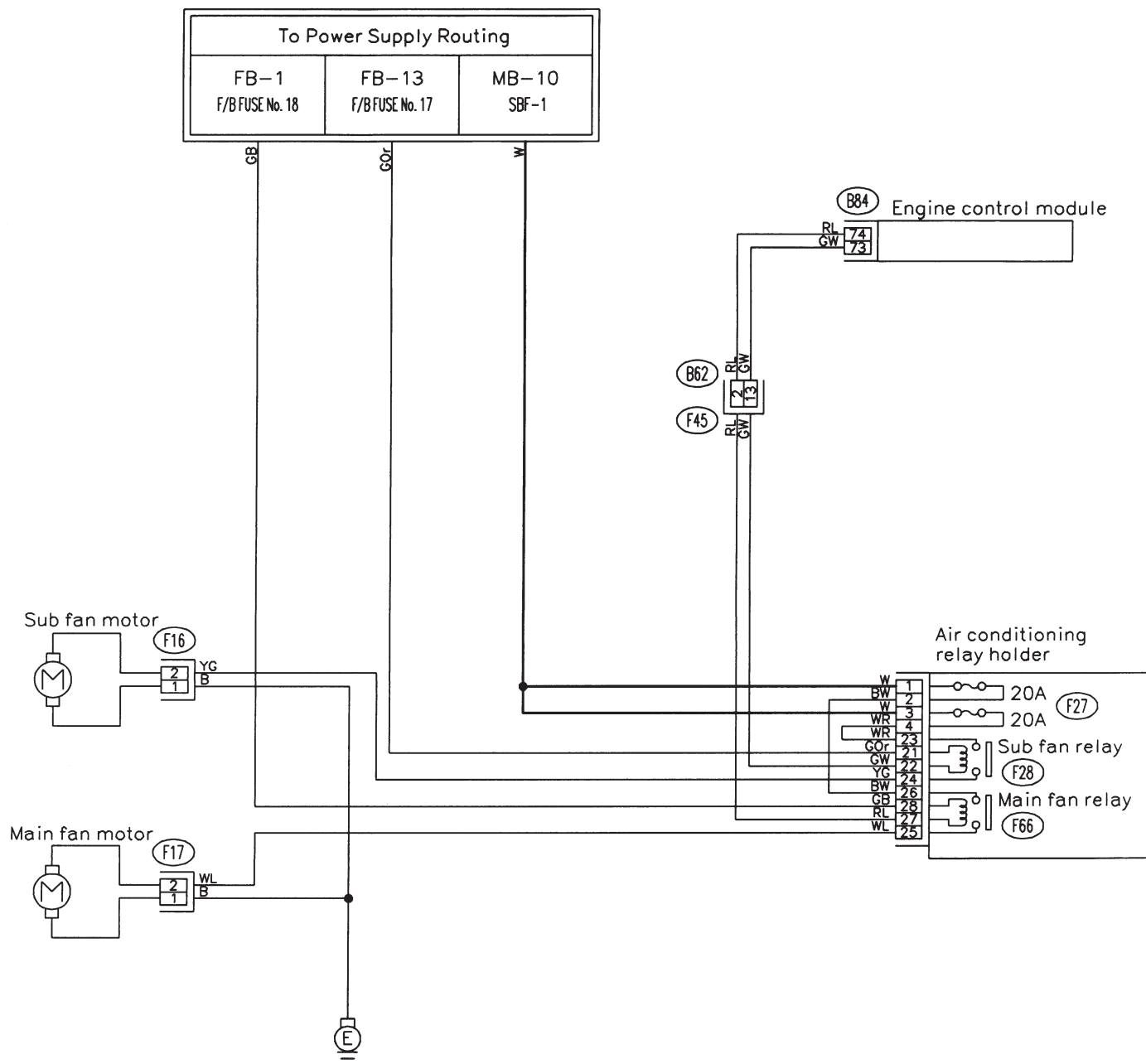


1. Wiring Diagram



(F16) (Black)

(F17) (Black)

(B62) (Blue)

(F27) (Black)

(F65) (Black)

(F31) (Black)

(F28) (Black)

(F66) (Black)

(F67) (Black)



1	2	3	4	5	6	☒	7	8	☐	9	10	11	
12	13	14	15	16	17	18	19	20	21	☐	22	23	24

1	2	5	6	9	13	14	17	21	22	25	29
3	4	7	10	15	18	23	26	27	28	30	
8	11	12	16	19	20	24	27	28	30		

SU14-01

(B84) (Light blue)

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
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96

SU14-01

2. Radiator Main Fan

A: OPERATION

DETECTING CONDITION:

Condition:

- Engine coolant temperature is above 95°C (203°F).
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOM:

- Radiator main fan does not rotate under the above conditions.

2A1 : CHECK POWER SUPPLY TO MAIN FAN MOTOR.

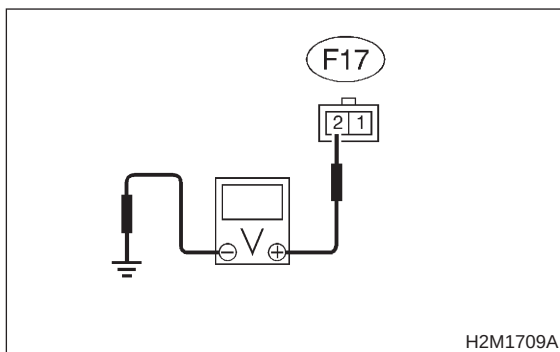
CAUTION:

Be careful not to overheat engine during repair.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from main fan motor.
- 3) Start the engine, and warm it up until engine coolant temperature increases over 95°C (203°F).
- 4) Stop the engine and turn ignition switch to ON.
- 5) Measure voltage between main fan motor connector and chassis ground.

Connector & terminal

(F17) No. 2 (+) — Chassis ground (-):



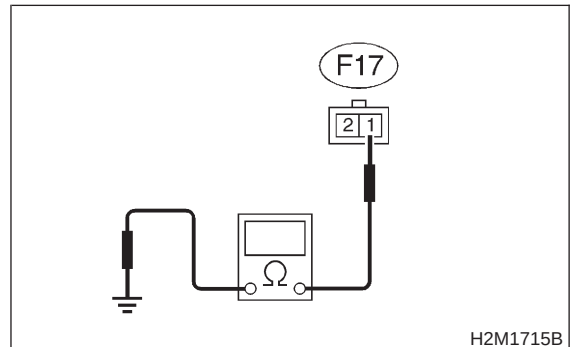
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 2A2.
- NO** : Go to step 2A5.

2A2 : CHECK GROUND CIRCUIT OF MAIN FAN MOTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between main fan motor connector and chassis ground.

Connector & terminal

(F17) No. 1 — Chassis ground:



- CHECK** : Is the resistance less than 5 Ω?
- YES** : Go to step 2A3.
- NO** : Repair open circuit in harness between main fan motor connector and chassis ground.

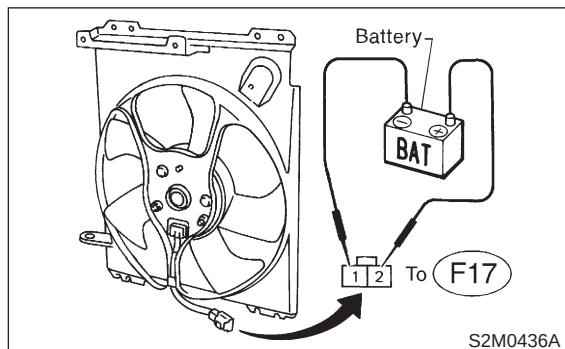
2A3 : CHECK POOR CONTACT.

Check poor contact in main fan motor connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fan motor connector?
- YES** : Repair poor contact in main fan motor connector.
- NO** : Go to step 2A4.

2A4 : CHECK MAIN FAN MOTOR.

Connect battery positive (+) terminal to terminal No. 2, and negative (-) terminal to terminal No. 1 of main fan motor connector.

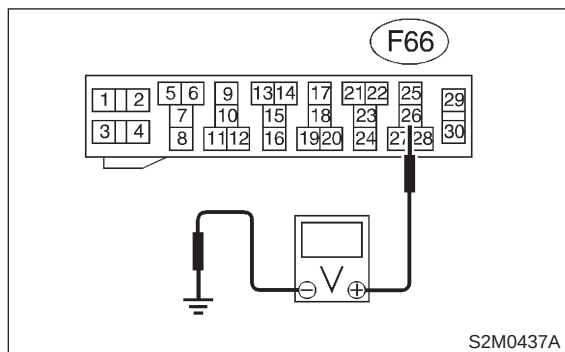


- CHECK** : *Does the main fan rotate?*
- YES** : Repair poor contact in main fan motor connector.
- NO** : Replace main fan motor with a new one.

2A5 : CHECK POWER SUPPLY TO MAIN FAN RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove main fan relay from A/C relay holder.
- 3) Measure voltage between main fan relay terminal and chassis ground.

Connector & terminal
(F66) No. 26 (+) — Chassis ground (-):

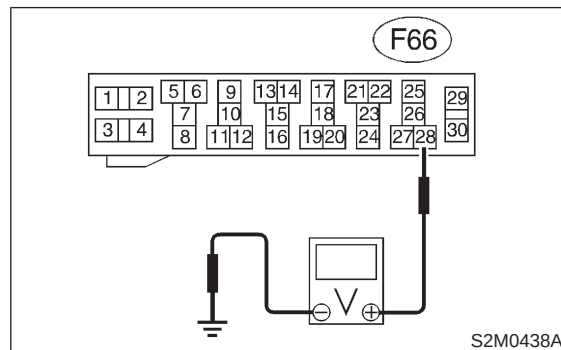


- CHECK** : *Is the voltage more than 10 V?*
- YES** : Go to step 2A6.
- NO** : Go to step 2A7.

2A6 : CHECK POWER SUPPLY TO MAIN FAN RELAY.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between main fan relay terminal and chassis ground.

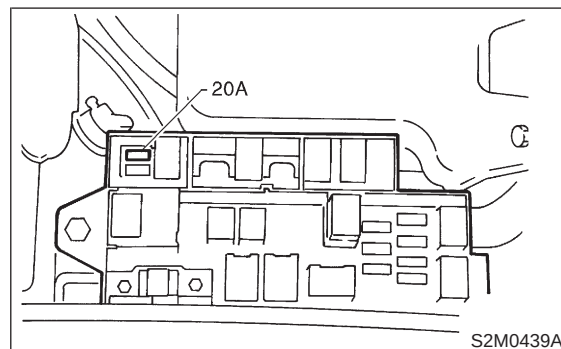
Connector & terminal
(F66) No. 28 (+) — Chassis ground (-):



- CHECK** : *Is the voltage more than 10 V?*
- YES** : Go to step 2A16.
- NO** : Go to step 2A12.

2A7 : CHECK 20 A FUSE.

- 1) Remove 20 A fuse from A/C relay holder.
- 2) Check condition of fuse.



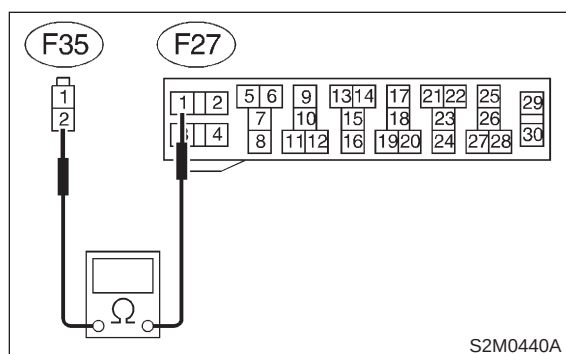
- CHECK** : *Is the fuse blown-out?*
- YES** : Replace fuse.
- NO** : Go to step 2A8.

2A8 : CHECK HARNESS CONNECTOR BETWEEN MAIN FUSE BOX AND A/C RELAY HOLDER 20 A FUSE.

- 1) Disconnect connector from main fuse box.
- 2) Disconnect connectors (F25) and (F26) from generator, and (F34) from SBF holder.
- 3) Measure resistance of harness connector between main fuse box connector and A/C relay holder 20 A fuse terminal.

Connector & terminal

(F35) No. 2 — (F27) No. 1:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 2A9.
- NO** : Repair open circuit in harness between main fuse box connector and 20 A fuse terminal.

2A9 : CHECK POOR CONTACT.

Check poor contact in main fuse box connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fuse box connector?
- YES** : Repair poor contact in main fuse box connector.
- NO** : Go to step 2A10.

2A10 : CHECK POOR CONTACT.

Check poor contact in A/C relay holder 20 A fuse connector. <Ref. to FOREWORD [T3C1].>

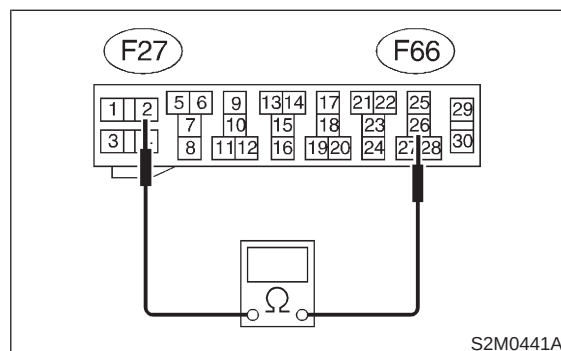
- CHECK** : Is there poor contact in A/C relay holder 20 A fuse connector?
- YES** : Repair poor contact in 20 A fuse
- NO** : Go to step 2A11.

2A11 : CHECK HARNESS CONNECTOR BETWEEN 20 A FUSE AND MAIN FAN RELAY IN A/C RELAY HOLDER.

Measure resistance of harness between 20 A fuse and main fan relay terminal.

Connector & terminal

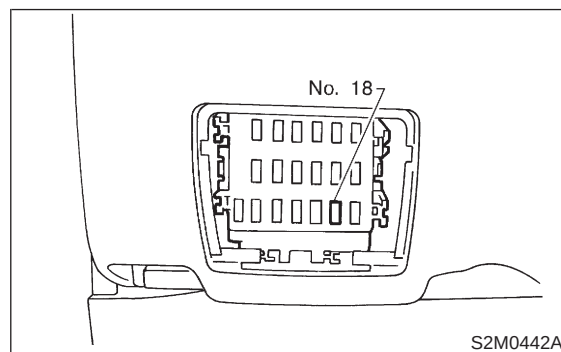
(F27) No. 2 — (F66) No. 26:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Repair poor contact in main fan relay connector.
- NO** : Repair open circuit in harness between 20 A fuse and main fan relay connector.

2A12 : CHECK FUSE.

- 1) Turn ignition switch to OFF.
- 2) Remove fuse No. 18 from joint box.
- 3) Check condition of fuse.



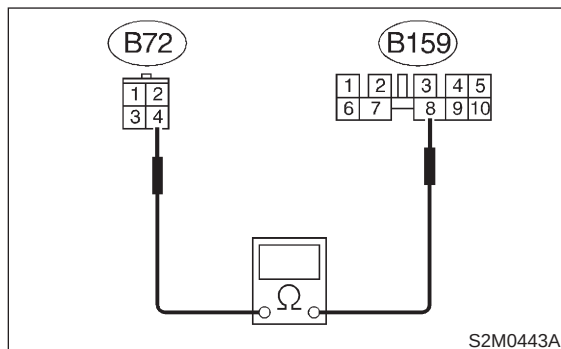
- CHECK** : Is the fuse blown-out?
- YES** : Replace fuse.
- NO** : Go to step 2A13.

2A13 : CHECK HARNESS CONNECTOR BETWEEN IGNITION SWITCH AND JOINT BOX.

- 1) Disconnect connector from ignition switch.
- 2) Separate connectors (F44) and (B61).
- 3) Disconnect connector (B159) from joint box.
- 4) Measure resistance of harness between ignition switch connector and joint box.

Connector & terminal

(B72) No. 4 — (B159) No. 8:



CHECK : Is the resistance less than 1 Ω?

YES : Go to step 2A14.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ignition switch connector and joint box.
- Poor contact in coupling connector (B61).

2A14 : CHECK POOR CONTACT.

Check poor contact in ignition switch connector.
<Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in ignition switch connector?

YES : Repair poor contact in ignition switch connector.

NO : Go to step 2A15.

2A15 : CHECK POOR CONTACT.

Check poor contact in joint box 10 A fuse connector. <Ref. to FOREWORD [T3C1].>

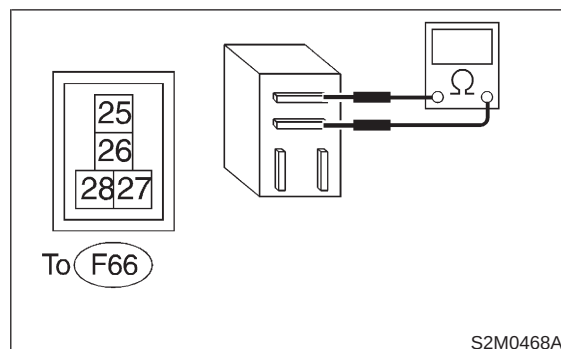
CHECK : Is there poor contact in joint box 10 A fuse connector?

YES : Repair poor contact in joint box connector.

NO : Go to step 2A16.

2A16 : CHECK MAIN FAN RELAY.

- 1) Turn ignition switch to OFF.
- 2) Check continuity between main fan relay terminals.



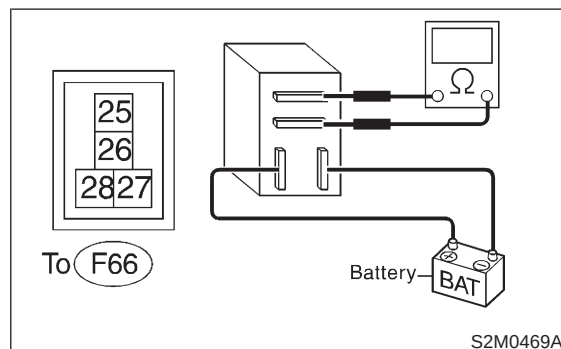
CHECK : Does no continuity exist between terminals No. 25 and No. 26?

YES : Go to step 2A17.

NO : Replace main fan relay.

2A17 : CHECK MAIN FAN RELAY.

- 1) Connect battery to terminals No. 27 and No. 28 of main fan relay.
- 2) Check continuity between main fan relay terminals.



CHECK : Does continuity exist between terminals No. 25 and No. 26?

YES : Go to step 2A18.

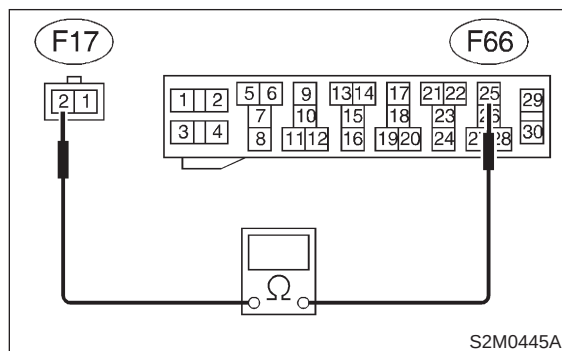
NO : Replace main fan relay.

2A18 : CHECK HARNESS CONNECTOR BETWEEN MAIN FAN RELAY AND MAIN FAN MOTOR.

Measure resistance of harness between main fan motor connector and main fan relay terminal.

Connector & terminal

(F17) No. 2 — (F66) No. 25:



- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 2A19.
- NO** : Repair open circuit in harness between main fan motor and main fan relay connector.

2A19 : CHECK POOR CONTACT.

Check poor contact in main fan relay connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fan relay connector?
- YES** : Repair poor contact in main fan relay connector.
- NO** : Go to step 2A20.

2A20 : CHECK POOR CONTACT.

Check poor contact in main fan relay connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fan motor connector?
- YES** : Repair poor contact in main fan motor connector.
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

3. Radiator Sub Fan (With A/C model only)

A: OPERATION

DETECTING CONDITION:

Condition (1):

- Engine coolant temperature is below 95°C (203°F).
- A/C switch is turned ON.
- Vehicle speed is below 19 km/h (12 MPH).

Condition (2):

- Engine coolant temperature is above 100°C (212°F).
- A/C switch is turned OFF.
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOM:

- Radiator sub fan does not rotate under conditions (1) and (2) above.

3A1 : CHECK POWER SUPPLY TO SUB FAN MOTOR.

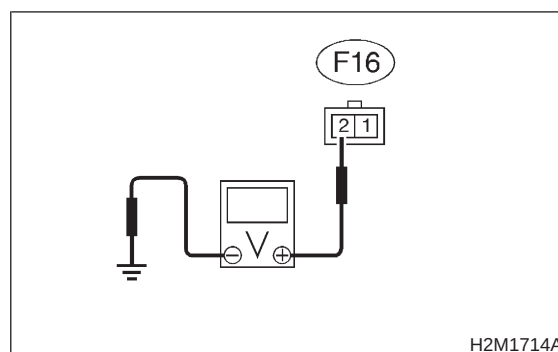
CAUTION:

Be careful not to overheat engine during repair.

