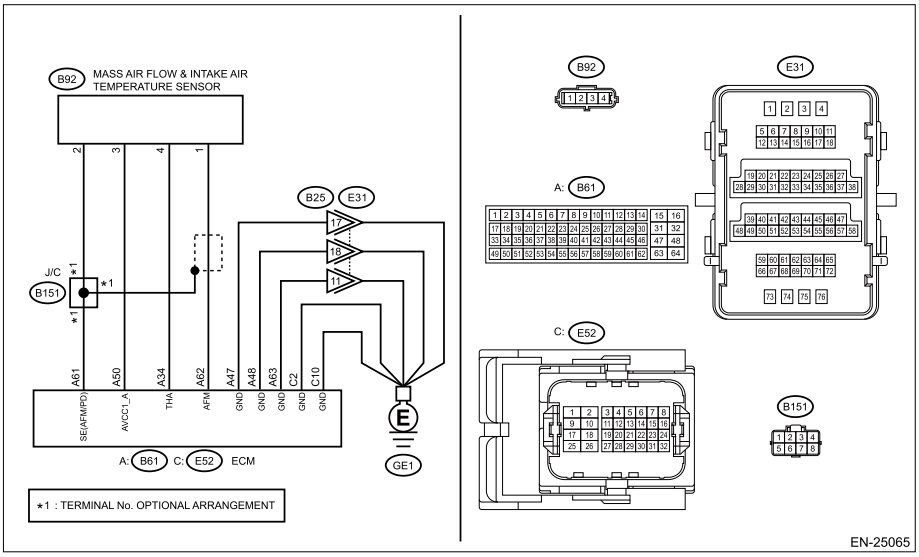

M/B
MAIN RELAY
No. 27 15A
SLOW BLOW FUSE
BATTERY
GB11
INTAKE OIL CONTROL SOLENOID LH
E106
INTAKE OIL CONTROL SOLENOID RH
E105
B25
E31
J/C
E141
B13
B14
OCV2
OCV1
B: E51 ECM
E105 E106
E31
E141
B: E51
∗1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 13, 14, 15, 16 AND 17
EN-25058


M/B
MAIN RELAY
No. 27 15A
SLOW BLOW FUSE
BATTERY
GB11
EXHAUST OIL CONTROL SOLENOID LH
E108
EXHAUST OIL CONTROL SOLENOID RH
E107
B25
E31
J/C
E141
B11
B12
OCV4
OCV3
B: E51 ECM
E107 E108
E31
E141
B: E51
∗1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 13, 14, 15, 16 AND 17
EN-25059

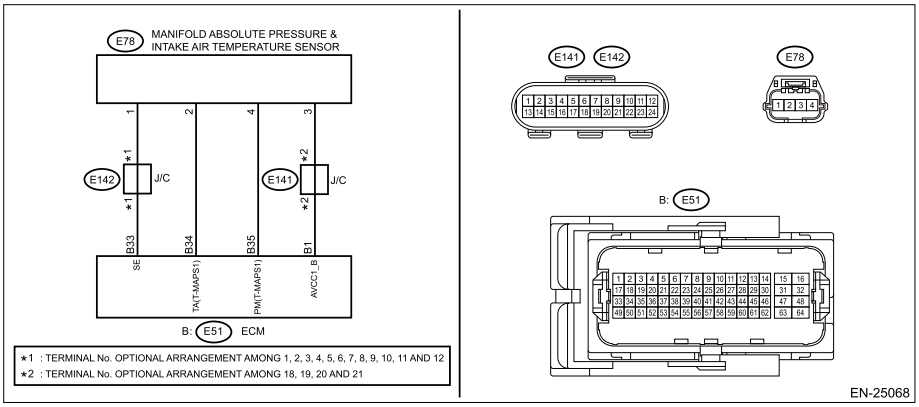

M/B
MAIN RELAY
No. 23 10A
SLOW BLOW FUSE
BATTERY
GB11
INTAKE CAMSHAFT POSITION SENSOR LH
E62
INTAKE CAMSHAFT POSITION SENSOR RH
E61
B25
E31
J/C
E141
B57
B41
B56
VVTCAM_L
CAM_GND
VVTCAM_R
B: E51 ECM
E61 E62
E31
E141
B: E51
∗1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 8, 9, 10, 11 AND 12
EN-25060



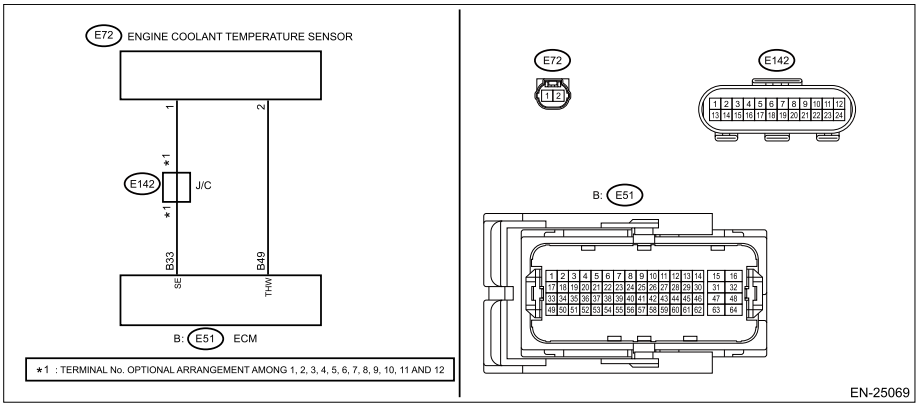
EN-25061



EN-25065



EN-25068



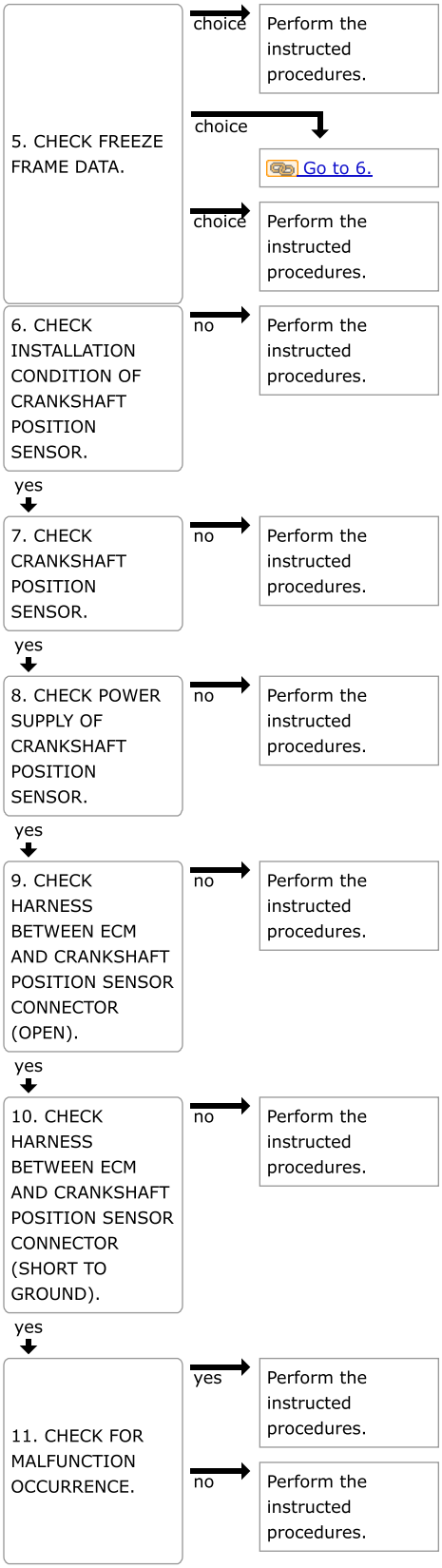
Caution:

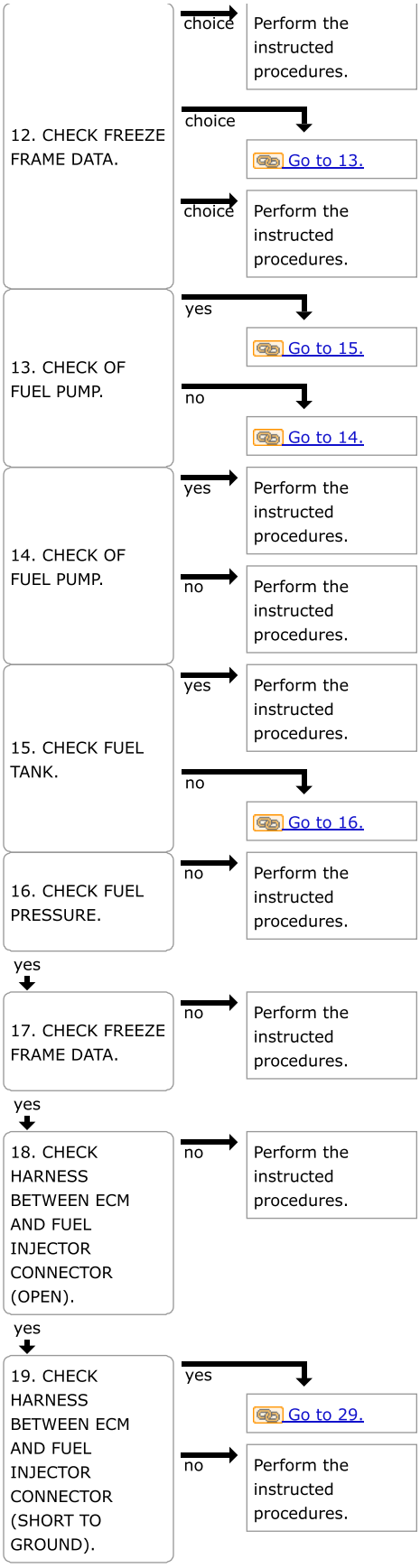
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

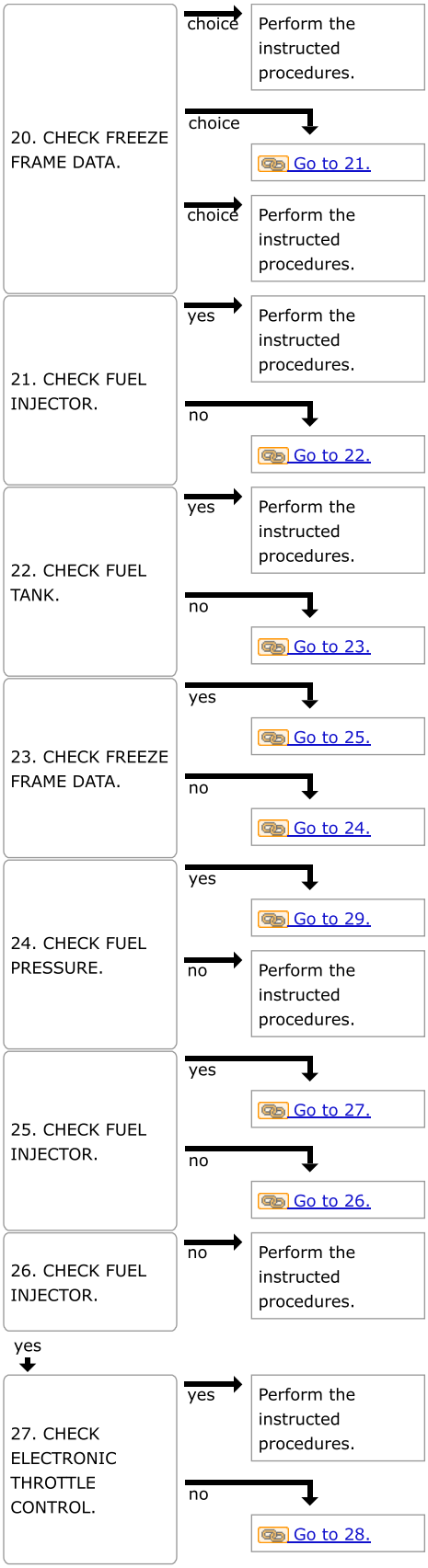
Note:

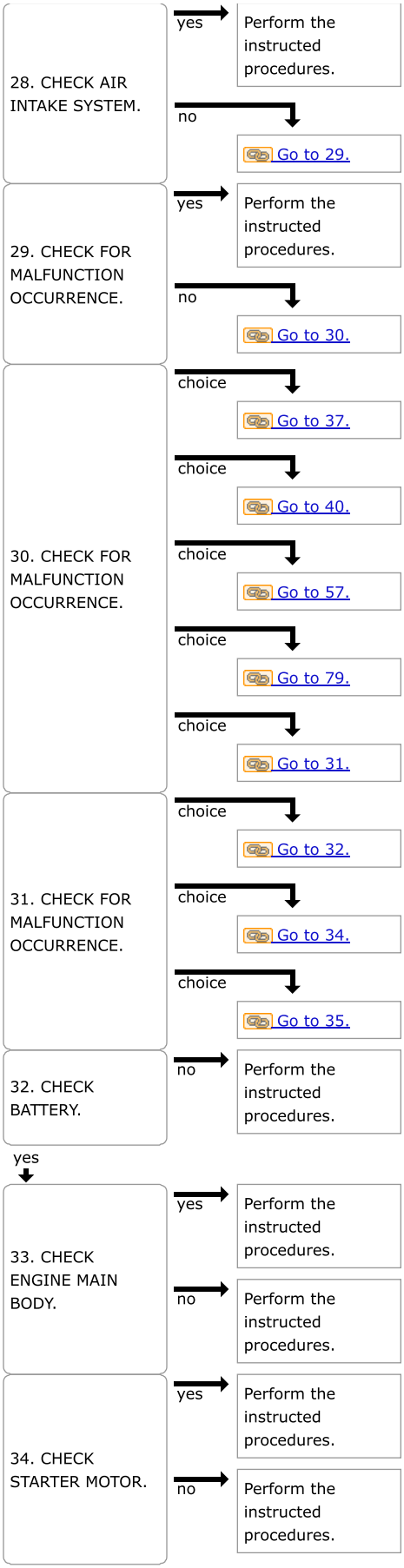
- **This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user. Ref. to COMMON (DIAGNOSTICS)>Clear memory.**
- **After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.**

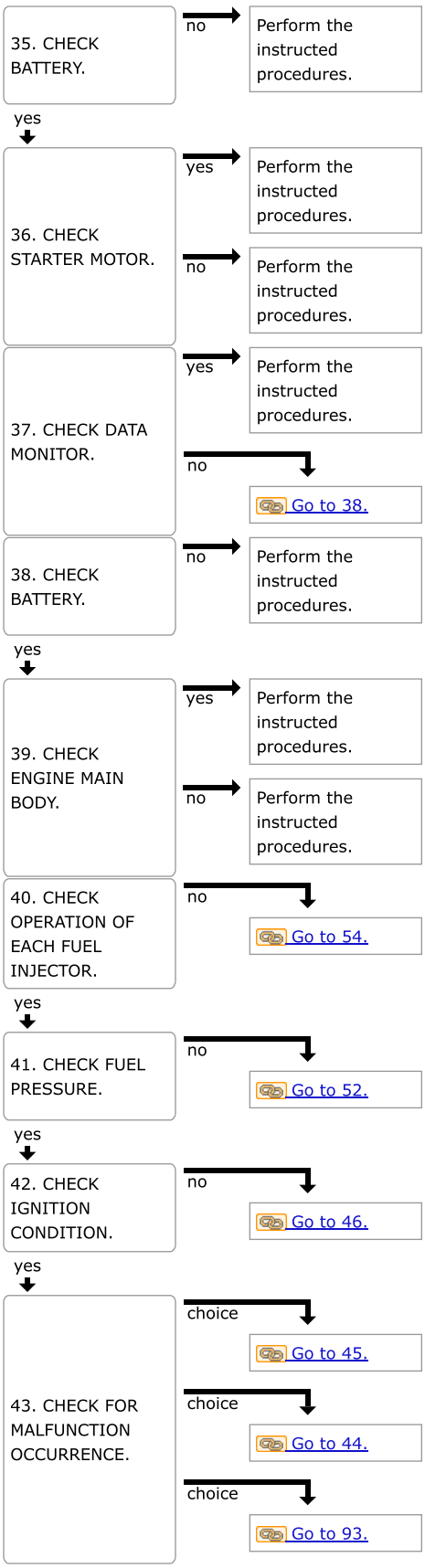
1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK IMMOBILIZER.	no	Perform the instructed procedures.
yes ↓		
3. CHECK FOR MALFUNCTION OCCURRENCE.	yes	Go to 30.
	no	Go to 4.
4. CHECK FREEZE FRAME DATA.	choice	Perform the instructed procedures.
	choice	Go to 5.
	choice	Go to 12.
	choice	Go to 20.

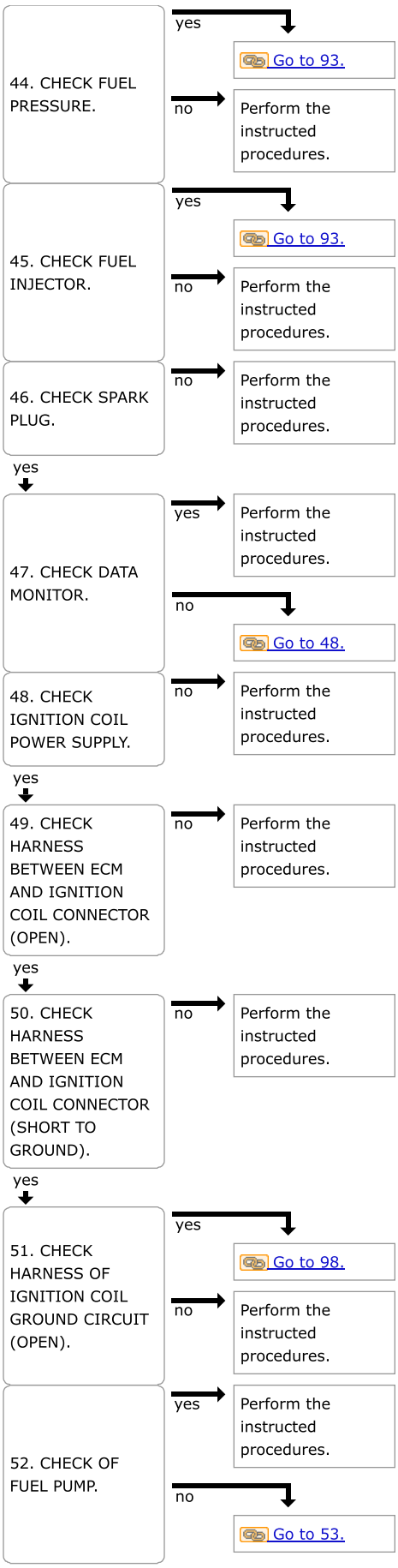

5. CHECK FREEZE FRAME DATA.
choice
Perform the instructed procedures.
choice
Go to 6.
choice
Perform the instructed procedures.
6. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.
no
Perform the instructed procedures.
yes
7. CHECK CRANKSHAFT POSITION SENSOR.
no
Perform the instructed procedures.
yes
8. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.
no
Perform the instructed procedures.
yes
9. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
10. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
11. CHECK FOR MALFUNCTION OCCURRENCE.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

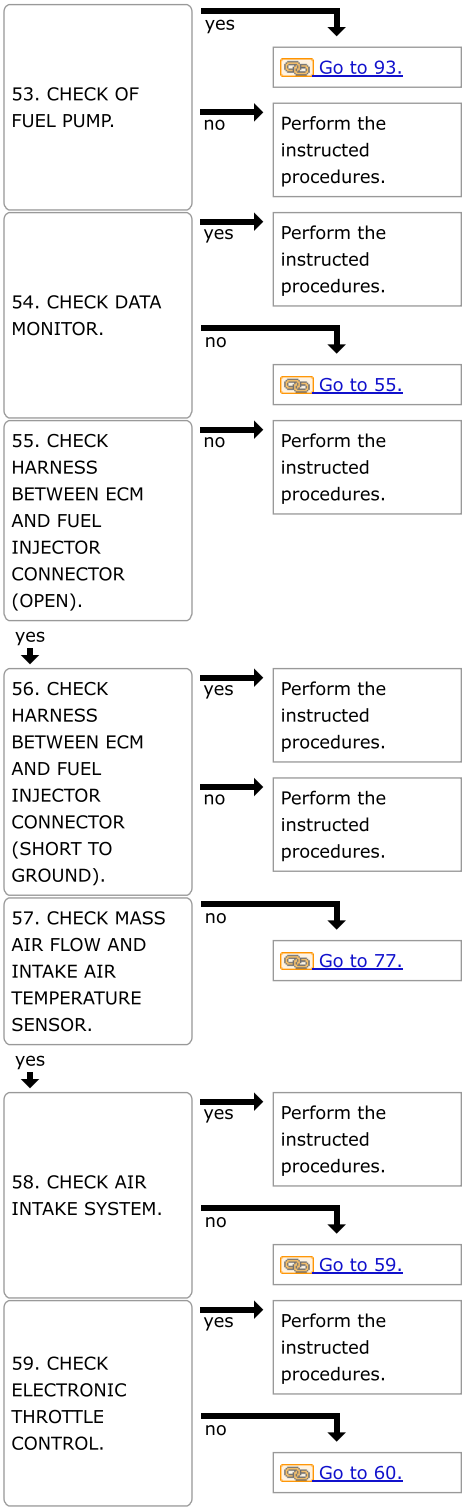

12. CHECK FREEZE FRAME DATA.
choice
Perform the instructed procedures.
choice
Go to 13.
choice
Perform the instructed procedures.
13. CHECK OF FUEL PUMP.
yes
Go to 15.
no
Go to 14.
14. CHECK OF FUEL PUMP.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
15. CHECK FUEL TANK.
yes
Perform the instructed procedures.
no
Go to 16.
16. CHECK FUEL PRESSURE.
no
Perform the instructed procedures.
yes
17. CHECK FREEZE FRAME DATA.
no
Perform the instructed procedures.
yes
18. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
19. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
yes
Go to 29.
no
Perform the instructed procedures.

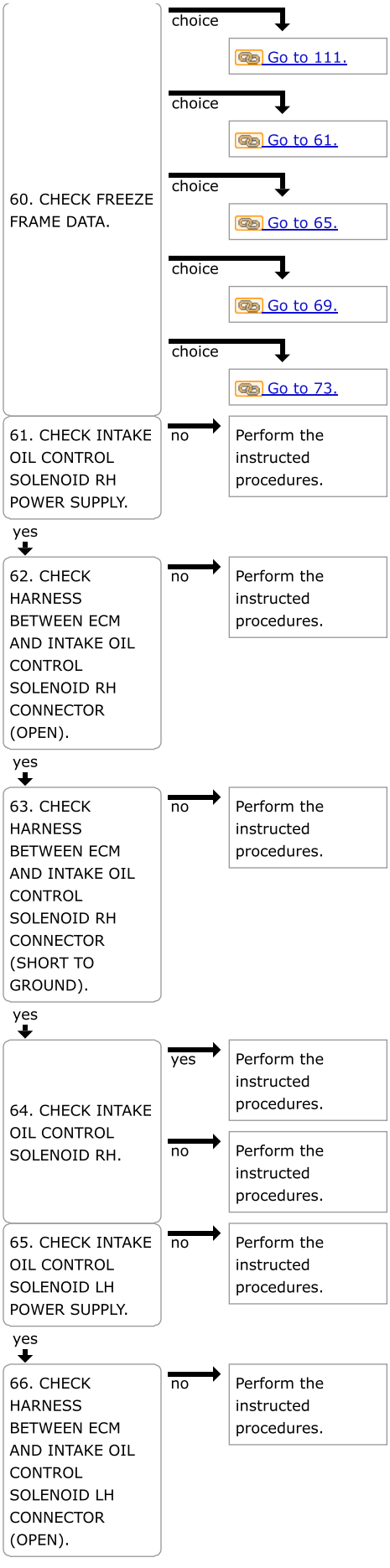

20. CHECK FREEZE FRAME DATA.
choice
Perform the instructed procedures.
choice
Go to 21.
choice
Perform the instructed procedures.
21. CHECK FUEL INJECTOR.
yes
Perform the instructed procedures.
no
Go to 22.
22. CHECK FUEL TANK.
yes
Perform the instructed procedures.
no
Go to 23.
23. CHECK FREEZE FRAME DATA.
yes
Go to 25.
no
Go to 24.
24. CHECK FUEL PRESSURE.
yes
Go to 29.
no
Perform the instructed procedures.
25. CHECK FUEL INJECTOR.
yes
Go to 27.
no
Go to 26.
26. CHECK FUEL INJECTOR.
no
Perform the instructed procedures.
yes
27. CHECK ELECTRONIC THROTTLE CONTROL.
yes
Perform the instructed procedures.
no
Go to 28.


28. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 29.
29. CHECK FOR MALFUNCTION OCCURRENCE.
yes
Perform the instructed procedures.
no
Go to 30.
30. CHECK FOR MALFUNCTION OCCURRENCE.
choice
Go to 37.
choice
Go to 40.
choice
Go to 57.
choice
Go to 79.
choice
Go to 31.
31. CHECK FOR MALFUNCTION OCCURRENCE.
choice
Go to 32.
choice
Go to 34.
choice
Go to 35.
32. CHECK BATTERY.
no
Perform the instructed procedures.
yes
33. CHECK ENGINE MAIN BODY.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
34. CHECK STARTER MOTOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.


35. CHECK BATTERY.
no
Perform the instructed procedures.
yes
36. CHECK STARTER MOTOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
37. CHECK DATA MONITOR.
yes
Perform the instructed procedures.
no
Go to 38.
38. CHECK BATTERY.
no
Perform the instructed procedures.
yes
39. CHECK ENGINE MAIN BODY.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
40. CHECK OPERATION OF EACH FUEL INJECTOR.
no
Go to 54.
yes
41. CHECK FUEL PRESSURE.
no
Go to 52.
yes
42. CHECK IGNITION CONDITION.
no
Go to 46.
yes
43. CHECK FOR MALFUNCTION OCCURRENCE.
choice
Go to 45.
choice
Go to 44.
choice
Go to 93.


44. CHECK FUEL PRESSURE.
yes
Go to 93.
no
Perform the instructed procedures.
45. CHECK FUEL INJECTOR.
yes
Go to 93.
no
Perform the instructed procedures.
46. CHECK SPARK PLUG.
no
Perform the instructed procedures.
yes
47. CHECK DATA MONITOR.
yes
Perform the instructed procedures.
no
Go to 48.
48. CHECK IGNITION COIL POWER SUPPLY.
no
Perform the instructed procedures.
yes
49. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
50. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
51. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT (OPEN).
yes
Go to 98.
no
Perform the instructed procedures.
52. CHECK OF FUEL PUMP.
yes
Perform the instructed procedures.
no
Go to 53.


53. CHECK OF FUEL PUMP.
yes
Go to 93.
no
Perform the instructed procedures.
54. CHECK DATA MONITOR.
yes
Perform the instructed procedures.
no
Go to 55.
55. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
56. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
57. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Go to 77.
yes
58. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 59.
59. CHECK ELECTRONIC THROTTLE CONTROL.
yes
Perform the instructed procedures.
no
Go to 60.


60. CHECK FREEZE FRAME DATA.
choice
Go to 111.
choice
Go to 61.
choice
Go to 65.
choice
Go to 69.
choice
Go to 73.
61. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.
no
Perform the instructed procedures.
yes
62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
64. CHECK INTAKE OIL CONTROL SOLENOID RH.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
65. CHECK INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.
no
Perform the instructed procedures.
yes
66. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (OPEN).
no
Perform the instructed procedures.

yes

67. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

68. CHECK INTAKE OIL CONTROL SOLENOID LH.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

69. CHECK EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.

no → Perform the instructed procedures.

yes

70. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes

71. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

72. CHECK EXHAUST OIL CONTROL SOLENOID RH.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

73. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.

no → Perform the instructed procedures.

yes

74. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes ↓

75. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes ↓

76. CHECK EXHAUST OIL CONTROL SOLENOID LH.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

77. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes ↓

78. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

yes → Go to 111.

no → Perform the instructed procedures.

79. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

no → Go to 124.

yes ↓

80. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).

no → Go to 124.

yes ↓

81. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).

no → Go to 124.

yes ↓

82. CHECK DATA MONITOR.

yes → Go to 85.

no → Go to 83.

83. CHECK FOR MALFUNCTION OCCURRENCE.

no → Go to 85.

yes ↓

84. CHECK IDLE SPEED.

yes → Go to 122.

no → Go to 122.

85. CHECK FUEL PRESSURE.

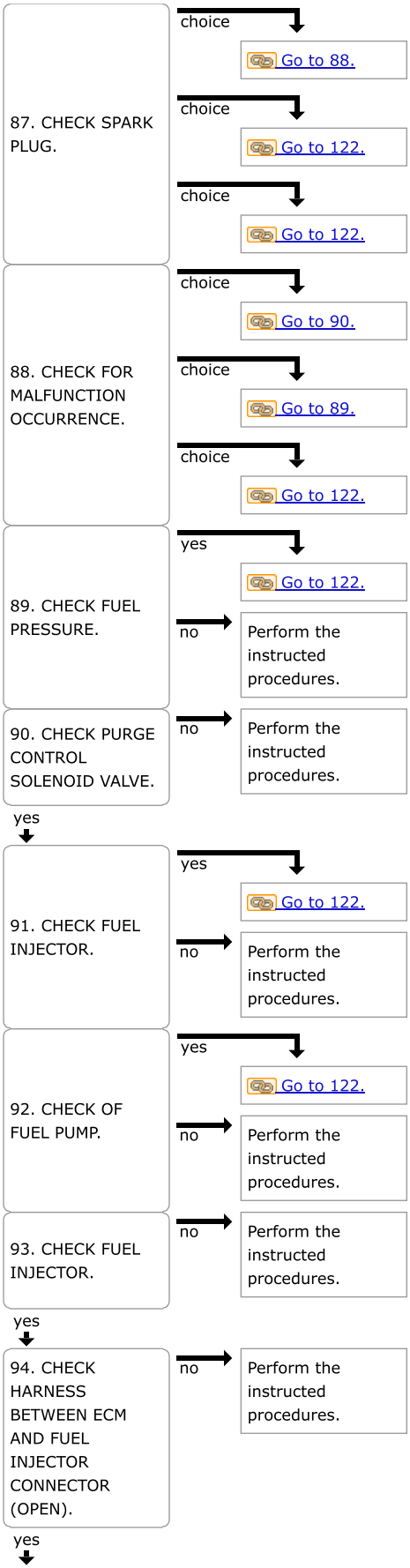
no → Go to 92.

yes ↓

86. CHECK FREEZE FRAME DATA.

no → Perform the instructed procedures.

yes ↓


87. CHECK SPARK PLUG.
choice
Go to 88.
choice
Go to 122.
choice
Go to 122.
88. CHECK FOR MALFUNCTION OCCURRENCE.
choice
Go to 90.
choice
Go to 89.
choice
Go to 122.
89. CHECK FUEL PRESSURE.
yes
Go to 122.
no
Perform the instructed procedures.
90. CHECK PURGE CONTROL SOLENOID VALVE.
no
Perform the instructed procedures.
yes
91. CHECK FUEL INJECTOR.
yes
Go to 122.
no
Perform the instructed procedures.
92. CHECK OF FUEL PUMP.
yes
Go to 122.
no
Perform the instructed procedures.
93. CHECK FUEL INJECTOR.
no
Perform the instructed procedures.
yes
94. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes

95. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

96. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Go to 97.

97. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

98. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

99. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

100. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

101. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

102. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

103. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.
no → Perform the instructed procedures.
yes ↓

104. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).
no → Perform the instructed procedures.
yes ↓

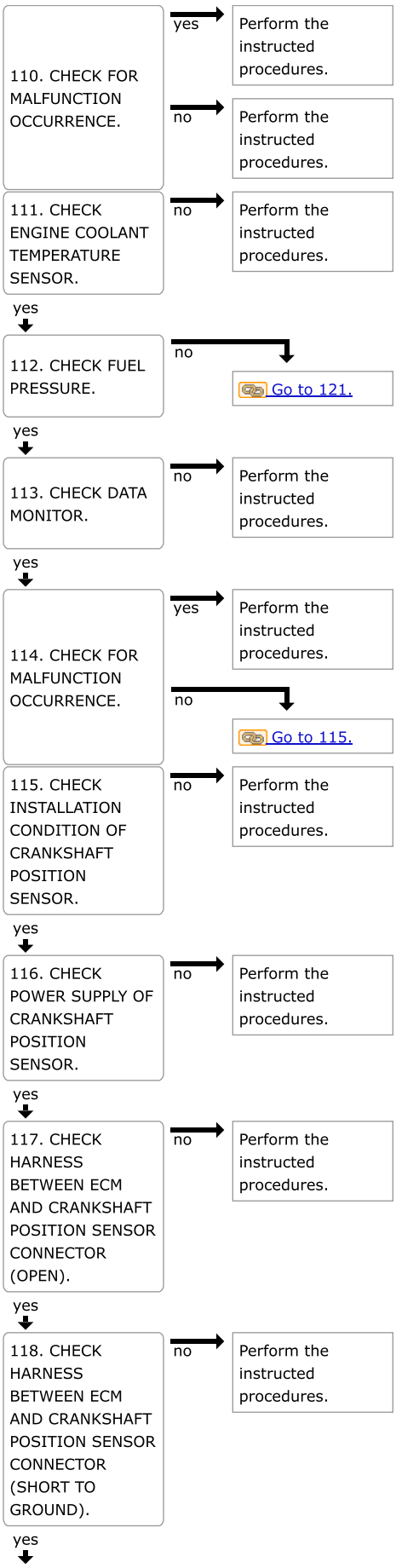
105. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
no → Perform the instructed procedures.
yes ↓

106. CHECK POWER SUPPLY OF EXHAUST CAMSHAFT POSITION SENSOR.
no → Perform the instructed procedures.
yes ↓

107. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).
no → Perform the instructed procedures.
yes ↓

108. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
no → Perform the instructed procedures.
yes ↓

109. CHECK FOR MALFUNCTION OCCURRENCE.
yes → Perform the instructed procedures.
no → Go to 110.


110. CHECK FOR MALFUNCTION OCCURRENCE.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
111. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
112. CHECK FUEL PRESSURE.
no
Go to 121.
yes
113. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
114. CHECK FOR MALFUNCTION OCCURRENCE.
yes
Perform the instructed procedures.
no
Go to 115.
115. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.
no
Perform the instructed procedures.
yes
116. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.
no
Perform the instructed procedures.
yes
117. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
118. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes

119. CHECK COMPRESSION PRESSURE.
- no → Perform the instructed procedures.
- yes ↓

120. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

121. CHECK OF FUEL PUMP.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

122. CHECK FUEL PRESSURE.
- no → Go to 130.
- yes ↓

123. CHECK DATA MONITOR.
- no → Perform the instructed procedures.
- yes ↓

124. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Go to 125.

125. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

126. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

127. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

128. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

129. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

130. CHECK OF FUEL PUMP.
- no → Perform the instructed procedures.
- yes ↓

131. CHECK FUEL PUMP SYSTEM.
- no → Perform the instructed procedures.
- yes ↓

132. CHECK PURGE CONTROL SOLENOID VALVE.
- no → Perform the instructed procedures.
- yes ↓

133. CHECK FUEL INJECTOR.
- no → Perform the instructed procedures.
- yes ↓

134. CHECK INTAKE VALVE.
- yes → Perform the instructed procedures.
- no → Go to 135.

135. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
- no → Perform the instructed procedures.
- yes ↓

136. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

137. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.
→ no: Perform the instructed procedures.
↓ yes

138. CHECK POWER SUPPLY OF CRANKSHAFT POSITION SENSOR.
→ no: Perform the instructed procedures.
↓ yes

139. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).
→ no: Perform the instructed procedures.
↓ yes

140. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
→ no: Perform the instructed procedures.
↓ yes

141. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.
→ no: Perform the instructed procedures.
↓ yes

142. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).
→ no: Perform the instructed procedures.
↓ yes

143. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
→ no: Perform the instructed procedures.
↓ yes

144. CHECK POWER SUPPLY OF EXHAUST CAMSHAFT POSITION SENSOR.
- no → Perform the instructed procedures.
- yes ↓

145. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).
- no → Perform the instructed procedures.
- yes ↓

146. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).
- no → Perform the instructed procedures.
- yes ↓

147. CHECK COMPRESSION PRESSURE.
- no → Perform the instructed procedures.
- yes ↓

148. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Go to 149.

149. CHECK FOR MALFUNCTION OCCURRENCE.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P1604 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK IMMOBILIZER.

Check the immobilizer. Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Repair the immobilizer. Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.

3. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault 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.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Engine Speed] and [Control module voltage].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

If the value of [Engine Speed] is 0 [rpm] and the value of [Control module voltage] is less than 5 V, go to A.
If the value of [Engine Speed] is 0 [rpm] and the value of [Control module voltage] is 5 V or more, go to B.
If the value of [Engine Speed] is not 0 [rpm] and is less than 250 [rpm], go to C.
If the value of [Engine Speed] is 250 [rpm] or more, go to D.

A	Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.
B	Go to 5.
C	Go to 12.
D	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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

If the value of [Control module voltage] is less than 9 [V], go to A.
If the value of [Control module voltage] changes in any one of freeze frame data, go to B.
If the value of [Control module voltage] does not change in any one of freeze frame data, go to C.

A	It is possible that the engine friction is too large. Check the engine. Ref. to MECHANICAL(H4DOTC)>Symptoms and causes>INSPECTION.
B	Go to 6.
C	Check the starter motor circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.

6. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the 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.

7. CHECK CRANKSHAFT POSITION SENSOR.

Check the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 8.
No	Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

8. 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
   (E65) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 9.
No	Repair open or short circuit to ground in the harness between ECM connector and crankshaft position sensor connector.

9. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).

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
   (E52) No. 4 — (E65) No. 1:
   (E52) No. 5 — (E65) No. 2:

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 (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E65) No. 1 — 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 COMMON (DIAGNOSTICS)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

12. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient Temperature] and [Fuel Pump Duty].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

3. Check if the values from step 2) satisfy the following conditions.
Condition
The value of [Coolant Temp.] is 120[°C] (248°F) or more, or the value of [Coolant Temp.] is 15[°C] (27°F) lower than that of [Ambient Temperature].

If this condition is met, go to A.
If this condition is not met and the value of [Fuel Pump Duty] is 60% or more, go to B.
If this condition is not met and the value of [Fuel Pump Duty] is less than 60%, go to C.

A	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.
B	Go to 13.
C	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

13. CHECK OF FUEL PUMP.

1. Using the Subaru Select Monitor, select [Fuel Pump Relay] of [Active Test].

Note:
For detailed operation procedures, refer to the "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 Assembly>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

15. CHECK FUEL TANK.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Check if any foreign matters such as iron powder exist in the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 17.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Delivery and Evaporation Lines>INSPECTION.

17. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 (OPEN).

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 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) 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 (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — 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.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient Temperature] and [Engine Speed].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.

3. Check if the values from step 2) satisfy the following conditions.

Condition

The value of [Coolant Temp.] is 120[°C] (248°F) or more, or the value of [Coolant Temp.] is 15[°C] (27°F) lower than that of [Ambient Temperature].

If this condition is met, go to A.
If this condition is not met and the minimum value of [Engine Speed] is less than 300 rpm, go to B.
If this condition is not met and the minimum value of [Engine Speed] is 300 rpm or more, go to C.

A	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.
B	Go to 21.
C	It is possible that the compression pressure of the engine 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.

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.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Check if any foreign matters such as iron powder exist in the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DOTC)>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 kg/cm^2, 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 between intake manifold and purge control solenoid valve and perform the measurement. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT > FUEL PIPE 1.

Is the HC concentration less than 4000 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.

Is the check result OK?

Yes — Go to 27.

No — Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

27. CHECK ELECTRONIC THROTTLE CONTROL.

Check the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.

Is there any deposit inside the electronic throttle control?

Yes — Replace the electronic throttle control. 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.

Check for the condition of fault occurrence.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
No	Go to 30.

30. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

If the engine speed during cranking is abnormal, go to A.
If an initial combustion does not occur, go to B.
If the engine stalls immediately after engine start, go to C.
If the engine takes time to start, go to D.
If the engine does not crank, go to E.

A	Go to 37.
B	Go to 40.
C	Go to 57.
D	Go to 79.
E	Go to 31.

31. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

If the starter motor does not rotate, go to A.
If the starter motor rotates but does not engage, go to B.
If the sound does not occur by a protruding starter pinion gear during cranking, go to C.

A	Go to 32.
B	Go to 34.
C	Go to 35.

32. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 33.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

33. CHECK ENGINE MAIN BODY.

Using the Subaru ST, rotate the crankshaft.

Subaru ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?

Yes	Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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(H4DOTC)>Starter>INSPECTION.

Is there any wear or damage in the starter pinion gear?

Yes	Repair the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter.
No	CVT model: Replace the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Torque Converter. MT model: Replace the flywheel. Ref. to CLUTCH SYSTEM>Flywheel.

35. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 36.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

36. CHECK STARTER MOTOR.

Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter>INSPECTION.

Is the check result OK?

Yes	Check the starter motor circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.
No	Repair the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter.

37. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value of [Engine Speed] during cranking.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes — Go to 39.

No — Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

39. CHECK ENGINE MAIN BODY.

Using the Subaru ST, rotate the crankshaft.

Subaru ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?

Yes — Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 42.
No	Go to 52.

42. CHECK IGNITION CONDITION.

Check the ignition condition. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 43.
No	Go to 46.

43. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

If a fault occurs only within approx. 15 to 120 minutes after the engine is stopped, go to A.
If a fault occurs in two or three minutes or a long time after the engine is stopped, go to B.
If the fault occurrence pattern is inconsistent, go to C.

A	Go to 45.
B	Go to 44.
C	Go to 93.

44. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DOTC)>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 kg/cm^2, 21 psi) or more?

Yes	Go to 93.
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 between intake manifold and purge control solenoid valve and perform the measurement. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT > FUEL PIPE 1.

Is the HC concentration less than 4000 ppm?

Yes — Go to 93.

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.

Is the check result OK?

Yes — Go to 47.

No — Replace all spark plugs on all cylinders. Ref. to IGNITION(H4DOTC)>Spark Plug.

47. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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.

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
(E111) No. 1 (+) — Engine ground (−):
(E112) No. 1 (+) — Engine ground (−):
(E113) No. 1 (+) — Engine ground (−):
(E114) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 49.

No — Repair the following item.
- Open or short to ground in power supply circuit
- Poor contact of coupling connector
- Poor contact of J/C
- Blown out of fuse

49. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

(E51) No. 10 — (E111) No. 2:
(E51) No. 26 — (E112) No. 2:
(E51) No. 42 — (E113) No. 2:
(E51) No. 58 — (E114) No. 2:

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 (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(E51) No. 10 — Engine ground:
(E51) No. 26 — Engine ground:
(E51) No. 42 — Engine ground:
(E51) No. 58 — 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 (OPEN).

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

(E111) No. 3 — Engine ground:
(E112) No. 3 — Engine ground:
(E113) No. 3 — Engine ground:
(E114) No. 3 — 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 98.
No	Repair the open circuit in harness between ignition coil connector and engine ground terminal.

52. CHECK OF FUEL PUMP.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, select [Fuel Pump Relay] of [Active Test].

Note:
For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.

3. 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 Assembly>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 Assembly>INSPECTION.

Is the check result OK?

Yes — Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
If the fault occurs after servicing, continue the diagnosis. Go to 93.

No — Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

54. CHECK DATA MONITOR.

Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 (OPEN).

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 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) 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 (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — Engine ground:

Is the resistance 1 MΩ 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 check result OK?

Yes — Go to 58.

No — Go to 77.

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.

Check the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.

Is there any deposit inside the electronic throttle control?

Yes	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.
No	Go to 60.

60. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to ON.
2. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.
3. 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].

If all of the advance angle amount and retard angle amount synchronize with their target values, go to A.
If the difference between the advance angle amount of the intake oil control solenoid RH and its target value is 10 degrees or more, go to B.
If the difference between the advance angle amount of the intake oil control solenoid LH and its target value is 10 degrees or more, go to C.
If the difference between the retard angle amount of the exhaust oil control solenoid RH and its target value is 10 degrees or more, go to D.
If the difference between the retard angle amount of the exhaust oil control solenoid LH and its target value is 10 degrees or more, go to E.

A	Go to 111.
B	Go to 61.
C	Go to 65.
D	Go to 69.
E	Go to 73.

61. CHECK INTAKE OIL CONTROL SOLENOID RH POWER SUPPLY.

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
   (E105) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 62.

No — Repair the following item.
- Open circuit in harness between M/B and intake oil control solenoid RH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 14 — (E105) 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 (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid RH connector and engine ground.
Connector & terminal
(E105) No. 2 — Engine ground:

Is the resistance 1 MΩ 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 check result OK?

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 INTAKE OIL CONTROL SOLENOID LH POWER SUPPLY.

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
   (E106) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 66.

No — Repair the following item.
- Open circuit in harness between M/B and intake oil control solenoid LH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

66. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 13 — (E106) 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 (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid LH connector and engine ground.
Connector & terminal
(E106) No. 2 — Engine ground:

Is the resistance 1 MΩ 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 check result OK?

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 EXHAUST OIL CONTROL SOLENOID RH POWER SUPPLY.

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
   (E107) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 70.

No — Repair the following item.
- Open circuit in harness between M/B and exhaust oil control solenoid RH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

70. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 12 — (E107) 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 (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid RH connector and engine ground.
Connector & terminal
(E107) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 72.

No — Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid RH connector.

72. 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 check result OK?

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.

73. CHECK EXHAUST OIL CONTROL SOLENOID LH POWER SUPPLY.

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
   (E108) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 74.

No — Repair the following item.
- Open circuit in harness between M/B and exhaust oil control solenoid LH connector
- Blown out of fuse
- Poor contact of coupling connector
- Poor contact of J/C

74. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (OPEN).

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.
   Connector & terminal
   (E51) No. 11 — (E108) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 75.

No — Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.

75. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid LH connector and engine ground.
Connector & terminal
(E108) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 76.

No — Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

76. 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 check result OK?

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.

77. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Disconnect the connector from the manifold absolute pressure and intake air temperature sensor.
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.

Connector & terminal

(B61) No. 62 — (B92) No. 1:
(B61) No. 61 — (B92) No. 2:
(B61) No. 50 — (B92) No. 3:
(B61) No. 34 — (B92) No. 4:
(E51) No. 33 — (E78) No. 1:
(E51) No. 34 — (E78) No. 2:
(E51) No. 1 — (E78) No. 3:
(E51) No. 35 — (E78) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 78.

No — Repair the following item.
- Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Open circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector
- Poor contact of J/C

78. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR CONNECTOR AND BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE & INTAKE AIR TEMPERATURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(B61) No. 34 — Engine ground:
(B61) No. 50 — Engine ground:
(B61) No. 62 — Engine ground:
(E51) No. 1 — Engine ground:
(E51) No. 34 — Engine ground:
(E51) No. 35 — Engine ground:

Is the resistance 1 MΩ 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 111.

No — Repair the following item.
- Short circuit to ground in harness between ECM connector and the mass air flow and intake air temperature sensor connector
- Ground short circuit of harness between ECM connector and the manifold absolute pressure and intake air temperature sensor connector

79. 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 check result OK?

Yes — Go to 80.

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 124.

80. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E51) No. 33 — (E72) No. 1:

(E51) No. 49 — (E72) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 81.

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 124.

81. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR CONNECTOR (SHORT CIRCUIT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(E51) No. 49 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 82.

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 124.

82. 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 [Atmosphere Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Long term fuel trim B1] −25 — 25 [%]? And is the value of [Atmosphere Pressure] 80 [kPa] (600 mmHg, 23.6 inHg) or more?

Yes — Go to 85.

No — Go to 83.

83. CHECK FOR MALFUNCTION OCCURRENCE.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Start the engine.

Does the engine start?

Yes — Go to 84.

No — Go to 85.

84. 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)(H4DOTC)>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 122.

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 122.

85. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes — Go to 86.

No — Go to 92.

86. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 87.
No	Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>High Pressure Fuel Pump>INSPECTION.

87. CHECK SPARK PLUG.

Check all spark plugs on all cylinders. Ref. to IGNITION(H4DOTC)>Spark Plug>INSPECTION.

If the check result is OK, go to A.
If spark plugs in some cylinders are faulty, go to B.
If all spark plugs in all cylinders are faulty, go to C.

A	Go to 88.
B	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 122.
C	Replace all spark plugs on all cylinders. Ref. to IGNITION(H4DOTC)>Spark Plug. If the fault occurs after servicing, continue the diagnosis. Go to 122.

88. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

If a fault occurs only within approx. 15 to 120 minutes after the engine is stopped, go to A.
If a fault occurs in two or three minutes or a long time after the engine is stopped, go to B.
If the fault occurrence pattern is inconsistent, go to C.

A	Go to 90.
B	Go to 89.
C	Go to 122.

89. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

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 kg/cm^2, 21 psi) or more?

Yes	Go to 122.
No	Replace the pressure regulator. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Filter.

90. CHECK PURGE CONTROL SOLENOID VALVE.

Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 91.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

91. 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 between intake manifold and purge control solenoid valve and perform the measurement. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT > FUEL PIPE 1.

Is the HC concentration less than 4000 ppm?

Yes	Go to 122.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

92. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT. If the fault occurs after servicing, continue the diagnosis. Go to 122.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

93. CHECK FUEL INJECTOR.

Check fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 94.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

94. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

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 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) 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 (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

#1 (E51) No. 15 — Engine ground:
#1 (E51) No. 16 — Engine ground:
#2 (E51) No. 31 — Engine ground:
#2 (E51) No. 32 — Engine ground:
#3 (E51) No. 47 — Engine ground:
#3 (E51) No. 48 — Engine ground:
#4 (E51) No. 63 — Engine ground:
#4 (E51) No. 64 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 96.

No — Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

96. 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 COMMON (DIAGNOSTICS)>Clear memory.

No — Go to 97.

97. 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 COMMON (DIAGNOSTICS)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

98. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 99.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

99. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.

Check the installation condition of camshaft position sensor.

Is the camshaft position sensor installed correctly?

Yes	Go to 100.
No	Install the camshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

100. 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
   (E65) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 101.
No	Repair open or short circuit to ground in the harness between ECM connector and crankshaft position sensor connector.

101. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).

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
   (E52) No. 4 — (E65) No. 1:
   (E52) No. 5 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 102.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

102. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.
Connector & terminal
(E65) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 103.

No — Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

103. 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
   (E61) No. 1 (+) — Engine ground (−):
   (E62) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 104.

No — Repair the following item.
- Open circuit or short circuit to ground in harness between M/B and intake camshaft position sensor connector
- Poor contact of coupling connector
- Blown out of fuse

104. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).

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

(E51) No. 56 — (E61) No. 2:
(E51) No. 41 — (E61) No. 3:
(E51) No. 57 — (E62) No. 2:
(E51) No. 41 — (E62) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 105.

No — Repair the following item.
- Open circuit in the harness between ECM connector and intake camshaft position sensor connector
- Poor contact of J/C

105. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between intake camshaft position sensor connector and engine ground.

Connector & terminal

(E61) No. 2 — Engine ground:
(E62) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 106.

No — Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

106. 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

(E63) No. 1 (+) — Engine ground (−):
(E64) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 107.

No — Repair the following item.
- Open circuit in harness between M/B and exhaust camshaft position sensor connector
- Blown out of fuse
- Poor contact of coupling connector

107. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).

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

(E51) No. 24 — (E63) No. 2:
(E51) No. 41 — (E63) No. 3:
(E51) No. 40 — (E64) No. 2:
(E51) No. 41 — (E64) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 108.
No	Repair the following item. • Open circuit in harness between ECM connector and exhaust camshaft position sensor connector • Poor contact of J/C

108. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust camshaft position sensor connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(E63) No. 2 — Engine ground:
(E64) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 109.
No	Repair short circuit to ground in the harness between ECM connector and exhaust camshaft position sensor connector.

109. 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 COMMON (DIAGNOSTICS)>Clear memory.
No	Go to 110.

110. 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 COMMON (DIAGNOSTICS)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

111. 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 check result OK?

Yes — Go to 112.

No — Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

112. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Measure the fuel pressure during cranking or five minutes after the engine is stopped. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure.

Is the fuel pressure during cranking 315 — 400 kPa (3.2 — 4.1 kg/cm^2, 46 — 58 psi), and is the fuel pressure five minutes after engine stop 147 kPa (1.5 kg/cm^2, 21 psi) or more?

Yes — Go to 113.

No — Go to 121.

113. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Does the value of [Long term fuel trim B1] fall within a range of −15 — 15 [%]?

Yes — Go to 114.

No — Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

114. 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. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel.

No — Go to 115.

115. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 116.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

116. 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

(E65) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 117.
No	Repair open or short circuit to ground in the harness between ECM connector and crankshaft position sensor connector.

117. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).

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

(E52) No. 4 — (E65) No. 1:

(E52) No. 5 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 118.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

118. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(E65) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 119.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

119. CHECK COMPRESSION PRESSURE.

Check the compression pressure. Ref. to MECHANICAL(H4DOTC)>Compression>INSPECTION.

Is the check result OK?

Yes	Go to 120.
No	Check the engine. Ref. to MECHANICAL(H4DOTC)>Symptoms and causes>INSPECTION.

120. 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 COMMON (DIAGNOSTICS)>Clear memory.
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).

121. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

122. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

Measure the fuel pressure during cranking or five minutes after the engine is stopped. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure.

Is the fuel pressure during cranking 315 — 400 kPa (3.2 — 4.1 kg/cm^2, 46 — 58 psi), and is the fuel pressure five minutes after engine stop 147 kPa (1.5 kg/cm^2, 21 psi) or more?

Yes	Go to 123.
No	Go to 130.

123. 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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Does the value of [Long term fuel trim B1] fall within a range of −15 — 15 [%]?

Yes — Go to 124.

No — Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

124. 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. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel.

No — Go to 125.

125. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes — Go to 126.

No — Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

126. 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
   (E65) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 127.

No — Repair open or short circuit to ground in the harness between ECM connector and crankshaft position sensor connector.

127. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).

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

(E52) No. 4 — (E65) No. 1:
(E52) No. 5 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 128.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

128. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal

(E65) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 129.

No — Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

129. 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 COMMON (DIAGNOSTICS)>Clear memory.

No — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

130. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes — Go to 131.

No — Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

131. CHECK FUEL PUMP SYSTEM.

Check fuel pump circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

Is the check result OK?

Yes	Go to 132.
No	Repair the fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

132. CHECK PURGE CONTROL SOLENOID VALVE.

Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 133.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Purge Control Solenoid Valve.

133. 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 between intake manifold and purge control solenoid valve and perform the measurement. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>General Description>COMPONENT > FUEL PIPE 1.

Is the HC concentration less than 4000 ppm?

Yes	Go to 134.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

134. CHECK INTAKE VALVE.

Check the intake valve. Ref. to MECHANICAL(H4DOTC)>Cylinder Head.

Is there any deposit in the intake valve?

Yes	Clean the intake valve. Ref. to MECHANICAL(H4DOTC)>Cylinder Head.
No	Go to 135.

135. 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 check result OK?

Yes	Go to 136.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Coolant Temperature Sensor.

136. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes — Go to 137.

No — Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

137. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.

Check the installation condition of camshaft position sensor.

Is the camshaft position sensor installed correctly?

Yes — Go to 138.

No — Install the camshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Camshaft Position Sensor.

138. 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
   (E65) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 139.

No — Repair open or short circuit to ground in the harness between ECM connector and crankshaft position sensor connector.

139. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (OPEN).

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
   (E52) No. 4 — (E65) No. 1:
   (E52) No. 5 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 140.

No — Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

140. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Connector & terminal

(E65) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 141.

No — Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

141. 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

(E61) No. 1 (+) — Engine ground (−):

(E62) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 142.

No — Repair the following item.

- Open circuit or short circuit to ground in harness between M/B and intake camshaft position sensor connector
- Blown out of fuse
- Poor contact of coupling connector

142. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).

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

(E51) No. 56 — (E61) No. 2:

(E51) No. 41 — (E61) No. 3:

(E51) No. 57 — (E62) No. 2:

(E51) No. 41 — (E62) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 143.

No — Repair the following item.

- Open circuit in the harness between ECM connector and intake camshaft position sensor connector
- Poor contact of J/C

143. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between intake camshaft position sensor connector and engine ground.

Connector & terminal

(E61) No. 2 — Engine ground:

(E62) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 144.

No — Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

144. 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

(E63) No. 1 (+) — Engine ground (−):

(E64) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 145.

No — Repair the following item.

- Open circuit in harness between M/B and exhaust camshaft position sensor connector
- Blown out of fuse
- Poor contact of coupling connector

145. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).

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

(E51) No. 24 — (E63) No. 2:

(E51) No. 41 — (E63) No. 3:

(E51) No. 40 — (E64) No. 2:

(E51) No. 41 — (E64) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 146.

No — Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor connector.

146. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between exhaust camshaft position sensor connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E63) No. 2 — Engine ground:
(E64) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 147.

No — Repair short circuit to ground in the harness between ECM connector and exhaust camshaft position sensor connector.

147. CHECK COMPRESSION PRESSURE.

Check the compression pressure. Ref. to MECHANICAL(H4DOTC)>Compression>INSPECTION.

Is the check result OK?

Yes — Go to 148.

No — Check the engine. Ref. to MECHANICAL(H4DOTC)>Symptoms and causes>INSPECTION.

148. 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 COMMON (DIAGNOSTICS)>Clear memory.

No — Go to 149.

149. 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 COMMON (DIAGNOSTICS)>Clear memory.

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).

GENERAL DESCRIPTION

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)

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 or less

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Engine speed	Less than 500 rpm

Judge as NG when the following conditions are established.

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Engine speed	Less than 300 rpm

Time needed for diagnosis:

Diagnosis 1: 2 — 26 s

Diagnosis 2: Less than 1 s

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

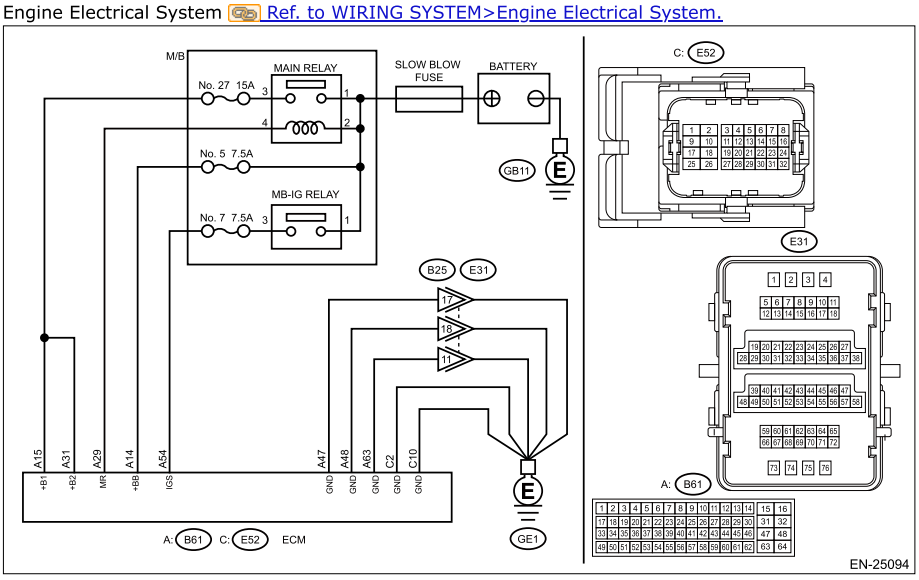
DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.**

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.**

1. CHECK INPUT VOLTAGE OF ECM.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK ECM GROUND HARNESS.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK INPUT VOLTAGE OF ECM.

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 15 (+) — Engine ground (−):
   (B61) No. 31 (+) — Engine ground (−):

Is the voltage 10 — 13 V?

Yes — Go to 2.

No — Repair the following item.
- Open circuit in harness between ECM connector and battery terminal
- Blown out of fuse
- Defective main relay
- Replace M/B

2. CHECK ECM GROUND HARNESS.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 47 (+) — Engine ground (−):
   (B61) No. 48 (+) — Engine ground (−):
   (B61) No. 63 (+) — Engine ground (−):
   (E52) No. 2 (+) — Engine ground (−):
   (E52) No. 10 (+) — Engine ground (−):

Is the voltage less than 1 V?

Yes — Go to 3.

No — Repair the following item.
- Open circuit in ground circuit
- Loose engine ground terminal
- Poor contact of coupling connector

3. CHECK DTC.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.
3. Using Subaru Select Monitor, check the readiness code of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>All Readiness Diagnostic Code(s).

Is DTC P162A displayed as a readiness code?

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 — 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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Judge as NG when the monitor value of the starter interlock inner circuit does not correspond to the expected value.

COMPONENT DESCRIPTION
Inner circuit to inhibit starter drive operation in drive range

EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	ON
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Interlock inner circuit monitor value	Different from expected value

Time needed for diagnosis: 400 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

DTC P1C00 BATTERY MONITOR MODULE "A" PERFORMANCE

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1C00 displayed? (Current code)

Yes	Replace the battery sensor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Diagnosis 1: Judge as NG when faulty signal of each part is sent from the battery sensor.
Diagnosis 2: Judge as battery sensor malfunction when the battery current value sent from the battery sensor is out of normal range for a predetermined time or more.
Diagnosis 3: Judge as battery sensor malfunction when the battery voltage value sent from the battery sensor is out of normal range for a predetermined time or more.
Diagnosis 4: Judge as battery sensor malfunction when the battery temperature value sent from the battery sensor is out of normal range for a predetermined time or more.
Diagnosis 5: Judge as battery sensor malfunction when the battery SOC value sent from the battery sensor is out of normal range for a predetermined time or more.
Diagnosis 6: Judge as battery sensor malfunction when the amount of change of the battery current value sent from the battery sensor is less than the predetermined value for a predetermined time or more.

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	ON
SOC calibration*	Completed

*: The ignition switch and SOC calibration are conditions for the battery SOC diagnosis only. For others, the condition is the ignition switch only.

GENERAL DRIVING CYCLE
Perform the diagnosis every time after the enable conditions have been established.

DIAGNOSTIC METHOD
Judge as NG when the following conditions are established.
Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Receives pulse discharge malfunction Or, Receives voltage measurement malfunction Or,	ON ON

Malfunction Criteria	Threshold Value
Receives current measurement malfunction	ON

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Battery current	Less than −1000 A Or, More than 300 A

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value
Battery voltage	Less than 6 V Or, More than 16.2 V

Judgment value (diagnosis 4)

Malfunction Criteria	Threshold Value
Battery temperature	More than 105°C (221°F)

Judgment value (diagnosis 5)

Malfunction Criteria	Threshold Value
Battery SOC	More than 100%

Judgment value (diagnosis 6)

Malfunction Criteria	Threshold Value
|Battery current (current value) − Battery current (previous value)|	0.003 A or less

Time needed for diagnosis:
Diagnosis 1: Less than 1 s
Diagnosis 2, 3, 4 and 5: 10 s
Diagnosis 6: 60 s
Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

DTC P2004 TGV CONTROL STUCK OPEN BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK TUMBLE GENERATOR VALVE RH.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2004 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK TUMBLE GENERATOR VALVE RH.

1. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Intake Manifold Assembly.
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. **Note:** **The tumble generator valve cannot be disassembled.**

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Tumble generator valve "close" signal output time	1.8 s or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	39.5 deg or more

Time needed for diagnosis: 3000 ms

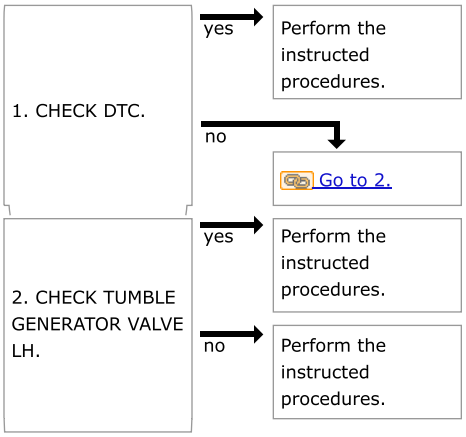
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2005 TGV CONTROL STUCK OPEN BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2005 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK TUMBLE GENERATOR VALVE LH.

1. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Intake Manifold Assembly.
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. **Note:** **The tumble generator valve cannot be disassembled.**

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P2004. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2004 TGV CONTROL STUCK OPEN BANK 1.

DTC P2006 TGV CONTROL STUCK CLOSED BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK TUMBLE GENERATOR VALVE RH.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2006 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK TUMBLE GENERATOR VALVE RH.

1. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Intake Manifold Assembly.
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.

Note:
The tumble generator valve cannot be disassembled.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Tumble generator valve "open" signal output time	1.8 s or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 39.5 deg

Time needed for diagnosis: 3000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2007 TGV CONTROL STUCK CLOSED BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK TUMBLE GENERATOR VALVE LH.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2007 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK TUMBLE GENERATOR VALVE LH.

1. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Intake Manifold Assembly.
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. **Note:** **The tumble generator valve cannot be disassembled.**

GENERAL DESCRIPTION

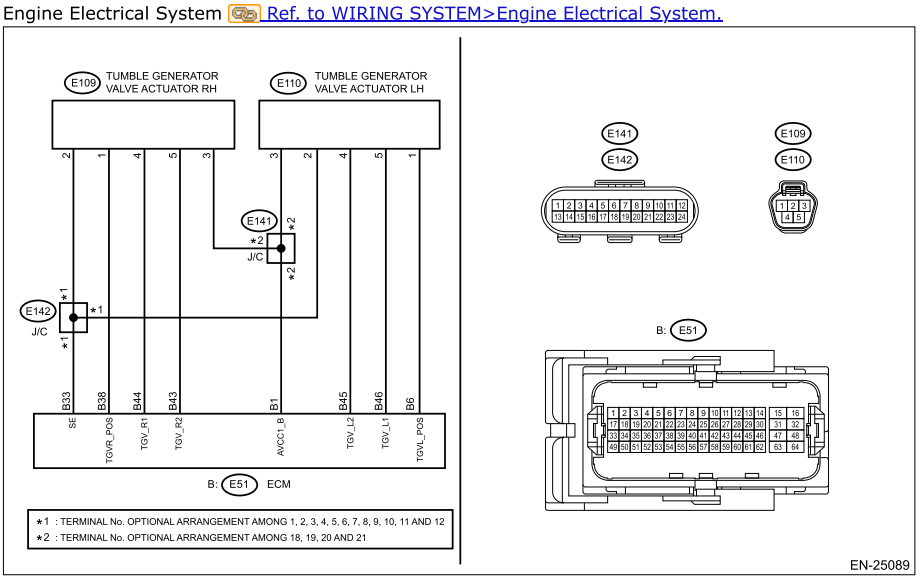
OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P2006. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2006 TGV CONTROL STUCK CLOSED BANK 1.

DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR (SHORT TO POWER SUPPLY).

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 engine ground.
   Connector & terminal
   (E51) No. 43 (+) — Engine ground (−):
   (E51) No. 44 (+) — Engine 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)(H4DOTC)>Tumble Generator Valve Actuator.

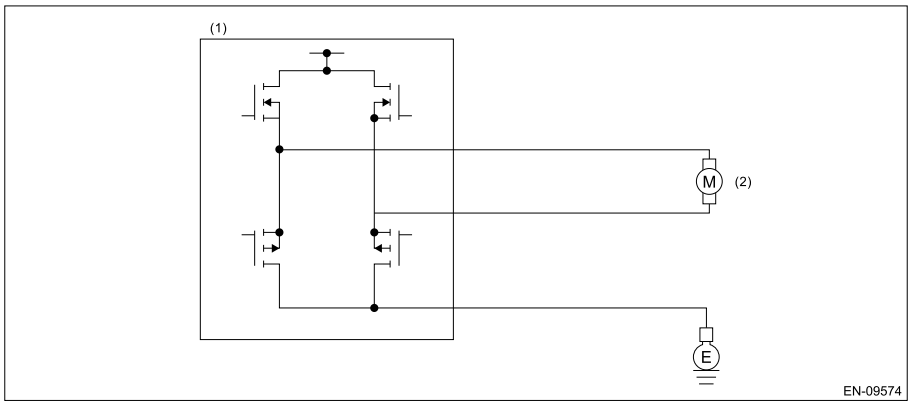
Note:
The tumble generator valve actuator cannot be disassembled.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Engine control module (ECM) (2) Tumble generator valve

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Tumble generator valve driving signal	Open or Closed

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

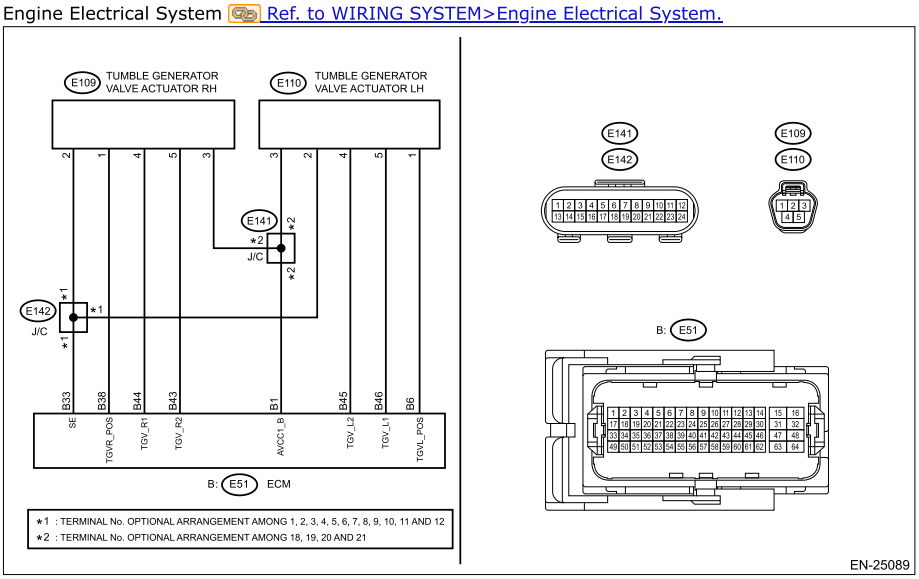
Malfunction Criteria	Threshold Value
Overcurrent signal from tumble generator valve drive IC	ON

Time needed for diagnosis: 320 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR (SHORT TO POWER SUPPLY).

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 engine ground.
   Connector & terminal
   (E51) No. 45 (+) — Engine ground (−):
   (E51) No. 46 (+) — Engine 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)(H4DOTC)>Tumble Generator Valve Actuator.

Note:
The tumble generator valve actuator cannot be disassembled.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2009. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1.

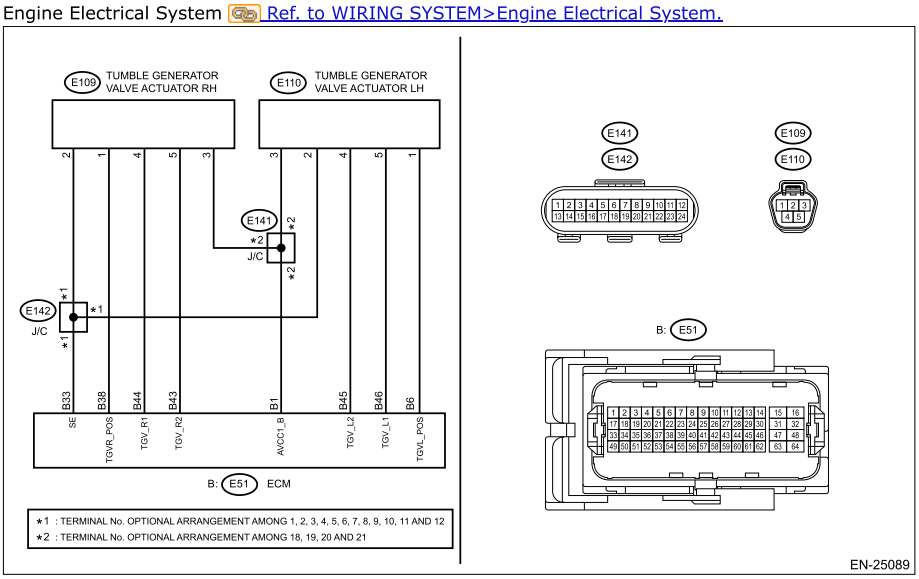
DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

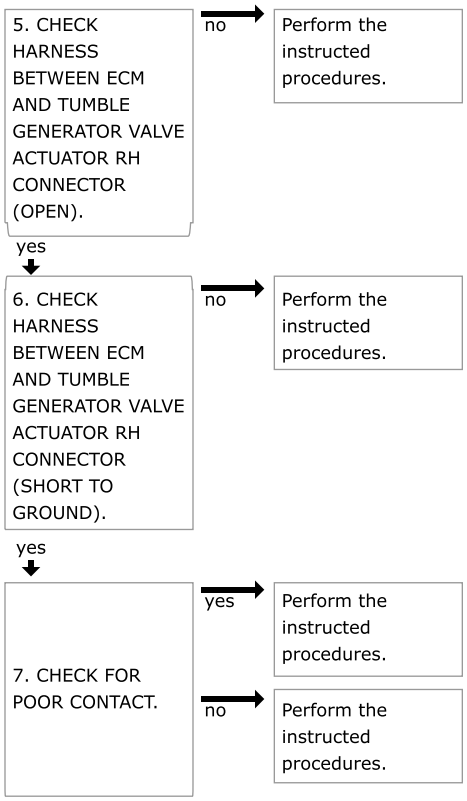
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
	yes ↓	
4. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR RH.	no →	Perform the instructed procedures.
	yes ↓	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value in [TGV Position Sensor R] less than 0.2 [V]?

Yes — Go to 4.

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.

4. 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
   (E109) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 5.

No — Repair the following item.
- Open circuit in harness between ECM connector and tumble generator valve actuator RH connector
- Poor contact of ECM connector
- Poor contact of J/C

5. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR (OPEN).

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
   (E51) No. 38 — (E109) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit in harness between ECM connector and tumble generator valve actuator RH connector.

6. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E51) No. 38 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit to ground in harness between ECM connector and tumble generator valve actuator RH connector.

7. 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 Actuator.

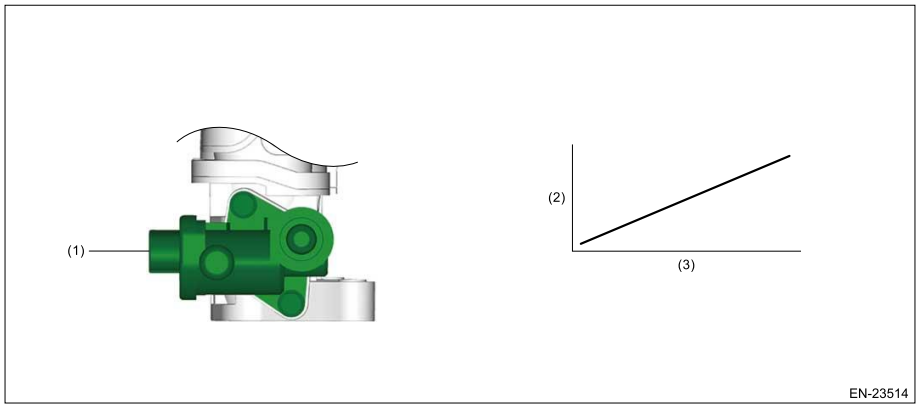
Note:
The tumble generator valve actuator cannot be disassembled.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Tumble generator valve (2) Voltage (V) (3) Tumble generator valve opening angle (°)

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.113 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

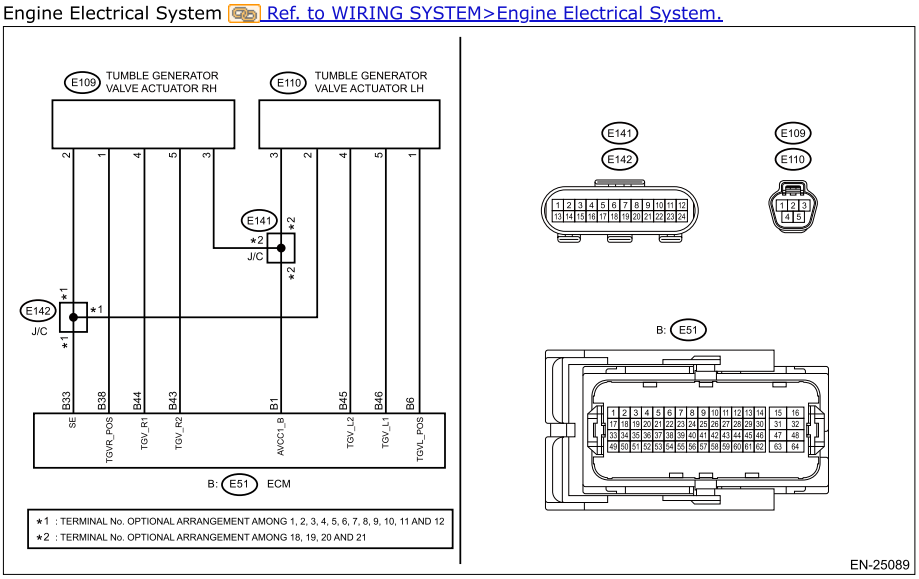
DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

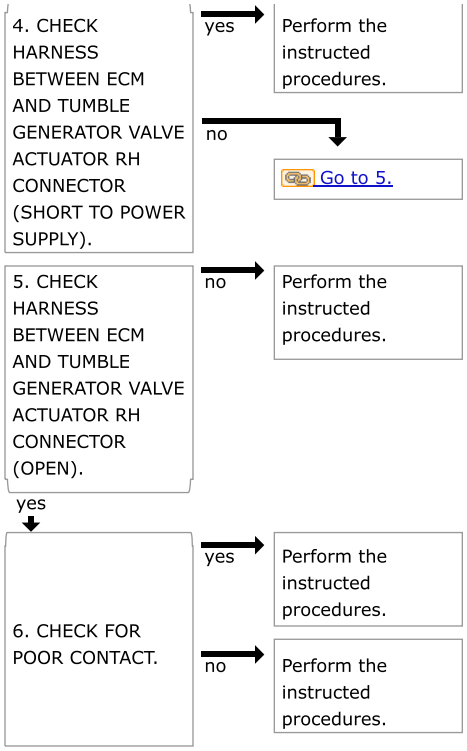
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
	yes ↓	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [TGV Position Sensor R] 5 [V] or more?

Yes — Go to 4.

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.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR (SHORT TO POWER SUPPLY).

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 5.

5. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH CONNECTOR (OPEN).

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
   (E109) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and tumble generator valve actuator RH connector
- Poor contact of ECM connector
- Poor contact of J/C

6. 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 Actuator.

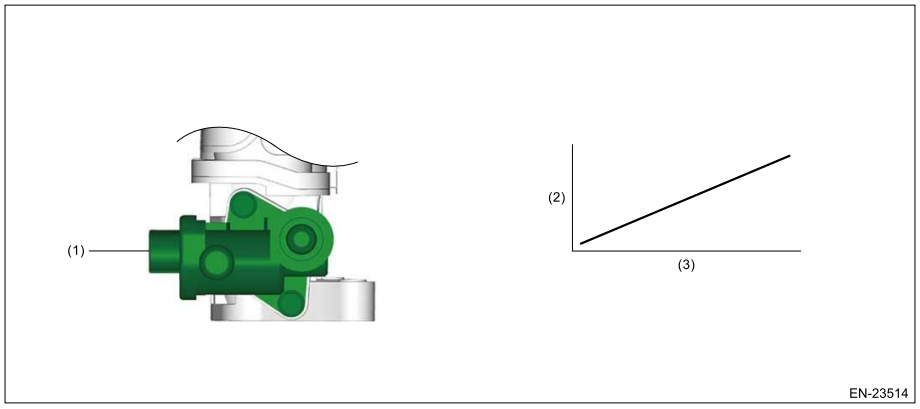
Note:
The tumble generator valve actuator cannot be disassembled.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Tumble generator valve (2) Voltage (V) (3) Tumble generator valve opening angle (°)

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.927 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

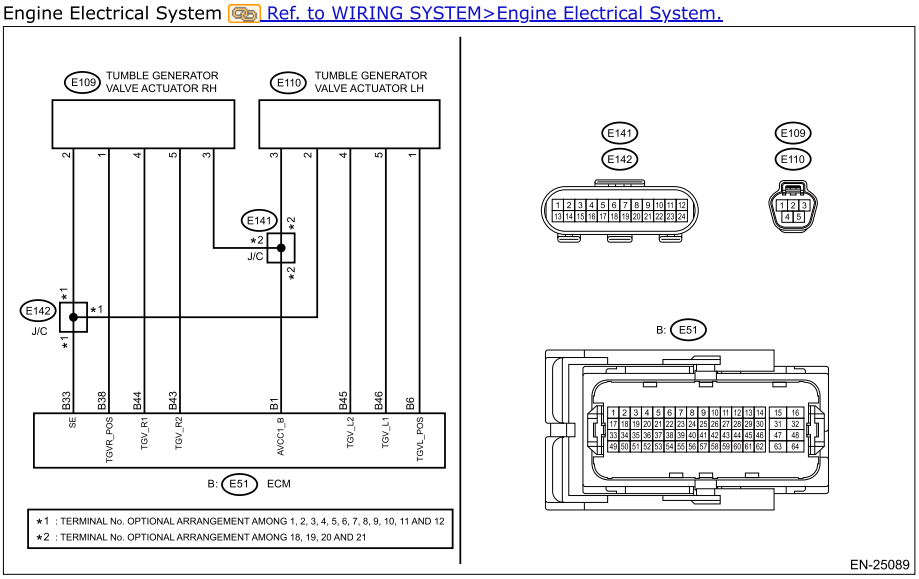
DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

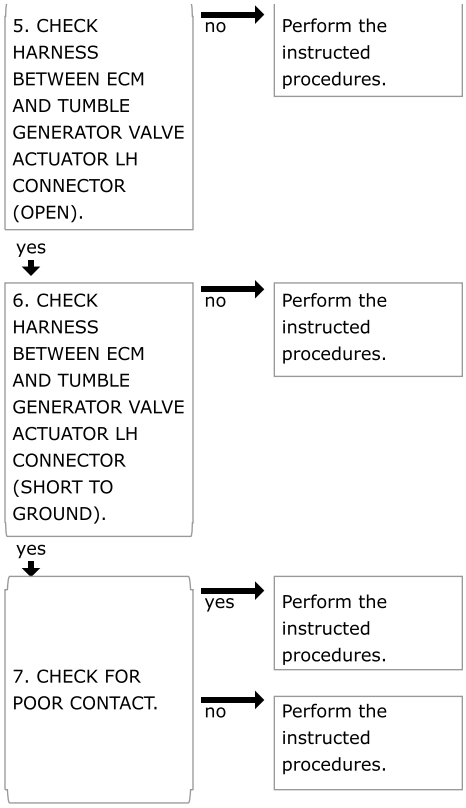
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
	yes ↓	
4. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR LH.	no →	Perform the instructed procedures.
	yes ↓	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value in [TGV Position Sensor L] less than 0.2 [V]?

Yes — Go to 4.

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.

4. 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
   (E110) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 5.

No — Repair the following item.
- Open circuit in harness between ECM connector and tumble generator valve actuator LH connector
- Poor contact of ECM connector
- Poor contact of J/C

5. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR (OPEN).

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 LH connector.
   Connector & terminal
   (E51) No. 6 — (E110) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit in harness between ECM connector and tumble generator valve actuator LH connector.

6. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E51) No. 6 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit to ground in harness between ECM connector and tumble generator valve actuator LH connector.

7. 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 Actuator.

Note:
The tumble generator valve actuator cannot be disassembled.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P2016. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1.

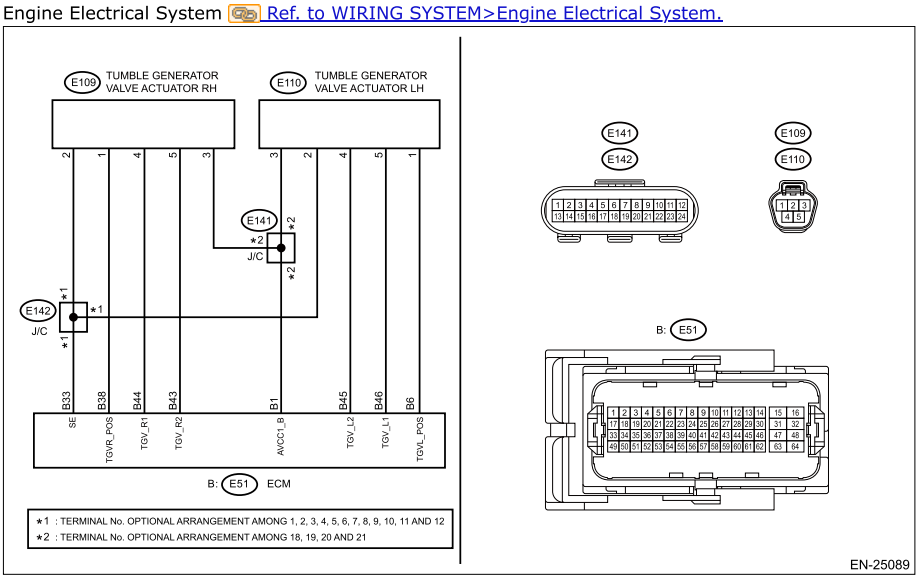
DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

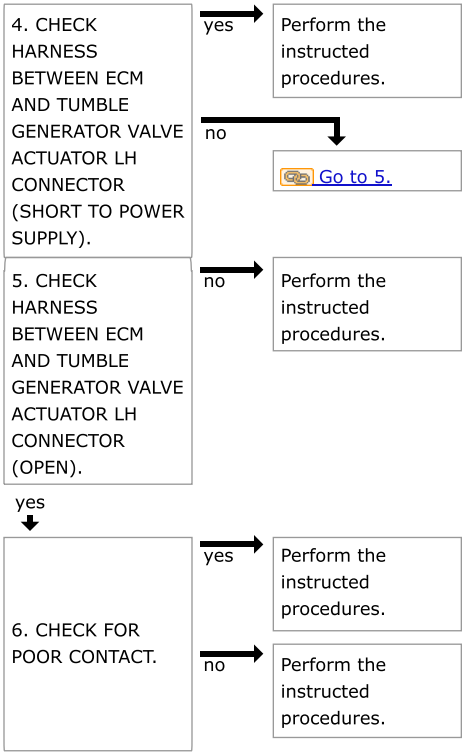
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
	yes ↓	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [TGV Position Sensor L] 5 [V] or more?

Yes — Go to 4.

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.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR (SHORT TO POWER SUPPLY).

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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>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 5.

5. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH CONNECTOR (OPEN).

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
   (E110) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and tumble generator valve actuator LH connector
- Poor contact of ECM connector
- Poor contact of J/C

6. 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 Actuator.

Note:
The tumble generator valve actuator cannot be disassembled.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P2017. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1.

DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

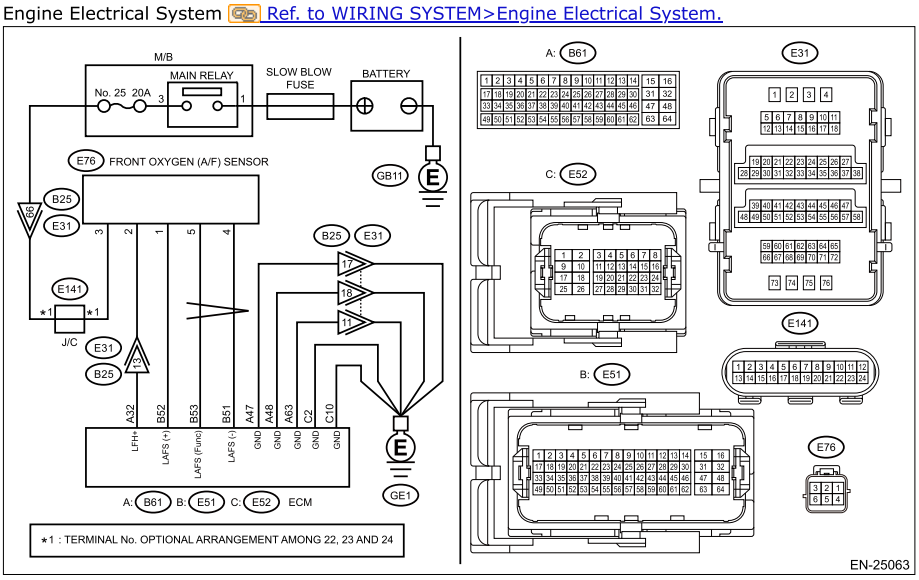
1. —

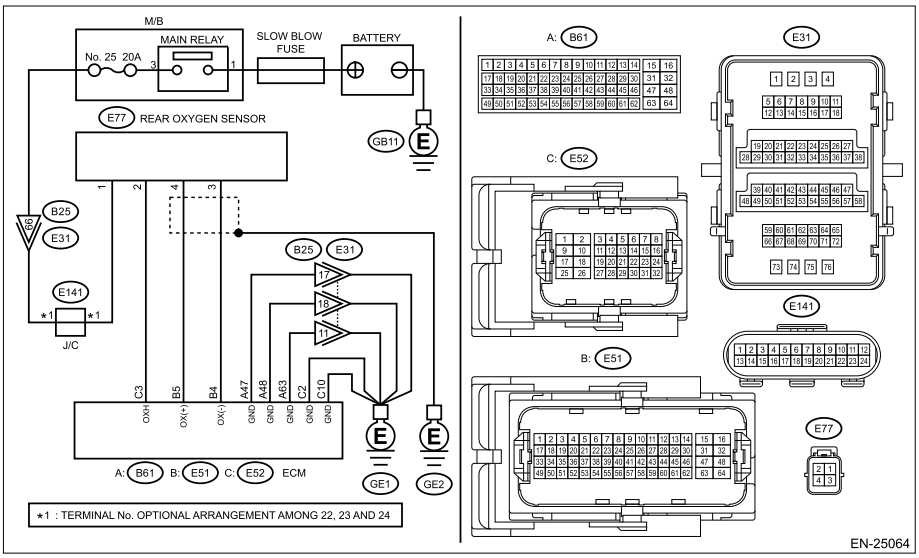
DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





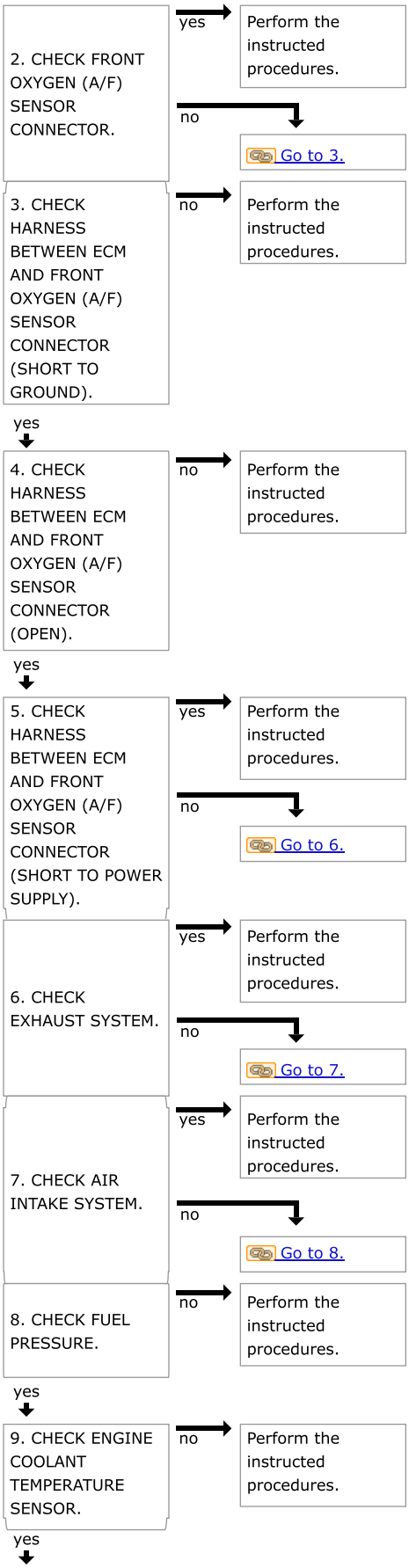
Caution:

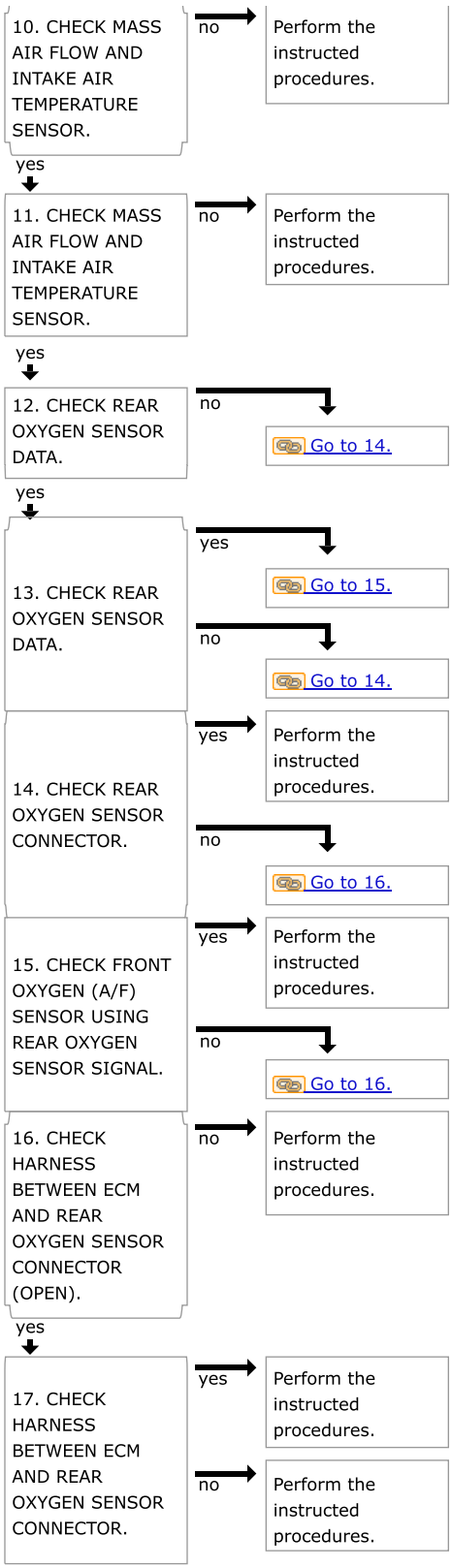
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.


2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Go to 3.
3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
5. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK EXHAUST SYSTEM.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK FUEL PRESSURE.
no
Perform the instructed procedures.
yes
9. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes


10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
11. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
12. CHECK REAR OXYGEN SENSOR DATA.
no
Go to 14.
yes
13. CHECK REAR OXYGEN SENSOR DATA.
yes
Go to 15.
no
Go to 14.
14. CHECK REAR OXYGEN SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Go to 16.
15. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.
yes
Perform the instructed procedures.
no
Go to 16.
16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
17. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2096 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the front oxygen (A/F) sensor 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 (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — Engine 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 front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the front oxygen (A/F) sensor.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E51) No. 52 — (E76) No. 1:
(E51) No. 51 — (E76) No. 4:
(E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 5.

No — Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

5. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

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 engine ground.

Connector & terminal

(E76) No. 1 (+) — Engine ground (−):
(E76) No. 4 (+) — Engine ground (−):
(E76) No. 5 (+) — Engine 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	Go to 6.

6. CHECK EXHAUST SYSTEM.

Check the 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.

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 8.

8. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

1. Connect the front oxygen (A/F) sensor connector.
2. Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 9.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>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, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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 until the engine coolant temperature exceeds 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, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 2 — 5 [g/s] (0.26 — 0.66 lb/min)?

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 until the engine coolant temperature exceeds 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, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Subtract ambient temperature from [IAT Sensor #11]. 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 INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.

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, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.49 [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 3000 rpm.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.25 [V] or more?

Yes — Go to 15.

No — Go to 14.

14. CHECK REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the rear oxygen sensor 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 the engine coolant temperature exceeds 75°C (167°F) and leave it at idling for 5 minutes or more.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] kept at 0.25 [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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 4 — (E77) No. 3:
   (E51) No. 5 — (E77) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 17.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor 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 engine ground.
   Connector & terminal
   (E77) No. 4 (+) — Engine ground (−):

Is the voltage 0.2 — 0.5 V?

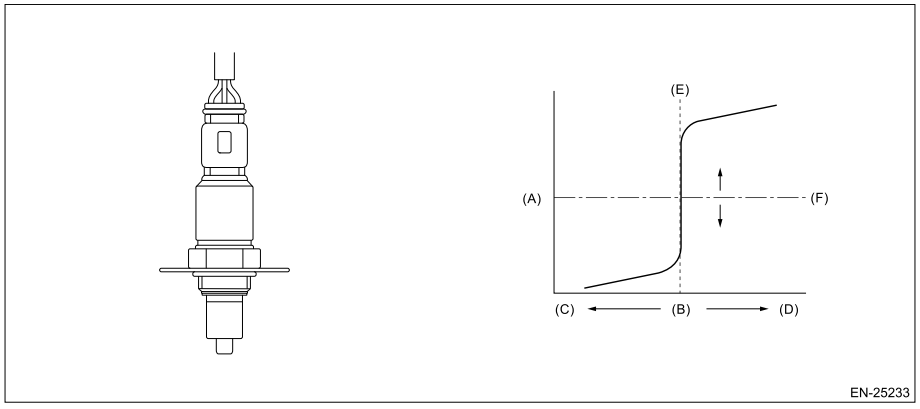
Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.
No	Repair the following item. • Open circuit in harness between ECM connector and rear oxygen sensor connector • Poor contact of ECM connector

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

EXECUTION CONDITION

Secondary parameters	Execution condition
Sub feedback	In operation
Increased fuel amount	Not in operation

GENERAL DRIVING CYCLE

Perform the diagnosis continuously during sub feedback operation.

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	−0.054 or less

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1

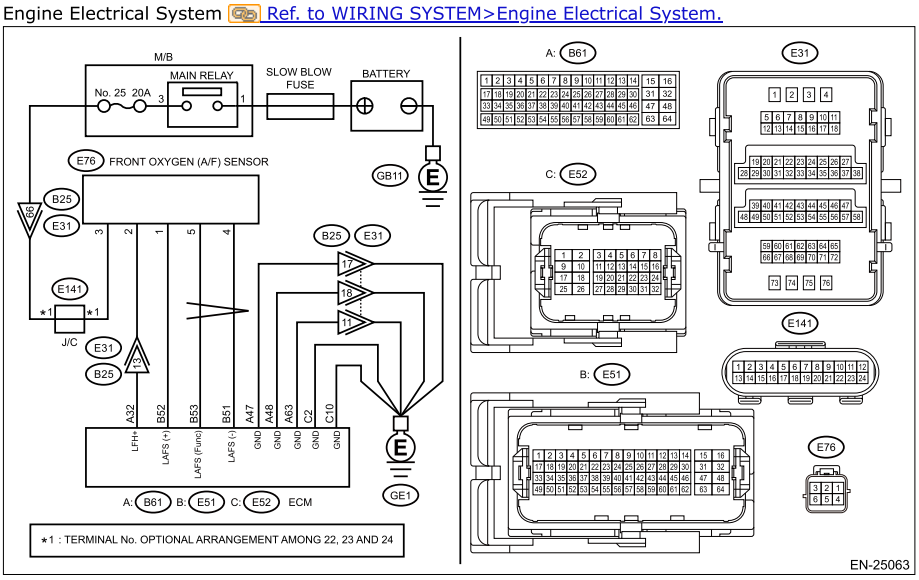
1. —

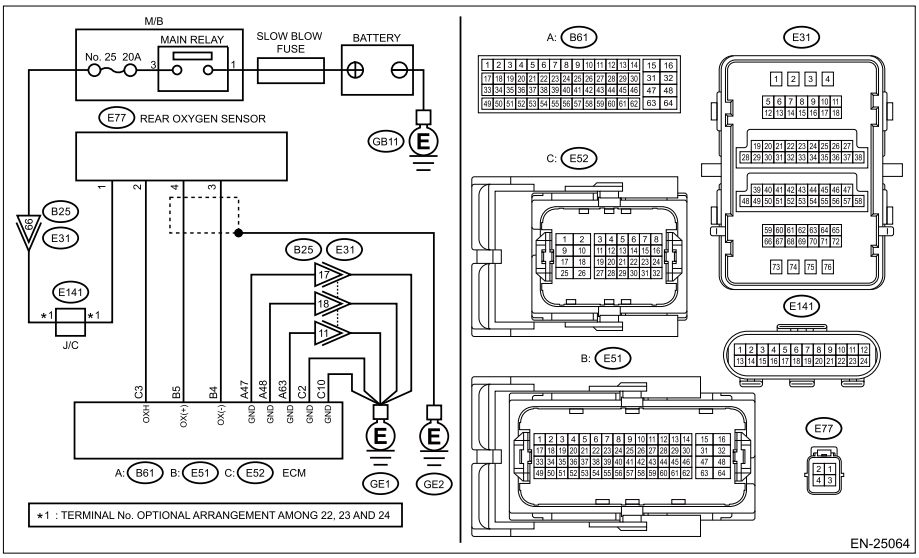
DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





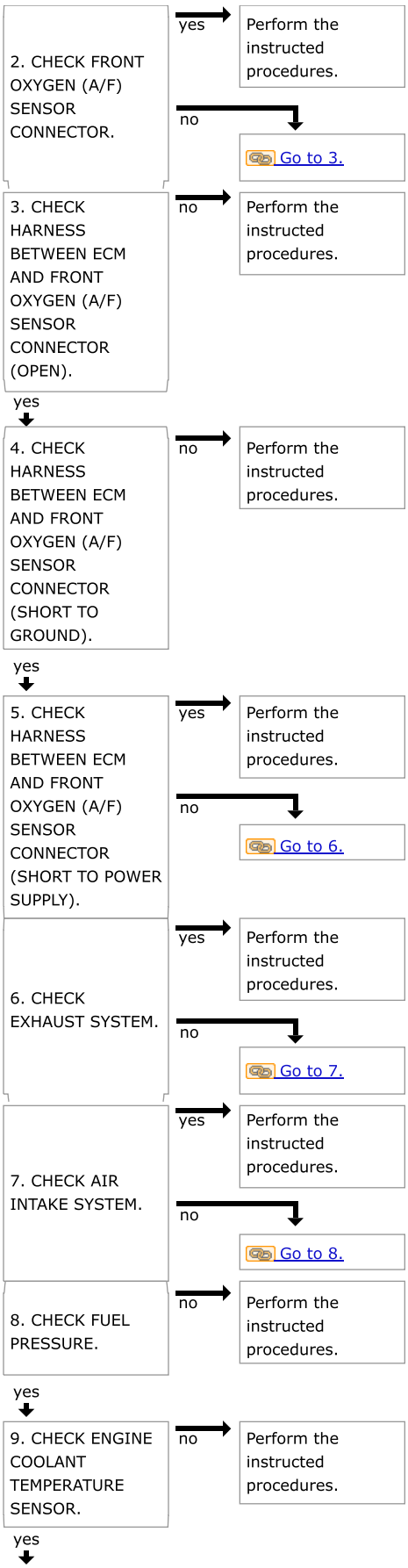
Caution:

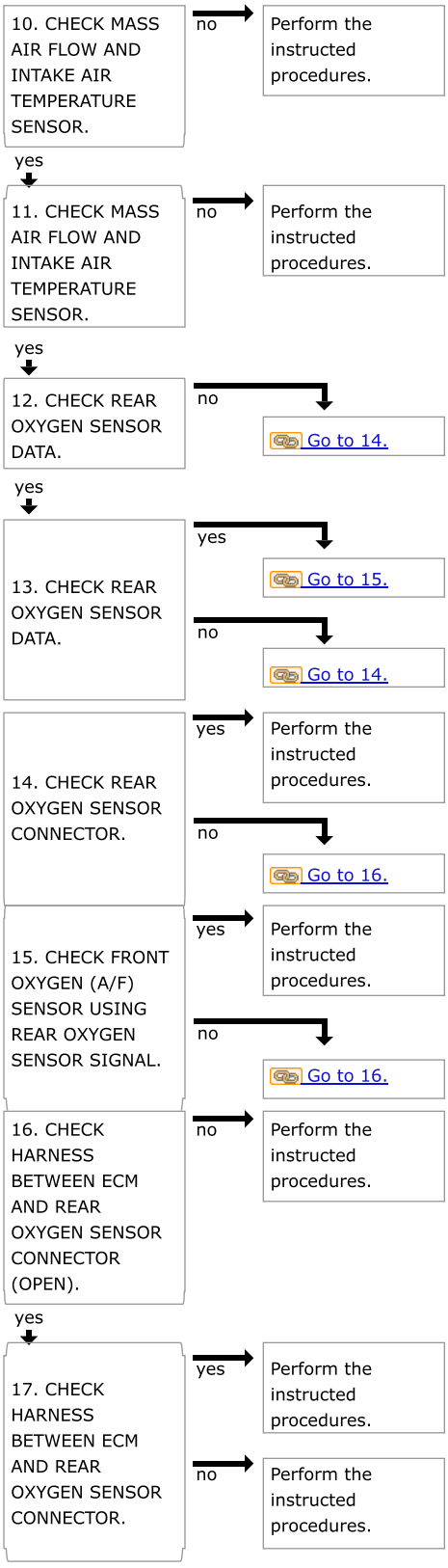
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.


2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Go to 3.
3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
5. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK EXHAUST SYSTEM.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK FUEL PRESSURE.
no
Perform the instructed procedures.
yes
9. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes


10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
11. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
12. CHECK REAR OXYGEN SENSOR DATA.
no
Go to 14.
yes
13. CHECK REAR OXYGEN SENSOR DATA.
yes
Go to 15.
no
Go to 14.
14. CHECK REAR OXYGEN SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Go to 16.
15. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.
yes
Perform the instructed procedures.
no
Go to 16.
16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
17. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2097 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the front oxygen (A/F) sensor 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 (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the front oxygen (A/F) sensor.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E51) No. 52 — (E76) No. 1:
(E51) No. 51 — (E76) No. 4:
(E51) No. 53 — (E76) No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — 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 front oxygen (A/F) sensor connector.

5. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

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 engine ground.

Connector & terminal

(E76) No. 1 (+) — Engine ground (−):
(E76) No. 4 (+) — Engine ground (−):
(E76) No. 5 (+) — Engine 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	Go to 6.

6. CHECK EXHAUST SYSTEM.

Check the 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.

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 8.

8. CHECK FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

1. Connect the front oxygen (A/F) sensor connector.
2. Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 9.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>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, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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 until the engine coolant temperature exceeds 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, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 2 — 5 [g/s] (0.26 — 0.66 lb/min)?

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 until the engine coolant temperature exceeds 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, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Subtract ambient temperature from [IAT Sensor #11]. 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 INJECTION (FUEL SYSTEMS)(H4DOTC)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.

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, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.49 [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 3000 rpm.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.25 [V] or less?

Yes — Go to 15.

No — Go to 14.

14. CHECK REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the rear oxygen sensor 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 the engine coolant temperature exceeds 75°C (167°F) and leave it at idling for 5 minutes or more.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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)(H4DOTC)>Front Oxygen (A/F) Sensor.

No — Go to 16.

16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 4 — (E77) No. 3:
   (E51) No. 5 — (E77) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 17.

No — Repair the open circuit of harness between ECM connector and rear oxygen sensor 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 engine ground.
   Connector & terminal
   (E77) No. 4 (+) — Engine 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.

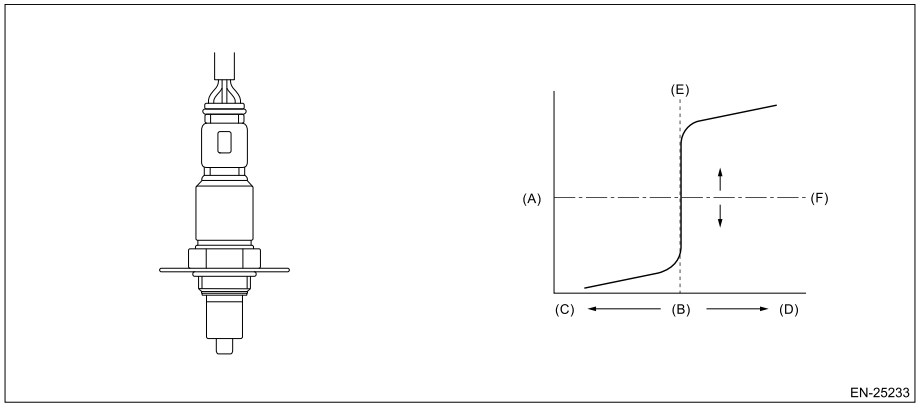
No — Repair the following item.
- Open circuit in harness between ECM connector and rear oxygen sensor connector
- Poor contact of ECM connector

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

EXECUTION CONDITION

Secondary parameters	Execution condition
Sub feedback	In operation
Increased fuel amount	Not in operation

GENERAL DRIVING CYCLE

Perform the diagnosis continuously during sub feedback operation.

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	0.060 or more

Time needed for diagnosis: 1000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

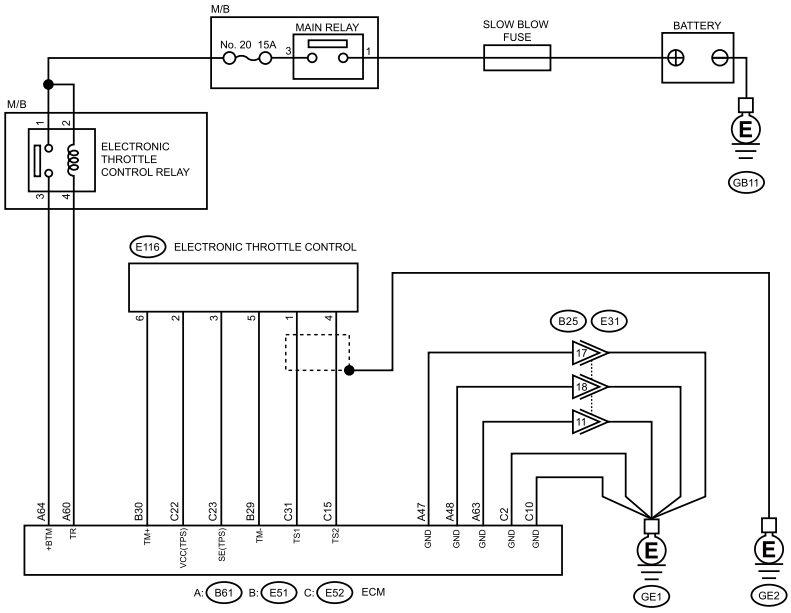
DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE

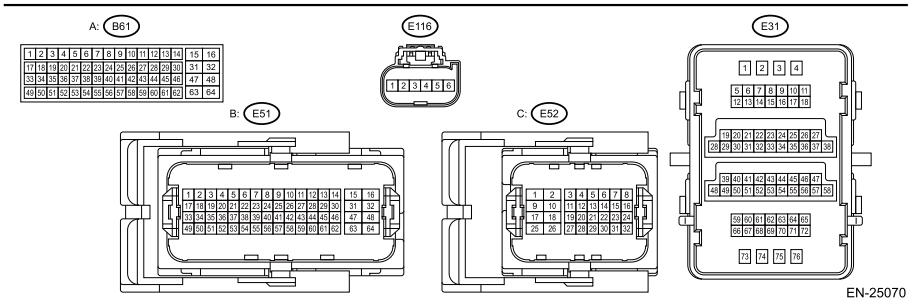
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.	no →	Perform the instructed procedures.

yes

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (OPEN).

no → Perform the instructed procedures.

yes

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

7. CHECK SHORT CIRCUIT INSIDE ECM (SHORT TO GROUND).

no → Perform the instructed procedures.

yes

8. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes

9. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes

10. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 11.

11. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).

no → Perform the instructed procedures.

yes ↓

12. CHECK SENSOR OUTPUT.

no → Perform the instructed procedures.

yes ↓

13. CHECK SENSOR OUTPUT.

no → Perform the instructed procedures.

yes ↓

14. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

no → Perform the instructed procedures.

yes ↓

15. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 16.

16. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

no → Perform the instructed procedures.

yes ↓

17. CHECK HARNESS FOR ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).
→ no → Perform the instructed procedures.

yes ↓

18. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT (OPEN).
→ no → Perform the instructed procedures.

yes ↓

19. CHECK ELECTRONIC THROTTLE CONTROL.
→ no → Perform the instructed procedures.

yes ↓

20. CHECK ELECTRONIC THROTTLE CONTROL.
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

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. 2 and No. 4 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.

Terminals

No. 1 — No. 3:

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 M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 1 (+) — Engine ground (−):

No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B (fuse No. 20) and M/B (electronic throttle control relay) terminal • Blown out of fuse

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO POWER SUPPLY).

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 4 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and M/B (electronic throttle control relay) terminal.
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Measure the resistance between M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 3 — Engine ground:

No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in the harness between ECM connector and M/B (electronic throttle control relay) terminal.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (OPEN).

Measure the resistance between ECM connector and M/B (electronic throttle control relay) terminal.

Connector & terminal

(B61) No. 64 — No. 3:

(B61) No. 60 — No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and M/B (electronic throttle control relay) terminal.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from electronic throttle control.
3. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E52) No. 15 — Engine ground:

(E52) No. 22 — Engine ground:

(E52) No. 31 — 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 electronic throttle control connector.

7. CHECK SHORT CIRCUIT INSIDE ECM (SHORT TO GROUND).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 1 — Engine ground:
   (E116) No. 4 — Engine ground:

Is the resistance 220 kΩ 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)(H4DOTC)>Engine Control Module (ECM).

8. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E52) No. 31 — (E116) No. 1:
   (E52) No. 23 — (E116) No. 3:
   (E52) No. 15 — (E116) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

9. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 10.

No — Repair the following item.
- Open circuit of harness between ECM connector and engine ground
- Poor contact of ECM connector

10. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 1 (+) — Engine ground (−):
   (E116) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply 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 (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(E52) No. 22 — (E52) No. 15:
(E52) No. 22 — (E52) No. 31:

Is the resistance 1 MΩ or more?

Yes	Go to 12.
No	Repair the short circuit between lines in 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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Main-Throttle Sensor] 0.6 — 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 operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Sub-Throttle Sensor] 0.6 — 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 CONNECTOR (OPEN).

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

(E51) No. 29 — (E116) No. 5:

(E51) No. 30 — (E116) No. 6:

Is the resistance less than 1 Ω?

Yes — Go to 15.

No — Repair the open circuit of harness between ECM connector and electronic throttle control connector.

15. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

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

(E116) No. 5 (+) — Engine ground (−):

(E116) No. 6 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes — Repair the short circuit to power supply 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 (SHORT TO GROUND).

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

(E116) No. 5 — Engine ground:

(E116) No. 6 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 17.

No — Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

17. CHECK HARNESS FOR ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).

Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E116) No. 5 — (E116) No. 6:

Is the resistance 1 MΩ or more?

Yes — Go to 18.

No — Repair the short circuit between lines in harness between ECM connector and electronic throttle control connector.

18. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT (OPEN).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 19.

No — 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. 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.

1. Move the throttle valve to the fully opened and fully closed positions with fingers.
2. 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

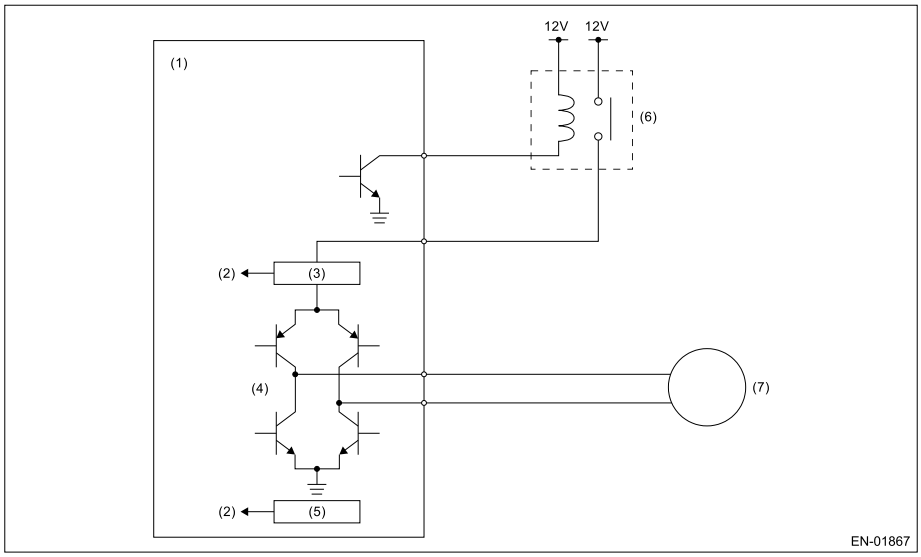
Yes — Repair the poor contact of ECM connector.

No — Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Detecting circuit
(3) Overcurrent detection circuit
(4) Drive circuit
(5) Temperature detection circuit
(6) Electronic throttle control relay
(7) Motor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	0 V or more

GENERAL DRIVING CYCLE

Perform the diagnosis when the ignition switch is turned from OFF to ON.

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 during throttle minimum stop position learning	36.6% or more

Time needed for diagnosis: 190 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

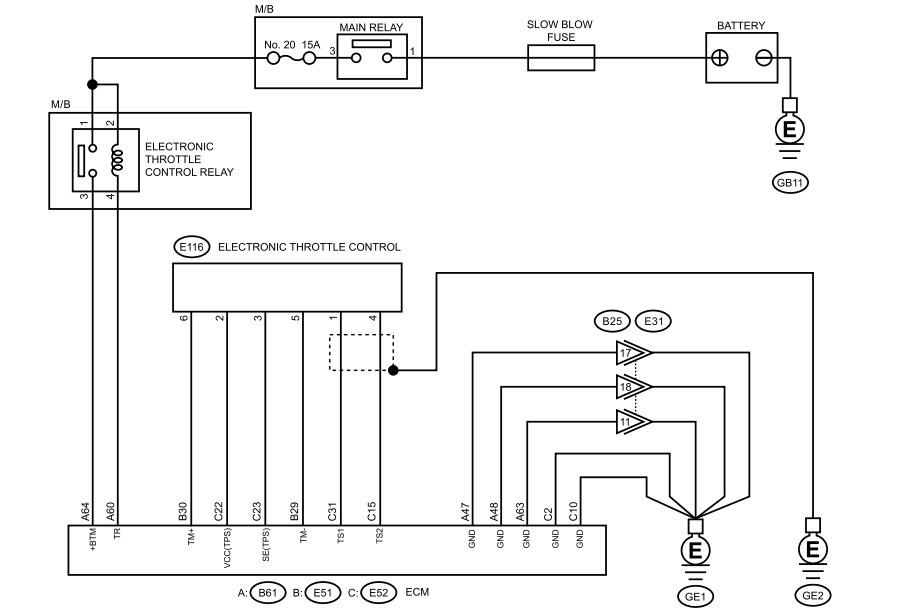
DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW

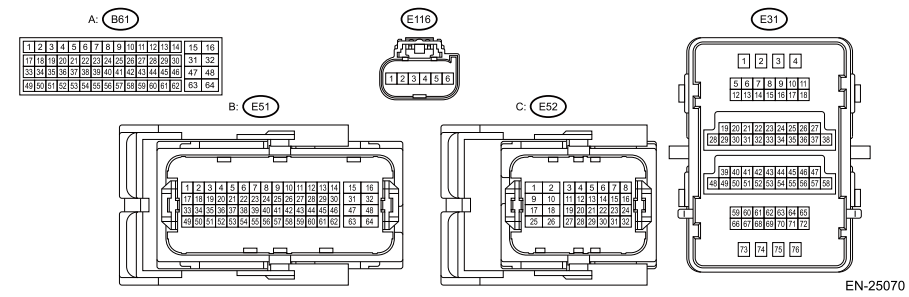
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

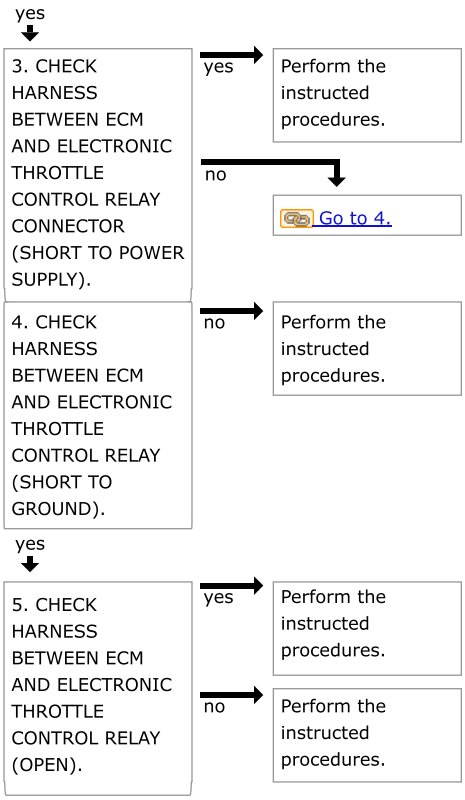




Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK POWER SUPPLY OF ELECTRONIC THROTTLE CONTROL RELAY.	no →	Perform the instructed procedures.



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. 2 and No. 4 of electronic throttle control relay.
4. Measure the resistance between electronic throttle control relay terminals.

Terminals

No. 1 — No. 3:

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 M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 1 (+) — Engine ground (−):

No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the following item. • Open circuit or short circuit to ground in harness between M/B (fuse No. 20) and M/B (electronic throttle control relay) terminal • Blown out of fuse

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY CONNECTOR (SHORT TO POWER SUPPLY).

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 4 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and M/B (electronic throttle control relay) terminal.
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Measure the resistance between M/B (electronic throttle control relay) terminal and engine ground.

Terminals

No. 3 — Engine ground:

No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in the harness between ECM connector and M/B (electronic throttle control relay) terminal.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (OPEN).

Measure the resistance between ECM connector and M/B (electronic throttle control relay) terminal.

Connector & terminal

(B61) No. 64 — No. 3:

(B61) No. 60 — No. 4:

Is the resistance less than 1 Ω?

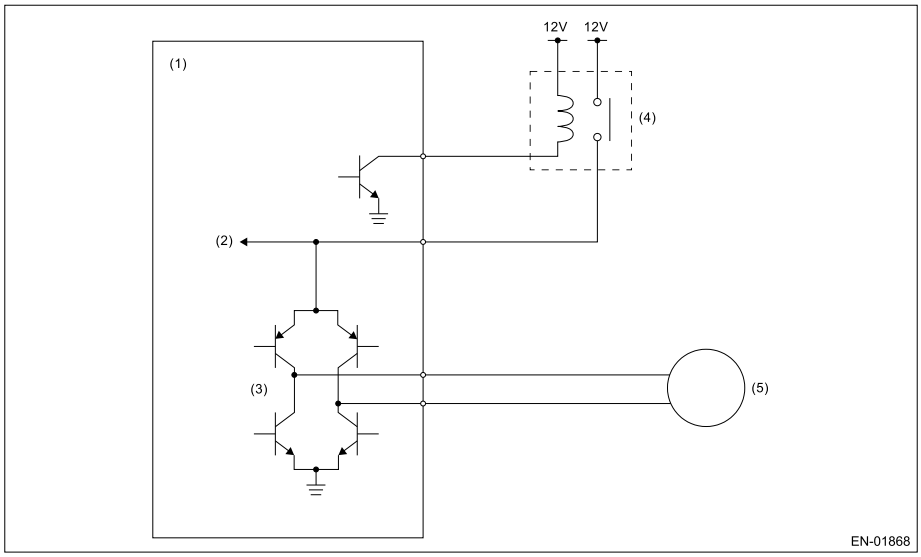
Yes	Repair the poor contact of ECM connector.
No	Repair the open circuit in harness between ECM connector and electronic throttle control relay connector.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Voltage detection circuit
(3) Drive circuit
(4) Electronic throttle control relay
(5) Motor

EXECUTION CONDITION

Secondary parameters	Execution condition
<For electronic throttle control power supply>	
Battery voltage	6 V or more
Electronic throttle control relay output	ON
<For electronic throttle control relay monitor>	
Battery voltage	10.9 V or more
Electronic throttle control relay output	OFF

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 6 V
<For electronic throttle control relay monitor>	
Electronic throttle control relay monitor voltage	1 V or less

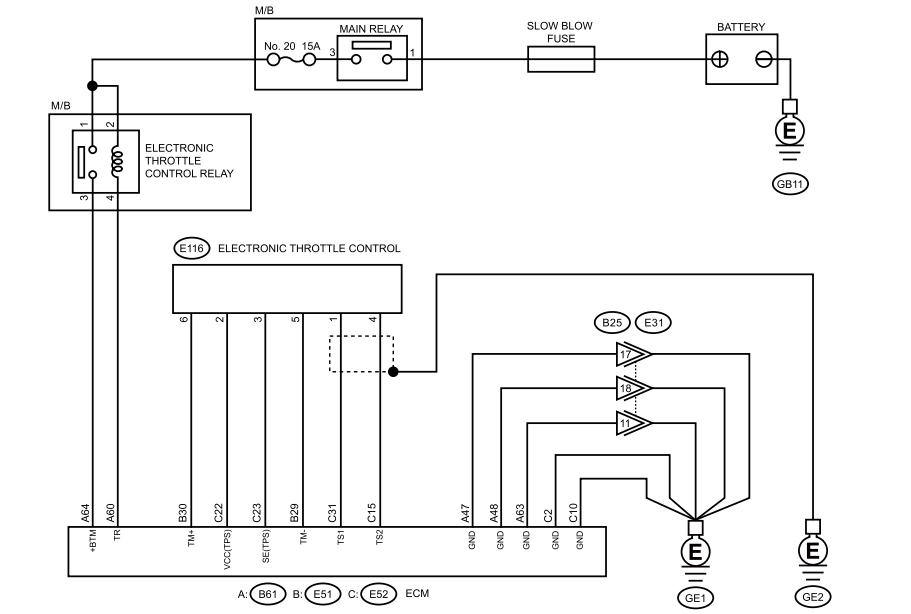
Time needed for diagnosis: 510 ms

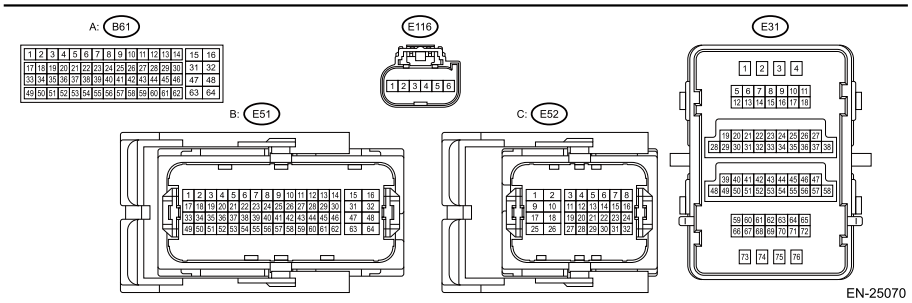
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.





Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ELECTRONIC THROTTLE CONTROL RELAY.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no ↓	
		Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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. 1 — No. 3:

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 HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between M/B (electronic throttle control relay) terminal and engine ground.
   Terminals
   No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and M/B (electronic throttle control relay).
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL RELAY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 60 — Engine ground:

Is the resistance 1 MΩ or more?

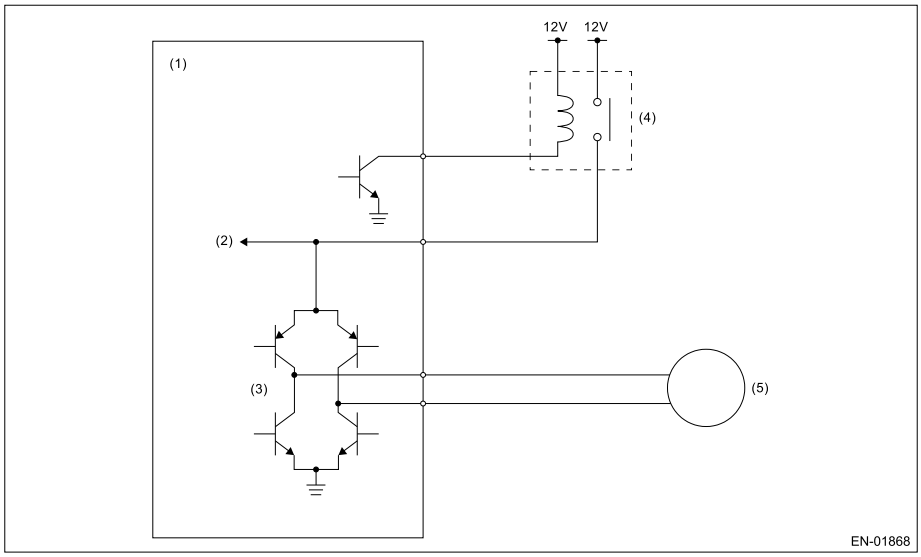
Yes	Repair the poor contact of ECM connector.
No	Repair the short circuit to ground in the harness between ECM connector and M/B (electronic throttle control relay).

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Voltage detection circuit
(3) Drive circuit
(4) Electronic throttle control relay
(5) Motor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Electronic throttle control relay output	ON

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	6 V or more

Time needed for diagnosis: 1500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

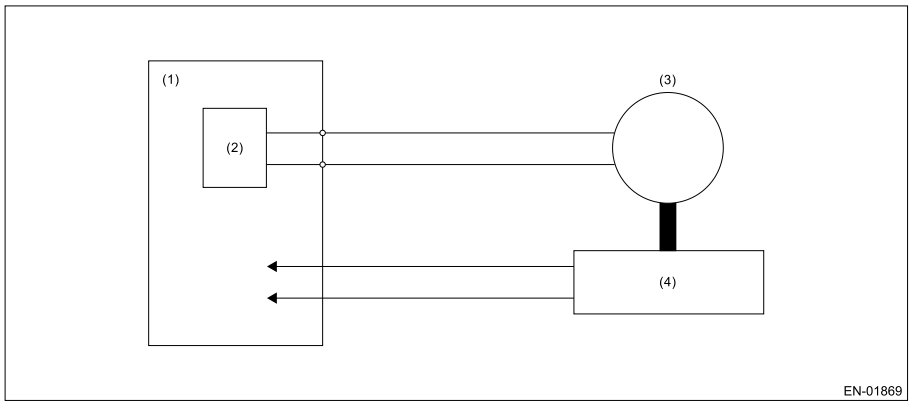
DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE

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 conducted or abnormal value is detected.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM) (3) Motor (4) Throttle position sensor
(2) Drive circuit

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 position when the ignition switch is ON − Throttle minimum stop position	Less than 2.6 % (sensor 1) Less than 2.6 % (sensor 2)

Time needed for diagnosis: 200 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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 position 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

Diagnosis 1: Throttle position is out of range

Secondary parameters	Execution condition
Battery voltage	6 V or more
Micro-computer (CPU failure) (P0606)	Under detection

Diagnosis 2: Intake air amount is out of range

Secondary parameters	Execution condition
Battery voltage	6 V or more
Micro-computer (CPU failure) (P0606)	Under detection

Diagnosis 3: All time monitoring

Secondary parameters	Execution condition
Battery voltage	6 V or more

Diagnosis 4: Actual opening angle change amount is small

Secondary parameters	Execution condition
Battery voltage	6 V or more
Actual opening angle change amount	More than 0.89 %/msec

Diagnosis 5: Actual opening angle change amount is large

Secondary parameters	Execution condition
Battery voltage	6 V or more
Actual opening angle change amount	More than 2.22 %/msec

Diagnosis 6: Actual opening angle does not change

Secondary parameters	Execution condition
Battery voltage	More than 6 V
Continuous time when actual opening angle changing amount is 0%/msec	5000 ms or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.
Judgment value

Diagnosis 1: Throttle position is out of range

Malfunction Criteria	Threshold Value
Throttle position	23.2 % or more

Diagnosis 2: Intake air amount is out of range

Malfunction Criteria	Threshold Value
Amount of intake air	More than 28.4 g/s (1.0017 oz/s)

Diagnosis 3: All time monitoring

Malfunction Criteria	Threshold Value
Difference between actual throttle opening angle and estimated opening angle	4.4 % or more

Diagnosis 4: Actual opening angle change amount is small

Malfunction Criteria	Threshold Value
Difference between actual throttle opening angle and estimated opening angle	1.8 % or more

Diagnosis 5: Actual opening angle change amount is large

Malfunction Criteria	Threshold Value
Difference between actual throttle opening angle and estimated opening angle	4.4 % or more

Diagnosis 6: Actual opening angle does not change

Malfunction Criteria	Threshold Value
Difference between actual throttle opening angle and target throttle opening angle	1.8 % or more

Time needed for diagnosis
Diagnosis 1: 200 ms
Diagnosis 2: 200 ms
Diagnosis 3: 200 ms
Diagnosis 4: 1000 ms
Diagnosis 5: 500 ms
Diagnosis 6: 1000 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

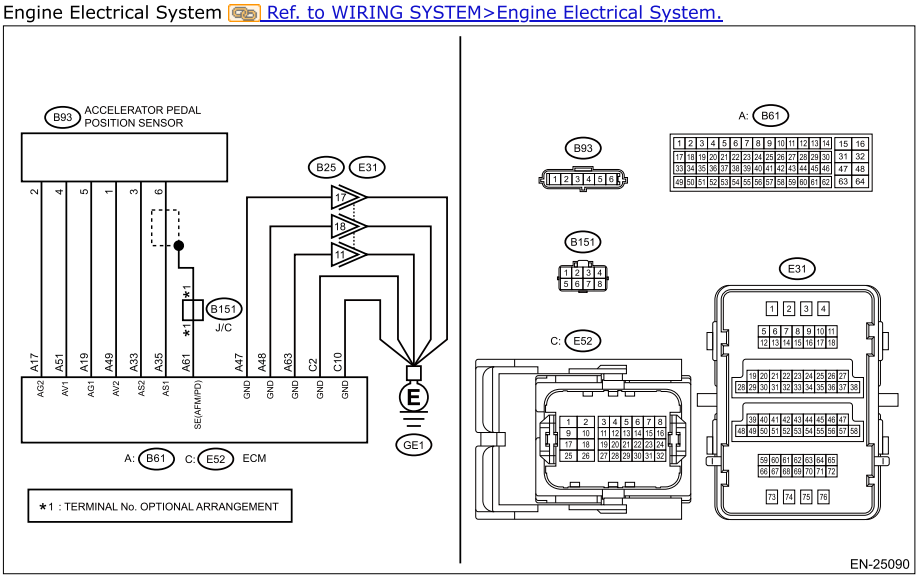
DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK DTC.	no	Perform the instructed procedures.
	yes	
4. CHECK FOR POOR CONTACT.	yes	Perform the instructed procedures.
	no	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).
→ no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO GROUND).
→ no → Perform the instructed procedures.

yes ↓

7. CHECK ACCELERATOR PEDAL POSITION SENSOR POWER SUPPLY.
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes — Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.

No — Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes — Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.

No — Go to 3.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P2122 displayed? (Current code)

Yes	Go to 4.
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.

4. CHECK FOR POOR CONTACT.

1. Turn the ignition switch to OFF.
2. Check for poor contact of ECM and accelerator pedal position sensor connector.

Is there poor contact of ECM or accelerator pedal position sensor connector?

Yes	Repair the poor contact of ECM or accelerator pedal position sensor connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.

Connector & terminal

(B61) No. 51 — (B93) No. 4:

(B61) No. 35 — (B93) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness between ECM connector and accelerator pedal position sensor connector.

6. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 51 — Engine ground:

(B61) No. 35 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector.

7. CHECK ACCELERATOR PEDAL POSITION SENSOR POWER SUPPLY.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B93) No. 4 — Chassis ground:

Is the voltage 4.5 — 5.5 V?

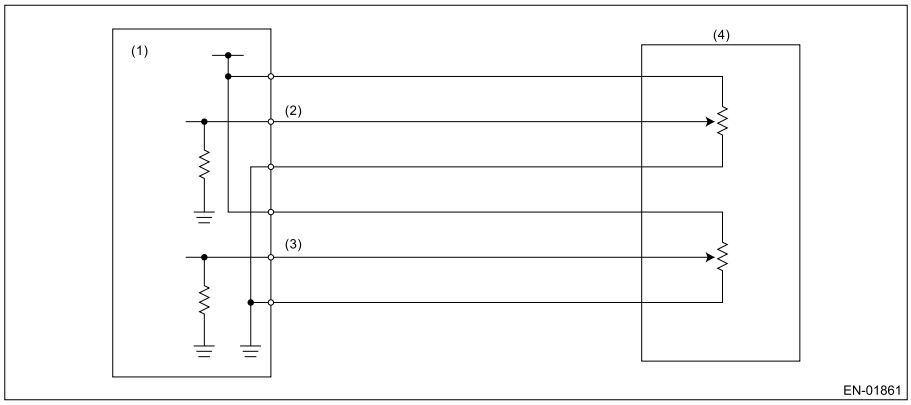
Yes	Replace the accelerator pedal assembly. Ref. to SPEED CONTROL SYSTEMS(H4DOTC)>Accelerator Pedal.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 output voltage	Less than 0.415 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

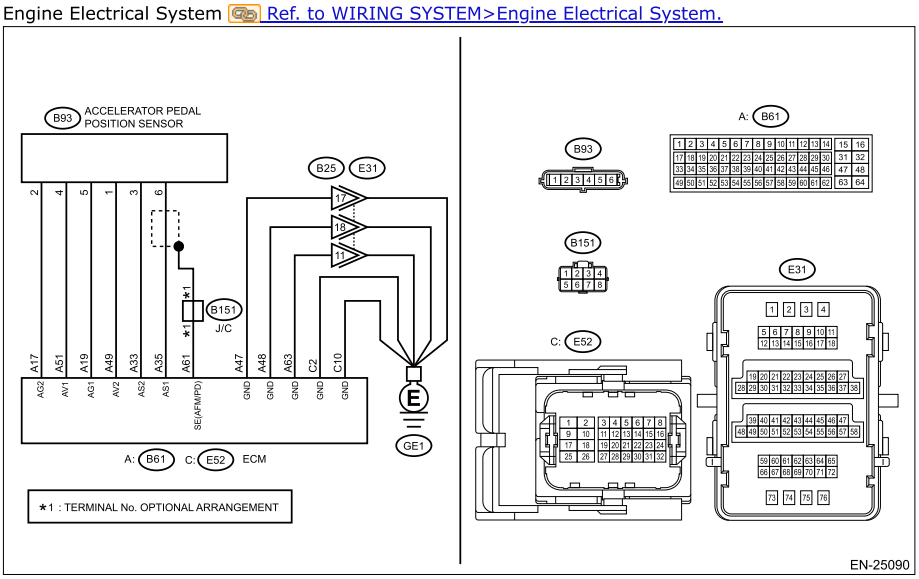
DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

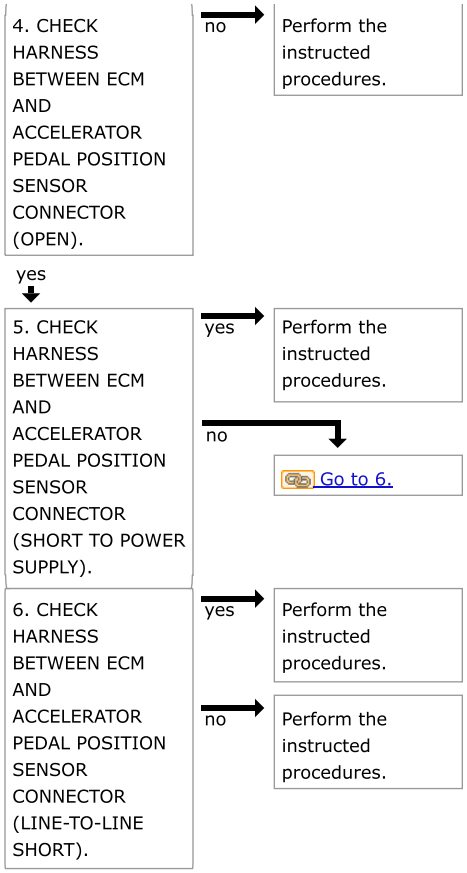


Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.

yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B1 displayed? (Current code)

Yes	Check for DTC P06B1. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B1 SENSOR POWER SUPPLY "A" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B2 displayed? (Current code)

Yes	Check for DTC P06B2. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B2 SENSOR POWER SUPPLY "A" CIRCUIT HIGH.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.
   Connector & terminal
   (B61) No. 19 — (B93) No. 5:
   (B61) No. 35 — (B93) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and accelerator pedal position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B93) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 5.
No	Repair the following item. • Open circuit in harness between ECM connector and Chassis ground • Poor contact of ECM connector

5. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B93) 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 6.

6. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (LINE-TO-LINE SHORT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (B61) No. 51 — (B61) No. 35:

Is the resistance 1 MΩ or more?

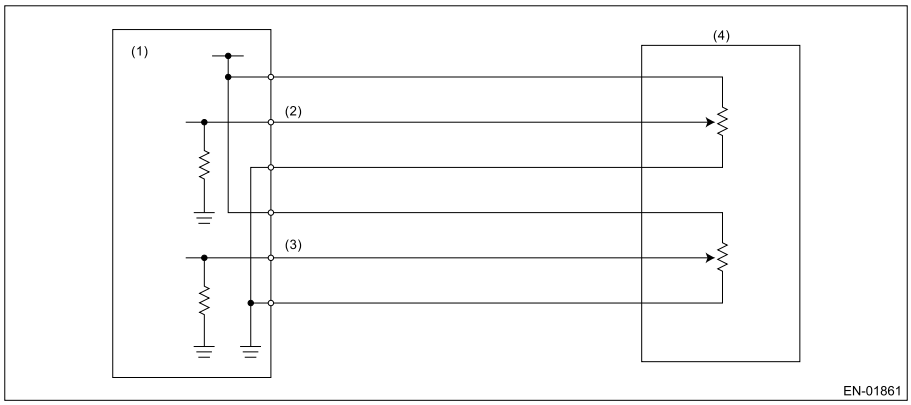
Yes	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal assembly if defective. Ref. to SPEED CONTROL SYSTEMS(H4DOTC)>Accelerator Pedal.
No	Repair the short circuit between lines in harness between ECM connector and accelerator pedal position sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 output voltage	More than 4.755 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

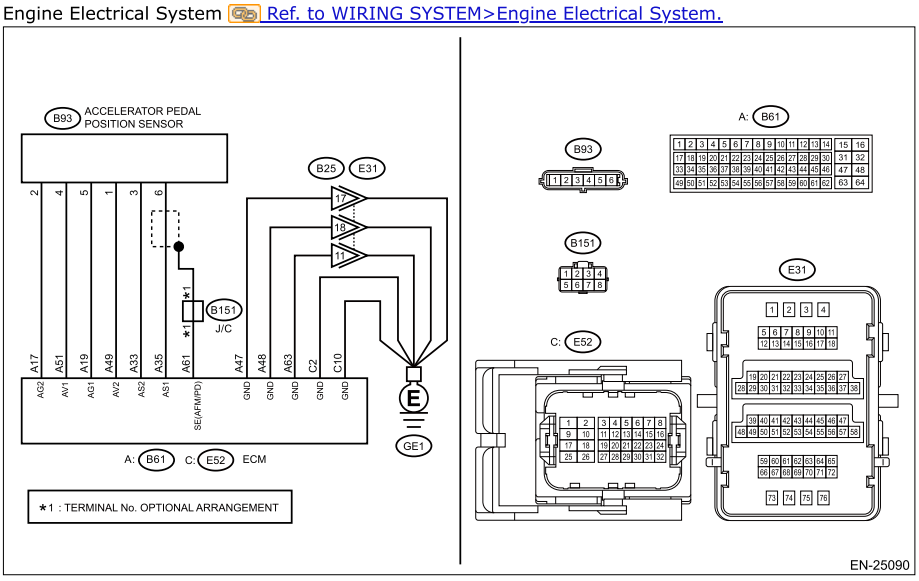
DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

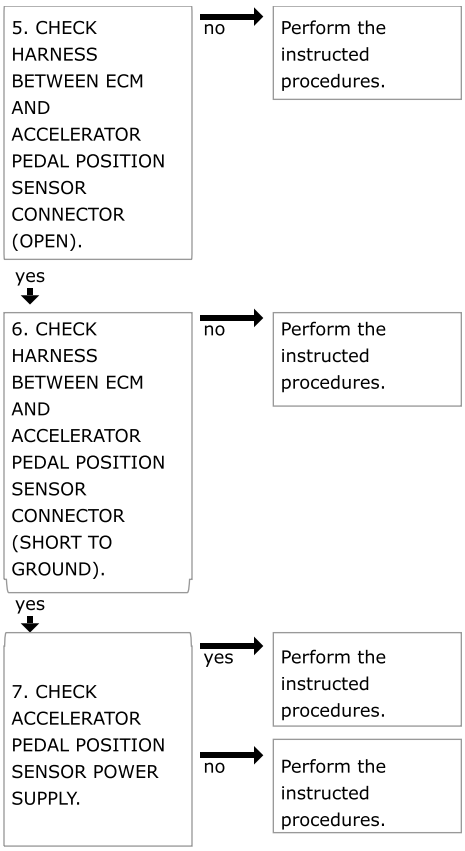
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK DTC.	no	Perform the instructed procedures.
	yes	
4. CHECK FOR POOR CONTACT.	yes	Perform the instructed procedures.
	no	Go to 5.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P2127 displayed? (Current code)

Yes — Go to 4.

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.

4. CHECK FOR POOR CONTACT.

1. Turn the ignition switch to OFF.
2. Check for poor contact of ECM connector and accelerator pedal position sensor connector.

Is there poor contact of ECM connector or accelerator pedal position sensor connector?

Yes — Repair the poor contact of ECM connector or accelerator pedal position sensor connector.

No — Go to 5.

5. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the accelerator pedal position sensor.
3. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.

Connector & terminal

(B61) No. 49 — (B93) No. 1:

(B61) No. 33 — (B93) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness between ECM connector and accelerator pedal position sensor connector.

6. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B61) No. 33 — Engine ground:

(B61) No. 49 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector.

7. CHECK ACCELERATOR PEDAL POSITION SENSOR POWER SUPPLY.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B93) No. 1 — Chassis ground:

Is the voltage 4.5 — 5.5 V?

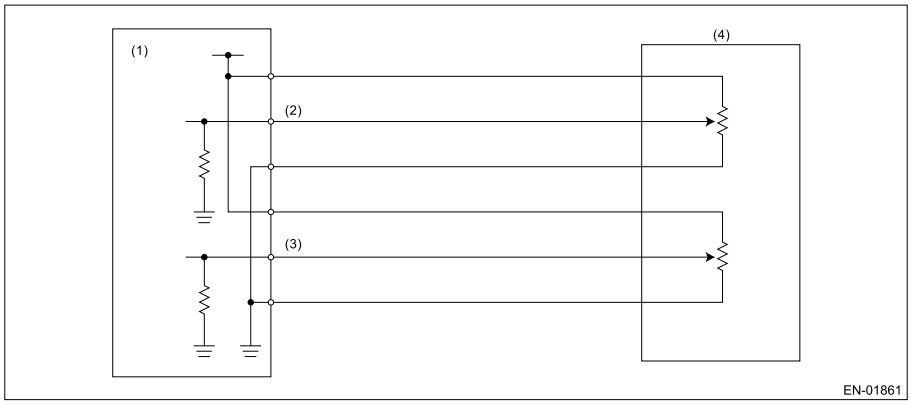
Yes	Replace the accelerator pedal assembly. Ref. to SPEED CONTROL SYSTEMS(H4DOTC)>Accelerator Pedal.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.338 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

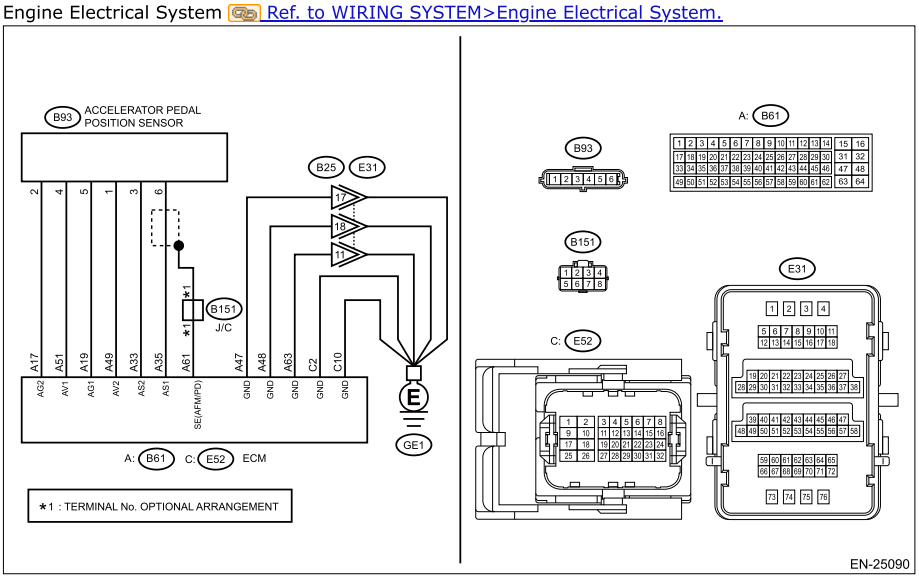
DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.

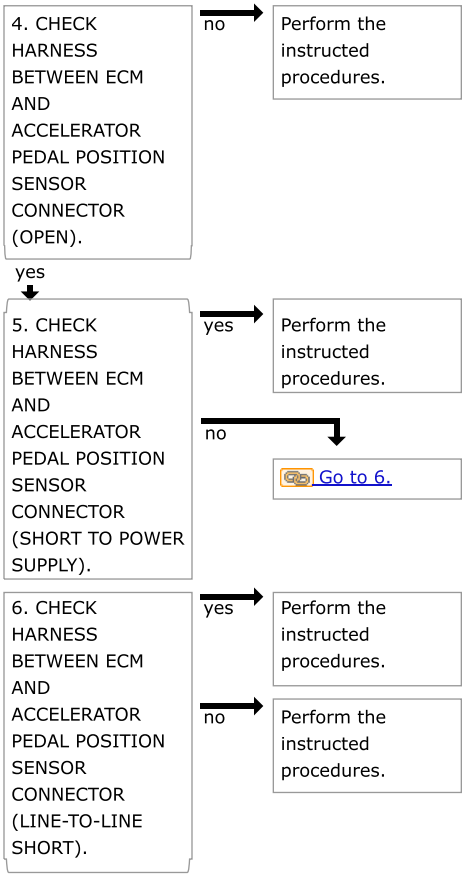


Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.

yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.
   Connector & terminal
   (B61) No. 17 — (B93) No. 2:
   (B61) No. 33 — (B93) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair the open circuit of harness between ECM connector and accelerator pedal position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B93) No. 2 — Chassis ground:

Is the resistance less than 1 Ω?

Yes — Go to 5.

No — Repair the following item.
- Open circuit in harness between ECM connector and Chassis ground
- Poor contact of ECM connector

5. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B93) 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 6.

6. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (LINE-TO-LINE SHORT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (B61) No. 49 — (B61) No. 33:

Is the resistance 1 MΩ or more?

Yes — Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal assembly if defective. Ref. to SPEED CONTROL SYSTEMS(H4DOTC)>Accelerator Pedal.

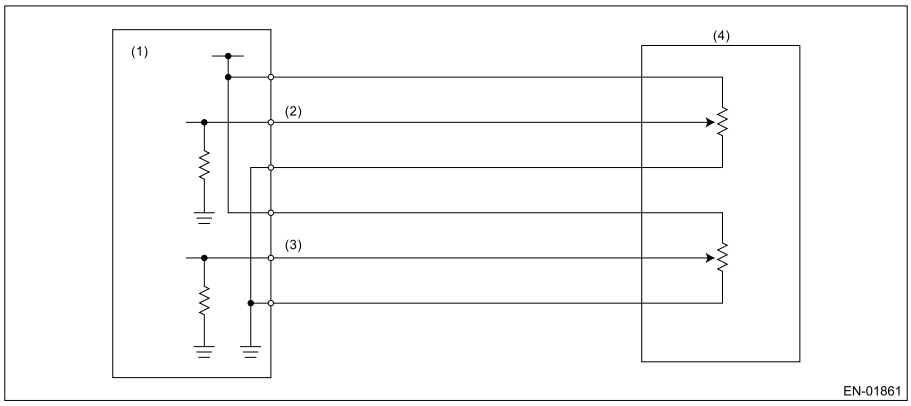
No — Repair the short circuit between lines in harness between ECM connector and accelerator pedal position sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.755 V

Time needed for diagnosis: 100 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

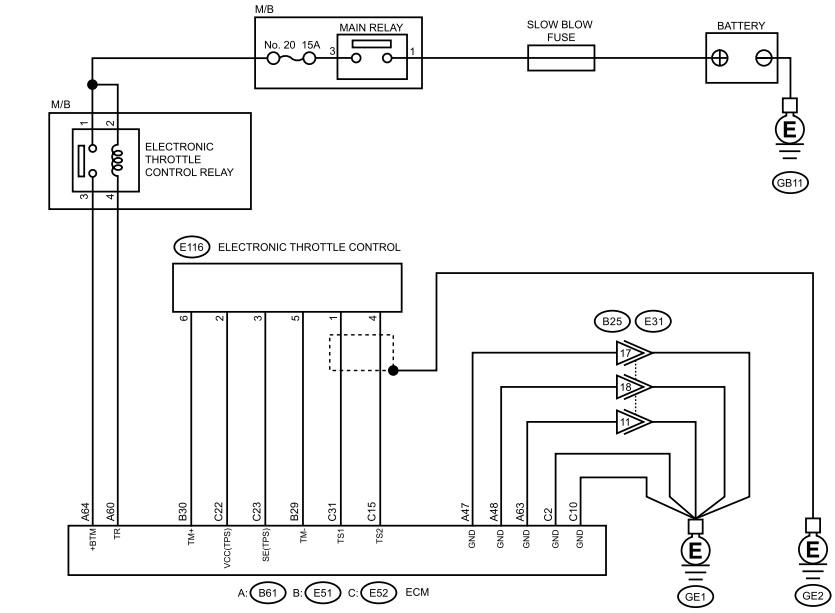
DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION

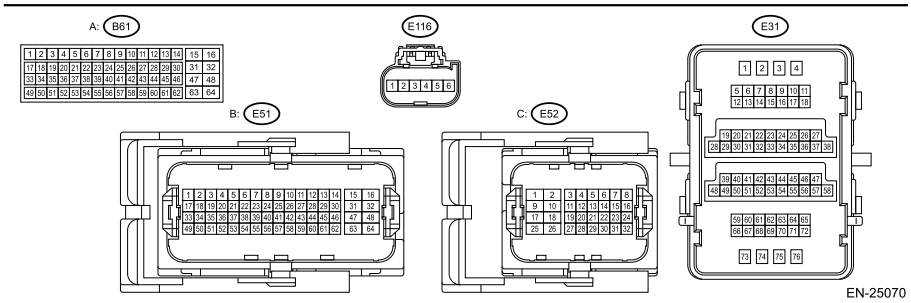
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



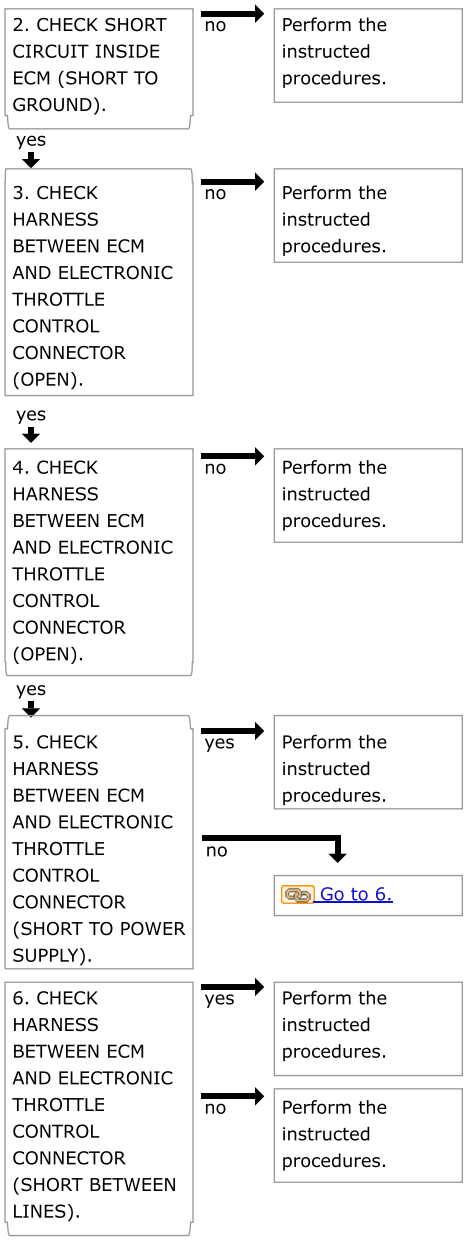


Caution:
Use the check board when measuring the ECM terminal voltage and resistance. **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.**

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. **Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.**

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.

yes ↓



1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO GROUND).

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 the ECM connector and engine ground.

Connector & terminal

(E52) No. 15 — Engine ground:
(E52) No. 22 — Engine ground:
(E52) No. 31 — Engine ground:

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 ECM (SHORT TO GROUND).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 1 — Engine ground:
   (E116) No. 4 — Engine ground:

Is the resistance 1 MΩ 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)(H4DOTC)>Engine Control Module (ECM).

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E52) No. 31 — (E116) No. 1:
   (E52) No. 23 — (E116) No. 3:
   (E52) No. 15 — (E116) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 5.
No	Repair the following item. • Open circuit of harness between ECM connector and engine ground • Poor contact of ECM connector

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E116) No. 1 (+) — Engine ground (−):
   (E116) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power supply 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 (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(E52) No. 22 — (E52) No. 15:
(E52) No. 22 — (E52) No. 31:

Is the resistance 1 MΩ or more?

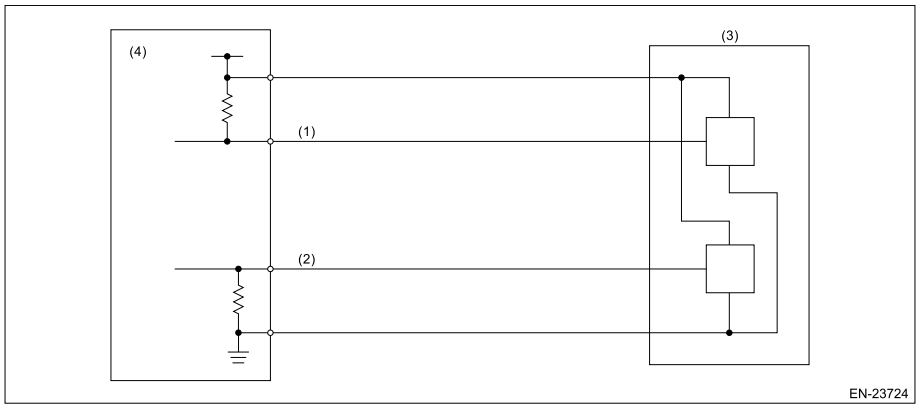
Yes	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Throttle Body.
No	Repair the short circuit between lines in harness between ECM connector and electronic throttle control connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of throttle position sensor 1 is different from the throttle position sensor 2.

COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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)|	More than 0.79 V

Time needed for diagnosis: 120 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

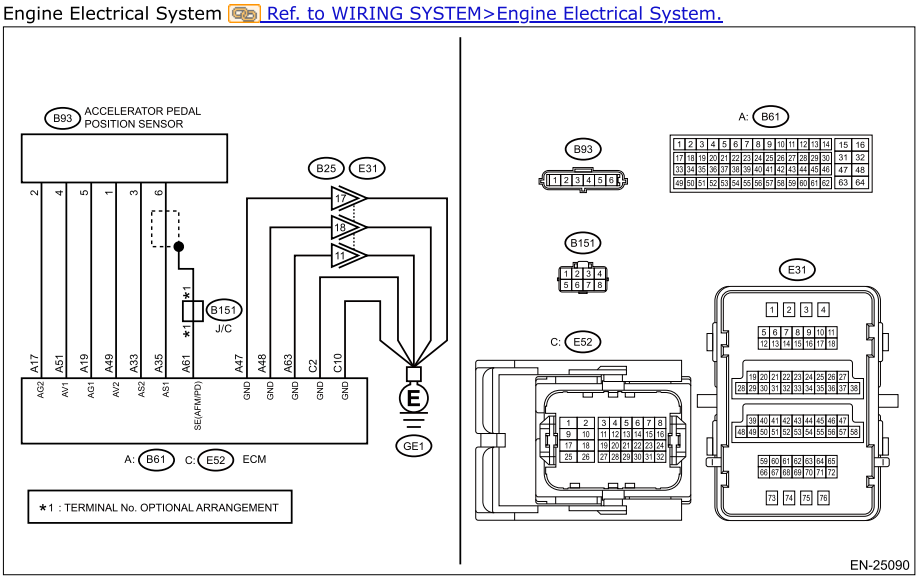
DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Improper idling
- Poor driving performance

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.	yes	Go to 3.
	no	Go to 2.
2. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.
3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR CONNECTOR (OPEN).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

1. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   Accelerator pedal position sensor main signal
   (B61) No. 35 (+) — Engine ground (−):
   Accelerator pedal position sensor sub signal
   (B61) No. 33 (+) — Engine ground (−):

Is the difference in measured values for the accelerator pedal position sensor main signal and the accelerator pedal position sensor sub signal 0 V?

Yes	Go to 3.
No	Go to 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.

Measure the voltage between accelerator pedal position sensor connector and chassis ground.
Connector & terminal
(B93) No. 3 (+) — Chassis ground (−):
(B93) No. 6 (+) — Chassis ground (−):

Is the difference in measured values for the accelerator pedal position sensor main signal and the accelerator pedal position sensor sub signal 0 V?

Yes	Replace the accelerator pedal assembly. Ref. to SPEED CONTROL SYSTEMS(H4DOTC)>Accelerator Pedal.
No	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 (OPEN).

Measure the resistance of harness between the accelerator pedal position sensor connector and chassis ground.
Connector & terminal
(B93) No. 2 — Chassis ground:
(B93) No. 5 — Chassis ground:

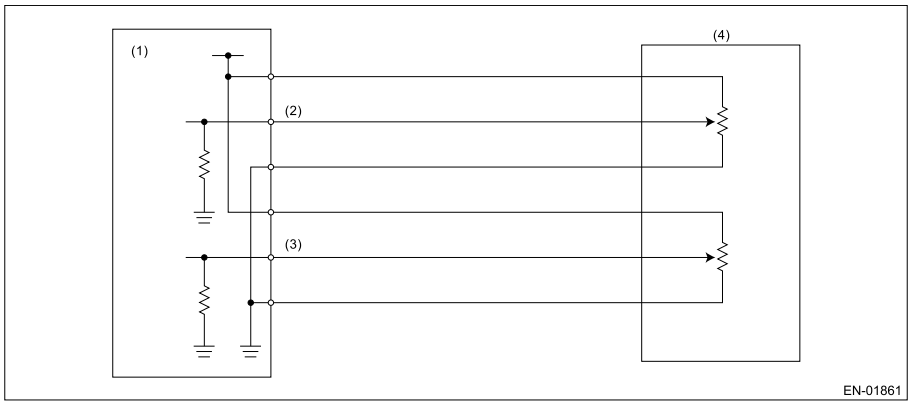
Is the resistance less than 5 Ω?

Yes	Repair the poor contact of ECM connector.
No	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

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

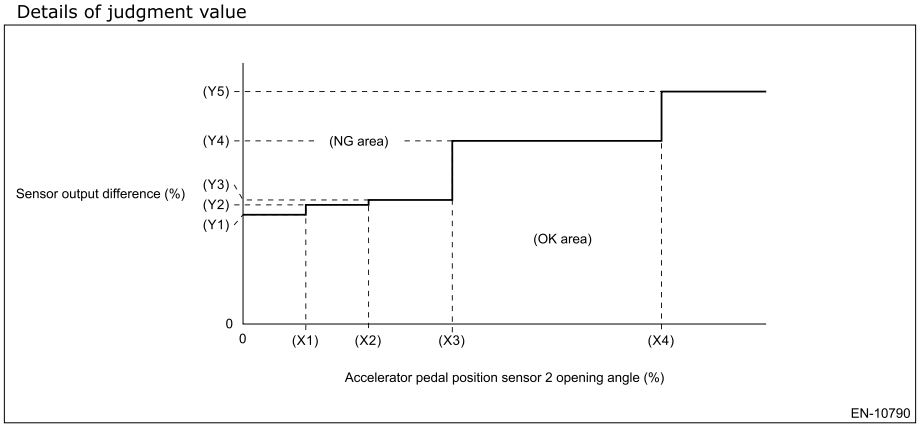
DIAGNOSTIC METHOD

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



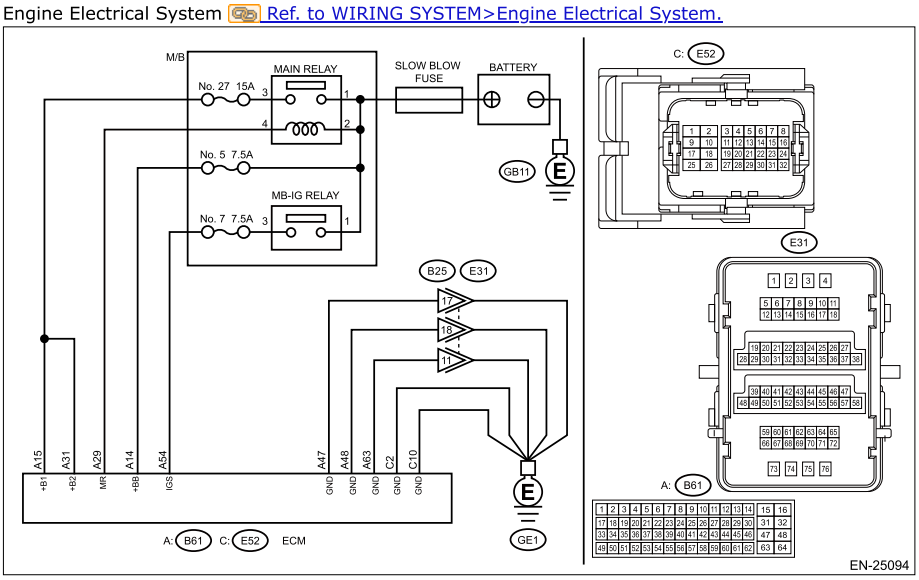
(X1) 1.82 %
(X2) 3.64 %
(X3) 6.06 %
(X4) 12.12 %
(Y1) 4.44 %
(Y2) 4.84 %
(Y3) 5.04 %
(Y4) 7.44 %
(Y5) 9.44 %

Time needed for diagnosis: 140 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2146 FUEL INJECTOR GROUP "A" SUPPLY VOLTAGE CIRCUIT/OPEN

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK INPUT VOLTAGE OF ECM.	no	Go to 3.
yes ↓		
2. CHECK ECM CONNECTOR.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.
3. CHECK FUSE NO. 27 (M/B).	no	Go to 5.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND M/B (SHORT TO GROUND).	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.
5. CHECK HARNESS BETWEEN ECM AND M/B (MAIN RELAY) (OPEN).	no	Perform the instructed procedures.

yes

6. CHECK MAIN RELAY.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 15 (+) — Engine ground (−):
   (B61) No. 31 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).
No	Connect the ECM connector correctly.

3. CHECK FUSE NO. 27 (M/B).

1. Turn the ignition switch to OFF.
2. Remove and check the fuse No. 27. Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

Is the fuse blown out?

Yes	Go to 4.
No	Go to 5.

4. CHECK HARNESS BETWEEN ECM AND M/B (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 15 — Engine ground:
   (B61) No. 31 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Replace the fuse.
No	Repair the short circuit to ground in harness between ECM connector and M/B.

5. CHECK HARNESS BETWEEN ECM AND M/B (MAIN RELAY) (OPEN).

1. Install the fuse No. 27.
2. Remove the main relay.
3. Measure the resistance of harness between ECM connector and M/B (main relay).
   Connector & terminal
   (B61) No. 15 — No. 3:
   (B61) No. 31 — No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the following item. • Repair the open circuit of harness between ECM connector and M/B (main relay). • Poor contact of fuse

6. CHECK MAIN RELAY.

Check the main relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Main Relay>INSPECTION.

Is the check result OK?

Yes	Repair the following item. • Defective main relay • Open circuit or short circuit to ground in main relay power supply circuit
No	Replace the main relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Main Relay.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open/short circuit of injector power supply circuit and injector booster circuit. (Diagnosis 1 and 2)
Judge as NG if voltage supplied to the injector booster circuit is abnormal. (Diagnosis 3)

EXECUTION CONDITION
Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage Injector power supply voltage	10.9 V or more 6 V or more and 17.2 V or less

Diagnosis 3

Secondary parameters	Execution condition
Battery voltage	9.44 V or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

DIAGNOSTIC METHOD
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value (diagnosis 1)

Malfunction Criteria	Threshold Value
Injector power supply voltage	Less than 6 V Or, More than 17.2 V

Judgment value (diagnosis 2)

Malfunction Criteria	Threshold Value
Injector booster power supply voltage	Less than 5.98 V Or, More than 69.42 V

Judgment value (diagnosis 3)

Malfunction Criteria	Threshold Value
Input voltage of DC/DC converter	Less than 4.25 V

Time needed for diagnosis

Diagnosis 1: 1000 ms
Diagnosis 2: 280 ms
Diagnosis 3: 50 times

Map

Engine speed (rpm)	Time needed for 50 times of diagnosis (sec)
500	3
2000	0.75
4000	0.375
6000	0.25

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1

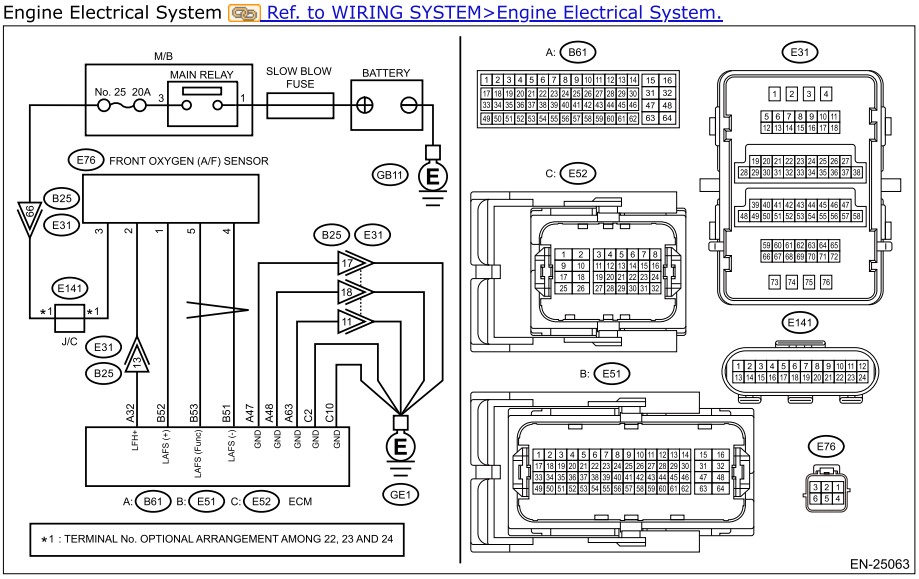
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the 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 (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — 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 front oxygen (A/F) sensor connector.

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Connect the connector to ECM.
2. Disconnect the connector from the front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(E51) No. 51 (+) — Engine ground (−):
(E51) No. 52 (+) — Engine ground (−):
(E51) No. 53 (+) — Engine 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	Repair the poor contact of ECM connector.

GENERAL DESCRIPTION

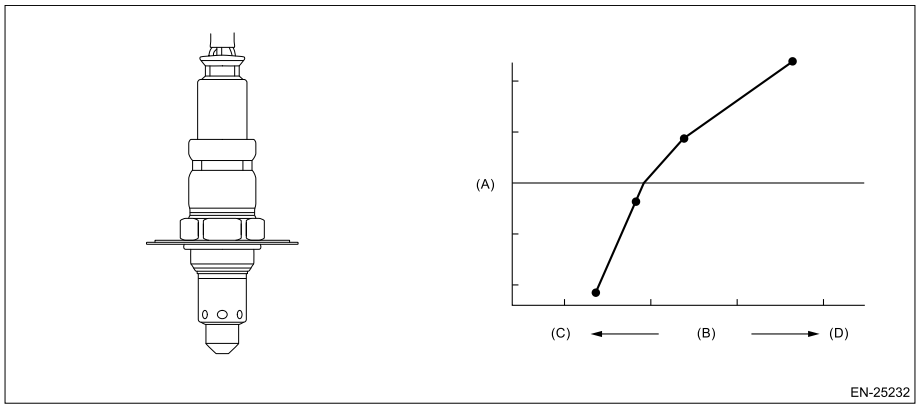
OUTLINE OF DIAGNOSIS

Detect that λ value remains lean.

Judge as NG when lambda value is determined as abnormal in accordance with driving conditions such as intake air amount and main 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 λ > 1: Lean λ < 1: Rich

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Main feedback	In operation
Amount of intake air	6 g/s (0.21 oz/s) or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more

GENERAL DRIVING CYCLE

Perform the diagnosis continuously when the conditions are established.

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	More than 1.15
Output voltage value of rear oxygen sensor	0.55 V or more

Time needed for diagnosis: 10 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1

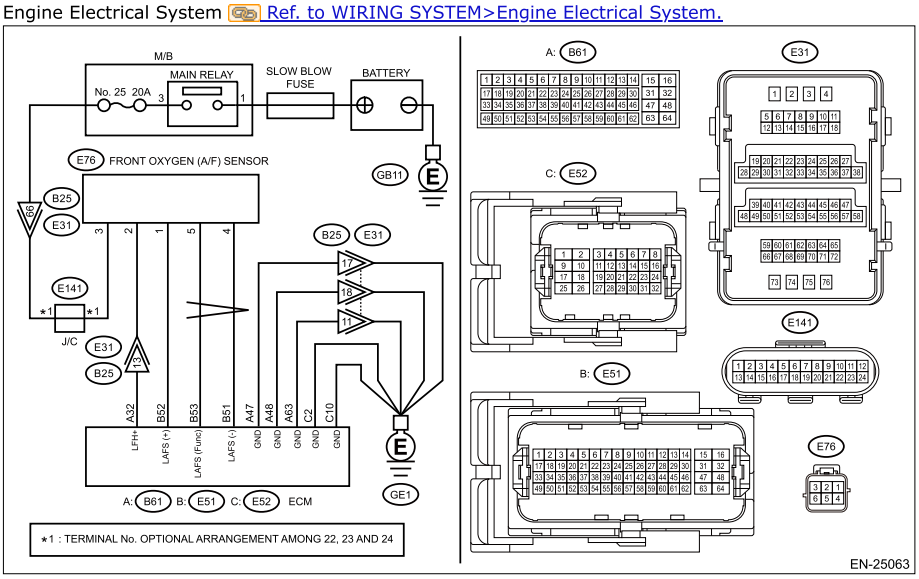
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the 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 (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the front oxygen (A/F) sensor.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E51) No. 52 — (E76) No. 1:
(E51) No. 51 — (E76) No. 4:
(E51) No. 53 — (E76) No. 5:

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 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.

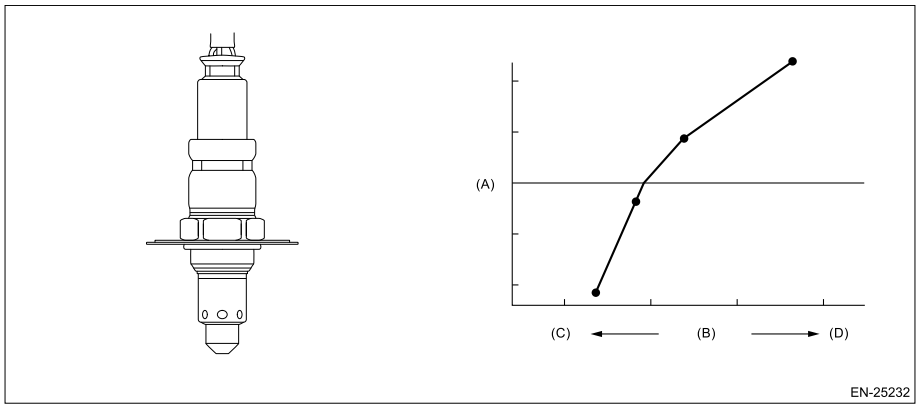
GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect that λ value remains rich.
Judge as NG when lambda value is determined as abnormal in accordance with driving conditions such as intake air amount and main 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 λ > 1: Lean λ < 1: Rich

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Main feedback	In operation
Amount of intake air	6 g/s (0.21 oz/s) or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more

GENERAL DRIVING CYCLE

Perform the diagnosis continuously when the conditions are established.

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	Less than 0.85
Output voltage value of rear oxygen sensor	0.15 V or less

Time needed for diagnosis: 10 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P219A BANK 1 AIR-FUEL RATIO IMBALANCE

1. —

DTC detecting condition:

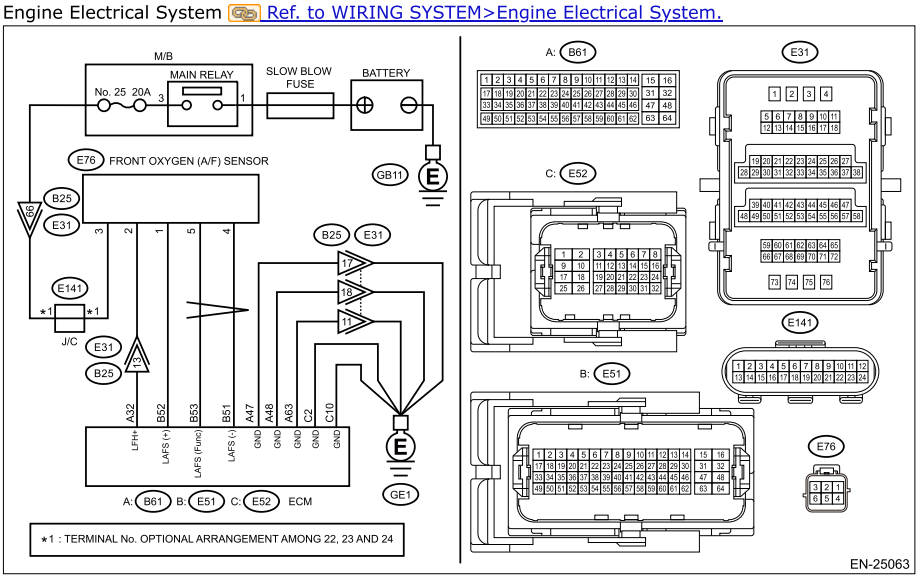
Detected when two consecutive driving cycles with fault occur.

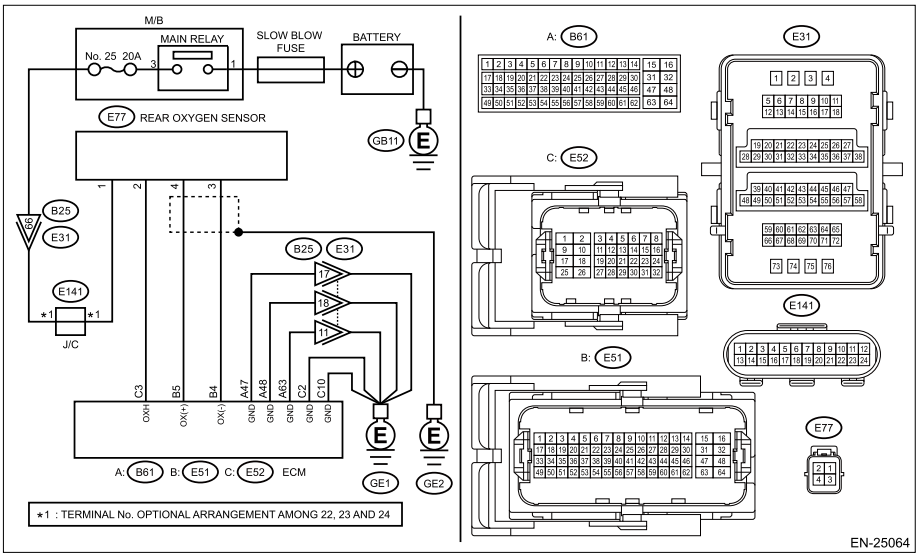
Trouble symptom:

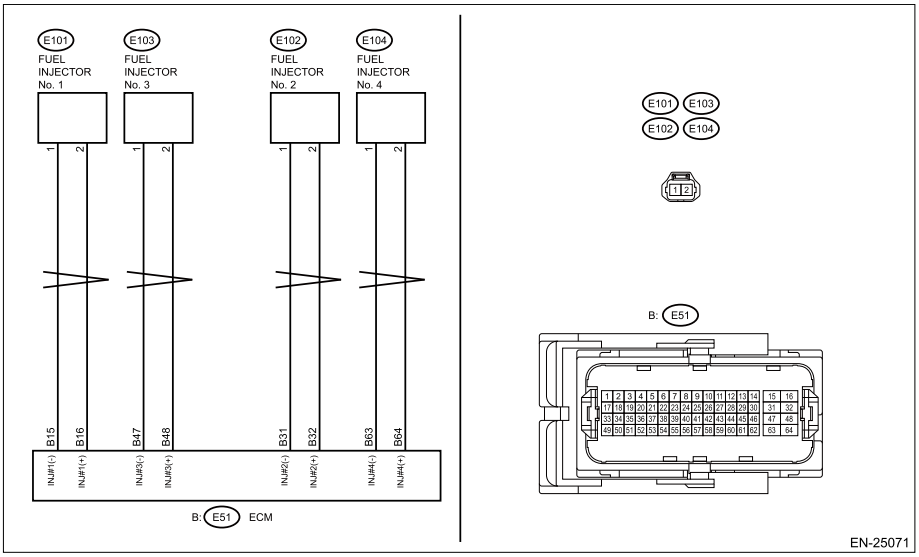
- Engine stall
- Improper idling

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.