- Turn ignition switch to OFF.
- Disconnect connector from sub fan motor.
- Start the engine, and warm it up until engine coolant temperature increases over 100°C (212°F).
- Stop the engine and turn ignition switch to ON.
- Measure voltage between sub fan motor connector and chassis ground.

Connector & terminal

(F16) No. 2 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 3A2.
- NO** : Go to step 3A5.

ENGINE COOLING SYSTEM

[T3A1] 2-5

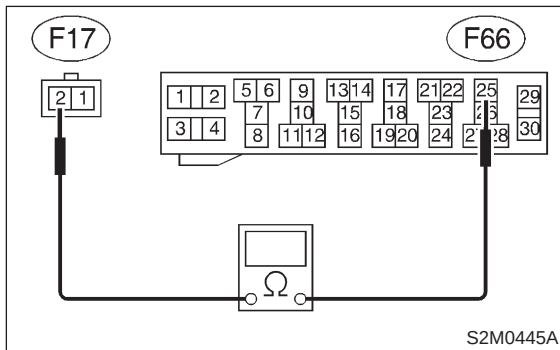
3. Radiator Sub Fan (With A/C model only)

2A18 : CHECK HARNESS CONNECTOR BETWEEN MAIN FAN RELAY AND MAIN FAN MOTOR.

Measure resistance of harness between main fan motor connector and main fan relay terminal.

Connector & terminal

(F17) No. 2 — (F66) No. 25:



- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 2A19.
- NO** : Repair open circuit in harness between main fan motor and main fan relay connector.

2A19 : CHECK POOR CONTACT.

Check poor contact in main fan relay connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fan relay connector?
- YES** : Repair poor contact in main fan relay connector.
- NO** : Go to step 2A20.

2A20 : CHECK POOR CONTACT.

Check poor contact in main fan relay connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fan motor connector?
- YES** : Repair poor contact in main fan motor connector.
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

3. Radiator Sub Fan (With A/C model only)

A: OPERATION

DETECTING CONDITION:

Condition (1):

- Engine coolant temperature is below 95°C (203°F).
- A/C switch is turned ON.
- Vehicle speed is below 19 km/h (12 MPH).

Condition (2):

- Engine coolant temperature is above 100°C (212°F).
- A/C switch is turned OFF.
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOM:

- Radiator sub fan does not rotate under conditions (1) and (2) above.

3A1 : CHECK POWER SUPPLY TO SUB FAN MOTOR.

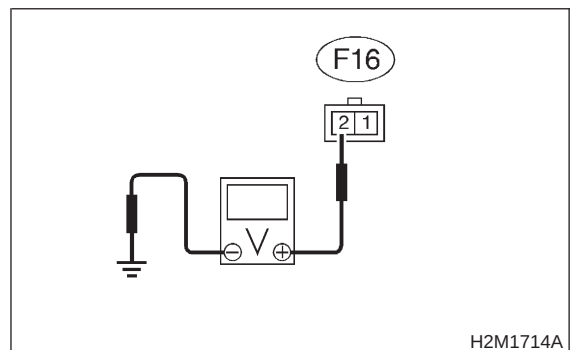
CAUTION:

Be careful not to overheat engine during repair.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from sub fan motor.
- 3) Start the engine, and warm it up until engine coolant temperature increases over 100°C (212°F).
- 4) Stop the engine and turn ignition switch to ON.
- 5) Measure voltage between sub fan motor connector and chassis ground.

Connector & terminal

(F16) No. 2 (+) — Chassis ground (-):



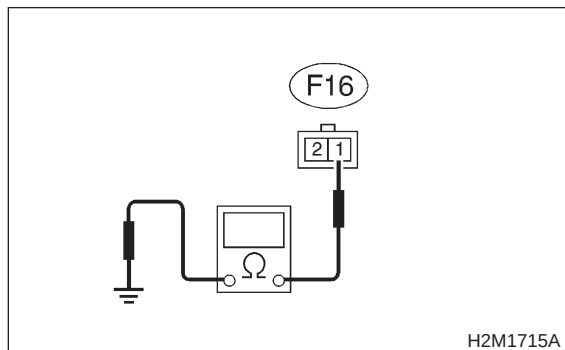
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 3A2.
- NO** : Go to step 3A5.

3A2 : CHECK GROUND CIRCUIT OF SUB FAN MOTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between sub fan motor connector and chassis ground.

Connector & terminal

(F16) No. 1 — Chassis ground:



- CHECK** : Is the resistance less than 5 Ω ?
- YES** : Go to step 3A3.
- NO** : Repair open circuit in harness between sub fan motor connector and chassis ground.

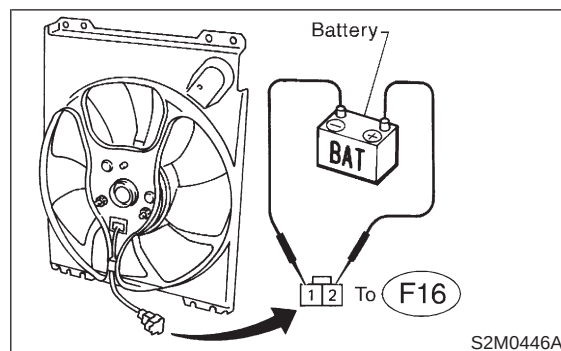
3A3 : CHECK POOR CONTACT.

Check poor contact in sub fan motor connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in sub fan motor connector?
- YES** : Repair poor contact in sub fan motor connector.
- NO** : Go to step 3A4.

3A4 : CHECK SUB FAN MOTOR.

Connect battery positive (+) terminal to terminal No. 2, and negative (-) terminal to terminal No. 1 of sub fan motor connector.



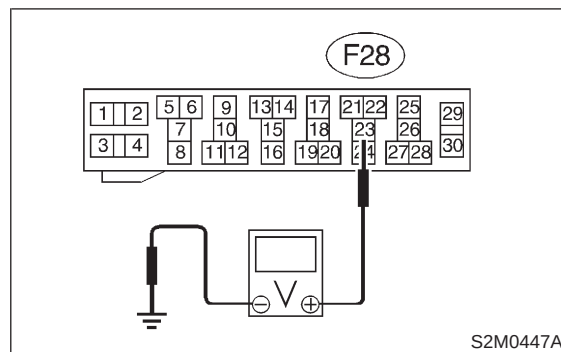
- CHECK** : Does the sub fan rotate?
- YES** : Repair poor contact in sub fan motor connector.
- NO** : Replace sub fan motor with a new one.

3A5 : CHECK POWER SUPPLY TO SUB FAN RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove sub fan relay from A/C relay holder.
- 3) Measure voltage between sub fan relay terminal and chassis ground.

Connector & terminal

(F28) No. 23 (+) — Chassis ground (-):



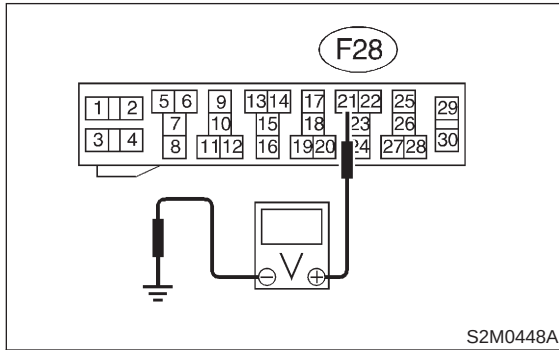
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 3A6.
- NO** : Go to step 3A7.

3A6 : CHECK POWER SUPPLY TO SUB FAN RELAY.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between sub fan relay terminal and chassis ground.

Connector & terminal

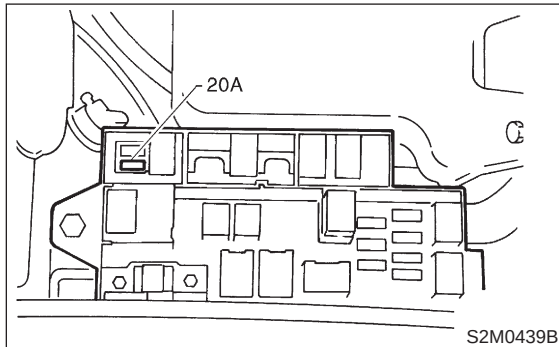
(F28) No. 21 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 3A16.
- NO** : Go to step 3A12.

3A7 : CHECK 20 A FUSE.

- 1) Remove 20 A fuse from A/C relay holder.
- 2) Check condition of fuse.



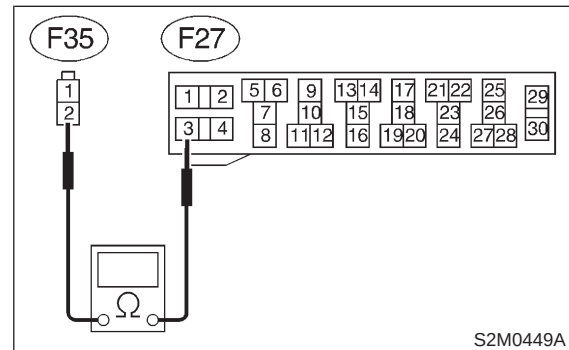
- CHECK** : Is the fuse blown-out?
- YES** : Replace fuse.
- NO** : Go to step 3A8.

3A8 : CHECK HARNESS CONNECTOR BETWEEN MAIN FUSE BOX AND A/C RELAY HOLDER 20 A FUSE.

- 1) Disconnect connector from main fuse box.
- 2) Disconnect connectors (F25) and (F26) from generator, and (F34) from SBF holder.
- 3) Measure resistance of harness connector between main fuse box connector and A/C relay holder 20 A fuse terminal.

Connector & terminal

(F35) No. 2 — (F27) No. 3:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 3A9.
- NO** : Repair open circuit in harness between main fuse box connector and 20 A fuse terminal.

3A9 : CHECK POOR CONTACT.

Check poor contact in main fuse box connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in main fuse box connector?
- YES** : Repair poor contact in main fuse box connector.
- NO** : Go to step 3A10.

3A10 : CHECK POOR CONTACT.

Check poor contact in A/C relay holder 20 A fuse connector. <Ref. to FOREWORD [T3C1].>

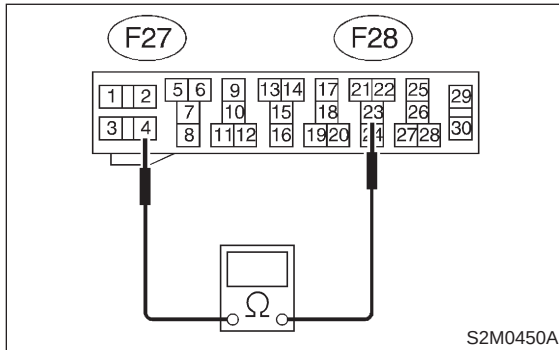
- CHECK** : Is there poor contact in A/C relay holder 20 A fuse connector?
- YES** : Repair poor contact in 20 A fuse
- NO** : Go to step 3A11.

3A11 : CHECK HARNESS CONNECTOR BETWEEN 20 A FUSE AND SUB FAN RELAY IN A/C RELAY HOLDER.

Measure resistance of harness between 20 A fuse and sub fan relay terminal.

Connector & terminal

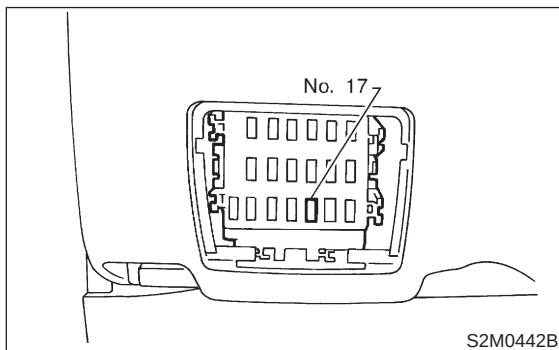
(F27) No. 4 — (F28) No. 23:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Repair poor contact in sub fan relay connector.
- NO** : Repair open circuit in harness between 20 A fuse and sub fan relay connector.

3A12 : CHECK FUSE.

- 1) Turn ignition switch to OFF.
- 2) Remove fuse No. 17 from joint box.
- 3) Check condition of fuse.



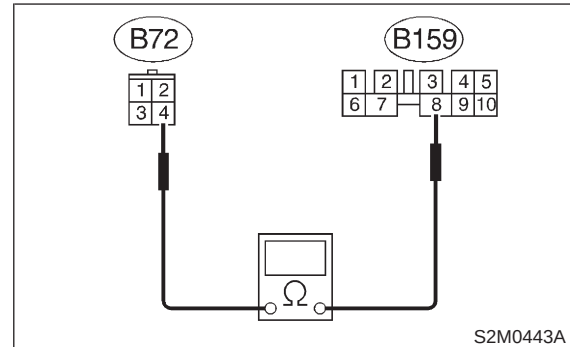
- CHECK** : Is the fuse blown-out?
- YES** : Replace fuse.
- NO** : Go to step 3A13.

3A13 : CHECK HARNESS CONNECTOR BETWEEN IGNITION SWITCH AND JOINT BOX.

- 1) Disconnect connector from ignition switch.
- 2) Separate connectors (F44) and (B61).
- 3) Disconnect connector (B159) from joint box.
- 4) Measure resistance of harness between ignition switch connector and joint box.

Connector & terminal

(B72) No. 4 — (B159) No. 8:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 3A14.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ignition switch connector and joint box.
- Poor contact in coupling connector (B61).

3A14 : CHECK POOR CONTACT.

Check poor contact in ignition switch connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in ignition switch connector?
- YES** : Repair poor contact in ignition switch connector.
- NO** : Go to step 3A15.

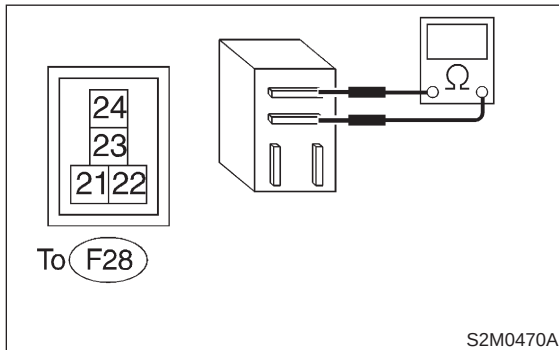
3A15 : CHECK POOR CONTACT.

Check poor contact in joint box 10 A fuse connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in joint box 10 A fuse connector?
- YES** : Repair poor contact in joint box connector.
- NO** : Go to step 3A16.

3A16 : CHECK SUB FAN RELAY.

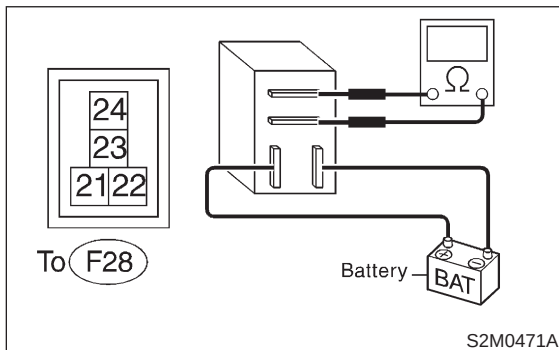
- 1) Turn ignition switch to OFF.
- 2) Check continuity between sub fan relay terminals.



- CHECK** : Does no continuity exist between terminals No. 23 and No. 24?
- YES** : Go to step 3A17.
- NO** : Replace sub fan relay.

3A17 : CHECK SUB FAN RELAY.

- 1) Connect battery to terminals No. 21 and No. 22 of sub fan relay.
- 2) Check continuity between sub fan relay terminals.

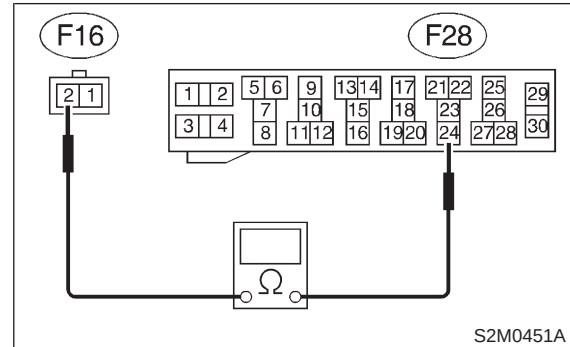


- CHECK** : Does continuity exist between terminals No. 23 and No. 24?
- YES** : Go to step 3A18.
- NO** : Replace sub fan relay.

3A18 : CHECK HARNESS CONNECTOR BETWEEN SUB FAN RELAY AND SUB FAN MOTOR.

Measure resistance of harness between sub fan motor connector and sub fan relay terminal.

Connector & terminal
(F16) No. 2 — (F28) No. 24:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 3A19.
- NO** : Repair open circuit in harness between sub fan motor and sub fan relay connector.

3A19 : CHECK POOR CONTACT.

Check poor contact in sub fan relay connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in sub fan relay connector?
- YES** : Repair poor contact in sub fan relay connector.
- NO** : Go to step 3A20.

3A20 : CHECK POOR CONTACT.

Check poor contact in sub fan relay connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in sub fan motor connector?
- YES** : Repair poor contact in sub fan motor connector.
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

MEMO:

1. General

A: GENERAL DESCRIPTION

- The on-board diagnostics (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter indicates occurrence of a fault or trouble.
- Further, against such a failure or sensors as may disable the drive, the fail-safe function is provided to ensure the minimal driveability.
- The OBD system incorporated with the vehicles within this engine family complies with Section 1968.1, California Code of Regulations (OBD-II regulation). 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, MIL illuminates. At the same time of the MIL illumination or blinking, a diagnostic trouble code (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 first.
- If the OBD system detects the various malfunctions including the fault of fuel trim or misfire, the OBD system first stores freeze frame engine conditions about the fuel trim or misfire.
- When the malfunction does not occur again for three consecutive driving cycles, MIL is turned off, but DTC remains at on-board computer.
- The OBD-II system is capable of communication with a general scan tool (OBD-II general scan tool) formed by ISO 9141 CARB.
- The OBD-II diagnostics procedure is different from the usual diagnostics procedure. When troubleshooting OBD-II vehicles, connect Subaru select monitor or the OBD-II general scan tool to the vehicle.

B: ENGINE

1. ENGINE AND EMISSION CONTROL SYSTEM

- The Multipoint Fuel Injection (MFI) system is a system that supplies the optimum air-fuel mixture to the engine for all the various operating conditions through the use of the latest electronic technology.

With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection

system where the electro-magnetic injection valve (fuel injector) opens only for a short period of time, depending on the quantity of air required for one cycle of operation. In actual operation, the injection quantity is determined by the duration of an electric pulse applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

- Further, all the operating conditions of the engine are converted into electric signals, and this results in additional features of the system, such as large improved adaptability, easier addition of compensating element, etc.

The MFI system also has the following features:

- Reduced emission of harmful exhaust gases.
- Reduced in fuel consumption.
- Increased engine output.
- Superior acceleration and deceleration.
- Superior startability and warm-up performance in cold weather since compensation is made for coolant and intake air temperature.

C: AUTOMATIC TRANSMISSION

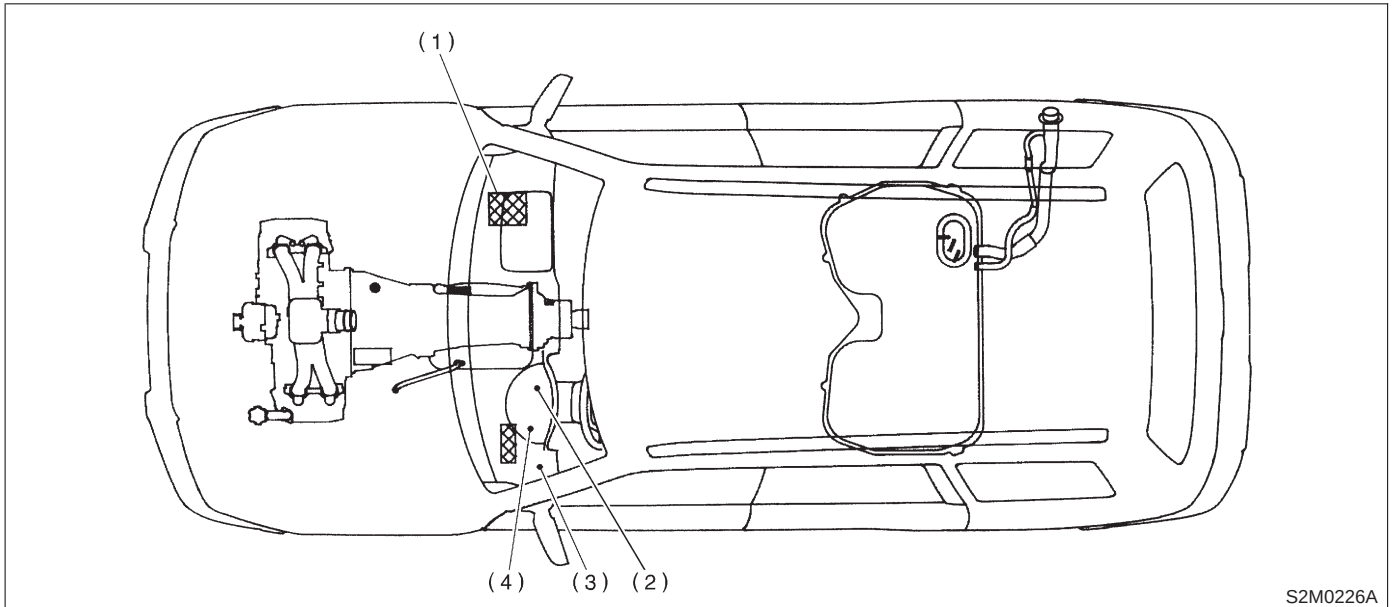
1. ELECTRONIC-HYDRAULIC CONTROL SYSTEM

The electronic-hydraulic control system consists of various sensors and switches, a transmission control module (TCM) and the hydraulic controller including solenoid valves. The system controls the transmission proper including shift control, lock-up control, overrunning clutch control, line pressure control and shift timing control. It also controls the AWD transfer clutch. In other words, the system detects various operating conditions from various input signals and sends output signals to shift solenoids 1, 2 and 3 and duty solenoids A, B and C (a total of six solenoids).