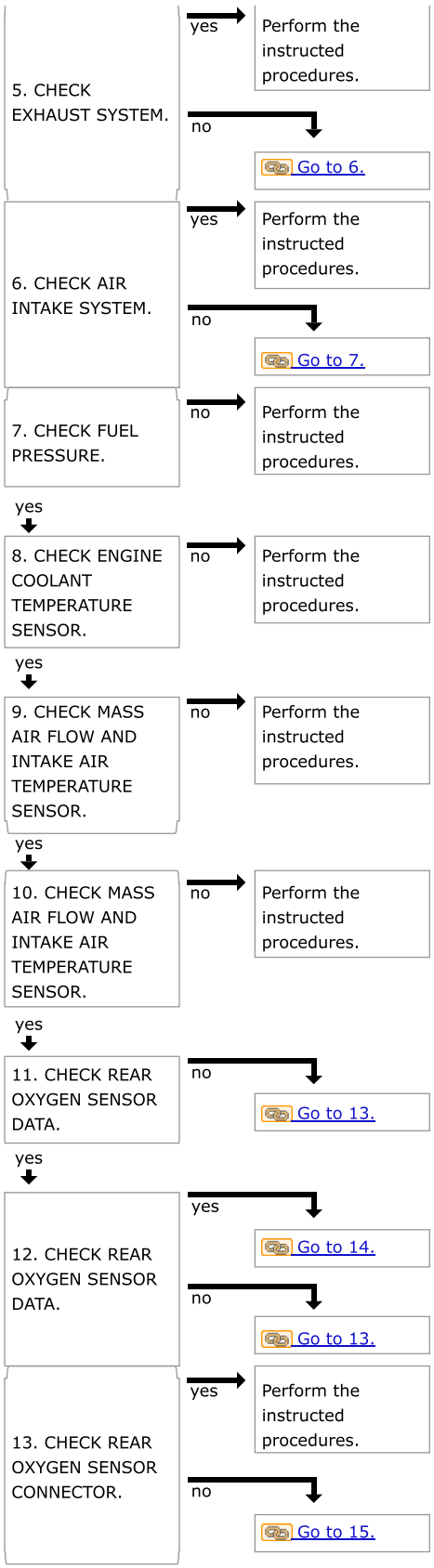
Caution:

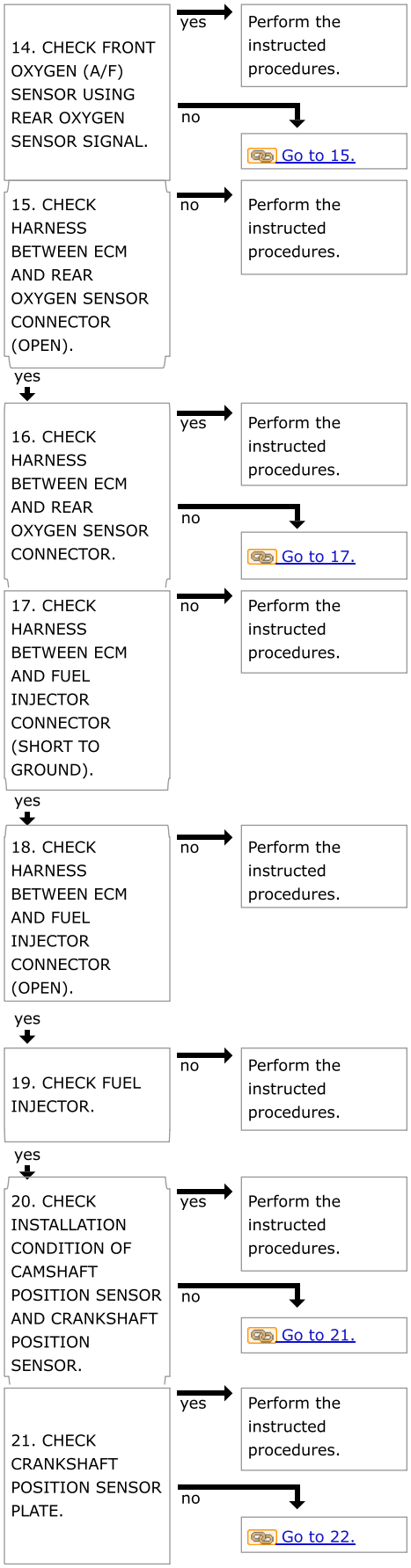
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Go to 5.


5. CHECK EXHAUST SYSTEM.
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK AIR INTAKE SYSTEM.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK FUEL PRESSURE.
no
Perform the instructed procedures.
yes
8. CHECK ENGINE COOLANT TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
9. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
10. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.
no
Perform the instructed procedures.
yes
11. CHECK REAR OXYGEN SENSOR DATA.
no
Go to 13.
yes
12. CHECK REAR OXYGEN SENSOR DATA.
yes
Go to 14.
no
Go to 13.
13. CHECK REAR OXYGEN SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Go to 15.


14. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.
yes
Perform the instructed procedures.
no
Go to 15.
15. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
16. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.
yes
Perform the instructed procedures.
no
Go to 17.
17. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (SHORT TO GROUND).
no
Perform the instructed procedures.
yes
18. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
19. CHECK FUEL INJECTOR.
no
Perform the instructed procedures.
yes
20. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.
yes
Perform the instructed procedures.
no
Go to 21.
21. CHECK CRANKSHAFT POSITION SENSOR PLATE.
yes
Perform the instructed procedures.
no
Go to 22.

22. CHECK INSTALLATION CONDITION OF TIMING CHAIN.
- yes → Perform the instructed procedures.
- no → Go to 23.

23. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.
- no → Perform the instructed procedures.
- yes ↓

24. CHECK AIR INTAKE SYSTEM.
- yes → Perform the instructed procedures.
- no → Go to 25.

25. CHECK MISFIRE SYMPTOM.
- yes → Go to 28.
- no → Go to 26.

26. CHECK DTC.
- yes → Go to 29.
- no → Go to 27.

27. CHECK DTC.
- yes → Go to 30.
- no → Go to 31.

28. ONLY ONE CYLINDER.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

29. GROUP OF #1 AND #3 CYLINDERS.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

30. GROUP OF #2 AND #4 CYLINDERS.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

31. NO SPECIFIC CYLINDER.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the 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 (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the front oxygen (A/F) sensor.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E51) No. 52 — (E76) No. 1:
(E51) No. 51 — (E76) No. 4:
(E51) No. 53 — (E76) No. 5:

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 (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E51) No. 51 — Engine ground:
(E51) No. 52 — Engine ground:
(E51) No. 53 — Engine 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 front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

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 engine ground.

Connector & terminal

(E76) No. 1 (+) — Engine ground (−):
(E76) No. 4 (+) — Engine ground (−):
(E76) No. 5 (+) — Engine 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	Go to 5.

5. CHECK EXHAUST SYSTEM.

Check the 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.

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 FUEL PRESSURE.

Warning:
Place "NO OPEN FLAMES" signs near the working area.

Caution:
- **Be careful not to spill fuel.**
- **Before attaching/detaching a fuel pressure gauge, release the fuel pressure.**

1. Connect the front oxygen (A/F) sensor connector.
2. Check the fuel pressure. Ref. to MECHANICAL(H4DOTC)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 8.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>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, read the value in [Coolant Temp.].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

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 until the engine coolant temperature exceeds 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, read the value in [Mass Air Flow].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Mass Air Flow] 2 — 5 [g/s] (0.26 — 0.66 lb/min)?

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 until the engine coolant temperature exceeds 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, read the value in [IAT Sensor #11].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Subtract ambient temperature from [IAT Sensor #11]. 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>INSPECTION.

11. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until the engine coolant temperature exceeds 75°C (167°F) and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.49 [V] or more?

Yes — Go to 12.

No — Go to 13.

12. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until the engine coolant temperature exceeds 75°C (167°F), and decrease the engine speed rapidly from 3,000 rpm.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] 0.25 [V] or less?

Yes — Go to 14.

No — Go to 13.

13. CHECK REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the rear oxygen sensor 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 the engine coolant temperature exceeds 75°C (167°F) and leave it at idling for 5 minutes or more.
2. Using the Subaru Select Monitor, read the value in [Oxygen sensor #12].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Oxygen sensor #12] kept at 0.25 [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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 4 — (E77) No. 3:
   (E51) No. 5 — (E77) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 16.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor 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 engine ground.
   Connector & terminal
   (E77) No. 4 (+) — Engine 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 (SHORT TO GROUND).

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 (E101) No. 1 — Engine ground:
   #1 (E101) No. 2 — Engine ground:
   #2 (E102) No. 1 — Engine ground:
   #2 (E102) No. 2 — Engine ground:
   #3 (E103) No. 1 — Engine ground:
   #3 (E103) No. 2 — Engine ground:
   #4 (E104) No. 1 — Engine ground:
   #4 (E104) 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 connector and fuel injector connector.

18. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR CONNECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) 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 FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector>INSPECTION.

Is the check result 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 AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and 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.
Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor.

No — Go to 21.

21. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate>INSPECTION.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes — Replace the crankshaft position sensor plate. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Crankshaft Position Sensor Plate.

No — Go to 22.

22. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using the Subaru ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

Subaru 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 STATUS OF MALFUNCTION INDICATOR LIGHT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Start the engine, and drive the vehicle at 60 km/h (37.3 MPH) or more for 10 minutes or more.

Warning:
Observe the traffic law on the public road and prioritize safety driving.

Note:
Refill the fuel before driving so that the fuel level meter indicates above "Lower" level.

Does the malfunction indicator light illuminate or blink?

Yes — Go to 24.

No — Repair the following item.
- Poor contact of ignition coil connector
- Poor contact of fuel injector connector on faulty cylinders
- Poor contact of ECM connector

24. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Is there any fault in air intake system?

Yes — Repair the air intake system. Ref. to INTAKE (INDUCTION)(H4DOTC)>General Description.

Note:
Check the following items.
- **Air leak or air suction due to looseness of installation**
- **Cracking or drop-off of hose**

No — Go to 25.

25. CHECK MISFIRE SYMPTOM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is there only one DTC displayed? (Current code)

Yes — Go to 28.

No — Go to 26.

26. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs P0301 and P0303 displayed? (Current code)

Yes	Go to 29.
No	Go to 27.

27. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs P0302 and P0304 displayed? (Current code)

Yes	Go to 30.
No	Go to 31.

28. ONLY ONE CYLINDER.

Check the following items for the relevant cylinder.
- Spark plug
- Ignition coil
- Fuel injector
- Compression pressure

Is there any fault in the relevant cylinder?

Yes	Repair or replace faulty parts.
No	Check for DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

29. GROUP OF #1 AND #3 CYLINDERS.

Check the following items for the bank RH (cylinder #1, #3).
- Spark plug
- Ignition coil
- Fuel injector
- Compression pressure
- Skipping timing chain teeth

Are there any faults in #1 and #3 cylinders?

Yes	Repair or replace faulty parts.
No	Check for DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

30. GROUP OF #2 AND #4 CYLINDERS.

Check the following items for the bank LH (cylinder #2, #4).
- Spark plug
- Ignition coil
- Fuel injector
- Compression pressure
- Skipping timing chain teeth

Are there any faults in #2 and #4 cylinders?

Yes	Repair or replace faulty parts.
No	Check for DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

31. NO SPECIFIC CYLINDER.

1. Start the engine.
2. Check the idling.

Is the engine idle rough?

Yes	Check for DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.
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.**

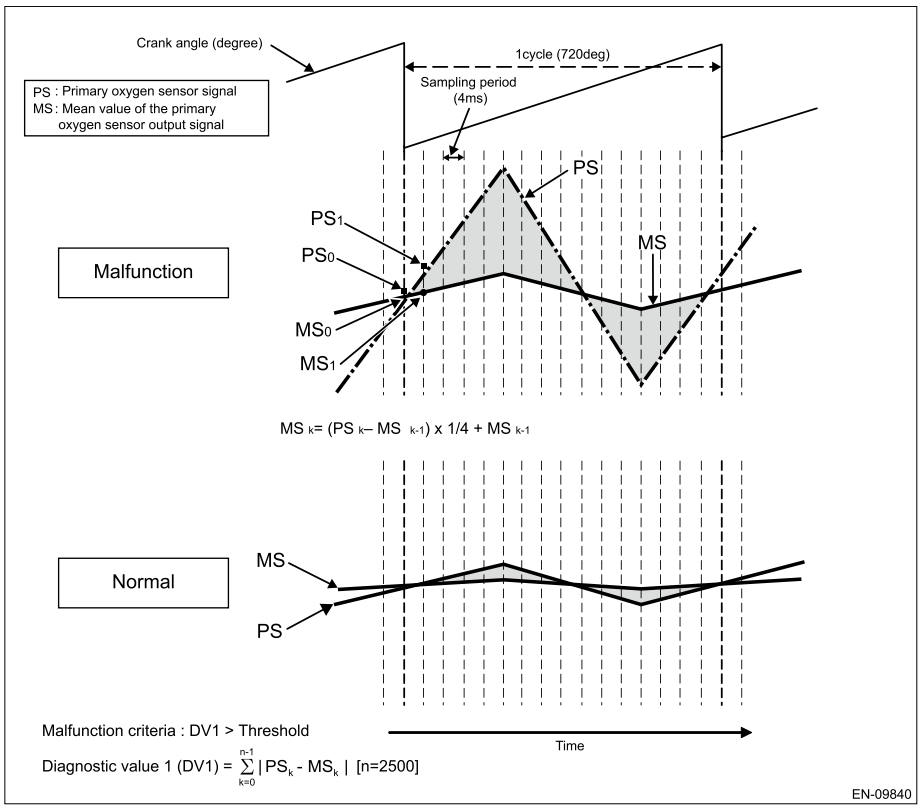
GENERAL DESCRIPTION

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



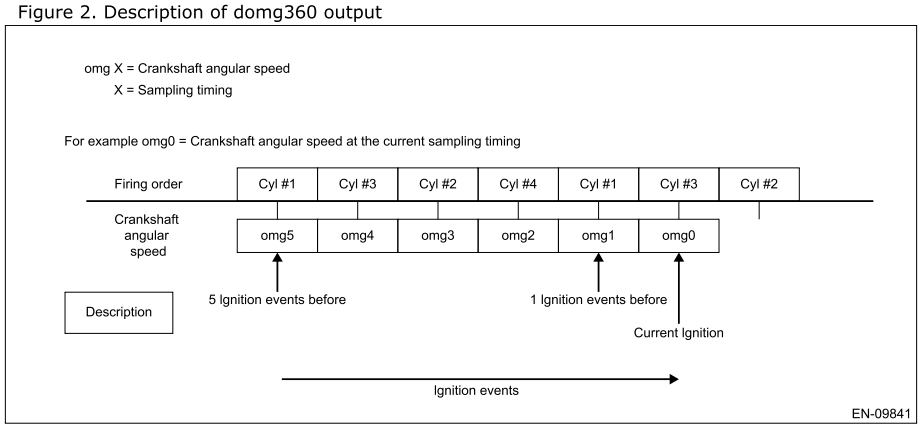
<Monitor B1>

Method used: Difference method of 360 degrees CA

Monitor value: domg360 = (omg 1 − omg 0) − (omg 3 − omg 2) = angular speed

Each crankshaft angular speed is defined as Figure 2 below.

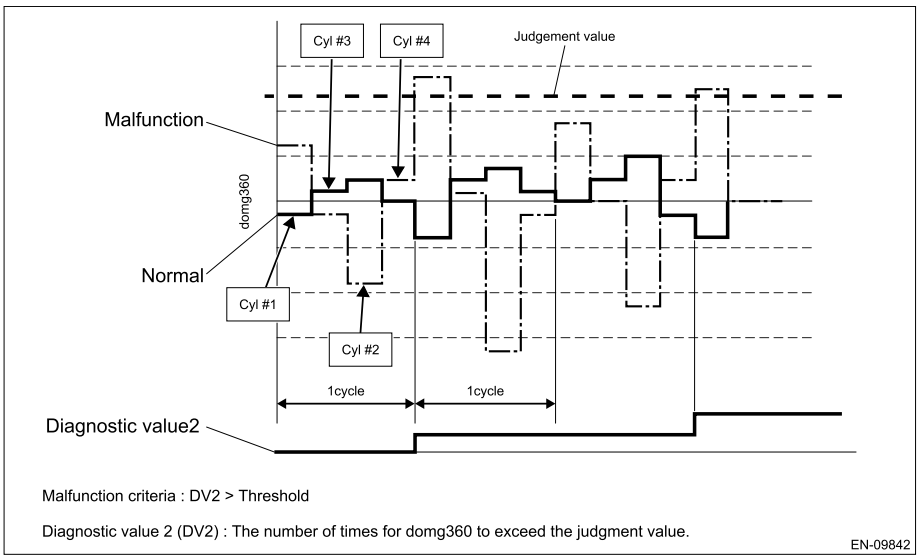
Figure 2. Description of domg360 output



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



EXECUTION CONDITION

Monitor A1: Primary oxygen sensor fluctuation

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.06 kPa (563.1 mmHg, 22.2 inHg) or more
Main feedback	In operation
Engine speed	More than 1500 rpm and Less than 4000 rpm
Charging efficiency	More than 70 air mass %
Time when not under catalyst neutralization control and not in slow changing condition	500 ms or more

Monitor B1: Crankshaft speed fluctuation

Secondary parameters	Execution condition
Misfiring diagnosis monitoring	In operation
Accelerator pedal position	Not equal to 0%
Engine speed	More than 1500 rpm and Less than 4000 rpm
Charging efficiency	More than 70 air mass %

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

Judge as NG when Monitor A1 and Monitor B1 are both NG, and when either is OK, judge as OK.

Judgment value

Judge as NG when the following conditions are established.

Monitor A1

Malfunction Criteria	Threshold Value
Diagnostic value 1 (DV1)	More than Map

Threshold value 1 (TV1):

$$\sum_{k=0}^{n-1} Map_k \quad [n=2500]$$

EN-09888

Map (Lean side)

		Charging efficiency (air mass %)							
		70	**80**	**90**	**100**	**110**	**120**	**140**	**160**
Engine speed	1500	0.013	0.014	0.017	0.021	0.021	0.021	0.021	0.021

		Charging efficiency (air mass %)							
		70	80	90	100	110	120	140	160
(rpm)	2000	0.007	0.01	0.013	0.017	0.03	0.026	0.026	0.026
	2500	0.009	0.013	0.016	0.022	0.028	0.047	0.047	0.047
	3000	0.016	0.021	0.028	0.029	0.03	0.035	0.035	0.035
	3500	0.012	0.018	0.023	0.025	0.03	0.03	0.03	0.03
	4000	0.014	0.016	0.023	0.027	0.027	0.027	0.027	0.027

Map (Rich side)

		Charging efficiency (air mass %)							
		70	80	90	100	110	120	140	160
Engine speed (rpm)	1500	0.022	0.02	0.028	0.028	0.028	0.028	0.028	0.028
	2000	0.011	0.022	0.028	0.039	0.036	0.033	0.033	0.033
	2500	0.018	0.025	0.038	0.046	0.056	0.058	0.058	0.058
	3000	0.025	0.043	0.052	0.057	0.066	0.067	0.067	0.067
	3500	0.031	0.035	0.041	0.051	0.056	0.056	0.056	0.056
	4000	0.032	0.037	0.045	0.059	0.059	0.059	0.059	0.059

Monitor B1

Malfunction Criteria	Threshold Value
Diagnostic Value2 (DV2) (Lean side) (Rich side)	 More than 80 times More than 40 times

Time needed for diagnosis
Monitor A1: 4.8 s
Monitor B1: 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 P2226 BAROMETRIC PRESSURE SENSOR “A“ CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2226 displayed? (Current code)

Yes — Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect communication error between CPU and the barometric pressure sensor.
Judge as NG when communication error occurs.

COMPONENT DESCRIPTION
The barometric pressure sensor is built into the ECM.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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
Communication data between CPU and the barometric pressure sensor	Different from expected value

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2227 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DATA MONITOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2227 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read the values of [Atmosphere Pressure] and [Mani. Absolute Pressure] to compare with actual atmospheric pressure.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the difference with the actual atmospheric pressure 8 [kPa] (60 mmHg, 2.4 inHg) or more?

Yes

Replace the part that showed larger deviation from the actual atmospheric pressure than the other.

- If deviations in value for [Atmosphere Pressure] is larger: Replace ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM).

  Note:
  The barometric pressure sensor is built into the ECM.
- 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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the malfunction of barometric pressure sensor output property.
Judge as NG when the barometric pressure sensor output value is largely different from the intake manifold pressure at engine start.

COMPONENT DESCRIPTION

The barometric pressure sensor is built into the ECM.

EXECUTION CONDITION

Secondary parameters	Execution condition
Soaking time	60 s or more
Elapsed time after ignition switch is turned to ON	Less than 60 s

GENERAL DRIVING CYCLE

Perform the diagnosis only once at ignition switch ON.

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 start|	12.12 kPa (90.9 mmHg, 3.6 inHg) or more

Time needed for diagnosis: Less than 1 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 P2228 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT LOW

1. —

DTC detecting condition:

Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2228 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open/short circuit of the barometric pressure sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION
The barometric pressure sensor is built into the ECM.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	Less than 52.825 kPa (396.3 mmHg, 15.6 inHg)

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2229 BAROMETRIC PRESSURE SENSOR "A" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2229 displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open/short circuit of the barometric pressure sensor.
Judge as NG if out of specification.

COMPONENT DESCRIPTION
The barometric pressure sensor is built into the ECM.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	More than 107.925 kPa (809.6 mmHg, 31.9 inHg)

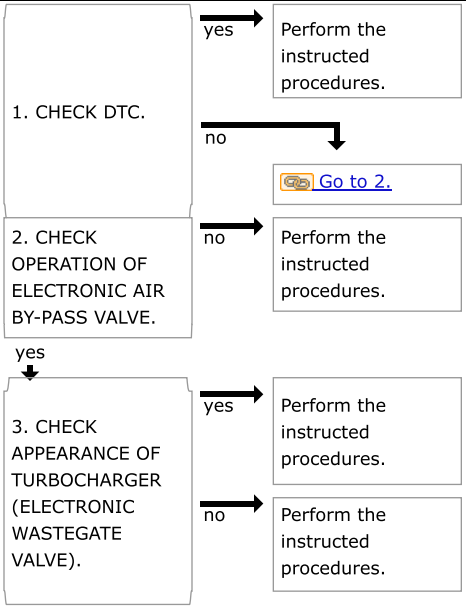
Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P226B TURBOCHARGER/SUPERCHARGER BOOST PRESSURE TOO HIGH - MECHANICAL

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P226B displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK OPERATION OF ELECTRONIC AIR BY-PASS VALVE.

1. Using the Subaru Select Monitor, select [Electric Waste Gate Valve Control] of [Active Test].
   Note:
   - **For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.**
   - **Electronic wastegate valve actuator repeats open and closed every 3 seconds with [Electric Waste Gate Valve Control] selected.**
2. Check if operating sound (clatter) occurs in the electronic wastegate valve according to ON/OFF switching operation of [Electric Waste Gate Valve Control].

Is the check result OK?

Yes — Go to 3.

No — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

3. CHECK APPEARANCE OF TURBOCHARGER (ELECTRONIC WASTEGATE VALVE).

1. Turn the ignition switch to OFF.
2. Remove the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.
3. Check the appearance of turbocharger to make sure that there is no foreign matter pinched in the electronic wastegate valve.

Caution:
Do not remove the electronic air by-pass valve and electronic wastegate valve since they are non-disassembled parts.

Is the check result OK?

Yes — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

No — Remove the foreign matters from the turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Judge as NG when becoming high boost pressure.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 of Map or more

Map

		Atmospheric pressure (kPa (mmHg, inHg))							
		70 (525.1, 20.7)	75 (562.6, 22.2)	80 (600.2, 23.6)	85 (637.7, 25.1)	90 (675.2, 26.6)	92.5 (693.9, 27.3)	95 (712.7, 28.1)	97.5 (731.4, 28.8)
Engine speed (rpm)	2000	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)
	2400	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)
	2800	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)
	3200	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)
	3600	185.1 (1388.6, 54.7)	189.3 (1420.1, 55.9)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)	189.7 (1423.1, 56)
	4000	168.4 (1263.3, 49.7)	189.7 (1423.1, 56)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)	191.7 (1438.1, 56.6)
	4400	173.9 (1304.6, 51.4)	188.7 (1415.6, 55.7)	195.5 (1466.6, 57.7)	196.7 (1475.6, 58.1)	196.7 (1475.6, 58.1)	196.7 (1475.6, 58.1)	196.7 (1475.6, 58.1)	196.7 (1475.6, 58.1)
	4800	168.8 (1266.3, 49.9)	179.1 (1343.6, 52.9)	189.3 (1420.1, 55.9)	201.7 (1513.1, 59.6)	201.7 (1513.1, 59.6)	201.7 (1513.1, 59.6)	201.7 (1513.1, 59.6)	201.7 (1513.1, 59.6)
	5200	171 (1282.8, 50.5)	182 (1365.3, 53.8)	195.2 (1464.4, 57.7)	206.1 (1546.1, 60.9)	212.7 (1595.6, 62.8)	212.7 (1595.6, 62.8)	212.7 (1595.6, 62.8)	212.7 (1595.6, 62.8)
	5600	167.5 (1256.6, 49.5)	180.7 (1355.6, 53.4)	191.7 (1438.1, 56.6)	200.5 (1504.1, 59.2)	202.7 (1520.6, 59.9)	207.1 (1553.6, 61.2)	213.7 (1603.2, 63.1)	213.7 (1603.2, 63.1)

	Atmospheric pressure (kPa (mmHg, inHg))							
	70 (525.1, 20.7)	**75 (562.6, 22.2)**	**80 (600.2, 23.6)**	**85 (637.7, 25.1)**	**90 (675.2, 26.6)**	**92.5 (693.9, 27.3)**	**95 (712.7, 28.1)**	**97.5 (731.4, 28.8)**
	(kPa (mmHg, inHg))							

Note:
Map shows the values when intake temperature is at 25°C (77°F)

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2

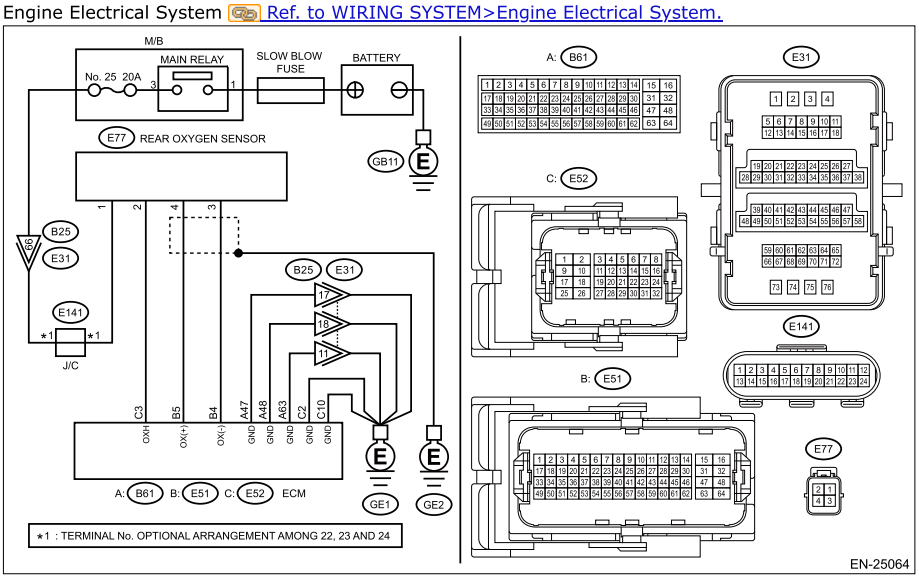
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK REAR OXYGEN SENSOR CONNECTOR.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK EXHAUST SYSTEM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the 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 (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the rear oxygen sensor.
3. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 4 — (E77) No. 3:
   (E51) No. 5 — (E77) 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
   (E77) 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.) of front oxygen (A/F) sensor or rear oxygen sensor**

Is there any fault in exhaust system?

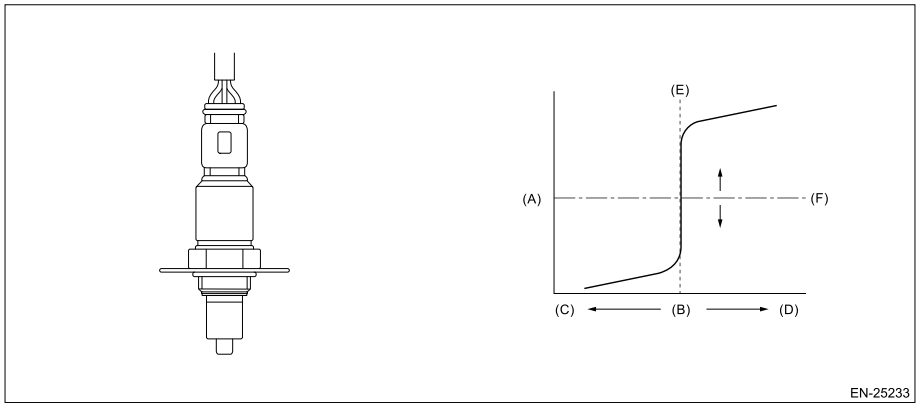
Yes	Repair or replace faulty parts.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Sub feedback	In operation
Amount of intake air	10 g/s (0.35 oz/s) or more
Estimated temperature of the rear oxygen sensor element	450°C (932°F) or more
Enable conditions at interrupt control are as follows	
Continuous time when rear oxygen sensor output voltage is less than 0.55 V	5000 ms or more
Air fuel ratio reduced from target air fuel ratio	8%

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

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	Less than 0.55 V

Time needed for diagnosis: 13 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2

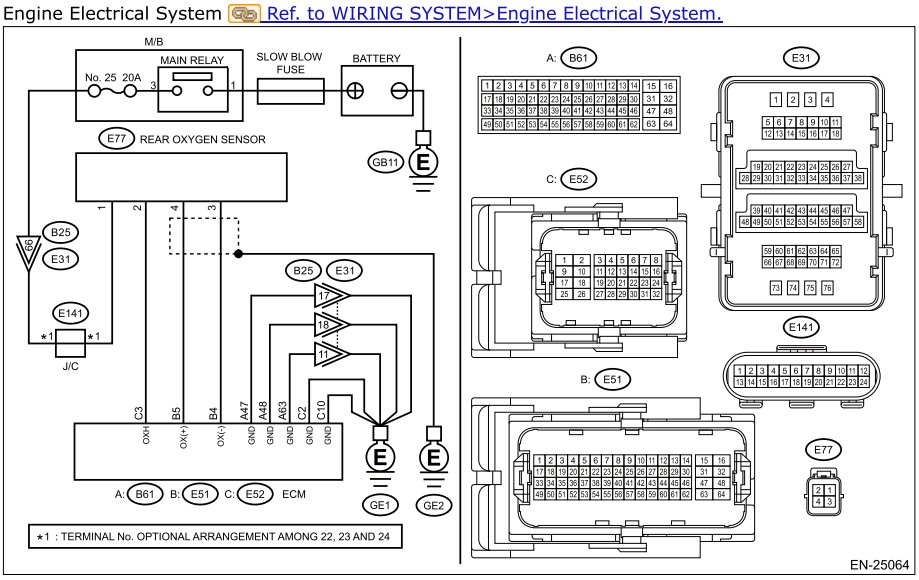
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK REAR OXYGEN SENSOR CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		

4. CHECK EXHAUST SYSTEM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK REAR OXYGEN SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the 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 (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the rear oxygen sensor.
3. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (E51) No. 4 — (E77) No. 3:
   (E51) No. 5 — (E77) 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 (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E51) No. 5 — Engine 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 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.) of front oxygen (A/F) sensor or rear oxygen sensor**

Is there any fault in exhaust system?

Yes — Repair or replace faulty parts.

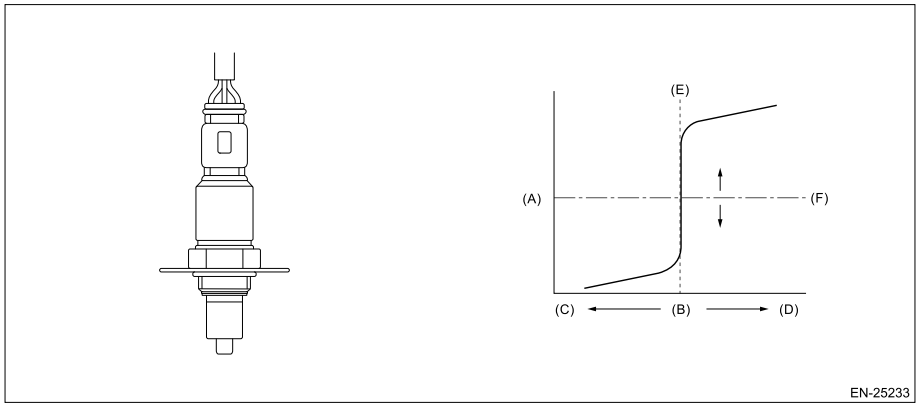
No — Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Rear Oxygen Sensor.

GENERAL DESCRIPTION

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.

COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Time while the fuel shut-off function is in operation	5000 ms or more
Estimated temperature of the rear oxygen sensor element	450°C (842°F) or more

GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

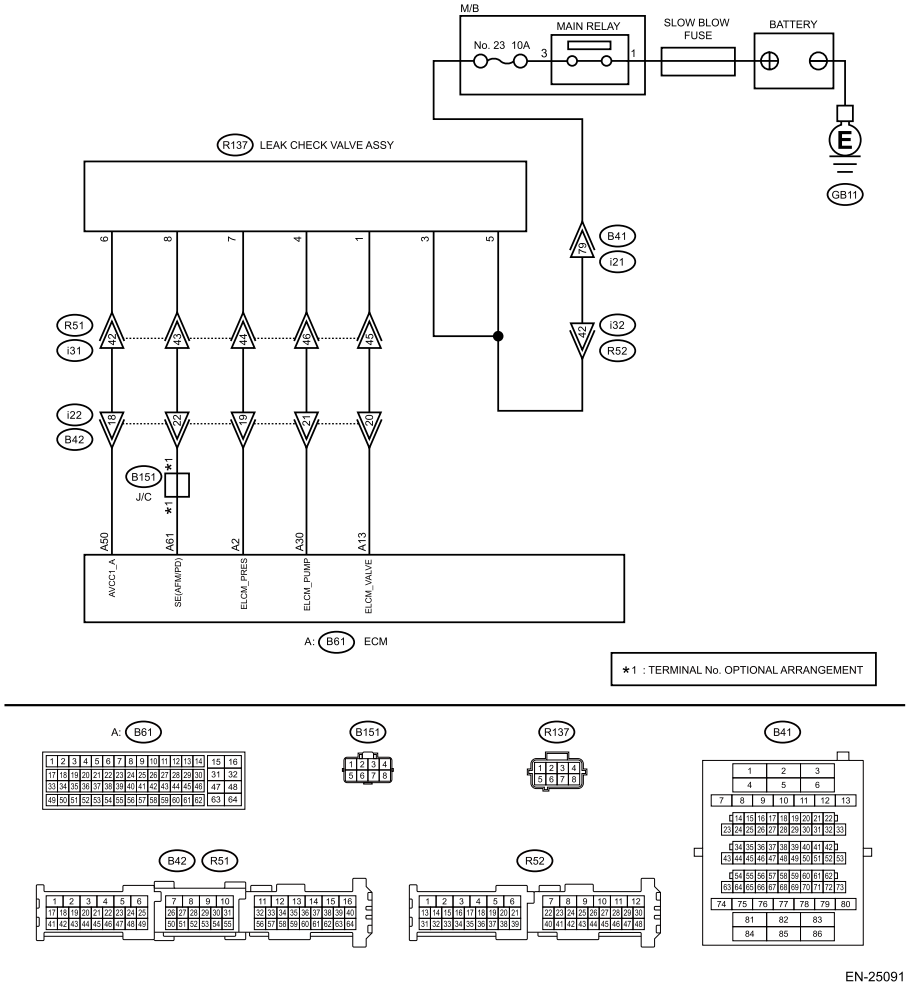
Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	More than 0.15 V

Time needed for diagnosis: 500 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.
   - no → Go to 3.
   - yes →
2. CHECK FOR POOR CONTACT.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY. → no → Perform the instructed procedures.

yes ↓

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO GROUND). → no → Perform the instructed procedures.

yes ↓

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN). → no → Perform the instructed procedures.

yes ↓

6. CHECK LEAK CHECK VALVE ASSEMBLY.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

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 engine ground.
   Connector & terminal
   (B61) No. 30 (+) — 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 open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

Measure the voltage between the leak check valve assembly connector and chassis ground.
Connector & terminal
(R137) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.
- Open circuit in harness between M/B and the leak check valve assembly connector
- Poor contact of coupling connector
- Blown out of fuse

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the leak check valve assembly.
4. Measure the resistance between leak check valve assembly and chassis ground.
   Connector & terminal
   (R137) 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 connector and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN).

Measure the resistance of harness between ECM connector and the leak check valve assembly connector.
Connector & terminal
(B61) No. 30 — (R137) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — 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)(H4DOTC)>Leak Check Valve Assembly>INSPECTION.

Is the check result OK?

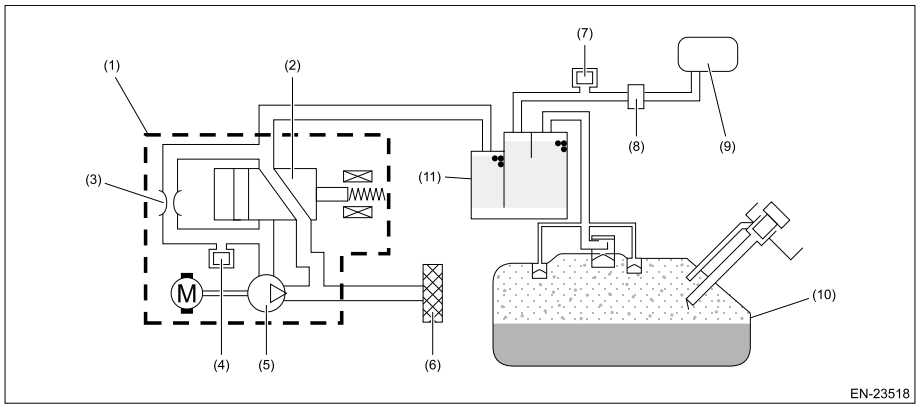
Yes — Repair the poor contact in the leak check valve assembly connector.

No — Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit of the vacuum pump in leak check valve assembly.
Judge as NG if out of specification.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Vacuum pump drive signal in the leak check valve assembly	OFF

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 V or less
Or,	
Output voltage Output current	More than 2.3 V Less than 0.03 mA

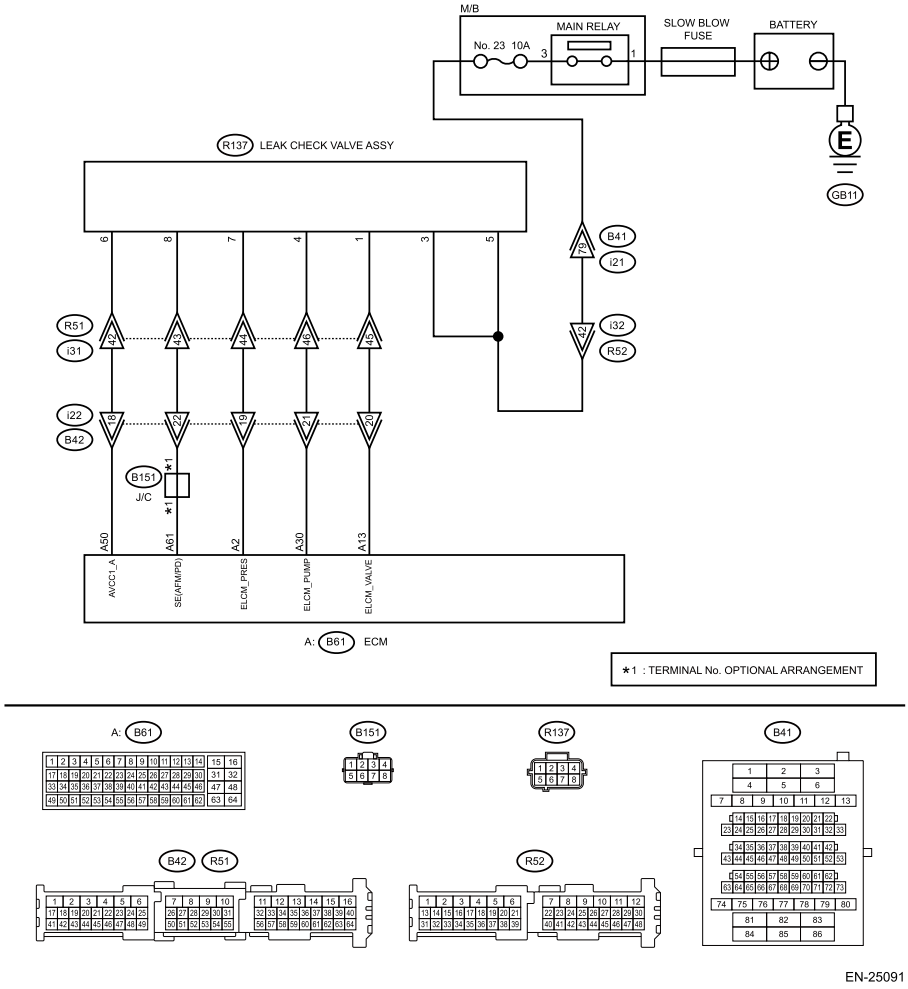
Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



EN-25091

Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO POWER SUPPLY).	yes	Perform the instructed procedures.
	no	Go to 2.

2. CHECK LEAK CHECK VALVE ASSEMBLY.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO POWER SUPPLY).

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
   (R137) 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)(H4DOTC)>Leak Check Valve Assembly>INSPECTION.

Is the check result OK?

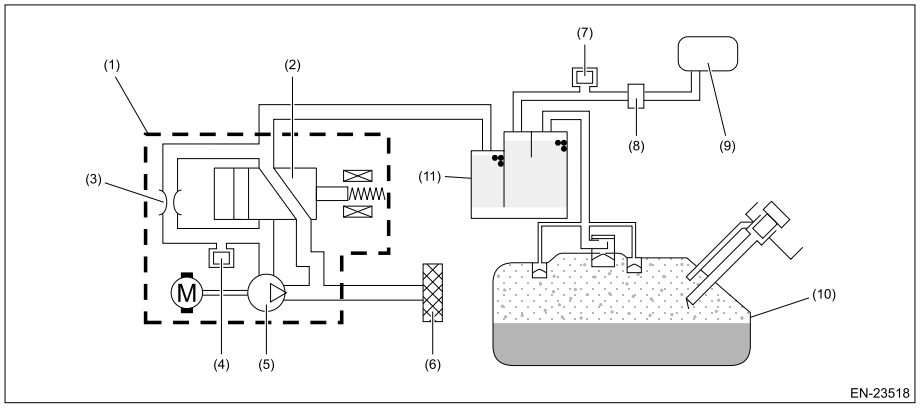
Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of the vacuum pump in leak check valve assembly.
Judge as NG if out of specification.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Vacuum pump drive signal in the leak check valve assembly	ON

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 or more

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2404 EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE

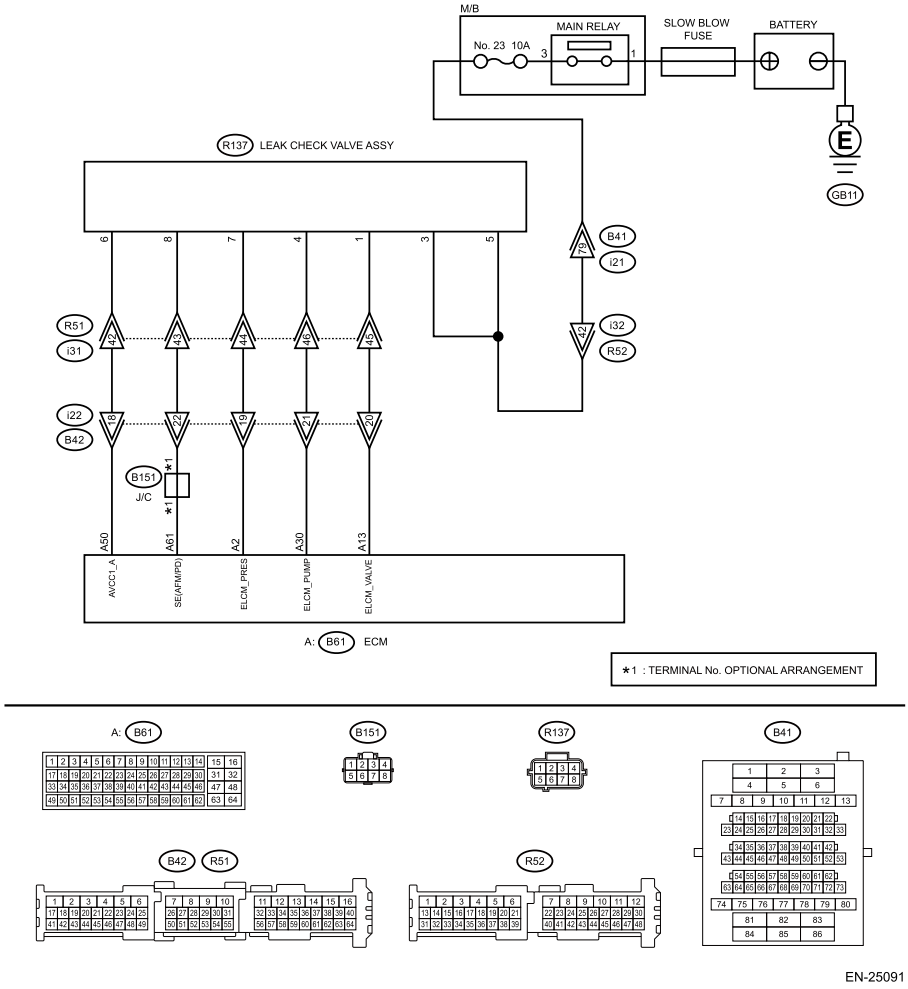
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



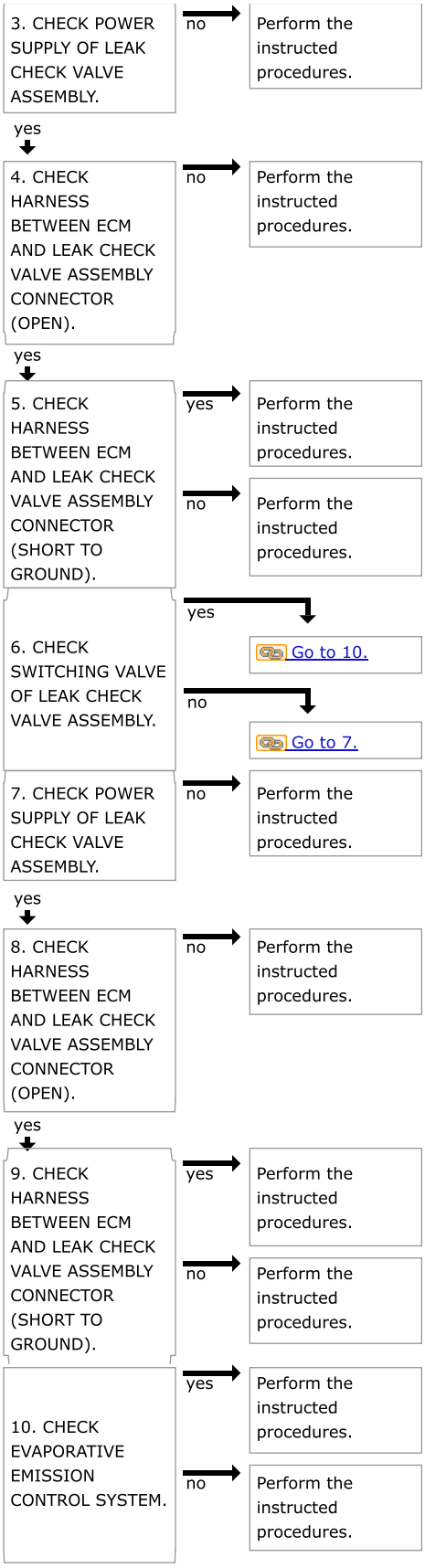
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK VACUUM PUMP OF LEAK CHECK VALVE ASSEMBLY.	yes →	Go to 6.
	no →	Go to 3.


3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.
no
Perform the instructed procedures.
yes
4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO GROUND).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
6. CHECK SWITCHING VALVE OF LEAK CHECK VALVE ASSEMBLY.
yes
Go to 10.
no
Go to 7.
7. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.
no
Perform the instructed procedures.
yes
8. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN).
no
Perform the instructed procedures.
yes
9. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO GROUND).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
10. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2404 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK VACUUM PUMP OF LEAK CHECK VALVE ASSEMBLY.

Using the Subaru Select Monitor, select [ELCM pump] of [Active Test] and operate the vacuum pump of the leak check valve assembly.

Note:
For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.

Does the vacuum pump of the leak check valve assembly 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
   (R137) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.
- Open circuit in harness between M/B and the leak check valve assembly connector
- Poor contact of coupling connector
- Blown out of fuse

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN).

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
   (B61) No. 30 — (R137) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 5.

No — 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 (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and engine ground.
Connector & terminal
(B61) No. 30 — Engine 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 connector and leak check valve assembly connector.

6. CHECK SWITCHING VALVE OF LEAK CHECK VALVE ASSEMBLY.

Using the Subaru Select Monitor, select [ELCM switching valve] of [Active Test] and operate the switching valve of the leak check valve assembly.

Note:
For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Active Test.

Does the switching valve of the leak check valve assembly 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
   (R137) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 8.

No — Repair the following item.
- Open circuit in harness between M/B and the leak check valve assembly connector
- Poor contact of coupling connector
- Blown out of fuse

8. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN).

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
   (B61) No. 13 — (R137) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 9.

No — 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 (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and engine ground.
Connector & terminal
(B61) No. 13 — Engine 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 connector and leak check valve assembly connector.

10. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

Perform the corresponding inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Is DTC P2404 displayed? (Current code)

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.**

GENERAL DESCRIPTION

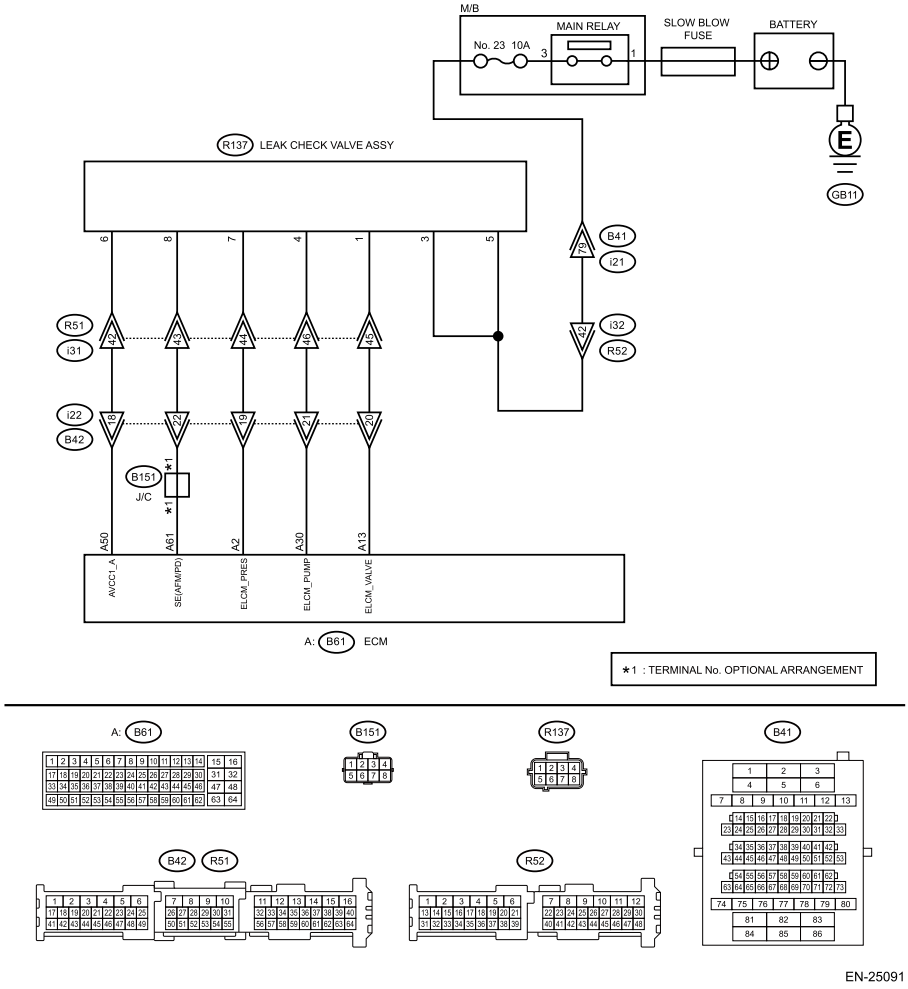
OUTLINE OF DIAGNOSIS

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).

DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW

1. —

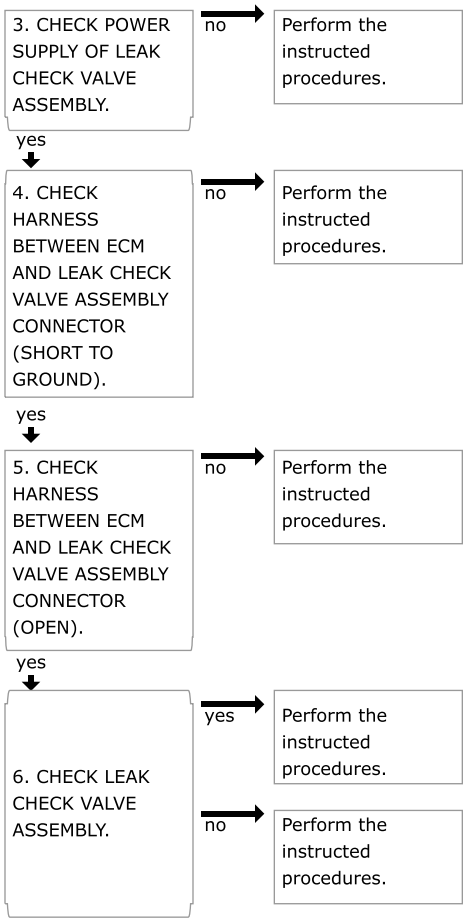
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR.
- no → Go to 3.
- yes → 2. CHECK FOR POOR CONTACT.
  - yes → Perform the instructed procedures.
  - no → Perform the instructed procedures.



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 engine ground.
   Connector & terminal
   (B61) No. 13 (+) — 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 open or short circuit of harness or temporary poor contact of connector may be the cause.

3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

Measure the voltage between the leak check valve assembly connector and chassis ground.
Connector & terminal
(R137) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.
- Open circuit in harness between M/B and the leak check valve assembly connector
- Poor contact of coupling connector
- Blown out of fuse

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the leak check valve assembly.
4. Measure the resistance between leak check valve assembly and chassis ground.
   Connector & terminal
   (R137) 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 (OPEN).

Measure the resistance of harness between ECM connector and the leak check valve assembly connector.
Connector & terminal
(B61) No. 13 — (R137) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — 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)(H4DOTC)>Leak Check Valve Assembly>INSPECTION.

Is the check result OK?

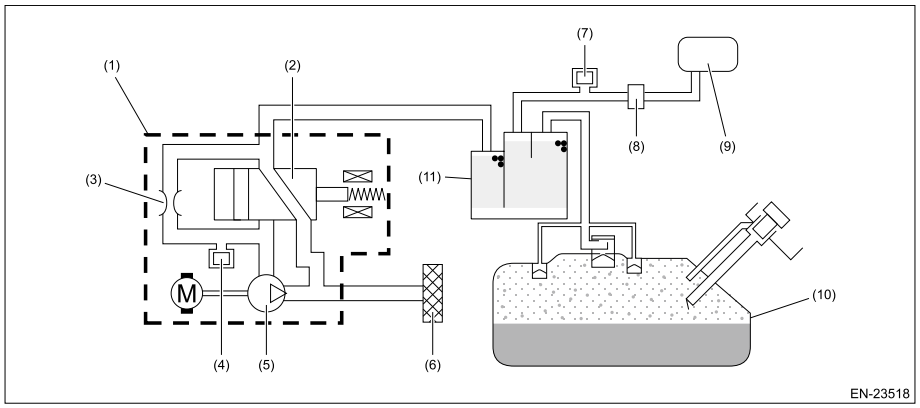
Yes — Repair the poor contact in the leak check valve assembly connector.

No — Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit of the leak check valve assembly switching valve.
Judge as NG if out of specification.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Switching valve drive signal in leak check valve assembly	OFF

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 V or less
Or,	
Output voltage Output current	More than 2.3 V Less than 0.03 mA

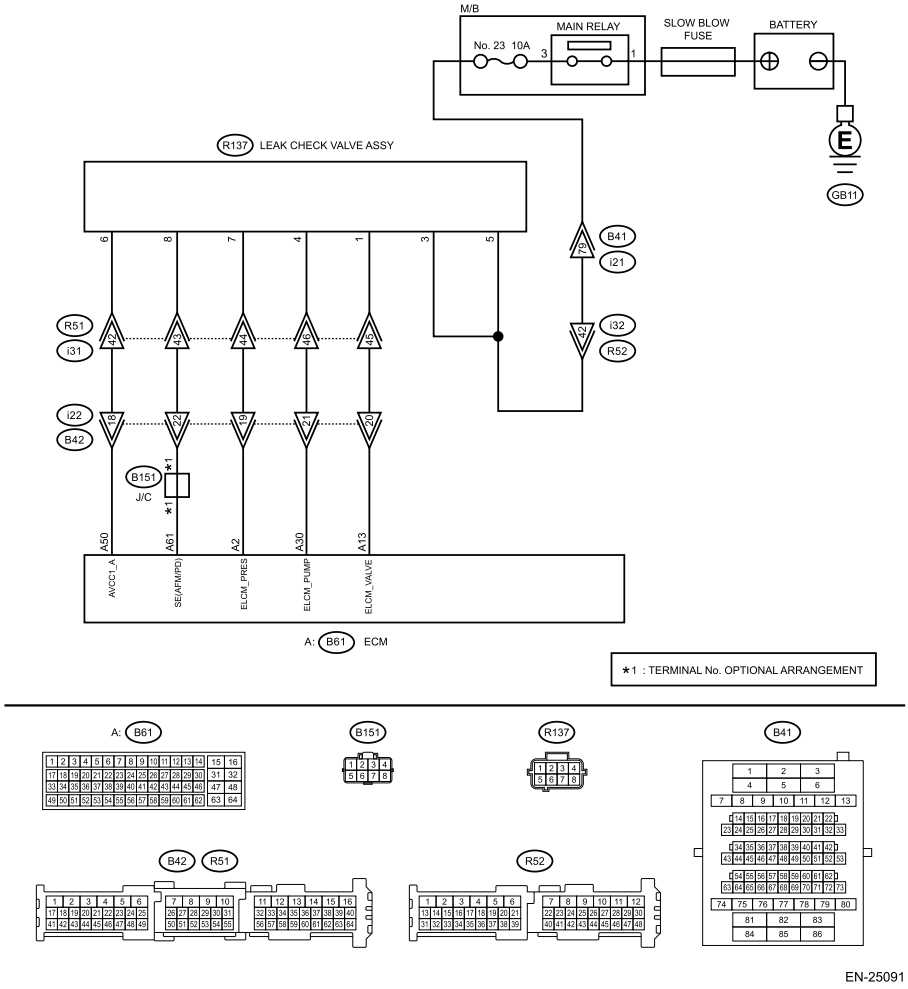
Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO POWER SUPPLY).	yes →	Perform the instructed procedures.
	no →	Go to 2.

2. CHECK LEAK CHECK VALVE ASSEMBLY.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO POWER SUPPLY).

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
   (R137) 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)(H4DOTC)>Leak Check Valve Assembly>INSPECTION.

Is the check result OK?

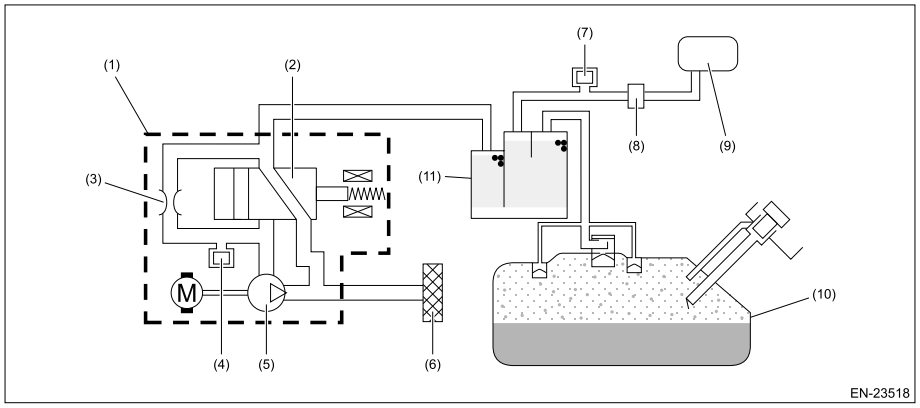
Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of the switching valve in leak check valve assembly.
Judge as NG if out of specification.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Switching valve drive signal in leak check valve assembly	ON

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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 or more

Time needed for diagnosis: 2250 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P24B9 EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DATA MONITOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P24B9 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON (engine OFF).
2. Using the Subaru Select Monitor, read the values of [Absolute Evap System Vapor Pressure] and [Mani. Absolute Pressure] to compare with actual atmospheric pressure.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the difference with the actual atmospheric pressure 7.3 [kPa] (54.8 mmHg, 2.2 inHg) or more?

Yes — Replace the part that showed larger deviation from the actual atmospheric pressure than the other.
- If deviations in value for [Absolute 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.

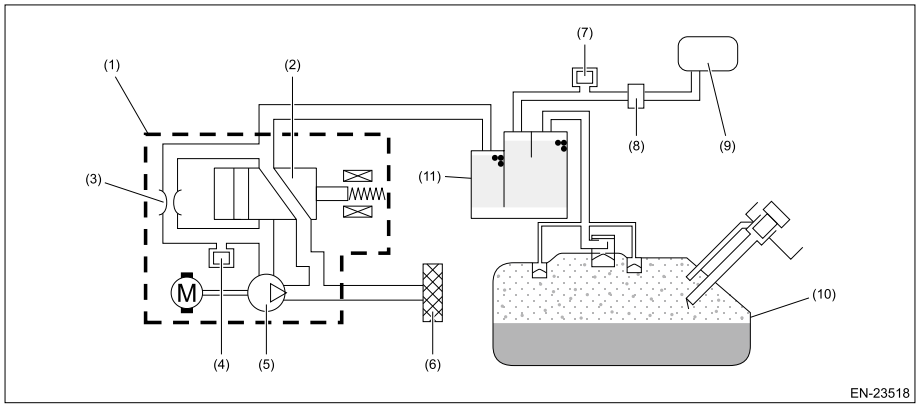
Note:
In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect output characteristics malfunction of the pressure sensor in the leak check valve assembly.
Judge as NG when the pressure sensor output value in the leak check valve assembly is largely different from the intake manifold pressure when the ignition switch is ON.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after ignition switch is turned to ON	500 ms or more and Less than 60 s
Soaking time	60 s or more
Vacuum pump in the leak check valve assembly	Not in operation
Switching valve in the leak check valve assembly	Open
Purge control	Not in operation

GENERAL DRIVING CYCLE
Perform the diagnosis only once at ignition switch ON.

DIAGNOSTIC METHOD
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value

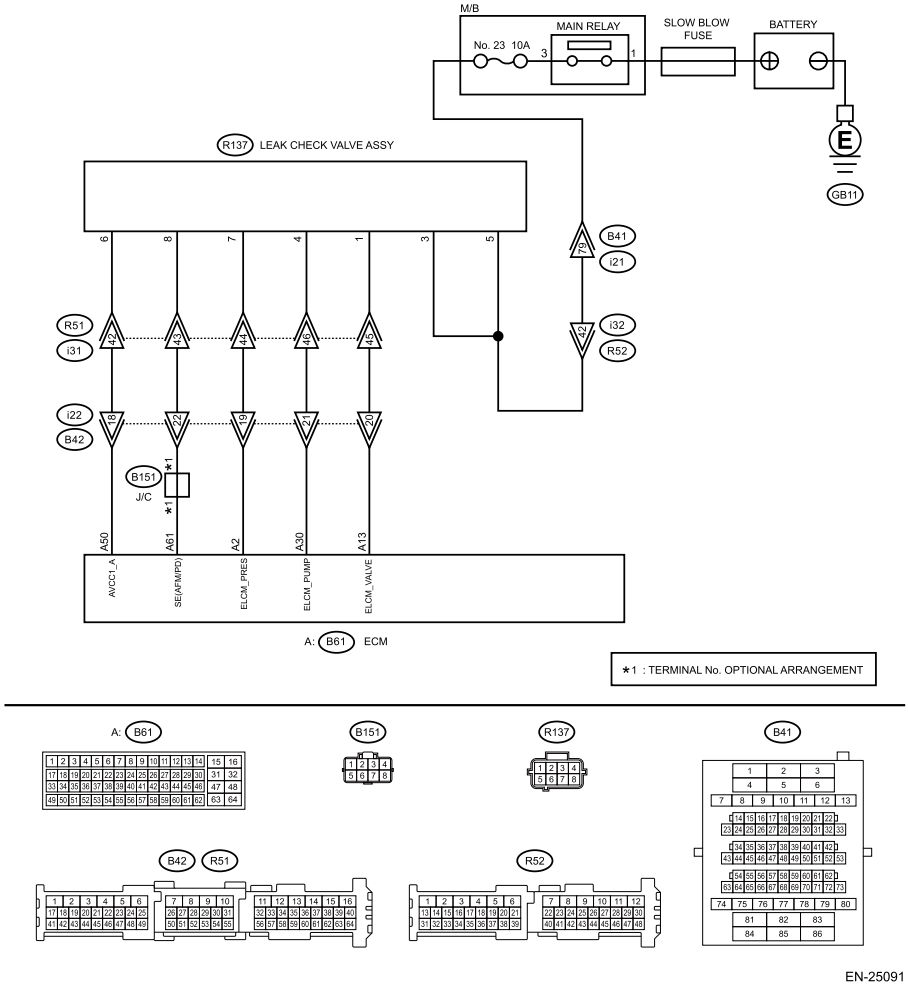
Malfunction Criteria	Threshold Value
|Pressure sensor output value in leak check valve assembly − Intake manifold pressure (absolute pressure) when ignition switch is ON|	14.6 kPa (109.5 mmHg, 4.3 inHg) or more

Time needed for diagnosis: 320 ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P24BA EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.	no →	Perform the instructed procedures.
yes ↓		

3. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		
4. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [Absolute Evap System Vapor Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value in [Absolute 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
   (R137) No. 6 (+) — Chassis ground (−):

Is the voltage 4.5 V or more?

Yes — Go to 3.

No — 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 (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 2 — Engine 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?

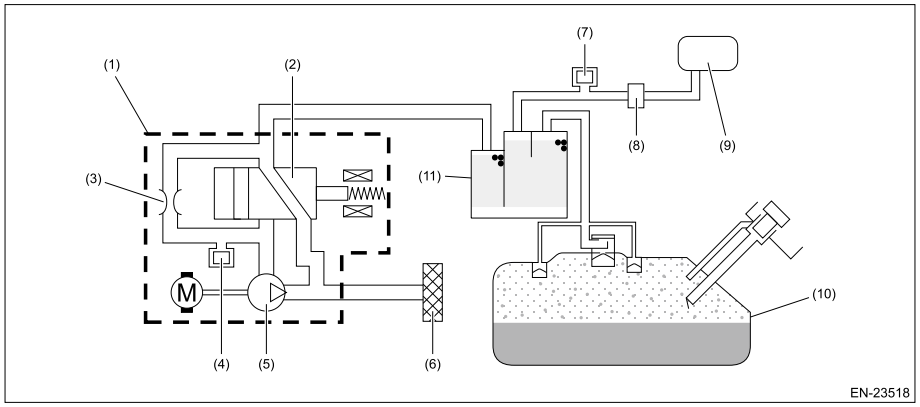
Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the short circuit of the pressure sensor in leak check valve assembly.
Judge as NG if out of specification.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

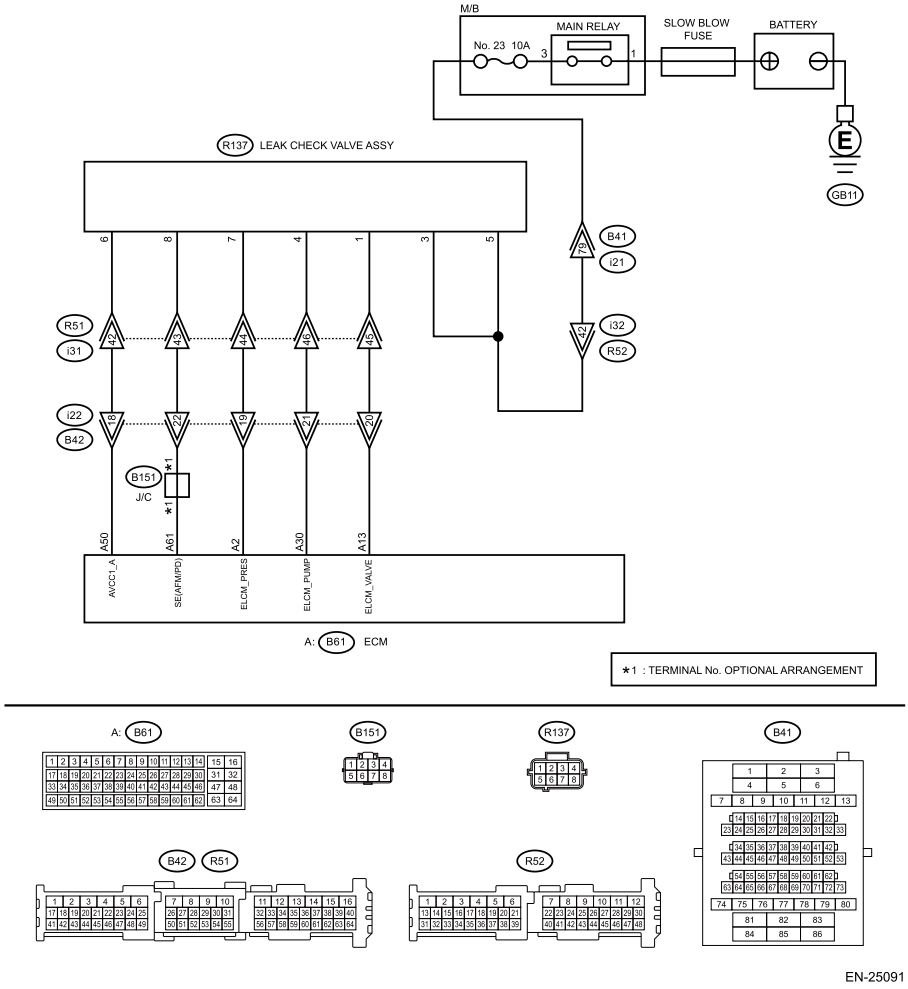
Malfunction Criteria	Threshold Value
Output voltage	Less than 0.922 V

Time needed for diagnosis: 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P24BB EVAP SYSTEM LEAK DETECTION PUMP PRESSURE SENSOR CIRCUIT HIGH

1. —

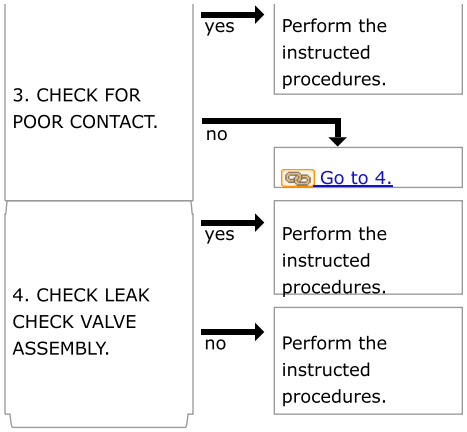
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [Absolute Evap System Vapor Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Absolute 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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the leak check valve assembly.
4. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal
(B61) No. 2 — (R137) No. 7:
(B61) No. 61 — (R137) No. 8:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — 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 J/C

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.

Is the check result OK?

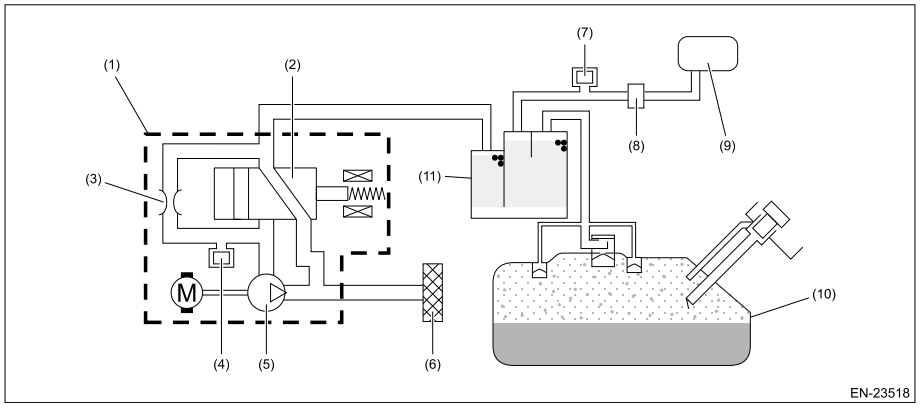
Yes	Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>Leak Check Valve Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the pressure sensor in leak check valve assembly.
Judge as NG if out of specification.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	More than 4.239 V

Time needed for diagnosis: 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P24D6 EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE

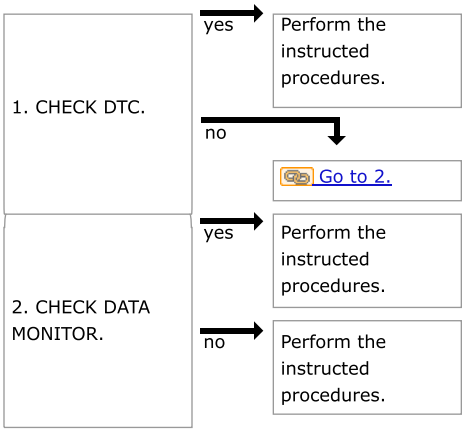
1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P24D6 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON (engine OFF).
2. Using the Subaru Select Monitor, read the values of [Absolute Evap System Vapor Pressure] and [Purge Line Pressure] to compare with actual atmospheric pressure.

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the difference with the actual atmospheric pressure 4.8 [kPa] (36 mmHg, 1.4 inHg) or more?

Yes — Replace the part that showed larger deviation from the actual atmospheric pressure than the other.
- If deviations in value for [Absolute 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 [Purge Line Pressure] is larger: Replace the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC 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.

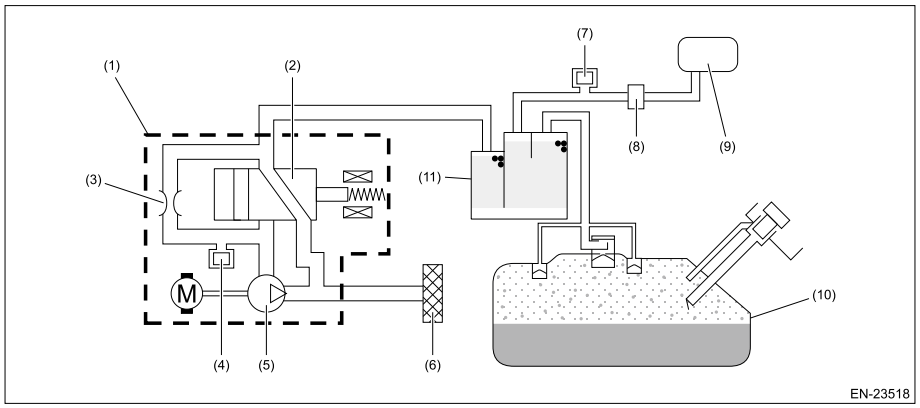
Note:
In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the output characteristics malfunction of CPC pressure sensor.
Judge as NG when the pressure sensor output value in the leak check valve assembly is largely different from the CPC pressure sensor output value.

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) CPC pressure sensor
(9) Intake manifold
(10) Fuel tank
(11) Canister

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Switching valve in leak check valve assembly	Open
and	
Purge control duty ratio	0%
and	
Elapsed time	3000 ms or more
Elapsed time after ignition switch is turned to ON	500 ms or more

GENERAL DRIVING CYCLE

Perform the diagnosis regardless of cold or warmed-up condition.

DIAGNOSTIC METHOD

Judge as NG when the difference of output values between pressure sensor in the leak check valve assembly and CPC pressure sensor is equal to or more than the predetermined value when compared.

Judgment value

Malfunction Criteria	Threshold Value
|(Pressure sensor output value in leak check valve assembly − Purge line pressure)|	More than 9.658 kPa (72.5 mmHg, 2.9 inHg)

Time needed for diagnosis: 320 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 P24D7 EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW

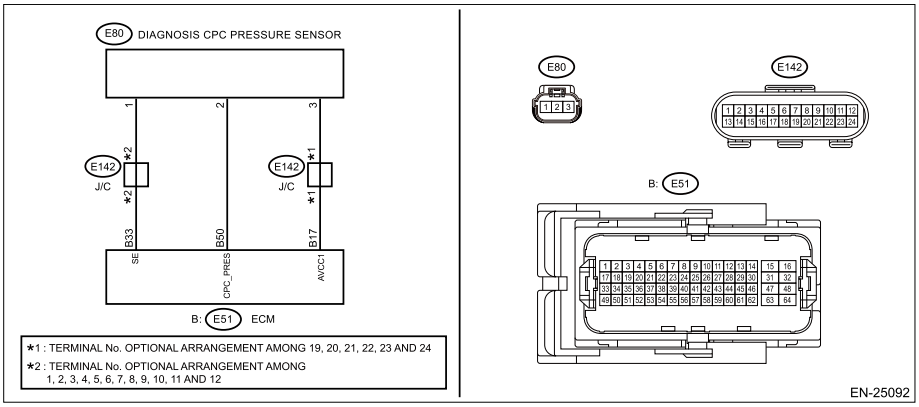
1. —

DTC detecting condition:

Immediately at fault recognition

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



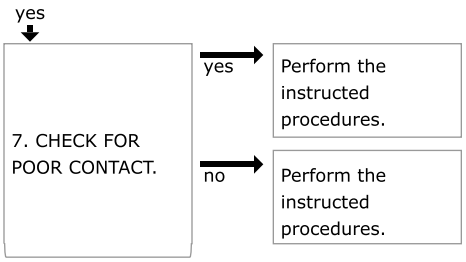
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
	yes ↓	
4. CHECK CPC PRESSURE SENSOR POWER SUPPLY.	no →	Perform the instructed procedures.
	yes ↓	
5. CHECK HARNESS BETWEEN ECM AND CPC PRESSURE SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
	yes ↓	
6. CHECK HARNESS BETWEEN ECM AND CPC PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes — Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.

No — Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes — Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.

No — Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Purge Line Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Purge Line Pressure] less than 38.63 [kPa] (290 mmHg, 11.4 inHg)?

Yes — Go to 4.

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.

4. CHECK CPC PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from CPC pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between CPC pressure sensor connector and engine ground.
   Connector & terminal
   (E80) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit in harness between ECM connector and CPC pressure sensor connector • Poor contact of ECM connector • Poor contact of J/C

5. CHECK HARNESS BETWEEN ECM AND CPC PRESSURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and CPC pressure sensor connector.
   Connector & terminal
   (E51) No. 50 — (E80) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and CPC pressure sensor connector.

6. CHECK HARNESS BETWEEN ECM AND CPC PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between CPC pressure sensor connector and engine ground.
Connector & terminal
(E80) No. 2 — 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 CPC pressure sensor connector.

7. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and CPC pressure sensor connector.

Is there poor contact of the ECM or CPC pressure sensor connector?

Yes	Repair the poor contact of the ECM or CPC pressure sensor connector.
No	Replace the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC Pressure Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit of the CPC pressure sensor.
Judge as NG if out of specification.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 1.762 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 P24D8 EVAP SYSTEM PRESSURE SENSOR/SWITCH "B" CIRCUIT HIGH

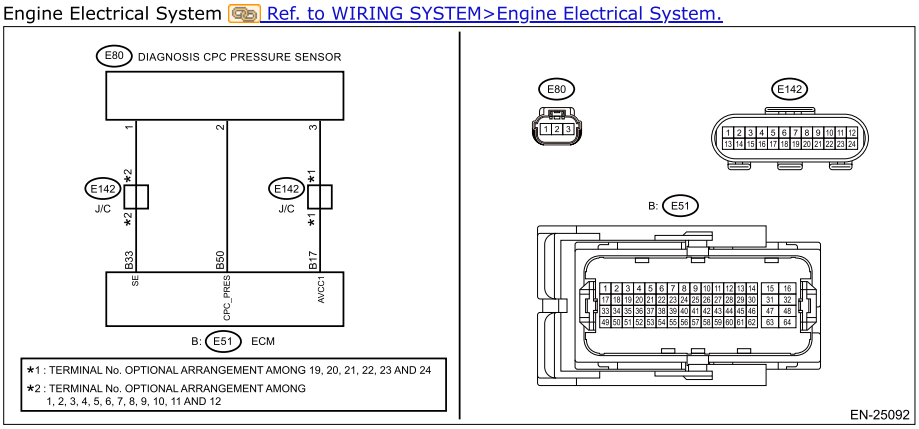
1. —

DTC detecting condition:

Immediately at fault recognition

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



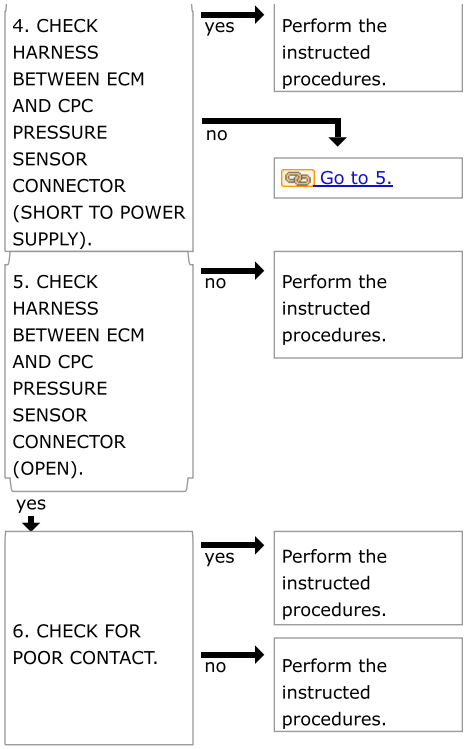
Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK DATA MONITOR.	no	Perform the instructed procedures.
	yes	



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Purge Line Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Purge Line Pressure] 116.8 [kPa] (878 mmHg, 34.6 inHg) or more?

Yes — Go to 4.

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.

4. CHECK HARNESS BETWEEN ECM AND CPC PRESSURE SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from CPC pressure sensor.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [Purge Line Pressure].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Purge Line Pressure] 116.8 [kPa] (878 mmHg, 34.6 inHg) or more?

Yes — Repair the short circuit to power in the harness between ECM connector and CPC pressure sensor connector.

No — Go to 5.

5. CHECK HARNESS BETWEEN ECM AND CPC PRESSURE SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance in harness between CPC pressure sensor connector and engine ground.
   Connector & terminal
   (E80) No. 1 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and CPC pressure sensor connector
- Poor contact of ECM connector
- Poor contact of J/C

6. CHECK FOR POOR CONTACT.

Check for poor contact of CPC pressure sensor connector.

Is there poor contact of the CPC pressure sensor connector?

Yes — Repair the poor contact of the CPC pressure sensor connector.

No — Replace the CPC pressure sensor. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DOTC)>CPC Pressure Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the CPC pressure sensor.
Judge as NG if out of specification.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

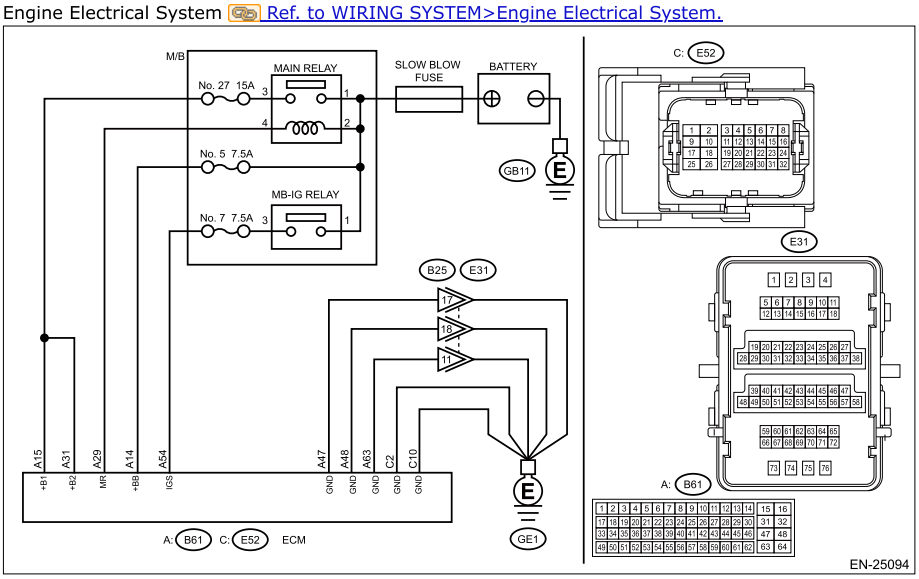
Malfunction Criteria	Threshold Value
Output voltage	More than 4.120 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper idling
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ECM CONNECTOR.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK INPUT VOLTAGE OF ECM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 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 M/B.
   Connector & terminal
   (B61) No. 54 (+) — 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.
- **Poor contact of ECM connector**
- **Poor contact of MB-IG relay**

No — Repair the following item.
- Blown out of fuse
- Open circuit or short circuit to ground in harness between M/B and ECM connector
- Faulty MB-IG relay
- Poor contact of MB-IG relay

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect instantaneous open in ignition switch input circuit to ECM.
Judge as NG if out of specification.

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine speed	475 rpm or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously after the enable conditions have been established.

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 or more

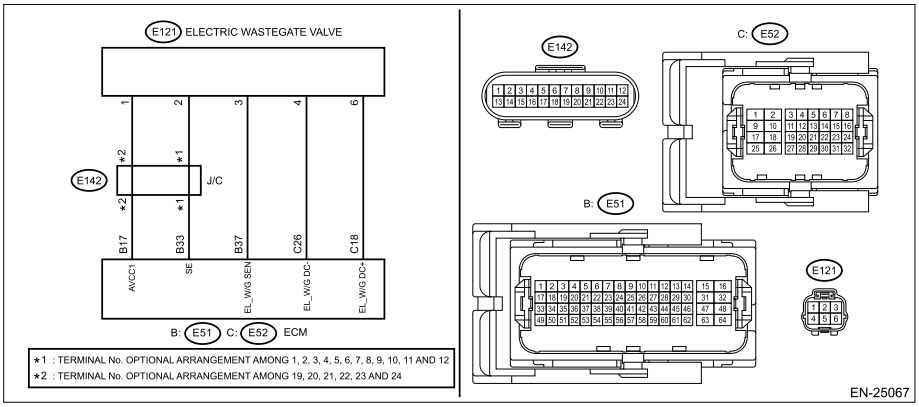
Time needed for diagnosis: 5000 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2564 TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Poor driving performance
- Poor acceleration

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK ELECTRONIC WASTEGATE VALVE POWER SUPPLY.	no →	Perform the instructed procedures.
yes ↓		
5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		

7. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Electric Waste Gate Valve Actual Position Value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value in [Electric Waste Gate Valve Actual Position Value] less than −3.5 [mm] (−0.14 in)?

Yes	Go to 4.
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.

4. CHECK ELECTRONIC WASTEGATE VALVE POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from electronic wastegate valve.
3. Turn the ignition switch to ON.
4. Measure the voltage between electronic wastegate valve connector and engine ground.
   Connector & terminal
   (E121) No. 1 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 5.
No	Repair the following item. • Open circuit in harness between ECM connector and electronic wastegate valve connector • Poor contact of ECM connector • Poor contact of J/C

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and electronic wastegate valve connector.
   Connector & terminal
   (E51) No. 37 — (E121) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and electronic wastegate valve connector.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(E51) No. 37 — 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 electronic wastegate valve connector.

7. CHECK FOR POOR CONTACT.

Check for poor contact in ECM and electronic wastegate valve connector.

Is there poor contact in ECM or electronic wastegate valve connector?

Yes	Repair the poor contact of ECM or electronic wastegate valve connector.
No	Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit of electronic wastegate valve.
Judge as NG if out of specification.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

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	Less than 0.455 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 P2565 TURBOCHARGER BOOST CONTROL POSITION SENSOR "A" CIRCUIT HIGH

1. —

DTC detecting condition:

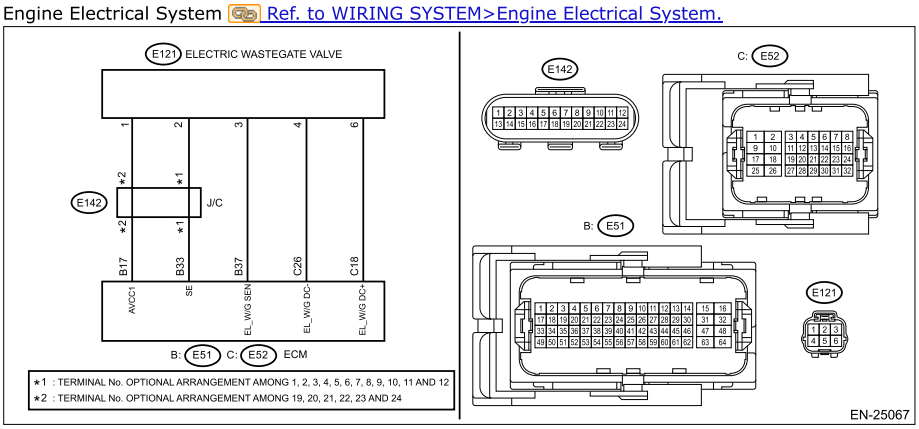
Immediately at fault recognition

Trouble symptom:

- Poor driving performance
- Poor acceleration

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:

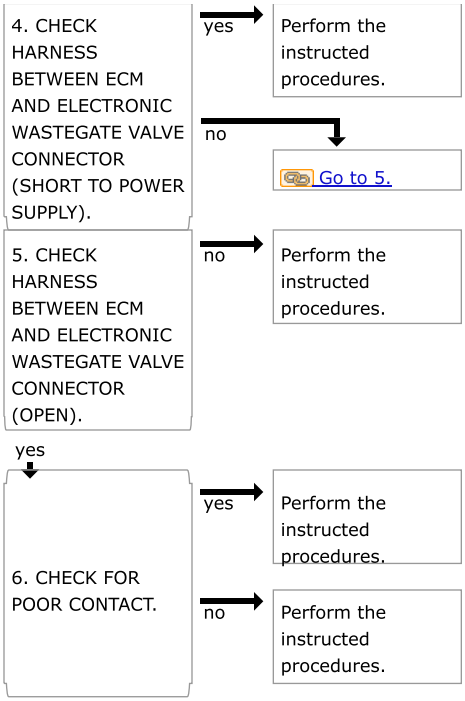
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DATA MONITOR.	no →	Perform the instructed procedures.

yes ↓



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B4 displayed? (Current code)

Yes	Check for DTC P06B4. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B4 SENSOR POWER SUPPLY "B" CIRCUIT LOW.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P06B5 displayed? (Current code)

Yes	Check for DTC P06B5. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P06B5 SENSOR POWER SUPPLY "B" CIRCUIT HIGH.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Electric Waste Gate Valve Actual Position Value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Electric Waste Gate Valve Actual Position Value] 16 [mm] (0.63 in) or more?

Yes — Go to 4.

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.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from electronic wastegate valve.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [Electric Waste Gate Valve Actual Position Value].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is the value of [Electric Waste Gate Valve Actual Position Value] 16 [mm] (0.63 in) or more?

Yes — Repair the power supply short circuit of harness between ECM connector and electronic wastegate valve connector.

No — Go to 5.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC WASTEGATE VALVE CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between electronic wastegate valve connector and engine ground.
   Connector & terminal
   (E121) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between ECM connector and electronic wastegate valve connector
- Poor contact of ECM connector
- Poor contact of J/C

6. CHECK FOR POOR CONTACT.

Check for poor contact in electronic wastegate valve connector.

Is there poor contact in electronic wastegate valve connector?

Yes — Repair the poor contact of electronic wastegate valve connector.

No — Replace the turbocharger. Ref. to INTAKE (INDUCTION)(H4DOTC)>Turbocharger.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the open or short circuit of electronic wastegate valve.
Judge as NG if out of specification.

EXECUTION CONDITION

Secondary parameters	Execution condition
None	

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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	More than 4.682 V

Time needed for diagnosis: 520 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2610 displayed? (Current code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
This diagnosis consists of the following eight cases. Judge as NG when in any one of the following cases, abnormality is detected.

Monitor 1	Detects communication error between CPU and wake-up timer.
Monitor 2	Detects communication error between CPU and main relay off timer.
Monitor 3	Confirms the wake-up timing accuracy using the main relay off timer and wake-up timer. Detects malfunction if difference is large.
Monitor 4	Detects malfunction if the main relay off timer is not activated.
Monitor 5	Detects malfunction if the main relay off timer cannot be initialized.
Monitor 6	Detects communication error between CPU and wake-up timer.
Monitor 7	Detects communication error between CPU and main relay off timer.

Monitor 8	Confirms the wake-up timing accuracy using the main relay off timer and wake-up timer. Detects malfunction if difference is large.

COMPONENT DESCRIPTION

The wake-up timer and the main relay off timer are built into the ECM.

EXECUTION CONDITION

<Monitor 1, 2, 3>

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

<Monitor 4, 5, 6, 7, 8>

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Wake-up experience flag	OFF

GENERAL DRIVING CYCLE

Monitor 1, 2, 3:

Perform the diagnosis only once when wake-up operates after the ignition switch is OFF.

Monitor 4, 5, 6, 7, 8:

Perform the diagnosis only once when the following driving cycle starts after the ignition switch is OFF.

DIAGNOSTIC METHOD

Judgment value <Monitor 1>

Malfunction Criteria	Threshold Value
Wake-up timer response to the CPU request command	Error

Judgment value <Monitor 2>

Malfunction Criteria	Threshold Value
Main relay off timer response to the CPU request command	Error

Judgment value <Monitor 3>

Malfunction Criteria	Threshold Value
|(Main relay off timer) − (Wake-up request time)| / Wake-up request time	More than 0.24

Judgment value <Monitor 4>

Malfunction Criteria	Threshold Value
Main relay off timer response to the CPU power ON command	No response

Judgment value <Monitor 5>

Malfunction Criteria	Threshold Value
Main relay off timer	Initialization error

Judgment value <Monitor 6>

Malfunction Criteria	Threshold Value
Wake-up timer response to the CPU request command	Error

Judgment value <Monitor 7>

Malfunction Criteria	Threshold Value
Main relay off timer response to the CPU power ON command	Error

Judgment value <Monitor 8>

Malfunction Criteria	Threshold Value
{(Main relay off timer) − (Wake-up request time)} / Wake-up request time	More than 0.24

Time needed for diagnosis

Monitor 1, 2, 6, and 7: 2 s
Monitor 3 and 8: Less than 1 s
Monitor 4: 1 second
Monitor 5: 100 times

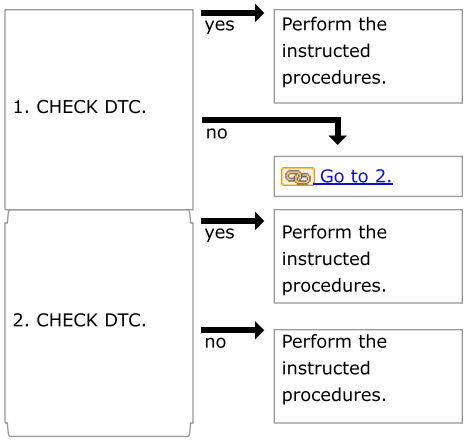
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2B00 CYLINDER 1 INJECTION PULSE PERFORMANCE

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2B00, P2B01, P2B02, P2B03, P2B08, P2B09, P2B0A and P2B0B displayed? (Current code or history code)

Yes — Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK DTC.

Perform the inspection mode S. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Is any of DTC P2B00, P2B01, P2B02 or P2B03 displayed? (Current code)

Yes — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect that injection is not performed according to the injection timing and injection stage specified by ECM CPU.
Judge as NG when the number of detection at the predetermined engine speed is outside of the judgment value.

COMPONENT DESCRIPTION
CPU is built into the ECM.

EXECUTION CONDITION
Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Vehicle speed	Less than 3000 rpm
Fuel system status	Not during fuel cut
Following condition A or B is met	

Secondary parameters	Execution condition
A: Throttle position	0.312% or more
B: Integrated value of intake air amount	Value of Map or more

Map

Coolant temperature at first engine start (°C (°F))	-40 (-40)	50 (122)	60 (140)	70 (158)	75 (167)	100 (212)	110 (230)
Integrated value of intake air amount (g (oz))	1333 (47.01)	1333 (47.01)	1267 (44.69)	1000 (35.27)	250 (8.82)	0 (0)	0 (0)

GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Diagnosis 1

Malfunction Criteria	Threshold Value
Injection status was detected before CPU output injection command	TRUE

Diagnosis 2

Malfunction Criteria	Threshold Value
Injection timing delay	1.5 ms or more

Time needed for diagnosis: Time until 10 errors are detected during 100 revolutions (not during CSERS (Cold Start Emission Reduction Strategy))
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B01 CYLINDER 2 INJECTION PULSE PERFORMANCE

Note:
For the diagnostic procedure and detection standard, refer to DTC P2B00. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B00 CYLINDER 1 INJECTION PULSE PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B02 CYLINDER 3 INJECTION PULSE PERFORMANCE

Note:
For the diagnostic procedure and detection standard, refer to DTC P2B00. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B00 CYLINDER 1 INJECTION PULSE PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B03 CYLINDER 4 INJECTION PULSE PERFORMANCE

Note:
For the diagnostic procedure and detection standard, refer to DTC P2B00. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B00 CYLINDER 1 INJECTION PULSE PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B08 COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.

2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC other than P2B00, P2B01, P2B02, P2B03, P2B08, P2B09, P2B0A and P2B0B displayed? (Current code or history code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DTC.

Perform the inspection mode H. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.

Is any of DTC P2B08, P2B09, P2B0A or P2B0B displayed? (Current code)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect that injection at cold start is not performed according to the injection timing and injection stage specified by ECM CPU.
Judge as NG when the number of detection at the predetermined engine speed is outside of the judgment value.

COMPONENT DESCRIPTION

CPU is built into the ECM.

EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Throttle position	Less than 0.312%
Integrated value of intake air amount	Less than value of Map
Vehicle speed	Less than 3000 rpm
Fuel system status	Not during fuel cut

Map

Coolant temperature at first engine start (°C (°F))	-40 (-40)	50 (122)	60 (140)	70 (158)	75 (167)	100 (212)	110 (230)
Integrated value of intake air amount (g (oz))	1333 (47.01)	1333 (47.01)	1267 (44.69)	1000 (35.27)	250 (8.82)	0 (0)	0 (0)

GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established at cold start.

DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Diagnosis 1

Malfunction Criteria	Threshold Value
Injection status was detected before CPU output injection command	TRUE

Diagnosis 2

Malfunction Criteria	Threshold Value
Injection timing delay	1.5 ms or more

Time needed for diagnosis: Time until 10 errors are detected during 100 revolutions (during CSERS (Cold Start Emission Reduction Strategy))
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B09 COLD START CYLINDER 2 INJECTION PULSE PERFORMANCE

Note:
For the diagnostic procedure and detection standard, refer to DTC P2B08. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B08 COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B0A COLD START CYLINDER 3 INJECTION PULSE PERFORMANCE

Note:
For the diagnostic procedure and detection standard, refer to DTC P2B08. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B08 COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2B0B COLD START CYLINDER 4 INJECTION PULSE PERFORMANCE

Note:
For the diagnostic procedure and detection standard, refer to DTC P2B08. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2B08 COLD START CYLINDER 1 INJECTION PULSE PERFORMANCE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS 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 or more

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

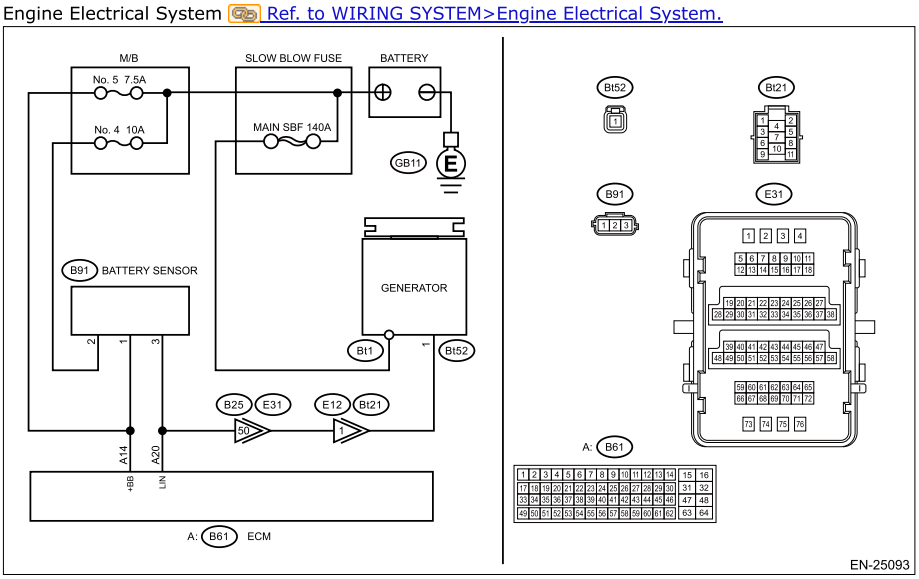
Malfunction Criteria	Threshold Value
CAN bus condition	Bus off

Time needed for diagnosis: 436 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0077 LIN COMMUNICATION BUS "ECM/PCM" OFF

1. —

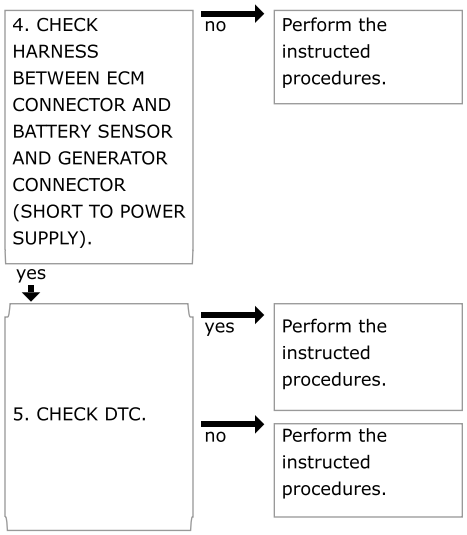
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS BETWEEN ECM CONNECTOR AND BATTERY SENSOR AND GENERATOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN ECM CONNECTOR AND BATTERY SENSOR AND GENERATOR CONNECTOR (SHORT TO GROUND).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U0077 displayed? (Current code)

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 CONNECTOR AND BATTERY SENSOR AND GENERATOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from battery sensor.
4. Disconnect the connector from the generator.
5. Measure the resistance of harness between ECM connector and battery sensor connector and generator connector.
   Connector & terminal
   (B61) No. 20 — (B91) No. 3:
   (B61) No. 20 — (Bt52) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the following item. • Open circuit in harness between ECM connector and battery sensor connector • Open circuit of harness between ECM connector and generator connector • Poor contact of coupling connector

3. CHECK HARNESS BETWEEN ECM CONNECTOR AND BATTERY SENSOR AND GENERATOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(B61) No. 20 — Engine ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair the following item.
- Short circuit to ground in harness between ECM connector and battery sensor connector
- Short circuit to ground in harness between ECM connector and generator connector

4. CHECK HARNESS BETWEEN ECM CONNECTOR AND BATTERY SENSOR AND GENERATOR CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B61) No. 20 — Engine ground:

Is the voltage less than 1 V?

Yes — Go to 5.

No — Repair the following item.
- Short circuit to power supply in harness between ECM connector and battery sensor connector
- Short circuit to power supply in harness between ECM connector and generator connector

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U0077 displayed? (Current code)

Yes — Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect malfunction of LIN communication.
Judge as NG when the data sent/received via LIN communication is abnormal.

COMPONENT DESCRIPTION
LIN communication is used to send/receive the data between ECM, battery sensor, and generator.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE
Always perform the diagnosis continuously.

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
LIN bus condition	Bus off

Time needed for diagnosis: 1500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U007B CONTROL MODULE COMMUNICATION BUS "I" 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 or more

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: Does not illuminate even when 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 CAN communication failure between TCM, VDC CM and combination meter 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 or more

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.**
- **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.**
- **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 or more

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: 500 ms
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.**
- **For the detection standard, refer to DTC U0402. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>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

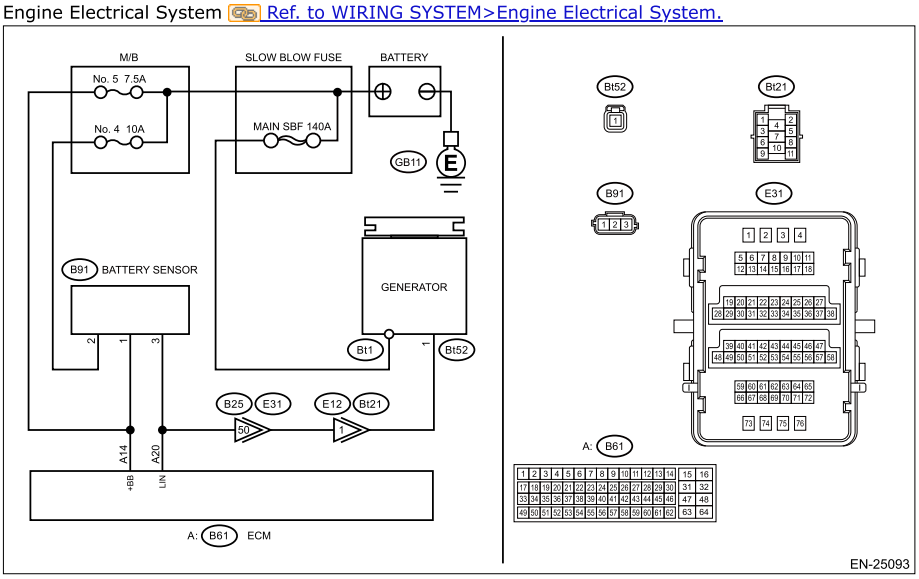
Note:
- **For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**
- **For the detection standard, refer to DTC U0402. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.**

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1712 LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE

1. —

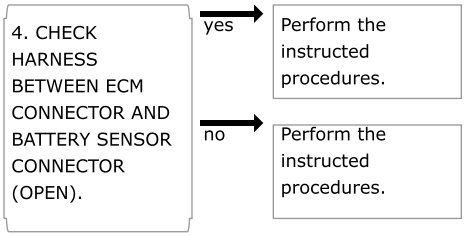
DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK ECM CONNECTOR.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN BATTERY AND BATTERY SENSOR CONNECTOR (OPEN).	no →	Perform the instructed procedures.
yes ↓		



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U1712 displayed? (Current code)

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.

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

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 (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > 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 — (B91) No. 1:
Positive cable terminal — (B91) No. 2:

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 CONNECTOR AND BATTERY SENSOR CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and battery sensor connector.

Connector & terminal
(B91) No. 3 — (B61) No. 20:

Is the resistance less than 1 Ω?

Yes — Repair the poor contact of ECM connector or battery sensor connector.

No — Repair the open circuit in harness between ECM connector and battery sensor connector.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.
Judge as NG when LIN communication failure has occurred with the battery sensor.

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.

(Common specifications)

Communication protocol: LIN 2.0
Communication speed: 19.2 kbps

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

GENERAL DRIVING CYCLE

Perform the diagnosis every time after the enable conditions have been established.

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

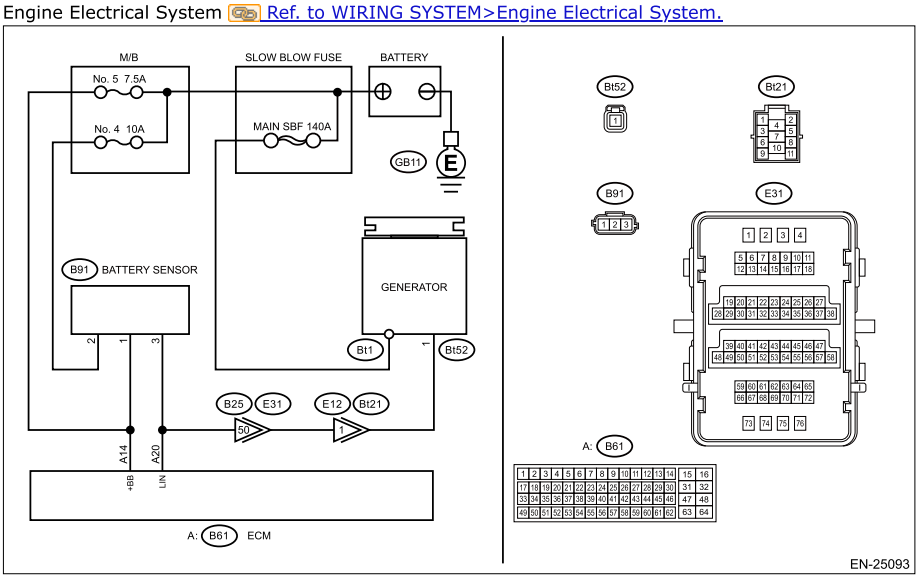
Malfunction Criteria	Threshold Value
Data received from control modules connected to LIN	No change Or, Checksum error

Time needed for diagnosis: 7 s
Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

DTC U171F LOST LIN COMMUNICATION WITH GENERATOR

1. —

DTC detecting condition:
Immediately at fault recognition
Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System.



Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK ECM CONNECTOR.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK VOLTAGE OF GENERATOR TERMINAL B.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HARNESS BETWEEN ECM AND GENERATOR CONNECTOR (OPEN).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U171F displayed? (Current code)

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 TERMINAL B.

1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Measure the voltage of the generator terminal B.
   Connector & terminal
   Generator terminal B (+) — Engine ground (−):

Is the voltage battery voltage?

Yes	Go to 4.
No	Check the generator terminal B harness and fuse.

4. CHECK HARNESS BETWEEN ECM AND GENERATOR CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the LIN communication connector from the generator.
3. Measure the resistance of the harness between ECM connector and generator LIN communication connector.
   Connector & terminal
   (B61) No. 20 — (Bt52) No. 1:

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(H4DOTC)>Generator.
No	Repair the following item. • Open circuit of harness between ECM connector and generator • Poor contact of coupling connector

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.
Judge as NG if LIN communication failure has occurred with the generator.

COMPONENT DESCRIPTION

LIN communication is a network used for sending/receiving data between the control modules connected by LIN communication system.

EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
LIN communication schedule	Normal schedule

GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

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 Or, Internal malfunction flag of generator (communication malfunction warning)	No change Or, Checksum error ON

Time needed for diagnosis: 2000 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

LIST

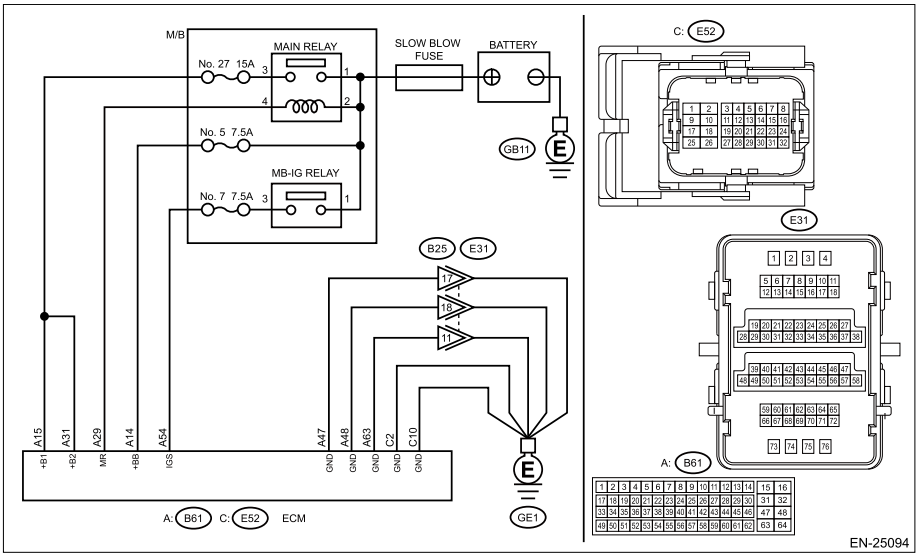
1. LIST

Note:
Malfunction of parts other than those listed is also possible. Ref. to MECHANICAL(H4DOTC)>Symptoms and causes.

Symptoms	Item	Reference
Engine does not start **Note:** **Perform the diagnosis in the numerical order on the right.**	1. Check fuel level	Check the fuel level.
	2. Check immobilizer	With Telematics: Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ENGINE WILL NOT START.
		Without keyless access with push button start system: Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.
		With keyless access with push button start system: Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Basic Diagnostic Procedure.
	3. Check ECM power supply and ground line	Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostics with Phenomenon>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
	4. Inspection of starter motor circuit	Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.
	5. Inspection of ignition control system	Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.
	6. Inspection of fuel pump circuit	Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
	7. Inspection of fuel injector circuit	Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostics with Phenomenon>FUEL INJECTOR CIRCUIT.
Brake override does not operate	Check brake override system	Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostics with Phenomenon>CHECK BRAKE OVERRIDE SYSTEM.

CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Check the main relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Main Relay>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the main relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Main Relay.

2. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(B61) No. 47 — Engine ground:
(B61) No. 48 — Engine ground:
(B61) No. 63 — Engine ground:
(E52) No. 2 — Engine ground:
(E52) No. 10 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the following item. • Open circuit of harness between ECM connector and engine ground • Poor contact of coupling connector

3. CHECK INPUT VOLTAGE OF ECM (SHORT TO GROUND).

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

Connector & terminal

(B61) No. 14 (+) — Engine ground (−):
(B61) No. 54 (+) — Engine 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 M/B (MAIN RELAY) INPUT VOLTAGE.

Measure the voltage between M/B (main relay) terminal and engine ground.

Terminals

No. 1 (+) — Engine ground (−):
No. 2 (+) — Engine 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. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(B61) No. 29 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 6.

No — Repair the open circuit of harness between ECM connector and M/B (main relay) terminal.

6. CHECK INPUT VOLTAGE OF ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(B61) No. 15 (+) — Engine ground (−):
(B61) No. 31 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Check the starter motor circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.

No — Repair the following item.

- Open circuit of harness between ECM connector and M/B (main relay)
- Poor contact of M/B (main relay)
- Blown out of fuse
- Poor contact of ECM connector

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

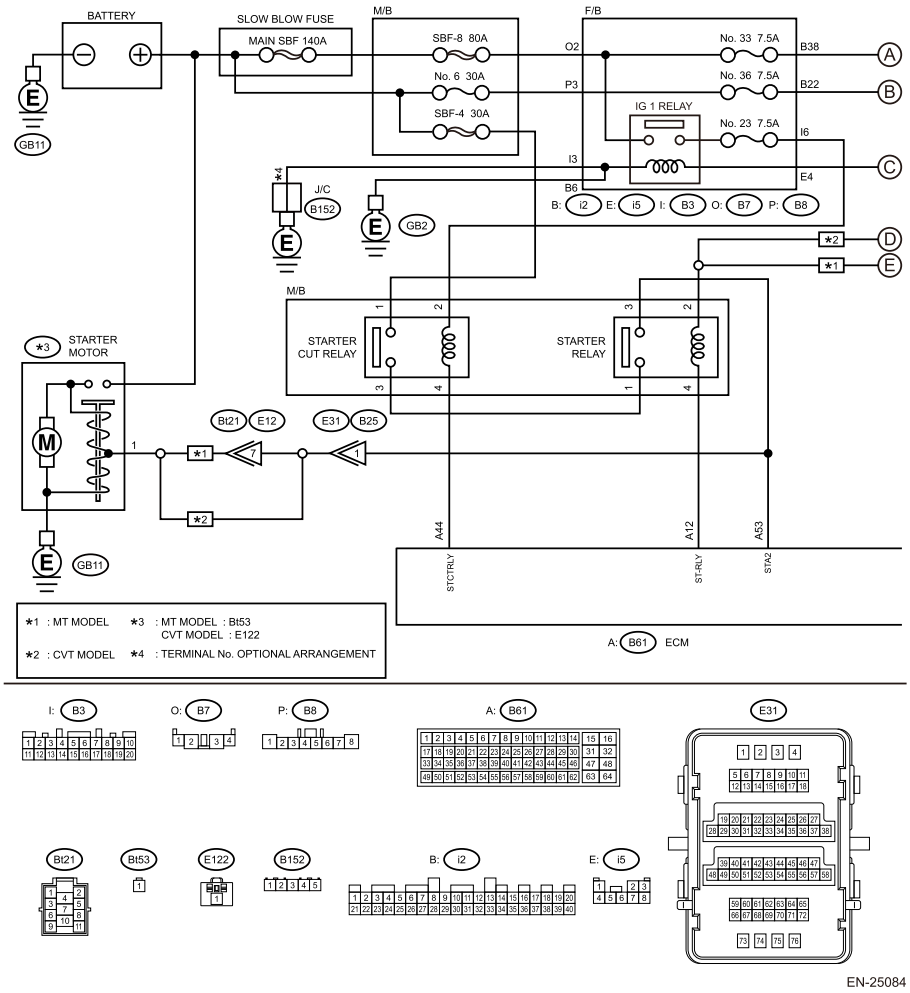
ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics with Phenomenon

STARTER MOTOR CIRCUIT

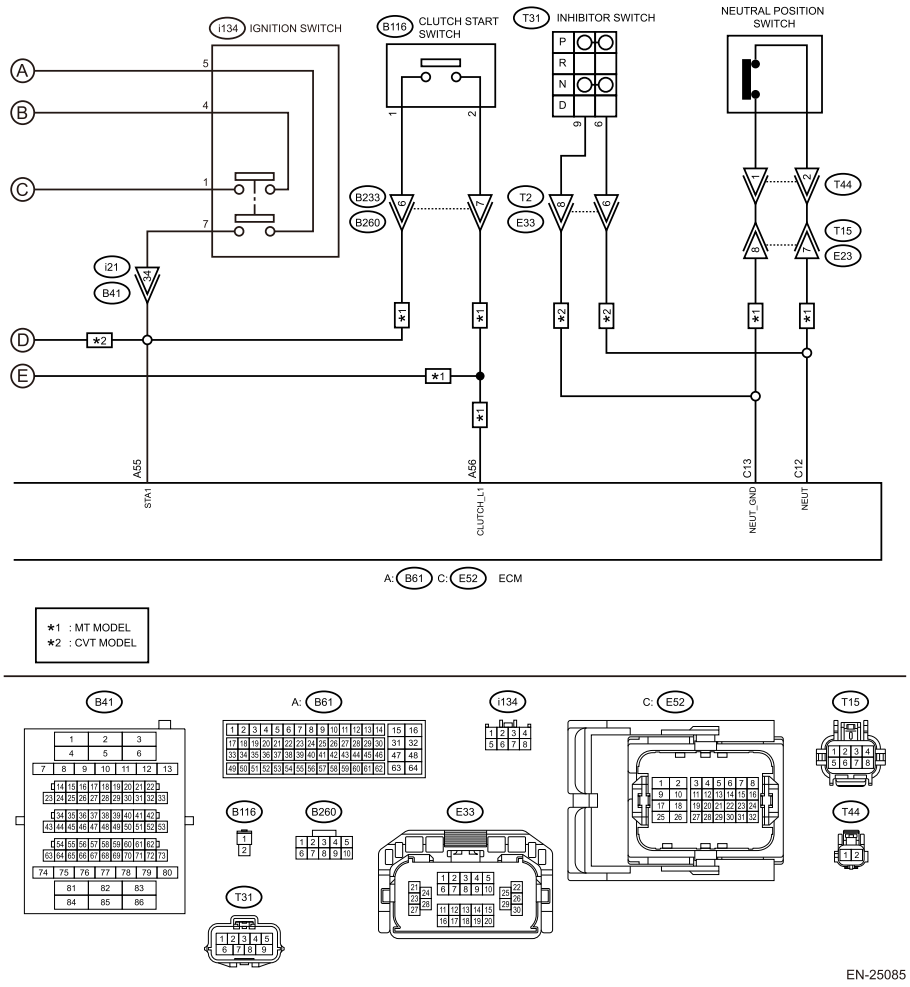
1. MODEL WITHOUT PUSH BUTTON START

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



EN-25084



EN-25085

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK BATTERY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK OPERATION OF STARTER MOTOR.
   - no → Go to 4.
   - yes ↓
3. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.
4. CHECK INPUT SIGNAL FOR STARTER MOTOR.
   - yes → Perform the instructed procedures.
   - no → Go to 5.

5. CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.
no → Perform the instructed procedures.
yes ↓

6. CHECK IGNITION SWITCH.
no → Perform the instructed procedures.
yes ↓

7. CHECK INPUT VOLTAGE OF IG1 RELAY.
no → Perform the instructed procedures.
yes ↓

8. CHECK IG1 RELAY GROUND CIRCUIT.
no → Perform the instructed procedures.
yes ↓

9. CHECK IG1 RELAY.
no → Perform the instructed procedures.
yes ↓

10. CHECK INPUT VOLTAGE OF STARTER CUT RELAY.
no → Perform the instructed procedures.
yes ↓

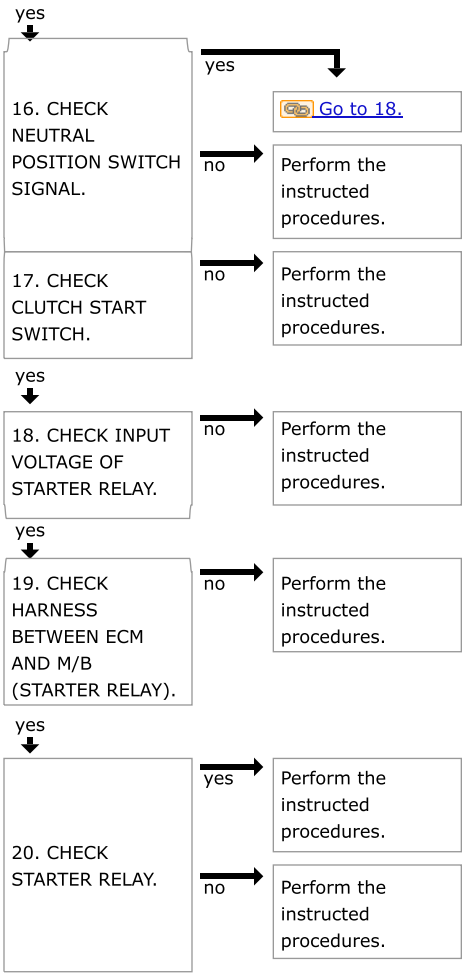
11. CHECK HARNESS BETWEEN ECM AND M/B (STARTER CUT RELAY).
no → Perform the instructed procedures.
yes ↓

12. CHECK STARTER CUT RELAY.
no → Perform the instructed procedures.
yes ↓

13. CHECK TRANSMISSION TYPE.
no → Go to 17.
yes ↓

14. CHECK INHIBITOR SWITCH.
no → Perform the instructed procedures.
yes ↓

15. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.
no → Perform the instructed procedures.



1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

2. CHECK OPERATION OF STARTER MOTOR.

Check the starter motor operation.

Does the starter motor operate?

Yes	Go to 3.
No	Go to 4.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Check ignition control system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>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. Measure the voltage between starter motor connector and engine ground with the ignition switch set to START position.
   Connector & terminal
   CVT model
   (E122) No. 1 (+) — Engine ground (−):
   MT model
   (Bt53) No. 1 (+) — Engine ground (−):

Note:
- **For CVT model, place the select lever in "P" range or "N" range.**
- **For MT model, depress the clutch pedal.**

Is the voltage 10 V or more?

Yes	Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter>INSPECTION.
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 voltage between ignition switch connector and chassis ground.
   Connector & terminal
   (i134) No. 4 (+) — Chassis ground (−):
   (i134) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Repair the following item. • Open or short circuit to ground in harness between battery and ignition switch connector • Blown out of fuse • Poor contact of F/B connector • Replacement of F/B • Replace M/B

6. CHECK IGNITION SWITCH.

Measure the resistance between ignition switch terminals after turning the ignition switch to START position.

Terminals

No. 4 — No. 1:

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 IG1 RELAY.

1. Turn the ignition switch to OFF.
2. Remove the IG1 relay.
3. Connect the connector to ignition switch.
4. Turn the ignition switch to ON.
5. Measure the voltage between F/B (IG1 relay) connector and chassis ground.

Connector & terminal

(B7) No. 2 (+) — Chassis ground (−):

(i5) No. 4 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 8.

No — Repair the following item.

- Open harness between F/B (IG1 relay) connector and ignition switch connector
- Open circuit of the harness between M/B and F/B (IG1 relay) connector
- Blown out of fuse

8. CHECK IG1 RELAY GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance in harness between F/B (IG1 relay) connector and chassis ground.

Connector & terminal

(B3) No. 3 — Chassis ground:

(i2) No. 6 — Chassis ground:

Is the resistance less than 5 Ω?

Yes — Go to 9.

No — Repair the following item.

- Open circuit of the harness between F/B (IG1 relay) connector and chassis ground
- Poor contact of J/C

9. CHECK IG1 RELAY.

Check the IG1 relay. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes — Go to 10.

No — Replace the IG1 relay. Ref. to SECURITY AND LOCKS>Relay and Fuse.

10. CHECK INPUT VOLTAGE OF STARTER CUT RELAY.

1. Remove the starter cut relay.
2. Install the IG1 relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between M/B (starter cut relay) terminals No. 1 and No. 2 and engine ground.

Terminals

No. 1 (+) — Engine ground (−):
No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 11.
No	Repair the following item. • Open circuit or short circuit to ground in harness between SBF-4 and M/B (starter cut relay) • Open circuit or short circuit to ground in harness between M/B (starter cut relay) and F/B (IG1 relay) connector • Blown out of fuse • Poor contact of F/B connector • Replacement of F/B • Replace M/B

11. CHECK HARNESS BETWEEN ECM AND M/B (STARTER CUT RELAY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and M/B (starter cut relay) terminal No. 4.

Connector & terminal

(B61) No. 44 — No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 12.
No	Repair the following item. • Open circuit in harness between ECM connector and M/B (starter cut relay) • Replace M/B

12. CHECK STARTER CUT RELAY.

Check the starter cut relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay>INSPECTION.

Is the check result OK?

Yes	Go to 13.
No	Replace the starter cut relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay>LOCATION.

13. CHECK TRANSMISSION TYPE.

Check the transmission type.

Is the transmission type CVT?

Yes	Go to 14.
No	Go to 17.

14. CHECK INHIBITOR SWITCH.

1. Place the select lever in "P" range or "N" range.
2. Disconnect the connector from inhibitor switch.
3. Measure the resistance between inhibitor switch terminals.

Terminals

No. 6 — No. 9:

Is the resistance less than 1 Ω?

Yes — Go to 15.

No — Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Inhibitor Switch.

15. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

Measure the resistance of harness between ECM connector and inhibitor switch connector.

Connector & terminal

(E52) No. 12 — (T31) No. 6:

(E52) No. 13 — (T31) No. 9:

Is the resistance less than 1 Ω?

Yes — Go to 16.

No — Repair the following item.

- Open circuit in harness between ECM connector and inhibitor switch connector
- Poor contact of coupling connector

16. CHECK NEUTRAL POSITION SWITCH SIGNAL.

1. Connect all relays and connectors to their proper positions.
2. Turn the ignition switch to ON.
3. Place the select lever in "P" range or "N" range.
4. Using the Subaru Select Monitor, read the value in [Neutral Position Switch].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Is [Neutral] displayed?

Yes — Go to 18.

No — Repair the poor contact of ECM connector.

17. CHECK CLUTCH START SWITCH.

Check the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSPECTION > CLUTCH START SWITCH.

Is the check result OK?

Yes — Go to 18.

No — Replace the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch.

18. CHECK INPUT VOLTAGE OF STARTER RELAY.

1. Turn the ignition switch to OFF.
2. Remove the starter relay.
3. Turn the ignition switch to START position, and measure the voltage between M/B (starter relay) terminal No. 1 and No. 2 and engine ground.

Terminals

No. 1 (+) — Engine ground (−):
No. 2 (+) — Engine ground (−):

Note:
- **For CVT model, place the select lever in "P" range or "N" range.**
- **For MT model, depress the clutch pedal.**

Is the voltage 10 V or more?

Yes	Go to 19.
No	Repair the following item. • Open circuit in harness between M/B (starter relay) and M/B (starter cut relay) • Open circuit in harness between M/B (starter relay) and ignition switch connector (CVT model) • Open circuit in harness between M/B (starter relay) and clutch start switch connector (MT model) • Poor contact of coupling connector • Poor contact of the clutch start switch connector (MT model)

19. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and M/B (starter relay) terminal No. 4.

Connector & terminal

(B61) No. 12 — No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 20.
No	Repair the following item. • Open circuit in harness between ECM connector and M/B (starter relay) • Replace M/B

20. CHECK STARTER RELAY.

Check the starter relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay>INSPECTION.

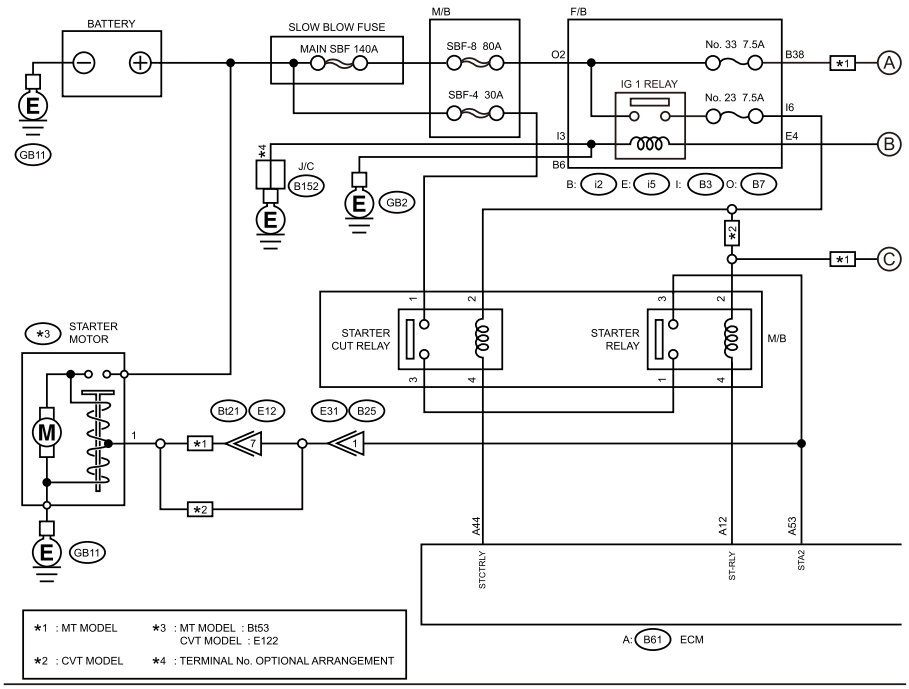
Is the check result OK?

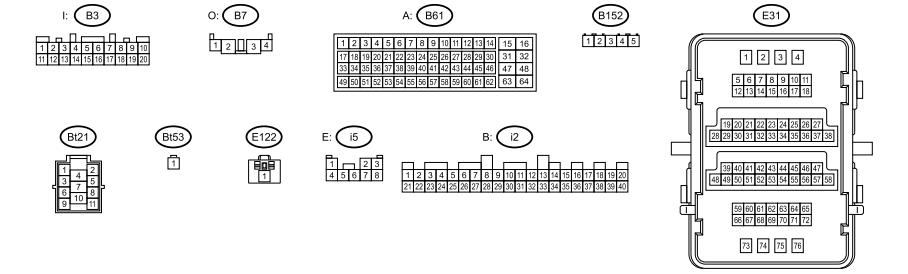
Yes	Check the following item and repair if necessary. • Open circuit of harness between M/B (starter relay) and starter motor connector • Poor contact of coupling connector
No	Replace the starter relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

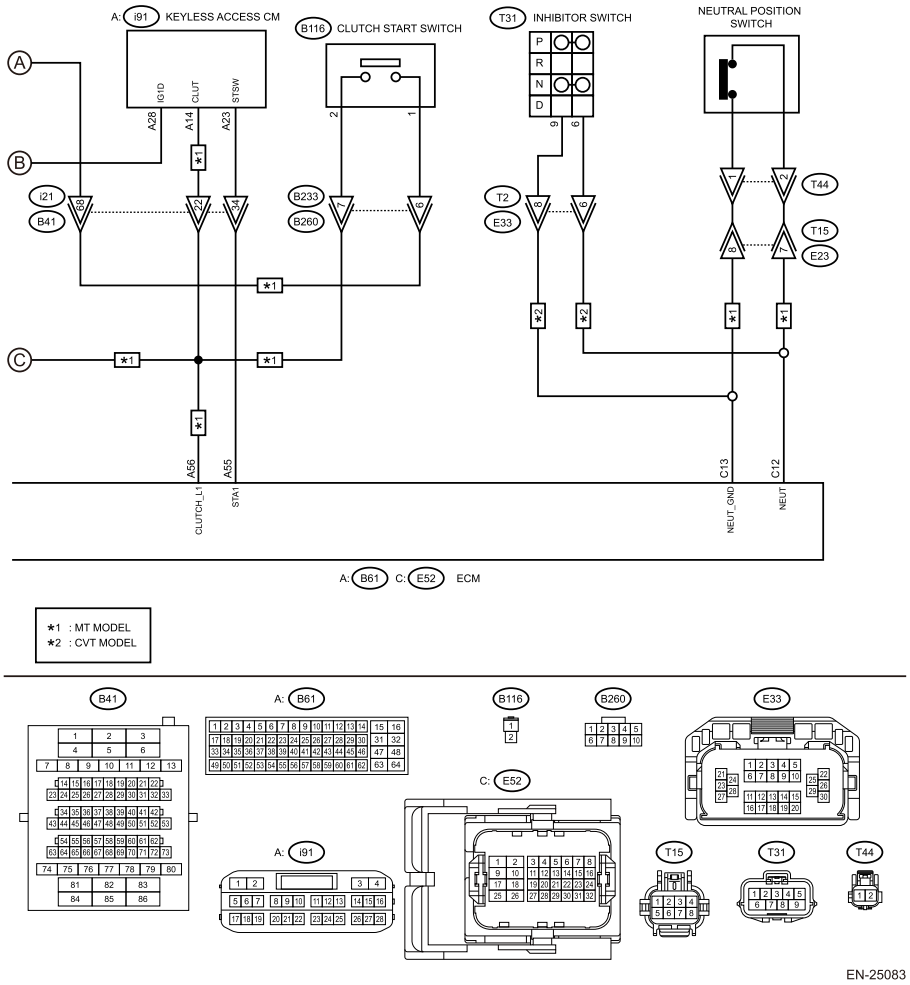
2. MODEL WITH PUSH BUTTON START

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


BATTERY
SLOW BLOW FUSE
MAIN SBF 140A
M/B
SBF-8 80A
SBF-4 30A
F/B
O2
No. 33 7.5A
B38
IG 1 RELAY
No. 23 7.5A
I6
I3
E4
B6
B: i2 E: i5 I: B3 O: B7
GB11
J/C
B152
GB2
*1
*2
*3
*4
STARTER MOTOR
STARTER CUT RELAY
STARTER RELAY
M/B
Bt21 E12
E31 B25
A44
A12
A53
STCTRLY
ST-RLY
STA2
A: B61 ECM
*1 : MT MODEL
*2 : CVT MODEL
*3 : MT MODEL : Bt53
CVT MODEL : E122
*4 : TERMINAL No. OPTIONAL ARRANGEMENT


I: B3
O: B7
A: B61
B152
E31
Bt21
Bt53
E122
E: i5
B: i2

EN-25082



Caution:

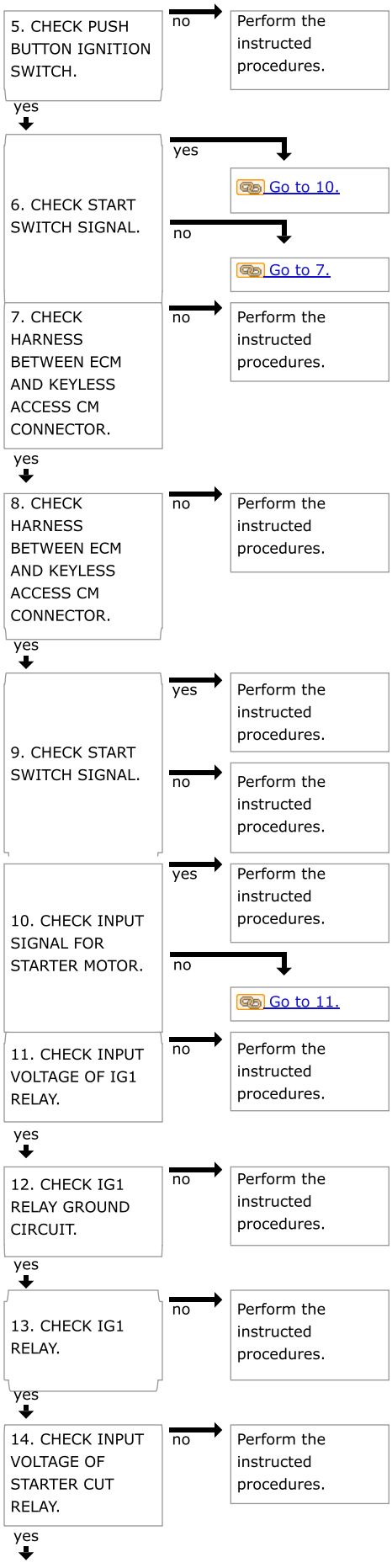
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK BATTERY.
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK OPERATION OF STARTER MOTOR.
   - no → Go to 4.
   - yes ↓

3. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

4. CHECK PUSH BUTTON IGNITION SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓


5. CHECK PUSH BUTTON IGNITION SWITCH.
no
Perform the instructed procedures.
yes
6. CHECK START SWITCH SIGNAL.
yes
Go to 10.
no
Go to 7.
7. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM CONNECTOR.
no
Perform the instructed procedures.
yes
8. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM CONNECTOR.
no
Perform the instructed procedures.
yes
9. CHECK START SWITCH SIGNAL.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
10. CHECK INPUT SIGNAL FOR STARTER MOTOR.
yes
Perform the instructed procedures.
no
Go to 11.
11. CHECK INPUT VOLTAGE OF IG1 RELAY.
no
Perform the instructed procedures.
yes
12. CHECK IG1 RELAY GROUND CIRCUIT.
no
Perform the instructed procedures.
yes
13. CHECK IG1 RELAY.
no
Perform the instructed procedures.
yes
14. CHECK INPUT VOLTAGE OF STARTER CUT RELAY.
no
Perform the instructed procedures.
yes

15. CHECK HARNESS BETWEEN ECM AND M/B (STARTER CUT RELAY).
no → Perform the instructed procedures.

yes

16. CHECK STARTER CUT RELAY.
no → Perform the instructed procedures.

yes

17. CHECK INPUT VOLTAGE OF STARTER RELAY.
no → Perform the instructed procedures.

yes

18. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY).
no → Perform the instructed procedures.

yes

19. CHECK STARTER RELAY.
yes → Perform the instructed procedures.
no → Perform the instructed procedures.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes — Go to 2.

No — Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

2. CHECK OPERATION OF STARTER MOTOR.

Check the starter motor operation.

Does the starter motor operate?

Yes — Go to 3.

No — Go to 4.

3. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Check the appropriate DTC using the "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Check ignition control system. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>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. (CVT model)**
- **Release the clutch pedal. (MT model)**

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)>Diagnostics with Phenomenon>LIST.

5. CHECK PUSH BUTTON IGNITION SWITCH.

1. Depress the brake pedal (CVT model) or clutch pedal (MT model).

   Note:
   For CVT model, position the select lever in "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>LIST.

6. CHECK START SWITCH SIGNAL.

1. Using the Subaru Select Monitor, read the value in [Starter Switch].

   Note:
   For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.
2. Press the push button ignition switch once with the brake pedal depressed.

Does the value of [Starter Switch] change according to push button ignition switch operation?

Yes	Go to 10.
No	Go to 7.

7. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM CONNECTOR.

1. Turn the ignition switch 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
   (B61) No. 55 — (i91) No. 23:

Is the resistance less than 1 Ω?

Yes — Go to 8.

No — Repair the following item.
- Open circuit of harness between ECM connector and keyless access CM connector
- Poor contact of coupling connector

8. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM CONNECTOR.

Measure the resistance between the ECM connector and engine ground.
Connector & terminal
(B61) No. 55 (+) — Engine ground (−):

Is the resistance 1 MΩ or more?

Yes — Go to 9.

No — Repair the short circuit to ground in harness between ECM connector and keyless access CM connector.

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 (CVT model) or clutch pedal (MT model) depressed.
   Connector & terminal
   (B61) No. 55 (+) — Engine 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 switch to OFF.
2. Disconnect the connector from starter motor.
3. Set the select lever in "P" range or "N" range (CVT model), or the shift lever in neutral. (MT model)
4. Press the push button ignition switch once with the brake pedal (CVT model) or clutch pedal (MT model) depressed.
5. Measure the voltage between the starter motor connector and the engine ground.
   Connector & terminal
   CVT model
   (E122) No. 1 (+) — Engine ground (−):
   MT model
   (Bt53) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter>INSPECTION.

No — Go to 11.

11. CHECK INPUT VOLTAGE OF IG1 RELAY.

1. Turn the ignition switch to OFF.
2. Remove the IG1 relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between F/B (IG1 relay) connector and chassis ground.
   Connector & terminal
   (B7) No. 2 (+) — Chassis ground (−):
   (i5) No. 4 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 12.

No — Repair the following item.
- Open circuit or short circuit to ground in harness between F/B (IG1 relay) connector and keyless access CM connector
- Open circuit of the harness between M/B and F/B (IG1 relay) connector
- Blown out of fuse

12. CHECK IG1 RELAY GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance in harness between F/B (IG1 relay) connector and chassis ground.
   Connector & terminal
   (B3) No. 3 — Chassis ground:
   (i2) No. 6 — Chassis ground:

Is the resistance less than 5 Ω?

Yes — Go to 13.

No — Repair the following item.
- Open circuit of the harness between F/B (IG1 relay) connector and chassis ground
- Poor contact of J/C

13. CHECK IG1 RELAY.

Check the IG1 relay. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 14.
No	Replace the IG1 relay. Ref. to SECURITY AND LOCKS>Relay and Fuse.

14. CHECK INPUT VOLTAGE OF STARTER CUT RELAY.

1. Remove the starter cut relay.
2. Install the IG1 relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between M/B (starter cut relay) terminal No. 1 and No. 2 and engine ground.

Terminals

No. 1 (+) — Engine ground (−):
No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 15.
No	Repair the following item. • Open circuit or short circuit to ground in harness between SBF-4 and M/B (starter cut relay) • Open circuit or short circuit to ground in harness between M/B (starter cut relay) and F/B (IG1 relay) connector • Blown out of fuse • Poor contact of F/B connector • Replacement of F/B • Replace M/B

15. CHECK HARNESS BETWEEN ECM AND M/B (STARTER CUT RELAY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and M/B (starter cut relay) terminal No. 4.

Connector & terminal

(B61) No. 44 — No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 16.
No	Repair the following item. • Open circuit in harness between ECM connector and M/B (starter cut relay) • Replace M/B

16. CHECK STARTER CUT RELAY.

Check the starter cut relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay>INSPECTION.

Is the check result OK?

Yes	Go to 17.
No	Replace the starter cut relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay.

17. CHECK INPUT VOLTAGE OF STARTER RELAY.

1. Remove the starter relay.
2. Install the starter cut relay.
3. Connect the connector to ECM.
4. While depressing the brake pedal (CVT model) or clutch pedal (MT model), press the push button ignition switch once, and measure the voltage between M/B (starter relay) terminal No. 1 and No. 2 and engine ground.
   Terminals
   No. 1 (+) — Engine ground (−):
   No. 2 (+) — Engine ground (−):

Note:
For CVT model, position the select lever in "P" range.

Is the voltage 10 V or more?

Yes — Go to 18.

No — Repair the following item.
- Open circuit in harness between M/B (starter relay) and M/B (starter cut relay)
- Open circuit of the harness between M/B (starter relay) and F/B (IG1 relay) connector (CVT model)
- Open circuit in harness between M/B (starter relay) and clutch start switch connector (MT model)

18. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and M/B (starter relay) terminal No. 4.
   Connector & terminal
   (B61) No. 12 — No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 19.

No — Repair the following item.
- Open circuit in harness between ECM connector and M/B (starter relay)
- Replace M/B

19. CHECK STARTER RELAY.

Check the starter relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay>INSPECTION.

Is the check result OK?

Yes — Check the following item and repair if necessary.
- Open circuit of harness between M/B (starter relay) and starter motor connector
- Poor contact of coupling connector

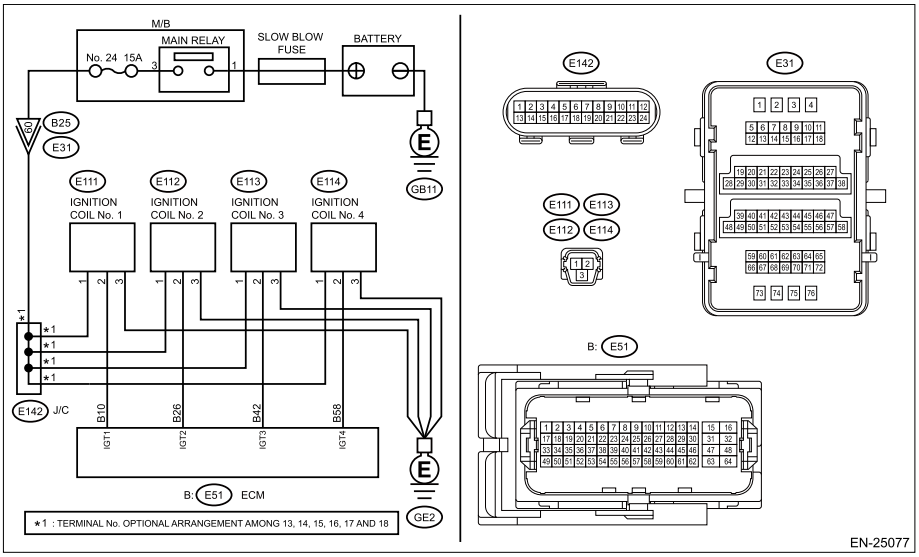
No — Replace the starter relay. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Starter Relay.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics with Phenomenon

IGNITION CONTROL SYSTEM

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK SPARK PLUG CONDITION.

Remove the spark plug, and check the condition. Ref. to IGNITION(H4DOTC)>Spark Plug>INSPECTION.

Is the check result OK?

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 with Phenomenon>FUEL PUMP CIRCUIT.

No — Go to 3.

3. CHECK IGNITION COIL POWER SUPPLY.

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

(E111) No. 1 (+) — Engine ground (−):
(E112) No. 1 (+) — Engine ground (−):
(E113) No. 1 (+) — Engine ground (−):
(E114) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Repair the following item.

- Open or short to ground in harness of power supply circuit
- Poor contact of coupling connector
- Poor contact of J/C
- Blown out of fuse

4. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

(E111) No. 3 — Engine ground:
(E112) No. 3 — Engine ground:
(E113) No. 3 — Engine ground:
(E114) No. 3 — 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 ground.

5. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

(E51) No. 10 — (E111) No. 2:
(E51) No. 26 — (E112) No. 2:
(E51) No. 42 — (E113) No. 2:
(E51) No. 58 — (E114) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit in harness between ECM connector and ignition coil connector.

6. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and engine ground.
Connector & terminal
(E51) No. 10 — Engine ground:
(E51) No. 26 — Engine ground:
(E51) No. 42 — Engine ground:
(E51) No. 58 — 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?

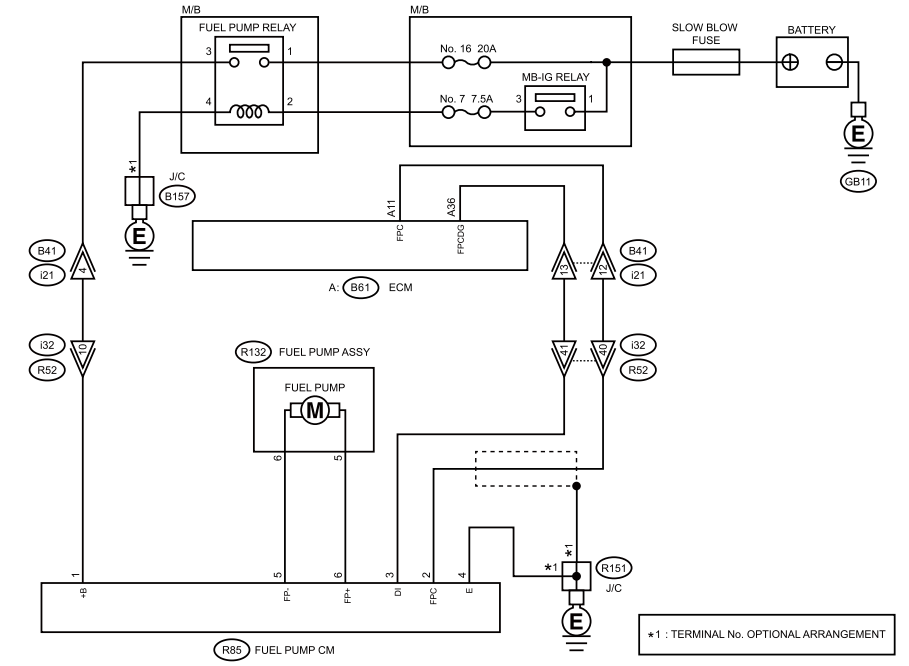
Yes	Repair the poor contact of ECM connector.
No	Replace the ignition coil. Ref. to IGNITION(H4DOTC)>Ignition Coil.

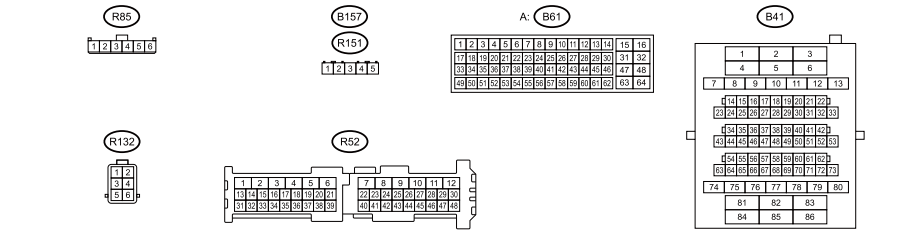
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics with Phenomenon

FUEL PUMP CIRCUIT

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





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Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

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)(H4DOTC)>Active Test.

Does the fuel pump emit operating sound?

Yes — Check the fuel injector circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostics with Phenomenon>FUEL INJECTOR CIRCUIT.

No — Go to 2.

2. CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from fuel pump control unit.
3. Measure the resistance of harness between fuel pump control unit connector and chassis ground.
   Connector & terminal
   (R85) 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 control unit connector and chassis ground.

3. CHECK FUEL PUMP CONTROL UNIT POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between fuel pump control unit connector and chassis ground.
   Connector & terminal
   (R85) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Go to 5.

4. CHECK OF FUEL PUMP.

1. Turn the ignition switch to OFF.
2. Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly>INSPECTION.

Is the check result OK?

Yes — Repair the poor contact of fuel pump control unit connector.

No — Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Assembly.

5. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND M/B (FUEL PUMP RELAY) (OPEN).

1. Remove the fuel pump relay.
2. Measure the resistance of harness between fuel pump control unit connector and M/B (fuel pump relay).
   Connector & terminal
   (R85) No. 1 — M/B (fuel pump relay) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the following item.
- Open circuit in harness between fuel pump control unit connector and M/B (fuel pump relay)
- Poor contact of coupling connector

6. CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND M/B (FUEL PUMP RELAY) (SHORT TO GROUND).

Measure the resistance of harness between fuel pump connector and M/B (fuel pump relay).
Connector & terminal
(R85) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit to ground in harness between fuel pump control unit connector and M/B (fuel pump relay).

7. CHECK FUEL PUMP RELAY.

Check the fuel pump relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Relay>INSPECTION.

Is the check result OK?

Yes — Go to 8.

No — Replace the fuel pump relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Pump Relay.

8. CHECK POWER SUPPLY OF M/B (FUEL PUMP RELAY).

1. Turn the ignition switch to ON.
2. Measure the voltage between M/B (fuel pump relay) and engine ground.
   Connector & terminal
   M/B (fuel pump relay) No. 1 (+) — Engine ground (−):
   M/B (fuel pump relay) No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes — Go to 9.

No — Repair the following item.
- Blown out of fuse
- Faulty MB-IG relay
- Poor contact of MB-IG relay

9. CHECK GROUND CIRCUIT OF M/B (FUEL PUMP RELAY) (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance in harness between M/B (fuel pump relay) terminal and engine ground.
   Connector & terminal
   M/B (fuel pump relay) No. 4 — Engine ground:

Is the resistance less than 5 Ω?

Yes — Repair the poor contact of fuel pump control unit connector.

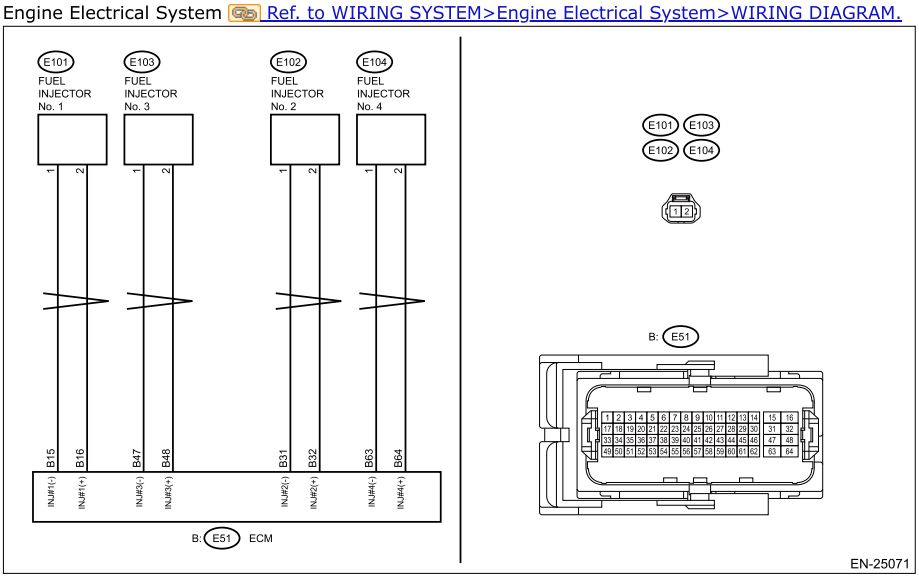
No — Repair the following item.
- Open circuit between M/B (fuel pump relay) and engine ground
- Poor contact of J/C

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

FUEL INJECTOR CIRCUIT

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

- **Check or repair only faulty parts.**
- **Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.**

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 (OPEN).

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 and fuel injector connector.

Connector & terminal

#1 (E51) No. 15 — (E101) No. 1:
#1 (E51) No. 16 — (E101) No. 2:
#2 (E51) No. 31 — (E102) No. 1:
#2 (E51) No. 32 — (E102) No. 2:
#3 (E51) No. 47 — (E103) No. 1:
#3 (E51) No. 48 — (E103) No. 2:
#4 (E51) No. 63 — (E104) No. 1:
#4 (E51) No. 64 — (E104) 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 (SHORT TO GROUND).

Measure the resistance between fuel injector connector and engine ground.

Connector & terminal

#1 (E101) No. 1 — Engine ground:
#1 (E101) No. 2 — Engine ground:
#2 (E102) No. 1 — Engine ground:
#2 (E102) No. 2 — Engine ground:
#3 (E103) No. 1 — Engine ground:
#3 (E103) No. 2 — Engine ground:
#4 (E104) No. 1 — Engine ground:
#4 (E104) No. 2 — Engine 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.

Is the check result OK?

Yes — Repair the poor contact of ECM connector.

No — Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Fuel Injector.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DOTC) > Diagnostics with Phenomenon

CHECK BRAKE OVERRIDE SYSTEM

Warning:
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.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of all systems using the Subaru Select Monitor or a general scan tool. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes — Check the appropriate DTC using the "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 "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Does the value of [Stop Light Switch] change according to brake pedal operation?

Yes — Go to 3.

No — Check the stop light switch and relevant harness, and repair the defective part or replace when necessary. Ref. to LIGHTING SYSTEM>Stop Light System.

3. CHECK BRAKE PEDAL.

Check the brake pedal. Ref. to BRAKE>Brake Pedal>INSPECTION.

Is the check result 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].

Note:
For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.

Do the values of [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] change according to accelerator pedal operation?

Yes — Go to 5.

No — Replace the accelerator pedal assembly. Ref. to SPEED CONTROL SYSTEMS(H4DOTC)>Accelerator Pedal.

5. READ DATA MONITOR.

Using Subaru Select Monitor, read the value of [Vehicle Speed] when driving at a constant vehicle speed of 16.1 km/h (10 MPH) or 64.4 km/h (40 MPH).

Warning:
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 allows the data during driving to be stored. The stored data can be checked after the driving.**
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**

Does the value of [Vehicle Speed] change widely?

Yes — Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

No — In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

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. For values, refer to "Data Monitor".)**
- **Even if the voltage difference between [Accel. Opening Angle] and the accelerator sensor No. 1 is large and the value of [Accel. Opening 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 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: Operated the brake pedal with the left foot while operating the accelerator pedal)**

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). Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
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
   (9) MODE $0A: Emission-related DTC (with Permanent Status)
4. Read out the data according to repair procedures. (For detailed operation procedures, refer to the general scan tool operation manual.)

Note:
For details concerning DTC, refer to "Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

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 is shown in the following table.

PID	Data	Unit
$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 (bank 1)	%
$07	Long term fuel trim (bank 1)	%
$0C	Engine speed	rpm
$0D	Vehicle speed	km/h
$0E	Ignition timing advance	°
$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	km
$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	km
$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
$62	Actual engine illustrated torque	%
$63	Engine reference torque	Nm
$65	Neutral status	—
$68	Intake air temperature	Celsius
$6D	Fuel pressure and target fuel pressure	kPa
$72	Actual wastegate opening angle and target wastegate opening angle	%
$87	Intake manifold absolute pressure	kPa
$8E	Engine friction torque	%
$9D	Engine fuel consumption and vehicle fuel consumption	g/s
$9E	Engine exhaust flow	kg/h
$A6	Vehicle Odometer	km

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 is shown in the following table.

PID	Data	Unit
$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)	%
$07	Long term fuel trim (bank 1)	%
$0C	Engine speed	rpm
$0D	Vehicle speed	km/h
$0E	Ignition timing advance	°
$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 %
$1F	Elapsed time after starting the engine	sec
$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	%
$33	Barometric pressure	kPa
$34	A/F value and A/F sensor current (bank 1 sensor 1)	— and mA
$3C	Catalyst temperature #1	Celsius
$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	%
$5C	Engine oil temperature	Celsius
$65	Neutral status	—
$68	Intake air temperature	Celsius
$6D	Fuel pressure and target fuel pressure	kPa
$72	Actual wastegate opening angle and target wastegate opening angle	%
$87	Intake manifold absolute pressure	kPa

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 "Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

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)

OPERATION

1. On [Start] screen, select [Generic OBDII].

2. On [Main Menu] screen, select [Each System].
3. On [Select System] screen, select [ECM-Engine Control] and then select [Enter].
4. On [Select Function] screen, select [On-board monitor test result].

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 "Help" of application.
- **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. (Used to check on-board monitor test results of DTC P000A, P000B, P000C, P000D, P0011, P0014, P0016, P0017, P0018, P0019, P0021 and P0024.)

List 1

OBDMID	TID	SID	Diagnostic item
$01	$84	$1E	A/F sensor range failure (bank 1 sensor 1)
	$85	$1E	
	$91	$20	A/F sensor response failure (bank 1 sensor 1)
	$92	$10	
	$A3	$20	
	$A4	$10	
	$AC	$10	
	$AD	$10	
	$AE	$10	
	$AF	$10	
	$CD	$20	
	$CF	$20	
$02	$05	$10	Oxygen sensor response failure (bank 1 sensor 2)
	$06	$10	
	$07	$0B	Oxygen sensor drop failure (bank 1 sensor 2)
	$08	$0B	
	$D1	$10	Oxygen sensor delay failure (bank 1 sensor 2)
	$D2	$10	
$21	$89	$3B	Catalyst deterioration diagnosis (bank 1)
$31	$BE	$17	EGR system diagnosis
	$BF	$17	
$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
	$C2	$FE	
	$C3	$FE	
	$C4	$FE	
	$C5	$FE	
	$C6	$35	
	$C7	$FE	
	$C8	$FE	
	$C9	$FE	
	$CA	$FE	

OBDMID	TID	SID	Diagnostic item
$3D	$E2	$FE	ELCM purge flow
	$EA	$FC	
	$EB	$FC	
	$EC	$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)
$81	$DB	$24	Imbalance diagnosis
	$DC	$24	Imbalance diagnosis
	$DD	$03	Imbalance diagnosis
	$DE	$03	Imbalance diagnosis
$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	

List 2

OBDMID	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 (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.

10. MODE $0A (EMISSION-RELATED DTC (WITH PERMANENT STATUS))

Refer to “Diagnostic Trouble Code (DTC)” for information about data denoting emission-related DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.

TRANSMISSION (DIAGNOSTICS)

TM(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Transmission Control Module (TCM) I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Active Test
12. Learning Control
13. All Readiness Diagnostic Code(s)
14. Diagnostic Trouble Code (DTC)
15. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
16. Diagnostic Procedure without Diagnostic Trouble Code (DTC)
17. Diagnostics with Phenomenon
18. General Scan Tool

PROCEDURE

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the Check List for Interview. 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 test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Stall Test.
   - Secondary pressure test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Test.
   - Line pressure test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Line Pressure Test.
   - Transfer clutch pressure test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transfer Clutch Pressure Test.
   - Time lag test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Time Lag Test.
   - Road test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Road Test.
   - 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.

Start the engine and wait for 2 seconds or more.

Does the AT OIL TEMP light blink?

Yes — Go to 3.

No — Go to 4.

3. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (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 TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

Are any DTCs displayed?

Yes — Record the DTC, time stamp and freeze frame data. Go to 5.

No — Go to 4.

4. 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 road test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Road Test.
4. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Go to 5.
No	Finish the diagnosis.

5. 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 "Diagnostic Trouble Code (DTC)". Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.
5. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
6. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

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.

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out below for use.

Customer's name			
Date of purchase	Year Month Date		
Date of repair	Year Month Date		
Transmission model	Transmission		Chassis number
Odometer reading	km (miles)		
Frequency	❑ Continuous ❑ Intermittent (times/day)		
Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Others ( )		
Place	❑ Highland ❑ Suburbs ❑ Inner city ❑ Uphill ❑ Downhill ❑ Rough road ❑ Other ( )		
Ambient air temperature	❑ Hot ❑ Warm ❑ Cool ❑ Cold		
Vehicle speed	km/h (MPH)		
AT OIL TEMP light	❑ Blinks continuously ❑ Does not blink		
Select lever position	❑ P ❑ R ❑ N ❑ D ❑ Manual mode ❑ L		
Driving condition	❑ Not affected ❑ At racing ❑ While decelerating	❑ At starting ❑ While accelerating ❑ While turning (❑ RH / ❑ LH)	❑ While idling ❑ When cruising (Vehicle speed km/h (MPH)) ❑ Immediately after starting the engine
Manual mode	❑ ON ❑ OFF		
Symptoms	❑ Vehicle does not move (❑ Any position ❑ Particular position)		
	❑ Vehicle does not move (no load racing condition as in N range)		
	❑ Vehicle does not move (engine speed does not increase, felt as stall condition)		
	❑ Noise or vibration (Specifically:)		
	❑ Shock felt at N → D selection (seconds after shifting, when engine cold or after warm-up)		
	❑ Shock felt at N → R selection (seconds after shifting, when engine cold or after warm-up)		
	❑ Shifting is wrong (Specifically:)		
	❑ 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 ( )		
Control operation history Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Work Support>OPERATION.	❑ Exists / ❑ Does not exist		

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. CONTROL MODULE

1. The TCM connector is waterproof. When measuring the TCM connector terminal voltage, or the resistance between the terminals, use the check board.
2. When measuring the voltage or resistance of individual sensors, 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 a taper pin or the like has been inserted into the connector terminal, replace the connector.

3. MODULE REGISTRATION

When the TCM or ECM is replaced, perform the module registration. Ref. to COMMON (DIAGNOSTICS)>Unit Registration.

INSPECTION

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. TRANSMISSION GROUND

Make sure that the ground terminal bolt is tightened securely.

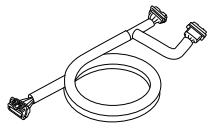
3. OPERATION OF SELECT LEVER

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.

PREPARATION TOOL

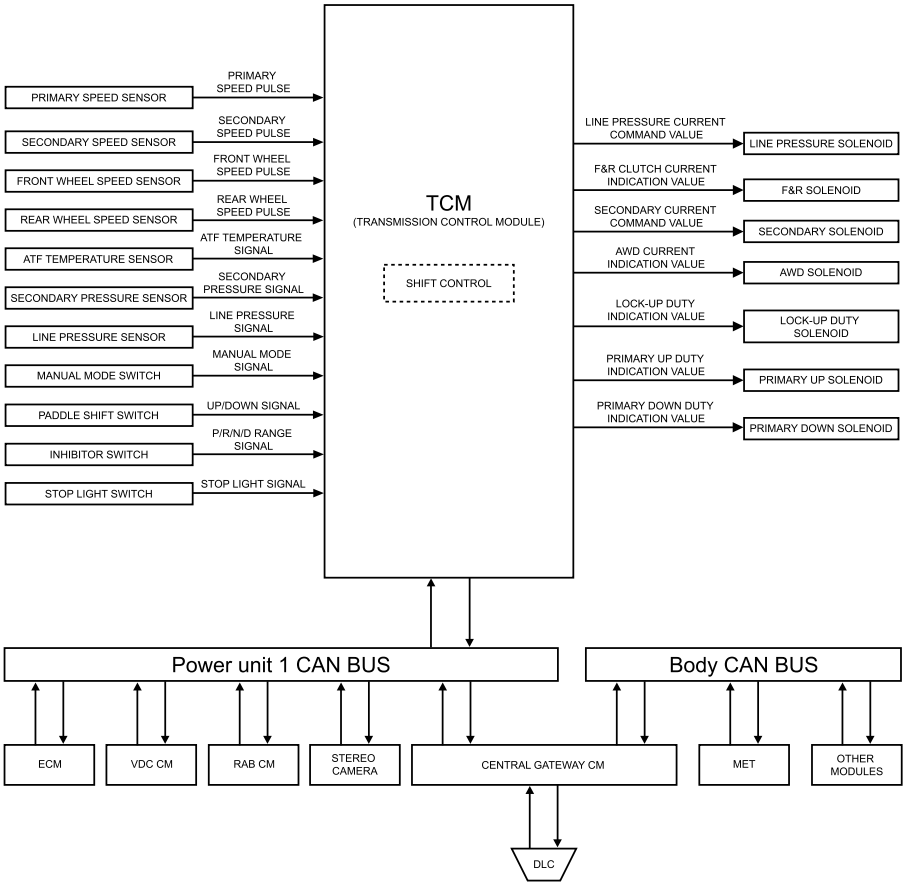
1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**
 ST18460AA040	18460AA040	CHECK BOARD	Used for measuring voltage and resistance of TCM terminals.

2. OTHER

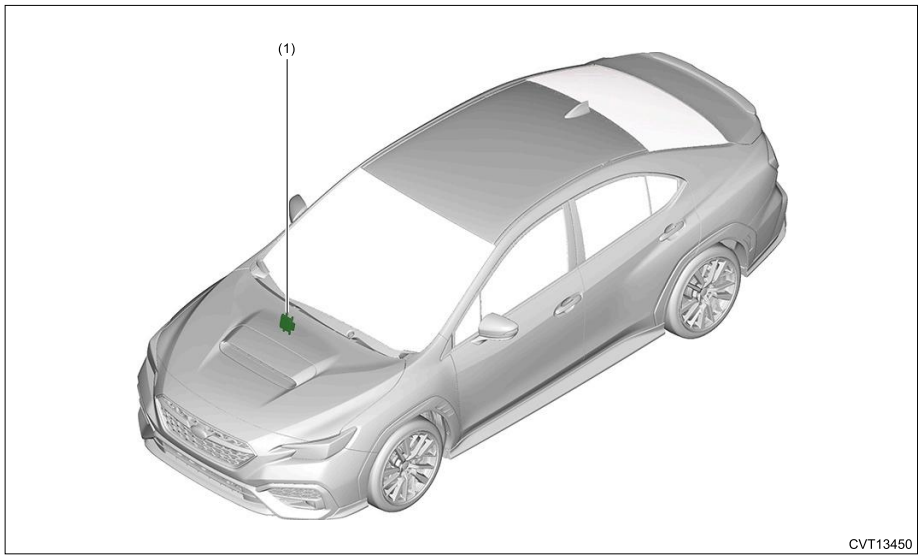
	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.

SYSTEM BLOCK DIAGRAM

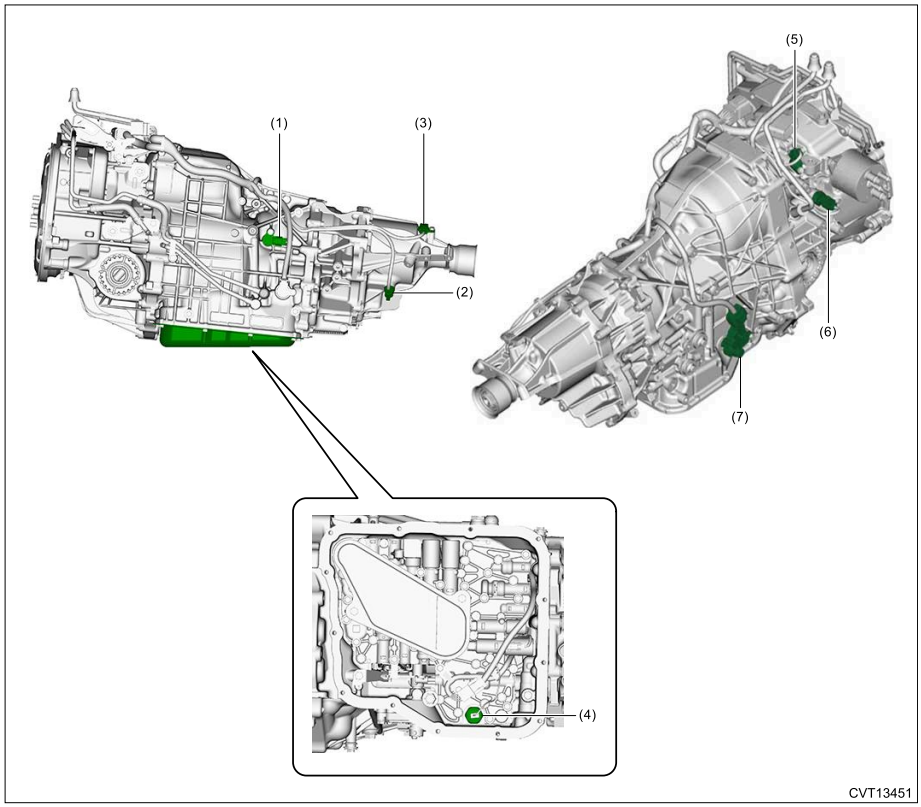


CVT14050

LOCATION

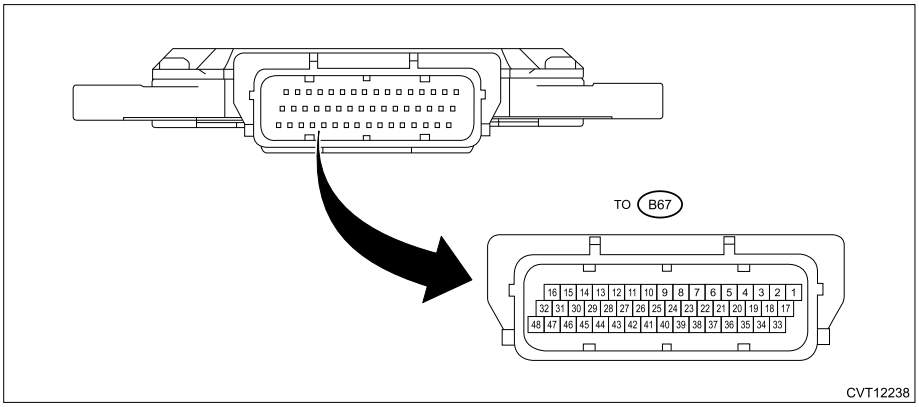


(1) TCM



(1) Secondary speed sensor
(2) Front wheel speed sensor
(3) Rear wheel speed sensor
(4) Line pressure sensor
(5) Primary speed sensor
(6) Secondary pressure sensor
(7) Inhibitor switch

ELECTRICAL SPECIFICATION



Caution:
Use the check board when measuring the TCM terminal.

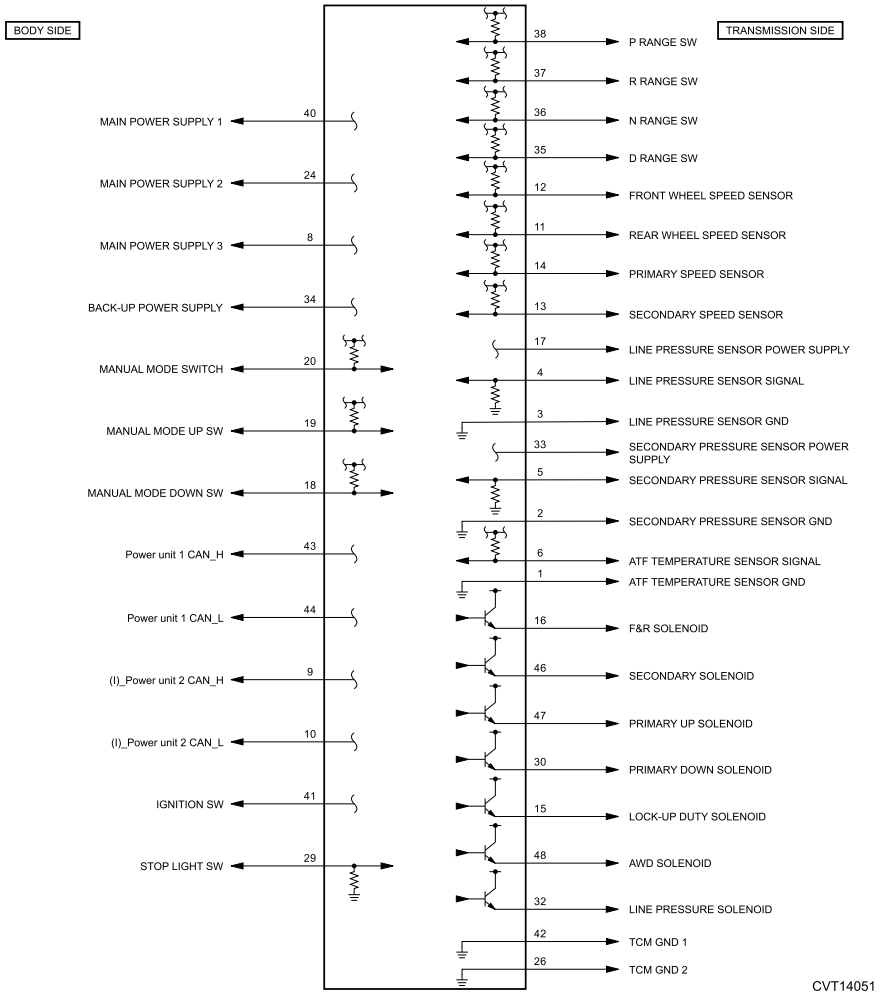
Note:
Measure after warming up.

Terminal No.	Contents	Measuring condition	Standard	Note
(B67) No. 1 ←→ Chassis ground	ATF temperature sensor GND	Always	0 V	—
(B67) No. 2 ←→ Chassis ground	Secondary pressure sensor GND	Always	0 V	—
(B67) No. 3 ←→ Chassis ground	Line pressure sensor GND	Always	0 V	—
(B67) No. 4 ←→ (B67) No. 3	Line pressure sensor signal	Ignition switch ON, engine OFF	Approx. 0.5 V (0 MPa)	Value increases with increase of engine load. (0.5 — 4.5 V)
		Engine ON and idle	Approx. 1.0 V (1.0 MPa)	
(B67) No. 5 ←→ (B67) No. 2	Secondary pressure sensor signal	Ignition switch ON, engine OFF	Approx. 0.5 V (0 MPa)	Value increases with increase of engine load. (0.5 — 4.5 V)
		Engine ON and idle	Approx. 1.0 V (1.0 MPa)	
(B67) No. 6 ←→ (B67) No. 1	ATF temperature sensor signal	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
(B67) No. 8 ←→ (B67) No. 26 or (B67) No. 42	Main power supply 3	Ignition switch ON	Battery voltage	—
(B67) No. 9	(I)_Power unit 2 CAN H signal	—	—	—
(B67) No. 10	(I)_Power unit 2 CAN L signal	—	—	—
(B67) No. 11 ←→ (B67) No. 26 or (B67) No. 42	Rear wheel speed sensor	Engine ON, "P" or "N" range	0 or 5 V	Refer to the waveform (sensor) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission Control Module (TCM) I/O Signal>WAVEFORM > SENSOR.
(B67) No. 12 ←→ (B67) No. 26 or (B67) No. 42	Front wheel speed sensor	Engine ON, "P" or "N" range	0 or 5 V	Refer to the waveform (sensor) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission

Terminal No.	Contents	Measuring condition	Standard	Note
				Control Module (TCM) I/O Signal>WAVEFORM > SENSOR.
(B67) No. 13 ←→ (B67) No. 26 or (B67) No. 42	Secondary speed sensor	While driving	0 or 5 V	Refer to the waveform (sensor) Ref. to TRANSMISSION (DIAGNOSTICS)>Transmission Control Module (TCM) I/O Signal>WAVEFORM > SENSOR.
(B67) No. 14 ←→ (B67) No. 26 or (B67) No. 42	Primary speed sensor	While driving	0 or 5 V	Refer to the waveform (sensor) Ref. to TRANSMISSION (DIAGNOSTICS)>Transmission Control Module (TCM) I/O Signal>WAVEFORM > SENSOR.
(B67) No. 15 ←→ (B67) No. 26 or (B67) No. 42	Lock-up duty solenoid	While driving in "D" range	Refer to the waveform (solenoid (1)) Ref. to TRANSMISSION (DIAGNOSTICS)>Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 10 — 14.2 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
(B67) No. 16 ←→ (B67) No. 26 or (B67) No. 42	F&R solenoid	Engine ON, "P" range	Refer to the waveform (solenoid (2)) Ref. to TRANSMISSION (DIAGNOSTICS)>Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 3.5 — 7.1 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
(B67) No. 17 ←→ (B67) No. 3	Line pressure sensor power supply	Ignition switch ON	5 V	—
(B67) No. 18 ←→ (B67) No. 26 or (B67) No. 42	Manual mode DOWN switch	Ignition switch ON, manual mode down switch ON	0 V	—
		Ignition switch ON, manual mode down switch OFF	Battery voltage	
(B67) No. 19 ←→ (B67) No. 26 or (B67) No. 42	Manual mode UP switch	Ignition switch ON, manual mode up switch ON	0 V	—
		Ignition switch ON, manual mode up switch OFF	Battery voltage	
(B67) No. 20 ←→ (B67) No. 26 or (B67) No. 42	Manual mode switch	Ignition switch ON / Manual mode switch ON	0 V	—

Terminal No.	Contents	Measuring condition	Standard	Note
		Ignition switch ON / Manual mode switch OFF	Battery voltage	
(B67) No. 24 ←→ (B67) No. 26 or (B67) No. 42	Main power supply 2	Ignition switch ON	Battery voltage	—
(B67) No. 26 ←→ Chassis ground	GND	Always	0 V	—
(B67) No. 29 ←→ (B67) No. 26 or (B67) No. 42	Stop light switch	Stop light switch ON	Battery voltage	—
		Stop light switch OFF	0 V	
(B67) No. 30 ←→ (B67) No. 26 or (B67) No. 42	Primary DOWN solenoid	Engine ON, "P" range	Refer to the waveform (solenoid (3)) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 10 — 14.2 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
(B67) No. 32 ←→ (B67) No. 26 or (B67) No. 42	Line pressure solenoid	Engine ON, "P" range	Refer to the waveform (solenoid (4)) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 3.3 — 7.3 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
(B67) No. 33 ←→ (B67) No. 2	Secondary pressure sensor power supply	Ignition switch ON	5 V	—
(B67) No. 34 ←→ (B67) No. 26 or (B67) No. 42	Backup power supply	Always	Battery voltage	—
(B67) No. 35 ←→ (B67) No. 26 or (B67) No. 42	D range switch	Ignition switch ON, D range	0 V	—
		Ignition switch ON, other than D range	Battery voltage	
(B67) No. 36 ←→ (B67) No. 26 or (B67) No. 42	N range switch	Ignition switch ON, N range	0 V	—
		Ignition switch ON, other than N range	Battery voltage	
(B67) No. 37 ←→ (B67) No. 26 or (B67) No. 42	R range switch	Ignition switch ON, R range	0 V	—
		Ignition switch ON, other than R range	Battery voltage	
(B67) No. 38 ←→ (B67) No. 26 or (B67) No. 42	P range switch	Ignition switch ON, P range	0 V	—
		Ignition switch ON, other than P range	Battery voltage	
(B67) No. 40 ←→ (B67) No. 26 or (B67) No. 42	Main power supply 1	Ignition switch ON	Battery voltage	—
(B67) No. 41 ←→ (B67) No. 26 or (B67) No. 42	Ignition switch	Ignition switch ON	Battery voltage	—
(B67) No. 42 ←→ Chassis ground	GND	Always	0 V	—
(B67) No. 43	Power unit 1 CAN H signal	—	—	—

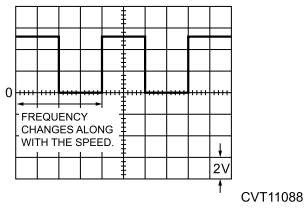
Terminal No.	Contents	Measuring condition	Standard	Note
(B67) No. 44	Power unit 1 CAN L signal	—	—	—
(B67) No. 46 ←→ (B67) No. 26 or (B67) No. 42	Secondary solenoid	Engine ON, “P” range	Refer to the waveform (solenoid (4)) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 3.3 — 7.3 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
(B67) No. 47 ←→ (B67) No. 26 or (B67) No. 42	Primary UP solenoid	Engine ON, “P” range	Refer to the waveform (solenoid (5)) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 10 — 14.2 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
(B67) No. 48 ←→ (B67) No. 26 or (B67) No. 42	AWD solenoid	Engine ON, “D” range	Refer to the waveform (solenoid (6)) Ref. to TRANSMISSION (DIAGNOSTICS)> Transmission Control Module (TCM) I/O Signal>WAVEFORM > SOLENOID.	Resistance: Approx. 3.3 — 7.3 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.