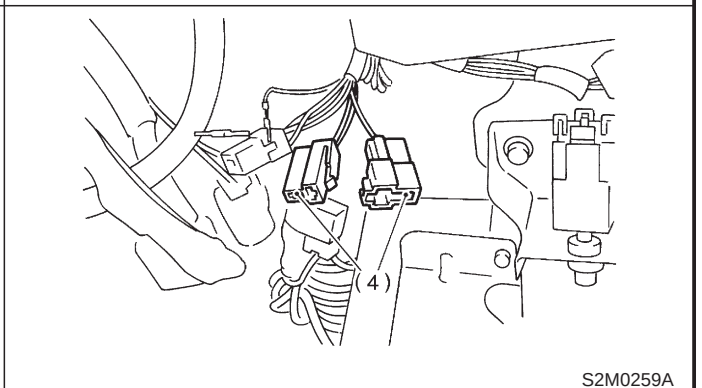
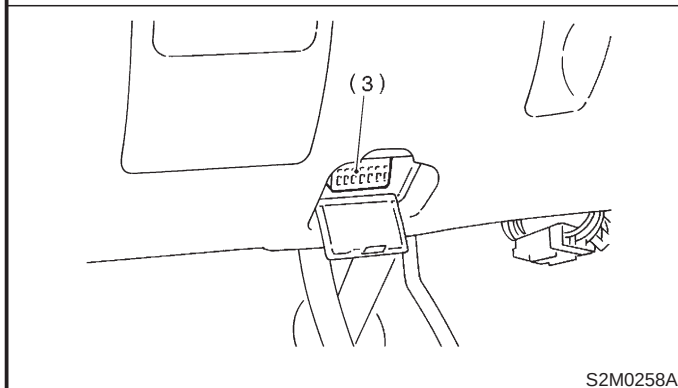
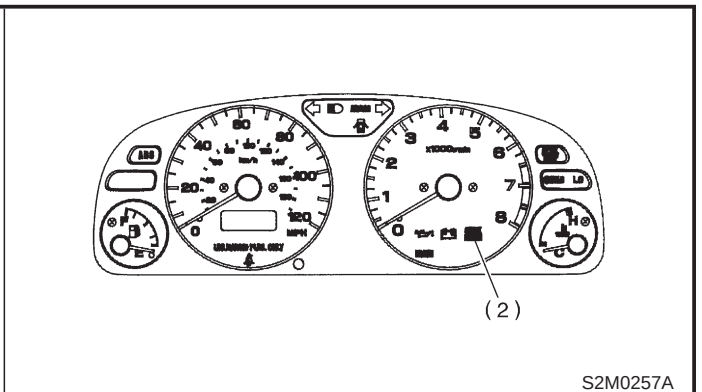
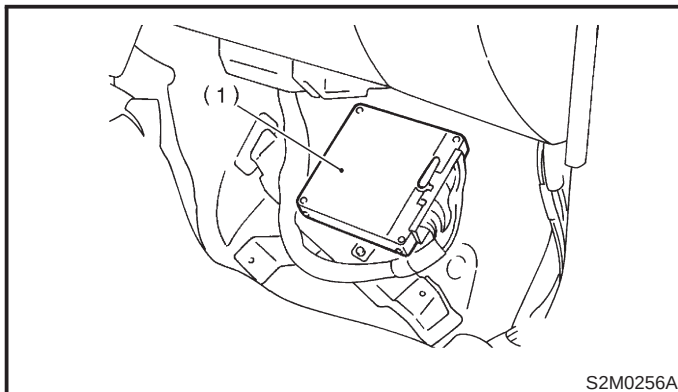
2. Electrical Components Location

A: ENGINE

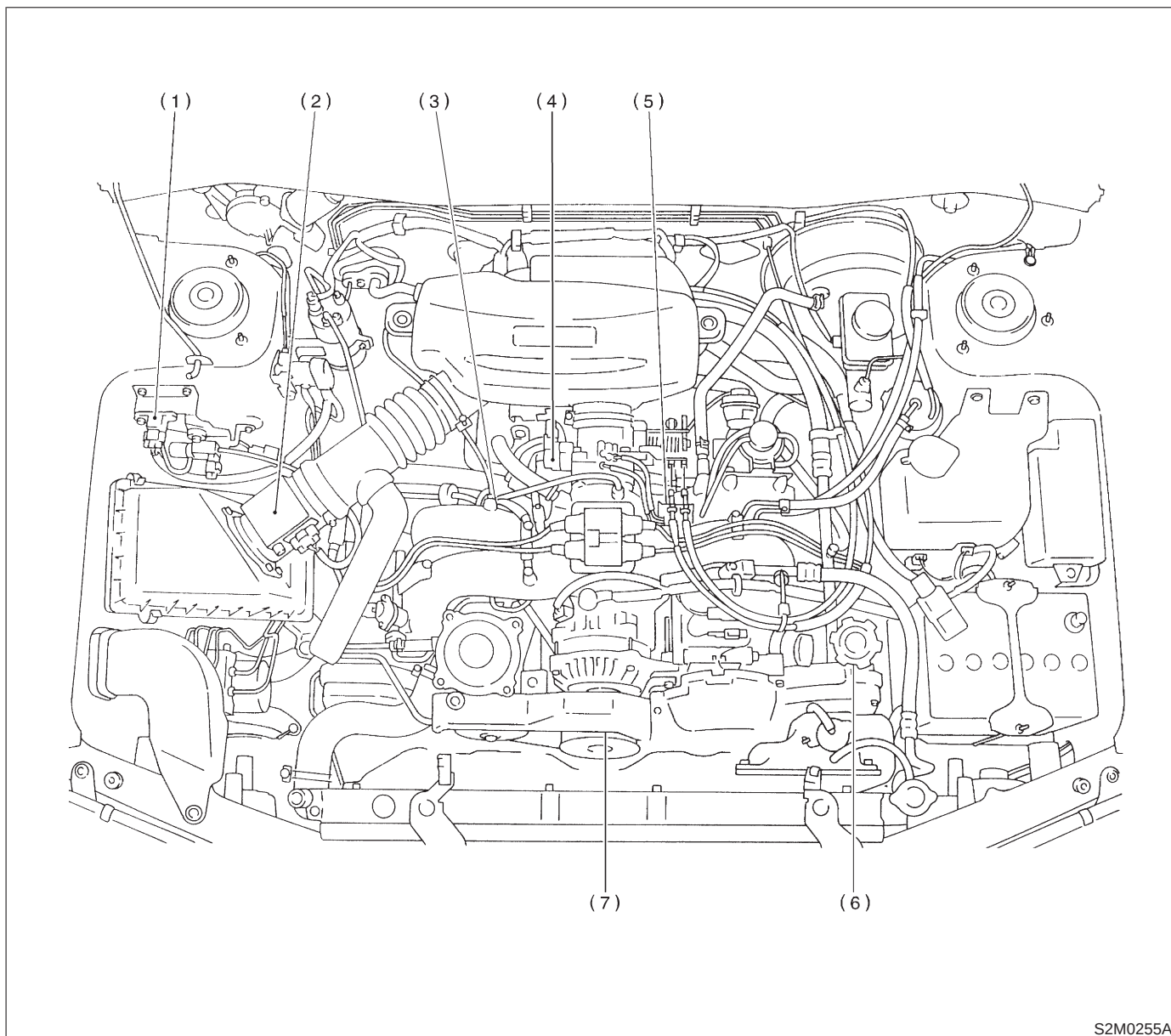
1. MODULE



(1) Engine control module (ECM)	(3) Data link connector
(2) CHECK ENGINE malfunction indicator lamp (MIL)	(4) Test mode connector

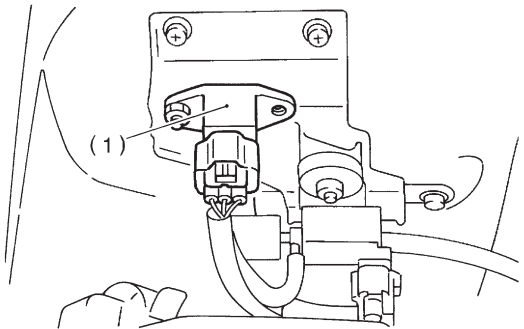
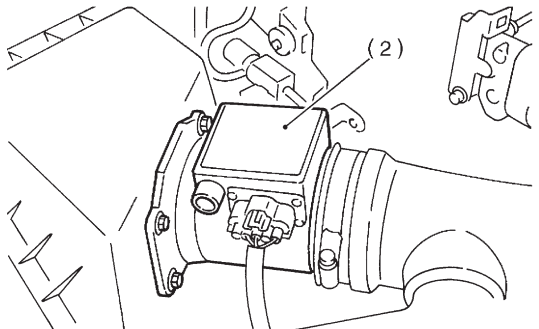
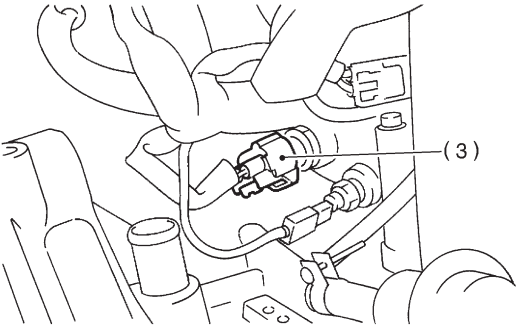
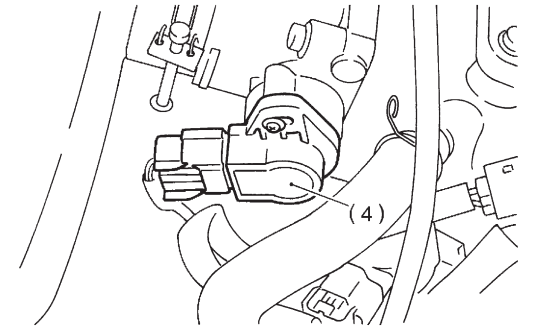
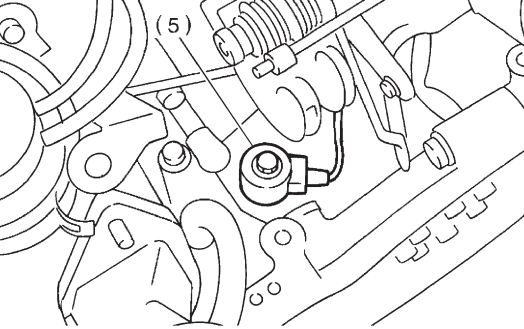
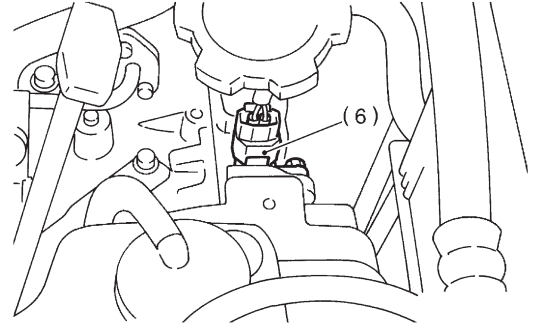
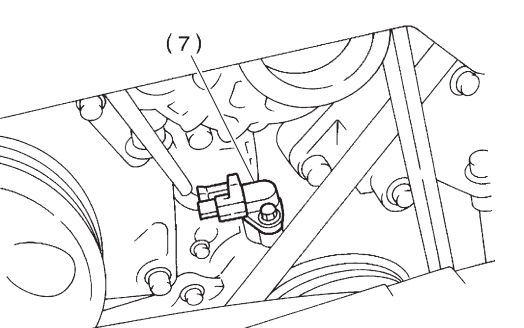


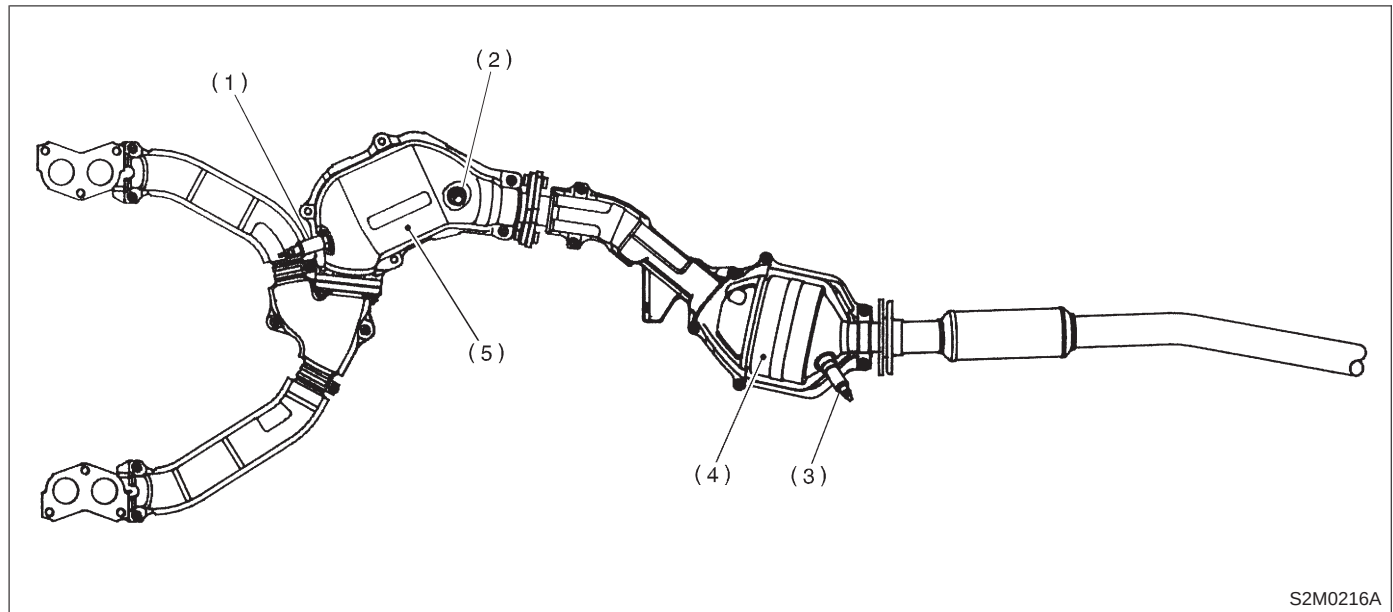
2. SENSOR



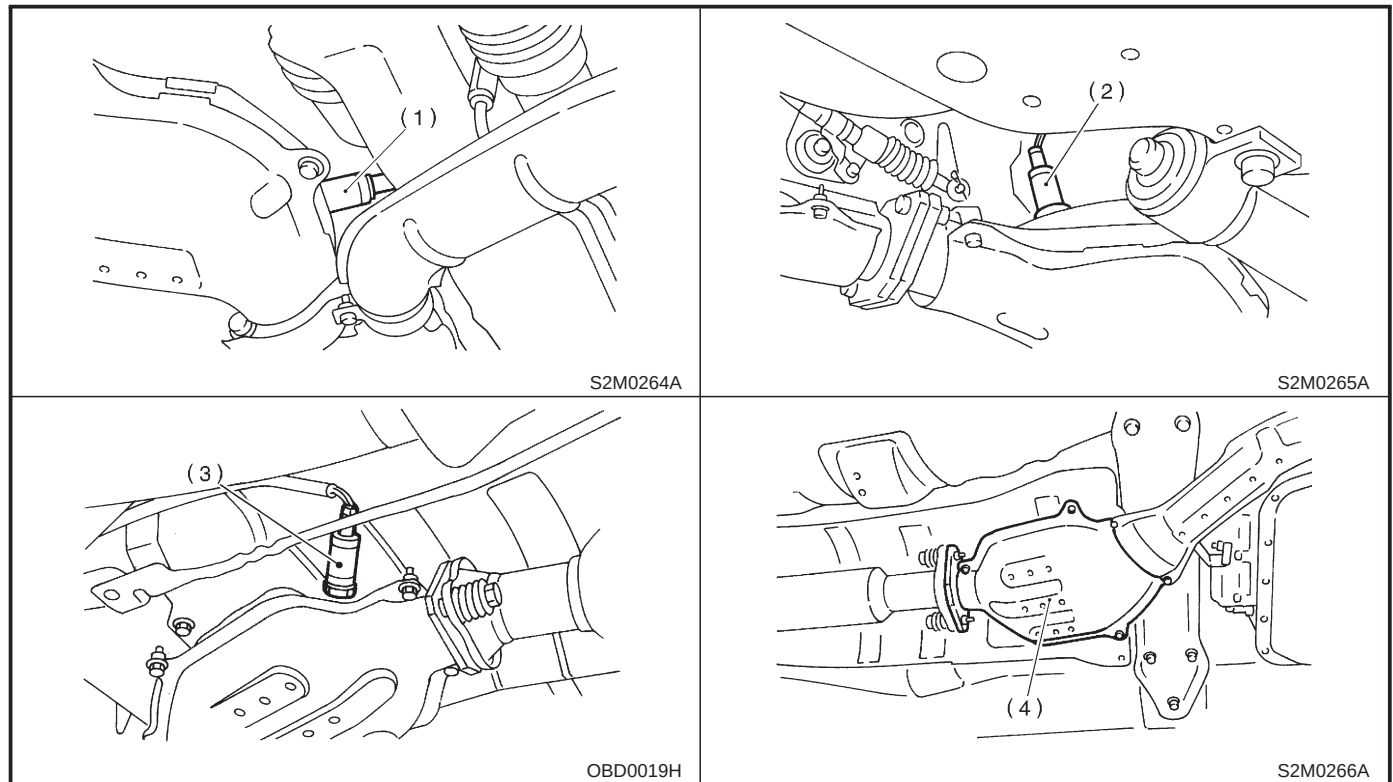
S2M0255A

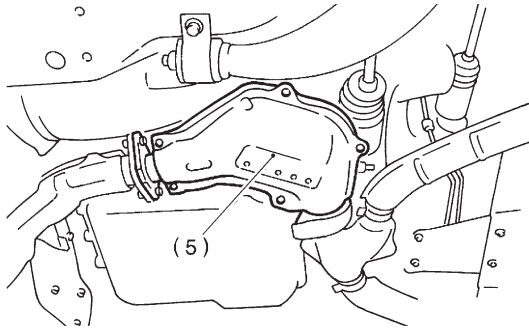
(1) Pressure sensor	(4) Throttle position sensor
(2) Mass air flow sensor	(5) Knock sensor
(3) Engine coolant temperature sensor	(6) Camshaft position sensor
	(7) Crankshaft position sensor

 S2M0260A	 S2M0261A
 B2M1690E	 S2M0262A
 B2M1691C	 S2M0263A
 B2M0213I	SUBARU.