TRANSMISSION (DIAGNOSTICS) > Transmission Control Module (TCM) I/O Signal

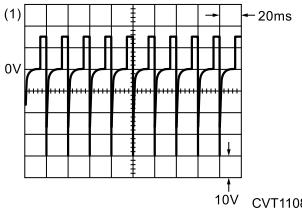
WAVEFORM

1. SENSOR

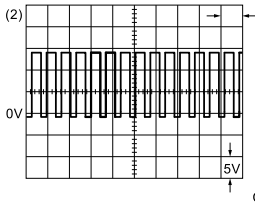


CVT11088

2. SOLENOID

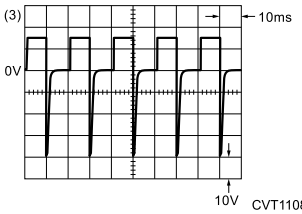


CVT11080



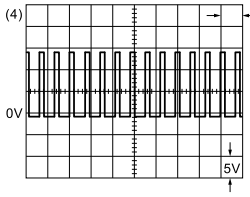
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(3)



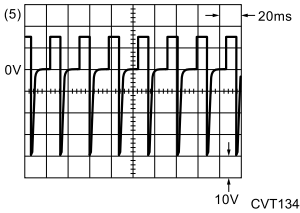
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(4)



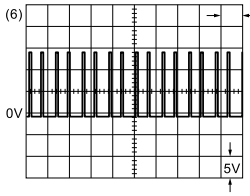
CVT13443

(5)



CVT13444

(6)



CVT13445

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. PREPARATION FOR THE INSPECTION MODE

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.

Note:
- **Perform the inspection mode after warming up the engine except when the ATF temperature at engine start is specified.**
- **For "DTC P162B", refer to "DTC P162A" in "ENGINE (DIAGNOSTICS)". Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Inspection Mode.**
- **For DTC P1E00, refer to "Unit Registration (Verification)" in Common (Diagnostics). Ref. to COMMON (DIAGNOSTICS)>Unit Registration (Verification).**

2. INSPECTION MODE A

DTC	Description & trouble part	Condition
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	—
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	—
P0613	TCM PROCESSOR	—
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	Perform inspection mode A twice
P0705	TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)	—
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	—
P0847	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW	—
P0848	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" 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	—
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—
P2729	PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT LOW	—
P2730	PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT HIGH	—

Diagnostic procedure:

1. Start the engine.
2. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
3. Depress the brake pedal and move the select lever to each range at an interval of 5 seconds.

Note:
Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".

4. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

3. INSPECTION MODE B

DTC	Description & trouble part	Condition
P0711	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—

Diagnostic procedure:

1. Soak for six hours.
2. Start the engine under condition that ATF temperature is at 20°C (68°F) or below.
3. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
4. 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.
5. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

4. INSPECTION MODE C

DTC	Description & trouble part	Condition
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—
P0720	OUTPUT SHAFT SPEED SENSOR CIRCUIT	—
P0721	OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE	—
P0961	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE	—
P0965	PRESSURE CONTROL SOLENOID "B" CONTROL 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	—
P1706	REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT NO SIGNAL	—
P170B	REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE	—
P2158	VEHICLE SPEED SENSOR "B" CIRCUIT	—
P2728	PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT RANGE/PERFORMANCE	—
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	—
P2764	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW	—

Diagnostic procedure:

1. Start the engine.
2. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
3. Shift the select lever to "D" range and wait for 10 seconds.
4. Accelerate slowly to a legal speed, and then decelerate slowly to a stop.
5. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

5. INSPECTION MODE D

DTC	Description & trouble part	Condition
P0713	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH	—
P0730	INCORRECT GEAR RATIO	—
P0751	SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF	Perform inspection mode D twice

DTC	Description & trouble part	Condition
P0752	SHIFT SOLENOID "A" STUCK ON	Perform inspection mode D twice
P0756	SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P0757	SHIFT SOLENOID "B" STUCK ON	Perform inspection mode D twice
P0776	PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P0867	TRANSMISSION FLUID PRESSURE	—
P1758	COLD START TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON	Soak until the engine coolant temperature drops below 30°C (86°F).
P1867	TRANSMISSION SECONDARY FLUID PRESSURE	—
P1894	CVT GEAR RATIO VARIATION	—
P2757	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF	Perform inspection mode D twice

Diagnostic procedure:

1. Start the engine.
2. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
3. Drive in any driving pattern for 20 minutes. (Include driving at a constant legal speed (for 20 seconds) at least once.)
4. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

6. INSPECTION MODE E

DTC	Description & trouble part	Condition
P0801	REVERSE INHIBIT CONTROL CIRCUIT/OPEN	—
P0841	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE	Perform inspection mode E three times
P0846	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE	Perform inspection mode E three times
U0073	CONTROL MODULE COMMUNICATION BUS OFF	—
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	—
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	—
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY 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	—
U0417	INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE	—
U0420	INVALID DATA RECEIVED FROM POWER STEERING 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	—
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	—

DTC	Description & trouble part	Condition
U1235	LOST COMMUNICATION WITH EyeSight	—
U1433	INVALID DATA RECEIVED FROM EyeSight	—
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	—
U1C07	INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS	—
U1C08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	—
U1D00	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	—
U1D07	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS	—
U1D08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	—
U1E00	LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS	—
U1E07	LOST COMMUNICATION OF AUTHENTICATION DATA WITH ECM/PCM PU-BUS	—
U1E08	LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS	—

Diagnostic procedure:

1. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
2. Start the engine.
3. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

7. INSPECTION MODE G

DTC	Description & trouble part	Condition
P0708	TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH	—
P1603	ENGINE STALL HISTORY	—
P2758	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON	Perform inspection mode G twice

Diagnostic procedure:

1. Start the engine.
2. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
3. Depress the brake pedal and move the select lever to each range at an interval of 5 seconds.

   Note:
   Move the select lever in the following order: "P" → "R" → "N" → "D".
4. Drive for three seconds at 16 km/h (10 MPH).

   Note:
   Drive in "D" range and "R" range.
5. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

8. INSPECTION MODE H

DTC	Description & trouble part	Condition
P0719	BRAKE SWITCH "B" CIRCUIT LOW	—
P0724	BRAKE SWITCH "B" CIRCUIT HIGH	—
P0951	AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE	—

Diagnostic procedure:

1. Start the engine.
2. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
3. Operate the stop light switch or the manual mode switch.
4. Read the data of the stop light switch or the manual mode switch using the Subaru Select Monitor. Or measure the terminal voltage.
5. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

9. INSPECTION MODE J

DTC	Description & trouble part	Condition
P0746	PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF	—
P0747	PRESSURE CONTROL SOLENOID "A" STUCK ON	—
P2723	PRESSURE CONTROL SOLENOID "E" PERFORMANCE/STUCK OFF	—

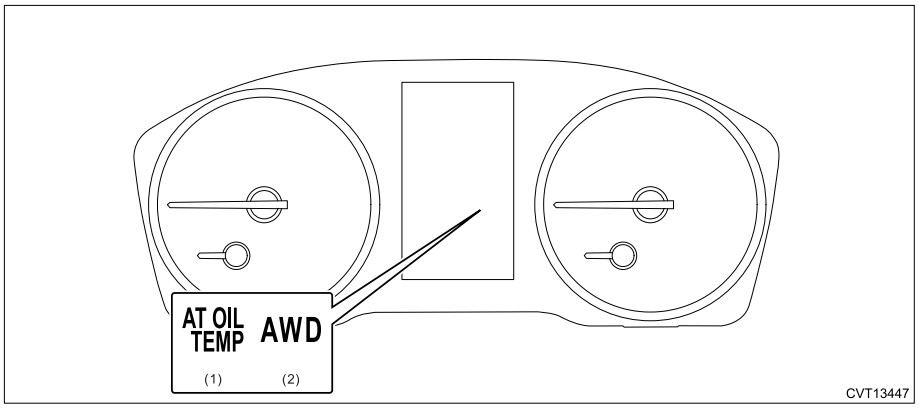
Diagnostic procedure:

1. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is not completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).
2. After starting the engine, set the ATF temperature to 20°C (68°F) or more.
3. Drive in any driving pattern for 20 minutes. (Include driving at a constant legal speed (for 20 seconds) at least once.)
4. Turn the ignition switch to OFF, and wait for 30 seconds or more.
5. Start the engine.

   Note:
   Repeat two driving cycles in this driving pattern.
6. Check the readiness code of [Transmission] using Subaru Select Monitor and confirm that the diagnosis is completed. Ref. to TRANSMISSION (DIAGNOSTICS)>All Readiness Diagnostic Code(s).

TRANSMISSION (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION



(1) AT OIL TEMP light (2) AWD light

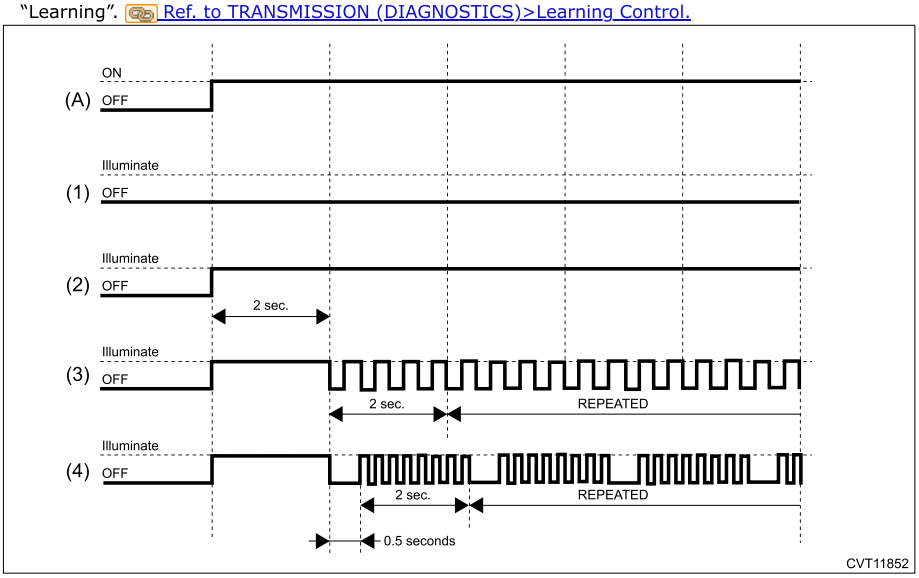
- The AT OIL TEMP light illuminates or blinks, when the ATF temperature is high and malfunction occurs in CVT.
- AWD light illuminates or blinks when a fault occurs in AWD.

TRANSMISSION (DIAGNOSTICS) > Warning Light Illumination Pattern

AT OIL TEMP WARNING LIGHT DISPLAY

1. INSPECTION

- At normal condition
  Always light 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". Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control.



(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 illumination patterns are not as above, check the AT OIL TEMP light circuit.

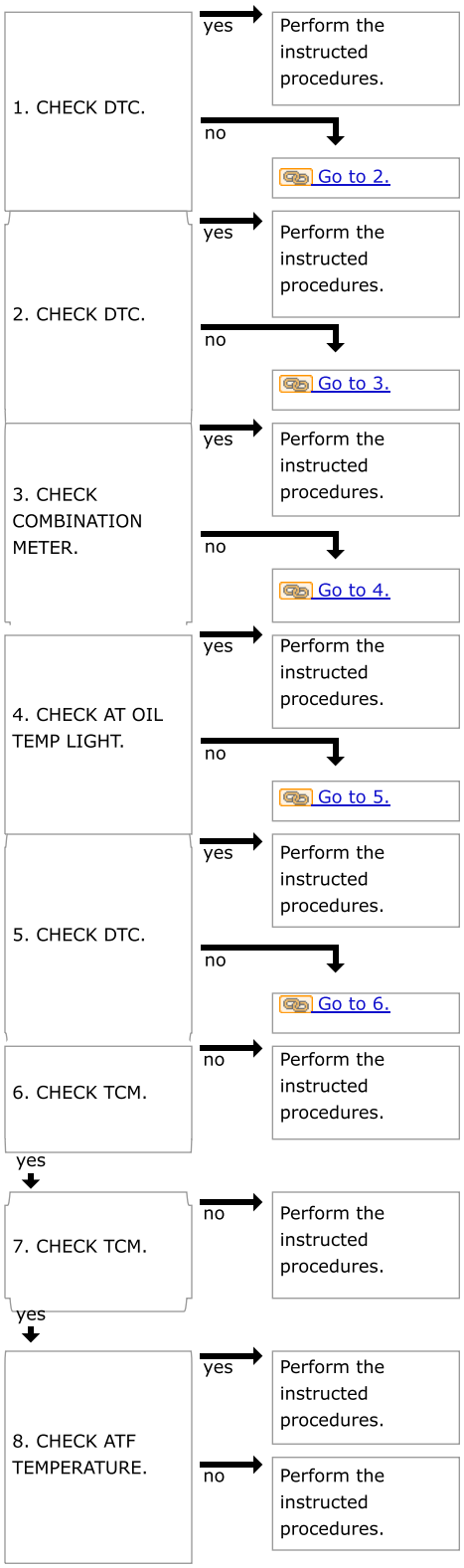
2. DIAGNOSIS

Detecting condition:

- CAN communication is lost with the combination meter.
- Combination meter malfunction
- TCM is in special control mode.
- AT learning is not finished.

Trouble symptom:

AT OIL TEMP light remains lit after engine start.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U0155 or U0423 displayed?

Yes	Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than U0155 and U0423 displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK COMBINATION METER.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. 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 5.

5. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK TCM.

Using the Subaru Select Monitor, read data of [ATF Temperature Lamp] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [ON] displayed?

Yes	Go to 7.
No	Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

7. CHECK TCM.

Using the Subaru Select Monitor, read data of [ATF Temp.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is the display 130°C or more?

Yes	Go to 8.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

8. 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?

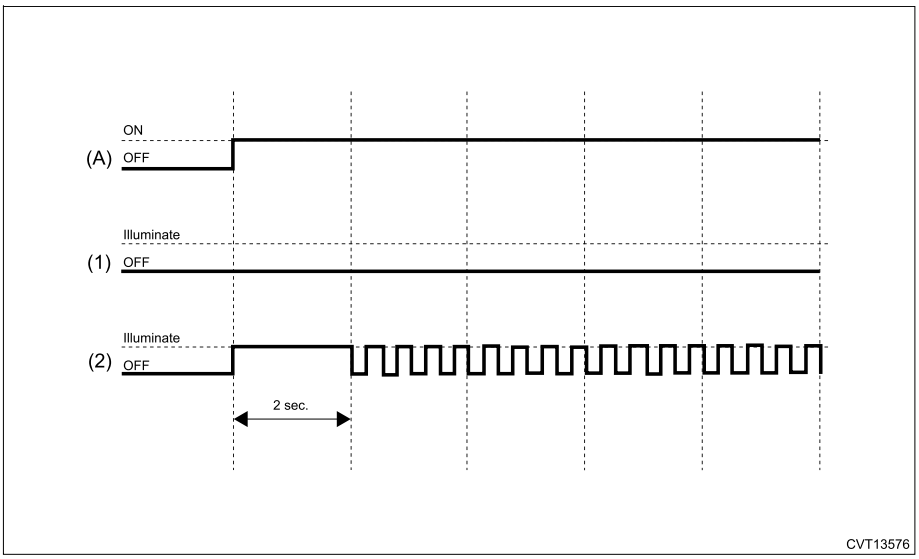
Yes	Perform the diagnosis according to DTC P0712. If there is no problem, perform the diagnosis according to DTC P0713.
No	When ATF temperature can be judged as actually high, perform the diagnosis again after the ATF temperature lowers.

TRANSMISSION (DIAGNOSTICS) > Warning Light Illumination Pattern

AWD WARNING LIGHT DISPLAY

1. INSPECTION

- At normal condition
  Always light OFF
- 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.
  2. When air pressure of any of four tires is excessively low.



(A) Ignition switch condition

(1) At normal condition (2) When malfunction is detected

If the illumination patterns are not as above, check the AWD light circuit.

2. DIAGNOSIS

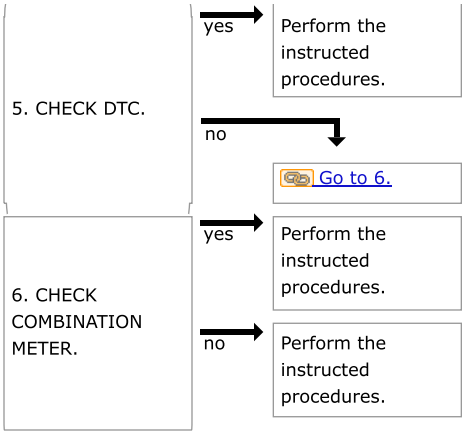
Detecting condition:

- CAN communication is lost with the combination meter.
- Combination meter malfunction

Trouble symptom:

- AWD light remains lit after engine start.
- AWD light is blinking immediately after engine start.

1. CHECK TCM.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK TCM.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK COMBINATION METER.	yes	Perform the instructed procedures.
	no	Go to 4.
4. CHECK AWD LIGHT.	yes	Perform the instructed procedures.
	no	Go to 5.



1. CHECK TCM.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U0155 or U0423 displayed?

Yes — Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

No — Go to 2.

2. CHECK TCM.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than U0155 and U0423 displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 3.

3. CHECK COMBINATION METER.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 4.

4. 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 5.

5. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 6.

6. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

No — Repair or replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

INSPECTION

1. —

Detecting condition:

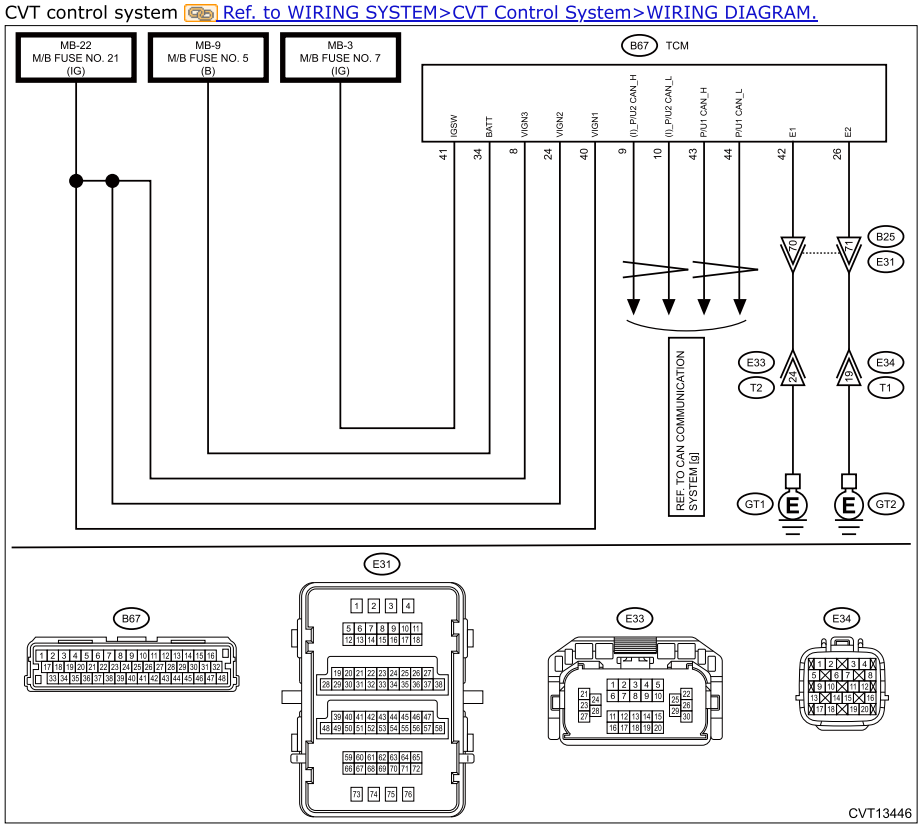
- Defective harness connector
- Defective TCM

Trouble symptom:

Subaru Select Monitor communication failure

Wiring diagram:

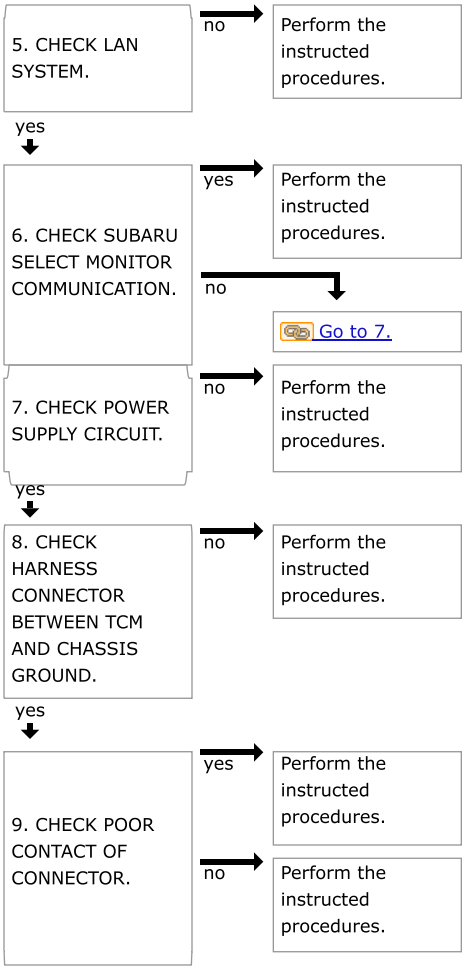
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

Use the check board when measuring the TCM terminal voltage and resistance.

1. CHECK IGNITION SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK BATTERY.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK BATTERY TERMINAL.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK INSTALLATION OF TCM CONNECTOR.
   - no → Perform the instructed procedures.
   - yes ↓



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. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 6.

No — Perform the diagnosis for LAN system.

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] screen displayed?

Yes — Check DTC of TCM. Ref. to TRANSMISSION (DIAGNOSTICS)>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
   (B67) No. 40 (+) — Chassis ground (−):
   (B67) No. 24 (+) — Chassis ground (−):
   (B67) No. 8 (+) — Chassis ground (−):
   (B67) No. 34 (+) — Chassis ground (−):
   (B67) No. 41 (+) — 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
   (B67) No. 42 — Chassis ground:
   (B67) No. 26 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 9.

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 — Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

TRANSMISSION (DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor>LIST.**

TRANSMISSION (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Unit of measure
Engine Speed	Engine 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 front wheel rotation speed.	km/h or MPH
Rear Wheel Speed	Rear wheel speed calculated from the rear wheel 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.	%
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 speed calculated by the TCM using signals from the front wheel speed sensor.	rpm
Rear Wheel Speed	Rear wheel speed calculated by the TCM using signals from the rear wheel 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

Item	Contents	Unit of measure
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(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#
SI Drive mode(Display)*1	Currently selected SI-DRIVE mode, which is transmitted from ECM. Determined by the SI-DRIVE SW operation. TCM input value.	I, S or S#
Shift Step in Manual 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
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.	Completed or Not Completed
Trip Count	Number of times the ignition 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.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder detected by the secondary pressure sensor.	MPa
System Voltage	Power supply voltage supplied to the backup power supply (≈ battery voltage).	V
Actual line press.	Line pressure detected by the line pressure sensor.	MPa
Lin. Sol. Set Current	Value of the indicator current for controlling the line pressure solenoid calculated by the TCM.	mA
Lin. Sol. Actual Current	Actual current value of the line pressure solenoid. TCM output value.	mA
AWD. Sol. Set Current	Value of the indicator current for controlling the AWD solenoid calculated by the TCM.	mA
AWD. Sol. Actual Current	Actual current value of the AWD solenoid. TCM output value.	mA
Line Pressure Sensor Voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the line pressure sensor. TCM input value.	V
AWD mode*2	Control status of the AWD control switched in TCM according to SI-DS_AWD setting flag sent from CCM (cockpit control module) via CAN communication.	-

*1: Model without ATF air cooler

*2: Model with ATF air cooler

For the relationship between user selection results of the drive select mode, Subaru Select Monitor 4 indication, and control, refer to the following table.

User selection	Comfort	Normal	Sport	Sport+	Individual
Subaru Select Monitor display (CVT)	I	I	S	S#	I, S or S#
CVT control	I	I	S	S#	I, S or S#

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on freeze frame data, refer to the list. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data>LIST.**

LIST

Item	Contents	Unit of measure
Engine Speed	Engine 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 front wheel rotation speed	km/h or MPH
Rear Wheel Speed	Rear wheel speed calculated from the rear wheel 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.	%
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 speed calculated by the TCM using signals from the front wheel speed sensor.	rpm
Rear Wheel Speed	Rear wheel speed calculated by the TCM using signals from the rear wheel 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

Item	Contents	Unit of measure
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(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#
SI Drive mode(Display)*1	Currently selected SI-DRIVE mode, which is transmitted from ECM. Determined by the SI-DRIVE SW operation. TCM input value.	I, S or S#
Shift Step in Manual 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.	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 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.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder detected by the secondary pressure sensor.	MPa
System Voltage	Power supply voltage supplied to the backup power supply (≈ battery voltage).	V
Actual line press.	Line pressure detected by the line pressure sensor.	MPa
Lin. Sol. Set Current	Value of the indicator current for controlling the line pressure solenoid calculated by the TCM.	mA
Lin. Sol. Actual Current	Actual current value of the line pressure solenoid. TCM output value.	mA
AWD. Sol. Set Current	Value of the indicator current for controlling the AWD solenoid calculated by the TCM.	mA
AWD. Sol. Actual Current	Actual current value of the AWD solenoid. TCM output value.	mA
Line Pressure Sensor Voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the line pressure sensor. TCM input value.	V
AWD mode*2	Control status of the AWD control switched in TCM according to SI-DS_AWD setting flag sent from CCM (cockpit control module) via CAN communication.	-

*1: Model without ATF air cooler

*2: Model with ATF air cooler

For the relationship between user selection results of the drive select mode, Subaru Select Monitor 4 indication, and control, refer to the following table.

User selection	Comfort	Normal	Sport	Sport+	Individual
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CVT control	I	I	S	S#	I, S or S#

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 COMMON (DIAGNOSTICS)>Clear memory.**

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, enter vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Transmission].
5. On [Select Function] screen, select [Active Test].

TRANSMISSION (DIAGNOSTICS) > Active Test

LIST

Active test item	Contents	Unit used in operation	Execution condition
F&R Clutch Solenoid	Forcibly operate the F&R clutch solenoid that controls engagement/disengagement states of the forward/reverse clutches. Check if it operates normally by listening to the operating sound.	100 mA	When all of the following conditions are met: • P range • Ignition switch is ON (engine stops) • Battery voltage 10.9 V or more
Secondary Solenoid	Forcibly operate the secondary solenoid that controls the pressure applied to the secondary pulley cylinder. Check if the solenoid operates normally by listening to the clicking sound.	100 mA	
Primary Down Solenoid	Forcibly operate the primary DOWN solenoid that controls the pressure applied to the primary pulley cylinder to the decrease side. Check if it operates normally by listening to the clicking sound.	10%	
Primary Up Solenoid	Forcibly operate the primary UP solenoid that controls the pressure applied to the primary pulley cylinder to the increase side. Check if it operates normally by listening to the clicking sound.	10%	
Lock-Up Duty Solenoid	Forcibly operate the lockup duty solenoid that controls engagement/disengagement states of the lockup clutch. Check if it operates normally by listening to the clicking sound.	10%	
Line Solenoid	Forcibly operate the line pressure solenoid that controls the line pressure. Check if the solenoid operates normally by listening to the clicking sound.	100 mA	
AWD Linear Solenoid	Forcibly operate the AWD solenoid that controls engagement/disengagement states of the transfer clutch. Check if it operates normally by listening to the operating sound.	100 mA	

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.

TRANSMISSION (DIAGNOSTICS) > Learning Control

PROCEDURE

Refer to CONTINUOUSLY VARIABLE TRANSMISSION. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>AT learning.

OPERATION

Note:

- **The readiness code shows self-diagnosis status of each DTC. The DTCs displayed here are either not yet self-diagnosed or self-diagnosed but not 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, 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. Perform the inspection mode again.**
- **For detailed operation procedures, refer to "Help" of application.**

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, enter vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Transmission], and then select [Next].
5. On [Select Function] screen, select [DTC].
6. On [DTC] screen, select [All Readiness Diagnostic Code(s)].

TRANSMISSION (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on DTCs, refer to the list. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

TRANSMISSION (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	Ref. to TRANSMISSION (DIAGNOSTICS)>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 TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR.
P0613	TCM PROCESSOR	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0613 TCM PROCESSOR.
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	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)	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	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 RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0711 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0712	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH.
P0719	BRAKE SWITCH "B" CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0719 BRAKE SWITCH "B" CIRCUIT LOW.
P0720	OUTPUT SHAFT SPEED SENSOR CIRCUIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0720 OUTPUT SHAFT SPEED SENSOR CIRCUIT.

DTC	Description & trouble part	Reference
P0721	OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0724 BRAKE SWITCH "B" CIRCUIT HIGH.
P0730	INCORRECT GEAR RATIO	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0730 INCORRECT GEAR RATIO.
P0746	PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF	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	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	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	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	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0757 SHIFT SOLENOID "B" STUCK ON.
P0776	PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF.
P0801	REVERSE INHIBIT CONTROL CIRCUIT/OPEN	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	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	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0843 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH.
P0846	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0846

DTC	Description & trouble part	Reference
		TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE .
P0847	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0847 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW .
P0848	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0848 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT HIGH .
P0867	TRANSMISSION FLUID PRESSURE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0867 TRANSMISSION FLUID PRESSURE .
P0890	TCM POWER RELAY SENSE CIRCUIT LOW	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	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	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	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	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	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	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	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	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0971 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH.

DTC	Description & trouble part	Reference
P0973	SHIFT SOLENOID "A" CONTROL CIRCUIT LOW	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	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	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0977 SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH.
P1603	ENGINE STALL HISTORY	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1603 ENGINE STALL HISTORY.
P162B	WARNING INDICATOR REQUEST	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P162B WARNING INDICATOR REQUEST.
P1706	REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT NO SIGNAL	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1706 REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT NO SIGNAL.
P170B	REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P170B REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE.
P1758	COLD START TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1758 COLD START TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON.
P1867	TRANSMISSION SECONDARY FLUID PRESSURE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1867 TRANSMISSION SECONDARY FLUID PRESSURE .
P1894	CVT GEAR RATIO VARIATION	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1894 CVT GEAR RATIO VARIATION.
P1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.
P2158	VEHICLE SPEED SENSOR "B" CIRCUIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2158 VEHICLE SPEED SENSOR "B" CIRCUIT.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT.
P2723	PRESSURE CONTROL SOLENOID "E" PERFORMANCE/STUCK OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2723 PRESSURE CONTROL SOLENOID "E" PERFORMANCE/STUCK OFF .

DTC	Description & trouble part	Reference
P2728	PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2728 PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT RANGE/PERFORMANCE .
P2729	PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2729 PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT LOW .
P2730	PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2730 PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT HIGH .
P2746	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE	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 SENSOR "B" CIRCUIT NO SIGNAL	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL.
P2750	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE	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	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/STUCK OFF	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	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	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 CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2764 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	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"	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".

DTC	Description & trouble part	Reference
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0417	INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE.
U0420	INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE	Ref. to TRANSMISSION (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	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	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	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424

DTC	Description & trouble part	Reference
		INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1C07	INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C07 INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS.
U1C08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C08 INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS.
U1D00	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1D00 CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1D07	CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1D07 CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS.
U1D08	INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1D08 INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS.
U1E00	LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E00 LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS.
U1E07	LOST COMMUNICATION OF AUTHENTICATION DATA WITH ECM/PCM PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E07 LOST COMMUNICATION OF AUTHENTICATION DATA WITH ECM/PCM PU-BUS.
U1E08	LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E08 LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS.

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "ENGINE (DIAGNOSTICS)" for diagnostic procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
TCM RAM is faulty.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0604 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the malfunction in RAM area of the TCM.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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
Error Correcting Code (ECC) check error	Detect

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
TCM ROM is faulty.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0605 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect the malfunction in ROM area of the TCM.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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
Error Correcting Code (ECC) check error	Detect

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0613 TCM PROCESSOR

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper gear shifting

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0613 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Detect malfunction of the TCM microcomputer.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 Estimated deceleration calculated from vehicle model	-3 m/s^2 or less
Diagnosis 2 Cycle counter	Not equal to 5 times
Diagnosis 3 CRC error of the TPU software	Detect

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR

1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
TCM EEPROM is faulty.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P062F displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

GENERAL DESCRIPTION

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 malfunction when the consistency in the EEPROM area is lost.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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.

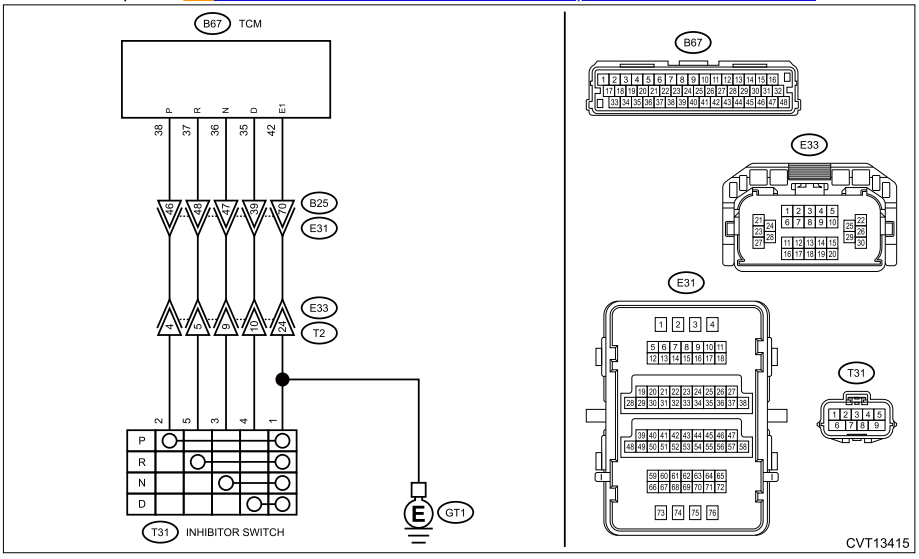
DTC P0705 TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)

1. —

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.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK INPUT SIGNAL FOR TCM.
   - yes → Go to 5.
   - no → Go to 2.
2. CHECK HARNESS.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK INHIBITOR SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓

5. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Move the select lever to each range, and read the data of [P Range], [R Range Signal], [N Range], [D Range Signal] in the [Data Monitor] of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is the display of the range other than corresponding range [OFF]?

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

(B67) No. 38 — Chassis ground:
(B67) No. 37 — Chassis ground:
(B67) No. 36 — Chassis ground:
(B67) 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

(T2) No. 4 — Chassis ground:
(T2) No. 5 — Chassis ground:
(T2) No. 9 — Chassis ground:
(T2) No. 10 — 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(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(TR690)>Transmission Control Module (TCM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission range switch.
- Judge as NG if more than one input of transmission range switch are detected.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	400 rpm or more

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 or less.**	True

Time needed for diagnosis: 3 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

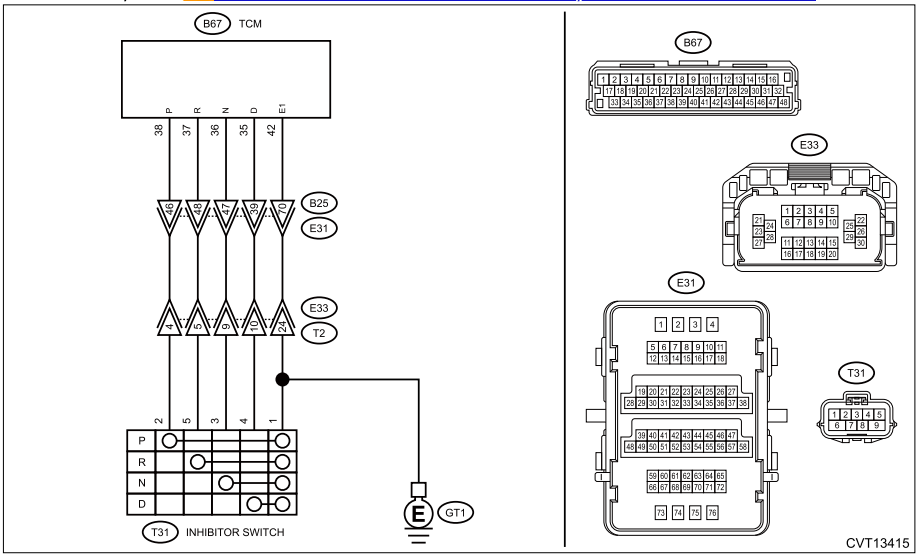
DTC P0708 TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH

1. —

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.

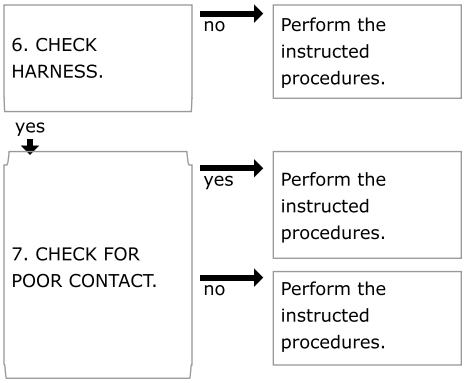
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK INPUT SIGNAL FOR TCM.	yes	Go to 7.
	no	Go to 2.
2. CHECK HARNESS.	no	Perform the instructed procedures.
3. CHECK HARNESS.	no	Perform the instructed procedures.
4. CHECK HARNESS.	no	Perform the instructed procedures.
5. CHECK INHIBITOR SWITCH.	no	Perform the instructed procedures.



1. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Move the select lever to each range, and read the data of [P Range], [R Range Signal], [N Range], [D Range Signal] in the [Data Monitor] of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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

(B67) No. 38 — (E33) No. 4:
(B67) No. 37 — (E33) No. 5:
(B67) No. 36 — (E33) No. 9:
(B67) No. 35 — (E33) No. 10:

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

(T31) 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 of harness between transmission connector and inhibitor switch connector.

Connector & terminal

(T2) No. 4 — (T31) No. 2:
(T2) No. 5 — (T31) No. 5:
(T2) No. 9 — (T31) No. 3:
(T2) No. 10 — (T31) 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.

Connector & terminal

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 Ω?

Yes — Go to 6.

No — Replace the 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 (E33 side)
(E33) No. 4 (+) — Chassis ground (−):
(E33) No. 5 (+) — Chassis ground (−):
(E33) No. 9 (+) — Chassis ground (−):
(E33) No. 10 (+) — Chassis ground (−):
Transmission connector (T31 side)
(T31) No. 2 (+) — Chassis ground (−):
(T31) No. 5 (+) — Chassis ground (−):
(T31) No. 3 (+) — Chassis ground (−):
(T31) 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(TR690)>Transmission Control Module (TCM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission range switch.
- Judge as NG if there is no input from all transmission range switches.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from measured front output shaft speed sensor)	6.2 MPH or more

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 or more.**	True

Time needed for diagnosis: 3 s

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

1. —

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

For the diagnostic procedure, perform the diagnosis according to "DTC P0712" and "DTC 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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Diagnosis 1

- Judge the malfunction of ATF 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

- Judge the malfunction of ATF temperature sensor characteristics (stuck to high temperature side).
- Judge as malfunction when the difference between engine coolant temperature and CVT oil temperature is equal to or more than specified value at starting.

EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1	
12 V battery system voltage (The timer is held when the following conditions are not satisfied.)	10 V or more
Transmission range	Drive
Vehicle speed (calculated from measured secondary pulley shaft speed sensor)	21.7 MPH or more
Diagnosis 2	
12 V battery system voltage	10 V or more
Soak time (received from ECM)	21600 s or more
(Engine speed	400 rpm or more
for time)	300 s or more

Secondary parameters	Execution condition
Note: **The monitor detects Transmission fluid temperature sensor stuck high after the elapse of 300 seconds required for Engine coolant temperature sensor diagnosis. It is necessary to avoid misdiagnosis of P0711 caused by a malfunctioning ECT sensor.**	

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	
Absolute change of measured Transmission fluid temperature sensor input voltage	Less than 0.049 V
Transmission fluid temperature	Less than 20 degC
Diagnosis 2	
Transmission fluid temperature at engine start − Engine coolant temperature at engine start	Exceeds 18 degC

Time needed for diagnosis:

- **Diagnosis 1:** 600 s
- **Diagnosis 2:** Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

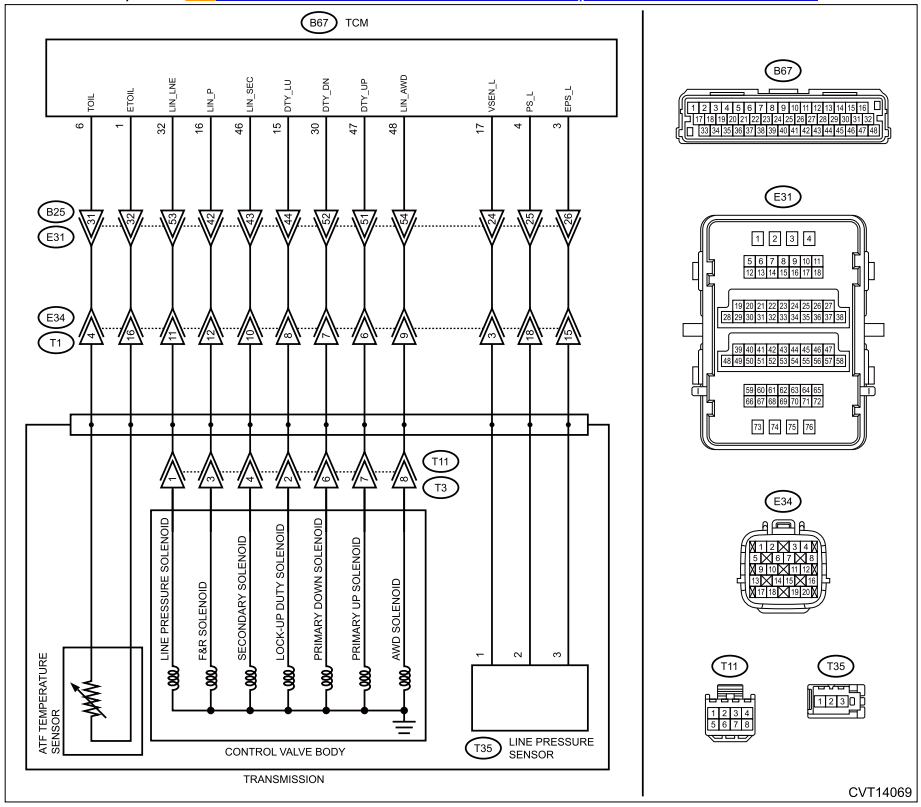
DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK HARNESS.	yes	Go to 4.
	no	Go to 2.
2. CHECK HARNESS.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK HARNESS INSIDE TRANSMISSION.	no	Perform the instructed procedures.

yes

4. CHECK ATF TEMPERATURE SENSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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
   (B67) No. 1 — Chassis ground:
   (B67) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Go to 2.

2. CHECK HARNESS.

1. Disconnect the transmission connector.
2. Measure the resistance of harness between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 4 — Chassis ground:
   (T1) No. 16 — Chassis ground:

Is the resistance 1 MΩ 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 transmission oil pan.
2. Check for the harness pinch, damage.

Is the check result OK?

Yes — Go to 4.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

4. CHECK ATF TEMPERATURE SENSOR.

Measure the resistance between transmission connector terminals.

Connector & terminal

(T1) No. 4 — (T1) No. 16:

Note:

Perform the measurements using multiple oil temperatures.

Is resistance as follows?

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(TR690)>Transmission Control Module (TCM).

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of ATF temperature sensor.
- Judge as NG if the voltage detected by the ATF temperature sensor is lower than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 Transmission fluid temperature sensor input voltage (Transmission fluid temperature)	Less than 0.132 V (Exceeds 150 degC)

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

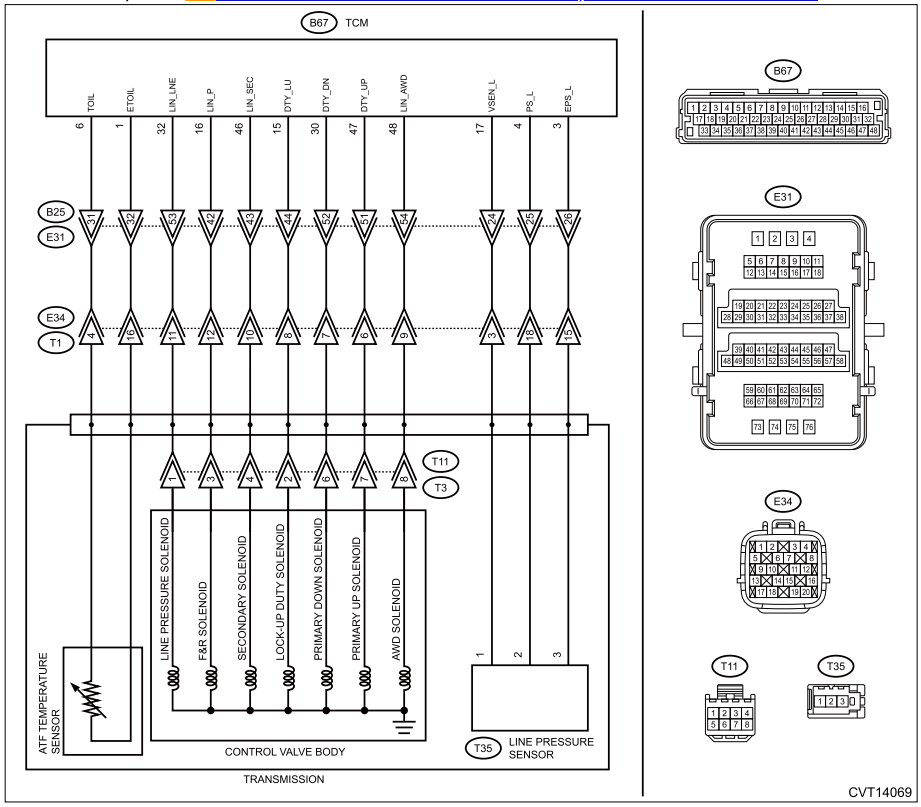
DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

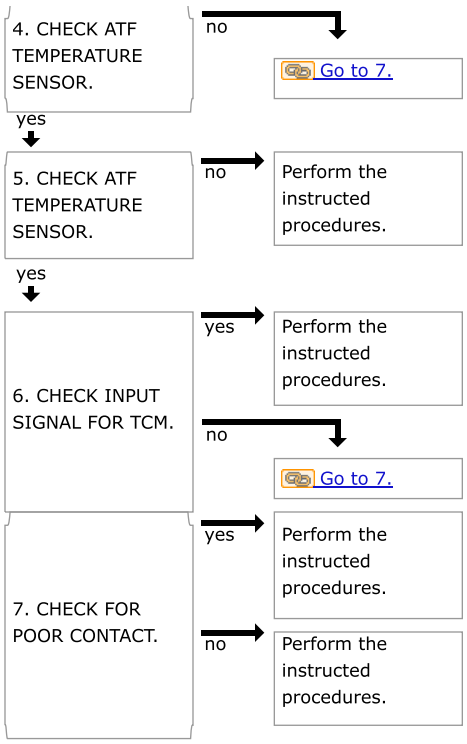
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK HARNESS.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK HARNESS.	no	Perform the instructed procedures.
	yes	
3. CHECK ATF TEMPERATURE SENSOR.	yes	Perform the instructed procedures.
	no	Go to 4.



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
   (B67) No. 6 (+) — (B67) 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 of harness between TCM connector and transmission connector.
   Connector & terminal
   (B67) No. 6 — (E34) No. 4:
   (B67) No. 1 — (E34) No. 16:

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
(T1) No. 4 — (T1) No. 16:

Is the resistance 1 MΩ or more?

Yes — Repair the open circuit of transmission harness.

No — Go to 4.

4. 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
   (T1) No. 4 — (T1) No. 16:

Is the resistance 730 — 1120 Ω?

Yes — Go to 5.

No — Go to 7.

5. CHECK ATF TEMPERATURE SENSOR.

Measure the resistance between transmission connector terminals.
Connector & terminal
(T1) No. 4 — (T1) No. 16:

Does the resistance value increase gradually while the ATF temperature decreases?

Yes — Go to 6.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

6. CHECK INPUT SIGNAL FOR TCM.

1. Connect the transmission connector.
2. Turn the ignition switch to ON. (Do not start engine.)
3. Using the Subaru Select Monitor, read data of [ATF Temp.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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 7.

7. 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(TR690)>Transmission Control Module (TCM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the ATF temperature sensor 5 V system.
- Judge as NG if the voltage detected by the ATF temperature sensor is higher than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Vehicle speed (calculated from measured front output shaft speed sensor)	6.2 MPH or more
Above condition satisfied for	50 s or more

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 Transmission fluid temperature sensor input voltage (Transmission fluid temperature)	More than 4.502 V (Less than − 53 degC)

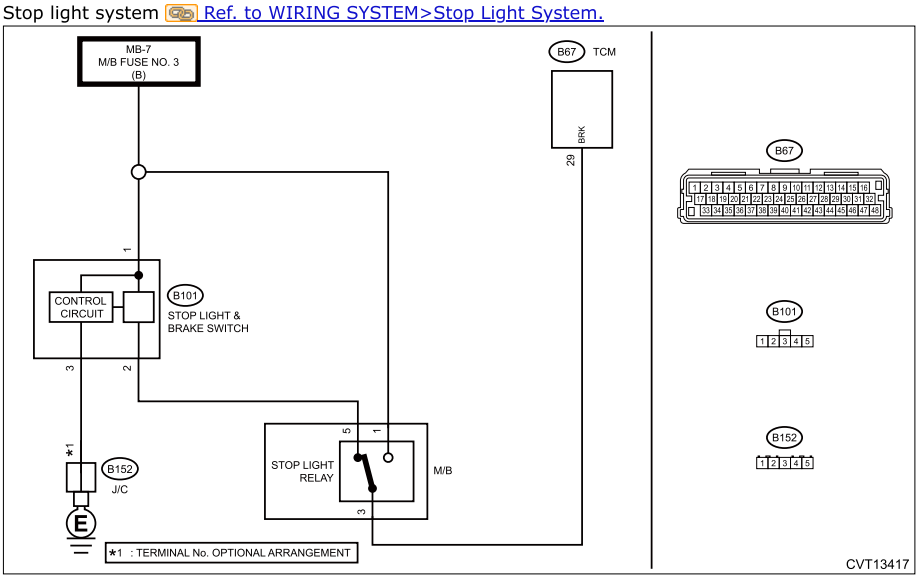
Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0719 BRAKE SWITCH "B" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Gear is not shifted down when climbing a hill or driving down a hill.
Wiring diagram:
Stop light system Ref. to WIRING SYSTEM>Stop Light System.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK M/B FUSE (NO. 3).	no	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS.	no	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS.	no	Perform the instructed procedures.
yes ↓		
4. CHECK INPUT SIGNAL FOR TCM.	no	Perform the instructed procedures.
yes ↓		
5. CHECK INPUT SIGNAL FOR TCM.	yes	Perform the instructed procedures.
	no ↓	Go to 6.

6. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK M/B FUSE (NO. 3).

1. Turn the ignition switch to OFF.
2. Remove the M/B fuse (No. 3).
3. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the M/B fuse (No. 3). If the new fuse (No. 3) has blown out easily, repair the short circuit of harness between the fuse (No. 3) 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
   (B67) No. 29 — (B101) 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 M/B fuse (No. 3).
Connector & terminal
(B101) No. 1 — (M/B fuse) No. 3:

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. 3).
2. Connect the stop light switch connector.
3. Depress the brake pedal.
4. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) 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] in the [Data Monitor] of [Transmission] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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 stop light switch input signal circuit?

Yes — Repair the poor contact.

No — Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the stop light switch OFF side stuck.
- Judge as NG when the brake signal ON state does not continue for a predetermined time or longer 10 consecutive times while the vehicle decelerates from a predetermined speed to 0 km/h.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more

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
The brake switch B is continuously OFF while the vehicle speed changed from "X" to "Y". Vehicle speed "X" Vehicle speed "Y" **Note:** **"Brake switch B OFF" is defined as Brake switch B input voltage <= 1.7 V**	 18.8 MPH or more Less than 0.6 MPH

Time needed for diagnosis: 10 times
Malfunction indicator light illumination: Does not illuminate.

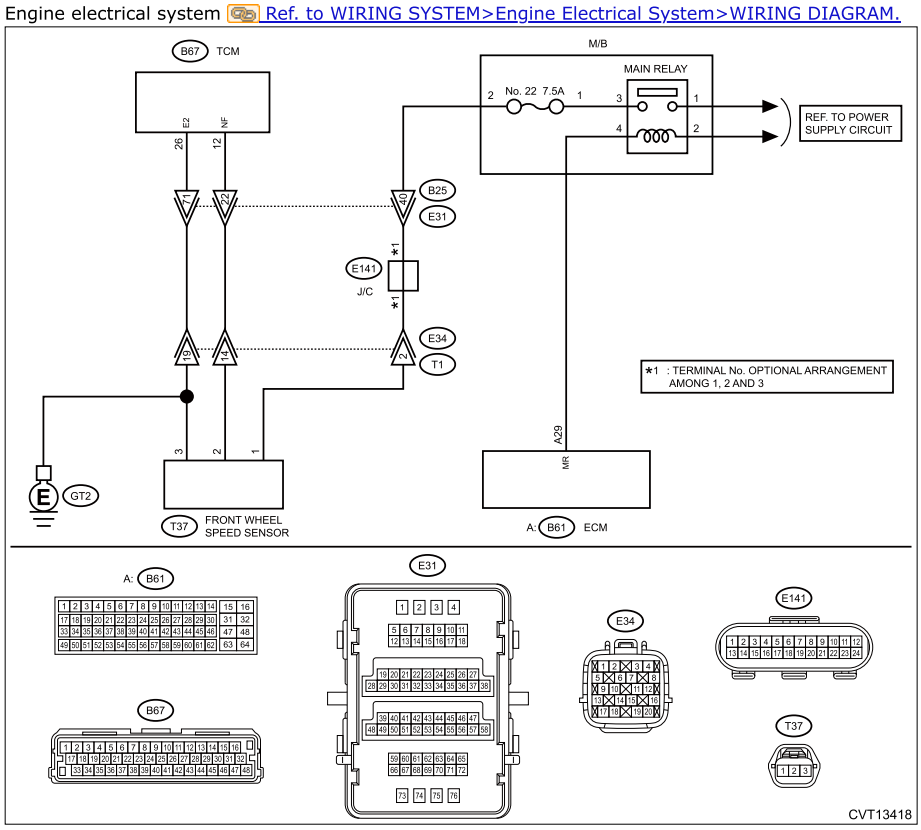
DTC P0720 OUTPUT SHAFT SPEED SENSOR CIRCUIT

1. —

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.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.
DC power supply circuit Ref. to WIRING SYSTEM>Power Supply Circuit>WIRING DIAGRAM.
Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

- **Use the check board when measuring the TCM/ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.	no →	Perform the instructed procedures.

yes ↓

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.
- yes → Perform the instructed procedures.
- no → Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.
- no → Perform the instructed procedures.
- yes ↓

5. CHECK HARNESS.
- no → Perform the instructed procedures.
- yes ↓

6. CHECK HARNESS.
- no → Perform the instructed procedures.
- yes ↓

7. CHECK TRANSMISSION HARNESS.
- no → Perform the instructed procedures.
- yes ↓

8. CHECK INPUT SIGNAL FOR TCM.
- yes → Perform the instructed procedures.
- no → Go to 9.

9. CHECK TRANSMISSION HARNESS.
- no → Perform the instructed procedures.
- yes ↓

10. CHECK FRONT WHEEL SPEED SENSOR HARNESS.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0890 displayed?

Yes — Perform the diagnosis according to DTC P0890. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW.

No — Go to 2.

2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.

Check connecting condition of the connectors indicated in the wiring diagram.

Are the connectors indicated in the wiring diagram properly connected?

Yes — Go to 3.

No — Properly connect the connectors indicated in the wiring diagram.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 2 (+) — Chassis 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 of harness between transmission connector and main relay connector**
- **Defective main relay**

No — Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 29 — 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 main relay connector.

5. 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
   (B67) No. 12 — (E34) No. 14:
   (B67) No. 26 — (E34) No. 19:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.
Connector & terminal
(B67) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E34, T1)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (E34) No. 2 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes — Go to 8.

No — Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Drive in “D” range.
6. Using the Subaru Select Monitor, read data of [Front Wheel Speed] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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 9.

9. 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

(T1) No. 2 — (T37) No. 1:
(T1) No. 14 — (T37) No. 2:
(T1) No. 19 — (T37) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

10. CHECK FRONT WHEEL SPEED SENSOR HARNESS.

Measure the resistance between transmission connector and chassis ground.

Connector & terminal

(T1) No. 2 — Chassis ground:
(T1) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the front wheel speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Front Wheel Speed Sensor.
If the replacement of the front wheel speed sensor does not eliminate the malfunction, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

No — Repair the short circuit of harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from wheel speed sensor)	3 MPH or more
Transmission range	Drive or Reverse

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.

DTC P0721 OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- No lock-up occurs.
- The engine stalls when the vehicle is stopped.
- Shift control malfunction

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0721, is any of the DTC P1706 or P0500 displayed?

Yes	Perform the diagnosis according to DTCs other than P0721. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of front wheel speed sensor signal 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from wheel speed sensor)	12 MPH or more

DIAGNOSTIC METHOD
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value

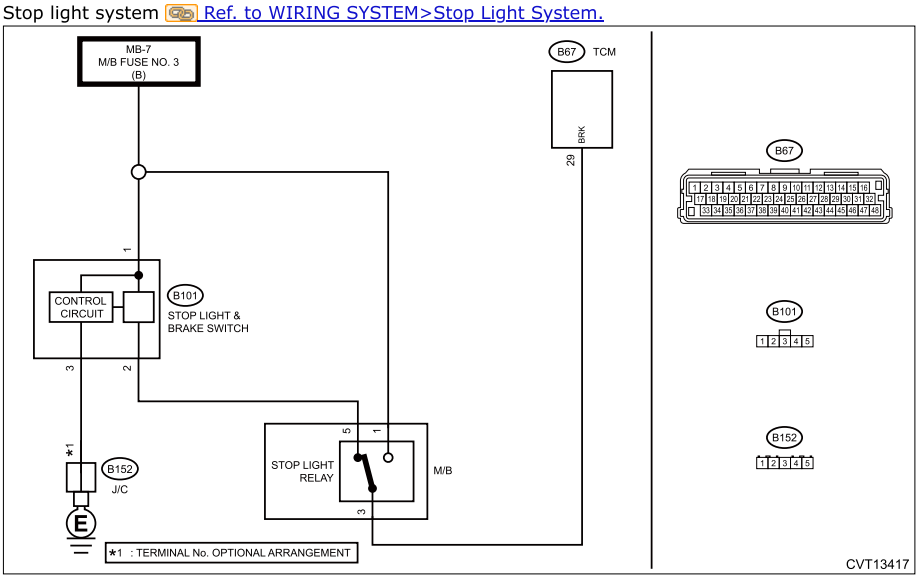
Malfunction Criteria	Threshold Value
ABS* (Vehicle speed (calculated from measured front output shaft speed sensor) – Vehicle speed (calculated from wheel speed sensor))	Exceeds 10 MPH

*ABS: Absolute value
Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0724 BRAKE SWITCH "B" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Gear is not shifted down when climbing a hill or driving down a hill.
Wiring diagram:
Stop light system Ref. to WIRING SYSTEM>Stop Light System.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK STOP LIGHT SWITCH.	no	Perform the instructed procedures.
yes ↓		
2. CHECK HARNESS.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK INPUT SIGNAL FOR TCM.	yes	Perform the instructed procedures.
	no	Go to 4.
4. CHECK FOR POOR CONTACT.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

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.
   Connector & terminal
   (B101) 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
   (B67) 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. Using the Subaru Select Monitor, read data of [Stop Light Switch] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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 stop light switch input signal circuit?

Yes — Repair the poor contact.

No — Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the stop light switch ON side stuck.
- Judge as NG when the brake signal OFF state does not continue for a predetermined time or longer 10 consecutive times while the vehicle accelerates from 0 km/h to a predetermined speed.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more

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
The brake switch B is continuously ON while the vehicle speed changed from "Y" to "X".	
Vehicle speed "Y"	Less than 0.6 MPH
Vehicle speed "X"	18.8 MPH or more
Note: **"Brake switch B ON" is defined as Brake switch B input voltage >= 3.4 V**	

Time needed for diagnosis: 10 times

Malfunction indicator light illumination: Does not illuminate.

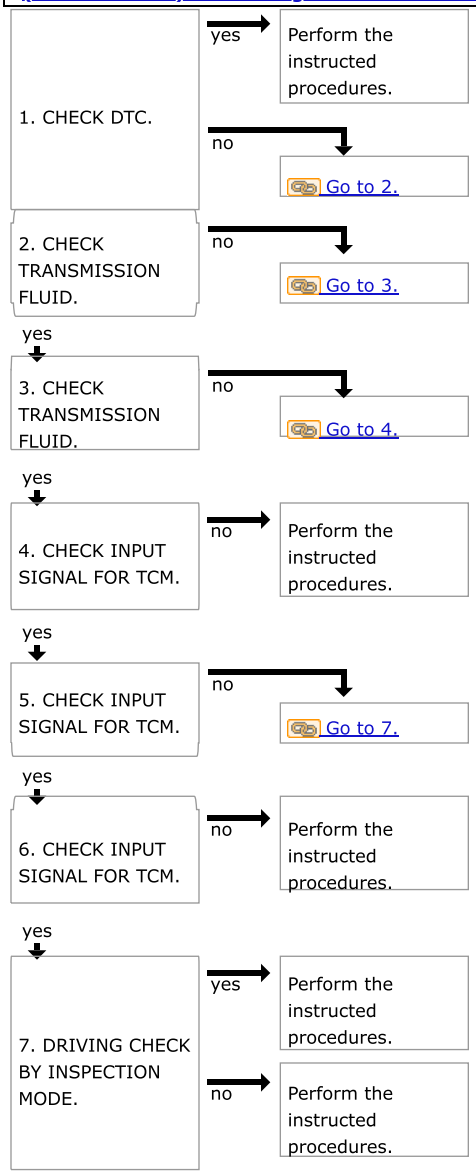
DTC P0730 INCORRECT GEAR RATIO

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0730, is any of the DTC P2746, P2747, P2750, P2751, P1706, P170B, P0720 or P0721 displayed?

Yes	Perform the diagnosis according to DTCs other than P0730. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK TRANSMISSION FLUID.

Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 3.

3. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes	Return ATF. Go to 4.
No	Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 4.

4. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes	Go to 5.
No	Perform the diagnosis according to DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0867 TRANSMISSION FLUID PRESSURE .

5. 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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 2.0 — 2.7?

Yes — Go to 6.

No — Go to 7.

6. 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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 0.5 — 1.5?

Yes — Go to 7.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

7. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute 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(TR690)>Transmission Assembly.

No — Current condition is normal. It is possible that temporary poor contact occurs.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the abnormality in transmission gear ratio control function.
- Judge as NG if a 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.)

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	400 rpm or more
Transmission range	Drive

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
ABS* (Target primary pulley shaft speed − Measured primary pulley shaft speed)	600 rpm or more
(Commanded duty of shift up pressure control solenoid) or Commanded duty of shift down pressure control solenoid)	90% or more

*ABS: Absolute value

Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0746 PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF

1. —

DTC detecting condition:

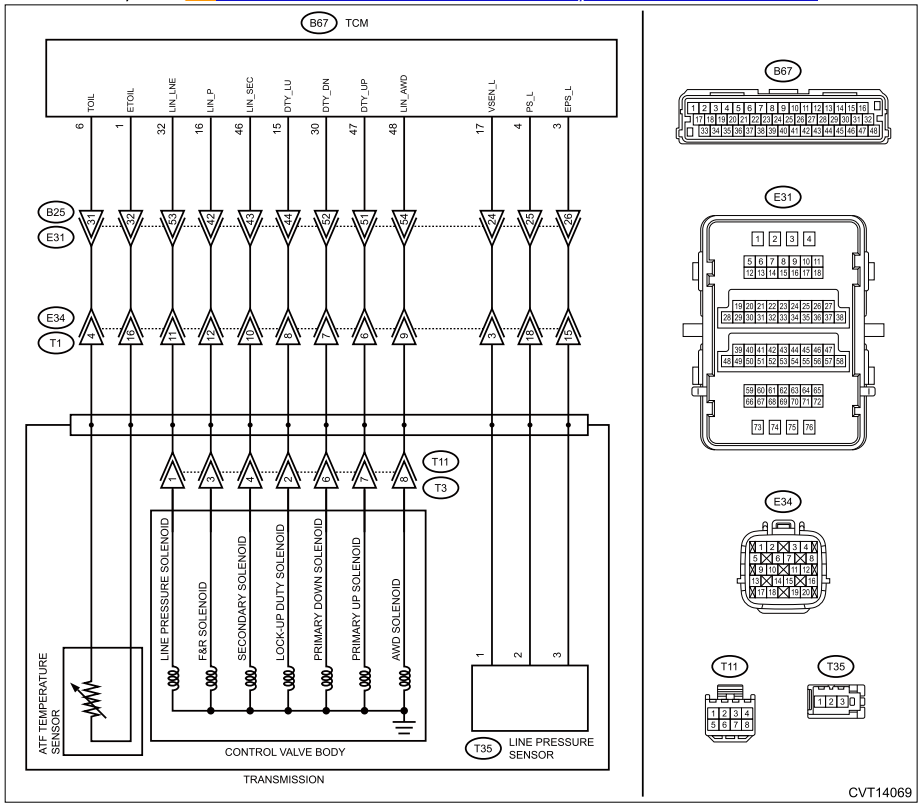
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction

Wiring diagram:

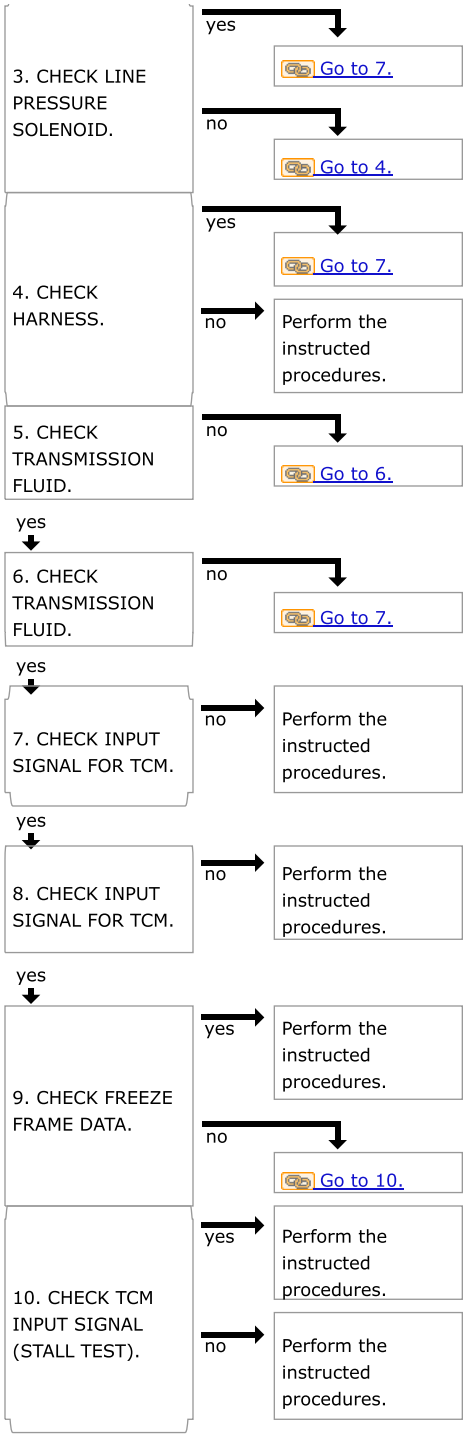
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0746 and P0867, is any of the DTC P0842, P0843, P0961, P0962 or P0963 displayed?

Yes — Perform the diagnosis according to DTCs other than P0746 and P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for line pressure solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 5.

No — Go to 3.

3. CHECK LINE PRESSURE 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

(T1) No. 11 — Transmission body:

Is the resistance approximately 3.3 — 7.3 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 7.

7. CHECK INPUT SIGNAL FOR TCM.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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 5 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes — Go to 8.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

8. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

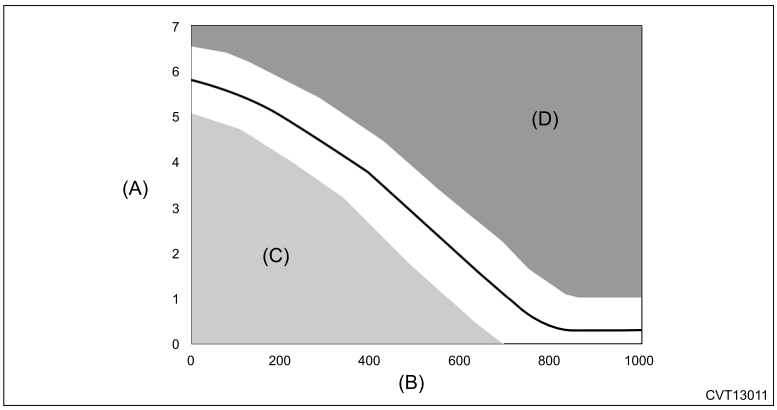
Is [Actual line press.] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 7 0.2 MPa or more?

Yes — Go to 9.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

9. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data for DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data.
3. Apply the values of [Actual line press.] and [Lin. Sol. 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 line pressure (MPa)
(B) Line actual current (mA)
(C) Low-voltage malfunction
(D) High-voltage malfunction

Note:
Symptom that the DTC P0867 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**

Was the detected symptom low-voltage malfunction?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 10.

10. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual line press.] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to high pressure side).
- Judge as NG, when the line pressure sensor value at P0867 detection is the predetermined value or more, and the line pressure sensor voltage value after the predetermined period of time has elapsed since IG OFF is within the predetermined range.

EXECUTION CONDITION

Secondary parameters	Execution condition
Phase 1	
12 V battery system voltage	10 V or more
Engine speed	At or more than rpm values in Table 1
Phase 2	
Fail detected (P0867)	TRUE
12 V battery system voltage	10 V or more
Ignition state	OFF
Measured primary pulley shaft speed	400 rpm or less
Transmission fluid temperature	10 degC or more

Table 1

		Target line pressure (kPa)								
		0	500	1000	1500	2000	3000	4000	5000	6000
Transmission fluid temperature (degC)	−40	500	500	500	500	529	636	791	961	8000
	−20	500	500	500	500	529	636	791	961	8000
	0	500	500	500	500	529	636	791	961	8000
	20	500	500	500	500	529	636	791	961	8000
	40	500	500	500	500	529	636	791	961	8000
	60	500	500	506	561	631	807	1154	8000	8000
	80	500	500	590	705	818	991	1300	4658	8000
	100	500	569	670	795	901	1174	1458	4962	8000
	120	500	653	782	897	1060	1352	1707	8000	8000

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	
ABS* (Target line pressure − Measured line pressure)	More than 500 kPa
Measured line pressure	3000 kPa or more
Phase 2	
Measured line pressure sensor input voltage (Line pressure)	0.8 V or less (570 kPa or less)
Measured line pressure sensor input voltage (Line pressure)	0.195 V or more (0 kPa or more)
Note: **Both Phase 1 and Phase 2 must be met to fail the diagnostics.**	

*ABS: Absolute value

Time needed for diagnosis:

- **Phase 1**: 5 s
- **Phase 2**: 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0747 PRESSURE CONTROL SOLENOID "A" STUCK ON

1. —

DTC detecting condition:

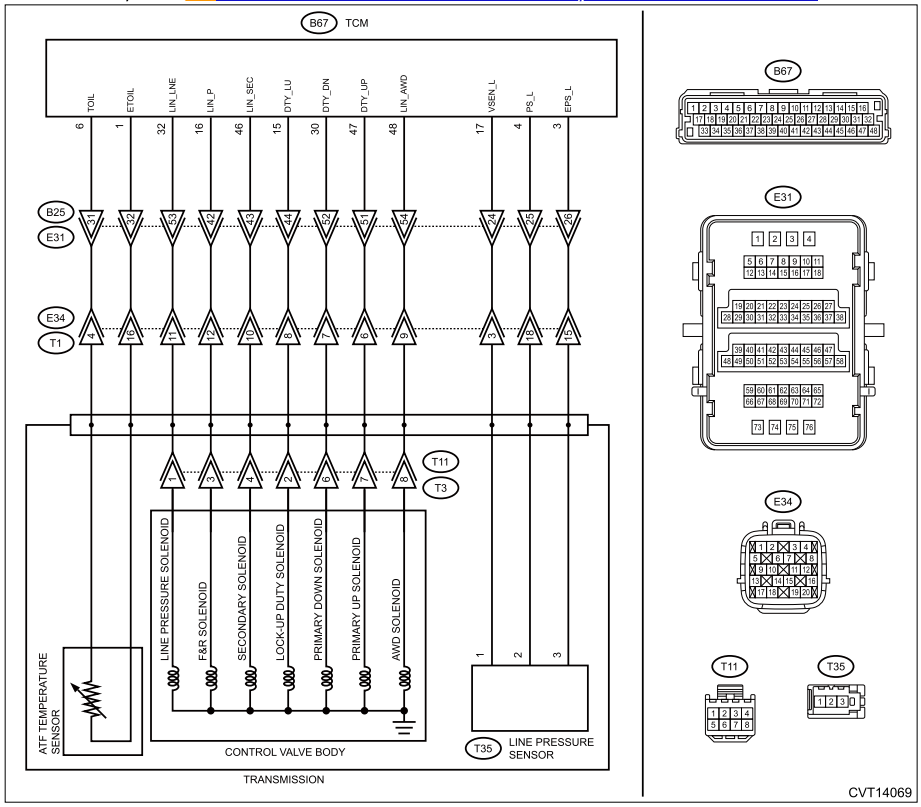
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Shift control malfunction
- CVT chain slippage

Wiring diagram:

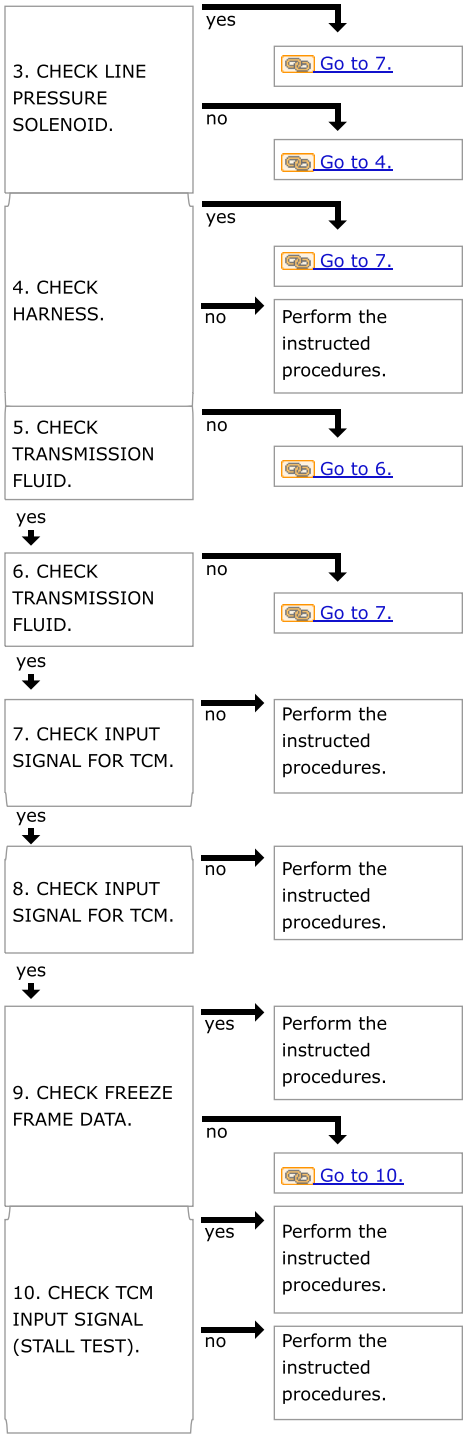
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).	yes →	Go to 5.
	no →	Go to 3.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0747 and P0867, is any of the DTC P0842, P0843, P0961, P0962 or P0963 displayed?

Yes — Perform the diagnosis according to DTCs other than P0747 and P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for line pressure solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 5.

No — Go to 3.

3. CHECK LINE PRESSURE 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

(T1) No. 11 — Transmission body:

Is the resistance approximately 3.3 — 7.3 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 7.

7. CHECK INPUT SIGNAL FOR TCM.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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 5 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

8. CHECK INPUT SIGNAL FOR TCM.

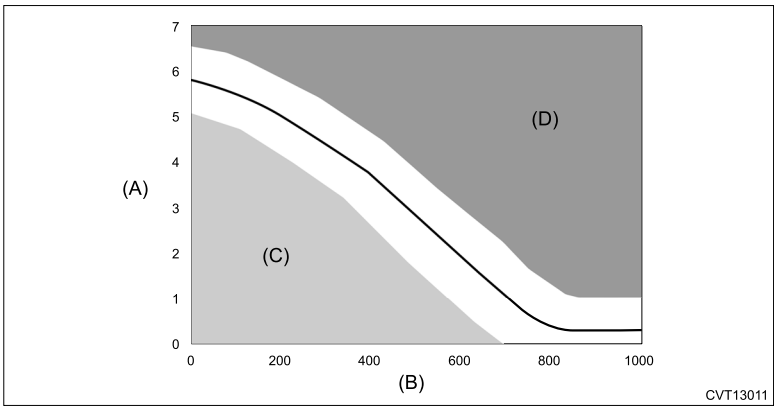
1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 7 0.2 MPa or more?

Yes	Go to 9.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

9. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data for DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data.
3. Apply the values of [Actual line press.] and [Lin. Sol. 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 line pressure (MPa)
(B) Line actual current (mA)
(C) Low-voltage malfunction
(D) High-voltage malfunction

Note:
Symptom that the DTC P0867 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**

Was the detected symptom low-voltage malfunction?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 10.

10. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual line press.] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to low pressure side).
- Judge as NG, when the line pressure sensor value at P0867 detection is less than the predetermined value, and the line pressure sensor voltage value after the predetermined period of time has elapsed since IG OFF is within the predetermined range.

EXECUTION CONDITION

Secondary parameters	Execution condition
Phase 1 12 V battery system voltage Engine speed	 10 V or more At or more than rpm values in Table 1
Phase 2 Fail detected (P0867) 12 V battery system voltage Ignition state Measured primary pulley shaft speed Transmission fluid temperature	 TRUE 10 V or more OFF 400 rpm or less 10 degC or more

Table 1

		Target line pressure (kPa)								
		0	500	1000	1500	2000	3000	4000	5000	6000
Transmission fluid temperature (degC)	−40	500	500	500	500	529	636	791	961	8000
	−20	500	500	500	500	529	636	791	961	8000
	0	500	500	500	500	529	636	791	961	8000
	20	500	500	500	500	529	636	791	961	8000
	40	500	500	500	500	529	636	791	961	8000
	60	500	500	506	561	631	807	1154	8000	8000
	80	500	500	590	705	818	991	1300	4658	8000
	100	500	569	670	795	901	1174	1458	4962	8000
	120	500	653	782	897	1060	1352	1707	8000	8000

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 ABS* (Target line pressure − Measured line pressure) Measured line pressure	 More than 500 kPa Less than 3000 kPa
Phase 2 Measured line pressure sensor input voltage (Line pressure) Measured line pressure sensor input voltage (Line pressure) **Note:** **Both Phase 1 and Phase 2 must be met to fail the diagnostics.**	 0.8 V or less (570 kPa or less) 0.195 V or more (0 kPa or more)

*ABS: Absolute value

Time needed for diagnosis:

- **Phase 1**: 5 s
- **Phase 2**: 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0751 SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF

1. —

DTC detecting condition:

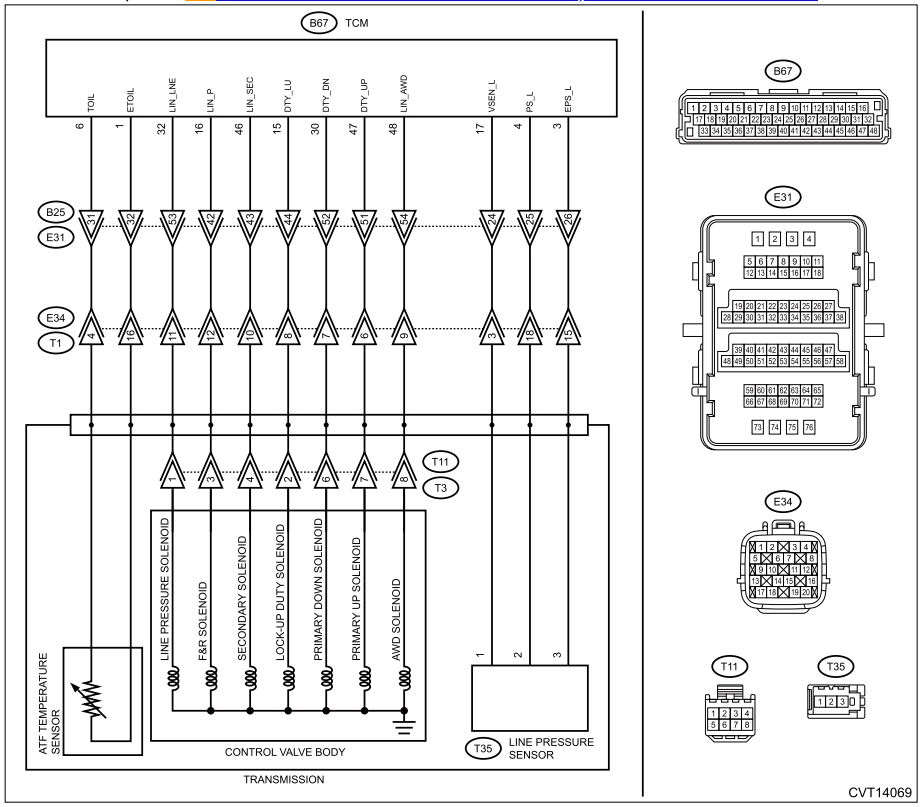
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Shift control malfunction
- Engine speed increases abruptly.

Wiring diagram:

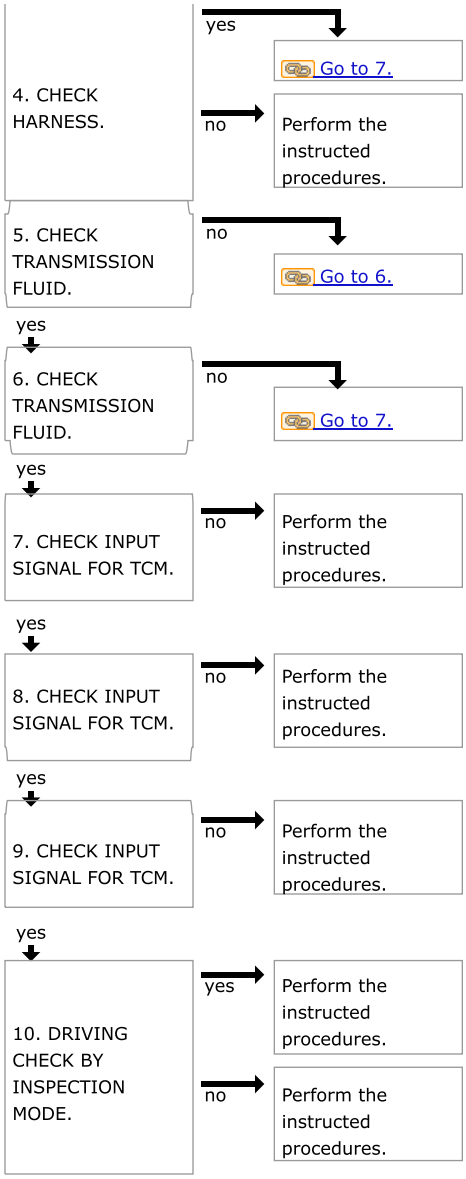
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK PRIMARY UP SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.
3. CHECK PRIMARY UP SOLENOID.	yes	Go to 7.
	no	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

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. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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 the active test for primary UP solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, 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
   (T1) No. 6 — Transmission body:

Is the resistance approximately 10 — 14.2 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 7.

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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes — Go to 8.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 2.0 — 2.7?

Yes — Go to 9.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 0.5 — 1.5?

Yes — Go to 10.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute 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(TR690)>Transmission Assembly.

No — Current condition is normal. It is possible that temporary poor contact occurs.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of characteristics in the primary UP solenoid and hydraulic circuit (stuck to low pressure side).

- Judge as NG if the amount of gear rate change for a predetermined period of time is equal to or larger than the predetermined value, even though the up-shift command is issued.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	More than 1.5 and Less than 2.629

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

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	More than −0.08
Commanded duty of shift up pressure control solenoid	90% or more

Time needed for diagnosis: Table 1 s

Table 1

		Transmission fluid temperature (°C)				
		−10	20	40	80	120
Engine Speed (rpm)	1000	1	1	1	1	1
	2000	1	1	1	1	1
	2500	1	0.5	0.45	0.45	0.45
	3000	1	0.5	0.45	0.45	0.45
	4000	1	0.5	0.45	0.45	0.45
	5000	1	0.5	0.45	0.45	0.45
	6000	1	0.5	0.45	0.45	0.45

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0752 SHIFT SOLENOID "A" STUCK ON

1. —

DTC detecting condition:

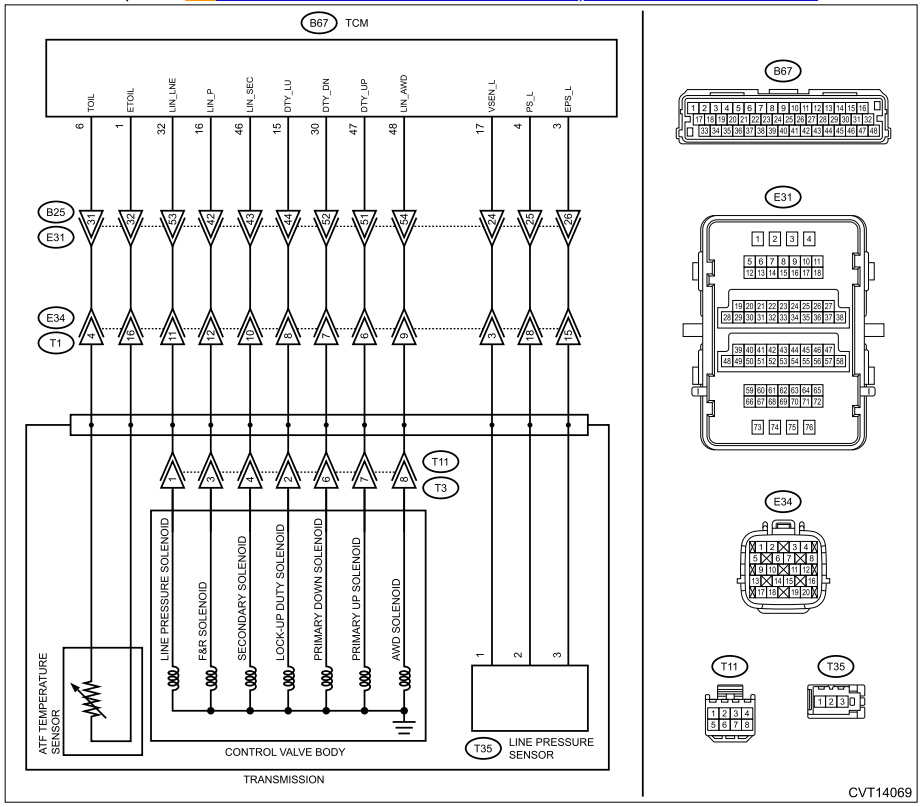
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction

Wiring diagram:

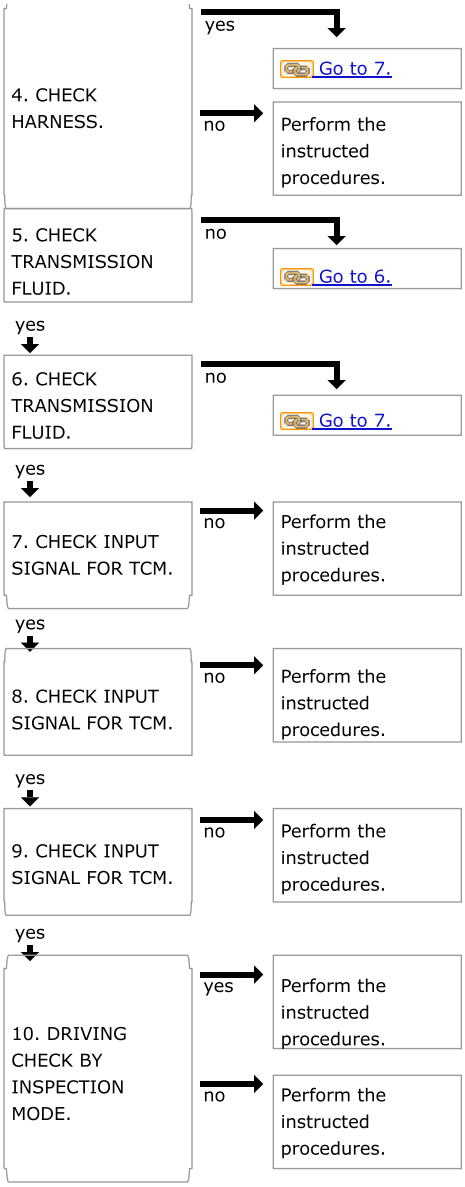
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK PRIMARY UP SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.
3. CHECK PRIMARY UP SOLENOID.	yes	Go to 7.
	no	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0752, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes — Perform the diagnosis according to DTCs other than P0752. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 the active test for primary UP solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, 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
   (T1) No. 6 — Transmission body:

Is the resistance approximately 10 — 14.2 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 7.

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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes — Go to 8.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 2.0 — 2.7?

Yes — Go to 9.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 0.5 — 1.5?

Yes — Go to 10.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute 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(TR690)>Transmission Assembly.

No — Current condition is normal. It is possible that temporary poor contact occurs.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of characteristics in the primary UP solenoid and hydraulic circuit (stuck to high pressure side).

- Judge as NG if the amount of gear rate change for a predetermined period of time is within the predetermined value, even though the down-shift command is issued.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	Less than 0.5

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

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	More than −0.08 and Less than 0.08
Commanded duty of shift down pressure control solenoid	More than 80%

Time needed for diagnosis: Table 1 s

Table 1

Transmission fluid temperature (°C)	−10	20	40	80	120
Time Required (sec)	1	0.3	0.25	0.25	0.25

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0756 SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF

1. —

DTC detecting condition:

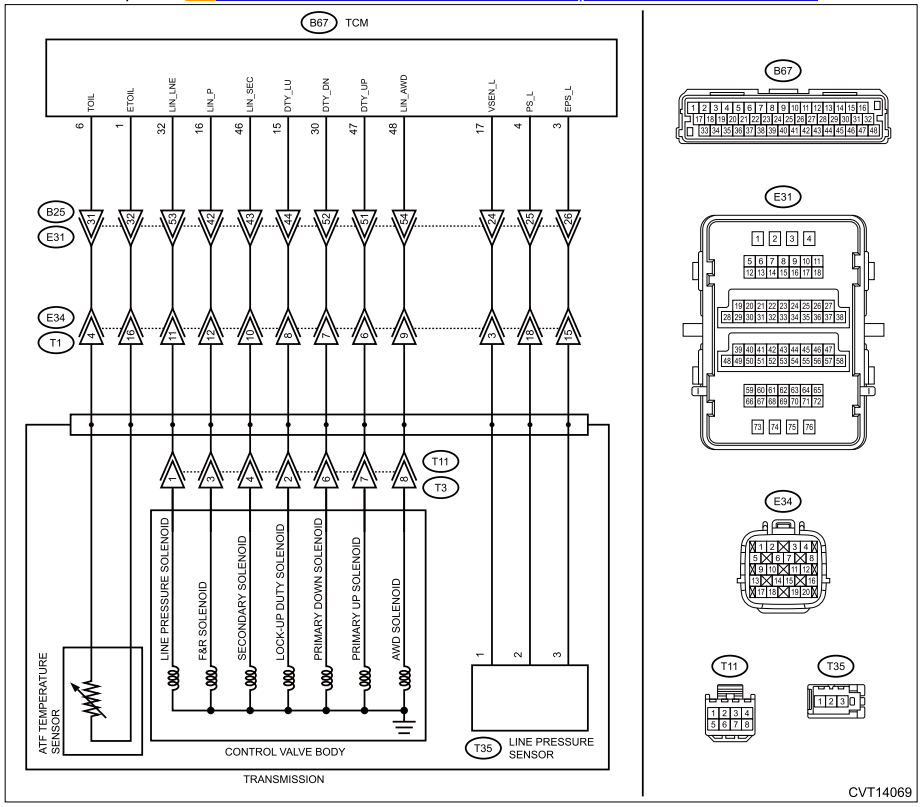
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction

Wiring diagram:

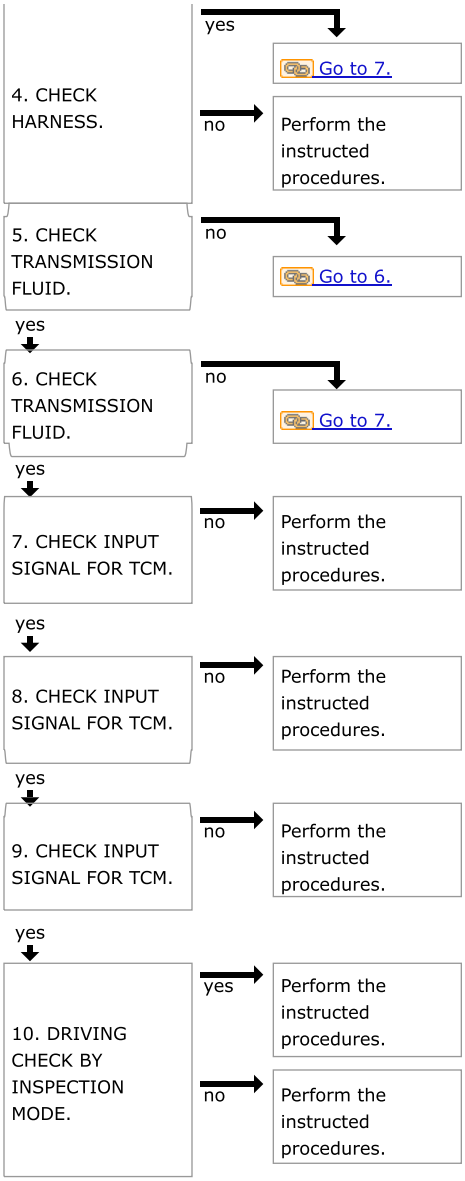
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK PRIMARY DOWN SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.
3. CHECK PRIMARY DOWN SOLENOID.	yes	Go to 7.
	no	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0756, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes — Perform the diagnosis according to DTCs other than P0756. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 the active test for primary DOWN solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, 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
   (T1) No. 7 — Transmission body:

Is the resistance approximately 10 — 14.2 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 7.

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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes — Go to 8.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 2.0 — 2.7?

Yes — Go to 9.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 0.5 — 1.5?

Yes — Go to 10.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute 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(TR690)>Transmission Assembly.

No — Current condition is normal. It is possible that temporary poor contact occurs.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of characteristics in the primary DOWN solenoid and hydraulic circuit (stuck to low pressure side).

- Judge as NG if the amount of gear rate change for a predetermined period of time is within the predetermined value, even though the down-shift command is issued.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	0.5 or more and 2.629 or less

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

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	More than −0.08 and Less than 0.08
Commanded duty of shift down pressure control solenoid	More than 80%

Time needed for diagnosis: Table 1 s

Table 1

Transmission fluid temperature (°C)	−10	20	40	80	120
Time Required (sec)	1	0.3	0.25	0.25	0.25

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0757 SHIFT SOLENOID "B" STUCK ON

1. —

DTC detecting condition:

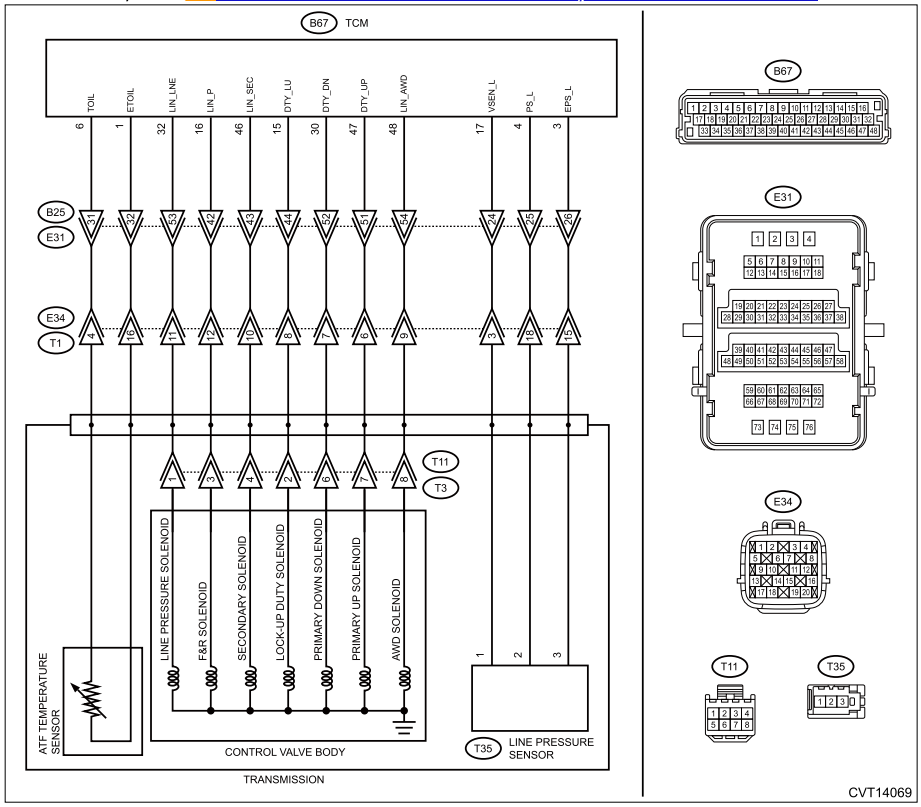
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Vibration occurs at shift change.
- Shift control malfunction

Wiring diagram:

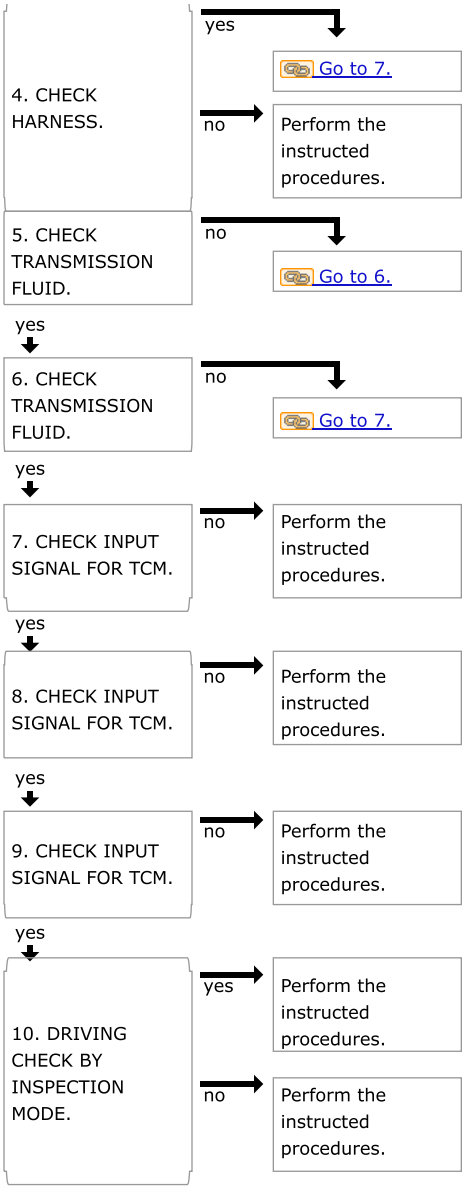
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK PRIMARY DOWN SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.
3. CHECK PRIMARY DOWN SOLENOID.	yes	Go to 7.
	no	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

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. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 the active test for primary DOWN solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, 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

(T1) No. 7 — Transmission body:

Is the resistance approximately 10 — 14.2 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 7.

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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 2.0 — 2.7?

Yes	Go to 9.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>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. Using the Subaru Select Monitor, read data of [Actual Gear Ratio] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Gear Ratio] 0.5 — 1.5?

Yes	Go to 10.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute 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(TR690)>Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of characteristics in the primary DOWN solenoid and hydraulic circuit (stuck to high pressure side).

- Judge as NG if the amount of gear rate change for a predetermined period of time is equal to or larger than the predetermined value, even though the up-shift command is issued.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	0.379 or more and 2.629 or less

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

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	More than 0.04
Commanded duty of shift up pressure control solenoid	More than 50%

Time needed for diagnosis: 1 s × 10 times

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF

1. —

DTC detecting condition:

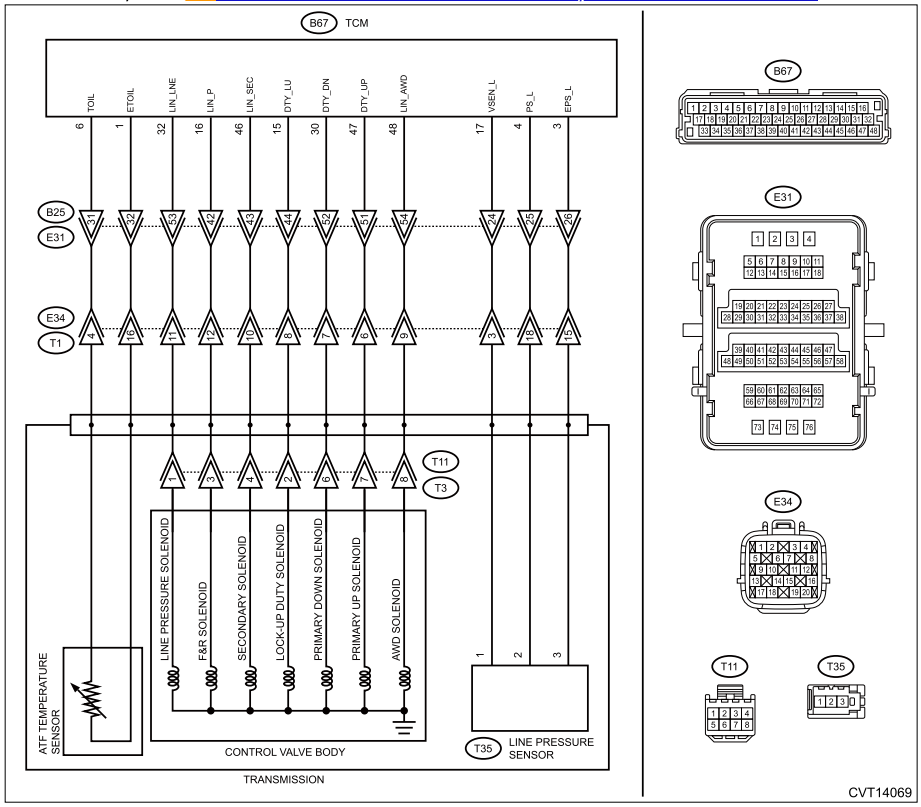
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine speed increases abruptly, and cannot accelerate.
- Excessive slippage is felt.

Wiring diagram:

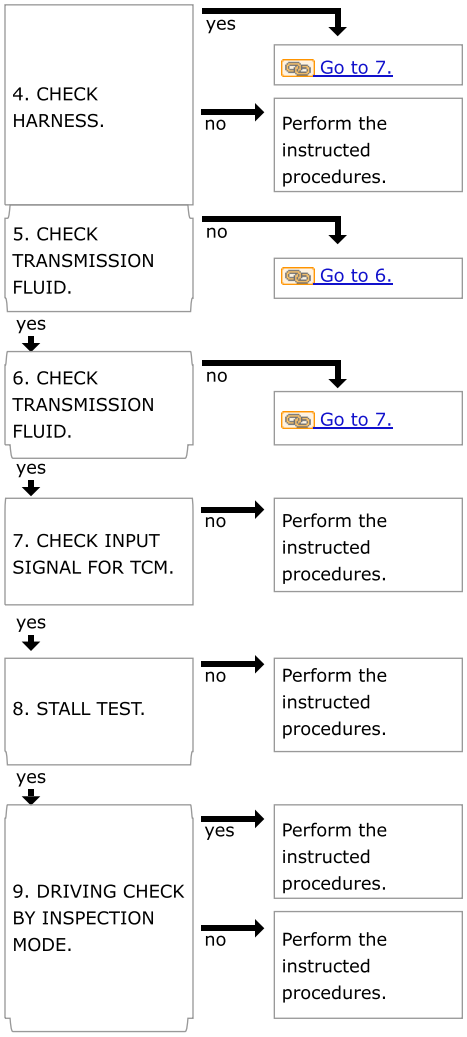
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK F&R SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.
3. CHECK F&R SOLENOID.	yes	Go to 7.
	no	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0776, is DTC P0720, P0966, P0967, or P2751 displayed?

Yes — Perform the diagnosis according to DTCs other than P0776. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 the active test for F&R solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, 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
   (T1) No. 12 — Transmission body:

Is the resistance approximately 3.5 — 7.1 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 7.

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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 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(TR690)>Stall Test.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

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(TR690)>Transmission Assembly.

9. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute 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(TR690)>Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Diagnosis 1

- 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.

Diagnosis 2

Judge as NG when the turbine speed becomes the predetermined value or larger at starting.

EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	10 V or more
Transmission range	Drive
Measured secondary pulley shaft speed	100 rpm or more
Measured front output shaft speed	100 rpm or more
Commanded forward & reverse clutch pressure control solenoid current	Less than 0.9 A
Engine speed	400 rpm or more
Diagnosis 2	

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Transmission range	Drive
Measured front output shaft speed	Less than 100 rpm
Commanded forward & reverse clutch pressure control solenoid current	Less than 0.9 A
Accelerator pedal position (from ECM)	Exceeds 6%
Engine speed	400 rpm or more

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 ABS* (Measured front output shaft speed − Measured secondary pulley shaft speed)	Exceeds rpm values in Table 1
Diagnosis 2 Measured secondary pulley shaft speed	More than 600 rpm

*ABS: Absolute value

Table 1

Vehicle speed (calculated from front output shaft speed sensor) (MPH)	0	13	25	38	50	63	75
ABS (Measured front output shaft speed − Measured secondary pulley shaft speed) (rpm)	150	100	100	100	100	100	100

Vehicle speed (calculated from front output shaft speed sensor) (MPH)	88	100	113	125	138	150	159
ABS (Measured front output shaft speed − Measured secondary pulley shaft speed) (rpm)	100	100	100	100	100	100	100

Time needed for diagnosis: 5 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0801 REVERSE INHIBIT CONTROL CIRCUIT/OPEN

DTC detecting condition:

Immediately at fault recognition

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Note:

For diagnostic procedures, refer to "DTC B1016 SHIFT LOCK CIRCUIT" in "BODY CONTROL SYSTEM (DIAGNOSTICS)". **Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1016 SHIFT LOCK CIRCUIT.**

DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:

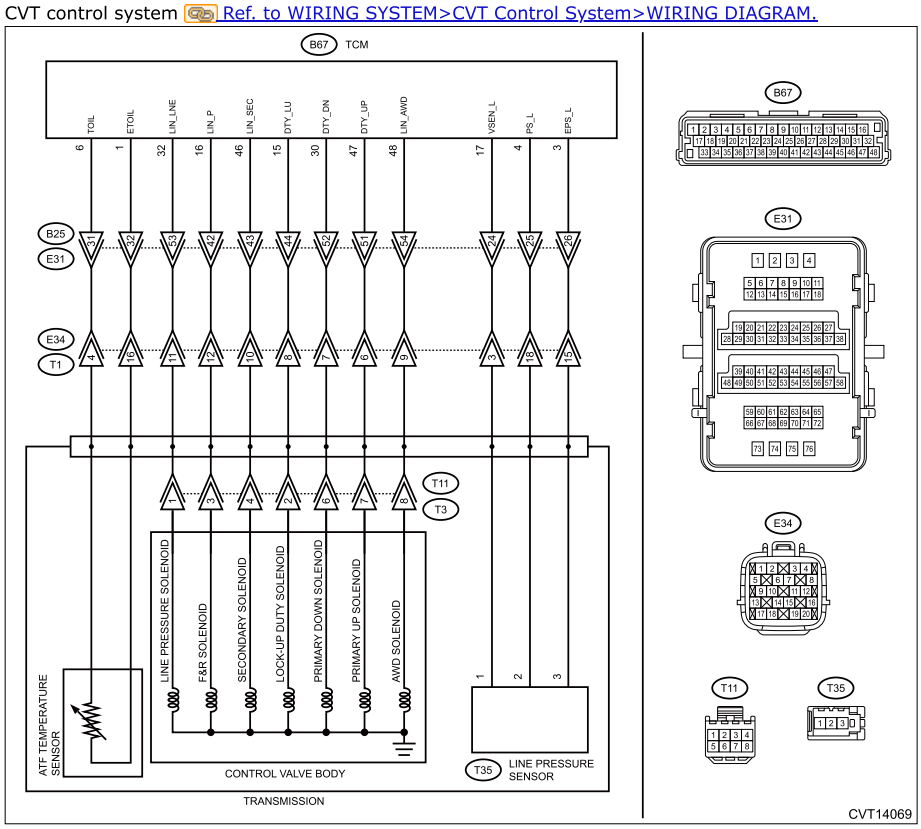
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Wiring diagram:

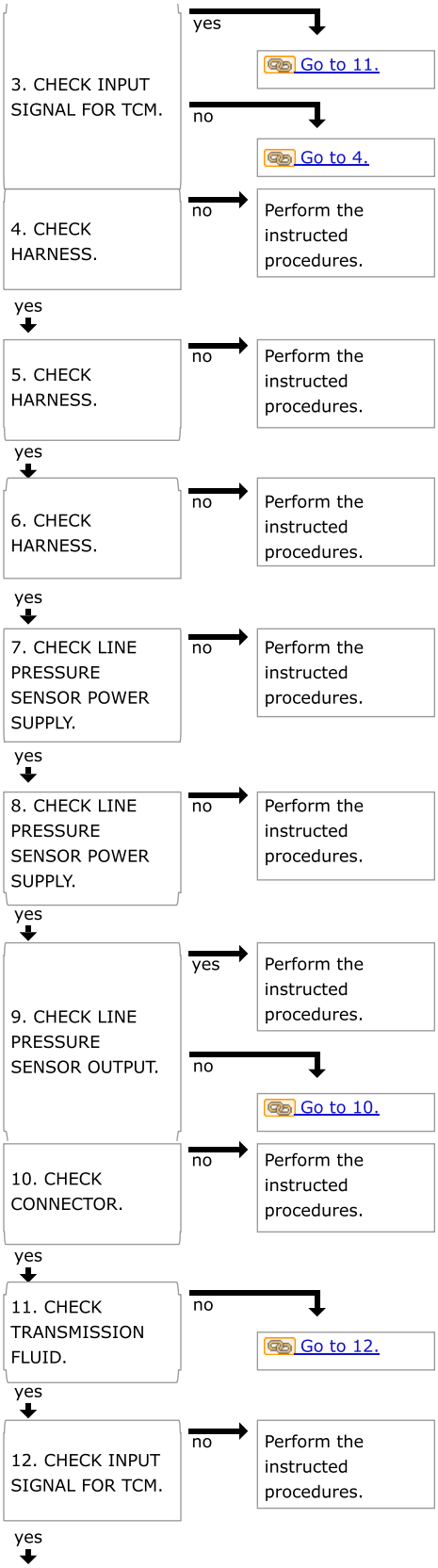
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.


3. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 11.
no
Go to 4.
4. CHECK HARNESS.
no
Perform the instructed procedures.
yes
5. CHECK HARNESS.
no
Perform the instructed procedures.
yes
6. CHECK HARNESS.
no
Perform the instructed procedures.
yes
7. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
8. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
9. CHECK LINE PRESSURE SENSOR OUTPUT.
yes
Perform the instructed procedures.
no
Go to 10.
10. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes
11. CHECK TRANSMISSION FLUID.
no
Go to 12.
yes
12. CHECK INPUT SIGNAL FOR TCM.
no
Perform the instructed procedures.
yes

13. CHECK INPUT SIGNAL FOR TCM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0841, is any of the DTC P0842 or P0843 displayed?

Yes	Perform the diagnosis according to DTC P0842 or P0843. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0841, is any of the DTC P0746 or P0747 displayed?

Yes	Perform the diagnosis according to DTC P0746 or P0747. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read data of [Line Pressure Sensor Voltage.] in the [Data Monitor] of [Transmission]. (While shaking the line pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Line Pressure Sensor Voltage.] 0.39 — 0.61 V?

Yes	Go to 11.
No	Go to 4.

4. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission oil pan.
4. Disconnect the line pressure sensor connector.
5. Measure the resistance between TCM connector and line pressure sensor connector.

Connector & terminal
(B67) No. 3 — (T35) No. 3:
(B67) No. 4 — (T35) No. 2:
(B67) No. 17 — (T35) No. 1:

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 connectors.

Connector & terminal
(B67) No. 3 — (B67) No. 17:
(B67) No. 4 — (B67) No. 3:
(B67) No. 17 — (B67) No. 4:

Is the resistance 1 MΩ or more?

Yes — Go to 6.

No — Repair the short circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.

Connector & terminal
(B67) No. 3 — Transmission body:
(B67) No. 4 — Transmission body:
(B67) No. 17 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit of harness.

7. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 8.

No — 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).

8. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Connect the line pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 9.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

9. CHECK LINE PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 4 (+) — (B67) No. 3 (−):

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(TR690)>Transmission Control Module (TCM).

No — Go to 10.

10. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the line pressure sensor connector.
4. Check the TCM connector (B67) and the line pressure sensor connector (T35).

Is the check result OK?

Yes — Go to 11.

No — Repair the connector, or replace harness.

11. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 12.

12. 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 move the select lever to each range at an interval of 5 seconds.

Note:
Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".

4. Stabilize the engine speed at idle.
5. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes — Go to 13.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

13. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 12 0.2 MPa or more?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure sensor function.
- Judge as NG if the voltage of the line pressure sensor after the predetermined period of time has elapsed since IG OFF exceeded the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Ignition state	OFF
Measured primary pulley shaft speed	400 rpm or less
Transmission fluid temperature	10 degC or more

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 (Line pressure)	More than 0.8 V (Exceeds 570 kPa)

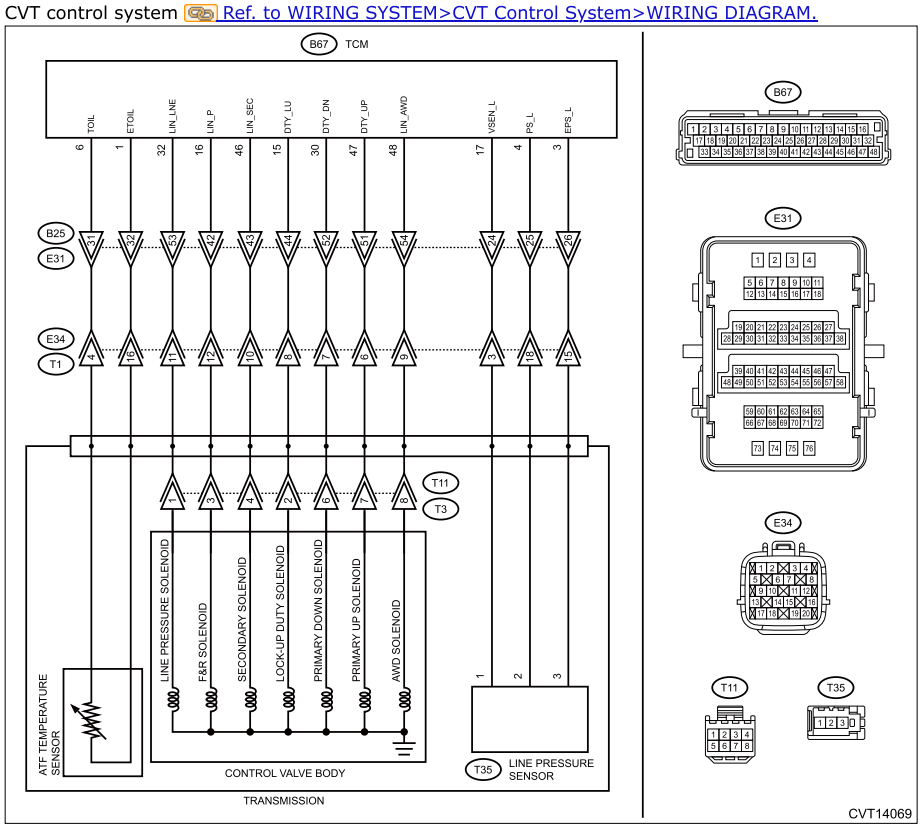
Time needed for diagnosis: 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0842 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Shift characteristics malfunction
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK INPUT SIGNAL FOR TCM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK TRANSMISSION HARNESS.	no →	Perform the instructed procedures.

yes

5. CHECK TRANSMISSION HARNESS. → no → Perform the instructed procedures.

yes

6. CHECK LINE PRESSURE SENSOR POWER SUPPLY. → yes → Perform the instructed procedures.

→ no → Perform the instructed procedures.

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. Set the select lever to "D" range.
4. Shift the select lever to "P" range.
5. Stabilize the engine speed at idle.
6. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 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

(B67) No. 3 — (E34) No. 15:
(B67) No. 4 — (E34) No. 18:
(B67) No. 17 — (E34) No. 3:

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

(B67) No. 4 — Chassis ground:
(B67) No. 17 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit of harness.

4. CHECK TRANSMISSION HARNESS.

Caution:
Start work after ATF cools down.

1. Remove the transmission oil pan.
2. Disconnect the line pressure sensor connector.
3. Measure the resistance between transmission connector and line pressure sensor connector.
   Connector & terminal
   (T1) No. 3 — (T35) No. 1:
   (T1) No. 15 — (T35) No. 3:
   (T1) No. 18 — (T35) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 5.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

5. CHECK TRANSMISSION HARNESS.

Measure the resistance between transmission connector and chassis ground.
Connector & terminal
(T1) No. 3 — Chassis ground:
(T1) No. 18 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 6.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

6. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Connect the TCM connector.
2. Connect the transmission connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between line pressure sensor connector terminals.
   Connector & terminal
   (T35) No. 1 (+) — (T35) No. 3 (−):

Is the voltage 4.5 V or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — 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).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of the transmission line pressure sensor.
- Judge as NG if the voltage detected by the transmission line pressure sensor is lower than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

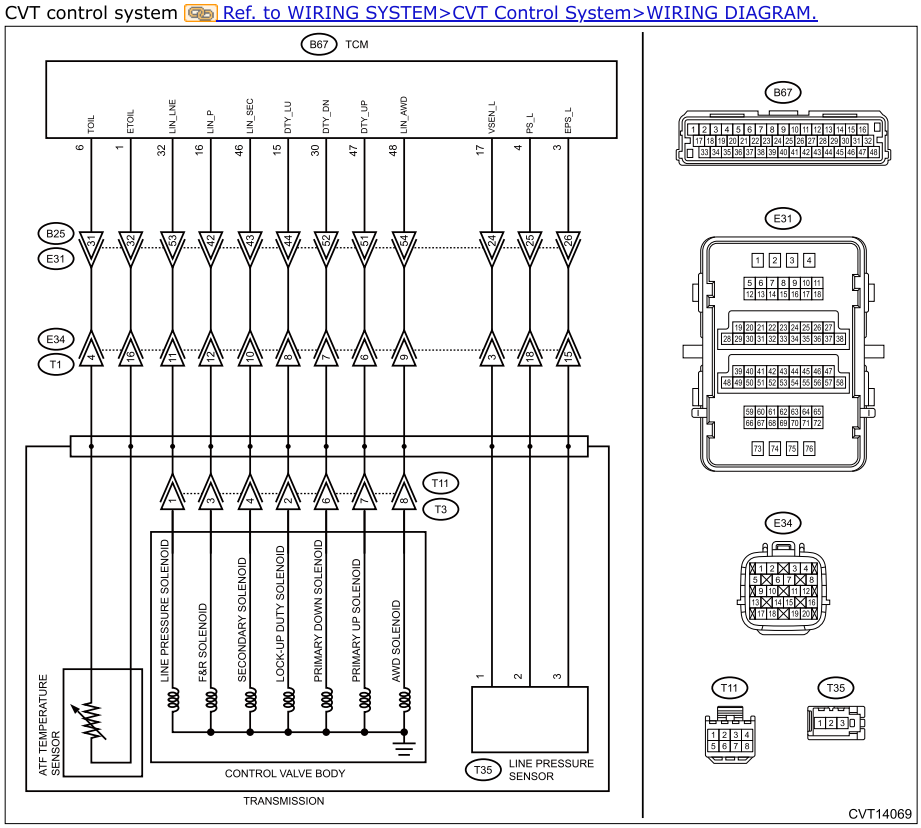
Malfunction Criteria	Threshold Value
Measured line pressure sensor input voltage (Line pressure)	Less than 0.195 V (Less than 0 kPa)

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0843 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH

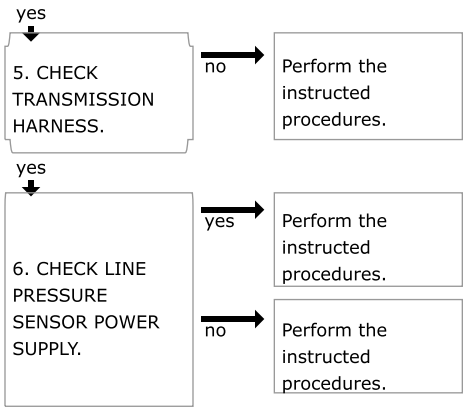
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Shift characteristics malfunction
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK INPUT SIGNAL FOR TCM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK LINE PRESSURE SENSOR POWER SUPPLY.	no →	Perform the instructed procedures.



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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 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
   (B67) No. 4 (+) — Chassis ground (−):
   (B67) No. 17 (+) — 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
   (B67) No. 4 — (B67) No. 17:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair the short circuit of harness.

4. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

Caution:
Start work after ATF cools down.

1. Remove the transmission oil pan.
2. Disconnect the line pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 3 (+) — Chassis ground (−):
   (T1) No. 18 (+) — 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
   (T1) No. 3 — (T1) No. 18:

Is the resistance 1 MΩ or more?

Yes — Go to 6.

No — Repair the short circuit of harness.

6. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Connect the TCM connector.
2. Connect the transmission connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between line pressure sensor connector terminals.
   Connector & terminal
   (T35) No. 1 (+) — (T35) No. 3 (−):

Is the voltage 4.5 V or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — 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).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission line pressure sensor 5 V system.
- Judge as NG if the voltage detected by the transmission line pressure sensor is higher than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 (Line pressure)	More than 4.883 V (Exceeds 8200 kPa)

Time needed for diagnosis: 1.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0846 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:

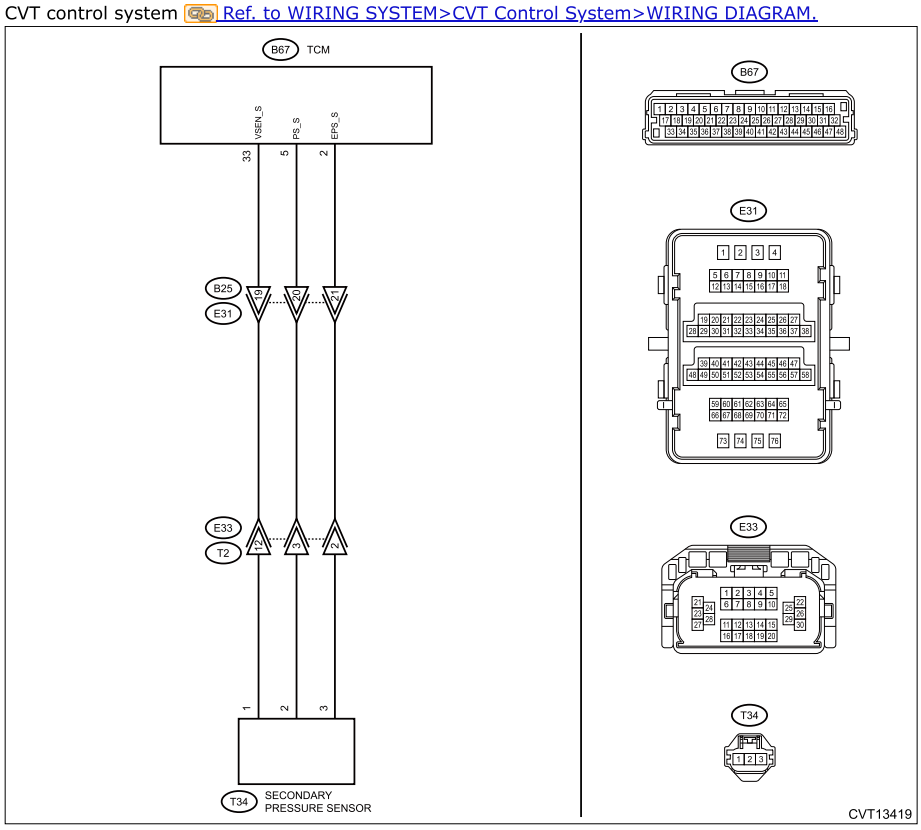
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Wiring diagram:

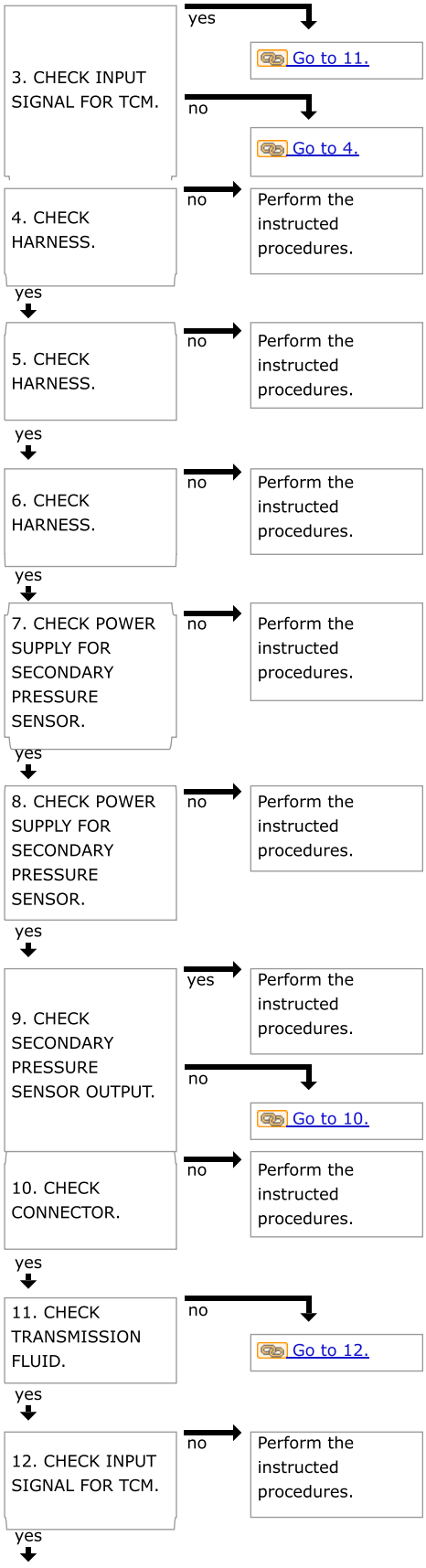
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.


3. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 11.
no
Go to 4.
4. CHECK HARNESS.
no
Perform the instructed procedures.
yes
5. CHECK HARNESS.
no
Perform the instructed procedures.
yes
6. CHECK HARNESS.
no
Perform the instructed procedures.
yes
7. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
no
Perform the instructed procedures.
yes
8. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
no
Perform the instructed procedures.
yes
9. CHECK SECONDARY PRESSURE SENSOR OUTPUT.
yes
Perform the instructed procedures.
no
Go to 10.
10. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes
11. CHECK TRANSMISSION FLUID.
no
Go to 12.
yes
12. CHECK INPUT SIGNAL FOR TCM.
no
Perform the instructed procedures.
yes

13. CHECK INPUT SIGNAL FOR TCM.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0846, is DTC P0847 or P0848 displayed?

Yes — Perform the diagnosis according to DTC P0847 or P0848. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0846, is DTC P2723 displayed?

Yes — Perform the diagnosis according to DTC P2723. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2723 PRESSURE CONTROL SOLENOID "E" PERFORMANCE/STUCK OFF .

No — Go to 3.

3. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read data of [secondary pressure sensor voltage.] in the [Data Monitor] of [Transmission]. (While shaking the secondary pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [secondary pressure sensor voltage.] 0.39 — 0.61 V?

Yes — Go to 11.

No — Go to 4.

4. 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

(B67) No. 2 — (T34) No. 3:
(B67) No. 5 — (T34) No. 2:
(B67) No. 33 — (T34) No. 1:

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 connectors.
Connector & terminal
(B67) No. 2 — (B67) No. 33:
(B67) No. 5 — (B67) No. 2:
(B67) No. 33 — (B67) No. 5:

Is the resistance 1 MΩ or more?

Yes — Go to 6.

No — Repair the short circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.
Connector & terminal
(B67) No. 2 — Transmission body:
(B67) No. 5 — Transmission body:
(B67) No. 33 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit of harness.

7. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 8.

No — 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).

8. 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
   (B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 9.

No — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

9. CHECK SECONDARY PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 5 (+) — (B67) 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(TR690)>Transmission Control Module (TCM).

No — Go to 10.

10. 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 (B67) and the secondary pressure sensor connector (T34).

Is the check result OK?

Yes — Go to 11.

No — Repair the connector, or replace harness.

11. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 12.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 12.

12. CHECK INPUT SIGNAL FOR TCM.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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 5 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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 0.3 — 1.5 MPa?

Yes — Go to 13.

No — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

13. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to “P” range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 12 0.2 MPa or more?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission secondary pressure sensor function.
- Judge as NG if the voltage of the secondary pressure sensor after the predetermined period of time has elapsed since IG OFF exceeded the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Ignition state	OFF
Measured primary pulley shaft speed	400 rpm or less
Transmission fluid temperature	10 degC or more

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 pulley pressure sensor input voltage (Pulley pressure)	More than 0.8 V (Exceeds 570 kPa)

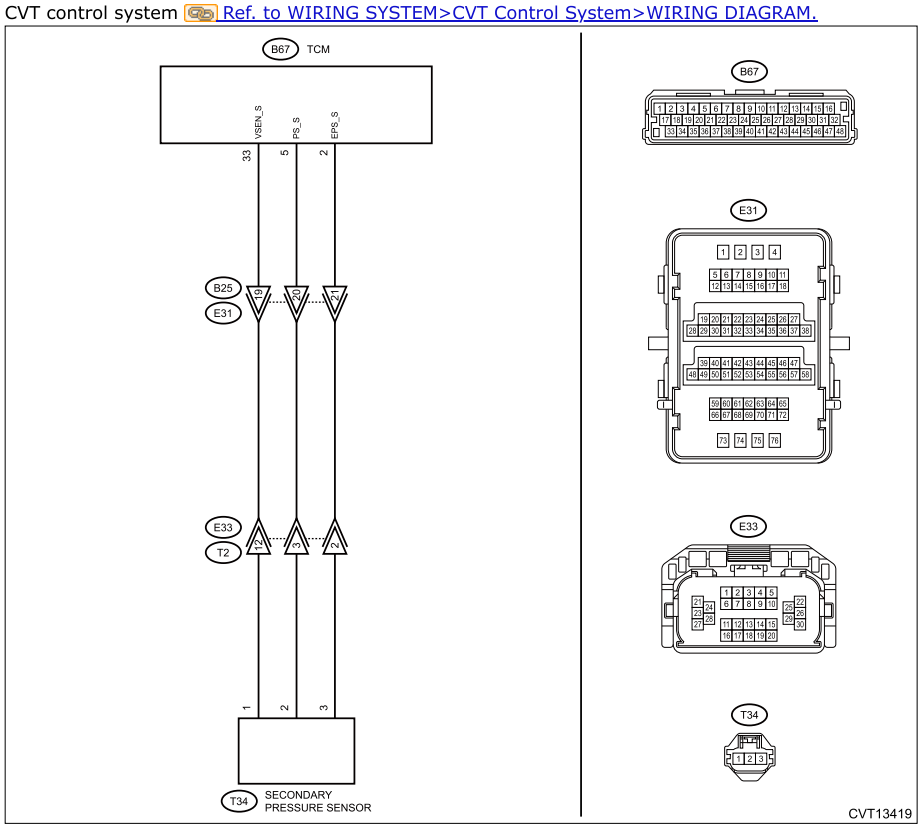
Time needed for diagnosis: 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0847 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT LOW

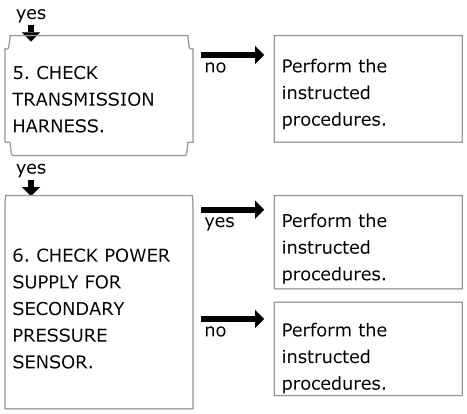
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Shift characteristics malfunction
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK INPUT SIGNAL FOR TCM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK TRANSMISSION HARNESS.	no →	Perform the instructed procedures.



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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 0.3 — 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

(B67) No. 2 — (E33) No. 2:
(B67) No. 5 — (E33) No. 3:
(B67) No. 33 — (E33) No. 12:

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

(B67) No. 5 — Chassis ground:
(B67) No. 33 — Chassis ground:

Is the resistance 1 MΩ 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
   (T2) No. 2 — (T34) No. 3:
   (T2) No. 3 — (T34) No. 2:
   (T2) No. 12 — (T34) No. 1:

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
(T2) No. 3 — Chassis ground:
(T2) No. 12 — Chassis ground:

Is the resistance 1 MΩ 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
   (T34) No. 1 (+) — (T34) No. 3 (−):

Is the voltage 4.5 V or more?

Yes — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

No — 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).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of the transmission secondary pressure sensor.
- Judge as NG if the voltage detected by the transmission secondary pressure sensor is lower than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

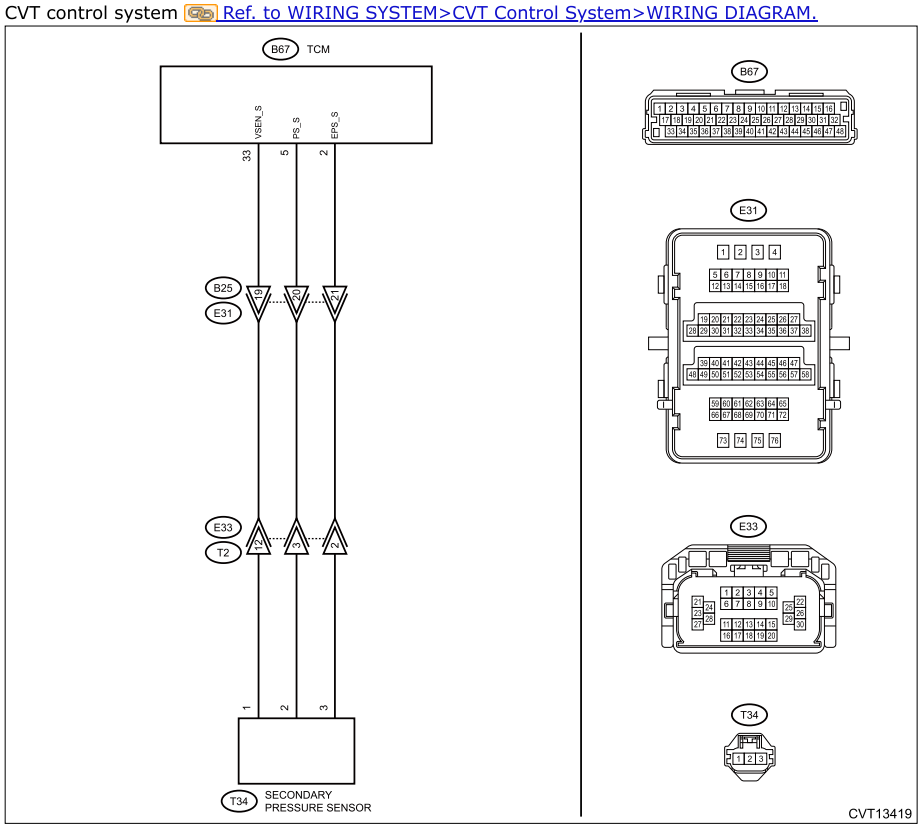
Malfunction Criteria	Threshold Value
Measured pulley pressure sensor input voltage (Pulley pressure)	Less than 0.195 V (Less than 0 kPa)

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0848 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Shift characteristics malfunction
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK INPUT SIGNAL FOR TCM.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK TRANSMISSION HARNESS.	no →	Perform the instructed procedures.

yes

5. CHECK TRANSMISSION HARNESS. → no → Perform the instructed procedures.

yes

6. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 0.3 — 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
   (B67) No. 5 (+) — Chassis ground (−):
   (B67) 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
   (B67) No. 5 — (B67) No. 33:

Is the resistance 1 MΩ 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. Turn the ignition switch to ON.
3. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T2) No. 3 (+) — Chassis ground (−):
   (T2) No. 12 (+) — 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
   (T2) No. 3 — (T2) No. 12:

Is the resistance 1 MΩ 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
   (T34) No. 1 (+) — (T34) No. 3 (−):

Is the voltage 4.5 V or more?

Yes — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

No — 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).

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission secondary pressure sensor 5 V system.
- Judge as NG if the voltage detected by the transmission secondary pressure sensor is higher than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 pulley pressure sensor input voltage (Pulley pressure)	More than 4.883 V (Exceeds 8200 kPa)

Time needed for diagnosis: 1.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

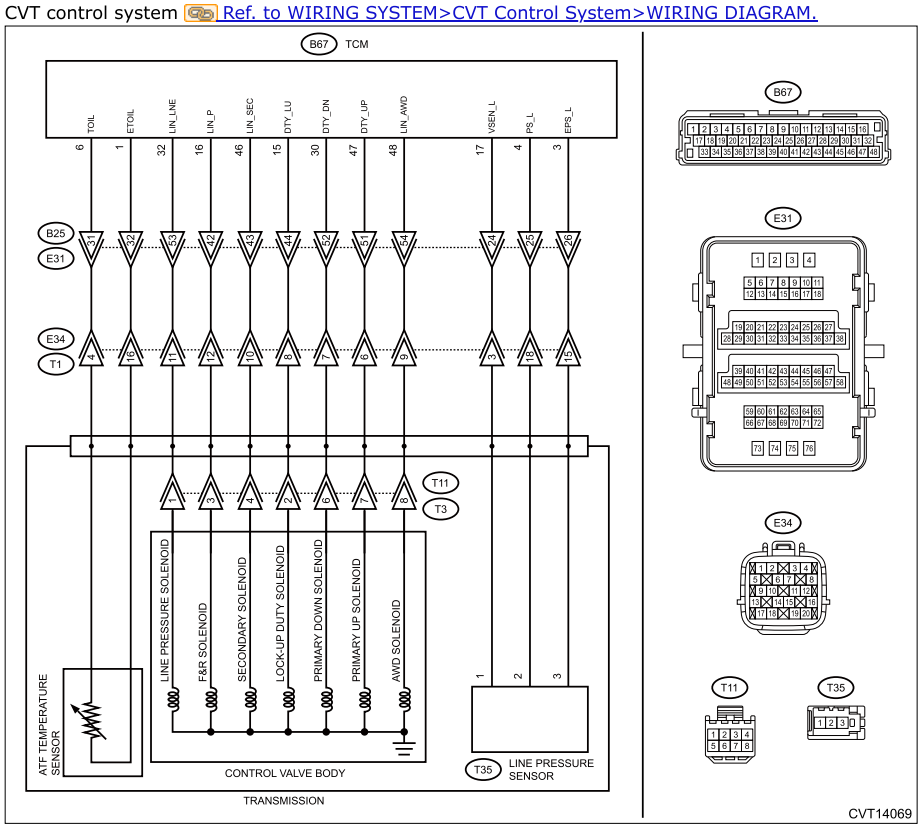
DTC P0867 TRANSMISSION FLUID PRESSURE

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.
- CVT chain slippage

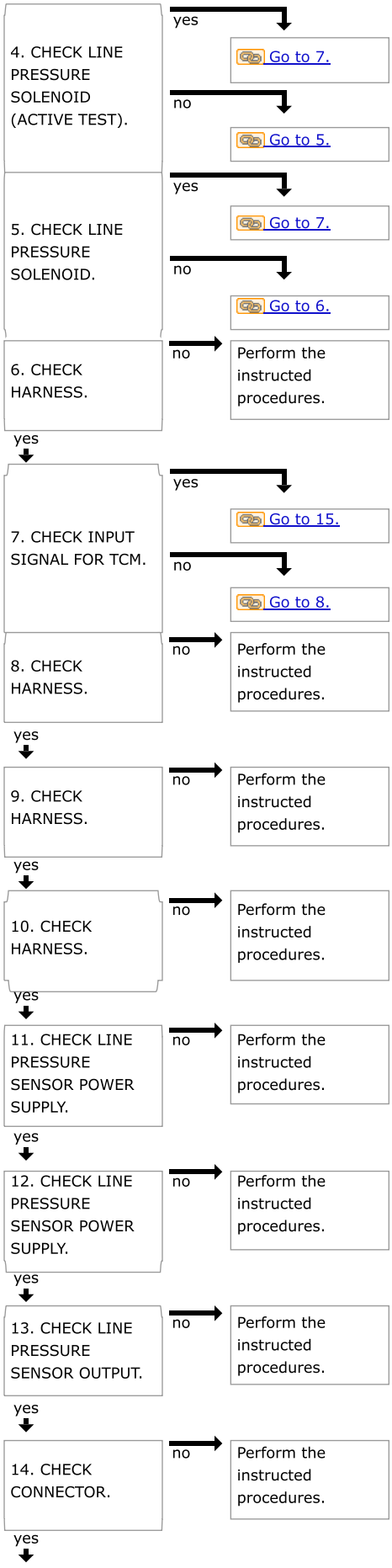
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.

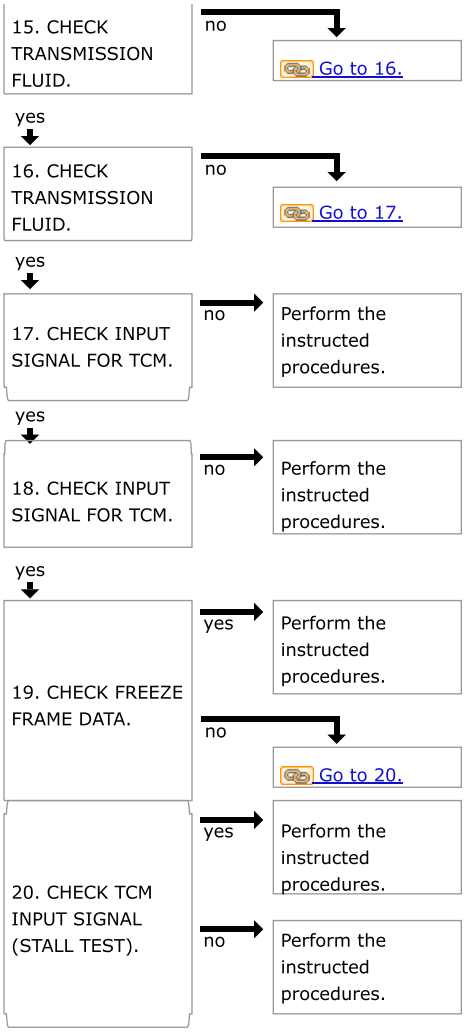


Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.
   - yes → Go to 4.
   - no → Go to 2.
2. CHECK DTC.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK DTC.
   - no → Perform the instructed procedures.
   - yes ↓


4. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).
yes
Go to 7.
no
Go to 5.
5. CHECK LINE PRESSURE SOLENOID.
yes
Go to 7.
no
Go to 6.
6. CHECK HARNESS.
no
Perform the instructed procedures.
yes
7. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 15.
no
Go to 8.
8. CHECK HARNESS.
no
Perform the instructed procedures.
yes
9. CHECK HARNESS.
no
Perform the instructed procedures.
yes
10. CHECK HARNESS.
no
Perform the instructed procedures.
yes
11. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
12. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
13. CHECK LINE PRESSURE SENSOR OUTPUT.
no
Perform the instructed procedures.
yes
14. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is only DTC P0867 displayed?

Yes — Go to 4.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0841 displayed?

Yes — Go to 3.

No — Perform the diagnosis according to DTCs other than P0867 and P0841. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST. 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.) After driving, repeat the step 1.

3. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0746 or P0747 displayed?

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 LINE PRESSURE SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for line pressure solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 7.

No — Go to 5.

5. CHECK LINE PRESSURE 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
   (T1) No. 11 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes — Go to 7.

No — Go to 6.

6. 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.

7. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read data of [Line Pressure Sensor Voltage.] in the [Data Monitor] of [Transmission]. (While shaking the line pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Line Pressure Sensor Voltage.] 0.39 — 0.61 V?

Yes — Go to 15.

No — Go to 8.

8. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission oil pan.
4. Disconnect the line pressure sensor connector.
5. Measure the resistance between TCM connector and line pressure sensor connector.
   Connector & terminal
   (B67) No. 3 — (T35) No. 3:
   (B67) No. 4 — (T35) No. 2:
   (B67) No. 17 — (T35) No. 1:

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 connectors.
Connector & terminal
(B67) No. 3 — (B67) No. 17:
(B67) No. 4 — (B67) No. 3:
(B67) No. 17 — (B67) No. 4:

Is the resistance 1 MΩ or more?

Yes — Go to 10.

No — Repair the short circuit of harness.

10. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.
Connector & terminal
(B67) No. 3 — Transmission body:
(B67) No. 4 — Transmission body:
(B67) No. 17 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 11.

No — Repair the short circuit of harness.

11. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes	Go to 12.
No	Check for poor contact of connector and for short circuit in harness between the 12 V power supply system. If no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

12. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Connect the line pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes	Go to 13.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

13. CHECK LINE PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 4 (+) — (B67) No. 3 (−):

Is the voltage 0.39 — 0.61 V?

Yes	Go to 14.
No	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).

14. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the line pressure sensor connector.
4. Check the TCM connector (B67) and the line pressure sensor connector (T35).

Is the check result OK?

Yes	Go to 15.
No	Repair the connector, or replace harness.

15. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 16.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 16.

16. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 17.

No — Follow the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 17.

17. CHECK INPUT SIGNAL FOR TCM.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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 5 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes — Go to 18.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

18. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

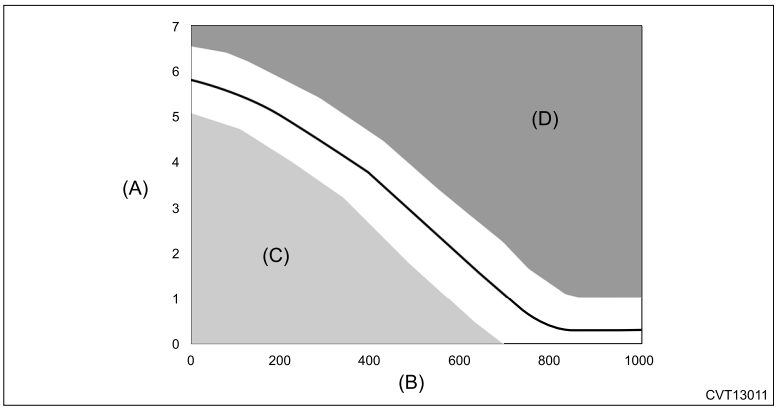
Is [Actual line press.] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 17 0.2 MPa or more?

Yes — Go to 19.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

19. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data for DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data.
3. Apply the values of [Actual line press.] and [Lin. Sol. 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 line pressure (MPa)
(B) Line actual current (mA)
(C) Low-voltage malfunction
(D) High-voltage malfunction

Note:
Symptom that the DTC P0867 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**

Was the detected symptom low-voltage malfunction?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 20.

20. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual line press.] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
- Detect the malfunction of transmission line pressure control function.
- Judge as NG if a discrepancy between the target line oil pressure (as internal data) and the detected value of the line oil pressure sensor becomes the predetermined value or more.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	At or more than rpm values in Table 1

Table 1

		Target line pressure (kPa)								
		0	500	1000	1500	2000	3000	4000	5000	6000
Transmission fluid temperature (degC)	−40	500	500	500	500	529	636	791	961	8000
	−20	500	500	500	500	529	636	791	961	8000
	0	500	500	500	500	529	636	791	961	8000
	20	500	500	500	500	529	636	791	961	8000
	40	500	500	500	500	529	636	791	961	8000
	60	500	500	506	561	631	807	1154	8000	8000
	80	500	500	590	705	818	991	1300	4658	8000
	100	500	569	670	795	901	1174	1458	4962	8000
	120	500	653	782	897	1060	1352	1707	8000	8000

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
ABS∗ (Target line pressure − Measured line pressure)	More than 500 kPa

∗ABS: Absolute value

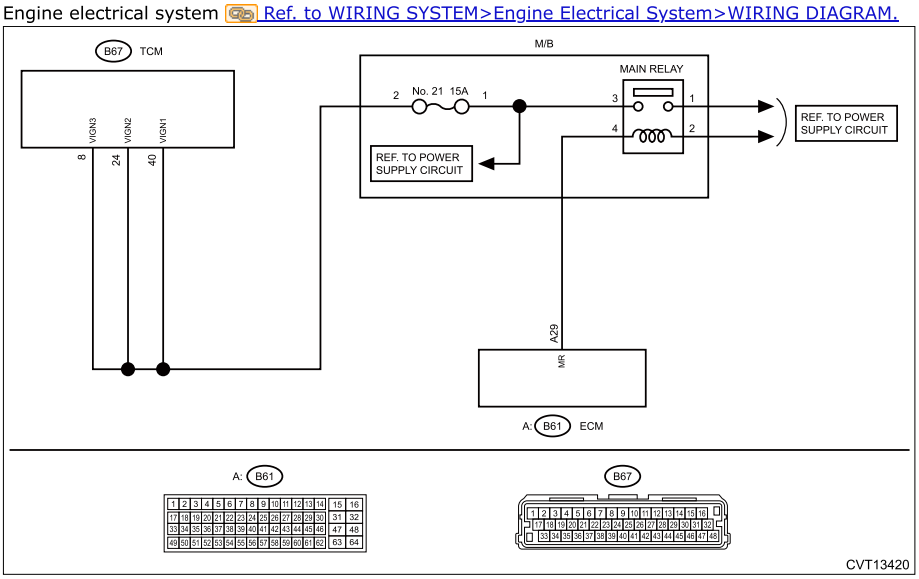
Time needed for diagnosis: 5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Improper gear shifting
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.
DC power supply circuit Ref. to WIRING SYSTEM>Power Supply Circuit>WIRING DIAGRAM.
Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM•ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

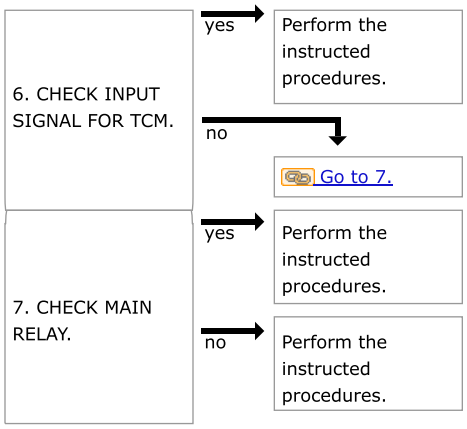
1. CHECK HARNESS.
- no → Perform the instructed procedures.
- yes ↓

2. CHECK HARNESS.
- no → Perform the instructed procedures.
- yes ↓

3. CHECK HARNESS.
- no → Perform the instructed procedures.
- yes ↓

4. CHECK RELAY POWER SUPPLY.
- no → Perform the instructed procedures.
- yes ↓

5. CHECK MAIN RELAY.
- no → Perform the instructed procedures.
- yes ↓



1. CHECK HARNESS.

1. Disconnect the TCM connector.
2. Remove the main relay.
3. Measure the resistance between TCM connector and M/B.
   Connector & terminal
   (B67) No. 8 — (M/B) No. 3:
   (B67) No. 24 — (M/B) No. 3:
   (B67) No. 40 — (M/B) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 2.

No — Repair the open circuit of harness.

2. CHECK HARNESS.

1. Disconnect the ECM connector.
2. Measure the resistance between ECM connector and M/B.
   Connector & terminal
   (B61) No. 29 — (M/B) No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Repair the open circuit of harness.

3. CHECK HARNESS.

1. Remove the M/B fuse No. 21.
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 8 — Chassis ground:
   (B67) No. 24 — Chassis ground:
   (B67) No. 40 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair the short circuit of harness.

4. CHECK RELAY POWER SUPPLY.

1. Install the M/B fuse No. 21.
2. Measure the voltage between M/B and chassis ground.
   Connector & terminal
   (M/B) No. 1 (+) — Chassis ground (−):
   (M/B) No. 2 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 5.

No — Repair the open or short circuit of harness.

5. CHECK MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Check the main relay. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Main Relay>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Replace the main relay.

6. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Install the main relay.
3. Using the Subaru Select Monitor, read data of [Control module voltage] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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 MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Replace the main relay.
3. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0890 displayed?

Yes — Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

No — The original main relay is defective.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

Secondary parameters	Execution condition
Ignition state	Run or Crank

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	Less than 2 V

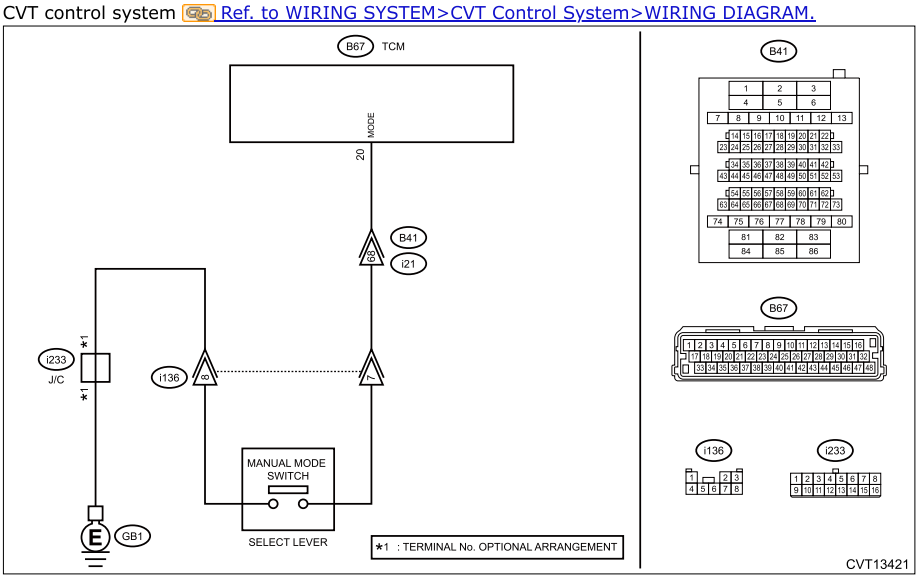
Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE

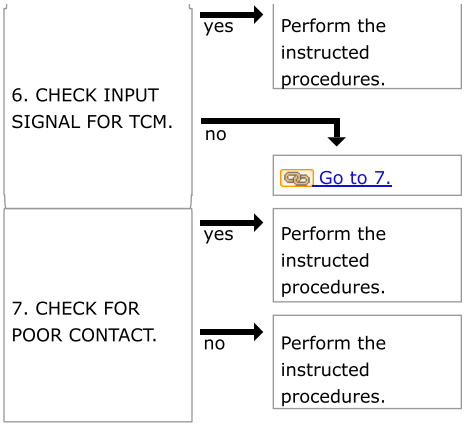
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Manual mode cannot be set.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK HARNESS.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK MANUAL MODE SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK MANUAL MODE SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK HARNESS.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK HARNESS.
   - no → Perform the instructed procedures.
   - yes ↓



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
   (i136) 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.
Connector & terminal
No. 7 — No. 8:

Is the resistance 1 MΩ 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.
   Connector & terminal
   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
   (B67) No. 20 — (i136) 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
(i136) 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. Using the Subaru Select Monitor, read data of [Manual Mode Switch] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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(TR690)>Transmission Control Module (TCM).

DTC P0961 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:

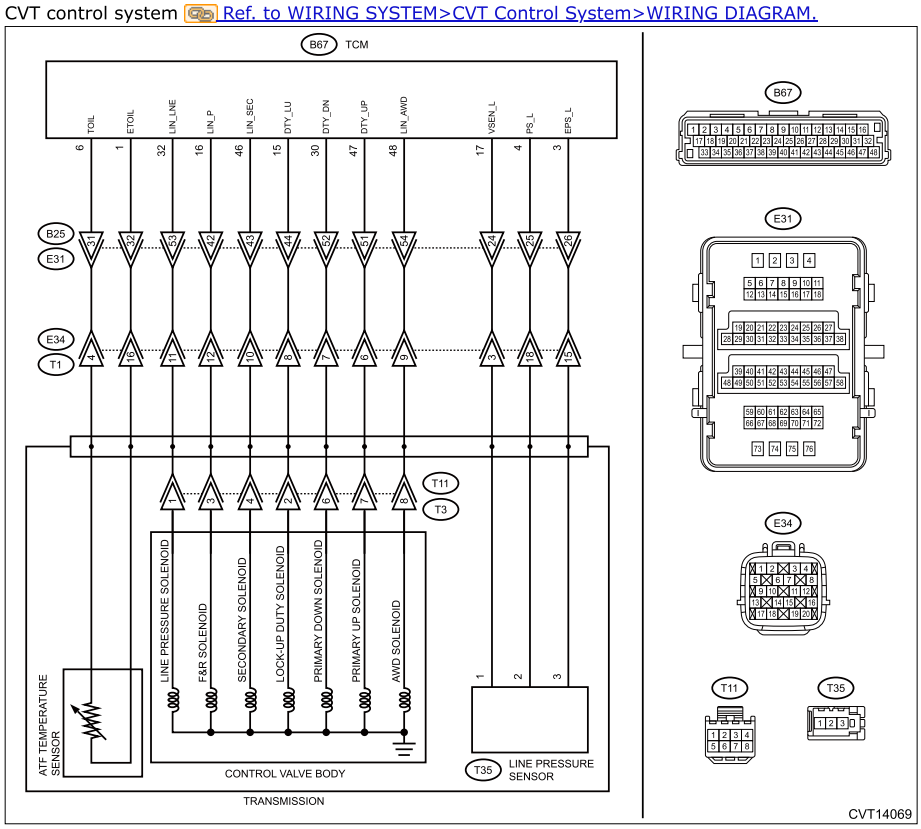
Immediately at fault recognition

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).	no →	Go to 4.
yes ↓		

3. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.
4. CHECK LINE PRESSURE SOLENOID.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0961, is DTC P0962 or P0963 displayed?

Yes	Perform the diagnosis according to DTCs other than P0961. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for line pressure solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Is 300 → 500 → 700 mA indicated at the active test, and does [Lin. Sol. Actual Current] follow [Lin. Sol. 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 line pressure 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(TR690)>Transmission Control Module (TCM).

4. CHECK LINE PRESSURE 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
   (T1) No. 11 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 ABS* (Target line pressure control solenoid valve current − Measured line pressure control solenoid valve current)	Exceeds 0.2 A
Diagnosis 2 Measured line pressure control solenoid valve current	Exceeds 1.05 A and 1.6 A or less

*ABS: Absolute value

Time needed for diagnosis: 1.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

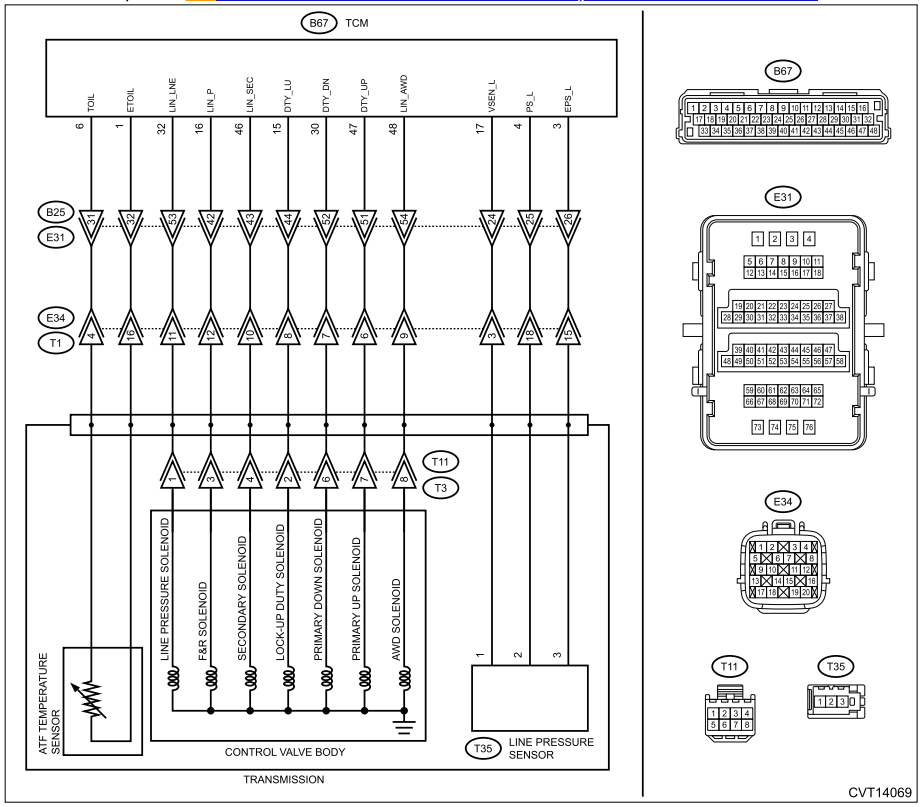
DTC P0962 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine speed increases abruptly, and cannot start.
- Engine speed increases abruptly during driving.

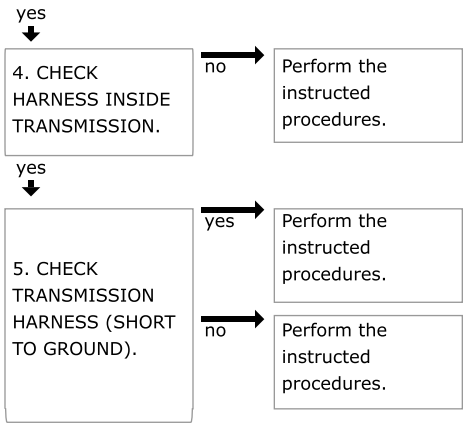
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).	no	Go to 3.
yes ↓		
2. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).	no	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS (GROUND SHORT CIRCUIT).	no	Perform the instructed procedures.



1. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 32 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω?

Yes	Go to 2.
No	Go to 3.

2. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 32 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes	Go to 3.
No	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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 32 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the harness.

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 the check result OK?

Yes	Go to 5.
No	Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 11 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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* As defined by: Measured line pressure control solenoid valve current, more than 1.6 A	ON

*IC: Integrated circuit

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

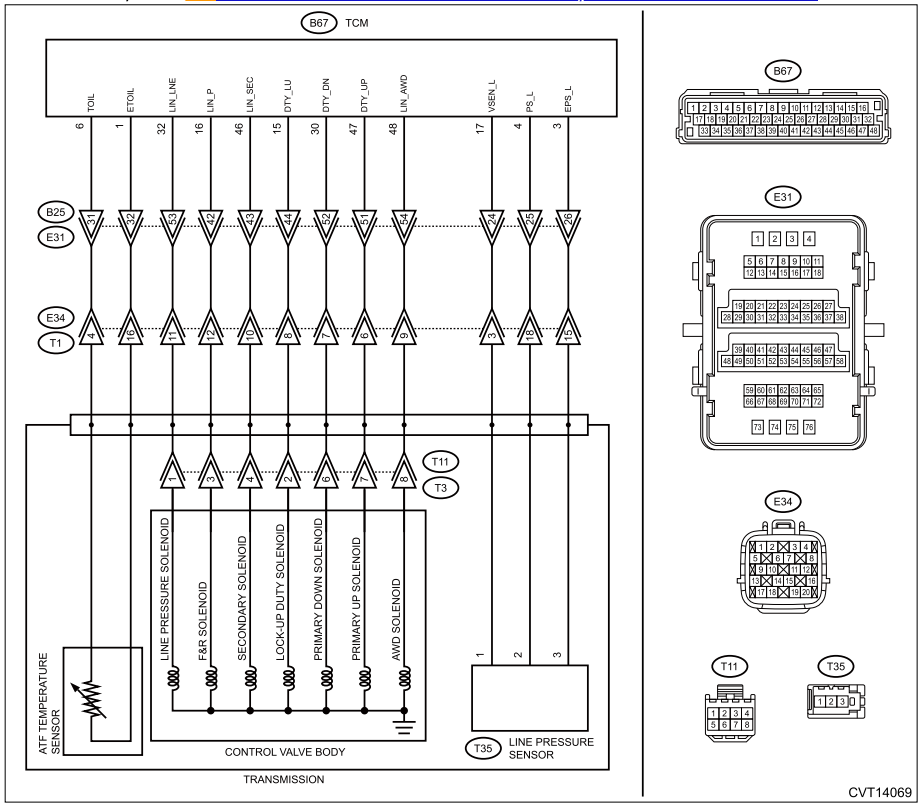
DTC P0963 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine speed increases abruptly, and cannot start.
- Engine speed increases abruptly during driving.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.

yes

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY). → no → Perform the instructed procedures.

yes

5. CHECK HARNESS INSIDE TRANSMISSION. → no → Perform the instructed procedures.

yes

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT). → no → Perform the instructed procedures.

yes

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 32 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK LINE PRESSURE SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 32 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 32 — (E34) No. 11:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 32 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 11 — (T11) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 11 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded line pressure control solenoid valve current	0.1 A or more

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* As defined by: Measured line pressure control solenoid valve current, less than 5.9 mA	ON

*IC: Integrated circuit

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

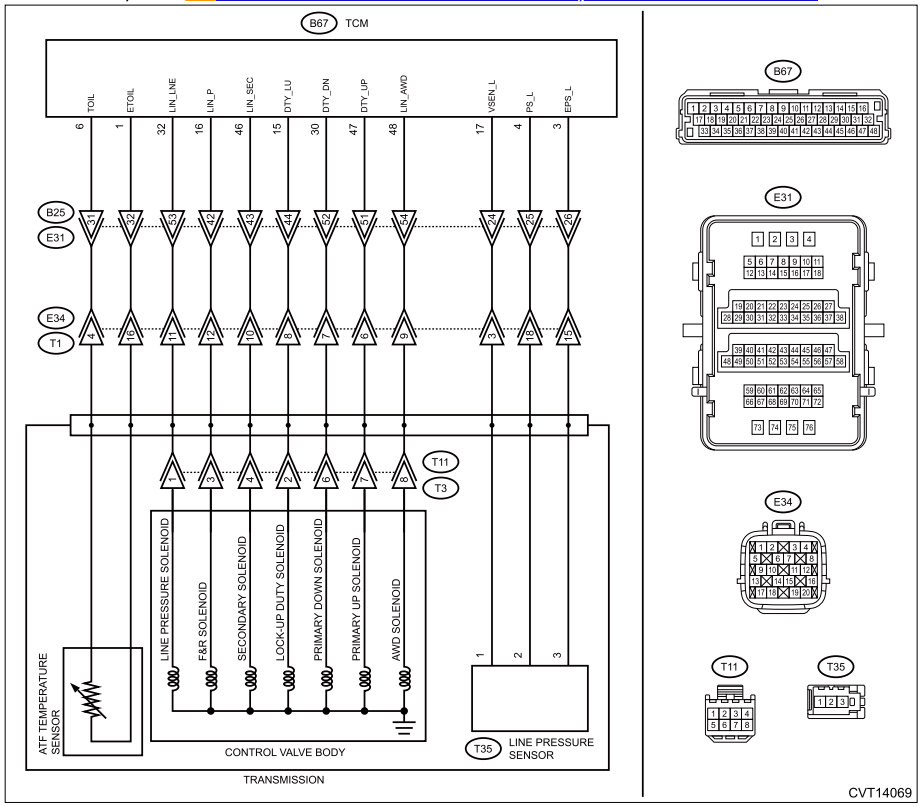
DTC P0965 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine speed increases abruptly, and cannot accelerate.
- Excessive slippage is felt.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK F&R SOLENOID (ACTIVE TEST).	no	Go to 4.
	yes	
3. CHECK FOR POOR CONTACT.	yes	Perform the instructed procedures.
	no	Perform the instructed procedures.

4. CHECK F&R SOLENOID.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P0965, is DTC P0720, P0966, P0967, or P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P0965. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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 the active test for F&R solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Is 300 → 500 → 700 mA indicated at the active test, 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(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
   (T1) No. 12 — Transmission body:

Is the resistance approximately 3.5 — 7.1 Ω? (When cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 ABS* (Target forward & reverse clutch pressure control solenoid current − Measured forward & reverse clutch pressure control solenoid circuit)	Exceeds 0.2 A
Diagnosis 2 Measured forward & reverse clutch pressure control solenoid current	Exceeds 1.05 A and 1.6 A or less

*ABS: Absolute value

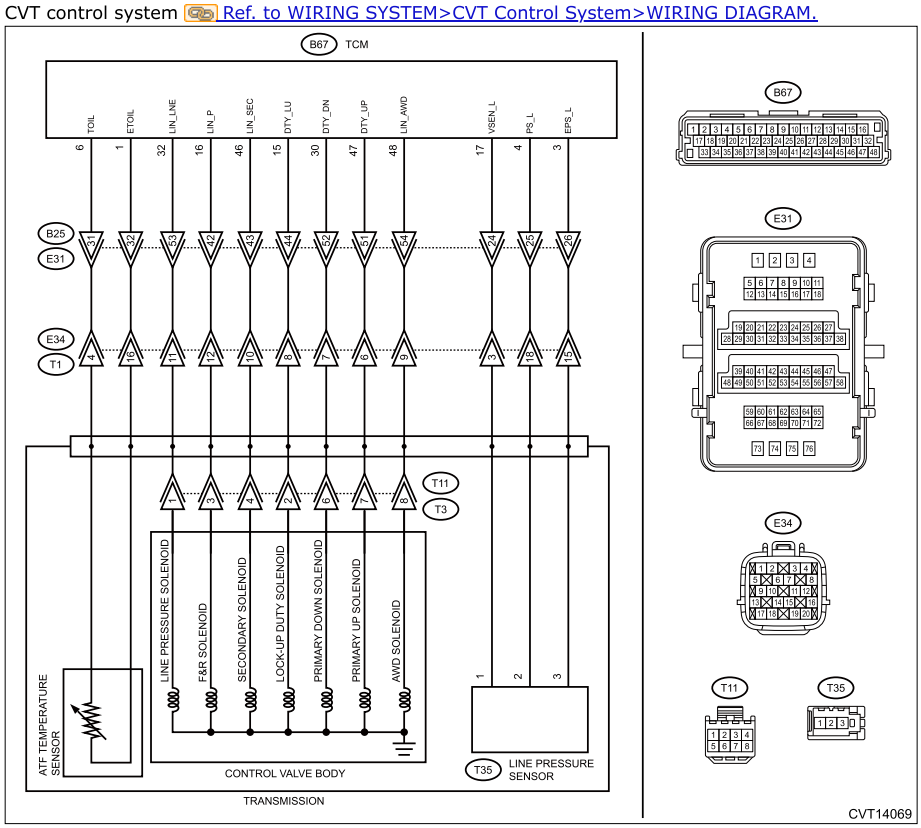
Time needed for diagnosis: 1.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0966 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW

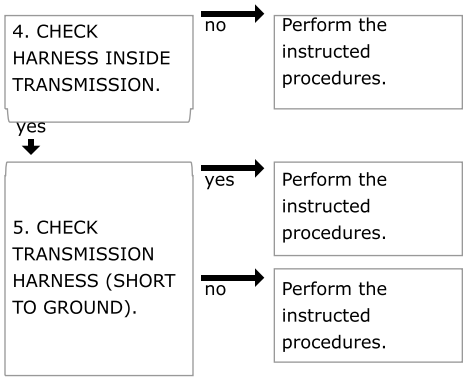
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Excessive shift shock
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK F&R SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK F&R SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK F&R SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 16 — Transmission body:

Is the resistance approximately 3.5 — 7.1 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK F&R SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 16 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 16 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the harness.

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 the check result OK?

Yes	Go to 5.
No	Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the short circuit to ground 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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* As defined by: Measured forward & reverse clutch pressure control solenoid current, more than 1.6 A	ON

*IC: Integrated circuit

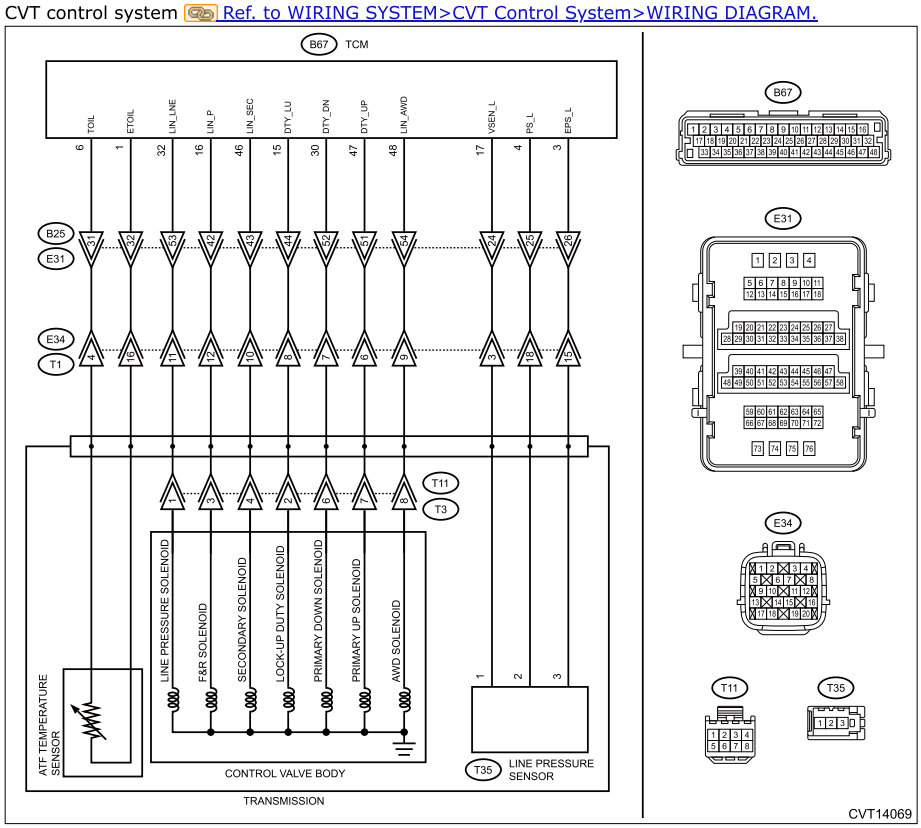
Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0967 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Engine speed increases abruptly, and cannot start.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK F&R SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK F&R SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).
→ no → Perform the instructed procedures.

yes ↓

5. CHECK HARNESS INSIDE TRANSMISSION.
→ no → Perform the instructed procedures.

yes ↓

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).
→ no → Perform the instructed procedures.

yes ↓

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK F&R SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 16 — Transmission body:

Is the resistance approximately 3.5 — 7.1 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK F&R SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 16 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 16 — (E34) No. 12:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 16 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 12 — (T11) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 12 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Target forward & reverse clutch pressure control solenoid current	0.1 A or more

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* As defined by: Measured forward & reverse clutch pressure control solenoid current less than 5.9 mA	ON

*IC: Integrated circuit

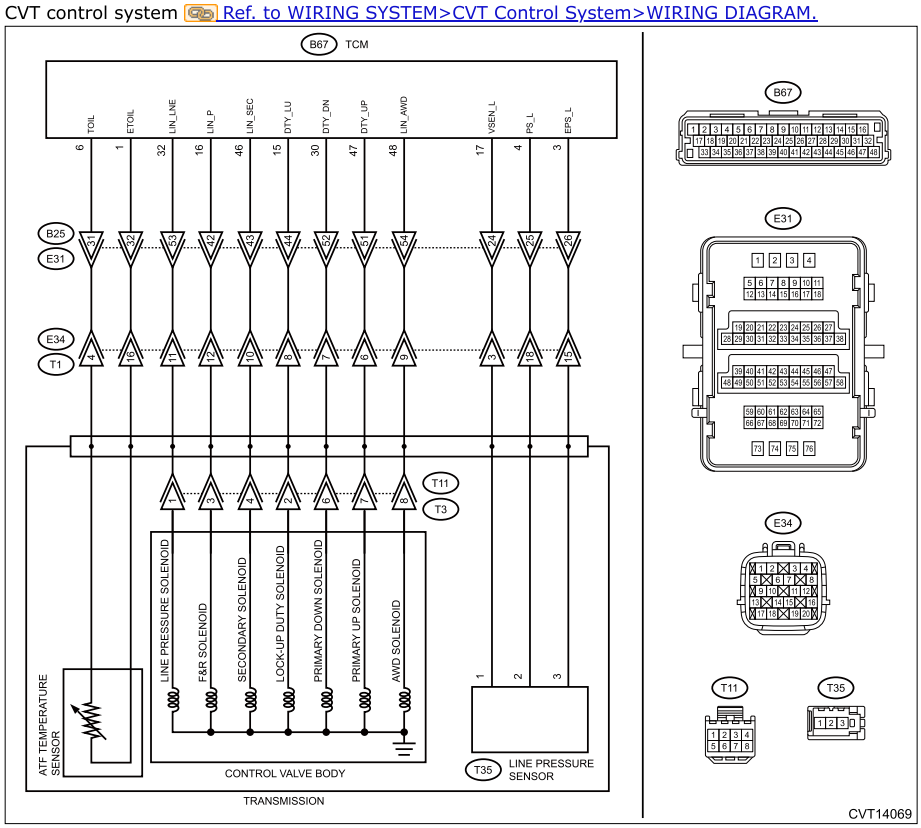
Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0970 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW

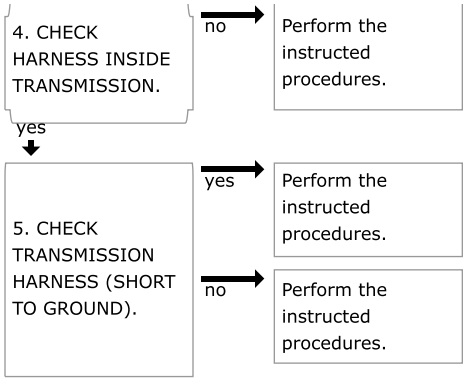
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Drivability getting worse.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK AWD SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK AWD SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK AWD SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 48 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK AWD SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 48 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 48 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair or replace the harness.

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 the check result OK?

Yes — Go to 5.

No — Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the ground 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
Target duty cycle	0%

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 counts or more

*IC: Integrated circuit

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Does not illuminate.

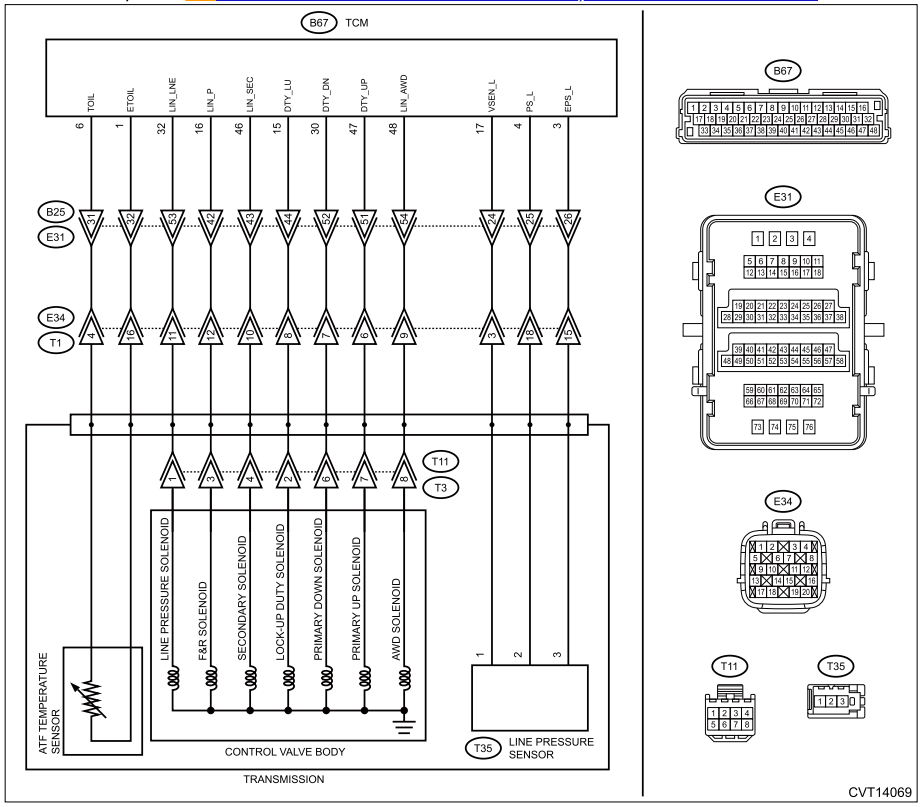
DTC P0971 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Tight corner braking phenomenon occurs.
- Drivability getting worse.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK AWD SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK AWD SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).
→ no → Perform the instructed procedures.

yes ↓

5. CHECK HARNESS INSIDE TRANSMISSION.
→ no → Perform the instructed procedures.

yes ↓

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).
→ no → Perform the instructed procedures.

yes ↓

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK AWD SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 48 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK AWD SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 48 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 48 — (E34) No. 9:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 48 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 9 — (T11) No. 8:

Is the resistance less than 1 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 9 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect open circuit or short circuit to power supply in the transfer solenoid circuit.
- Judge as NG if an open circuit or a short circuit to power supply is detected more than 10 times via the detection circuit in the transfer solenoid drive circuit.

EXECUTION CONDITION

Secondary parameters	Execution condition
Target duty cycle	100%

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 counts or more

*IC: Integrated circuit

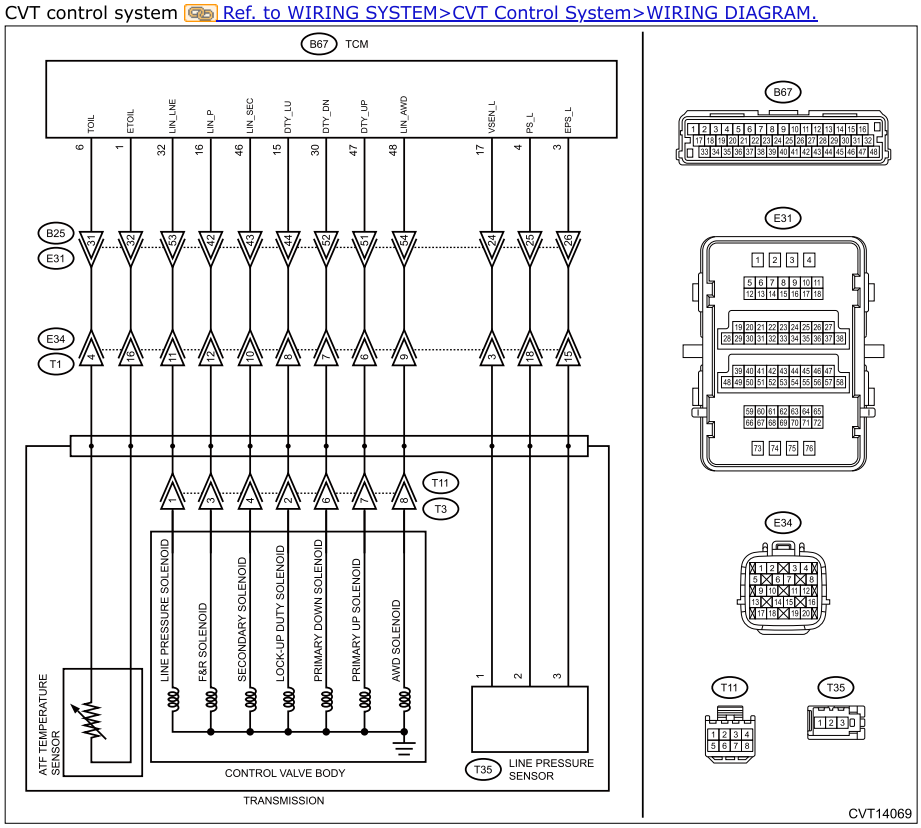
Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Does not illuminate.

DTC P0973 SHIFT SOLENOID "A" CONTROL CIRCUIT LOW

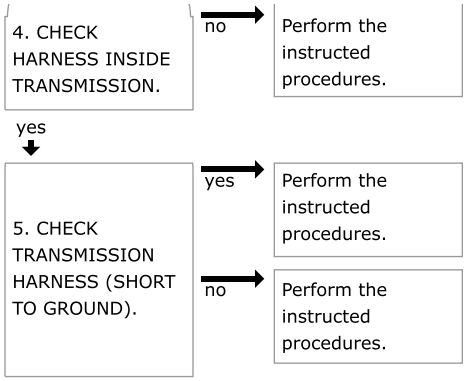
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Gear is not changed. (No up-shift)
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 47 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω?

Yes	Go to 2.
No	Go to 3.

2. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 47 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes	Go to 3.
No	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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 47 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair or replace the harness.

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 the check result OK?

Yes — Go to 5.

No — Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift up pressure control solenoid	100%

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 0.8 V or less	

*IC: Integrated circuit

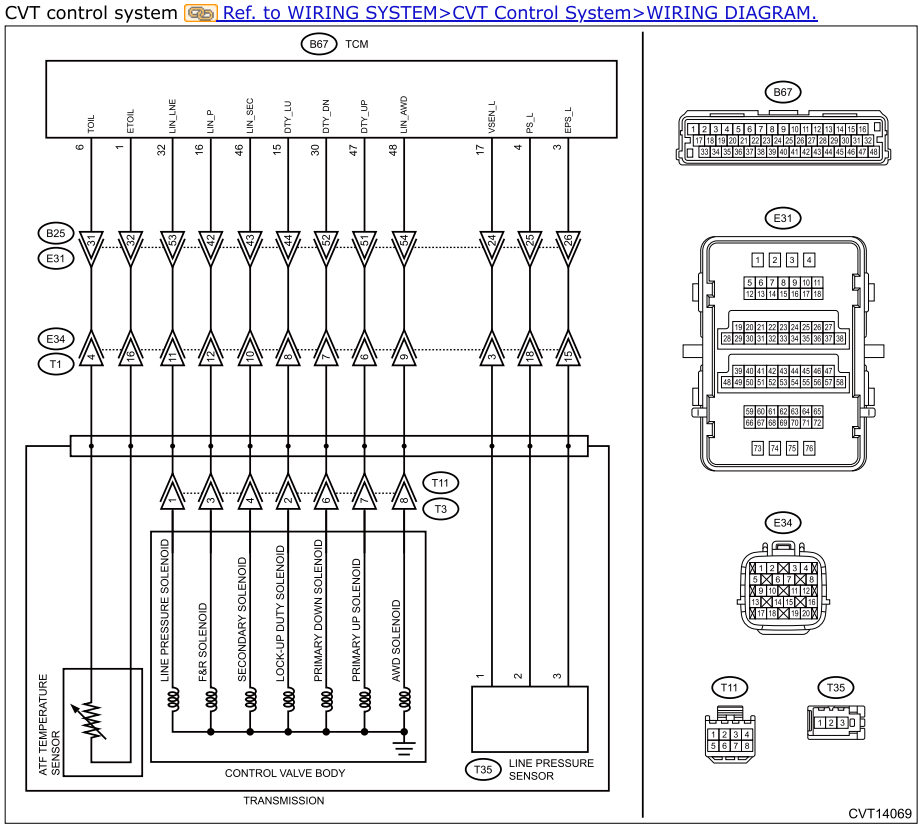
Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0974 SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH

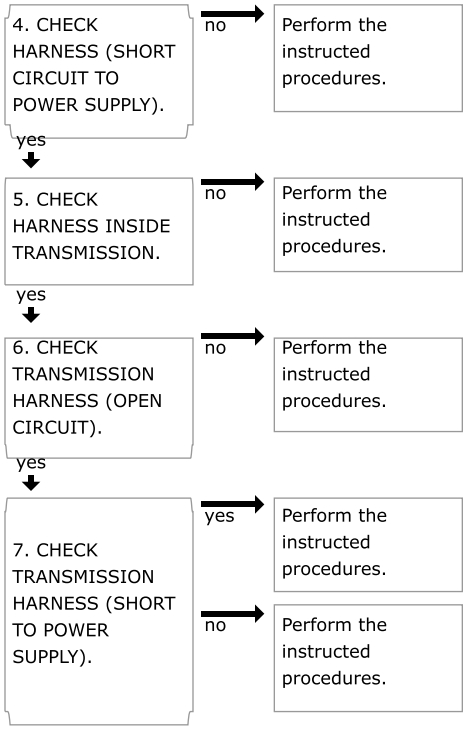
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Gear is not changed. (No up-shift)
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 47 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK PRIMARY UP SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 47 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 47 — (E34) No. 6:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 47 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 6 — (T11) No. 7:

Is the resistance less than 1 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 6 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift up pressure control solenoid	0%

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 2.5 V or more	

*IC: Integrated circuit

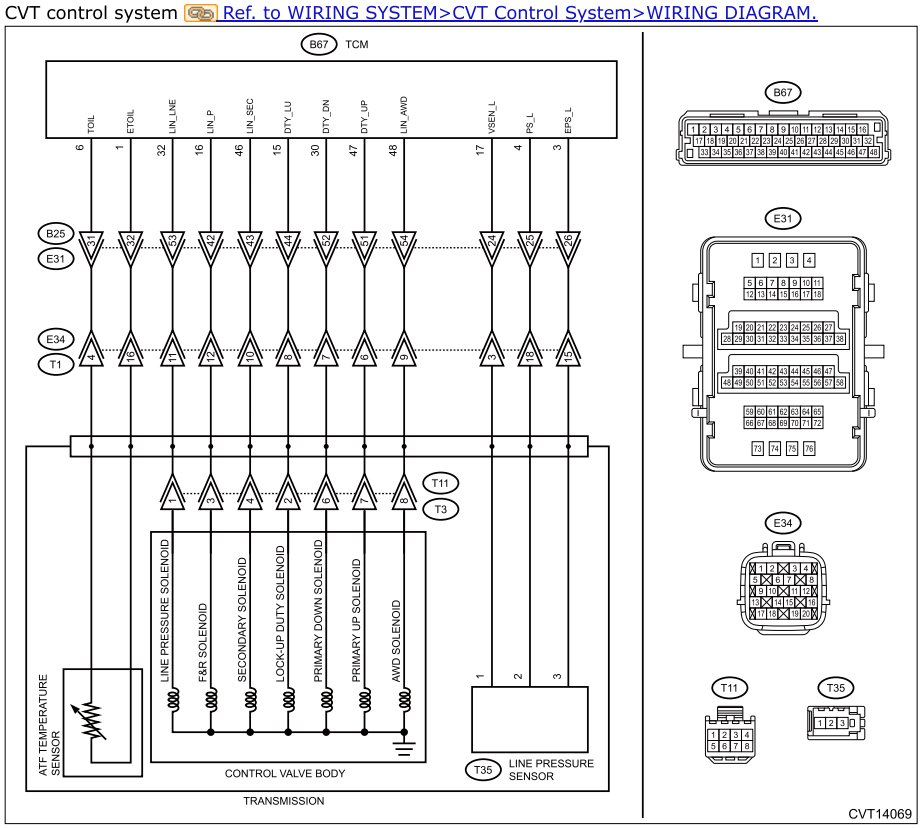
Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0976 SHIFT SOLENOID "B" CONTROL CIRCUIT LOW

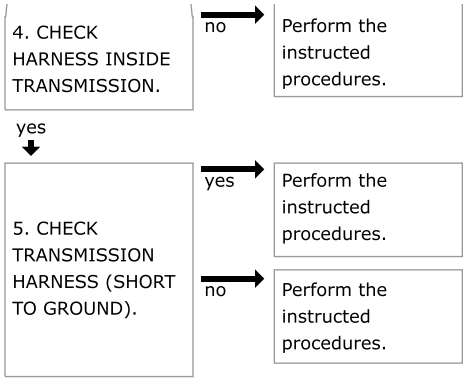
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Gear is not changed. (No down-shift)
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 30 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 30 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 30 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair or replace the harness.

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 the check result OK?

Yes — Go to 5.

No — Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 7 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift down pressure control solenoid	100%

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* As defined by: Measured shift down pressure control solenoid voltage 0.8 V or less	ON

*IC: Integrated circuit

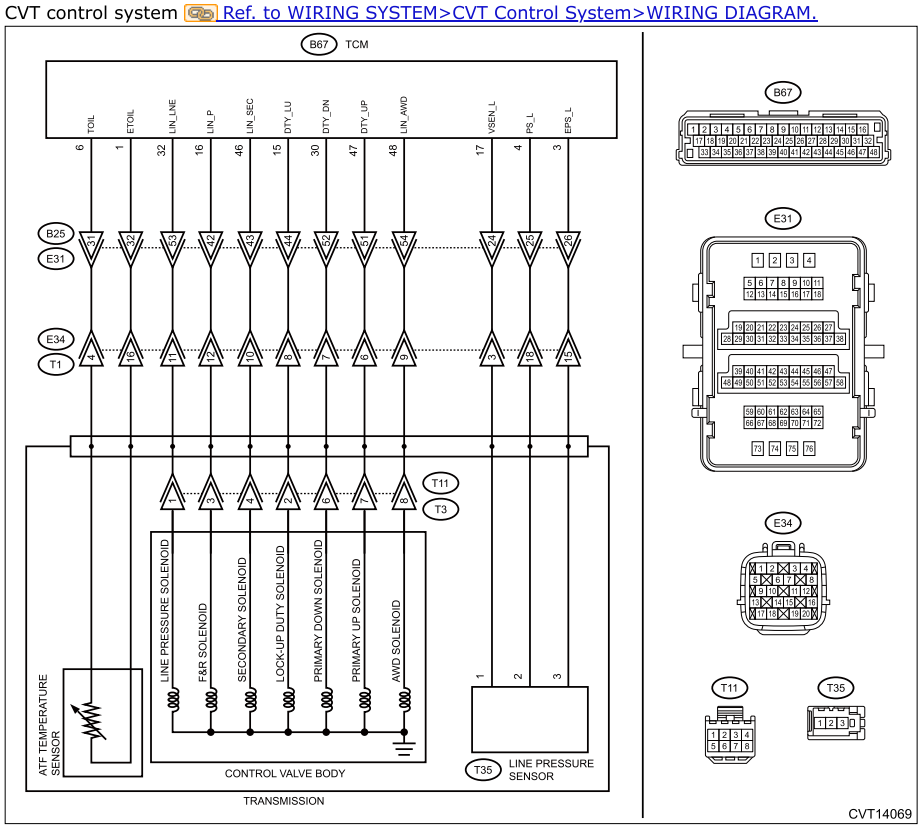
Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0977 SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Gear is not changed. (No down-shift)
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).
→ no → Perform the instructed procedures.
yes ↓

5. CHECK HARNESS INSIDE TRANSMISSION.
→ no → Perform the instructed procedures.
yes ↓

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).
→ no → Perform the instructed procedures.
yes ↓

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 30 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK PRIMARY DOWN SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 30 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 30 — (E34) No. 7:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 30 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 7 — (T11) No. 6:

Is the resistance less than 1 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 7 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift down pressure control solenoid	0%

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* As defined by: Measured shift down pressure control solenoid voltage 2.5 V or more	ON

*IC: Integrated circuit

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 P1603 ENGINE STALL HISTORY

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "ENGINE (DIAGNOSTICS)" for diagnostic procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1603 ENGINE STALL HISTORY.

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

DTC P162B WARNING INDICATOR REQUEST

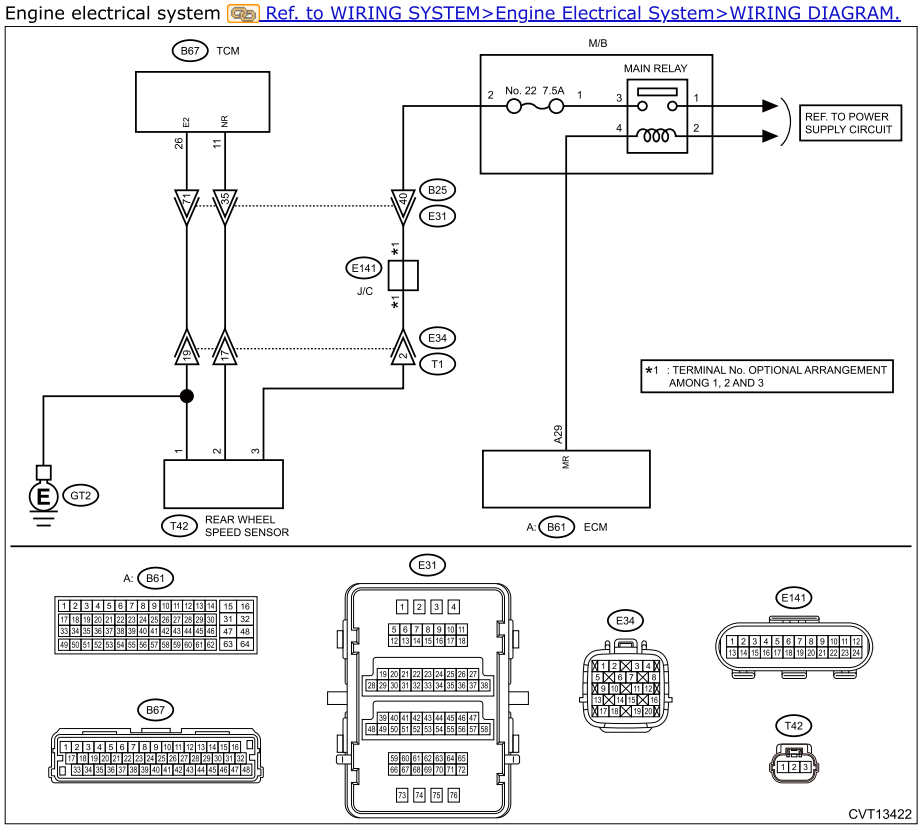
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT" under "ENGINE (DIAGNOSTICS)" for diagnostic procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT.

DTC P1706 REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT NO SIGNAL

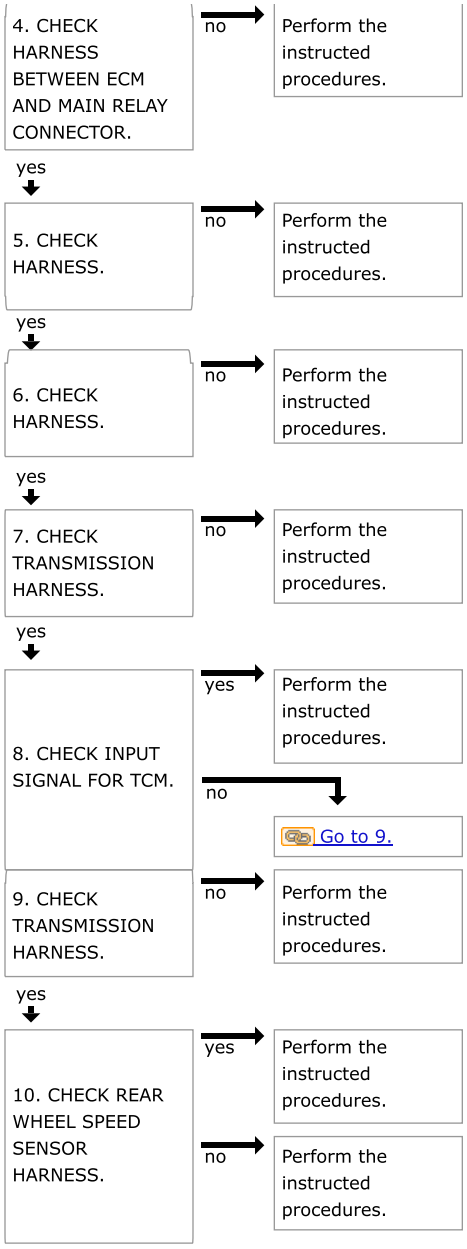
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
AWD does not function.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.
DC power supply circuit Ref. to WIRING SYSTEM>Power Supply Circuit>WIRING DIAGRAM.
Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:
- **Use the check board when measuring the TCM/ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0890 displayed?

Yes	Perform the diagnosis according to DTC P0890. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW.
No	Go to 2.

2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.

Check connecting condition of the connectors indicated in the wiring diagram.

Are the connectors indicated in the wiring diagram properly connected?

Yes — Go to 3.

No — Properly connect the connectors indicated in the wiring diagram.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 2 (+) — Chassis 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 of harness between transmission connector and main relay connector**
- **Defective main relay**

No — Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 29 — 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 main relay connector.

5. 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
   (B67) No. 11 — (E34) No. 17:
   (B67) No. 26 — (E34) No. 19:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.
Connector & terminal
(B67) No. 11 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E34, T1)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (E34) No. 2 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes — Go to 8.

No — Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Drive in “D” range.
6. Using the Subaru Select Monitor, read data of [Rear Wheel Speed] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Does the value of [Rear Wheel Speed] change according to the engine speed?

Yes — Current condition is normal. Repair the poor contacts of harnesses of rear wheel speed sensor and transmission connector.

No — Go to 9.

9. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the rear wheel speed sensor connector.
4. Measure the resistance between transmission connector and rear wheel speed sensor connector.
   Connector & terminal
   (T1) No. 2 — (T42) No. 3:
   (T1) No. 17 — (T42) No. 2:
   (T1) No. 19 — (T42) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

10. CHECK REAR WHEEL SPEED SENSOR HARNESS.

Measure the resistance between transmission connector and chassis ground.
Connector & terminal
(T1) No. 2 — Chassis ground:
(T1) No. 17 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the rear wheel speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Rear Wheel Speed Sensor.
If the replacement of the rear wheel speed sensor does not eliminate the malfunction, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

No — Repair the short circuit of harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the no input signal from the rear wheel speed sensor.
- Judge as NG if there is no output from the rear 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from wheel speed sensor)	3 MPH or more
Transmission range	Drive or Reverse

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: 3 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P170B REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT RANGE/PERFORMANCE

1. —

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

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P170B, is any of the DTC P0720 or P0500 displayed?

Yes — Perform the diagnosis according to DTCs other than P170B. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Perform the diagnosis according to DTC P1706. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1706 REAR OUTPUT SHAFT SPEED SENSOR CIRCUIT NO SIGNAL.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of rear wheel speed sensor signal characteristics.
- Judge as NG when the deviation between vehicle speed from VDC and rear wheel speed sensor becomes equal to or larger than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from wheel speed sensor)	12 MPH or more
Transmission range	Drive or Reverse

DIAGNOSTIC METHOD
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.
Judgment value

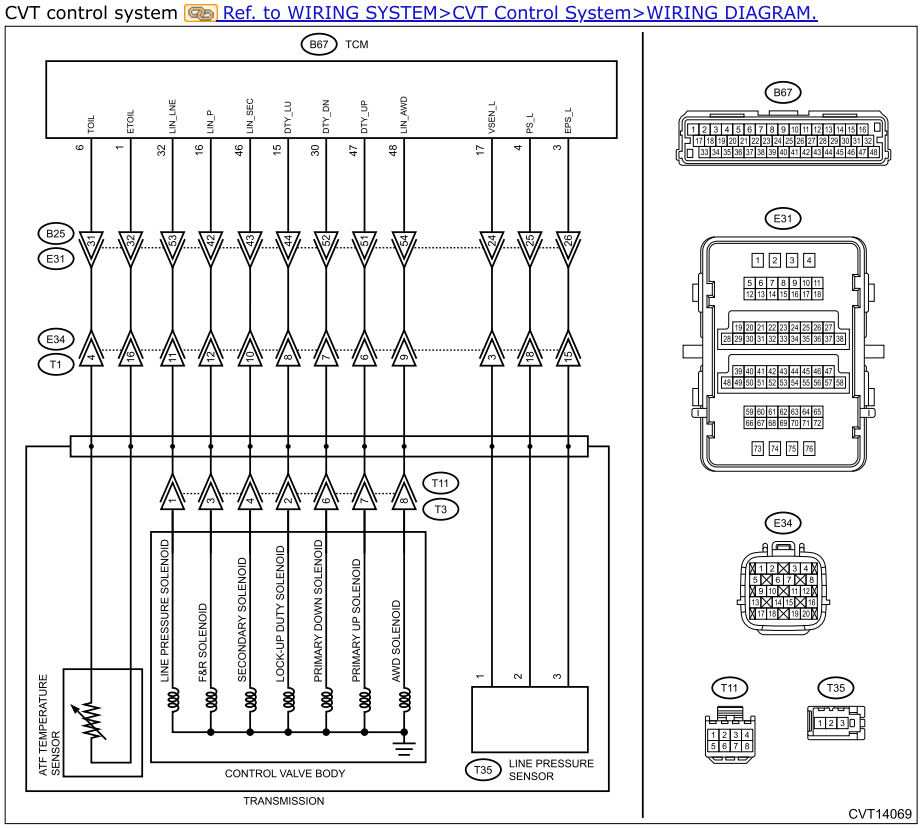
Malfunction Criteria	Threshold Value
ABS* (Vehicle speed (calculated from measured rear output shaft speed) – Vehicle speed (calculated from wheel speed sensor))	Exceeds 10 MPH

*ABS: Absolute value
Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P1758 COLD START TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON

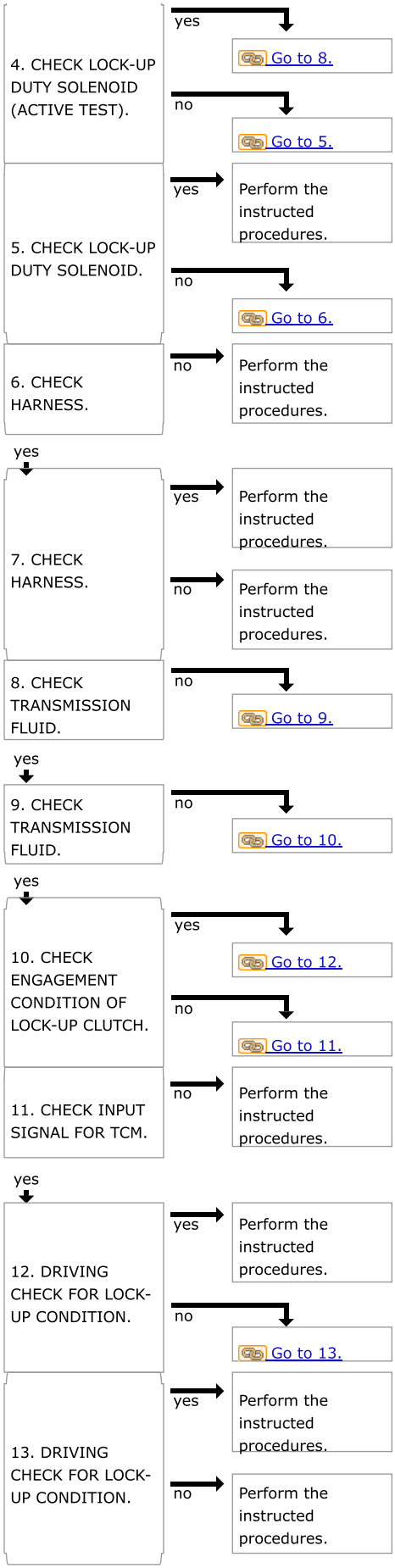
1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Engine stalls at deceleration.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Go to 4.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 4.


4. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).
yes
Go to 8.
no
Go to 5.
5. CHECK LOCK-UP DUTY SOLENOID.
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK HARNESS.
no
Perform the instructed procedures.
yes
7. CHECK HARNESS.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
8. CHECK TRANSMISSION FLUID.
no
Go to 9.
yes
9. CHECK TRANSMISSION FLUID.
no
Go to 10.
yes
10. CHECK ENGAGEMENT CONDITION OF LOCK-UP CLUTCH.
yes
Go to 12.
no
Go to 11.
11. CHECK INPUT SIGNAL FOR TCM.
no
Perform the instructed procedures.
yes
12. DRIVING CHECK FOR LOCK-UP CONDITION.
yes
Perform the instructed procedures.
no
Go to 13.
13. DRIVING CHECK FOR LOCK-UP CONDITION.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is only DTC P1758 displayed?

Yes — Go to 4.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P2758 displayed?

Yes — Perform the diagnosis according to DTC P2758. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON.

No — Go to 3.

3. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P2763 or P2764 displayed?

Yes — Perform the diagnosis according to DTC P2763 or P2764. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 4.

4. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test of the lock-up duty solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, and does operating sound emit during indicating 50%?

Yes — Go to 8.

No — Go to 5.

5. 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
   (T1) No. 8 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω? (When cold)

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Go to 6.

6. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Remove the transmission oil pan.
2. Disconnect the control valve body connector.
3. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 8 — (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 & terminal
(T11) No. 2 — Control valve body:

Is the resistance 1 MΩ or more?

Yes — Replace the 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(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 9.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 9.

9. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 10.

No — Follow the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 10.

10. CHECK ENGAGEMENT CONDITION OF LOCK-UP CLUTCH.

1. Start the engine.
2. Warm up until the ATF temperature exceeds 50°C (122°F).
3. Depress the brake pedal, and shift the select lever to "D" range.

Are there any vibrations due to engine stall or engine speed drop?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body. Go to 12.
No	Go to 11.

11. 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. Drive at 2 km/h (1 MPH) or more.
6. Shift the select lever to "P" range.
7. Stabilize the engine speed at idle.
8. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body. Go to 12.
No	Perform the diagnosis according to DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0867 TRANSMISSION FLUID PRESSURE .

12. DRIVING CHECK FOR LOCK-UP CONDITION.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Turn the ignition switch to OFF.
3. Soak until the engine coolant temperature drops below 30°C (86°F).
4. Start the engine.
5. Depress the brake pedal, and shift the select lever to "D" range.
6. Shift the select lever to "P" range.
7. Turn the ignition switch to OFF.
8. Start the engine.
9. Perform step 3) — step 6) again.
10. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Does the AT OIL TEMP light blink and is DTC P2758 displayed? Or are there any vibrations due to engine stall or engine speed drop?

Yes	Replace the torque converter assembly, and perform step 12 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Torque Converter. If the replacement of the torque converter assembly does not eliminate the malfunction, replace the transmission assembly and perform step 12 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Go to 13.

13. DRIVING CHECK FOR LOCK-UP CONDITION.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Turn the ignition switch to OFF.
3. Soak until the engine coolant temperature drops below 30°C (86°F).
4. Start the engine.
5. Using Subaru Select Monitor, display data of [Accel. Opening Angle] in [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
6. Depress the brake pedal, and shift the select lever to "D" range.
7. With the engine coolant temperature below 54°C (129°F), perform five-second acceleration with [Accel. Opening Angle] at approximately 30% three times.
8. Shift the select lever to "P" range.
9. Turn the ignition switch to OFF.
10. Start the engine.
11. Perform step 3) — step 8) again.
12. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Does the AT OIL TEMP light blink and is DTC P1758 displayed? Or are there any vibrations due to engine stall or engine speed drop?

Yes — Replace the torque converter assembly, and perform step 13 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Torque Converter. If the replacement of the torque converter assembly does not eliminate the malfunction, replace the transmission assembly and perform step 13 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Current condition is normal. It is possible that temporary failure occurred to the energization status or to the hydraulic circuit.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of characteristics in lock-up fluid pressure control solenoid and hydraulic circuit, or drive circuit (stuck to high pressure side), while lock-up is prohibited to promote engine warm-up immediately after cold start.
- Judge as NG if the deviation between engine speed and turbine speed becomes equal to or smaller than the predetermined value, even though the lock-up is prohibited as above.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Commanded duty of torque converter clutch pressure control solenoid	0% or less
Vehicle speed	1.9 MPH or more
Engine speed	1000 rpm or more and 5000 rpm or less
Transmission fluid temperature	−10 degC or more and 120 degC or less
Engine coolant temperature	−10 degC or more
Transmission range	Drive
Engine torque	At or more than N·m values in Table 1
Cold Start	Operation
All above conditions satisfied for time.	0.1 sec or more

Table 1

		Difference between current engine torque calculated by ECM and torque demanded by driver (N·m)			
		0	60	90	100
Turbine shaft speed (rpm)	0	45	45	45	45
	500	45	45	45	45
	1000	48	48	48	48
	1500	52	52	52	52
	2000	55	55	55	55
	2500	60	60	60	60
	3000	100	100	100	100
	3500	250	250	250	250

	4000	358	358	358	358
	4500	443	443	443	443
	5000	512	512	512	512
	5500	512	512	512	512
	6000	512	512	512	512
	6500	512	512	512	512
	7000	512	512	512	512

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 counter / Diagnostic execution counter When the difference between Engine speed and Turbine shaft speed count up Malfunction counter	70% or more Less than 50 rpm

Time needed for diagnosis: Cumulative time of 3 s during the lock-up prohibition at cold

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P1867 TRANSMISSION SECONDARY FLUID PRESSURE

1. —

DTC detecting condition:

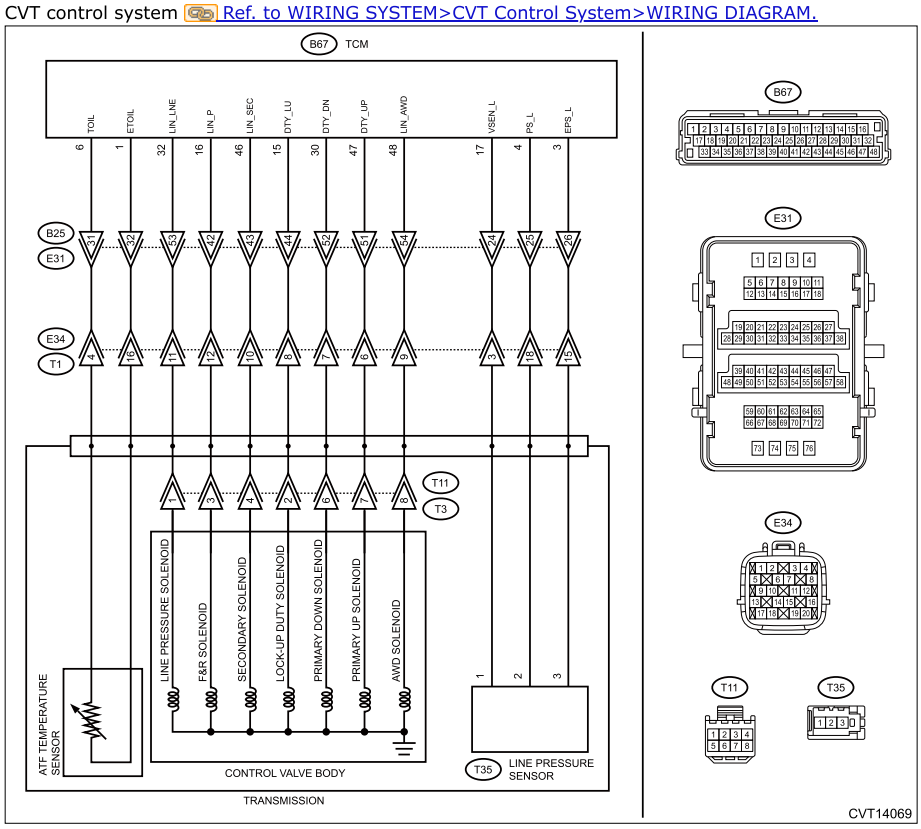
Immediately at fault recognition

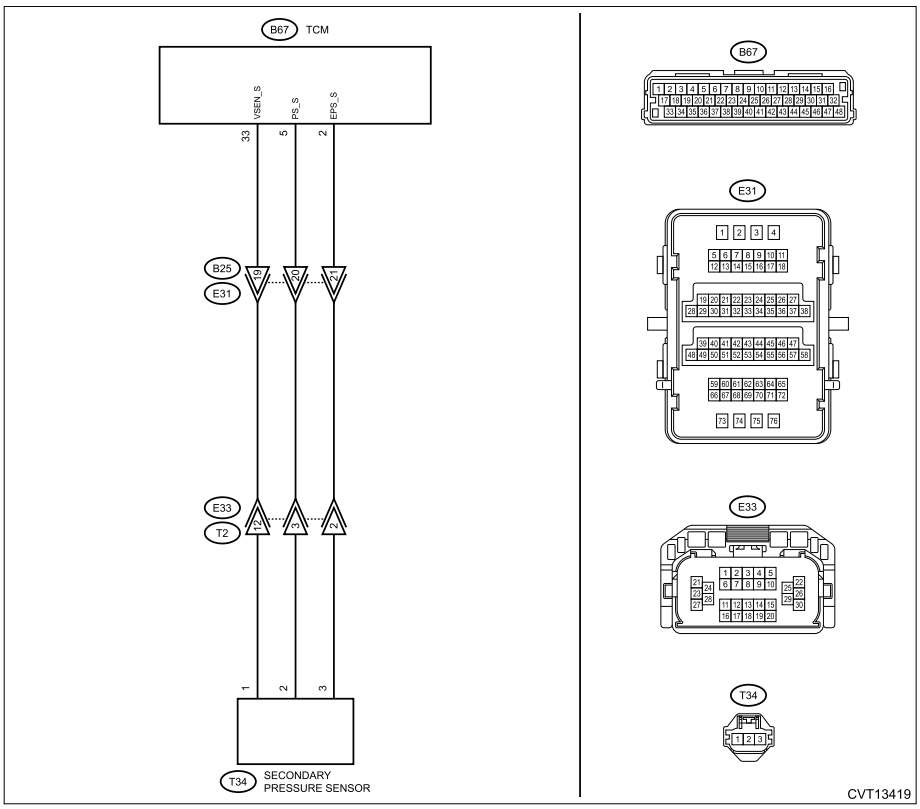
Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.
- CVT chain slippage

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.

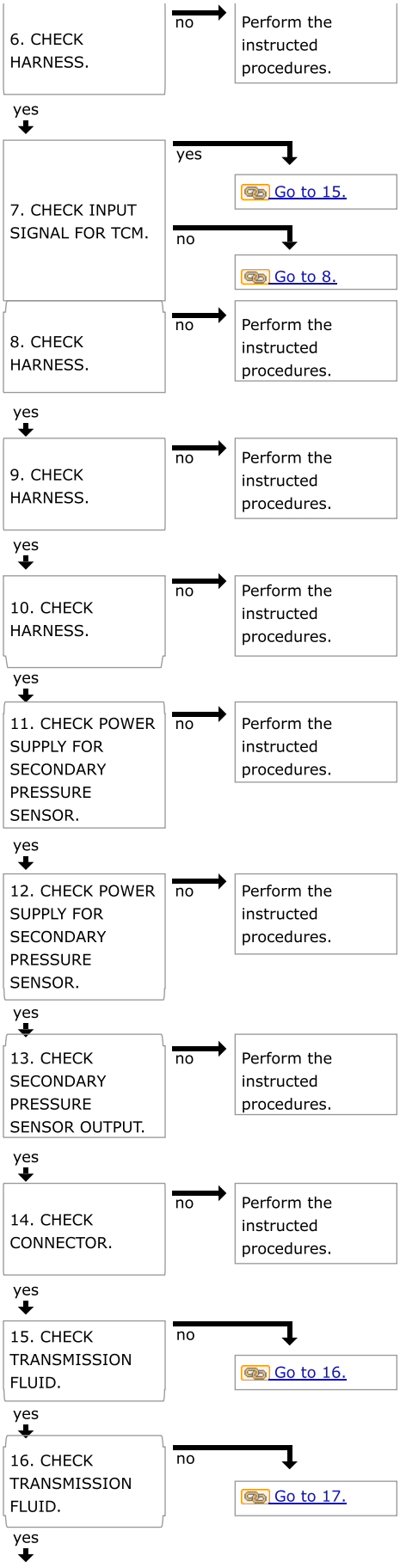


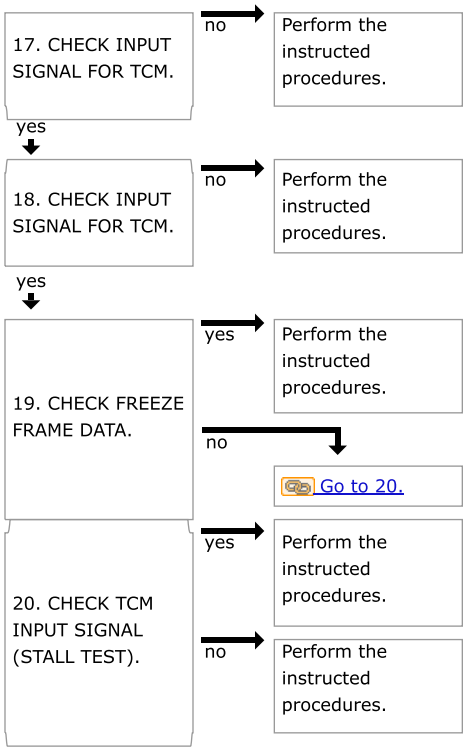


Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Go to 4.
	no	Go to 2.
2. CHECK DTC.	no	Perform the instructed procedures.
2. CHECK DTC.	yes	
3. CHECK DTC.	no	Perform the instructed procedures.
3. CHECK DTC.	yes	
4. CHECK SECONDARY SOLENOID (ACTIVE TEST).	yes	Go to 7.
	no	Go to 5.
5. CHECK SECONDARY SOLENOID.	yes	Go to 7.
	no	Go to 6.


6. CHECK HARNESS.
no
Perform the instructed procedures.
yes
7. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 15.
no
Go to 8.
8. CHECK HARNESS.
no
Perform the instructed procedures.
yes
9. CHECK HARNESS.
no
Perform the instructed procedures.
yes
10. CHECK HARNESS.
no
Perform the instructed procedures.
yes
11. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
no
Perform the instructed procedures.
yes
12. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
no
Perform the instructed procedures.
yes
13. CHECK SECONDARY PRESSURE SENSOR OUTPUT.
no
Perform the instructed procedures.
yes
14. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes
15. CHECK TRANSMISSION FLUID.
no
Go to 16.
yes
16. CHECK TRANSMISSION FLUID.
no
Go to 17.
yes



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is only DTC P1867 displayed?

Yes — Go to 4.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0846 displayed?

Yes — Go to 3.

No — Perform the diagnosis according to DTCs other than P1867 and P0846. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST. 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.) After driving, repeat the step 1.

3. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P2723 displayed?

Yes — Go to 4.

No — Perform the diagnosis according to DTC P0846. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0846 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "B" CIRCUIT RANGE/PERFORMANCE .

4. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 7.

No — Go to 5.

5. 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
   (T1) No. 10 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes — Go to 7.

No — Go to 6.

6. 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.

7. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read data of [secondary pressure sensor voltage.] in the [Data Monitor] of [Transmission]. (While shaking the secondary pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [secondary pressure sensor voltage.] 0.39 — 0.61 V?

Yes — Go to 15.

No — Go to 8.

8. 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

(B67) No. 2 — (T34) No. 3:
(B67) No. 5 — (T34) No. 2:
(B67) No. 33 — (T34) No. 1:

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 connectors.

Connector & terminal

(B67) No. 2 — (B67) No. 33:
(B67) No. 5 — (B67) No. 2:
(B67) No. 33 — (B67) No. 5:

Is the resistance 1 MΩ or more?

Yes — Go to 10.

No — Repair the short circuit of harness.

10. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.

Connector & terminal

(B67) No. 2 — Transmission body:
(B67) No. 5 — Transmission body:
(B67) No. 33 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 11.

No — Repair the short circuit of harness.

11. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.

Connector & terminal

(B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 12.

No — Check for poor contact of connector and for short circuit in harness between the 12 V power supply system. If no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

12. 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
   (B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 13.

No — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

13. CHECK SECONDARY PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 5 (+) — (B67) No. 2 (−):

Is the voltage 0.39 — 0.61 V?

Yes — Go to 14.

No — 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).

14. 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 (B67) and the secondary pressure sensor connector (T34).

Is the check result OK?

Yes — Go to 15.

No — Repair the connector, or replace harness.

15. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 16.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 16.

16. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes	Return ATF. Go to 17.
No	Follow the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 17.

17. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Start the engine.
4. Warm up until the ATF temperature reaches to 40 — 70 °C (104 — 158 °F).
5. Depress the brake pedal and move the select lever to each range at an interval of 5 seconds.

Note:
Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".

6. Stabilize the engine speed at idle.
7. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 0.3 — 1.5 MPa?

Yes	Go to 18.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

18. CHECK INPUT SIGNAL FOR TCM.

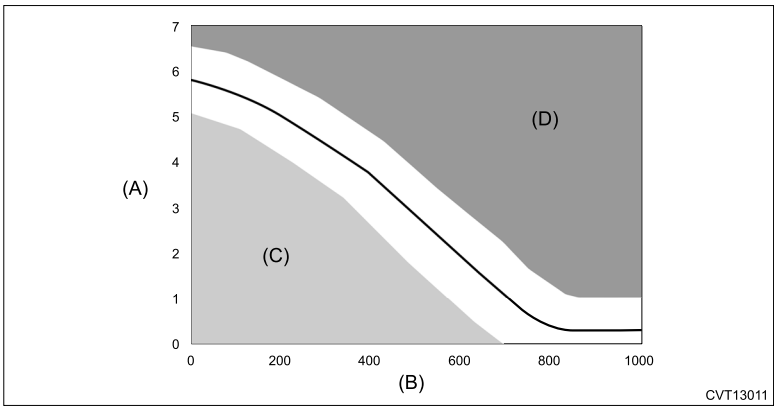
1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 17 0.2 MPa or more?

Yes	Go to 19.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

19. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data for DTC P1867. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data.
3. 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)
(B) Secondary actual current (mA)
(C) Low-voltage malfunction
(D) High-voltage malfunction

Note:
Symptom that the DTC P1867 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**

Was the detected symptom low-voltage malfunction?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 20.

20. 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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual Secondary Pressure] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

GENERAL DESCRIPTION

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 pressure sensor becomes the predetermined value or more.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	At or more than rpm values in Table 1

Table 1

		Target line pressure (kPa)								
		0	500	1000	1500	2000	3000	4000	5000	6000
Transmission fluid temperature (degC)	−40	500	500	500	500	529	636	791	961	8000
	−20	500	500	500	500	529	636	791	961	8000
	0	500	500	500	500	529	636	791	961	8000
	20	500	500	500	500	529	636	791	961	8000
	40	500	500	500	500	529	636	791	961	8000
	60	500	500	506	561	631	807	1154	8000	8000
	80	500	500	590	705	818	991	1300	4658	8000
	100	500	569	670	795	901	1174	1458	4962	8000
	120	500	653	782	897	1060	1352	1707	8000	8000

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
ABS* (Target pulley pressure − Measured pulley pressure)	More than 500 kPa

*ABS: Absolute value

Time needed for diagnosis: 5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P1894 CVT GEAR RATIO VARIATION

1. —

DTC detecting condition:

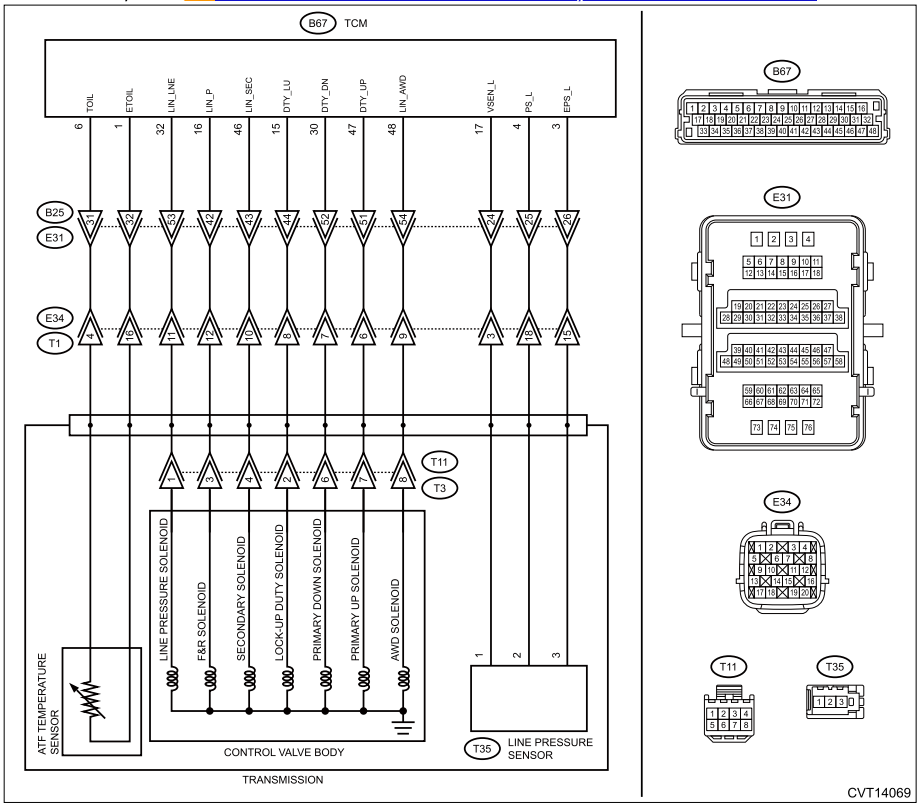
Immediately at fault recognition

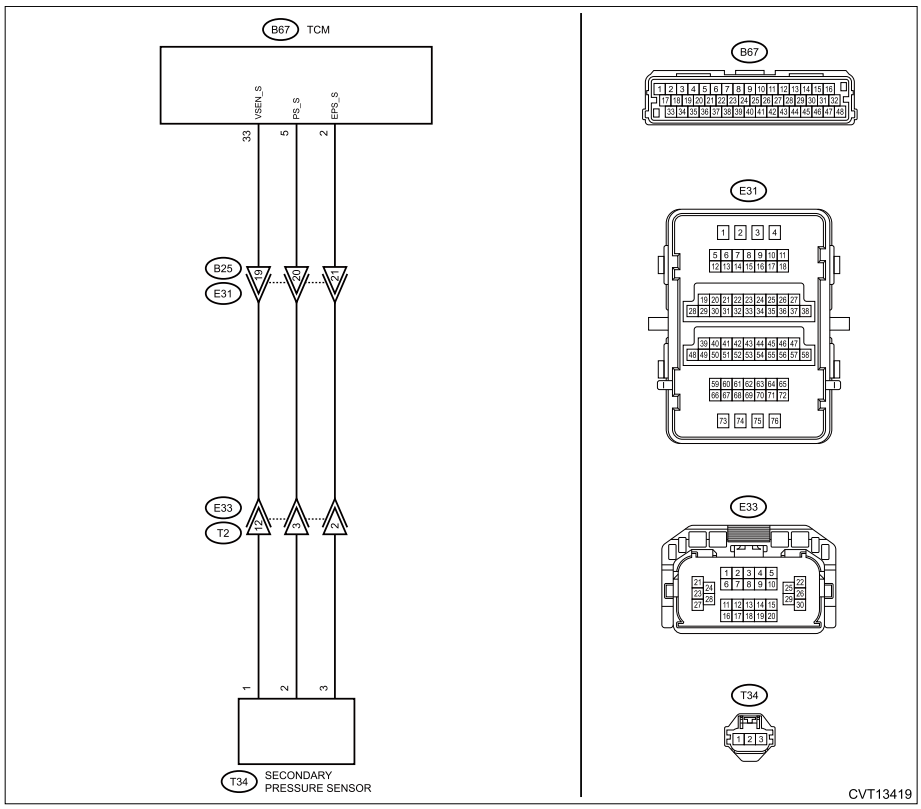
Trouble symptom:

- Excessive shock occurs at re-acceleration from a constant speed.
- Vehicle vibration occurs.

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.

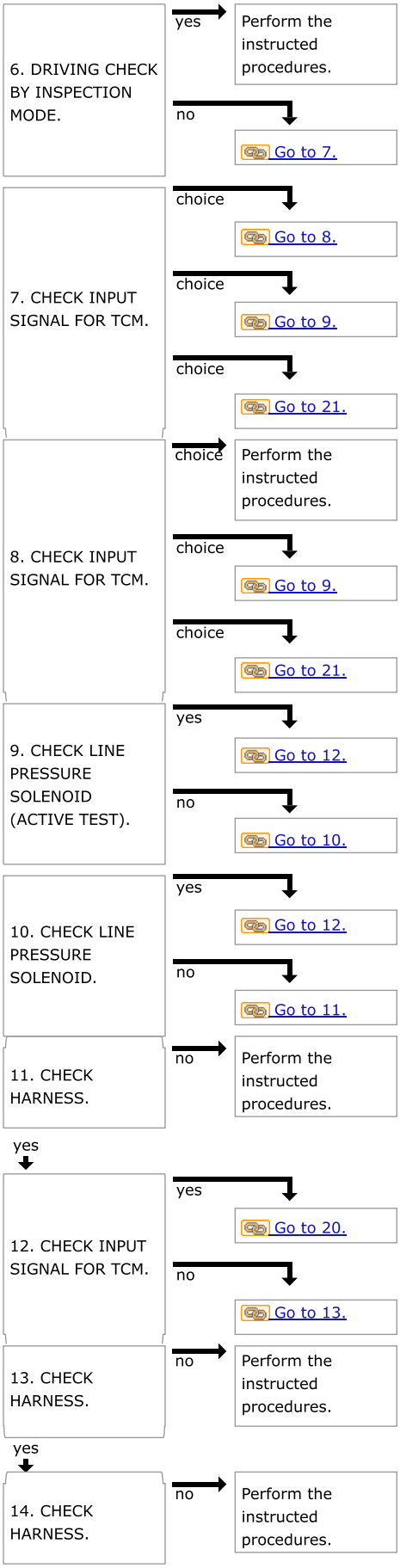


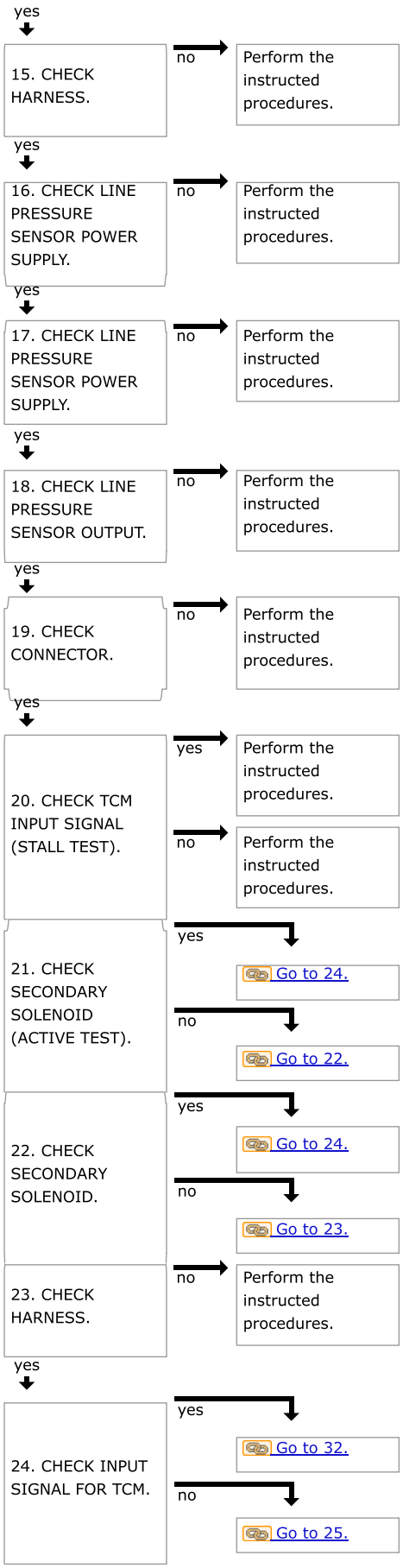


Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.
   - no → Go to 2.
   - yes ↓
2. CHECK TRANSMISSION FLUID.
   - no → Go to 3.
   - yes ↓
3. CHECK TRANSMISSION FLUID.
   - no → Go to 4.
   - yes ↓
4. CHECK TCM INPUT SIGNAL (STALL TEST).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK CONDITION AT STALL TEST.
   - yes → Perform the instructed procedures.
   - no → Go to 6.


6. DRIVING CHECK BY INSPECTION MODE.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK INPUT SIGNAL FOR TCM.
choice
Go to 8.
choice
Go to 9.
choice
Go to 21.
8. CHECK INPUT SIGNAL FOR TCM.
choice
Perform the instructed procedures.
choice
Go to 9.
choice
Go to 21.
9. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).
yes
Go to 12.
no
Go to 10.
10. CHECK LINE PRESSURE SOLENOID.
yes
Go to 12.
no
Go to 11.
11. CHECK HARNESS.
no
Perform the instructed procedures.
yes
12. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 20.
no
Go to 13.
13. CHECK HARNESS.
no
Perform the instructed procedures.
yes
14. CHECK HARNESS.
no
Perform the instructed procedures.


yes
15. CHECK HARNESS.
no
Perform the instructed procedures.
yes
16. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
17. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
18. CHECK LINE PRESSURE SENSOR OUTPUT.
no
Perform the instructed procedures.
yes
19. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes
20. CHECK TCM INPUT SIGNAL (STALL TEST).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
21. CHECK SECONDARY SOLENOID (ACTIVE TEST).
yes
Go to 24.
no
Go to 22.
22. CHECK SECONDARY SOLENOID.
yes
Go to 24.
no
Go to 23.
23. CHECK HARNESS.
no
Perform the instructed procedures.
yes
24. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 32.
no
Go to 25.

25. CHECK HARNESS.
no → Perform the instructed procedures.
yes ↓

26. CHECK HARNESS.
no → Perform the instructed procedures.
yes ↓

27. CHECK HARNESS.
no → Perform the instructed procedures.
yes ↓

28. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
no → Perform the instructed procedures.
yes ↓

29. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.
no → Perform the instructed procedures.
yes ↓

30. CHECK SECONDARY PRESSURE SENSOR OUTPUT.
no → Perform the instructed procedures.
yes ↓

31. CHECK CONNECTOR.
no → Perform the instructed procedures.
yes ↓

32. CHECK TCM INPUT SIGNAL (STALL TEST).
yes → Perform the instructed procedures.
no → Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any DTC other than DTC P1894 displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
And then, Go to 2.

No — Go to 2.

2. CHECK TRANSMISSION FLUID.

Note:
When ATF inspection is performed in the diagnosis for DTC other than DTC P1894, go to step 4.

Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 3.

3. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes	Go to 4.
No	Follow the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 4.

4. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the value of [Actual line press.] 5.0 MPa or more?

Yes	Go to 5.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

5. CHECK CONDITION AT STALL TEST.

Check the condition at stall test.

Does the shock or noise occur at stall test?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Go to 6.

6. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Note:
Check FFD in advance, and slowly accelerate the vehicle under the same conditions (vehicle speed, oil temperature) as those when P1894 was recorded. If FFD was not saved, perform inspection mode D (including slow acceleration from a certain vehicle speed).

3. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P1894 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Go to 7.

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 move the select lever to each range at an interval of 5 seconds.

Note:
Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".

4. Set the select lever to "D" range.
5. Drive at 2 km/h or more.
6. Stop the vehicle.
7. Shift the select lever to "P" range.
8. Stabilize the engine speed at idle.
9. Using the Subaru Select Monitor, read data of [Actual line press.], [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

If [Actual line press.] is 0.5 — 1.5 MPa and [Actual Secondary Pressure] is 0.3 — 1.5 MPa, go to A.
If [Actual line press.] is not within 0.5 — 1.5 MPa, go to B.
If [Actual Secondary Pressure] is not within 0.3 — 1.5 MPa, go to C.

A	Go to 8.
B	Go to 9.
C	Go to 21.

8. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual line press.], [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

If [Actual line press.] [Actual Secondary Pressure] are 1.5 — 2.5 MPa, go to A.
If [Actual line press.] is not within 1.5 — 2.5 MPa, go to B.
If [Actual Secondary Pressure] is not within 1.5 — 2.5 MPa, go to C.

A	Currently, it is normal. Clear the memory to finish the diagnosis.
B	Go to 9.
C	Go to 21.

9. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for line pressure solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 12.

No — Go to 10.

10. CHECK LINE PRESSURE SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
   Connector & terminal
   (B67) No. 32 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes — Go to 12.

No — Go to 11.

11. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)
Connector & terminal
(B67) No. 17 — (T35) No. 1:
(B67) No. 4 — (T35) No. 2:
(B67) No. 3 — (T35) No. 3:
(B67) No. 32 — (T11) No. 1:

Is the check result OK?

Yes — Go to 12.

No — Repair the harness.

12. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read data of [Line Pressure Sensor Voltage.] in the [Data Monitor] of [Transmission]. (While shaking the line pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Line Pressure Sensor Voltage.] 0.39 — 0.61 V?

Yes — Go to 20.

No — Go to 13.

13. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission oil pan.
4. Disconnect the line pressure sensor connector.
5. Measure the resistance between TCM connector and line pressure sensor connector. (While wiggling the harness)

Connector & terminal
(B67) No. 3 — (T35) No. 3:
(B67) No. 4 — (T35) No. 2:
(B67) No. 17 — (T35) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 14.

No — Repair the open circuit of harness.

14. CHECK HARNESS.

Measure the resistance between TCM connectors. (While wiggling the harness)
Connector & terminal
(B67) No. 3 — (B67) No. 17:
(B67) No. 4 — (B67) No. 3:
(B67) No. 17 — (B67) No. 4:

Is the resistance 1 MΩ or more?

Yes — Go to 15.

No — Repair the short circuit of harness.

15. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
Connector & terminal
(B67) No. 3 — Transmission body:
(B67) No. 4 — Transmission body:
(B67) No. 17 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 16.

No — Repair the short circuit of harness.

16. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes	Go to 17.
No	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).

17. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Connect the line pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes	Go to 18.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

18. CHECK LINE PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 4 (+) — (B67) No. 3 (−):

Is the voltage 0.39 — 0.61 V?

Yes	Go to 19.
No	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).

19. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the line pressure sensor connector.
4. Check the TCM connector (B67) and the line pressure sensor connector (T35).

Is the check result OK?

Yes	Go to 20.
No	Repair the connector, or replace harness.

20. CHECK TCM INPUT SIGNAL (STALL TEST).

1. Connect all connectors.
2. Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.
3. Lift up the vehicle.
4. Start the engine.
5. Apply the parking brake.
6. Set the select lever to "D" range.
7. Depress the brake pedal firmly.
8. Slowly open the accelerator fully, and stabilize the engine speed.
9. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual line press.] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

21. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 24.

No — Go to 22.

22. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
   Connector & terminal
   (B67) No. 46 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes — Go to 24.

No — Go to 23.

23. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Connector & terminal

(B67) No. 33 — (T34) No. 1:
(B67) No. 5 — (T34) No. 2:
(B67) No. 2 — (T34) No. 3:
(B67) No. 46 — (T11) No. 4:

Is the check result OK?

Yes — Go to 24.

No — Repair the harness.

24. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read data of [secondary pressure sensor voltage.] in the [Data Monitor] of [Transmission]. (While shaking the secondary pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [secondary pressure sensor voltage.] 0.39 — 0.61 V?

Yes — Go to 32.

No — Go to 25.

25. 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. (While wiggling the harness)

   Connector & terminal

   (B67) No. 2 — (T34) No. 3:
   (B67) No. 5 — (T34) No. 2:
   (B67) No. 33 — (T34) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 26.

No — Repair the open circuit of harness.

26. CHECK HARNESS.

Measure the resistance between TCM connectors. (While wiggling the harness)

Connector & terminal

(B67) No. 2 — (B67) No. 33:
(B67) No. 5 — (B67) No. 2:
(B67) No. 33 — (B67) No. 5:

Is the resistance 1 MΩ or more?

Yes — Go to 27.

No — Repair the short circuit of harness.

27. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body. (While wiggling the harness)

Connector & terminal

(B67) No. 2 — Transmission body:

(B67) No. 5 — Transmission body:

(B67) No. 33 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 28.

No — Repair the short circuit of harness.

28. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.

Connector & terminal

(B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 29.

No — 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).

29. 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

(B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 30.

No — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

30. CHECK SECONDARY PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.

Connector & terminal

(B67) No. 5 (+) — (B67) No. 2 (−):

Is the voltage 0.39 — 0.61 V?

Yes — Go to 31.

No — 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).

31. 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 (B67) and the secondary pressure sensor connector (T34).

Is the check result OK?

Yes	Go to 32.
No	Repair the connector, or replace harness.

32. CHECK TCM INPUT SIGNAL (STALL TEST).

1. Connect all connectors.
2. Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.
3. Lift up the vehicle.
4. Start the engine.
5. Apply the parking brake.
6. Set the select lever to "D" range.
7. Depress the brake pedal firmly.
8. Slowly open the accelerator fully, and stabilize the engine speed.
9. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual Secondary Pressure] 6.0 MPa or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

DTC P1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "CENTRAL GATEWAY (DIAGNOSTICS)" for diagnostic procedure. Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.

DTC P2158 VEHICLE SPEED SENSOR "B" CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
VDC does not operate.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Repair the poor contact of connector and harness between VDCCM&H/U and wheel speed sensor.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Judge the malfunction of VDC wheel speed sensor.
- Judge as NG when the wheel speed sensor normal status signal from VDC is cleared.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10.9 V or more

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

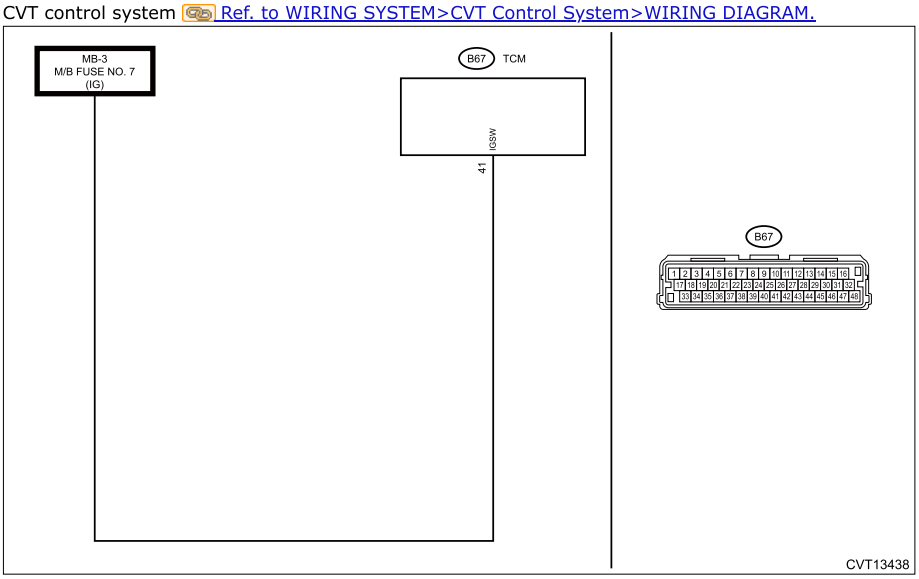
Malfunction Criteria	Threshold Value
Signal of malfunction from Vehicle Dynamics Control Module **Note:** **The VDC controller detects malfunction if one of the speed sensors does not output a signal and the other vehicle speed sensor output signal is above 7.46 MPH**	ON

Time needed for diagnosis: 2.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Faulty TCM operation
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK CONNECTOR.
- no → Perform the instructed procedures.
- yes ↓

2. CHECK INPUT VOLTAGE OF TCM.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK CONNECTOR.

Check the installing condition of TCM connector.

Is the TCM connector installed properly?

Yes	Go to 2.
No	Install the TCM connector.

2. CHECK INPUT VOLTAGE OF TCM.

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 connector and chassis ground. (While wiggling the harness)
   Connector & terminal
   (B67) 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 in harness between TCM connector and IG relay 1 connector**
- **Poor contact of IG relay 1 connector**
- **Poor contact of IG relay 1**

No — Repair the harness and connector.

Note:
In this case, repair the following item:
- **Open circuit or short circuit to ground in harness between TCM connector and IG relay 1 connector**
- **Poor contact of IG relay 1 connector**
- **Poor contact of IG relay 1**

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10.9 V or more
Engine speed	400 rpm or more

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 counts or more

Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2723 PRESSURE CONTROL SOLENOID "E" PERFORMANCE/STUCK OFF

1. —

DTC detecting condition:

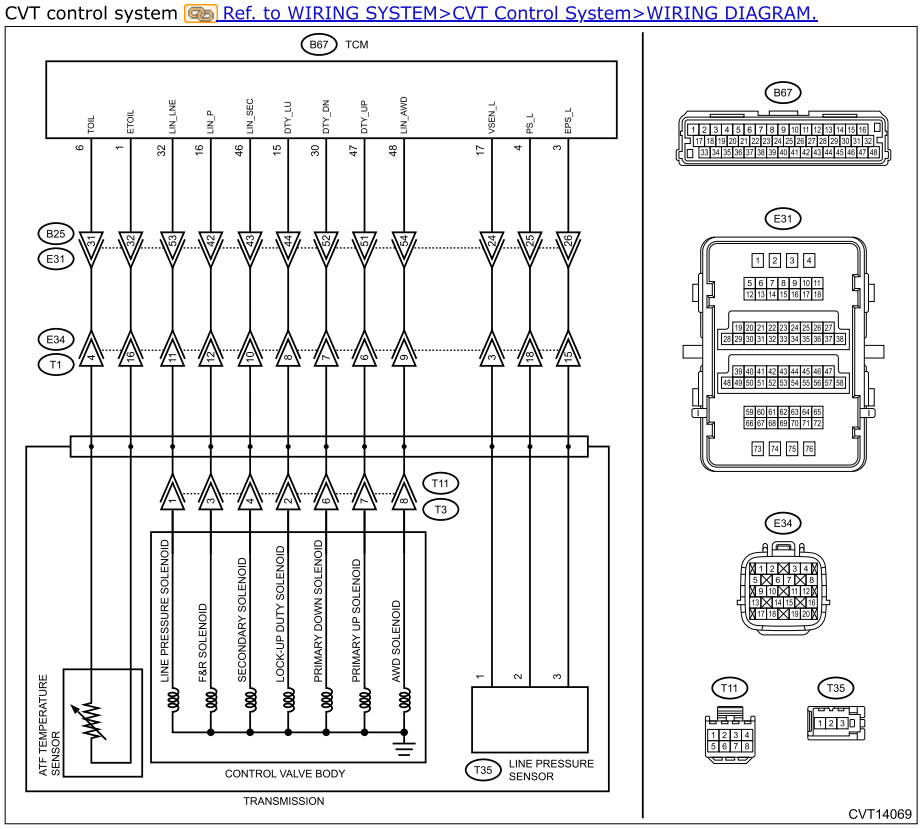
Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- CVT chain slippage

Wiring diagram:

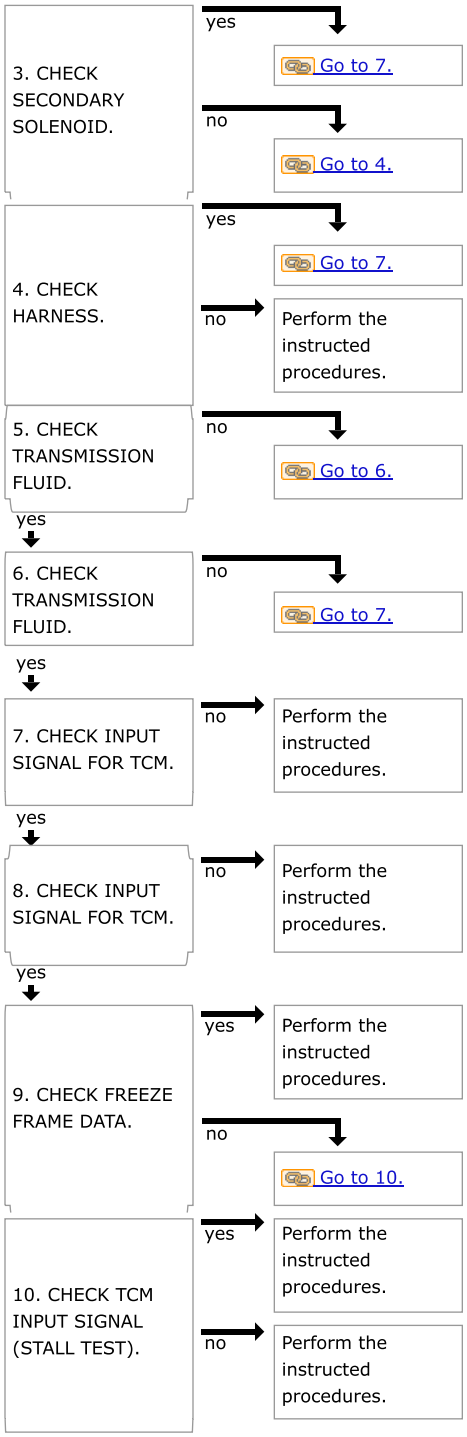
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK SECONDARY SOLENOID (ACTIVE TEST).	yes	Go to 5.
	no	Go to 3.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P2723 and P1867, is any of the DTC P0847, P0848, P2728, P2729 or P2730 displayed?

Yes — Perform the diagnosis according to DTCs other than P2723 and P1867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, 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

(T1) No. 10 — Transmission body:

Is the resistance approximately 3.3 — 7.3 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 all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 6.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 7.

No — Follow the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 7.

7. CHECK INPUT SIGNAL FOR TCM.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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 5 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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 0.3 — 1.5 MPa?

Yes	Go to 8.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

8. CHECK INPUT SIGNAL FOR TCM.

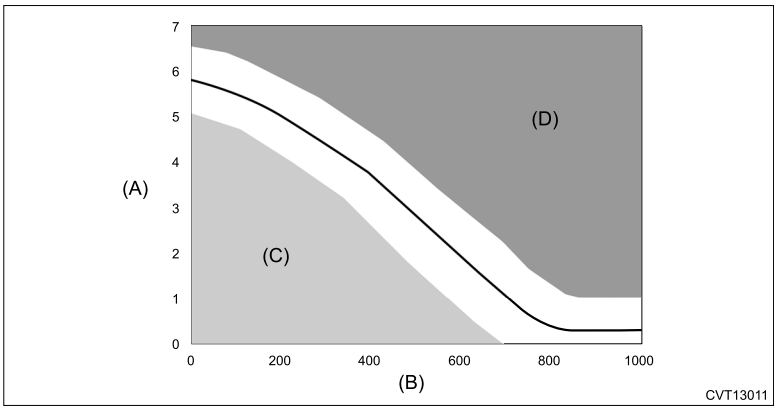
1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual Secondary Pressure] 1.5 — 2.5 MPa? Is the difference between the actual oil pressure and the value measured in Step 7 0.2 MPa or more?

Yes	Go to 9.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

9. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data for DTC P1867. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data.
3. 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)
(B) Secondary actual current (mA)
(C) Low-voltage malfunction
(D) High-voltage malfunction

Note:
Symptom that the DTC P1867 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**

Was the detected symptom low-voltage malfunction?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 10.

10. 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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual Secondary Pressure] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
- Detect the malfunction of transmission secondary solenoid and hydraulic circuit (stuck to high / low pressure side).
- After P1867 is detected, judge as NG if the voltage of the secondary pressure sensor is within the predetermined value after the predetermined period of time has elapsed since IG OFF.

EXECUTION CONDITION

Secondary parameters	Execution condition
Phase 1 12 V battery system voltage Engine speed	 10 V or more At or more than rpm values in Table 1
Phase 2 Fail detected (P1867) 12 V battery system voltage Ignition state Measured primary pulley shaft speed Transmission fluid temperature	 TRUE 10 V or more OFF 400 rpm or less 10 degC or more

Table 1

		Target line pressure (kPa)								
		0	500	1000	1500	2000	3000	4000	5000	6000
Transmission fluid temperature (degC)	−40	500	500	500	500	529	636	791	961	8000
	−20	500	500	500	500	529	636	791	961	8000
	0	500	500	500	500	529	636	791	961	8000
	20	500	500	500	500	529	636	791	961	8000
	40	500	500	500	500	529	636	791	961	8000
	60	500	500	506	561	631	807	1154	8000	8000
	80	500	500	590	705	818	991	1300	4658	8000
	100	500	569	670	795	901	1174	1458	4962	8000
	120	500	653	782	897	1060	1352	1707	8000	8000

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 ABS* (Target pulley pressure − Measured pulley pressure)	 More than 500 kPa
Phase 2 Measured pulley pressure sensor input voltage (Measured pulley pressure) Measured pulley pressure sensor input voltage (Measured pulley pressure) **Note:** **Both Phase 1 and Phase 2 must be met to fail the diagnostics.**	 0.8 V or less (570 kPa or less) 0.195 V or more (0 kPa or more)

*ABS: Absolute value

Time needed for diagnosis:

- **Phase 1:** 5 s
- **Phase 2:** 3 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2728 PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:

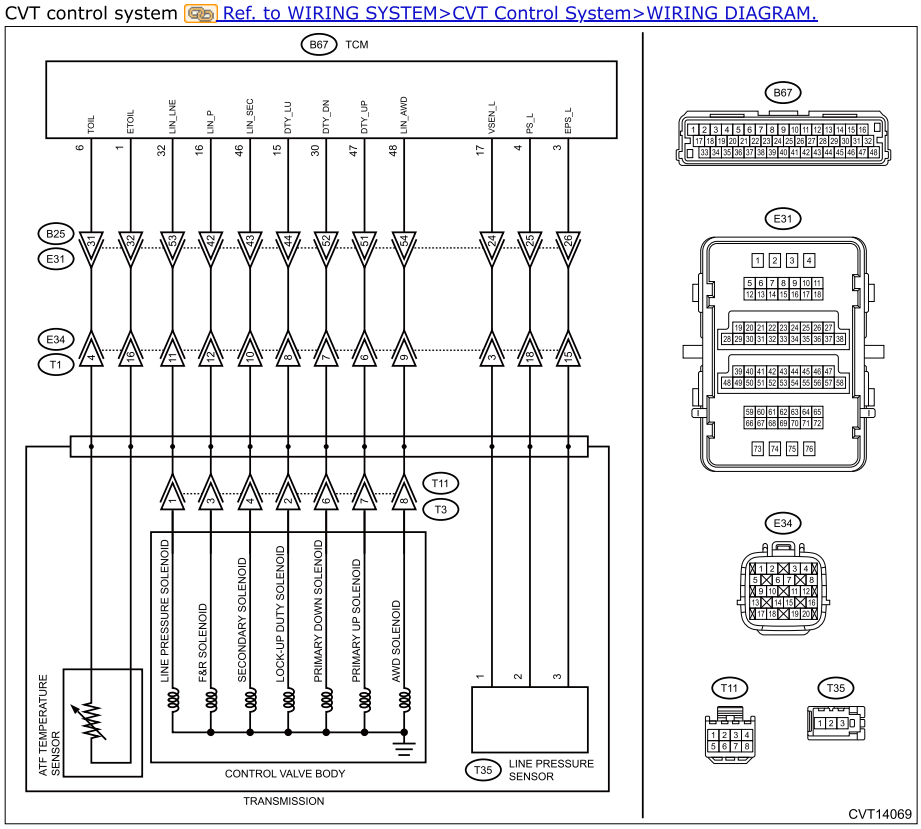
Immediately at fault recognition

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK SECONDARY SOLENOID (ACTIVE TEST).	no	Go to 4.
	yes	

3. CHECK FOR POOR CONTACT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.
4. CHECK SECONDARY SOLENOID.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P2728, is any of the DTC P2729 or P2730 displayed?

Yes — Perform the diagnosis according to DTCs other than P2728. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Is 300 → 500 → 700 mA indicated at the active test, 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(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
   (T1) No. 10 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of the transmission secondary solenoid drive circuit.
- Judge as NG when the deviation between target current and actual current of the transmission secondary solenoid becomes equal to or larger than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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 ABS* (Target pulley pressure control solenoid current − Measured pulley pressure control solenoid current)	Exceeds 0.2 A
Diagnosis 2 Measured pulley pressure control solenoid current	Exceeds 1.05 A and 1.6 A or less

*ABS: Absolute value

Time needed for diagnosis: 1.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

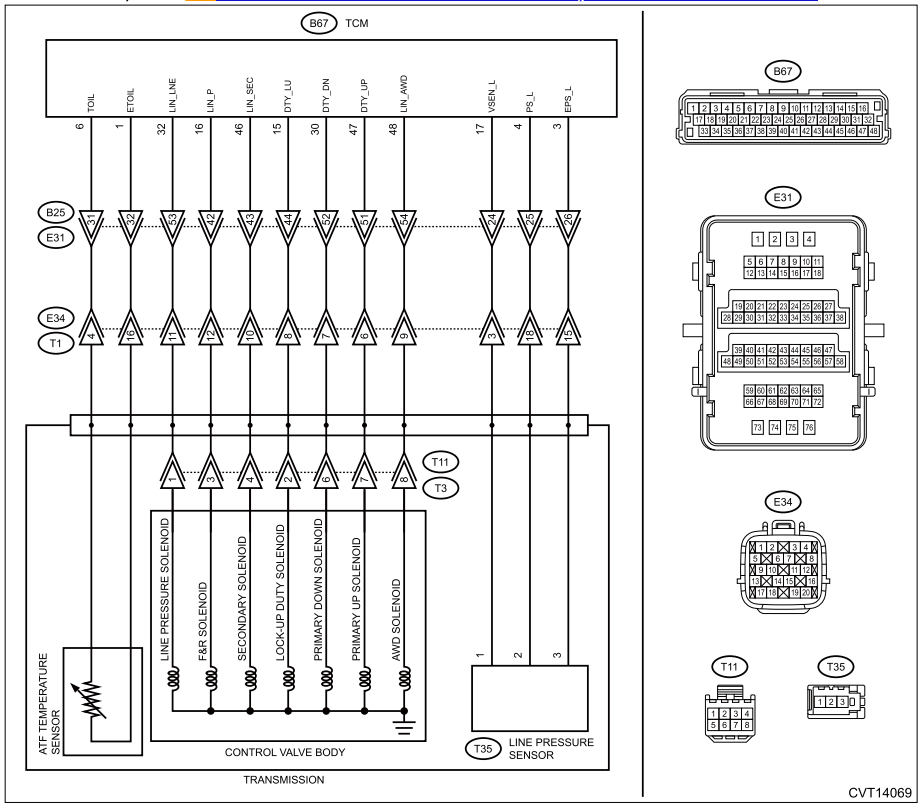
DTC P2729 PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT LOW

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine speed increases abruptly, and cannot start.
- Engine speed increases abruptly during driving.

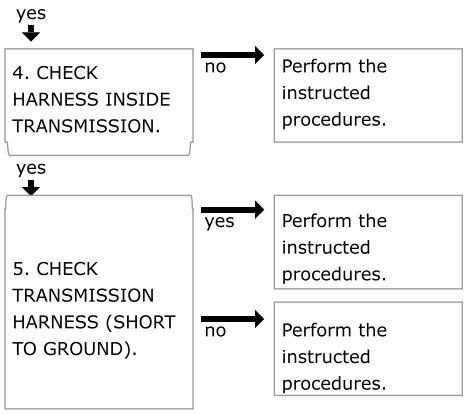
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).	no	Go to 3.
yes ↓		
2. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).	no	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS (GROUND SHORT CIRCUIT).	no	Perform the instructed procedures.



1. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 46 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 46 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 46 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the harness.

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 the check result OK?

Yes	Go to 5.
No	Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 10 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

Diagnosis 1

- Detect the ground short of the transmission secondary solenoid drive circuit.
- Judge as NG if the transmission secondary solenoid drive current is higher than the predetermined value.

Diagnosis 2

- Detect the ground short of the transmission secondary solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the transmission secondary solenoid drive circuit.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

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* As defined by: Measured pulley pressure control solenoid current, more than 1.6 A	ON

*IC: Integrated circuit

Time needed for diagnosis: 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

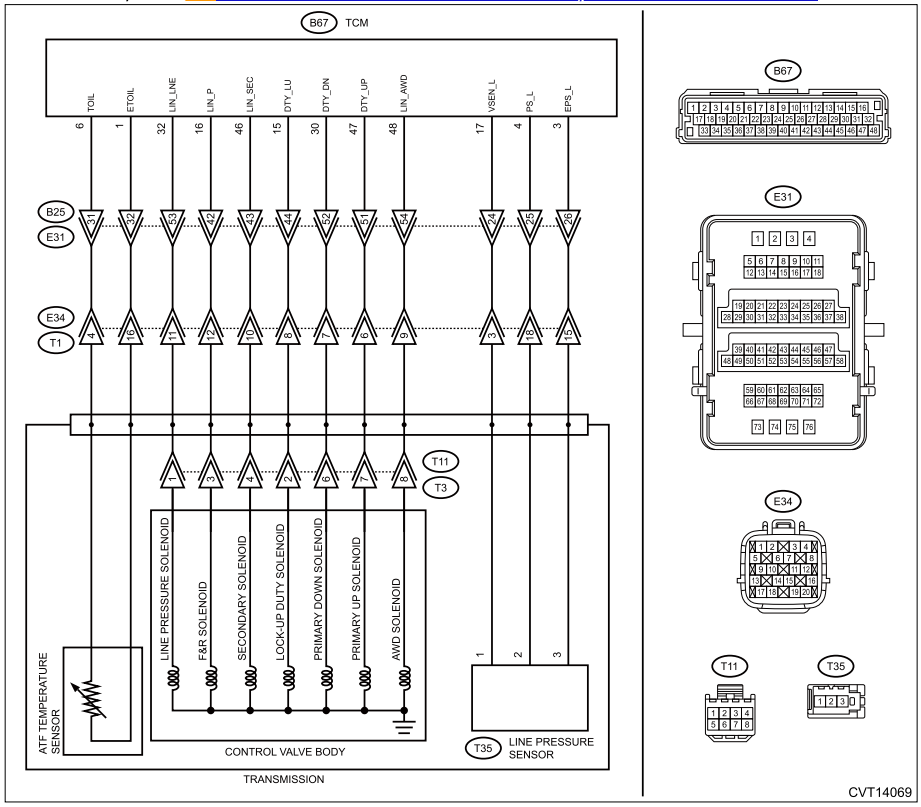
DTC P2730 PRESSURE CONTROL SOLENOID "E" CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Engine speed increases abruptly, and cannot start.
- Engine speed increases abruptly during driving.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).	no	Go to 3.
yes ↓		
2. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).	no	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS (OPEN CIRCUIT).	no	Perform the instructed procedures.

yes

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY). → no → Perform the instructed procedures.

yes

5. CHECK HARNESS INSIDE TRANSMISSION. → no → Perform the instructed procedures.

yes

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT). → no → Perform the instructed procedures.

yes

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 46 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω?

Yes Go to 2.

No Go to 3.

2. CHECK SECONDARY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 46 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 46 — (E34) No. 10:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 46 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 10 — (T11) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 10 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair or replace the harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission secondary solenoid drive circuit.
- Judge as NG if the transmission secondary solenoid drive current is lower than the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded line pressure control solenoid valve current	0.1 A or more

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* As defined by: Measured pulley pressure control solenoid current, less than 5.9 mA	ON

*IC: Integrated circuit

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2746 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE

1. —

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:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P2746, is DTC P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P2746. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage Engine speed	10 V or more 400 rpm or more

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 primary pulley shaft speed × Primary reduction gear ratio*	Less than rpm values in Table 1

*Primary reduction gear ratio: 1.000
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
Measured primary pulley shaft speed × Primary reduction gear ratio (rpm)	4000	4500	5000	5500	6000	6500	7000

Time needed for diagnosis: 10 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

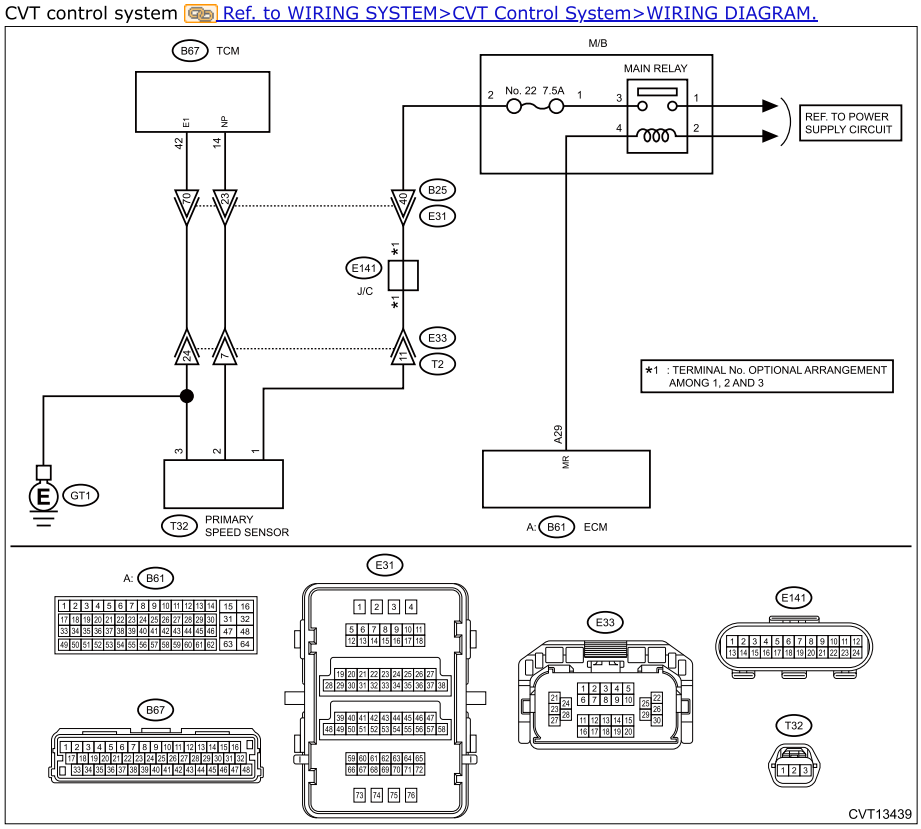
DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL

1. —

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.

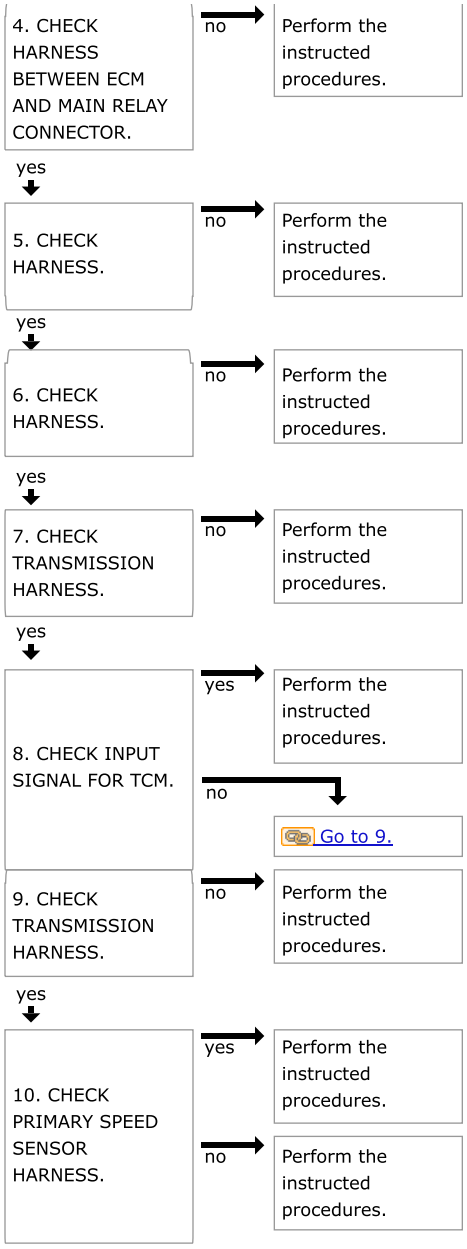
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM•ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0890 displayed?

Yes	Perform the diagnosis according to DTC P0890. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW.
No	Go to 2.

2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.

Check connecting condition of the connectors indicated in the wiring diagram.

Are the connectors indicated in the wiring diagram properly connected?

Yes — Go to 3.

No — Properly connect the connectors indicated in the wiring diagram.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T2) No. 11 (+) — Chassis 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 of harness between transmission connector and main relay connector**
- **Defective main relay**

No — Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 29 — 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 main relay connector.

5. 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
   (B67) No. 14 — (E33) No. 7:
   (B67) No. 42 — (E33) No. 24:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.
Connector & terminal
(B67) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E33, T2)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector terminals.
   Connector & terminal
   (E33) No. 11 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes — Go to 8.

No — Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Set the select lever to "D" range.
6. Using the Subaru Select Monitor, read data of [Primary Rev Speed], [Engine Speed] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Does the value of [Primary Rev Speed] change according to the [Engine Speed]?

Yes — Current condition is normal. Repair the poor contacts of harnesses of primary speed sensor and transmission connector.

No — Go to 9.

9. 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

(T2) No. 7 — (T32) No. 2:
(T2) No. 11 — (T32) No. 1:
(T2) No. 24 — (T32) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

10. CHECK PRIMARY SPEED SENSOR HARNESS.

Measure the resistance between transmission connector and chassis ground.

Connector & terminal

(T2) No. 7 — Chassis ground:
(T2) No. 11 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Primary Speed Sensor.
If the replacement of the primary speed sensor does not eliminate the malfunction, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

No — Repair the short circuit of harness.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- 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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured secondary pulley shaft speed	500 rpm or more

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 primary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2750 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Shifting shock is felt.
- Acceleration is poor during standing start.
- Shift control malfunction

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Besides DTC P2750, is any of the DTC U0122 or U0416 displayed?

Yes — Perform the diagnosis according to DTCs other than P2750. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS
Diagnosis 1

- Detect the malfunction of the secondary speed sensor 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 the secondary speed sensor characteristics.
- Judge as NG if the secondary speed exceeds the predetermined value.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Transmission range	Drive or Reverse
(Measured primary pulley shaft speed / Measured front output shaft speed)	0.38 or more and 2.62 or less

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 primary pulley shaft speed / Measured secondary pulley shaft speed)	Less than 0.34 or More than 2.89
Diagnosis 2 Measured secondary pulley shaft speed	Exceeds 11280 rpm

Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

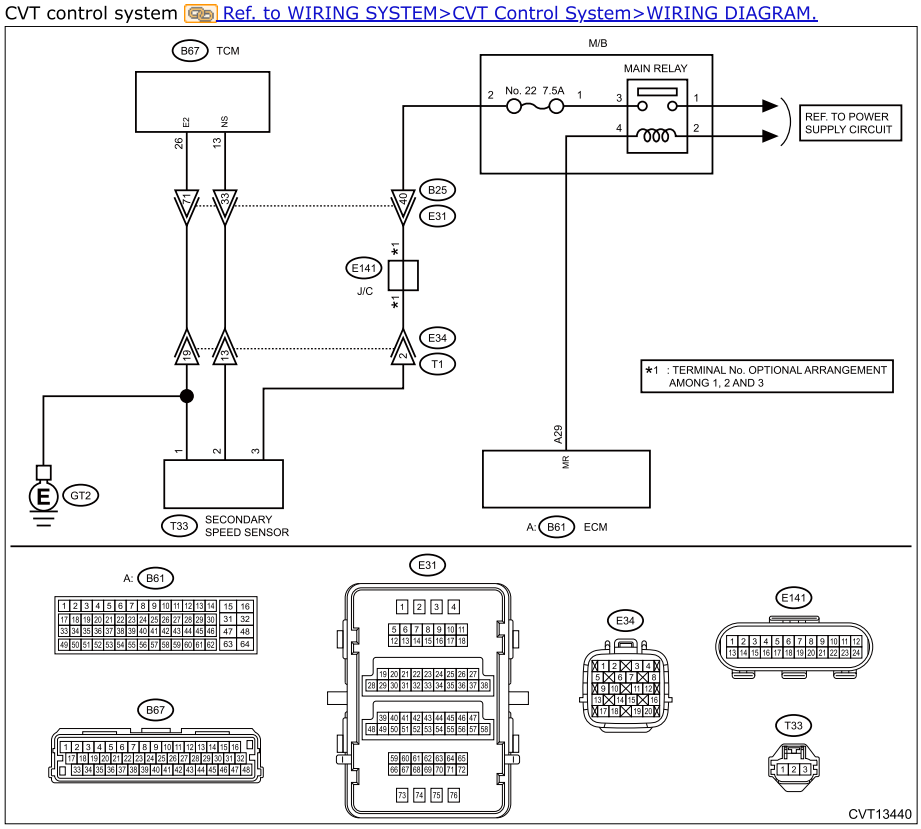
DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- Shifting shock is felt.
- Acceleration is poor during standing start.
- Shift control malfunction

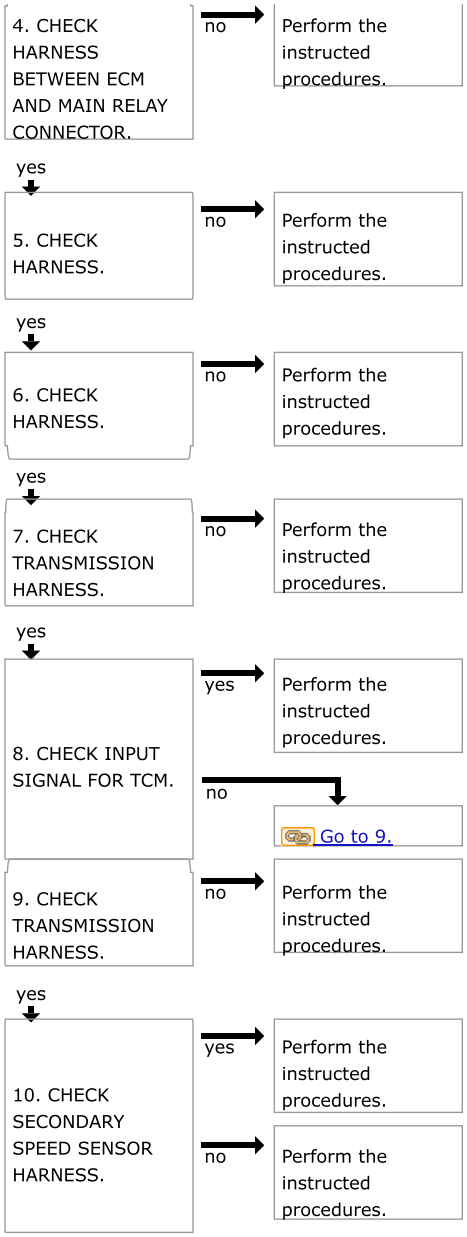
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM•ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 2.
2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.	no	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.	yes	Perform the instructed procedures.
	no	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P0890 displayed?

Yes	Perform the diagnosis according to DTC P0890. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW.
No	Go to 2.

2. CHECK THE CONNECTORS INDICATED IN THE WIRING DIAGRAM.

Check connecting condition of the connectors indicated in the wiring diagram.

Are the connectors indicated in the wiring diagram properly connected?

Yes — Go to 3.

No — Properly connect the connectors indicated in the wiring diagram.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 2 (+) — Chassis 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 of harness between transmission connector and main relay connector**
- **Defective main relay**

No — Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B61) No. 29 — 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 main relay connector.

5. 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
   (B67) No. 13 — (E34) No. 13:
   (B67) No. 26 — (E34) No. 19:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.
Connector & terminal
(B67) No. 13 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E34, T1)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector terminals.
   Connector & terminal
   (E34) No. 2 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes — Go to 8.

No — Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Set the select lever to "D" range.
6. Using the Subaru Select Monitor, read data of [Secondary Rev Speed] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data 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 9.

9. 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

(T1) No. 2 — (T33) No. 3:
(T1) No. 13 — (T33) No. 2:
(T1) No. 19 — (T33) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 10.

No — Replace the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Harness.

10. CHECK SECONDARY SPEED SENSOR HARNESS.

Measure the resistance between transmission connector and chassis ground.

Connector & terminal

(T1) No. 2 — Chassis ground:
(T1) No. 13 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Speed Sensor.
If the replacement of the secondary speed sensor does not eliminate the malfunction, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

No — Repair the short circuit of harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Transmission range	Drive or Reverse
Measured primary pulley shaft speed	1000 rpm or more

DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

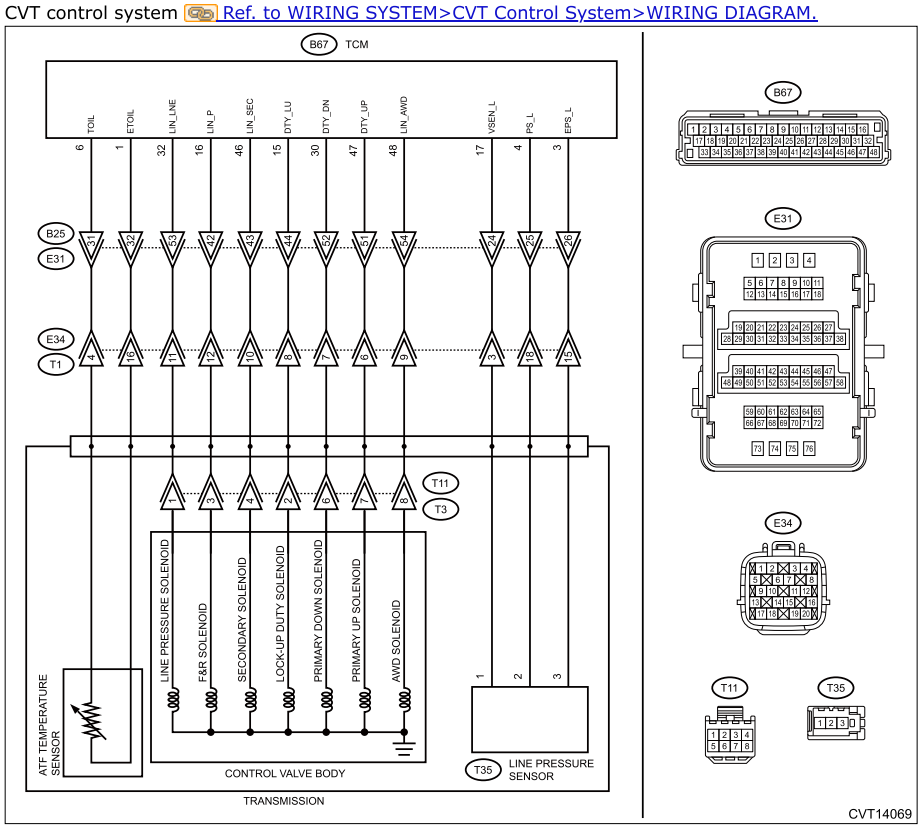
Malfunction Criteria	Threshold Value
Measured secondary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2757 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF

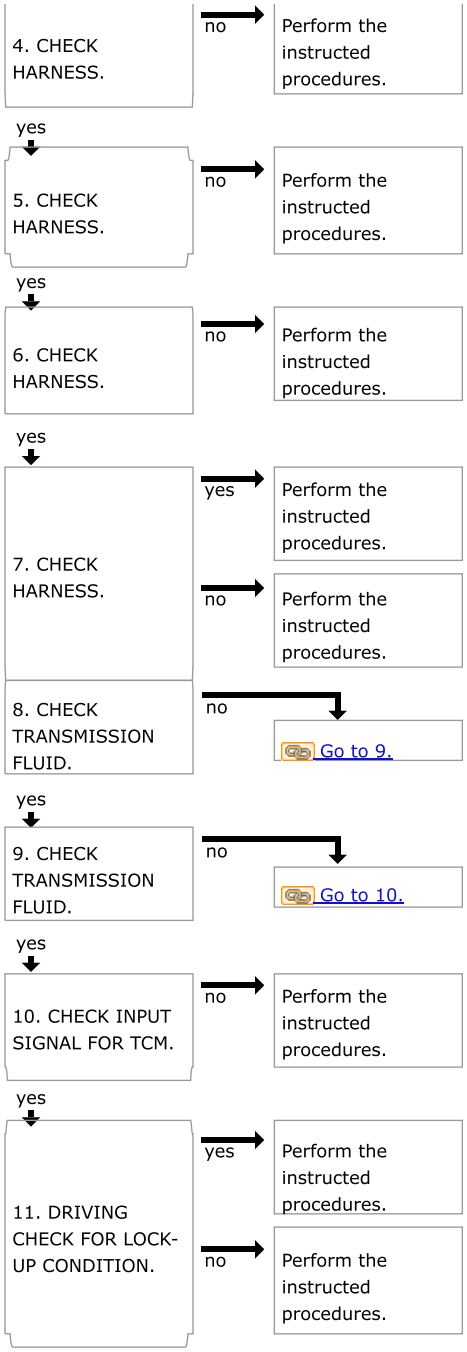
1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
No lock-up occurs.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).	yes →	Go to 8.
	no →	Go to 3.
3. CHECK LOCK-UP DUTY SOLENOID.	yes →	Perform the instructed procedures.
	no →	Go to 4.



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any DTC other than DTC P2757 displayed?

Yes — Perform the diagnosis according to DTCs other than P2757. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — 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 the active test of the lock-up duty solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, and does operating sound emit during indicating 50%?

Yes — Go to 8.

No — 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
   (T1) No. 8 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω? (When cold)

Yes — Replace the 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
   (B67) No. 15 — (E34) No. 8:

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
(B67) No. 15 — Transmission body:

Is the resistance 1 MΩ 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 transmission oil pan.
2. Disconnect the control valve body connector.
3. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 8 — (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 & terminal
(T11) No. 2 — Control valve body:

Is the resistance 1 MΩ or more?

Yes — Replace the 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(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 9.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 9.

9. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Return ATF. Go to 10.

No — Follow the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 10.

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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body. Go to 11.
No	Perform the diagnosis according to DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0867 TRANSMISSION FLUID PRESSURE .

11. DRIVING CHECK FOR LOCK-UP CONDITION.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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. Using Subaru Select Monitor, display the data of [Lock Up Duty Ratio] and [Front Wheel Speed] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
6. Drive the vehicle for one minute or more while keeping such constant speed that [Lock Up Duty Ratio] is 70% or more, and [Front Wheel Speed] is 40 km/h (25 MPH) or more.
7. Turn the ignition switch to OFF.
8. Start the engine.
9. Perform the procedure in step 6) again.
10. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Does the AT OIL TEMP light blink and is DTC P2757 displayed?

Yes	Replace the torque converter assembly, and perform step 11 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Torque Converter. If the replacement of the torque converter assembly does not eliminate the malfunction, replace the transmission assembly and perform step 11 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Current condition is normal. It is possible that temporary failure occurred to the energization status or to the hydraulic circuit.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect the malfunction of lock-up fluid pressure control solenoid, and hydraulic circuit, or drive circuit characteristics (stuck to low pressure side).
- Judge as NG if the deviation between engine speed and primary pulley speed becomes equal to or larger than the predetermined value, even though the lock-up command is issued.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Transmission range	Drive
Commanded duty of torque converter clutch pressure control solenoid	95.2 % or more
Measured primary pulley shaft speed × Primary reduction gear ratio*	Exceeds rpm values in Table 1

*Primary reduction gear ratio: 1.000

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
Measured primary pulley shaft speed × Primary reduction gear ratio (rpm)	4000	4500	5000	5500	6000	6500	7000

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**
ABS* (Engine speed − Measured primary pulley shaft speed × Primary reduction gear ratio)	Exceeds rpm values in Table 2

*ABS: Absolute value

Table 2

Engine speed (rpm)	0	500	1000	1500	2000	2500	3000	3500
ABS (Engine speed − Measured primary pulley shaft speed × Primary reduction gear ratio) (rpm)	200	200	200	200	200	200	200	200

Engine speed (rpm)	4000	4500	5000	5500	6000	6500	7000
ABS (Engine speed − Measured primary pulley shaft speed × Primary reduction gear ratio) (rpm)	200	200	200	200	200	200	200

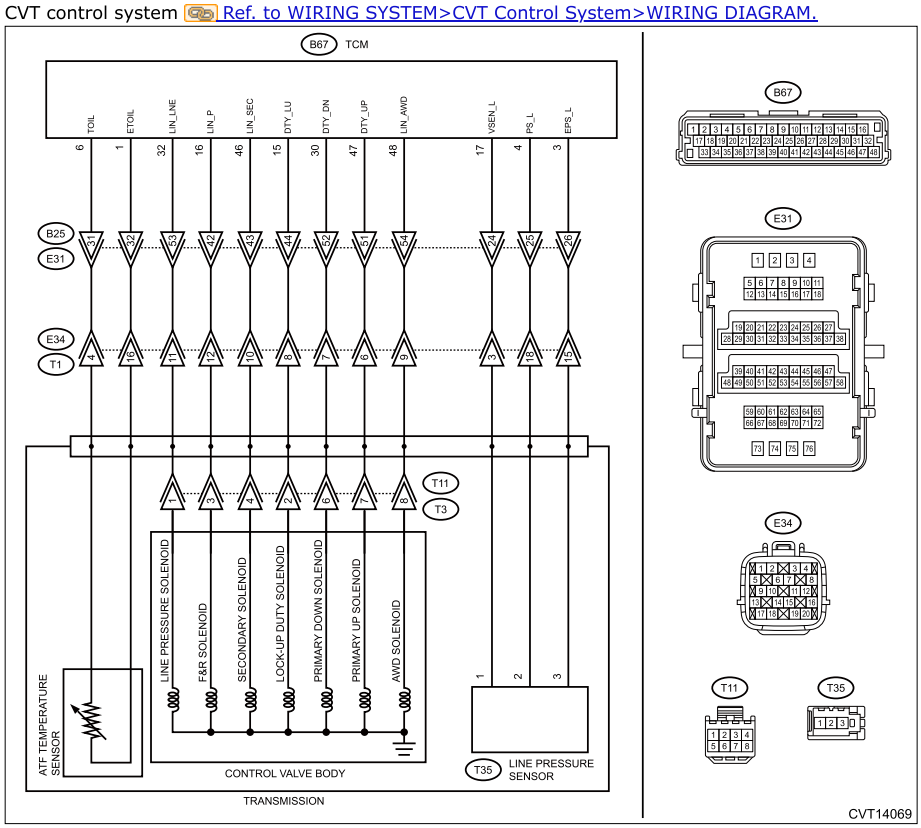
Time needed for diagnosis: 10 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON

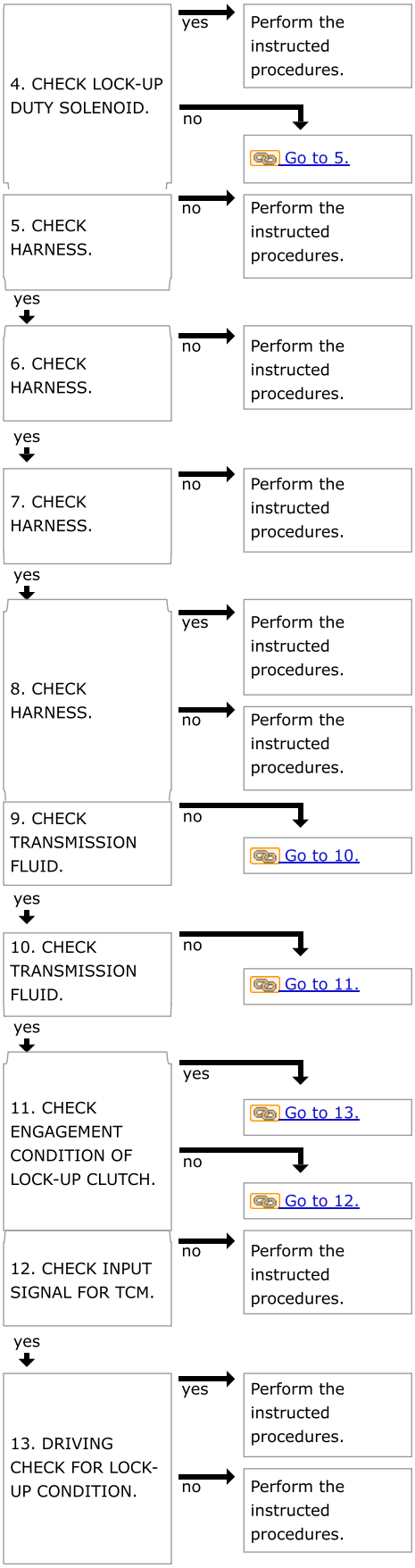
1. —

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
The engine stalls when the vehicle is stopped.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK DTC.	yes	Go to 3.
	no	Go to 2.
2. CHECK DTC.	yes	Perform the instructed procedures.
	no	Go to 3.
3. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).	yes	Go to 9.
	no	Go to 4.


4. CHECK LOCK-UP DUTY SOLENOID.
yes
Perform the instructed procedures.
no
Go to 5.
5. CHECK HARNESS.
no
Perform the instructed procedures.
yes
6. CHECK HARNESS.
no
Perform the instructed procedures.
yes
7. CHECK HARNESS.
no
Perform the instructed procedures.
yes
8. CHECK HARNESS.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
9. CHECK TRANSMISSION FLUID.
no
Go to 10.
yes
10. CHECK TRANSMISSION FLUID.
no
Go to 11.
yes
11. CHECK ENGAGEMENT CONDITION OF LOCK-UP CLUTCH.
yes
Go to 13.
no
Go to 12.
12. CHECK INPUT SIGNAL FOR TCM.
no
Perform the instructed procedures.
yes
13. DRIVING CHECK FOR LOCK-UP CONDITION.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is only DTC P2758 displayed?

Yes — Go to 3.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC P2763 or P2764 displayed?

Yes — Perform the diagnosis according to DTC P2763 or P2764. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 3.

3. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test of the lock-up duty solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during the active test, and does operating sound emit during indicating 50%?

Yes — Go to 9.

No — Go to 4.

4. 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
   (T1) No. 8 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω? (When cold)

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Go to 5.

5. CHECK HARNESS.

1. Disconnect the TCM connector.
2. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (B67) No. 15 — (E34) No. 8:

Is the resistance less than 1 Ω?

Yes — Go to 6.

No — Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.
Connector & terminal
(B67) No. 15 — Transmission body:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the short circuit of harness.

7. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Remove the transmission oil pan.
2. Disconnect the control valve body connector.
3. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 8 — (T11) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair the open circuit of harness.

8. CHECK HARNESS.

Measure the resistance between transmission connector and control valve body.
Connector & terminal
(T11) No. 2 — Control valve body:

Is the resistance 1 MΩ or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.
No	Repair the short circuit of harness.

9. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes	Go to 10.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 10.

10. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes	Return ATF. Go to 11.
No	Follow the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 11.

11. CHECK ENGAGEMENT CONDITION OF LOCK-UP CLUTCH.

1. Start the engine.
2. Warm up until the ATF temperature exceeds 50°C (122°F).
3. Depress the brake pedal, and shift the select lever to "D" range.

Are there any vibrations due to engine stall or engine speed drop?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body. Go to 13.
No	Go to 12.

12. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Actual line press.] 0.5 — 1.5 MPa?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body. Go to 13.
No	Perform the diagnosis according to DTC P0867. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0867 TRANSMISSION FLUID PRESSURE .

13. DRIVING CHECK FOR LOCK-UP CONDITION.

1. Using the Subaru Select Monitor, perform the clear memory of [Transmission]. Ref. to COMMON (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. Depress the brake pedal, and shift the select lever to "D" range.
6. Shift the select lever to "P" range.
7. Turn the ignition switch to OFF.
8. Start the engine.
9. Perform step 5) — step 6) again.
10. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Does the AT OIL TEMP light blink and is DTC P2758 displayed? Or are there any vibrations due to engine stall or engine speed drop?

Yes	Replace the torque converter assembly, and perform step 13 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Torque Converter. If the replacement of the torque converter assembly does not eliminate the malfunction, replace the transmission assembly and perform step 13 again. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Current condition is normal. It is possible that temporary failure occurred to the energization status or to the hydraulic circuit.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- 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 vibrations from the turbine revolution caused by engine speed drop with the lock-up clutch kept engaged are detected, even though the lock-up release command is issued when selecting the driving range or while decelerating the vehicle to stop.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Accelerator pedal position (from ECM)	0.959 deg or less
Pulley ratio	2.0 or more
Commanded duty of torque converter clutch pressure control solenoid	0% or less
Transmission fluid temperature	−10 degC or more and 120 degC or less
Engine speed* *Latch condition: This condition does not reset until the ignition switch is turned off or Engine Start & Stop System is activated.	400 rpm or more
Measured turbine shaft speed** **Latch condition: This condition does not reset until the state below (Measured turbine shaft speed for time.)	400 rpm or less Condition higher than 400 rpm for 0.2 sec
Measured turbine shaft speed*** ***Latch condition: This condition does not reset until the state below (Measured turbine shaft speed for time.)	Higher than 0 rpm Condition 0 rpm or lower for 0.1 sec
Transmission range	Drive or Reverse
Inhibit condition**** ****(If change in vehicle speed or ABS [change in vehicle acceleration] activated for time)	−3 m/s^2 or less Table 1 m/s^3 or more 20 sec
Cold Start	Not in operation
Engine Start/Stop System stops engine	Not in operation

Table 1

Vehicle speed (MPH)	0	20	40	60	80
Change in vehicle acceleration (m/s^3)	130	130	130	130	130

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
The number of intersections between Engine speed and Turbine shaft speed The TCM determines the normal condition only the state below (All secondary parameters satisfied and measured turbine shaft speed for time.)	4 times or more 0 rpm or less 0.1 sec

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

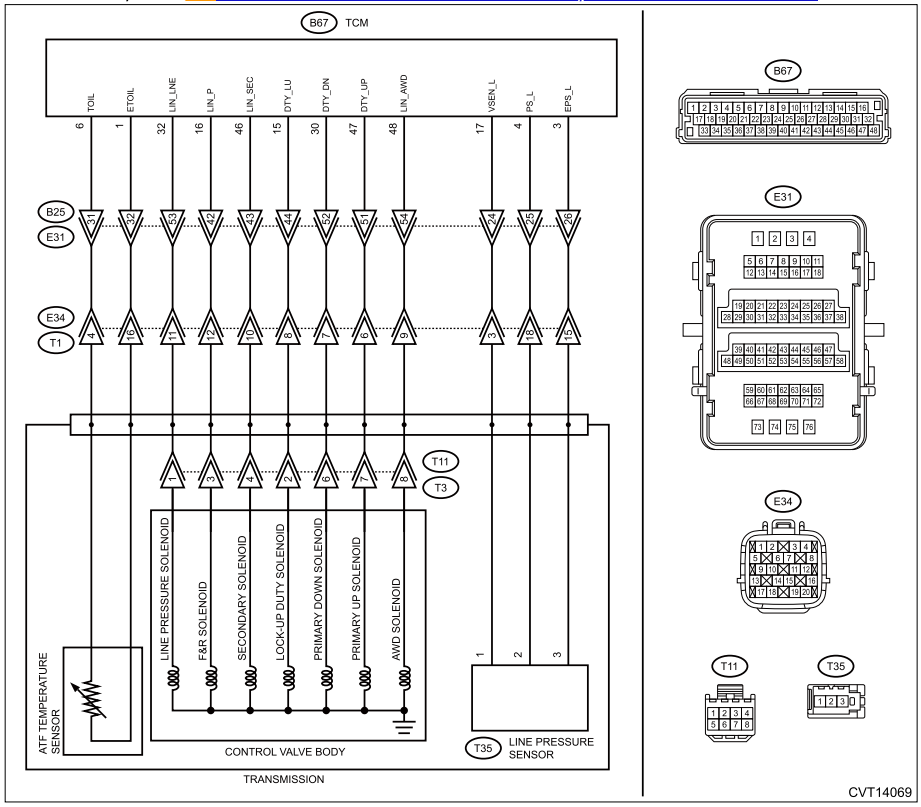
DTC P2763 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH

1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:

- No lock-up occurs.
- Engine stalls.

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).	no	Go to 3.
yes		
2. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).	no	Perform the instructed procedures.
yes		
3. CHECK HARNESS (OPEN CIRCUIT).	no	Perform the instructed procedures.

yes

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY). → no → Perform the instructed procedures.

yes

5. CHECK HARNESS INSIDE TRANSMISSION. → no → Perform the instructed procedures.

yes

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT). → no → Perform the instructed procedures.

yes

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 15 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.

Connector & terminal

(B67) No. 15 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

(B67) No. 15 — (E34) No. 8:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

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

Connector & terminal

(B67) No. 15 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. 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 the check result OK?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK TRANSMISSION HARNESS (OPEN CIRCUIT).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and control valve body connector.
   Connector & terminal
   (T1) No. 8 — (T11) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK TRANSMISSION HARNESS (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between transmission connector and transmission body.
   Connector & terminal
   (T1) No. 8 (+) — Transmission body (−):

Is the voltage approx. 0 V?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of torque converter clutch pressure control solenoid	0%

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* As defined by: Measured torque converter clutch pressure control solenoid voltage, 2.5 V or more	ON

*IC: Integrated circuit

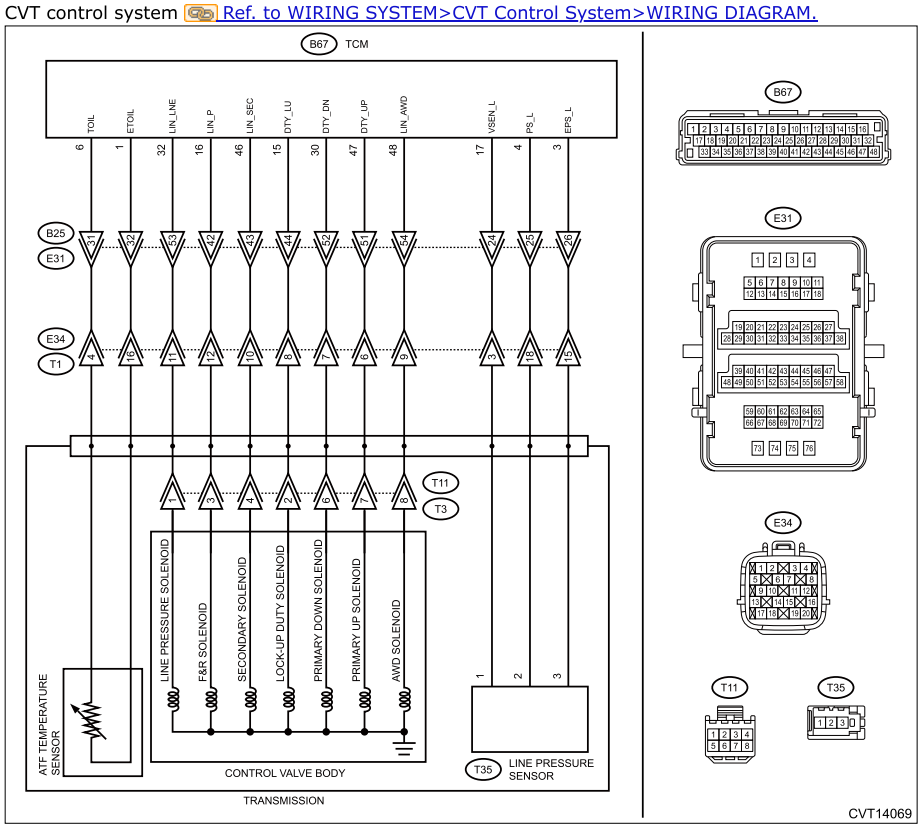
Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2764 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW

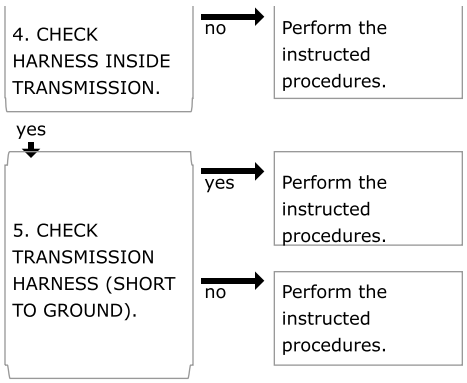
1. —

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
No lock-up occurs.
Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



Caution:
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).
   - no → Go to 3.
   - yes ↓
2. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS COLD: ATF TEMPERATURE APPROX. 20°C).

1. Using the Subaru Select Monitor, check that [ATF Temp.] in [Data Monitor] of [Transmission] is 20°C. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
2. Turn the ignition switch to OFF.
3. Disconnect the TCM connector.
4. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 15 — Transmission body:

Is the resistance approximately 10 — 14.2 Ω?

Yes — Go to 2.

No — Go to 3.

2. CHECK LOCK-UP DUTY SOLENOID (WHEN THE ENGINE IS WARMED-UP: ATF TEMPERATURE 80°C OR MORE).

1. Connect the TCM connector.
2. Using the Subaru Select Monitor, warm up the engine until [ATF Temp.] in [Data Monitor] of [Transmission] reaches 80°C or more. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
3. Turn the ignition switch to OFF.
4. Disconnect the TCM connector.
5. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (B67) No. 15 — Transmission body:

Note:
The resistance value increases as the temperature increases.

Is the resistance the same as the measured value in step 1 or less?

Yes — Go to 3.

No — 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).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the transmission connector. (E34, T1)
2. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (B67) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair or replace the harness.

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 the check result OK?

Yes — Go to 5.

No — Repair or replace the harness.

5. CHECK TRANSMISSION HARNESS (SHORT TO GROUND).

1. Disconnect the control valve body connector.
2. Measure the resistance between transmission connector and chassis ground.
   Connector & terminal
   (T1) No. 8 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Repair or replace the harness.

GENERAL DESCRIPTION

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.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of torque converter clutch pressure control solenoid	100%

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, 0.8 V or less	

*IC: Integrated circuit

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

1. —

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure has occurred.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured primary pulley shaft speed or Transmission range	More than 0 rpm Drive or Reverse

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
CAN bus condition	Bus off

Time needed for diagnosis: 2 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

1. —

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the ECM.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured primary pulley shaft speed or Transmission range	More than 0 rpm Drive or Reverse

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
CAN data from ECM	Lost

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

1. —

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the VDC CM.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured primary pulley shaft speed or Transmission range	More than 0 rpm Drive or Reverse

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
CAN data from Vehicle Dynamics Control Module	Lost

Time needed for diagnosis: 0.8 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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

DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

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

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

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

1. —

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from ECM is not normal.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured primary pulley shaft speed or Transmission range	More than 0 rpm Drive or Reverse

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
CAN data from ECM	Did not change

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 U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

1. —

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

GENERAL DESCRIPTION

OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from VDC CM is not normal.

EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured primary pulley shaft speed or Transmission range	More than 0 rpm Drive or Reverse

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
CAN data from Vehicle Dynamics Control Module	Did not change

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

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

DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1C07 INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1C08 INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1D00 CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1D07 CONTINUINGLY INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1D08 INVALID AUTHENTICATION DATA RECEIVED FROM VDC PU-BUS

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1E00 LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1E07 LOST COMMUNICATION OF AUTHENTICATION DATA WITH ECM/PCM PU-BUS

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U1E08 LOST COMMUNICATION OF AUTHENTICATION DATA WITH VDC PU-BUS

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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 SHIFT POSITION INDICATOR LIGHT SETTINGS.

Check the ON/OFF settings of the shift position indicator light from the center information display setting screen.

Note:
If the shift position indicator light settings are not displayed on the center information display, go to step 2.

Is the shift position indicator light set to "OFF"?

Yes — Set the shift position indicator light to "ON".

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U0155 or U0423 displayed?

Yes — Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

No — Go to 3.

3. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTCs other than DTC U0155, U0423 displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 4.

4. CHECK COMBINATION METER.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 5.

5. CHECK TCM.

1. Operate the + side of the paddle shift switch.
2. Using the Subaru Select Monitor, read data of [Up Switch] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Does the display switch between [ON] and [OFF] according to the operation?

Yes	Go to 6.
No	Check for poor contact between TCM and paddle shift UP switch, and repair the defective part.

6. CHECK TCM.

1. Operate the − side of the paddle shift switch.
2. Using the Subaru Select Monitor, read data of [Down Switch] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Does the display switch between [ON] and [OFF] according to the operation?

Yes	Go to 7.
No	Check for poor contact between TCM and paddle shift down switch, and repair the defective part.

7. CHECK TCM.

1. Turn the ignition switch OFF, then turn it ON again.
2. Shift the select lever to manual mode.
3. Using the Subaru Select Monitor, read data of [Shift Step in Manual Mode] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is "1" displayed?

Yes	Go to 8.
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.

8. CHECK TCM.

1. Shift up the select lever.
2. Using the Subaru Select Monitor, read data of [Shift Step in Manual Mode] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is "2" displayed?

Yes	Go to 9.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

9. CHECK SHIFT INDICATOR.

Using Subaru Select Monitor, check the [Shift Display] in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

Do the indication on Subaru Select Monitor and the shift indicator indication match?

Yes	Currently, it is normal.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

LIST

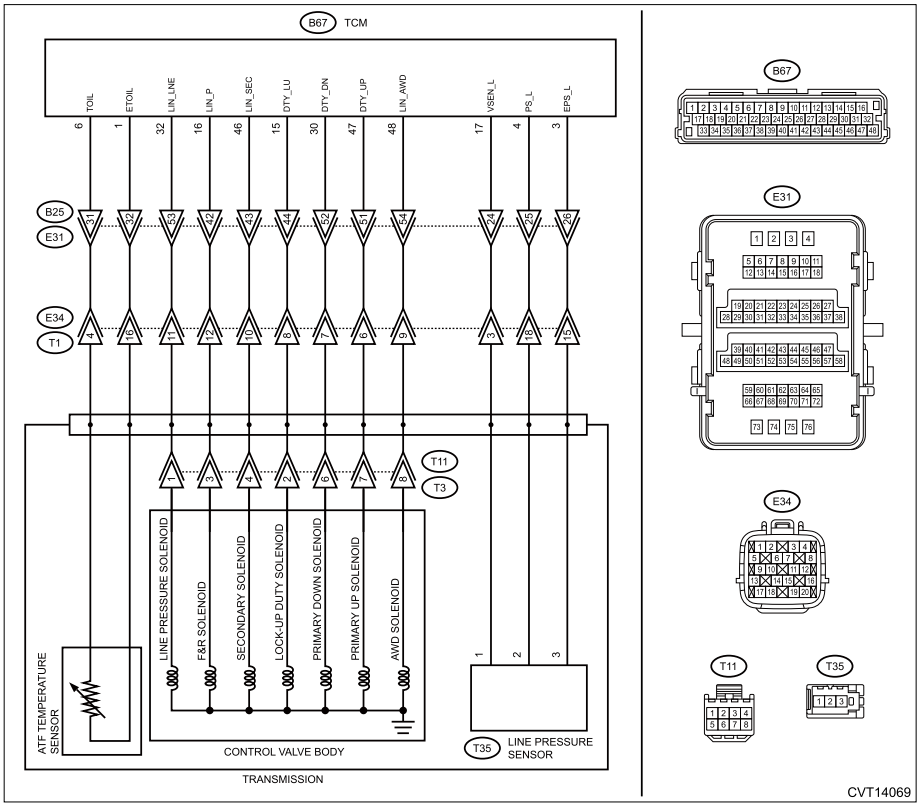
Note:
When DTC is detected, perform the diagnosis for the DTC first.

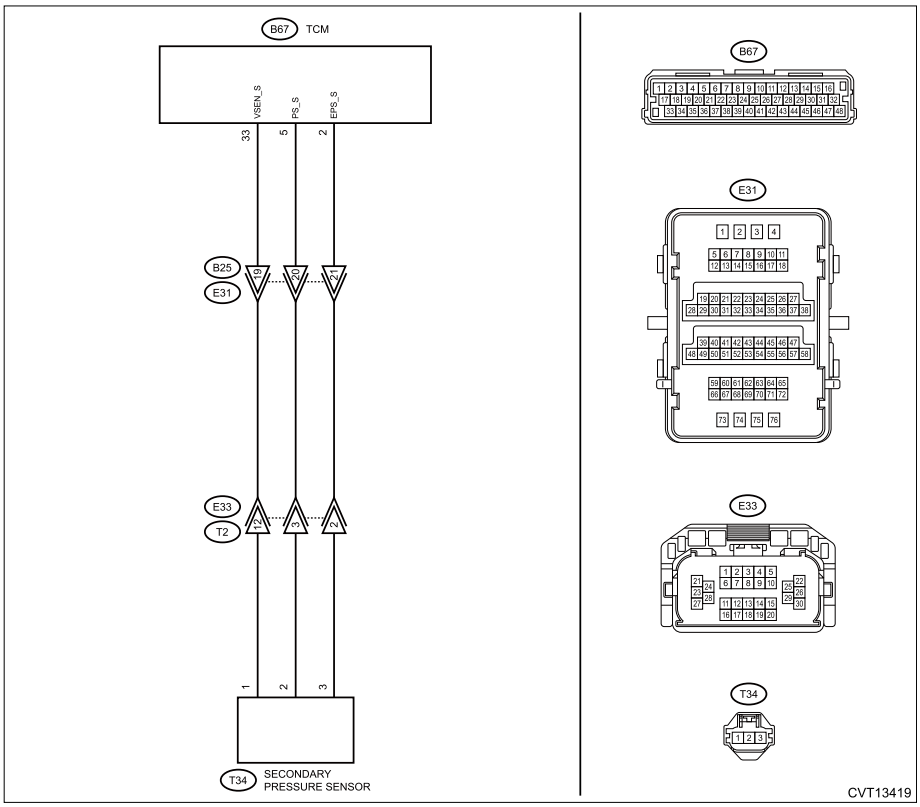
Symptoms	Faulty parts
Engine stalls when driving in "D" or "R" range, or selecting "N" → "D", "N" → "R".	• Control valve • Engine control system
While driving in "D" range, vibration occurs immediately before the stop or engine stalls. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION.	• Control valve • Torque converter
Excessive shock or vibration occurs at re-acceleration from a constant speed. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION.	• Torque converter • F&R clutch pack • Control valve • ATF deterioration or lack • Line pressure sensor • Secondary pressure sensor
Vehicle cannot shift while driving in "D" range.	• Control valve • TCM • Shift mechanism • Power supply system
Excessive shock when selecting "N" → "D", and "N" → "R".	• Control valve • TCM • F&R clutch pack • ATF deterioration or lack
Excessive shock at standing start in "D" range.	• Control valve • TCM • F&R clutch pack • ATF deterioration or lack
Engine speed increases abruptly during driving in "D" or "R" range.	• Control valve • Line pressure sensor • Secondary pressure sensor • F&R clutch pack • ATF deterioration or lack
Vehicle cannot start when depressing the accelerator pedal in "D" or "R" range, or acceleration is very poor. (Without abrupt engine increase)	• 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.	• Inhibitor switch • Select cable related • Combination meter
Manual mode enters even though the select lever and paddle shift switch is not operated.	• Manual mode switch • Paddle shift switch • Select lever • TCM
Engine speed increases abruptly in "D" or "R" range, vehicle cannot start.	• F&R clutch pack • Select cable related
Manual mode cannot be set	• Select lever • TCM

INSPECTION

1. EXCESSIVE SHOCK OR VIBRATION OCCURS AT RE-ACCELERATION FROM A CONSTANT SPEED

Wiring diagram:
CVT control system Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.



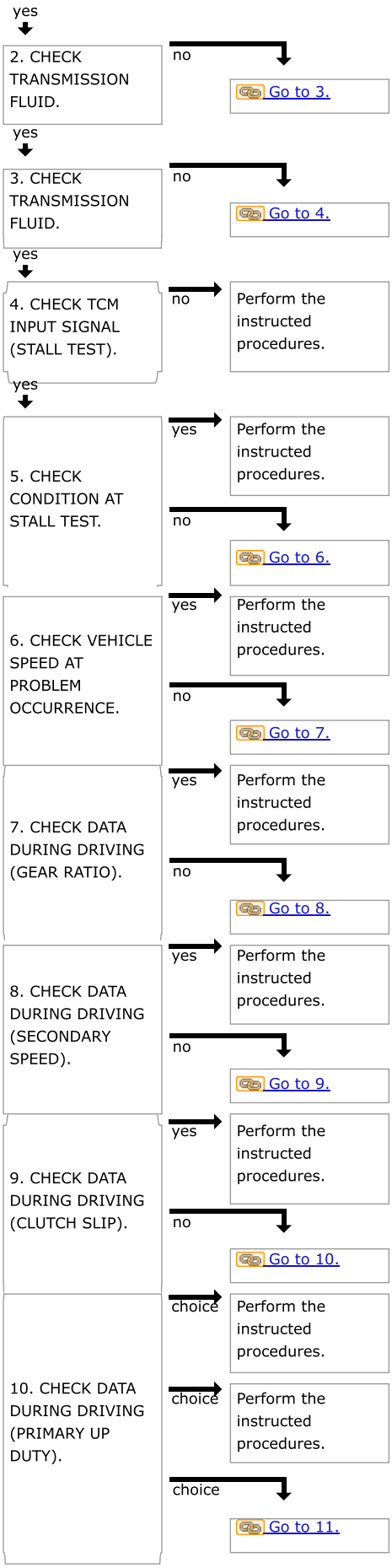


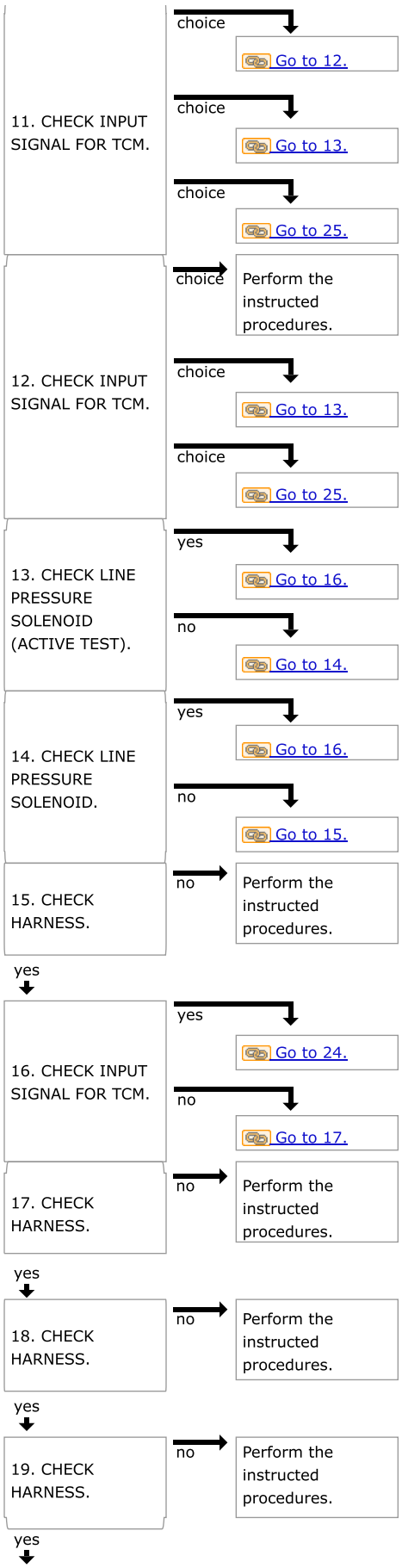
Caution:

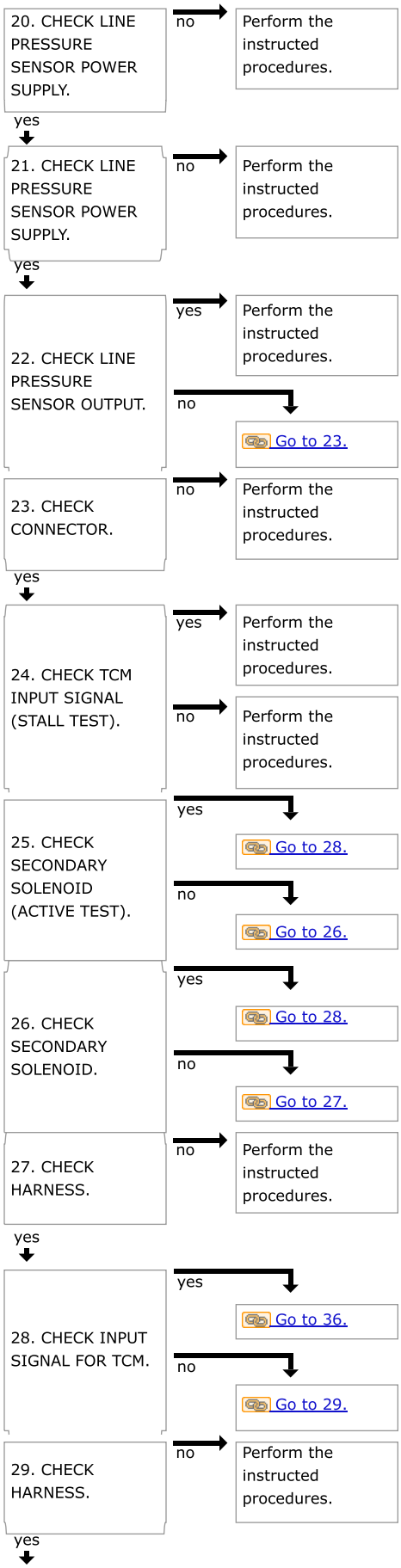
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

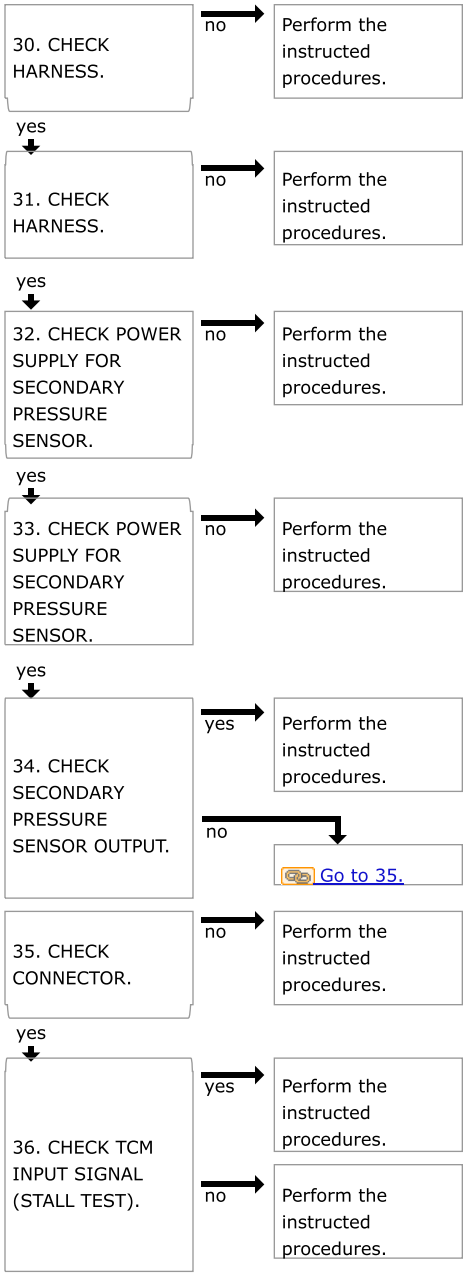
1. CHECK DTC.

no → Go to 2.


yes
2. CHECK TRANSMISSION FLUID.
no
Go to 3.
yes
3. CHECK TRANSMISSION FLUID.
no
Go to 4.
yes
4. CHECK TCM INPUT SIGNAL (STALL TEST).
no
Perform the instructed procedures.
yes
5. CHECK CONDITION AT STALL TEST.
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK VEHICLE SPEED AT PROBLEM OCCURRENCE.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK DATA DURING DRIVING (GEAR RATIO).
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK DATA DURING DRIVING (SECONDARY SPEED).
yes
Perform the instructed procedures.
no
Go to 9.
9. CHECK DATA DURING DRIVING (CLUTCH SLIP).
yes
Perform the instructed procedures.
no
Go to 10.
10. CHECK DATA DURING DRIVING (PRIMARY UP DUTY).
choice
Perform the instructed procedures.
choice
Perform the instructed procedures.
choice
Go to 11.


11. CHECK INPUT SIGNAL FOR TCM.
choice
Go to 12.
choice
Go to 13.
choice
Go to 25.
12. CHECK INPUT SIGNAL FOR TCM.
choice
Perform the instructed procedures.
choice
Go to 13.
choice
Go to 25.
13. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).
yes
Go to 16.
no
Go to 14.
14. CHECK LINE PRESSURE SOLENOID.
yes
Go to 16.
no
Go to 15.
15. CHECK HARNESS.
no
Perform the instructed procedures.
yes
16. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 24.
no
Go to 17.
17. CHECK HARNESS.
no
Perform the instructed procedures.
yes
18. CHECK HARNESS.
no
Perform the instructed procedures.
yes
19. CHECK HARNESS.
no
Perform the instructed procedures.
yes


20. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
21. CHECK LINE PRESSURE SENSOR POWER SUPPLY.
no
Perform the instructed procedures.
yes
22. CHECK LINE PRESSURE SENSOR OUTPUT.
yes
Perform the instructed procedures.
no
Go to 23.
23. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes
24. CHECK TCM INPUT SIGNAL (STALL TEST).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
25. CHECK SECONDARY SOLENOID (ACTIVE TEST).
yes
Go to 28.
no
Go to 26.
26. CHECK SECONDARY SOLENOID.
yes
Go to 28.
no
Go to 27.
27. CHECK HARNESS.
no
Perform the instructed procedures.
yes
28. CHECK INPUT SIGNAL FOR TCM.
yes
Go to 36.
no
Go to 29.
29. CHECK HARNESS.
no
Perform the instructed procedures.
yes



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
And then, Go to 2.

No — Go to 2.

2. CHECK TRANSMISSION FLUID.

Note:
When ATF inspection is performed in the diagnosis for the displayed DTC, go to step 4.

Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION.

Is the check result OK?

Yes — Go to 3.

No — Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>INSPECTION. Go to 3.

3. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT.

Is the check result OK?

Yes — Go to 4.

No — Check according to the "Corrective action" of ATF (CVTF) "CONDITION CHECK". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>CVTF>REPLACEMENT. Go to 4.

4. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the value of [Actual line press.] 5.0 MPa or more?

Yes — Go to 5.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

5. CHECK CONDITION AT STALL TEST.

Check the condition at stall test.

Does the shock or noise occur at stall test?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 6.

6. CHECK VEHICLE SPEED AT PROBLEM OCCURRENCE.

Check the vehicle speed at problem occurrence.

Is the vehicle speed 15 km/h or more at problem occurrence?

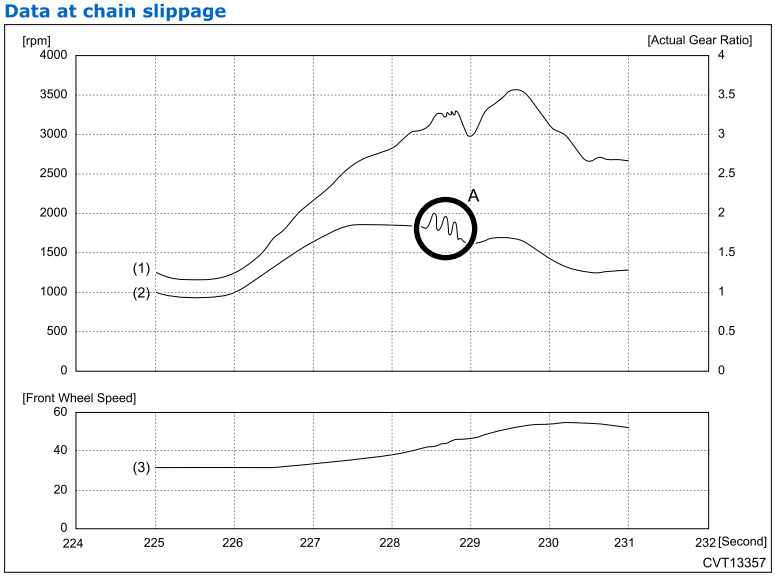
Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 7.

7. CHECK DATA DURING DRIVING (GEAR RATIO).

1. Start the engine.
2. Reproduce the symptom occurrence conditions (vehicle speed, oil temperature).
3. Using the Subaru Select Monitor, read the following data in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
   - Actual Gear Ratio
   - Primary Pulley Speed
   - Front Wheel Speed

Note:
Data at chain slippage



(A) Actual gear ratio: change

(1) Primary speed
(2) Actual gear ratio
(3) Front wheel speed (15 km/h (9.3 MPH) or more)

Is the value change of [Actual Gear Ratio] 0.1 or more and 2 Hz or more?

Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

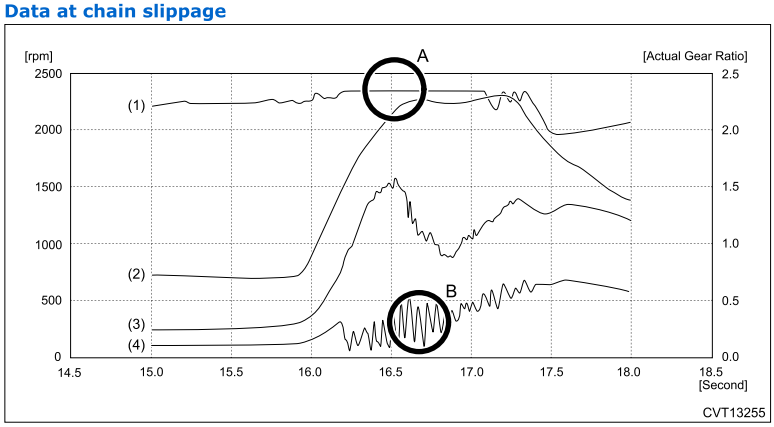
No — Go to 8.

8. CHECK DATA DURING DRIVING (SECONDARY SPEED).

1. Start the engine.
2. Reproduce the symptom occurrence conditions (vehicle speed, oil temperature).
3. Using the Subaru Select Monitor, read the following data in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
   - Engine Speed
   - Actual Gear Ratio
   - Primary Pulley Speed
   - Secondary Pulley Speed

Note:

Data at chain slippage



(A) Actual gear ratio: no change
(B) Secondary speed: change
(1) Actual gear ratio
(2) Engine speed
(3) Primary speed
(4) Secondary speed

Is the value change of [Secondary Rev Speed] 100 rpm or more and 10 Hz or more?

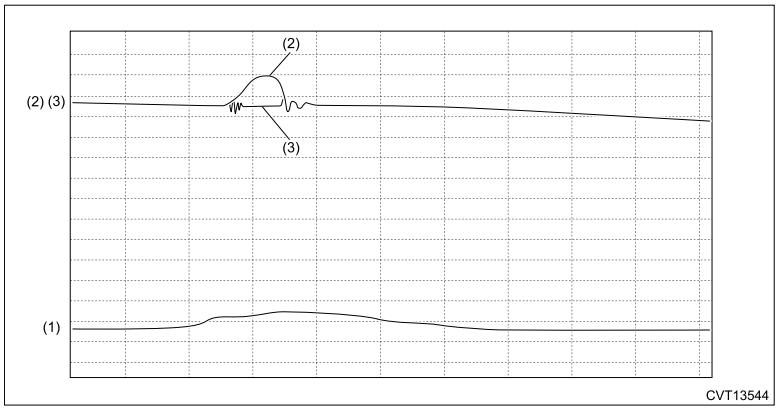
Yes — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

No — Go to 9.

9. CHECK DATA DURING DRIVING (CLUTCH SLIP).

1. Start the engine.
2. Reproduce the symptom occurrence conditions (vehicle speed, oil temperature).
3. Using the Subaru Select Monitor, read the following data in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
   - Secondary Pulley Speed
   - Front Wheel Speed
   - Actual Gear Ratio

Note:
Data at chain slippage



(1) Actual gear ratio: no change
(2) Secondary speed
(3) Front wheel speed

Note:
Due to the gear ratio (1.229), change the scale of the Subaru Select Monitor as follows before performing the check.
- **[Secondary Rev Speed]: 0 - 5000 rpm**
- **[Front Wheel Speed]: 0 - 4068 rpm**

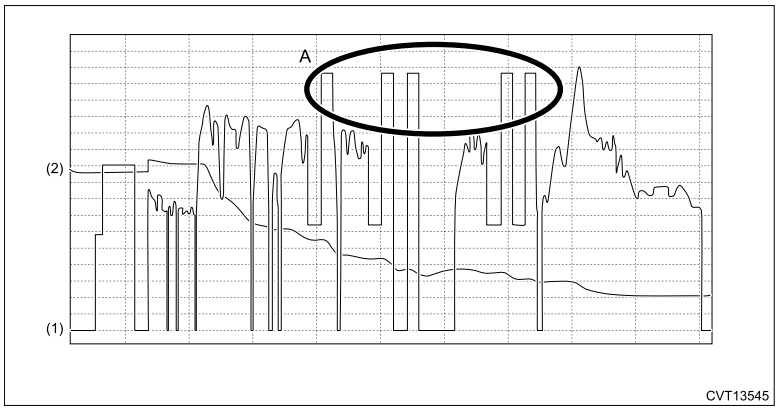
Is the difference between [Secondary Rev Speed] and [Front Wheel Speed] (x1.229) 50 rpm or more?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
No	Go to 10.

10. CHECK DATA DURING DRIVING (PRIMARY UP DUTY).

1. Start the engine.
2. Reproduce the symptom occurrence conditions (vehicle speed, oil temperature).
3. Using the Subaru Select Monitor, read the following data in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.
   - Actual Gear Ratio
   - Primary UP Duty

Note:
Data at chain slippage



(A) Primary UP DUTY: Rectangle waveform (a wave that indicates two constant values, high and low, repeatedly. The waveform is a repeating rectangle wave.)
(1) Actual gear ratio
(2) Primary UP DUTY

If the primary UP DUTY is a rectangle waveform (A in the reference shown above) and the TCM part number is 30919AH13A — D or 30919AH14A — D, go to A.
If the primary UP DUTY is a rectangle waveform (A in the reference shown above) and the TCM part number is other than 30919AH13A — D or 30919AH14A — D, go to B.
For cases other than above, go to C.

A	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).
B	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.
C	Go to 11.

11. 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 move the select lever to each range at an interval of 5 seconds.
   Note:
   Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".
4. Set the select lever to "D" range.
5. Drive at 2 km/h or more.
6. Stop the vehicle.
7. Shift the select lever to "P" range.
8. Stabilize the engine speed at idle.
9. Using the Subaru Select Monitor, read data of [Actual line press.], [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

If [Actual line press.] is 0.5 — 1.5 MPa and [Actual Secondary Pressure] is 0.3 — 1.5 MPa, go to A.
If [Actual line press.] is not within 0.5 — 1.5 MPa, go to B.
If [Actual Secondary Pressure] is not within 0.3 — 1.5 MPa, go to C.

A	Go to 12.
B	Go to 13.
C	Go to 25.

12. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to "P" range.
2. Keep the engine speed at 3,000 rpm.
3. Using the Subaru Select Monitor, read data of [Actual line press.], [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

If [Actual line press.] [Actual Secondary Pressure] are 1.5 — 2.5 MPa, go to A.
If [Actual line press.] is not within 1.5 — 2.5 MPa, go to B.
If [Actual Secondary Pressure] is not within 1.5 — 2.5 MPa, go to C.

A	Currently, it is normal. Clear the memory to finish the diagnosis.
B	Go to 13.
C	Go to 25.

13. CHECK LINE PRESSURE SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for line pressure solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes	Go to 16.
No	Go to 14.

14. CHECK LINE PRESSURE SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
   Connector & terminal
   (B67) No. 32 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes — Go to 16.

No — Go to 15.

15. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)
Connector & terminal
(B67) No. 17 — (T35) No. 1:
(B67) No. 4 — (T35) No. 2:
(B67) No. 3 — (T35) No. 3:
(B67) No. 32 — (T11) No. 1:

Is the check result OK?

Yes — Go to 16.

No — Repair the harness.

16. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read data of [Line Pressure Sensor Voltage.] in the [Data Monitor] of [Transmission]. (While shaking the line pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [Line Pressure Sensor Voltage.] 0.39 — 0.61 V?

Yes — Go to 24.

No — Go to 17.

17. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the line pressure sensor connector.
4. Measure the resistance between TCM connector and line pressure sensor connector. (While wiggling the harness)
   Connector & terminal
   (B67) No. 3 — (T35) No. 3:
   (B67) No. 4 — (T35) No. 2:
   (B67) No. 17 — (T35) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 18.

No — Repair the open circuit of harness.

18. CHECK HARNESS.

Measure the resistance between TCM connectors. (While wiggling the harness)
Connector & terminal
(B67) No. 3 — (B67) No. 17:
(B67) No. 4 — (B67) No. 3:
(B67) No. 17 — (B67) No. 4:

Is the resistance 1 MΩ or more?

Yes — Go to 19.

No — Repair the short circuit of harness.

19. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
Connector & terminal
(B67) No. 3 — Transmission body:
(B67) No. 4 — Transmission body:
(B67) No. 17 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 20.

No — Repair the short circuit of harness.

20. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 21.

No — 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).

21. CHECK LINE PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Connect the line pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 17 (+) — (B67) No. 3 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 22.

No — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

22. CHECK LINE PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 4 (+) — (B67) No. 3 (−):

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(TR690)>Transmission Control Module (TCM).

No — Go to 23.

23. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the line pressure sensor connector.
4. Check the TCM connector (B67) and the line pressure sensor connector (T35).

Is the check result OK?

Yes — Go to 24.

No — Repair the connector, or replace harness.

24. 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. Using the Subaru Select Monitor, read data of [Actual line press.] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual line press.] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

25. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the active test for secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during the active test, and does operating sound emit during indicating 500 mA?

Yes — Go to 28.

No — Go to 26.

26. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
   Connector & terminal
   (B67) No. 46 — Transmission body:

Is the resistance approximately 3.3 — 7.3 Ω? (When cold)

Yes — Go to 28.

No — Go to 27.

27. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)
Connector & terminal
(B67) No. 33 — (T34) No. 1:
(B67) No. 5 — (T34) No. 2:
(B67) No. 2 — (T34) No. 3:
(B67) No. 46 — (T11) No. 4:

Is the check result OK?

Yes — Go to 28.

No — Repair the harness.

28. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read data of [secondary pressure sensor voltage.] in the [Data Monitor] of [Transmission]. (While shaking the secondary pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Is [secondary pressure sensor voltage.] 0.39 — 0.61 V?

Yes — Go to 36.

No — Go to 29.

29. 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. (While wiggling the harness)
   Connector & terminal
   (B67) No. 2 — (T34) No. 3:
   (B67) No. 5 — (T34) No. 2:
   (B67) No. 33 — (T34) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 30.

No — Repair the open circuit of harness.

30. CHECK HARNESS.

Measure the resistance between TCM connectors. (While wiggling the harness)
Connector & terminal
(B67) No. 2 — (B67) No. 33:
(B67) No. 5 — (B67) No. 2:
(B67) No. 33 — (B67) No. 5:

Is the resistance 1 MΩ or more?

Yes — Go to 31.

No — Repair the short circuit of harness.

31. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body. (While wiggling the harness)
Connector & terminal
(B67) No. 2 — Transmission body:
(B67) No. 5 — Transmission body:
(B67) No. 33 — Transmission body:

Is the resistance 1 MΩ or more?

Yes — Go to 32.

No — Repair the short circuit of harness.

32. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.
   Connector & terminal
   (B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 33.

No — 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).

33. 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
   (B67) No. 33 (+) — (B67) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes — Go to 34.

No — Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Secondary Pressure Sensor.

34. CHECK SECONDARY PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(B67) No. 5 (+) — (B67) 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(TR690)>Transmission Control Module (TCM).

No — Go to 35.

35. 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 (B67) and the secondary pressure sensor connector (T34).

Is the check result OK?

Yes — Go to 36.

No — Repair the connector, or replace harness.

36. 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. Using the Subaru Select Monitor, read data of [Actual Secondary Pressure] in the [Data Monitor] of [Transmission]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Caution:
Do not perform a stall test for 5 seconds or more at a time.

Is the [Actual Secondary Pressure] 6.0 MPa or more?

Yes — Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Control Valve Body.

No — Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Assembly.

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). Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
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 $07: Initial emission-related powertrain DTC
   (6) MODE $09: Request vehicle information
   (7) MODE $0A: Emission-related DTC
4. Read out the data according to repair procedures. (For detailed operation procedures, refer to the general scan tool operation manual.)

Note:
For details concerning DTC, refer to "Diagnostic Trouble Code (DTC)". Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 is 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, readiness code	—
$05	Engine coolant temperature	Celsius
$0C	Engine speed	rpm
$0D	Vehicle speed	km/h or MPH
$1F	Time elapsed after engine start	sec
$41	Diagnostic monitor of each driving cycle	—

Note:
Refer to general scan tool manufacturer's operation manual to access the present 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 is shown in the following table.

PID	Data	Unit of measure
$02	DTC that caused freeze frame data to be stored	—
$05	Engine coolant temperature	Celsius
$0C	Engine speed	rpm
$0D	Vehicle speed	km/h or MPH

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 "Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 $07 (INITIAL EMISSION-RELATED POWERTRAIN DTC)

Refer to the data of DTC (pending code) for troubleshooting result about emission in the first time.

7. MODE $09 (REQUEST VEHICLE INFORMATION)

Refer to the data of the vehicle specification.

8. MODE $0A (EMISSION-RELATED DTC (WITH PERMANENT STATUS))

Refer to “Diagnostic Trouble Code (DTC)” for information about data denoting emission-related DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

BRAKE CONTROL (DIAGNOSTICS)

BC(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Work Support
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
14. General Diagnostic Table

PROCEDURE

Caution:
Remove foreign matter (dust, water, oil etc.) from the VDCCM&H/U connector during removal and installation.

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Check List for Interview.
2. Before performing diagnostics, check the component which might affect VDC or parking brake system 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 ON.
2. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE 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 BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

Are any DTCs displayed?

Yes — Record the DTC, time stamp and freeze frame data. Go to 4.

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>INSPECTION.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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?
Do the brake warning light (EBD warning light)/electronic parking brake warning light and the electronic parking brake operation indicator light go off with the electronic parking brake disengaged?

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. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>BRAKE WARNING LIGHT (EBD WARNING LIGHT) / ELECTRONIC PARKING BRAKE WARNING LIGHT DOES NOT GO OFF. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>ELECTRONIC PARKING BRAKE INDICATOR LIGHT DO NOT GO OFF.

4. PERFORM DIAGNOSIS.

1. Refer to "Diagnostic Trouble Code (DTC)".

   Note:
   For the DTC list, refer to "Diagnostic Trouble Code (DTC)". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Repeat step 4 until DTC is not shown.
No	Finish the diagnosis.

Note:
- **To check harness for open or short circuits, shake the suspected trouble spot or connector.**
- **Refer to "Check List for Interview". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Check List for Interview.**

CHECK

- Inspect the following items regarding the vehicle’s state.
- Print out below for use.

1. STATE OF ABS WARNING LIGHT

ABS warning light illuminates.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate • When/How long does it illuminate?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ 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.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate • When/How long does it illuminate?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating		
	• Part name: • Operating condition:		

3. STATE OF VDC OFF INDICATOR LIGHT

VDC OFF indicator light illuminates.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate • When/How long does it illuminate?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating		
	• Part name: • Operating condition:		

4. BRAKE WARNING LIGHT (EBD WARNING LIGHT)/ELECTRONIC PARKING BRAKE WARNING LIGHT STATUS

Brake warning light (EBD warning light)/electronic parking brake warning light illuminate, go off, or blink.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate ❑ Does not go off ❑ Blinks • When/How long does it illuminate/go off/blink?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START ❑ When the parking brake switch is pressed ❑ When the parking brake switch is pulled ❑ When the parking brake switch is pressed continually (times) ❑ When the parking brake switch is pulled continually (times)		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating		
	• Part name: • Operating condition:		

5. CONDITION OF ELECTRONIC PARKING BRAKE OPERATION INDICATOR LIGHT

Electronic parking brake operation indicator light does not illuminate.	❑ Always ❑ Sometimes ❑ Only once ❑ Illuminates • When/How long does it illuminate?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START ❑ When the parking brake switch is pressed ❑ When the parking brake switch is pulled ❑ When the parking brake switch is pressed continually (times) ❑ When the parking brake switch is pulled continually (times)		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating		
	• Part name: • Operating condition:		

6. STATUS OF THE ELECTRONIC PARKING BRAKE WARNING LIGHT/BRAKE SYSTEM WARNING LIGHT

Electronic parking brake warning light/brake system warning light illuminates.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate • When/How long does it illuminate?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START ❑ When the parking brake switch is pressed ❑ When the parking brake switch is pulled ❑ When the parking brake switch is pressed continually (times) ❑ When the parking brake switch is pulled continually (times)		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating		
	• Part name: • Operating condition:		

7. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	a) Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Other:
	b) Ambient temperature	°C (°F)
	c) Road	❑ Inner city ❑ Suburbs ❑ Highway ❑ Local street ❑ Uphill ❑ Downhill ❑ Paved road ❑ Gravel road ❑ Muddy road ❑ Sandy place ❑ Straight road ❑ Sharp curve ❑ Gentle curve ❑ S-curve ❑ Road with a slope on both sides ❑ Other:
	d) Road surface	❑ Dry ❑ Wet ❑ Covered with fresh snow ❑ Covered with hardened snow ❑ Frozen slope ❑ Other:
Condition	a) Brakes	Deceleration: G
		❑ Continuous / ❑ intermittent
	b) Accelerator	Acceleration: G
		❑ Continuous / ❑ intermittent
	c) Vehicle speed	km/h | MPH
		❑ Advancing ❑ While accelerating ❑ While decelerating ❑ At low speed ❑ When turning ❑ Other:
	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	❑ Sharp turning ❑ Gentle turning ❑ Straight forward motion ❑ Gentle return ❑ Sharp return
	g) Tire/Wheel size	❑ Specified size ❑ Except for specification ( )
	h) Tire variation	❑ Summer tire ❑ Studless tire (brand:)
	i) Tire chain is attached: ❑ Yes / ❑ No	
	j) Using T-type tires: ❑ Yes / ❑ No	
	k) Condition of suspension alignment:	
	l) Load condition:	
	m) Repaired parts are used: ❑ Yes / ❑ No	
	• Contents:	
	n) Others:	

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.**

2. MODULE REGISTRATION

When the VDC CM or steering angle sensor is replaced, perform the module registration. Ref. to COMMON (DIAGNOSTICS)>Unit Registration.

INSPECTION

Before performing diagnosis, check the following items which might affect VDC problems.

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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 VDC OPERATION USING A PRESSURE GAUGE.
- 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. PARKING BRAKE ASSEMBLY

Check the parking brake assembly. Ref. to PARKING BRAKE>General Description>COMPONENT.

8. TIRES

Check the tire specifications, tire wear and air pressure. Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

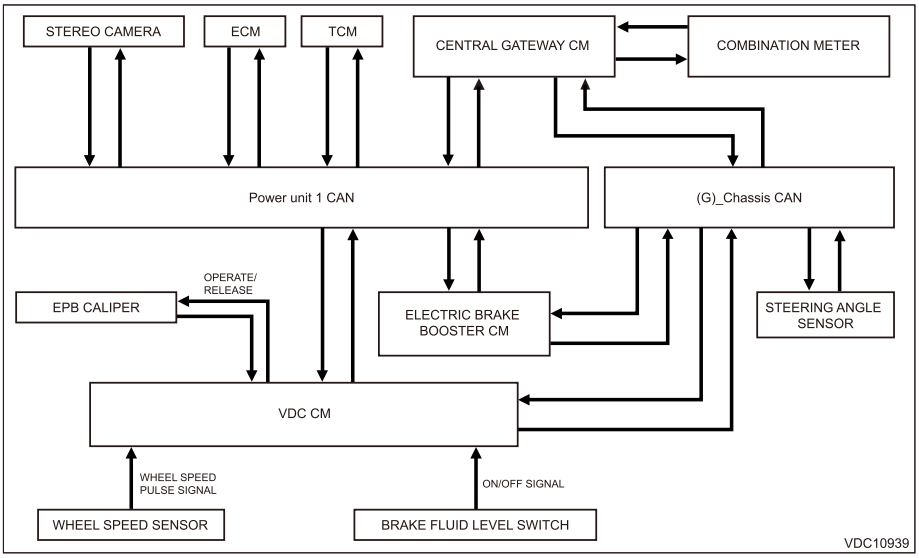
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.

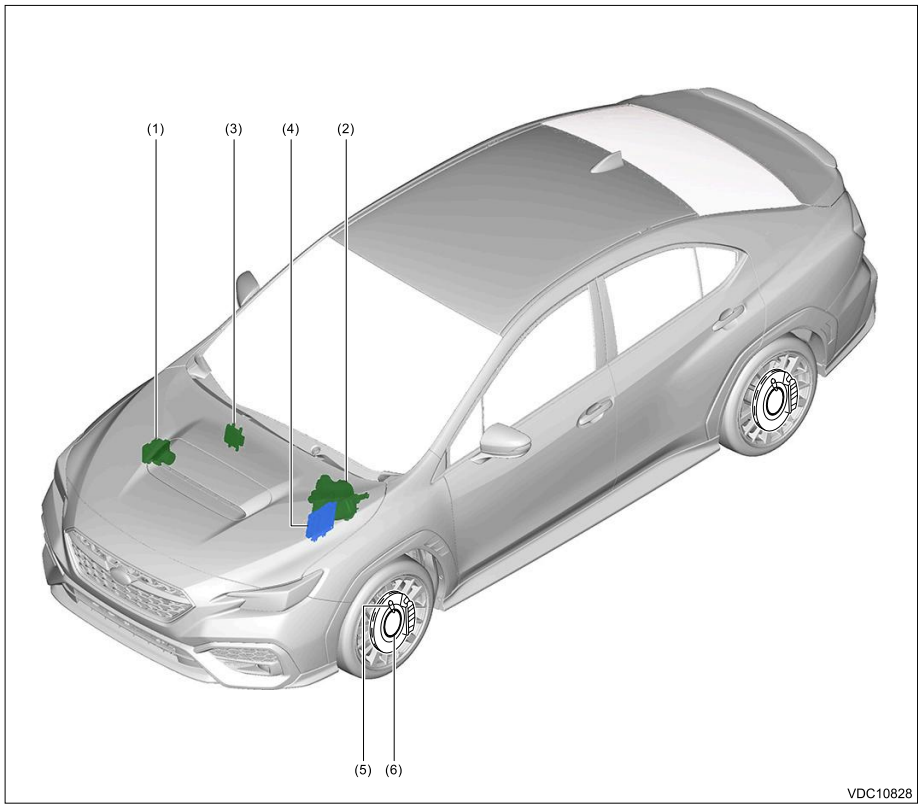
BRAKE CONTROL (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

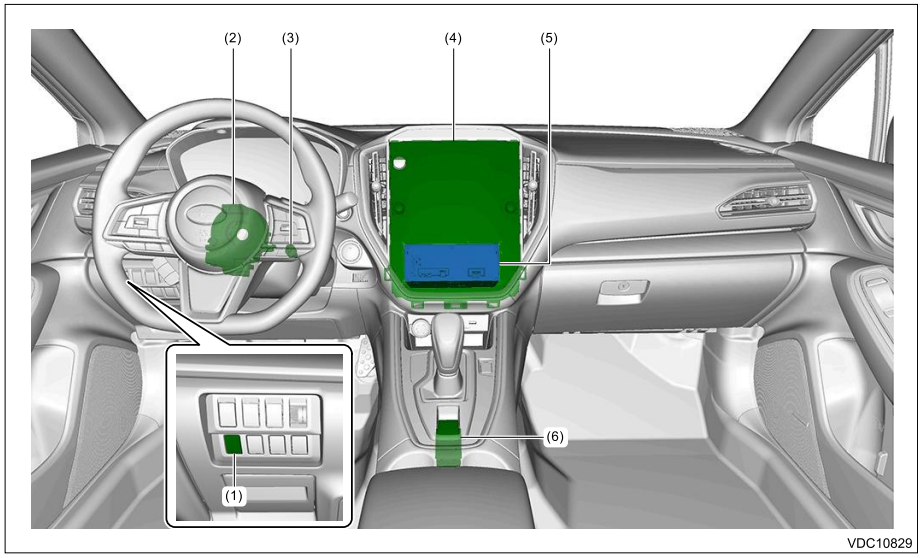


If the electric brake booster lost its boost function, VDC will back up the boost function.

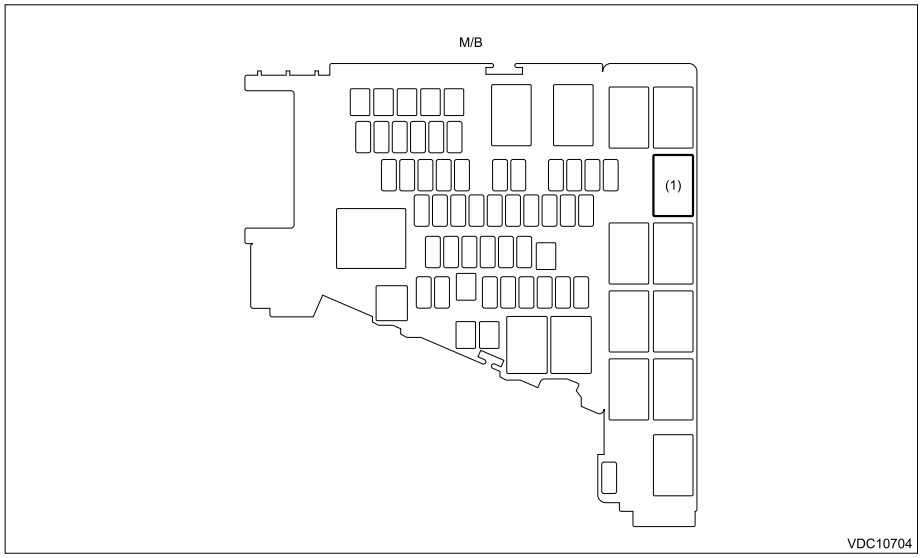
LOCATION



(1) VDCCM&H/U
(2) Electric brake booster CM (master cylinder)
(3) TCM
(4) ECM
(5) ABS wheel speed sensor
(6) Magnetic encoder

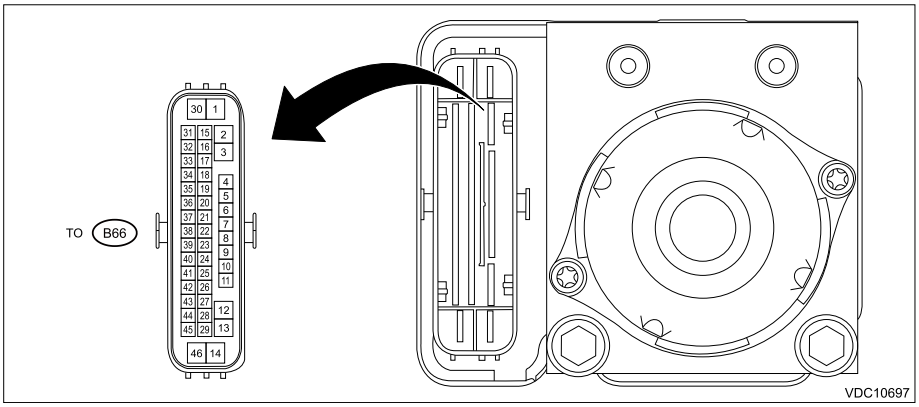


(1) VDC OFF switch
(2) Steering angle sensor
(3) Stop light and brake switch
(4) AVH switch (center information display)
(5) Cockpit control module
(6) Electronic parking brake switch



(1) Stop light relay

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)/parking brake warning light, ABS warning light, VDC warning light & VDC indicator light and VDC OFF indicator light illuminate.**

Terminal No.	Contents	Measuring condition	Standard
(B66) No. 1 ←→ Chassis ground	VDC pump motor power supply	Always	Battery voltage
(B66) No. 2	RH rear brake caliper (+)*1	—	—
(B66) No. 3	RH rear brake caliper (−)*1	—	—
(B66) No. 5	Power unit 1 CAN H signal	—	—
(B66) No. 7	FL wheel speed sensor GND	—	—
(B66) No. 8 ←→ Chassis ground	Electronic parking brake indicator light*1	Always	Battery voltage
(B66) No. 11	(G)_Chassis CAN H signal	—	—
(B66) No. 12	LH rear brake caliper (−)*1	—	—
(B66) No. 13	LH rear brake caliper (+)*1	—	—
(B66) No. 14	Ground	—	—
(B66) No. 15	Electronic parking brake switch*1	—	—
(B66) No. 16	Electronic parking brake switch*1	—	—
(B66) No. 19	Power unit 1 CAN L signal	—	—
(B66) No. 20 ←→ Chassis ground	Brake booster pressure sensor power supply*2	Ignition switch: ON	4.85 — 5.15 V
(B66) No. 21	FR wheel speed sensor signal	—	—
(B66) No. 22	RR wheel speed sensor signal	—	—
(B66) No. 23	RL wheel speed sensor GND	—	—
(B66) No. 24	FL wheel speed sensor signal	—	—
(B66) No. 25	(G)_Chassis CAN L signal	—	—
(B66) No. 26	FR wheel speed sensor GND	—	—
(B66) No. 27 ←→ Chassis ground	Brake fluid level switch	Ignition switch: ON	6 V or more
(B66) No. 28	Brake booster pressure sensor GND*2	—	—
(B66) No. 30 ←→ Chassis ground	VDCCM power supply	Always	Battery voltage
(B66) No. 31	Electronic parking brake switch*1	—	—
(B66) No. 32	Electronic parking brake switch*1	—	—
(B66) No. 33 ←→ Chassis ground	Stop light switch output	Ignition switch: ON	Ignition power supply voltage
(B66) No. 34	VSO PIN output	—	—
(B66) No. 35	VSO PIN output	—	—
(B66) No. 36 ←→ Chassis ground	Ignition power supply	Ignition switch: ON	Ignition power supply voltage
(B66) No. 37	RR wheel speed sensor GND	—	—
(B66) No. 38 ←→ Chassis ground	Stop light switch	Brake pedal operation	Brake ON: Battery voltage Brake OFF: Ground
(B66) No. 39	RL wheel speed sensor signal	—	—
(B66) No. 41 ←→ Chassis ground	VDC OFF switch	VDC OFF switch operation	Switch ON: 1 Ω or less

Terminal No.	Contents	Measuring condition	Standard
			Switch OFF: 1 MΩ or more
(B66) No. 45	Brake booster pressure sensor signal*2	—	—
(B66) No. 46	Ground	—	—

*1: CVT MODEL

*2: WITHOUT ELECTRIC BRAKE BOOSTER

PROCEDURE

1. VDC SYSTEM

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Drive the vehicle at least ten minutes. (Reproduce nearly the same condition as occurred when the DTC was recorded.)

Note:
Make sure the vehicle is not dragged to one side under usual driving condition.

2. ELECTRONIC PARKING BRAKE SYSTEM

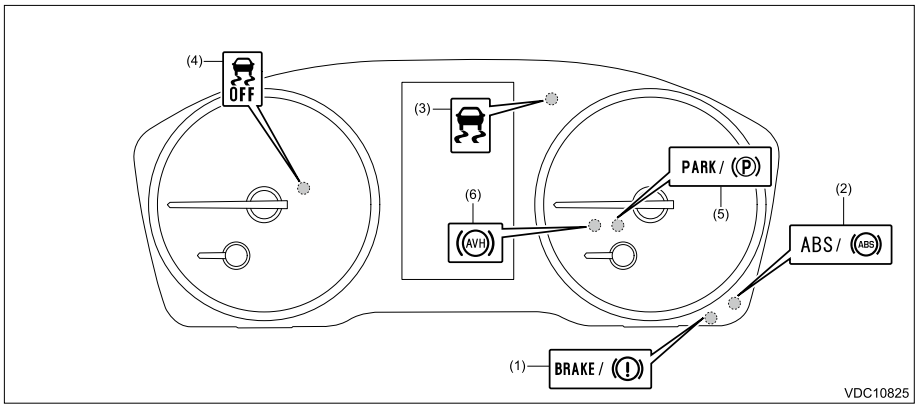
1. Start the engine, and operate and release the electronic parking brake a few times with the vehicle at a standstill.
2. Check if the warning light illuminates or blinks, or DTC is displayed.

Note:
If the DTC is displayed, perform the diagnosis using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).

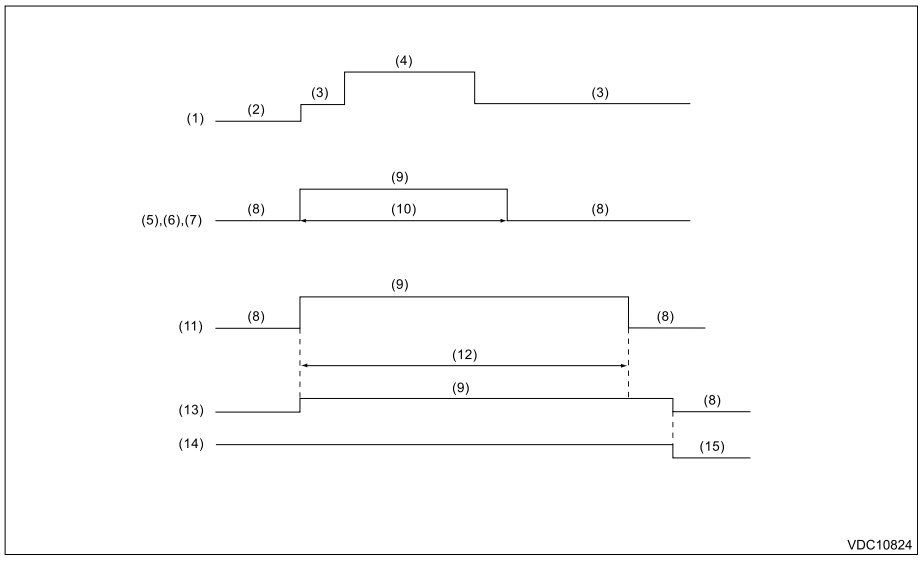
3. Drive the vehicle at least 10 minutes, and operate and release the electronic parking brake a few times.

Caution:
Do not drive the vehicle with the warning light illuminated or blinked.