(1) Front oxygen sensor	(3) Rear oxygen sensor (Federal spec. vehicles)	(5) Front catalytic converter
(2) Rear oxygen sensor (California spec. vehicles)	(4) Rear catalytic converter	

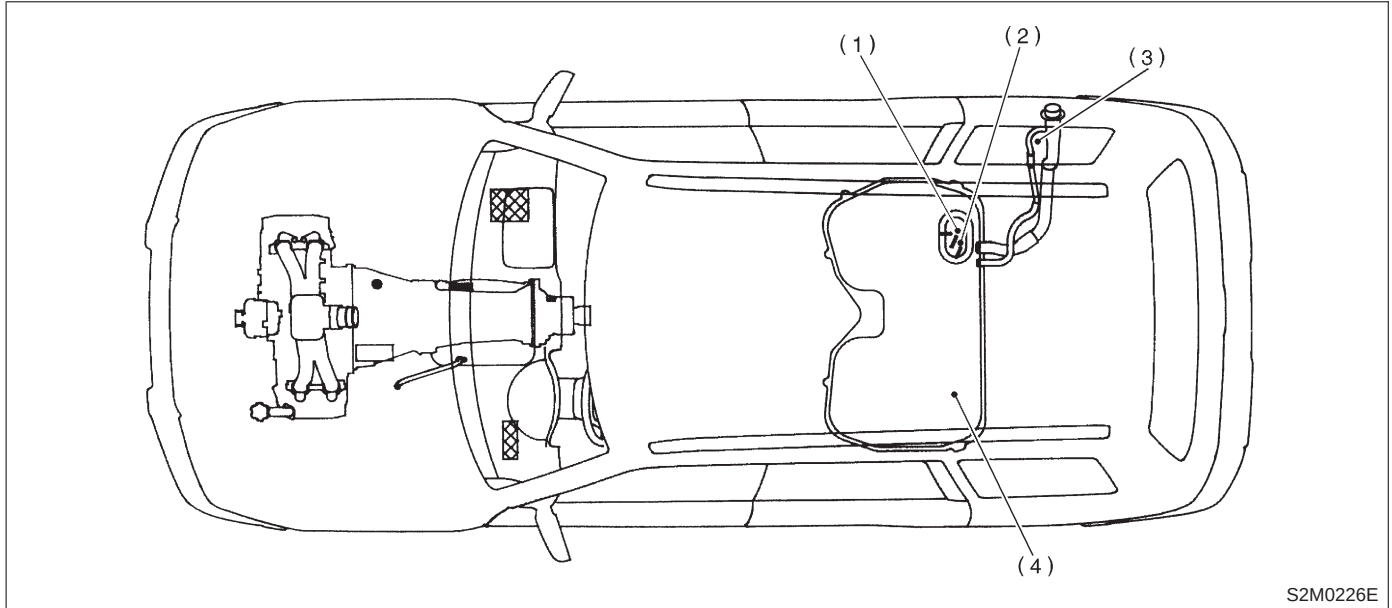




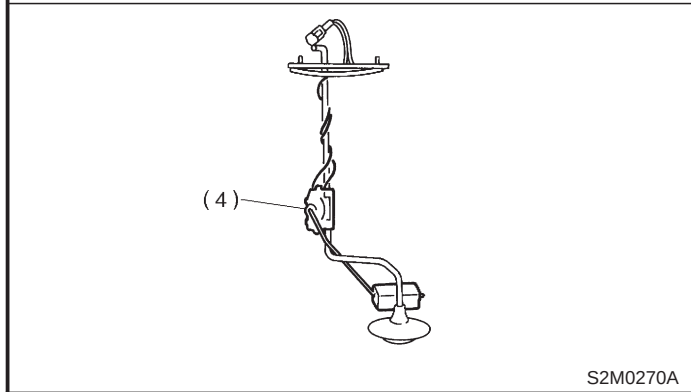
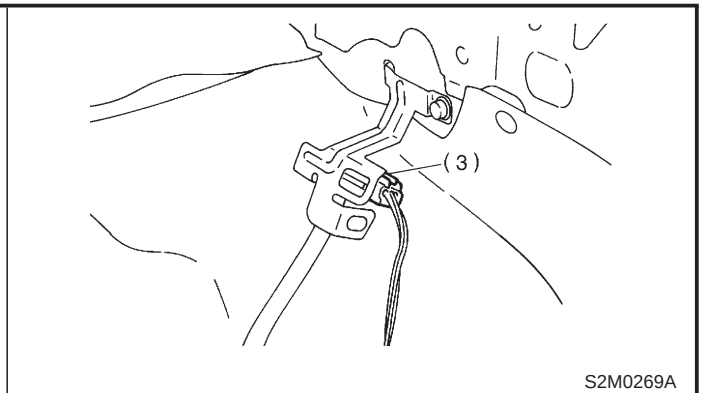
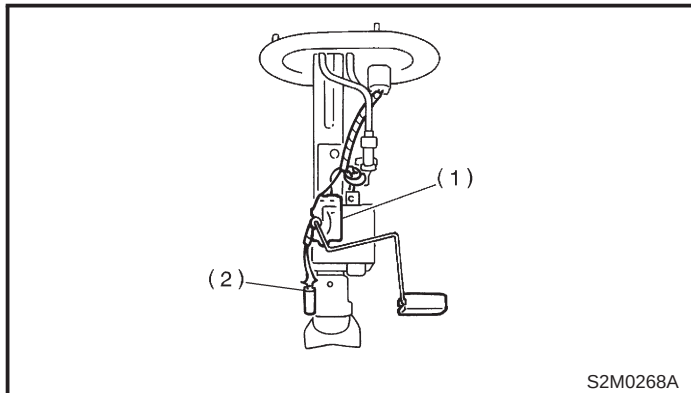
S2M0267A

SUBARU.

● WITHOUT ORVR MODEL

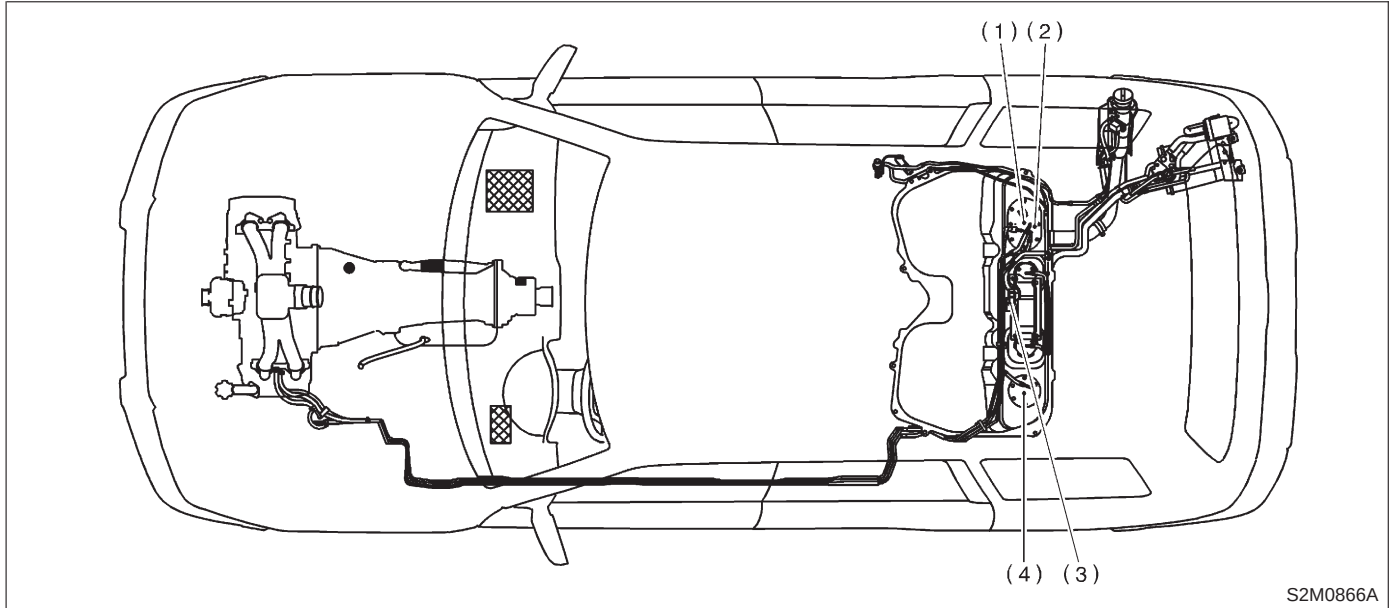


(1) Fuel level sensor (Main)	(3) Fuel tank pressure sensor
(2) Fuel temperature sensor	(4) Fuel level sensor (Sub)



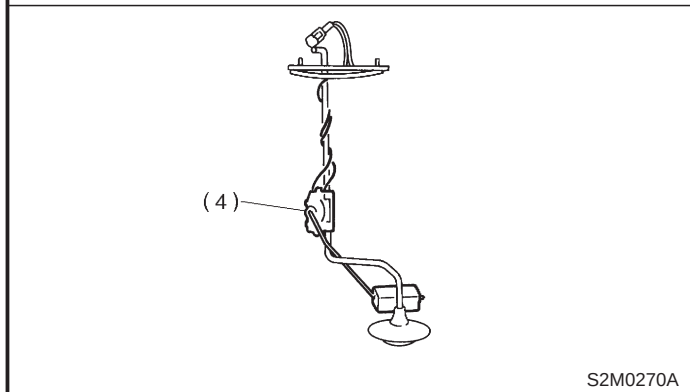
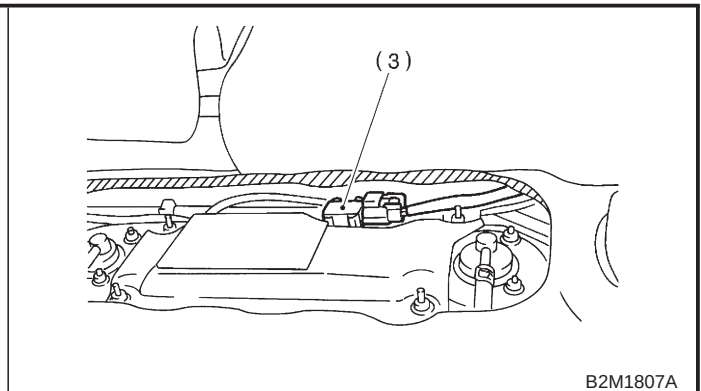
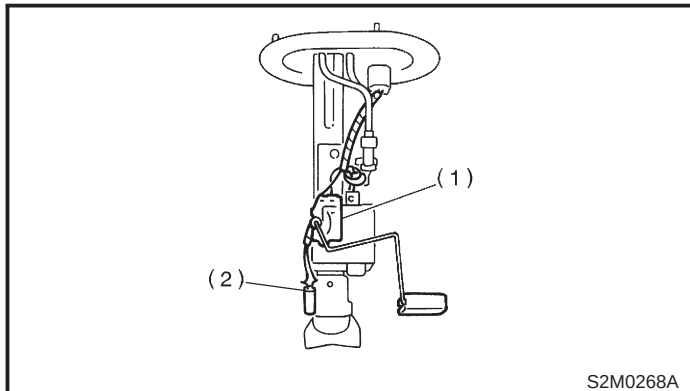
SUBARU.

● WITH ORVR MODEL

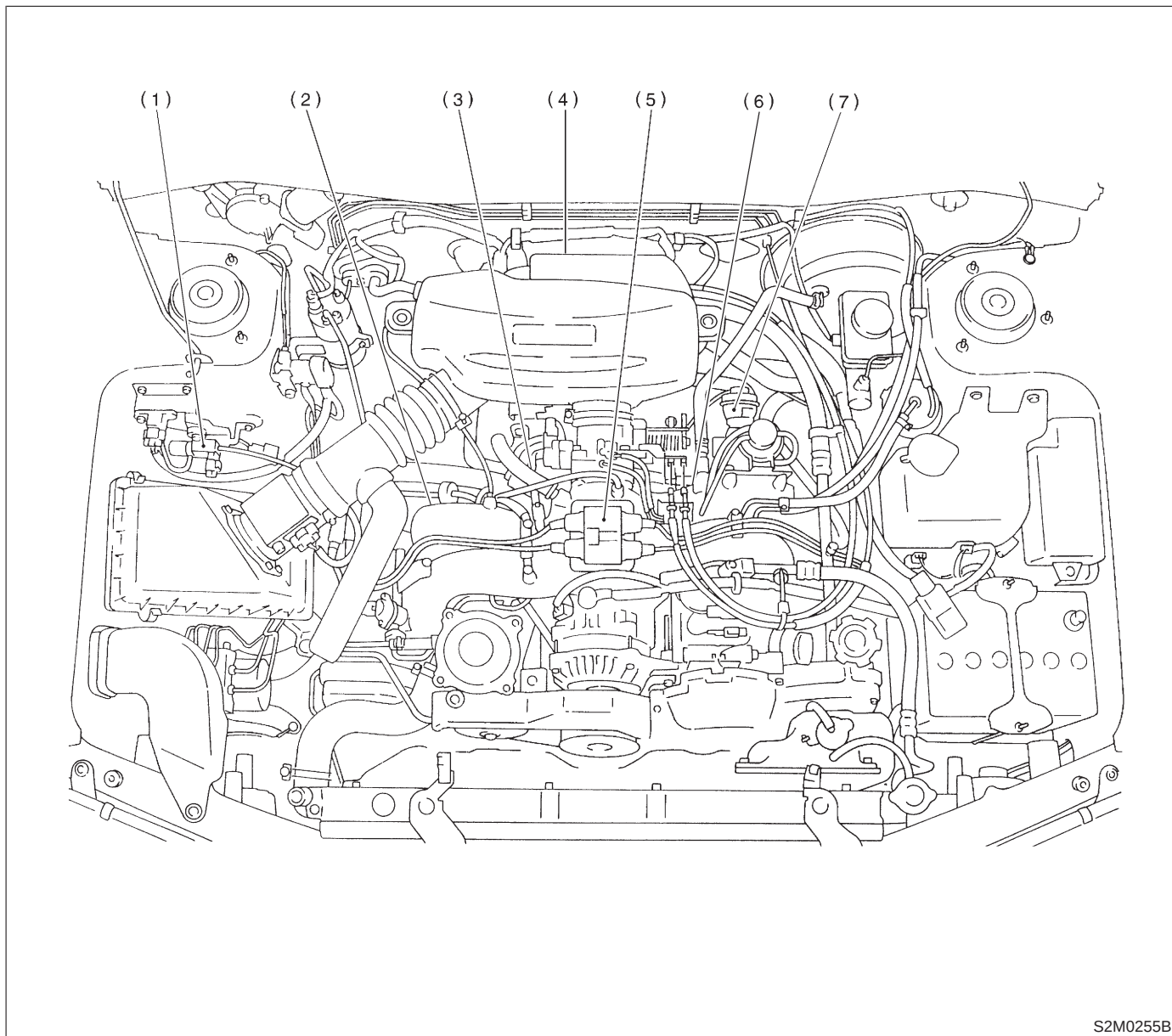


- (1) Fuel level sensor (Main)
- (2) Fuel temperature sensor

- (3) Fuel tank pressure sensor
- (4) Fuel level sensor (Sub)



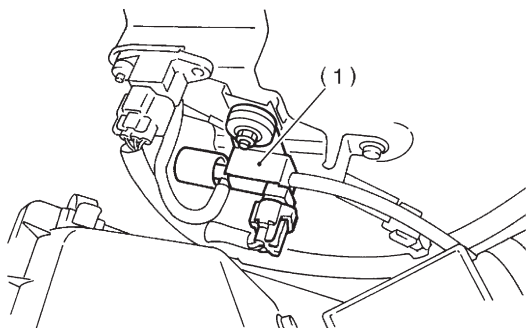
SUBARU.

3. SOLENOID VALVE, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS

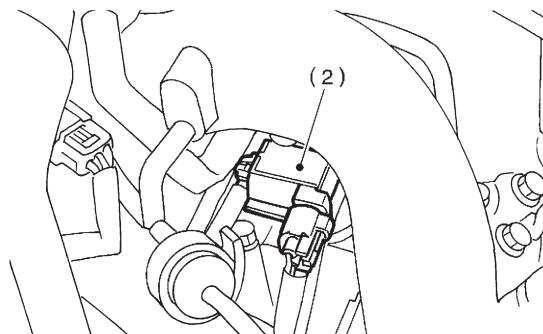
- (1) Pressure sources switching solenoid valve
(2) Purge control solenoid valve

- (3) Idle air control solenoid valve
(4) Ignitor
(5) Ignition coil

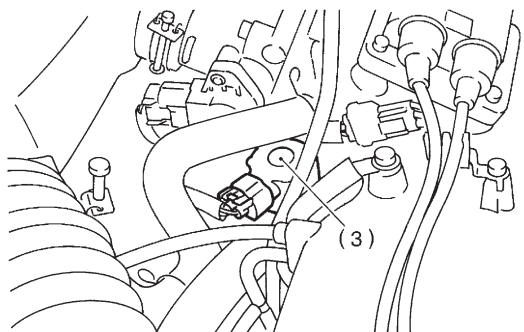
- (6) EGR control solenoid valve
(7) EGR valve



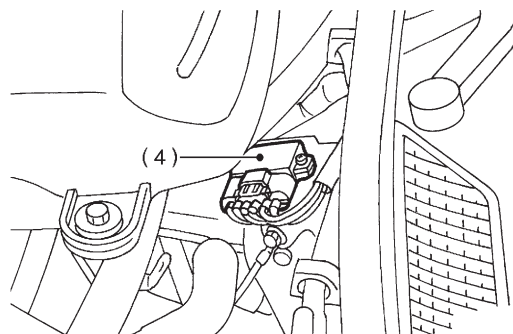
S2M0271A



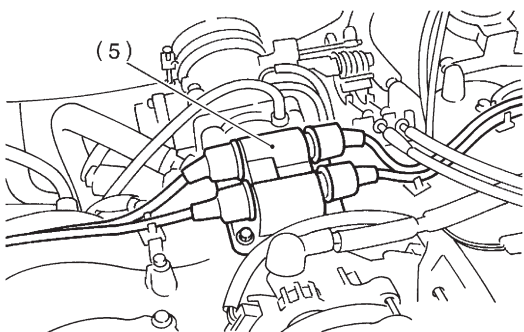
B2M1039J



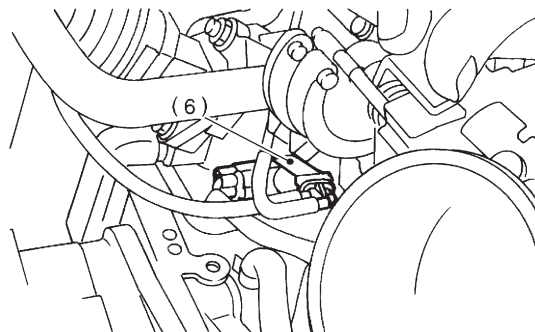
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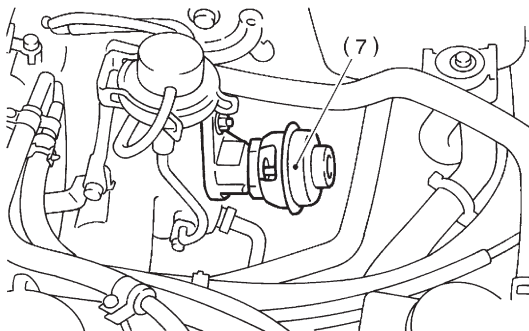
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S2M0273A