INSPECTION



(1) Brake warning light (EBD warning light)/electronic parking brake warning light
(2) ABS warning light
(3) VDC warning light & VDC indicator light
(4) VDC OFF indicator light
(5) Electronic parking brake operation indicator light
(6) AVH ON/operation indicator light



(1) Ignition switch
(2) OFF
(3) ON
(4) Engine start
(5) ABS warning light
(6) Brake warning light (EBD warning light)/electronic parking brake warning light
(7) VDC OFF indicator light
(8) Light OFF
(9) Light ON
(10) 2 seconds
(11) VDC warning light & VDC indicator light
(12) 2 seconds or more
(13) Electronic parking brake operation indicator light
(14) Parking brake
(15) Released

Note:
- **The AVH ON/operation indicator light illuminates/goes off when the AVH switch is operated with the ignition switch ON or after the engine is started.**
- **The AVH ON/operation indicator light blinks when the AVH is activated, and goes off when the AVH is deactivated.**

1. When warning lights or indicator lights do not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2. 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>ELECTRONIC PARKING BRAKE INDICATOR LIGHT DO NOT COME ON.
3. When the ABS warning light, VDC OFF indicator light, VDC warning light & VDC indicator light and electronic parking brake operation indicator 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>ELECTRONIC PARKING BRAKE INDICATOR LIGHT DO NOT GO OFF.

Note:

- **Even when 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. 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. Perform the Clear Memory Mode because DTC may be recorded at this time. Ref. to COMMON (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 COMMON (DIAGNOSTICS)>Clear memory.**
- **When operation and release of the electronic parking brake is repeated excessively, the brake warning light (EBD warning light)/electronic parking brake warning light may illuminate or the electronic parking brake operation indicator light may blink and then the parking brake switch operation may not be accepted; this is not malfunction.**

EBD WARNING LIGHT, ABS WARNING, VDC OFF INDICATOR LIGHT, VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT COME ON

Detecting condition:
Defective combination meter
Trouble symptom:
When the ignition switch is turned to ON (engine OFF), brake warning light (EBD warning light), ABS warning light, VDC OFF indicator light, and VDC warning light & VDC indicator light do not illuminate.

1. CHECK OTHER INDICATOR LIGHT.

Turn the ignition switch to ON.

Immediately after the ignition switch is turned to ON, do all the indicator lights for VDC system and others illuminate?

Yes — Go to 2.

No — Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

2. CHECK VDCCM.

Using the Subaru Select Monitor, read data of [EBD Warning Light] in the [Data Monitor] of [Brake Control] while the engine is not running. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Immediately after the ignition switch is turned to ON, is the [EBD Warning Light] set to [ON]?

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.

Using the Subaru Select Monitor, read data of [ABS Warning Lamp] in the [Data Monitor] of [Brake Control] while the engine is not running. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Immediately after the ignition switch is turned to ON, is the [ABS Warning Lamp] set to [ON]?

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 VDCCM.

Using the Subaru Select Monitor, read data of [VDC-OFF Light] in the [Data Monitor] of [Brake Control] while the engine is not running. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Immediately after the ignition switch is turned to ON, is the [VDC-OFF Light] set to [ON]?

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.

Using the Subaru Select Monitor, read data of [VDC Warning Lamp] in the [Data Monitor] of [Brake Control] while the engine is not running. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Immediately after the ignition switch is turned to ON, is the [VDC Warning Lamp] set to [ON]?

Yes — Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

No — Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

ELECTRONIC PARKING BRAKE INDICATOR LIGHT DO NOT COME ON

Detecting condition:
Defective combination meter
Trouble symptom:
When the ignition switch is ON (engine OFF), the electronic parking brake operation indicator light does not illuminate even when the electronic parking brake switch is operated.

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 COMBINATION METER (DIAGNOSTICS)>Active Test.

2. READ DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 4.
No	Perform the diagnosis for LAN system.

4. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

AVH ON INDICATOR LIGHT DO NOT COME ON

Detecting condition:

- Defective combination meter
- Defective cockpit control module

Trouble symptom:

When the ignition switch is turned to ON, the AVH ON indicator light does not illuminate even when the AVH switch (center information display) is operated.

1. CHECK AVH SWITCH (CENTER INFORMATION DISPLAY).

Check the AVH switch (center information display). Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 2.
No	Replace the cockpit control module. Ref. to ENTERTAINMENT & MONITORING>Cockpit Display.

2. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

ELECTRONIC PARKING BRAKE INDICATOR LIGHT IS BLINKING

Detecting condition:

- When VDCCM&H/U was replaced
- When fault was detected or electronic parking brake switch was operated under faulty condition
- When electronic parking brake switch was operated during maintenance mode
- When electronic parking brake was operated while the vehicle was running on the free roller or while the tires were rotating with a help of the free roller
- When electronic parking brake was operated with the brake high in temperature or operated on a steep slope

Trouble symptom:

Electronic parking brake may not operate properly.

1. CHECK VDCCM&H/U.

Note:
If VDCCM&H/U was not replaced, start the diagnosis from step 2.

Was electronic parking brake operated after replacement of VDCCM&H/U?

Yes — Go to 2.

No — It is normal if the electronic parking brake operation indicator light comes on by operating the electronic parking brake and goes off by disengaging.

2. CHECK ELECTRONIC PARKING BRAKE WARNING LIGHT/BRAKE SYSTEM WARNING LIGHT.

Turn the ignition switch to ON. (Engine OFF)

Do the electronic parking brake warning light/brake system warning light illuminate?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 3.

3. CHECK VEHICLE CONDITION.

Is the brake condition other than overheating?
Is the electronic parking brake is operated except on a steep road?

Yes — Normal.

No — Go to 4.

4. CHECK DRIVING CONDITION.

Was the vehicle running except on the free roller?

Yes — Normal.

No — Go to 5.

5. CHECK OPERATION OF ELECTRONIC PARKING BRAKE.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.

Does electronic parking brake operation indicator light blink?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Electronic parking brake was temporarily prohibited.

AVH ON / OPERATION INDICATOR LIGHT COME ON

Detecting condition:

- Defective combination meter
- Defective CAN communication
- Defective cockpit control module

Trouble symptom:

When the ignition switch is turned to ON, the AVH ON indicator light illuminates with the AVH switch (center information display) not operated.

1. READ DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 3.

No — Perform the diagnosis for LAN system.

3. CHECK AVH SWITCH (CENTER INFORMATION DISPLAY).

Check the AVH switch (center information display). Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 4.

No — Replace the cockpit control module. Ref. to ENTERTAINMENT & MONITORING>Cockpit Display.

4. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

No — Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

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 of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDCCM.

Using the Subaru Select Monitor, read data of [ABS Warning Lamp] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is [ABS Warning Lamp] set to [ON]?

Yes	Go to 3.
No	Go to 5.

3. CHECK WARNING LIGHT.

1. Save the freeze frame data. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

Does the ABS warning light go off?

Yes	Normal. Perform the inspection mode to check that the light does not turn ON again.
No	Go to 4.

4. READ DTC.

After driving the vehicle at 40 km/h (25 MPH) or more, read DTCs of [Brake Control] using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

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.

Note:

The VDC warning light & VDC indicator light may not go off if wheel speed due to vibrations, etc. is detected when starting the engine. (The VDC warning light & VDC indicator light go off when the brake is released after starting the engine.)

1. READ DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK VDCCM.

Using the Subaru Select Monitor, read data of [VDC Warning Lamp] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is [VDC Warning Lamp] set to [ON]?

Yes — Go to 3.

No — Go to 5.

3. CHECK WARNING LIGHT.

1. Save the freeze frame data. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

Does the VDC warning light & VDC indicator light go off?

Yes — Normal. Perform the inspection mode to check that the light does not turn ON again.

No — Go to 4.

4. READ DTC.

After driving the vehicle at 40 km/h (25 MPH) or more, read DTCs of [Brake Control] using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 5.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

ELECTRONIC PARKING BRAKE INDICATOR LIGHT DO NOT GO OFF

Detecting condition:
Defective combination meter
Trouble symptom:
When starting the engine, the electronic parking brake operation indicator light does not go off.

1. CHECK INDICATOR LIGHT.

1. Start the engine.
2. Operate the electronic parking brake switch.

Does electronic parking brake operation indicator light go off?

Yes — Normal.

No — Go to 2.

2. READ DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 3.

3. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 4.

No — Perform the diagnosis for LAN system.

4. CHECK VDCCM&H/U.

Using the Subaru Select Monitor, read data of [EPB Operation Light] in the [Data Monitor] of [Brake Control] while the engine is running. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is [EPB Operation Light] set to [ON]?

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 COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

BRAKE WARNING LIGHT (EBD WARNING LIGHT) / ELECTRONIC PARKING BRAKE WARNING LIGHT DOES NOT GO OFF

Detecting condition:

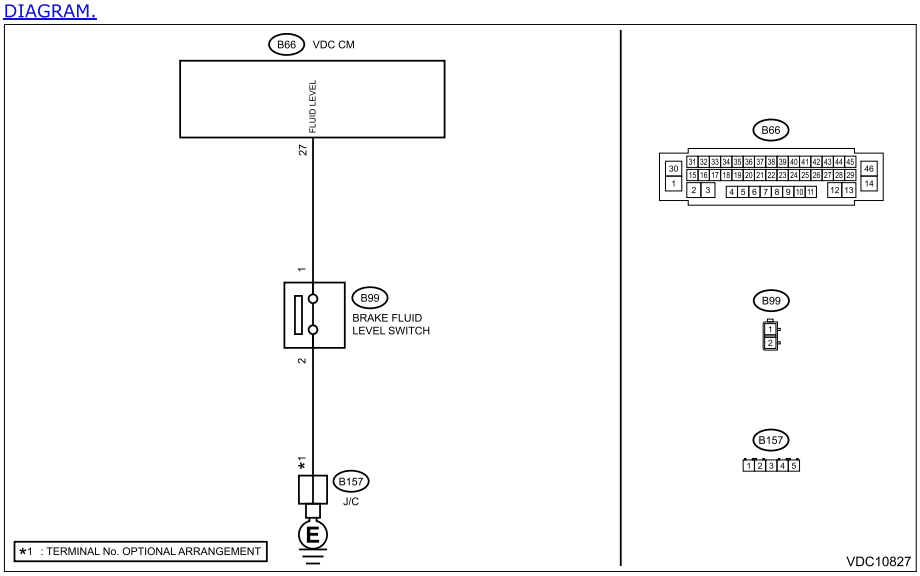
- Defective combination meter
- Brake warning light circuit is shorted.
- Defective sensor/connector
- Defective CAN communication

Trouble symptom:

Electronic parking brake warning light/brake system warning light does not go off when the engine is started.

Wiring diagram:

Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



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 of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 3.

3. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 4.

No — Perform the diagnosis for LAN system.

4. CHECK VDCCM.

Using the Subaru Select Monitor, read data of [Parking System Warning Light] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is [Parking System Warning Light] set to [ON]?

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 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 6.

No — Replenish brake fluid to the specified value.

6. CHECK BRAKE FLUID LEVEL SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the level switch connector (B99) 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 7.

No — Replace the master cylinder. Ref. to BRAKE>Master Cylinder.

7. CHECK GROUND SHORT OF HARNESS.

1. Disconnect the connector from VDCCM.
2. Measure the resistance between VDCCM connector and chassis ground.

Connector & terminal

(B66) No. 27 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 8.

No — Repair the harness between VDCCM and brake fluid level switch.

8. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

VDC OFF INDICATOR LIGHT DOES NOT GO OFF

Detecting condition:

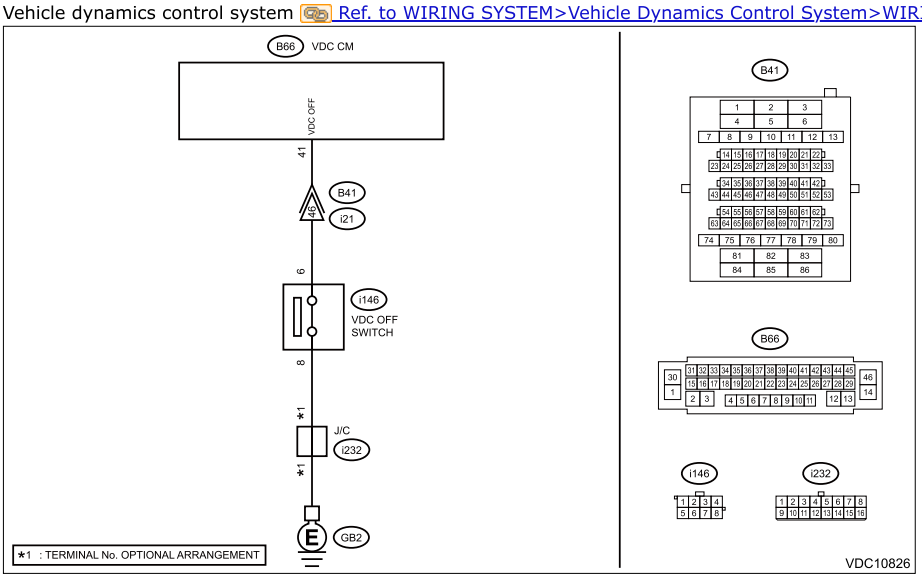
- Defective combination meter
- Defective CAN communication
- Defective VDC OFF switch

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>WIRING DIAGRAM.



1. READ DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK VDC OFF SWITCH.

Using the Subaru Select Monitor, read data of [OFF SW Signal] in the [Data Monitor] of [Brake Control] while the engine is running. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

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>INSPECTION.

Is the check result OK?

Yes — Go to 4.

No — Replace the VDC OFF switch. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>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

(B66) No. 41 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Check the VDC OFF switch circuit.
No	Go to 5.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK COMBINATION METER.

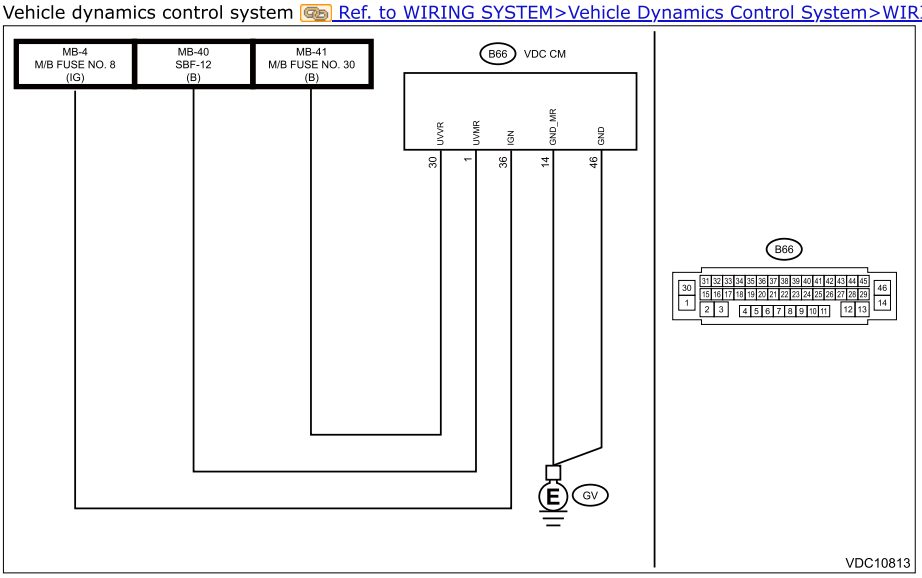
Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

INSPECTION

Detecting condition:
Defective harness connector
Trouble symptom:
Communication is impossible between VDC and Subaru Select Monitor.
Wiring diagram:
Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes — Go to 2.

No — Turn the ignition switch to ON, and select the [Brake Control] 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. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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 is locked?

Yes	Go to 5.
No	Insert VDCCM&H/U connector into VDCCM&H/U.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

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] screen displayed?

Yes	Check the DTC in VDC system. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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
   (B66) No. 1 (+) — Chassis ground (−):
   (B66) No. 30 (+) — Chassis ground (−):
   (B66) No. 36 (+) — 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

(B66) No. 14 — Chassis ground:

(B66) No. 46 — 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) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor>LIST.**

BRAKE CONTROL (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Total number of ignition switch ON	Time	—
Count	Counter	-	—
Time Count	Elapsed time after ignition switch is turned to ON	ms	—
FR Wheel Speed	Wheel speed detected by front ABS wheel speed sensor RH	km/h	—
FL Wheel Speed	Wheel speed detected by front ABS wheel speed sensor LH	km/h	—
RR Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor RH	km/h	—
RL Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor LH	km/h	—
Steering Angle Sensor	Steering angle detected by steering angle sensor	deg	—
Yaw Rate Sensor	Angle of the vehicle detected by yaw rate sensor	deg/s	—
Pressure Sensor Output	Brake fluid pressure detected by pressure sensor	bar	—
Longitudinal G Sensor	Vehicle longitudinal acceleration detected by longitudinal G sensor	m/s^2	—
Lateral G Sensor	Vehicle lateral acceleration detected by lateral G sensor	m/s^2	—
Voltage of IGN	Voltage supplied to VDCCM&H/U	V	—
M. Relay monitor Voltage	Voltage applied to the motor relay	V	—
FL wheel cylinder pressure sensor output	FL wheel cylinder brake fluid pressure detected by pressure sensor	bar	—
FR wheel cylinder pressure sensor output	FR wheel cylinder brake fluid pressure detected by pressure sensor	bar	—
Eyesight Request Pressure	Requested fluid pressure when braking command is sent from EyeSight to VDC	MPa	—
Brake Booster Gauge Sensor Output	Vacuum pressure value inside brake booster measured by VDC (difference from atmospheric pressure)	kPa	—
Motor Relay Signal	Motor relay drive signal	ON or OFF	—
Valve Relay Signal	Valve relay drive signal	ON or OFF	—
EBD Warning Light	Signal for ON operation (illumination) of EBD warning light	ON or OFF	—
ABS Warning Lamp	Signal for ON operation (illumination) of ABS warning light	ON or OFF	—
VDC Warning Lamp	Signal for ON operation (illumination) of VDC warning light	ON or OFF	—
EBD Control Flag	Flag of EBD control activation status	ON or OFF	—
ABS Control Flag	Flag of ABS control activation status	ON or OFF	—
TCS Control Flag	Flag of TCS control activation status	ON or OFF	—
VDC Control Flag	Flag of VDC control activation status	ON or OFF	—
E/G Torque Down Control Stop Flag	Flag of engine control command signal	1 or 0	—
Stop-lamp relay drive signal	Brake light relay drive signal	ON or OFF	—
E/G torques up Control Stop Flag	Flag of engine control command signal	1 or 0	—

Item	Contents	Standard/Unit	Note
Brake Negative Pressure Warning	Signal for illuminating warning light for brake vacuum pressure fault	1 or 0	—
OHB Control Flag	Flag of OHB* control activation status	1 or 0	—
OHB Operation Number	Number of OHB* control activation time	Time	—
Vectoring Control Flag	Activation status flag of brake-based torque vectoring control	ON or OFF	—
Brake Fluid Level Warning Lamp	Signal for illuminating brake fluid level warning light	ON or OFF	—
VDC-OFF Light	ON/OFF status of VDC OFF indicator light	ON or OFF	—
OFF SW Signal	Operation status of VDC OFF switch	ON or OFF	—
Brake Light Switch	ON/OFF status of brake	ON or OFF	—
Clutch Switch	Clutch ON/OFF status (MT model)	ON or OFF	—
Reverse Signal	ON/OFF status of reverse gear	ON or OFF	—
Fluid Switch State	Recognition status of fluid level switch	ON or OFF	—
Incline	Incline of the vehicle	%	—
Total Operation Number	Total number of the electronic parking brake operation	Time	—
Auto Operation Number	Number of times that the electronic parking brake operated automatically while using the adaptive cruise control is displayed	Time	—
Auto Cancel Number	Number of times that the automatic accelerator interlock cancel function operated at starting	Time	—
Parking Operation Number when driving	Total number of the electronic parking brake operation while driving	Time	—
Engine Torque	Engine torque	Nm	—
Ambient Temp Sensor	Ambient temperature	°C	—
Auto Vehicle Hold Operation Number	Number of times that the AVH function is activated	Time	—
Manual Parking Operation	Operation status of parking brake	ON or OFF	—
Auto Parking Operation	Operation status of parking brake	ON or OFF	—
Parking Operation when driving	Operation status of parking brake	ON or OFF	—
Parking Cancel	Operation status of parking brake	ON or OFF	—
Ignition Signal	Input condition of ignition signal	ON or OFF	—
Parking System Warning Light	Control status of the electronic parking brake warning light/brake system warning light	ON or OFF	—
Neutral Signal	Input condition of neutral signal	ON or OFF	—
Reverse Signal	Input condition of reverse signal	ON or OFF	—
Engine idle flag	Engine running condition	ON or OFF	—
Door Signal	Input condition of door (4 locations) open/close signal	ON or OFF	—
Driver Seat Belt Signal	Input condition of driver’s seat belt buckle signal	ON or OFF	—
Auto Vehicle Hold ON Lamp	ON/OFF status of AVH ON indicator light	ON or OFF	—
EPB Operation Light	ON/OFF status of electronic parking brake operation indicator light	ON or OFF	—
EPB Switch Indicator	Lighting condition of electronic parking brake switch indicator light	ON or OFF	—
Auto Vehicle Hold Switch State	ON/OFF status of AVH switch	ON or OFF	—
HSA OFF Lamp	Hill start assist function OFF status	ON or OFF	—
Brake Assist System Operation Flag	Flag of brake assist control activation status	ON or OFF	—
Clutch Switch	Clutch switch recognition status	ON or OFF	—
Booster Automatic Brake Function Status	Use status of the automatic braking function of the electric brake booster	Initializing, Inoperative or During Diagnostic	—

Item	Contents	Standard/Unit	Note
		Mode, or Operable and Not Diagnosis Mode	
Driver Stroke	Driver request stroke	mm	—
Driver Stroke Status	Status of driver request stroke value	Initializing, Inoperative or During Diagnostic Mode, or Operable and Not Diagnosis Mode	—
Brake Pedal Operation Flag	Recognition status of driver’s brake pedal operation	ON or OFF	—
Brake Pedal Operation Flag Status	Status of the brake pedal operation flag	Initializing, Normal, or Fault	—
Full Load Point Equivalent Fluid Pressure	Fluid pressure value equivalent to the full load point	bar	—
Full Load Point Equivalent Fluid Pressure Status	Status of the fluid pressure equivalent to the full load point	Initializing, Normal, or Fault	—
VDC Communication Error	Detected communication error with the vehicle dynamics control of the electric brake booster	1 or 0	—
Automatic Brake Request Status	Request status of the automatic braking function including the cruise control and pre-collision brake function	Uncontrolled, ACC Execution, or AEB Execution	—
Automatic Brake Request Reception Status	Recognition status of the request of the automatic braking function including the cruise control and pre-collision brake function	Uncontrolled, ACC Execution, or AEB Execution	—
Booster Automatic Brake Control Permission State	Control permission status of the automatic braking function of the electric brake booster	ON or OFF	—
Brake Booster Function Warning Light	Signal for illuminating warning for brake boost function	ON or OFF	—
Booster Boost Assist Count	The number of boost assist operations done by the vehicle dynamics control when the boost function of the electric brake booster is degraded	Time	—
Booster Boost Failure Count	The number of boost assist operations done by the vehicle dynamics control when the boost function of the electric brake booster is lost	Time	—
EPB Switch Signal	Electronic parking brake switch recognition status	Neutral, Release, Apply or Unknown	—

∗: OHB = Optimized Hydraulic Brake (brake assist function when the boost function of brake booster is lost)

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data>LIST.**

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Total number of ignition switch ON	Time	—
Count	Counter	-	—
Time Count	Elapsed time after ignition switch is turned to ON	ms	—
FR Wheel Speed	Wheel speed detected by front ABS wheel speed sensor RH	km/h	—
FL Wheel Speed	Wheel speed detected by front ABS wheel speed sensor LH	km/h	—
RR Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor RH	km/h	—
RL Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor LH	km/h	—
Vehicle Speed	Vehicle speed	km/h	—
Steering Angle Sensor	Steering angle detected by steering angle sensor	deg	—
Yaw Rate Sensor	Angle of the vehicle detected by yaw rate sensor	deg/s	—
Pressure Sensor Output	Brake fluid pressure detected by pressure sensor	bar	—
Longitudinal G Sensor	Vehicle longitudinal acceleration detected by longitudinal G sensor	m/s^2	—
Lateral G Sensor	Vehicle lateral acceleration detected by lateral G sensor	m/s^2	—
Voltage of IGN	Voltage supplied to VDCCM&H/U	V	—
Acceleration Pedal Position	Accelerator pedal opening angle	%	—
Engine Speed	Engine speed	rpm	—
FL wheel cylinder pressure sensor output	FL wheel cylinder brake fluid pressure detected by pressure sensor	bar	—
FR wheel cylinder pressure sensor output	FR wheel cylinder brake fluid pressure detected by pressure sensor	bar	—
Eyesight Request Pressure	Requested fluid pressure when braking command is sent from EyeSight to VDC	MPa	—
Brake Booster Gauge Sensor Output	Vacuum pressure value inside brake booster measured by VDC (difference from atmospheric pressure)	kPa	—
Steering angle flag	Absolute angle status of steering angle sensor	Recognized or No recognition	—
EBD Control Flag	Flag of EBD control activation status	ON or OFF	—
ABS Control Flag	Flag of ABS control activation status	ON or OFF	—
TCS Control Flag	Flag of TCS control activation status	ON or OFF	—
VDC Control Flag	Flag of VDC control activation status	ON or OFF	—
E/G Torque Down Control Stop Flag	Flag of engine control command signal	1 or 0	—
Stop-lamp relay drive signal	Brake light relay drive signal	ON or OFF	—
E/G torques up Control Stop Flag	Flag of engine control command signal	1 or 0	—
Brake Negative Pressure Warning	Signal for illuminating warning light for brake vacuum pressure fault	1 or 0	—
OHB Control Flag	Flag of OHB* control activation status	1 or 0	—
OHB Operation Number	Number of OHB* control activation time	Time	—

Item	Contents	Standard/Unit	Note
Vectoring Control Flag	Activation status flag of brake-based torque vectoring control	ON or OFF	—
VDC OFF Status	Operation status of VDC OFF switch	ON or OFF	—
Brake Light Switch	ON/OFF status of brake	ON or OFF	—
Clutch Switch	Clutch ON/OFF status (MT model)	ON or OFF	—
Reverse Signal	ON/OFF status of reverse gear	ON or OFF	—
Detailed DTC(s)	Further categorization of diagnosis code	—	—
Incline	Incline of the vehicle	%	—
Engine Torque	Engine torque	Nm	—
Ambient Temp Sensor	Ambient temperature	°C	—
Manual Parking Operation	Operation status of parking brake	ON or OFF	—
Auto Parking Operation	Operation status of parking brake	ON or OFF	—
Parking Operation when driving	Operation status of parking brake	ON or OFF	—
Parking Cancel	Operation status of parking brake	ON or OFF	—
Ignition Signal	Input condition of ignition signal	ON or OFF	—
Neutral Signal	Input condition of neutral signal	ON or OFF	—
Reverse Signal	Input condition of reverse signal	ON or OFF	—
Engine idle flag	Engine running condition	ON or OFF	—
Door Signal	Input condition of door (4 locations) open/close signal	ON or OFF	—
Driver Seat Belt Signal	Input condition of driver’s seat belt buckle signal	ON or OFF	—
Auto Vehicle Hold ON Lamp	ON/OFF status of AVH ON indicator light	ON or OFF	—
EPB Switch Signal	Recognition status of EPB switch	Neutral, Release, Apply or Unknown	—

∗: OHB = Optimized Hydraulic Brake (brake assist function when the boost function of brake booster is lost)

BRAKE CONTROL (DIAGNOSTICS) > Work Support

OPERATION

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, enter vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Brake Control].
5. On [Select Function] screen, select [Work Support].

BRAKE CONTROL (DIAGNOSTICS) > Work Support

LIST

Work Support item	Contents	Reference
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.
Brake Lamp Lighting Operation	Forcibly activate the brake light relay to illuminate the brake light.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Brake Lamp Relay>OPERATION > BRAKE LIGHT LIGHTING OPERATION BY SUBARU SELECT MONITOR.
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.
Reading of parameter: ECM to SSM	Read VDCCM parameter data.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER READING.
Writing of parameter: SSM to ECM	Write the parameter data to the VDCCM.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER WRITING.
Selection of Parameter	Select and register parameters in the VDCCM.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.
Confirm on parameter	Parameters registered in the VDCCM are displayed.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENA

Work Support item	Contents	Reference
		NCE MODE > VDCCM PARAMETER CHECK.
Brake Maintenance Mode	Used when inspecting and repairing parts related to rear brake.	Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.
Electric Parking Brake Compulsion Release Mode	Release the electronic parking brake forcibly.	Ref. to PARKING BRAKE>Emergency Release of Electronic Parking Brake>OPERATION.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
C1211	FRONT RIGHT ABS SENSOR CIRCUIT	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	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	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	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	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	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	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	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.
C1251	WHEEL SPEED SENSOR SYSTEM	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	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	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1311 FR HOLD VALVE.
C1312	FR PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1312 FR PRESSURE REDUCING VALVE.
C1321	FL HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1321 FL HOLD VALVE.
C1322	FL PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with

DTC	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC C1322 FL PRESSURE REDUCING VALVE.
C1331	RR HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1331 RR HOLD VALVE.
C1332	RR PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1332 RR PRESSURE REDUCING VALVE.
C1341	RL HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1341 RL HOLD VALVE.
C1342	RL PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1342 RL PRESSURE REDUCING VALVE.
C1351	NORMAL OPENING VALVE 1	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1351 NORMAL OPENING VALVE 1.
C1352	NORMAL OPENING VALVE 2	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1352 NORMAL OPENING VALVE 2.
C1361	NORMAL CLOSING VALVE 1	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1361 NORMAL CLOSING VALVE 1.
C1362	NORMAL CLOSING VALVE 2	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.
C1411	ELECTRICAL CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1411 ELECTRICAL CONTROL MODULE.
C1412	SELECTED PARAMETER	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1412 SELECTED PARAMETER.
C1413	POWER SUPPLY VOLTAGE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1413 POWER SUPPLY VOLTAGE.
C1422	VDC INTERRUPTION FOR ENGINE CONVENIENCE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1422 VDC INTERRUPTION FOR ENGINE CONVENIENCE.
C1423	DIFFERENT ECU SPECIFICATIONS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1423 DIFFERENT ECU SPECIFICATIONS.
C1424	ECM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1424 ECM.
C1431	AT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1431 AT.
C1432	DIFFERENT ECU SPECIFICATIONS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1432 DIFFERENT ECU SPECIFICATIONS.
C1441	EYESIGHT REQUEST PRESSURE ABNORMAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with

DTC	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC C1441 EyeSight REQUEST PRESSURE ABNORMAL.
C1460	BRAKE BOOSTER ABNORMALITY	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1460 BRAKE BOOSTER ABNORMALITY.
C1511	VALVE RELAY	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1511 VALVE RELAY.
C1512	VALVE SYSTEM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1512 VALVE SYSTEM.
C1521	MOTOR RELAY	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1521 MOTOR RELAY.
C1531	BLS OFF STUCK	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1531 BLS OFF STUCK.
C1532	BLS ON STUCK	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1532 BLS ON STUCK.
C1541	CLUTCH SWITCH OFF MALFUNCTION	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1541 CLUTCH OFF FAULT.
C1542	CLUTCH SWITCH ON MALFUNCTION	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1542 CLUTCH ON FAULT.
C1561	REVERSE OFF FAULT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1561 REVERSE OFF FAULT.
C1562	REVERSE ON FAULT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1562 REVERSE ON FAULT.
C1571	BRAKE LAMP RELAY OFF STUCK	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	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1572 BRAKE LAMP RELAY ON STUCK.
C1581	BRAKE BOOST NEGATIVE PRESSURE ABNORMAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1581 BRAKE BOOST NEGATIVE PRESSURE ABNORMAL.
C1711	STEERING ANGLE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1711 STEERING ANGLE SENSOR.
C1721	YAW RATE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1721 YAW RATE SENSOR.
C1731	G SENSOR FAILURE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1731 G SENSOR ABNORMAL.

DTC	Description & trouble part	Reference
C1732	LATERAL G SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1732 LATERAL G SENSOR.
C1733	LONGITUDINAL G SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1733 LONGITUDINAL G SENSOR.
C1741	PRESSURE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1741 PRESSURE SENSOR.
C1742	WHEEL CYLINDER PRESSURE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1742 WHEEL CYLINDER PRESSURE SENSOR.
C1751	BRAKE BOOST GAUGE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1751 BRAKE BOOST GAUGE SENSOR.
C1811	SYSTEM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1811 SYSTEM.
C1821	BRAKE TEMPERATURE ABNORMAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1821 BRAKE TEMPERATURE ABNORMAL.
C1921	PARKING POSITION SWITCH CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1921 PARKING POSITION SWITCH CIRCUIT.
C1923	AUTO VEHICLE HOLD SWITCH CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1923 AUTO VEHICLE HOLD SWITCH CIRCUIT.
C1935	IGNITION SWITCH CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1935 IGNITION SWITCH CIRCUIT.
C1942	POWER SUPPLY VOLTAGE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1942 POWER SUPPLY VOLTAGE.
C1951	ACTUATOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1951 ACTUATOR.
C1954	RH ACTUATOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1954 RH ACTUATOR.
C1955	LH ACTUATOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1955 LH ACTUATOR.
C1956	RH ACTUATOR CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1956 RH ACTUATOR CIRCUIT.
C1957	LH ACTUATOR CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1957 LH ACTUATOR CIRCUIT.
C1983	HIGH FREQUENCY OPERATION	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with

DTC	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC C1983 HIGH FREQUENCY OPERATION.
C1984	BRAKE MAINTENANCE MODE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1984 BRAKE MAINTENANCE MODE.
C1985	FORBIDDEN STATE OF DYNAMIC ACTUATOR OPERATION	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1985 FORBIDDEN STATE OF DYNAMIC ACTUATOR OPERATION.
C1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0079	CONTROL MODULE COMMUNICATION BUS "G" OFF	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0079 CONTROL MODULE COMMUNICATION BUS "G" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0126	LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0129	LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0129 LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0146	LOST COMMUNICATION WITH SERIAL DATA GATEWAY MODULE "A"	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0146 LOST COMMUNICATION WITH SERIAL DATA GATEWAY MODULE "A".
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Ref. to BRAKE CONTROL (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 BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.

DTC	Description & trouble part	Reference
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	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	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0418	INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0418 INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to BRAKE CONTROL (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 BRAKE CONTROL (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	Ref. to BRAKE CONTROL (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	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1120	LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1120 LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE.
U1129	LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE PU-CAN	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1129 LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE PU-CAN.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1418	INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-CAN	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1418 INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-CAN.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1469	INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1469 INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE.

DTC	Description & trouble part	Reference
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1C07	INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C07 INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS.
U1C0A	INVALID AUTHENTICATION DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-BUS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C0A INVALID AUTHENTICATION DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-BUS.
U1C0B	INVALID AUTHENTICATION DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE CH-BUS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C0B INVALID AUTHENTICATION DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE CH-BUS.
U1C0C	INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C0C INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS.
U1C0F	INVALID AUTHENTICATION DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE CH-BUS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C0F INVALID AUTHENTICATION DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE CH-BUS.

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.

DTC C1241 REAR LEFT ABS SENSOR CIRCUIT

DTC detecting condition:

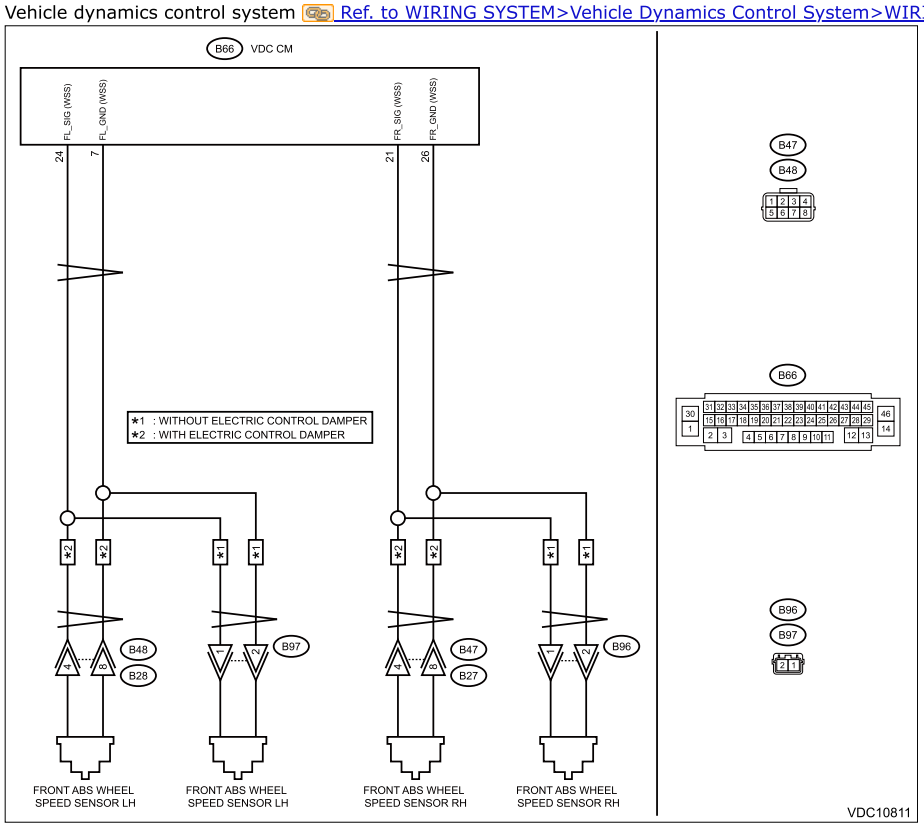
Judge as malfunction when the current value of the wheel speed sensor is out of normal range for a predetermined time or more.

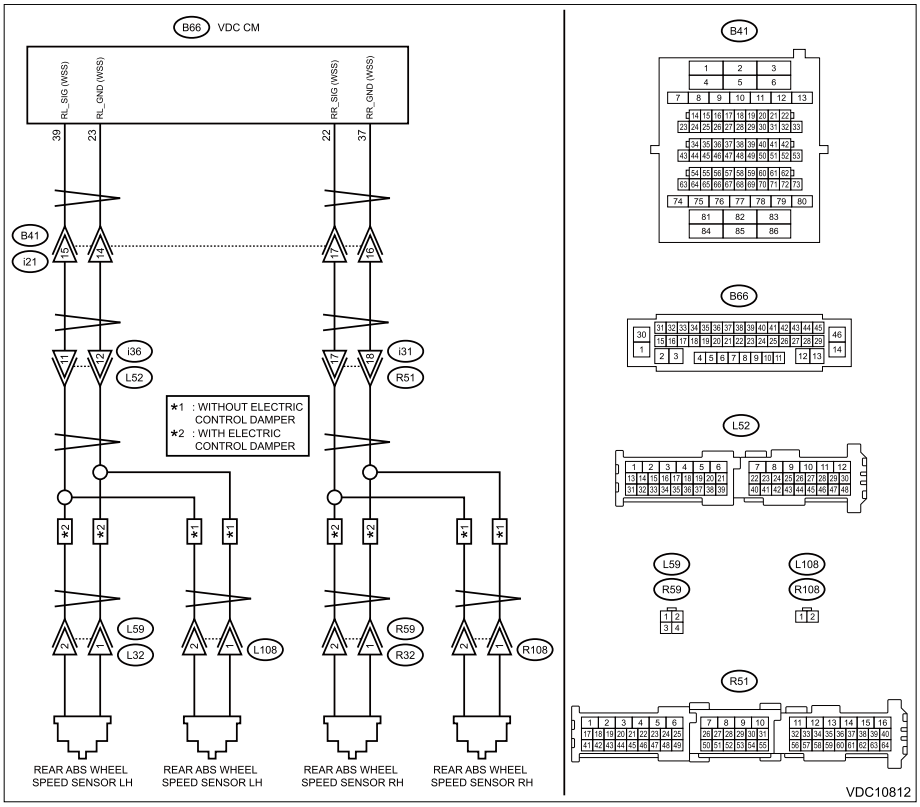
Trouble symptom:

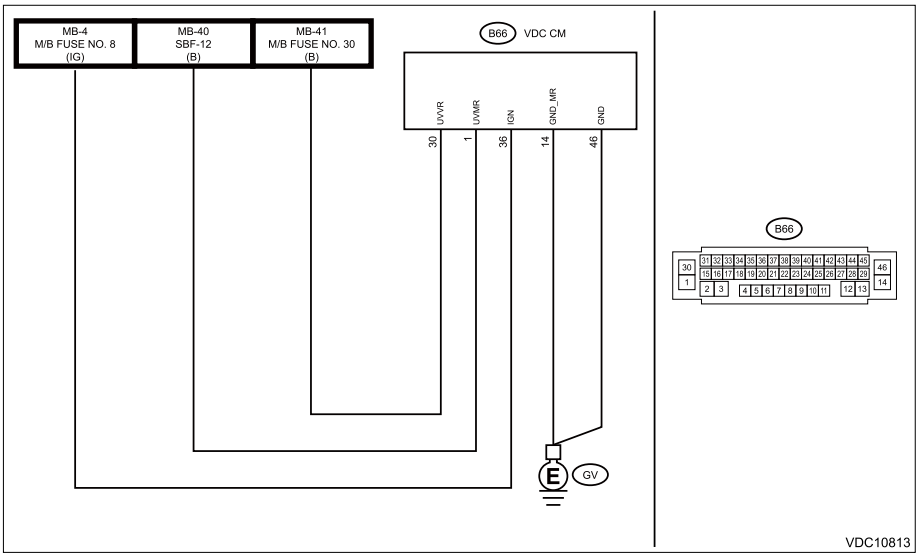
- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.







Note:
This DTC may be stored when the wheel speed sensor connector is disconnected regardless of the ignition switch condition (ON/OFF).
Perform the Clear Memory after diagnosis if a DTC is recorded. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

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 (B66) 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

Without electronically-controlled damper
(B66) No. 21 — (B96) No. 1:
(B66) No. 26 — (B96) No. 2:
With electronically-controlled damper
(B66) No. 21 — (B47) No. 4:
(B66) No. 26 — (B47) No. 8:

DTC C1221

Without electronically-controlled damper
(B66) No. 24 — (B97) No. 1:
(B66) No. 7 — (B97) No. 2:
With electronically-controlled damper
(B66) No. 24 — (B46) No. 4:
(B66) No. 7 — (B46) No. 8:

DTC C1231

Without electronically-controlled damper
(B66) No. 22 — (R108) No. 2:
(B66) No. 37 — (R108) No. 1:
With electronically-controlled damper
(B66) No. 22 — (R59) No. 2:
(B66) No. 37 — (R59) No. 1:

DTC C1241

Without electronically-controlled damper
(B66) No. 39 — (L108) No. 2:
(B66) No. 23 — (L108) No. 1:
With electronically-controlled damper
(B66) No. 39 — (L59) No. 2:
(B66) No. 23 — (L59) No. 1:

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

(B66) No. 26 — Chassis ground:

DTC C1221

(B66) No. 7 — Chassis ground:

DTC C1231

(B66) No. 37 — Chassis ground:

DTC C1241

(B66) No. 23 — Chassis ground:

Is the resistance 1 MΩ 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

Without electronically-controlled damper
(B96) No. 1 (+) — Chassis ground (−):
With electronically-controlled damper
(B47) No. 4 (+) — Chassis ground (−):

DTC C1221

Without electronically-controlled damper
(B97) No. 1 (+) — Chassis ground (−):
With electronically-controlled damper
(B48) No. 4 (+) — Chassis ground (−):

DTC C1231

Without electronically-controlled damper
(R108) No. 2 (+) — Chassis ground (−):
With electronically-controlled damper
(R59) No. 2 (+) — Chassis ground (−):

DTC C1241

Without electronically-controlled damper
(L108) No. 2 (+) — Chassis ground (−):
With electronically-controlled damper
(L59) 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

(B66) No. 1 (+) — (B66) No. 14 (−):
(B66) No. 30 (+) — (B66) No. 46 (−):
(B66) No. 36 (+) — (B66) No. 46 (−):

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.

Check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor>INSPECTION.

Is the check result OK?

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1242 REAR LEFT ABS SENSOR SIGNAL

DTC detecting condition:

- A fault is detected if the time of decompression or hold exceeds the predetermined time.
- A fault is detected if noise of the wheel speed sensor signal is detected.
- A fault is detected if the wheel speed sensor signal is lost, or the wheel speed sensor signal continuously indicates significantly low speed by calculating the difference between maximum speed and minimum speed among the four wheels.
- A fault is detected if the wheel speed sensor signal continuously indicates excessively high or low speed.
- A fault is detected if the wheel speed sensor signal changes irregularly.
- A fault is detected if the wheel speed sensor signal drops cyclically.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Note:
This DTC may be stored when the wheel speed sensor connector is disconnected regardless of the ignition switch condition (ON/OFF).
Perform the Clear Memory after diagnosis if a DTC is recorded. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

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 the DTC for [Brake Control] is detected. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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. Using the Subaru Select Monitor, check [Data Monitor] of the wheel speed sensor that is not indicating the same value in [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Does the speed indicated on [Data Monitor] 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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.

Check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor>INSPECTION.

Is the check result OK?

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

14. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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 40 km/h (25 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.

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.
- AVH does not function.
- EyeSight does not operate.

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 System is normal. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (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.

Check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor>INSPECTION.

Is the check result OK?

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 9.

9. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

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". 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". 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". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

DTC C1362 NORMAL CLOSING VALVE 2

DTC detecting condition:

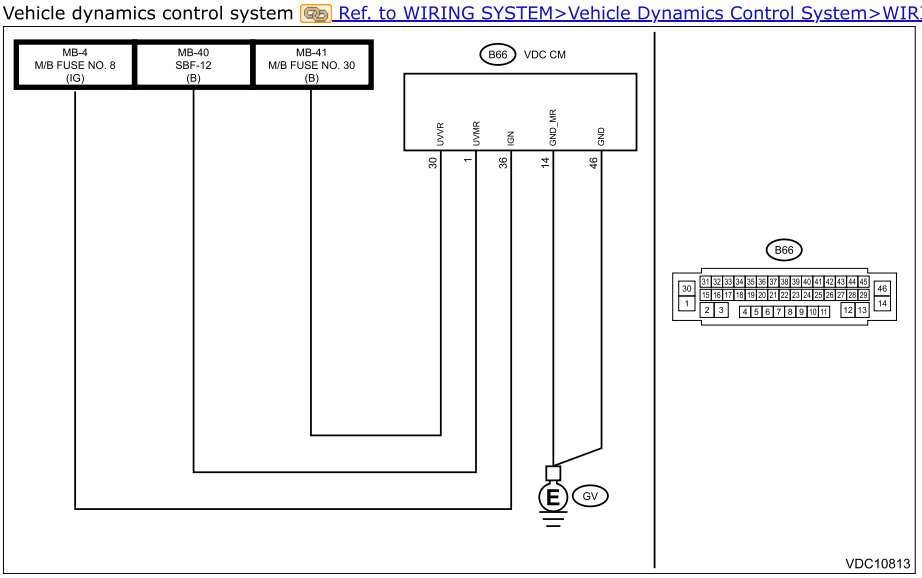
A fault is detected if electrical malfunction judgment is generated for VDCH/U solenoid valve.

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



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

(B66) No. 1 (+) — Chassis ground (−):
(B66) No. 30 (+) — Chassis ground (−):
(B66) No. 36 (+) — 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

(B66) No. 14 — Chassis ground:
(B66) No. 46 — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1411 ELECTRICAL CONTROL MODULE

DTC detecting condition:

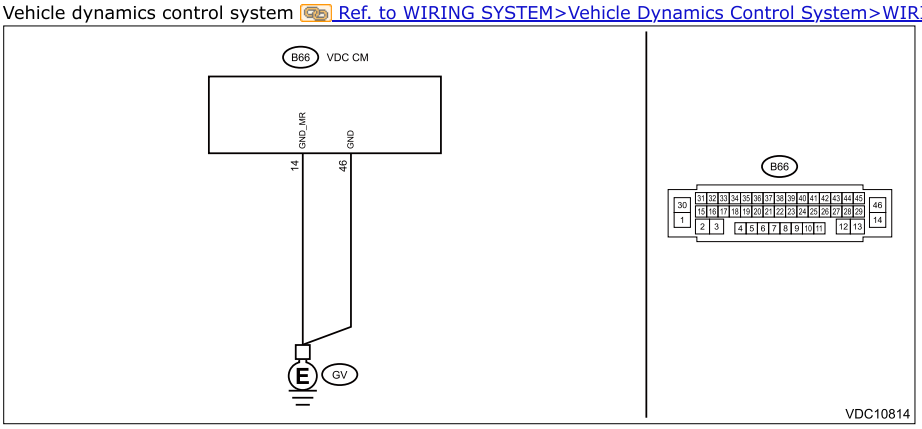
- Judge as malfunction when ECM internal malfunction is detected.
- This malfunction is stored if the electronic parking brake does not operate.

Trouble symptom:

- ABS does not operate sometimes.
- EBD does not operate sometimes.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



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

(B66) No. 46 — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1412 SELECTED PARAMETER

DTC detecting condition:
A fault is detected if abnormal set value is found on the vehicle model that were given some parameters.
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Note:
When the 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.

Check the VDCCM parameters. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.

Does the parameter registered in the VDCCM match the relevant vehicle?

Yes	Go to 3.
No	Select and register the correct parameter. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.

3. CHECK SPECIFICATIONS OF OTHER CONTROL MODULES.

Check the specifications of ECM and TCM.

Are the specifications of ECM and TCM the same as vehicle specification?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the ECM and TCM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DOTC)>Engine Control Module (ECM). Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR690)>Transmission Control Module (TCM).

DTC C1413 POWER SUPPLY VOLTAGE

DTC detecting condition:

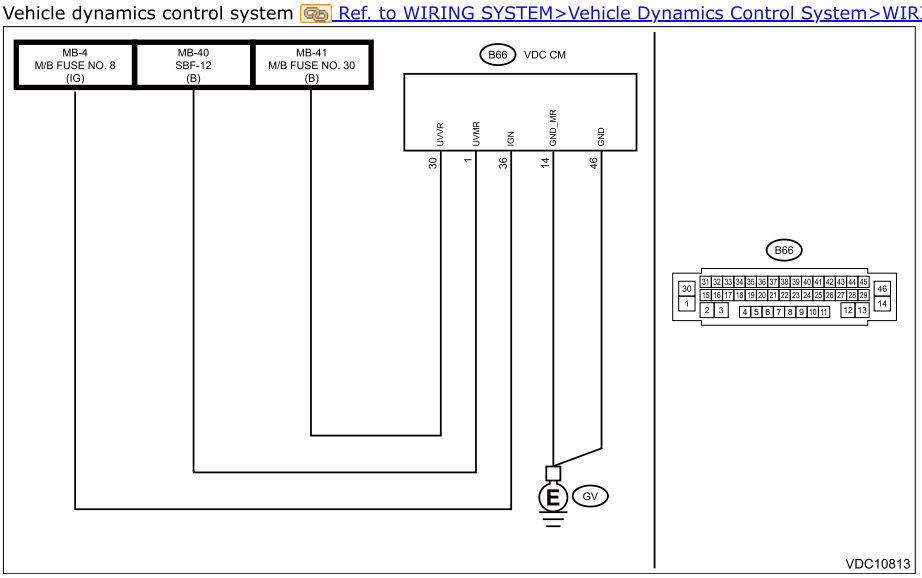
A fault is detected if the power supply voltage is out of normal range for a predetermined time or more.

Trouble symptom:

- ABS does not operate.
- EBD may not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



Note:

Warning lights go off if voltage returns.

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 battery positive terminal and the battery sensor ground terminal securely installed?

Yes — Go to 3.

No — Install the battery terminal correctly.

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
   (B66) No. 1 (+) — Chassis ground (−):
   (B66) No. 30 (+) — Chassis ground (−):
   (B66) No. 36 (+) — 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
   (B66) No. 14 — Chassis ground:
   (B66) No. 46 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 5.

No — Repair the VDCCM&H/U ground harness circuit.

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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:
A fault is detected if engine control prohibition flag from ECM is received.
Trouble symptom:
VDC does not operate.

Note:
The warning light goes off if the engine control prohibition flag from ECM returns normally.

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. Using the Subaru Select Monitor, read data of [E/G Torque Down Control Stop Flag] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the [E/G Torque Down Control Stop Flag] set to [1]?

Yes	Go to 4.
No	Go to 2.

2. CHECK WARNING LIGHT.

Check whether the VDC warning light illuminates after driving for 1 minute or more at a speed of 10 km/h (6 MPH) or more.

Does the VDC warning light illuminate?

Yes	Go to 3.
No	VDC System is normal. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (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 OF ECM.

Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1423 DIFFERENT ECU SPECIFICATIONS

DTC detecting condition:
A fault is detected if the vehicle type information obtained from ECM via communication is different from the parameter setting information.
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

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 (VEHICLE MODEL) SELECTED IN VDCCM.

Check the VDCCM parameters. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.

Does the parameter registered in the VDCCM match the relevant vehicle?

Yes	Go to 3.
No	Select and register the correct parameter. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM 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(TR690)>Transmission Control Module (TCM).

4. CHECK CVT SYSTEM.

1. Start the engine.
2. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Transmission] displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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).

6. CHECK ENGINE SYSTEM.

1. Start the engine.
2. Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC).

Is DTC for [Engine] displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 7.

7. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1424 ECM

DTC detecting condition:
A fault is detected if malfunction judgment flag for the engine system is received from ECM for a predetermined time or more.
Trouble symptom:

- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

1. CHECK ECM.

1. Start the engine.
2. Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 3.

3. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1431 AT

DTC detecting condition:
A fault is detected if malfunction flag is received from TCM.
Trouble symptom:

- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

1. CHECK TCM.

1. Start the engine.
2. Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 3.

3. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

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.

DTC C1441 EYESIGHT REQUEST PRESSURE ABNORMAL

DTC detecting condition:
Defective stereo camera
Trouble symptom:
EyeSight does not operate.

1. CHECK DTC DETECTION OF OTHER SYSTEM.

Using the Subaru Select Monitor, read all DTCs. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1460 BRAKE BOOSTER ABNORMALITY

Note:
Refer to "ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)" for diagnostic procedure. **Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Basic Diagnostic Procedure.**

DTC C1511 VALVE RELAY

DTC detecting condition:

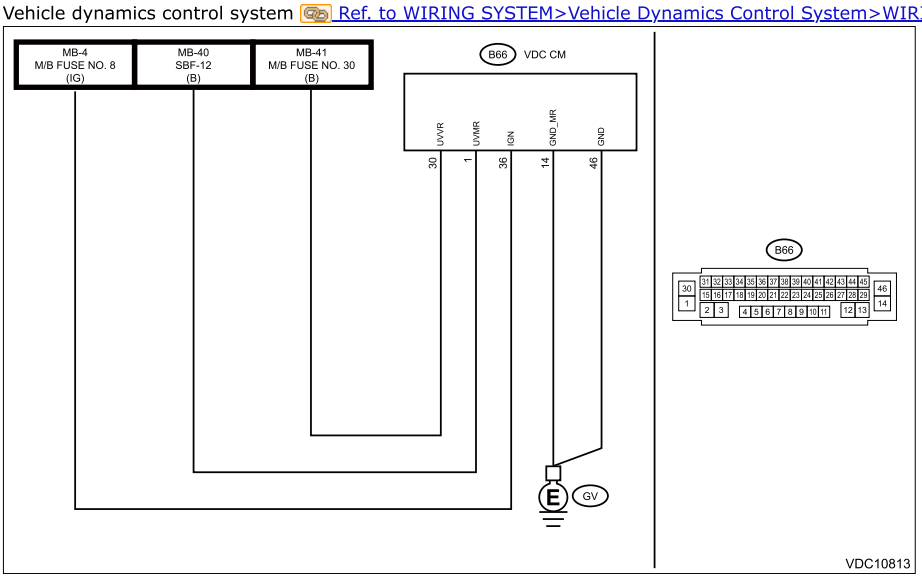
A fault is detected if valve relay drive voltage failure is detected.

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



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

(B66) No. 30 (+) — Chassis ground (−):

(B66) No. 36 (+) — 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: (B66) No. 30 (+) — Chassis ground (−):

B: (B66) No. 36 (+) — 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
   (B66) No. 46 — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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.

DTC C1521 MOTOR RELAY

DTC detecting condition:

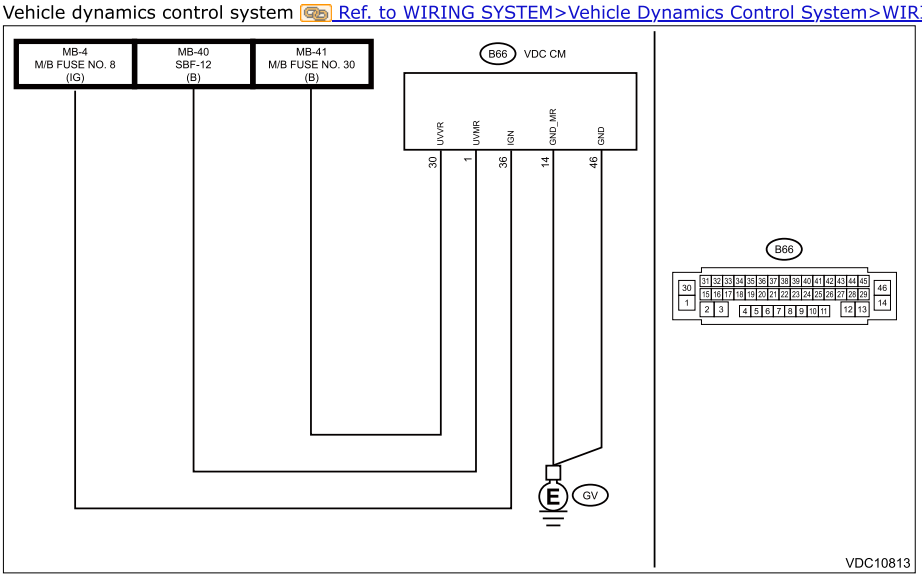
A fault is detected if the pump motor supply voltage becomes significantly low when the pump motor is not driven.

Trouble symptom:

- ABS does not operate sometimes.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



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

(B66) No. 1 (+) — Chassis ground (−):

(B66) No. 36 (+) — 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: (B66) No. 1 (+) — Chassis ground (−):

B: (B66) No. 36 (+) — 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 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

(B66) 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 VDCCM&H/U MOTOR RELAY.

Measure the resistance between VDCCM&H/U terminals.

Terminals

No. 1 — No. 14:

Is the resistance 1 MΩ 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1531 BLS OFF STUCK

1. CVT MODEL

DTC detecting condition:

A fault is detected if stop light switch signal is OFF for a predetermined time or more with the pressure signal of the pressure sensor high.

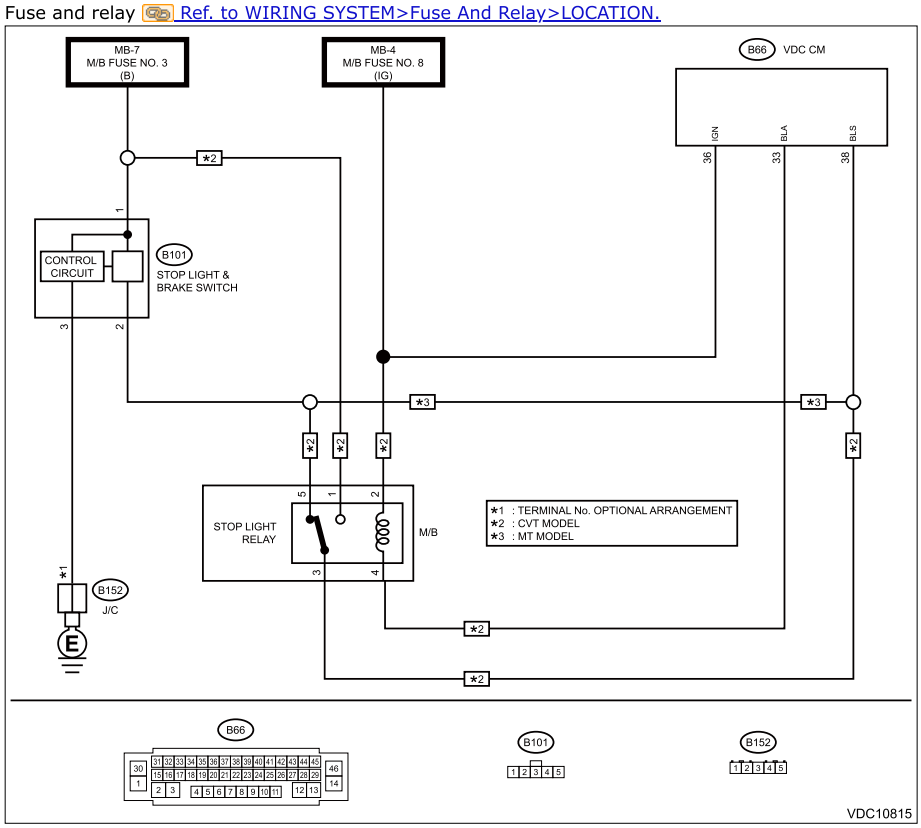
Trouble symptom:

- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.

Fuse and relay Ref. to WIRING SYSTEM>Fuse And Relay>LOCATION.



1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH. → no → Perform the instructed procedures.

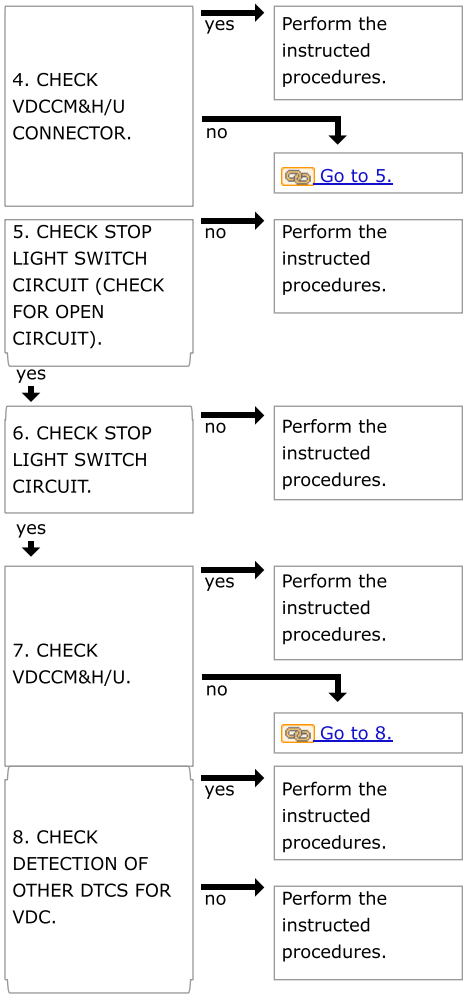
yes ↓

2. CHECK STOP LIGHT SWITCH UNIT. → no → Perform the instructed procedures.

yes ↓

3. CHECK STOP LIGHT RELAY. → no → Perform the instructed procedures.

yes ↓



1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH.

Check the installation position of the stop light switch. Ref. to BRAKE>Stop Light Switch>INSPECTION > INSPECT THE SPECIFIED POSITION.

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>ADJUSTMENT.

2. CHECK STOP LIGHT SWITCH UNIT.

Perform the inspection of stop light switch unit. Ref. to BRAKE>Stop Light Switch>INSPECTION > CHECK OUTPUT.

Is the check result OK?

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. 3 —No. 5:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

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
(B66) No. 38 — (M/B) No. 3:
(B101) No. 2 — (M/B) No. 5:
(B101) No. 1 — (M/B fuse) No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 6.

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 stop light relay and chassis ground.
   Connector & terminal
   (M/B) No. 3 (+) — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

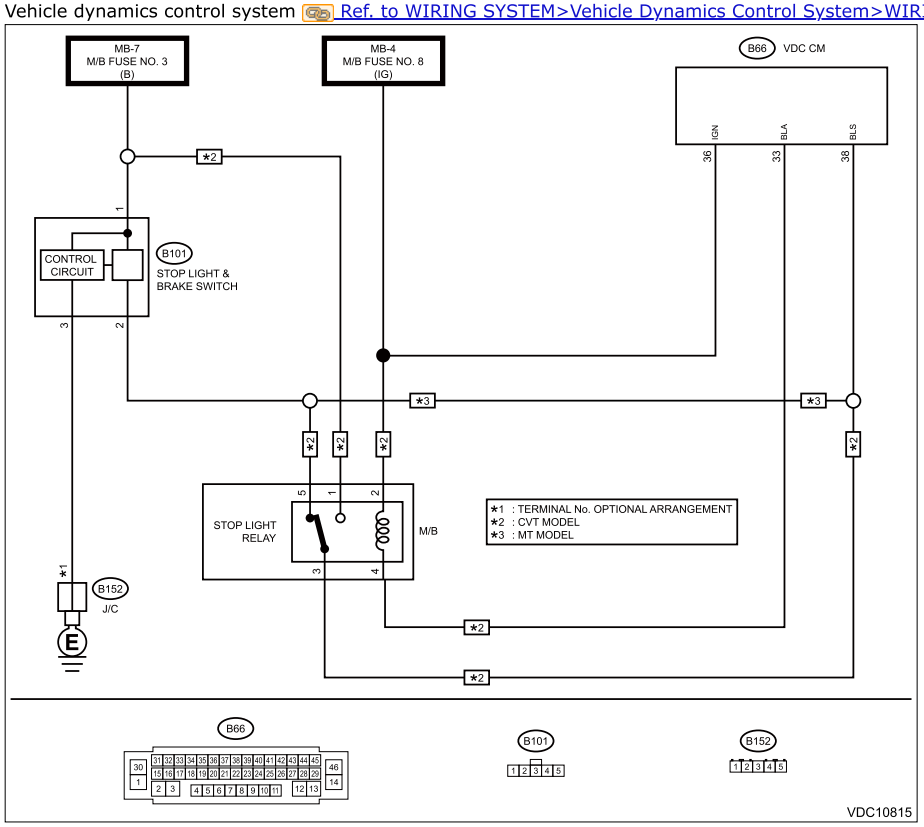
Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

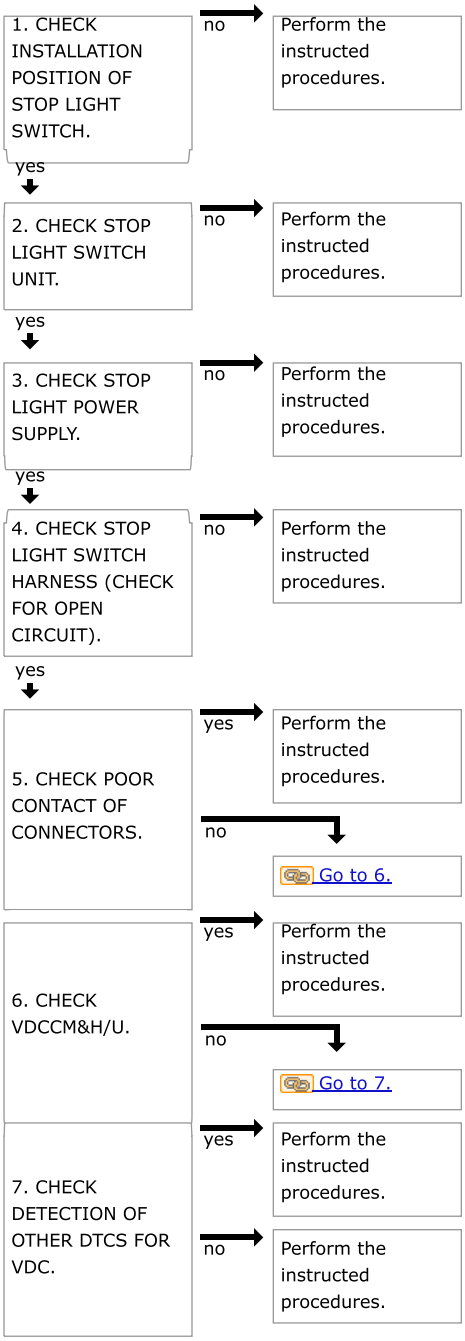
Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

2. MT MODEL

DTC detecting condition:
Defective stop light switch
Trouble symptom:
VDC does not operate.
Wiring diagram:
Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.





1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH.

Check the installation position of the stop light switch. Ref. to BRAKE>Stop Light Switch>INSPECTION > INSPECT THE SPECIFIED POSITION.

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>ADJUSTMENT.

2. CHECK STOP LIGHT SWITCH UNIT.

Perform the inspection of stop light switch unit. Ref. to BRAKE>Stop Light Switch>INSPECTION > CHECK OUTPUT.

Is the check result OK?

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
(B101) 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
   (B101) No. 2 — (B66) No. 38:

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1532 BLS ON STUCK

1. CVT MODEL

DTC detecting condition:

- A fault is detected if a change of the vehicle speed from high to low occurs for a predetermined number of times or more, while a change of the stop light switch from OFF to ON is not detected.
- A fault is detected if stop light switch ON status continues for long time while the vehicle speed is at the predetermined speed or higher.

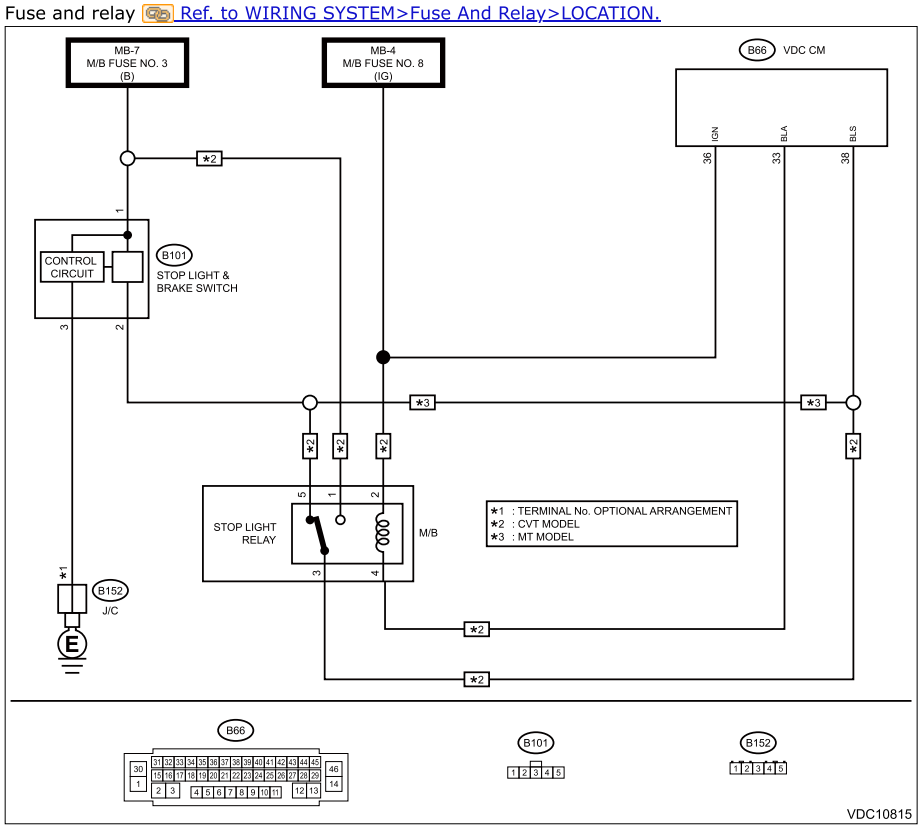
Trouble symptom:

- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.

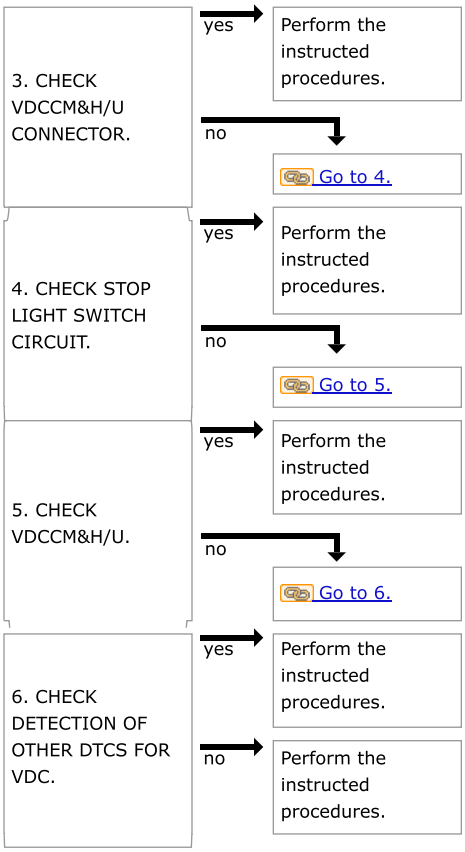
Fuse and relay Ref. to WIRING SYSTEM>Fuse And Relay>LOCATION.



Note:

If the pressure sensor is defective, this DTC may probably be stored in addition to pressure sensor malfunction.

1. INTERVIEW CUSTOMERS.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK STOP LIGHT RELAY.	yes →	Perform the instructed procedures.
	no →	Go to 3.



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. 1 —No. 3:

Is the resistance less than 1 Ω?

Yes	Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.
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 relay and chassis ground.
   Connector & terminal
   (M/B) No. 3 (+) — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

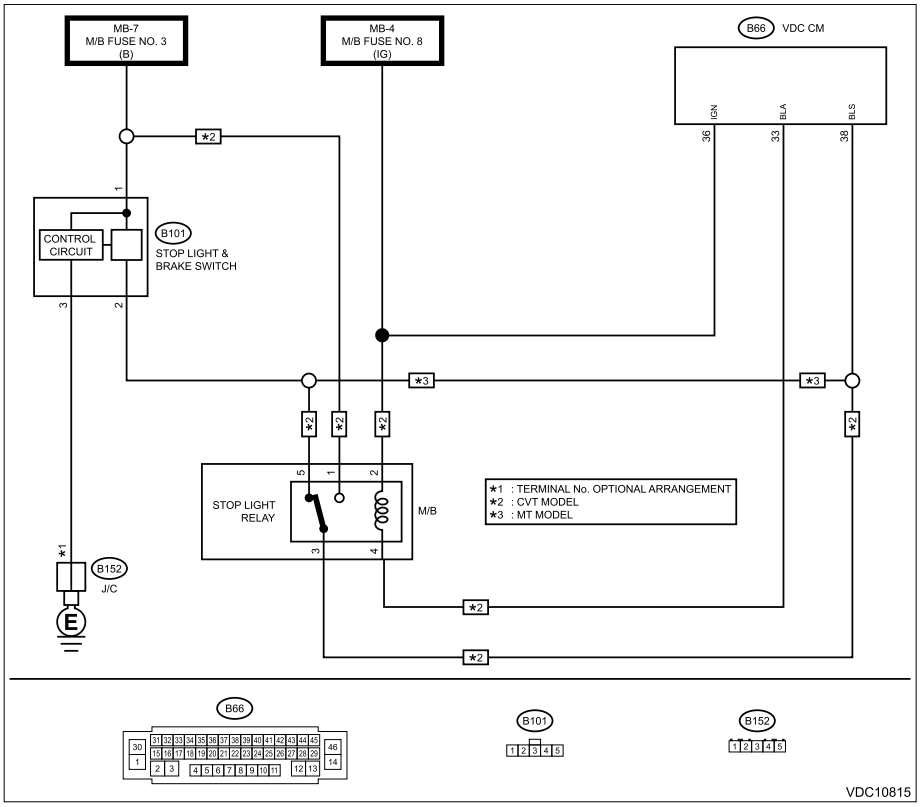
Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

2. MT MODEL

Defective stop light switch
Trouble symptom:
VDC does not operate.
Wiring diagram:
Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



1. INTERVIEW CUSTOMERS.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK STOP LIGHT SWITCH UNIT.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK STOP LIGHT SWITCH HARNESS.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK VDCCM&H/U.	yes →	Perform the instructed procedures.
	no →	Go to 5.
5. CHECK DETECTION OF OTHER DTCS FOR VDC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

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 UNIT.

Perform the inspection of stop light switch unit. Ref. to BRAKE>Stop Light Switch>INSPECTION > CHECK OUTPUT.

Is the check result OK?

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

(B66) No. 38 — Chassis ground:

Is the resistance less than 1 MΩ?

Yes — Go to 4.

No — Repair the stop light switch circuit.

4. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

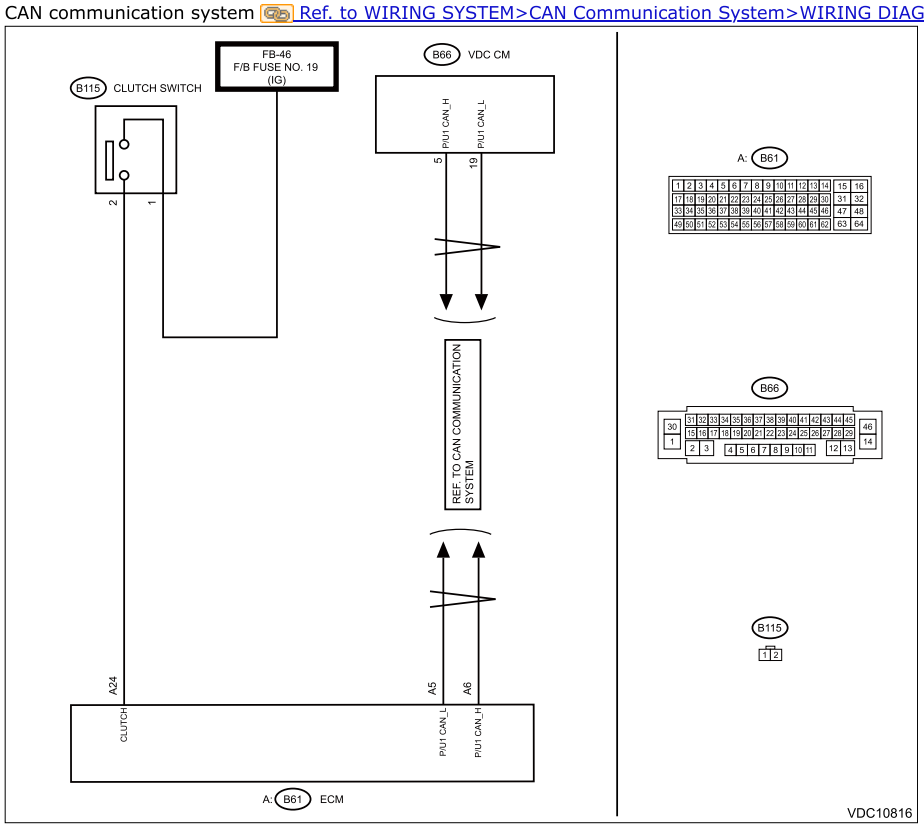
No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

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.

DTC C1542 CLUTCH ON FAULT

DTC detecting condition:
Abnormal clutch signal
Trouble symptom:
Hill start assist does not operate.
Wiring diagram:
Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.
Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



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.

1. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 2.

No — Perform the diagnosis for LAN system.

2. CHECK CLUTCH SIGNAL USING SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [Clutch Switch] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

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, read data of [Clutch Switch] in the [Data Monitor] of [Engine]. Ref. to ENGINE (DIAGNOSTICS) (H4DOTC)>Data Monitor.

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 connector from ECM.
3. Disconnect the connector from the clutch switch.
4. Measure the resistance of harness between ECM and clutch switch connector.
   Connector & terminal
   (B61) No. 24 — (B115) 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

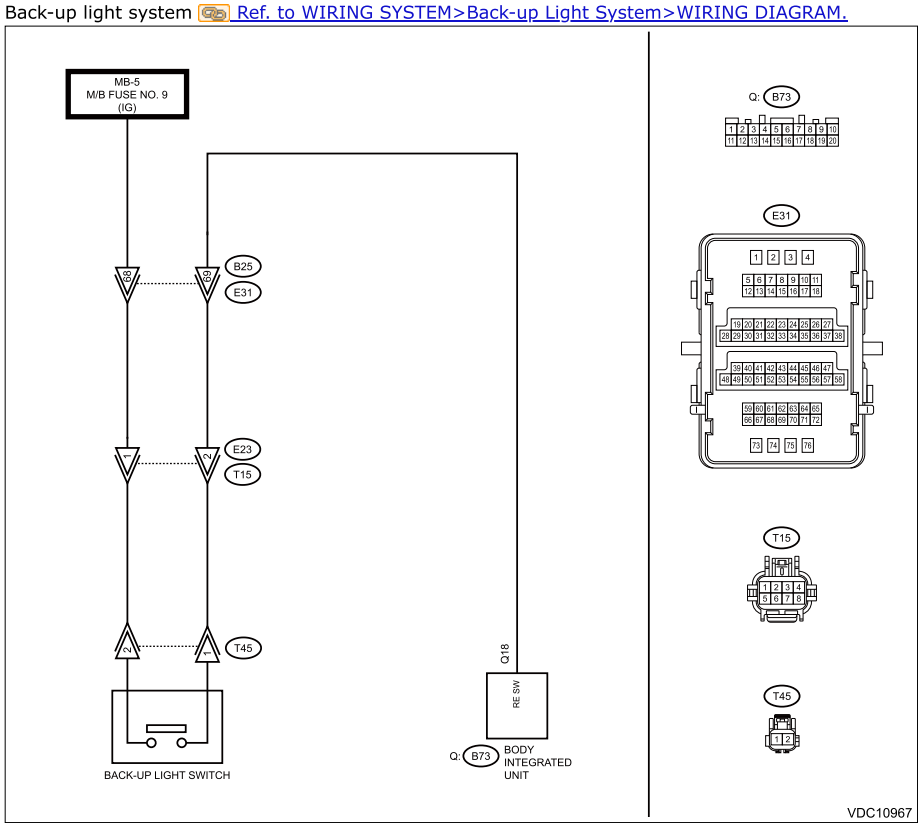
BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

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.

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.



1. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 2.

No — Perform the diagnosis for LAN system.

2. CHECK REVERSE SIGNAL USING SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [Reverse Signal] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

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
   (B73) No. 18 — (T45) No. 1:

Is the resistance less than 1 Ω?

Yes	Replace the back-up light switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(TY75)>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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1571 BRAKE LAMP RELAY OFF STUCK

DTC detecting condition:

A fault is detected if the stop light relay operation request were compared with the feedback signal and detected as follows:

- The feedback signal is OFF.
- The stop light relay operation request is ON.

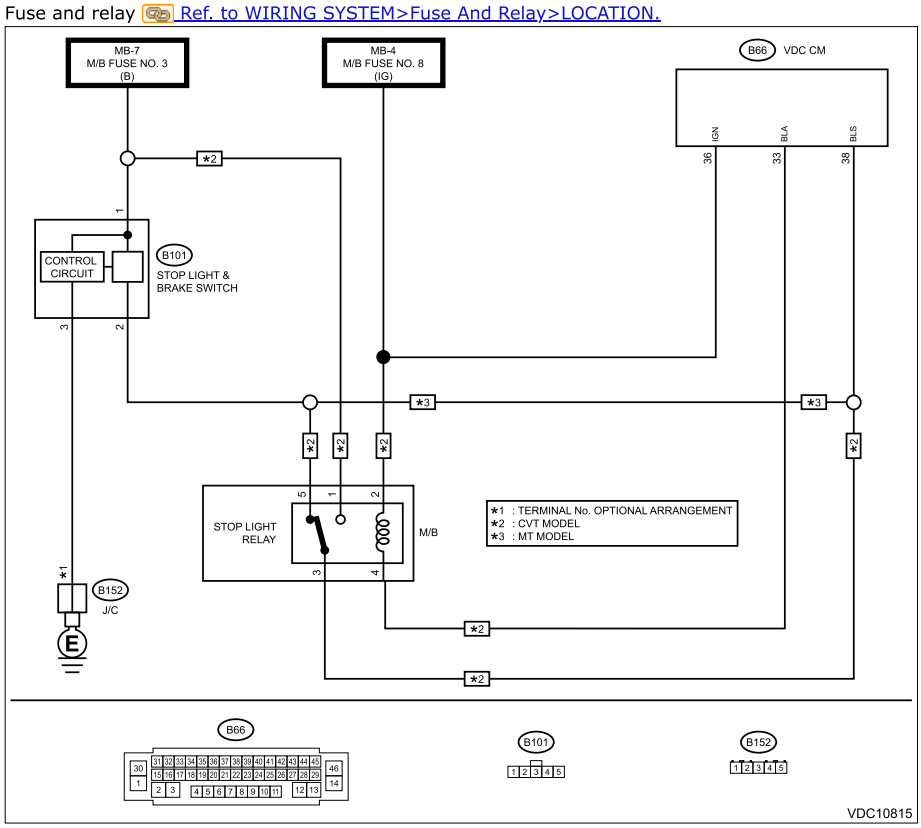
Trouble symptom:

- EyeSight does not operate.
- Stop lights do not illuminate sometimes.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.

Fuse and relay Ref. to WIRING SYSTEM>Fuse And Relay>LOCATION.



1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs related to the stop light switch displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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. 2 — No. 4 when the battery voltage is applied.
   Terminals
   No. 1 — No. 3:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

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
(M/B) No. 1 — (M/B fuse) No. 3:

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
   (M/B) No. 1 (+) — 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
   (M/B) No. 4 (+) — 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
(M/B) No. 2 (+) — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 9.

9. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

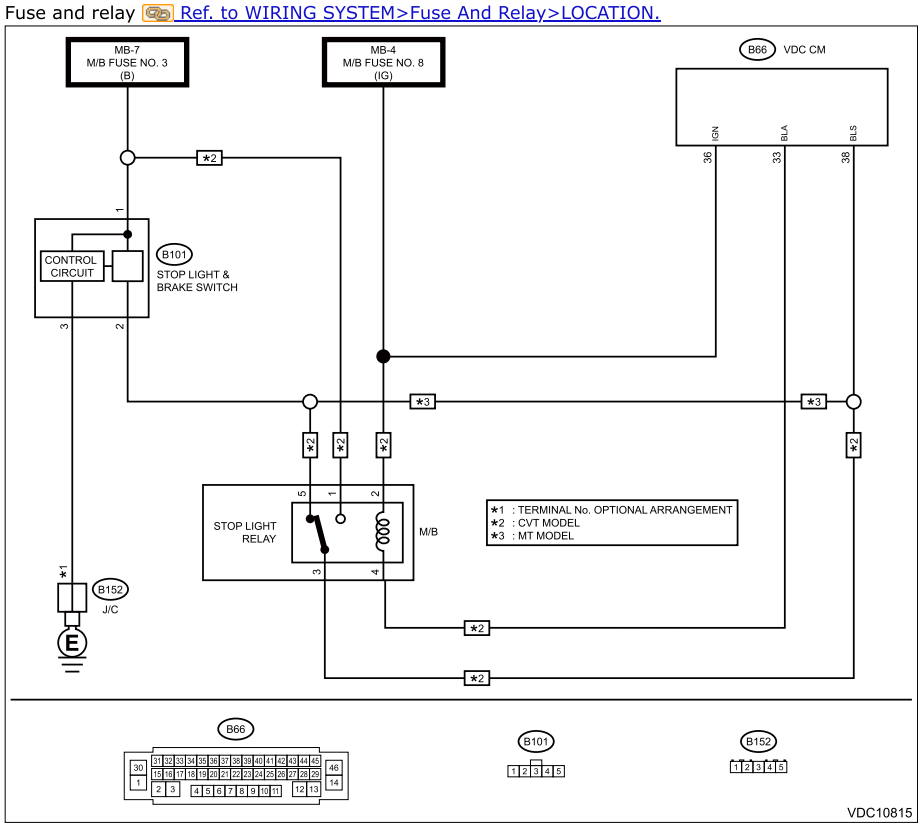
No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1572 BRAKE LAMP RELAY ON STUCK

DTC detecting condition:
Defective stop light relay signal
Trouble symptom:

- EyeSight does not operate.
- Stop lights do not go off sometimes.

Wiring diagram:
Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.
Fuse and relay Ref. to WIRING SYSTEM>Fuse And Relay>LOCATION.



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the M/B fuse (No. 8).

Is the fuse blown out?

Yes — Replace the M/B fuse (No. 8).

No — Go to 2.

2. CHECK STOP LIGHT RELAY.

Measure the resistance of stop light relay terminals.
Terminals
No. 2 — No. 4:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

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

(M/B) No. 4 — (B66) No. 33:

(M/B) No. 2 — (M/B fuse) No. 8:

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

   (M/B) No. 2 (+) — 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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1581 BRAKE BOOST NEGATIVE PRESSURE ABNORMAL

DTC detecting condition:
This malfunction is stored if vacuum pressure value inside brake booster drops below the normal pressure and stays for a specific period of time.
Trouble symptom:
Brake pedal becomes heavier. (Brake assist function is activated when vacuum pressure drops.)

1. CHECK DTC.

1. Start the engine.
2. Warm up for at least three minutes.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1581 a current code?

Yes — Go to 2.

No — Currently, it is normal. It results from a temporary vacuum pressure drop.

2. CHECK OUTPUT OF BRAKE BOOSTER PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read [Brake Booster Gauge Sensor Output] in [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is [Brake Booster Gauge Sensor Output] −20 kPa or more?

Yes — Go to 3.

No — Currently, it is normal. It results from a temporary vacuum pressure drop.

3. CHECK OUTPUT OF BRAKE BOOSTER PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using Subaru Select Monitor, read [Brake Booster Gauge Sensor Output] in [Data Monitor] of [Brake Control] while depressing the brake pedal several times. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Does the value of [Brake Booster Gauge Sensor Output] change along with the operation?

Yes — Currently, it is normal. It results from a temporary vacuum pressure drop.

No — Go to 4.

4. CHECK BRAKE VACUUM SYSTEM.

1. Check for connections and air tightness of brake vacuum system (between brake booster and intake manifold).
2. Check for connections and air tightness of brake vacuum system (between brake booster and brake vacuum pump).

Are there any air leaks in the brake vacuum system?

Yes — Repair the air leak in the brake vacuum system.

No — Replace the brake booster. Ref. to BRAKE>Brake Booster.

DTC C1711 STEERING ANGLE SENSOR

DTC detecting condition:

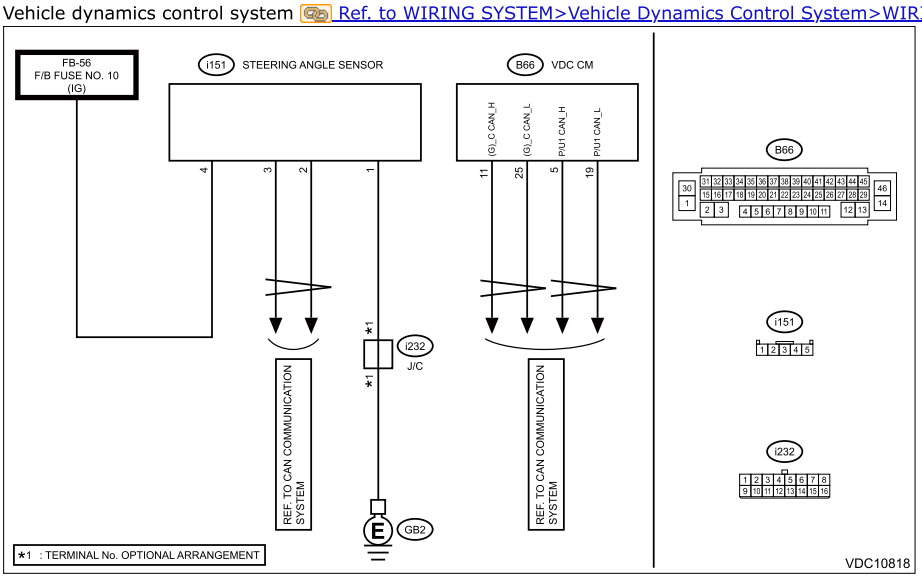
- A fault is detected if the sensor signal value is not correct.
- A fault is detected if the yaw rate sensor signal / lateral G sensor signal change while the sensor signal of steering angle sensor indicates a constant value.
- A fault is detected if the communication status of steering angle sensor is abnormal.

Trouble symptom:

- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



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
   (i151) No. 4 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes — Go to 2.

No — Repair the steering angle sensor power supply circuit including the fuse.

2. CHECK GROUND CIRCUIT OF STEERING ANGLE SENSOR (CHECK FOR OPEN CIRCUIT).

Measure the resistance between steering angle sensor and chassis ground.
Connector & terminal
(i151) 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
   (i151) No. 2 — (B66) No. 25:
   (i151) No. 3 — (B66) No. 11:

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
(i151) No. 2 — Chassis ground:
(i151) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

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, read data of [Steering Angle Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the value of [Steering Angle Sensor] between −10 — 10 deg?

Yes — 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 7.

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1721 YAW RATE SENSOR

DTC detecting condition:

- A fault is detected if the sensor signal value is not correct.
- A fault is detected if the steering angle sensor signal / lateral G sensor signal change while the yaw rate sensor signal indicates a constant value.
- A fault is detected if the communication status of yaw rate sensor is abnormal.

Trouble symptom:

- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

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 & HYDRAULIC CONTROL UNIT (VDC CM&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, read data of [Yaw Rate Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the value of [Yaw Rate Sensor] between −4 — 4 deg/s?

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 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, read data of [Steering Angle Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the value of [Steering Angle Sensor] between −10 — 10 deg?

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. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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 C1731 G SENSOR ABNORMAL

Note:
For the diagnostic procedure, refer to "DTC C1732 LATERAL G SENSOR". 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:
- A fault is detected if the sensor signal value is not correct.
- A fault is detected if the steering angle sensor signal / yaw rate sensor signal change while the lateral G sensor signal indicates a constant value.
- A fault is detected if the communication status of lateral G sensor is abnormal.

Trouble symptom:
- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

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 & HYDRAULIC CONTROL UNIT (VDC CM&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, read data of [Steering Angle Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the value of [Steering Angle Sensor] between −10 — 10 deg?

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, read data of [Lateral G Sensor], [Longitudinal G Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Are the values of [Lateral G Sensor] and [Longitudinal G Sensor] between −2 — 2 m/s^2?

Yes — Go to 4.

No — Recheck from step 1, and if the problem is not solved, Go to 7.

4. SET 0 POINT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Select the [Work Support] using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

5. PERFORM DRIVING TEST.

Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.

Does the ABS warning light or VDC warning light illuminate during driving?
Does ABS or VDC operate abnormally?

Yes	Recheck from step 1, and when the warning lights illuminate or improperly operate, 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 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, read data of [Lateral G Sensor], [Longitudinal G Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Are the values of [Lateral G Sensor] and [Longitudinal G Sensor] between −1.5 — 1.5 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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

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, read data of [Lateral G Sensor], [Longitudinal G Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

When the VDCCM&H/U is in a horizontal position, are the values of [Lateral G Sensor] and [Longitudinal G Sensor] between −1.5 — 1.5 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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1733 LONGITUDINAL G SENSOR

DTC detecting condition:

- A fault is detected if the communication status of longitudinal G sensor is abnormal.
- A fault is detected if malfunction judgment is generated by self-diagnosis test of the longitudinal G sensor.
- A fault is detected if the longitudinal G sensor signal is out of normal range.
- A fault is detected if the longitudinal G sensor compensation value is out of normal range.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

Note:
For the diagnostic procedure, refer to "DTC C1732 LATERAL G SENSOR". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1732 LATERAL G SENSOR.

DTC C1741 PRESSURE SENSOR

DTC detecting condition:

- A fault is detected if the fluid pressure signal in master cylinder are out of normal range.
- A fault is detected if the condition that supply voltage for the fluid pressure sensor is out of normal judgment range continues for predetermined time.
- A fault is detected if the communication status of fluid pressure sensor is abnormal.
- A fault is detected if the data of fluid pressure sensor is abnormal.
- A fault is detected if the offset value of fluid pressure sensor signal exceeds a predetermined judgment value.

Trouble symptom:

- VDC does not operate sometimes.
- ABS does not operate sometimes.
- AVH does not function.
- EyeSight does not operate.

1. CHECK STOP LIGHT SWITCH CIRCUIT AND INSTALLATION CONDITION.

Check the stop light switch circuit and the installation condition.

Is the check result OK?

Yes	Go to 2.
No	Repair the stop light switch circuit or correct the installation condition. **Note:** **If there is malfunction in the stop light circuit, DTC may be recorded in the memory.**

2. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [Pressure Sensor Output] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

With the brake pedal released, is the value of [Pressure Sensor Output] 0 — 11 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 OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [Pressure Sensor Output] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

When the brake pedal is operated, does the value of [Pressure Sensor Output] change in accordance with the brake pedal?

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 VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1742 WHEEL CYLINDER PRESSURE SENSOR

DTC detecting condition:

- A fault is detected if the condition that supply voltage for the fluid pressure sensor is out of normal judgment range continues for predetermined time.
- A fault is detected if the communication status of fluid pressure sensor is abnormal.
- A fault is detected if the data of fluid pressure sensor is abnormal.
- A fault is detected if the offset value of fluid pressure sensor signal exceeds a predetermined judgment value.
- A fault is detected if a difference between fluid pressures for the wheels exceeds a predetermined judgment value.
- A fault is detected if master cylinder pressure and fluid pressures for the wheels exceed predetermined judgment values.

Trouble symptom:

EyeSight does not operate.

1. CHECK STOP LIGHT SWITCH CIRCUIT AND INSTALLATION CONDITION.

Check the stop light switch circuit and the installation condition.

Is the check result OK?

Yes — Go to 2.

No — Repair the stop light switch circuit or correct the installation condition.

2. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [FL wheel cylinder pressure sensor output], [FR wheel cylinder pressure sensor output] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

With the brake pedal released, are the values of [FL wheel cylinder pressure sensor output] and [FR wheel cylinder pressure sensor output] between 0 — 11 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 OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [FL wheel cylinder pressure sensor output], [FR wheel cylinder pressure sensor output] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

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 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 VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1751 BRAKE BOOST GAUGE SENSOR

DTC detecting condition:

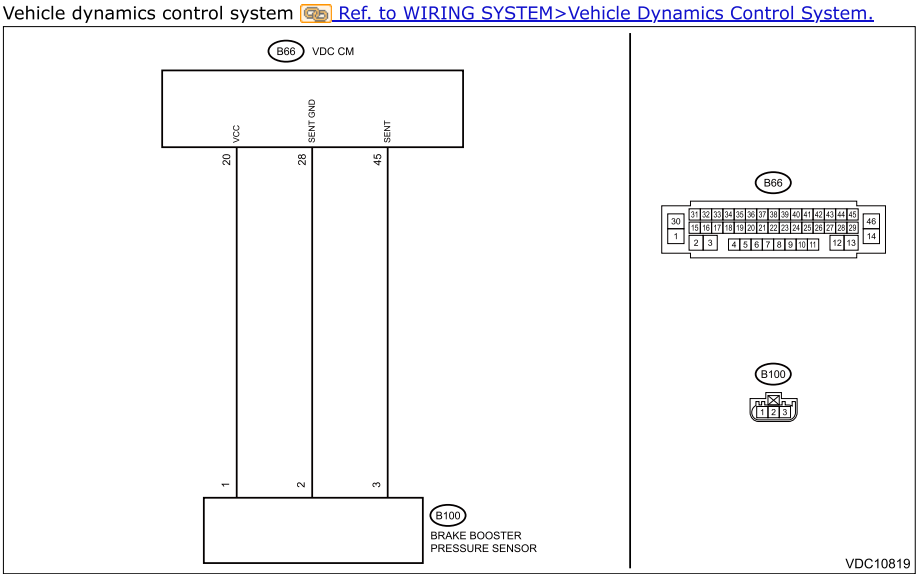
- A fault is detected if the power supply to the brake vacuum pressure sensor is abnormal.
- A fault is detected if the communication signal from the brake vacuum pressure sensor is abnormal.

Trouble symptom:

Brake assist function is not activated when vacuum pressure drops.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the brake booster pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between brake booster pressure sensor connector terminals.
   Connector & terminal
   (B100) No. 1 (+) — (B100) No. 2 (−):

Is the voltage 4.9 — 5.1 V?

Yes — Go to 3.

No — Go to 2.

2. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY SYSTEM.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Measure the resistance between the VDCCM&H/U and the brake booster pressure sensor connector.
   Connector & terminal
   (B66) No. 20 — (B100) No. 1:
   (B66) No. 28 — (B100) No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Repair the harness connector between the VDCCM&H/U and the brake booster pressure sensor.

3. CHECK BRAKE BOOSTER PRESSURE SENSOR SIGNAL SYSTEM.

Measure the resistance between the VDCCM&H/U connector and the brake booster pressure sensor.
Connector & terminal
(B66) No. 45 — (B100) No. 3:

Is the resistance less than 1 Ω?

Yes	Replace the brake booster. Ref. to BRAKE>Brake Booster.
No	Repair the harness connector between the VDCCM&H/U and the brake booster pressure sensor.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1811 SYSTEM

DTC detecting condition:
A fault is detected if VDC control status and ABS control status continue for a long period of time.
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- AVH does not function.
- EyeSight does not operate.

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 & HYDRAULIC CONTROL UNIT (VDC CM&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, read data of [Steering Angle Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the value of [Steering Angle Sensor] between −10 — 10 deg?

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. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle 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, read data of [Lateral G Sensor], [Longitudinal G Sensor], and [Yaw Rate Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the reading of each sensor following value?
[Lateral G Sensor]: −2 — 2 m/s^2
[Longitudinal G Sensor]: −2 — 2 m/s^2
[Yaw Rate Sensor]: −4 — 4 deg/s

Yes — Go to 5.

No — Recheck from step 1, and if the problem is not solved, Go to 8.

5. SET 0 POINT SETTING OF LONGITUDINAL G SENSOR USING SUBARU SELECT MONITOR.

1. Select the [Work Support] using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 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&H/U and steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U). Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.

6. PERFORM DRIVING TEST.

Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.

Does the ABS warning light or VDC warning light illuminate during driving?
Does ABS or VDC operate abnormally?

Yes — Recheck from step 1, and when the warning lights illuminate or improperly operate, replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

No — Go to 7.

7. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, read data of [Lateral G Sensor], [Longitudinal G Sensor], and [Yaw Rate Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the reading of each sensor following value?
[Lateral G Sensor]: −2 — 2 m/s^2
[Longitudinal G Sensor]: −2 — 2 m/s^2
[Yaw Rate Sensor]: −4 — 4 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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

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, read data of [Lateral G Sensor], [Longitudinal G Sensor], and [Yaw Rate Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

When VDCCM&H/U is in a horizontal position, is the reading of each sensor following value?
[Lateral G Sensor]: −1.5 — 1.5 m/s^2
[Longitudinal G Sensor]: −1.5 — 1.5 m/s^2
[Yaw Rate Sensor]: −4 — 4 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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

DTC C1821 BRAKE TEMPERATURE ABNORMAL

DTC detecting condition:
This code is recorded when the estimated value of temperature under braking is above certain threshold and therefore the conditions for control intervention are met.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1821 a current code?

Yes	Stop the vehicle and turn off the engine until the DTC becomes a history code.
No	It results from a temporal increase in brake temperature. Check the brake pads, disc rotors, and brake fluid.

DTC C1921 PARKING POSITION SWITCH CIRCUIT

DTC detecting condition:

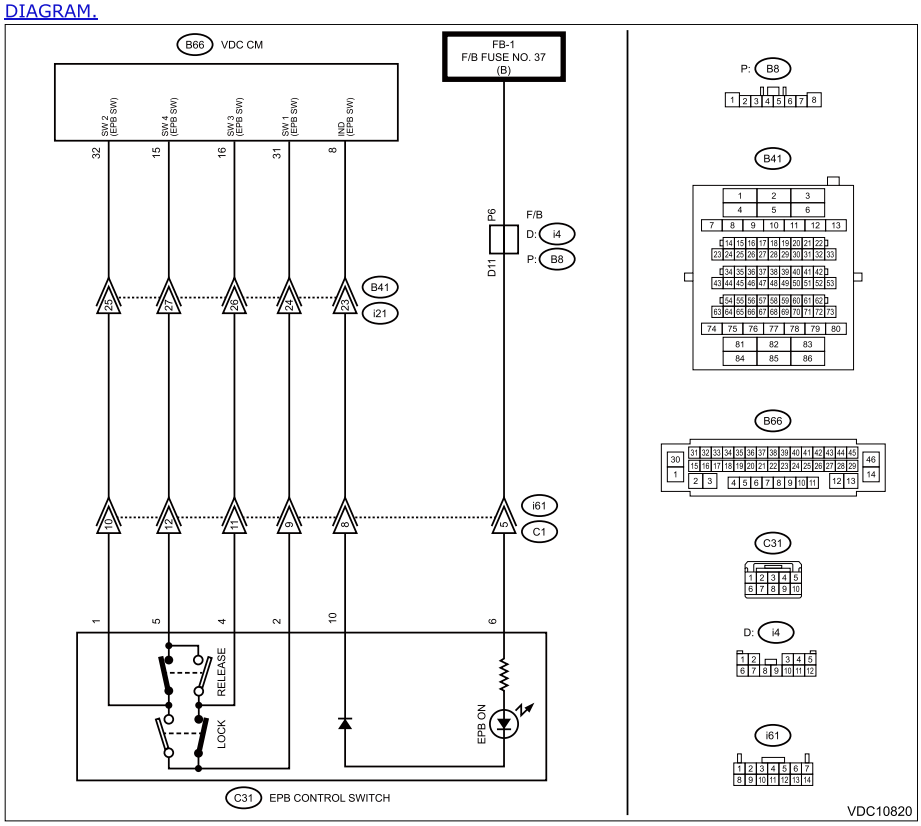
- A fault is detected if the switch was positioned at lock or release continuously for 300 seconds while the vehicle is stopped.
- A fault is detected if an irregular switch condition continues for a predetermined period of time immediately after the switch position is changed. A fault is also detected if the switch condition is not confirmed afterwards.
- A fault is detected if the switch harness is open or shorted.

Trouble symptom:

Parking brake system does not operate.

Wiring diagram:

Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



1. CHECK OPERATION OF ELECTRONIC PARKING BRAKE.

Operate the parking brake switch.

Does the electronic parking brake operate properly?

Yes

Ask the customer whether the following switch operation was performed.

- Operated slowly over one second or more.
- Repeated ON/OFF operation several times within one second.

When the case above is true, the system is normal.

When it is normal, a temporary poor contact or noise interference is a possible cause.

No

Go to 2.

2. CHECK HARNESS (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the VDCCM&H/U and parking brake switch.
3. Measure the resistance between VDCCM&H/U and parking brake switch connector.

Connector & terminal

(B66) No. 15 — (C31) No. 5:
(B66) No. 16 — (C31) No. 4:
(B66) No. 31 — (C31) No. 2:
(B66) No. 32 — (C31) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 3.

No — Repair harness and connector between VDCCM&H/U and parking brake switch connector.

3. CHECK HARNESS (CHECK FOR GROUND SHORT CIRCUIT).

Measure the resistance between the parking brake switch connector and chassis ground.

Connector & terminal

(C31) No. 5 — Chassis ground:
(C31) No. 4 — Chassis ground:
(C31) No. 2 — Chassis ground:
(C31) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Repair ground short of harness between VDCCM&H/U and parking brake switch connector.

4. CHECK HARNESS (CHECK FOR SHORT CIRCUIT TO POWER SUPPLY).

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

Connector & terminal

(C31) No. 5 (+) — Chassis ground (−):
(C31) No. 4 (+) — Chassis ground (−):
(C31) No. 2 (+) — Chassis ground (−):
(C31) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 5.

No — Repair short to power supply of harness between VDCCM&H/U and parking brake switch connector.

5. CHECK PARKING BRAKE SWITCH.

Check the parking brake switch. Ref. to PARKING BRAKE>Parking Brake Switch>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Replace the parking brake switch. Ref. to PARKING BRAKE>Parking Brake Switch.

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1923 AUTO VEHICLE HOLD SWITCH CIRCUIT

DTC detecting condition:
A fault is detected if the AVH switch is pressed and held for a long period of time.
Trouble symptom:
AVH function cannot be set.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1923 a current code?

Yes — Perform the diagnosis for the cockpit control module. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

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.

DTC C1935 IGNITION SWITCH CIRCUIT

DTC detecting condition:

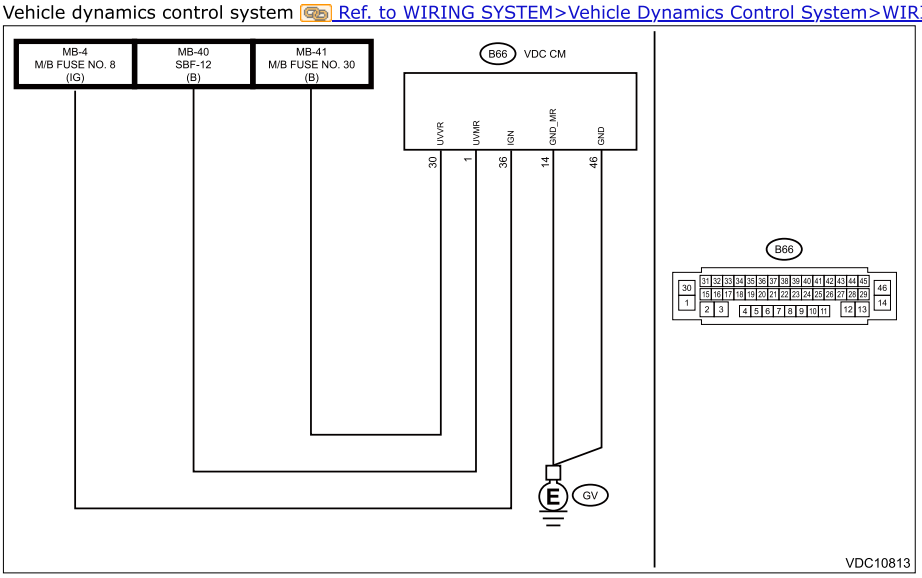
A fault is detected after a predetermined period of time, if the hardware IGN signal and CAN IGN signal were compared and did not match.

Trouble symptom:

Electronic parking brake warning light/brake system warning light illuminates.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



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
   (B66) No. 36 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes — Go to 2.

No — Repair or replace the open circuit in the power supply circuit including the fuse.

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
   (B66) No. 46 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair the VDCCM&H/U ground circuit.

3. CHECK INPUT VOLTAGE OF BODY INTEGRATED UNIT.

Using the Subaru Select Monitor, read data of [IGN voltage] in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Is the voltage 10 — 15 V?

Yes — Go to 4.

No — Perform the diagnosis for the body control system. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.

4. 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 according to the DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 5.

5. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes — Repair the connector.

No — Go to 6.

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

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 C1942 POWER SUPPLY VOLTAGE

DTC detecting condition:

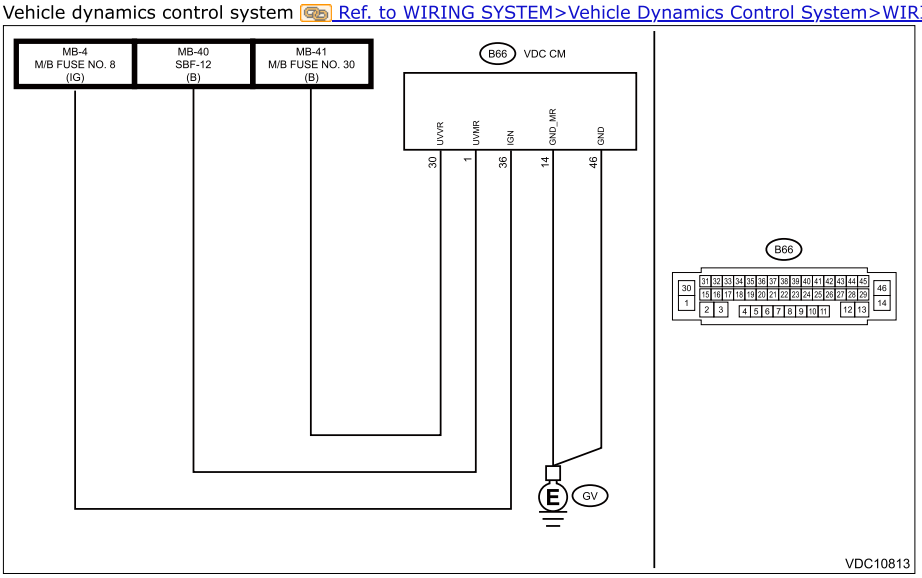
A fault is detected if low voltage is detected during the electronic parking brake operation.

Trouble symptom:

Parking brake system does not operate sometimes.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



1. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Check the battery voltage. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the voltage 10 — 15 V?

Yes — Go to 2.

No — Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

2. 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 connector and chassis ground.

Connector & terminal

(B66) No. 46 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair the VDCCM&H/U ground circuit.

3. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes — Repair the connector.

No — Go to 4.

4. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

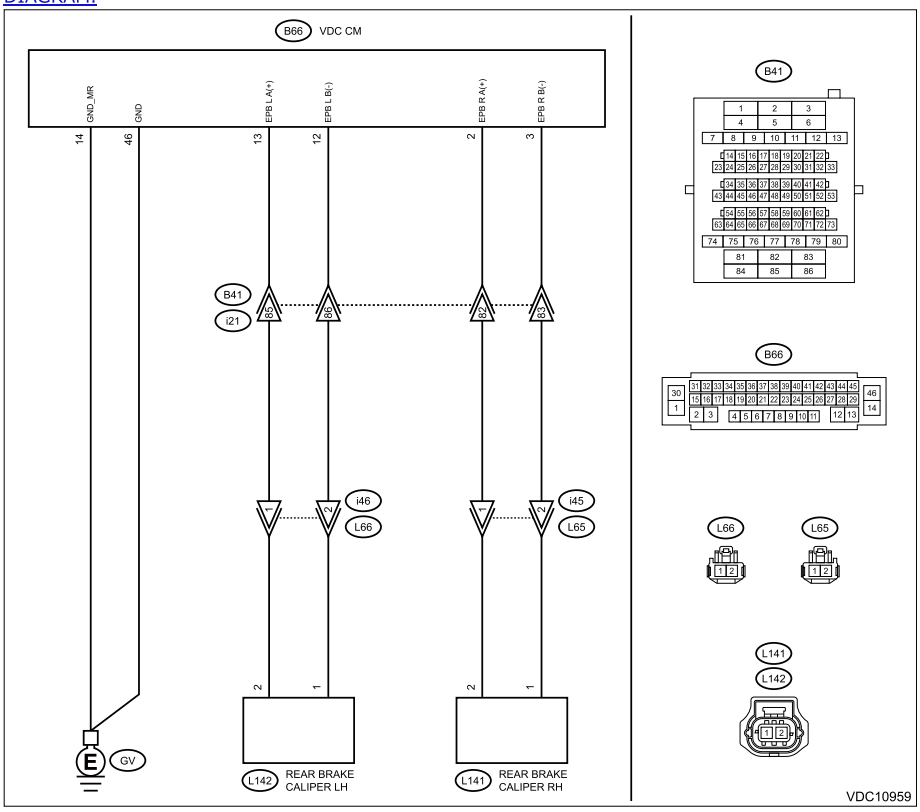
Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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 C1951 ACTUATOR

DTC detecting condition:
A fault is detected if the electronic parking brake operation status does not match the operation request.
Trouble symptom:
Parking brake system does not operate.
Wiring diagram:
Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



1. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Check the battery voltage. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the voltage 10 — 15 V?

Yes — Go to 2.

No — Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery. Check the generator circuit.

2. 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 connector and chassis ground.

Connector & terminal

(B66) No. 46 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair the VDCCM&H/U ground circuit.

3. CHECK HARNESS (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from rear brake caliper.
3. Measure the resistance between VDCCM&H/U and rear brake caliper connector.

Connector & terminal

(B66) No. 2 — (L141) No. 2:
(B66) No. 3 — (L141) No. 1:
(B66) No. 13 — (L142) No. 2:
(B66) No. 12 — (L142) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Repair harness and connector between VDCCM&H/U and rear brake caliper connector.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes — Repair the connector.

No — Go to 5.

5. CHECK DRIVER'S DOOR SWITCH.

Check the driver's door switch. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR SWITCH.

Is the driver's door switch normal?

Yes	Go to 6.
No	Repair the driver's door switch or circuit.

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

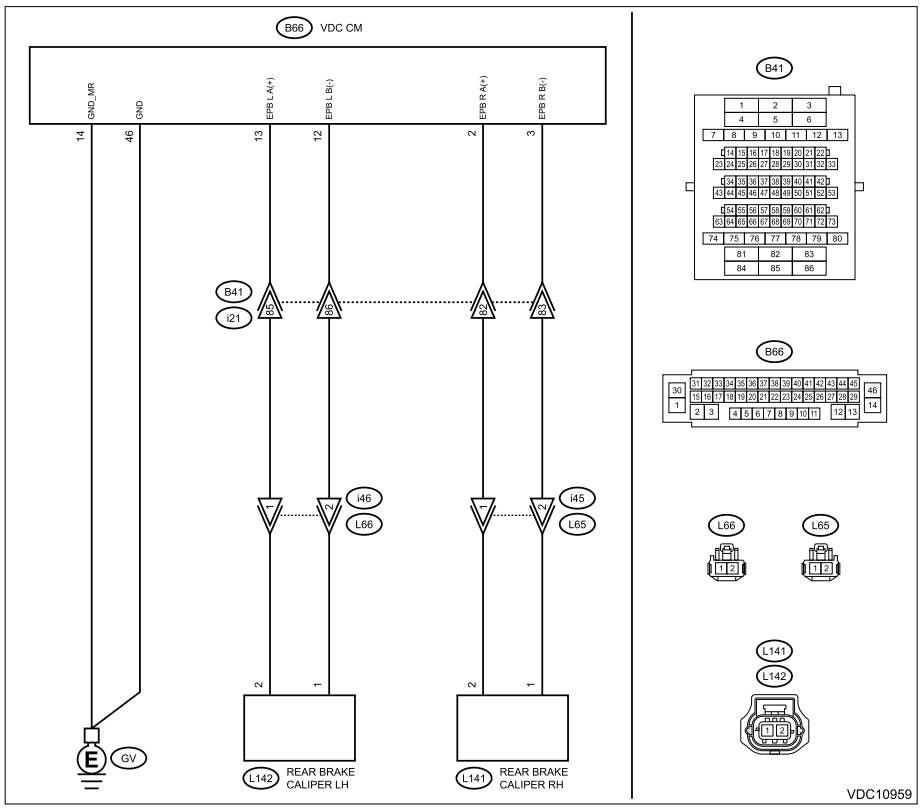
Is any other DTC displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
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 C1954 RH ACTUATOR

DTC detecting condition:
A fault is detected if mechanical sticking or abnormal operation of the rear brake caliper RH is detected.
Trouble symptom:
Parking brake system does not operate.
Wiring diagram:
Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



1. CHECK HARNESS (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the VDCCM&H/U and rear brake caliper RH.
3. Measure the resistance between VDCCM&H/U and rear brake caliper RH connector.
   Connector & terminal
   (B66) No. 2 — (L141) No. 2:
   (B66) No. 3 — (L141) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair harness and connector between VDCCM&H/U and rear brake caliper RH connector.

2. CHECK HARNESS (CHECK FOR GROUND SHORT CIRCUIT).

Measure the resistance between the rear brake caliper RH connector and chassis ground.
Connector & terminal
(L141) No. 1 — Chassis ground:
(L141) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair ground short of harness between VDCCM&H/U and rear brake caliper RH connector.

3. CHECK HARNESS (CHECK FOR SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between the rear brake caliper RH connector and chassis ground.
   Connector & terminal
   (L141) No. 1 (+) — Chassis ground (−):
   (L141) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 4.

No — Repair short to power supply of harness between VDCCM&H/U and rear brake caliper RH connector.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes — Repair the connector.

No — Go to 5.

5. CHECK REAR BRAKE CALIPER.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from rear brake caliper RH.
3. Measure the resistance between rear brake caliper RH terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 100 Ω?

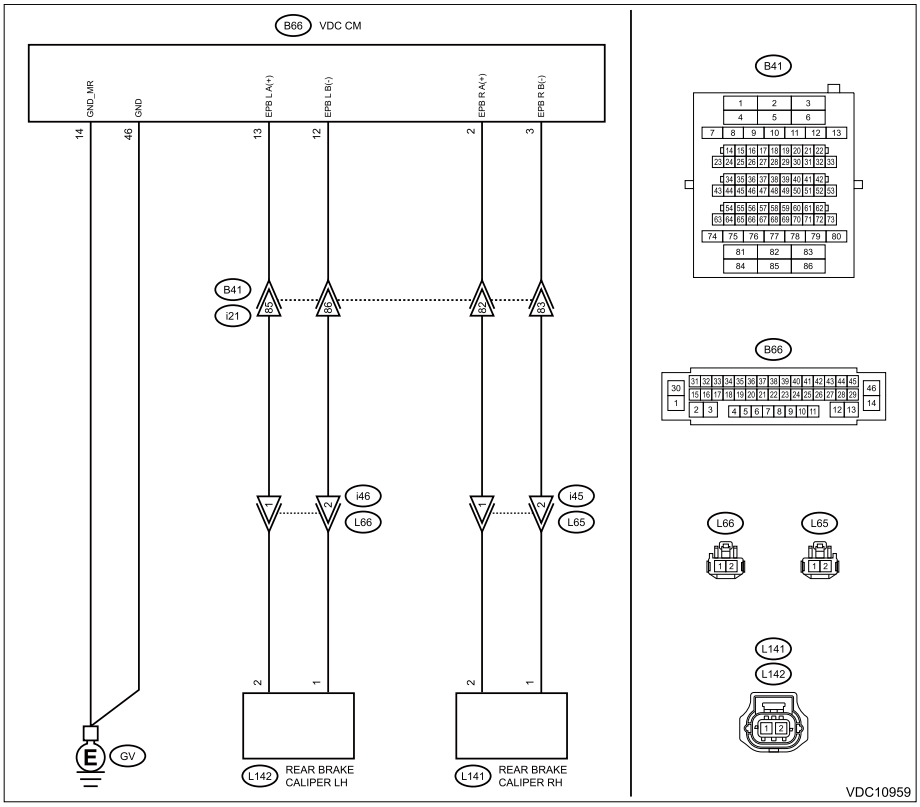
Yes — Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

No — Replace the parking brake actuator assembly RH. Ref. to PARKING BRAKE>Parking Brake Actuator.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1955 LH ACTUATOR

DTC detecting condition:
A fault is detected if mechanical sticking or abnormal operation of the rear brake caliper LH is detected.
Trouble symptom:
Parking brake system does not operate.
Wiring diagram:
Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



1. CHECK HARNESS (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the VDCCM&H/U and rear brake caliper LH.
3. Measure the resistance between VDCCM&H/U and rear brake caliper LH connector.
   Connector & terminal
   (B66) No. 13 — (L142) No. 2:
   (B66) No. 12 — (L142) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair harness and connector between VDCCM&H/U and rear brake caliper LH connector.

2. CHECK HARNESS (CHECK FOR GROUND SHORT CIRCUIT).

Measure the resistance between the rear brake caliper LH connector and chassis ground.
Connector & terminal
(L142) No. 1 — Chassis ground:
(L142) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair ground short of harness between VDCCM&H/U and rear brake caliper LH connector.

3. CHECK HARNESS (CHECK FOR SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between the rear brake caliper LH connector and chassis ground.
   Connector & terminal
   (L142) No. 1 (+) — Chassis ground (−):
   (L142) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Repair short to power supply of harness between VDCCM&H/U and rear brake caliper LH connector.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes	Repair the connector.
No	Go to 5.

5. CHECK REAR BRAKE CALIPER.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from rear brake caliper LH.
3. Measure the resistance between rear brake caliper LH terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 100 Ω?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the parking brake actuator assembly LH. Ref. to PARKING BRAKE>Parking Brake Actuator.

DTC C1956 RH ACTUATOR CIRCUIT

DTC detecting condition:

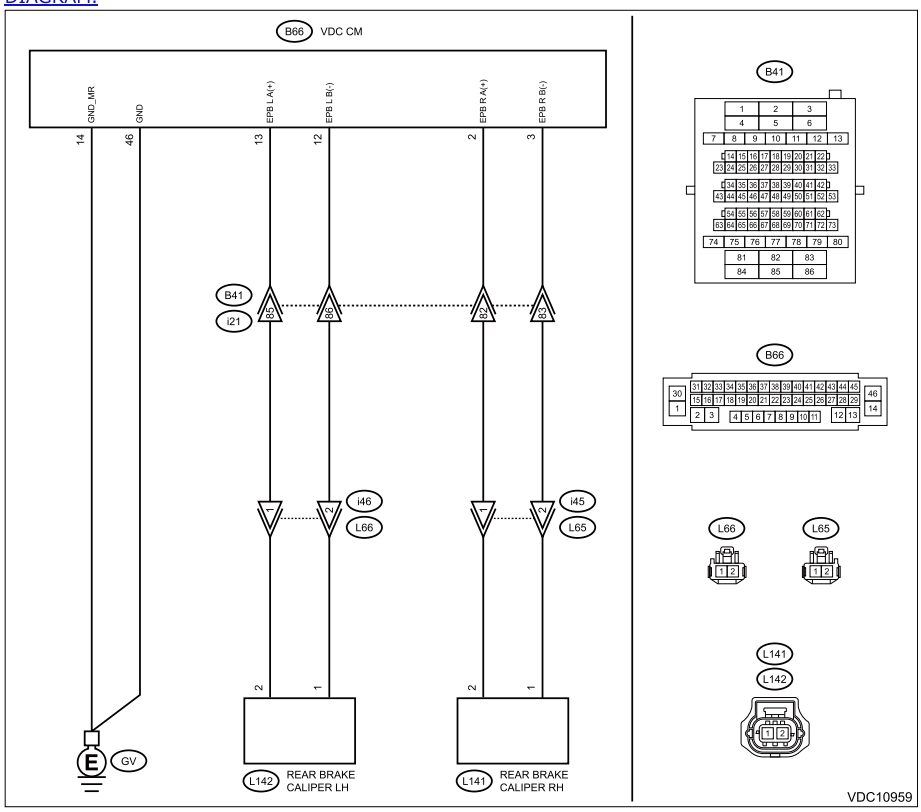
- A fault is detected, if the motor control mismatch occurs during the motor operation.
- A fault is detected if the motor circuit or harness is open or shorted.

Trouble symptom:

Parking brake system does not operate.

Wiring diagram:

Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



Note:

This DTC may be stored when the rear brake caliper connector is disconnected regardless of the ignition switch condition (ON/OFF). Perform the Clear Memory after diagnosis if a DTC is recorded. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

1. CHECK HARNESS (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the VDCCM&H/U and rear brake caliper RH.
3. Measure the resistance between VDCCM&H/U and rear brake caliper RH connector.

Connector & terminal

(B66) No. 2 — (L141) No. 2:

(B66) No. 3 — (L141) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 2.

No — Repair harness and connector between VDCCM&H/U and rear brake caliper RH connector.

2. CHECK HARNESS (CHECK FOR GROUND SHORT CIRCUIT).

Measure the resistance between the rear brake caliper RH connector and chassis ground.
Connector & terminal
(L141) No. 1 — Chassis ground:
(L141) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Repair ground short of harness between VDCCM&H/U and rear brake caliper RH connector.

3. CHECK HARNESS (CHECK FOR SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between the rear brake caliper RH connector and chassis ground.
   Connector & terminal
   (L141) No. 1 (+) — Chassis ground (−):
   (L141) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 4.

No — Repair short to power supply of harness between VDCCM&H/U and rear brake caliper RH connector.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes — Repair the connector.

No — Go to 5.

5. CHECK REAR BRAKE CALIPER.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from rear brake caliper RH.
3. Measure the resistance between rear brake caliper RH terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 100 Ω?

Yes — Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

No — Replace the parking brake actuator assembly RH. Ref. to PARKING BRAKE>Parking Brake Actuator.

DTC C1957 LH ACTUATOR CIRCUIT

DTC detecting condition:

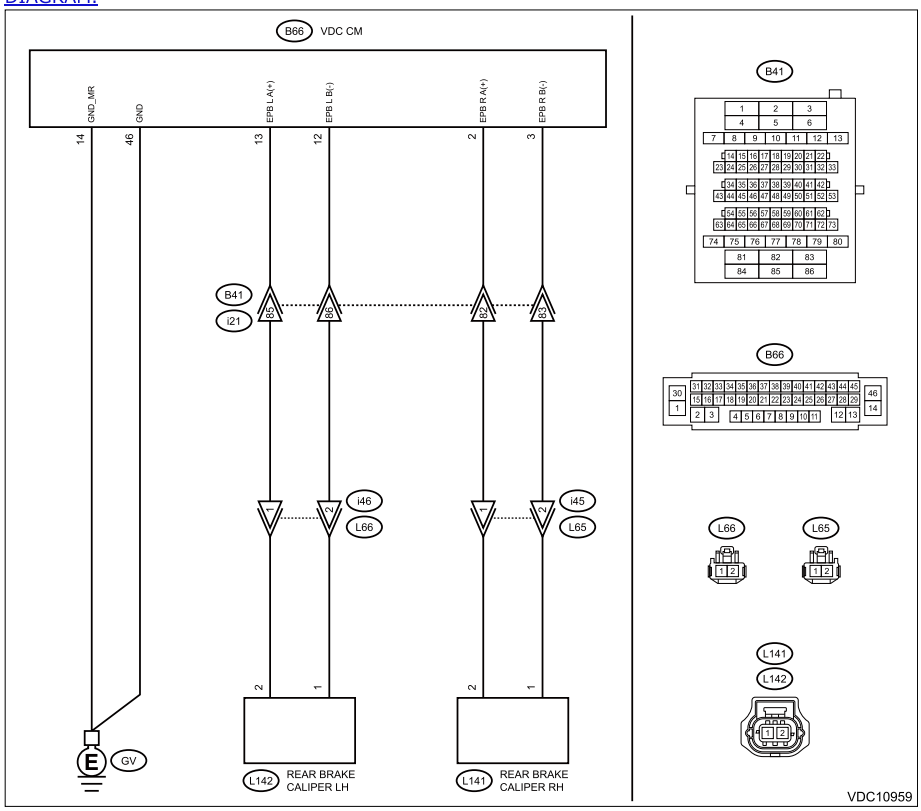
- A fault is detected, if the motor control mismatch occurs during the motor operation.
- A fault is detected if the motor circuit or harness is open or shorted.

Trouble symptom:

Parking brake system does not operate.

Wiring diagram:

Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System>WIRING DIAGRAM.



Note:

This DTC may be stored when the rear brake caliper connector is disconnected regardless of the ignition switch condition (ON/OFF). Perform the Clear Memory after diagnosis if a DTC is recorded. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

1. CHECK HARNESS (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the VDCCM&H/U and rear brake caliper LH.
3. Measure the resistance between VDCCM&H/U and rear brake caliper LH connector.

Connector & terminal

(B66) No. 13 — (L142) No. 2:

(B66) No. 12 — (L142) No. 1:

Is the resistance less than 1 Ω?

Yes — Go to 2.

No — Repair harness and connector between VDCCM&H/U and rear brake caliper LH connector.

2. CHECK HARNESS (CHECK FOR GROUND SHORT CIRCUIT).

Measure the resistance between the rear brake caliper LH connector and chassis ground.
Connector & terminal
(L142) No. 1 — Chassis ground:
(L142) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Repair ground short of harness between VDCCM&H/U and rear brake caliper LH connector.

3. CHECK HARNESS (CHECK FOR SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between the rear brake caliper LH connector and chassis ground.
   Connector & terminal
   (L142) No. 1 (+) — Chassis ground (−):
   (L142) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 4.

No — Repair short to power supply of harness between VDCCM&H/U and rear brake caliper LH connector.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of power supply circuit, ground circuit and VDCCM&H/U connector?

Yes — Repair the connector.

No — Go to 5.

5. CHECK REAR BRAKE CALIPER.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from rear brake caliper LH.
3. Measure the resistance between rear brake caliper LH terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 100 Ω?

Yes — Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

No — Replace the parking brake actuator assembly LH. Ref. to PARKING BRAKE>Parking Brake Actuator.

DTC C1983 HIGH FREQUENCY OPERATION

DTC detecting condition:
This malfunction is stored if the electronic parking brake is operated with high frequency in a short period of time.
Trouble symptom:
Parking brake system does not operate sometimes.

1. CHECK OUTPUT OF AMBIENT SENSOR USING SUBARU SELECT MONITOR.

Using the Subaru Select Monitor, read data of [Ambient Temp Sensor] in the [Data Monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Is the reading of [Ambient Temp Sensor] within the range of ±10°C (50°F) to the ambient temperature?

Yes — Go to 2.

No — Repair the ambient sensor circuit.

2. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. Stop the vehicle for approximately one hour.
3. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>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 3.

3. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1984 BRAKE MAINTENANCE MODE

DTC detecting condition:
This malfunction is stored when the brake maintenance mode is in progress.
Trouble symptom:
Parking brake system does not operate.

Note:
When any other DTC is detected, start the diagnosis with the DTC.

1. CHECK ELECTRONIC PARKING MODE.

Is the brake maintenance mode in progress?

Yes — Currently, it is normal. Although DTC C1984 is input during the brake maintenance mode, it is normal. Ref. to PARKING BRAKE>Parking Brake System>OPERATION > BRAKE MAINTENANCE MODE.

No — Go to 2.

2. CHECK OPERATION OF ELECTRONIC PARKING BRAKE.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Apply the electronic parking brake several times.
3. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC stored even though the electronic parking brake does not operate or the electronic parking brake operates?

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 3.

3. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
Perform the diagnosis from step 1 again, and if the same DTC is stored, replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

No — Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

DTC C1985 FORBIDDEN STATE OF DYNAMIC ACTUATOR OPERATION

DTC detecting condition:
This malfunction is stored if dynamic parking through the electronic parking brake actuator does not operate.
Trouble symptom:
Parking brake system does not operate.

1. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

Note:
This DTC is stored for other malfunctions.

No — Go to 2.

2. CHECK OPERATION OF ELECTRONIC PARKING BRAKE.

1. Using the Subaru Select Monitor, perform the clear memory of [Brake Control]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.

Does it operate properly?

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&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT

Note:
Refer to "CENTRAL GATEWAY (DIAGNOSTICS)" for diagnostic procedure. Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

DTC U0079 CONTROL MODULE COMMUNICATION BUS "G" OFF

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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.

DTC U0101 LOST COMMUNICATION WITH TCM

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

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 U0129 LOST COMMUNICATION WITH BRAKE SYSTEM 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 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 U0146 LOST COMMUNICATION WITH SERIAL DATA GATEWAY MODULE "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 U0151 LOST COMMUNICATION WITH RESTRAINTS 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 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.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY 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 U0418 INVALID DATA RECEIVED FROM BRAKE SYSTEM 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 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 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.

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 U0452 INVALID DATA RECEIVED FROM RESTRAINTS 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 U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY 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 U1120 LOST COMMUNICATION WITH AUTOSTART STOP 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 U1129 LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE PU-CAN

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 U1418 INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-CAN

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) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1469 INVALID DATA RECEIVED FROM AUTOSTART STOP 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 U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY

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 U1C07 INVALID AUTHENTICATION DATA RECEIVED FROM ECM/PCM PU-BUS

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 U1C0A INVALID AUTHENTICATION DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE PU-BUS

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 U1C0B INVALID AUTHENTICATION DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE CH-BUS

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 U1C0C INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT PU-BUS

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 U1C0F INVALID AUTHENTICATION DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE CH-BUS

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. **Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**

INSPECTION

Symptoms		Main probable cause	Other probable cause
Poor brake performance	Long braking/stopping distance	• VDCCM&H/U • Brake pad • Aeration to brake line • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections	• 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	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Incorrect wiring or piping connections	• 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	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Parking brake • Axle and wheels • Brake pedal play	• 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	• Aeration to brake line • Brake pedal play	• VDCCM&H/U • Master cylinder • Brake caliper • Brake pad • Brake pipe • Brake booster
	Vehicle vertical pitching	• VDCCM&H/U • Road surface (uneven) • Suspension play or fatigue (reduced damping) • Incorrect wiring or piping connections	• 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.
Poor brake performance	Unstable braking	• 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	• 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)
Vibration or noise • When braking suddenly • When accelerating rapidly • While driving on a slippery road	Excessive brake pedal vibration	• Road surface (uneven) • Incorrect wiring or piping connections	• VDCCM&H/U • Brake booster • Suspension play or fatigue (reduced damping)
	Noise from VDCCM&H/U	• VDCCM&H/U (mount bushing) • Defective ABS wheel speed sensor or sensor gap • Brake pipe	• VDCCM&H/U • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U.
	Noise from the front side of vehicle	• VDCCM&H/U (mount bushing) • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper	• Axle and wheels • Tire specifications, tire wear and air pressures

Symptoms		Main probable cause	Other probable cause
		• Brake pad • Disc rotor • Brake pipe • Brake booster • Suspension play or fatigue (reduced damping)	
	Noise from the rear side of vehicle	• Defective ABS wheel speed sensor or sensor gap • Brake caliper • Brake pad • Disc rotor • Parking brake • Brake pipe • Suspension play or fatigue (reduced damping)	• Axle and wheels • Tire specifications, tire wear and air pressures
Engine does not accelerate or goes into a stall when accelerating suddenly or driving on a slippery surface.		• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Parking brake • Incorrect wiring or piping	• Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Brake pipe
Poor change-direction-operation stability of TCS	Deviation to right or left direction	• 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	• Disc rotor • Brake pipe • Axle and wheels • Suspension play or fatigue (reduced damping)
	Vehicle spin	• 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	• Brake caliper • Brake pipe
Steering wheel drag while driving		• 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. • Incorrect wiring or piping connections • Power steering system	• Brake caliper • Brake pad • Disc rotor • Wheel alignment • Road surface (uneven) • Road with crowns or banks • Suspension play or fatigue (reduced damping) • Tire specifications, tire wear and air pressures

Symptoms		Main probable cause	Other probable cause
VDC operates while driving normally.		• 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	
VDC OFF indicator light does not illuminate when the VDC OFF switch is operated.		• Harness • Combination meter • Defective cockpit control module	
Parking brake warning light/brake warning light (EBD warning light) illuminate.	Parking brake system does not operate.	• Defective parking brake switch • Malfunction in VDCCM&H/U • Defective CAN communication	
	AVH function and accelerator interlocking release function do not operate.	• Defective cockpit control module • Malfunction signal reception from ECM • Malfunction signal reception from TCM • Malfunction signal reception from VDCCM • Defective parameter selection for VDCCM&H/U • CAN signal not received from ECM • CAN signal not received from TCM • CAN signal not received from body integrated unit • Defective longitudinal G sensor	
When the AVH function is set to ON, drugging of brake may occur when the vehicle starts to move.		—	Driver’s seat belt is not fastened.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)

EBB(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Warning Light Illumination Pattern
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Diagnostic Trouble Code (DTC)
11. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes — Go to 2.

No — Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes — Go to 3.

No — Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK WARNING LIGHT.

Check the lighting condition of brake warning light (EBD warning light)/electronic parking brake warning light in the combination meter. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Warning Light Illumination Pattern>INSPECTION.

Do the brake warning light (EBD warning light)/electronic parking brake warning light illuminate?

Yes — Go to 4.

No — Currently, it is normal.

4. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Electric Brake Booster].

Note:
For detailed operation procedures, refer to "Help" of application.

Is communication possible?

Yes — Go to 5.

No — Check the communication circuit. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

5. CHECK DTC.

Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are DTC, time stamp and freeze frame data displayed?

Yes	Record the DTC, time stamp and freeze frame data. Go to 6.
No	Currently, it is normal.

6. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the faulty parts.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Repeat step 6 until DTC is not shown.
No	Finish the diagnosis.

CHECK

Check the following item about the vehicle's state.

<table>
<tr><th colspan="5">Brake Control System Electronic Controlled Brake System Check List for Interview</th></tr>
<tr><td rowspan="3">Customer's Name</td><td rowspan="3"></td><td>Registration date</td><td></td></tr>
<tr><td>Vehicle bring-in date</td><td></td></tr>
<tr><td>Date vehicle return (scheduled)</td><td></td></tr>
<tr><td>Registration No.</td><td></td><td>Odometer reading</td><td></td></tr>
<tr><td>Frame No.</td><td></td><td>-</td><td></td></tr>
<tr><td>Date when problem occurred</td><td colspan="3"></td></tr>
<tr><td>Frequency of trouble occurrence</td><td colspan="3">❑ Continuous
❑ Occasionally (times a day / week / month)</td></tr>
<tr><td>Main area where the vehicle is used</td><td colspan="3">❑ Inner city
❑ Suburbs
❑ Mountains
❑ Other ( )</td></tr>
<tr><td>Frequency of use</td><td colspan="3">❑ Almost everyday
❑ Occasionally (times a day / week / month)</td></tr>
<tr><td>Questions to ask in the interview</td><td colspan="3">Conditions before problem occurred (Were there any phenomenon or operation different from usual?)
•
Conditions when problem occurred (as much details as possible, such as when, where, and what happened)
•
Brake pedal feel when problem occurred (brake pedal feels hard, heavy, or soft)
•
Conditions after problem occurred (What did the customer do? What occurred in the vehicle, such as illumination of any warning indicators, whether or not the vehicle was able to be started, etc.)
•</td></tr>
<tr><td>Driving condition</td><td colspan="3">Vehicle speed (km/h)
❑ At starting
❑ While accelerating
❑ When driving at a normal, constant speed
❑ While decelerating
❑ When braking
❑ When stopped
❑ When parked
❑ When turning
❑ Other ( )</td></tr>
<tr><td>Road condition</td><td colspan="3">❑ On level ground (no slope)
❑ On slope road (up•down)
❑ Dry paved road
❑ Wet paved road
❑ Irregular paved road
❑ Gravel road
❑ Snow•Compacted snow•Frozen road
❑ Over step•Curb
❑ Other ( )</td></tr>
<tr><td rowspan="3">Operation state</td><td colspan="3">Brake pedal operation:
❑ Soft braking
❑ Sudden braking
❑ Left foot braking
❑ No braking operation</td></tr>
<tr><td colspan="3">Accelerator pedal operation:
❑ When depressing the pedal
❑ When applying constant pressure on the pedal
❑ When loosening the pressure on the pedal
❑ When releasing the pedal</td></tr>
<tr><td colspan="3">Switch operation:</td></tr>
</table>

	❑ VDC OFF switch ❑ Electronic parking brake switch ❑ AVH switch
Vehicle status	Vehicle use condition: ❑ Unattended (hours•days) ❑ Engine start (when IG ON) ❑ Engine start ❑ (minutes after) engine started ❑ (minutes after) driving started ❑ When the system stopped
	Engine condition: ❑ While engine is stopped ❑ While engine is running
	Shifter position (indicator) state: ❑ Shifter position ( ) ❑ Shifter position (→ when operated) ❑ No display ❑ Unclear
	Warning light illumination state: ❑ ABS warning light ❑ Brake warning light (EBD warning light)/electronic parking brake warning light ❑ Electronic parking brake operation indicator light ❑ VDC warning light & VDC indicator light ❑ VDC OFF indicator light ❑ AVH ON/operation indicator light ❑ Other ( )
	Warning buzzer sound state: ❑ Yes ❑ No
	Other (electrical load•fuel level state, etc.): ❑ Other ( ) ❑ Other ( ) ❑ Other ( )

ELECTRIC BRAKE BOOSTER (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.**

2. MODULE REGISTRATION

When the electric brake booster CM is replaced, perform the module registration. Ref. to COMMON (DIAGNOSTICS)>Unit Registration.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > General Description

INSPECTION

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. RELAY AND FUSE

Check the relay and fuse.

3. GROUND

Check the installation of the ground bolt for the electric brake booster CM.

4. ELECTRIC BRAKE BOOSTER CM CONNECTOR

Check the connecting condition of the electric brake booster CM connector.

5. BRAKE FLUID

1. Check the brake fluid level.
2. Check the brake fluid for leaks.

6. BRAKE DRAG

Check for brake drag.

7. 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.

8. BRAKE PEDAL

Check the installation condition of brake pedal. Ref. to BRAKE>Brake Pedal.

9. PARKING BRAKE ASSEMBLY

Check the parking brake assembly. Ref. to PARKING BRAKE>General Description>COMPONENT.

10. TIRES

Check the tire specifications, tire wear and air pressure. Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

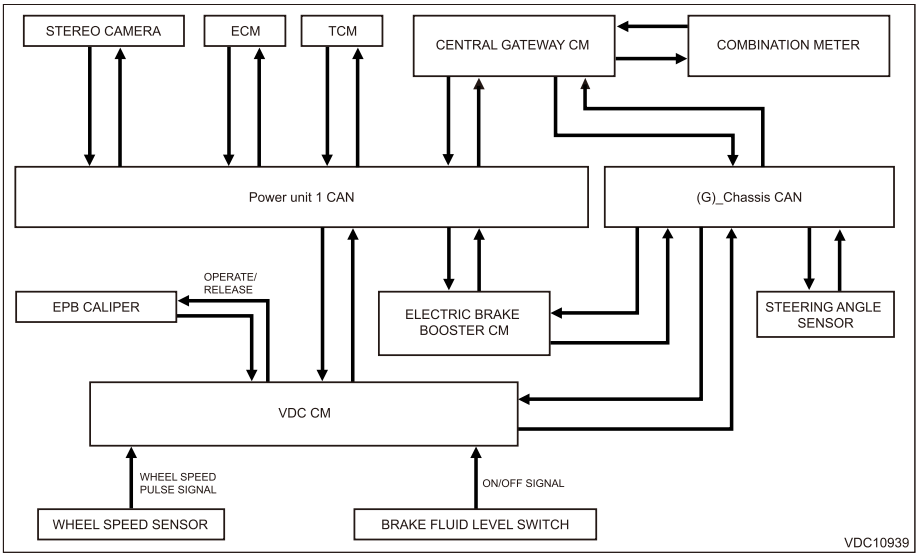
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

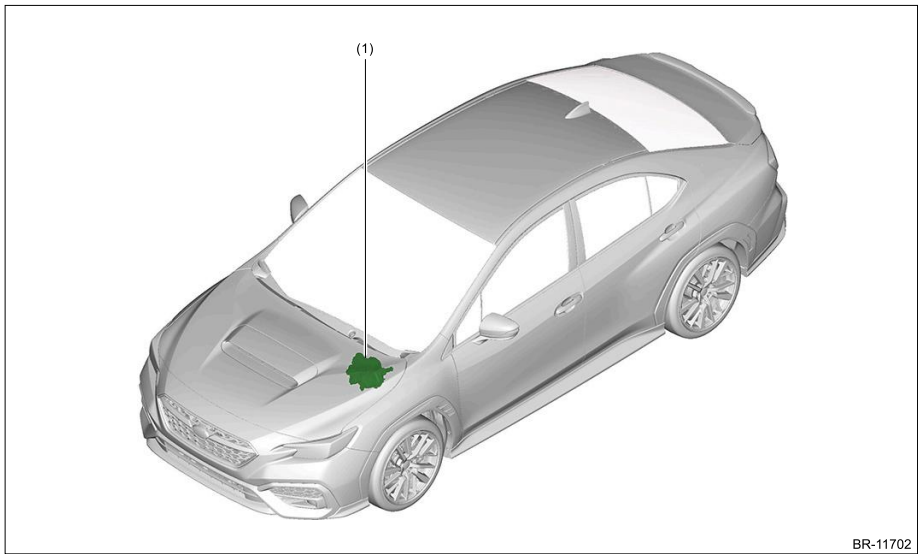
ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM



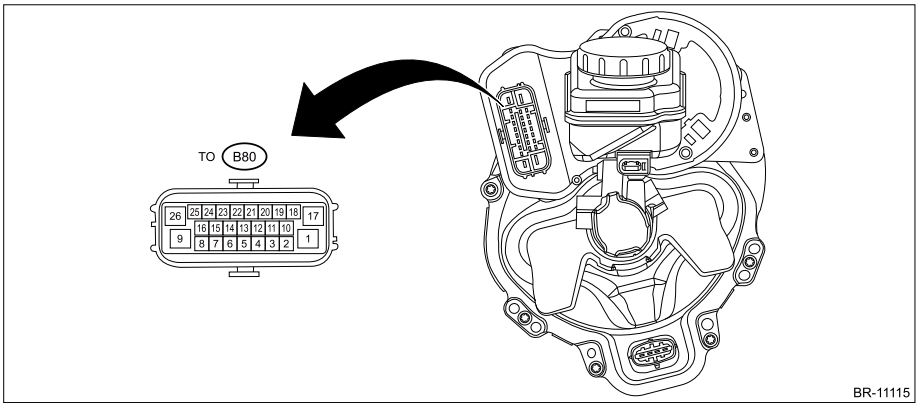
If the electric brake booster lost its boost function, VDC will back up the boost function.

LOCATION



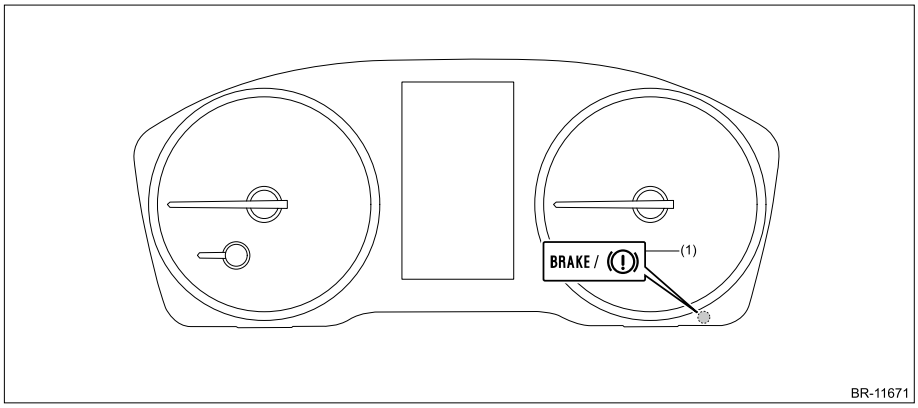
(1) Electric brake booster CM (master cylinder)

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(B80) No. 1	Main power supply	Always	Battery voltage
(B80) No. 2	Booster stroke sensor power supply	Always	Battery voltage
(B80) No. 3	—	—	—
(B80) No. 4	—	—	—
(B80) No. 5	—	—	—
(B80) No. 6	—	—	—
(B80) No. 7	—	—	—
(B80) No. 8	Booster stroke sensor GND	—	—
(B80) No. 9	GND	—	—
(B80) No. 10	(G)_Chassis CAN L	—	—
(B80) No. 11	—	—	—
(B80) No. 12	—	—	—
(B80) No. 13	—	—	—
(B80) No. 14	—	—	—
(B80) No. 15	—	—	—
(B80) No. 16	Power unit 1 CAN L	—	—
(B80) No. 17	—	—	—
(B80) No. 18	(G)_Chassis CAN H	—	—
(B80) No. 19	—	—	—
(B80) No. 20	Ignition power supply	Ignition switch ON	Ignition power supply
(B80) No. 21	Brake light switch	When the brake pedal is operated	Brake ON: Battery voltage Brake OFF: Ground
(B80) No. 22	Booster stroke sensor signal 1	—	—
(B80) No. 23	Booster stroke sensor signal 2	—	—
(B80) No. 24	—	—	—
(B80) No. 25	Power unit 1 CAN H	—	—
(B80) No. 26	—	—	—

INSPECTION



(1) Brake warning light (EBD warning light)/electronic parking brake warning light

BRAKE WARNING LIGHT (EBD WARNING LIGHT) / ELECTRONIC PARKING BRAKE WARNING LIGHT DOES NOT GO OFF

Detecting condition:
Defective combination meter
Trouble symptom:
The brake warning light (EBD warning light)/electronic parking brake warning light does not go off when the engine is started.

1. READ DTC.

Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 3.

No — Perform the diagnosis for LAN system.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

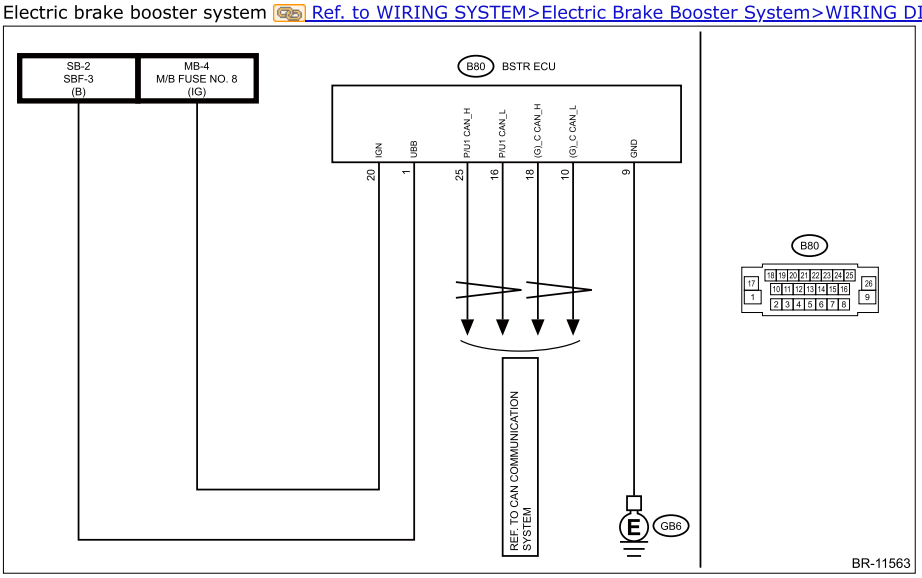
Is the check result OK?

Yes — Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>BRAKE WARNING LIGHT (EBD WARNING LIGHT) / ELECTRONIC PARKING BRAKE WARNING LIGHT DOES NOT GO OFF.

No — Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.

INSPECTION

Detecting condition:
Defective harness connector
Trouble symptom:
Communication is impossible between electric brake booster CM and Subaru Select Monitor.
Wiring diagram:
Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes — Go to 2.

No — Turn the ignition switch to ON, and select the [Electric Brake Booster] 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. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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 ELECTRIC BRAKE BOOSTER CM CONNECTOR.

Turn the ignition switch to OFF.

Is the electric brake booster CM connector inserted into the electric brake booster CM until the clamp locks?

Yes	Go to 5.
No	Insert the electric brake booster CM connector into the VDCCM&H/U.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to the electric brake booster system can be executed normally.

Is the [Select Function] screen displayed?

Yes	Check the DTC of the electric brake booster system. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>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 electric brake booster connector and chassis ground.
   Connector & terminal
   (B80) No. 1 (+) — Chassis ground (−):
   (B80) No. 20 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 9.
No	Repair the open circuit of harness between electric brake booster CM and battery.

9. CHECK HARNESS CONNECTOR BETWEEN ELECTRIC BRAKE BOOSTER CM AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the electric brake booster CM.
3. Measure the resistance of harness between electric brake booster CM connector and chassis ground.
   Connector & terminal
   (B80) No. 9 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of the electric brake booster CM 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 electric brake booster CM. Ref. to BRAKE>Brake Booster.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor>LIST.**

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit
Main Power Supply Voltage	Voltage supplied to electric brake booster	V
Stroke Sensor Power Supply Voltage	Voltage supplied to stroke sensor	V
IGN Power Supply Signal	Input condition of ignition signal	ON or OFF
Brake Lamp Switch	Brake light switch ON/OFF status	ON or OFF
Driver stroke	Amount of brake pedal stroke	mm
Input Rod Position	Amount of input rod movement	mm
Output Rod Position	Amount of output rod position movement	mm
Actuator Position	Amount of actuator movement	mm
Motor Drive Circuit Temperature Sensor 1	Motor drive circuit temperature (1)	°C
Motor Drive Circuit Temperature Sensor 2	Motor drive circuit temperature (2)	°C
Rotation angular velocity	Motor rotation angular velocity	rad/s
Motor torque	Amount of torque generated by motor	Nm
Vehicle Speed	Vehicle speed	km/h
ABS Operation Flag	Flag of ABS control status	ON or OFF
Master Cylinder Fluid Pressure	Value of brake fluid pressure in master cylinder	Mpa
Master Cylinder Fluid Pressure Status	Status of master cylinder fluid pressure	Not Initialized, Normal or Abnormal
Vehicle Speed Status	Status of vehicle speed	Not Initialized, Normal or Abnormal
IGN Information	Ignition status	ON or OFF
Automatic Brake Operation Flag	Flag showing automatic braking is in operation	ON or OFF
Automatic Brake Function Status	Status of automatic braking function	Not Initialized, Normal or Abnormal
Driver Stroke Status	Status of driver request stroke value	Not Initialized, Normal or Abnormal
Output Rod Stroke Function Status	Status of output rod stroke value	Not Initialized, Normal or Abnormal
Brake Pedal Operation Flag	Flag of brake pedal operation	ON or OFF
Brake Pedal Operation Flag Status	Status of brake pedal operation flag	Not Initialized, Normal or Abnormal
Brake Booster Warning Light	Electric brake booster warning light	ON or OFF
Total Operation Number	Total number of driver braking operations and automatic braking operations	Time
Automatic Brake Operation Number	Number of automatic braking operations	Time

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Freeze Frame Data>LIST.**

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit
Trip Count	Total number of ignition switch ON	Time
Count	Counter	-
Time Count	Elapsed time after ignition switch is turned to ON	ms
Main Power Supply Voltage	Voltage supplied to electric brake booster	V
Stroke Sensor Power Supply Voltage	Voltage supplied to stroke sensor	V
IGN Power Supply Signal	Input condition of ignition signal	ON or OFF
Driver stroke	Amount of brake pedal stroke	mm
Input Rod Position	Amount of input rod movement	mm
Output Rod Position	Amount of output rod position movement	mm
Actuator Position	Amount of actuator movement	mm
Motor Drive Circuit Temperature Sensor 1	Motor drive circuit temperature (1)	°C
Motor Drive Circuit Temperature Sensor 2	Motor drive circuit temperature (2)	°C
Rotation angular velocity	Motor rotation angular velocity	rad/s
Motor torque	Amount of torque generated by motor	Nm
Vehicle Speed	Vehicle speed	km/h
ABS Operation Flag	Flag of ABS control status	ON or OFF
Master Cylinder Fluid Pressure	Value of brake fluid pressure in master cylinder	Mpa
Master Cylinder Fluid Pressure Status	Status of master cylinder fluid pressure	Not Initialized, Normal or Abnormal
Vehicle Speed Status	Status of vehicle speed	Not Initialized, Normal or Abnormal
IGN Information	Ignition status	ON or OFF
Automatic Brake Operation Flag	Flag showing automatic braking is in operation	ON or OFF
Driver Stroke Status	Status of driver request stroke value	Not Initialized, Normal or Abnormal
Output Rod Stroke Function Status	Status of output rod stroke value	Not Initialized, Normal or Abnormal
Brake Pedal Operation Flag	Flag of brake pedal operation	ON or OFF
Brake Pedal Operation Flag Status	Status of brake pedal operation flag	Not Initialized, Normal or Abnormal
Classification	—	—

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
C0021	BRAKE BOOSTER PERFORMANCE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0021 BRAKE BOOSTER PERFORMANCE.
C0048	BRAKE BOOSTER TRAVEL SENSOR	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0048 BRAKE BOOSTER TRAVEL SENSOR.
C056F	BRAKE BOOSTER TRAVEL SENSOR CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C056F BRAKE BOOSTER TRAVEL SENSOR CIRCUIT LOW.
C0570	BRAKE BOOSTER TRAVEL SENSOR CIRCUIT HIGH	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0570 BRAKE BOOSTER TRAVEL SENSOR CIRCUIT HIGH.
C0579	BRAKE BOOSTER TEMPERATURE SENSOR "B" CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0579 BRAKE BOOSTER TEMPERATURE SENSOR "B" CIRCUIT LOW.
C057A	BRAKE BOOSTER TEMPERATURE SENSOR "B" CIRCUIT HIGH	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C057A BRAKE BOOSTER TEMPERATURE SENSOR "B" CIRCUIT HIGH.
C057E	BRAKE BOOSTER TEMPERATURE SENSOR "A/B" CORRELATION	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C057E BRAKE BOOSTER TEMPERATURE SENSOR "A/B" CORRELATION .
C0580	BRAKE BOOSTER MOTOR "A" PHASE U-V-W CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0580 BRAKE BOOSTER MOTOR "A" PHASE U-V-W CIRCUIT LOW.
C0588	BRAKE BOOSTER MOTOR "A" POSITION SENSOR CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0588 BRAKE BOOSTER MOTOR "A" POSITION SENSOR CIRCUIT LOW.
C0589	BRAKE BOOSTER MOTOR "A" POSITION SENSOR CIRCUIT HIGH	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0589 BRAKE BOOSTER MOTOR "A" POSITION SENSOR CIRCUIT HIGH.
C058C	BRAKE BOOSTER MOTOR "B" POSITION SENSOR CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C058C BRAKE BOOSTER MOTOR "B" POSITION SENSOR CIRCUIT LOW.
C058D	BRAKE BOOSTER MOTOR "B" POSITION SENSOR CIRCUIT HIGH	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C058D BRAKE BOOSTER MOTOR "B" POSITION SENSOR CIRCUIT HIGH.

DTC	Description & trouble part	Reference
C0594	BRAKE BOOSTER MOTOR "A" PERFORMANCE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0594 BRAKE BOOSTER MOTOR "A" PERFORMANCE.
C0595	BRAKE BOOSTER INTERNAL POWER DRIVER RANGE/PERFORMANCE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0595 BRAKE BOOSTER INTERNAL POWER DRIVER RANGE/PERFORMANCE.
C0596	BRAKE BOOSTER MOTOR ”A” CURRENT SENSOR CIRCUIT RANGE/PERFORMANCE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0596 BRAKE BOOSTER MOTOR ”A” CURRENT SENSOR CIRCUIT RANGE/PERFORMANCE.
C0599	BRAKE BOOSTER CONTROL MODULE MISSING CALIBRATION	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C0599 BRAKE BOOSTER CONTROL MODULE MISSING CALIBRATION.
C05AF	BRAKE BOOSTER MOTOR ”B” CURRENT SENSOR CIRCUIT RANGE/PERFORMANCE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C05AF BRAKE BOOSTER MOTOR ”B” CURRENT SENSOR CIRCUIT RANGE/PERFORMANCE.
C05B3	BRAKE BOOSTER TEMPERATURE SENSOR ”C” CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C05B3 BRAKE BOOSTER TEMPERATURE SENSOR ”C” CIRCUIT LOW.
C05B4	BRAKE BOOSTER TEMPERATURE SENSOR ”C” CIRCUIT HIGH	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C05B4 BRAKE BOOSTER TEMPERATURE SENSOR ”C” CIRCUIT HIGH.
C05BB	BRAKE BOOSTER MOTOR ”A” POSITION SENSOR SUPPLY CIRCUIT RANGE/PERFORMANCE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C05BB BRAKE BOOSTER MOTOR ”A” POSITION SENSOR SUPPLY CIRCUIT RANGE/PERFORMANCE.
C05C2	BRAKE BOOSTER MOTOR "A" OVER TEMPERATURE	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C05C2 BRAKE BOOSTER MOTOR "A" OVER TEMPERATURE.
C05C3	BRAKE BOOSTER MOTOR ”A” SUPPLY CIRCUIT	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C05C3 BRAKE BOOSTER MOTOR ”A” SUPPLY CIRCUIT.
C1A90	BRAKE BOOSTER MOTOR SENSOR	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1A90 BRAKE BOOSTER MOTOR SENSOR.
C1B60	BRAKE BOOSTER MOTOR	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1B60 BRAKE BOOSTER MOTOR.
C1C20	SUPPLY VOLTAGE LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1C20 SUPPLY VOLTAGE LOW.
C1C21	SUPPLY VOLTAGE HIGH	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1C21 SUPPLY VOLTAGE HIGH.
C1C30	IG1 CIRCUIT LOW	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with

DTC	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC C1C30 IG1 CIRCUIT LOW.
C1C40	BRAKE ECU	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1C40 BRAKE ECU.
C1C53	VDC CONTROL SYSTEM	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1C53 VDC CONTROL SYSTEM.
C1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0079	CONTROL MODULE COMMUNICATION BUS "G" OFF	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0079 CONTROL MODULE COMMUNICATION BUS "G" OFF.
U1122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE C-CAN	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE C-CAN.
U114B	LOST COMMUNICATION WITH GATEWAY "A" CH-BUS	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U114B LOST COMMUNICATION WITH GATEWAY "A" CH-BUS.
U1416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE C-CAN	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE C-CAN.
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1C09	INVALID AUTHENTICATION DATA RECEIVED FROM VDC CH-BUS	Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C09 INVALID AUTHENTICATION DATA RECEIVED FROM VDC CH-BUS.

DTC C0021 BRAKE BOOSTER PERFORMANCE

DTC detecting condition:

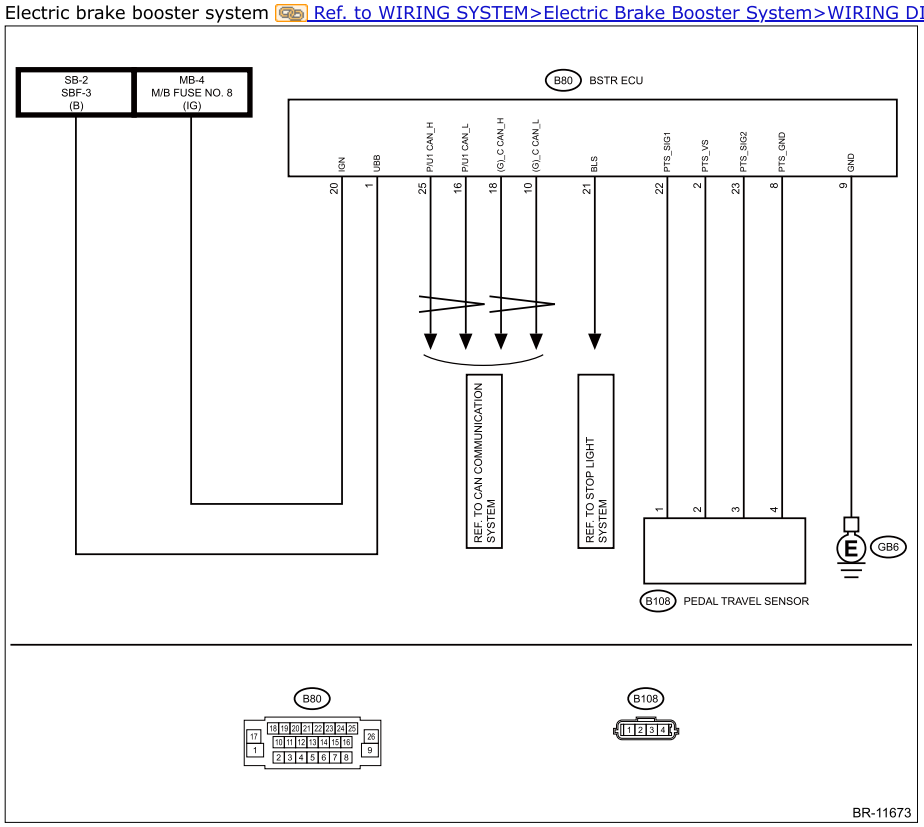
- When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
- When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0021 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C0048 BRAKE BOOSTER TRAVEL SENSOR

DTC detecting condition:

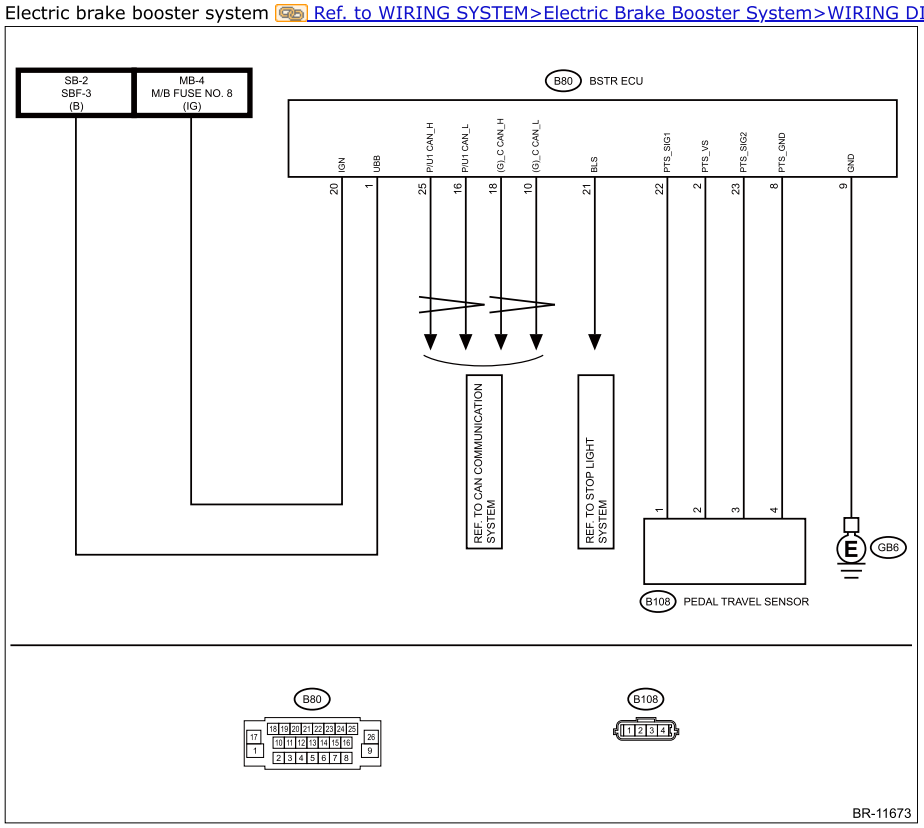
When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector. (Lightly shake the connector and harness vertically and horizontally.)

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0048 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C056F BRAKE BOOSTER TRAVEL SENSOR CIRCUIT LOW

DTC detecting condition:

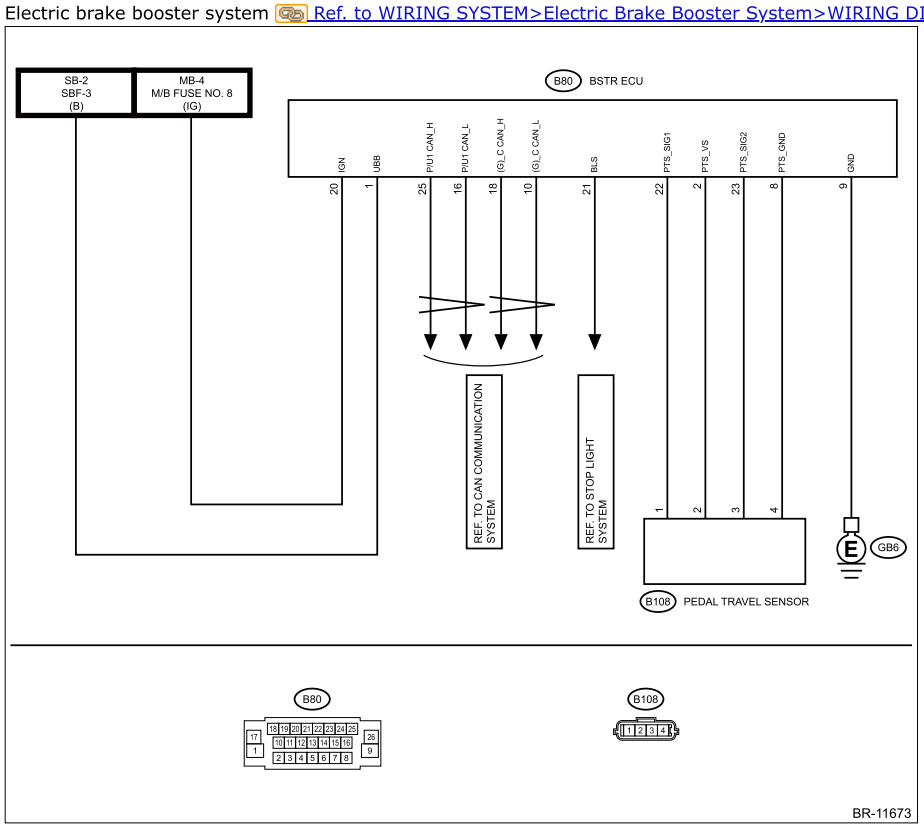
When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector. (Lightly shake the connector and harness vertically and horizontally.)

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C056F displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C0570 BRAKE BOOSTER TRAVEL SENSOR CIRCUIT HIGH

DTC detecting condition:

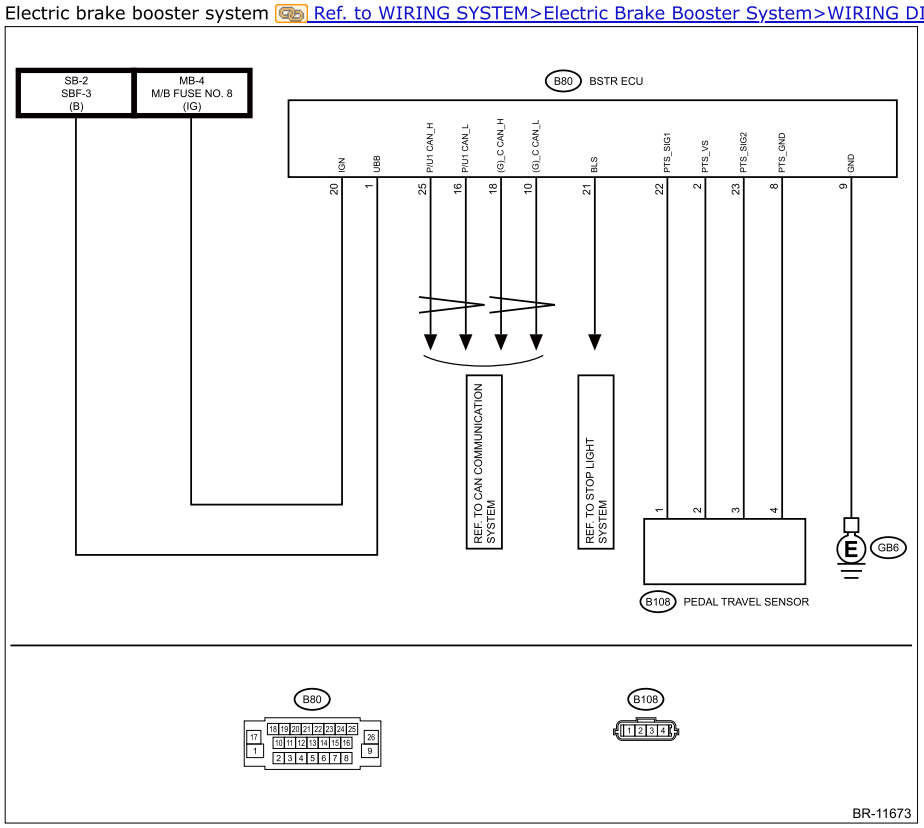
When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector. (Lightly shake the connector and harness vertically and horizontally.)

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0570 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C0579 BRAKE BOOSTER TEMPERATURE SENSOR "B" CIRCUIT LOW

DTC detecting condition:
When malfunction of the electric brake booster (internal) temperature sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] less than −48°C?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Go to 3.

No — Go to 4.

3. RE-CHECK DATA MONITOR.

1. Turn the ignition switch to OFF.
2. Open the hood and cool the engine compartment for 10 minutes or more.
3. Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 4.

4. RECHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0579 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C057A BRAKE BOOSTER TEMPERATURE SENSOR "B" CIRCUIT HIGH

DTC detecting condition:
When malfunction of the electric brake booster (internal) temperature sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] less than −48°C?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Go to 3.

No — Go to 4.

3. RE-CHECK DATA MONITOR.

1. Turn the ignition switch to OFF.
2. Open the hood and cool the engine compartment for 10 minutes or more.
3. Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 4.

4. RECHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C057A displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C057E BRAKE BOOSTER TEMPERATURE SENSOR "A/B" CORRELATION

DTC detecting condition:
When malfunction of the electric brake booster (internal) temperature sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is the difference between the displayed values of [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 30% or more?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 2.

2. RECHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C057E displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C0580 BRAKE BOOSTER MOTOR "A" PHASE U-V-W CIRCUIT LOW

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0580 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C0588 BRAKE BOOSTER MOTOR "A" POSITION SENSOR CIRCUIT LOW

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor rotation detection (RPS) sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0588 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C0589 BRAKE BOOSTER MOTOR "A" POSITION SENSOR CIRCUIT HIGH

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor rotation detection (RPS) sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0589 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C058C BRAKE BOOSTER MOTOR "B" POSITION SENSOR CIRCUIT LOW

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor rotation detection (RPS) sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C058C displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C058D BRAKE BOOSTER MOTOR "B" POSITION SENSOR CIRCUIT HIGH

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor rotation detection (RPS) sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C058D displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C0594 BRAKE BOOSTER MOTOR "A" PERFORMANCE

DTC detecting condition:

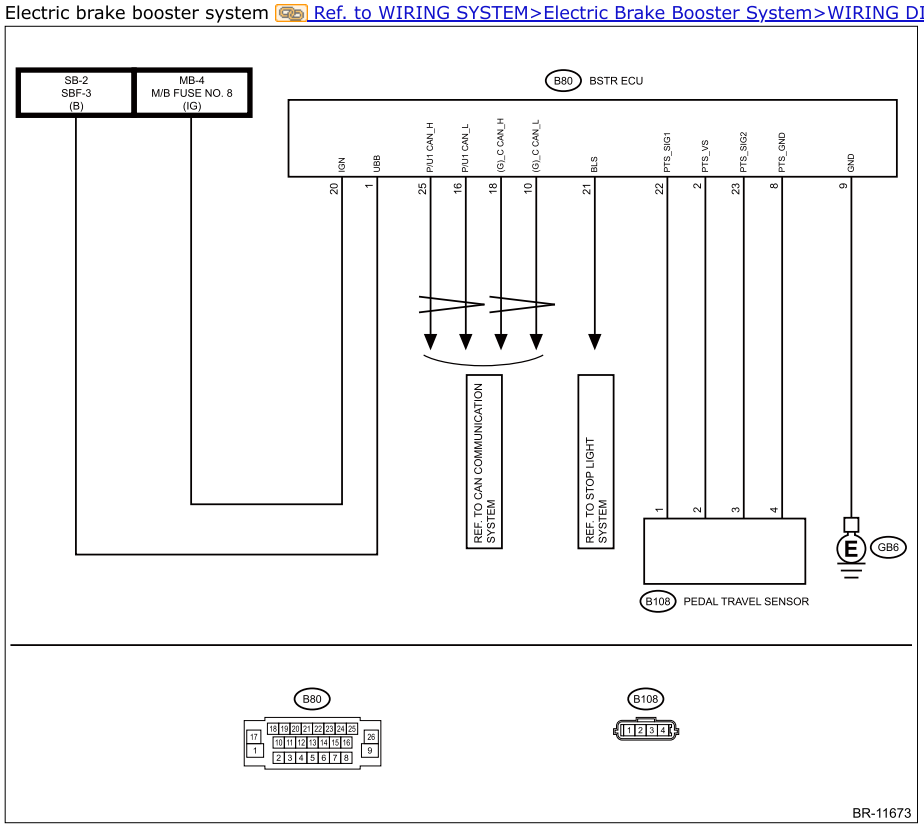
- When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
- When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0594 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C0595 BRAKE BOOSTER INTERNAL POWER DRIVER RANGE/PERFORMANCE

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0595 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C0596 BRAKE BOOSTER MOTOR "A" CURRENT SENSOR CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0596 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C0599 BRAKE BOOSTER CONTROL MODULE MISSING CALIBRATION

DTC detecting condition:

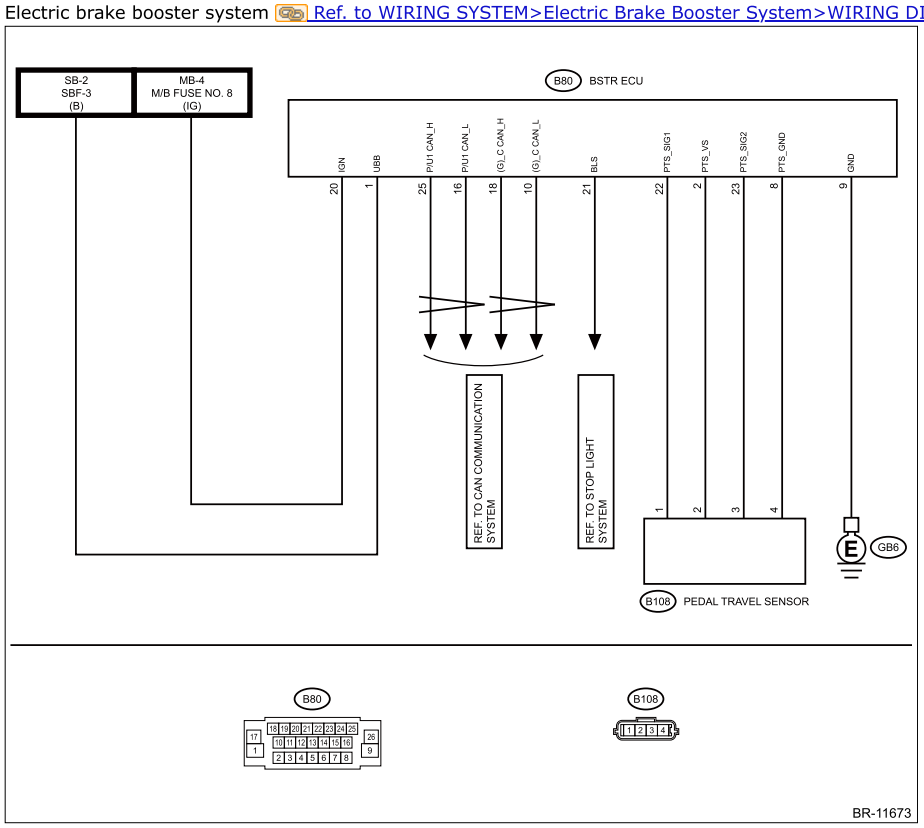
- When malfunction of the electric brake booster CM is detected.
- When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C0599 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C05AF BRAKE BOOSTER MOTOR "B" CURRENT SENSOR CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C05AF displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C05B3 BRAKE BOOSTER TEMPERATURE SENSOR "C" CIRCUIT LOW

DTC detecting condition:
When malfunction of the electric brake booster (internal) temperature sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] less than −48°C?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Go to 3.

No — Go to 4.

3. RE-CHECK DATA MONITOR.

1. Turn the ignition switch to OFF.
2. Open the hood and cool the engine compartment for 10 minutes or more.
3. Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 4.

4. RECHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C05B3 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C05B4 BRAKE BOOSTER TEMPERATURE SENSOR "C" CIRCUIT HIGH

DTC detecting condition:
When malfunction of the electric brake booster (internal) temperature sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] less than −48°C?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Go to 3.

No — Go to 4.

3. RE-CHECK DATA MONITOR.

1. Turn the ignition switch to OFF.
2. Open the hood and cool the engine compartment for 10 minutes or more.
3. Using the Subaru Select Monitor, read data of [Motor Drive Circuit Temperature Sensor 1], [Motor Drive Circuit Temperature Sensor 2] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Are the [Motor Drive Circuit Temperature Sensor 1] and [Motor Drive Circuit Temperature Sensor 2] 128°C or more?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 4.

4. RECHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C05B4 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C05BB BRAKE BOOSTER MOTOR "A" POSITION SENSOR SUPPLY CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C05BB displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C05C2 BRAKE BOOSTER MOTOR "A" OVER TEMPERATURE

DTC detecting condition:
When malfunction of the electric brake booster CM is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The boost function of electric brake booster is limited.

1. RECHECK DTC.

1. Turn the ignition switch to OFF.
2. Open the hood and cool the engine compartment for 10 minutes or more.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C05C2 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C05C3 BRAKE BOOSTER MOTOR "A" SUPPLY CIRCUIT

DTC detecting condition:

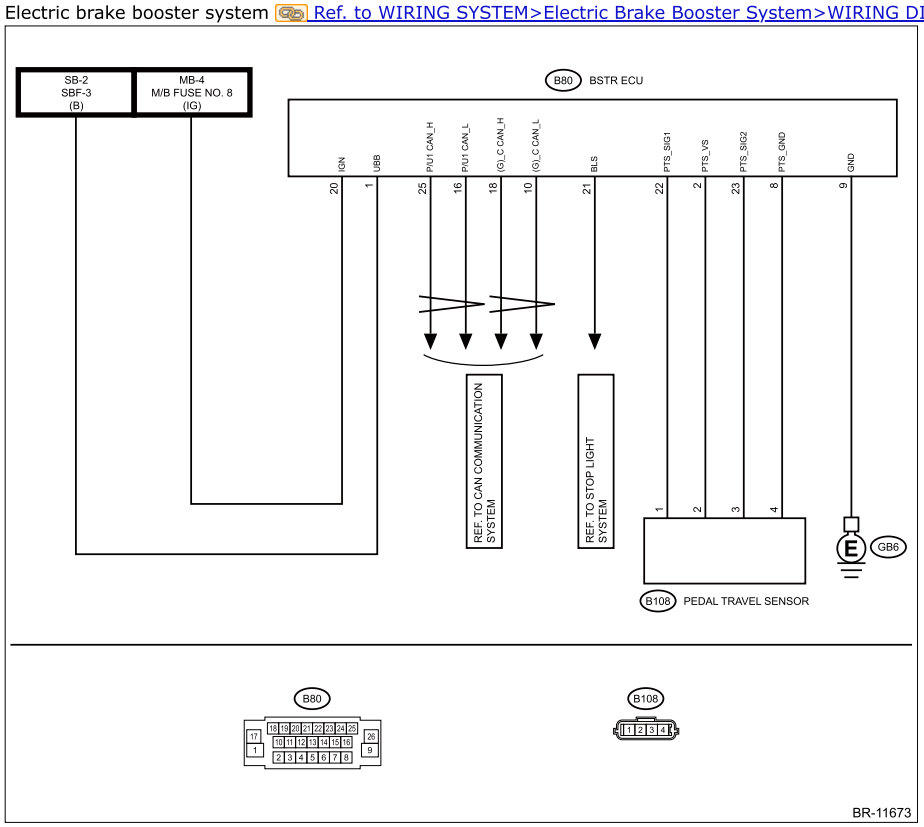
- When malfunction of the electric brake booster CM is detected.
- When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C05C3 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C1A90 BRAKE BOOSTER MOTOR SENSOR

DTC detecting condition:
When malfunction of the electric brake booster (internal) motor rotation detection (RPS) sensor is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1A90 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C1B60 BRAKE BOOSTER MOTOR

DTC detecting condition:

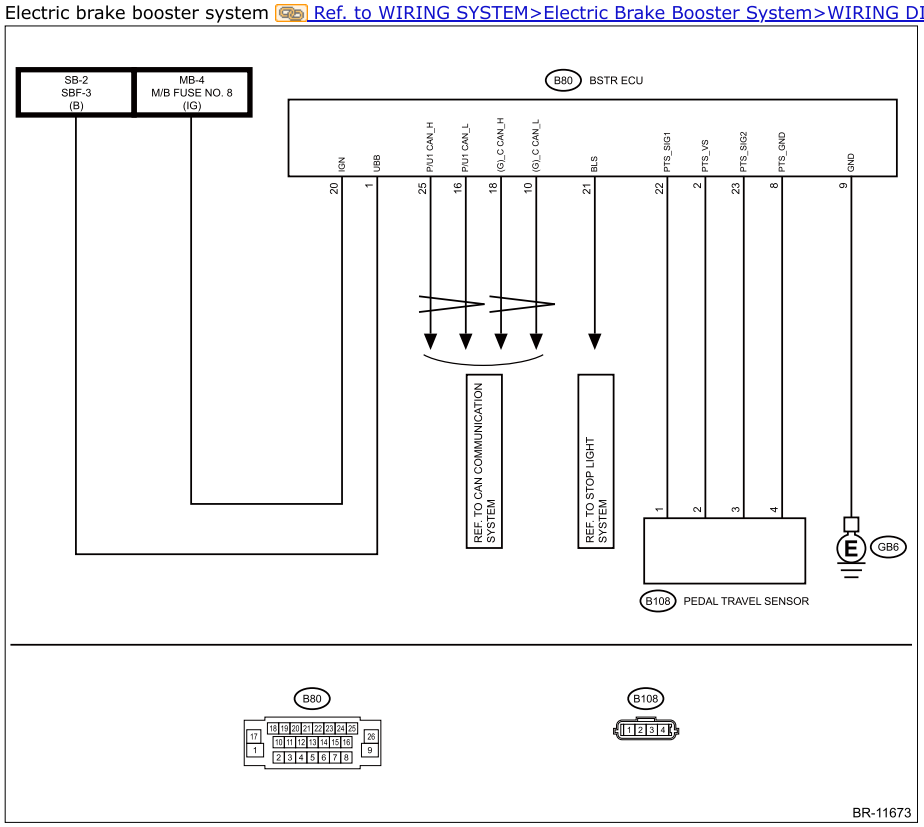
- When malfunction of the electric brake booster (internal) motor drive circuit/motor is detected.
- When malfunction of the electric brake booster (internal) driver stroke sensor (DTS) is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes	Repair or replace the connector.
No	Go to 4.

4. CHECK HARNESS.

Check the resistance between the electric brake booster CM connector and the booster stroke sensor connector.

Connector & terminal

(B80) No. 22 — (B108) No. 1:
(B80) No. 2 — (B108) No. 2:
(B80) No. 23 — (B108) No. 3:
(B80) No. 8 — (B108) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the harness.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1B60 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

DTC C1C20 SUPPLY VOLTAGE LOW

DTC detecting condition:

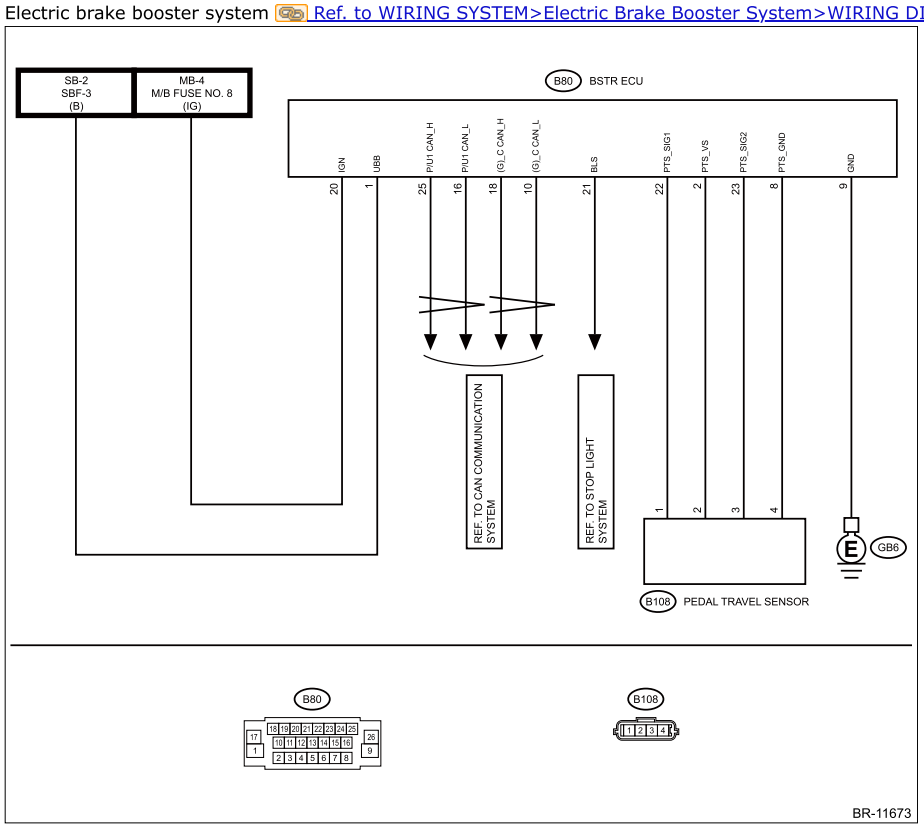
When malfunction of the power supply voltage circuit LOW is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:

Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK FUSE.

Check the fuse.

Is the check result OK?

Yes — Go to 2.

No — Replace the defective fuse. If the replaced fuse blows out easily, check the short circuit in harness.

2. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the electric brake booster CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between electric brake booster CM connector and chassis ground.
   Connector & terminal
   (B80) No. 1 (+) — Chassis ground (−):
   (B80) No. 20 (+) — Chassis ground (−):

Is the voltage 9 V or more?

Yes — Go to 3.

No — Check the power supply system circuit, and if any fault is found, repair or replace the defective parts.

3. CHECK HARNESS (GROUND CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between electric brake booster CM connector and chassis ground.
   Connector & terminal
   (B80) No. 9 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 4.

No — Check the ground system circuit, and if any fault is found, repair or replace the defective parts.

4. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR.

Check the connecting condition of the electric brake booster CM connector.

Is the check result OK?

Yes — Go to 5.

No — Repair or replace the connector.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1C20 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C1C21 SUPPLY VOLTAGE HIGH

DTC detecting condition:
When malfunction of the power supply voltage circuit HIGH is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK GENERATOR.

1. Start the engine and idle for a while.
2. Measure the voltage between generator terminal B and chassis ground.

Is the voltage 16 V or more?

Yes — Check the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator>INSPECTION.

No — Go to 2.

2. CHECK BATTERY AND DATA MONITOR.

1. Turn the ignition switch to ON.
2. Measure the battery terminal voltage.
3. Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is the [Main Power Supply Voltage] higher than the battery terminal voltage by 2 V or more?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Go to 3.

3. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1C21 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

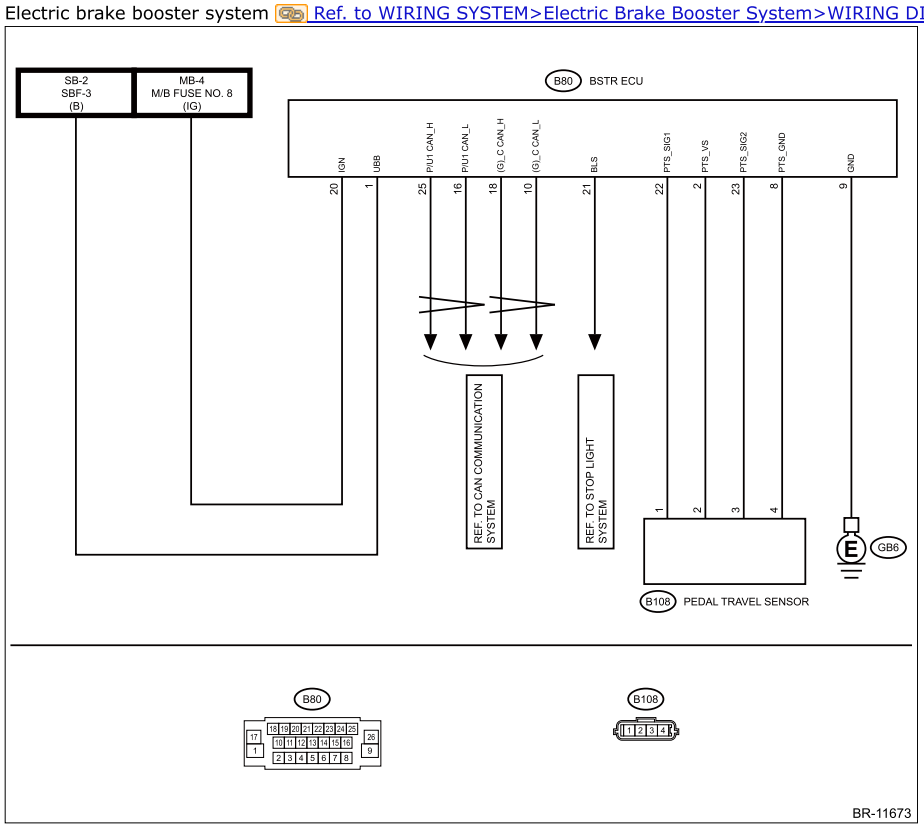
No — Currently, it is normal. Finish the diagnosis.

DTC C1C30 IG1 CIRCUIT LOW

DTC detecting condition:
When malfunction of the IG power supply voltage circuit is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

Wiring diagram:
Electric brake booster system Ref. to WIRING SYSTEM>Electric Brake Booster System>WIRING DIAGRAM.



1. CHECK DATA MONITOR OF ELECTRIC BRAKE BOOSTER CM.

Using the Subaru Select Monitor, read data of [IGN Power Supply Signal] in the [Data monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

After the ignition switch is turned to ON, does the [IGN Power Supply Signal] turn to [ON]?

Yes — Go to 2.

No — Go to 3.

2. CHECK DATA MONITOR OF VDC CM.

Using the Subaru Select Monitor, read data of [Ignition Signal] in the [Data monitor] of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

After the ignition switch is turned to ON, does the [Ignition Signal] turn to [ON]?

Yes — Go to 3.

No — Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and poor contact of terminal.

Is there looseness, deformation, or corrosion at the connectors?

Yes — Repair or replace the connector.

No — Go to 4.

4. CHECK POWER SUPPLY CIRCUIT. (CHECK IGNITION POWER SUPPLY CIRCUIT.).

1. Turn the ignition switch to ON.
2. Measure the voltage between electric brake booster CM connector and chassis ground.
   Connector & terminal
   (B80) No. 20 (+) — Chassis ground (−):

Is the voltage 10 — 16 V?

Yes — Go to 5.

No — Repair or replace the harness.

5. RECHECK DTC.

1. Connect the electric brake booster CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1C30 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C1C40 BRAKE ECU

DTC detecting condition:
When malfunction of the electric brake booster CM is detected.
Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes — Go to 2.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the connector or harness.

3. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Disconnect the electric brake booster CM connector and booster stroke sensor connector.
2. Check the electric brake booster CM connector and booster stroke sensor connector.

Is there deformation or corrosion in the connector terminals?

Yes — Repair or replace the connector.

No — Go to 4.

4. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1C40 displayed?

Yes — Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.

No — Currently, it is normal. Finish the diagnosis.

DTC C1C53 VDC CONTROL SYSTEM

DTC detecting condition:

When malfunction of the VDC control system is detected.

Trouble symptom:

- The boost function of electric brake booster does not operate.
- The brake boost function by EyeSight does not operate.

1. CHECK DTC OF VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of VDC system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Main Power Supply Voltage] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Is [Main Power Supply Voltage] 10 — 16 V?

Yes	Go to 3.
No	Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Master Cylinder Fluid Pressure Status], [Vehicle Speed Status] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Do the [Master Cylinder Fluid Pressure Status] and [Vehicle Speed Status] display [Normal]?

Yes	Go to 4.
No	Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [Master Cylinder Fluid Pressure] in the [Data Monitor] of [Electric Brake Booster]. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Data Monitor.

Does the [Master Cylinder Fluid Pressure] change according to brake operation?

Yes	Go to 5.
No	Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

5. CHECK ELECTRIC BRAKE BOOSTER CM CONNECTOR AND BOOSTER STROKE SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting condition of the electric brake booster CM connector and booster stroke sensor connector.

•Do the brake warning light (EBD warning light)/electronic parking brake warning light illuminate?
•Is the current code recorded?

Yes	Repair or replace the connector or harness.
No	Go to 6.

6. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Brake Booster]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Brake Booster] using the Subaru Select Monitor. Ref. to ELECTRIC BRAKE BOOSTER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C1C53 displayed?

Yes	Replace the electric brake booster CM. Ref. to BRAKE>Brake Booster.
No	Currently, it is normal. Finish the diagnosis.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT

Note:
Refer to "CENTRAL GATEWAY (DIAGNOSTICS)" for diagnostic procedure. Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.

ELECTRIC BRAKE BOOSTER (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.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0079 CONTROL MODULE COMMUNICATION BUS "G" OFF

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE C-CAN

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U114B LOST COMMUNICATION WITH GATEWAY "A" CH-BUS

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE C-CAN

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. **Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**

ELECTRIC BRAKE BOOSTER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1C09 INVALID AUTHENTICATION DATA RECEIVED FROM VDC CH-BUS

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. **Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**

STEERING ANGLE SENSOR

SAS(diag)

1. Basic Diagnostic Procedure
2. General Description
3. Control Module I/O Signal
4. Diagnostic Procedure for Subaru Select Monitor Communication
5. Diagnostic Trouble Code (DTC)
6. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

PROCEDURE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. **Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**

STEERING ANGLE SENSOR > General Description

CAUTION

1. SRS 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. MODULE REGISTRATION

When the steering angle sensor is replaced, perform the module registration. Ref. to COMMON (DIAGNOSTICS)>Unit Registration.

STEERING ANGLE SENSOR > General Description

INSPECTION

Before performing diagnosis, check the following items which might be affecting the steering angle sensor problem.

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. GROUND

Make sure that the ground terminal bolt is tightened securely.

STEERING ANGLE SENSOR > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

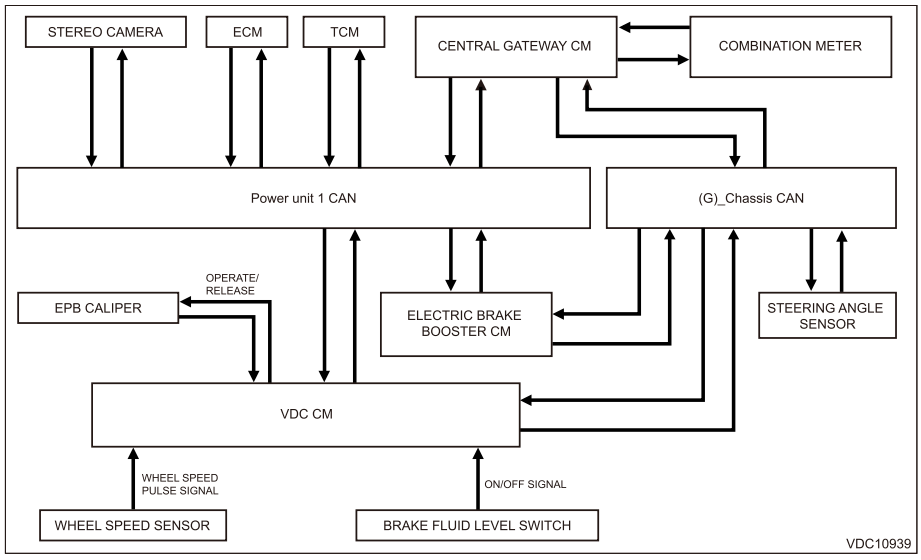
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

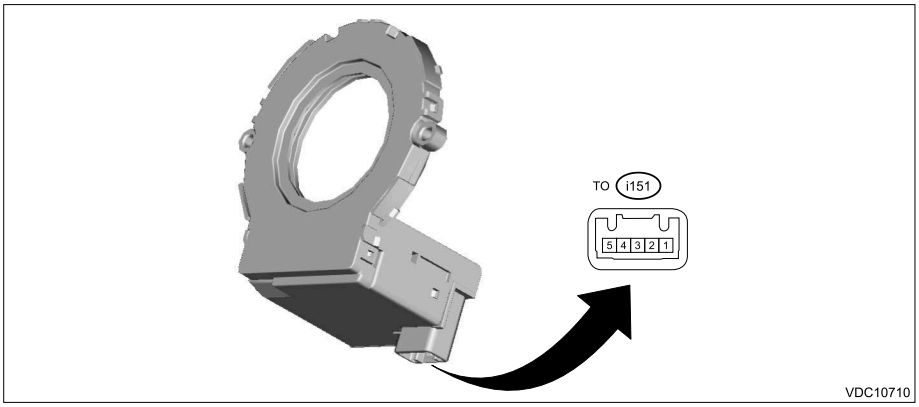
	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

STEERING ANGLE SENSOR > General Description

SYSTEM BLOCK DIAGRAM



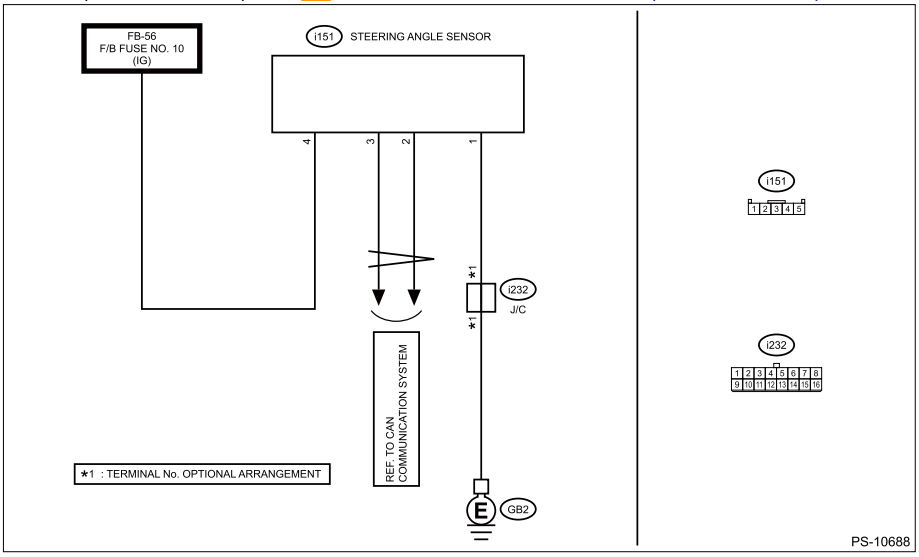
ELECTRICAL SPECIFICATION



Connector No.	Terminal No.	Contents	Measuring condition	Standard
i151	1	Ground	—	—
i151	2	(G)_Chassis CAN L signal	—	—
i151	3	(G)_Chassis CAN H signal	—	—
i151	4	Ignition power supply	Ignition switch: ON	9 — 16 V
i151	5	—	—	—

INSPECTION

Detecting condition:
Defective harness connector
Trouble symptom:
Communication is impossible between the steering angle sensor and Subaru Select Monitor.
Wiring diagram:
Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.



1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes — Go to 2.

No — Turn the ignition switch to ON, and select the [Steering Angle Sensor] 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. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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 STEERING ANGLE SENSOR CONNECTOR.

Turn the ignition switch to OFF.

Is the steering angle sensor connector inserted into the steering angle sensor until the clamp locks?

Yes — Go to 5.

No — Insert the steering angle sensor connector into the steering angle sensor.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 6.

No — Perform the diagnosis for LAN system.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to steering angle sensor system can be executed normally.

Is the [Select Function] screen displayed?

Yes — Check the DTC of the steering angle sensor system. Ref. to STEERING ANGLE SENSOR>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 the steering angle sensor connector and chassis ground.
   Connector & terminal
   (i151) No. 4 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes — Go to 9.

No — Repair the open circuit of harness between the steering angle sensor and battery.

9. CHECK HARNESS CONNECTOR BETWEEN STEERING ANGLE SENSOR AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from steering angle sensor.
3. Measure the resistance of harness between the steering angle sensor connector and chassis ground.

Connector & terminal

(i151) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of the steering angle sensor ground circuit and poor contact of connector.

10. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of steering angle sensor power supply, ground circuit and data link connector?

Yes	Repair the connector.
No	Replace the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.

STEERING ANGLE SENSOR > Diagnostic Trouble Code (DTC)

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on DTCs, refer to the list. Ref. to STEERING ANGLE SENSOR>Diagnostic Trouble Code (DTC)>LIST.**

STEERING ANGLE SENSOR > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
C1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	Ref. to STEERING ANGLE SENSOR>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to STEERING ANGLE SENSOR>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1E00	LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS	Ref. to STEERING ANGLE SENSOR>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1E00 LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS.

STEERING ANGLE SENSOR > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT

Note:
Refer to "CENTRAL GATEWAY (DIAGNOSTICS)" for diagnostic procedure. Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.

STEERING ANGLE SENSOR > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

STEERING ANGLE SENSOR > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1E00 LOST COMMUNICATION OF AUTHENTICATION DATA WITH GATEWAY "A" PU-BUS

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS)

PS(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

PROCEDURE

Caution:
- **The power steering CM continues to operate after the engine stops and calculates 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. 30 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 CM connector.**
- **Be sure to record the malfunction information obtained via DTC check.**
- **Do not perform the clear memory until the repair or replacement of faulty parts is completed.**
- **If a problem (connector terminal with foreign matter, etc.) is found, record the faulty part (take a photo • store the foreign matter, etc.).**
- **When performing the diagnosis for the power steering control module, be sure to do so after an interval of 30 seconds or more between the ignition OFF and ON period.**

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to POWER STEERING (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes — Go to 2.

No — Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to POWER STEERING (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes — Go to 3.

No — Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK WARNING LIGHT.

Check the lighting condition of STEERING warning light in the combination meter.

Does the STEERING warning light illuminate?

Yes — Go to 4.

No — Currently, it is normal.

4. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Power Steering].

Note:
For detailed operation procedures, refer to "Help" of application.

Is communication possible?

Yes — Go to 5.

No — Check the communication circuit. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

5. CHECK DTC.

Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed?

Yes	Record the DTC, time stamp and freeze frame data. Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data. Ref. to COMMON (DIAGNOSTICS)>Time Stamp. Go to 7.
No	Go to 6.

6. PERFORM GENERAL DIAGNOSTICS.

1. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
2. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
3. 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)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.

7. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed in current code?

Yes	Repeat step 7 until DTC is not shown.
No	Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out below for use.

1. TROUBLE STATUS

Phenomenon of the vehicle	❑ Steering is heavy ❑ Steering is not smooth ❑ Steering is unstable (wondering) ❑ Steering does not return to center ❑ Steering is not straight
	❑ Steering force required is not the same for right and left turn ❑ Steering force required is not even ❑ Steering is too light
	❑ Noise ❑ Vibration ❑ STEERING warning light illuminates ❑ Other:
Frequency	❑ Always ❑ Sometimes ❑ Immediately after starting the engine ❑ Only once ❑ Other:
	❑ Recovers after leaving it for minutes
Steering wheel operation	❑ Dry steering ❑ When turning ❑ Quick steering ❑ Slow steering ❑ Returning the steering wheel ❑ End abutting
	❑ Releasing the steering wheel ❑ Only supporting the steering wheel by hand ❑ Repetitive dry steering ❑ Beginning of steering
Steering wheel status / direction	❑ Around center position ❑ Near end of lock to lock
	❑ When turning the steering to right ❑ When turning the steering to left ❑ Both to right and to left ❑ ①Steering angle: degrees ❑ ②Maneuvering time: minutes
	❑ Slow steering ❑ Quick steering ❑ While holding the steering ❑ When repeating the dry wheel operation
Vehicle speed	❑ Stall 0 km/h (0 MPH) ❑ Very low speed up to 20 km/h (up to 12 MPH) ❑ Low speed up to 40 km/h (up to 25 MPH) ❑ Medium speed up to 80 km/h (up to 50 MPH) ❑ High speed up to 80 km/h or more (up to 50 MPH or more)
	❑ At starting ❑ While accelerating ❑ While decelerating ❑ When accelerating rapidly ❑ When decelerating rapidly
	❑ Other:
Engine speed	❑ Idling ❑ ①Near rpm ❑ ② rpm — rpm ❑ ③ rpm or more / or less

2. STATE OF STEERING WARNING LIGHT

STEERING warning light illuminates	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate

	❑ Other:
Ignition key position	❑ LOCK ❑ ACC ❑ ON (when starting engine) ❑ START ❑ ON (when starting engine, while engine is running) ❑ ON (when starting engine, when engine is at a standstill)
Timing	❑ Immediately after turning the ignition ON ❑ Immediately after turning the ignition to START
	❑ At idling ❑ During Auto Start Stop ❑ When reversing ❑ While accelerating ❑ While decelerating ❑ When cruising at — km/h (MPH)
	❑ When other electrical parts are operating Part name: Operating condition:

3. ENVIRONMENT

a) Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Other:
b) Outside temperature	❑ °C (°F)
c) Road	❑ Inner city ❑ Suburbs ❑ Highway ❑ Local street ❑ Alley way ❑ Private road ❑ Parking lot ❑ Mountain road ❑ Paved road ❑ Gravel road ❑ Gravel road ❑ Sandy place ❑ Muddy road ❑ Concrete road ❑ Stone pavement ❑ Racetrack ❑ Other:
d) Road surface	❑ Dry ❑ Wet ❑ Covered with fresh snow ❑ Covered with hardened snow ❑ Other:
e) Tire	❑ Tire chain ❑ Studless tire ❑ 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	❑ Yes ❑ No Record after-market parts if any. (Steering wheel, audio, tires, and similar parts)
i) Condition of suspension alignment	
j) Electrical load conditions	❑ Audio ❑ Air conditioner

	❑ Other:
k) Loaded state	Condition:
l) Repair parts	❑ No ❑ Yes Contents:
m) Others	

POWER STEERING (DIAGNOSTICS) > General Description

CAUTION

1. SRS 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 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)>Battery>INSPECTION.

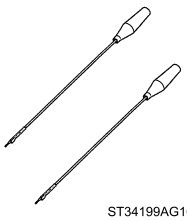
2. TIRES

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. SUBARU SPECIAL TOOL

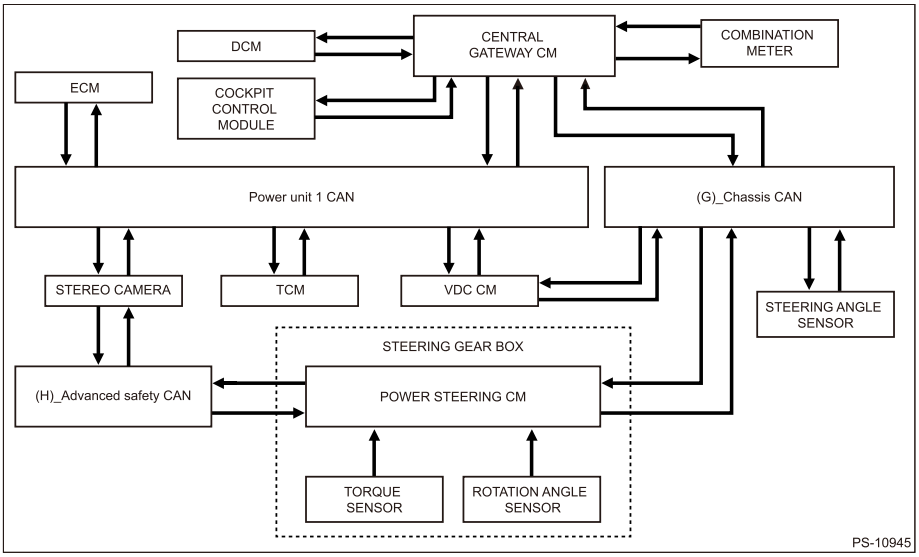
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**
 ST34199AG100	34199AG100	SPECIAL TOOL HARNESS	Used for troubleshooting the electrical system.

2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

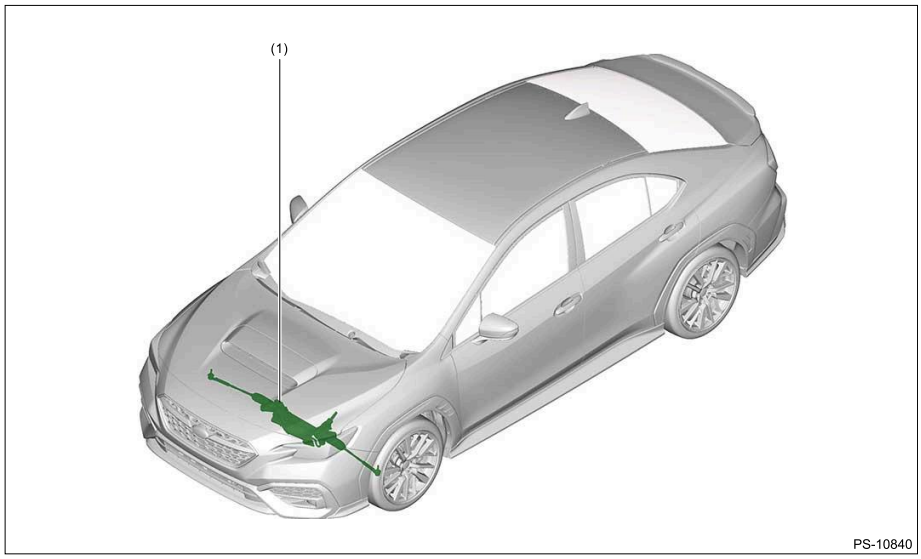
POWER STEERING (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM



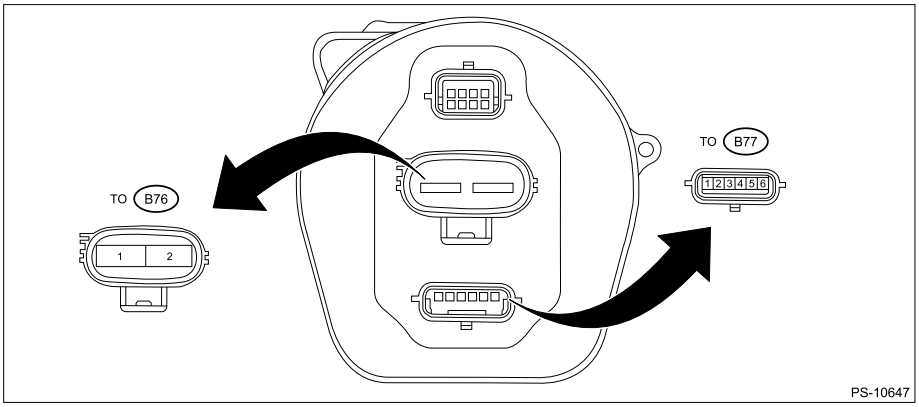
- The assist control is performed based on the engine speed information from the ECM, the vehicle speed information from the VDC CM, and the sensor signals in the power steering CM (torque sensor, rotation angle sensor).
- Additional steering assist control is performed based on the steering signal from EyeSight.
- Assist steering constant$*1$ is changed based on the mode information from the cockpit CM.
  $*1$: Varies depending on the grade.

LOCATION



(1) Steering gearbox (including power steering CM)

ELECTRICAL SPECIFICATION



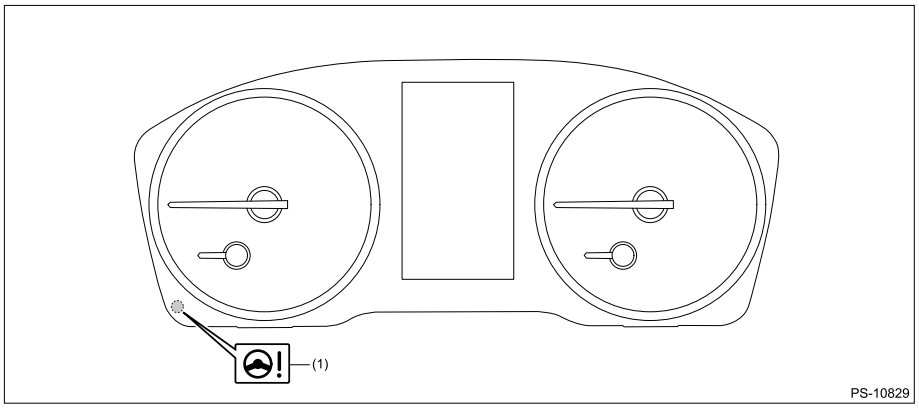
Connector No.	Terminal No.	Contents	Measuring condition	Standard
B76	1	Ground	Always Measurement between (B76) No. 1 — (B76) No. 2	10 — 16 V
B76	2	Battery power supply		
B77	1	Ignition power supply	Ignition switch: ON Measurement between (B77) No. 1 — (B76) No. 1	9 — 16 V
B77	2	(H)_Advanced safety CAN H signal	Digital signal; cannot be measured	—
B77	3	(H)_Advanced safety CAN L signal	Digital signal; cannot be measured	—
B77	5	(G)_Chassis CAN L signal	Digital signal; cannot be measured	—
B77	6	(G)_Chassis CAN H signal	Digital signal; cannot be measured	—

PROCEDURE

1. Turn the ignition switch to OFF for 10 seconds or more.
2. Start the engine.
3. Idle the engine for 5 seconds or more.
4. Operate the steering wheel from side to side.
5. Reproduce the malfunction occurrence condition as much as possible.

POWER STEERING (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION



(1) STEERING warning light

- When the ignition switch is turned to ON (engine OFF), the STEERING warning light illuminates.
- After starting the engine, the STEERING warning light goes out. If it does not go off, a malfunction occurs in electric power steering • combination meter.

POWER STEERING (DIAGNOSTICS) > Warning Light Illumination Pattern

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.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK LAN SYSTEM.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK COMBINATION METER.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

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 COMBINATION METER (DIAGNOSTICS)>Active Test.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Current condition is normal.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

2. POWER STEERING ASSIST DISABLED

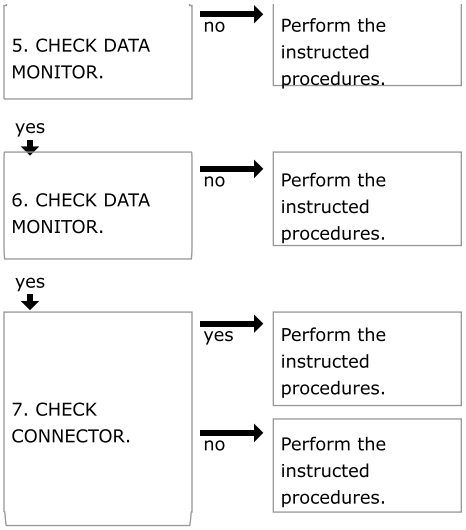
Detecting condition:
CAN communication error (engine rpm signal not received)
Trouble symptom:

- Not assisted due to power supply voltage failure.
- The STEERING warning light is normal but there is no power steering assist (steering feels heavy).

Note:

- **During driving, the assist system will not be activated when the ignition voltage drops.**
- **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. 30 minutes for cooling, the assist will start operating. While assist limitation (overheat protection control) is in active, [Assist limitation] is displayed in [EPS Status] in the Subaru Select Monitor [Data Monitor].
- **History can be confirmed on [ECU Overheat Protection] or [IG Count after ECU Overheat Protection(latest)] 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.**

1. CHECK BATTERY. → no → Perform the instructed procedures.
   ↓ yes
2. CHECK BATTERY TERMINAL AND FUSE. → no → Perform the instructed procedures.
   ↓ yes
3. CHECK DATA MONITOR. → no → Perform the instructed procedures.
   ↓ yes
4. CHECK DATA MONITOR. → yes → Perform the instructed procedures.
   → no → Go to 5.



1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes — Go to 2.

No — Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

2. CHECK BATTERY TERMINAL 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 DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read data of [Engine Speed] in the [Data Monitor] of [Power Steering]. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.

Is [Engine Speed] the same as that in the combination meter?

Yes — Go to 4.

No — Check the CAN communication. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [EPS Status] in the [Data Monitor] of [Power Steering]. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.

Is [Assist limitation] displayed?

Yes	It is possible that temporary assist limitation has occurred due to overheat protection. Stop the engine for approx. 30 minutes, and check again.
No	Go to 5.

5. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, read data of [Torque Sensor Main], [Torque Sensor Sub] in the [Data Monitor] of [Power Steering]. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.
2. Move the steering wheel to the left and right.

Do the values of [Torque Sensor Main] and [Torque Sensor Sub] change along with the operation?

Yes	Go to 6.
No	Check for poor contact of the torque sensor connector.

6. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read data of [IG Voltage] in the [Data Monitor] of [Power Steering]. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.

Is [IG Voltage] stable? (While wiggling the harness)

Yes	Go to 7.
No	Check the ignition switch and IG voltage harness, and repair the defective part.

7. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (B53).

Is there any damage to the terminal or other parts either on the power steering CM side or on the connector side?

Yes	Repair the terminal.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Warning Light Illumination Pattern

STEERING WARNING LIGHT DOES NOT GO OFF

Detecting condition:

- Defective combination meter
- Defective harness (LAN system failure)
- CAN communication error (engine speed signal not received)

Trouble symptom:

When starting the engine, the STEERING warning light continues to illuminate.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the steering box. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

INSPECTION

Detecting condition:

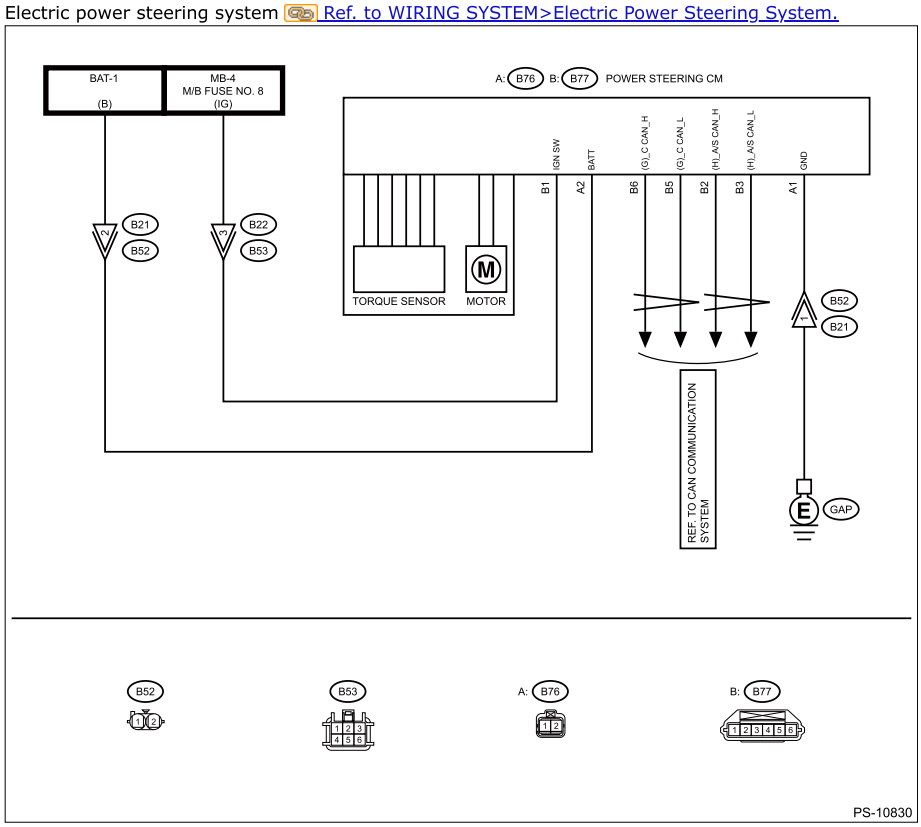
- Defective harness connector
- Defective power steering CM

Trouble symptom:

- Communication is impossible between the power steering CM 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.



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. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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 CM CONNECTOR INSTALLATION.

Turn the ignition switch to OFF.

Is the power steering CM connector inserted into the power steering CM until the clamp locks?

Yes	Go to 5.
No	Insert the power steering CM connector into the power steering CM.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

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)>Diagnostic Trouble Code (DTC)>LIST.
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 the power steering CM connector and chassis ground.
   Connector & terminal
   (B52) No. 2 (+) — Chassis ground (−):
   (B53) No. 3 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 9.
No	Repair the open circuit in the harness between the power steering CM and the battery.

9. CHECK HARNESS CONNECTOR BETWEEN POWER STEERING CM AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the power steering CM.
3. Measure the resistance of the harness between the power steering CM connector and chassis ground.
   Connector & terminal
   (B52) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of the power steering CM ground circuit and the poor contact of the connector.

10. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact in the power steering CM power supply, ground circuit, and data link connector?

Yes	Repair the connector.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor>LIST.**

POWER STEERING (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Total number of ignition switch ON	0 — 65534 Time	—
Count	Counter	Common/Originally	—
Time Count	Elapsed time after ignition switch is turned to ON	0 — 53687091000 ms	—
Power Supply Current	Primary current recognized by power steering CM	−128 — 127 A	—
Vehicle Speed	Vehicle speed	0 — 255 km/h	—
Engine Speed	Engine speed	0 — 12750 rpm	—
CU Sensing Current(q)	q axis current recognized by power steering CM	−128 — 127 A	—
Motor Current(U)	U axis current recognized by power steering CM	−128 — 127 A	—
Motor Current(V)	V axis current recognized by power steering CM	−128 — 127 A	—
Motor Speed	Motor rotational speed (rpm)	−4096 — 4064 rpm	—
CU Temperature	Power steering CM inner temperature	−50 — 205 °C	—
Power Supply Voltage	Voltage supplied to power steering CM	0 — 25.5 V	—
Torque Sensor Power Supply	Voltage supplied to torque sensor	0 — 10.2 V	—
IG Voltage	IGN voltage recognized by power steering CM	0 — 25.5 V	—
CAN Bus Status	CAN bus status	Active/Bus off	—
EPS Status	EPS assist status	Normal/Assist stop/Assist limitation	—
CU Target current(q)	q axis indicator current from power steering CM to motor	−128 — 127 A	—
ECU Overheat Protection	Number of interventions of the overheat protection control*1	0 — 250 Time	—
IG Count after ECU Overheat Protection(latest)	Number of times the ignition switch is ON from the last intervention of overheat protection control*2	0 — 65000 Time	—
IG Count after ECU Overheat Protection(Previous)	Number of times the ignition switch is ON from the second last intervention of overheat protection control*2	0 — 65000 Time	—
IG Count after ECU Overheat Protection(Before Previous)	Number of times the ignition switch is ON from the third last intervention of overheat protection control*2	0 — 65000 Time	—
Assist limited(Abnormal voltage)	Number of the intervention of assist restriction control due to voltage failure	0 — 250 Time	—
Assist Map Number	Assist MAP specification used for control	Not Selected/MAP1/MAP2/MAP3/MAP4/MAP5	*3
Assist Map Number Discord	Number of times the assist MAP to be used for control could not be properly selected	0 — 250 Time	—

Item	Contents	Standard/Unit	Note
IGN-OFF Intervention Count while Running	Number of times the ignition switch is turned OFF while driving	0 — 250 Time	—
Torque Sensor Main	Torque sensor (main) output value	−15.36 — 15.24 Nm	—
Torque Sensor Sub	Torque sensor (sub) output value	−15.36 — 15.24 Nm	—
Steering Angle	Steering wheel rotational angle	−640 — 640 deg	—

- *1: When the value exceeds the maximum of 250 times, 250 is displayed. If an error such as control unit memory error, etc. occurs, “254” is displayed.
- *2: When the value exceeds the maximum of 65000 times, 65000 is displayed. If an error such as control unit memory error, etc. occurs, “65534” is displayed. When there is no intervention of the overheating protection control, “65535” is displayed.
- *3: When the ignition switch is ON (engine OFF), [Not Selected] is displayed.
- For detailed operation procedures, refer to “Help” of application.

POWER STEERING (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on freeze frame data, refer to the list. Ref. to POWER STEERING (DIAGNOSTICS)>Freeze Frame Data>LIST.**

POWER STEERING (DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Total number of ignition switch ON	0 — 65534 Time	—
Count	Counter	Common/Originally	—
Time Count	Elapsed time after ignition switch is turned to ON	0 — 53687091000 ms	—
Power Supply Current	Primary current recognized by power steering CM	−128 — 127 A	—
Vehicle Speed	Vehicle speed	0 — 255 km/h	—
Engine Speed	Engine speed	0 — 12750 rpm	—
CU Sensing Current(q)	q axis current recognized by power steering CM	−128 — 127 A	—
Motor Current(U)	U axis current recognized by power steering CM	−128 — 127 A	—
Motor Current(V)	V axis current recognized by power steering CM	−128 — 127 A	—
Motor Speed	Motor rotational speed (rpm)	−4096 — 4064 rpm	—
CU Temperature	Power steering CM inner temperature	−50 — 205 °C	*1
Power Supply Voltage	Voltage supplied to power steering CM	0 — 25.5 V	—
Torque Sensor Power Supply	Voltage supplied to torque sensor	0 — 10.2 V	—
IG Voltage	IGN voltage recognized by power steering CM	0 — 25.5 V	—
CAN Bus Status	CAN bus status	Active/Bus off	—
EPS Status	EPS assist status	Normal/Assist stop/Assist limitation	—
CU Target current(q)	q axis indicator current from power steering CM to motor	−128 — 127 A	—
ECU Overheat Protection	Number of interventions of the overheat protection control*2	0 — 250 Time	—
IG Count after ECU Overheat Protection(latest)	Number of times the ignition switch is ON from the last intervention of overheat protection control*3	0 — 65000 Time	—
IG Count after ECU Overheat Protection(Previous)	Number of times the ignition switch is ON from the second last intervention of overheat protection control*3	0 — 65000 Time	—
IG Count after ECU Overheat Protection(Before Previous)	Number of times the ignition switch is ON from the third last intervention of overheat protection control*3	0 — 65000 Time	—
Assist limited(Abnormal voltage)	Number of the intervention of assist restriction control due to voltage failure	0 — 250 Time	—
Assist Map Number	Assist MAP specification used for control	Not Selected/MAP1/MAP2/MAP3/MAP4/MAP5	*4
Assist Map Number Discord	Number of times the assist MAP to be used for control could not be properly selected	0 — 250 Time	—

Item	Contents	Standard/Unit	Note
IGN-OFF Intervention Count while Running	Number of times the ignition switch is turned OFF while driving	0 — 250 Time	—
Torque Sensor Main	Torque sensor (main) output value	−15.36 — 15.24 Nm	—
Torque Sensor Sub	Torque sensor (sub) output value	−15.36 — 15.24 Nm	—
Steering Angle	Steering wheel rotational angle	−640 — 640 deg	—

- *1: Depending on the grade, two [CU Temperature] are displayed. One shows 150°C, but it is normal.
- *2: When the value exceeds the maximum of 250 times, 250 is displayed. If an error such as control unit memory error, etc. occurs, “254” is displayed.
- *3: When the value exceeds the maximum of 65000 times, 65000 is displayed. If an error such as control unit memory error, etc. occurs, “65534” is displayed. When there is no intervention of the overheating protection control, “65535” is displayed.
- *4: Depending on the timing where freeze frame data is recorded, [Not Selected] is displayed. However, it is normal if DTC C2549 is not recorded.
- For detailed operation procedures, refer to “Help” of application.

POWER STEERING (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

POWER STEERING (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
None	No display	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.
	[Assist limitation] is displayed on the data monitor [EPS Status].	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.
	The data monitor [ECU Overheat Protection] indicates at least 1 time.	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.
C1E00	REGISTRATION FAULT OF AUTHENTICATION UNIT	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.
C2511	TORQUE SENSOR MAIN	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	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2521 MOTOR MALFUNCTION.
C2522	RESOLVER SENSOR	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2522 RESOLVER SENSOR.
C2531	CONTROL MODULE CPU	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2531 CONTROL MODULE CPU.
C2532	CONTROL MODULE PERIPHERAL CIRCUIT	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2532 CONTROL MODULE PERIPHERAL CIRCUIT.
C2533	CONTROL MODULE BOARD TEMPERATURE SENSOR	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	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with

DTC	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC C2541 VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR.
C2545	EYESIGHT SYSTEM	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2545 EYESIGHT SYSTEM .
C2547	EYESIGHT CHECK SUM	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2547 EYESIGHT CHECK SUM .
C2549	ASSIST MAP SELECTION	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2549 ASSIST MAP SELECTION .
C254A	EYESIGHT VALUE 2	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C254A EYESIGHT VALUE 2.
C254B	EYESIGHT COOPERATIVE CONTROL 1	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C254B EYESIGHT COOPERATIVE CONTROL 1.
C254C	EYESIGHT COOPERATIVE CONTROL 2	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C254C EYESIGHT COOPERATIVE CONTROL 2.
C2551	POWER SUPPLY RELAY	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2551 POWER SUPPLY RELAY.
U0079	CONTROL MODULE COMMUNICATION BUS "G" OFF	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0079 CONTROL MODULE COMMUNICATION BUS "G" OFF.
U007A	CONTROL MODULE COMMUNICATION BUS "H" OFF	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U007A CONTROL MODULE COMMUNICATION BUS "H" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	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	Ref. to POWER STEERING (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	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.

DTC	Description & trouble part	Reference
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	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	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1120	LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1120 LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE.
U114C	LOST COMMUNICATION WITH GATEWAY "A" SA-BUS	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U114C LOST COMMUNICATION WITH GATEWAY "A" SA-BUS.
U1283	LOST COMMUNICATION WITH EYESIGHT SA-BUS	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1283 LOST COMMUNICATION WITH EYESIGHT SA-BUS.
U1469	INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1469 INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE.
U1584	INVALID DATA RECEIVED FROM EYESIGHT SA-BUS	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1584 INVALID DATA RECEIVED FROM EYESIGHT SA-BUS.
U1C00	INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY.
U1C0D	INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT SA-BUS	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1C0D INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT SA-BUS.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT

Note:
Refer to "CENTRAL GATEWAY (DIAGNOSTICS)" for diagnostic procedure. Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1E00 REGISTRATION FAULT OF AUTHENTICATION UNIT.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2511 TORQUE SENSOR MAIN

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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 C2512 TORQUE SENSOR SUB

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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 C2513 TORQUE SENSOR MUCH TOLERANCE

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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 C2514 TORQUE SENSOR POWER SUPPLY

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

DTC C2521 MOTOR MALFUNCTION

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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 C2532 CONTROL MODULE PERIPHERAL CIRCUIT

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, 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

Caution:
Do not perform the clear memory after checking DTCs.

Note:
When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

DTC C2541 VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR

DTC detecting condition:
When VDCCM reception failure (related to vehicle speed sensor) is detected after the ignition switch is ON.
Trouble symptom:

- The steering wheel operation feels heavy. (The EPS warning light does not illuminate.)
- EyeSight steering support function does not operate. (The EPS warning light does not illuminate.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is a DTC related to VDC system or vehicle speed signal system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK VEHICLE SPEED SIGNAL.

1. Using the Subaru Select Monitor, read data of [Vehicle Speed] in the [Data Monitor] of [Power Steering]. Ref. to POWER STEERING (DIAGNOSTICS)>Data 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. Clear the memory. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

DTC C2545 EYESIGHT SYSTEM

DTC detecting condition:
When the EyeSight system fail flag from stereo camera is received after the ignition switch is ON.
Trouble symptom:
EyeSight steering support function does not operate. (The EPS warning light does not illuminate.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK POWER STEERING CM.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2545 displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2547 EYESIGHT CHECK SUM

DTC detecting condition:
When checksum error of EyeSight transmission data is detected after the ignition switch is ON.
Trouble symptom:
EyeSight steering support function does not operate. (The EPS warning light does not illuminate.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK POWER STEERING CM.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2547 displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2549 ASSIST MAP SELECTION

DTC detecting condition:
CAN communication error is received or CCM information is not received correctly.
Trouble symptom:
Proper constant may not be set and the driver may feel odd when operating the steering wheel. (The EPS warning light does not illuminate.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Cockpit Control] using the Subaru Select Monitor. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of the cockpit control module displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK POWER STEERING CM.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Power Steering System] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2549 displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C254A EYESIGHT VALUE 2

DTC detecting condition:
CAN communication error is received or EyeSight information is not received correctly.
Trouble symptom:
EyeSight steering support function does not operate. (The EPS warning light does not illuminate.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK POWER STEERING CM.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C254A displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C254B EYESIGHT COOPERATIVE CONTROL 1

DTC detecting condition:
CAN communication error is received or EyeSight information is not received correctly.
Trouble symptom:
EyeSight steering support function does not operate. (The EPS warning light does not illuminate.)

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK POWER STEERING CM.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C254B displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C254C EYESIGHT COOPERATIVE CONTROL 2

DTC detecting condition:
CAN communication error is received or steering angle sensor information is not received correctly.
Trouble symptom:
EyeSight steering support function does not operate. (The EPS warning light does not illuminate.)

1. CHECK STEERING ANGLE SENSOR.

1. Turn the ignition switch to ON.
2. Inspect DTC C1711 of [Brake Control]. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1711 STEERING ANGLE SENSOR.

Is the check result OK?

Yes	Go to 2.
No	Repair or replace faulty parts.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK POWER STEERING CM.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C254C displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

DTC C2551 POWER SUPPLY RELAY

DTC detecting condition:

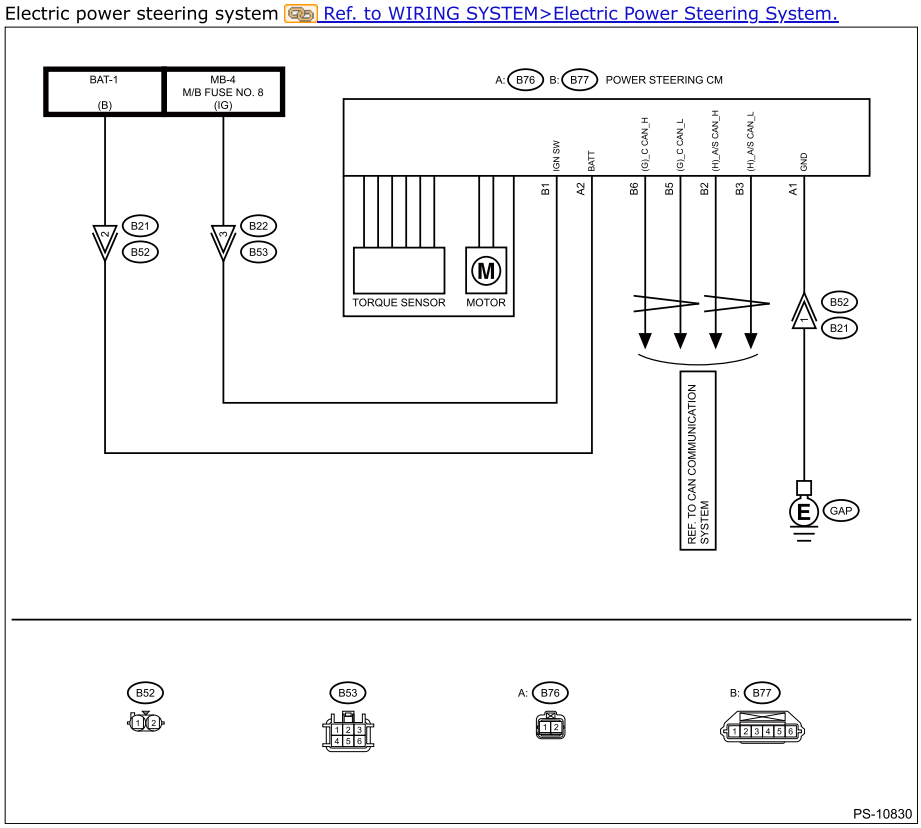
- When short malfunction of power supply relay is detected at initial check.
- When power supply voltage failure is detected after the ignition switch is ON.
- When power supply voltage drop is detected with 500 rpm engine speed reception.

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.



Note:
If power supply voltage failure exists at the vehicle side, the warning light goes off if the normal voltage returns.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes — Go to 2.

No — Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.

2. CHECK BATTERY TERMINAL 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. (B21, B52)
2. Turn the ignition switch to ON.
3. Using a tester and special tool harness, check the voltage between terminals.
   Connector & terminal
   (B21) 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 CM and the battery.

4. CHECK GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Using a tester and special tool harness, check the resistance between terminals.
   Connector & terminal
   (B21) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes — Go to 5.

No — Repair the open circuit or poor contact of the harness between the power steering CM and chassis ground.

5. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the power steering CM connector (B76).
3. Using a tester and special tool harness, check the resistance between harness terminals.
   Connector & terminal
   (B52) No. 1 — (B76) No. 1:
   (B52) No. 2 — (B76) No. 2:

Is the resistance less than 1 Ω?

Yes — Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

No — Repair or replace the harness.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0079 CONTROL MODULE COMMUNICATION BUS "G" 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 U007A CONTROL MODULE COMMUNICATION BUS "H" 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 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.

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 U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY 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 U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY 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 U1120 LOST COMMUNICATION WITH AUTOSTART STOP 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 U114C LOST COMMUNICATION WITH GATEWAY "A" SA-BUS

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 U1283 LOST COMMUNICATION WITH EYESIGHT SA-BUS

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)

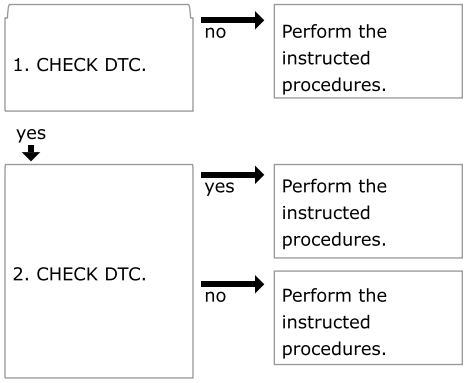
DTC U1469 INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE

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 U1584 INVALID DATA RECEIVED FROM EYESIGHT SA-BUS

1. WHEN ONLY THE POWER STEERING CONTROL MODULE STORES THE CURRENT CODE DTC U1584



1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. After 10 minutes have elapsed, turn the ignition switch to ON.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U1584 displayed in current code?

Yes	Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION. Go to 2.
No	Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. After 10 seconds or more have elapsed, turn the ignition switch to ON.
3. Read the DTC of [Power Steering] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC U1584 displayed in current code?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

2. WHEN THE RELATED SYSTEM OTHER THAN THE POWER STEERING CONTROL MODULE STORES THE CURRENT CODE DTC U1584

Note:
- **Perform the diagnosis for the EyeSight system. Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure.**
- **Related system: LAN system, Blind Spot Detection/Rear Cross Traffic Alert, reverse automatic braking, combination meter, body control, cockpit control**

3. WHEN HISTORY CODE DTC U1584 IS STORED

It results from a temporary noise interference. Clear the memory to finish the diagnosis. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1C00 INVALID AUTHENTICATION DATA RECEIVED FROM GATEWAY

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 U1C0D INVALID AUTHENTICATION DATA RECEIVED FROM EYESIGHT SA-BUS

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS)

DAM(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

PROCEDURE

Caution:
- **Remove foreign matter (dust, water, oil, etc.) from the electronically-controlled damper CM connector during removal and installation.**
- **Be sure to record the malfunction information obtained via DTC check.**
- **Do not perform the clear memory until the repair or replacement of faulty parts is completed.**
- **If a problem (connector terminal with foreign matter, etc.) is found, record the faulty part (take a photo • store the foreign matter, etc.).**

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Check List for Interview.
2. Before performing diagnosis, check the components which may be affecting the electronically-controlled damper system problems. Ref. to ELECTRIC CONTROL DAMPER (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 ON.
2. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (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 ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

Are any DTCs displayed?

Yes	Record the DTC, time stamp and freeze frame data. Go to 4.
No	Go to 3.

3. PERFORM GENERAL DIAGNOSTICS.

1. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
2. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
3. Check that the DTC is not displayed.

Is the electronically-controlled damper warning light off after the ignition switch is turned ON?

Yes	The electronically-controlled damper function is normal. Finish the diagnosis.
No	Check the combination meter circuit. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Warning Light Illumination Pattern>ELECTRIC CONTROL DAMPER WARNING LIGHT DOES NOT GO OFF.

4. PERFORM DIAGNOSIS.

1. Refer to “Diagnostic Trouble Code (DTC)”.

   Note:
   For the DTC list, refer to “Diagnostic Trouble Code (DTC)”. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Repeat step 4 until DTC is not shown.
No	Finish the diagnosis.

CHECK

- Do not perform the clear memory when returning the parts.
- ∗1: Be sure to attach the monitoring result when returning the parts.

Electronically-controlled Damper System Check List for Interview			
Customer's Name		Registration date	
		Vehicle bring-in date	
		Date vehicle return (scheduled)	
Registration No.		Odometer reading	
Frame No.		—	
Date when problem occurred			
Phenomenon of the vehicle	❑ Noise ❑ Poor ride comfort ❑ Large rebound shock ❑ Rocking of the vehicle continues too long after running over bumpy road surface ❑ Electronically-controlled damper warning light illuminates ❑ Mode does not switch by drive mode select		
Frequency	❑ Always ❑ Sometimes ❑ Immediately after operation start ❑ Only once ❑ Other ❑ Recovers after leaving it for minutes		
Steering wheel operation	❑ Dry steering ❑ When turning ❑ Quick steering ❑ Slow steering ❑ Returning the steering wheel ❑ Releasing the steering wheel ❑ Only supporting the steering wheel by hand		
Vehicle speed	❑ While not operating (0 km/h) ❑ Very low speed (— 20 km/h) ❑ Low speed (— 40 km/h) ❑ Medium speed (— 80 km/h) ❑ High speed (80 km/h or more) ❑ At starting ❑ While accelerating ❑ While decelerating ❑ When accelerating rapidly ❑ When decelerating rapidly		
Engine speed	❑ Idling ❑ Close to rpm ❑ rpm — rpm ❑ rpm or more/less		
Electronically-controlled damper warning light illumination	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate ❑ Other		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after ignition switch ON ❑ Immediately after ignition switch START ❑ At idling ❑ While accelerating ❑ While decelerating ❑ When cruising at a constant speed of km/h ❑ When other electrical parts are operating (parts name: operating condition:)		
Recording of DTC	❑ Yes (DTC) ❑ No		
DTC specific items (Subaru Select Monitor)∗1	❑ Check DTC ❑ Malfunction information (freeze frame data)		
Check the DTC in related systems (VDC, EGI, AVN)	❑ Yes (system DTC) ❑ No		
Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Others		
Temperature	°C (°F)		
Road	❑ Inner city ❑ Suburbs ❑ Highway ❑ Local street ❑ Alley way ❑ Private road ❑ Parking lot ❑ Mountain road ❑ Paved road ❑ Unpaved road ❑ Gravel road ❑ Sandy place ❑ Muddy road ❑ Concrete road ❑ Stone pavement ❑ Racetrack ❑ Other		
Road surface	❑ Dry ❑ Wet ❑ Covered with fresh snow ❑ Covered with hardened snow ❑ Other		
Tires	❑ Tire chain ❑ Studless tire ❑ T-type tire (FR FL RR RL)		
Tire inflation pressure	FR: kPa • FL: kPa • RR: kPa • RL: kPa		
Tire groove	FR: mm • FL: mm • RR: mm • RL: mm		
Genuine part	❑ Yes ❑ No		

	❑ After-market part name ( )
Condition of suspension alignment	Condition:
Electrical load conditions	❑ Audio ❑ Air conditioning ❑ Other
Load condition	Condition:
Repair parts	❑ No ❑ Yes: Details ( )
Other	

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > General Description

CAUTION

1. SRS 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.**

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which may be affecting the electronically-controlled damper problems.

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

2. FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

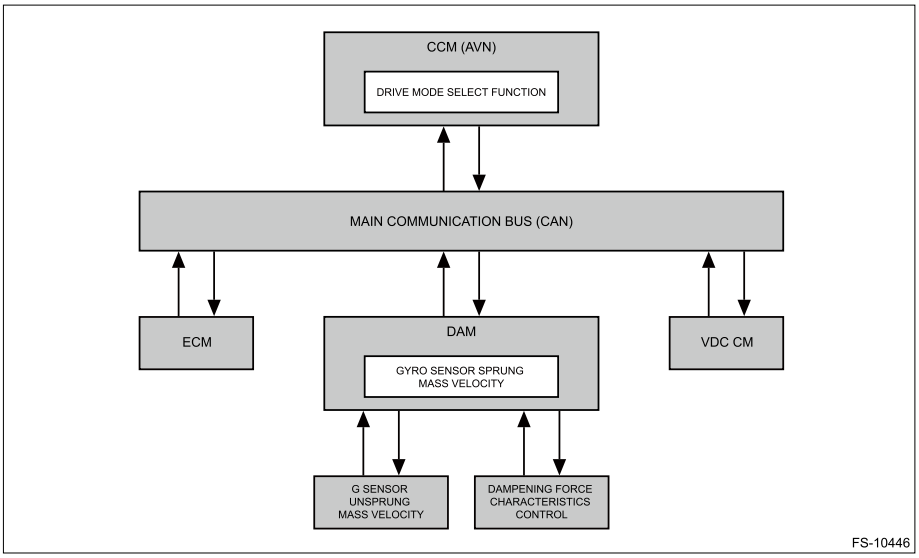
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > General Description

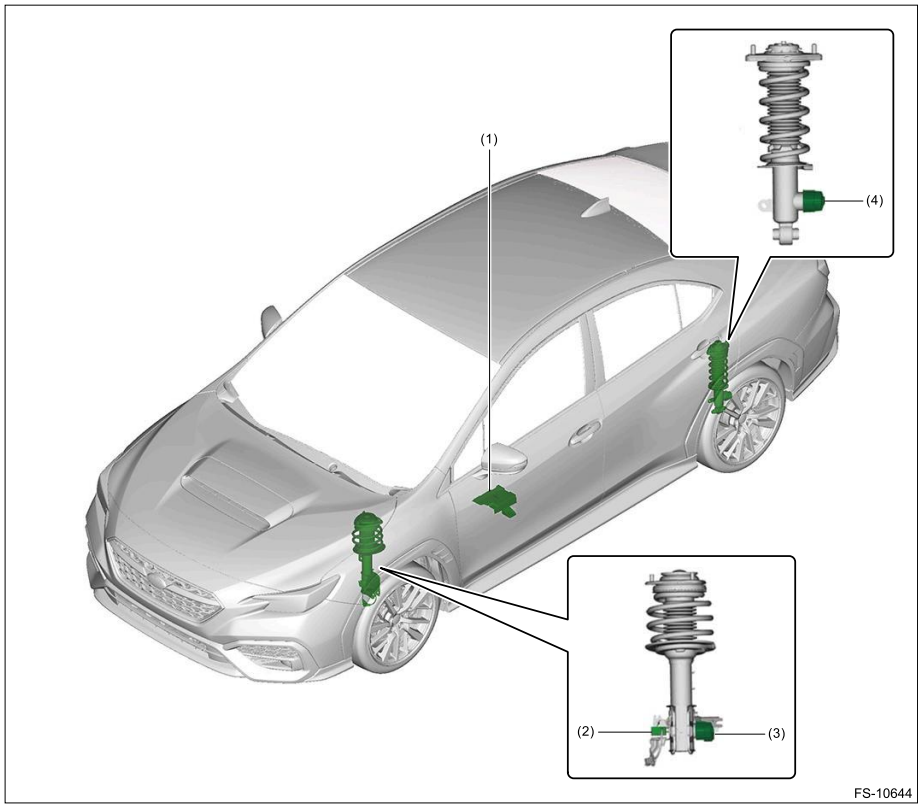
SYSTEM BLOCK DIAGRAM



- The dampening force characteristics of the dampers are controlled using the CAN information from the G sensors set on the dampers, the Gyro sensor in the electronically-controlled damper CM, and the engine/VDC.

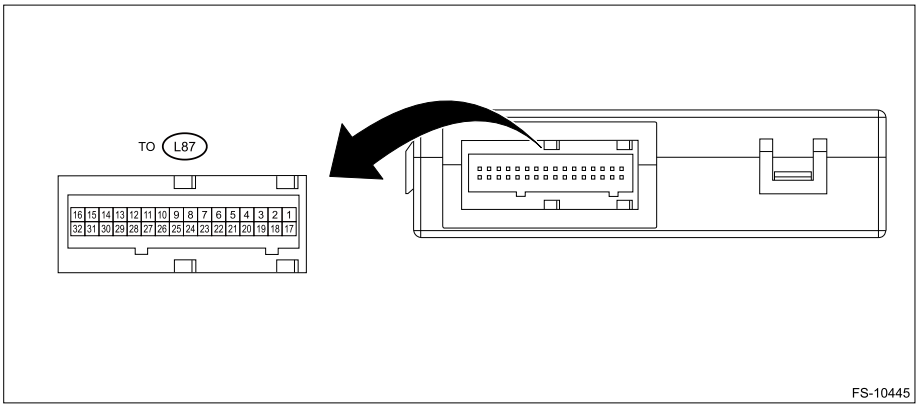
- The drive mode select function changes the mode of electronically-controlled damper based on the mode information from CCM.
- The drive mode select is a function where multiple systems, such as the electronically-controlled damper, engine and A/C, link with each other. Therefore, the drive mode select does not function in all the systems, when malfunctions occur in any of the systems.
- When malfunctions occur with the drive mode select function, it is important to perform the diagnosis for CCM first to narrow down the systems causing the problems.

LOCATION



(1) Electronically-controlled damper CM
(2) Damper G sensor
(3) Front damper solenoid valve
(4) Rear damper solenoid valve

ELECTRICAL SPECIFICATION



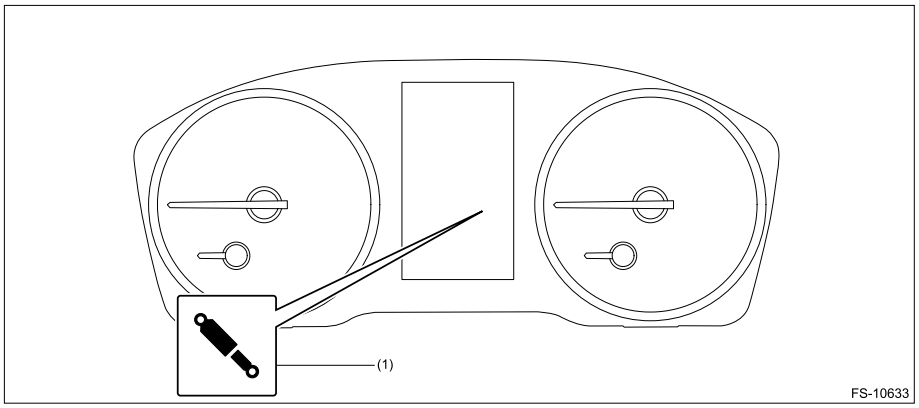
Terminal No.	Contents	Measuring condition	Standard
(L87) No. 1	Battery voltage	Ignition switch: ON (L87) No. 1 ←→ (L87) No. 18 or (L87) No. 19	Battery voltage
(L87) No. 2	Rear damper RH (−)	Ignition switch: ON (L87) No. 2 ←→ (L87) No. 3	When the vehicle speed reaches 0 km/h or more and the control starts, voltage fluctuates according to the driving conditions.
(L87) No. 3	Rear damper RH (+)	Ignition switch: ON (L87) No. 2 ←→ (L87) No. 3	
(L87) No. 4	Rear damper LH (+)	Ignition switch: ON (L87) No. 4 ←→ (L87) No. 5	
(L87) No. 5	Rear damper LH (−)	Ignition switch: ON (L87) No. 4 ←→ (L87) No. 5	
(L87) No. 6	Ignition switch	Ignition switch: ON (L87) No. 6 ←→ (L87) No. 17	Battery voltage
(L87) No. 7	Front G sensor RH power supply	Ignition switch: ON (L87) No. 7 ←→ (L87) No. 8	Approx. 5 V
(L87) No. 8	Front G sensor RH GND	—	—
(L87) No. 9	—	—	—
(L87) No. 10	Front G sensor LH signal	—	—
(L87) No. 11	Front G sensor RH signal	—	—
(L87) No. 12	Front G sensor LH power supply	Ignition switch: ON (L87) No. 12 ←→ (L87) No. 20	Approx. 5 V
(L87) No. 13	Front damper LH (−)	Ignition switch: ON (L87) No. 13 ←→ (L87) No. 14	When the vehicle speed reaches 0 km/h or more and the control starts, voltage fluctuates according to the driving conditions.
(L87) No. 14	Front damper LH (+)	Ignition switch: ON (L87) No. 13 ←→ (L87) No. 14	
(L87) No. 15	Front damper RH (+)	Ignition switch: ON (L87) No. 15 ←→ (L87) No. 16	
(L87) No. 16	Front damper RH (−)	Ignition switch: ON (L87) No. 15 ←→ (L87) No. 16	
(L87) No. 17	Battery voltage	Ignition switch: ON (L87) No. 17 ←→ (L87) No. 18 or (L87) No. 19	Battery voltage
(L87) No. 18	GND	—	—
(L87) No. 19	GND	—	—
(L87) No. 20	Front G sensor LH GND	—	—
(L87) No. 21	—	—	—
(L87) No. 22	Power unit 1 CAN H	Digital signal; cannot be measured	—
(L87) No. 23	—	—	—
(L87) No. 24	—	—	—
(L87) No. 25	Power unit 1 CAN L	Digital signal; cannot be measured	—
(L87) No. 26	—	—	—
(L87) No. 27	—	—	—
(L87) No. 28	—	—	—
(L87) No. 29	—	—	—
(L87) No. 30	—	—	—
(L87) No. 31	—	—	—
(L87) No. 32	—	—	—

PROCEDURE

1. Start the engine.
2. Drive the vehicle for three minutes or more.
3. Reproduce the malfunction occurrence condition as much as possible.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION



(1) Electronically-controlled damper warning light

The electronically-controlled damper warning light illuminates, when an error occurs in the electronically-controlled damper system.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Warning Light Illumination Pattern

ELECTRIC CONTROL DAMPER WARNING LIGHT DOES NOT GO OFF

Detecting condition:
- Defective combination meter
- Open circuit of harness

Trouble symptom:
The electronically-controlled damper warning light does not go off after the ignition switch is turned ON.

1. CHECK DTC.

Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes — Go to 3.

No — Perform the diagnosis for LAN system.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Warning Light Illumination Pattern

ELECTRIC CONTROL DAMPER WARNING LIGHT DOES NOT COME ON

Detecting condition:

- CAN communication failure
- Defective combination meter

Trouble symptom:

Electronically-controlled damper is faulty, but the warning light does not illuminate.

1. CHECK DTC.

Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Go to 2.
No	System is normal.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

INSPECTION

Detecting condition:

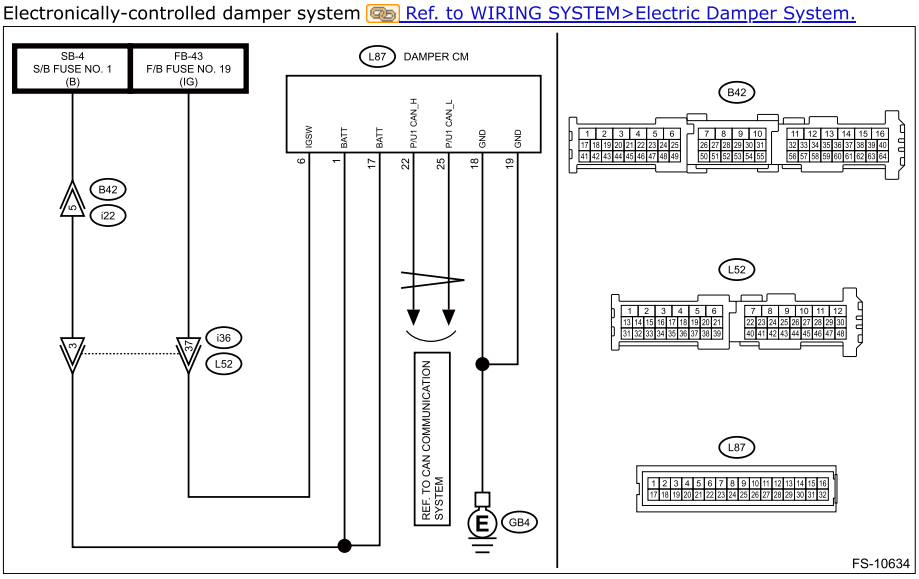
- Defective harness connector
- Defective electronically-controlled damper CM

Trouble symptom:

Subaru Select Monitor communication failure

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes — Go to 2.

No — Turn the ignition switch to ON, and select the [Electric Control Damper] 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. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>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 ELECTRONICALLY-CONTROLLED DAMPER CM CONNECTOR.

Turn the ignition switch to OFF.

Is the electronically-controlled damper CM connector inserted into the electronically-controlled damper CM until the clamp locks?

Yes	Go to 5.
No	Insert the electronically-controlled damper CM connector to the control module.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to the electronically-controlled damper system can be executed normally.

Is the [Select Function] screen displayed?

Yes	Check DTC for electronically-controlled damper system. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>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 the electronically-controlled damper CM connector and chassis ground.
   Connector & terminal
   (L87) No. 1 (+) — Chassis ground (−):
   (L87) No. 6 (+) — Chassis ground (−):
   (L87) No. 17 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 9.
No	Repair the open circuit of harness between the electronically-controlled damper CM and battery.

9. CHECK HARNESS CONNECTOR BETWEEN ELECTRONICALLY-CONTROLLED DAMPER CM AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the electronically-controlled damper CM.
3. Measure the resistance of harness between the electronically-controlled damper CM connector and chassis ground.

Connector & terminal

(L87) No. 18 — Chassis ground:

(L87) No. 19 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of the electronically-controlled damper CM ground circuit and the poor contact of connector.

10. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact in the electronically-controlled damper CM power supply, ground circuit or data link connector?

Yes	Repair the connector.
No	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Data Monitor>LIST.**

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Unit
Power Supply Voltage	Voltage supplied to electronically-controlled damper CM	V
CAN Bus Status	Either [Active], [Passive] or [Bus off] is displayed.	—
DAM operation state	Either [Normal], [Fault Level 1], [Fault Level 2] or [Fault Level 3] is displayed.	—
DAM mode state	Either [Default], [Comfort], [Normal] or [Sport] is displayed.	—
Solenoid command current value (FL)	Indicator current to solenoid valve (FL) is displayed.	A
Solenoid command current value (FR)	Indicator current to solenoid valve (FR) is displayed.	A
Solenoid command current value (RL)	Indicator current to solenoid valve (RL) is displayed.	A
Solenoid command current value (RR)	Indicator current to solenoid valve (RR) is displayed.	A
G-sensor (FL) vertical acceleration	Vertical acceleration detected by G sensor (FL) is displayed.	m/s^2
G-sensor (FR) vertical acceleration	Vertical acceleration detected by G sensor (FR) is displayed.	m/s^2
DAM ECU sensor vertical acceleration	Vertical acceleration detected by the sensor in the electronically-controlled damper CM is displayed.	m/s^2
DAM ECU sensor horizontal acceleration	Horizontal acceleration detected by the sensor in the electronically-controlled damper CM is displayed.	m/s^2
DAM ECU sensor longitudinal acceleration	Longitudinal acceleration detected by the sensor in the electronically-controlled damper CM is displayed.	m/s^2
DAM ECU sensor roll	Roll value detected by the sensor in the electronically-controlled damper CM is displayed.	deg/s
DAM ECU sensor pitch	Pitch value detected by the sensor in the electronically-controlled damper CM is displayed.	deg/s
DAM ECU sensor yaw	Yaw value detected by the sensor in the electronically-controlled damper CM is displayed.	deg/s
Vehicle speed	Vehicle speed is displayed. (CAN communication data)	km/h
Steering angle	Steering angle is displayed. (CAN communication data)	deg
VDC yaw rate	Yaw rate is displayed. (CAN communication data)	rad/s
VDC Lateral acceleration	Lateral G is displayed. (CAN communication data)	m/s^2
VDC longitudinal acceleration	Longitudinal G is displayed. (CAN communication data)	m/s^2
Brake pressure	Brake pressure is displayed. (CAN communication data)	Mpa
Engine Speed	Engine speed is displayed. (CAN communication data)	rpm
Engine shaft torque	Actual engine shaft torque is displayed. (CAN communication data)	Nm
Driver request torque	Torque requested by driver is displayed. (CAN communication data)	Nm

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Freeze Frame Data>LIST.**
- **Freeze frame data is not cleared even if the battery is removed.**
- **One FFD can be saved for one DTC.**

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Unit
Power Supply Voltage	Voltage supplied to electronically-controlled damper CM	V
CAN Bus Status	Either [Active], [Passive] or [Bus off] is displayed.	—
DAM operation state	Either [Normal], [Fault Level 1], [Fault Level 2] or [Fault Level 3] is displayed.	—
DAM mode state	Either [Default], [Comfort], [Normal] or [Sport] is displayed.	—
Vehicle speed	Vehicle speed is displayed. (CAN communication data)	km/h
Steering angle	Steering angle is displayed. (CAN communication data)	deg
Engine Speed	Engine speed is displayed. (CAN communication data)	rpm

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**
- **DTC is not cleared even if the battery is removed.**
- **When DTC is recorded, vehicle speed and mode information of FFD are recorded other than time stamp.**

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
C2911	DAM Solenoid Valve Circuit Open (FL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2911 DAM Solenoid Valve Circuit Open (FL).
C2912	DAM Solenoid valve Short Circuit (FL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2912 DAM Solenoid valve Short Circuit (FL).
C2913	DAM Solenoid Valve Circuit Open (FR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2913 DAM Solenoid Valve Circuit Open (FR).
C2914	DAM Solenoid valve Short Circuit (FR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2914 DAM Solenoid valve Short Circuit (FR).
C2915	DAM Solenoid Valve Circuit Open (RL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2915 DAM Solenoid Valve Circuit Open (RL).
C2916	DAM Solenoid valve Short Circuit (RL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2916 DAM Solenoid valve Short Circuit (RL).
C2917	DAM Solenoid Valve Circuit Open (RR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2917 DAM Solenoid Valve Circuit Open (RR).
C2918	DAM Solenoid valve Short Circuit (RR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2918 DAM Solenoid valve Short Circuit (RR).
C2922	DAM G Sensor Short to Battery (FL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2922 DAM G Sensor Short to Battery (FL).
C2923	DAM G Sensor Circuit Open (FL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2923 DAM G Sensor Circuit Open (FL).
C2924	DAM G Sensor Signal (FL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2924 DAM G Sensor Signal (FL).
C2925	DAM G Sensor Short to Ground (FR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2925 DAM G Sensor Short to Ground (FR).
C2926	DAM G Sensor Short to Battery (FR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2926 DAM G Sensor Short to Battery (FR).

DTC	Description & trouble part	Reference
C2927	DAM G Sensor Circuit Open (FR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2927 DAM G Sensor Circuit Open (FR).
C2928	DAM G Sensor Signal (FR)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2928 DAM G Sensor Signal (FR).
C2929	DAM G Sensor Short to Ground (FL)	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2929 DAM G Sensor Short to Ground (FL).
C2931	DAM ECU G Sensor High Voltage	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2931 DAM ECU G Sensor High Voltage.
C2932	DAM ECU G Sensor Low Voltage	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2932 DAM ECU G Sensor Low Voltage.
C2933	DAM ECU G Sensor Signal	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2933 DAM ECU G Sensor Signal.
C2941	DAM ECU RAM	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2941 DAM ECU RAM.
C2942	DAM ECU Program Memory	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2942 DAM ECU Program Memory.
C2943	DAM ECU Data Flash	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2943 DAM ECU Data Flash.
C2944	DAM ECU Watchdog	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2944 DAM ECU Watchdog.
C2945	DAM ECU Not Programmed	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2945 DAM ECU Not Programmed.
C2946	DAM ECU Current Calibration	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2946 DAM ECU Current Calibration.
C2947	DAM ECU Tuning Parameter	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2947 DAM ECU Tuning Parameter.
C2951	DAM System High Voltage	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2951 DAM System High Voltage.
C2952	DAM System Low Voltage	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2952 DAM System Low Voltage.
C2961	Speed Sensor Abnormal Detection	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2961 Speed Sensor Abnormal Detection.
C2962	VDC Fail Flag	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with

DTC	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC C2962 VDC Fail Flag.
C2963	EGI Fail Flag	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2963 EGI Fail Flag.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to ELECTRIC CONTROL DAMPER (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 ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to ELECTRIC CONTROL DAMPER (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 ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.

DTC C2911 DAM SOLENOID VALVE CIRCUIT OPEN (FL)

DTC detecting condition:

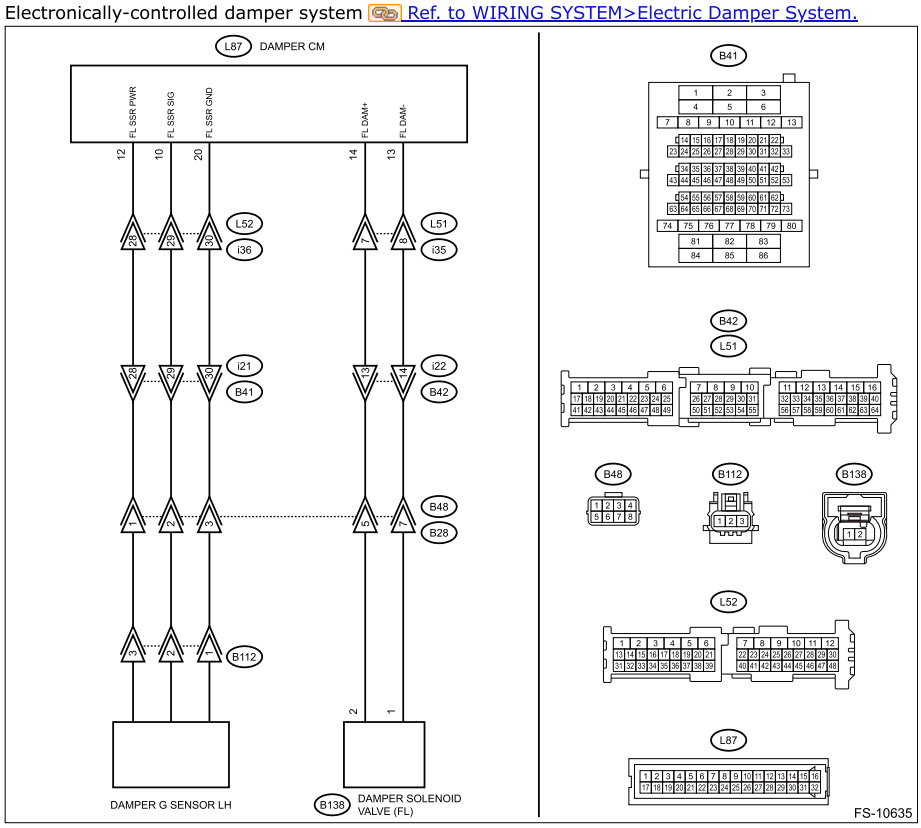
When open circuit of the solenoid valve (FL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK CONTINUITY OF HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check continuity between terminals.

Connector & terminal

(L87) No. 13 — (L87) No. 14:

Is there continuity?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (FL).
2. Using a tester, check continuity between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is there continuity?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to FRONT SUSPENSION>Front Strut.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (B28) and (B48).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(B138) No. 1 — (B28) No. 7:

(B138) No. 2 — (B28) No. 5:

Is there continuity?

Yes	Go to 4.
No	Replace the electronically-controlled damper underbody harness.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 14 — (B48) No. 5:

(L87) No. 13 — (B48) No. 7:

Is there continuity?

Yes	Currently normal. Reproduce the failure, and then perform the diagnosis again.
No	Repair or replace the harness on the vehicle body side.

DTC C2912 DAM SOLENOID VALVE SHORT CIRCUIT (FL)

DTC detecting condition:

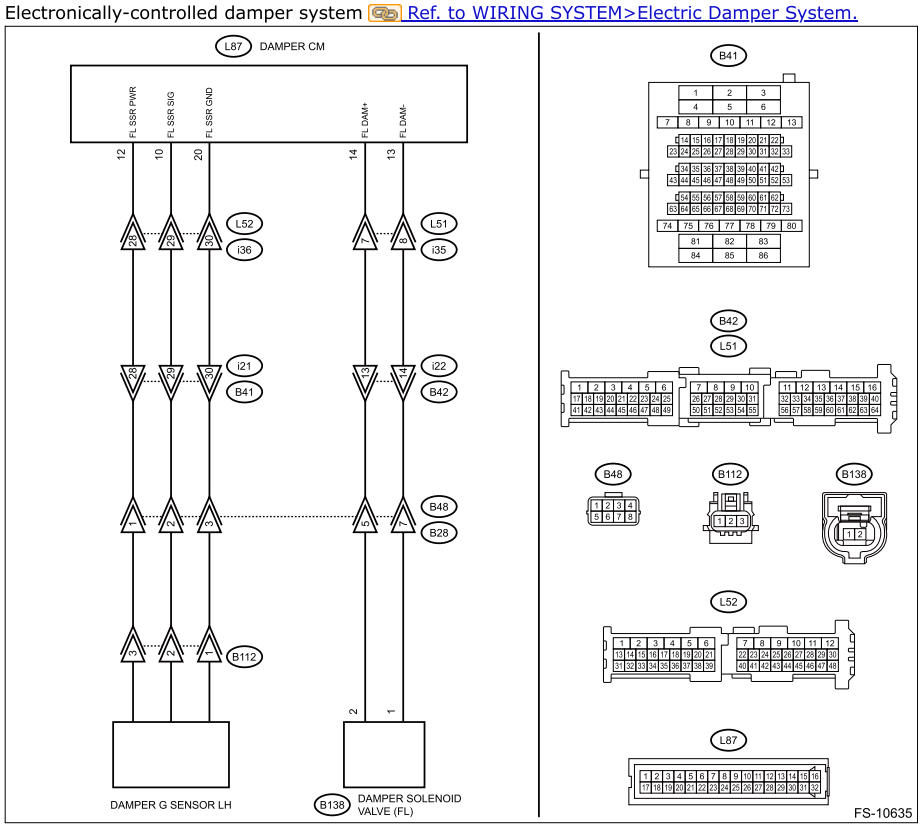
When short circuit of the solenoid valve (FL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check the resistance between the terminals.

Connector & terminal

(L87) No. 13 — (L87) No. 14:

Is the resistance 2.5 — 5.5 Ω?

Yes	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.
No	Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (FL).
2. Using a tester, check resistance between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is the resistance 2 — 5 Ω?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to FRONT SUSPENSION>Front Strut.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (B28) and (B48).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(B138) No. 1 — (B138) No. 2:

Is there continuity? (Is there short circuit?)

Yes	Replace the electronically-controlled damper underbody harness.
No	Go to 4.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 13 — (L87) No. 14:

Is there continuity? (Is there short circuit?)

Yes	Repair or replace the harness on the vehicle body side.
No	Currently normal. Reproduce the failure, and then perform the diagnosis again.

DTC C2913 DAM SOLENOID VALVE CIRCUIT OPEN (FR)

DTC detecting condition:

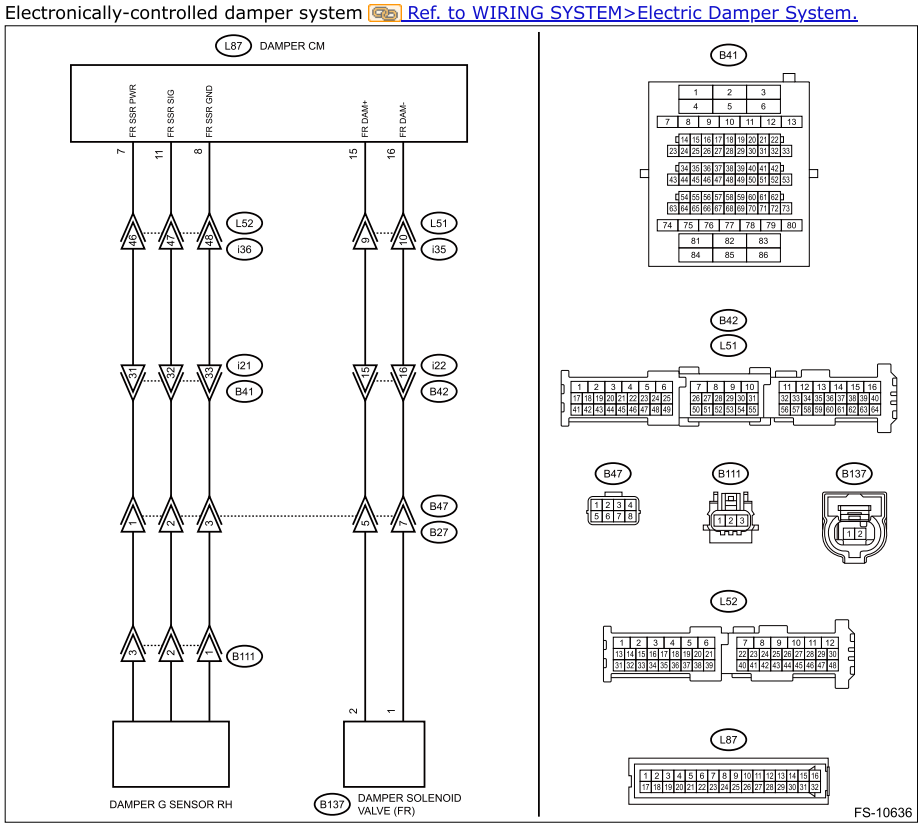
When open circuit of the solenoid valve (FR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK CONTINUITY OF HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check continuity between terminals.

Connector & terminal

(L87) No. 15 — (L87) No. 16:

Is there continuity?

Yes	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.
No	Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (FR).
2. Using a tester, check continuity between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is there continuity?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to FRONT SUSPENSION>Front Strut.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (B27) and (B47).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(B137) No. 1 — (B27) No. 7:

(B137) No. 2 — (B27) No. 5:

Is there continuity?

Yes	Go to 4.
No	Replace the electronically-controlled damper underbody harness.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 15 — (B47) No. 5:

(L87) No. 16 — (B47) No. 7:

Is there continuity?

Yes	Currently normal. Reproduce the failure, and then perform the diagnosis again.
No	Repair or replace the harness on the vehicle body side.

DTC C2914 DAM SOLENOID VALVE SHORT CIRCUIT (FR)

DTC detecting condition:

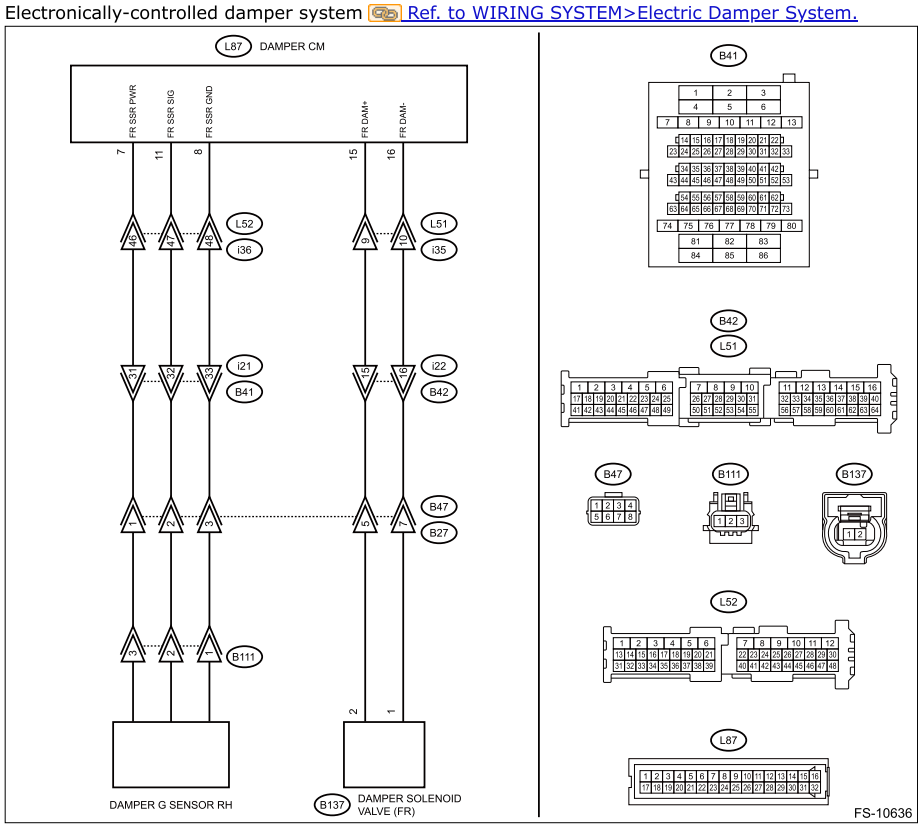
When short circuit of the solenoid valve (FR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check the resistance between the terminals.

Connector & terminal

(L87) No. 15 — (L87) No. 16:

Is the resistance 2.5 — 5.5 Ω?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (FR).
2. Using a tester, check resistance between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is the resistance 2 — 5 Ω?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to FRONT SUSPENSION>Front Strut.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (B27) and (B47).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(B137) No. 1 — (B137) No. 2:

Is there continuity? (Is there short circuit?)

Yes	Replace the electronically-controlled damper underbody harness.
No	Go to 4.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 15 — (L87) No. 16:

Is there continuity? (Is there short circuit?)

Yes	Repair or replace the harness on the vehicle body side.
No	Currently normal. Reproduce the failure, and then perform the diagnosis again.

DTC C2915 DAM SOLENOID VALVE CIRCUIT OPEN (RL)

DTC detecting condition:

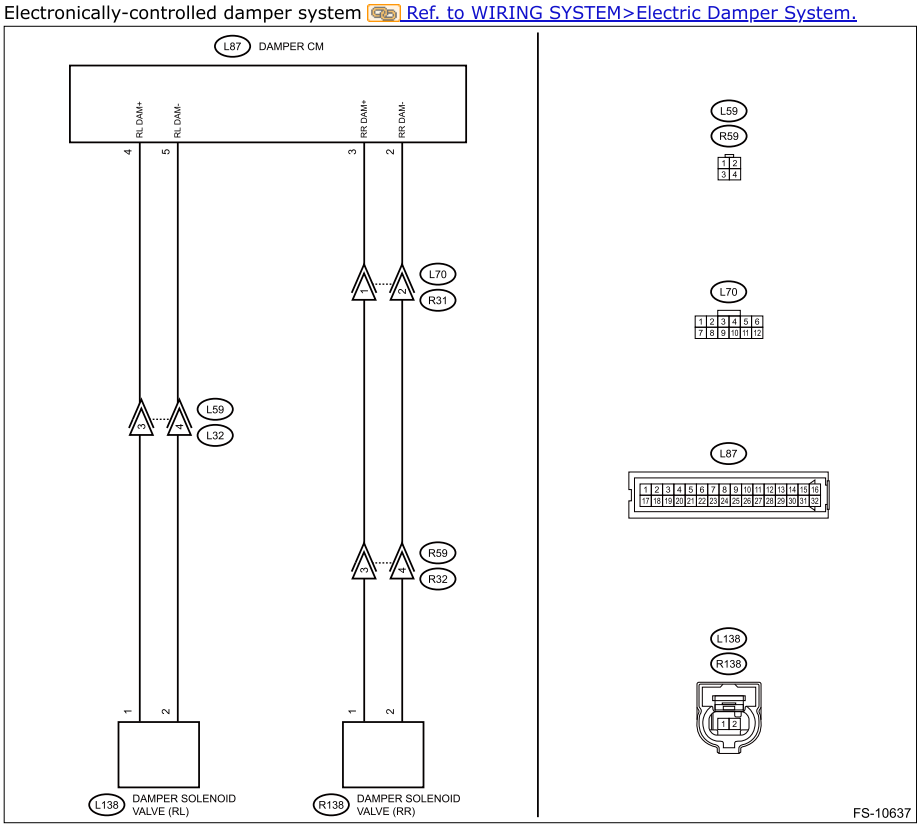
When open circuit of the solenoid valve (RL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK CONTINUITY OF HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check continuity between terminals.

Connector & terminal

(L87) No. 4 — (L87) No. 5:

Is there continuity?

Yes — Replace the electronically-controlled damper CM. Ref. to REAR SUSPENSION>Suspension Control Module.

No — Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (RL).
2. Using a tester, check continuity between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is there continuity?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to REAR SUSPENSION>Rear Shock Absorber.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (L32) and (L59).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(L138) No. 1 — (L32) No. 3:

(L138) No. 2 — (L32) No. 4:

Is there continuity?

Yes	Go to 4.
No	Replace the electronically-controlled damper underbody harness.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 4 — (L59) No. 3:

(L87) No. 5 — (L59) No. 4:

Is there continuity?

Yes	Currently normal. Reproduce the failure, and then perform the diagnosis again.
No	Repair or replace the harness on the vehicle body side.

DTC C2916 DAM SOLENOID VALVE SHORT CIRCUIT (RL)

DTC detecting condition:

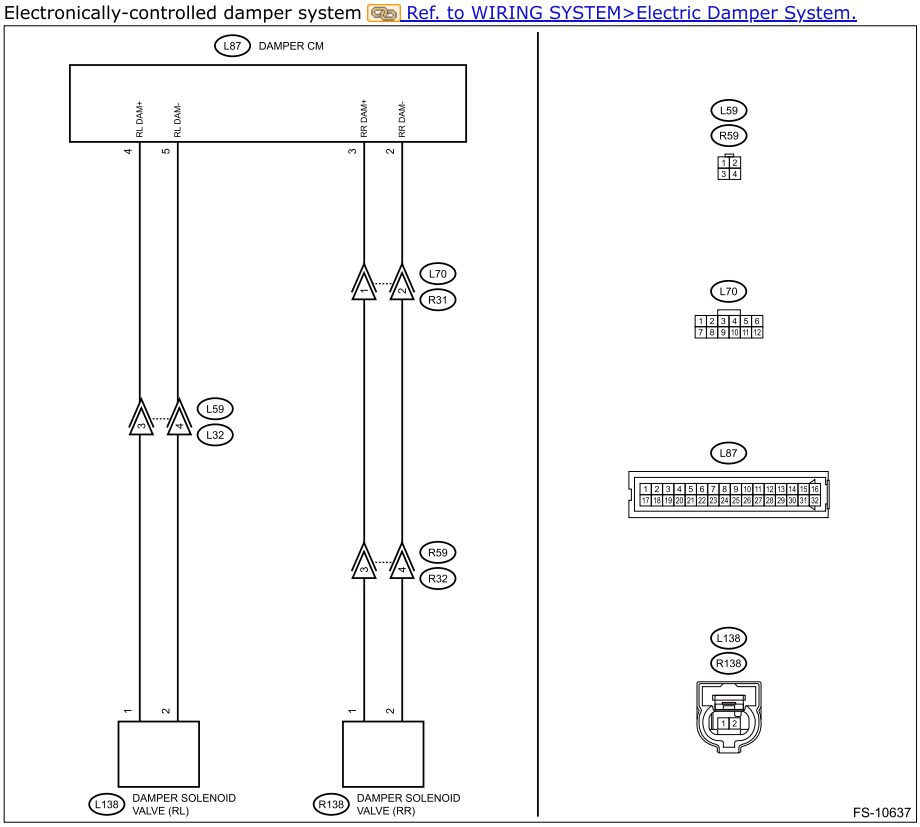
When short circuit of the solenoid valve (RL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check the resistance between the terminals.

Connector & terminal

(L87) No. 4 — (L87) No. 5:

Is the resistance 2.5 — 5.5 Ω?

Yes — Replace the electronically-controlled damper CM. Ref. to REAR SUSPENSION>Suspension Control Module.

No — Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (RL).
2. Using a tester, check resistance between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is the resistance 2 — 5 Ω?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to REAR SUSPENSION>Rear Shock Absorber.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (L32) and (L59).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(L138) No. 1 — (L138) No. 2:

Is there continuity? (Is there short circuit?)

Yes	Replace the electronically-controlled damper underbody harness.
No	Go to 4.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 4 — (L87) No. 5:

Is there continuity? (Is there short circuit?)

Yes	Repair or replace the harness on the vehicle body side.
No	Currently normal. Reproduce the failure, and then perform the diagnosis again.

DTC C2917 DAM SOLENOID VALVE CIRCUIT OPEN (RR)

DTC detecting condition:

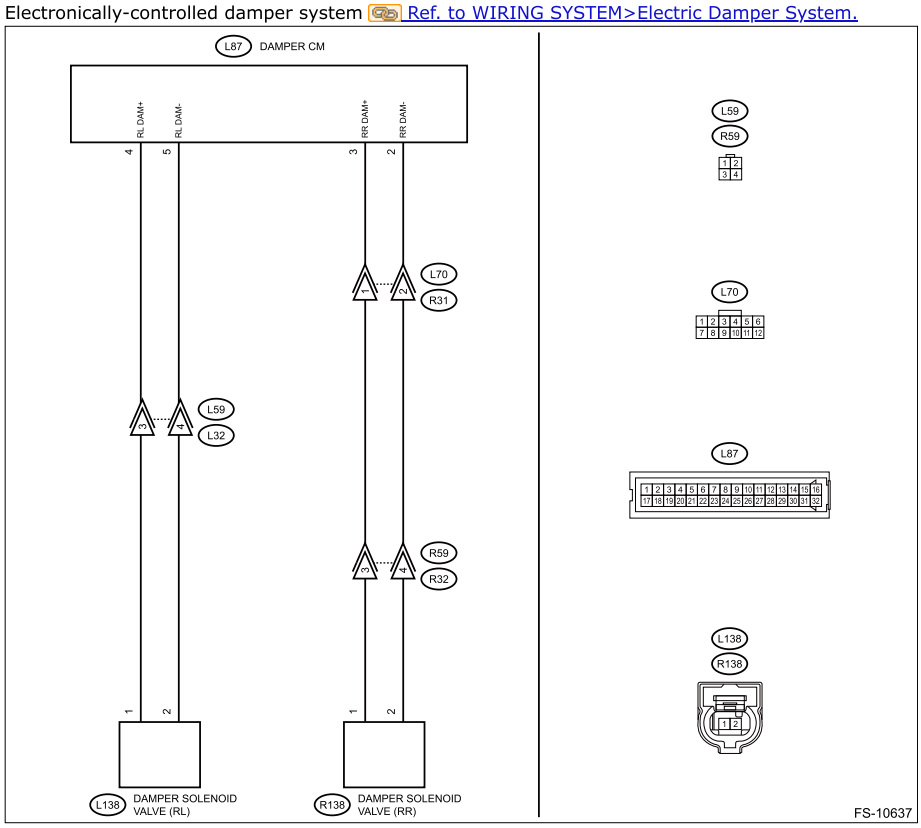
When open circuit of the solenoid valve (RR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK CONTINUITY OF HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check continuity between terminals.

Connector & terminal

(L87) No. 2 — (L87) No. 3:

Is there continuity?

Yes	Replace the electronically-controlled damper CM. Ref. to REAR SUSPENSION>Suspension Control Module.
No	Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (RR).
2. Using a tester, check continuity between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is there continuity?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to REAR SUSPENSION>Rear Shock Absorber.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (R32) and (R59).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(R138) No. 1 — (R32) No. 3:

(R138) No. 2 — (R32) No. 4:

Is there continuity?

Yes	Go to 4.
No	Replace the electronically-controlled damper underbody harness.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 2 — (R59) No. 4:

(L87) No. 3 — (R59) No. 3:

Is there continuity?

Yes	Currently normal. Reproduce the failure, and then perform the diagnosis again.
No	Repair or replace the harness on the vehicle body side.

DTC C2918 DAM SOLENOID VALVE SHORT CIRCUIT (RR)

DTC detecting condition:

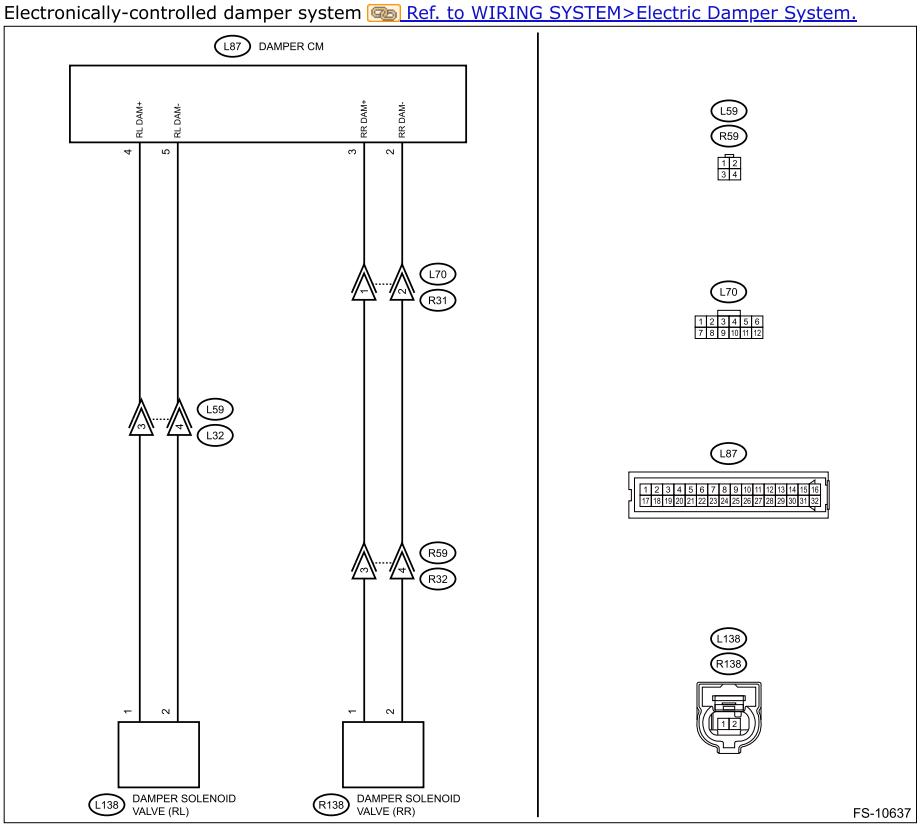
When short circuit of the solenoid valve (RR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Using a tester, check the resistance between the terminals.

Connector & terminal

(L87) No. 2 — (L87) No. 3:

Is the resistance 2.5 — 5.5 Ω?

Yes	Replace the electronically-controlled damper CM. Ref. to REAR SUSPENSION>Suspension Control Module.
No	Go to 2.

2. CHECK SOLENOID VALVE UNIT.

1. Disconnect the connector of the damper solenoid valve (RR).
2. Using a tester, check resistance between the damper solenoid valve terminals.

Terminals

No. 1 — No. 2:

Is the resistance 2 — 5 Ω?

Yes	Go to 3.
No	Replace the electronically-controlled damper. Ref. to REAR SUSPENSION>Rear Shock Absorber.

3. CHECK HARNESS (IDENTIFICATION OF FAULTY HARNESS).

1. Disconnect the intermediate connectors (R32) and (R59).
2. Using a tester, check the continuity between connectors.

Connector & terminal

(R138) No. 1 — (R138) No. 2:

Is there continuity? (Is there short circuit?)

Yes	Replace the electronically-controlled damper underbody harness.
No	Go to 4.

4. CHECK HARNESS.

Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 2 — (L87) No. 3:

Is there continuity? (Is there short circuit?)

Yes	Repair or replace the harness on the vehicle body side.
No	Currently normal. Reproduce the failure, and then perform the diagnosis again.

DTC C2922 DAM G SENSOR SHORT TO BATTERY (FL)

DTC detecting condition:

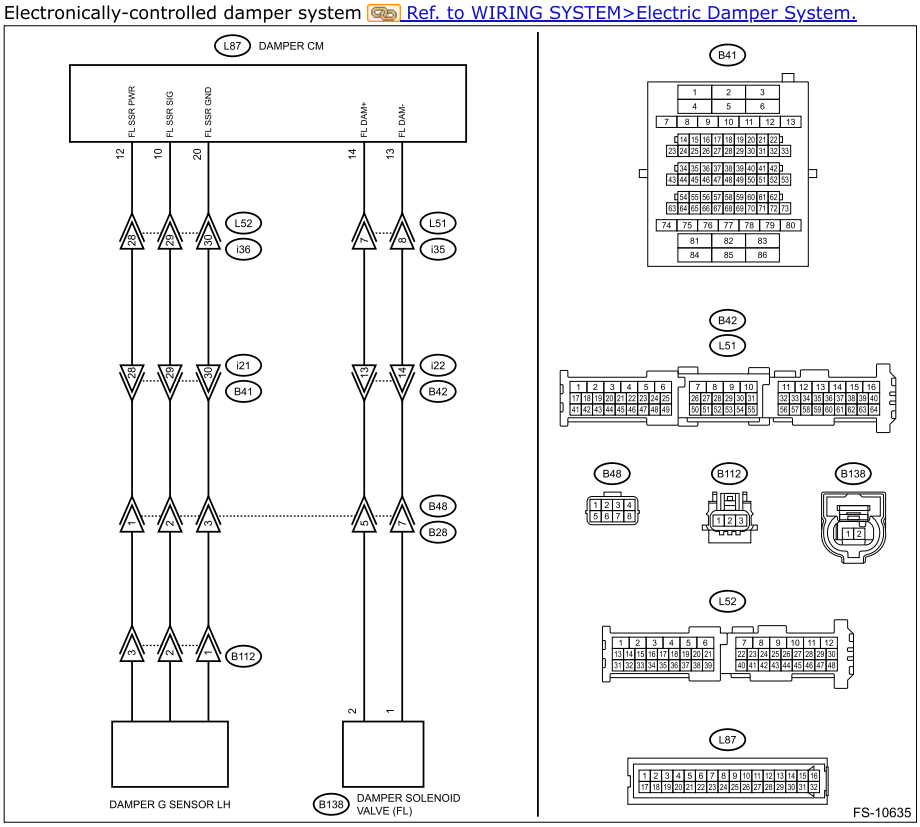
When BATT short of the G sensor (FL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Disconnect the damper G sensor LH connector.
4. Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 12 — (B112) No. 3:
(L87) No. 10 — (B112) No. 2:
(L87) No. 20 — (B112) No. 1:

Is there continuity?

Yes — Go to 2.

No — Repair or replace the open circuit.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the damper G sensor LH connector and chassis ground.

Connector & terminal

(B112) No. 2 — Chassis ground:

(B112) No. 3 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit.
No	Go to 3.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, check the voltage between the damper G sensor LH connector and chassis ground.

Connector & terminal

(B112) No. 2 (+) — Chassis ground (−):

Is the voltage 1 V or more?

Yes	Repair or replace the short circuit.
No	Go to 4.

4. CHECK DAMPER G SENSOR.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals in damper G sensor LH connector.

Connector & terminal

(B112) No. 1 — (B112) No. 2:

(B112) No. 1 — (B112) No. 3:

(B112) No. 2 — (B112) No. 3:

Is the resistance 10 Ω or less?

Yes	Replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.
No	Go to 5.

5. CHECK DAMPER G SENSOR.

1. Switch the left and right damper G sensors.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for the damper G sensor RH detected?

Yes	Return the switched damper G sensors to their original positions, and replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.
No	Return the switched damper G sensors to their original positions, and replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2923 DAM G SENSOR CIRCUIT OPEN (FL)

DTC detecting condition:

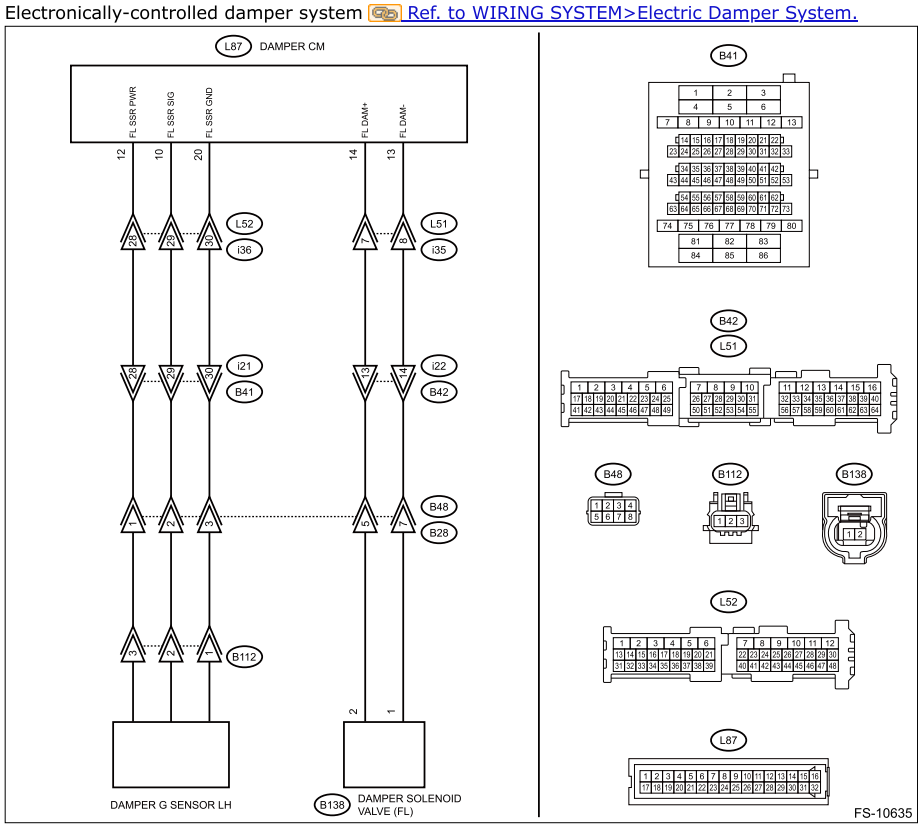
When open circuit of the G sensor (FL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Disconnect the damper G sensor LH connector.
4. Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 12 — (B112) No. 3:
(L87) No. 10 — (B112) No. 2:
(L87) No. 20 — (B112) No. 1:

Is there continuity?

Yes — Go to 2.

No — Repair or replace the open circuit.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the damper G sensor LH connector and chassis ground.

Connector & terminal

(B112) No. 2 — Chassis ground:

(B112) No. 3 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit.
No	Go to 3.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, check the voltage between the damper G sensor LH connector and chassis ground.

Connector & terminal

(B112) No. 2 (+) — Chassis ground (−):

Is the voltage 1 V or more?

Yes	Repair or replace the short circuit.
No	Go to 4.

4. CHECK DAMPER G SENSOR.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals in damper G sensor LH connector.

Connector & terminal

(B112) No. 1 — (B112) No. 2:

(B112) No. 1 — (B112) No. 3:

(B112) No. 2 — (B112) No. 3:

Is the resistance 10 Ω or less?

Yes	Replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.
No	Go to 5.

5. CHECK DAMPER G SENSOR.

1. Switch the left and right damper G sensors.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for the damper G sensor RH detected?

Yes	Return the switched damper G sensors to their original positions, and replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.
No	Return the switched damper G sensors to their original positions, and replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2924 DAM G SENSOR SIGNAL (FL)

DTC detecting condition:
When signal malfunction of the G sensor (FL) is detected after the ignition switch is turned ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC FOR ELECTRONICALLY-CONTROLLED DAMPER SYSTEM.

Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC C2941, C2942, C2943, C2944, C2945, C2946 or C2947 displayed?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.

DTC C2925 DAM G SENSOR SHORT TO GROUND (FR)

DTC detecting condition:

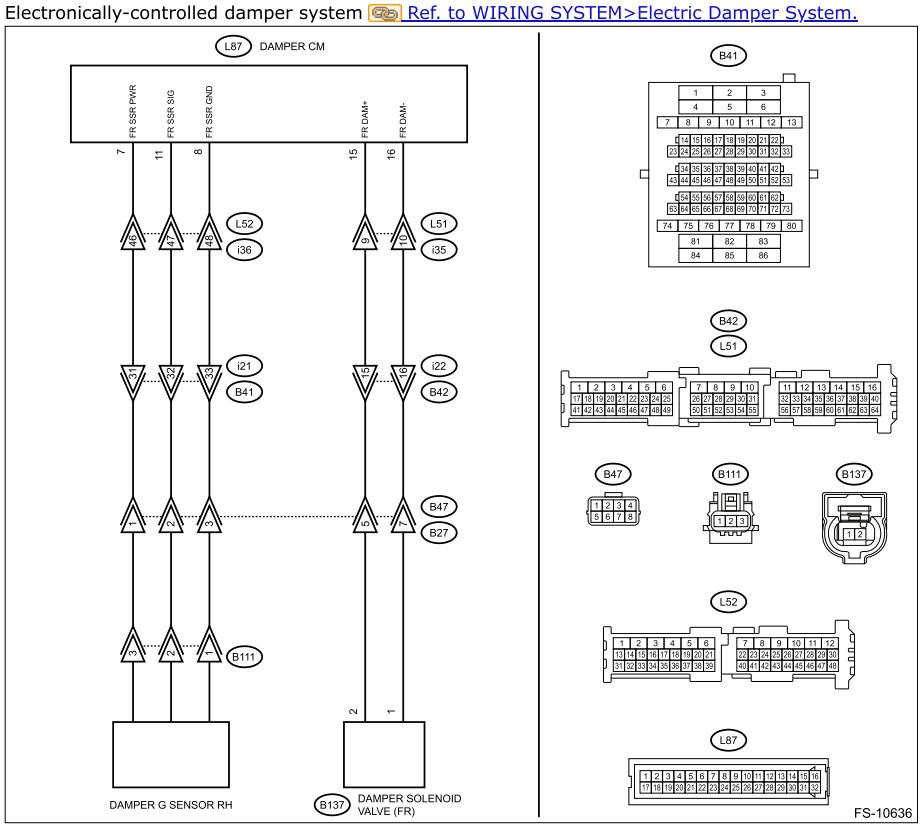
When short circuit to ground of the G sensor (FR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Disconnect the damper G sensor RH connector.
4. Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 7 — (B111) No. 3:
(L87) No. 11 — (B111) No. 2:
(L87) No. 8 — (B111) No. 1:

Is there continuity?

Yes — Go to 2.

No — Repair or replace the open circuit.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the damper G sensor RH connector and chassis ground.

Connector & terminal

(B111) No. 2 — Chassis ground:

(B111) No. 3 — Chassis ground:

Is there continuity?

Yes — Repair or replace the short circuit.

No — Go to 3.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, check the voltage between the damper G sensor RH connector and chassis ground.

Connector & terminal

(B111) No. 2 (+) — Chassis ground (−):

Is the voltage 1 V or more?

Yes — Repair or replace the short circuit.

No — Go to 4.

4. CHECK DAMPER G SENSOR.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals in damper G sensor RH connector.

Connector & terminal

(B111) No. 1 — (B111) No. 2:

(B111) No. 1 — (B111) No. 3:

(B111) No. 2 — (B111) No. 3:

Is the resistance 10 Ω or less?

Yes — Replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.

No — Go to 5.

5. CHECK DAMPER G SENSOR.

1. Switch the left and right damper G sensors.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for the damper G sensor LH detected?

Yes — Return the switched damper G sensors to their original positions, and replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.

No — Return the switched damper G sensors to their original positions, and replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2926 DAM G SENSOR SHORT TO BATTERY (FR)

DTC detecting condition:

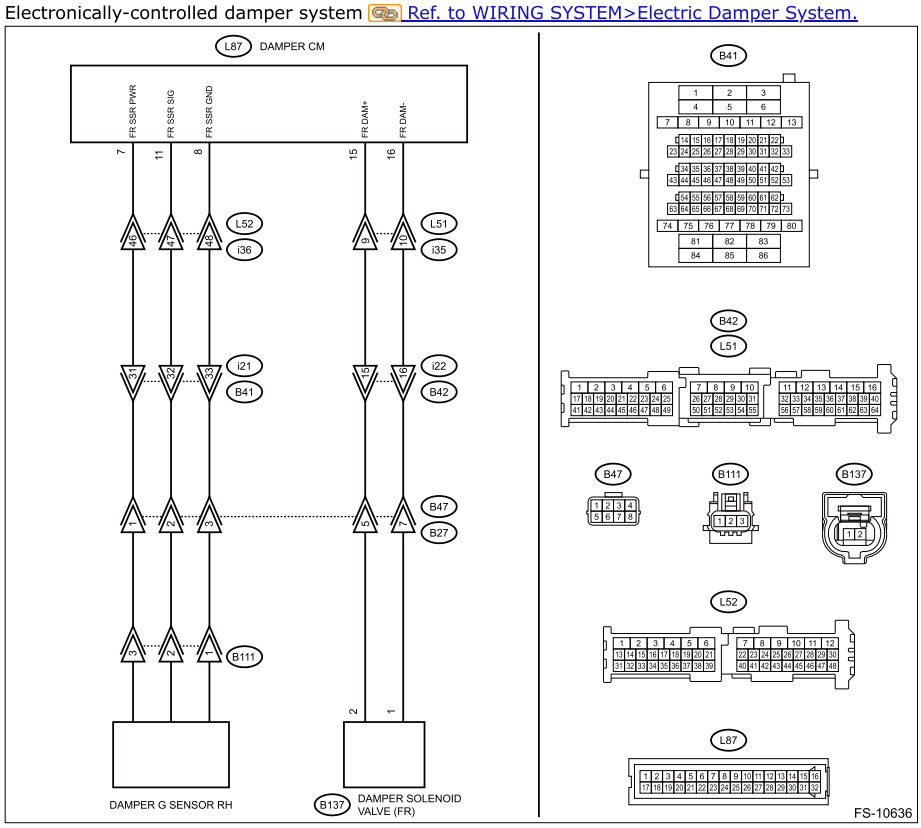
When BATT short of the G sensor (FR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Disconnect the damper G sensor RH connector.
4. Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 7 — (B111) No. 3:
(L87) No. 11 — (B111) No. 2:
(L87) No. 8 — (B111) No. 1:

Is there continuity?

Yes — Go to 2.

No — Repair or replace the open circuit.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the damper G sensor RH connector and chassis ground.

Connector & terminal

(B111) No. 2 — Chassis ground:

(B111) No. 3 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit.
No	Go to 3.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, check the voltage between the damper G sensor RH connector and chassis ground.

Connector & terminal

(B111) No. 2 (+) — Chassis ground (−):

Is the voltage 1 V or more?

Yes	Repair or replace the short circuit.
No	Go to 4.

4. CHECK DAMPER G SENSOR.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals in damper G sensor RH connector.

Connector & terminal

(B111) No. 1 — (B111) No. 2:

(B111) No. 1 — (B111) No. 3:

(B111) No. 2 — (B111) No. 3:

Is the resistance 10 Ω or less?

Yes	Replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.
No	Go to 5.

5. CHECK DAMPER G SENSOR.

1. Switch the left and right damper G sensors.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for the damper G sensor LH detected?

Yes	Return the switched damper G sensors to their original positions, and replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.
No	Return the switched damper G sensors to their original positions, and replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2927 DAM G SENSOR CIRCUIT OPEN (FR)

DTC detecting condition:

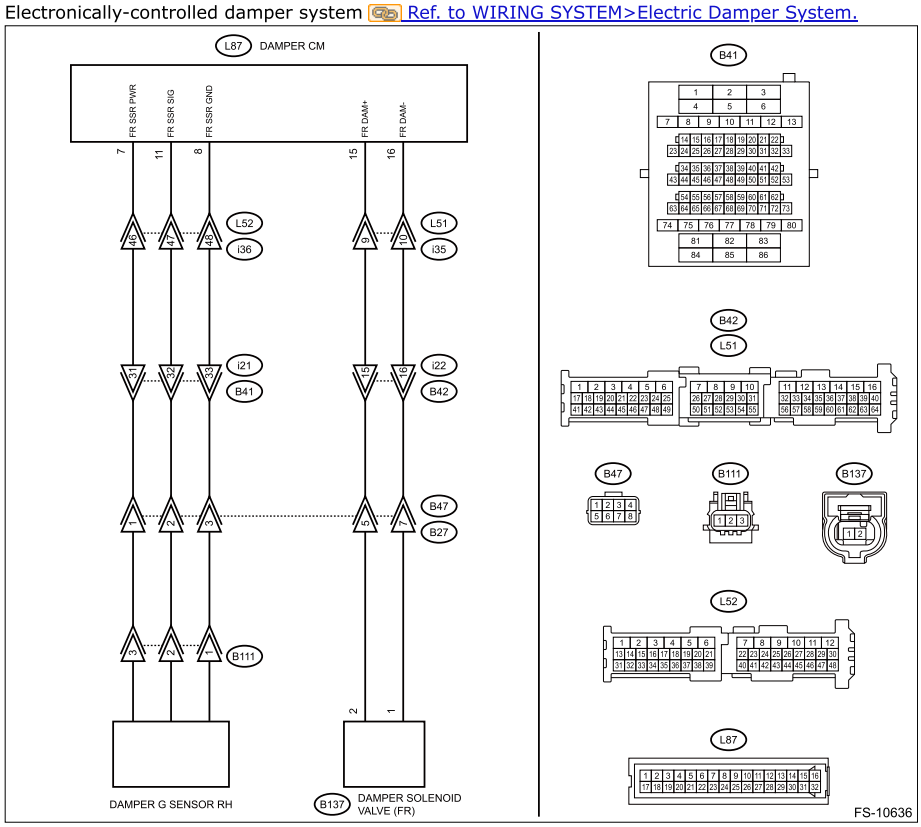
When open circuit of the G sensor (FR) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Disconnect the damper G sensor RH connector.
4. Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 7 — (B111) No. 3:
(L87) No. 11 — (B111) No. 2:
(L87) No. 8 — (B111) No. 1:

Is there continuity?

Yes — Go to 2.

No — Repair or replace the open circuit.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the damper G sensor RH connector and chassis ground.
Connector & terminal
(B111) No. 2 — Chassis ground:
(B111) No. 3 — Chassis ground:

Is there continuity?

Yes — Repair or replace the short circuit.

No — Go to 3.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, check the voltage between the damper G sensor RH connector and chassis ground.
   Connector & terminal
   (B111) No. 2 (+) — Chassis ground (−):

Is the voltage 1 V or more?

Yes — Repair or replace the short circuit.

No — Go to 4.

4. CHECK DAMPER G SENSOR.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals in damper G sensor RH connector.
   Connector & terminal
   (B111) No. 1 — (B111) No. 2:
   (B111) No. 1 — (B111) No. 3:
   (B111) No. 2 — (B111) No. 3:

Is the resistance 10 Ω or less?

Yes — Replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.

No — Go to 5.

5. CHECK DAMPER G SENSOR.

1. Switch the left and right damper G sensors.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for the damper G sensor LH detected?

Yes — Return the switched damper G sensors to their original positions, and replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.

No — Return the switched damper G sensors to their original positions, and replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2928 DAM G SENSOR SIGNAL (FR)

DTC detecting condition:
When signal malfunction of the G sensor (FR) is detected after the ignition switch is turned ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC FOR ELECTRONICALLY-CONTROLLED DAMPER SYSTEM.

Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC C2941, C2942, C2943, C2944, C2945, C2946 or C2947 displayed?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Replace the damper G sensor RH. Ref. to FRONT SUSPENSION>G Sensor.

DTC C2929 DAM G SENSOR SHORT TO GROUND (FL)

DTC detecting condition:

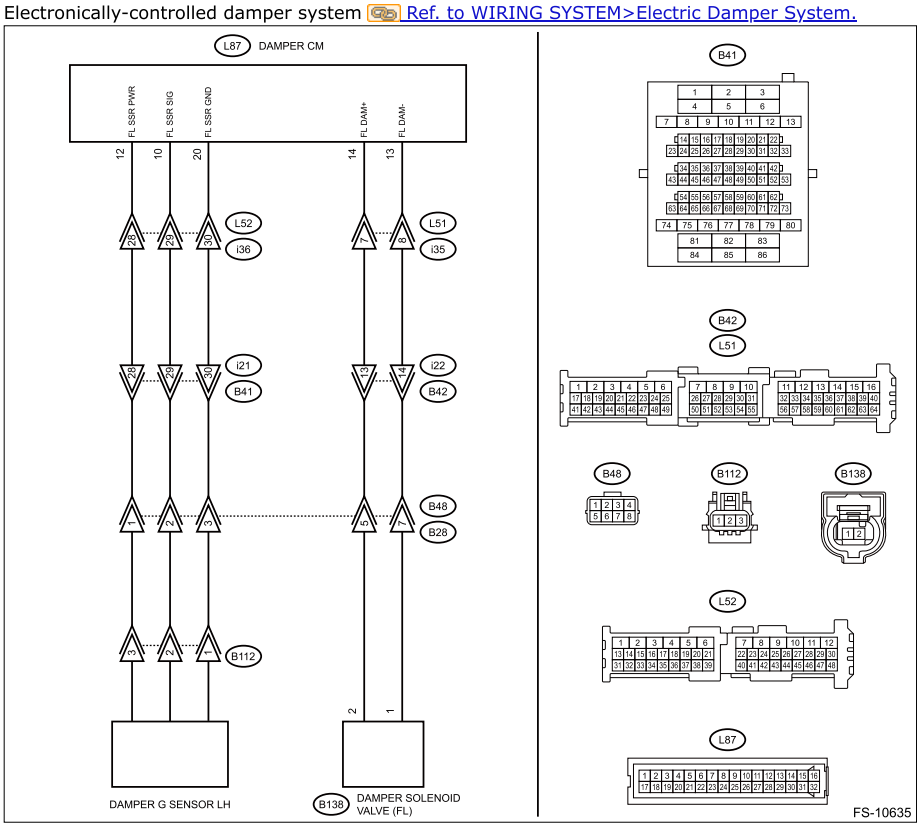
When short circuit to ground of the G sensor (FL) is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector for the electronically-controlled damper CM.
3. Disconnect the damper G sensor LH connector.
4. Using a tester, check the continuity between connectors.

Connector & terminal

(L87) No. 12 — (B112) No. 3:
(L87) No. 10 — (B112) No. 2:
(L87) No. 20 — (B112) No. 1:

Is there continuity?

Yes — Go to 2.

No — Repair or replace the open circuit.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the damper G sensor LH connector and chassis ground.
Connector & terminal
(B112) No. 2 — Chassis ground:
(B112) No. 3 — Chassis ground:

Is there continuity?

Yes — Repair or replace the short circuit.

No — Go to 3.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, check the voltage between the damper G sensor LH connector and chassis ground.
   Connector & terminal
   (B112) No. 2 (+) — Chassis ground (−):

Is the voltage 1 V or more?

Yes — Repair or replace the short circuit.

No — Go to 4.

4. CHECK DAMPER G SENSOR.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals in damper G sensor LH connector.
   Connector & terminal
   (B112) No. 1 — (B112) No. 2:
   (B112) No. 1 — (B112) No. 3:
   (B112) No. 2 — (B112) No. 3:

Is the resistance 10 Ω or less?

Yes — Replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.

No — Go to 5.

5. CHECK DAMPER G SENSOR.

1. Switch the left and right damper G sensors.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for the damper G sensor RH detected?

Yes — Return the switched damper G sensors to their original positions, and replace the damper G sensor LH. Ref. to FRONT SUSPENSION>G Sensor.

No — Return the switched damper G sensors to their original positions, and replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2931 DAM ECU G SENSOR HIGH VOLTAGE

DTC detecting condition:
When an increase in the power supply voltage is detected at the sensor in the electronically-controlled damper CM after the ignition switch is turned ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC FOR ELECTRONICALLY-CONTROLLED DAMPER SYSTEM.

Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2951 displayed?

Yes — Perform the diagnosis according to the DTC. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2951 DAM System High Voltage.

No — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2932 DAM ECU G SENSOR LOW VOLTAGE

DTC detecting condition:
When a decrease in the power supply voltage is detected at the sensor in the electronically-controlled damper CM after the ignition switch is turned ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC FOR ELECTRONICALLY-CONTROLLED DAMPER SYSTEM.

Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2952 displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2952 DAM System Low Voltage.
No	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2933 DAM ECU G SENSOR SIGNAL

DTC detecting condition:

When a sensor error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2941 DAM ECU RAM

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2942 DAM ECU PROGRAM MEMORY

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2943 DAM ECU DATA FLASH

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2944 DAM ECU WATCHDOG

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2945 DAM ECU NOT PROGRAMMED

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2946 DAM ECU CURRENT CALIBRATION

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2947 DAM ECU TUNING PARAMETER

DTC detecting condition:

When an error in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Note:

When this DTC is displayed, replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2951 DAM SYSTEM HIGH VOLTAGE

DTC detecting condition:
When an increase in the power supply voltage in the electronically-controlled damper CM is detected after the ignition switch is turned ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK GENERATOR.

1. Start the engine and idle for a while.
2. Measure the voltage between generator terminal B and chassis ground.

Is the voltage 16 V or less?

Yes — Go to 2.

No — Check the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Generator>INSPECTION.

2. CHECK BATTERY AND DATA MONITOR.

1. Turn the ignition switch to ON.
2. Measure the battery terminal voltage.
3. Using the Subaru Select Monitor, read data of [Power Supply Voltage] in the [Data Monitor] of [Electric Control Damper]. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Data Monitor.

Is the [Power Supply Voltage] higher than the battery terminal voltage by 2 V or more?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Go to 3.

3. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Data Monitor.

Is DTC C2951 detected?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Currently normal.

DTC C2952 DAM SYSTEM LOW VOLTAGE

DTC detecting condition:

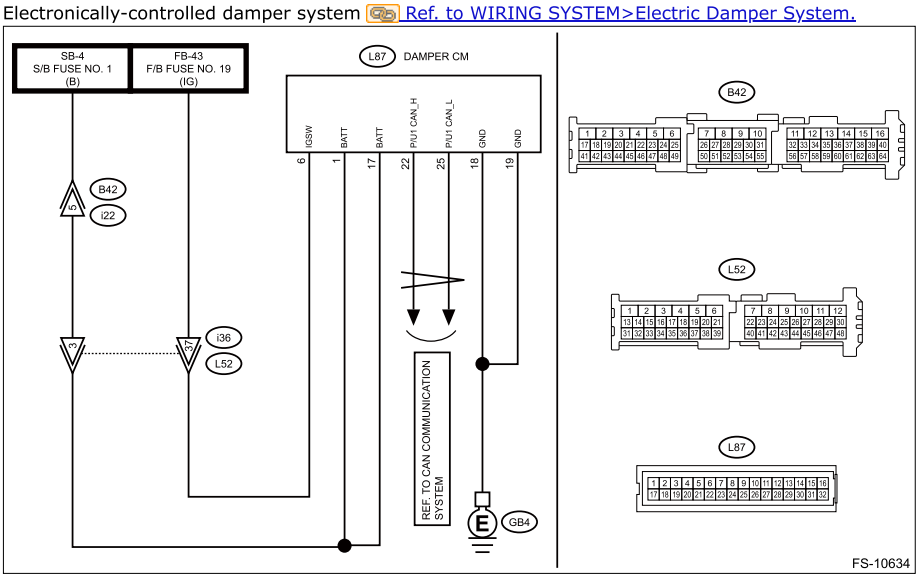
When a decrease in the power supply voltage in the electronically-controlled damper CM is detected after the ignition switch is turned ON.

Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

Wiring diagram:

Electronically-controlled damper system Ref. to WIRING SYSTEM>Electric Damper System.



1. CHECK FUSE.

Check the fuse.

Is the check result OK?

Yes — Go to 2.

No — Replace the defective fuse. If the replaced fuse blows out easily, check the short circuit in harness.

2. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the electronically-controlled damper CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the electronically-controlled damper CM connector and chassis ground.

Connector & terminal

(L87) No. 1 (+) — Chassis ground (−):
(L87) No. 6 (+) — Chassis ground (−):
(L87) No. 17 (+) — Chassis ground (−):

Is the voltage 9 V or more?

Yes — Go to 3.

No — Check the power supply system circuit, and if any fault is found, repair or replace the defective parts.

3. CHECK HARNESS (GROUND CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between the electronically-controlled damper CM connector and chassis ground.
   Connector & terminal
   (L87) No. 18 — Chassis ground:
   (L87) No. 19 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 4.

No — Check the ground system circuit, and if any fault is found, repair or replace the defective parts.

4. CHECK ELECTRONICALLY-CONTROLLED DAMPER CM CONNECTOR.

Check the connecting condition of the electronically-controlled damper CM connector.

Is the check result OK?

Yes — Go to 5.

No — Repair or replace the connector.

5. RECHECK DTC.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2952 detected?

Yes — Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

No — Currently normal.

DTC C2961 SPEED SENSOR ABNORMAL DETECTION

DTC detecting condition:
When VDC error signal is detected after the ignition switch is ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is a DTC related to VDC system or vehicle speed signal system detected?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK VEHICLE SPEED SIGNAL.

1. Using the Subaru Select Monitor, read data of [Vehicle speed] in the [Data Monitor] of [Electric Control Damper].
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.

Is the value of [Vehicle speed] in sync with the vehicle speed in the combination meter?

Yes	It is possible that temporary poor communication occurs. Clear the memory. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
No	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.

DTC C2962 VDC FAIL FLAG

DTC detecting condition:
When VDC error signal is detected after the ignition switch is ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is a DTC related to VDC system detected?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK ELECTRONICALLY-CONTROLLED DAMPER CM.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2962 detected?

Yes	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.
No	It results from a temporary noise interference.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2963 EGI FAIL FLAG

DTC detecting condition:
When engine error signal is detected after the ignition switch is ON.
Trouble symptom:

- Worsening ride comfort
- Illumination of electronically-controlled damper warning light
- Drive mode select does not function.

1. CHECK DTC.

Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC).

Is a DTC related to engine system detected?

Yes	Perform the diagnosis according to the DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DOTC)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. CHECK ELECTRONICALLY-CONTROLLED DAMPER CM.

1. Using the Subaru Select Monitor, perform the clear memory of [Electric Control Damper]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Electric Control Damper] using the Subaru Select Monitor. Ref. to ELECTRIC CONTROL DAMPER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2963 detected?

Yes	Replace the electronically-controlled damper CM. Ref. to FRONT SUSPENSION>Suspension Control Module.
No	It results from a temporary noise interference.

ELECTRIC CONTROL DAMPER (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.

ELECTRIC CONTROL DAMPER (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.

ELECTRIC CONTROL DAMPER (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.

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. **Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**

ELECTRIC CONTROL DAMPER (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.**

ELECTRIC CONTROL DAMPER (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.**

ELECTRIC CONTROL DAMPER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. **Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.**

TIRE PRESSURE MONITOR(DIAGNOSTICS)

TPM(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Work Support
10. Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

PROCEDURE

Caution:
Remove foreign matter (dust, water, oil, etc.) from the TPMS & keyless entry CM connector or TPMS CM connector during removal and installation.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes — Go to 2.

No — Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes — Go to 3.

No — Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Tire Pressure Monitor].

Note:
For detailed operation procedures, refer to "Help" of application.

Is communication possible?

Yes — Go to 4.

No — Check the communication circuit. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION.

4. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes — Record the DTC, and Go to 5.

No — 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. Perform the diagnosis according to the displayed DTC. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Tire Pressure Monitor]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out below for use.

<table>
<tr><td colspan="2">Tire Pressure Monitor Check List for Interview</td><td colspan="2">Date the Vehicle is Received Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td>Year Month Date</td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Occurrence location</td><td colspan="3"></td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic trouble code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

Airbag system wiring harness is routed near the TPMS control module. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

2. TPMS & KEYLESS ENTRY CM OR TPMS CM

- If the transmitter is replaced, ID registration for the transmitter is required. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>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.
- 235/45R17

Temperature °C (°F)	**Indoor temperature**	**15.5 (60)**		
	Ambient air temperature	**−1 (30)**	**−12 (10)**	**−23 (−10)**
Air pressure kPa (psi)	Front	250 (36)	265 (38)	280 (41)
	Rear	240 (35)	255 (37)	270 (39)

- 245/40R18

Temperature °C (°F)	**Indoor temperature**	**15.5 (60)**		
	Ambient air temperature	**−1 (30)**	**−12 (10)**	**−23 (−10)**
Air pressure kPa (psi)	Front	250 (36)	265 (38)	280 (41)
	Rear	240 (35)	255 (37)	270 (39)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following item which might affect the quality of the tire pressure monitoring system.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.
2. Check the fuse condition. Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.
   Make sure that ampere of the fuse is setting value, and it is not blown out.
3. Inspect that the tire pressure is within the specification while the tire is cool. (Refer to Tire Caution Label.)
4. Check the tires for damage or the insertion of foreign matters.
5. Check the connecting condition of harness and harness connector.

Note:
To check harness for open or short circuits, shake the suspected trouble spot or connector.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

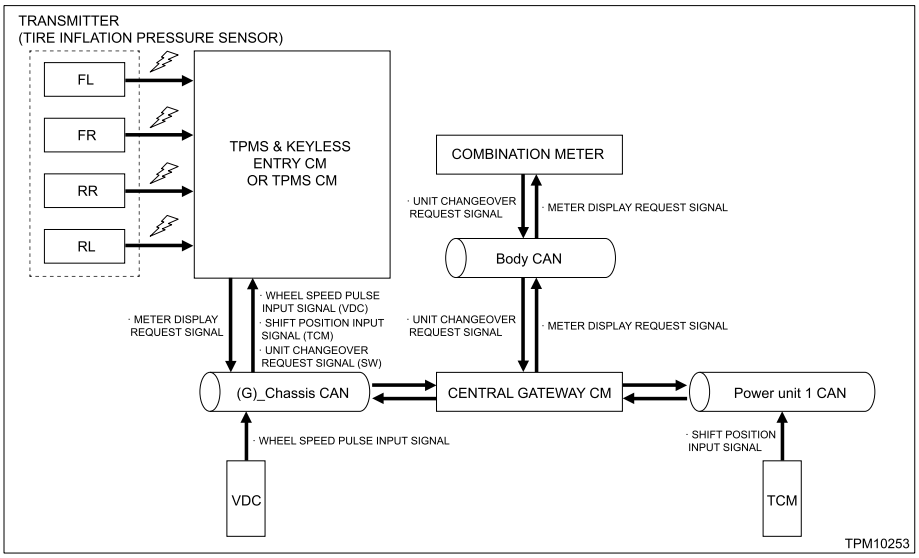
2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Transmitter registration tool	Used to register the transmitter ID.

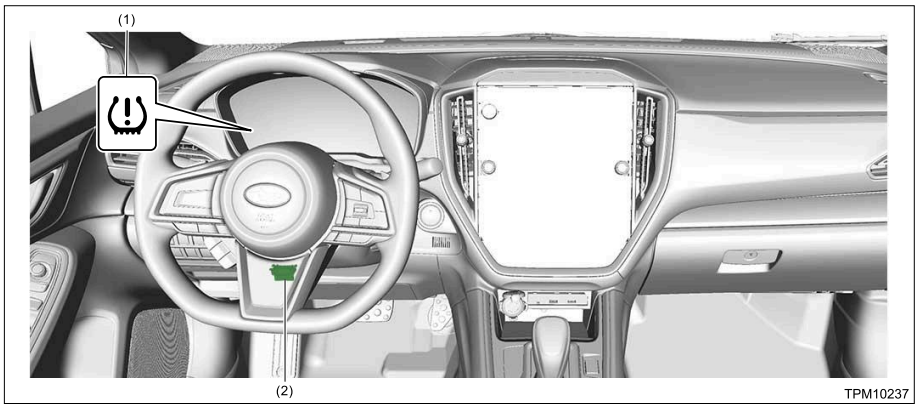
	REMARKS
	Manufacturer: Latest model of ATEQ Corp. Or, use an ATEQ model with the updated software compatible with Generation6 transmitter. **Note:** **For details of the software update, registration procedures and retailers, contact ATEQ in your country.**

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

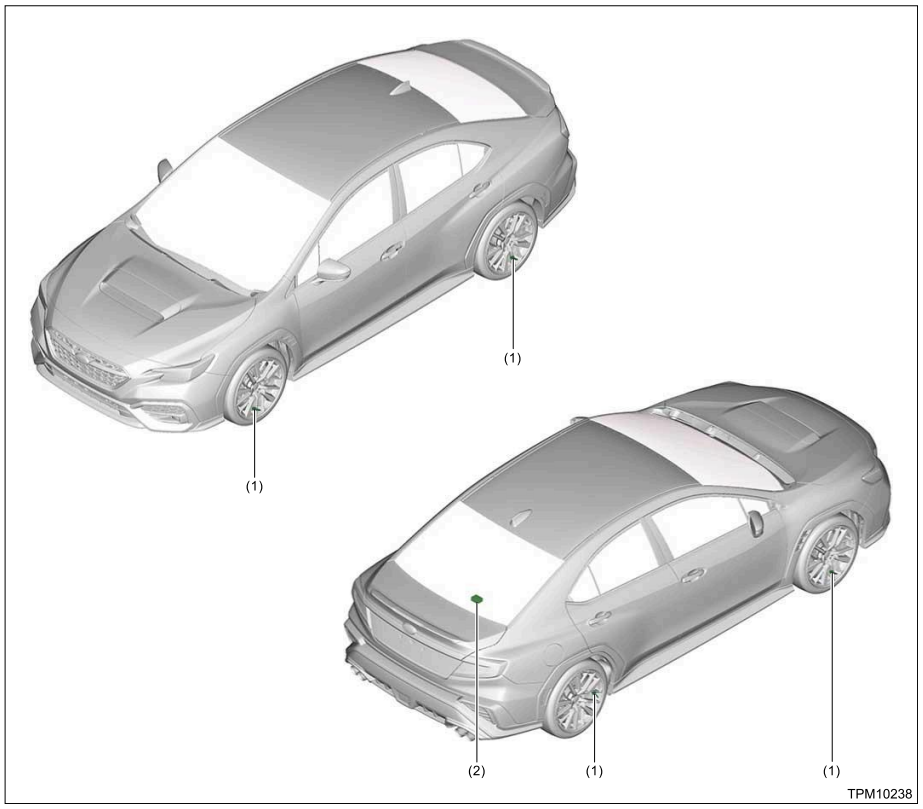
SYSTEM BLOCK DIAGRAM



LOCATION



(1) Tire pressure warning light (2) Data link connector

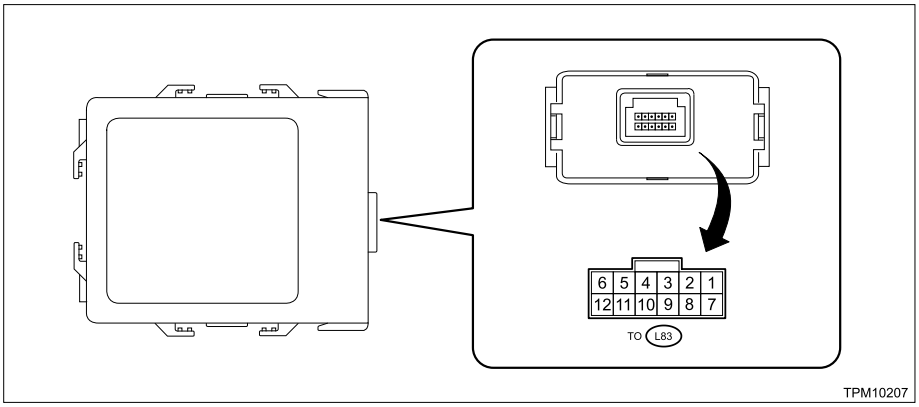


(1) Transmitter (tire inflation pressure sensor) (2) TPMS & keyless entry CM*1 or TPMS CM*2

*1: Without keyless access & push button start system

*2: With keyless access & push button start system

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(L83) No. 1	(G)_Chassis CAN L	Digital signal; cannot be measured	—
(L83) No. 2	(G)_Chassis CAN H	Digital signal; cannot be measured	—
(L83) No. 3	—	—	—
(L83) No. 4	—	—	—
(L83) No. 5	—	—	—
(L83) No. 6 ←→ Chassis ground	Ignition power supply	When ignition switch is ON	9 — 16 V
(L83) No. 7 ←→ Chassis ground	GND	Always	1 Ω or less
(L83) No. 8	—	—	—
(L83) No. 9	—	—	—
(L83) No. 10	—	—	—
(L83) No. 11	—	—	—
(L83) No. 12 ←→ Chassis ground	Battery power supply	Always	9 — 16 V

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.

INSPECTION

Detecting condition:

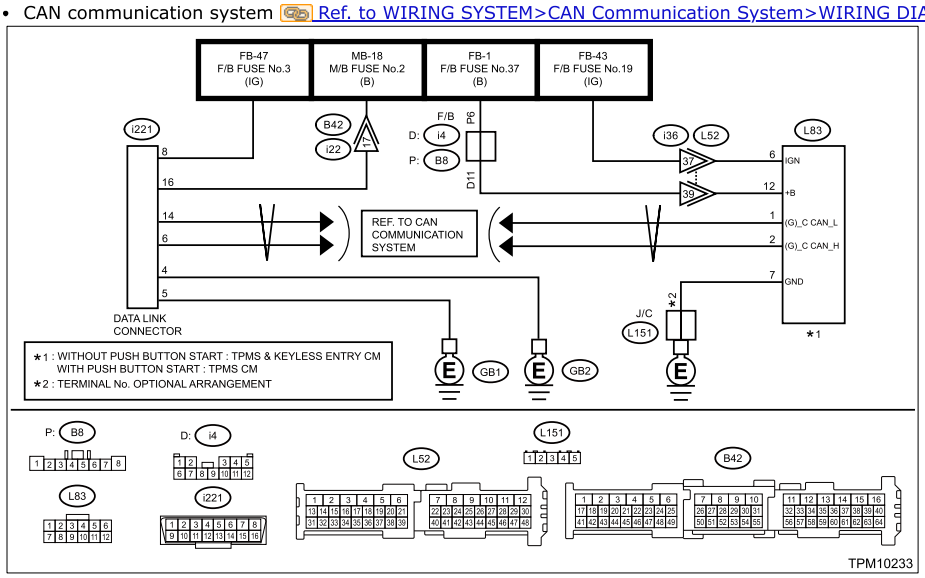
- Defective harness
- Power supply circuit malfunction
- Defective TPMS & keyless entry CM or TPMS CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Not communicable with Subaru Select Monitor.

Wiring diagram:

- Tire pressure monitoring system Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". **Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK POWER SUPPLY CIRCUIT.

Connect the interface for Subaru Select Monitor to the data link connector.

Does the interface for Subaru Select Monitor turn on?

Yes — Go to 4.

No — Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.

Connector & terminal

(i221) No. 8 (+) — Chassis ground (−):
(i221) 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**

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

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between data link connector and chassis ground.

Connector & terminal

(i221) No. 4 — Chassis ground:
(i221) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes — Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found, Go to 4.

No — Repair the harness and connector.

4. CHECK SUBARU SELECT MONITOR.

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

Is communication possible?

Yes — Go to 5.

No — Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

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

Is the check result OK?

Yes — Go to 6.

No — Perform the inspection according to the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check for poor contact of TPMS & keyless entry CM or TPMS CM connector, data link connector, or intermediate connector.

Is the check result OK?

Yes — Go to 7.

No — Repair the connector.

7. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse. Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.

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 TPMS & keyless entry CM or TPMS CM connector and fuse.

8. CHECK TPMS & KEYLESS ENTRY CM OR TPMS CM CONNECTOR POWER SUPPLY CIRCUIT (OPEN).

1. Disconnect the connector of the TPMS & keyless entry CM or TPMS CM.
2. Turn the ignition switch to ON.
3. Measure the voltage between TPMS & keyless entry CM or TPMS CM connector and chassis ground.

Connector & terminal

(L83) No. 6 (+) — Chassis ground (−):

(L83) No. 12 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 9.

No — Check for open or short circuit in the harness between TPMS & keyless entry CM or TPMS CM connector and fuse.

9. CHECK TPMS & KEYLESS ENTRY CM OR TPMS CM GROUND CIRCUIT (OPEN).

Measure the resistance of harness between TPMS & keyless entry CM or TPMS CM connector and chassis ground.

Connector & terminal

(L83) No. 7 — Chassis ground:

Is the resistance less than 1 Ω?

Yes — Check the connection between the data link connector and Subaru Select Monitor.

No — Repair the harness for ground line.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor>LIST.**

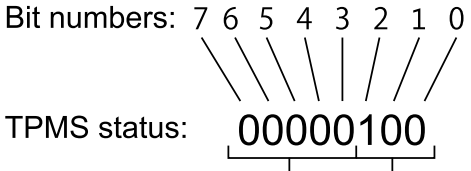
TIRE PRESSURE MONITOR(DIAGNOSTICS) > Data Monitor

LIST

Item	Content / display range	Standard	Note
FL Tire status	Status of the front left transmitter	00000000 — 11111111	For details, refer to the Notes in the margin.
FR Tire status	Status of the front right transmitter		
RR Tire status	Status of the rear right transmitter		
RL Tire status	Status of the rear left transmitter		
FL Tire air pressure	Value converted to tire pressure from data delivered from transmitter is displayed. (The figure may differ from the actual measured values.)	0 — 351.645 kPa	—
FR Tire air pressure		0 — 351.645 kPa	—
RR Tire air pressure		0 — 351.645 kPa	—
RL Tire air pressure		0 — 351.645 kPa	—
Vehicle Speed	Vehicle speed signal which is input in control module	0 — 255 km/h	—
Pressure warning	Threshold where tire pressure warning light illuminates	0 — 351.645 kPa	—
Return pressure	Threshold where tire pressure warning light goes out	0 — 351.645 kPa	—
Transmitter power supply	Transmitter power supply status	ON MODE/OFF	—
INDICATOR LAMP	Status of tire pressure warning light	ON/OFF	—
FL Registered ID	ID of the front left transmitter	0 — FFFFFFFF	—
FR Registered ID	ID of the front right transmitter	0 — FFFFFFFF	
RR Registered ID	ID of the rear right transmitter	0 — FFFFFFFF	
RL Registered ID	ID of the rear left transmitter	0 — FFFFFFFF	
Latest reception ID	Second latest reception ID	0 — FFFFFFFF	
Reception ID one ahead	Third latest reception ID	0 — FFFFFFFF	
Before reception ID2	Fourth latest reception ID	0 — FFFFFFFF	
Before reception ID3	Fifth latest reception ID	0 — FFFFFFFF	

Note:
Details of tire status

Bit	Data	Condition	
7	Low Battery	Shows the remaining battery level.	0: Normal
			1: Low level
6	Sensor Fail	Shows the malfunction of TPMS.	0: Normal
			1: Malfunctioning
5	LF Response	Shows the responding transmission to the LF signal.	0: Transmission for other than LF response
			1: Transmission for LF response
4	PAL Condition	Shows the status of position information.	0: Position detection finished
			1: Position detection in progress
3	Rolling Detection	Shows the status of tire rotation detection.	0: Tire stop status detected
			1: Tire rotation status detected



NOTE:
Bit2-0 is a group rather than an single.

Bit	Data	Condition	
2-0 (2.1.0)	Status code	Shows the status in valve transmission.	000: Responding to the LF signal “Learn LF”
			001: Detecting the change in tire pressure
			010: —
			011: Responding to the LF signal “Entering off LF”
			100: Position detection is in progress (transmission timing is synchronized with tire rotation)
			101: Position detection is in progress (transmission timing is not synchronized with tire rotation)
			110: Normal driving status (position detection mode is ended)
			111: Detecting the completion of change in tire pressure

TPM10221

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Work Support

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Work Support.**
- **For detailed operation procedures, refer to "Help" of application.**
- **For details on the work support, refer to the list. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Work Support>LIST.**

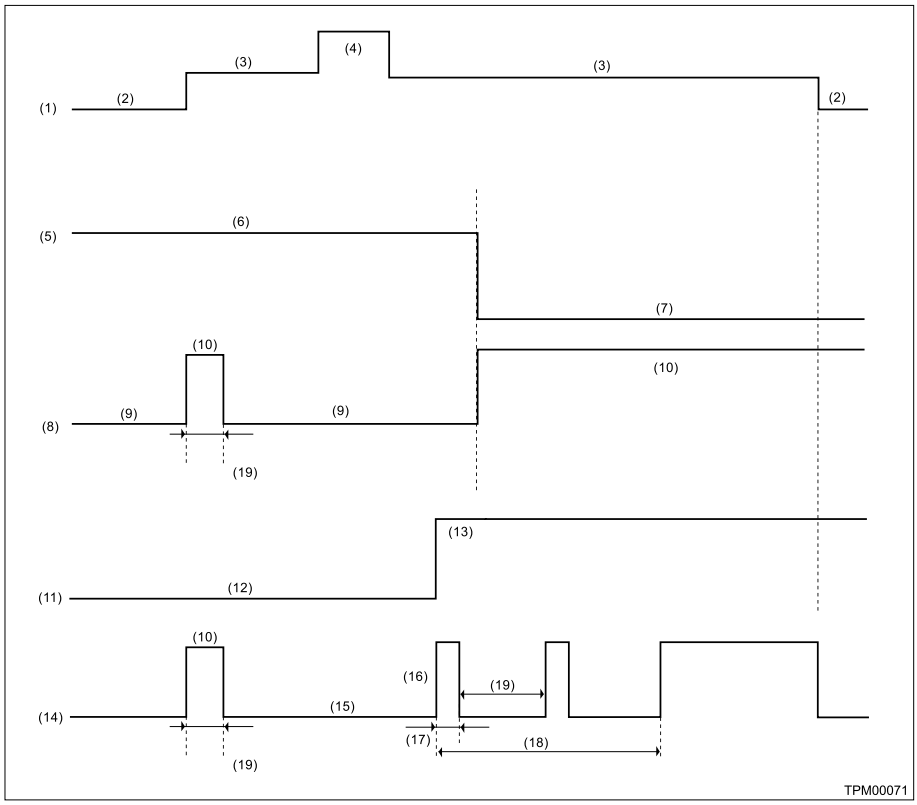
TIRE PRESSURE MONITOR(DIAGNOSTICS) > Work Support

LIST

Work Support item	Contents	Remarks
ID registration	Register the transmitter ID. Perform the registration procedure of the transmitter ID in the following cases: • Transmitter is replaced. • TPMS & keyless entry CM or TPMS CM is replaced.	Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>OPERATION.
SWID HWID	Software ID and hardware ID are displayed.	—

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

INSPECTION



(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 (For the pressure warning level, refer to "Data monitor". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.)	(14)	Tire inflation pressure warning light (system condition)		

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 & keyless entry CM or TPMS 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 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).

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTCs. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK COMBINATION METER.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- TPMS warning

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 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.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. 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)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. CHECK TRANSMITTER (ID).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.

- FL Registered ID
- FR Registered ID
- RR Registered ID
- RL Registered ID

Is the transmitter ID registered?

Yes — Go to 3.

No — Register the transmitter ID. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>OPERATION.

3. CHECK TRANSMITTER DATA OUTPUT.

1. Start the engine.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.
   - INDICATOR LAMP
   - FR Registered ID
   - RR Registered ID
   - RL Registered ID

Is [ON] displayed?

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 WARNING LIGHT IS 25 TIMES BLINKING AND TURN ON

Detecting condition:

- Defective TPMS & keyless entry CM or TPMS CM
- Defective harness
- Transmitter is faulty.

Trouble symptom:

Every time the engine starts, tire pressure warning light blinks 25 times and then illuminates.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN COMMUNICATION.

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

Is the check result OK?

Yes	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Perform the inspection according to the diagnosis for LAN system.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:
- **For detailed operation procedures, refer to "Common (Diagnostics)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
C2021	FL TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2021 FL TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2022	FR TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2022 FR TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2023	RR TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2023 RR TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2024	RL TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2121	FL TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2121 FL TRANSMITTER NO DATA.
C2122	FR TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2122 FR TRANSMITTER NO DATA.
C2123	RR TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2123 RR TRANSMITTER NO DATA.
C2124	RL TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 RL TRANSMITTER NO DATA.
C2221	FL TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2221 FL TRANSMITTER PRESSURE DATA ABNORMAL.
C2222	FR TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2222 FR TRANSMITTER PRESSURE DATA ABNORMAL.
C2223	RR TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2223 RR TRANSMITTER PRESSURE DATA ABNORMAL.
C2224	RL TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL.
C2321	FL TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure

DTC	Description & trouble part	Reference
		with Diagnostic Trouble Code (DTC)>DTC C2321 FL TRANSMITTER STATUS ABNORMAL.
C2322	FR TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2322 FR TRANSMITTER STATUS ABNORMAL.
C2323	RR TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2323 RR TRANSMITTER STATUS ABNORMAL.
C2324	RL TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.
C2421	FL TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2421 FL TRANSMITTER BATTERY VOLTAGE DECREASE.
C2422	FR TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2422 FR TRANSMITTER BATTERY VOLTAGE DECREASE.
C2423	RR TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2423 RR TRANSMITTER BATTERY VOLTAGE DECREASE.
C2424	RL TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.
C2521	SPEED ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2521 SPEED ABNORMAL.
C2721	THRESHOLD READ MALFUNCTION	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2721 THRESHOLD READ MALFUNCTION.
C2821	WHEEL POSITION SENSING ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2821 WHEEL POSITION SENSING ABNORMAL.
C2921	ID REGISTRATION ERROR	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2921 ID REGISTRATION ERROR.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2021 FL TIRE AIR PRESSURE DECREASE 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 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2022 FR TIRE AIR PRESSURE DECREASE 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 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2023 RR TIRE AIR PRESSURE DECREASE 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 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE

DTC detecting condition:
Inflation pressure of tires dropped below the specified value.

Note:
For the specifications, refer to [Data monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.

Trouble symptom:
Tire pressure warning light illuminates.

Caution:
- When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.
- Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK TIRES.

Lift up the vehicle and check for damage in the tires.

Are there cracks or damage?

Yes	Replace the tire.
No	Go to 2.

2. CHECK TIRES.

Check the tire air pressure.

Is the tire pressure in the specifications?

Yes	Go to 3.
No	Adjust the air pressure.

3. CHECK TRANSMITTER DATA.

1. Drive at 40 km/h (25 MPH) or more.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.
   - FL Tire air pressure
   - FR Tire air pressure
   - RR Tire air pressure
   - RL Tire air pressure

Is there a transmitter with different display?

Yes	Replace the transmitter (tire pressure sensor) with different display. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Go to 4.

4. PERFORM DRIVING TEST.

1. Using the Subaru Select Monitor, perform the clear memory of [Tire Pressure Monitor]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Perform a driving test. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode>PROCEDURE.
3. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC C2021, C2022, C2023 or C2024 displayed? (Current malfunction)

Yes	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Even if the DTC is displayed, the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2121 FL TRANSMITTER 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 RL TRANSMITTER NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2122 FR TRANSMITTER 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 RL TRANSMITTER NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2123 RR TRANSMITTER 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 RL TRANSMITTER NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2124 RL TRANSMITTER NO DATA

DTC detecting condition:
Detected when no data is received from each transmitter for 8 minutes or more at a vehicle speed of 40 km/h (25 MPH) or more. (Timer is not cleared when the vehicle speed becomes lower than 40 km/h halfway.)
Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

Caution:
- **When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.**

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 of [Tire Pressure Monitor] using the Subaru Select Monitor. 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. START FRONT LEFT TRANSMITTER.

1. Connect the Subaru Select Monitor and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.
   - Reception ID one ahead
3. Use the transmitter registration tool and transmit the ID from the front left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 3.
No	Replace the front left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

3. CHECK FRONT LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [FL Registered ID].

Are the two IDs same?

Yes	Go to 4.
No	Record [Latest reception ID] as the front left. Go to 4.

4. START FRONT RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the front right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 5.
No	Replace the front right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

5. CHECK FRONT RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [FR Registered ID].

Are the two IDs same?

Yes — Go to 6.

No — Record [Latest reception ID] as the front right. Go to 6.

6. START REAR RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes — Go to 7.

No — Replace the rear right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

7. CHECK REAR RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [RR Registered ID].

Are the two IDs same?

Yes — Go to 8.

No — Record [Latest reception ID] as the rear right. Go to 8.

8. START REAR LEFT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes — Go to 9.

No — Replace the rear left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

9. CHECK REAR LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [RL Registered ID].

Are the two IDs same?

Yes — Go to 10.

No — Record [Latest reception ID] as the rear left. Go to 10.

10. CHECK MALFUNCTION TRANSMITTER.

Is ID recorded by this procedure?

Yes	Go to 11.
No	Go to 2.

11. CHECK MALFUNCTION TRANSMITTER.

Check the registered ID of the transmitter indicated by DTC.

Is there checked ID in the record?

Yes	Replace the transmitter of the recorded position. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the transmitter showing the latest ID that is not included in the registered IDs. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2221 FL TRANSMITTER 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 RL TRANSMITTER PRESSURE DATA ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2222 FR TRANSMITTER 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 RL TRANSMITTER PRESSURE DATA ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2223 RR TRANSMITTER 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 RL TRANSMITTER PRESSURE DATA ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL

DTC detecting condition:
Detected when error data is received from each transmitter at a vehicle speed of 40 km/h (25 MPH) or more.

- When comparing the data from each transmitter to the previous data, the change is large.
- The pressure exceeds what the transmitter can measure. (Excessive pressure)

Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

Caution:

- **When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.**

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 of [Tire Pressure Monitor] using the Subaru Select Monitor. 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. START FRONT LEFT TRANSMITTER.

1. Connect the Subaru Select Monitor and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.
   - Reception ID one ahead
3. Use the transmitter registration tool and transmit the ID from the front left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes — Go to 3.

No — Replace the front left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

3. CHECK FRONT LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [FL Registered ID].

Are the two IDs same?

Yes — Go to 4.

No — Record [Latest reception ID] as the front left. Go to 4.

4. START FRONT RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the front right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes — Go to 5.

No — Replace the front right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

5. CHECK FRONT RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [FR Registered ID].

Are the two IDs same?

Yes	Go to 6.
No	Record [Latest reception ID] as the front right. Go to 6.

6. START REAR RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 7.
No	Replace the rear right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

7. CHECK REAR RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [RR Registered ID].

Are the two IDs same?

Yes	Go to 8.
No	Record [Latest reception ID] as the rear right. Go to 8.

8. START REAR LEFT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 9.
No	Replace the rear left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

9. CHECK REAR LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [RL Registered ID].

Are the two IDs same?

Yes	Go to 10.
No	Record [Latest reception ID] as the rear left. Go to 10.

10. CHECK MALFUNCTION TRANSMITTER.

Is ID recorded by this procedure?

Yes — Go to 11.

No — Go to 2.

11. CHECK MALFUNCTION TRANSMITTER.

Check the registered ID of the transmitter indicated by DTC.

Is there checked ID in the record?

Yes — Replace the transmitter of the recorded position. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

No — Replace the transmitter showing the latest ID that is not included in the registered IDs. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2321 FL TRANSMITTER STATUS ABNORMAL

Note:
Refer to DTC C2324 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2322 FR TRANSMITTER STATUS ABNORMAL

Note:
Refer to DTC C2324 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2323 RR TRANSMITTER STATUS ABNORMAL

Note:
Refer to DTC C2324 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2324 RL TRANSMITTER STATUS ABNORMAL

Detected when error data is received from each transmitter at a vehicle speed of 40 km/h (25 MPH) or more.
DTC detecting condition:
Unexpected function codes received from each transmitter.
Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

Caution:
- **When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.**

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 of [Tire Pressure Monitor] using the Subaru Select Monitor. 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. START FRONT LEFT TRANSMITTER.

1. Connect the Subaru Select Monitor and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.
   - Reception ID one ahead
3. Use the transmitter registration tool and transmit the ID from the front left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes — Go to 3.

No — Replace the front left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

3. CHECK FRONT LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [FL Registered ID].

Are the two IDs same?

Yes — Go to 4.

No — Record [Latest reception ID] as the front left. Go to 4.

4. START FRONT RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the front right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes — Go to 5.

No — Replace the front right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

5. CHECK FRONT RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [FR Registered ID].

Are the two IDs same?

Yes	Go to 6.
No	Record [Latest reception ID] as the front right. Go to 6.

6. START REAR RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 7.
No	Replace the rear right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

7. CHECK REAR RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [RR Registered ID].

Are the two IDs same?

Yes	Go to 8.
No	Record [Latest reception ID] as the rear right. Go to 8.

8. START REAR LEFT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 9.
No	Replace the rear left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

9. CHECK REAR LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [RL Registered ID].

Are the two IDs same?

Yes	Go to 10.
No	Record [Latest reception ID] as the rear left. Go to 10.

10. CHECK MALFUNCTION TRANSMITTER.

Is ID recorded by this procedure?

Yes — Go to 11.

No — Replace the transmitter indicated by DTC. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

11. CHECK MALFUNCTION TRANSMITTER.

Check the registered ID of the transmitter indicated by DTC.

Is there checked ID in the record?

Yes — Replace the transmitter of the recorded position. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

No — Replace the transmitter indicated by DTC. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2421 FL TRANSMITTER BATTERY VOLTAGE DECREASE

Note:
Refer to DTC C2424 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2422 FR TRANSMITTER BATTERY VOLTAGE DECREASE

Note:
Refer to DTC C2424 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2423 RR TRANSMITTER BATTERY VOLTAGE DECREASE

Note:
Refer to DTC C2424 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE

DTC detecting condition:
Detected when power supply voltage failure signal is received from each transmitter.
Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

Caution:
- **When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.**

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 of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed as current code?

Yes	Go to 2.
No	When DTC is displayed as history code, 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 WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>OPERATION.
2. Using the Subaru Select Monitor, perform the clear memory of [Tire Pressure Monitor]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Perform the inspection mode. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode.

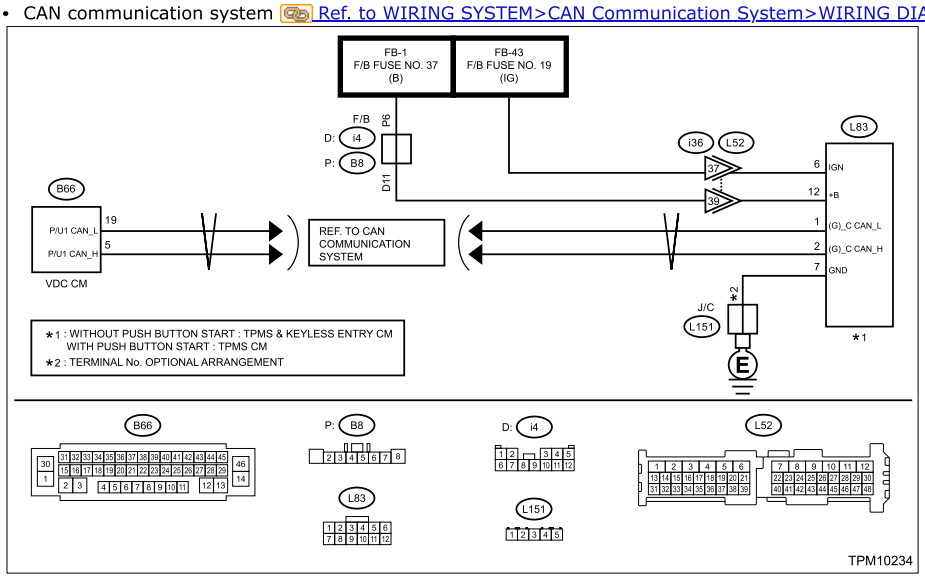
Is the fault eliminated?

Yes	Internal battery of the transmitter had worn out.
No	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

DTC C2521 SPEED ABNORMAL

DTC detecting condition:
Detected when transmitter normal signal is received at a vehicle speed of less than 6 km/h (4 MPH).
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.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK LAN COMMUNICATION.

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

Is the check result OK?

Yes — Go to 2.

No — Perform the inspection according to the diagnosis for LAN system.

2. CHECK VDC.

Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes — Go to 3.

No — Perform the inspection according to the VDC diagnosis.

3. CHECK CONNECTOR.

Check each connector.

Is there poor contact or any other faults?

Yes — Repair the connector.

No — Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2721 THRESHOLD READ MALFUNCTION

DTC detecting condition:
When threshold read abnormal (TPMS & keyless entry CM or TPMS CM abnormal) is detected.
Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. REPRODUCTION OF FAILURE.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. 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. REPRODUCTION OF FAILURE.

1. Disconnect the ground terminal from the battery sensor, and reconnect it. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Turn the ignition switch to ON.
3. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed as current malfunction?

Yes — Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

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.

DTC C2821 WHEEL POSITION SENSING ABNORMAL

DTC detecting condition:
When the position detection does not finish and fails 10 times in a row.
Trouble symptom:
Pressure monitor display of the combination meter indicates "—".

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DRIVING HISTORY.

Ask the customer about the following items.
- Did the customer drive in a traffic congestion?
- Did the customer drive on rough road (such as unpaved road)?

Did the customer drive in a traffic congestion or on rough road?

Yes — When the vehicle is driven in a traffic congestion or on rough road, this DTC may be recorded.

No — Go to 2.

2. 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 of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed as current malfunction?

Yes — Go to 3.

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.

3. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any DTC other than DTC C2821 displayed as current malfunction?

Yes — Perform the diagnosis for DTCs other than the displayed DTC C2821. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 4.

4. CHECK VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed as current malfunction?

Yes — Perform the diagnosis for the displayed DTCs. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 5.

5. CHECK TCM.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK CONNECTOR.

Check each connector.

Is there poor contact or any other faults?

Yes	Repair the connector.
No	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

DTC C2921 ID REGISTRATION ERROR

DTC detecting condition:
When the ID registration failed.
Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTCs other than DTC C2921 displayed as current code or history code?

Yes — Perform the diagnosis for the displayed DTCs other than DTC C2921. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

No — Go to 2.

2. 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. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.
   - FL Tire status
   - FR Tire status
   - RR Tire status
   - RL Tire status

Does the symptom that the tire status does not change or is reset (00000000) occur?

Yes — Perform the diagnosis of DTC C2121 — C2124 that applies to the sensor whose tire status does not change or is reset.

No — Go to 3.

3. REPRODUCTION OF FAILURE.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC displayed as current code?

Yes — Go to 4.

No — When DTC is displayed as history code, 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.

4. ID REGISTRATION.

Register the ID. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System>OPERATION.

Can the ID be registered?

Yes — Go to 2.

No — Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

AIR CONDITIONER(DIAGNOSTICS)

AC(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Customize
12. Work Support
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. Diagnostics with Phenomenon

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. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection. Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Air Conditioner].

Note:
For detailed operation procedures, refer to "Help" of application.

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out below for use.

<table>
<tr><td colspan="2">A/C Check List for Interview</td><td colspan="2">Vehicle Bring-in Date Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td>Year Month Date</td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Occurrence location</td><td colspan="3"></td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic trouble code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

AIR CONDITIONER(DIAGNOSTICS) > General Description

CAUTION

1. AIR CONDITIONER

- Never connect the battery in reverse polarity.
  A/C CM may be immediately damaged.
- 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 A/C CM etc.
- Before disconnecting the connectors of sensors and the A/C CM, be sure to turn off the ignition switch.
  A/C CM may be damaged.
- A/C-related parts are precision parts, so do not let them fall.
- When removing A/C related parts, refer to Cautions for A/Cs. Ref. to AIR CONDITIONER>General Description>CAUTION.

2. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

AIR CONDITIONER(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

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

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.
3. Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

AIR CONDITIONER(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

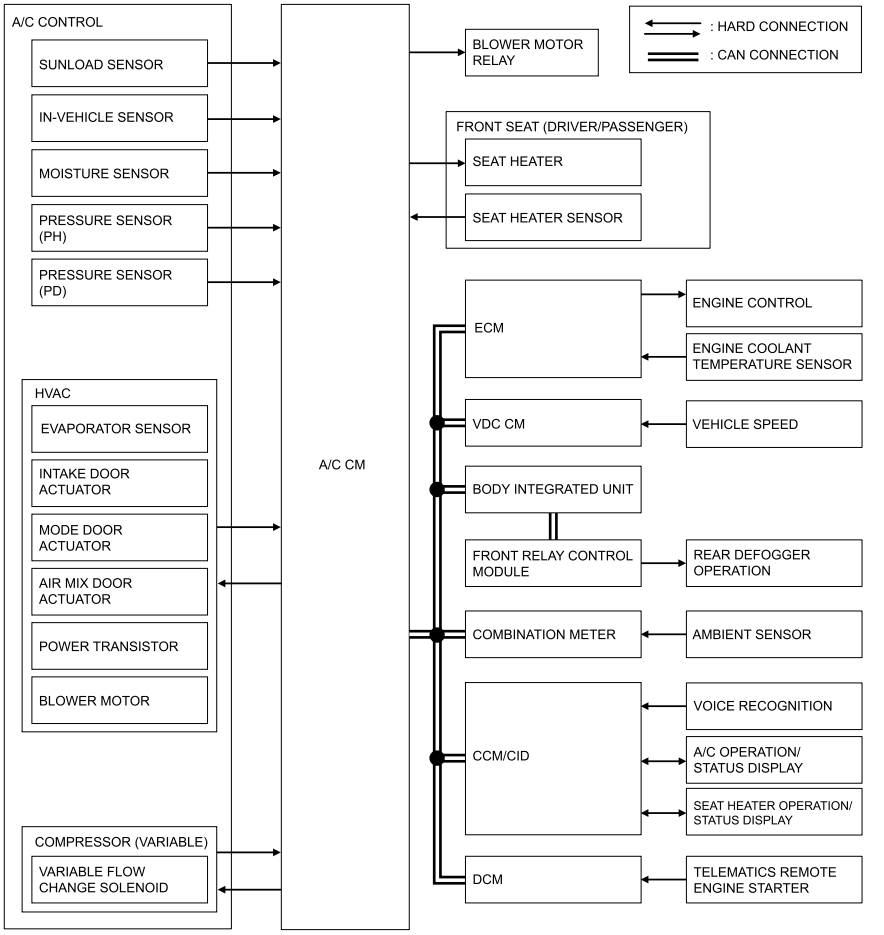
2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

AIR CONDITIONER(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

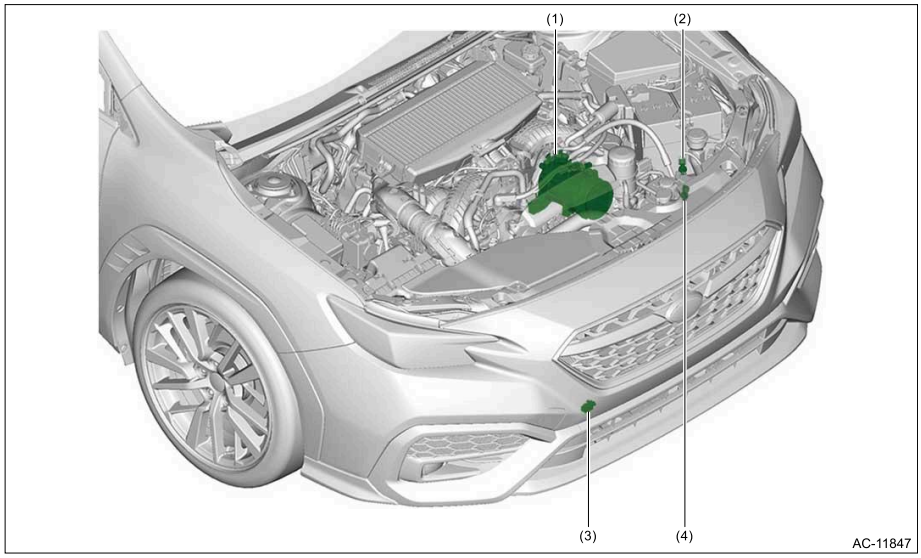
- A/C control & status display
  Using the CAN communication, perform A/C control from vehicle information and each sensor value to actuate the A/C system device. Also, A/C status is output through CAN to display the A/C status on the center information display (CID).
- Engine control
  Transmit the A/C status via CAN for engine control.
- Rear defogger operation
  Output switch signals to body integrated unit. The control of rear defogger operation is carried out via body integrated unit.
- Voice recognition
  Change the A/C setting according to the voice input by incorporating with the cockpit control module (CCM) and the center information display (CID).


A/C CONTROL
SUNLOAD SENSOR
IN-VEHICLE SENSOR
MOISTURE SENSOR
PRESSURE SENSOR (PH)
PRESSURE SENSOR (PD)
HVAC
EVAPORATOR SENSOR
INTAKE DOOR ACTUATOR
MODE DOOR ACTUATOR
AIR MIX DOOR ACTUATOR
POWER TRANSISTOR
BLOWER MOTOR
COMPRESSOR (VARIABLE)
VARIABLE FLOW CHANGE SOLENOID
A/C CM
BLOWER MOTOR RELAY
FRONT SEAT (DRIVER/PASSENGER)
SEAT HEATER
SEAT HEATER SENSOR
ECM
ENGINE CONTROL
ENGINE COOLANT TEMPERATURE SENSOR
VDC CM
VEHICLE SPEED
BODY INTEGRATED UNIT
FRONT RELAY CONTROL MODULE
REAR DEFOGGER OPERATION
COMBINATION METER
AMBIENT SENSOR
CCM/CID
VOICE RECOGNITION
A/C OPERATION/ STATUS DISPLAY
SEAT HEATER OPERATION/ STATUS DISPLAY
DCM
TELEMATICS REMOTE ENGINE STARTER
: HARD CONNECTION
: CAN CONNECTION

AC-11830

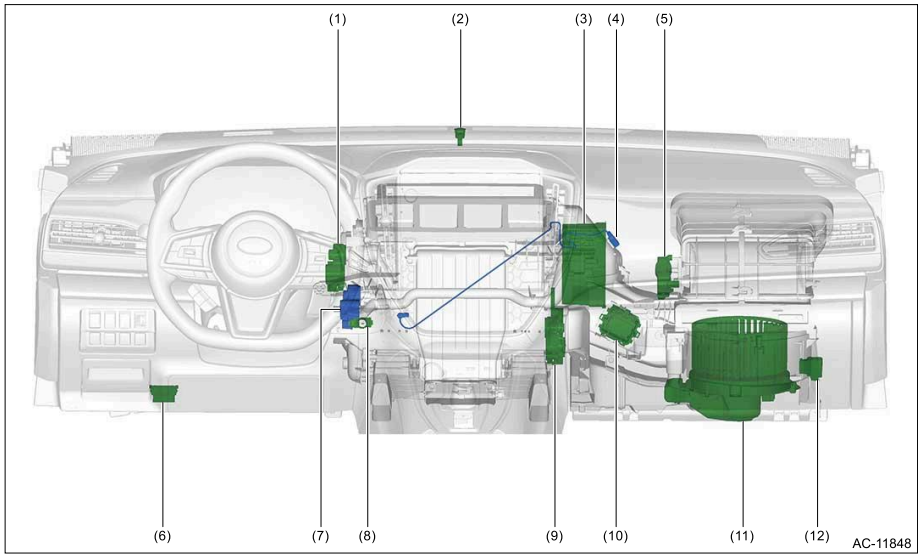
LOCATION

1. ENGINE COMPARTMENT



(1) A/C compressor
(2) Pressure sensor (PD)
(3) Ambient sensor
(4) Pressure sensor (PH)

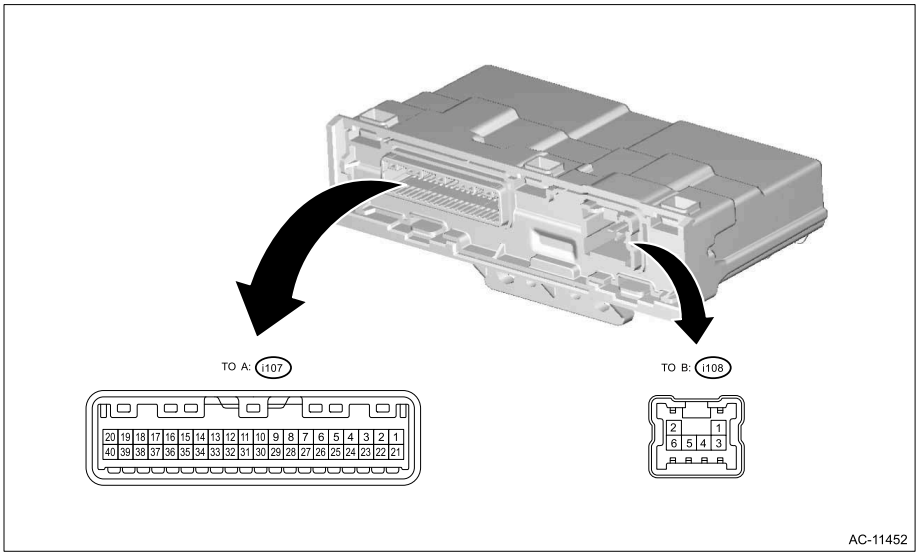
2. COMPARTMENT



(1) Mode door actuator
(2) Sunload sensor
(3) A/C CM
(4) Evaporator sensor
(5) Intake door actuator
(6) Data link connector
(7) Air mix door actuator LH*2
(8) In-vehicle sensor or temperature and humidity sensor
(9) Air mix door actuator*1 or air mix door actuator RH*2
(10) Power transistor
(11) Blower motor
(12) Blower motor relay

*1: Without left/right independent air conditioning function
*2: With left/right independent air conditioning function

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(i107) No. 1	Mode door actuator #4	Digital signal; cannot be measured	—
(i107) No. 2	Mode door actuator #3	Digital signal; cannot be measured	—
(i107) No. 3	Mode door actuator #2	Digital signal; cannot be measured	—
(i107) No. 4	Mode door actuator #1	Digital signal; cannot be measured	—
(i107) No. 5	—	—	—
(i107) No. 6 (+) ←→ (i107) No. 8 (−)	Intake door actuator drive output (FRESH)	While operating to FRESH side	8 V or more
(i107) No. 7	—	—	—
(i107) No. 8 (+) ←→ (i107) No. 6 (−)	Intake door actuator drive output (RECIRC)	While operating to RECIRC side	8 V or more
(i107) No. 9 ←→ Chassis ground (−)	Blower motor relay drive output	Blower switch: ON	1 V or less
(i107) No. 10 ←→ Chassis ground (−)	Sensor and actuator power supply	Ignition switch: ON	5 V
(i107) No. 11	—	—	—
(i107) No. 12 ←→ Chassis ground (−)	Intake door actuator position signal	Ignition switch: ON	0 — 5 V
(i107) No. 13 (+) ←→ Chassis ground (−)	Pressure sensor (PD) signal	Compressor operation status	0.1 — 4.9 V
(i107) No. 14 (+) ←→ Chassis ground (−)	Sensor GND	Always	1 V or less
(i107) No. 15 (+) ←→ Chassis ground (−)	ACC power supply	Ignition switch: ACC	Battery voltage
(i107) No. 16 (+) ←→ Chassis ground (−)	Sunload sensor signal	Sunlight is contacting sensor	1 — 4 V
(i107) No. 17 (+) ←→ Chassis ground (−)	In-vehicle sensor signal	Ignition switch: ON	25°C: Approx. 2.5 V
(i107) No. 18 (+) ←→ Chassis ground (−)	Evaporator sensor signal	Depends on temperature after the evaporator.	1 — 4.5 V
(i107) No. 19	Body CAN L	Digital signal; cannot be measured	—
(i107) No. 20	Body CAN H	Digital signal; cannot be measured	—
(i107) No. 21	Air mix door actuator LH #4*2	Digital signal; cannot be measured	—

Terminal No.	Contents	Measuring condition	Standard
(i107) No. 22	Air mix door actuator LH #3*2	Digital signal; cannot be measured	—
(i107) No. 23	Air mix door actuator LH #2*2	Digital signal; cannot be measured	—
(i107) No. 24	Air mix door actuator LH #1*2	Digital signal; cannot be measured	—
(i107) No. 25	Air mix door actuator #4*1 or air mix door actuator RH #4*2	Digital signal; cannot be measured	—
(i107) No. 26	Air mix door actuator #3*1 or air mix door actuator RH #3*2	Digital signal; cannot be measured	—
(i107) No. 27	Air mix door actuator #2*1 or air mix door actuator RH #2*2	Digital signal; cannot be measured	—
(i107) No. 28	Air mix door actuator #1*1 or air mix door actuator RH #1*2	Digital signal; cannot be measured	—
(i107) No. 29	—	—	—
(i107) No. 30	—	—	—
(i107) No. 31 (+) ←→ Chassis ground (−)	Battery power supply	Always	Battery voltage
(i107) No. 32 (+) ←→ Chassis ground (−)	Ignition power supply	Ignition switch: ON	Battery voltage
(i107) No. 33 (+) ←→ Chassis ground (−)	Humidity sensor signal*3	Ignition switch: ON Fluctuates depending on humidity of the vehicle interior.	1 — 4.5 V
(i107) No. 34 (+) ←→ Chassis ground (−)	GND	Always	1 V or less
(i107) No. 35	—	—	—
(i107) No. 36 (+) ←→ Chassis ground (−)	Variable compressor solenoid valve drive output	Ignition switch: ON Blower switch: ON A/C switch: ON	2 — 12 V
(i107) No. 37	—	—	—
(i107) No. 38 (+) ←→ Chassis ground (−)	Pressure sensor (PH) signal	Compressor operation status	0.1 — 4.9 V
(i107) No. 39	—	—	—
(i107) No. 40 (+) ←→ Chassis ground (−)	Blower motor control output	Blower switch: ON Outlet opening: VENT	1st gear: Approx. 10.0 V 2nd gear: Approx. 9.0 V 3rd gear: Approx. 8.0 V 4th gear: Approx. 7.0 V 5th gear: Approx. 5.5 V 6th gear: Approx. 4.0 V 7th gear: Approx. 3.0 V
(i108) No. 1 (+) ←→ Chassis ground (−)	Seat heater (Dr) drive output*4	Ignition switch: ON Seat heater switch: ON	Battery voltage
(i108) No. 2 (+) ←→ Chassis ground (−)	Seat heater (Pa) GND*4	Always	1 V or less
(i108) No. 3 (+) ←→ Chassis ground (−)	Seat heater (Dr) GND*4	Always	1 V or less
(i108) No. 4 (+) ←→ Chassis ground (−)	Seat heater (Dr) temperature sensor signal*4	Ignition switch: ON Varies depending on temperature at seat heater.	0 — 5 V
(i108) No. 5 (+) ←→ Chassis ground (−)	Seat heater (Pa) temperature sensor signal*4	Ignition switch: ON Varies depending on temperature at seat heater.	0 — 5 V
(i108) No. 6 (+) ←→ Chassis ground (−)	Seat heater (Pa) drive output*4	Ignition switch: ON Seat heater switch: ON	Battery voltage

*1: Without left/right independent air conditioning function

*2: With left/right independent air conditioning function

*3: With humidity sensor
*4: With seat heater

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	Description & trouble part	Note
B1430	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN	—
B1431	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	—
B1432	AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER)	—
B1433	AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER)	—
B1434	EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN	—
B1435	EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	—
B1436	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER)	With left/right independent air conditioning function
B1437	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER)	With left/right independent air conditioning function
B1438	MODE DOOR ACTUATOR CIRCUIT OPEN	—
B1439	MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	—
B1440	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER)	—
B1442	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER)	—
B14B1	SEAT HEATER THERMISTOR CIRCUIT OPEN (DRIVER)	With seat heater
B14B2	SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (DRIVER)	With seat heater
B14B3	SEAT HEATER THERMISTOR CIRCUIT OPEN (PASSENGER)	With seat heater
B14B4	SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (PASSENGER'S)	With seat heater
B14E9	INTAKE DOOR ACTUATOR CIRCUIT OPEN	—
B14EA	INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	—
B14EB	INTAKE DOOR ACTUATOR STUCK	—
B14EC	HUMIDITY SENSOR CIRCUIT OPEN	With humidity sensor
B14ED	HUMIDITY SENSOR CIRCUIT SHORT	With humidity sensor

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(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 ON and then leave it for 16 seconds or more.
4. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(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	Description & trouble part	Note
B14A1	SUNLOAD SENSOR CIRCUIT LOW/OPEN	—
B14A2	SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(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. Park the vehicle in the place subjected to direct sunlight.
4. Turn the ignition switch to ON and then leave it for 4 seconds or more.
5. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(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	Description & trouble part	Note
B14A3	REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN	—
B14A4	REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT	—
B14A7	VARIABLE SOLENOID VALVE CIRCUIT	—
B14A8	COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT	—
B14EE	REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN (HOSE PRESSURE DISCHARGE)	—
B14EF	REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT (HOSE PRESSURE DISCHARGE)	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(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 [Variable compressor break-in drive]. Ref. to AIR CONDITIONER>Compressor.
4. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(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.

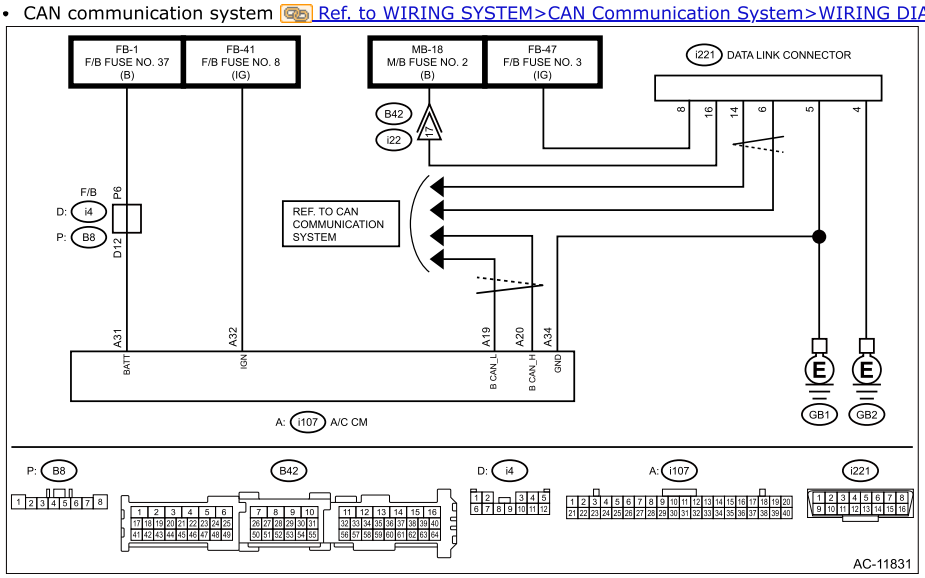
INSPECTION

Trouble symptom:
Cannot communicate with [Air Conditioner].
Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

- Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POWER SUPPLY CIRCUIT.

Connect the interface for Subaru Select Monitor to the data link connector.

Does the interface for Subaru Select Monitor turn on?

Yes — Go to 4.

No — Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i221) No. 8 (+) — Chassis ground (−):
   (i221) 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. 2, F/B No. 3)**

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

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between data link connector and chassis ground.
   Connector & terminal
   (i221) No. 4 — Chassis ground:
   (i221) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found, Go to 4.
No	Repair the harness and connector.

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?

Yes	Go to 5.
No	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?

Yes	Go to 6.
No	Repair it according to the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check poor contact of A/C CM connector and data link connector.

Is the check result OK?

Yes	Go to 7.
No	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. Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.

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 CM and fuse.

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

1. Disconnect the A/C CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between A/C CM connector and chassis ground.

Connector & terminal

(i107) No. 31 (+) — Chassis ground (−):

(i107) 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 CM and fuse.

9. CHECK A/C CM GROUND CIRCUIT (OPEN CIRCUIT).

Measure the resistance of harness between A/C CM connector and chassis ground.

Connector & terminal

(i107) No. 34 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check the connection between the data link connector and Subaru Select Monitor.
No	Repair the harness for ground line.

AIR CONDITIONER(DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Time stamp information Ref. to COMMON (DIAGNOSTICS)>Time Stamp.	Time	—
Count		—	—
Time Count		ms	—
In-vehicle Sensor Temperature	Display the in-vehicle sensor value.	−72.47 — 193.82 °C	—
Refrigerant Pressure	Display the pressure sensor (PH) value.	0 — 3.29 MPa	—
Quantity of Sunload	Display the sunload sensor value.	0 — 4448 W/m^2	—
Heater Water Temperature	Display the engine coolant temperature. (CAN information)	−40.00 — 214 °C	—
A/C Pressure Sensor	Display the pressure sensor (PD) value.	0 — 3.29 Mpa	—
Heater Control Panel Setting Value (Driver's)	Display the driver's side setting temperature of the center information display.	15 — 90	—
Heater Control Panel Setting Value (Passenger's)	Display the passenger's side setting temperature of the center information display.	15 — 90	With left/right independent air conditioning function
Blower outlet request temperature (Driver's)	Display the blow vents target temperature on driver's side.	−327.68 — 327.67 °C	—
Blower outlet request temperature (Passenger's)	Display the blow vents target temperature on passenger's side.	−327.68 — 327.67 °C	With left/right independent air conditioning function
Air mix door actuator position (driver's side)	Display the driver's seat air mix door actuator position information.	−32.68 — 133.33 %	—
Air mix door actuator position (passenger's side)	Display the passenger's seat air mix door actuator position information.	−32.68 — 133.33 %	With left/right independent air conditioning function
Mode Door Actuator Position	Display the mode door actuator position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position	Display the intake door actuator position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (driver's side)	Display the driver's seat air mix door actuator target position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (passenger's side)	Display the passenger's seat air mix door actuator target position information.	−32.68 — 133.33 %	With left/right independent air conditioning function
Mode Door Actuator Position Target	Display the mode door actuator target position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position Target	Display the intake door actuator target position information.	−32.68 — 133.33 %	—
Blower Fan Level	Display the blower fan motor speed level.	0 — 255	—
Ambient Air Temperature	Display the ambient sensor value. (CAN information)	−40 — 80 °C	—

Item	Contents	Standard/Unit	Note
Compressor operation status	Display the operation status of the compressor.	OFF/ON	—
Blower Fan Operating Condition	Display the operation status of the blower fan.	MANU/AUTO	—
A/C Operating Condition	Display the operation status of the compressor.	MANU/AUTO	—
Fresh/Recircle Air Operating Condition	Display the operation status of the FRESH/RECIRC.	MANU/AUTO	—
Mode Operating Condition	Display the operation status of the blow vents.	MANU/AUTO	—
Rear Defogger	Display the operation status of the rear defogger switch.	OFF/ON	—
Engine Speed	Display the engine speed. (CAN information)	0 — 32767 rpm	—
Vehicle Speed	Display the vehicle speed. (CAN information)	0 — 300 km/h	—
Evaporator Temperature	Display the evaporator sensor value.	−82.48 — 153.55 °C	—
Evaporator Temperature Target	Display the evaporator target temperature.	0 — 20 °C	—
Variable Flow Change Solenoid Duty	Display Duty value of the variable flow change solenoid valve.	0 — 100 %	—
Variable Load Compressor Torque Value	Display the estimated load torque value of the variable compressor.	0 — 100 Nm	—
Request Compressor Speed during Idling	Display the request compressor rotational speed at idling.	650 — 1425 rpm	—
Request engine speed	Display the request engine speed.	0: Without Request / 1: Cooler H / 2: Heater H / 3: Cooler L / 4: Heater L / 5: Heater M / 6: Heater LL	—
Humidity	Display humidity sensor readings.	0 — 100 %	With humidity sensor
Seat Heater operation steps(Driver's)	Display driver’s side seat heater level.	0 — 3	With seat heater
Seat Heater operation steps(Passenger's)	Display passenger’s side seat heater level.	0 — 3	With seat heater
Seat Heater Temp. (Driver's)	Display driver’s side seat heater thermistor temperature.	−72.2 — 293.74 °C	With seat heater
Seat Heater Temp. (Passenger's)	Display passenger’s side seat heater thermistor temperature.	−72.2 — 293.74 °C	With seat heater
SI-DS Climate Control - Mode Setting	Display SI-DS A/C mode settings.	NORMAL MILD	With drive mode select

AIR CONDITIONER(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Freeze Frame Data>LIST.**
- **FFD is not cleared even if the battery is removed. (It is saved in the non-volatile memory of the microcomputer and read when cold start is performed.)**
- **Up to 86 freeze frame data are recorded. (The number of data to be saved varies depending on vehicle information (DUAL/SINGLE, variable/fixed COMP, with/without Auto Start Stop, with/without humidity sensor, with/without seat heater).)**
- **Freeze frame data is stored for 2 DTCs. Freeze frame data for the third DTC is not recorded.**
  - **– When recording the first DTC**
    Three sheets of time series FFD and one sheet of FFD at failure detection are recorded.
  - **– When recording the second DTC**
    One sheet of FFD at failure detection is recorded.
- **As DTC B14A1 becomes a current code when not exposed to sunlight even if there is no failure, the history code and FFD are not saved.**

AIR CONDITIONER(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Time stamp information Ref. to COMMON (DIAGNOSTICS)>Time Stamp.	Time	—
Count		—	—
Time Count		ms	—
In-vehicle Sensor Temperature	Display the in-vehicle sensor value.	−72.47 — 193.82 °C	—
Refrigerant Pressure	Display the pressure sensor (PH) value.	0 — 3.29 MPa	—
Quantity of Sunload	Display the sunload sensor value.	0 — 4448 W/m^2	—
Heater Water Temperature	Display the engine coolant temperature. (CAN information)	−40.00 — 214 °C	—
A/C Pressure Sensor	Display the pressure sensor (PD) value.	0 — 3.29 Mpa	—
Heater Control Panel Setting Value (Driver's)	Display the driver's side setting temperature of the center information display.	15 — 90	—
Heater Control Panel Setting Value (Passenger's)	Display the passenger's side setting temperature of the center information display.	15 — 90	With left/right independent air conditioning function
Blower outlet request temperature (Driver's)	Display the blow vents target temperature on driver's side.	−327.68 — 327.67 °C	—
Blower outlet request temperature (Passenger's)	Display the blow vents target temperature on passenger's side.	−327.68 — 327.67 °C	With left/right independent air conditioning function
Air mix door actuator position (driver's side)	Display the driver's seat air mix door actuator position information.	−32.68 — 133.33 %	—
Air mix door actuator position (passenger's side)	Display the passenger's seat air mix door actuator position information.	−32.68 — 133.33 %	With left/right independent air conditioning function
Mode Door Actuator Position	Display the mode door actuator position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position	Display the intake door actuator position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (driver's side)	Display the driver's seat air mix door actuator target position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (passenger's side)	Display the passenger's seat air mix door actuator target position information.	−32.68 — 133.33 %	With left/right independent air conditioning function

Item	Contents	Standard/Unit	Note
Mode Door Actuator Position Target	Display the mode door actuator target position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position Target	Display the intake door actuator target position information.	−32.68 — 133.33 %	—
Blower Fan Level	Display the blower fan motor speed level.	0 — 255	—
Ambient Air Temperature	Display the ambient sensor value. (CAN information)	−40 — 80 °C	—
Compressor operation status	Display the operation status of the compressor.	OFF/ON	—
Blower Fan Operating Condition	Display the operation status of the blower fan.	MANU/AUTO	—
A/C Operating Condition	Display the operation status of the compressor.	MANU/AUTO	—
Fresh/Recircle Air Operating Condition	Display the operation status of the FRESH/RECIRC.	MANU/AUTO	—
Mode Operating Condition	Display the operation status of the blow vents.	MANU/AUTO	—
Rear Defogger	Display the operation status of the rear defogger switch.	OFF/ON	—
Engine Speed	Display the engine speed. (CAN information)	0 — 32767 rpm	—
Vehicle Speed	Display the vehicle speed. (CAN information)	0 — 300 km/h	—
Evaporator Temperature	Display the evaporator sensor value.	−82.48 — 153.55 °C	—
Evaporator Temperature Target	Display the evaporator target temperature.	0 — 20 °C	—
Variable Flow Change Solenoid Duty	Display Duty value of the variable flow change solenoid valve.	0 — 100 %	—
Variable Load Compressor Torque Value	Display the estimated load torque value of the variable compressor.	0 — 100 Nm	—
Request Compressor Speed during Idling	Display the request compressor rotational speed at idling.	650 — 1425 rpm	—
Request engine speed	Display the request engine speed.	0: Without Request / 1: Cooler H / 2: Heater H / 3: Cooler L / 4: Heater L / 5: Heater M / 6: Heater LL	—
Humidity	Display humidity sensor readings.	0 — 100 %	With humidity sensor
Seat Heater operation steps(Driver's)	Display driver’s side seat heater level.	0 — 3	With seat heater
Seat Heater operation steps(Passenger's)	Display passenger’s side seat heater level.	0 — 3	With seat heater
Seat Heater Temp. (Driver's)	Display driver’s side seat heater thermistor temperature.	−72.2 — 293.74 °C	With seat heater
Seat Heater Temp. (Passenger's)	Display passenger’s side seat heater thermistor temperature.	−72.2 — 293.74 °C	With seat heater
SI-DS Climate Control - Mode Setting	Display SI-DS A/C mode settings.	NORMAL MILD	With drive mode select

AIR CONDITIONER(DIAGNOSTICS) > Active Test

OPERATION

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

Note:
- **For detailed operation procedures, refer to "Help" of application.**
- **For details on active tests, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Active Test

LIST

Note:
Some items are not displayed according to destination area or vehicle equipment condition.

Active test item	Range	Contents	Execution condition
In-vehicle Air Temperature setting	−72.47 — 193.82 °C	Set in-vehicle sensor readings. Adjusting the in-vehicle sensor value to use for A/C control is useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Ambient Air Temperature Setting	-40 — 80 °C	Set ambient sensor readings. Adjusting the ambient sensor value to use for A/C control is useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Quantity of Sunload Setting	0 — 4448 W/m^2	Set sunload sensor readings. Adjusting the sunload sensor value to use for A/C control is useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Heater Water Temperature Setting	-40 — 214 °C	Set coolant temperature sensor readings. Adjusting the coolant temperature sensor value used for A/C control is useful for reproduction test in faulty events.	Engine ON
AUTO switch mode setting	ON	Transmit ON signal of AUTO button contact. By operating A/C with the signal, it is possible to judge whether the control is faulty or the button (center information display) is faulty.	Ignition switch ON **Note:** **Engine ON is recommended.**
Air mix door actuator target open (driver's side)	0 — 100 %	Set the driver's seat air mix door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Air mix door actuator target open (passenger's side)	0 — 100 %	Set the passenger's seat air mix door actuator opening angle. Useful for reproduction test in faulty events. ∗1	Ignition switch ON **Note:** **Engine ON is recommended.**
Fresh/Rec Air Dr Act Trgt Open Angle	0 — 100 %	Set the intake door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**

Active test item	Range	Contents	Execution condition
Mode Door Actuator Opening Angle Target	0 — 100 %	Set the mode door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Blower Fan Level Setting	0 — 255 **Note:** **Input up to 255 is possible, but 181 — 255 is the same.**	Set the blower fan level. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** • **Engine ON is recommended.** • **Compressor OFF is needed to set the level to 0.**
A/C Change Setting	ON/OFF	Set the compressor operation request. Useful for reproduction test in faulty events.	• Engine ON • Blower ON
Rear Defogger Setting	ON/OFF	Transmit the rear defogger button contact signal. By operating A/C with the signal, it is possible to judge whether the control is faulty or the button (center information display) is faulty.	Ignition switch ON **Note:** **Engine ON is recommended.**
Variable Flow Change Sol Duty Setting	0 — 100 %	Set Duty value of variable flow change solenoid valve. Useful for reproduction test in faulty events. **Note:** **The setting value may not be obtained due to A/C circuit protection.**	• Engine ON • Compressor ON • Blower ON
Humidity Setting	0 — 100 %	Set humidity sensor readings. Adjusting the humidity sensor value to use for A/C control is useful for reproduction test in faulty events. ∗2	Ignition switch ON **Note:** **Engine ON is recommended.**

∗1: With left/right independent air conditioning function

∗2: With humidity sensor

AIR CONDITIONER(DIAGNOSTICS) > Customize

OPERATION

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

Note:

- **For detailed operation procedures, refer to "Help" of application.**
- **For details on customization, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Customize>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Customize

LIST

Item	Initial setting value	Setting value	Contents
Fresh/Recircle Air Door Auto Mode	AUTO	AUTO	When AUTO mode is actuated, inlet switching is also automatically operated.
		MANU	Even when AUTO mode is actuated, inlet switching is not automatically operated. (Switching can only be manually operated)
Compressor auto mode	AUTO	AUTO	When AUTO mode is actuated, compressor is also automatically operated.
		MANU	Even when AUTO mode is actuated, compressor is not automatically operated. (Switching can only be manually operated)
Setting temperature shift	0	−3	Adjust the A/C target value relative to the set temperature.
		−2	
		−1	
		0	
		+1	
		+2	
		+3	
Mode/VentII	Yes	Yes	When AUTO mode is operated, VENT II mode (upper wind: large, lower wind: small) is present.
		No	When AUTO mode is operated, VENT II mode (upper wind: large, lower wind: small) is absent.
Mode/All Flow	Yes	Yes	When AUTO mode is operated, all-flow mode (wind comes from all blower vents) is present.
		No	When AUTO mode is operated, all-flow mode (wind comes from all blower vents) is absent.
Mode/HeatIII	Yes	Yes	When AUTO mode is operated, HEAT III mode (footwell/DEF ratio is different) is present.
		No	When AUTO mode is operated, HEAT III mode (footwell/DEF ratio is different) is absent.
Release Max A/C by Mode Sw	Yes	Yes	When the mode button is operated in MAX A/C status, MAX A/C status is deactivated.
		No	Even when the mode button is operated in MAX A/C status, MAX A/C status is not deactivated.

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Work Support.**
- **For detailed operation procedures, refer to "Help" of application.**
- **For details on the work support, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Work Support>LIST.**

LIST

Work Support item	Contents	Remarks
Actuator Initialization	Performing compensation of original point can correct the offset of operation for each actuator.	Ignition switch ON **Note:** **Engine ON recommended**
Variable compressor break-in drive	[Variable compressor break-in drive] must be performed due to the compressor protection, when the compressor assembly was replaced with a new one.	For more detail, refer to the compressor installation. Ref. to AIR CONDITIONER>Compressor>INSTALLATION.

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

OPERATION

Note:

- **For detailed operation procedures, refer to "Common (Diagnostics)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**
- **DTC is not cleared even if the battery is removed. (DTCs that are needed to be saved as history codes are all saved.)**

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

LIST

DTC	Description & trouble part	Reference
B1430	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT 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	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)	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)	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	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	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1435 EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT.
B1436	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1436 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER).
B1437	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1437 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER).
B1438	MODE DOOR ACTUATOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN.
B1439	MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1439 MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.

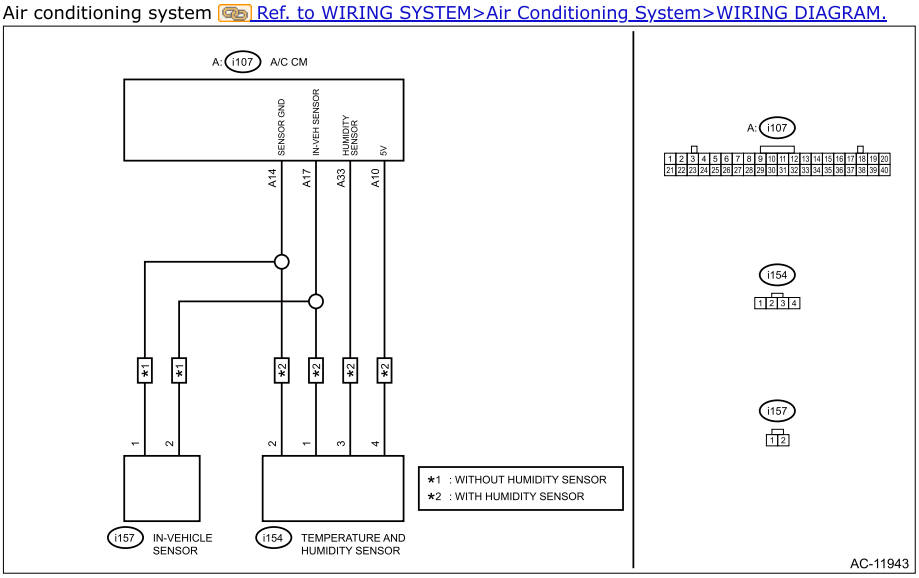
DTC	Description & trouble part	Reference
B1440	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1440 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER).
B1442	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1442 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER).
B14A1	SUNLOAD SENSOR CIRCUIT LOW/OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A1 SUNLOAD SENSOR CIRCUIT LOW/OPEN. When the sunload sensor inspection is performed indoors or in the shade, it may be diagnosed as having an open circuit due to an insufficient light volume. In this case, check the sunload sensor at a location exposed to direct sunlight.
B14A2	SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A2 SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT. When the sunload sensor inspection is performed indoors or in the shade, it may be diagnosed as having an open circuit due to an insufficient light volume. In this case, check the sunload sensor at a location exposed to direct sunlight.
B14A3	REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A3 REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN.
B14A4	REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A4 REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT .
B14A7	VARIABLE SOLENOID VALVE CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A7 VARIABLE SOLENOID VALVE CIRCUIT.
B14A8	COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A8 COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT.
B14B1	SEAT HEATER THERMISTOR CIRCUIT OPEN (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14B1 SEAT HEATER THERMISTOR CIRCUIT OPEN (DRIVER).
B14B2	SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14B2 SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (DRIVER).
B14B3	SEAT HEATER THERMISTOR CIRCUIT OPEN (PASSENGER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14B3 SEAT HEATER THERMISTOR CIRCUIT OPEN (PASSENGER).

DTC	Description & trouble part	Reference
B14B4	SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (PASSENGER'S)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14B4 SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (PASSENGER'S).
B14E9	INTAKE DOOR ACTUATOR CIRCUIT 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	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	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.
B14EC	HUMIDITY SENSOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EC HUMIDITY SENSOR CIRCUIT OPEN.
B14ED	HUMIDITY SENSOR CIRCUIT SHORT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14ED HUMIDITY SENSOR CIRCUIT SHORT .
B14EE	REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN (HOSE PRESSURE DISCHARGE)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EE REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN (HOSE PRESSURE DISCHARGE).
B14EF	REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT (HOSE PRESSURE DISCHARGE)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EF REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT (HOSE PRESSURE DISCHARGE) .
U0073	CONTROL MODULE COMMUNICATION BUS OFF	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"	Ref. to AIR CONDITIONER(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 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	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	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH

DTC	Description & trouble part	Reference
		INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to AIR CONDITIONER(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 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	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	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1146	LOST COMMUNICATION WITH GATEWAY "A" BODY-CAN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1146 LOST COMMUNICATION WITH GATEWAY "A" BODY-CAN.

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

DTC detecting condition:
In-vehicle sensor or temperature and humidity sensor (in-vehicle temperature) 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.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and in-vehicle sensor connector or temperature and humidity sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1430 displayed? (Current code)

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 IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
3. Short No. 1 and No. 2 in (i157) or (i154) connector.
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1431 displayed? (Current code)

Yes	Replace the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the A/C CM connector and in-vehicle sensor connector or temperature and humidity sensor connector.

Connector & terminal

Without humidity sensor

(i107) No. 14 — (i157) No. 1:
(i107) No. 17 — (i157) No. 2:

With humidity sensor

(i107) No. 14 — (i154) No. 2:
(i107) No. 17 — (i154) No. 1:

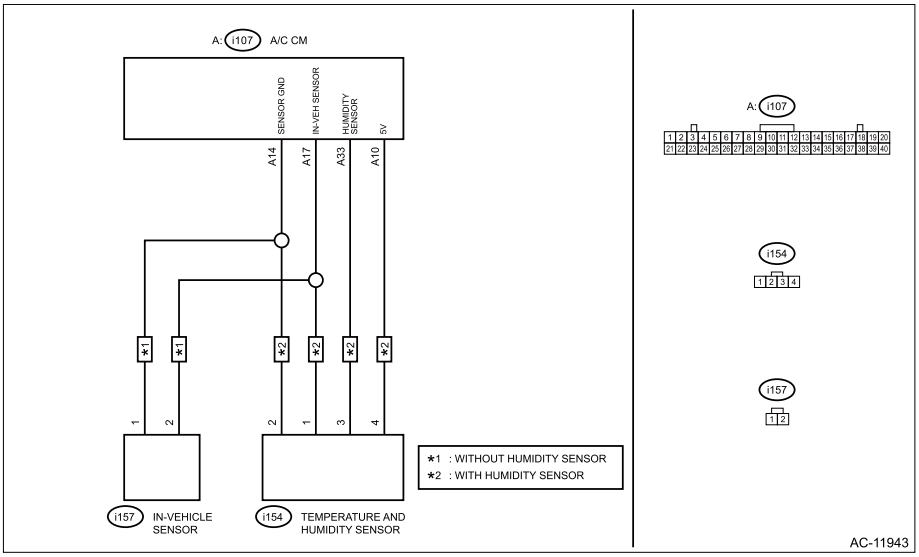
Is there continuity?

Yes	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.
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 or temperature and humidity sensor (in-vehicle temperature) 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.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and in-vehicle sensor connector or temperature and humidity sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1431 displayed? (Current code)

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 IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1430 displayed? (Current code)

Yes	Replace the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in the in-vehicle sensor connector or temperature and humidity sensor connector, and between the in-vehicle sensor connector or temperature and humidity sensor connector and chassis ground.
   Connector & terminal
   Without humidity sensor
   (i157) No. 1 — (i157) No. 2:
   (i157) No. 2 — Chassis ground:
   With humidity sensor
   (i154) No. 1 — (i154) No. 2:
   (i154) No. 1 — Chassis ground:

Is there continuity?

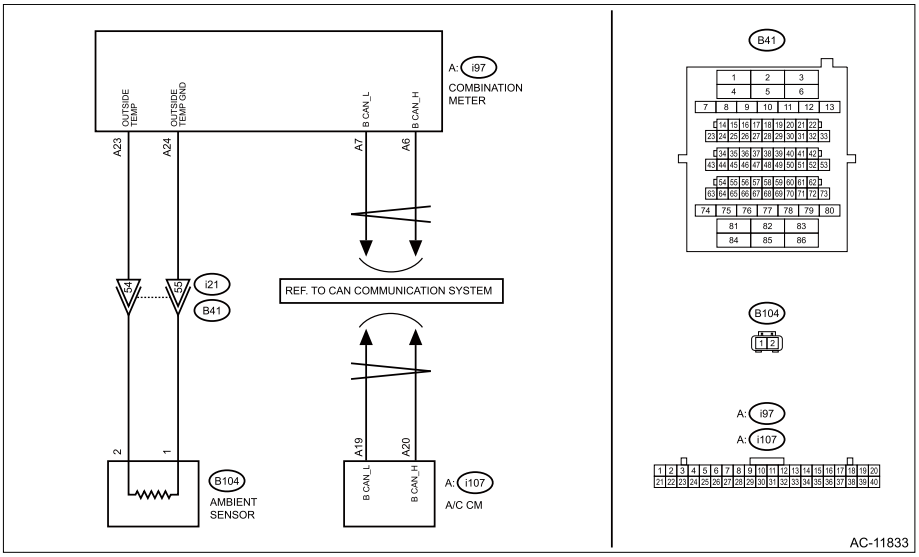
Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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

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

DTC detecting condition:
Ambient sensor to combination meter circuit is open.
Trouble symptom:
- Defective ambient temperature display.
- Ambient 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.
- Combination meter system Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting conditions of combination meter connector and ambient sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1432 displayed? (Current code)

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 AMBIENT SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.
3. Short the connector (B104).
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1433 displayed? (Current code)

Yes	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
4. Using a tester, check the continuity between combination meter connector and ambient sensor connector.
   Connector & terminal
   (B104) No. 1 — (i97) No. 24:
   (B104) No. 2 — (i97) No. 23:

Is there continuity?

Yes	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Repair or replace the open circuit of harness.

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

DTC detecting condition:

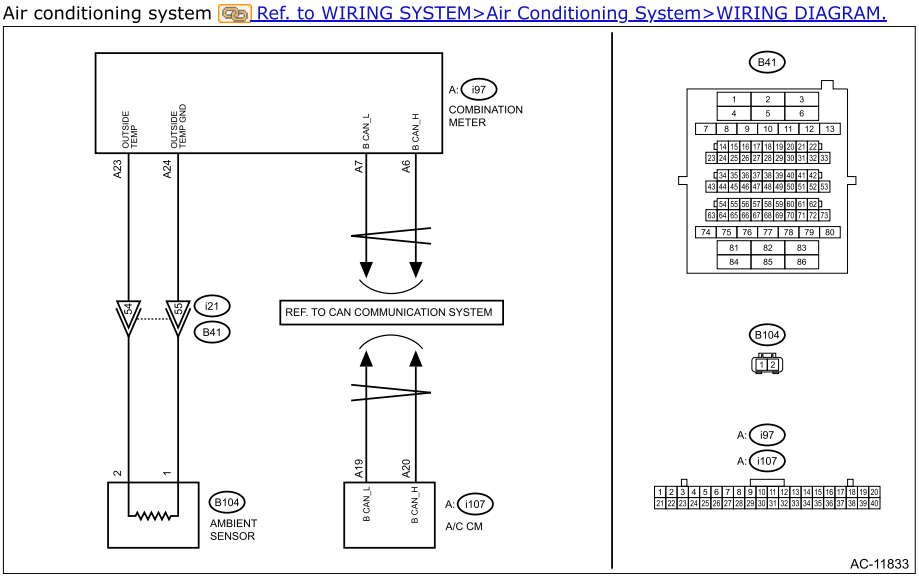
Ambient sensor to combination meter circuit is shorted.

Trouble symptom:

- Defective ambient temperature display.
- Ambient 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.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the connecting conditions of combination meter connector and ambient sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1433 displayed? (Current code)

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 AMBIENT SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1432 displayed? (Current code)

Yes — Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

No — Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
3. Using a tester, check the continuity between the terminals in the ambient sensor connector and between the ambient sensor connector and chassis ground.
   Connector & terminal
   (B104) No. 1 — (B104) No. 2:
   (B104) No. 2 — Chassis ground:

Is there continuity?

Yes — Repair or replace the short circuit of the harness.

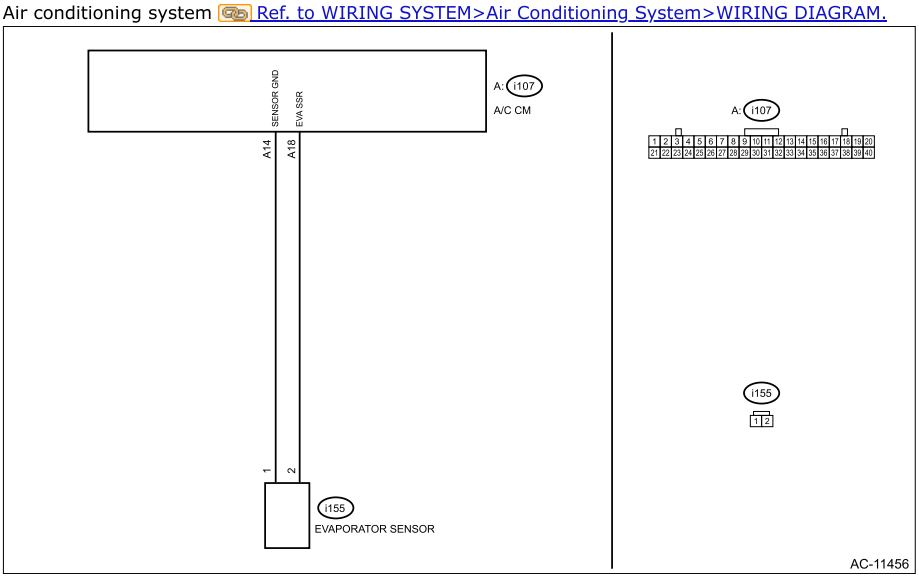
No — Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

DTC B1434 EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN

DTC detecting condition:
Evaporator sensor circuit is open.
Trouble symptom:

- Compressor does not operate.
- Evaporator temperature is falsely recognized, and the compartment temperature is adjusted.

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



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and evaporator sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1434 displayed? (Current code)

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 EVAPORATOR SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.
3. Short the connector (i155).
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1435 displayed? (Current code)

Yes	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the A/C CM connector and evaporator sensor connector.
   Connector & terminal
   (i155) No. 1 — (i107) No. 14:
   (I155) No. 2 — (i107) No. 18:

Is there continuity?

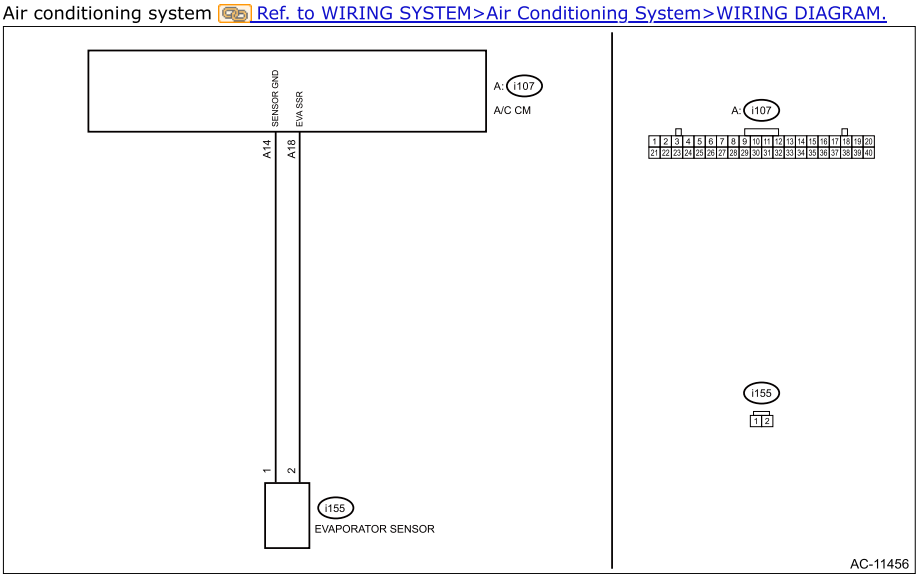
Yes	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.
No	Repair or replace the open circuit of harness.

DTC B1435 EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:
Evaporator sensor circuit is shorted.
Trouble symptom:

- Compressor does not operate.
- Evaporator temperature is falsely recognized, and the compartment temperature is adjusted.

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



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and evaporator sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1435 displayed? (Current code)

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 EVAPORATOR SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1434 displayed? (Current code)

Yes	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator.
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

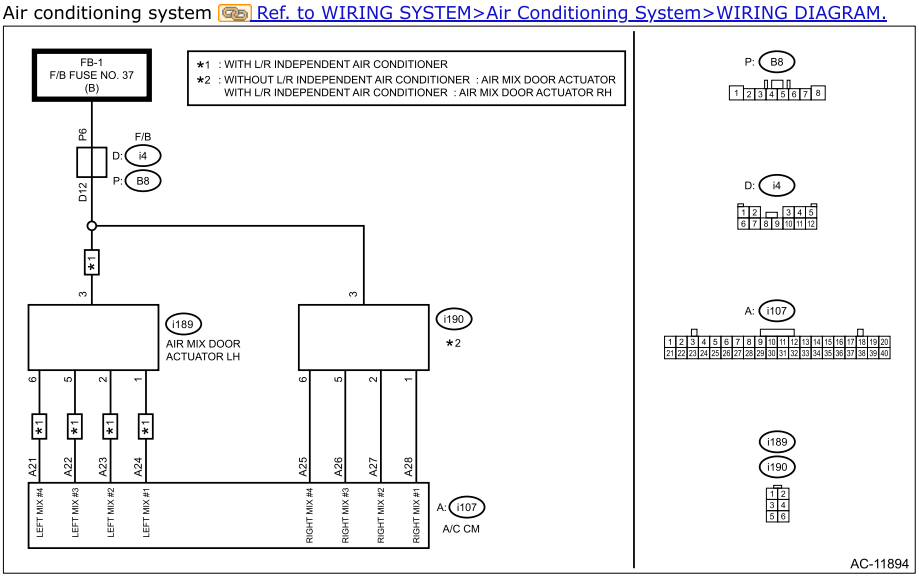
1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in the evaporator sensor connector and between the evaporator sensor connector and chassis ground.
   Connector & terminal
   (i155) No. 1 — (i155) No. 2:
   (i155) No. 1 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B1436 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER)

DTC detecting condition:
Air mix door actuator stepping motor circuit is open.
Trouble symptom:
Temperature on the passenger's side cannot be adjusted.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and air mix door actuator RH connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1436 displayed? (Current code)

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 POWER SUPPLY OF AIR MIX DOOR ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the air mix door actuator RH connector and chassis ground.
   Connector & terminal
   (i190) No. 3 (+) — Chassis ground (−):

Is the voltage approx. 10 V or more?

Yes — Go to 4.

No — Check the DC power supply circuit.

4. CHECK AIR MIX DOOR ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Measure the internal resistance of the air mix door actuator RH using a tester.
   Terminals
   (Air mix door actuator RH side)
   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 5.

No — Replace the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.

5. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, check the continuity between A/C CM connector and air mix door actuator RH connector.
   Connector & terminal
   (i190) No. 1 — (i107) No. 28:
   (i190) No. 2 — (i107) No. 27:
   (i190) No. 5 — (i107) No. 26:
   (i190) No. 6 — (i107) No. 25:

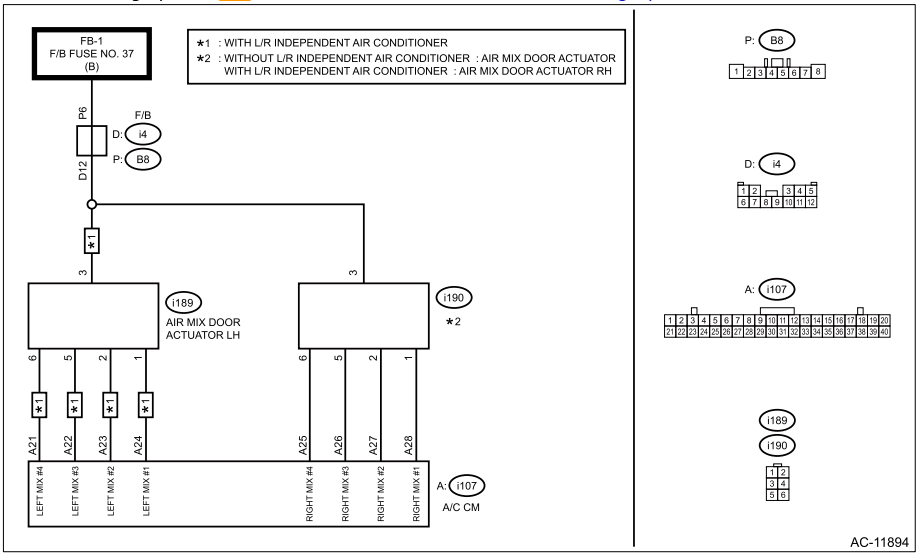
Is there continuity?

Yes — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

No — Repair or replace the open circuit of harness.

DTC B1437 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER)

DTC detecting condition:
Air mix door actuator stepping motor circuit is shorted.
Trouble symptom:
Temperature on the passenger's side cannot be adjusted.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and air mix door actuator RH connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK CONNECTOR.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1437 displayed? (Current code)

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 POWER SUPPLY OF AIR MIX DOOR ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the air mix door actuator RH connector and chassis ground.

Connector & terminal

(i190) No. 3 (+) — Chassis ground (−):

Is the voltage approx. 10 V or more?

Yes — Go to 4.

No — Check the DC power supply circuit.

4. CHECK AIR MIX DOOR ACTUATOR RH.

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

Terminals

(Air mix door actuator RH side)

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 5.

No — Replace the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, measure the voltage between the air mix door actuator RH connector and chassis ground.

Connector & terminal

(i190) No. 1 (+) — Chassis ground (−):

(i190) No. 2 (+) — Chassis ground (−):

(i190) No. 5 (+) — Chassis ground (−):

(i190) No. 6 (+) — Chassis ground (−):

Is there any voltage?

Yes — Repair or replace the short circuit of the harness.

No — Go to 6.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between air mix door actuator RH connector and chassis ground.

Connector & terminal

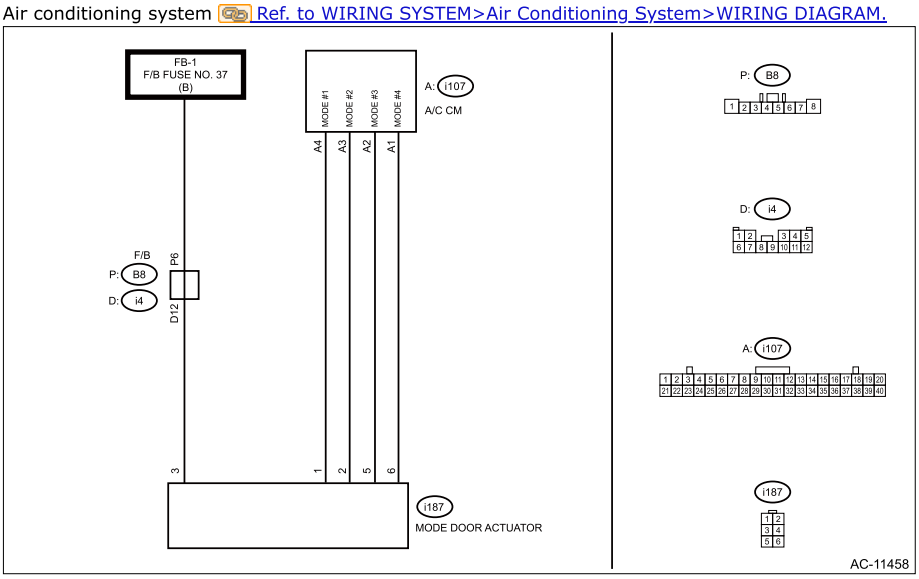
(i190) No. 1 — Chassis ground:
(i190) No. 2 — Chassis ground:
(i190) No. 5 — Chassis ground:
(i190) No. 6 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B1438 MODE DOOR ACTUATOR 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.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and mode door actuator connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1438 displayed? (Current code)

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 POWER SUPPLY FOR MODE DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between mode door actuator connector and chassis ground.

Connector & terminal

(i187) No. 3 (+) — Chassis ground (−):

Is the voltage approx. 10 V or more?

Yes — Go to 4.

No — Check the DC power supply circuit.

4. 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

(Mode door actuator side)

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 5.

No — Replace the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.

5. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, check the continuity between A/C CM connector and mode door actuator connector.

Connector & terminal

(i187) No. 1 — (i107) No. 4:

(i187) No. 2 — (i107) No. 3:

(i187) No. 5 — (i107) No. 2:

(i187) No. 6 — (i107) No. 1:

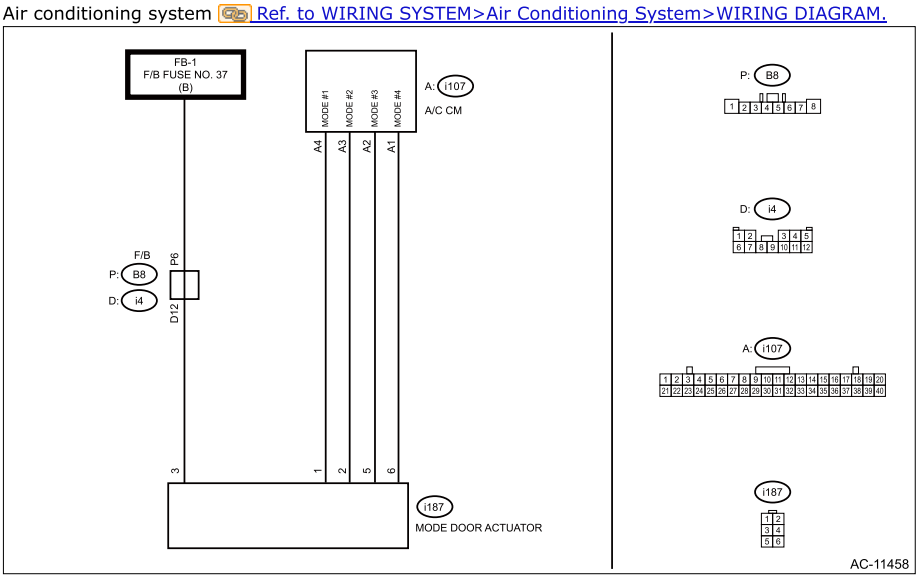
Is there continuity?

Yes — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

No — Repair or replace the open circuit of harness.

DTC B1439 MODE DOOR ACTUATOR 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.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and mode door actuator connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1439 displayed? (Current code)

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 POWER SUPPLY FOR MODE DOOR ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between mode door actuator connector and chassis ground.

Connector & terminal

(i187) No. 3 (+) — Chassis ground (−):

Is the voltage approx. 10 V or more?

Yes — Go to 4.

No — Check the DC power supply circuit.

4. 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

(Mode door actuator side)

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 5.

No — Replace the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, measure the voltage between mode door actuator connector and chassis ground.

Connector & terminal

(i187) No. 1 (+) — Chassis ground (−):

(i187) No. 2 (+) — Chassis ground (−):

(i187) No. 5 (+) — Chassis ground (−):

(i187) No. 6 (+) — Chassis ground (−):

Is there any voltage?

Yes — Repair or replace the short circuit of the harness.

No — Go to 6.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between mode door actuator connector and chassis ground.

Connector & terminal

(i187) No. 1 — Chassis ground:
(i187) No. 2 — Chassis ground:
(i187) No. 5 — Chassis ground:
(i187) No. 6 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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

DTC B1440 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER)

DTC detecting condition:

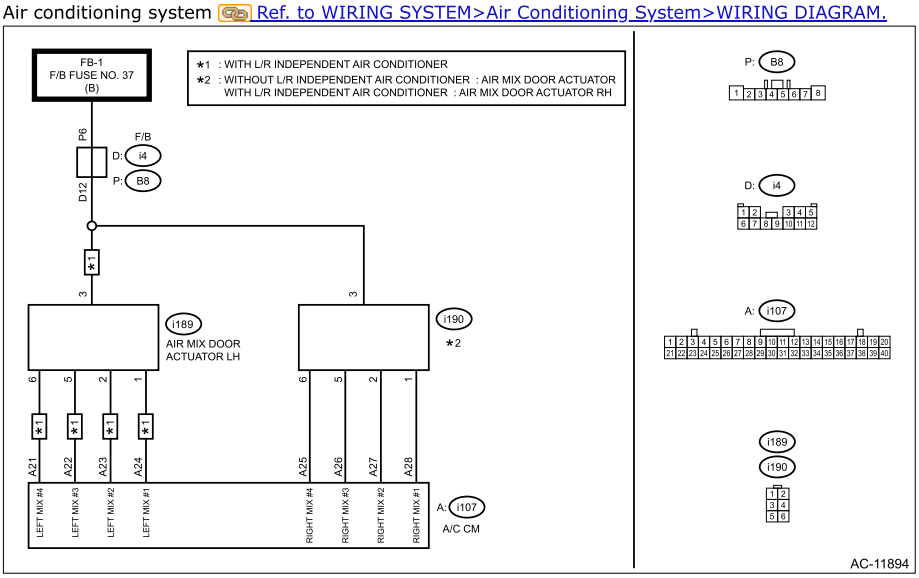
Air mix door actuator stepping motor circuit is open.

Trouble symptom:

- Temperature cannot be adjusted for model without left/right independent air conditioner.
- Temperature of the driver's side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

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



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and air mix door actuator connector (without left/right independent air conditioner) or air mix door actuator LH connector (with left/right independent air conditioner).

Is the check result OK?

Yes	Go to 2.
No	Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440 displayed? (Current code)

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 POWER SUPPLY FOR AIR MIX DOOR ACTUATOR (WITHOUT LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION) OR AIR MIX DOOR ACTUATOR LH (WITH LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function) and chassis ground.

Connector & terminal

Without left/right independent air conditioning function

(i190) No. 3 (+) — Chassis ground (−):

With left/right independent air conditioning function

(i189) No. 3 (+) — Chassis ground (−):

Is the voltage approx. 10 V or more?

Yes — Go to 4.

No — Check the DC power supply circuit.

4. CHECK AIR MIX DOOR ACTUATOR (WITHOUT LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION) OR AIR MIX DOOR ACTUATOR LH (WITH LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the internal resistance of the air mix door actuator (without left/right independent air conditioning function) or air mix door actuator LH (with left/right independent air conditioning function).

Terminals

(Air mix door actuator side (without left/right independent air conditioning function) or air mix door actuator LH side (with left/right independent air conditioning function))

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 5.

No — Replace the air mix door actuator (without left/right independent air conditioning function) or air mix door actuator LH (with left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.

5. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, check the continuity between A/C CM connector and air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function).

Connector & terminal

Without left/right independent air conditioning function

(i190) No. 1 — (i107) No. 28:
(i190) No. 2 — (i107) No. 27:
(i190) No. 5 — (i107) No. 26:
(i190) No. 6 — (i107) No. 25:

With left/right independent air conditioning function

(i189) No. 1 — (i107) No. 24:
(i189) No. 2 — (i107) No. 23:
(i189) No. 5 — (i107) No. 22:
(i189) No. 6 — (i107) No. 21:

Is there continuity?

Yes — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

No — Repair or replace the open circuit of harness.

DTC B1442 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER)

DTC detecting condition:

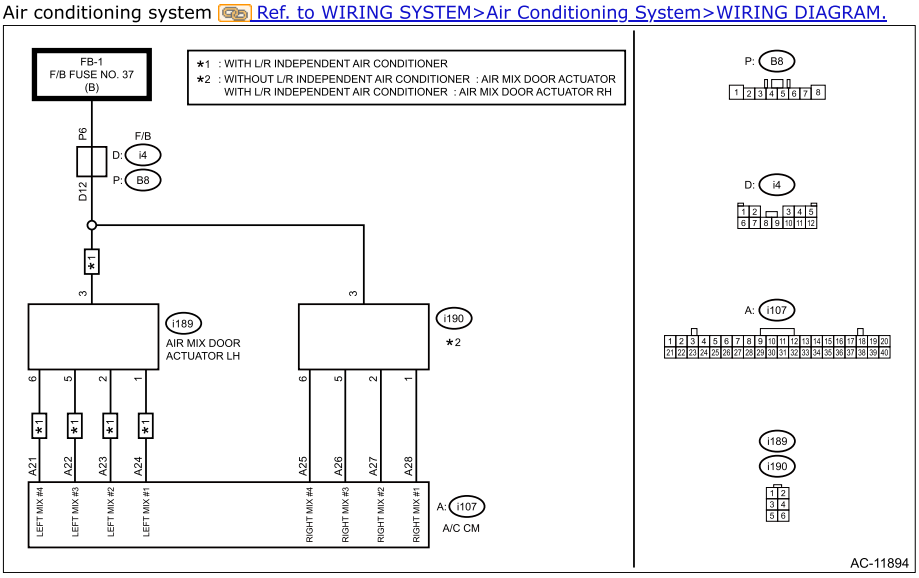
Air mix door actuator stepping motor circuit is shorted.

Trouble symptom:

- Temperature cannot be adjusted for model without left/right independent air conditioner.
- Temperature of the driver's side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

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



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and air mix door actuator connector (without left/right independent air conditioner) or air mix door actuator LH connector (with left/right independent air conditioner).

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1442 displayed? (Current code)

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 POWER SUPPLY FOR AIR MIX DOOR ACTUATOR (WITHOUT LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION) OR AIR MIX DOOR ACTUATOR LH (WITH LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION).

1. Turn the ignition switch to OFF.
2. Disconnect the air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function) and chassis ground.
   Connector & terminal
   Without left/right independent air conditioning function
   (i190) No. 3 (+) — Chassis ground (−):
   With left/right independent air conditioning function
   (i189) No. 3 (+) — Chassis ground (−):

Is the voltage approx. 10 V or more?

Yes — Go to 4.

No — Check the DC power supply circuit.

4. CHECK AIR MIX DOOR ACTUATOR (WITHOUT LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION) OR AIR MIX DOOR ACTUATOR LH (WITH LEFT/RIGHT INDEPENDENT AIR CONDITIONING FUNCTION).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the internal resistance of the air mix door actuator (without left/right independent air conditioning function) or air mix door actuator LH (with left/right independent air conditioning function).
   Terminals
   (Air mix door actuator side (without left/right independent air conditioning function) or air mix door actuator LH side (with left/right independent air conditioning function))
   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 5.

No — Replace the air mix door actuator (without left/right independent air conditioning function) or air mix door actuator LH (with left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, measure the voltage between the air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function) and chassis ground.

Connector & terminal

Without left/right independent air conditioning function

(i190) No. 1 (+) — Chassis ground (−):
(i190) No. 2 (+) — Chassis ground (−):
(i190) No. 5 (+) — Chassis ground (−):
(i190) No. 6 (+) — Chassis ground (−):

With left/right independent air conditioning function

(i189) No. 1 (+) — Chassis ground (−):
(i189) No. 2 (+) — Chassis ground (−):
(i189) No. 5 (+) — Chassis ground (−):
(i189) No. 6 (+) — Chassis ground (−):

Is there any voltage?

Yes	Repair or replace the short circuit of the harness.
No	Go to 6.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check the continuity between the air mix door actuator connector (without left/right independent air conditioning function) or air mix door actuator LH connector (with left/right independent air conditioning function) and chassis ground.

Connector & terminal

Without left/right independent air conditioning function

(i190) No. 1 — Chassis ground:
(i190) No. 2 — Chassis ground:
(i190) No. 5 — Chassis ground:
(i190) No. 6 — Chassis ground:

With left/right independent air conditioning function

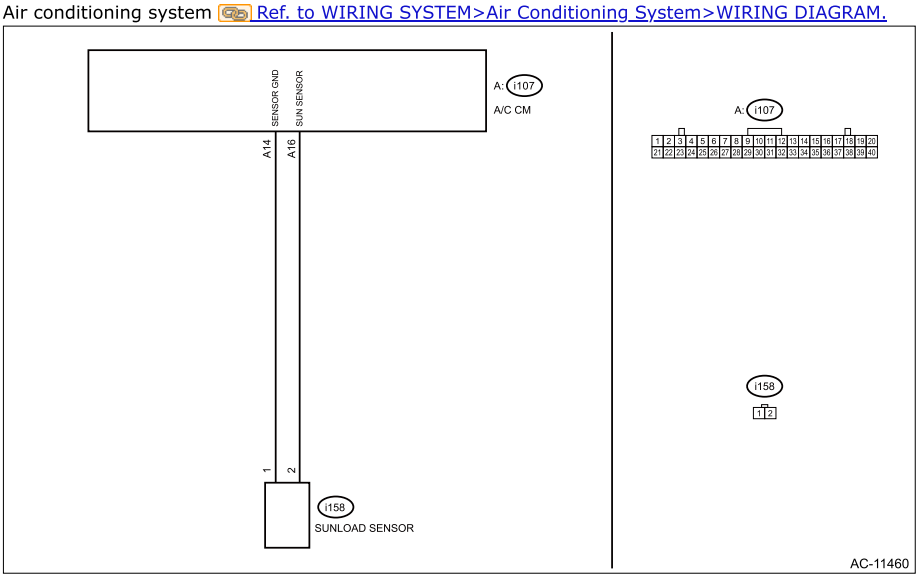
(i189) No. 1 — Chassis ground:
(i189) No. 2 — Chassis ground:
(i189) No. 5 — Chassis ground:
(i189) No. 6 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B14A1 SUNLOAD SENSOR CIRCUIT LOW/OPEN

DTC detecting condition:
Open circuit in the sunload sensor is detected for 4 seconds or more. (Displayed for current code)
Trouble symptom:
Operation is performed as no sunload.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

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.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and sunload sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A1 displayed?

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 SUNLOAD SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
3. Short No. 1 and No. 2 in (i158) connector.
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A2 displayed?

Yes	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

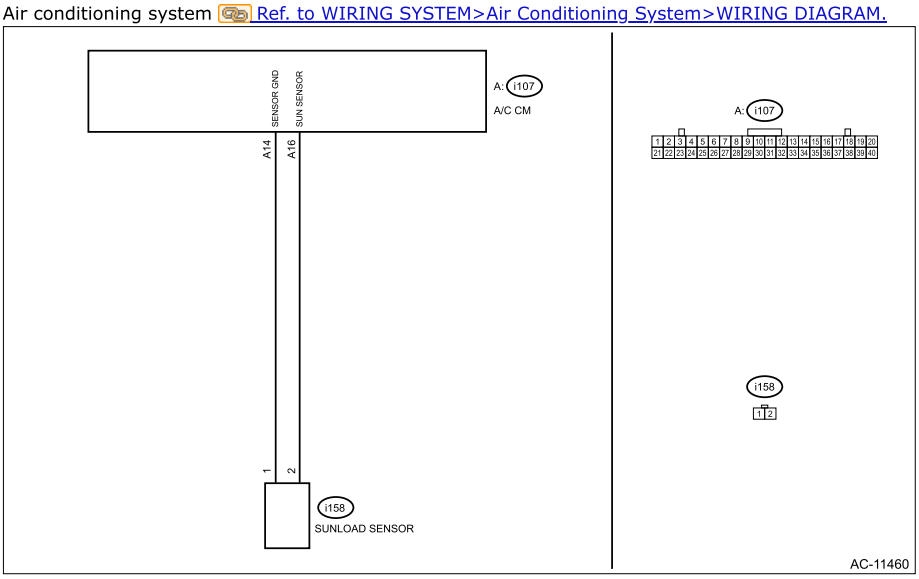
1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between sunload sensor connector and A/C CM connector.
   Connector & terminal
   (i158) No. 1 — (i107) No. 14:
   (i158) No. 2 — (i107) No. 16:

Is there continuity?

Yes	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.
No	Repair or replace the open circuit of harness.

DTC B14A2 SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:
Short circuit in the sunload sensor is detected for 4 seconds or more.
Trouble symptom:
Operation is performed as no sunload.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

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.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and sunload sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A2 displayed?

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 SUNLOAD SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A1 displayed?

Yes	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in sunload sensor connector and between sunload sensor connector and chassis ground.
   Connector & terminal
   (i158) No. 1 — (i158) No. 2:
   (i158) No. 2 — Chassis ground:

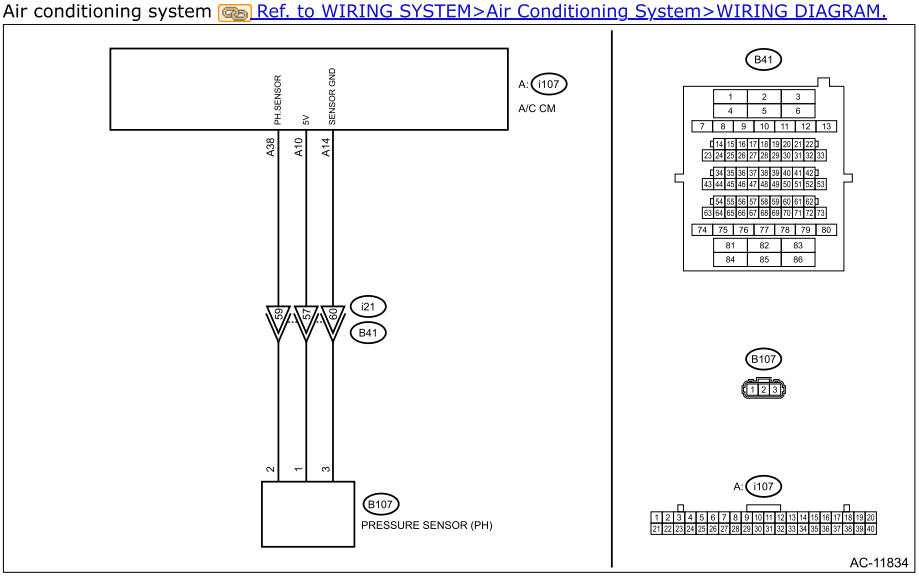
Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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

DTC B14A3 REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN

DTC detecting condition:
Pressure sensor (PH) circuit is open.
Trouble symptom:
Compressor does not operate.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, pressure sensor (PH) connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A3 displayed? (Current code)

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 PRESSURE SENSOR (PH).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from pressure sensor (PH). Ref. to AIR CONDITIONER>Pressure Sensor.
3. Short No. 2 and No. 3 in (B107) connector.
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A4 displayed? (Current code)

Yes — Replace the pressure sensor (PH). Ref. to AIR CONDITIONER>Pressure Sensor.

No — Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the A/C CM connector and pressure sensor (PH) connector.

Connector & terminal

(B107) No. 1 — (i107) No. 10:
(B107) No. 2 — (i107) No. 38:
(B107) No. 3 — (i107) No. 14:

Is there continuity?

Yes — Go to 5.

No — Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check the continuity between the terminals in pressure sensor (PH) connector and between pressure sensor (PH) connector and chassis ground.

Connector & terminal

(B107) No. 1 — (B107) No. 3:

(B107) No. 1 — Chassis ground:

Is there continuity?

Yes — Repair or replace the short circuit of the harness.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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

DTC B14A4 REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

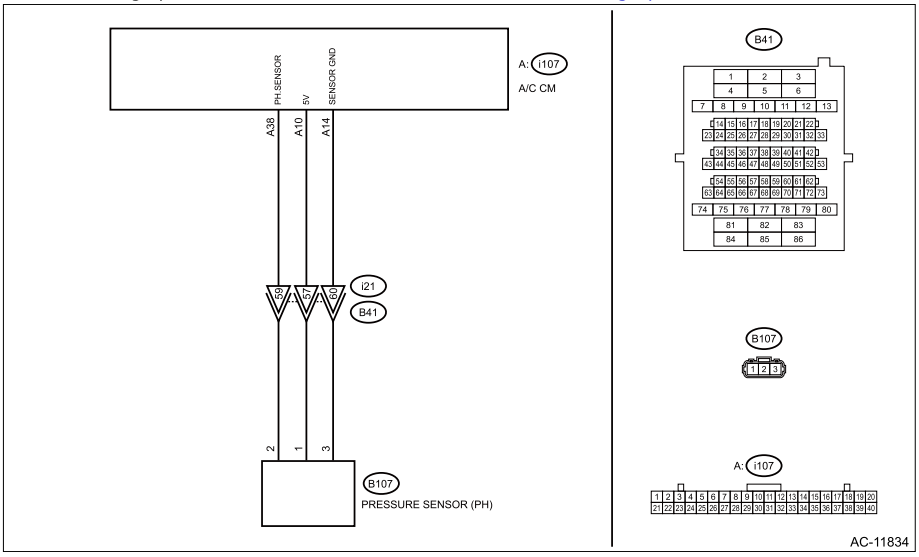
Pressure sensor (PH) circuit is shorted.

Trouble symptom:

Compressor does not operate.

Wiring diagram:

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



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, pressure sensor (PH) connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A4 displayed? (Current code)

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 PRESSURE SENSOR (PH).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from pressure sensor (PH). Ref. to AIR CONDITIONER>Pressure Sensor.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A3 displayed? (Current code)

Yes — Replace the pressure sensor (PH). Ref. to AIR CONDITIONER>Pressure Sensor.

No — Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in pressure sensor (PH) connector and between pressure sensor (PH) connector and chassis ground.

Connector & terminal

(B107) No. 2 — (B107) No. 1:
(B107) No. 2 — (B107) No. 3:
(B107) No. 1 — Chassis ground:
(B107) No. 2 — Chassis ground:

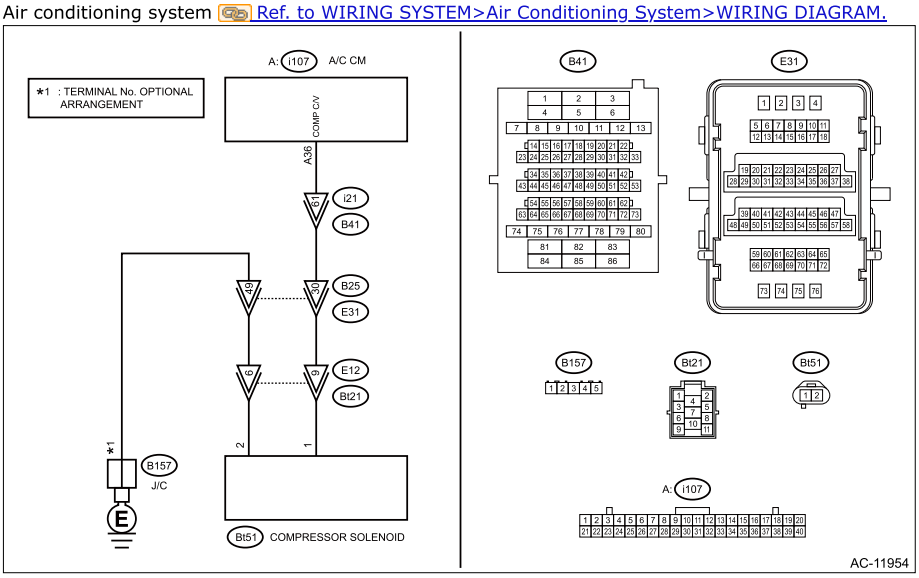
Is there continuity?

Yes — Repair or replace the short circuit of the harness.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B14A7 VARIABLE SOLENOID VALVE CIRCUIT

DTC detecting condition:
Variable flow change solenoid valve circuit is open or shorted.
Trouble symptom:
Refrigerant pressure cannot be changed.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and variable flow change solenoid connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Start the engine.
2. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - A/C: ON
   - Airflow capacity: MAX
3. Leave it for 30 seconds or more.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14A7 displayed? (Current code)

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 VARIABLE FLOW CHANGE SOLENOID.

1. Stop the engine.
2. Disconnect the connector from the variable flow change solenoid. Ref. to AIR CONDITIONER>Compressor.
3. Using a tester, measure the internal resistance of the variable flow change solenoid.
   Terminals
   (Compressor solenoid side) No. 1 — No. 2:

Is the resistance 10 — 12 Ω?

Yes	Go to 4.
No	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the A/C CM connector. Ref. to AIR CONDITIONER>Control Unit.
2. Using a tester, check the continuity between the A/C CM connector and the variable flow change solenoid connector and between the variable flow change solenoid connector and chassis ground.
   Connector & terminal
   (Bt51) No. 1 — (i107) No. 36:
   (Bt51) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check the continuity between the terminals in the variable flow change solenoid connector and between the variable flow change solenoid connector and chassis ground.

Connector & terminal
(Bt51) No. 1 — (Bt51) No. 2:
(Bt51) No. 1 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B14A8 COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT

DTC detecting condition:

- Compressor was operated while refrigerant was low.
- Compressor was operated while refrigerant pressure was extremely low.
- Judgment is made only when the delivery mode fuse is installed.

Trouble symptom:

Compressor does not operate.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK WORK HISTORY.

Check that the compressor has been replaced.

Has the compressor been replaced?

Yes — Go to 2.

No — Clear the memory and check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

2. CHECK AMOUNT OF REFRIGERANT.

Check the refrigerant pressure and filling amount. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the filling amount a standard value?

Yes — Go to 3.

No — Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

3. CHECK DTC.

Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

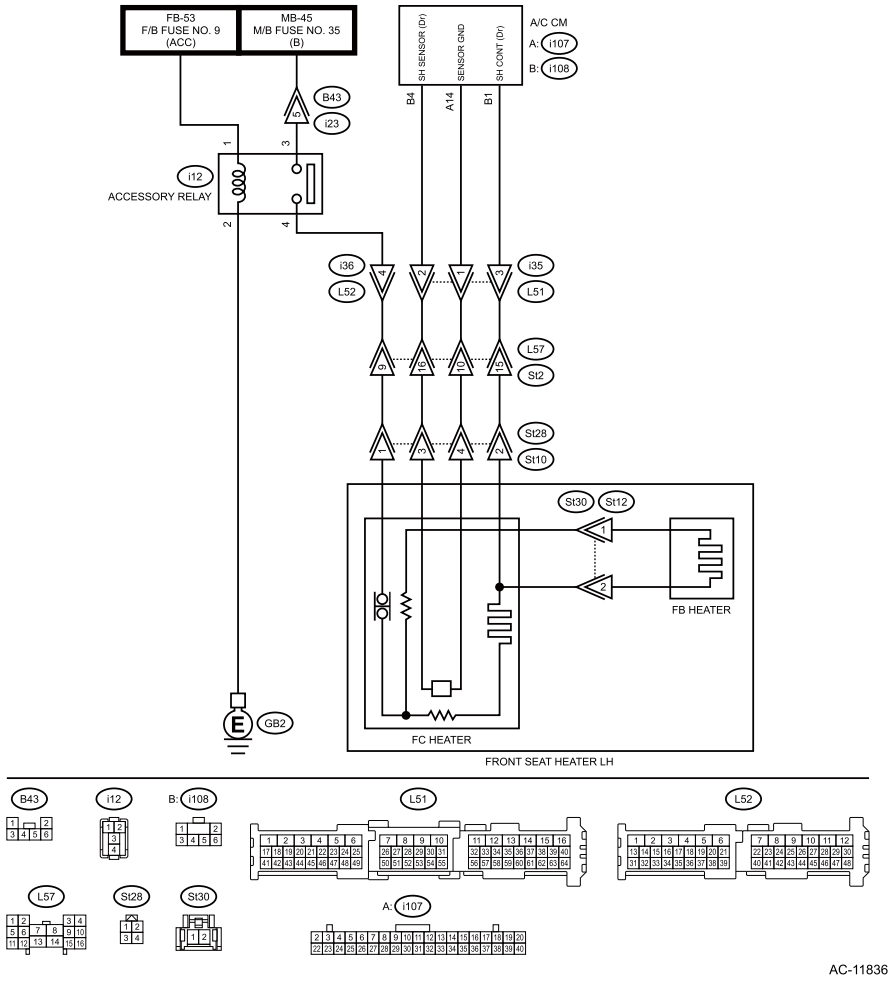
Is DTC B14A3 or B14A4 displayed?

Yes — Perform the diagnosis for the displayed DTC B14A3 or B14A4. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

DTC B14B1 SEAT HEATER THERMISTOR CIRCUIT OPEN (DRIVER)

DTC detecting condition:
The seat heater thermistor circuit is open.
Trouble symptom:
Driver's side seat heater does not function.
Wiring diagram:
Seat heater system Ref. to WIRING SYSTEM>Seat Heater System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, seat heater relay connector, seat connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B1 displayed? (Current code)

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 SEAT HEATER LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (St28) from the seat. Ref. to SEATS>Front Seat.
3. Short No. 3 and No. 4 of seat connector (St28).
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B2 displayed? (Current code)

Yes	Replace the seat heater module. Ref. to SEATS>Seat Heater.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

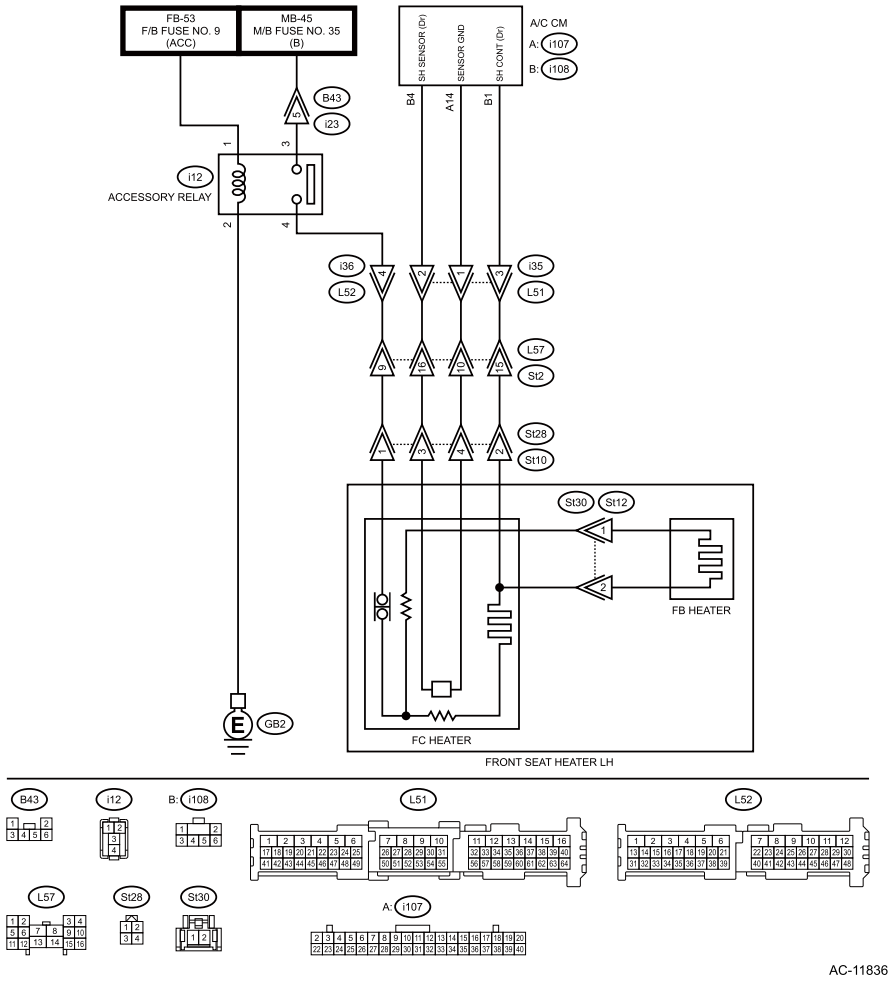
1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM connector. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the seat connector and the A/C CM connector.
   Connector & terminal
   (St28) No. 3 — (i108) No. 4:
   (St28) No. 4 — (i107) No. 14:

Is there continuity?

Yes	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.
No	Repair or replace the open circuit of harness.

DTC B14B2 SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (DRIVER)

DTC detecting condition:
The seat heater thermistor circuit is shorted.
Trouble symptom:
Driver's side seat heater does not function.
Wiring diagram:
Seat heater system Ref. to WIRING SYSTEM>Seat Heater System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, seat heater relay connector, seat connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B2 displayed? (Current code)

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 SEAT HEATER LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (St28) from the seat. Ref. to SEATS>Front Seat.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B1 displayed? (Current code)

Yes — Replace the seat heater module. Ref. to SEATS>Seat Heater.

No — Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in the seat connector and between seat connector and chassis ground.
   Connector & terminal
   (St28) No. 3 — (St28) No. 4:
   (St28) No. 3 — Chassis ground:

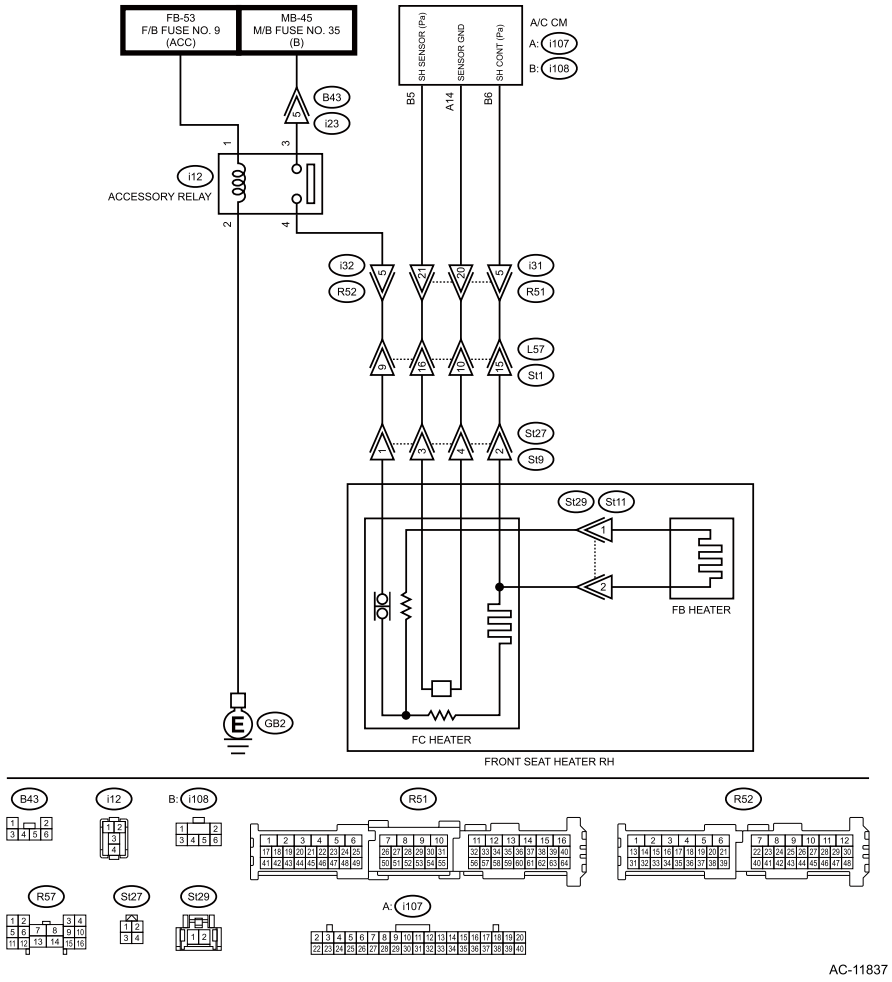
Is there continuity?

Yes — Repair or replace the short circuit of the harness.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B14B3 SEAT HEATER THERMISTOR CIRCUIT OPEN (PASSENGER)

DTC detecting condition:
The seat heater thermistor circuit is open.
Trouble symptom:
Passenger's side seat heater does not function.
Wiring diagram:
Seat heater system Ref. to WIRING SYSTEM>Seat Heater System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, seat heater relay connector, seat connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B3 displayed? (Current code)

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 SEAT HEATER RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (St27) from the seat. Ref. to SEATS>Front Seat.
3. Short No. 3 and No. 4 of seat connector (St27).
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B4 displayed? (Current code)

Yes — Replace the seat heater module and wire set - front seat cushion. Ref. to SEATS>Seat Heater.

No — Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM connector. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the seat connector and the A/C CM connector.

Connector & terminal

(St27) No. 3 — (i108) No. 5:

(St27) No. 4 — (i107) No. 14:

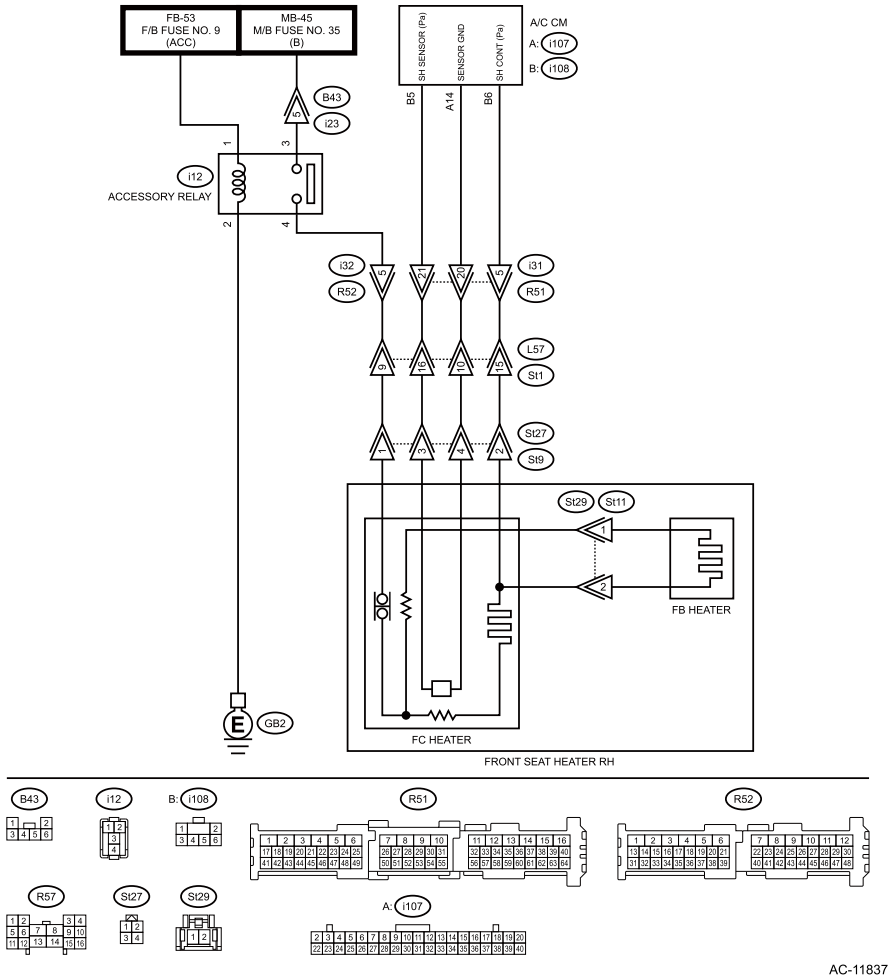
Is there continuity?

Yes — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

No — Repair or replace the open circuit of harness.

DTC B14B4 SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (PASSENGER'S)

DTC detecting condition:
The seat heater thermistor circuit is shorted.
Trouble symptom:
Passenger's side seat heater does not function.
Wiring diagram:
Seat heater system Ref. to WIRING SYSTEM>Seat Heater System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, seat heater relay connector, seat connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B4 displayed? (Current code)

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 SEAT HEATER RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (St27) from the seat. Ref. to SEATS>Front Seat.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14B3 displayed? (Current code)

Yes — Replace the seat heater module and wire set - front seat cushion. Ref. to SEATS>Seat Heater.

No — Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in the seat connector and between seat connector and chassis ground.
   Connector & terminal
   (St27) No. 3 — (St27) No. 4:
   (St27) No. 3 — Chassis ground:

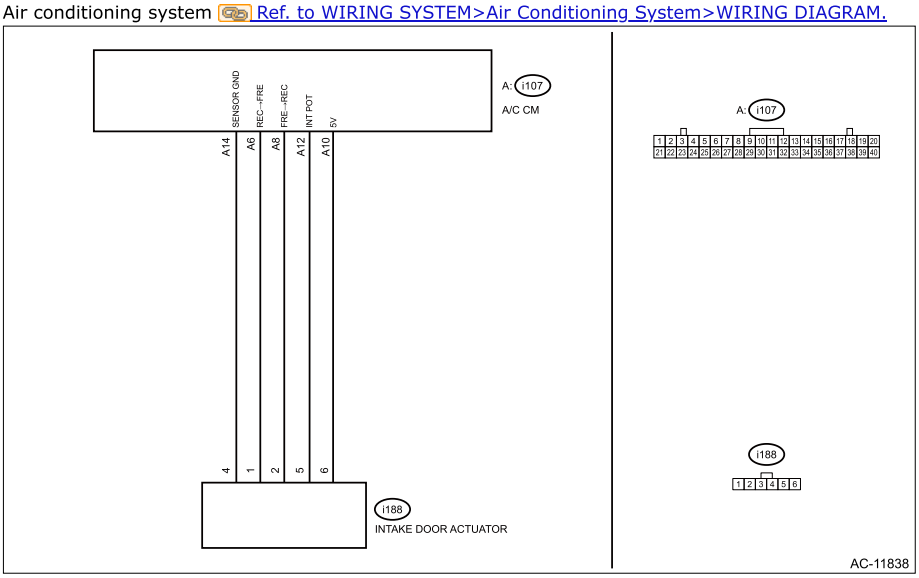
Is there continuity?

Yes — Repair or replace the short circuit of the harness.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and intake door actuator connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14E9 displayed? (Current code)

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 ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.
3. Short No. 4 and No. 5 of the intake door actuator connector (i188).
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EA displayed? (Current code)

Yes	Replace the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

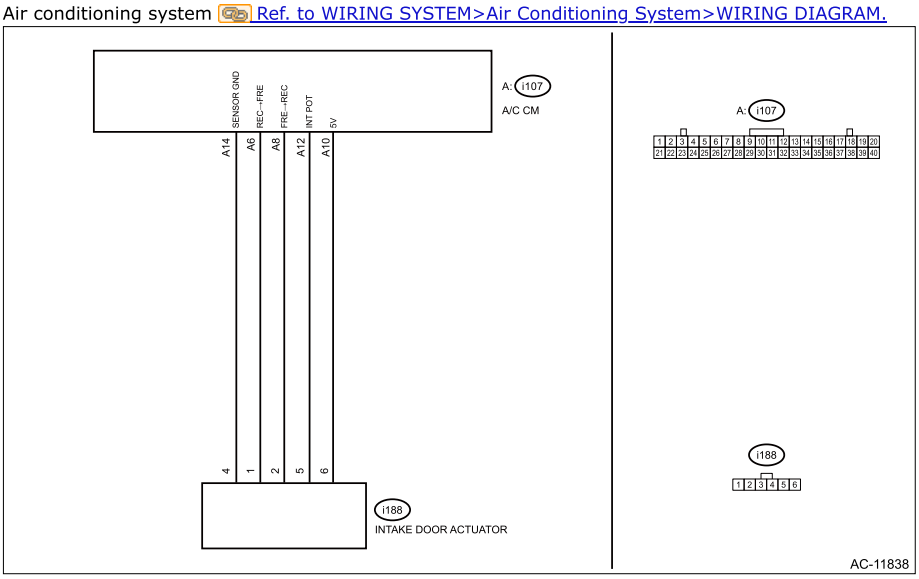
1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between A/C CM connector and intake door actuator connector.
   Connector & terminal
   (i188) No. 4 — (i107) No. 14:
   (i188) No. 5 — (i107) No. 12:
   (i188) No. 6 — (i107) No. 10:

Is there continuity?

Yes	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.
No	Repair or replace the open circuit of harness.

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.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and intake door actuator connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EA displayed? (Current code)

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 ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14E9 displayed? (Current code)

Yes — Replace the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.

No — Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between A/C CM connector and intake door actuator connector.

Connector & terminal

(i188) No. 4 — (i107) No. 14:
(i188) No. 5 — (i107) No. 12:
(i188) No. 6 — (i107) No. 10:

Is there continuity?

Yes — Go to 5.

No — Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check the continuity between terminals in the intake door actuator connector and between the intake door actuator connector and chassis ground.

Connector & terminal

(i188) No. 4 — (i188) No. 5:
(i188) No. 5 — (i188) No. 6:
(i188) No. 5 — Chassis ground:
(i188) No. 6 — Chassis ground:

Is there continuity?

Yes — Repair or replace the short circuit of the harness.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B14EB INTAKE DOOR ACTUATOR STUCK

DTC detecting condition:

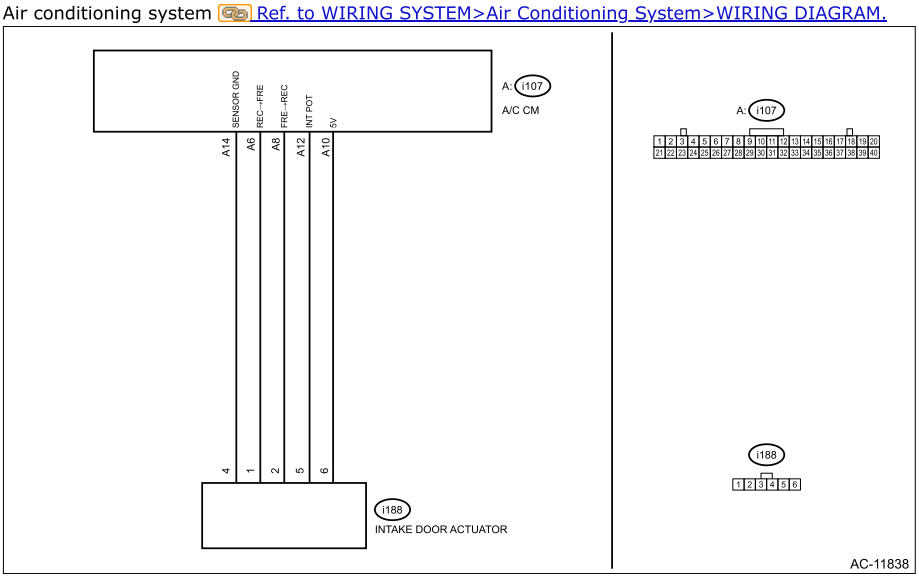
- Intake door actuator is locked.
- The potentiometer value of the actuator does not change.

Trouble symptom:

FRESH/RECIRC does not operate.

Wiring diagram:

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



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and intake door actuator connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the ON/OFF button of the center information display to ON.
3. Set the FRESH/RECIRC button to RECIRC.
4. Leave it for 16 seconds or more.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EB displayed? (Current code)

Yes — Go to 4.

No — Go to 3.

3. CHECK DTC.

1. Set the FRESH/RECIRC button to FRESH.
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EB displayed? (Current code)

Yes — Go to 4.

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.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between A/C CM connector and intake door actuator connector.

Connector & terminal
(i188) No. 4 — (i107) No. 14:
(i188) No. 1 — (i107) No. 6:
(i188) No. 2 — (i107) No. 8:
(i188) No. 5 — (i107) No. 12:
(i188) No. 6 — (i107) No. 10:

Is there continuity?

Yes — Go to 5.

No — Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check the continuity between terminals in the intake door actuator connector and between the intake door actuator connector and chassis ground.

Connector & terminal
(i188) No. 1 — (i188) No. 2:
(i188) No. 1 — Chassis ground:
(i188) No. 2 — Chassis ground:

Is there continuity?

Yes — Repair or replace the open circuit of harness.

No — Go to 6.

6. CHECK INTAKE DOOR ACTUATOR.

Check the intake door actuator unit. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator>INSPECTION.

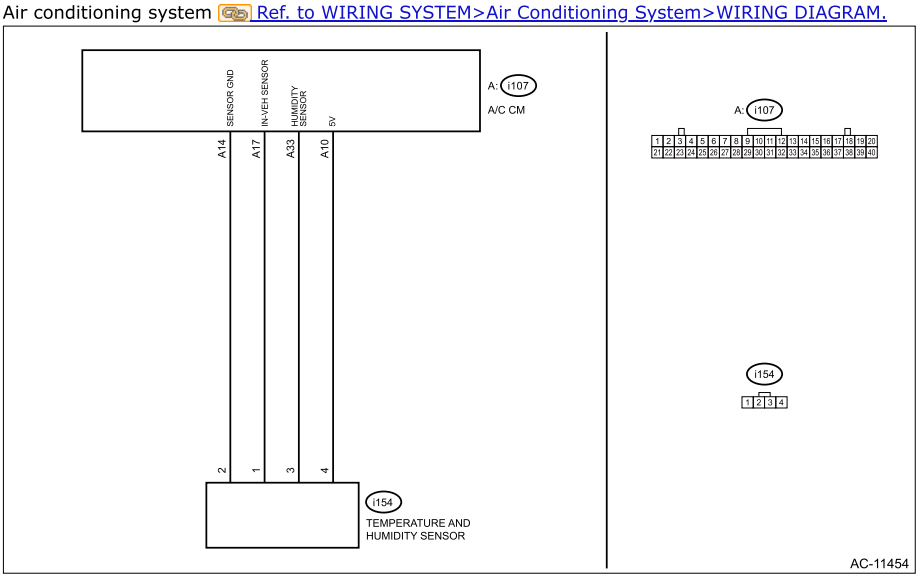
Is the check result OK?

Yes — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

No — Replace the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.

DTC B14EC HUMIDITY SENSOR CIRCUIT OPEN

DTC detecting condition:
Temperature and humidity sensor circuit is open.
Trouble symptom:
Proper outlet air temperature cannot be kept.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and temperature and humidity sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EC displayed? (Current code)

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 TEMPERATURE AND HUMIDITY SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the temperature and humidity sensor. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
3. Short No. 2 and No. 3 in (i154) connector.
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14ED displayed? (Current code)

Yes	Replace the temperature and humidity sensor. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the A/C CM connector and temperature and humidity sensor connector.

Connector & terminal

(i154) No. 2 — (i107) No. 14:
(i154) No. 3 — (i107) No. 33:
(i154) No. 4 — (i107) No. 10:

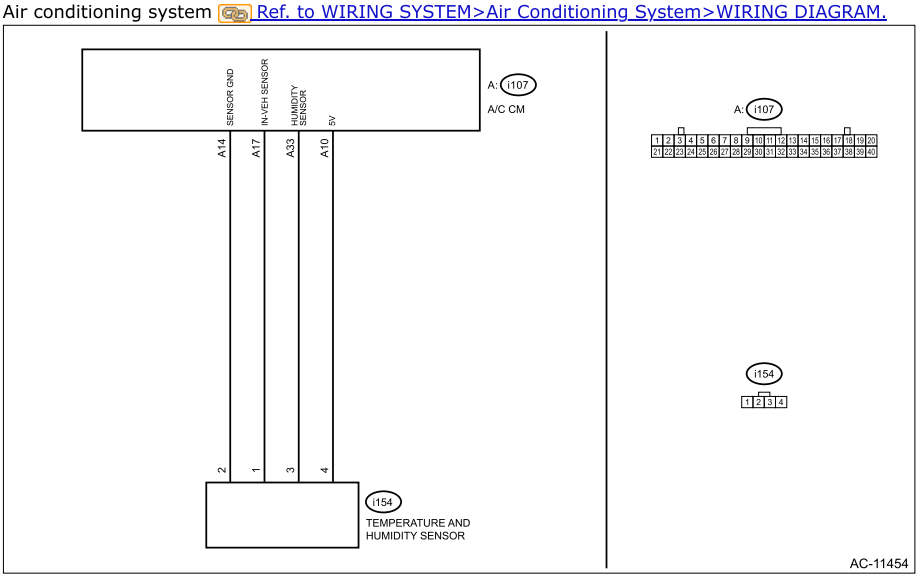
Is there continuity?

Yes	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.
No	Repair or replace the open circuit of harness.

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

DTC B14ED HUMIDITY SENSOR CIRCUIT SHORT

DTC detecting condition:
Temperature and humidity sensor circuit is shorted.
Trouble symptom:
Proper outlet air temperature cannot be kept.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector and temperature and humidity sensor connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14ED displayed? (Current code)

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 TEMPERATURE AND HUMIDITY SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the temperature and humidity sensor. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EC displayed? (Current code)

Yes — Replace the temperature and humidity sensor. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.

No — Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between terminals in the A/C CM connector and the temperature and humidity sensor connector.

Connector & terminal

(i154) No. 2 — (i107) No. 14:
(i154) No. 3 — (i107) No. 33:
(i154) No. 4 — (i107) No. 10:

Is there continuity?

Yes — Go to 5.

No — Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check the continuity between the terminals in temperature and humidity sensor connector and between the temperature and humidity sensor connector and chassis ground.

Connector & terminal

(i154) No. 2 — (i154) No. 3:
(i154) No. 3 — (i154) No. 4:
(i154) No. 3 — Chassis ground:
(i154) No. 4 — Chassis ground:

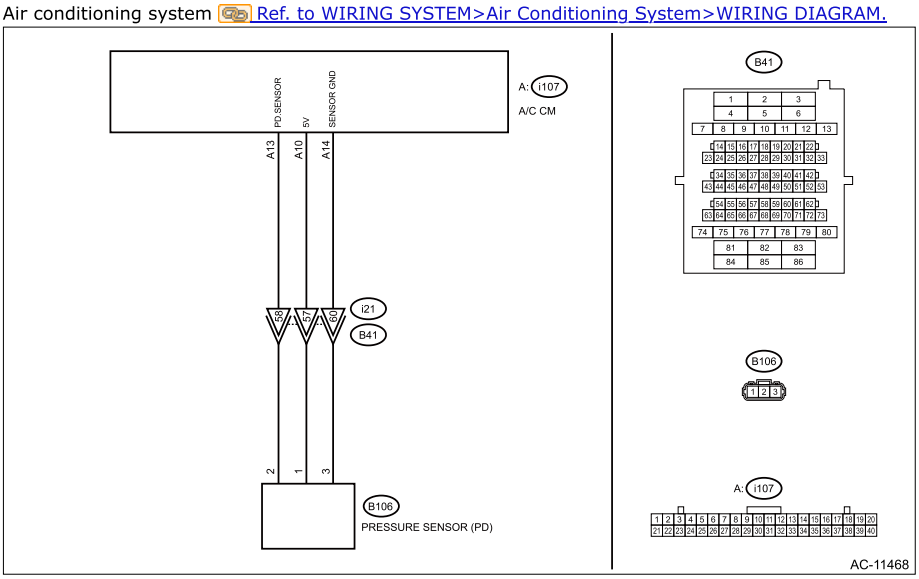
Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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

DTC B14EE REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN (HOSE PRESSURE DISCHARGE)

DTC detecting condition:
Pressure sensor (PD) circuit is open.
Trouble symptom:
Compressor does not operate.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, pressure sensor (PD) connector and coupling connector.

Is the check result OK?

Yes	Go to 2.
No	Repair the connector.

2. CHECK CONNECTOR.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EE displayed? (Current code)

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 PRESSURE SENSOR (PD).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from pressure sensor (PD). Ref. to AIR CONDITIONER>Pressure Sensor.
3. Short No. 2 and No. 3 in (B106) connector.
4. Turn the ignition switch to ON.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EF displayed? (Current code)

Yes — Replace the pressure sensor (PD). Ref. to AIR CONDITIONER>Pressure Sensor.

No — Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Restore the temporary shorted lines made in step 3.
3. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
4. Using a tester, check the continuity between the A/C CM connector and pressure sensor (PD) connector.
   Connector & terminal
   (B106) No. 1 — (i107) No. 10:
   (B106) No. 2 — (i107) No. 13:
   (B106) No. 3 — (i107) No. 14:

Is there continuity?

Yes — Go to 5.

No — Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check the continuity between the terminals in pressure sensor (PD) connector and between pressure sensor (PD) connector and chassis ground.

Connector & terminal
(B106) No. 1 — (B106) No. 3:
(B106) No. 1 — Chassis ground:

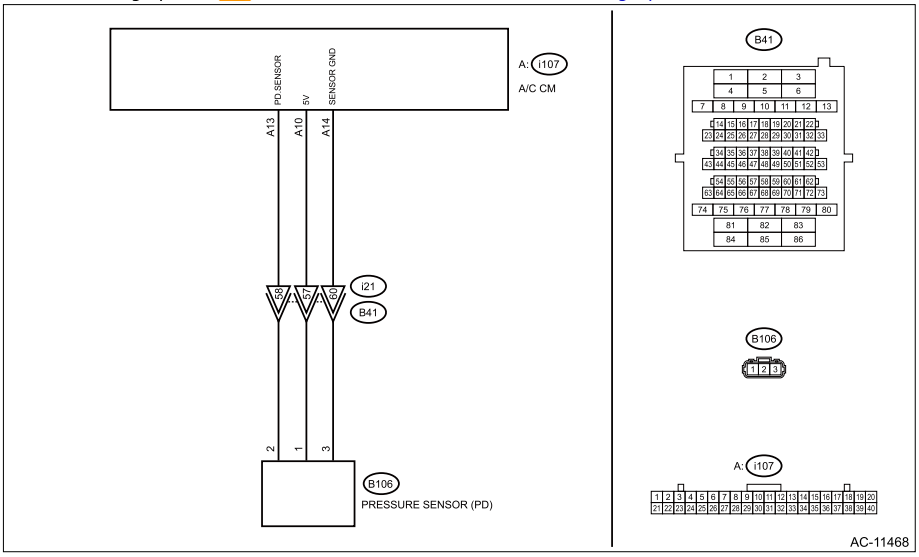
Is there continuity?

Yes — Repair or replace the short circuit of the harness.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

DTC B14EF REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT (HOSE PRESSURE DISCHARGE)

DTC detecting condition:
Pressure sensor (PD) circuit is shorted.
Trouble symptom:
Compressor does not operate.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check connecting condition of the A/C CM connector, pressure sensor (PD) connector and coupling connector.

Is the check result OK?

Yes — Go to 2.

No — Repair the connector.

2. CHECK CONNECTOR.

1. Turn the ignition switch to ON.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EF displayed? (Current code)

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 PRESSURE SENSOR (PD).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from pressure sensor (PD). Ref. to AIR CONDITIONER>Pressure Sensor.
3. Turn the ignition switch to ON.
4. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14EE displayed? (Current code)

Yes	Replace the pressure sensor (PD). Ref. to AIR CONDITIONER>Pressure Sensor.
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
3. Using a tester, check the continuity between the terminals in pressure sensor (PD) connector and between pressure sensor (PD) connector and chassis ground.
   Connector & terminal
   (B106) No. 1 — (B106) No. 2:
   (B106) No. 2 — (B106) No. 3:
   (B106) No. 1 — Chassis ground:
   (B106) No. 2 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

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

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

DTC detecting condition:
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.

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

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

DTC detecting condition:
No CAN data is received from 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

DTC detecting condition:
No CAN data is received from VDC CM.

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

DTC detecting condition:
No CAN data is received from body integrated unit.

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

DTC detecting condition:
No CAN data is received from combination meter.

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 U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE

DTC detecting condition:
Detected when CAN data from the cockpit control module is not transmitted.

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"

DTC detecting condition:
Received error CAN data from 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 U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:
Received error CAN data from VDC CM.

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

DTC detecting condition:
Error CAN data is received from body integrated unit.

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

DTC detecting condition:
Received error CAN data from combination meter.

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 U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE

DTC detecting condition:
Error CAN data is received from the cockpit control module.

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

DTC U1146 LOST COMMUNICATION WITH GATEWAY "A" BODY-CAN

DTC detecting condition:

Detected when CAN data from central gateway CM does not arrive.

Note:

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

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 ON/OFF button is pressed.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR CONDITIONER DOES NOT STOP EVEN WHEN THE ON/OFF BUTTON IS PRESSED.
3	The windshield glass is not cleared even when the DEF button is turned to ON.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE WINDSHIELD GLASS IS NOT CLEARED EVEN WHEN THE DEF BUTTON IS TURNED TO ON.
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. (BLOWER MOTOR DOES NOT ROTATE).
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. (BLOWER MOTOR ROTATES AT HIGH SPEED).
10	Cold air does not come out even when the A/C button 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 BUTTON 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 BLOW VENTS.
13	Front seat heater does not operate.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with

Symptoms		Diagnosis procedure
		Phenomenon>INSPECTION > FRONT SEAT HEATER DOES NOT OPERATE.

INSPECTION

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

Trouble symptom:

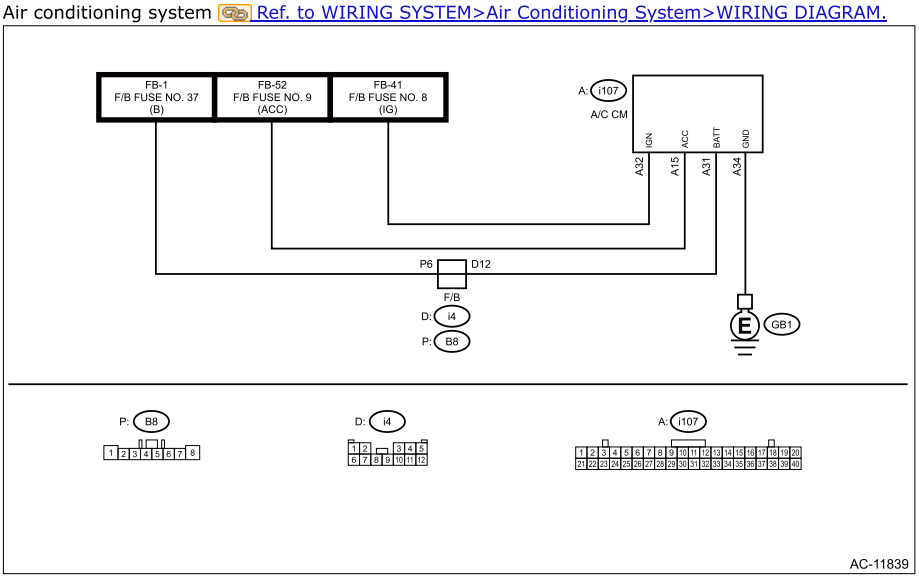
When the DEF button is turned ON with the ignition switch ON, nothing is displayed on the screen or indicators do not illuminate.

Trouble causes:

- A/C CM power supply circuit failure
- Cockpit control module power supply circuit failure
- Center information display power supply circuit failure
- CAN communication failure

Wiring diagram:

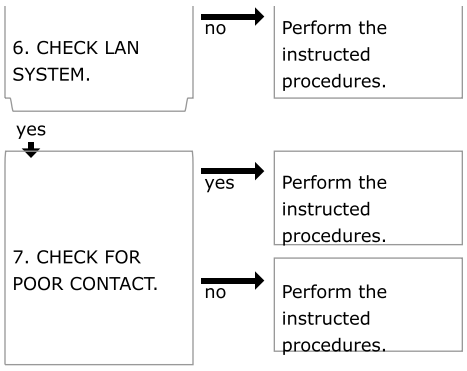
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK CONNECTOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK A/C CM POWER SUPPLY CIRCUIT (OPEN OR SHORT).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK A/C CM GROUND CIRCUIT (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuses No. 8, 9 and 37 from fuse & relay box.
3. Check the condition of fuse. Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.

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 A/C CM and fuse.

2. CHECK CONNECTOR.

Check poor contact of A/C CM connector, cockpit control module connector, center information display connector and coupling connector.

Is the check result OK?

Yes — Go to 3.

No — Repair the connector.

3. CHECK CENTER INFORMATION DISPLAY.

Perform the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes — Go to 4.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

4. CHECK A/C CM POWER SUPPLY CIRCUIT (OPEN OR SHORT).

1. Disconnect the connector from A/C CM. Ref. to AIR CONDITIONER>Control Unit.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between the A/C CM connector and chassis ground.

Connector & terminal

(i107) No. 15 (+) — Chassis ground (−):
(i107) No. 31 (+) — Chassis ground (−):
(i107) No. 32 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Check for open or short circuit in the harness between A/C CM connector and fuse.

5. CHECK A/C CM GROUND CIRCUIT (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between the A/C CM connector and chassis ground.

Connector & terminal

(i107) No. 34 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair the harness between A/C CM connector and chassis ground.

6. CHECK LAN SYSTEM.

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

Is the check result OK?

Yes	Go to 7.
No	Perform the inspection according to the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

7. CHECK FOR POOR CONTACT.

Check for poor contact of connector.

Is the check result OK?

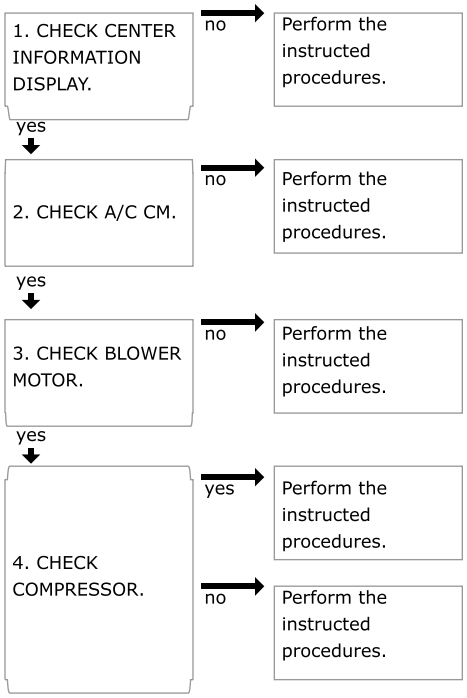
Yes	Since the A/C CM has an internal error, replace A/C CM with a new one. Ref. to AIR CONDITIONER>Control Unit.
No	Repair the connector.

2. AIR CONDITIONER DOES NOT STOP EVEN WHEN THE ON/OFF BUTTON IS PRESSED

Trouble symptom:
Even when the ON/OFF button is turned to OFF, the blower fan does not turn off and the compressor does not turn off.
Trouble causes:

- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Blower motor failure
- Compressor failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.



1. CHECK CENTER INFORMATION DISPLAY.

1. Start the engine.
2. Turn the ON/OFF button of the center information display to OFF.

Is the display on the center information display OFF?

Yes — Go to 2.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Keep the ON/OFF button set to OFF.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Blower Fan Level
   - Variable Flow Change Solenoid Duty

Does [Blower Fan Level] indicate 0, and [Variable Flow Change Solenoid Duty] indicate 0%?

Yes — Go to 3.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK BLOWER MOTOR.

1. Keep the ON/OFF button set to OFF.
2. Check the blower motor operation.

Is the blower motor stopped?

Yes	Go to 4.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL. (BLOWER MOTOR ROTATES AT HIGH SPEED).

4. CHECK COMPRESSOR.

1. Keep the ON/OFF button set to OFF.
2. 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 BUTTON IS PRESSED; THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE.).

3. THE WINDSHIELD GLASS IS NOT CLEARED EVEN WHEN THE DEF BUTTON IS TURNED TO ON

Trouble symptom:
The defroster indicator does not illuminate, the outlet opening does not switch to DEF, the compressor does not switch to ON, and the inlet opening does not switch to FRESH, when the DEF button is turned to ON.

Trouble causes:

- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Mode door actuator failure
- Compressor failure
- Intake door actuator failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY. → no → Perform the instructed procedures.
   yes ↓
2. CHECK A/C CM. → no → Perform the instructed procedures.
   yes ↓
3. CHECK MODE DOOR ACTUATOR. → no → Perform the instructed procedures.
   yes ↓
4. CHECK INTAKE DOOR ACTUATOR. → no → Perform the instructed procedures.
   yes ↓

5. CHECK COMPRESSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK CENTER INFORMATION DISPLAY.

1. Start the engine.
2. Set the DEF button of the center information display to ON.

Does the DEF indicator illuminate and is the display on the center information display DEF?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Keep the DEF button set to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Fresh/Recircle Air Door Actuator Position Target

Does [Mode Door Actuator Position Target] indicate 0%, [Variable Flow Change Solenoid Duty] indicate 0% or more, and [Fresh/Recircle Air Door Actuator Position Target] indicate 91.59%?

Yes	Go to 3.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK MODE DOOR ACTUATOR.

1. Keep the DEF button set to ON.
2. Check the mode door operation.

Does the air come out from the DEF outlet opening?

Yes	Go to 4.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH BLOW VENTS.

4. CHECK INTAKE DOOR ACTUATOR.

1. Keep the DEF button set to ON.
2. Check the intake door operation.

Is FRESH/RECIRC switch turned to “FRESH”?

Yes	Go to 5.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.

5. CHECK COMPRESSOR.

1. Keep the DEF button set to ON.
2. 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 BUTTON IS PRESSED; THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE.).

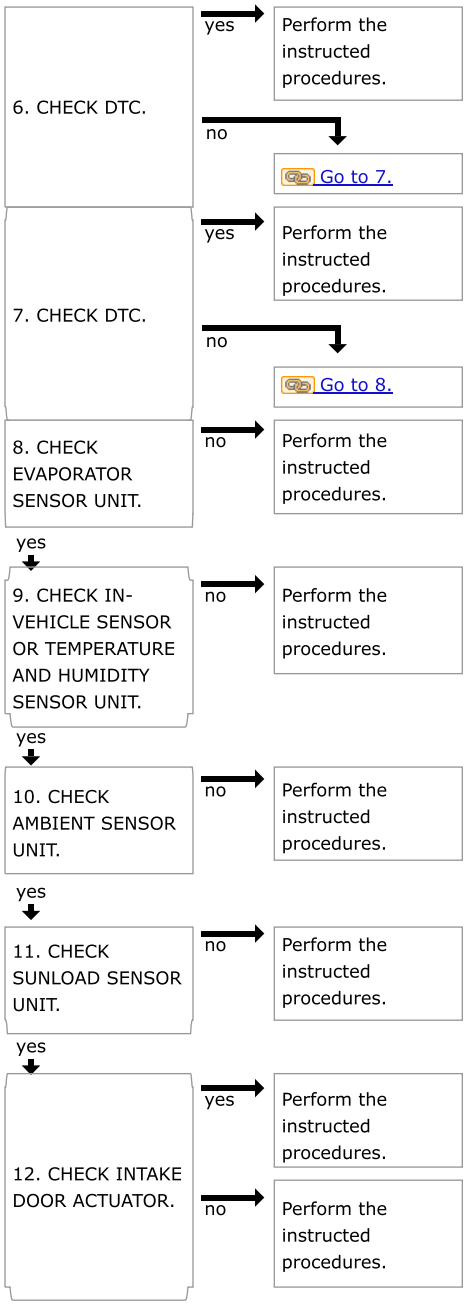
4. COLD AIR NOT EMITTED

Trouble symptom:
Cold air not emitted.
Trouble causes:

- Airflow capacity failure
- Refrigerant pressure failure
- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Air mix actuator failure (without left/right independent air conditioning function)
- Air mix actuator RH failure (with left/right independent air conditioning function)
- Air mix actuator LH failure (with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure (without humidity sensor)
- Temperature and humidity sensor failure (with humidity sensor)
- Ambient temperature sensor failure
- Sunload sensor failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY. → no → Perform the instructed procedures.
   yes ↓
2. CHECK A/C CM. → no → Perform the instructed procedures.
   yes ↓
3. CHECK A/C CM. → no → Perform the instructed procedures.
   yes ↓
4. CHECK AIRFLOW CAPACITY. → no → Perform the instructed procedures.
   yes ↓
5. CHECK AMOUNT OF REFRIGERANT PRESSURE. → no → Perform the instructed procedures.
   yes ↓


6. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK EVAPORATOR SENSOR UNIT.
no
Perform the instructed procedures.
yes
9. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.
no
Perform the instructed procedures.
yes
10. CHECK AMBIENT SENSOR UNIT.
no
Perform the instructed procedures.
yes
11. CHECK SUNLOAD SENSOR UNIT.
no
Perform the instructed procedures.
yes
12. CHECK INTAKE DOOR ACTUATOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK CENTER INFORMATION DISPLAY.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Start the engine.
3. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - FRESH/RECIRC: RECIRC
   - Outlet opening: VENT
   - A/C: ON
   - Airflow capacity: MAX

Is the display of center information display as follows?
- Temperature control: MAX COOL (driver's side, passenger's side)
- FRESH/RECIRC: RECIRC
- Outlet opening: VENT
- A/C: ON
- Airflow capacity: MAX

Yes — Go to 2.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - FRESH/RECIRC: RECIRC
   - Outlet opening: VENT
   - A/C: ON
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 59∗1
- Heater Control Panel Setting Value (Passenger's): 59∗1
- Fresh/Recircle Air Door Actuator Position Target: 8.40%
- Mode Door Actuator Position Target: 100%
- Variable Flow Change Solenoid Duty: 0% or more
- Blower Fan Level: 120 — 181

(∗1: For the 72°F center specification. 14.5 for the 22°C center specification.)

Yes — Go to 3.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX HOT (driver's side, passenger's side)
   - FRESH/RECIRC: FRESH
   - Outlet opening: HEAT
   - A/C: OFF
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 86∗2
- Heater Control Panel Setting Value (Passenger's): 86∗2
- Fresh/Recircle Air Door Actuator Position Target: 91.59%
- Mode Door Actuator Position Target: 37.35 — 39.70 %
- Variable Flow Change Solenoid Duty: 0%
- Blower Fan Level: 120 — 181

(∗2: For the 72°F center specification. 29.5 for the 22°C center specification.)

Yes	Go to 4.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

4. 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. (BLOWER MOTOR DOES NOT ROTATE).

Is the check result OK?

Yes	Go to 5.
No	Perform repair according to the description of "Air does not come out, or airflow capacity is insufficient (blower motor does not rotate)".

5. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the check result OK?

Yes	Go to 6.
No	Perform repair according to refrigerant pressure inspection.

6. CHECK DTC.

1. Set the temperature setting to MAX COOL. (Driver's side, passenger's side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK DTC.

1. Set the temperature setting to MAX HOT. (Driver's side, passenger's side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes	Perform the diagnosis for DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 8.

8. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 9.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

9. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.

Check the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model)>INSPECTION. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 10.
No	Replace the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.

10. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes	Go to 11.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

11. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

Is the check result OK?

Yes	Go to 12.
No	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

12. CHECK INTAKE DOOR ACTUATOR.

Visually check the intake door actuator operation.

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

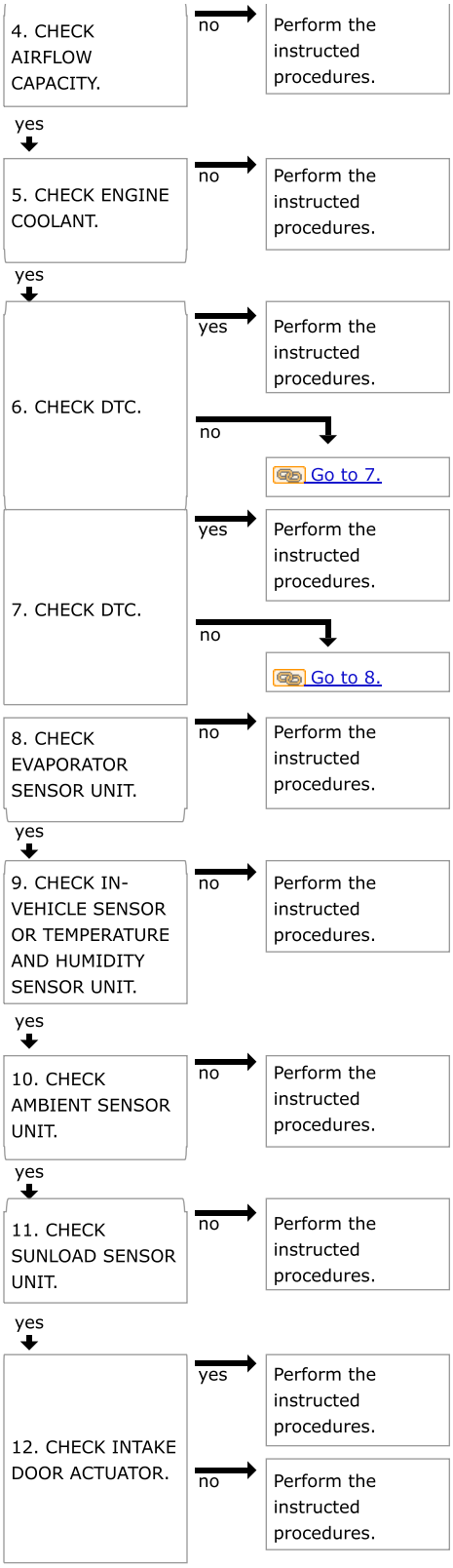
5. WARM AIR NOT EMITTED

Trouble symptom:
Warm air not emitted.
Trouble causes:

- Airflow capacity failure
- Coolant level failure
- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Air mix actuator failure (without left/right independent air conditioning function)
- Air mix actuator RH failure (with left/right independent air conditioning function)
- Air mix actuator LH failure (with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure (without humidity sensor)
- Temperature and humidity sensor failure (with humidity sensor)
- Ambient temperature sensor failure
- Sunload sensor failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY. → no → Perform the instructed procedures.
   yes ↓
2. CHECK A/C CM. → no → Perform the instructed procedures.
   yes ↓
3. CHECK A/C CM. → no → Perform the instructed procedures.
   yes ↓


4. CHECK AIRFLOW CAPACITY.
no
Perform the instructed procedures.
yes
5. CHECK ENGINE COOLANT.
no
Perform the instructed procedures.
yes
6. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK EVAPORATOR SENSOR UNIT.
no
Perform the instructed procedures.
yes
9. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.
no
Perform the instructed procedures.
yes
10. CHECK AMBIENT SENSOR UNIT.
no
Perform the instructed procedures.
yes
11. CHECK SUNLOAD SENSOR UNIT.
no
Perform the instructed procedures.
yes
12. CHECK INTAKE DOOR ACTUATOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK CENTER INFORMATION DISPLAY.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Start the engine.
3. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX HOT (driver's side, passenger's side)
   - FRESH/RECIRC: FRESH
   - Outlet opening: HEAT
   - A/C: OFF
   - Airflow capacity: MAX

Is the display of center information display as follows?
- Temperature control: MAX HOT (driver's side, passenger's side)
- FRESH/RECIRC: FRESH
- Outlet opening: HEAT
- A/C: OFF
- Airflow capacity: MAX

Yes — Go to 2.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - FRESH/RECIRC: RECIRC
   - Outlet opening: VENT
   - A/C: ON
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 59∗1
- Heater Control Panel Setting Value (Passenger's): 59∗1
- Fresh/Recircle Air Door Actuator Position Target: 8.40%
- Mode Door Actuator Position Target: 100%
- Variable Flow Change Solenoid Duty: 0% or more
- Blower Fan Level: 120 — 181

(∗1: For the 72°F center specification. 14.5 for the 22°C center specification.)

Yes — Go to 3.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX HOT (driver's side, passenger's side)
   - FRESH/RECIRC: FRESH
   - Outlet opening: HEAT
   - A/C: OFF
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 86*2
- Heater Control Panel Setting Value (Passenger's): 86*2
- Fresh/Recircle Air Door Actuator Position Target: 91.59%
- Mode Door Actuator Position Target: 37.35 — 39.70 %
- Variable Flow Change Solenoid Duty: 0%
- Blower Fan Level: 120 — 181

(*2: For the 72°F center specification. 29.5 for the 22°C center specification.)

Yes — Go to 4.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

4. 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. (BLOWER MOTOR DOES NOT ROTATE).

Is the check result OK?

Yes — Go to 5.

No — Perform repair according to the description of "Air does not come out, or airflow capacity is insufficient (blower motor does not rotate)".

5. CHECK ENGINE COOLANT.

Check the engine coolant. Ref. to COOLING(H4DOTC)>Engine Coolant.

Is the check result OK?

Yes — Go to 6.

No — Add the engine coolant.

Note:
If it is necessary to add the coolant, make sure that there are no engine coolant leaks.

6. CHECK DTC.

1. Set the temperature setting to MAX COOL. (Driver's side, passenger's side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 7.

7. CHECK DTC.

1. Set the temperature setting to MAX HOT. (Driver's side, passenger's side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes — Perform the diagnosis for DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 8.

8. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes — Go to 9.

No — Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

9. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.

Check the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model)>INSPECTION. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor>INSPECTION.

Is the check result OK?

Yes — Go to 10.

No — Replace the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.

10. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes — Go to 11.

No — Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

11. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

Is the check result OK?

Yes	Go to 12.
No	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

12. CHECK INTAKE DOOR ACTUATOR.

Visually check the intake door actuator operation.

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

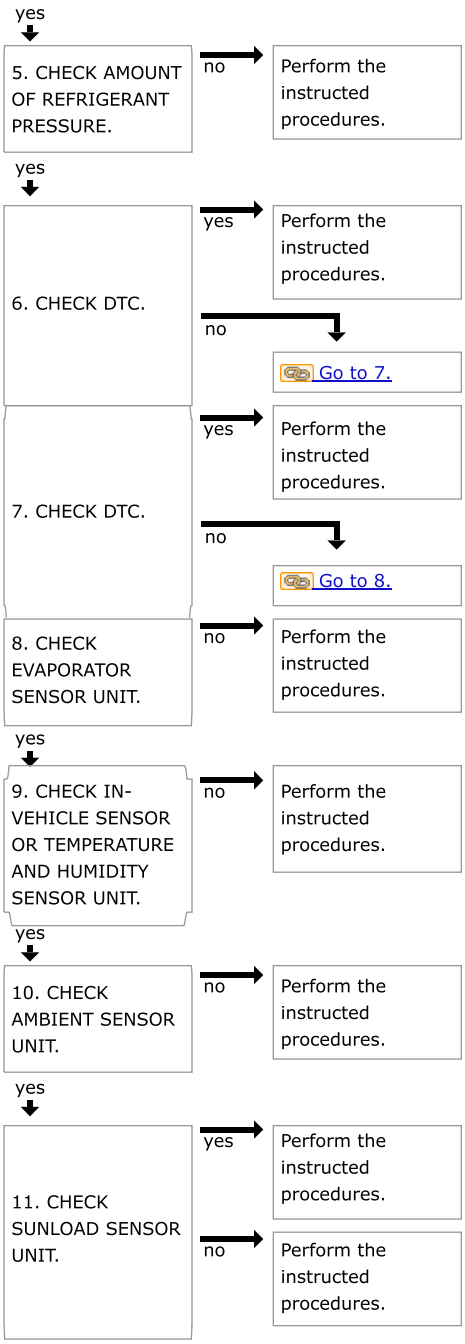
6. COMPARTMENT TEMPERATURE IS EXCESSIVELY LOWER THAN SETTING TEMPERATURE

Trouble symptom:
Compartment temperature is excessively lower than setting temperature.
Trouble causes:

- Airflow capacity failure
- Refrigerant pressure failure
- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Air mix actuator failure (without left/right independent air conditioning function)
- Air mix actuator RH failure (with left/right independent air conditioning function)
- Air mix actuator LH failure (with left/right independent air conditioning function)
- Evaporator sensor failure
- In-vehicle sensor failure (without humidity sensor)
- Temperature and humidity sensor failure (with humidity sensor)
- Ambient temperature sensor failure
- Sunload sensor failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK A/C CM.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C CM.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.


yes
5. CHECK AMOUNT OF REFRIGERANT PRESSURE.
no
Perform the instructed procedures.
yes
6. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK EVAPORATOR SENSOR UNIT.
no
Perform the instructed procedures.
yes
9. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.
no
Perform the instructed procedures.
yes
10. CHECK AMBIENT SENSOR UNIT.
no
Perform the instructed procedures.
yes
11. CHECK SUNLOAD SENSOR UNIT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK CENTER INFORMATION DISPLAY.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Start the engine.
3. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - FRESH/RECIRC: RECIRC
   - Outlet opening: VENT
   - A/C: ON
   - Airflow capacity: MAX

Is the display of center information display as follows?
- Temperature control: MAX COOL (driver's side, passenger's side)
- FRESH/RECIRC: RECIRC
- Outlet opening: VENT
- A/C: ON
- Airflow capacity: MAX

Yes — Go to 2.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - FRESH/RECIRC: RECIRC
   - Outlet opening: VENT
   - A/C: ON
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 59∗1
- Heater Control Panel Setting Value (Passenger's): 59∗1
- Fresh/Recircle Air Door Actuator Position Target: 8.40%
- Mode Door Actuator Position Target: 100%
- Variable Flow Change Solenoid Duty: 0% or more
- Blower Fan Level: 120 — 181

(∗1: For the 72°F center specification. 14.5 for the 22°C center specification.)

Yes — Go to 3.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX HOT (driver's side, passenger's side)
   - FRESH/RECIRC: FRESH
   - Outlet opening: HEAT
   - A/C: OFF
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 86∗2
- Heater Control Panel Setting Value (Passenger's): 86∗2
- Fresh/Recircle Air Door Actuator Position Target: 91.59%
- Mode Door Actuator Position Target: 37.35 — 39.70 %
- Variable Flow Change Solenoid Duty: 0%
- Blower Fan Level: 120 — 181

(∗2: For the 72°F center specification. 29.5 for the 22°C center specification.)

Yes	Go to 4.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

4. 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. (BLOWER MOTOR DOES NOT ROTATE).

Is the check result OK?

Yes	Go to 5.
No	Perform repair according to the description of "Air does not come out, or airflow capacity is insufficient (blower motor does not rotate)".

5. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the check result OK?

Yes	Go to 6.
No	Perform repair according to refrigerant pressure inspection.

6. CHECK DTC.

1. Set the temperature setting to MAX COOL. (Driver's side, passenger's side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK DTC.

1. Set the temperature setting to MAX HOT. (Driver's side, passenger's side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes	Perform the diagnosis for DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 8.

8. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 9.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

9. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.

Check the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model)>INSPECTION. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 10.
No	Replace the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.

10. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 11.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

11. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>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 AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

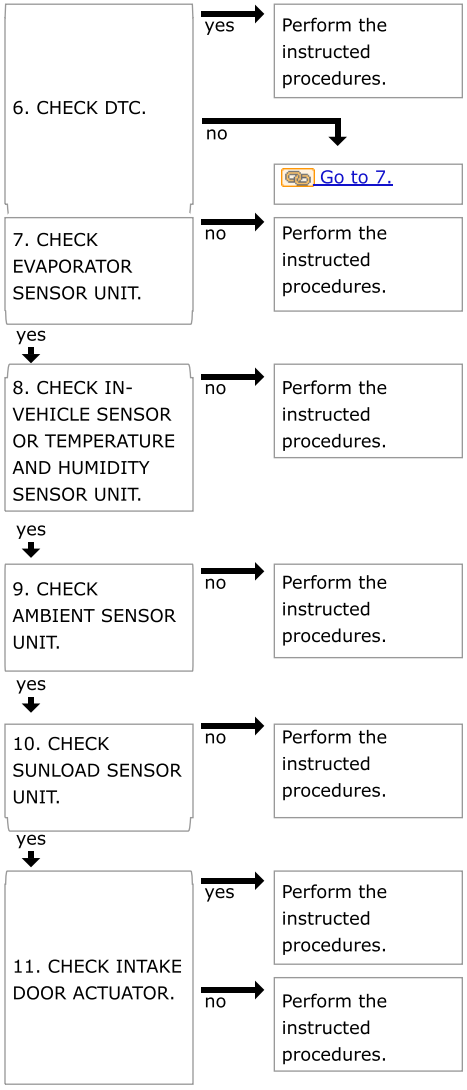
7. COMPARTMENT TEMPERATURE IS EXCESSIVELY HIGHER THAN SETTING TEMPERATURE

Trouble symptom:
Compartment temperature is excessively higher than setting temperature.
Trouble causes:

- Airflow capacity failure
- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Air mix actuator failure (without left/right independent air conditioning function)
- Air mix actuator RH failure (with left/right independent air conditioning function)
- Air mix actuator LH failure (with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure (without humidity sensor)
- Temperature and humidity sensor failure (with humidity sensor)
- Ambient temperature sensor failure
- Sunload sensor failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK A/C CM.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C CM.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 6.



1. CHECK CENTER INFORMATION DISPLAY.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Start the engine.
3. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX HOT (driver's side, passenger's side)
   - FRESH/RECIRC: FRESH
   - Outlet opening: HEAT
   - A/C: OFF
   - Airflow capacity: MAX

Is the display of center information display as follows?
- Temperature control: MAX HOT (driver's side, passenger's side)
- FRESH/RECIRC: FRESH
- Outlet opening: HEAT
- A/C: OFF
- Airflow capacity: MAX

Yes — Go to 2.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver's side, passenger's side)
   - FRESH/RECIRC: RECIRC
   - Outlet opening: VENT
   - A/C: ON
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 59∗1
- Heater Control Panel Setting Value (Passenger's): 59∗1
- Fresh/Recircle Air Door Actuator Position Target: 8.40%
- Mode Door Actuator Position Target: 100%
- Variable Flow Change Solenoid Duty: 0% or more
- Blower Fan Level: 120 — 181

(∗1: For the 72°F center specification. 14.5 for the 22°C center specification.)

Yes — Go to 3.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK A/C CM.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX HOT (driver's side, passenger's side)
   - FRESH/RECIRC: FRESH
   - Outlet opening: HEAT
   - A/C: OFF
   - Airflow capacity: MAX
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

   - Heater Control Panel Setting Value (Driver's)
   - Heater Control Panel Setting Value (Passenger's)
   - Fresh/Recircle Air Door Actuator Position Target
   - Mode Door Actuator Position Target
   - Variable Flow Change Solenoid Duty
   - Blower Fan Level

Does the data monitor indicate the following values?
- Heater Control Panel Setting Value (Driver's): 86∗2
- Heater Control Panel Setting Value (Passenger's): 86∗2
- Fresh/Recircle Air Door Actuator Position Target: 91.59%
- Mode Door Actuator Position Target: 37.35 — 39.70 %
- Variable Flow Change Solenoid Duty: 0%
- Blower Fan Level: 120 — 181

(∗2: For the 72°F center specification. 29.5 for the 22°C center specification.)

Yes — Go to 4.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

4. 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. (BLOWER MOTOR DOES NOT ROTATE).

Is the check result OK?

Yes	Go to 5.
No	Perform repair according to the description of “Air does not come out, or airflow capacity is insufficient (blower motor does not rotate)”.

5. CHECK DTC.

1. Set the temperature setting to MAX COOL. (Driver’s side, passenger’s side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 6.

6. CHECK DTC.

1. Set the temperature setting to MAX HOT. (Driver’s side, passenger’s side)
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1440, B1442, B1436 or B1437 displayed? (Current code)

Yes	Perform the diagnosis for DTC B1440, B1442, B1436 or B1437. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 8.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

8. CHECK IN-VEHICLE SENSOR OR TEMPERATURE AND HUMIDITY SENSOR UNIT.

Check the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model)>INSPECTION. Ref. to AIR CONDITIONER>Temperature and Humidity Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 9.
No	Replace the in-vehicle sensor or temperature and humidity sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model). Ref. to AIR CONDITIONER>Temperature and Humidity Sensor.

9. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor>INSPECTION.

Is the check result OK?

Yes — Go to 10.

No — Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

10. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model)>INSPECTION.

Is the check result OK?

Yes — Go to 11.

No — Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

11. CHECK INTAKE DOOR ACTUATOR.

Visually check the intake door actuator operation.

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

8. AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT. (BLOWER MOTOR DOES NOT ROTATE)

Trouble symptom:

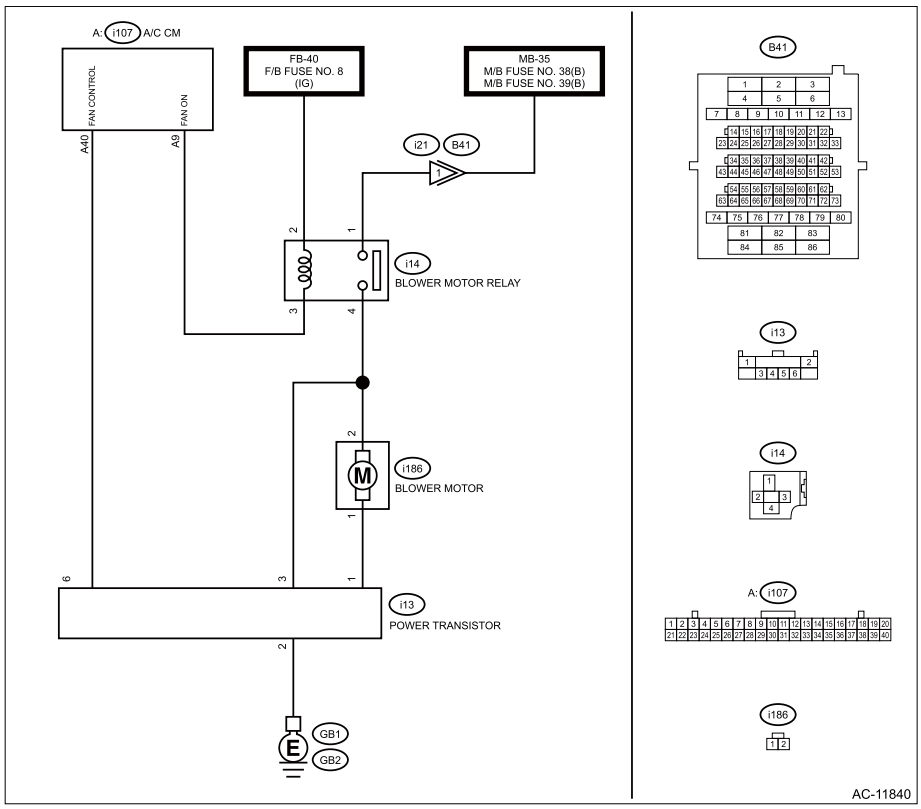
- Airflow capacity is insufficient.
- No air comes out even when the airflow capacity is adjusted.

Trouble causes:

- Airflow capacity failure
- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Blower motor failure

Wiring diagram:

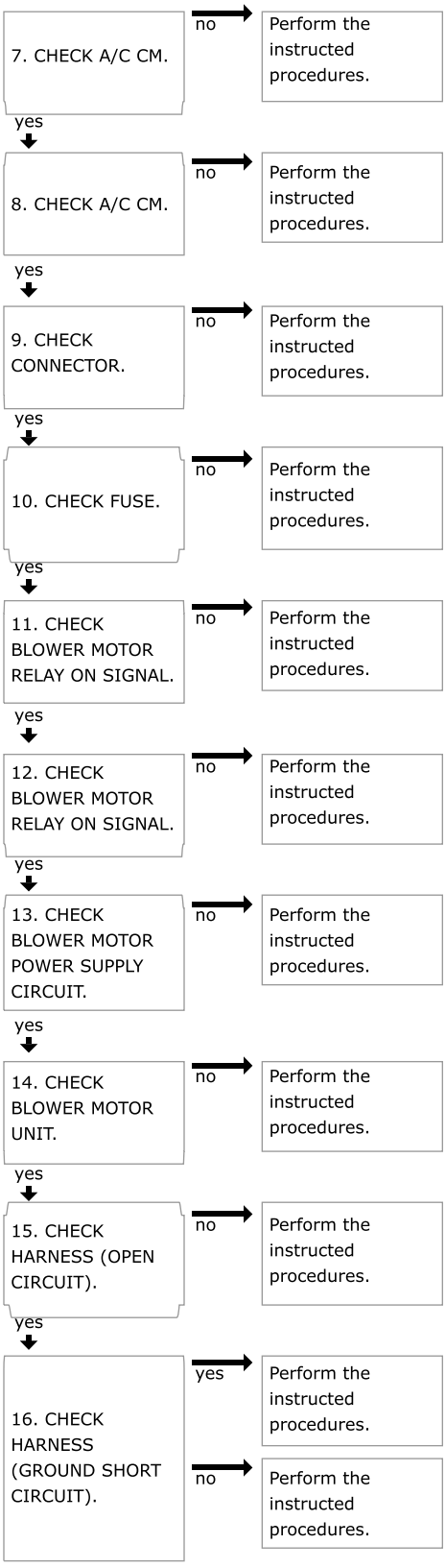
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C CM.
   - no → Go to 7.
   - yes ↓
4. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK A/C FILTER.
   - no → Perform the instructed procedures.
   - yes ↓
6. CHECK EACH DUCT.
   - no → Perform the instructed procedures.
   - yes ↓


7. CHECK A/C CM.
no
Perform the instructed procedures.
yes
8. CHECK A/C CM.
no
Perform the instructed procedures.
yes
9. CHECK CONNECTOR.
no
Perform the instructed procedures.
yes
10. CHECK FUSE.
no
Perform the instructed procedures.
yes
11. CHECK BLOWER MOTOR RELAY ON SIGNAL.
no
Perform the instructed procedures.
yes
12. CHECK BLOWER MOTOR RELAY ON SIGNAL.
no
Perform the instructed procedures.
yes
13. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT.
no
Perform the instructed procedures.
yes
14. CHECK BLOWER MOTOR UNIT.
no
Perform the instructed procedures.
yes
15. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
16. CHECK HARNESS (GROUND SHORT CIRCUIT).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK CENTER INFORMATION DISPLAY.

1. Start the engine.
2. Set the airflow capacity to maximum.

Is the airflow display on the center information display maximum?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK CENTER INFORMATION DISPLAY.

Set the airflow capacity to minimum.

Is the airflow display on the center information display minimum?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. CHECK A/C CM.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Target air mix door actuator position (driver's side)
   - Target air mix door actuator position (passenger's side)
   - Blower Fan Level
2. Set the temperature setting to MAX COOL. (Driver’s side, passenger’s side)
3. Increase/decrease the airflow on the center information display.

Does the data monitor indicate the following values?
- Target air mix door actuator position (driver's side): 0%
- Target air mix door actuator position (passenger's side): 0%
- Blower Fan Level: Increases/decreases in accordance with the airflow capacity operation

Yes	Go to 4.
No	Go to 7.

4. CHECK AIRFLOW CAPACITY.

1. Set the A/C setting of the center information display as follows.
   - Temperature control: MAX COOL (driver’s side, passenger’s side)
   - FRESH/RECIRC: RECIRC
   - Airflow capacity: MAX

Is the airflow capacity insufficient for the same model?

Yes	Go to 5.
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.**

5. CHECK A/C FILTER.

Check the A/C filter. Ref. to AIR CONDITIONER>A/C Filter>INSPECTION.

Is the check result OK?

Yes	Go to 6.
No	Clean or replace the A/C filter. Ref. to AIR CONDITIONER>A/C Filter.

6. CHECK EACH DUCT.

1. Check each duct joint for disconnection or clogging.
2. Check for fallen leaves or other foreign materials around the inlet opening underneath the cowl panel. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel.

Is the check result OK?

Yes	Go to 7.
No	Repair the duct or remove fallen leaves or other foreign materials.

7. CHECK A/C CM.

1. Set the airflow capacity to maximum.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Blower Fan Level

Does [Blower Fan Level] indicate 120 — 181?

Yes	Go to 8.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

8. CHECK A/C CM.

1. Set the airflow capacity to minimum.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Blower Fan Level

Does [Blower Fan Level] indicate 1 — 19?

Yes	Go to 9.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

9. CHECK CONNECTOR.

1. Stop the engine.
2. Check for poor contact of connector.

Is the check result OK?

Yes — Go to 10.

No — Repair the connector.

10. CHECK FUSE.

1. Remove the fuse No. 8 from fuse & relay box, and the fuses No. 38 and 39 from the main fuse box.
2. Check the condition of fuse. Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.

Is the check result OK?

Yes — Go to 11.

No — Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the blower motor relay and fuse.

11. CHECK BLOWER MOTOR RELAY ON SIGNAL.

1. Turn the ignition switch to ON.
2. Set the ON/OFF button to OFF.
3. Using a tester, measure the voltage between the A/C CM connector and chassis ground.
   Connector & terminal
   (i107) No. 9 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 12.

No
- Check open or short circuit of harness between fuse and A/C CM.
- Check the blower motor relay connector and relay unit. Ref. to AIR CONDITIONER>Relay and Fuse.

12. CHECK BLOWER MOTOR RELAY ON SIGNAL.

1. Start the engine.
2. Set the ON/OFF button to ON.
3. Using a tester, measure the voltage between the A/C CM connector and chassis ground.
   Connector & terminal
   (i107) No. 9 (+) — Chassis ground (−):

Is the voltage 0 V?

Yes — Go to 13.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

13. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT.

1. Stop the engine.
2. Turn the ignition switch to ON.
3. Set the ON/OFF button to ON.
4. Using a tester, measure the voltage between the blower motor connector and chassis ground.
   Connector & terminal
   (i14) No. 2 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 14.

No
- Check the blower motor power supply harness for open circuit or connector disconnection.
- Check the blower motor relay connector and relay unit. Ref. to AIR CONDITIONER>Relay and Fuse.

14. CHECK BLOWER MOTOR UNIT.

1. Turn the ignition switch to OFF.
2. Check the blower motor. Ref. to AIR CONDITIONER>Blower Motor>INSPECTION.

Is the check result of the blower motor OK?

Yes — Go to 15.

No — Replace the blower motor. Ref. to AIR CONDITIONER>Blower Motor.

15. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the power transistor and A/C CM.
2. Using a tester, measure the resistance between the power transistor connector and A/C CM connector, between the power transistor connector and blower motor, and between the power transistor connector and blower motor relay.
   Connector & terminal
   (i13) No. 1 — (i186) No. 1:
   (i13) No. 2 — Chassis ground:
   (i13) No. 3 — (i14) No. 4:
   (i13) No. 6 — (i107) No. 40:

Is the resistance less than 1 Ω?

Yes — Go to 16.

No — Repair or replace the open circuit of harness.

16. CHECK HARNESS (GROUND SHORT CIRCUIT).

Use a tester to measure the harness resistance between the power transistor connector and chassis ground.
Connector & terminal
(i13) No. 6 — Chassis ground:

Is the resistance less than 1 Ω?

Yes — Repair or replace the short circuit of the harness.

No — Replace the power transistor. Ref. to AIR CONDITIONER>Power Transistor.

9. AIR GOES OUT OF CONTROL. (BLOWER MOTOR ROTATES AT HIGH SPEED)

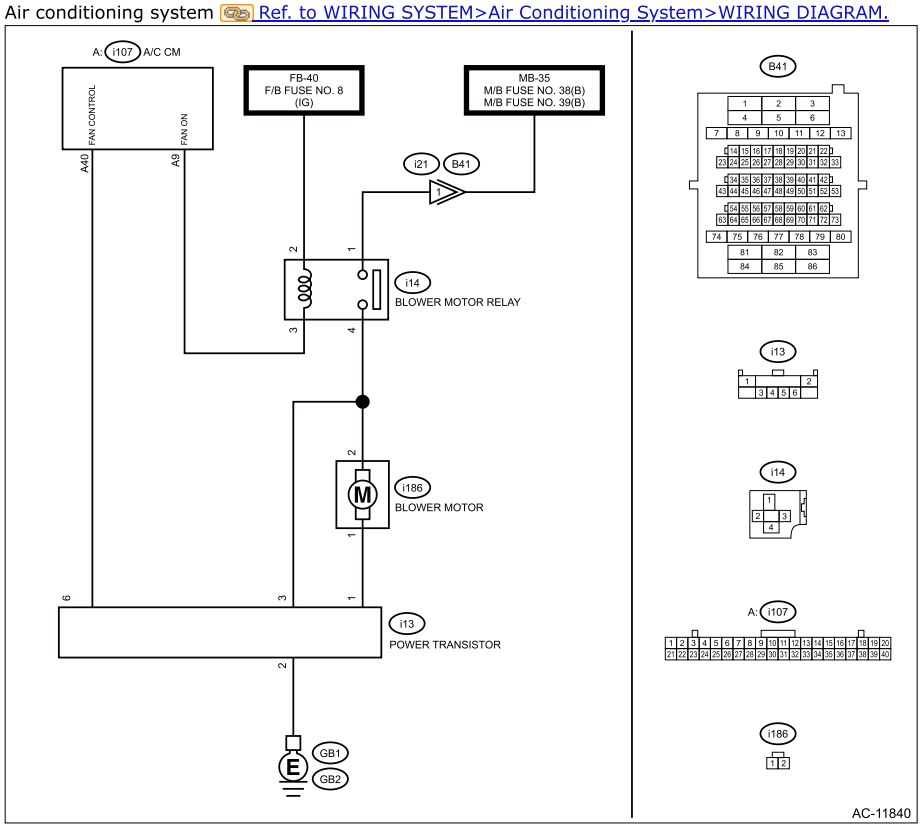
Trouble symptom:
- Even when the ON/OFF button is turned to OFF, the blower motor rotates.
- The blower motor continues to rotate at high speed (cannot be adjusted)

Trouble causes:

- Airflow capacity failure
- CAN communication failure
- Cockpit control module failure
- Center information display failure
- Blower motor failure

Wiring diagram:

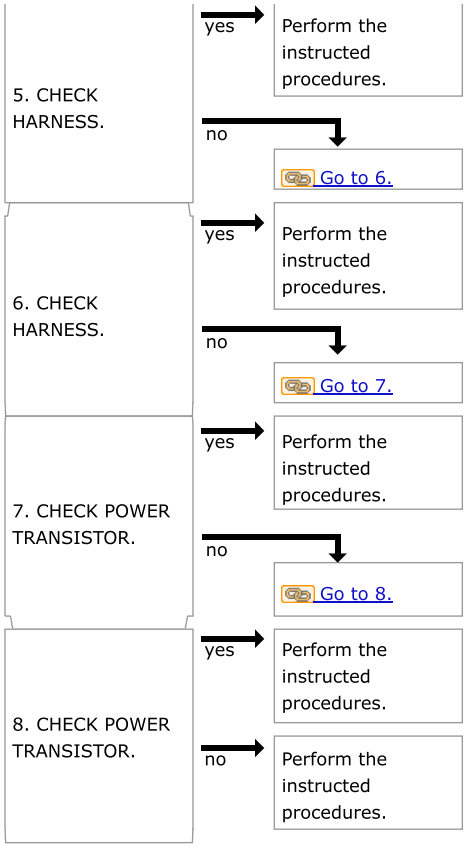
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK CENTER INFORMATION DISPLAY.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C CM.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK A/C CM.
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK CENTER INFORMATION DISPLAY.

1. Start the engine.
2. Set the airflow capacity to maximum.

Is the airflow display on the center information display maximum?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK CENTER INFORMATION DISPLAY.

Set the airflow capacity to minimum.

Is the airflow display on the center information display minimum?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. CHECK A/C CM.

1. Set the airflow capacity to maximum.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Blower Fan Level

Does [Blower Fan Level] indicate 120 — 181?

Yes — Go to 4.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

4. CHECK A/C CM.

1. Set the airflow capacity to minimum.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Blower Fan Level

Does [Blower Fan Level] indicate 1 — 19?

Yes — Go to 5.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

5. CHECK HARNESS.

1. Stop the engine.
2. Disconnect the connector from the power transistor.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.
   Connector & terminal
   (i13) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

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

No — Go to 6.

6. CHECK HARNESS.

1. Disconnect the connector from A/C CM.
2. Use a tester to measure the resistance between the power transistor connector and chassis ground.
   Connector & terminal
   (i13) No. 6 — Chassis ground:

Is the resistance less than 1 Ω?

Yes — Repair or replace the short circuit of the harness between blower motor connector and A/C CM connector.

No — Go to 7.

7. CHECK POWER TRANSISTOR.

1. Connect the disconnected connectors.
2. Turn the ignition switch to ON.
3. Set the blow vents to VENT.
4. Use a tester to measure the voltage between the power transistor connector and chassis ground.
   Connector & terminal
   (i13) No. 6 (+) — Chassis ground (−):
5. Measure the voltage when the airflow on the center information display is increased/decreased.

Is the voltage as follows?
- When the ON/OFF button is OFF: 0 V
- When the airflow is set to 1st: Approx. 10 V
- When the airflow is set to 6th: Approx. 4.0 V

Yes — Replace the power transistor. Ref. to AIR CONDITIONER>Power Transistor.

No — Go to 8.

8. CHECK POWER TRANSISTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from A/C CM.
3. Short No. 9 of (i107) connector to chassis ground.
4. Turn the ignition switch to ON.

Is the blower motor stopped?

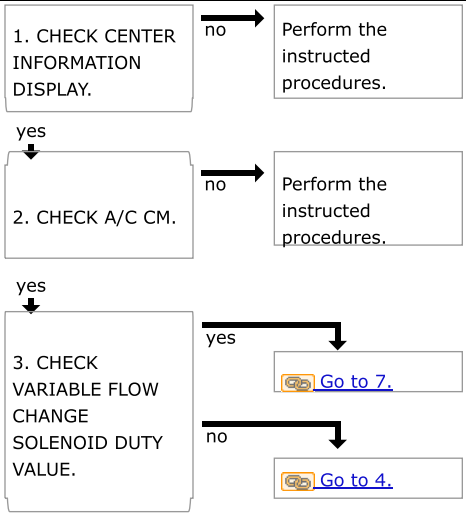
Yes — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

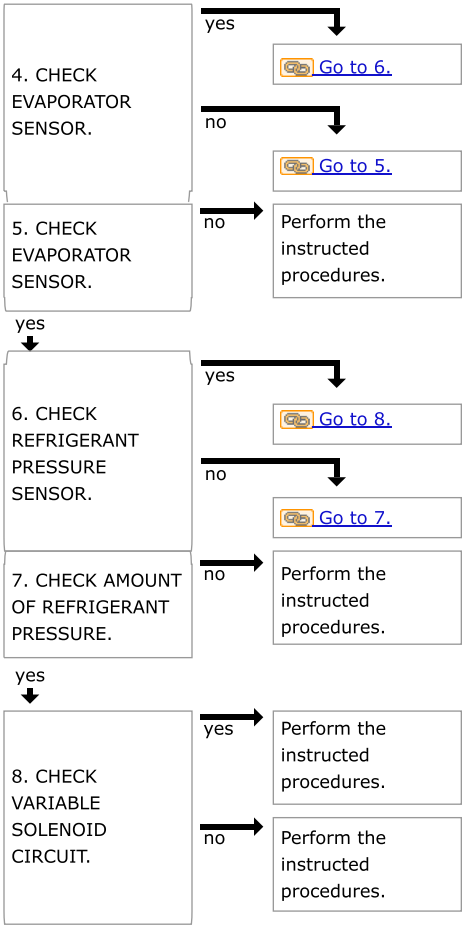
No — Replace the power transistor. Ref. to AIR CONDITIONER>Power Transistor.

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

Trouble symptom:
Compressor does not operate after turning the ON/OFF button to ON and airflow capacity between minimum — maximum.
Trouble causes:
Compressor failure

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.





1. CHECK CENTER INFORMATION DISPLAY.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Start the engine.
3. Set the airflow capacity to maximum.
4. Set the A/C button to ON.

Is the A/C button display on the center information display ON?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

- Blower Fan Level

Does [Blower Fan Level] indicate 120 — 181?

Yes	Go to 3.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK VARIABLE FLOW CHANGE SOLENOID DUTY VALUE.

1. Keep the ON/OFF button set to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Variable Flow Change Solenoid Duty

Does the display indicate the value greater than 0%?

Yes — Go to 7.

No — Go to 4.

4. CHECK EVAPORATOR SENSOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

- Evaporator Temperature

Does the display indicate 3°C (37.4°F) or more?

Yes — Go to 6.

No — Go to 5.

5. CHECK EVAPORATOR SENSOR.

Check the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor>INSPECTION.

Is the check result OK?

Yes — Go to 6.

No — Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

6. CHECK REFRIGERANT PRESSURE SENSOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

- Refrigerant Pressure

Does the display indicate 0.225 — 2.94 MPa?

Yes — Go to 8.

No — Go to 7.

7. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the check result OK?

Yes — Go to 8.

No — Perform repair according to refrigerant pressure inspection.

8. CHECK VARIABLE SOLENOID CIRCUIT.

1. Set the airflow capacity to maximum.
2. Set the A/C button to ON.
3. Set the temperature setting to MAX COOL. (Driver's side, passenger's side)
4. Leave it for 30 seconds or more.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

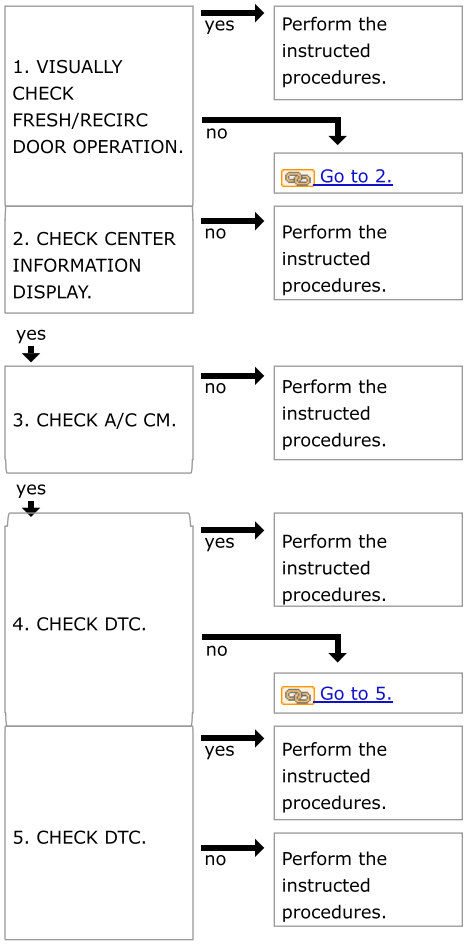
Is DTC B14A7 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTC B14A7. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A7 VARIABLE SOLENOID VALVE CIRCUIT.
No	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

11. UNABLE TO SWITCH SUCTION VENTS

Trouble symptom:
Even when the FRESH/RECIRC button is pressed, the inlet opening does not switch to RECIRC → FRESH or FRESH → RECIRC.
Trouble causes:
Intake door actuator failure.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.



1. VISUALLY CHECK FRESH/RECIRC DOOR OPERATION.

1. Remove the glove box. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
2. Turn the ignition switch to ON.
3. Operate the FRESH/RECIRC button, 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 CENTER INFORMATION DISPLAY.

Operate the FRESH/RECIRC button.

Does the FRESH/RECIRC button display on the center information display change in sync with the operation?

Yes — Go to 3.

No — Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. CHECK A/C CM.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Fresh/Recircle Air Door Actuator Position Target
2. Operate the FRESH/RECIRC button.

Does [Fresh/Recircle Air Door Actuator Position Target] indicate 8.40% ←→ 91.59%?

Yes — Go to 4.

No — Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

4. CHECK DTC.

1. Set the FRESH/RECIRC button to RECIRC.
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B14E9, B14EA or B14EB displayed? (Current code)

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 5.

5. CHECK DTC.

1. Set the FRESH/RECIRC button to FRESH.
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

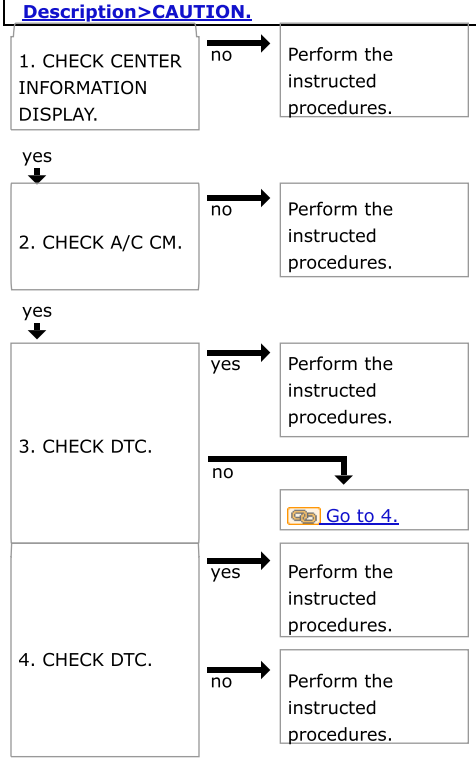
Is DTC B14E9, B14EA or B14EB displayed? (Current code)

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 BLOW VENTS

Trouble symptom:
Unable to switch blow vents
Trouble causes:
Mode door actuator failure.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.



1. CHECK CENTER INFORMATION DISPLAY.

1. Turn the ignition switch to ON.
2. Operate the blow vents on the center information display.

Does the blow vent display on the center information display change in sync with the operation?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for cockpit control system. Ref. to COCKPIT CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK A/C CM.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - Mode Door Actuator Position Target
2. Operate the blow vents on the center information display.

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

Yes	Go to 3.
No	Replace the A/C CM. Ref. to AIR CONDITIONER>Control Unit.

3. CHECK DTC.

1. Set the DEF button to ON.
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1438 or B1439 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTC B1438 or B1439. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1439 MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.
No	Go to 4.

4. CHECK DTC.

1. Set the blow vents to VENT.
2. Leave it for 16 seconds or more.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1438 or B1439 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTC B1438 or B1439. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1439 MODE DOOR ACTUATOR 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. FRONT SEAT HEATER DOES NOT OPERATE

Trouble symptom:

Front seat heater does not operate.

Note:

Perform the diagnosis for the seat. Ref. to SEATS>Seat Heater System>INSPECTION > FRONT SEAT HEATER DOES NOT OPERATE.

AIRBAG(DIAGNOSTICS)

AB(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Work Support
12. Event Record Data
13. Batch save of Event record data
14. Diagnostic Trouble Code (DTC)
15. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
16. Diagnostics with Phenomenon

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the Check List for Interview. Ref. to AIRBAG(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. CHECK WARNING LIGHT.

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

Does the airbag warning light illuminate?

Yes	Go to 3.
No	Check the illuminating pattern of the airbag warning light. If no fault is found, it is normal at present. Ref. to AIRBAG(DIAGNOSTICS)>Warning Light Illumination Pattern.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON (DIAGNOSTICS)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Airbag].

Note:
For detailed operation procedures, refer to "Help" of application.

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION.

4. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed? (Current code)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

CHECK

- Inspect the following items regarding the vehicle's state.
- Print out below for use.

<table>
<tr><td colspan="2">Airbag and Occupant Detection Check List for Interview</td><td colspan="2">Vehicle Bring-in Date Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td>Year Month Date</td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="7">Condition of trouble occurrence
(How the trouble occurs)</td><td>Weather</td><td colspan="2">❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Others ( )</td></tr>
<tr><td>Temperature</td><td colspan="2">°C (°F) — °C (°F)</td></tr>
<tr><td>Vehicle status</td><td colspan="2">❑ Starting
❑ Idling
❑ Driving
❑ Constant speed km/h (MPH)
❑ Acceleration km/h (MPH) — km/h (MPH)
❑ Deceleration km/h (MPH) — km/h (MPH)
❑ Turning km/h (MPH)
❑ Other:</td></tr>
<tr><td>Road conditions</td><td colspan="2">❑ Local street
❑ Highway
❑ Major arterial road
❑ Limited highway
❑ Other:</td></tr>
<tr><td>Road condition</td><td colspan="2">❑ Flat road
❑ Uphill
❑ Downhill
❑ Gravel road
❑ Dry
❑ Wet
❑ Covered with fresh snow
❑ Covered with hardened snow
❑ Frozen
❑ Other:</td></tr>
<tr><td>Seat slide position</td><td colspan="2"></td></tr>
<tr><td>Seat reclining position</td><td colspan="2"></td></tr>
<tr><td>Generation timing</td><td colspan="3">Example: It occurs about 30 minutes after driving.</td></tr>
<tr><td>Accessory installation condition</td><td colspan="3">❑ Child restraint seat
❑ ISO FIX
❑ Seat belt fixed
❑ Other:
❑ Passenger's seat cover
❑ Other:</td></tr>
<tr><td>Seat slide operation</td><td colspan="3">❑ Smooth
❑ Dragged
❑ Does not move
❑ Other:</td></tr>
<tr><td>Seat reclining operation</td><td colspan="3">❑ Smooth
❑ Dragged</td></tr>
</table>

	❑ Does not move ❑ Other:	
Situation inside seat back pocket	❑ Heavy object is in ( ) ❑ No heavy object is in	
Situation around seat	❑ Foreign matter exists ( ) ❑ No foreign matter exists	
Situation under seat	❑ Foreign matter exists ( ) ❑ No foreign matter exists	
Airbag warning light status	❑ Normal (After turning the ignition switch to ON, illuminates for 6 seconds and goes off.) ❑ Remains ON ❑ Remains OFF	
Passengers airbag ON/OFF indicator status	❑ Normal (After turning the ignition switch to ON, illuminates for 6 seconds then goes off for 2 seconds, and either ON (adult) or OFF (children/unoccupied) illuminates.) ❑ Both remain ON ❑ Both remain OFF	
Diagnostic trouble code	Airbag	❑ No ❑ Yes ( ) ❑ Select monitor communication impossible
Trouble condition	❑ Passenger’s airbag indicator indicates OFF even when an adult occupies the passenger’s seat. ❑ Passenger’s airbag indicator indicates ON even when a child restraint seat is installed on the passenger’s seat. ❑ Other:	
Sensor output at empty seat (Data monitor value) **Note:** **When measuring sensor output, adjust the seat to the same position as in system adjustment.**	Front left	kg (lb)
	Front right	kg (lb)
	Rear left	kg (lb)
	Rear right	kg (lb)
	Total load	kg (lb)
Sensor output at loading an inspection weight (Data monitor value) **Note:** **When measuring sensor output, adjust the seat to the same position as in system adjustment.**	Front left	kg (lb)
	Front right	kg (lb)
	Rear left	kg (lb)
	Rear right	kg (lb)
	Total load	kg (lb)
Vehicle bring-in history information		

CAUTION

1. AIRBAG SYSTEM

Before performing diagnosis, refer to “CAUTION” in “General Description” in AIRBAG SYSTEM. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. OCCUPANT DETECTION SYSTEM

1. When any of the following operation has been done, be sure to perform [Rezeroing] of occupant detection system. Ref. to AIRBAG SYSTEM>Rezero.
   - Replacing airbag control module
   - Replacing occupant detection system
   - Removing and disassembling passenger’s seat
   - Loosening passenger’s seat bolt
2. The load sensor of the occupant detection system (passenger seat only) is fixed to the cushion frame assembly. Never remove the load sensor from the cushion frame assembly.
3. The cushion pad, cushion cover and seat harness can be replaced as a single unit. When the cushion frame assembly is replaced, the seat harness and load sensor are incorporated. When replacing the cushion frame assembly, do not touch the load sensor to avoid electrical damage.
4. Never connect the battery in reverse polarity. Occupant detection system may be destroyed instantly.
5. 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 airbag control module.
6. Before disconnecting the connectors of sensors and the control module, be sure to Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Otherwise the airbag control module may be damaged.
7. Every occupant detection system-related part is a precision part. Do not drop them.
8. Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.
9. Be careful not to damage the airbag system wiring harness when servicing the occupant detection system.
10. Refer to CAUTION in Airbag System when repairing the occupant detection system. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

INSPECTION

Before performing diagnostics, check the following item which might affect airbag system or occupant detection system problems.

1. BASIC INSPECTION

- Airbag system
  1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.
  2. Check the main and other fuses, harnesses and connectors. Also check grounding.
- Occupant detection system
  1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.
  2. Check the main and other fuses, harnesses and connectors. Also check grounding.

PREPARATION TOOL

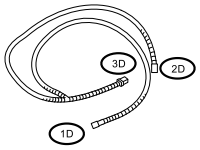
Caution:
To measure the voltage and resistance of airbag system component, be sure to use the specified test harness.