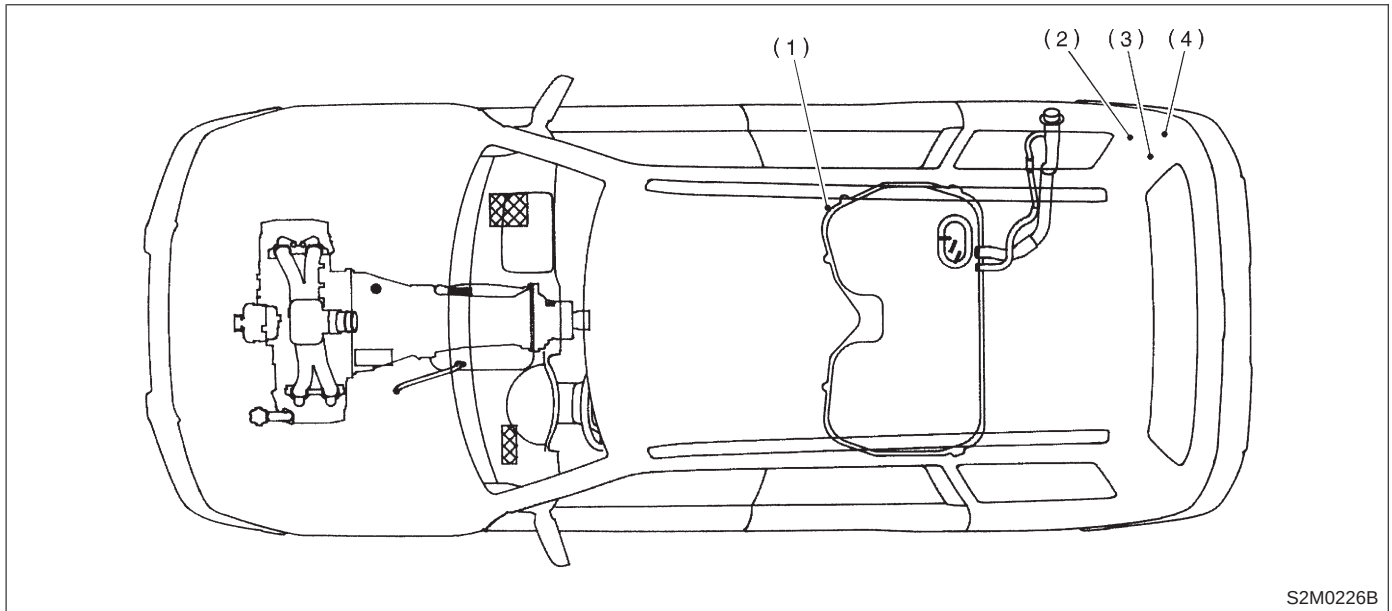
OBD0024E



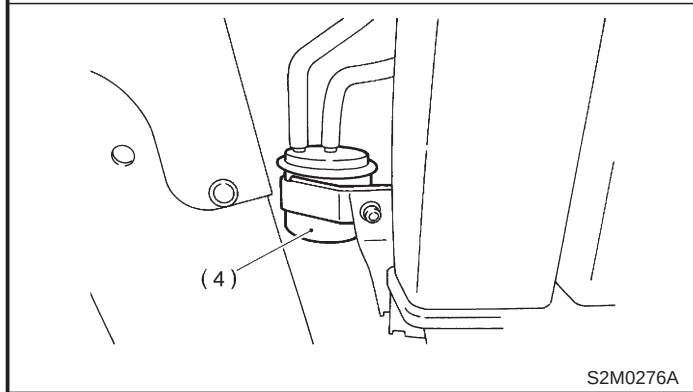
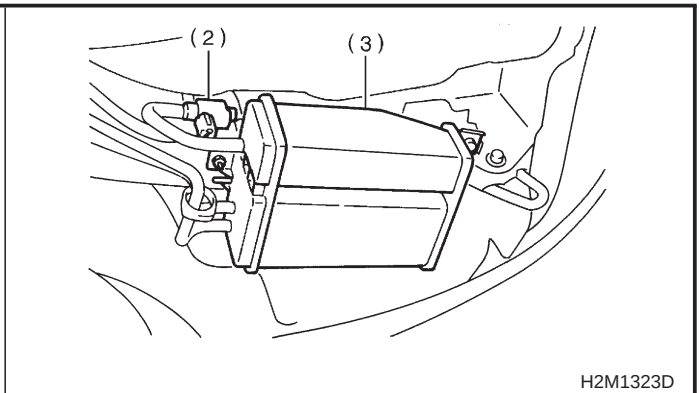
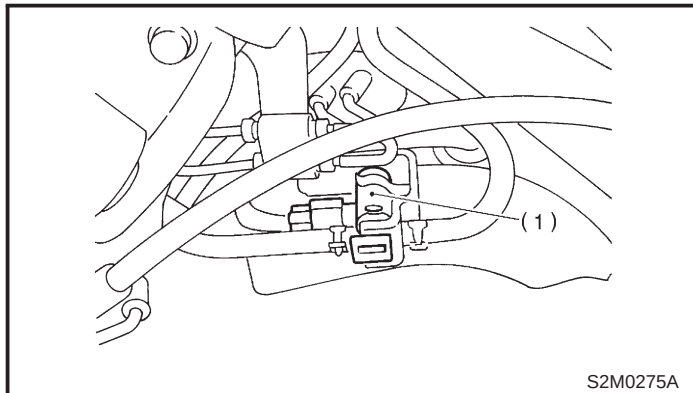
S2M0274A

SUBARU.

● WITHOUT ORVR MODEL

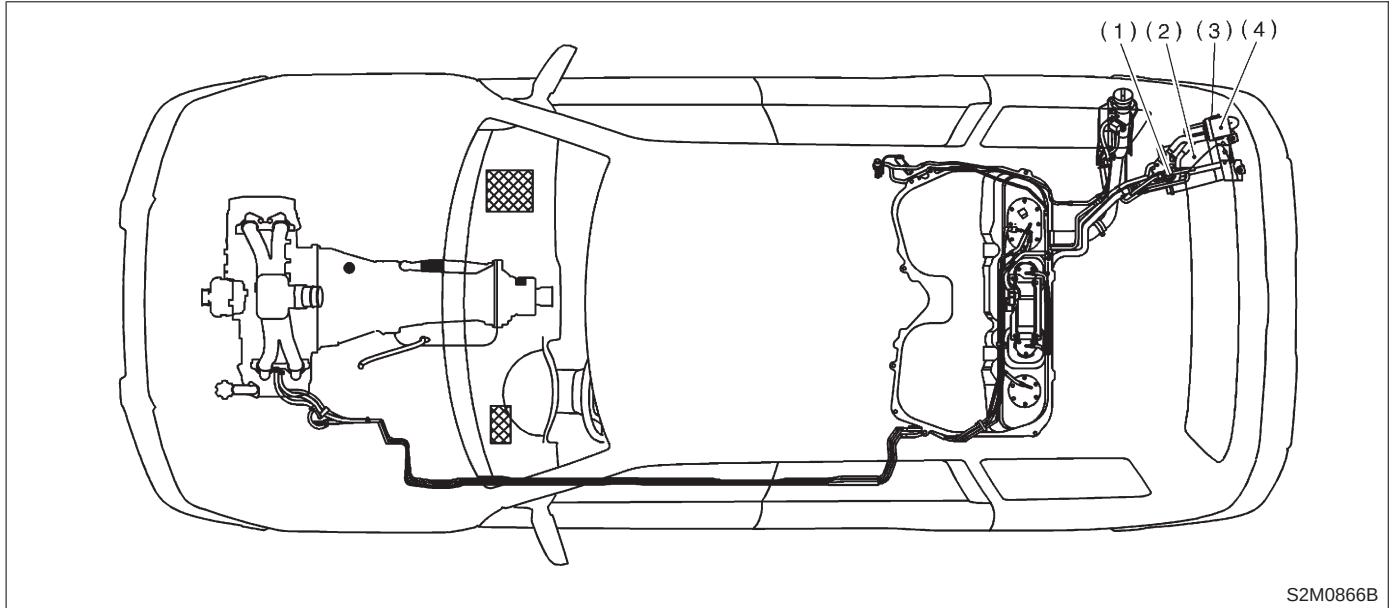


(1) Pressure control solenoid valve	(3) Canister
(2) Vent control solenoid valve	(4) Air filter



SUBARU.

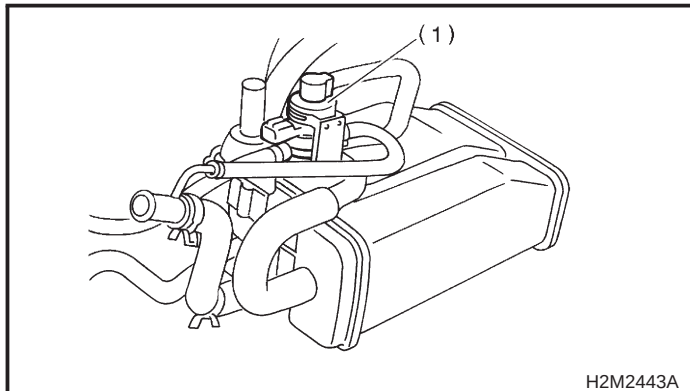
● WITH ORVR MODEL



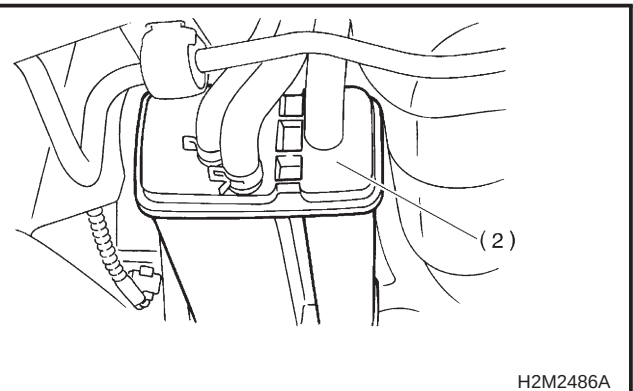
S2M0866B

- (1) Pressure control solenoid valve
(2) Canister

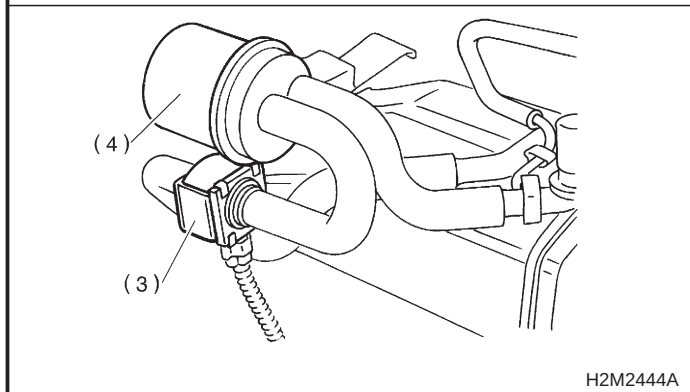
- (3) Drain valve
(4) Air filter



H2M2443A

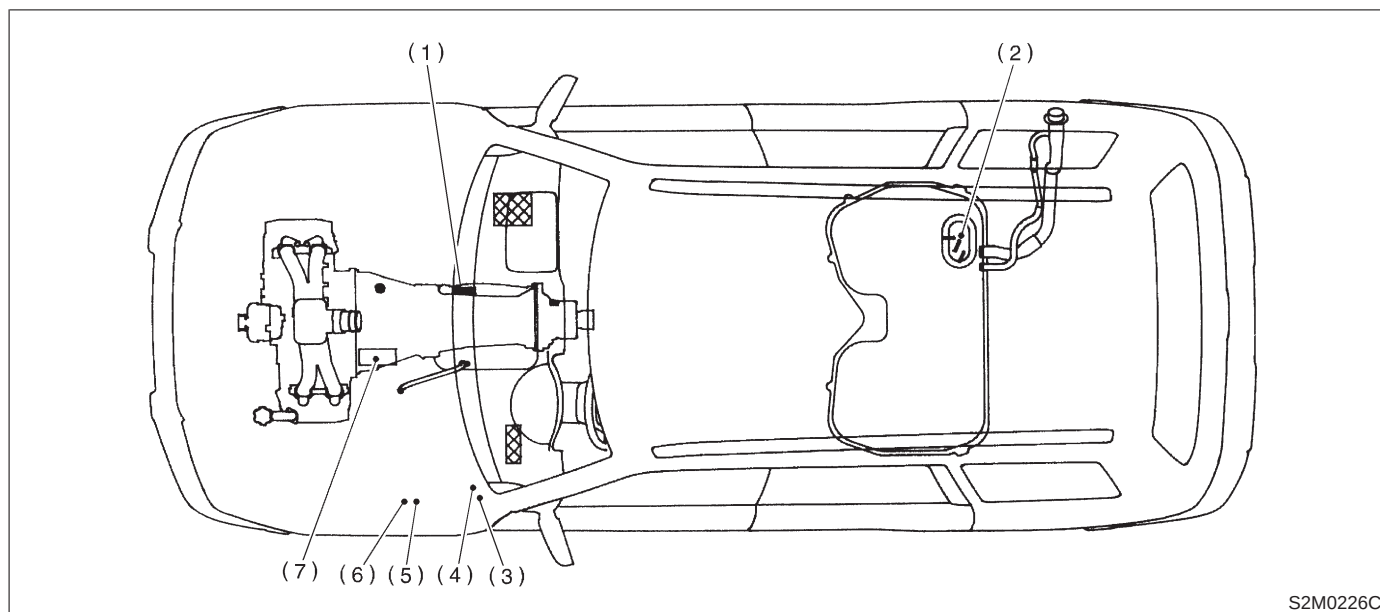


H2M2486A

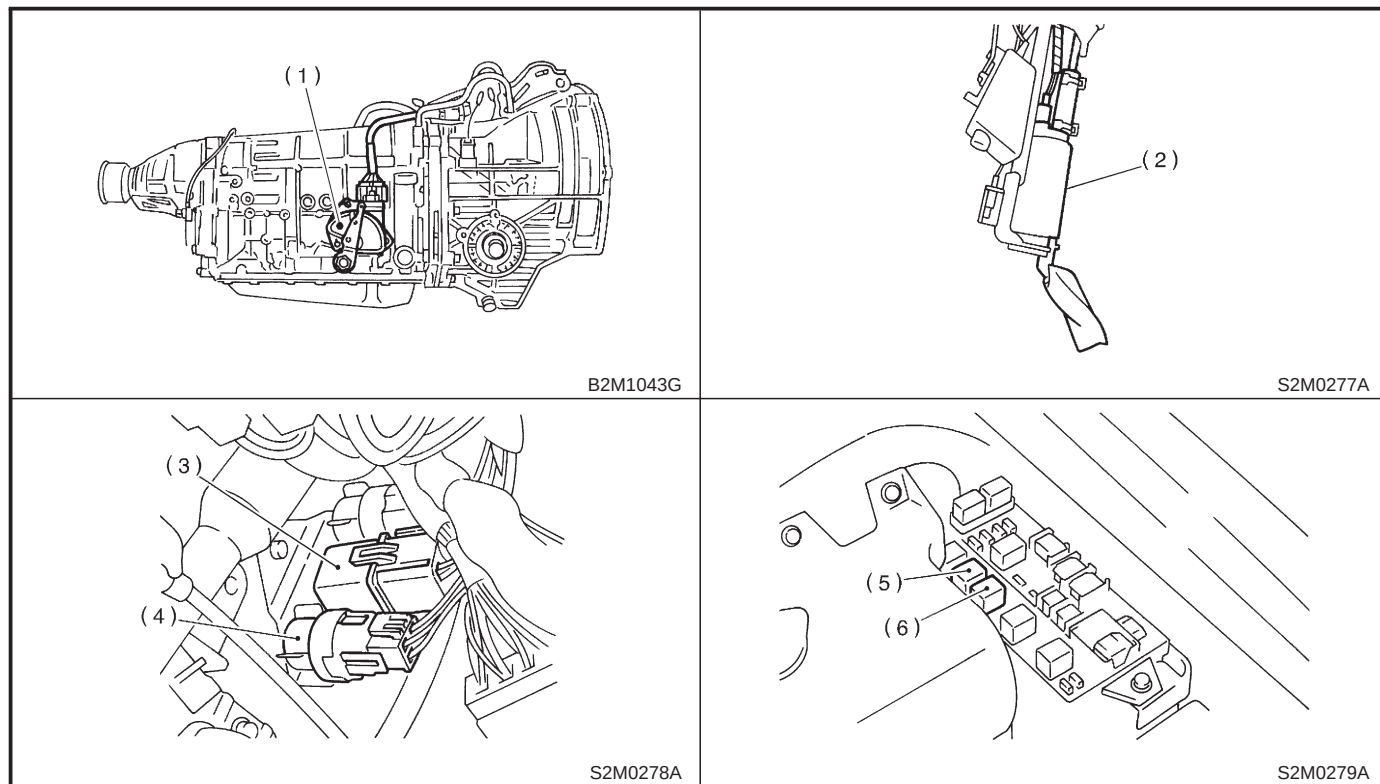


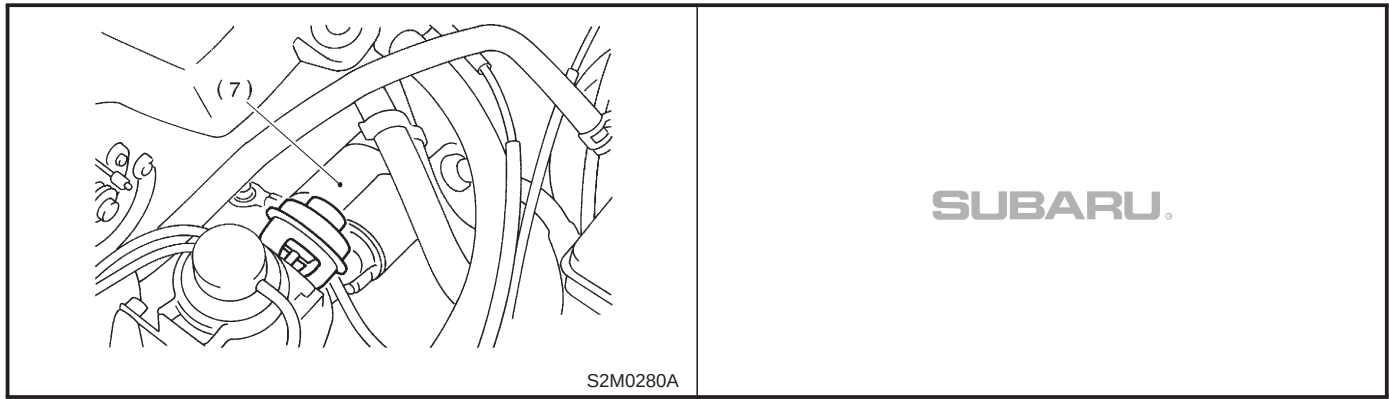
H2M2444A

SUBARU.



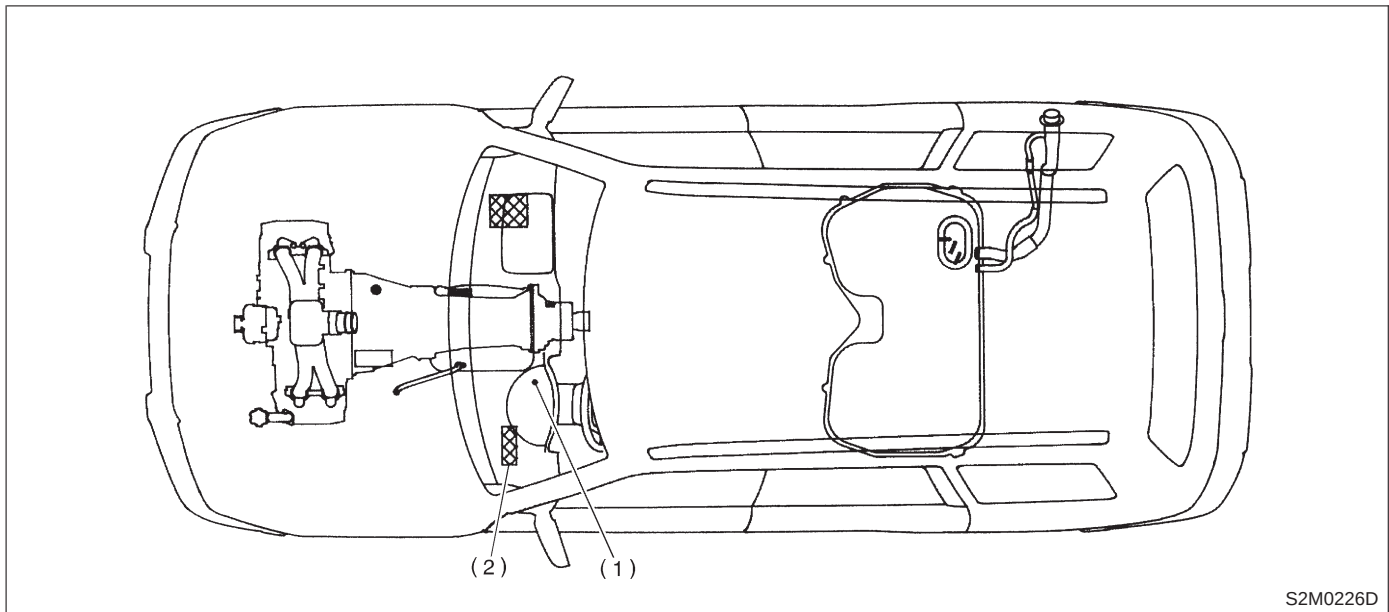
(1) Inhibitor switch	(4) Fuel pump relay	(7) Starter
(2) Fuel pump	(5) Radiator cooling main fan relay	
(3) Main relay	(6) Radiator cooling sub fan relay	





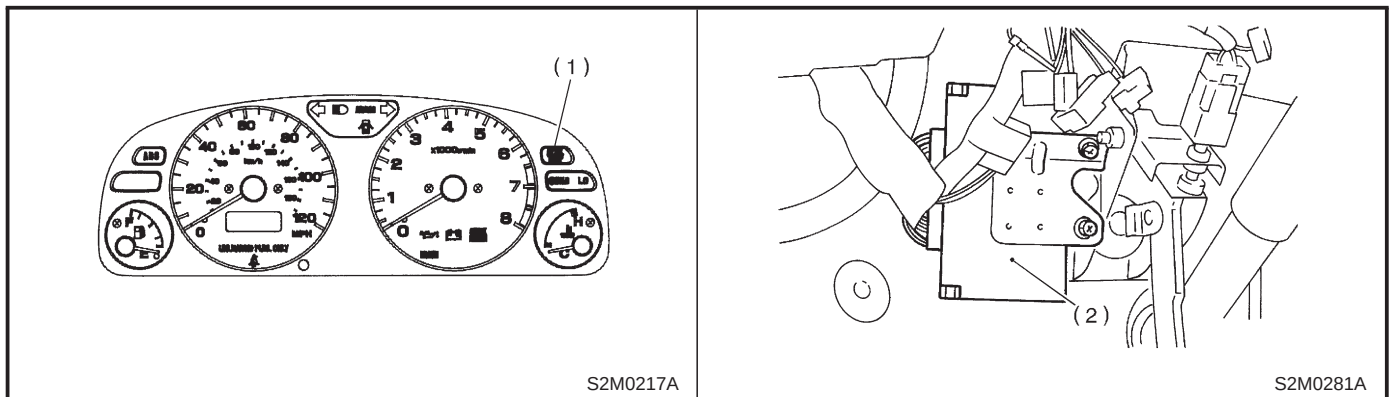
B: TRANSMISSION

1. MODULE

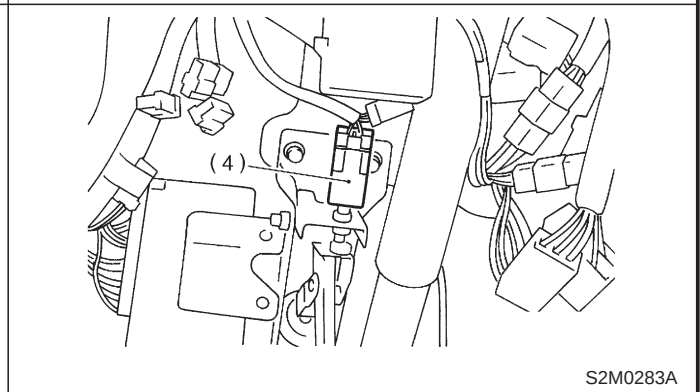
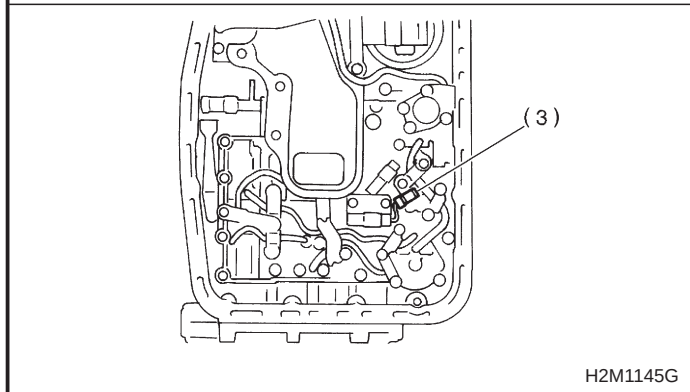
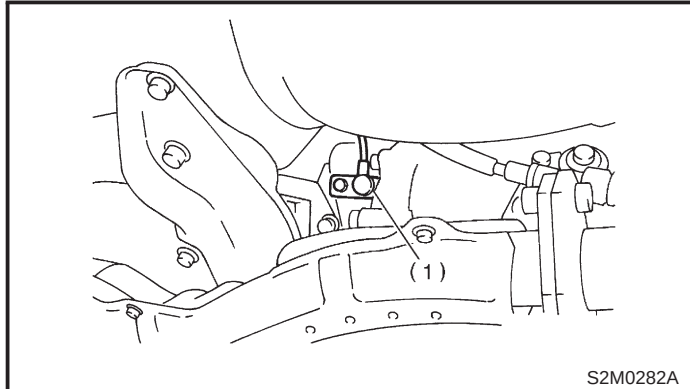


(1) AT diagnostic indicator light (for AT vehicles)

(2) Transmission Control Module (TCM) (for AT vehicles)



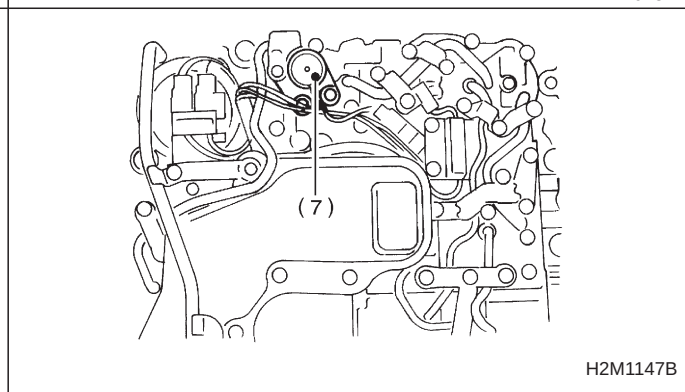
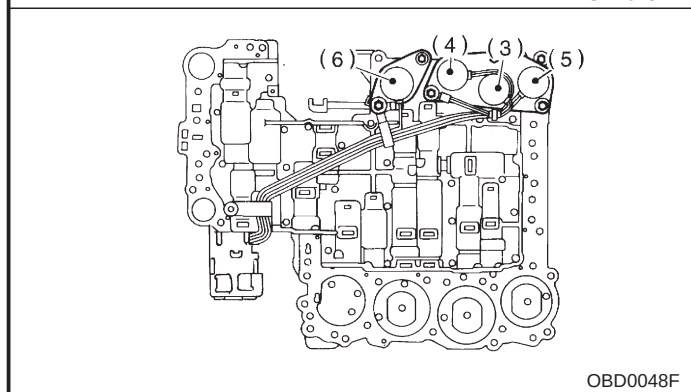
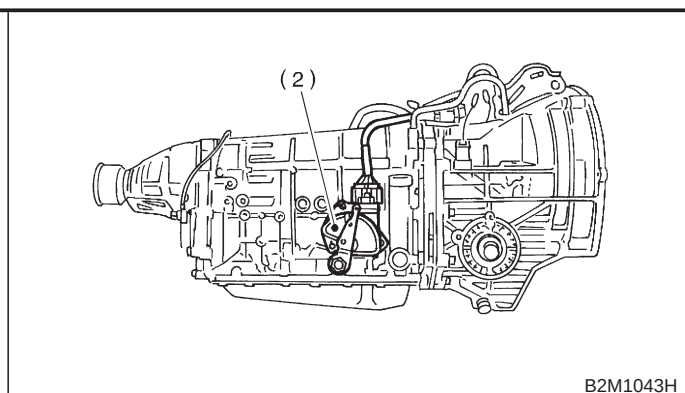
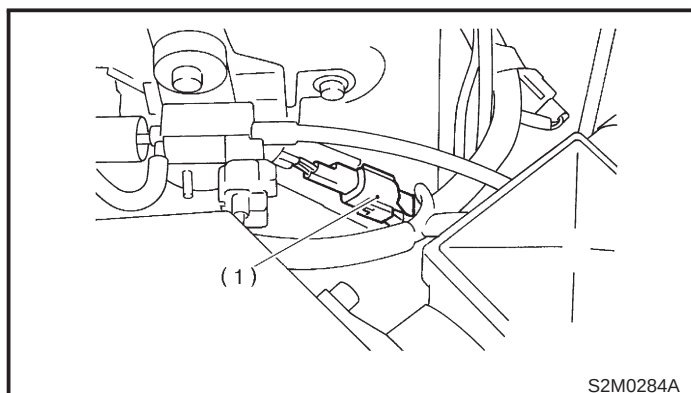
2. SENSOR



- (1) Vehicle speed sensor 1 (for AT vehicles)
- (2) Vehicle speed sensor 2
- (3) ATF temperature sensor (for AT vehicles)
- (4) Brake light switch

3. SOLENOID VALVE AND RELAY

● For AT vehicles

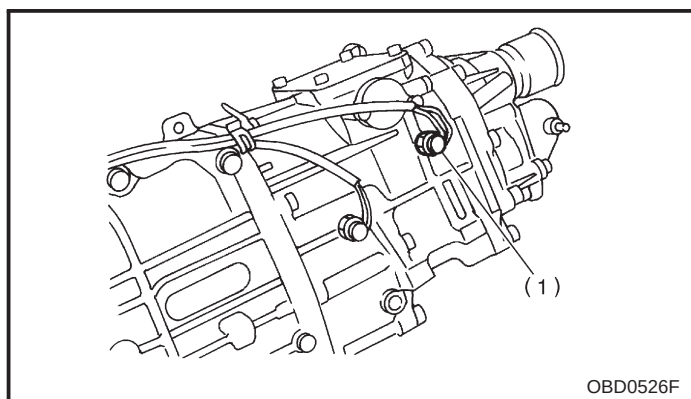


- (1) Dropping resistor
 (2) Inhibitor switch
 (3) Shift solenoid valve 1

- (4) Shift solenoid valve 2
 (5) Shift solenoid valve 3
 (6) Duty solenoid valve A

- (7) Duty solenoid valve B

● For MT vehicles



- (1) Neutral position switch (AWD models)

3. Diagnosis System

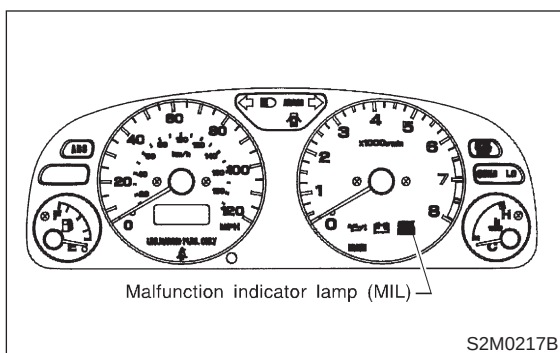
A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

1. ACTIVATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

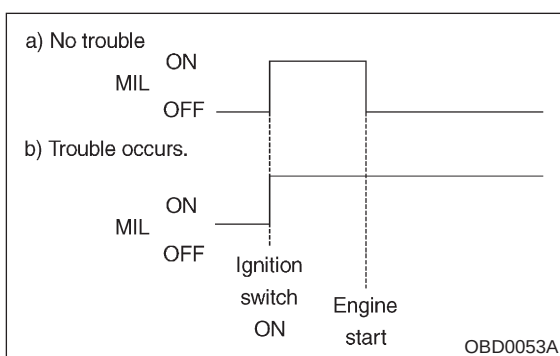
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter illuminates.

NOTE:

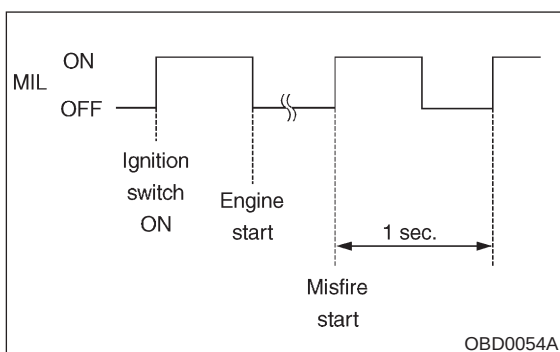
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Ref. to 2-7 [T700].>



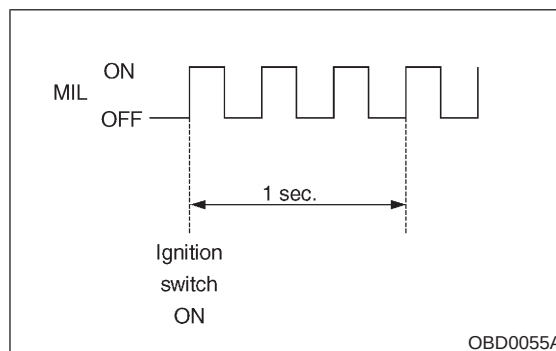
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.



3) If the diagnosis system senses a misfire which could damage the catalyzer, the MIL will blink at a cycle of 1 Hz.



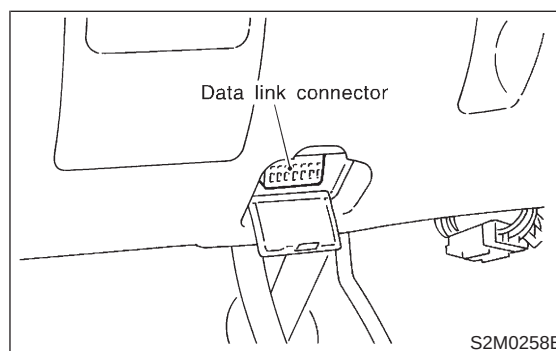
4) When ignition switch is turned to ON (engine off) or to "START" with the test mode connector connected, the MIL blinks at a cycle of 3 Hz.



B: OBD-II GENERAL SCAN TOOL

1. HOW TO USE OBD-II GENERAL SCAN TOOL

1) Prepare a general scan tool (OBD-II general scan tool) required by SAE J1978.
2) Open the cover and connect the OBD-II general scan tool to the data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.



3) Using the OBD-II general scan tool, call up diagnostic trouble code(s) and freeze frame data. OBD-II 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 diagnostic trouble codes
- (4) MODE \$04: Clear/Reset emission-related diagnostic information
- (5) MODE \$05: Oxygen sensor monitoring test results

Read out data according to repair procedures. (For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.)

NOTE:

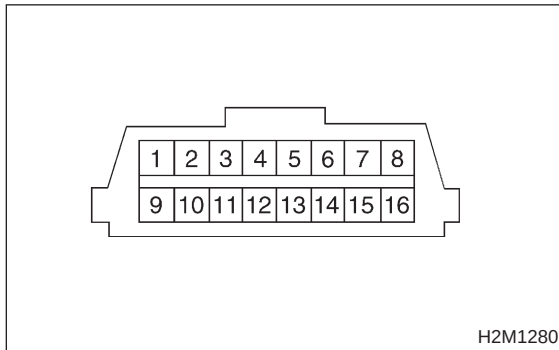
For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST, 2-7 [T10A0].

2. DATA LINK CONNECTOR

- 1) This connector is used both for OBD-II general scan tools and the Subaru Select Monitor.
- 2) Terminal No. 4 to No. 6 of the data link connector is used for the Subaru Select Monitor signal.

CAUTION:

Do not connect any scan tools other than the OBD-II general scan tools and the Subaru Select Monitor, because the circuit for the Subaru Select Monitor may be damaged.



Terminal No.	Contents	Terminal No.	Contents
1	Power supply	9	Blank
2	Blank	10	K line of ISO 9141 CARB
3	Blank	11	Blank
4	Subaru Select Monitor signal (ECM to Subaru Select Monitor)*	12	Ground
5	Subaru Select Monitor signal (Subaru Select Monitor to ECM)*	13	Ground
6	Subaru Select Monitor clock*	14	Blank
7	Blank	15	Blank
8	Blank	16	Blank

*: Circuit only for Subaru Select Monitor

3. CURRENT POWERTRAIN DIAGNOSTIC DATA (MODE \$01)

Refers to data denoting the current operating condition of analog input/output, digital input/output and/or the powertrain system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
01	Number of emission-related powertrain trouble codes and MIL status	ON/OFF
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h
0E	Ignition timing advance	°
10	Air flow rate from mass air flow sensor	g/sec
11	Throttle valve opening angle	%
13	Check whether oxygen sensor is installed.	—
14	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor—bank 1	V and %
15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor—bank 2	V and %
1C	On-board diagnosis system	—

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access generic OBD-II PIDs (MODE \$01).

4. POWERTRAIN FREEZE FRAME DATA (MODE \$02)

Refers to data denoting the operating condition when trouble is sensed by the on-board diagnosis system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
02	Trouble code that caused CARB required freeze frame data storage	—
03	Fuel system control status	—
04	Calculated engine load value	%
05	Engine coolant temperature	°C
06	Short term fuel trim	%
07	Long term fuel trim	%
0B	Intake manifold absolute pressure	kPa
0C	Engine revolution	rpm
0D	Vehicle speed	km/h

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access freeze frame data (MODE \$02).

5. EMISSION-RELATED POWERTRAIN DIAGNOSTIC TROUBLE CODE (MODE \$03)

Refers to data denoting emission-related powertrain diagnostic trouble codes.

For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0].>

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access emission-related powertrain diagnostic trouble codes (MODE \$03).

6. CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION (MODE \$04)

Refers to the mode used to clear or reset emission-related diagnostic information (OBD-II trouble diagnostic information).

NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to clear or reset emission-related diagnostic information (MODE \$04).

7. OXYGEN SENSOR MONITORING TEST RESULTS (MODE \$05)

Refers to the mode using oxygen sensor output data while the on-board diagnosis system is performing diagnosis on the oxygen sensor.

A list of the support oxygen sensor output data and test ID (identification) are shown in the following table.

Test ID	Data	Unit of measure
01	Rich to lean sensor threshold voltage (constant)	V
02	Lean to rich sensor threshold voltage (constant)	V
03	Low sensor voltage for switch time calculation (constant)	V
04	High sensor voltage for switch time calculation (constant)	V
05	Rich to lean sensor switch time (calculated)	sec.
06	Lean to rich sensor switch time (calculated)	sec.
07	Minimum sensor voltage for test cycle (calculated)	V
08	Maximum sensor voltage for test cycle (calculated)	V

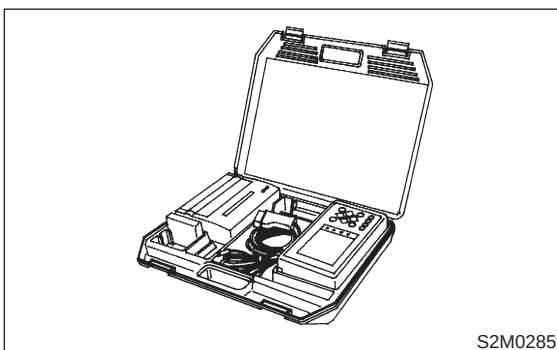
NOTE:

Refer to OBD-II general scan tool manufacturer's instruction manual to access oxygen sensor monitoring test results (MODE \$05).

C: SUBARU SELECT MONITOR

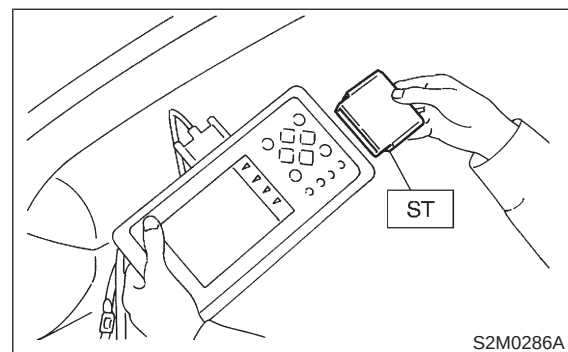
1. HOW TO USE SUBARU SELECT MONITOR

- 1) Prepare Subaru select monitor kit.



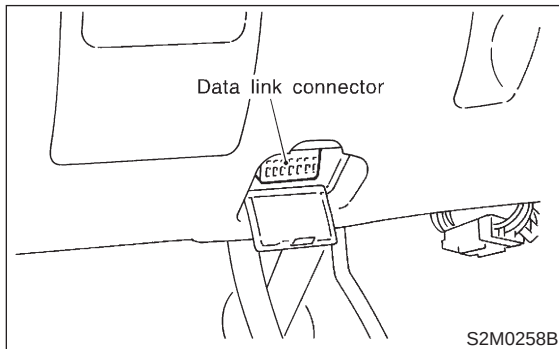
- 2) Connect diagnosis cable to Subaru select monitor.

- 3) Insert cartridge into Subaru select monitor.
ST 24082AA010 CARTRIDGE



4) Connect Subaru select monitor to data link connector.

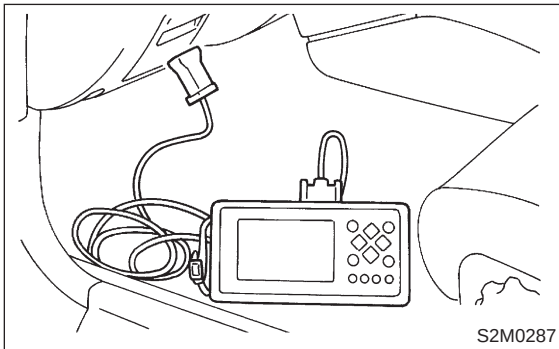
- (1) Open the cover data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.



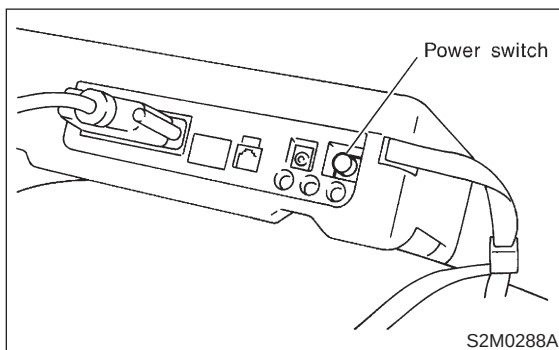
- (2) Connect diagnosis cable to data link connector.

CAUTION:

Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.



- 5) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.