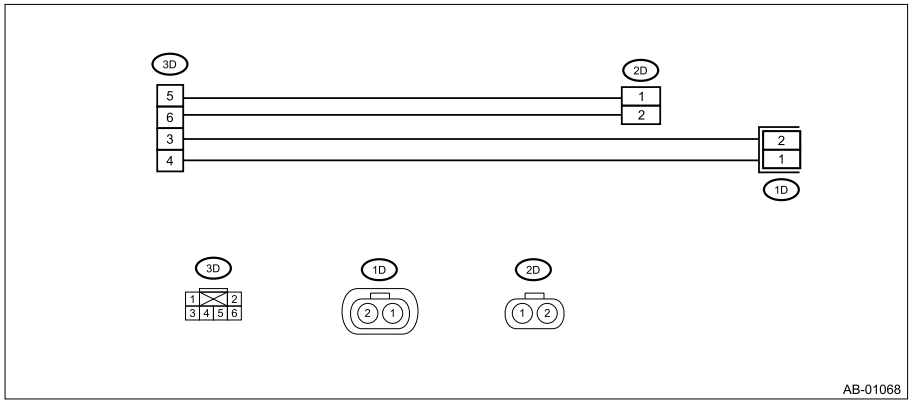
1. SUBARU SPECIAL TOOL

- Subaru Select Monitor

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

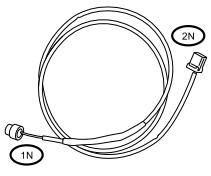
- TEST HARNESS D

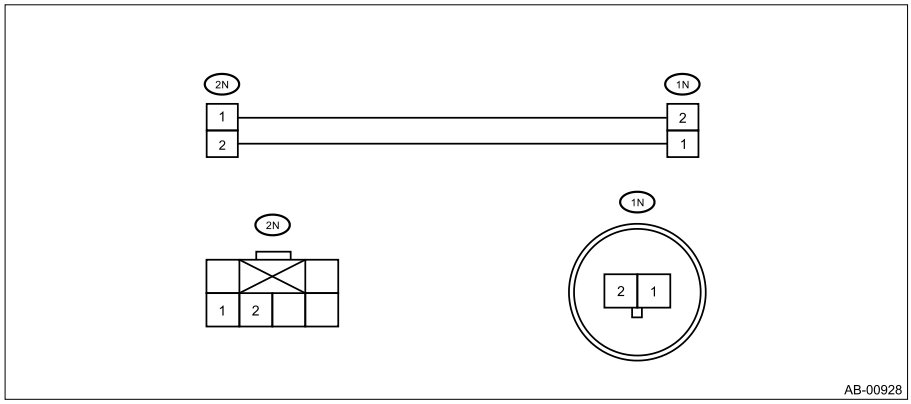
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG060	98299AG060	TEST HARNESS D	Used for troubleshooting seat belt buckle switch.



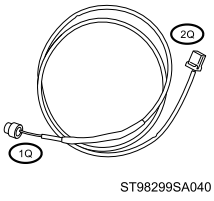
AB-01068

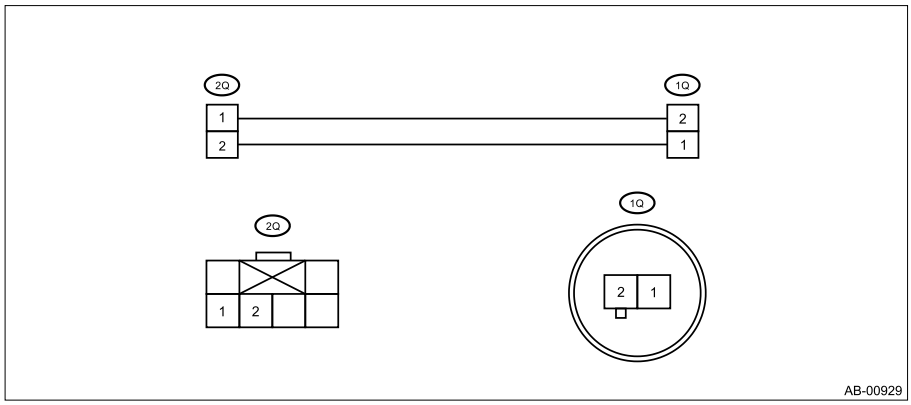
- TEST HARNESS N

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA000	98299SA000	TEST HARNESS N	Used when measuring voltage and resistance of driver's airbag module, driver's knee airbag module, or curtain airbag module.

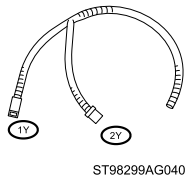


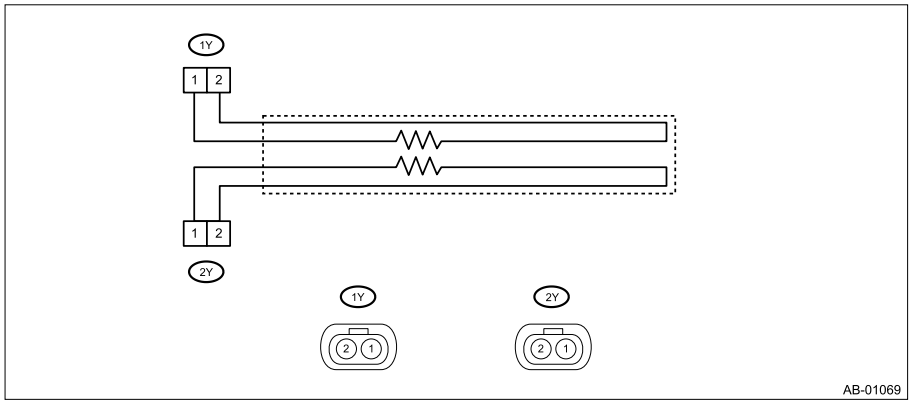
- TEST HARNESS Q

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	98299SA040	TEST HARNESS Q	Used when measuring voltage and resistance of driver's airbag module.

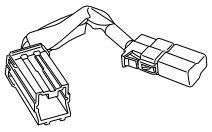


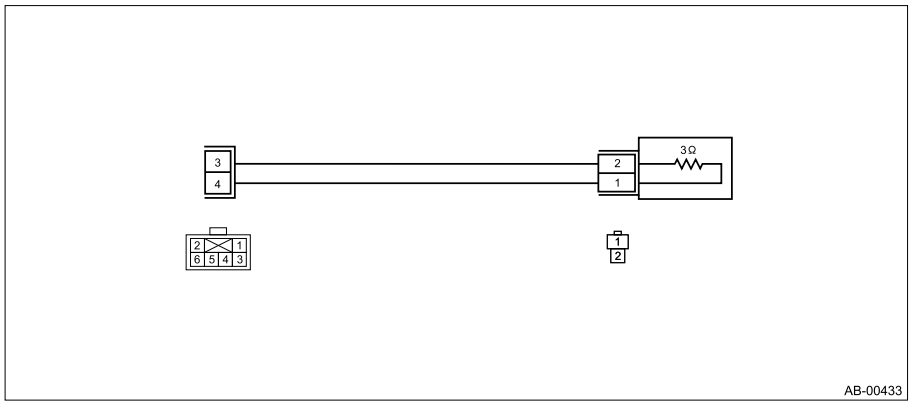
- TEST HARNESS Y

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	98299AG040	TEST HARNESS Y	Used for troubleshooting seat belt buckle switch.

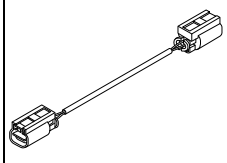


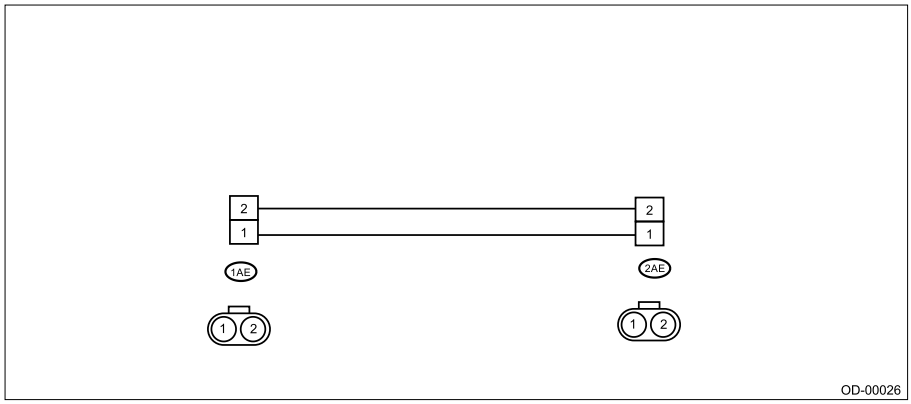
- AIRBAG RESISTOR

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299PA040	98299PA040	AIRBAG RESISTOR	Used in replacement of each airbag module, because the resistance value is the same as that of each airbag module. Two sets are required for diagnosis of two-stage inflator type airbag module.

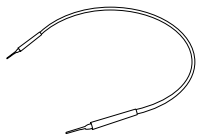


- TEST HARNESS AE

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299XA030	98299XA030	TEST HARNESS AE	TEST HARNESS Y adapter harness. Used for troubleshooting seat belt buckle switch.

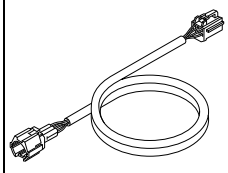


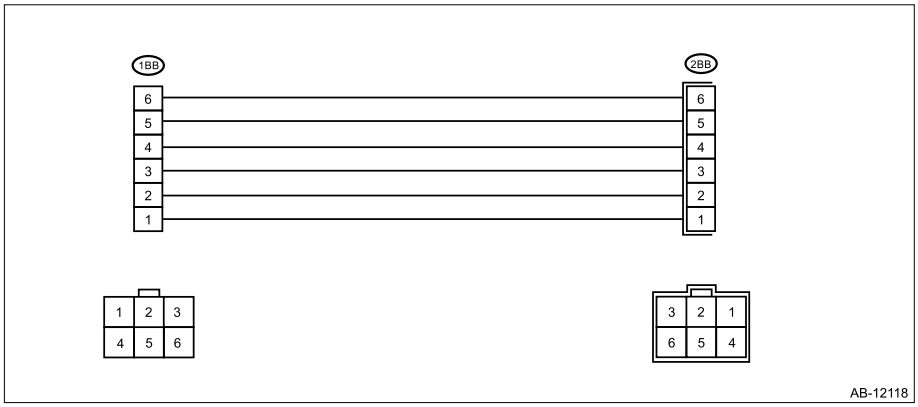
- TEST HARNESS AT

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299CA020	98299CA020	TEST HARNESS AT	Used when measuring power supply and resistance of side airbag harness and passenger's airbag module. Two sets may be required.

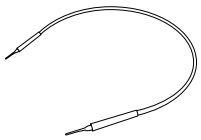


- TEST HARNESS BB

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299XA000	98299FL020	TEST HARNESS BB	Used when measuring voltage and resistance of occupant detection system.

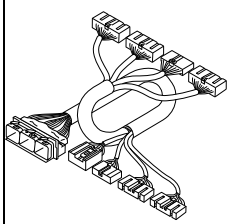


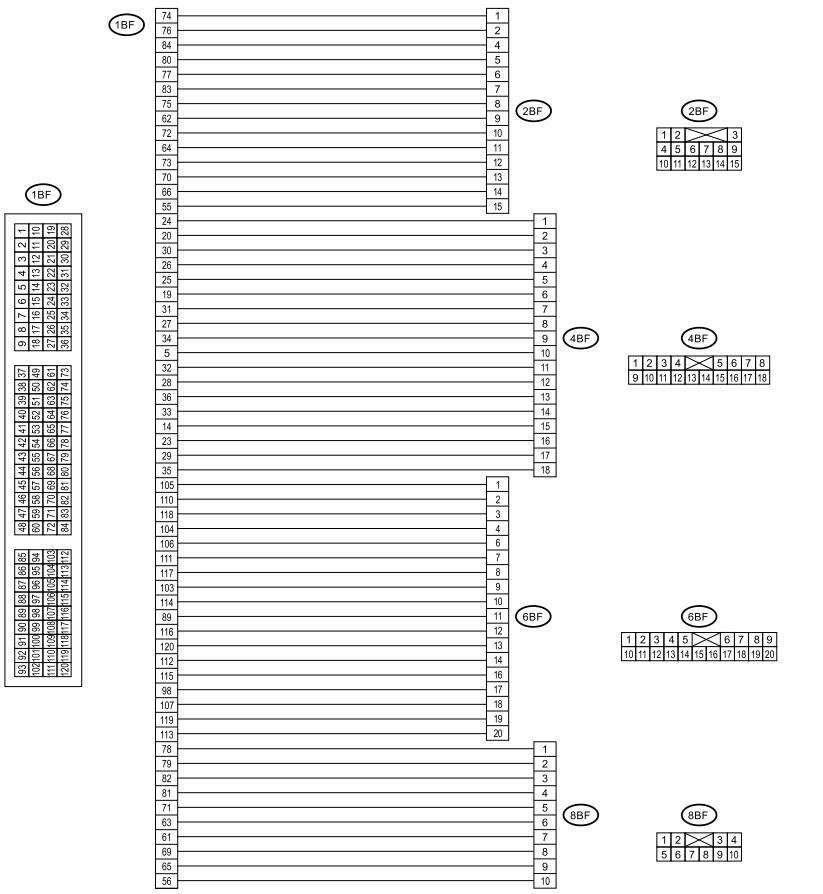
- TEST HARNESS BC

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AL020	98299FL030	TEST HARNESS BC	Used when measuring voltage and resistance of occupant detection system.

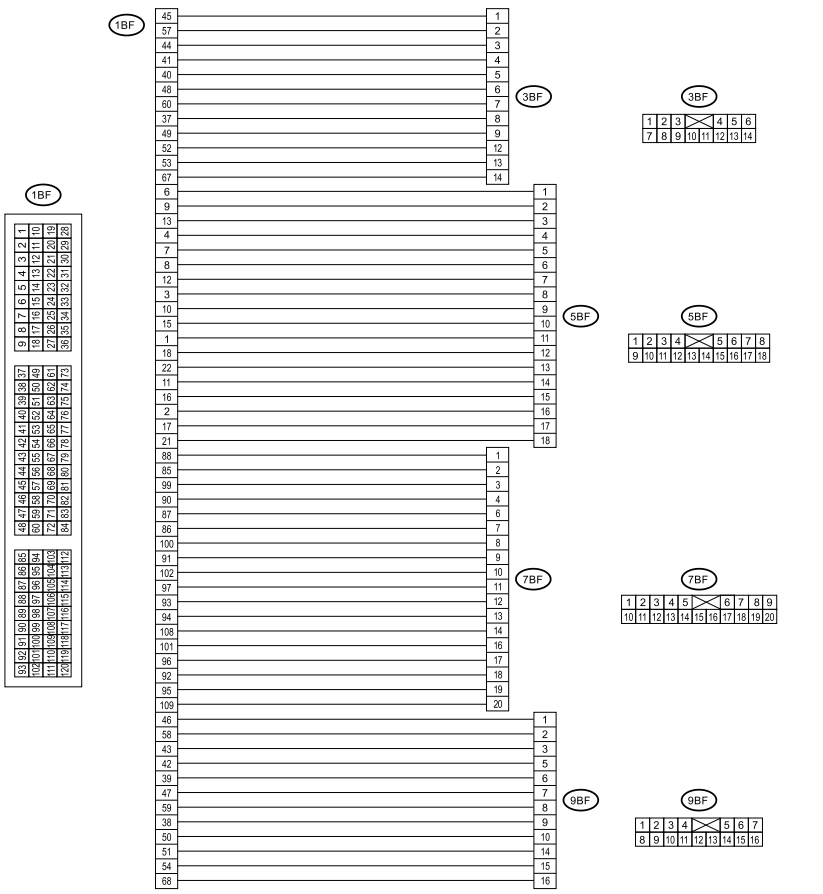


- TEST HARNESS BF

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AN000	98299AN000	TEST HARNESS BF	Used when measuring voltage and resistance of airbag control module.

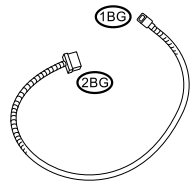

1BF
74 76 84 80 77 83 75 62 72 64 73 70 66 55
1 2 4 5 6 7 8 9 10 11 12 13 14 15
2BF
1 2 3
4 5 6 7 8 9
10 11 12 13 14 15
2BF
24 20 30 26 25 19 31 27 34 5 32 28 36 33 14 23 29 35
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
4BF
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16 17 18
4BF
105 110 118 104 106 111 117 103 114 89 116 120 112 115 98 107 119 113
1 2 3 4 6 7 8 9 10 11 12 13 14 16 17 18 19 20
6BF
1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16 17 18 19 20
6BF
78 79 82 81 71 63 61 69 65 56
1 2 3 4 5 6 7 8 9 10
8BF
1 2 3 4
5 6 7 8 9 10
8BF
1BF
1 2 10 11 19 20 28 29
3 12 21 30 31
4 13 22 32 33
5 14 23 24 34 35
6 15 16 25 26 27
8 17 18 35 36
37 38 46 47 48 49
39 50 58 59 60 61
40 51 52 62 63 64
41 42 53 54 65 66 67
43 44 55 56 68 69 70
45 57 71 72 73
74 75 76 77 78 79
80 81 82 83 84 85
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91 92 100 101 102 103
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120 119 128 127 126 125

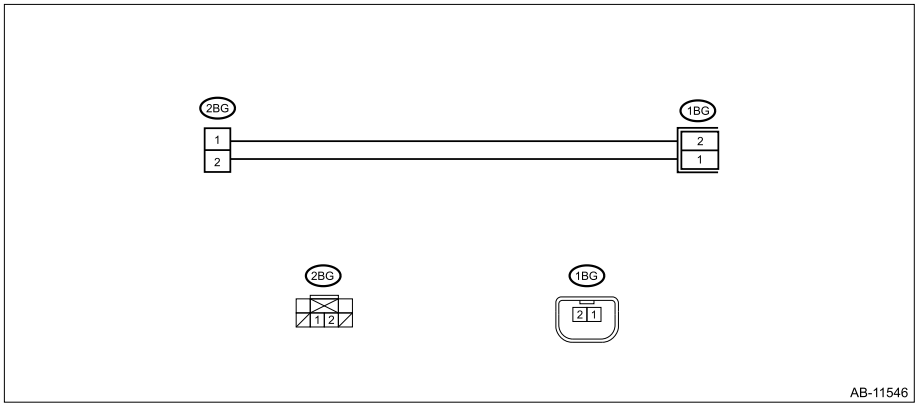
AB-11481



AB-11482

- TEST HARNESS BG

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AN010	98299AN010	TEST HARNESS BG	Used when measuring voltage and resistance of side impact sensor (front door).



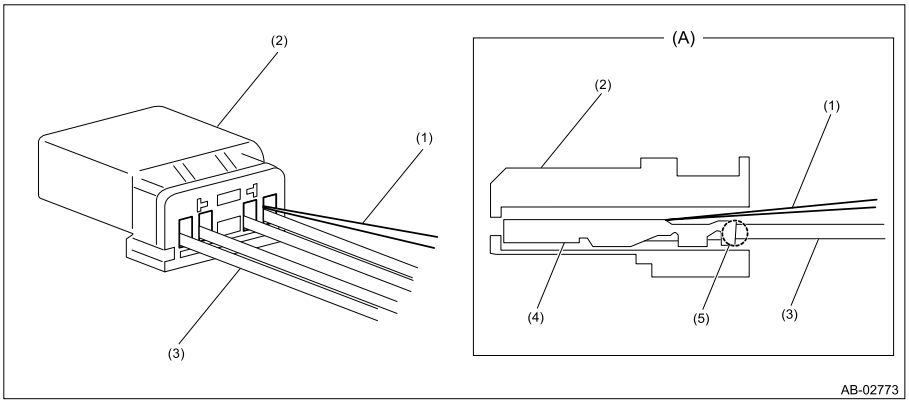
AB-11546

2. OTHER

	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Probe	Used when measuring voltage and resistance of passenger’s airbag module and airbag sensor.
Inspection weight	Used for sensitivity inspection after sensor rezero adjustment operation. Prepare an inspection weight of 30 kg to 40 kg in total. If it is a weight of which the accuracy has been verified (within ±0.5%), there is no need of measuring the actual value using a digital scale. **Note:** **The combination of 98399AG000 and 98399AG010 (total weight: 35.812 kg) can also be used.**
Digital scale	Used only for sensitivity inspection after sensor rezero adjustment operation, using an inspection weight of which the actual weight is not verified or unknown.

3. HOW TO USE PROBE

- Passenger's airbag module
  Insert the probe into the harness hole, and contact it with the terminal.

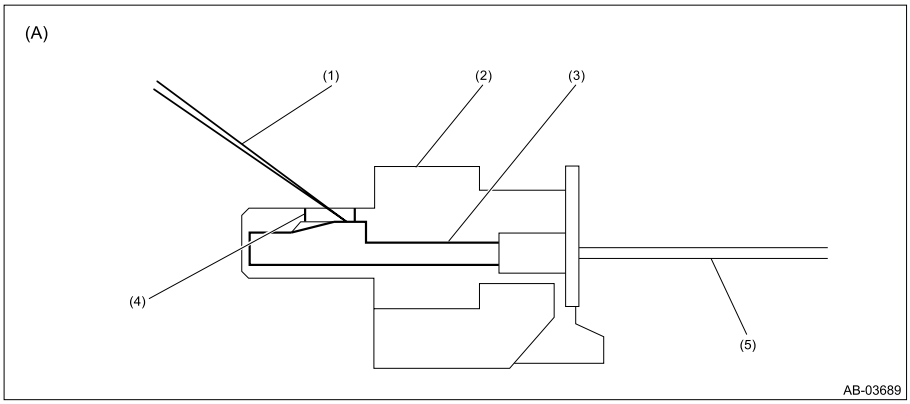


(A) Cross section

(1) Probe
(2) Connector (housing)
(3) Harness
(4) Terminal
(5) Connection

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.)**

- Airbag sensor
  Insert the probe into the inspection hole to contact with the terminal.

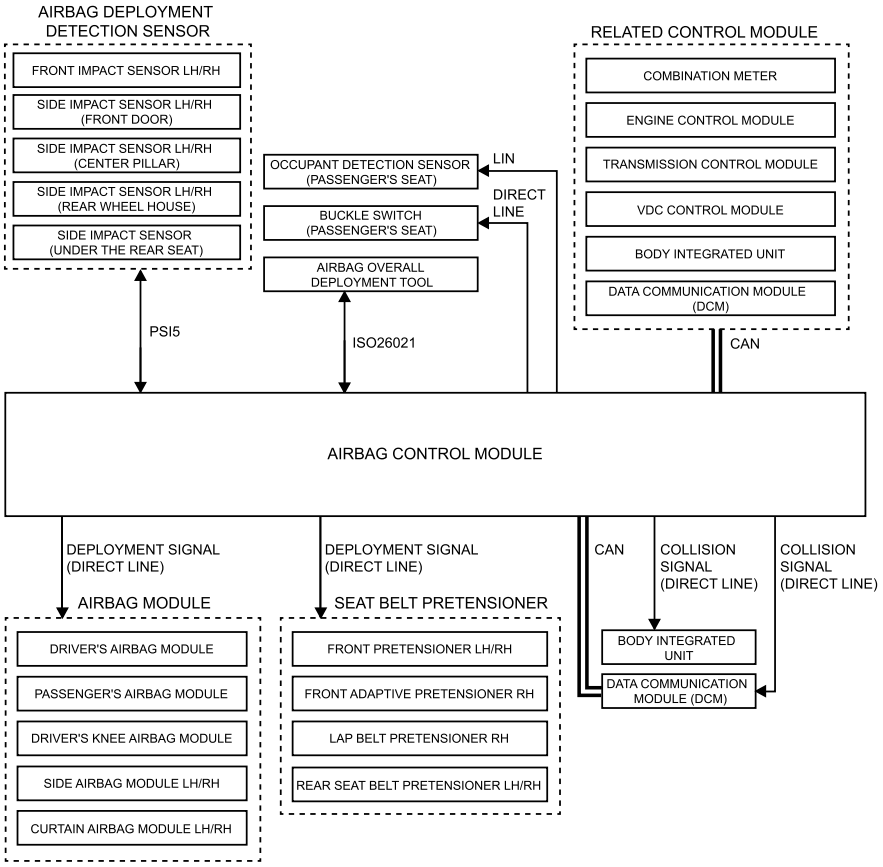


(A) Cross section

(1) Probe
(2) Connector (housing)
(3) Terminal
(4) Inspection hole
(5) Harness

Caution:
- **Do not push the probe with excessive force against the terminal. (Terminal will come off easily from housing, otherwise.)**
- **Do not insert the probe anywhere other than inspection hole. (Waterproof property will be lost, otherwise.)**

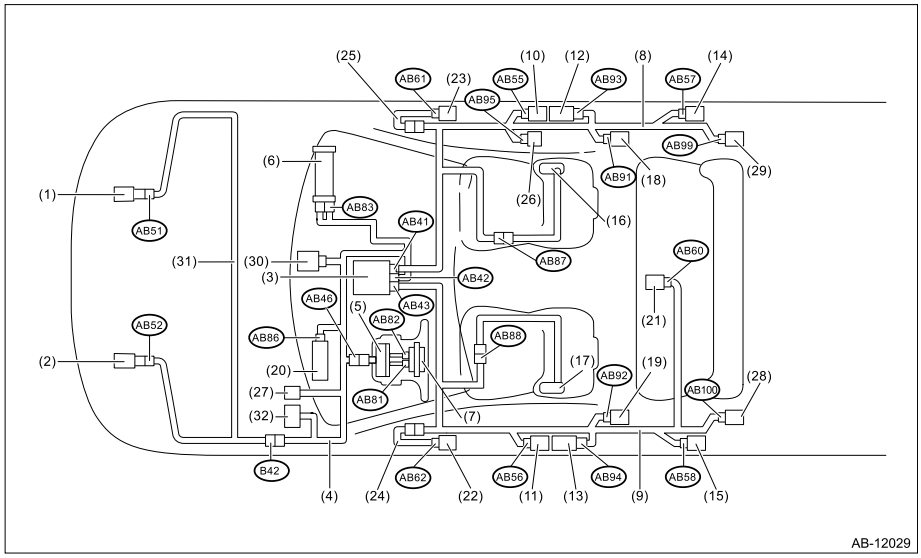
SYSTEM BLOCK DIAGRAM


AIRBAG DEPLOYMENT DETECTION SENSOR
FRONT IMPACT SENSOR LH/RH
SIDE IMPACT SENSOR LH/RH (FRONT DOOR)
SIDE IMPACT SENSOR LH/RH (CENTER PILLAR)
SIDE IMPACT SENSOR LH/RH (REAR WHEEL HOUSE)
SIDE IMPACT SENSOR (UNDER THE REAR SEAT)
OCCUPANT DETECTION SENSOR (PASSENGER'S SEAT)
LIN
DIRECT LINE
BUCKLE SWITCH (PASSENGER'S SEAT)
AIRBAG OVERALL DEPLOYMENT TOOL
RELATED CONTROL MODULE
COMBINATION METER
ENGINE CONTROL MODULE
TRANSMISSION CONTROL MODULE
VDC CONTROL MODULE
BODY INTEGRATED UNIT
DATA COMMUNICATION MODULE (DCM)
PSI5
ISO26021
CAN
AIRBAG CONTROL MODULE
DEPLOYMENT SIGNAL (DIRECT LINE)
DEPLOYMENT SIGNAL (DIRECT LINE)
CAN
COLLISION SIGNAL (DIRECT LINE)
COLLISION SIGNAL (DIRECT LINE)
AIRBAG MODULE
DRIVER'S AIRBAG MODULE
PASSENGER'S AIRBAG MODULE
DRIVER'S KNEE AIRBAG MODULE
SIDE AIRBAG MODULE LH/RH
CURTAIN AIRBAG MODULE LH/RH
SEAT BELT PRETENSIONER
FRONT PRETENSIONER LH/RH
FRONT ADAPTIVE PRETENSIONER RH
LAP BELT PRETENSIONER RH
REAR SEAT BELT PRETENSIONER LH/RH
BODY INTEGRATED UNIT
DATA COMMUNICATION MODULE (DCM)

AB-12414

LOCATION

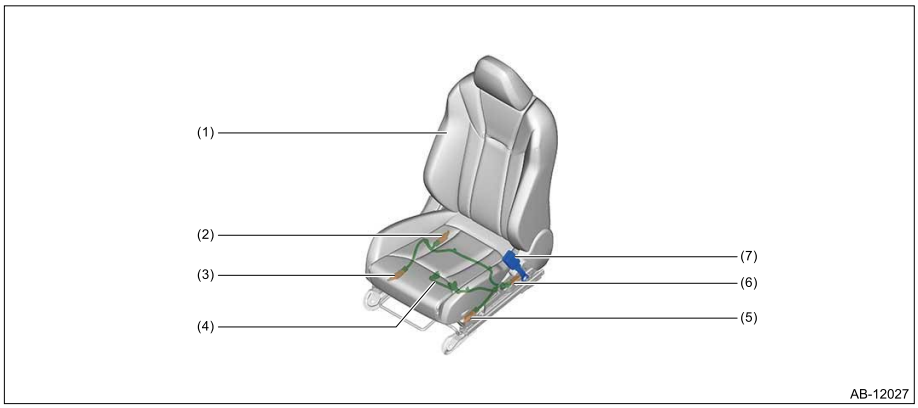
1. AIRBAG SYSTEM



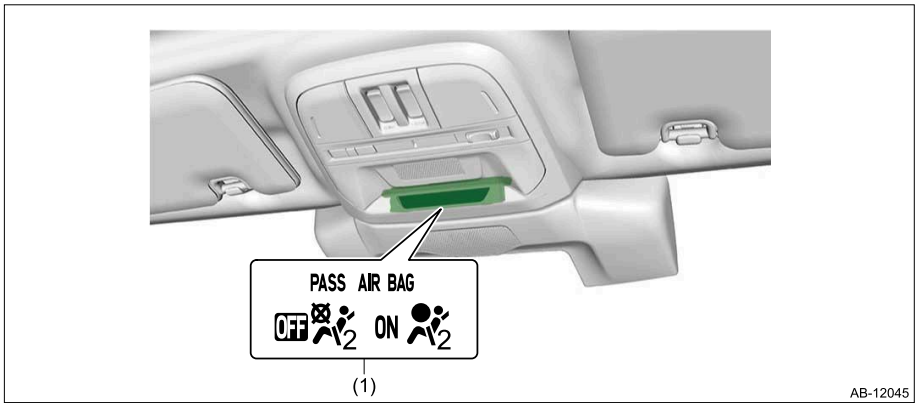
(1) Front impact sensor RH	(12) Front seat belt pretensioner RH	(23) Side impact sensor RH (front door)
(2) Front impact sensor LH	(13) Front seat belt pretensioner LH	(24) Door harness LH
(3) Airbag control module	(14) Side impact sensor RH (rear wheel house)	(25) Door harness RH
(4) Airbag main harness (instrument panel harness)	(15) Side impact sensor LH (rear wheel house)	(26) Lap seat belt pretensioner RH
(5) Roll connector	(16) Side airbag inflator RH	(27) Data link connector
(6) Passenger's airbag inflator	(17) Side airbag inflator LH	(28) Rear seat belt pretensioner LH
(7) Driver's airbag inflator	(18) Curtain airbag inflator RH	(29) Rear seat belt pretensioner RH
(8) Airbag rear harness RH	(19) Curtain airbag inflator LH	(30) Data communication module
(9) Airbag rear harness LH	(20) Driver's knee airbag inflator	(31) Bulkhead harness
(10) Side impact sensor RH (center pillar)	(21) Side impact sensor (under the rear center seat)	(32) Body integrated unit
(11) Side impact sensor LH (center pillar)	(22) Side impact sensor LH (front door)	

Note:
For the connector color and the number of pins, refer to the wiring system. Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.

2. OCCUPANT DETECTION SYSTEM

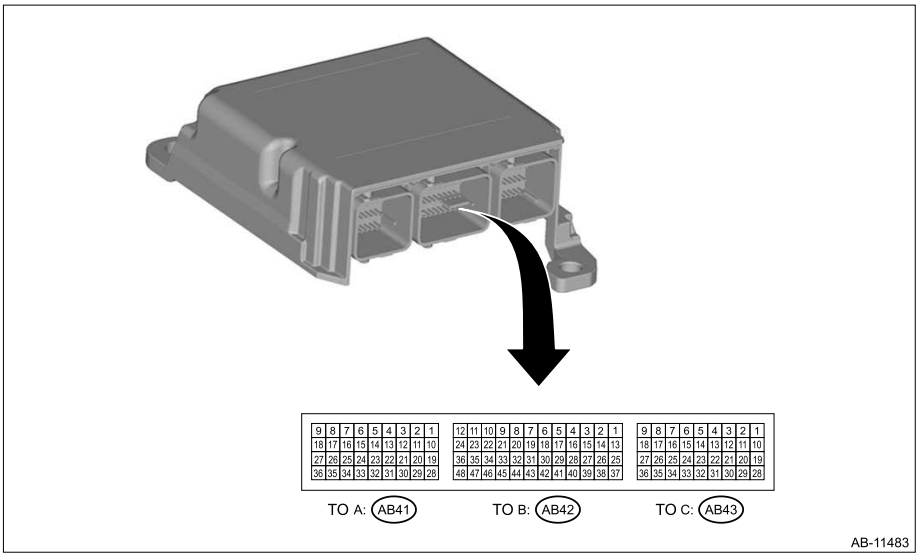


(1) Passenger's seat
(2) Load sensor 4 (RR)
(3) Load sensor 2 (FR)
(4) Harness ASSY occupant detection system
(5) Load sensor 1 (FL)
(6) Load sensor 3 (RL)
(7) Buckle switch



(1) Airbag ON/OFF indicator

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.

Contents		Terminal No.	Measuring condition	Standard
Side airbag module LH	+	(AB41) No. 1	—	—
	–	(AB41) No. 2		
Curtain airbag module LH	+	(AB41) No. 4	—	—
	–	(AB41) No. 3		
Rear seat belt pretensioner LH	+	(AB41) No. 9	—	—
	–	(AB41) No. 8		
Front seat belt pretensioner LH	+	(AB41) No. 15	—	—
	–	(AB41) No. 16		
Side impact sensor (under the rear center seat)	+	(AB41) No. 20	—	—
	–	(AB41) No. 19		
Side impact sensor LH (center pillar)	+	(AB41) No. 22	—	—
	–	(AB41) No. 21		
Side impact sensor LH (rear wheel house)	+	(AB41) No. 26	—	—
	–	(AB41) No. 27		
Side impact sensor LH (front door)	+	(AB41) No. 34	—	—
	–	(AB41) No. 33		
Passenger’s airbag module (2nd stage)	+	(AB42) No. 4	—	—
	–	(AB42) No. 3		
Passenger’s airbag module	+	(AB42) No. 5	—	—
	–	(AB42) No. 6		
Driver’s knee airbag module	+	(AB42) No. 8	—	—
	–	(AB42) No. 7		
Driver’s airbag module	+	(AB42) No. 9	—	—
	–	(AB42) No. 10		
Driver’s airbag module (2nd stage)	+	(AB42) No. 21	—	—
	–	(AB42) No. 22		
Batch operation tool for disposal		(AB42) No. 26	—	—
Front impact sensor RH	+	(AB42) No. 28	—	—
	–	(AB42) No. 27		
Front impact sensor LH	+	(AB42) No. 36	—	—
	–	(AB42) No. 35		
GND		(AB42) No. 38	—	—
Body integrated unit communication line (collision detection signal)		(AB42) No. 39	—	—

Contents		Terminal No.	Measuring condition	Standard
GND		(AB42) No. 40	—	—
DCM local CAN H		(AB42) No. 42	—	—
DCM local CAN L		(AB42) No. 43	—	—
Ignition power supply		(AB42) No. 44	—	—
(G)_Chassis CAN L		(AB42) No. 45	—	—
(G)_Chassis CAN H		(AB42) No. 46	—	—
Telematics communication line (collision detection signal)		(AB42) No. 47	—	—
Battery power supply		(AB42) No. 48	—	—
Rear seat belt pretensioner RH	+	(AB43) No. 1	—	—
	–	(AB43) No. 2		
Front seat belt pretensioner RH (adaptive)	+	(AB43) No. 4	—	—
	–	(AB43) No. 3		
Occupant detection sensor power supply		(AB43) No. 5	—	—
Curtain airbag module RH	+	(AB43) No. 6	—	—
	–	(AB43) No. 7		
Side airbag module RH	+	(AB43) No. 9	—	—
	–	(AB43) No. 8		
Lap seat belt pretensioner RH	+	(AB43) No. 10	—	—
	–	(AB43) No. 11		
Front seat belt pretensioner RH	+	(AB43) No. 13	—	—
	–	(AB43) No. 12		
Occupant detection sensor GND		(AB43) No. 14	—	—
Side impact sensor RH (rear wheel house)	+	(AB43) No. 20	—	—
	–	(AB43) No. 19		
Side impact sensor RH (center pillar)	+	(AB43) No. 24	—	—
	–	(AB43) No. 25		
Buckle switch RH	+	(AB43) No. 28	—	—
	–	(AB43) No. 29		
Side impact sensor RH (front door)	+	(AB43) No. 30	—	—
	–	(AB43) No. 31		
Occupant detection sensor LIN		(AB43) No. 34	—	—

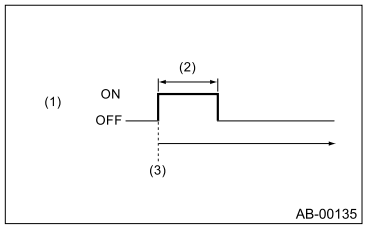
PROCEDURE

Turn the ignition switch to ON, and wait for 6 seconds or more.

INSPECTION

1. AIRBAG WARNING LIGHT

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 seconds
(3) Ignition switch ON

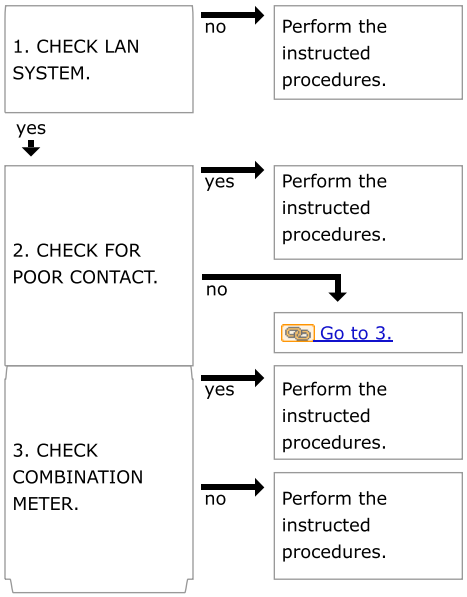
WARNING LIGHT DOES NOT ILLUMINATE

1. AIRBAG WARNING LIGHT

Detecting condition:

- Airbag warning light is faulty.
- Airbag control module to combination meter circuit is shorted or open.
- Grounding circuit is faulty.
- Airbag control module is faulty.
- Connector connection is improper.
- Connections of (AB41, AB42, AB43) to airbag control module are improper.

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



1. CHECK LAN SYSTEM.

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

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK FOR POOR CONTACT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check the connection status of airbag CM connector.

Is there poor contact of connector?

Yes	Reconnect the connector. Or repair the connector.
No	Go to 3.

3. CHECK COMBINATION METER.

Perform the diagnosis for combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes — Replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Perform the inspection according to the diagnosis for combination meter.

AIRBAG(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT REMAINS ON

Note:
For the diagnostic procedures, refer to "WARNING LIGHT DOES NOT COME ON". Ref. to AIRBAG(DIAGNOSTICS)>Warning Light Illumination Pattern>WARNING LIGHT DOES NOT ILLUMINATE.

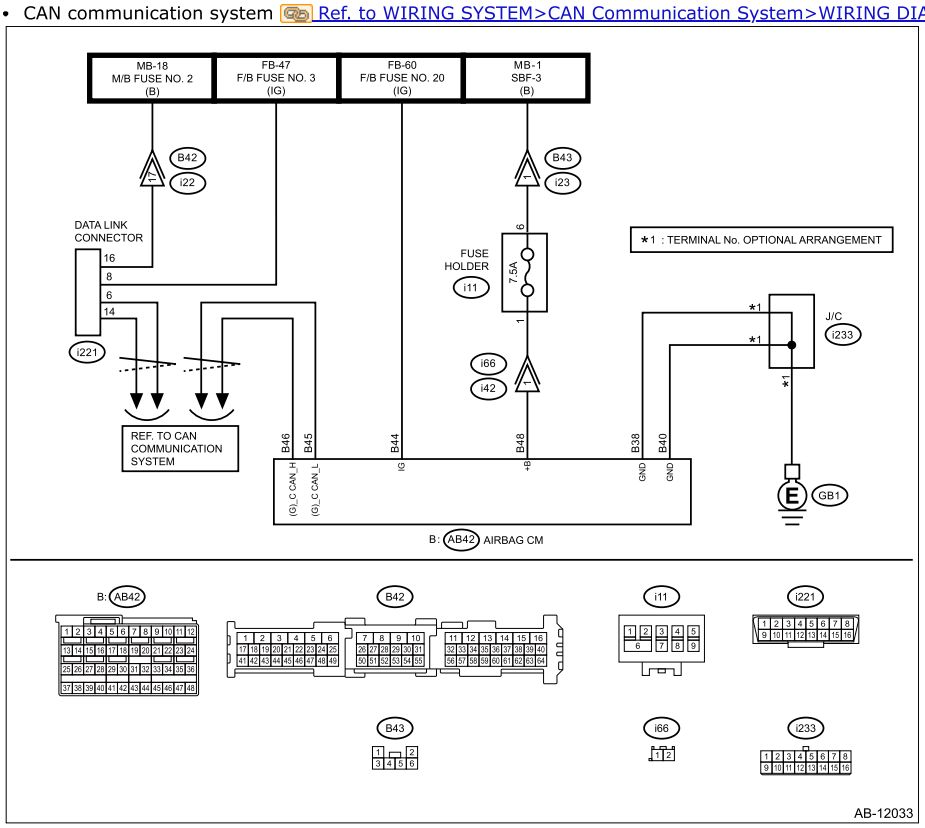
INSPECTION

Trouble symptom:
Cannot communicate with [Airbag].
DTC detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

- Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



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

1. CHECK CENTRAL Gateway CM AND SUBARU SELECT MONITOR COMMUNICATION.

Connect the Subaru Select Monitor, and check for the communication with [Central Gateway].

Is the check result OK?

Yes — Go to 5.

No — Go to 2.

2. CHECK SUBARU SELECT MONITOR.

Connect the Subaru Select Monitor to another vehicle, and check for the communication.

Is the check result OK?

Yes — Go to 3.

No — Repair or replace the Subaru Select Monitor.

3. CHECK DATA LINK CONNECTOR.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i221) No. 16 (+) — Chassis ground (−):
   (i221) No. 8 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Check the central gateway CM. Ref. to CENTRAL GATEWAY (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

No — Go to 4.

4. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove a fuse in the data link connector and visually check the fuse. Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

Is the check result OK?

Yes — Repair the harness between the battery and the data link connector.

No — Replace the fuse. If the fuse is blown out again, check the power supply circuit.

5. CHECK AIRBAG CONTROL MODULE CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Confirm that the connectors of airbag control module (AB41, AB42, AB43) are securely connected.

Is the check result OK?

Yes — Go to 6.

No — Connect the connector of the airbag control module.

6. CHECK FUSE.

Remove fuse No. 20 from the fuse & relay box, fuse SBF-3 from the main fuse box, and the fuse from the fuse holder, and perform visual inspection. Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.

Is the check result OK?

Yes — Go to 7.

No — Replace the fuse. If the fuse is blown out again, check the power supply circuit.

7. CHECK AIRBAG CM POWER SUPPLY CIRCUIT.

1. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
2. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
3. Turn the ignition switch to ON.
4. Measure the voltage between connector (2BF) in the test harness BF and chassis ground.
   Connector & terminal
   (2BF) No. 4 (+) — Chassis ground (−):
   (2BF) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Repair the harness between the airbag control module and the battery. Or replace the airbag main harness along with the bulkhead harness.

8. CHECK BETWEEN AIRBAG CONTROL MODULE AND CHASSIS GROUND (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the resistance between connector (2BF) in the test harness BF and chassis ground.
   Connector & terminal
   (2BF) No. 1 — Chassis ground:
   (2BF) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 9.
No	Repair the harness between the airbag control module and the chassis ground. Or replace the airbag main harness along with the bulkhead harness.

9. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of control module power supply, ground line and data link connector?

Yes	Repair the connector. (Replace the harness without repairing the airbag system connector.)
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Data Monitor

OPERATION

Note:
- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Data Monitor>LIST.**

AIRBAG(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Display value/unit	Note
Trip Count	Record • display the number of turning the ignition switch to ON.	Time	—
Count	-	-	—
Time Count	Record • display the time elapsed after turning the ignition switch to ON.	ms	—
Vehicle Speed	The value that the airbag CM received as data from VDC CM via CAN is displayed.	km/h	—
Ignition Voltage	Display the ignition voltage.	V	—
Passenger Occupant Status	Display the status of passenger seat's occupant.	When status is not confirmed: Unknown When the seat is unoccupied or when child restraint seat is installed: Empty or CRS When occupant is adult: Adult or Adult(AM50)	—
Passenger Airbag Status	Display the status of passenger seat's airbag.	Ignition possible: ON Ignition impossible: OFF	—
Front-Left Sensor Load Value	Load value of occupant detection sensor is displayed.	kg	—
Front-Right Sensor Load Value	Load value of occupant detection sensor is displayed.	kg	—
Rear-Left Sensor Load Value	Load value of occupant detection sensor is displayed.	kg	—
Rear-Right Sensor Load Value	Load value of occupant detection sensor is displayed.	kg	—
Total Load Value	Total load value of occupant detection sensor is displayed.	kg	—
Belt Buckle Switch RH	Display the status of passenger's seat buckle switch.	When status is not confirmed: Unknown When buckle switch is not engaged: Unbelted When buckle switch is engaged: Belted	—

AIRBAG(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Freeze Frame Data>LIST.**
- **Freeze frame data stores time stamp only at DTC occurrence.**

AIRBAG(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Record • display the number of turning the ignition switch to ON.	Time	—
Count	-	-	—
Time Count	Record • display the time elapsed after turning the ignition switch to ON.	ms	—

AIRBAG(DIAGNOSTICS) > Work Support

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Work Support.**
- **For detailed operation procedures, refer to "Help" of application.**
- **For details on the work support, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Work Support>LIST.**

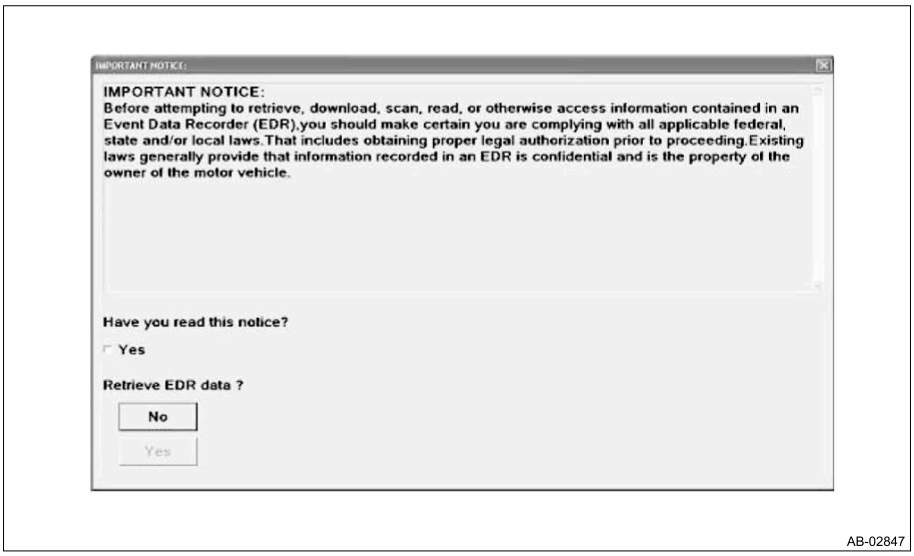
AIRBAG(DIAGNOSTICS) > Work Support

LIST

Work Support item	Contents	Remarks
ECU Parts Number	The airbag CM part number is displayed.	—
Rezeroing	Calibrate the occupant detection sensor if the airbag CM or passenger's seat was replaced with a new one, if the passenger's seat was removed/installed, or if DTC due to a minor collision was detected.	Ref. to AIRBAG SYSTEM>Rezero.
SSMID , ROMID	SSMID and ROMID of the airbag CM is displayed.	—

OPERATION

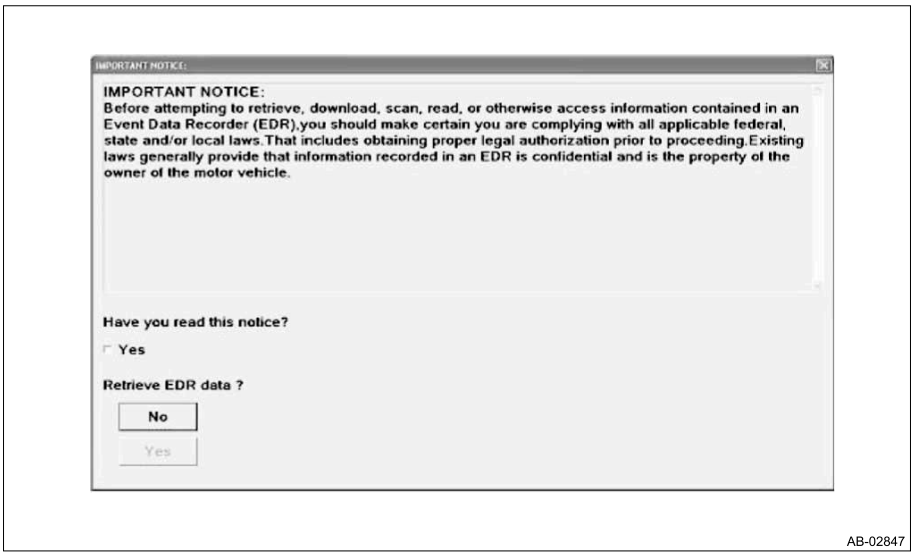
1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, input the target vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Airbag] and then select [Enter].
5. On [Airbag] screen, select [Work Support].
6. On [Work Support item] menu screen, select [Event Record Data]. After it is selected, [IMPORTANT NOTICE] screen is displayed.
7. After checking the content of [IMPORTANT NOTICE], click the checkbox for "Yes".
8. If the applicable law is not violated, click the [Yes] button to display the EDR data.



9. Select the items to be checked from each event record data.
10. Select the record data to be checked from each record data.
11. The selected record data is displayed. When no EDR data is recorded, [Event Record Data is not recorded] will be displayed.
12. Select [Exit] to return to each event record data screen.

OPERATION

1. On [Start] screen, select [Diagnosis].
2. On [Vehicle selection] screen, input the target vehicle information and select [OK].
3. On [Main Menu] screen, select [Each System].
4. On [Select System] screen, select [Airbag] and then select [Enter].
5. On [Airbag] screen, select [Work Support].
6. On [Work Support item] menu screen, select [Batch save of Event record data]. After it is selected, [IMPORTANT NOTICE] screen is displayed.
7. After checking the content of [IMPORTANT NOTICE], click the checkbox for "Yes".
8. If the applicable law is not violated, click the [Yes] button to display the EDR data.



9. Specify the destination for the event record data to save the data there.
10. After saving the file, click the [OK] button to return the menu screen.

AIRBAG(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **For detailed operation procedures, refer to "COMMON (DIAGNOSTICS)". Ref. to COMMON (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**
- **If a history code is present, priority is given to a current code to save new DTCs.**
- **DTC is not cleared even if the battery is removed.**
- **If the malfunction is already resolved when the ignition switch is turned to ON again, it is recorded as a history code.**

AIRBAG(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

DTC	Description & trouble part	Reference
B1000	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.
B1003	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1003 AIRBAG ECU MALFUNCTION.
B1007	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1007 AIRBAG ECU MALFUNCTION.
B1105	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1105 AIRBAG ECU MALFUNCTION.
B1106	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1106 AIRBAG ECU MALFUNCTION.
B1115	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1115 AIRBAG ECU MALFUNCTION.
B1116	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1116 AIRBAG ECU MALFUNCTION.
B1117	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1117 AIRBAG ECU MALFUNCTION.
B1118	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1118 AIRBAG ECU MALFUNCTION.
B1120	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1120 AIRBAG ECU MALFUNCTION.
B1121	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1121 AIRBAG ECU MALFUNCTION.
B1125	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1125 AIRBAG ECU MALFUNCTION.
B1126	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1126 AIRBAG ECU MALFUNCTION.
B1145	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1145 AIRBAG ECU MALFUNCTION.
B1146	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1146 AIRBAG ECU MALFUNCTION.
B1149	AIRBAG ECU POWER SUPPLY VOLTAGE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1149 AIRBAG ECU POWER SUPPLY VOLTAGE.

DTC	Description & trouble part	Reference
B1170	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1170 AIRBAG ECU MALFUNCTION.
B1185	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1185 AIRBAG ECU MALFUNCTION.
B1195	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1195 AIRBAG ECU MALFUNCTION.
B1196	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1196 AIRBAG ECU MALFUNCTION.
B1199	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1199 AIRBAG ECU MALFUNCTION.
B11E0	ROLLOVER DEPLOYMENT HISTORY	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11E0 ROLLOVER DEPLOYMENT HISTORY.
B11F0	DISPOSAL PROCESS COMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F0 DISPOSAL PROCESS COMPLETE.
B11F2	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F2 FRONT IMPACT DEPLOYMENT.
B11F3	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F3 FRONT IMPACT DEPLOYMENT.
B11F4	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F4 FRONT IMPACT DEPLOYMENT.
B11F5	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F5 FRONT IMPACT DEPLOYMENT.
B11F7	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.
B11F8	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F8 SIDE IMPACT DEPLOYMENT.
B11F9	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F9 SIDE IMPACT DEPLOYMENT.
B11FA	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11FA SIDE IMPACT DEPLOYMENT.
B11FB	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11FB SIDE IMPACT DEPLOYMENT.
B11FC	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11FC SIDE IMPACT DEPLOYMENT.
B1610	FRONT SUB SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1610 FRONT SUB SENSOR RH FAILURE.
B1612	FRONT SUB SENSOR RH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>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(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR.

DTC	Description & trouble part	Reference
B1615	FRONT SUB SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1615 FRONT SUB SENSOR LH FAILURE.
B1617	FRONT SUB SENSOR LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>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(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR.
B1620	SIDE AIRBAG SENSOR RH FAILURE	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	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	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	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	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION.
B1628	SIDE AIRBAG SENSOR LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
B1630	CURTAIN AIRBAG SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1630 CURTAIN AIRBAG SENSOR RH FAILURE.
B1632	CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION.
B1633	CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.
B1635	CURTAIN AIRBAG SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1635 CURTAIN AIRBAG SENSOR LH FAILURE.
B1637	CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION.
B1638	CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.
B1642	SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION	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 ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code

DTC	Description & trouble part	Reference
		(DTC)>DTC B1643 SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR.
B1647	SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1647 SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION.
B1648	SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1648 SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR.
B1655	FRONT BUCKLE SWITCH RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.
B1661	PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1661 PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE.
B1675	SATELLITE SAFING SENSOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1675 SATELLITE SAFING SENSOR FAILURE.
B1678	LOST COMMUNICATION WITH SATELLITE SAFING SENSOR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1678 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR.
B1679	SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1679 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE.
B1690	DOOR SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1690 DOOR SENSOR RH FAILURE.
B1692	LOST COMMUNICATION WITH DOOR SENSOR RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH.
B1693	DOOR SENSOR RH INITIALIZATION INCOMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.
B1695	DOOR SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1695 DOOR SENSOR LH FAILURE.
B1697	LOST COMMUNICATION WITH DOOR 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.
B16C5	VEHICLE SPEED (A/B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16C5 VEHICLE SPEED (A/B).
B16F2	FRONT SUB SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F2 FRONT SUB SENSOR RH RECOGNITION ERROR.
B16F3	FRONT SUB SENSOR LH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F3 FRONT SUB SENSOR LH RECOGNITION ERROR.
B16F4	SIDE AIRBAG SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code

DTC	Description & trouble part	Reference
		(DTC)>DTC B16F4 SIDE AIRBAG SENSOR RH RECOGNITION ERROR.
B16F5	SIDE AIRBAG SENSOR LH RECOGNITION ERROR	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	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	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F7 CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR.
B16F8	SATELLITE SAFING SENSOR RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F8 SATELLITE SAFING SENSOR RECOGNITION ERROR.
B16F9	DOOR SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F9 DOOR SENSOR RH RECOGNITION ERROR.
B16FA	DOOR SENSOR LH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16FA DOOR SENSOR LH RECOGNITION ERROR.
B1783	FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1784	FRONT RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1784 FRONT RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1785	REAR LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1785 REAR LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1786	REAR RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1786 REAR RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1788	OCCUPANT DETECTION SENSOR POWER SUPPLY	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1788 OCCUPANT DETECTION SENSOR POWER SUPPLY.
B178C	VEHICLE FACTORY CALIBRATION UNCOMPLETED	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178C VEHICLE FACTORY CALIBRATION UNCOMPLETED.
B178D	FRONT LEFT OCCUPANT DETECTION SENSOR LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178D FRONT LEFT OCCUPANT DETECTION SENSOR LOST COMMUNICATION.
B178E	FRONT RIGHT OCCUPANT DETECTION SENSOR LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178E FRONT RIGHT OCCUPANT DETECTION SENSOR LOST COMMUNICATION.
B178F	REAR LEFT OCCUPANT DETECTION SENSOR LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178F REAR LEFT OCCUPANT DETECTION SENSOR LOST COMMUNICATION.
B1790	REAR RIGHT OCCUPANT DETECTION SENSOR LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1790 REAR RIGHT OCCUPANT DETECTION SENSOR LOST COMMUNICATION.

DTC	Description & trouble part	Reference
B1791	FRONT LEFT OCCUPANT DETECTION SENSOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1791 FRONT LEFT OCCUPANT DETECTION SENSOR FAILURE.
B1792	FRONT RIGHT OCCUPANT DETECTION SENSOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1792 FRONT RIGHT OCCUPANT DETECTION SENSOR FAILURE.
B1793	REAR LEFT OCCUPANT DETECTION SENSOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1793 REAR LEFT OCCUPANT DETECTION SENSOR FAILURE.
B1794	REAR RIGHT OCCUPANT DETECTION SENSOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1794 REAR RIGHT OCCUPANT DETECTION SENSOR FAILURE.
B1796	OCCUPANT DETECTION SENSOR SERIAL ID MISMATCH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1796 OCCUPANT DETECTION SENSOR SERIAL ID MISMATCH.
B1797	OCCUPANT DETECTION SENSOR SUPPLIER ID AND FUNCTION ID MISMATCH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1797 OCCUPANT DETECTION SENSOR SUPPLIER ID AND FUNCTION ID MISMATCH.
B1800	SHORT IN DRIVER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1800 SHORT IN DRIVER'S AIRBAG.
B1801	OPEN IN DRIVER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1801 OPEN IN DRIVER'S AIRBAG.
B1802	SHORT IN DRIVER'S AIRBAG (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1802 SHORT IN DRIVER'S AIRBAG (TO GROUND).
B1803	SHORT IN DRIVER'S AIRBAG (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1803 SHORT IN DRIVER'S AIRBAG (TO +B).
B1804	SHORT IN DRIVER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1804 SHORT IN DRIVER'S AIRBAG .
B1805	SHORT IN PASSENGER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1805 SHORT IN PASSENGER'S AIRBAG.
B1806	OPEN IN PASSENGER'S AIRBAG	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)	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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1808 SHORT IN PASSENGER'S AIRBAG (TO +B).
B1809	SHORT IN PASSENGER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1809 SHORT IN PASSENGER'S AIRBAG.
B1810	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1810 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP.

DTC	Description & trouble part	Reference
B1811	OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	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)	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)	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).
B1814	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1814 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP.
B1815	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP	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	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)	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)	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).
B1819	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1819 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP.
B1820	SHORT IN SIDE AIRBAG RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1820 SHORT IN SIDE AIRBAG RH.
B1821	OPEN IN SIDE AIRBAG RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1821 OPEN IN SIDE AIRBAG RH.
B1822	SHORT IN SIDE AIRBAG RH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1822 SHORT IN SIDE AIRBAG RH (TO GROUND).
B1823	SHORT IN SIDE AIRBAG RH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1823 SHORT IN SIDE AIRBAG RH (TO +B).
B1824	SHORT IN SIDE AIRBAG RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1824 SHORT IN SIDE AIRBAG RH.
B1825	SHORT IN SIDE AIRBAG LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1825 SHORT IN SIDE AIRBAG LH.
B1826	OPEN IN SIDE AIRBAG LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1826 OPEN IN SIDE AIRBAG LH.
B1827	SHORT IN SIDE AIRBAG LH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1827 SHORT IN SIDE AIRBAG LH (TO GROUND).
B1828	SHORT IN SIDE AIRBAG LH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code

DTC	Description & trouble part	Reference
		(DTC)>DTC B1828 SHORT IN SIDE AIRBAG LH (TO +B).
B1829	SHORT IN SIDE AIRBAG LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1829 SHORT IN SIDE AIRBAG LH.
B1830	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1830 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT.
B1831	OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1832 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO GROUND).
B1833	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1833 SHORT IN CURTAIN SHIELD AIRBAG RH SQUIB CIRCUIT (TO +B).
B1834	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1834 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT.
B1835	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1835 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT.
B1836	OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1837 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND).
B1838	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1838 SHORT IN CURTAIN SHIELD AIRBAG LH SQUIB CIRCUIT (TO +B).
B1839	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1839 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT.
B1860	SHORT IN DRIVER'S KNEE AIRBAG	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	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)	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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1863 SHORT IN DRIVER’S KNEE AIRBAG (TO +B).
B1864	SHORT IN DRIVER'S KNEE AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1864 SHORT IN DRIVER'S KNEE AIRBAG .

DTC	Description & trouble part	Reference
B1900	SHORT IN FRONT P/T RH	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	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1901 OPEN IN FRONT P/T RH.
B1902	SHORT IN FRONT P/T RH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1903 SHORT IN FRONT P/T RH (TO +B).
B1904	SHORT IN FRONT P/T RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1904 SHORT IN FRONT P/T RH.
B1905	SHORT IN FRONT P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1905 SHORT IN FRONT P/T LH.
B1906	OPEN IN FRONT P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1906 OPEN IN FRONT P/T LH.
B1907	SHORT IN FRONT P/T LH (TO GROUND)	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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1908 SHORT IN FRONT P/T LH (TO +B).
B1909	SHORT IN FRONT P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1909 SHORT IN FRONT P/T LH.
B1910	SHORT IN FRONT P/T RH(ADAPTIVE)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1910 SHORT IN FRONT P/T RH(ADAPTIVE).
B1911	OPEN IN FRONT P/T RH (ADAPTIVE)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1911 OPEN IN FRONT P/T RH (ADAPTIVE).
B1912	SHORT IN FRONT P/T RH(ADAPTIVE/TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1912 SHORT IN FRONT P/T RH(ADAPTIVE/TO GROUND).
B1913	SHORT IN FRONT P/T RH(ADAPTIVE/TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1913 SHORT IN FRONT P/T RH(ADAPTIVE/TO +B).
B1918	SHORT IN FRONT P/T RH (ADAPTIVE)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1918 SHORT IN FRONT P/T RH (ADAPTIVE) .
B1920	SHORT IN REAR P/T RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1920 SHORT IN REAR P/T RH.
B1921	OPEN IN REAR P/T RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1921 OPEN IN REAR P/T RH.
B1922	SHORT IN REAR P/T RH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1922 SHORT IN REAR P/T RH (TO GROUND).

DTC	Description & trouble part	Reference
B1923	SHORT IN REAR P/T RH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1923 SHORT IN REAR P/T RH (TO +B).
B1924	SHORT IN REAR P/T RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1924 SHORT IN REAR P/T RH.
B1925	SHORT IN REAR P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1925 SHORT IN REAR P/T LH.
B1926	OPEN IN REAR P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1926 OPEN IN REAR P/T LH.
B1927	SHORT IN REAR P/T LH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1927 SHORT IN REAR P/T LH (TO GROUND).
B1928	SHORT IN REAR P/T LH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1928 SHORT IN REAR P/T LH (TO +B).
B1929	SHORT IN REAR P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1929 SHORT IN REAR P/T LH.
B19EE	SHORT IN FRONT P/T 2 RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19EE SHORT IN FRONT P/T 2 RH.
B19F0	SHORT IN FRONT P/T 2 RH	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	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)	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)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F3 SHORT IN FRONT P/T 2 RH (TO +B).
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.

DTC	Description & trouble part	Reference
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to AIRBAG(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 AIRBAG(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 AIRBAG(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 AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0417	INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to AIRBAG(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 AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

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

DTC B1000 AIRBAG ECU MALFUNCTION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Airbag CM internal circuit is faulty.

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

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of B1000, B1003, B1007, B1105, B1106, B1115, B1116, B1117, B1118, B1120, B1121, B1125, B1126, B1145, B1146, B1170, B1185, B1195, B1196 or B1199 displayed? (Current code)

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

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

DTC B1003 AIRBAG ECU MALFUNCTION

Note:
For details on DTC B1003, 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 B1007 AIRBAG ECU MALFUNCTION

Note:
For details on DTC B1007, 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 B1117 AIRBAG ECU MALFUNCTION

Note:
For details on DTC B1117, 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 B1118 AIRBAG ECU MALFUNCTION

Note:
For details on DTC B1118, 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 B1000 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)

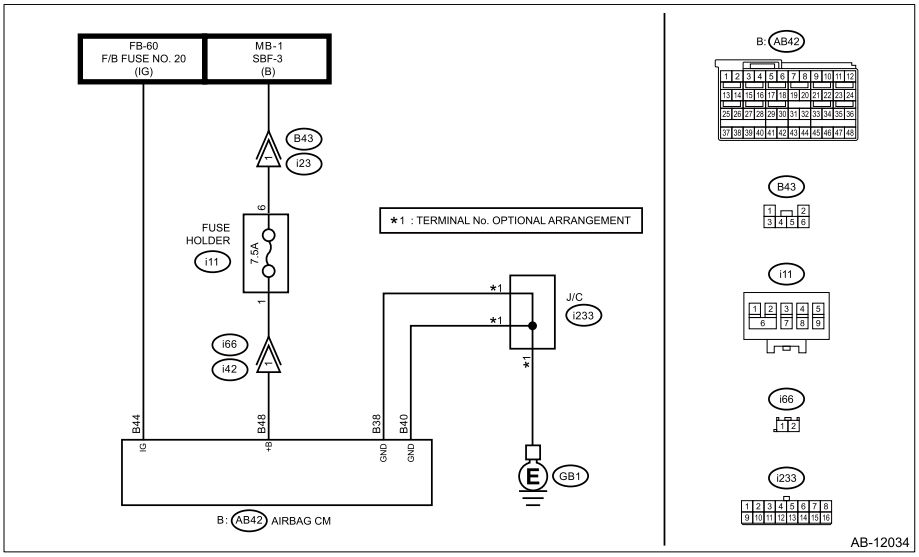
DTC B1146 AIRBAG ECU MALFUNCTION

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 B1149 AIRBAG ECU POWER SUPPLY VOLTAGE

DTC detecting condition:
Detected when an error occurs in the power supply voltage supplied to the airbag control module.
Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK DATA MONITOR.

Using Subaru Select Monitor, check the [Ignition Voltage] in the [Data Monitor] of [Airbag]. Ref. to AIRBAG(DIAGNOSTICS)>Data Monitor.

When [Ignition Voltage] is 0 V, go to A.
When [Ignition Voltage] is 0 — 11 V, go to B.
When [Ignition Voltage] is 11 — 16 V, go to C.

A — Go to 2.

B — Go to 3.

C — Go to 5.

2. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the battery OK?

Yes — Go to 3.

No — Replace or charge the battery.

3. CHECK BATTERY TERMINAL.

Check the battery terminal for poor contact.

Is there poor contact at battery terminal?

Yes — Repair poor contact of battery terminal.

No — Go to 4.

4. CHECK FUSE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove fuse No. 20 from the fuse & relay box, fuse SBF-3 from the main fuse box, and the fuse from the fuse holder, and perform visual inspection. Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.

Is the fuse OK?

Yes	Go to 5.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the airbag CM and fuse.

5. CHECK DATA MONITOR.

1. Using Subaru Select Monitor, check the [Ignition Voltage] in the [Data Monitor] of [Airbag]. Ref. to AIRBAG(DIAGNOSTICS)>Data Monitor.
2. Check [Ignition Voltage] while wiggling the harness between airbag CM connector and fuse.

Is [Ignition Voltage] 11 — 16 V?

Yes	Go to 6.
No	Repair or replace the faulty harness.

6. CHECK OPEN CIRCUIT OF AIRBAG CM GROUND CIRCUIT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector from the airbag CM.
3. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
4. Using a tester, measure the resistance between connector (2BF) in test harness BF and chassis ground.
   Connector & terminal
   (2BF) No. 1 — Chassis ground:
   (2BF) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 7.
No	Repair the open circuit in harness between airbag CM and chassis ground.

7. CHECK DTC.

1. Disconnect the test harness BF from the connectors (AB41, AB42, AB43).
2. Connect all connectors.
3. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1149 displayed? (Current code)

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 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 — 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. Therefore, refer to "Inspection Locations after a Collision" and follow the instructions indicated in it.
Ref. to AIRBAG SYSTEM>Inspection Locations after a Collision>INSPECTION.

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

DTC B11F0 DISPOSAL PROCESS COMPLETE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Airbag disposal is completed with ISO collective disposal tool.

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

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B11F0 displayed? (Current code)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

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

DTC B11F2 FRONT IMPACT DEPLOYMENT

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.

DTC detecting condition:
This DTC is displayed when the front airbag module and pretensioner are deployed.
Once this DTC is displayed, the memory cannot be cleared. Therefore, refer to "Inspection Locations after a Collision" and follow the instructions indicated in it.
Ref. to AIRBAG SYSTEM>Inspection Locations after a Collision>INSPECTION.

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 — 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. Therefore, refer to "Inspection Locations after a Collision" and follow the instructions indicated in it.
Ref. to AIRBAG SYSTEM>Inspection Locations after a Collision>INSPECTION.

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 B11F7 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.

DTC B1610 FRONT SUB SENSOR RH FAILURE

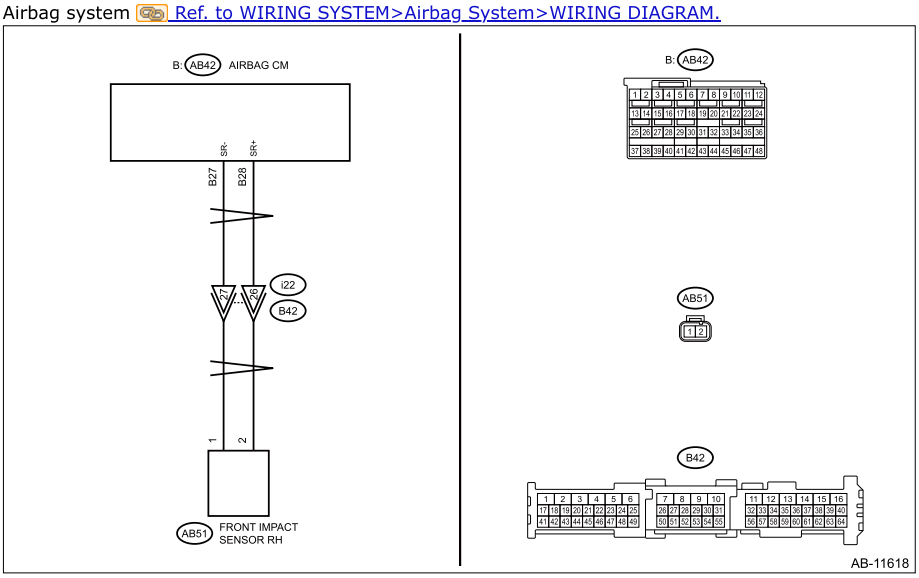
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Front impact sensor RH is faulty.
If DTC B1610 is displayed, the circuit within Front impact sensor RH is faulty.
Replace Front impact sensor RH. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > FRONT IMPACT SENSOR.

DTC B1612 FRONT SUB SENSOR RH LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Front impact sensor bus RH
- Front impact sensor RH is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB42, B42, AB51) between the airbag control module and Front impact sensor RH.

Is there poor contact?

Yes — Replace the bulkhead harness or airbag main harness.

No — Go to 2.

2. CHECK Front impact sensor RH.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Front impact sensor RH with Front impact sensor LH. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > FRONT IMPACT SENSOR.
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1612 or B1613 displayed? (Current code)

Yes — Go to 3.

No — Replace Front impact sensor RH that was attached on the right side at first. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > FRONT IMPACT SENSOR.

3. CHECK AIRBAG MAIN HARNESS (Front impact sensor BUS RH) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB83) from the passenger's airbag module.
4. Disconnect the connector (AB86) from the driver's knee airbag module.
5. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
6. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
7. Disconnect the connector (AB51) from Front impact sensor RH.
8. Using a probe, measure the resistance between the connectors (2BF), (8BF) in test harness BF and connector (AB51). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(8BF) No. 6 — (AB51) No. 1:
(2BF) No. 11 — (AB51) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Check the bulkhead harness or airbag main harness, and replace the faulty harness.

4. CHECK AIRBAG MAIN HARNESS (Front impact sensor BUS RH) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connectors (2BF), (8BF) in the test harness BF and chassis ground, and the resistance between the connectors (2BF) and (8BF) in the test harness BF.

Connector & terminal
(8BF) No. 6 — Chassis ground:
(2BF) No. 11 — Chassis ground:
(8BF) No. 6 — (2BF) No. 11:

Is the resistance 1 MΩ or more?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Check the bulkhead harness or airbag main harness, and replace the faulty harness.

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

DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR

Note:
For details on DTC B1613, refer to DTC B1612. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1612 FRONT SUB SENSOR RH LOST COMMUNICATION.

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

DTC B1615 FRONT SUB SENSOR LH FAILURE

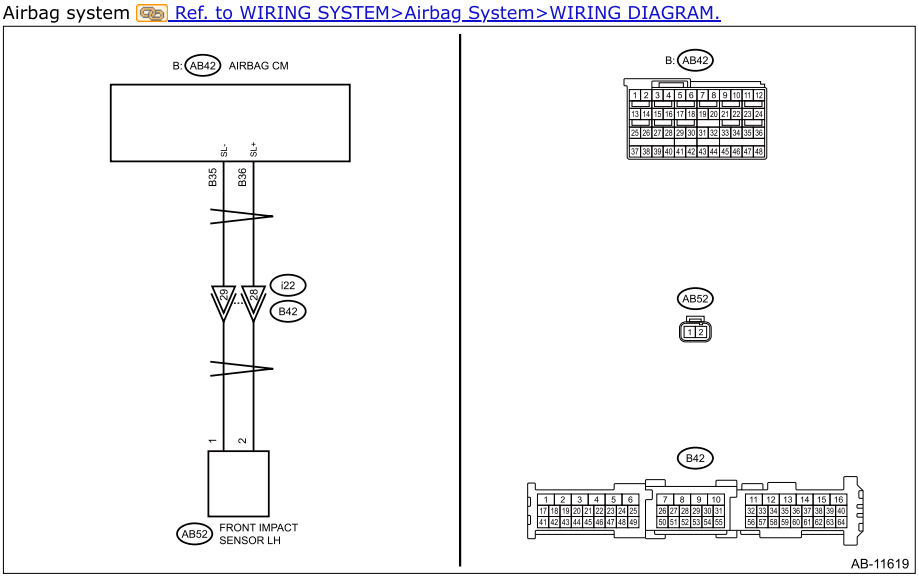
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Front impact sensor LH is faulty.
If DTC B1615 is displayed, the circuit within Front impact sensor LH is faulty.
Replace Front impact sensor LH. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > FRONT IMPACT SENSOR.

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

DTC B1617 FRONT SUB SENSOR LH LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Open or short circuit in harness of Front impact sensor bus LH
- Front impact sensor LH is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB42, B42, AB52) between the airbag control module and Front impact sensor LH.

Is there poor contact?

Yes — Replace the bulkhead harness or airbag main harness.

No — Go to 2.

2. CHECK Front impact sensor LH.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Front impact sensor LH with Front impact sensor RH. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > FRONT IMPACT SENSOR.
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1617 or B1618 displayed? (Current code)

Yes	Go to 3.
No	Replace Front impact sensor LH that was attached on the left side at first. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > FRONT IMPACT SENSOR.

3. CHECK AIRBAG MAIN HARNESS (Front impact sensor BUS LH) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB83) from the passenger's airbag module.
4. Disconnect the connector (AB86) from the driver's knee airbag module.
5. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
6. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
7. Disconnect the connector (AB52) from Front impact sensor LH.
8. Using a probe, measure the resistance between the connectors (2BF), (8BF) in test harness BF and connector (AB52). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(8BF) No. 5 — (AB52) No. 1:
(2BF) No. 10 — (AB52) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Check the bulkhead harness or airbag main harness, and replace the faulty harness.

4. CHECK AIRBAG MAIN HARNESS (Front impact sensor BUS LH) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connectors (2BF), (8BF) in the test harness BF and chassis ground, and the resistance between the connectors (2BF) and (8BF) in the test harness BF.

Connector & terminal
(8BF) No. 5 — Chassis ground:
(2BF) No. 10 — Chassis ground:
(8BF) No. 5 — (2BF) No. 10:

Is the resistance 1 MΩ or more?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Check the bulkhead harness or airbag main harness, and replace the faulty harness.

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

DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR

Note:
For details on DTC B1618, refer to DTC B1617. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1617 FRONT SUB SENSOR LH LOST COMMUNICATION.

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

DTC B1620 SIDE AIRBAG SENSOR RH FAILURE

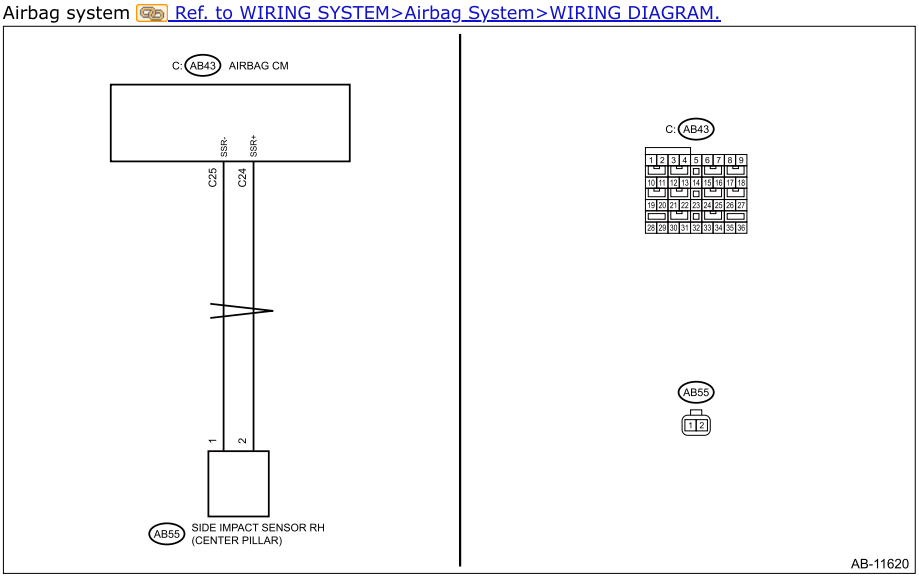
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Side impact sensor RH (center pillar) is faulty.
If DTC B1620 is displayed, the circuit within Side impact sensor RH (center pillar) is faulty.
Replace Side impact sensor RH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).

DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Side impact sensor RH (center pillar)
- Side impact sensor RH (center pillar) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB43, AB55) between the airbag control module and Side impact sensor RH (center pillar).

Is there poor contact?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 2.

2. CHECK Side impact sensor RH (center pillar).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (center pillar) with Side impact sensor LH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1622 or B1623 displayed? (Current code)

Yes — Go to 3.

No — Replace Side impact sensor RH (center pillar) that was attached on the right side at first. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (center pillar)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from Rear seatbelt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect the connector (AB55) from Side impact sensor RH (center pillar).
10. Using a probe, measure the resistance between the connector (4BF) in test harness BF and connector (AB55). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(4BF) No. 1 — (AB55) No. 2:
(4BF) No. 5 — (AB55) No. 1:

Is the resistance less than 10 Ω?

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 impact sensor RH (center pillar)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 1 — Chassis ground:
(4BF) No. 5 — Chassis ground:
(4BF) No. 1 — (4BF) No. 5:

Is the resistance 1 MΩ or more?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace the airbag rear harness along with body harness.

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

DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR

Note:
For details on DTC B1623, refer to DTC B1622. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION.

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

DTC B1625 SIDE AIRBAG SENSOR LH FAILURE

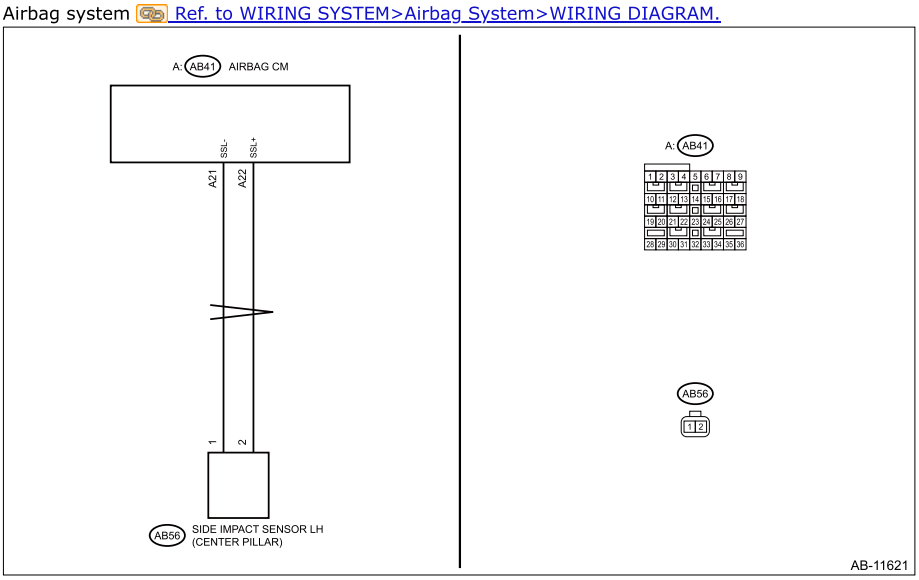
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Side impact sensor LH (center pillar) is faulty.
If DTC B1625 is displayed, the circuit within Side impact sensor LH (center pillar) is faulty.
Replace Side impact sensor LH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).

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

DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Open or short circuit in harness of Side impact sensor LH (center pillar)
- Side impact sensor LH (center pillar) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB41, AB56) between the airbag control module and Side impact sensor LH (center pillar).

Is there poor contact?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 2.

2. CHECK Side impact sensor LH (center pillar).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (center pillar) with Side impact sensor RH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1627 or B1628 displayed? (Current code)

Yes — Go to 3.

No — Replace Side impact sensor LH (center pillar) that was attached on the left side at first. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (center pillar)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB94) from seat belt pretensioner LH.
3. Disconnect the connector (AB100) from rear seat belt pretensioner LH.
4. Disconnect the connector (AB88) from side airbag module LH.
5. Disconnect the connector (AB92) from curtain airbag module LH.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Disconnect the connector (AB56) from Side impact sensor LH (center pillar).
9. Using a probe, measure the resistance between the connector (6BF) in test harness BF and connector (AB56). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(6BF) No. 1 — (AB56) No. 1:
(6BF) No. 6 — (AB56) No. 2:

Is the resistance less than 10 Ω?

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 impact sensor LH (center pillar)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

Connector & terminal
(6BF) No. 1 — Chassis ground:
(6BF) No. 6 — Chassis ground:
(6BF) No. 1 — (6BF) No. 6:

Is the resistance 1 MΩ or more?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace the airbag rear harness along with body harness.

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

DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR

Note:
For details on DTC B1628, refer to DTC B1627. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION.

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 — 16 V.
DTC detecting condition:
Side impact sensor RH (rear wheel house) is faulty.
If DTC B1630 is displayed, the circuit within Side impact sensor RH (rear wheel house) is faulty.
Replace Side impact sensor RH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).

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

DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION

Diagnosis start condition:

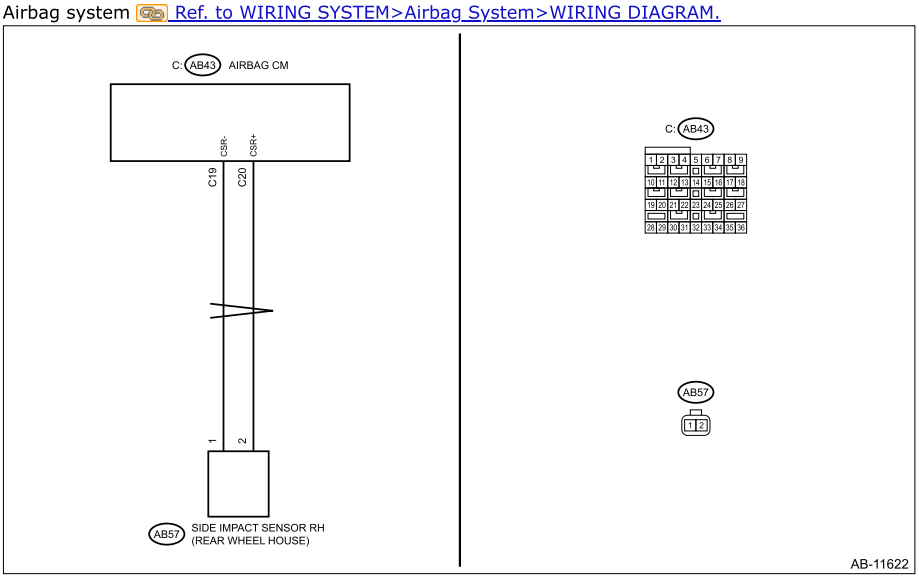
When the ignition voltage is 10 — 16 V.

DTC detecting condition:

- Open or short circuit in harness of Side impact sensor RH (rear wheel house)
- Side impact sensor RH (rear wheel house) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB43, AB57) between the airbag control module and Side impact sensor RH (rear wheel house).

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK Side impact sensor RH (rear wheel house).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (rear wheel house) with Side impact sensor LH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1632 or B1633 displayed? (Current code)

Yes	Go to 3.
No	Replace Side impact sensor RH (rear wheel house) that was attached on the right side at first. Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (rear wheel house)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from Rear seatbelt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect the connector (AB57) from Side impact sensor RH (rear wheel house).
10. Using a probe, measure the resistance between the connector (4BF) in test harness BF and connector (AB57). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(4BF) No. 6 — (AB57) No. 1:
(4BF) No. 2 — (AB57) No. 2:

Is the resistance less than 10 Ω?

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 impact sensor RH (rear wheel house)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 6 — Chassis ground:
(4BF) No. 2 — Chassis ground:
(4BF) No. 6 — (4BF) No. 2:

Is the resistance 1 MΩ or more?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace the airbag rear harness along with body harness.

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

DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR

Note:
For details on DTC B1633, refer to DTC B1632. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION.

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

DTC B1635 CURTAIN AIRBAG SENSOR LH FAILURE

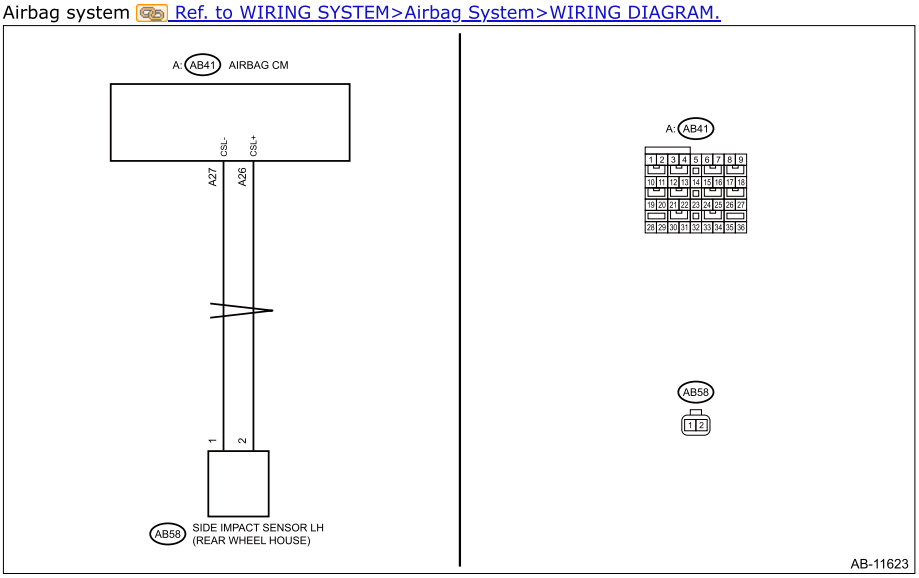
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Side impact sensor LH (rear wheel house) is faulty.
If DTC B1635 is displayed, the circuit within Side impact sensor LH (rear wheel house) is faulty.
Replace Side impact sensor LH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).

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

DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Open or short circuit in harness of Side impact sensor LH (rear wheel house)
- Side impact sensor LH (rear wheel house) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB41, AB58) between the airbag control module and Side impact sensor LH (rear wheel house).

Is there poor contact?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 2.

2. CHECK Side impact sensor LH (rear wheel house).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (rear wheel house) with Side impact sensor RH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1637 or B1638 displayed? (Current code)

Yes — Go to 3.

No — Replace Side impact sensor LH (rear wheel house) that was attached on the left side at first. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (rear wheel house)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB94) from seat belt pretensioner LH.
3. Disconnect the connector (AB100) from rear seat belt pretensioner LH.
4. Disconnect the connector (AB88) from side airbag module LH.
5. Disconnect the connector (AB92) from curtain airbag module LH.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Disconnect the connector (AB58) from Side impact sensor LH (rear wheel house).
9. Using a probe, measure the resistance between the connector (6BF) in test harness BF and connector (AB58). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(6BF) No. 7 — (AB58) No. 1:
(6BF) No. 2 — (AB58) No. 2:

Is the resistance less than 10 Ω?

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 impact sensor LH (rear wheel house)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

Connector & terminal
(6BF) No. 7 — Chassis ground:
(6BF) No. 2 — Chassis ground:
(6BF) No. 7 — (6BF) No. 2:

Is the resistance 1 MΩ or more?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace the airbag rear harness along with body harness.

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

DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR

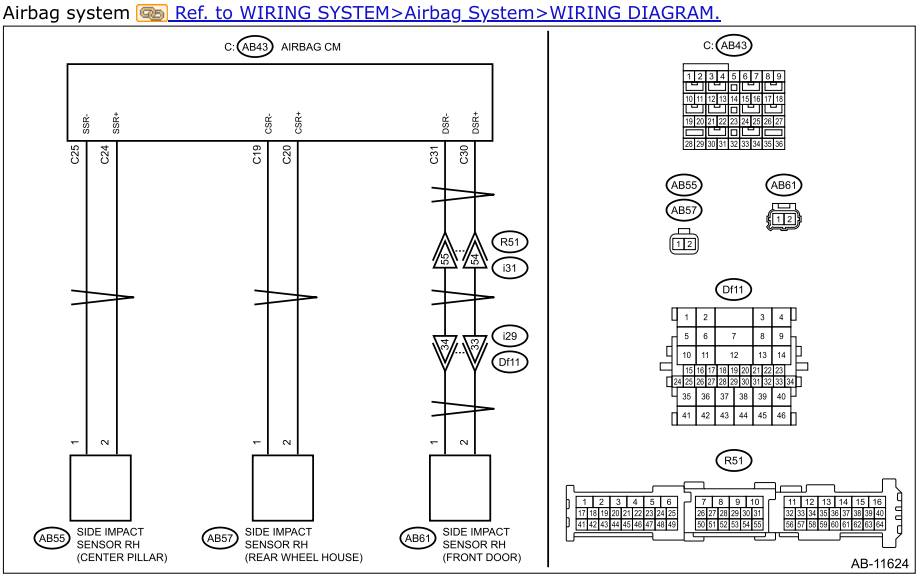
Note:
For details on DTC B1638, refer to DTC B1637. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION.

DTC B1642 SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Side impact sensor RH (center pillar)
- Side impact sensor RH (center pillar) is faulty.
- Open or short circuit in harness of Side impact sensor RH (rear wheel house)
- Side impact sensor RH (rear wheel house) is faulty.
- Open or short circuit in harness of Side impact sensor RH (front door)
- Side impact sensor RH (front door) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1622 or B1623 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1622 or B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1632 or B1633 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1632 or B1633. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.

No — Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1692 or B1693 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1692 or B1693. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.

No — Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

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

Is there poor contact?

Yes — Replace the airbag rear harness and the door harness.

No — Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (center pillar)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from Rear seatbelt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect the connector (AB55) from Side impact sensor RH (center pillar).
10. Using a probe, measure the resistance between the connector (4BF) in test harness BF and connector (AB55). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(4BF) No. 1 — (AB55) No. 2:
(4BF) No. 5 — (AB55) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 6.

No — Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (center pillar)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal

(4BF) No. 1 — Chassis ground:
(4BF) No. 5 — Chassis ground:
(4BF) No. 1 — (4BF) No. 5:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (rear wheel house)) (OPEN CIRCUIT).

1. Disconnect the connector (AB57) from Side impact sensor RH (rear wheel house).
2. Using a probe, measure the resistance between the connector (4BF) in test harness BF and connector (AB57). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal

(4BF) No. 6 — (AB57) No. 1:
(4BF) No. 2 — (AB57) No. 2:

Is the resistance less than 10 Ω?

Yes — Go to 8.

No — Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (rear wheel house)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal

(4BF) No. 6 — Chassis ground:
(4BF) No. 2 — Chassis ground:
(4BF) No. 6 — (4BF) No. 2:

Is the resistance 1 MΩ or more?

Yes — Go to 9.

No — Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (front door)) (OPEN CIRCUIT).

1. Disconnect the connector (AB61) from Side impact sensor RH (front door).
2. Connect the connector (1BG) in the test harness BG to the connector (AB61).
3. Measure the resistance between connector (4BF) in the test harness BF and connector (2BG) in the test harness BG.

Connector & terminal

(4BF) No. 7 — (2BG) No. 2:
(4BF) No. 3 — (2BG) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 10.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (front door)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal

(4BF) No. 7 — Chassis ground:
(4BF) No. 3 — Chassis ground:
(4BF) No. 7 — (4BF) No. 3:

Is the resistance 1 MΩ or more?

Yes — Go to 11.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Disconnect all test harnesses.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1642 displayed? (Current code)

Yes — Go to 12.

No — Finish the diagnosis.

12. REPLACE Side impact sensor RH (center pillar) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1642 displayed? (Current code)

Yes	Go to 13.
No	Finish the diagnosis.

13. REPLACE Side impact sensor RH (rear wheel house) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1642 displayed? (Current code)

Yes	Go to 14.
No	Finish the diagnosis.

14. REPLACE Side impact sensor RH (front door) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) .
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1642 displayed? (Current code)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Finish the diagnosis.

DTC B1643 SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR

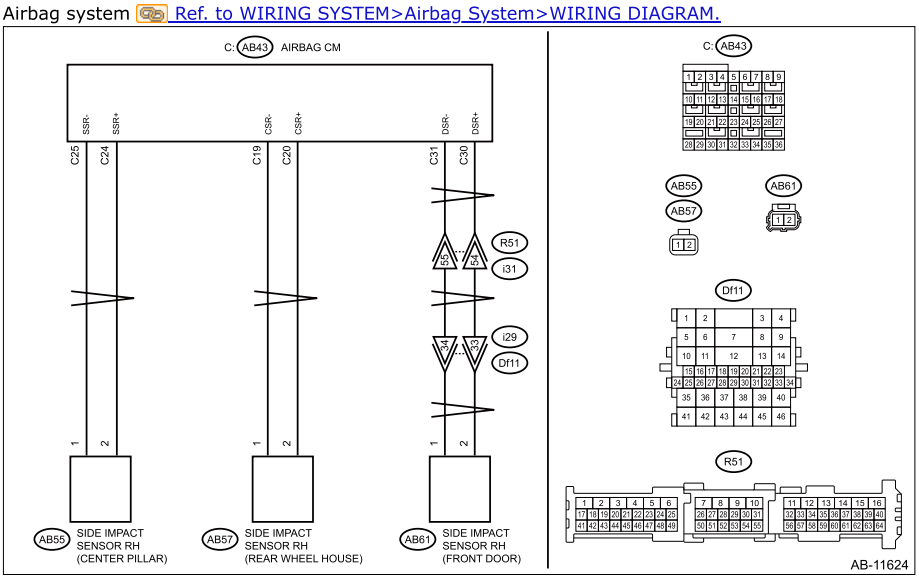
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Side impact sensor RH (center pillar) harness circuit is shorted to power supply or ground, or shorted between lines.

- Side impact sensor RH (center pillar) is faulty.
- Side impact sensor RH (rear wheel house) harness circuit is shorted to power supply or ground, or shorted between lines.
- Side impact sensor RH (rear wheel house) is faulty.
- Side impact sensor RH (front door) harness circuit is shorted to power supply or ground, or shorted between lines.
- Side impact sensor RH (front door) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

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

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1622 or B1623 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1622 or B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1632 or B1633 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1632 or B1633. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.

No — Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1692 or B1693 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1692 or B1693. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.

No — Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

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

Is there poor contact?

Yes — Replace the airbag rear harness and the door harness.

No — Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (center pillar)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from Rear seatbelt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect the connector (AB55) from Side impact sensor RH (center pillar).
10. Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

    Connector & terminal

    (4BF) No. 1 — Chassis ground:

    (4BF) No. 5 — Chassis ground:

    (4BF) No. 1 — (4BF) No. 5:

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 AIRBAG CONTROL MODULE AND Side impact sensor RH (center pillar)) (SHORT CIRCUIT TO POWER SUPPLY).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.
   Connector & terminal
   (4BF) No. 1 (+) — Chassis ground (−):
   (4BF) No. 5 (+) — 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 (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (rear wheel house)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB57) from Side impact sensor RH (rear wheel house).
3. Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.
   Connector & terminal
   (4BF) No. 6 — Chassis ground:
   (4BF) No. 2 — Chassis ground:
   (4BF) No. 6 — (4BF) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 8.
No	Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (rear wheel house)) (SHORT CIRCUIT TO POWER SUPPLY).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.
   Connector & terminal
   (4BF) No. 6 (+) — Chassis ground (−):
   (4BF) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 9.
No	Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (front door)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB61) from Side impact sensor RH (front door).
3. Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.
   Connector & terminal
   (4BF) No. 7 — Chassis ground:
   (4BF) No. 3 — Chassis ground:
   (4BF) No. 7 — (4BF) No. 3:

Is the resistance 1 MΩ or more?

Yes — Go to 10.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (front door)) (SHORT CIRCUIT TO POWER SUPPLY).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.
   Connector & terminal
   (4BF) No. 7 (+) — Chassis ground (−):
   (4BF) No. 3 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 11.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1643 displayed? (Current code)

Yes — Go to 12.

No — Finish the diagnosis.

12. REPLACE Side impact sensor RH (center pillar) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1643 displayed? (Current code)

Yes — Go to 13.

No — Finish the diagnosis.

13. REPLACE Side impact sensor RH (rear wheel house) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1643 displayed? (Current code)

Yes — Go to 14.

No — Finish the diagnosis.

14. REPLACE Side impact sensor RH (front door) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor RH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) .
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1643 displayed? (Current code)

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Finish the diagnosis.

DTC B1647 SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION

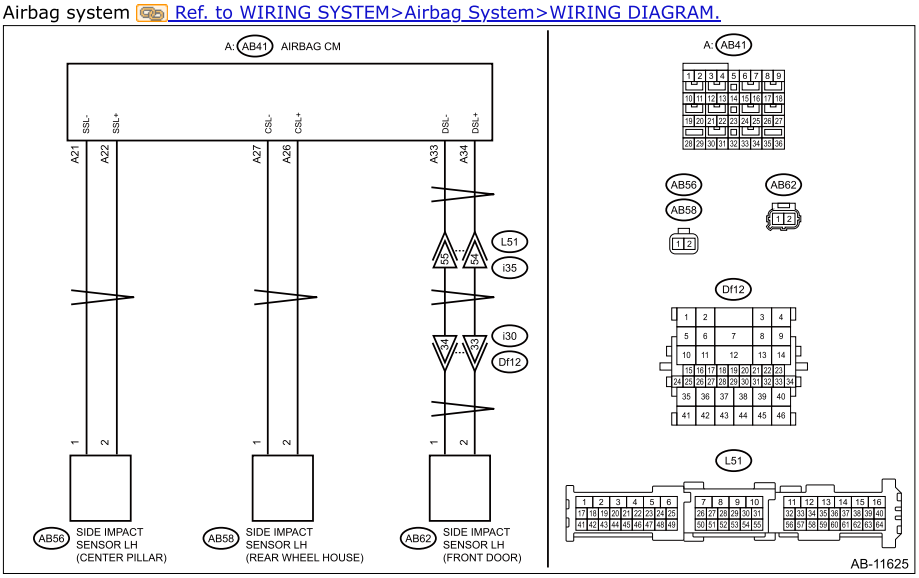
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Side impact sensor LH (center pillar)

- Side impact sensor LH (center pillar) is faulty.
- Open or short circuit in harness of Side impact sensor LH (rear wheel house)
- Side impact sensor LH (rear wheel house) is faulty.
- Open or short circuit in harness of Side impact sensor LH (front door)
- Side impact sensor LH (front door) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

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

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1627 or B1628 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1627 or B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1637 or B1638 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1637 or B1638. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.

No — Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1697 or B1698 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1697 or B1698. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.

No — Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

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

Is there poor contact?

Yes — Replace the airbag rear harness and the door harness.

No — Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (center pillar)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB94) from seat belt pretensioner LH.
3. Disconnect the connector (AB100) from rear seat belt pretensioner LH.
4. Disconnect the connector (AB88) from side airbag module LH.
5. Disconnect the connector (AB92) from curtain airbag module LH.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Disconnect the connector (AB56) from Side impact sensor LH (center pillar).
9. Using a probe, measure the resistance between the connector (6BF) in test harness BF and connector (AB56). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(6BF) No. 1 — (AB56) No. 1:
(6BF) No. 6 — (AB56) No. 2:

Is the resistance less than 10 Ω?

Yes — Go to 6.

No — Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (center pillar)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

Connector & terminal

(6BF) No. 1 — Chassis ground:
(6BF) No. 6 — Chassis ground:
(6BF) No. 1 — (6BF) No. 6:

Is the resistance 1 MΩ or more?

Yes — Go to 7.

No — Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (rear wheel house)) (OPEN CIRCUIT).

1. Disconnect the connector (AB58) from Side impact sensor LH (rear wheel house).
2. Using a probe, measure the resistance between the connector (6BF) in test harness BF and connector (AB58). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal

(6BF) No. 7 — (AB58) No. 1:
(6BF) No. 2 — (AB58) No. 2:

Is the resistance less than 10 Ω?

Yes — Go to 8.

No — Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (rear wheel house)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

Connector & terminal

(6BF) No. 7 — Chassis ground:
(6BF) No. 2 — Chassis ground:
(6BF) No. 7 — (6BF) No. 2:

Is the resistance 1 MΩ or more?

Yes — Go to 9.

No — Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (front door)) (OPEN CIRCUIT).

1. Disconnect the connector (AB62) from Side impact sensor LH (front door).
2. Connect the connector (1BG) in the test harness BG to the connector (AB62).
3. Measure the resistance between connector (6BF) in the test harness BF and connector (2BG) in the test harness BG.

Connector & terminal

(6BF) No. 8 — (2BG) No. 2:
(6BF) No. 3 — (2BG) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 10.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (front door)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

Connector & terminal

(6BF) No. 8 — Chassis ground:
(6BF) No. 3 — Chassis ground:
(6BF) No. 8 — (6BF) No. 3:

Is the resistance 1 MΩ or more?

Yes — Go to 11.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Disconnect all test harnesses.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1647 displayed? (Current code)

Yes — Go to 12.

No — Finish the diagnosis.

12. REPLACE Side impact sensor LH (center pillar) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1647 displayed? (Current code)

Yes	Go to 13.
No	Finish the diagnosis.

13. REPLACE Side impact sensor LH (rear wheel house) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1647 displayed? (Current code)

Yes	Go to 14.
No	Finish the diagnosis.

14. REPLACE Side impact sensor LH (front door) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) .
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1647 displayed? (Current code)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Finish the diagnosis.

DTC B1648 SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR

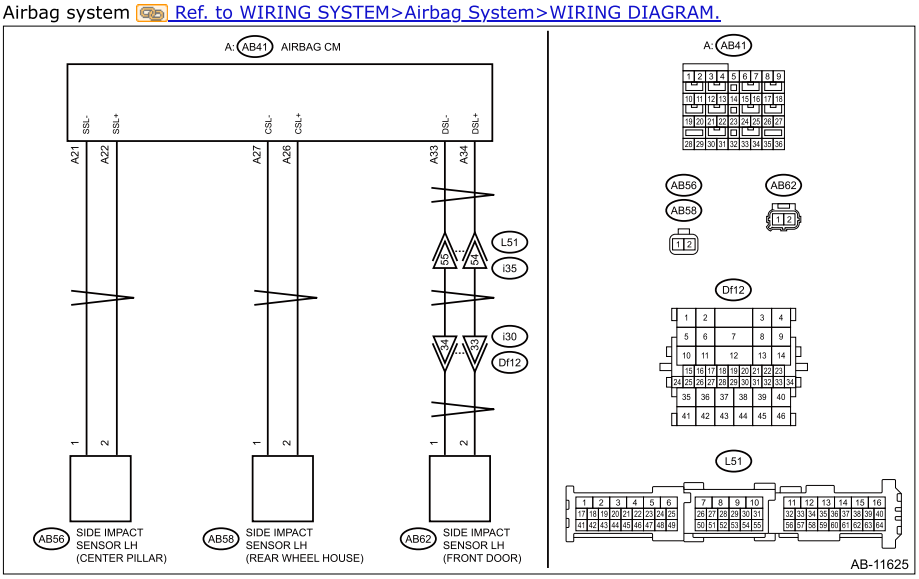
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Side impact sensor LH (center pillar) harness circuit is shorted to power supply or ground, or shorted between lines.

- Side impact sensor LH (center pillar) is faulty.
- Side impact sensor LH (rear wheel house) harness circuit is shorted to power supply or ground, or shorted between lines.
- Side impact sensor LH (rear wheel house) is faulty.
- Side impact sensor LH (front door) harness circuit is shorted to power supply or ground, or shorted between lines.
- Side impact sensor LH (front door) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

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

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1627 or B1628 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1627 or B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.

No — Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1637 or B1638 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1637 or B1638. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.

No — Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1697 or B1698 displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1697 or B1698. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.

No — Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

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

Is there poor contact?

Yes — Replace the airbag rear harness and the door harness.

No — Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (center pillar)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB94) from seat belt pretensioner LH.
3. Disconnect the connector (AB100) from rear seat belt pretensioner LH.
4. Disconnect the connector (AB88) from side airbag module LH.
5. Disconnect the connector (AB92) from curtain airbag module LH.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Disconnect the connector (AB56) from Side impact sensor LH (center pillar).
9. Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

   Connector & terminal

   (6BF) No. 1 — Chassis ground:

   (6BF) No. 6 — Chassis ground:

   (6BF) No. 1 — (6BF) No. 6:

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 AIRBAG CONTROL MODULE AND Side impact sensor LH (center pillar)) (SHORT CIRCUIT TO POWER SUPPLY).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (6BF) in the test harness BF and chassis ground.
   Connector & terminal
   (6BF) No. 1 (+) — Chassis ground (−):
   (6BF) No. 6 (+) — 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 (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (rear wheel house)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB58) from Side impact sensor LH (rear wheel house).
3. Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.
   Connector & terminal
   (6BF) No. 7 — Chassis ground:
   (6BF) No. 2 — Chassis ground:
   (6BF) No. 7 — (6BF) No. 2:

Is the resistance 1 MΩ or more?

Yes — Go to 8.

No — Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (rear wheel house)) (SHORT CIRCUIT TO POWER SUPPLY).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (6BF) in the test harness BF and chassis ground.
   Connector & terminal
   (6BF) No. 7 (+) — Chassis ground (−):
   (6BF) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 9.

No — Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (front door)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB62) from Side impact sensor LH (front door).
3. Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.
   Connector & terminal
   (6BF) No. 8 — Chassis ground:
   (6BF) No. 3 — Chassis ground:
   (6BF) No. 8 — (6BF) No. 3:

Is the resistance 1 MΩ or more?

Yes — Go to 10.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (front door)) (SHORT CIRCUIT TO POWER SUPPLY).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (6BF) in the test harness BF and chassis ground.
   Connector & terminal
   (6BF) No. 8 (+) — Chassis ground (−):
   (6BF) No. 3 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 11.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1648 displayed? (Current code)

Yes — Go to 12.

No — Finish the diagnosis.

12. REPLACE Side impact sensor LH (center pillar) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (center pillar). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (CENTER PILLAR).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1648 displayed? (Current code)

Yes — Go to 13.

No — Finish the diagnosis.

13. REPLACE Side impact sensor LH (rear wheel house) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (rear wheel house). Ref. to AIRBAG SYSTEM>Impact Sensor>INSTALLATION > SIDE IMPACT SENSOR (REAR WHEEL HOUSE).
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1648 displayed? (Current code)

Yes — Go to 14.

No — Finish the diagnosis.

14. REPLACE Side impact sensor LH (front door) AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace Side impact sensor LH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) .
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1648 displayed? (Current code)

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Finish the diagnosis.

DTC B1655 FRONT BUCKLE SWITCH RH FAILURE

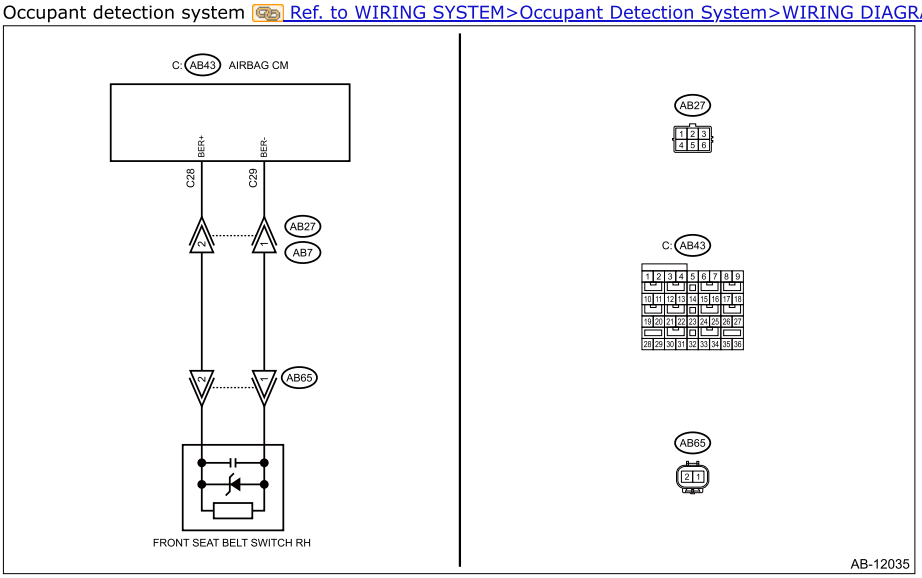
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Buckle switch RH is faulty.

- Seat harness is faulty.
- Airbag rear harness is faulty.

Wiring diagram:

Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

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

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC for [Airbag ECU Malfunction] displayed? (Current code)

Yes — Perform the diagnosis for [Airbag ECU Malfunction]. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

No — Go to 2.

2. CHECK AIRBAG REAR HARNESS AND SEAT HARNESS (BETWEEN AIRBAG CONTROL MODULE AND BUCKLE SWITCH) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from Rear seatbelt pretensioner RH.
5. Disconnect the connector (AB91) from curtain airbag module RH.
6. Disconnect the connector (AB87) of side airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect the connector (AB65) from the passenger's buckle switch.
10. Connect the connector (2D) in the test harness D to the connector (AB65).
11. Using a tester, measure the resistance in between connector (4BF) in the test harness BF and connector (3D) in the test harness D.

Connector & terminal

(4BF) No. 17 — (3D) No. 5:

(4BF) No. 12 — (3D) No. 6:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with body harness.

3. CHECK AIRBAG REAR HARNESS AND SEAT HARNESS (BETWEEN AIRBAG CONTROL MODULE AND BUCKLE SWITCH) (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between connector (3D) in the test harness D and chassis ground, and between connector (3D) terminals.

Connector & terminal

(3D) No. 5 — (3D) No. 6:

(3D) No. 5 — Chassis ground:

(3D) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with body harness.

4. CHECK AIRBAG REAR HARNESS AND SEAT HARNESS (BETWEEN AIRBAG CONTROL MODULE AND BUCKLE SWITCH) (BATTERY SHORT).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using a tester, measure the voltage between connector (3D) in test harness D and chassis ground.

Connector & terminal

(3D) No. 5 (+) — Chassis ground (−):

(3D) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 5.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with body harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check for poor contact in airbag control module connector and passenger's buckle switch connector.

Is the check result OK?

Yes	Go to 6.
No	Repair or replace the poor contact part.

6. CHECK PASSENGER'S SEAT BUCKLE SWITCH.

1. Disconnect all test harnesses.
2. Connect the airbag control module connector.
3. Connect the test harness AE and test harness Y to buckle switch connector (AB65).
4. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1655 displayed? (Current code)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace the buckle switch. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL.

DTC B1661 PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V.
DTC detecting condition:
Passenger’s airbag indicator failure received (CAN signal from combination meter)

Note:
Perform the diagnosis for combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

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

DTC B1675 SATELLITE SAFING SENSOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Side impact sensor (under the rear center seat) is faulty.
If DTC B1675 is displayed, the circuit within Side impact sensor (under the rear center seat) is faulty.
Replace Side impact sensor (under the rear center seat). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (UNDER THE REAR CENTER SEAT).

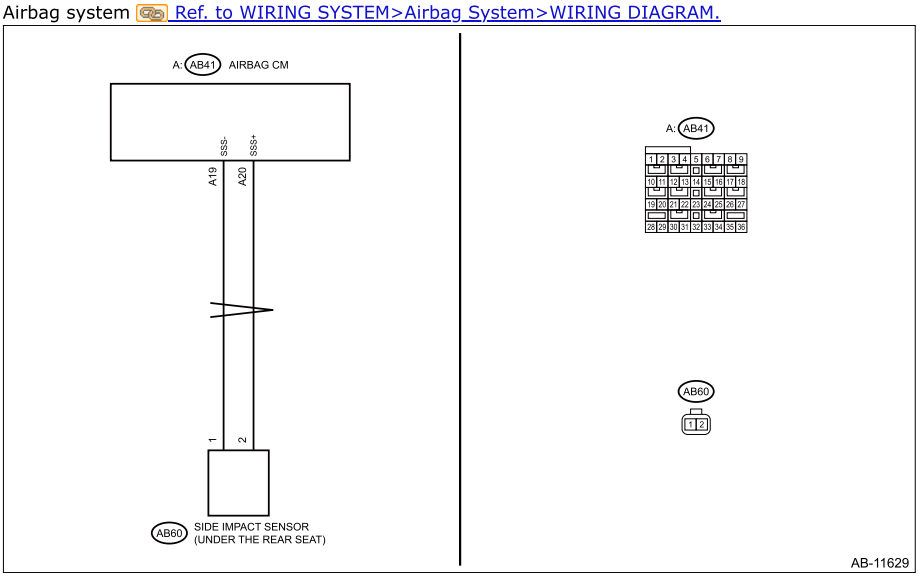
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1678 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Side impact sensor (under the rear center seat)
- Side impact sensor (under the rear center seat) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB41, AB60) between the airbag control module and Side impact sensor (under the rear center seat).

Is there poor contact?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 2.

2. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB94) from seat belt pretensioner LH.
3. Disconnect the connector (AB100) from rear seat belt pretensioner LH.
4. Disconnect the connector (AB92) from curtain airbag module LH.
5. Disconnect the connector (AB88) from side airbag module LH.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Disconnect the connector (AB60) from Side impact sensor (under the rear center seat).
9. Using a probe, measure the resistance between the connector (6BF) in test harness BF and connector (AB60). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

Caution:
When measuring the resistance, make sure to insert the probe from the inspection hole of the connector. Also, do not insert the probe forcibly.

Connector & terminal
(6BF) No. 9 — (AB60) No. 1:
(6BF) No. 4 — (AB60) No. 2:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor (under the rear center seat)).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) in the test harness BF.

Connector & terminal
(6BF) No. 9 — Chassis ground:
(6BF) No. 4 — Chassis ground:
(6BF) No. 9 — (6BF) No. 4:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Disconnect the test harness BF from the connectors (AB41, AB42, AB43).
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1678 or B1679 displayed? (Current code)

Yes — Replace Side impact sensor (under the rear center seat). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (UNDER THE REAR CENTER SEAT). Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Finish the diagnosis.

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

DTC B1679 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE

Note:
For details on DTC B1679, refer to DTC B1678. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1678 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR.

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

DTC B1690 DOOR SENSOR RH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Side impact sensor RH (front door) is faulty.
If DTC B1690 is displayed, the circuit within Side impact sensor RH (front door) is faulty.
Replace Side impact sensor RH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) .

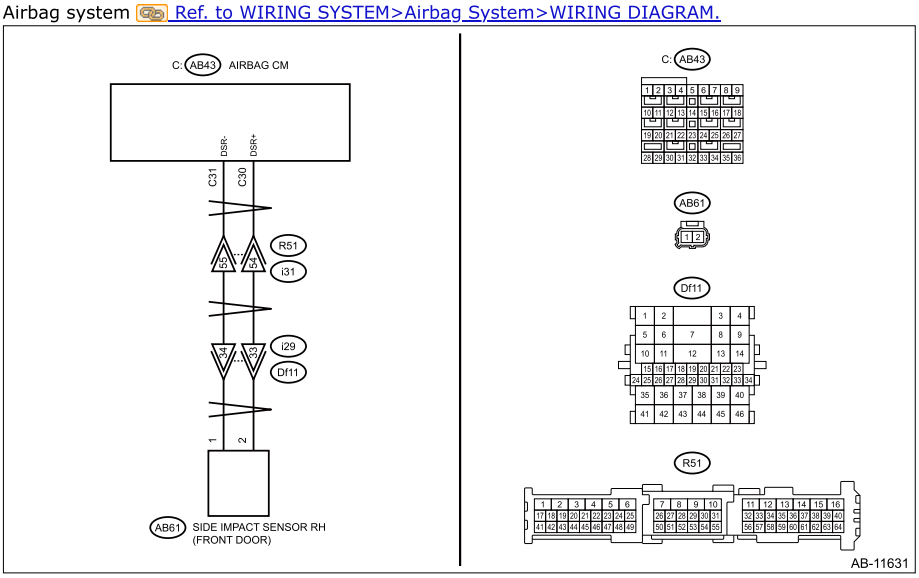
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Side impact sensor RH (front door)
- Side impact sensor RH (front door) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB43, R51, Df11, AB61) between the airbag control module and Side impact sensor RH (front door).

Is there poor contact?

Yes — Replace the door harness or the airbag main harness along with the instrument panel harness.

No — Go to 2.

2. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (front door)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from Rear seatbelt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect the connector (AB61) from Side impact sensor RH (front door).
10. Connect the connector (1BG) in the test harness BG to the connector (AB61).
11. Measure the resistance between connector (4BF) in the test harness BF and connector (2BG) in the test harness BG.
    Connector & terminal
    (4BF) No. 7 — (2BG) No. 2:
    (4BF) No. 3 — (2BG) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag main harness along with the instrument panel harness.

3. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor RH (front door)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 7 — Chassis ground:
(4BF) No. 3 — Chassis ground:
(4BF) No. 7 — (4BF) No. 3:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag main harness along with the instrument panel harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Disconnect all test harnesses.
2. Connect all connectors.
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1692 or B1693 displayed? (Current code)

Yes — Replace Side impact sensor RH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) . Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Finish the diagnosis.

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

DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE

Note:
For details on DTC B1693, refer to DTC B1692. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH.

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

DTC B1695 DOOR SENSOR LH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Side impact sensor LH (front door) is faulty.
If DTC B1695 is displayed, the circuit within Side impact sensor LH (front door) is faulty.
Replace Side impact sensor LH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) .

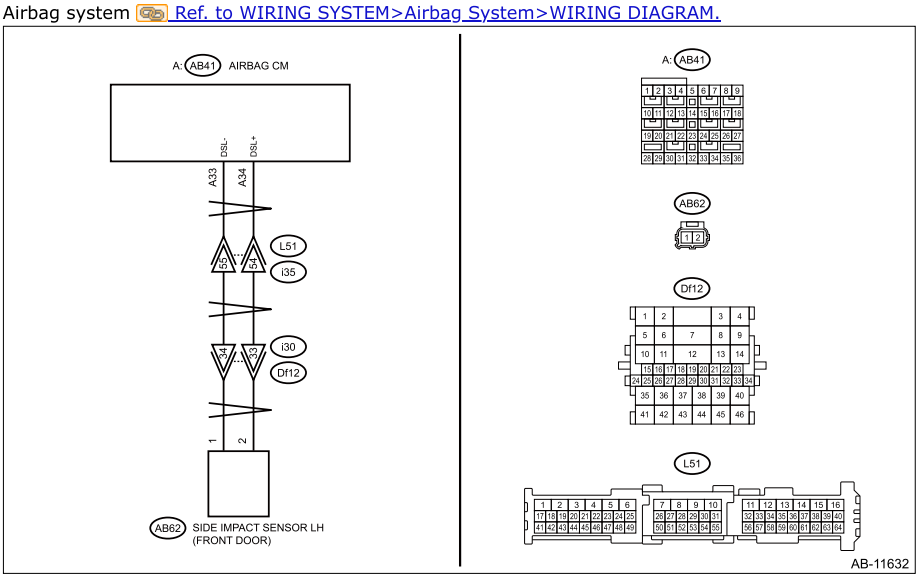
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit in harness of Side impact sensor LH (front door)
- Side impact sensor LH (front door) is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB41, L51, Df12, AB62) between the airbag control module and Side impact sensor LH (front door).

Is there poor contact?

Yes — Replace the door harness or the airbag rear harness along with body harness.

No — Go to 2.

2. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (front door)) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB94) from seat belt pretensioner LH.
3. Disconnect the connector (AB100) from rear seat belt pretensioner LH.
4. Disconnect the connector (AB88) from side airbag module LH.
5. Disconnect the connector (AB92) from curtain airbag module LH.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Disconnect the connector (AB62) from Side impact sensor LH (front door).
9. Connect the connector (1BG) in the test harness BG to the connector (AB62).
10. Measure the resistance between connector (6BF) in the test harness BF and connector (2BG) in the test harness BG.

Connector & terminal

(6BF) No. 8 — (2BG) No. 2:
(6BF) No. 3 — (2BG) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

3. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND Side impact sensor LH (front door)) (SHORTED TO GROUND AND SHORTED BETWEEN LINES).

Measure the resistance between connector (6BF) in the test harness BF and chassis ground, and the resistance between connector (6BF) terminals in the test harness BF.

Connector & terminal

(6BF) No. 8 — Chassis ground:
(6BF) No. 3 — Chassis ground:
(6BF) No. 8 — (6BF) No. 3:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Disconnect all test harnesses.
2. Connect all connectors.
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1697 or B1698 displayed? (Current code)

Yes — Replace Side impact sensor LH (front door). Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL > SIDE IMPACT SENSOR (FRONT DOOR) . Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Finish the diagnosis.

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

DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE

Note:
For details on DTC B1698, refer to DTC B1697. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH.

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

DTC B16C5 VEHICLE SPEED (A/B)

DTC detecting condition:
Abnormality in the vehicle speed received from VDCCM is detected.
Trouble symptom:
Identification of the occupant in the passenger's seat is not performed.

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

1. CHECK VDC.

Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes — Go to 2.

No — Perform the inspection according to the VDC diagnosis.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B16C5 displayed? (Current code)

Yes — Go to 3.

No — Finish the diagnosis.

3. CHECK LAN SYSTEM.

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

Is the check result OK?

Yes — Go to 4.

No — Perform the inspection according to the diagnosis for LAN system.

4. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B16C5 displayed? (Current code)

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 B16F2 FRONT SUB SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- The front impact sensor RH is installed incorrectly.
- The airbag control module is installed incorrectly.

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

1. CHECK THE FRONT IMPACT SENSOR RH.

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace with a genuine sensor.

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

DTC B16F3 FRONT SUB SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- The front impact sensor LH is installed incorrectly.
- The airbag control module is installed incorrectly.

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

1. CHECK THE FRONT IMPACT SENSOR LH.

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace with a genuine sensor.

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

DTC B16F4 SIDE AIRBAG SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor RH (center pillar) is misinstalled.
- The airbag control module is installed incorrectly.

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

1. CHECK Side impact sensor RH (center pillar).

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace with a genuine sensor.

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

DTC B16F5 SIDE AIRBAG SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor LH (center pillar) is misinstalled.
- The airbag control module is installed incorrectly.

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

1. CHECK Side impact sensor LH (center pillar).

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace with a genuine sensor.

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

DTC B16F6 CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor RH (rear wheel house) is misinstalled.
- The airbag control module is installed incorrectly.

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

1. CHECK Side impact sensor RH (rear wheel house).

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace with a genuine sensor.

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

DTC B16F7 CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor LH (rear wheel house) is misinstalled.
- The airbag control module is installed incorrectly.

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

1. CHECK Side impact sensor LH (rear wheel house).

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace with a genuine sensor.

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

DTC B16F8 SATELLITE SAFING SENSOR RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor (under rear seat) is misinstalled.
- The airbag control module is installed incorrectly.

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

1. CHECK Side impact sensor (under the rear center seat).

Check the part number printed on the sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.

Is the part number correct?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Replace with a genuine sensor.

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

DTC B16F9 DOOR SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor RH (front door) is misinstalled.
- Airbag control module is faulty.

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

1. REPLACEMENT OF Side impact sensor RH (front door).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace the Side impact sensor RH (front door) with a genuine sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B16F9 displayed? (Current code)

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 B16FA DOOR SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Side impact sensor LH (front door) is misinstalled.
- Airbag control module is faulty.

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

1. REPLACEMENT OF Side impact sensor LH (front door).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Replace the Side impact sensor LH (front door) with a genuine sensor. Ref. to AIRBAG SYSTEM>Impact Sensor>REMOVAL.
3. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B16FA displayed? (Current code)

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 B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Load sensor detects a collision.
Trouble symptom:
Occupant judgment of airbag control module stops.

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

1. CHECK AIRBAG SYSTEM OPERATION.

Check the operation status of the airbag system.

Is there any airbag system operated?

Yes	Replace the seat assembly. Ref. to SEATS>Front Seat. Perform inspection referring to inspection part after collision. Ref. to AIRBAG SYSTEM>Inspection Locations after a Collision>INSPECTION.
No	Go to 2.

2. PERFORM [Rezeroing].

Perform [Rezeroing]. Ref. to AIRBAG SYSTEM>Rezero.

Is [Rezeroing] completed?

Yes	Go to 3.
No	Perform operation according to an error code displayed when [Rezeroing] fails. Ref. to AIRBAG SYSTEM>Rezero>LIST.

3. CHECK AIRBAG CONTROL MODULE.

1. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1783, B1784, B1785 or B1786 displayed? (Current code)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Currently, it is normal.

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

DTC B1784 FRONT RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Note:
For details on DTC B1784, refer to DTC B1783. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.

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

DTC B1785 REAR LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Note:
For details on DTC B1785, refer to DTC B1783. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.

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

DTC B1786 REAR RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION

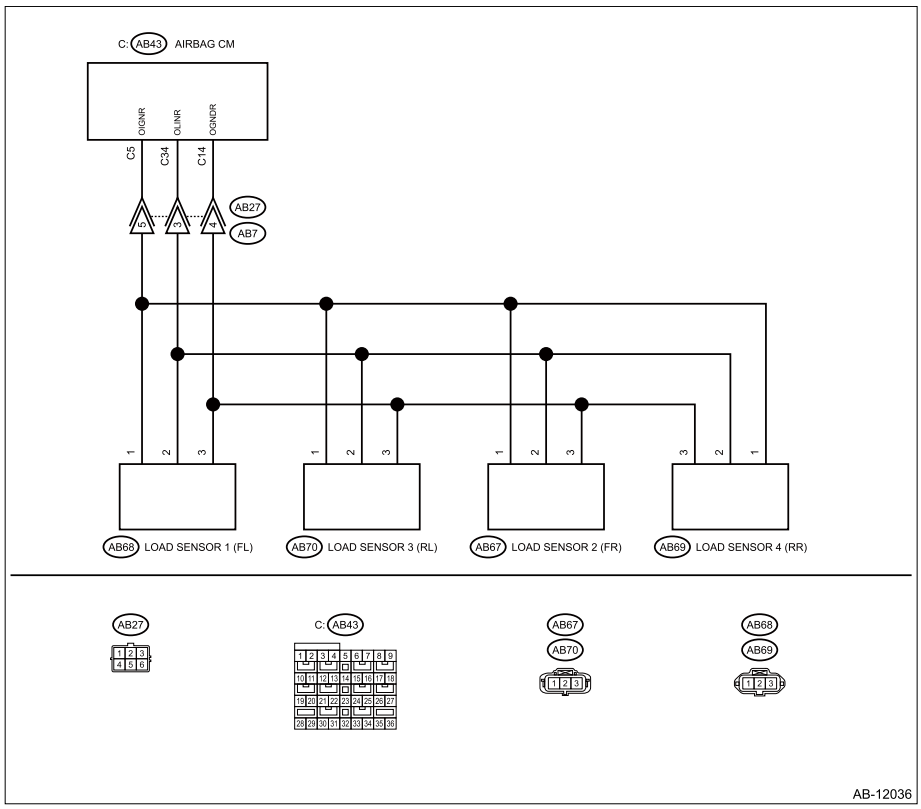
Note:
For details on DTC B1786, refer to DTC B1783. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.

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

DTC B1788 OCCUPANT DETECTION SENSOR POWER SUPPLY

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Open or short circuit of the occupant detection sensor harness
- Airbag control module malfunction.
- Occupant detection sensor malfunction

Trouble symptom:
Occupant judgment of airbag control module stops.
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC B178D, B178E, B178F, B1790, B1791, B1792, B1793 or B1794 displayed? (Current code)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SHORTED TO GROUND).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from rear seat belt pretensioner RH.
5. Disconnect the connector (AB87) of side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Using a tester, measure the resistance between connector (4BF) in the test harness BF and chassis ground, and between connector (4BF) terminals in the test harness BF.

Caution:
Connect the tester terminals as follows. Reverse polarity will result in incorrect values.
- **Tester positive terminal: IGN side ((4BF) No. 10)**
- **Tester negative terminal: GND side (chassis ground or (4BF) No. 15)**

Connector & terminal
(4BF) No. 10 — Chassis ground:
(4BF) No. 10 — (4BF) No. 15:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Go to 3.

3. CHECK SEAT HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the connector (AB7) from airbag rear harness.
2. Connect the connector (1BB) in the test harness BB to the connector (AB7).
3. Using a tester, measure the resistance between connector (2BB) in the test harness BB and chassis ground, and between connector (2BB) terminals in the test harness BB.

Caution:
Connect the tester terminals as follows. Reverse polarity will result in incorrect values.
- **Tester positive terminal: IGN side ((2BB) No. 5)**
- **Tester negative terminal: GND side (chassis ground or (2BB) No. 4)**

Connector & terminal
(2BB) No. 5 — Chassis ground:
(2BB) No. 5 — (2BB) No. 4:

Is the resistance 1 MΩ or more?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 8.

4. CHECK AIRBAG REAR HARNESS (OPEN).

1. Disconnect connector (AB67, AB68, AB69, AB70) from the load sensor.
2. Using a tester, measure the resistance between the connector (4BF) in test harness BF and the load sensor connector (AB67, AB68, AB69, AB70).

Caution:
Connect the terminal in test harness BC to connector (AB67, AB68, AB69, AB70) terminal, and apply the tester to test harness BC.

Connector & terminal
(4BF) No. 10 — (AB67) No. 1:
(4BF) No. 10 — (AB68) No. 1:
(4BF) No. 10 — (AB69) No. 1:
(4BF) No. 10 — (AB70) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 6.

No — Go to 5.

5. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Disconnect the connector (AB7) from airbag rear harness.
2. Connect the connector (1BB) in the test harness BB to the connector (AB7).
3. Using a tester, measure the resistance between the connector (2BB) in test harness BB and the load sensor connector (AB67, AB68, AB69, AB70).

Caution:
Connect the terminal in test harness BC to connector (AB67, AB68, AB69, AB70) terminal, and apply the tester to test harness BC.

Connector & terminal
(2BB) No. 5 — (AB67) No. 1:
(2BB) No. 5 — (AB68) No. 1:
(2BB) No. 5 — (AB69) No. 1:
(2BB) No. 5 — (AB70) No. 1:

Is the resistance less than 10 Ω?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 8.

6. CHECK AIRBAG REAR HARNESS (BATTERY SHORT).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using a tester, measure the voltage between connector (4BF) in test harness BF and chassis ground.

Connector & terminal
(4BF) No. 10 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Go to 7.

7. CHECK SEAT HARNESS (BATTERY SHORT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB7) from airbag rear harness.
3. Connect the connector (1BB) in the test harness BB to the connector (AB7).
4. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Using a tester, measure the voltage between connector (2BB) in test harness BB and chassis ground.
   Connector & terminal
   (2BB) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Replace the airbag rear harness along with body harness.

No — Go to 8.

8. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check for poor contact in airbag control module connector and load sensor connector.
3. Disconnect all the test harnesses, and connect all the connectors.
4. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1788 displayed? (Current code)

Yes — Replace the cushion frame assembly. Ref. to SEATS>Front Seat.

No — Finish the diagnosis.

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

DTC B178C VEHICLE FACTORY CALIBRATION UNCOMPLETED

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- [Rezeroing] for the occupant detection system was not performed at vehicle factory.
- [Rezeroing] was not performed after replacing the airbag control module.
- [Rezeroing] was not performed after replacing the passenger's seat assembly.

Trouble symptom:
Occupant judgment of airbag control module stops.

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

1. PERFORM [Rezeroing].

1. Perform [Rezeroing]. Ref. to AIRBAG SYSTEM>Rezero.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B178C displayed? (Current code)

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

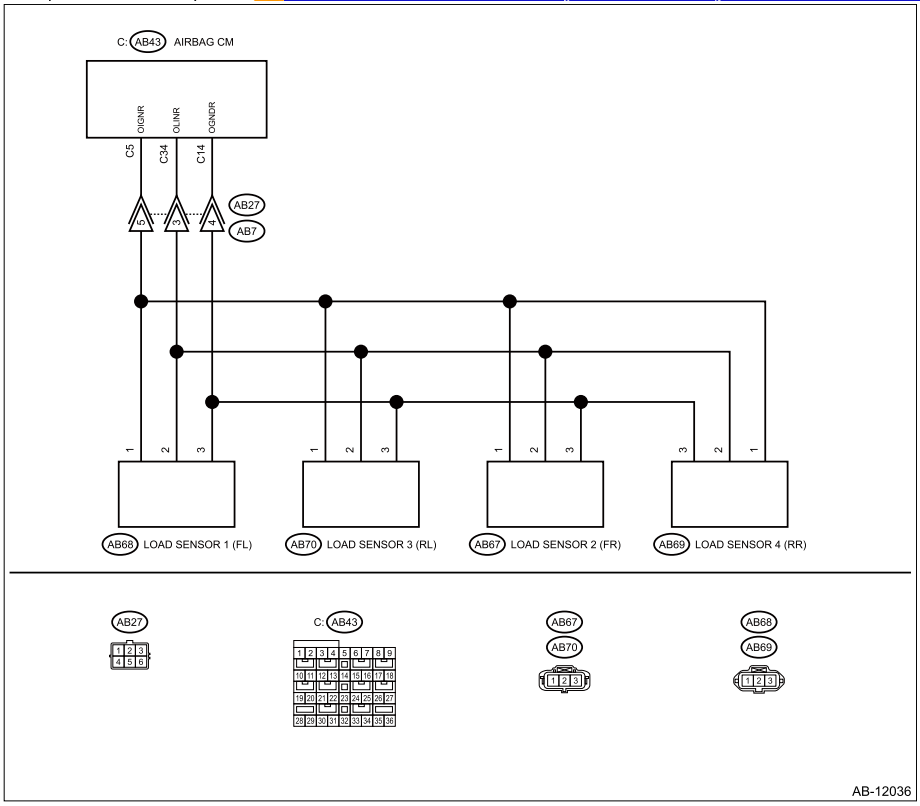
No — [Rezeroing] was not performed.

DTC B178D FRONT LEFT OCCUPANT DETECTION SENSOR LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit of the occupant detection sensor harness
- Occupant detection sensor malfunction

Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC B1655 or [Airbag ECU Malfunction] displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1655 or [Airbag ECU Malfunction]. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from rear seat belt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect connector (AB68) from the load sensor FL.
10. Using a tester, measure the resistance between the connector (4BF) in test harness BF and the load sensor FL connector (AB68).

Caution:
Connect the terminal in test harness BC to connector (AB68) terminal, and apply the tester to test harness BC.

Connector & terminal
(4BF) No. 10 — (AB68) No. 1:
(4BF) No. 9 — (AB68) No. 2:
(4BF) No. 15 — (AB68) No. 3:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with the body harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 10 — All terminals other than (4BF) No. 10:
(4BF) No. 9 — All terminals other than (4BF) No. 9:
(4BF) No. 15 — All terminals other than (4BF) No. 15:
(4BF) No. 10 — Chassis ground:
(4BF) No. 9 — Chassis ground:
(4BF) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with the body harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.

Connector & terminal
(4BF) No. 10 (+) — Chassis ground (−):
(4BF) No. 9 (+) — Chassis ground (−):
(4BF) No. 15 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 5.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with the body harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check for poor contact in airbag control module connector and load sensor connector.
3. Disconnect the test harness BF from the connectors (AB41, AB42, AB43) and connect all the connectors.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B178D displayed? (Current code)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

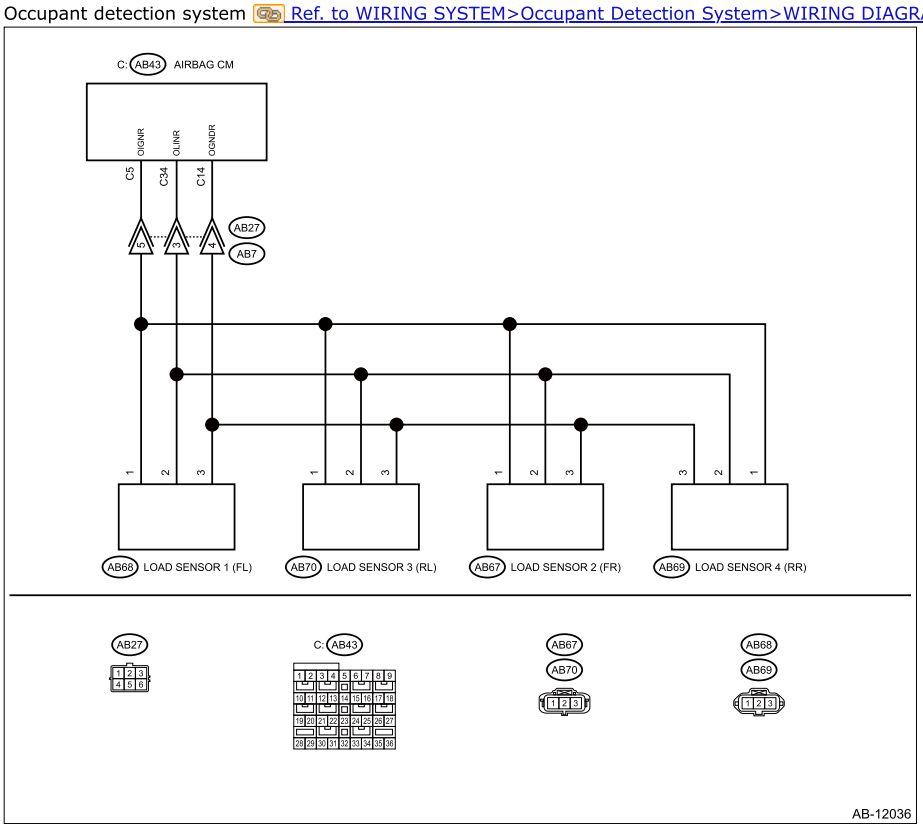
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B178E FRONT RIGHT OCCUPANT DETECTION SENSOR LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit of the occupant detection sensor harness
- Occupant detection sensor malfunction

Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC B1655 or [Airbag ECU Malfunction] displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1655 or [Airbag ECU Malfunction]. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from rear seat belt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect connector (AB67) from the load sensor FR.
10. Using a tester, measure the resistance between the connector (4BF) in test harness BF and the load sensor FR connector (AB67).

Caution:
Connect the terminal in test harness BC to connector (AB67) terminal, and apply the tester to test harness BC.

Connector & terminal
(4BF) No. 10 — (AB67) No. 1:
(4BF) No. 9 — (AB67) No. 2:
(4BF) No. 15 — (AB67) No. 3:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with the body harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 10 — All terminals other than (4BF) No. 10:
(4BF) No. 9 — All terminals other than (4BF) No. 9:
(4BF) No. 15 — All terminals other than (4BF) No. 15:
(4BF) No. 10 — Chassis ground:
(4BF) No. 9 — Chassis ground:
(4BF) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with the body harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.
   Connector & terminal
   (4BF) No. 10 (+) — Chassis ground (−):
   (4BF) No. 9 (+) — Chassis ground (−):
   (4BF) No. 15 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 5.

No — Check the seat harness, and if any fault is found, replace the seat harness. If there is no fault, replace the airbag rear harness together with the body harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check for poor contact in airbag control module connector and load sensor connector.
3. Disconnect the test harness BF from the connectors (AB41, AB42, AB43) and connect all the connectors.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B178E displayed? (Current code)

Yes — Replace the cushion frame assembly. Ref. to SEATS>Front Seat.

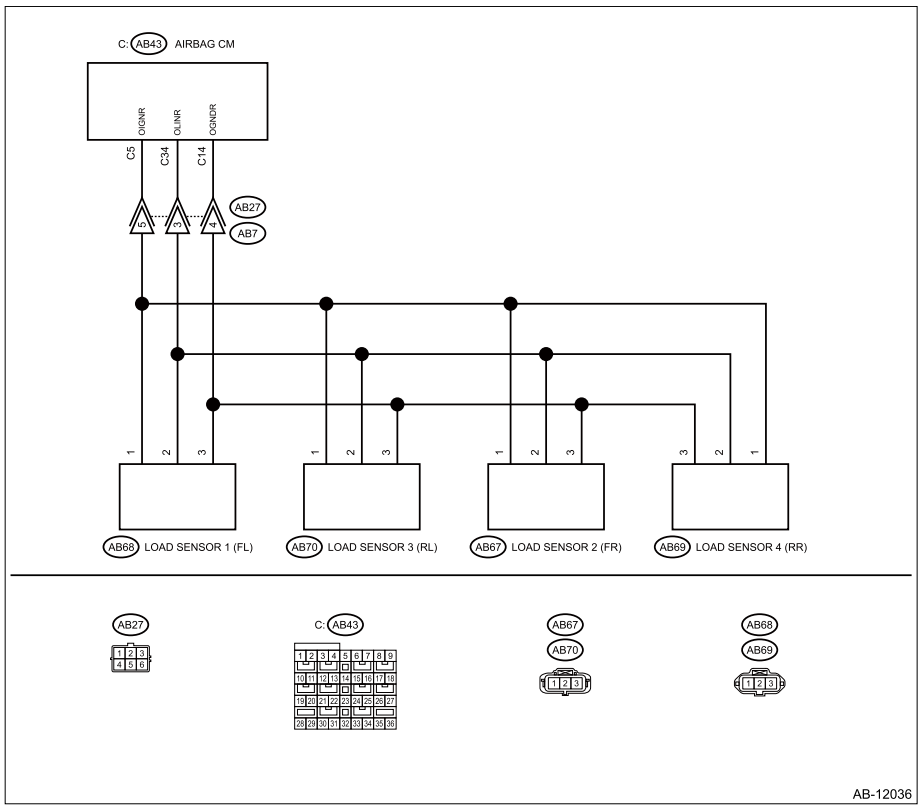
No — Finish the diagnosis.

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

DTC B178F REAR LEFT OCCUPANT DETECTION SENSOR LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
- Open or short circuit of the occupant detection sensor harness
- Occupant detection sensor malfunction

Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC B1655 or [Airbag ECU Malfunction] displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1655 or [Airbag ECU Malfunction]. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from rear seat belt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect connector (AB70) from the load sensor RL.
10. Using a tester, measure the resistance between the connector (4BF) in test harness BF and the load sensor RL connector (AB70).

Caution:
Connect the terminal in test harness BC to connector (AB70) terminal, and apply the tester to test harness BC.

Connector & terminal
(4BF) No. 10 — (AB70) No. 1:
(4BF) No. 9 — (AB70) No. 2:
(4BF) No. 15 — (AB70) No. 3:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Replace the airbag rear harness along with body harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 10 — All terminals other than (4BF) No. 10:
(4BF) No. 9 — All terminals other than (4BF) No. 9:
(4BF) No. 15 — All terminals other than (4BF) No. 15:
(4BF) No. 10 — Chassis ground:
(4BF) No. 9 — Chassis ground:
(4BF) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Replace the airbag rear harness along with body harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.

Connector & terminal
(4BF) No. 10 (+) — Chassis ground (−):
(4BF) No. 9 (+) — Chassis ground (−):
(4BF) No. 15 (+) — 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 CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check for poor contact in airbag control module connector and load sensor connector.
3. Disconnect the test harness BF from the connectors (AB41, AB42, AB43) and connect all the connectors.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B178F displayed? (Current code)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

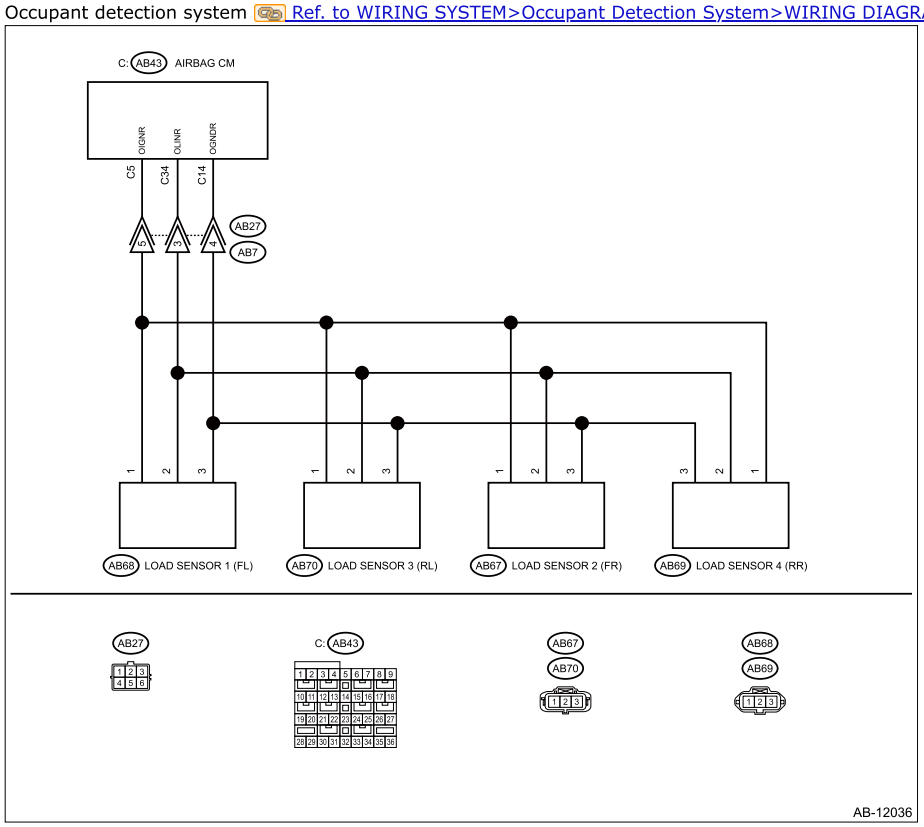
AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1790 REAR RIGHT OCCUPANT DETECTION SENSOR LOST COMMUNICATION

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Open or short circuit of the occupant detection sensor harness
- Occupant detection sensor malfunction

Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any of DTC B1655 or [Airbag ECU Malfunction] displayed? (Current code)

Yes — Perform the diagnosis for the displayed DTC B1655 or [Airbag ECU Malfunction]. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

No — Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB93) from seat belt pretensioner RH.
3. Disconnect the connector (AB95) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB99) from rear seat belt pretensioner RH.
5. Disconnect the connector (AB87) from side airbag module RH.
6. Disconnect the connector (AB91) from curtain airbag module RH.
7. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
8. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
9. Disconnect connector (AB69) from the load sensor RR.
10. Using a tester, measure the resistance between the connector (4BF) in test harness BF and the load sensor RR connector (AB69).

Caution:
Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC.

Connector & terminal
(4BF) No. 10 — (AB69) No. 1:
(4BF) No. 9 — (AB69) No. 2:
(4BF) No. 15 — (AB69) No. 3:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Replace the airbag rear harness along with body harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Measure the resistance between connector (4BF) in the test harness BF and chassis ground, and the resistance between connector (4BF) terminals in the test harness BF.

Connector & terminal
(4BF) No. 10 — All terminals other than (4BF) No. 10:
(4BF) No. 9 — All terminals other than (4BF) No. 9:
(4BF) No. 15 — All terminals other than (4BF) No. 15:
(4BF) No. 10 — Chassis ground:
(4BF) No. 9 — Chassis ground:
(4BF) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 4.

No — Replace the airbag rear harness along with body harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Measure the voltage between connector (4BF) in the test harness BF and chassis ground.
   Connector & terminal
   (4BF) No. 10 (+) — Chassis ground (−):
   (4BF) No. 9 (+) — Chassis ground (−):
   (4BF) No. 15 (+) — 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 CONNECTOR.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check for poor contact in airbag control module connector and load sensor connector.
3. Disconnect the test harness BF from the connectors (AB41, AB42, AB43) and connect all the connectors.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1790 displayed? (Current code)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

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

DTC B1791 FRONT LEFT OCCUPANT DETECTION SENSOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Occupant detection sensor malfunction
If DTC B1791 is displayed, a malfunction is inside the load sensor FL.
Replace the cushion frame assembly. Ref. to SEATS>Front Seat.

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

DTC B1792 FRONT RIGHT OCCUPANT DETECTION SENSOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Occupant detection sensor malfunction
If DTC B1792 is displayed, a malfunction is inside the load sensor FR.
Replace the cushion frame assembly. Ref. to SEATS>Front Seat.

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

DTC B1793 REAR LEFT OCCUPANT DETECTION SENSOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Occupant detection sensor malfunction
If DTC B1793 is displayed, a malfunction is inside the load sensor RL.
Replace the cushion frame assembly. Ref. to SEATS>Front Seat.

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

DTC B1794 REAR RIGHT OCCUPANT DETECTION SENSOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.

DTC detecting condition:
Occupant detection sensor malfunction
If DTC B1794 is displayed, a malfunction is inside the load sensor RR.
Replace the cushion frame assembly. Ref. to SEATS>Front Seat.

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

DTC B1796 OCCUPANT DETECTION SENSOR SERIAL ID MISMATCH

DTC detecting condition:
Detected when the serial ID of the occupant detection sensor currently mounted does not match the serial ID of the occupant detection sensor for which rezeroing was performed.

Note:
This DTC is detected if rezeroing is not yet performed after replacement of the passenger's seat. Perform rezeroing. Ref. to AIRBAG SYSTEM>Rezero.

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

DTC B1797 OCCUPANT DETECTION SENSOR SUPPLIER ID AND FUNCTION ID MISMATCH

DTC detecting condition:
Detected when an occupant detection sensor of a different manufacturer or for a different vehicle manufacturer is mounted.

Note:
This DTC is detected when a non-genuine occupant detection sensor is mounted. Replace with a genuine passenger's seat. Ref. to SEATS>Front Seat.

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

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DOTC)>Battery>INSPECTION.

Is the check result OK?

Yes — Go to 2.

No — Charge or replace the battery. And then, Go to 2.

2. CHECK AIRBAG CONTROL MODULE.

1. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON (DIAGNOSTICS)>Clear memory.
2. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

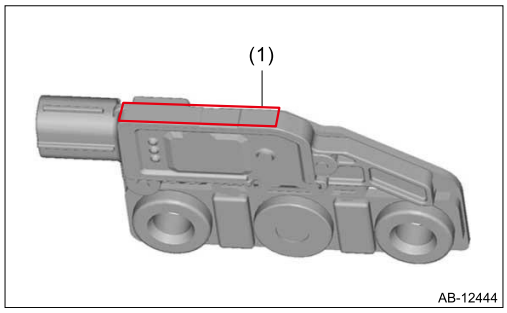
Is DTC B1797 displayed? (Current code)

Yes — Go to 3.

No — Go to 4.

3. CHECK OCCUPANT DETECTION SENSOR.

Check the serial ID on the side face of the occupant detection sensor.



(1) Serial ID

Are the last two digits EC or FC?

Yes	Replace the airbag control module. And then, Go to 4.
No	Replace the passenger's seat together with the occupant detection sensor. And then, Go to 4.

4. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is any other DTC displayed? (Current code)

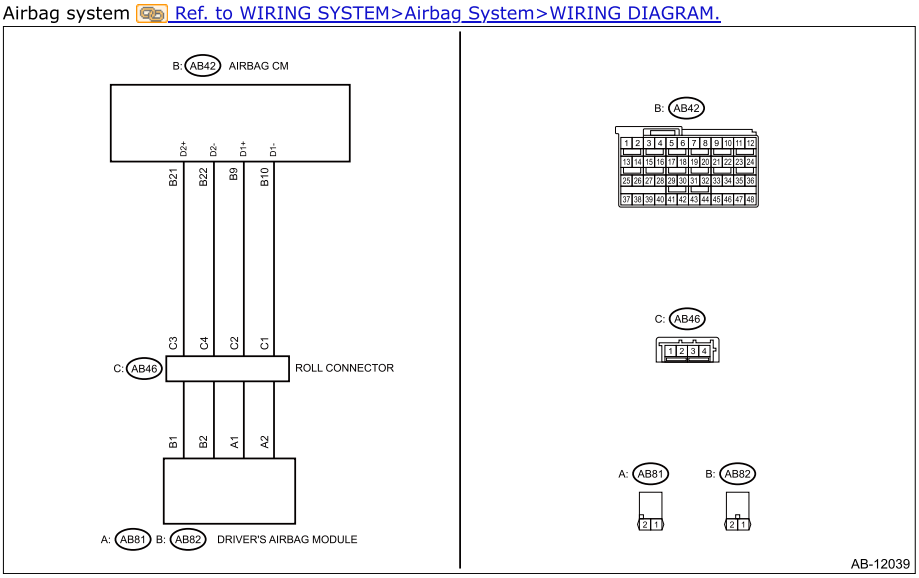
Yes	Perform the diagnosis for the displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1800 SHORT IN DRIVER'S AIRBAG

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- 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.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Prior to starting work, prepare one AIRBAG RESISTOR (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB82).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB81).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
9. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1800 displayed? (Current code)

Yes — Go to 3.

No — Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB83) from the passenger's airbag module.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
6. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
7. Measure the resistance between connector (2Q) terminals in test harness Q.
   Connector & terminal
   (2Q) No. 1 — (2Q) No. 2:

Is the resistance 1 MΩ or more?

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

No — Go to 4.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (SHORTED BETWEEN LINES).

1. Disconnect the connector (AB46) from the roll connector.
2. Measure the resistance between connectors (3BF) and (9BF) in test harness BF.
   Connector & terminal
   (3BF) No. 1 — (9BF) No. 1:

Is the resistance 1 MΩ or more?

Yes — Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

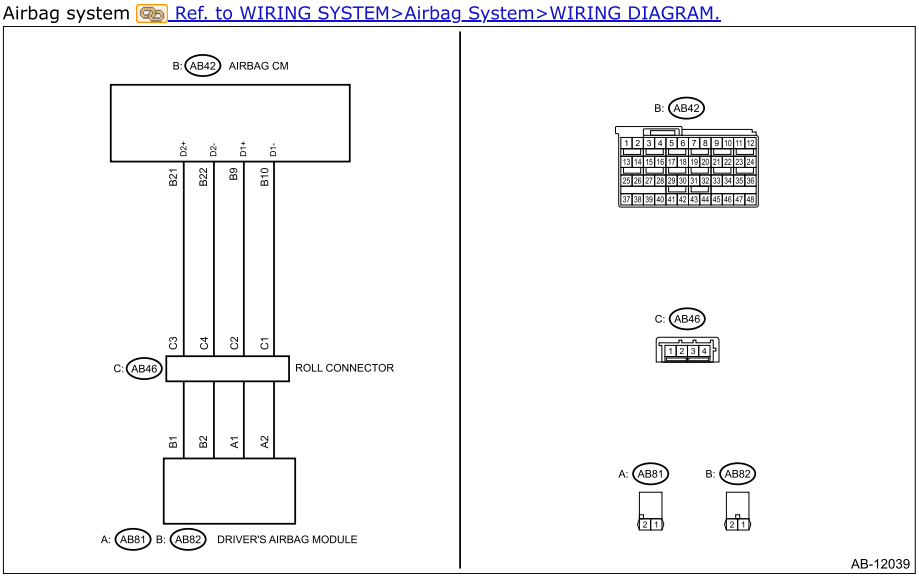
No — Replace the airbag main harness along with body harness.

DTC B1801 OPEN IN DRIVER'S AIRBAG

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Airbag main harness circuit is open.
- Airbag module harness (driver's side) circuit is open.
- Roll connector is open.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Prior to starting work, prepare one AIRBAG RESISTOR (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB82).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB81).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
9. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1801 displayed? (Current code)

Yes	Go to 3.
No	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB83) from the passenger's airbag module.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N.
5. Disconnect the airbag resistor from the connector (2Q) of test harness Q.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Measure the resistance between connector (2Q) terminals in test harness Q.
   Connector & terminal
   (2Q) No. 1 — (2Q) No. 2:

Is the resistance less than 10 Ω?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK ROLL CONNECTOR (OPEN CIRCUIT).

1. Disconnect the connector (AB46) from the roll connector.
2. Measure the resistance between connector (2Q) terminals in test harness Q.
   Connector & terminal
   (2Q) No. 1 — (2Q) No. 2:

Is the resistance less than 10 Ω?

Yes	Replace the airbag main harness along with body harness.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

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

DTC B1802 SHORT IN DRIVER'S AIRBAG (TO GROUND)

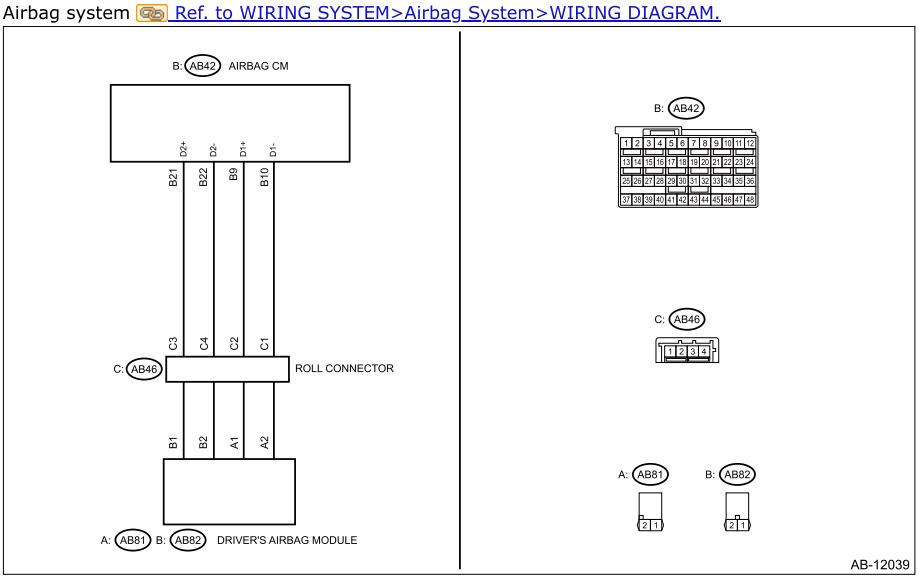
Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- 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.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

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

Note:

Prior to starting work, prepare one AIRBAG RESISTOR (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB81).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1802 displayed? (Current code)

Yes — Go to 3.

No — Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

3. CHECK ROLL CONNECTOR (SHORTED TO GROUND).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the airbag resistor from the connector (2N) in test harness N.
4. Measure the resistance between connector (2N) in the test harness N and chassis ground.
   Connector & terminal
   (2N) No. 1 — Chassis ground:
   (2N) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (SHORTED TO GROUND).

1. Disconnect the test harness N from connector (AB82).
2. Disconnect the connector (AB83) from the passenger's airbag module.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
5. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
6. Measure the resistance between connectors (3BF) and (9BF) in the test harness BF and chassis ground.
   Connector & terminal
   (3BF) No. 1 — Chassis ground:
   (9BF) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

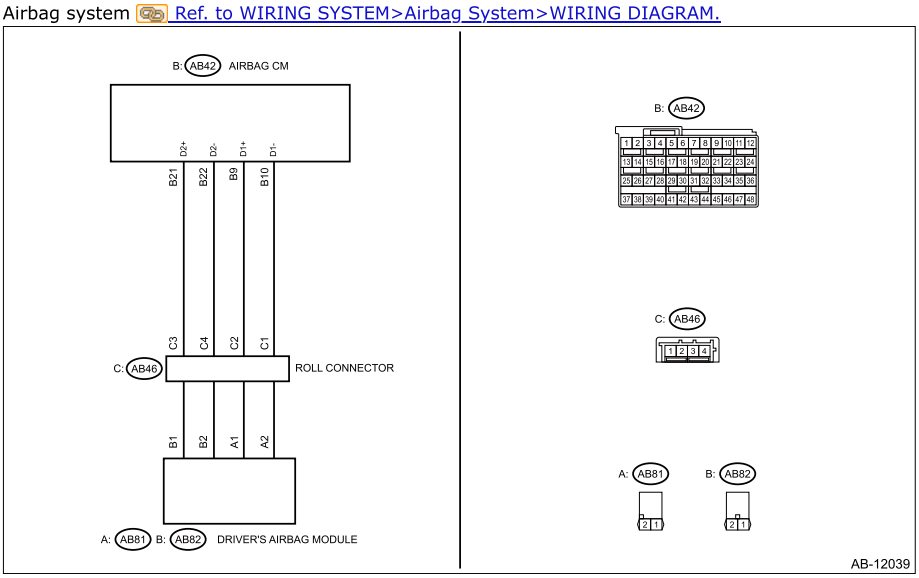
Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace the airbag main harness along with body harness.

DTC B1803 SHORT IN DRIVER'S AIRBAG (TO +B)

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Airbag main harness circuit is shorted to power supply.
- Airbag module harness (driver's side) circuit is shorted to power supply.
- Roll connector circuit is shorted to power supply.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Prior to starting work, prepare one AIRBAG RESISTOR (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB82).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB81).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
9. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1803 displayed? (Current code)

Yes	Go to 3.
No	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

3. CHECK ROLL CONNECTOR (SHORTED TO POWER SUPPLY).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
4. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Measure the voltage between connector (2Q) in the test harness Q and chassis ground.
   Connector & terminal
   (2Q) No. 1 (+) — Chassis ground (−):
   (2Q) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (SHORTED TO POWER SUPPLY).

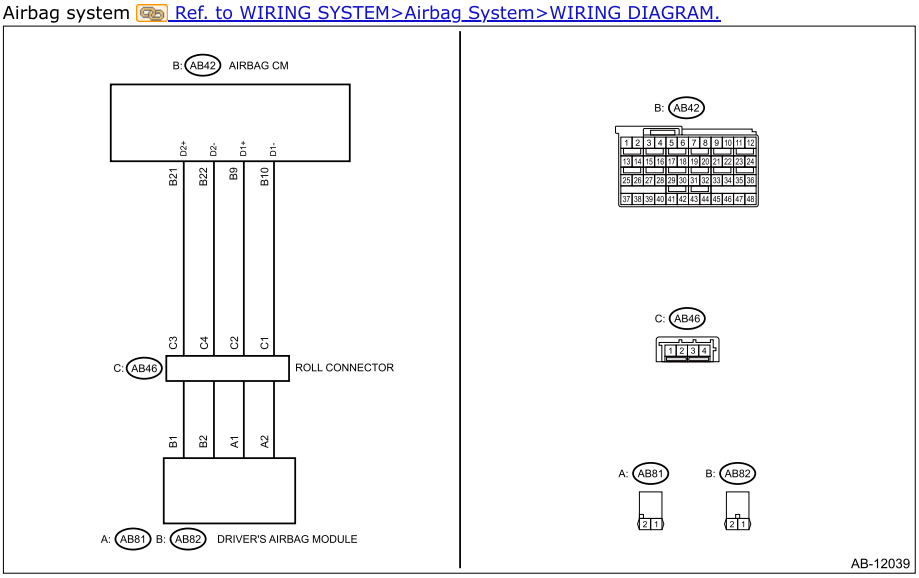
1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the test harness N from connector (AB82).
3. Disconnect the test harness Q from connector (AB81).
4. Disconnect the connector (AB83) from the passenger's airbag module.
5. Disconnect the connector (AB86) from the driver's knee airbag module.
6. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
7. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
8. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
9. Measure the voltage between the connectors (3BF) and (9BF) in the test harness BF and chassis ground.
   Connector & terminal
   (3BF) No. 1 (+) — Chassis ground (−):
   (9BF) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace the airbag main harness along with body harness.

DTC B1804 SHORT IN DRIVER'S AIRBAG

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Short circuit malfunction between driver's airbag circuit and other circuit
Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Prior to starting work, prepare one AIRBAG RESISTOR (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB82).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB81).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
9. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1804 displayed? (Current code)

Yes — Go to 3.

No — Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

3. CHECK ROLL CONNECTOR (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB83) from the passenger's airbag module.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
5. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
6. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
7. Measure the resistance between connector (2Q) in the test harness Q and all connector terminals in the test harness BF.
   Connector & terminal
   (2Q) No. 1 — All terminals in test harness BF (except for (9BF) No. 1):
   (2Q) No. 2 — All terminals in test harness BF (except for (3BF) No. 1):

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the roll connector and faulty harness. (Replace the airbag main harness along with body harness. Or replace the airbag rear harness along with body harness.) Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (SHORTED BETWEEN LINES).

1. Disconnect the connector (AB46) from the roll connector.
2. Disconnect the test harness N from connector (AB82).
3. Disconnect the test harness Q from connector (AB81).
4. Measure the resistance between connectors (3BF) and (9BF) in the test harness BF and all connector terminals in the test harness BF.
   Connector & terminal
   (9BF) No. 1 — All terminals in test harness BF (except for (9BF) No. 1):
   (3BF) No. 1 — All terminals in test harness BF (except for (3BF) No. 1):

Is the resistance 1 MΩ or more?

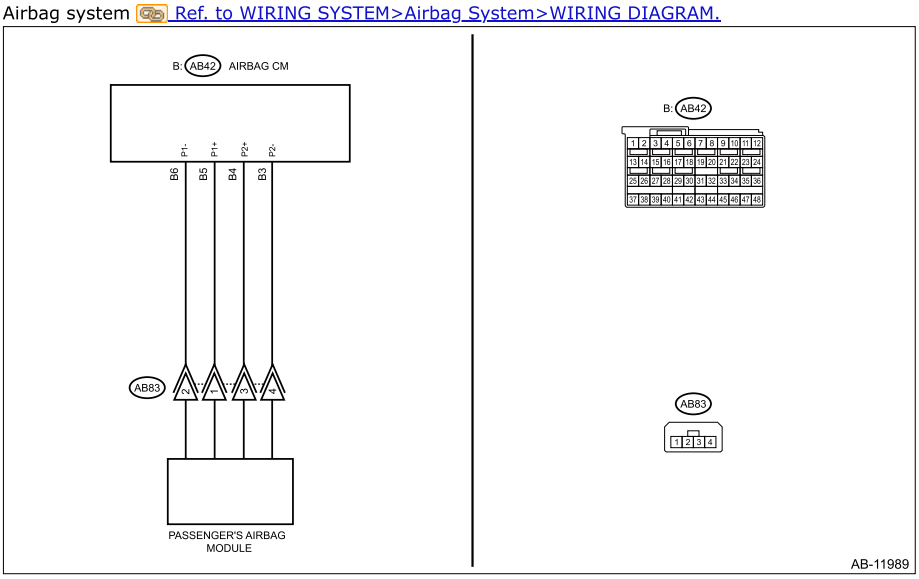
Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Replace the faulty harness. (Replace the airbag main harness along with body harness. Or replace the airbag rear harness along with body harness.)

DTC B1805 SHORT IN PASSENGER'S AIRBAG

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- 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.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare two sets of TEST HARNESS AT (98299CA020).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS) (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
5. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
6. Disconnect the connector (AB83) from the passenger's airbag module.
7. Using test harness AT, measure the resistance between terminals in connector (AB83).

Caution:
Connect the test harness AT terminal to the connector (AB83) terminal and contact a tester to the test harness AT. Two sets of test harness AT are required.

Connector & terminal
(AB83) No. 1 — (AB83) No. 2:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Disconnect the test harness BF from the connectors (AB41, AB42, AB43).
2. Connect the connectors (AB41, AB42, AB43) to the airbag control module.
3. Connect the connector (AB46) to the roll connector.
4. Connect the connector (AB86) to the driver's knee airbag module.
5. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1805 displayed? (Current code)

Yes — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

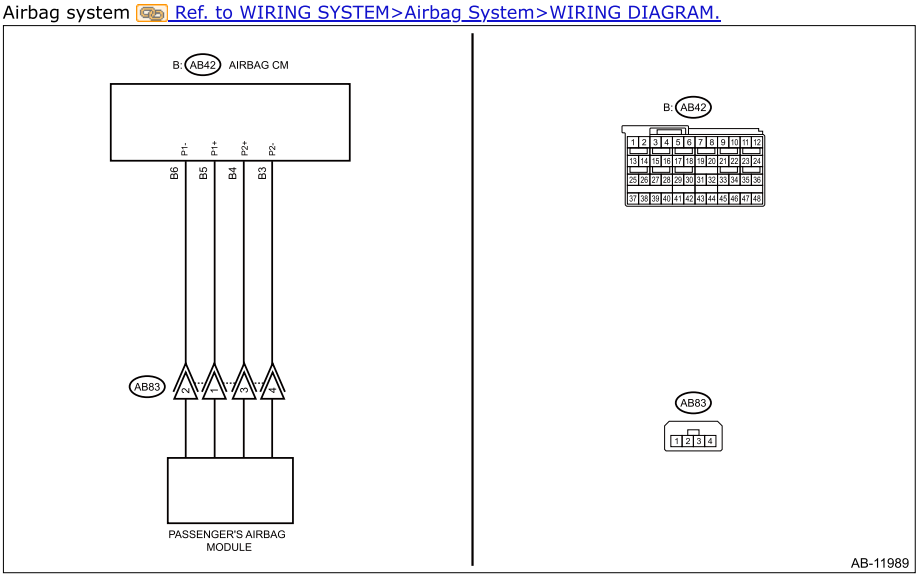
No — Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.

DTC B1806 OPEN IN PASSENGER'S AIRBAG

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- Airbag main harness circuit is open.
- Airbag module harness (passenger's side) circuit is open.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Before starting work, prepare two sets of TEST HARNESS AT (98299CA020).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
5. Disconnect the connector (AB83) from the passenger's airbag module.
6. Measure the resistance between terminals of connector (AB83) of passenger's side airbag module.

Caution:
Connect the test harness AT terminal to the connector (AB83) terminal and contact a tester to the test harness AT. Two sets of test harness AT are required.

Connector & terminal
(AB83) No. 1 — (AB83) No. 2:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB41, AB42, AB43) to the airbag control module.
2. Connect the connector (AB46) to the roll connector.
3. Connect the connector (AB86) to the driver's knee airbag module.
4. Using test harness AT, short the terminals No. 1 and No. 2 of connector (AB83).
   Connector & terminal
   (AB83) No. 1 — (AB83) No. 2:
5. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1805 displayed? (Current code)

Yes — Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.

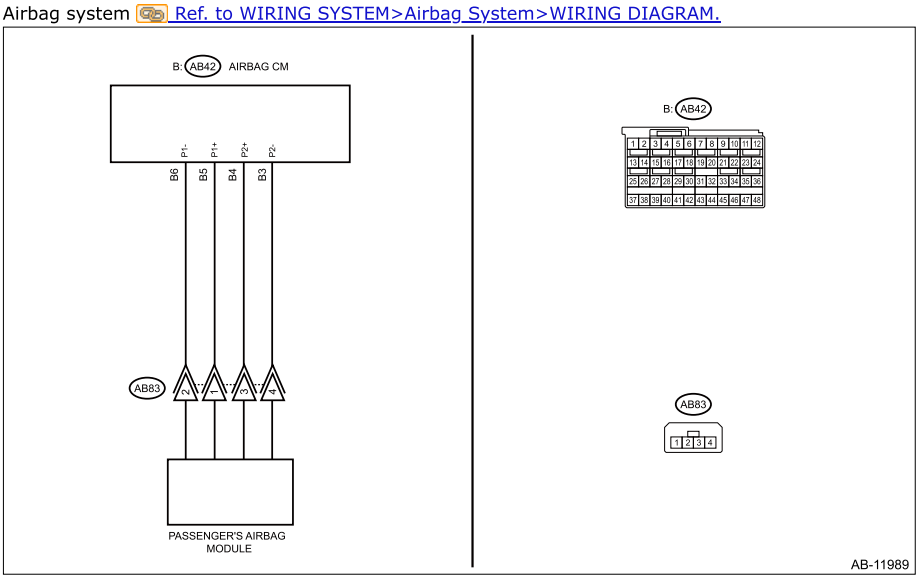
No — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

DTC B1807 SHORT IN PASSENGER'S AIRBAG (TO GROUND)

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- 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.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS) (SHORTED TO GROUND).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
5. Disconnect the connector (AB83) from the passenger's airbag module.
6. Using test harness AT, measure the resistance between connector (AB83) and chassis ground.

Caution:
Connect the test harness AT terminal to the connector (AB83) terminal and contact a tester to the test harness AT.

Connector & terminal
(AB83) No. 1 — Chassis ground:
(AB83) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes — Go to 3.

No — Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB41, AB42, AB43) to the airbag control module.
2. Connect the connector (AB46) to the roll connector.
3. Connect the connector (AB85) to the driver's knee airbag module.
4. Using test harness AT, short the terminals No. 1 and No. 2 of connector (AB83).

Connector & terminal
(AB83) No. 1 — (AB83) No. 2:

5. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1805 displayed? (Current code)

Yes — Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.

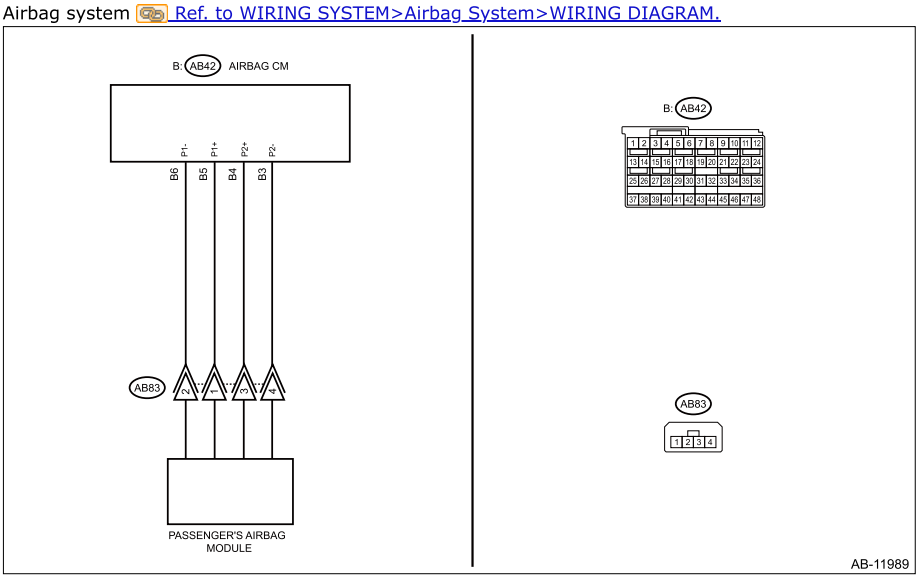
No — Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

DTC B1808 SHORT IN PASSENGER'S AIRBAG (TO +B)

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- 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.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS) (SHORTED TO POWER SUPPLY).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
5. Disconnect the connector (AB83) from the passenger's airbag module.
6. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Using test harness AT, measure the voltage between connector (AB83) and chassis ground.

Caution:
Connect the test harness AT terminal to the connector (AB83) terminal and contact a tester to the test harness AT.

Connector & terminal
(AB83) No. 1 (+) — Chassis ground (−):
(AB83) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

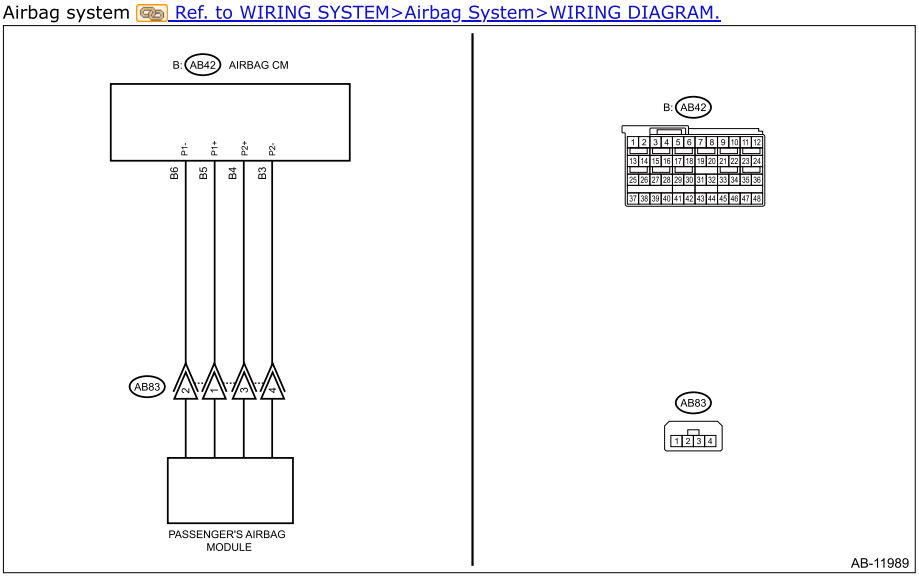
1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Connect the connectors (AB41, AB42, AB43) to the airbag control module.
3. Connect the connector (AB46) to the roll connector.
4. Connect the connector (AB86) to the driver's knee airbag module.
5. Using test harness AT, short the terminals No. 1 and No. 2 of connector (AB83).
   Connector & terminal
   (AB83) No. 1 — (AB83) No. 2:
6. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
8. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1805 displayed? (Current code)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

DTC B1809 SHORT IN PASSENGER'S AIRBAG

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:
Short circuit malfunction between passenger’s airbag circuit and other circuit
Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to “CAUTION” in “General Description”. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger’s airbag module.

Is there poor contact?

Yes — Replace the airbag main harness.

No — Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS) (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (AB46) from the roll connector.
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the connector (AB83) from the passenger's airbag module.
5. Disconnect the connectors (AB41, AB42, AB43) from airbag control module.
6. Connect the connector (1BF) in the test harness BF to the connectors (AB41, AB42, AB43).
7. Measure the resistance between connector (AB83) of the passenger's side airbag module and all connector terminals in the test harness BF.

Caution:
Connect the test harness AT terminal to the connector (AB83) terminal and contact a tester to the test harness AT.

Connector & terminal
(AB83) No. 1 — All terminals in test harness BF (except for (3BF) No. 4):
(AB83) No. 2 — All terminals in test harness BF (except for (9BF) No. 5):

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Disconnect the test harness BF from the connectors (AB41, AB42, AB43).
2. Connect the connectors (AB41, AB42, AB43) to the airbag control module.
3. Connect the connector (AB46) to the roll connector.
4. Connect the connector (AB86) to the driver's knee airbag module.
5. Using test harness AT, short the terminals No. 1 and No. 2 of connector (AB83).

Connector & terminal
(AB83) No. 1 — (AB83) No. 2:

6. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
8. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1805 displayed? (Current code)

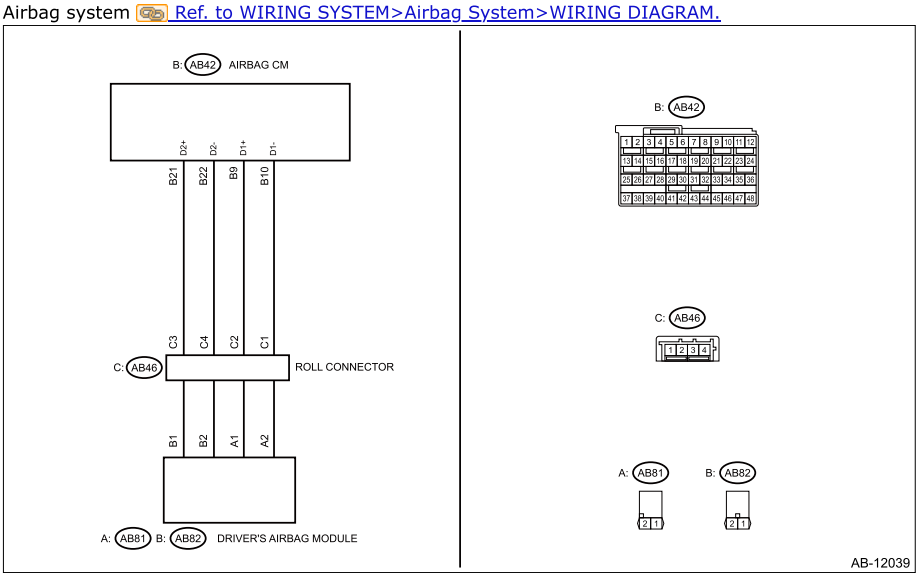
Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

DTC B1810 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP

Diagnosis start condition:
When the ignition voltage is 10 — 16 V.
DTC detecting condition:

- 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.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



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

Note:
Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes — Replace the airbag harness.

No — Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB82).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB81).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Install the ground terminal to the battery sensor and turn the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
9. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1810 displayed? (Current code)

Yes — Go to 3.

No — Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS) (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, and wait for 60 seconds or more after disconnecting the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the passenger's airbag module connector (AB83).
3. Disconnect the connector (AB86) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Disconnect the connectors (