- 6) Using Subaru select monitor, call up diagnostic trouble code(s) and various data, then record them.

2. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY FOR ENGINE. (NORMAL MODE)

- 1) On the 「Main Menu」 display screen, select the {1. All System Diagnosis} and press the [YES] key.

- 2) Make sure that a diagnostic trouble code (DTC) is shown on the {EGI/EMPI} display screen.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0].>

3. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY FOR ENGINE. (OBD MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
- 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {7. OBD System} and press the [YES] key.
- 5) On the 「OBD Menu」 display screen, select the {3. Diagnosis Code(s) Display} and press the [YES] key.
- 6) Make sure that a diagnostic trouble code (DTC) is shown on the display screen.

NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0].>

4. READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE. (NORMAL MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.
 - 5) On the 「Data Display Menu」 display screen, select the {1. 12 Data Display} and press the [YES] key.
 - 6) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

● WITHOUT ORVR MODEL

Contents	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed signal	Vehicle Speed	km/h or MPH
Engine speed signal	Engine Speed	rpm
Engine coolant temperature signal	Coolant Temp.	°C or °F
Ignition timing signal	Ignition Timing	deg
Mass air flow signal	Mass Air Flow	g/s or lb/m
Mass air flow signal	Air Flow Sensor Voltage	V
Throttle position signal	Throttle Opening Angle	%
Throttle position signal	Throttle Sensor Voltage	V
Injection pulse width	Fuel Injection #1 Pulse	ms
Idle air control signal	ISC Valve Duty Ratio	%
Engine load data	Engine Load	%
Front oxygen sensor output signal	Front O2 Sensor	V
Rear oxygen sensor output signal	Rear O2 Sensor	V
Short term fuel trim	A/F Correction #1	%
Knock sensor signal	Knocking Correction	deg
Atmospheric absolute pressure signal	Atmosphere Pressure	mmHg or kPa or inHg
Intake manifold absolute pressure signal	Mani. Relative Pressure	mmHg or kPa or inHg
A/F correction (short term fuel trim) by rear oxygen sensor	Rear O2 A/F Learning	%
Long term fuel trim	Whole A/F Learning	%
Long term whole fuel trim	Front O2 A/F Learning	%
Front oxygen sensor heater current	Front O2 Heater	A
Rear oxygen sensor heater current	Rear O2 Heater	A
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Fuel tank pressure signal	Fuel Tank Pressure	mmHg or kPa or inHg
Fuel temperature signal	Fuel Temp.	°C or °F
Fuel level signal	Fuel Level	V
Ignition switch signal	Ignition Switch	ON or OFF
Automatic transmission vehicle identification signal	AT Vehicle ID Signal	ON or OFF
Test mode connector signal	Test Mode Signal	ON or OFF
Neutral position switch signal	Neutral Position Switch	ON or OFF
Air conditioning switch signal	A/C Switch	ON or OFF
Air conditioning relay signal	A/C Relay	ON or OFF
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF
Fuel pump relay signal	Fuel Pump Relay	ON or OFF
Knocking signal	Knocking Signal	ON or OFF
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF
Engine torque control signal	Torque Control Signal	ON or OFF
Pressure sources switching solenoid valve	Pressure Sources Change	ON or OFF
Front oxygen sensor rich signal	Front O2 Rich Signal	ON or OFF
Rear oxygen sensor rich signal	Rear O2 Rich Signal	ON or OFF

Contents	Display	Unit of measure
Federal specification vehicle identification signal	FED Spec. Vehicle Signal	ON or OFF
Exhaust gas recirculation system diagnosis signal	EGR System Diagnosis	ON or OFF
Catalyst diagnosis signal	Catalyst Diagnosis	ON or OFF
Pressure control solenoid valve	PCV Solenoid Valve	ON or OFF
Exhaust gas recirculation solenoid valve	EGR Solenoid Valve	ON or OFF
Vent control solenoid valve	Vent. Solenoid Valve	ON or OFF

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

● WITH ORVR MODEL

Contents	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed signal	Vehicle Speed	km/h or MPH
Engine speed signal	Engine Speed	rpm
Engine coolant temperature signal	Coolant Temp.	°C or °F
Ignition timing signal	Ignition Timing	deg
Mass air flow signal	Mass Air Flow	g/s or lb/m
Mass air flow signal	Air Flow Sensor Voltage	V
Throttle position signal	Throttle Opening Angle	%
Throttle position signal	Throttle Sensor Voltage	V
Injection pulse width	Fuel Injection #1 Pulse	ms
Idle air control signal	ISC Valve Duty Ratio	%
Engine load data	Engine Load	%
Front oxygen sensor output signal	Front O2 Sensor	V
Rear oxygen sensor output signal	Rear O2 Sensor	V
Short term fuel trim	A/F Correction #1	%
Knock sensor signal	Knocking Correction	deg
Atmospheric absolute pressure signal	>Atmosphere Pressure	mmHg or kPa or inHg
Intake manifold absolute pressure signal	Mani. Relative Pressure	mmHg or kPa or inHg
A/F correction (short term fuel trim) by rear oxygen sensor	Rear O2 A/F Learning	%
Long term fuel trim	Whole A/F Learning	%
Long term whole fuel trim	Front O2 A/F Learning	%
Front oxygen sensor heater current	Front O2 Heater	A
Rear oxygen sensor heater current	Rear O2 Heater	A
Canister purge control solenoid valve duty ratio	CPC Valve Duty Ratio	%
Fuel tank pressure signal	Fuel Tank Pressure	mmHg or kPa or inHg
Fuel temperature signal	Fuel Temp.	°C or °F
Fuel level signal	Fuel Level	V
Ignition switch signal	Ignition Switch	ON or OFF
Automatic transmission vehicle identification signal	AT Vehicle ID Signal	ON or OFF
Test mode connector signal	Test Mode Signal	ON or OFF
Neutral position switch signal	Neutral Position Switch	ON or OFF
Air conditioning switch signal	A/C Switch	ON or OFF
Air conditioning relay signal	A/C Relay	ON or OFF
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF
Fuel pump relay signal	Fuel Pump Relay	ON or OFF
Knocking signal	Knocking Signal	ON or OFF
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF
Engine torque control signal	Torque Control Signal	ON or OFF
Pressure sources switching solenoid valve	Pressure Sources Change	ON or OFF
Front oxygen sensor rich signal	Front O2 Rich Signal	ON or OFF
Rear oxygen sensor rich signal	Rear O2 Rich Signal	ON or OFF
Federal specification vehicle identification signal	FED Spec. Vehicle Signal	ON or OFF
Exhaust gas recirculation system diagnosis signal	EGR System Diagnosis	ON or OFF
Catalyst diagnosis signal	Catalyst Diagnosis	ON or OFF
Pressure control solenoid valve	PCV Solenoid Valve	ON or OFF
Exhaust gas recirculation solenoid valve	EGR Solenoid Valve	ON or OFF
Drain valve	Vent. Solenoid Valve	ON or OFF

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

5. READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE. (OBD MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {7. OBD System} and press the [YES] key.
 - 5) On the 「OBD Menu」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.
 - 6) On the 「Data Display Menu」 display screen, select the {1. 12 Data Display} and press the [YES] key.
 - 7) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Number of diagnosis code	Number of Diagnosis Code	—
Malfunction indicator lamp status	MIL Status	ON or OFF
Monitoring test of misfire	Misfire monitoring	ON or OFF
Monitoring test of fuel system	Fuel system monitoring	ON or OFF
Monitoring test of comprehensive component	Component monitoring	ON or OFF
Test of catalyst	Catalyst Diagnosis	ON or OFF
Test of heated catalyst	Heated catalyst	ON or OFF
Test of evaporative emission purge control system	Evaporative purge system	ON or OFF
Test of secondary air system	Secondary air system	ON or OFF
Test of air conditioning system refrigerant	A/C system refrigerant	ON or OFF
Test of oxygen sensor	Oxygen sensor	ON or OFF
Test of oxygen sensor heater	Oxygen sensor heater	ON or OFF
Test of Exhaust gas recirculation system	EGR System Diagnosis	ON or OFF
Air fuel ratio control system for bank 1	Fuel system for Bank 1	ON or OFF
Engine load data	Engine load	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or inHg
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH
Ignition timing advance for #1 cylinder	Ignition timing adv. #1	°
Mass air flow signal	Mass Air Flow	g/s or lb/m
Throttle position signal	Throttle Opening Angle	%
Front oxygen sensor output signal	Oxygen sensor #11	V
Air fuel ratio correction by front oxygen sensor	Short term fuel trim #11	%
Rear oxygen sensor output signal	Oxygen sensor #12	V
Air fuel ratio correction by rear oxygen sensor	Short term fuel trim #12	%
On-board diagnostic system	OBD System	—

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

6. READ FREEZE FRAME DATA SHOWN ON DISPLAY FOR ENGINE. (OBD MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {7. OBD System} and press the [YES] key.
 - 5) On the 「OBD Menu」 display screen, select the {2. Freeze Frame Data} and press the [YES] key.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Diagnostic trouble code (DTC) for freeze frame data	Freeze frame data	DTC
Air fuel ratio control system for bank 1	Fuel system for Bank1	ON or OFF
Engine load data	Engine Load	%
Engine coolant temperature signal	Coolant Temp.	°C or °F
Short term fuel trim by front oxygen sensor	Short term fuel trim B1	%
Long term fuel trim by front oxygen sensor	Long term fuel trim B1	%
Intake manifold absolute pressure signal	Mani. Absolute Pressure	mmHg or kPa or inHg
Engine speed signal	Engine Speed	rpm
Vehicle speed signal	Vehicle Speed	km/h or MPH

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

7. READ OXYGEN SENSOR MONITORING TEST RESULTS DATA SHOWN ON DISPLAY FOR ENGINE. (OBD MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {7. OBD System} and press the [YES] key.
 - 5) On the 「OBD Menu」 display screen, select the {5. O2 Sensor Monitor} and press the [YES] key.
 - 6) On the 「O2 Sensor Select」 display screen, select the {Bank 1-Sensor1} or {Bank 1-Sensor2} and press the [YES] key.
- Bank 1-Sensor1 indicates the front oxygen sensor, and Bank 1-Sensor2 indicates the rear oxygen sensor.
 - A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Oxygen sensor for monitoring test	<O2 Sensor Monitor (-----)>	—
Rich to lean oxygen sensor threshold voltage	Rich to lean sensor volt	V
Lean to rich oxygen sensor threshold voltage	Lean to rich sensor volt	V
Low oxygen sensor voltage for switch time calculation	Low sensor voltage	V
High oxygen sensor voltage for switch time calculation	High sensor voltage	V
Rich to lean oxygen sensor switch time	Rich to lean switch time	sec
Lean to rich oxygen sensor switch time	Lean to rich switch time	sec
Maximum oxygen sensor voltage for test cycle	Maximum sensor Voltage	V
Minimum oxygen sensor voltage for test cycle	Minimum sensor Voltage	V

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

8. LED OPERATION MODE FOR ENGINE

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of engine type.
 - 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.
 - 5) On the 「Data Display Menu」 display screen, select the {2. 6 Data & LED Display} and press the [YES] key.
 - 6) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

● WITHOUT ORVR MODEL

Contents	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is turned ON.
Automatic transmission vehicle identification signal	AT Vehicle ID Signal	ON or OFF	When AT identification signal is entered.
Test mode connector signal	Test Mode Signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral Position Switch	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is turned ON.
Air conditioning relay signal	A/C Relay	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF	When radiator main fan relay is in function.
Fuel pump relay signal	Fuel Pump Relay	ON or OFF	When fuel pump relay is in function.
Knocking signal	Knocking Signal	ON or OFF	When knocking signal is entered.
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF	When radiator sub fan relay is in function.
Engine torque control signal	Torque Control Signal #1	ON or OFF	When engine torque control signal is entered.
Pressure sources switching solenoid valve	Pressure Sources Change	ON or OFF	When pressure sources switching solenoid valve is in function.
Front oxygen sensor rich signal	Front O2 Rich Signal	ON or OFF	When front oxygen sensor mixture ratio is rich.
Rear oxygen sensor rich signal	Rear O2 Rich Signal	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Federal specification vehicle identification signal	FED Spec. Vehicle Signal	ON or OFF	Federal specification vehicle identification signal is entered.
Exhaust gas recirculation system diagnosis signal	EGR System Diagnosis	ON or OFF	When diagnosis of EGR system is finished.
Catalyst diagnosis signal	Catalyst Diagnosis	ON or OFF	When diagnosis of catalyzer is finished.
Pressure control solenoid valve	PCV Solenoid Valve	ON or OFF	When pressure control solenoid valve is in function.
Exhaust gas recirculation solenoid valve	EGR Solenoid Valve	ON or OFF	When EGR Solenoid Valve is in function.
Vent control solenoid valve	Vent. Solenoid Valve	ON or OFF	When vent control solenoid valve is in function.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

● WITH ORVR MODEL

Contents	Display	Message	LED "ON" requirements
Ignition switch signal	Ignition Switch	ON or OFF	When ignition switch is turned ON.
Automatic transmission vehicle identification signal	AT Vehicle ID Signal	ON or OFF	When AT identification signal is entered.
Test mode connector signal	Test Mode Signal	ON or OFF	When test mode connector is connected.
Neutral position switch signal	Neutral Position Switch	ON or OFF	When neutral position signal is entered.
Air conditioning switch signal	A/C Switch	ON or OFF	When air conditioning switch is turned ON.
Air conditioning relay signal	A/C Relay	ON or OFF	When air conditioning relay is in function.
Radiator main fan relay signal	Radiator Fan Relay #1	ON or OFF	When radiator main fan relay is in function.
Fuel pump relay signal	Fuel Pump Relay	ON or OFF	When fuel pump relay is in function.
Knocking signal	Knocking Signal	ON or OFF	When knocking signal is entered.
Radiator sub fan relay signal	Radiator Fan Relay #2	ON or OFF	When radiator sub fan relay is in function.
Engine torque control signal	Torque Control Signal #1	ON or OFF	When engine torque control signal is entered.
Pressure sources switching solenoid valve	Pressure Sources Change	ON or OFF	When pressure sources switching solenoid valve is in function.
Front oxygen sensor rich signal	Front O2 Rich Signal	ON or OFF	When front oxygen sensor mixture ratio is rich.
Rear oxygen sensor rich signal	Rear O2 Rich Signal	ON or OFF	When rear oxygen sensor mixture ratio is rich.
Federal specification vehicle identification signal	FED Spec. Vehicle Signal	ON or OFF	Federal specification vehicle identification signal is entered.
Exhaust gas recirculation system diagnosis signal	EGR System Diagnosis	ON or OFF	When diagnosis of EGR system is finished.
Catalyst diagnosis signal	Catalyst Diagnosis	ON or OFF	When diagnosis of catalyzer is finished.
Pressure control solenoid valve	PCV Solenoid Valve	ON or OFF	When pressure control solenoid valve is in function.
Exhaust gas recirculation solenoid valve	EGR Solenoid Valve	ON or OFF	When EGR Solenoid Valve is in function.
Drain valve	Drain Valve	ON or OFF	When drain valve is in function.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

9. READ CURRENT DATA SHOWN ON DISPLAY FOR AT.

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - 2) On the 「System Selection Menu」 display screen, select the {AT/ECVT} and press the [YES] key.
 - 3) Press the [YES] key after displayed the information of transmission type.
 - 4) On the 「E-4AT/ECVT Diagnosis」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.
 - 5) On the 「Data Display Menu」 display screen, select the {1. 12 Data Display} and press the [YES] key.
 - 6) Using the scroll key, move the display screen up or down until the desired data is shown.
- A list of the support data is shown in the following table.

Contents	Display	Unit of measure
Battery voltage	Battery Voltage	V
Vehicle speed sensor 1 signal	Vehicle Speed #1	km/h or MPH
Vehicle speed sensor 2 signal	Vehicle Speed #2	km/h or MPH
Engine speed signal	Engine Speed	rpm
Automatic transmission fluid temperature	ATF Temp.	°C or °F
Throttle position signal	Throttle Sensor Voltage	V
Gear position	Gear Position	—
Line pressure control duty ratio	Line Pressure Duty Ratio	%
Lock up clutch control duty ratio	Lock Up Duty Ratio	%
Transfer clutch control duty ratio	Transfer Duty Ratio	%
Power supply for throttle position sensor	Throttle Sensor Power	V
Mass air sensor signal	Mass Air Flow Sensor	V
2 wheel drive switch signal	2WD Switch	ON or OFF
Kick down switch signal	Kick Down Switch	ON or OFF
Stop lamp switch signal	Stop Lamp Switch	ON or OFF
Anti lock brake system signal	ABS Signal	ON or OFF
Cruise control system signal	Cruise Control Signal	ON or OFF
Power mode switch signal	Power Mode Switch	ON or OFF
Neutral/Parking range signal	N/P Range Signal	ON or OFF
Reverse range signal	R Range Signal	ON or OFF
Drive range signal	D Range Signal	ON or OFF
3rd range signal	3rd Range Signal	ON or OFF
2nd range signal	2nd Range Signal	ON or OFF
1st range signal	1st Range Signal	ON or OFF
Hold mode switch signal	Hold Mode Switch	ON or OFF
Shift control solenoid A	Shift Solenoid #1	ON or OFF
Shift control solenoid B	Shift Solenoid #2	ON or OFF
Over running clutch control solenoid valve	Over Running Solenoid	ON or OFF
Automatic transmission fluid temperature warning lamp	ATF Temp. Warning Lamp	ON or OFF
Hold mode indicator lamp	Hold Lamp	ON or OFF
2 wheel drive mode indicator lamp	2WD Mode Lamp	ON or OFF
Torque control output signal	Torque Control Signal	ON or OFF

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

D: CLEAR MEMORY MODE

1. SUBARU SELECT MONITOR (NORMAL MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
- 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {3. Clear Memory} and press the [YES] key.
- 5) When the 'Done' and 'Turn Ignition Switch OFF' are shown on the display screen, turn the Subaru select monitor and ignition switch to OFF.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

2. SUBARU SELECT MONITOR (OBD MODE)

- 1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
- 2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
- 3) Press the [YES] key after displayed the information of engine type.
- 4) On the 「EGI/EMPI Diagnosis」 display screen, select the {7. OBD System} and press the [YES] key.
- 5) On the 「OBD Menu」 display screen, select the {4. Diagnosis Code(s) Cleared} and press the [YES] key.
- 6) When the 'Clear Diagnostic Code?' is shown on the display screen, press the [YES] key.
- 7) Turn Subaru select monitor and ignition switch to OFF.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

3. OBD-II GENERAL SCAN TOOL

For clear memory procedures using the OBD-II general scan tool, refer to the OBD-II General Scan Tool Instruction Manual.

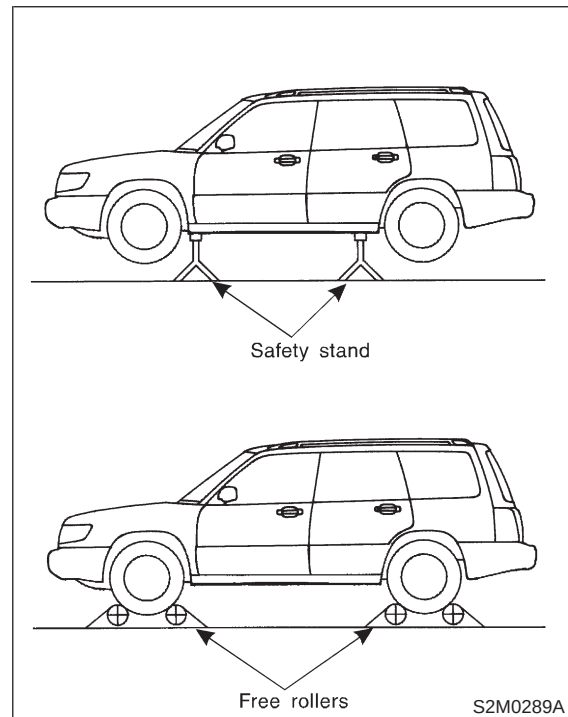
E: INSPECTION MODE

1. PREPARATIONS FOR THE INSPECTION MODE

Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

WARNING:

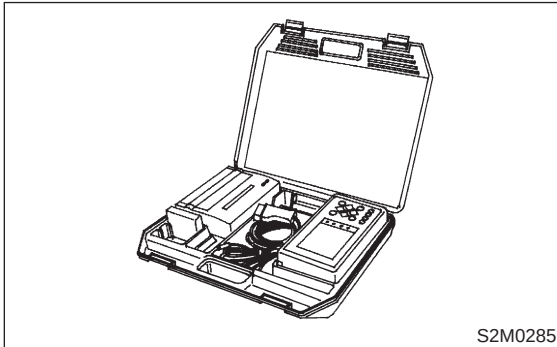
- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a safety stand.
- Secure a rope or wire to the front and rear towing or tie-down hooks to prevent the lateral runoff of front wheels.
- Do not abruptly depress/release clutch pedal or accelerator pedal during works even when engine is operating at low speeds since this may cause vehicle to jump off free rollers.
- In order to prevent the vehicle from slipping due to vibration, do not place any wooden blocks or similar items between the safety stands and the vehicle.
- Since the rear wheels will also rotate, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.



2. SUBARU SELECT MONITOR

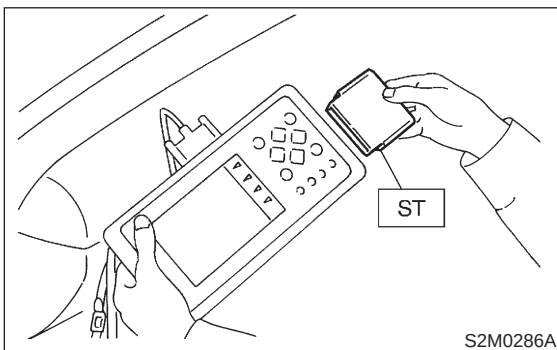
After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data.

- 1) Prepare Subaru select monitor kit.

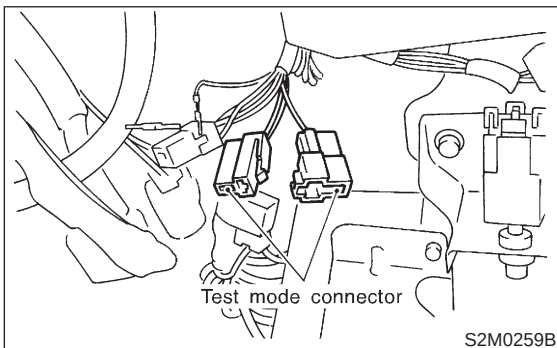


- 2) Connect diagnosis cable to Subaru select monitor.

- 3) Insert cartridge into Subaru select monitor.
ST 24082AA010 CARTRIDGE

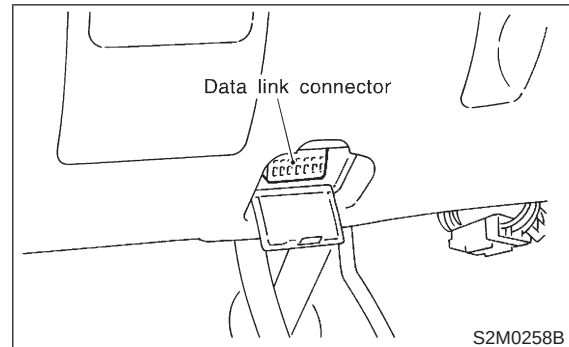


- 4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



- 5) Connect Subaru select monitor to data link connector.

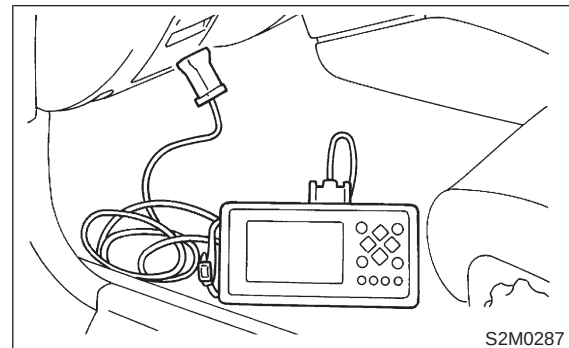
- (1) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.



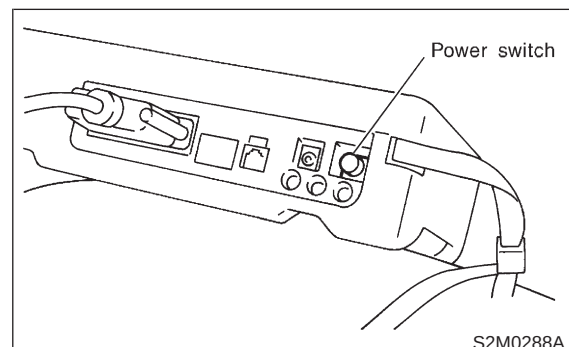
- (2) Connect diagnosis cable to data link connector.

CAUTION:

Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.



- 6) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.



- 7) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
- 8) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.
- 9) Press the [YES] key after displayed the information of engine type.

10) On the 「EGI/EMPI Diagnosis」 display screen, select the {6. Dealer Check Mode Procedure} and press the [YES] key.

11) When the “Perform Inspection (Dealer Check) Mode?” is shown on the display screen, press the [YES] key.

12) Perform subsequent procedures as instructed on the display screen.

- If trouble still remains in the memory, the corresponding diagnostic trouble code (DTC) appears on the display screen.

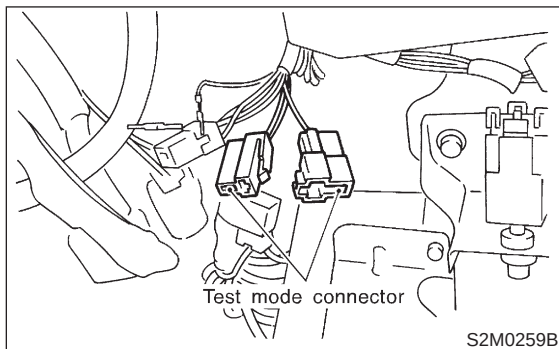
NOTE:

- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.
- For detailed concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0].>
- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

3. OBD-II GENERAL SCAN TOOL

After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data:

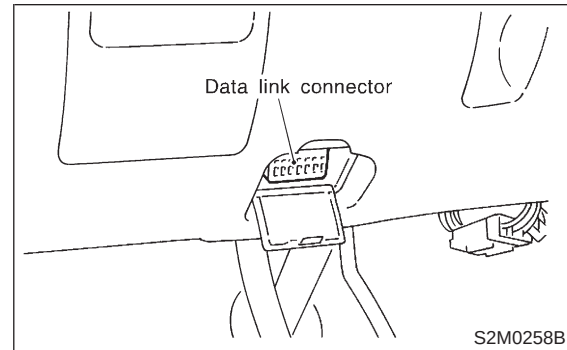
1) Connect test mode connector at the lower side of the instrument panel (on the driver's side), to the side of the center console box.



2) Open the cover and connect the OBD-II general scan tool to its data link connector in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:

Do not connect the scan tools except for Subaru select monitor and OBD-II general scan tool.



3) Start the engine.

NOTE:

- Ensure the selector lever is placed in the “P” position before starting. (AT vehicles)
- Depress clutch pedal when starting the engine. (MT vehicles)

4) Using the selector lever or shift lever, turn the “P” position switch and the “N” position switch to ON.

5) Depress the brake pedal to turn the brake switch ON. (AT vehicles)

6) Keep engine speed in the 2,500 — 3,000 rpm range for 40 seconds.

NOTE:

On models without tachometer, use the tachometer (Secondary pickup type).

7) Place the selector lever or shift lever in the “D” position (AT vehicles) or “1st” gear (MT vehicles) and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

NOTE:

- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system.

8) Using the OBD-II general scan tool, check for diagnostic trouble code(s) and record the result(s).

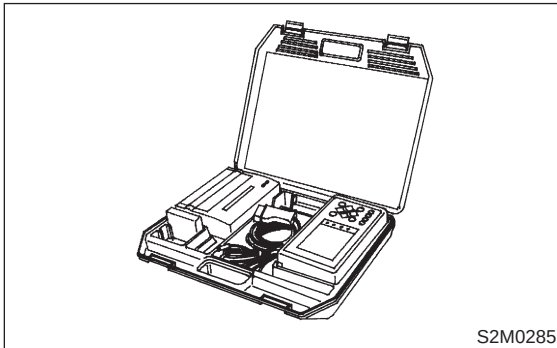
NOTE:

- For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.
- For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST. <Ref. to 2-7 [T10A0].>

F: COMPULSORY VALVE OPERATION CHECK MODE

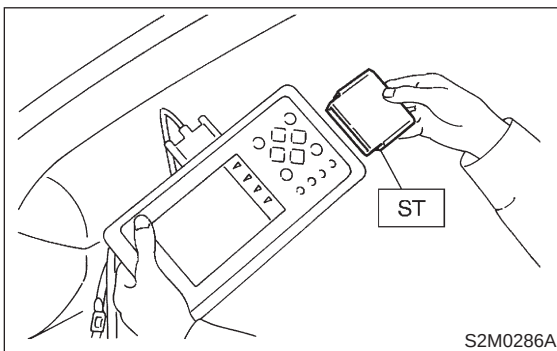
1. SUBARU SELECT MONITOR

- 1) Prepare Subaru select monitor kit.

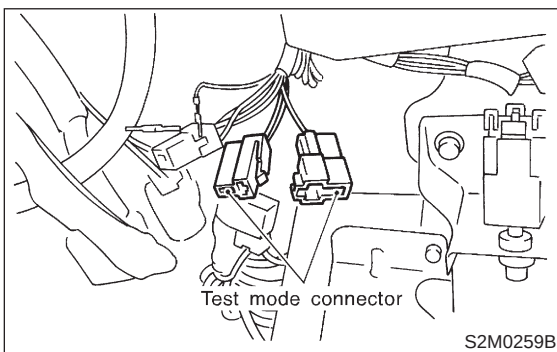


- 2) Connect diagnosis cable to Subaru select monitor.

- 3) Insert cartridge into Subaru select monitor.
ST 24082AA010 CARTRIDGE

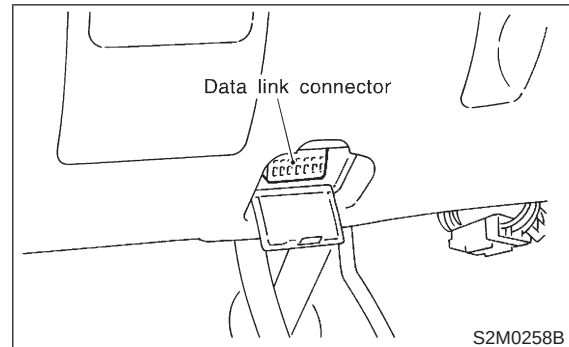


- 4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



- 5) Connect Subaru select monitor to data link connector.

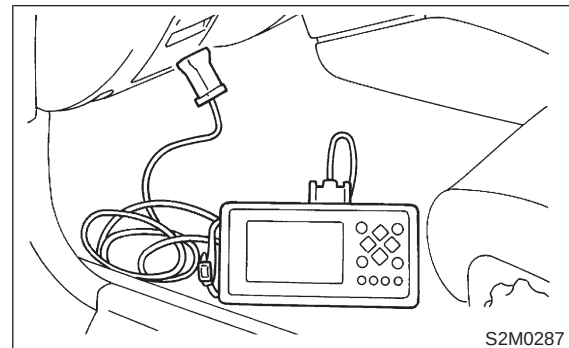
- (1) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.



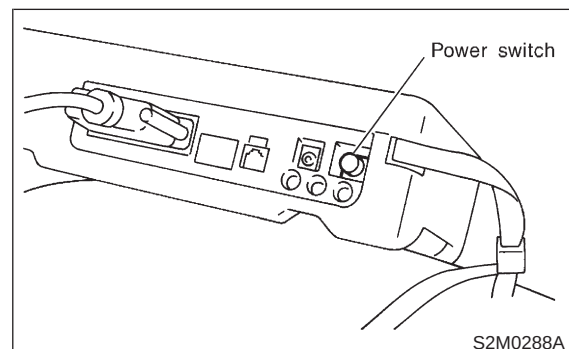
- (2) Connect diagnosis cable to data link connector.

CAUTION:

Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.



- 6) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.



- 7) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
8) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.
9) Press the [YES] key after displayed the information of engine type.

10) On the 「EGI/EMPI Diagnosis」 display screen, select the {4. System Operation Check Mode} and press the [YES] key.

11) On the 「System Operation Check Mode」 display screen, select the {Actuator ON/OFF Operation} and press the [YES] key.

12) Select the desired compulsory actuator on the 「Actuator ON/OFF Operation」 display screen and press the [YES] key.

13) Pressing the [NO] key completes the compulsory operation check mode. The display will then return to the 「Actuator ON/OFF Operation」 screen.

- A list of the support data is shown in the following table.

● WITHOUT ORVR MODEL

Contents	Display
Compulsory fuel pump relay operation check	Fuel Pump Relay
Compulsory purge control solenoid valve operation check	CPC Solenoid Valve
Compulsory radiator fan relay operation check	Radiator Fan Relay
Compulsory air conditioning relay operation check	A/C Relay
Compulsory exhaust gas recirculation control solenoid valve operation check	EGR Solenoid Valve
Compulsory pressure control solenoid valve operation check	PCV Solenoid Valve
Compulsory vent control solenoid valve operation check	Vent Control Solenoid Valve
Compulsory pressure sources switching solenoid valve operation check	Pressure Switching Sol.1

NOTE:

- Because ASV solenoid valve, FICD solenoid valve and air injection system diagnosis solenoid valve are not installed, ASV Solenoid Valve, FICD Solenoid Valve and Pressure Switching Sol.2 will be displayed but non-functional.
- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

● WITH ORVR MODEL

Contents	Display
Compulsory fuel pump relay operation check	Fuel Pump Relay
Compulsory purge control solenoid valve operation check	CPC Solenoid Valve
Compulsory radiator fan relay operation check	Radiator Fan Relay
Compulsory air conditioning relay operation check	A/C Relay
Compulsory exhaust gas recirculation control solenoid valve operation check	EGR Solenoid Valve
Compulsory pressure control solenoid valve operation check	PCV Solenoid Valve
Compulsory drain valve operation check	Vent Control Solenoid Valve
Compulsory pressure sources switching solenoid valve operation check	Pressure Switching Sol.1

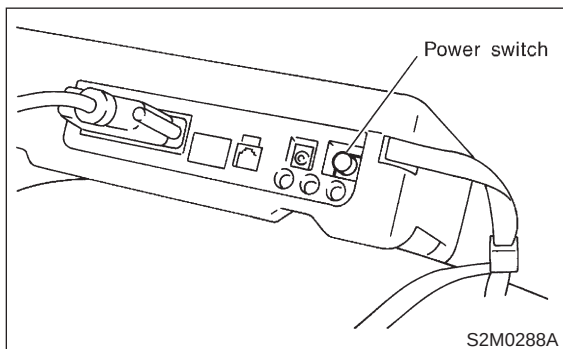
NOTE:

- Because ASV solenoid valve, FICD solenoid valve and air injection system diagnosis solenoid valve are not installed, ASV Solenoid Valve, FICD Solenoid Valve and Pressure Switching Sol.2 will be displayed but non-functional.
- For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

G: FINISHING DIAGNOSIS OPERATION

1. SUBARU SELECT MONITOR

- 1) Turn ignition switch to OFF.
- 2) Turn Subaru select monitor switch to OFF.



- 3) Disconnect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.
- 4) Disconnect Subaru select monitor from its data link connector.

4. Cautions

A: SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

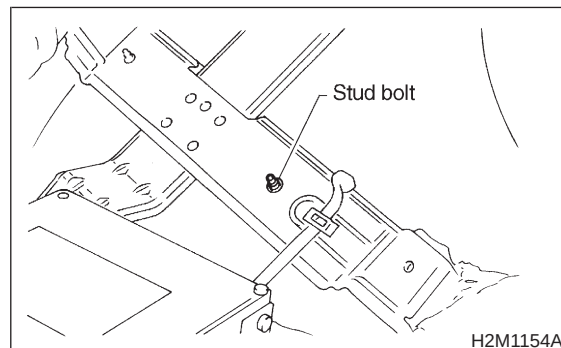
Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when servicing the engine control module (ECM), transmission control module (TCM), main relay and fuel pump relay.

B: PRECAUTIONS

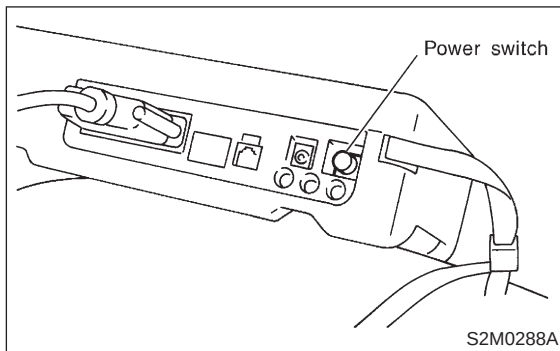
- 1) Never connect the battery in reverse polarity.
 - The ECM will be destroyed instantly.
 - The fuel injector and other part will be damaged in just a few minutes more.
- 2) Do not disconnect the battery terminals while the engine is running.
 - A large counter electromotive force will be generated in the alternator, and this voltage may damage electronic parts such as ECM, etc.
- 3) Before disconnecting the connectors of each sensor and the ECM, be sure to turn OFF the ignition switch.
- 4) Before removing ECM from the located position, disconnect two cables on battery.
 - Otherwise, the ECM may be damaged.
- 5) The connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.
- 6) Use ECM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.



G: FINISHING DIAGNOSIS OPERATION

1. SUBARU SELECT MONITOR

- 1) Turn ignition switch to OFF.
- 2) Turn Subaru select monitor switch to OFF.



- 3) Disconnect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.
- 4) Disconnect Subaru select monitor from its data link connector.

4. Cautions

A: SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

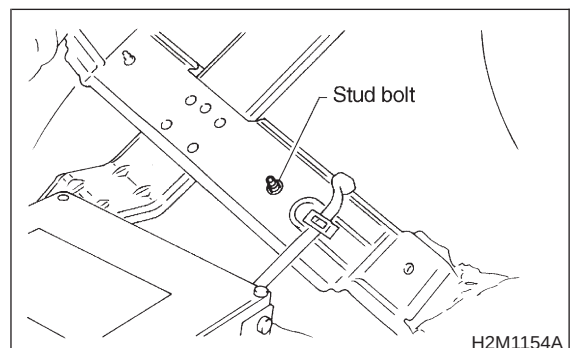
Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

CAUTION:

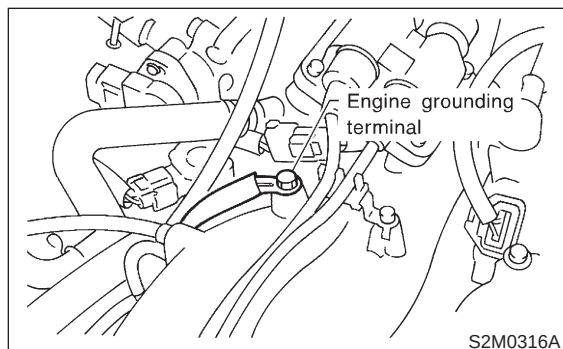
- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when servicing the engine control module (ECM), transmission control module (TCM), main relay and fuel pump relay.

B: PRECAUTIONS

- 1) Never connect the battery in reverse polarity.
 - The ECM will be destroyed instantly.
 - The fuel injector and other part will be damaged in just a few minutes more.
- 2) Do not disconnect the battery terminals while the engine is running.
 - A large counter electromotive force will be generated in the alternator, and this voltage may damage electronic parts such as ECM, etc.
- 3) Before disconnecting the connectors of each sensor and the ECM, be sure to turn OFF the ignition switch.
- 4) Before removing ECM from the located position, disconnect two cables on battery.
 - Otherwise, the ECM may be damaged.
- 5) The connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.
- 6) Use ECM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.



7) Use engine grounding terminal or engine proper as the grounding point to the body when measuring voltage and resistance in the engine compartment.



8) Every MFI-related part is a precision part. Do not drop them.

9) Observe the following cautions when installing a radio in MFI equipped models.

CAUTION:

- The antenna must be kept as far apart as possible from the control unit.

(The ECM is located under the steering column, inside of the instrument panel lower trim panel.)

- The antenna feeder must be placed as far apart as possible from the ECM and MFI harness.

- Carefully adjust the antenna for correct matching.

- When mounting a large power type radio, pay special attention to the three items above mentioned.

- Incorrect installation of the radio may affect the operation of the ECM.

10) Before disconnecting the fuel hose, disconnect the fuel pump connector and crank the engine for more than five seconds to release pressure in the fuel system. If engine starts during this operation, run it until it stops.

11) Problems in the electronic-controlled automatic transmission may be caused by failure of the engine, the electronic control system, the transmission proper, or by a combination of these. These three causes must be distinguished clearly when performing diagnostics.

12) Diagnostics should be conducted by rotating with simple, easy operations and proceeding to complicated, difficult operations. The most important thing in diagnostics is to understand the customer's complaint, and distinguish between the three causes.

13) In AT vehicles, do not continue the stall for more than five seconds at a time (from closed throttle, fully open throttle to stall engine speed).

14) On ABS vehicle, when performing driving test in jacked-up or lifted-up position, sometimes the warning light may be lit, but this is not a malfunction of the system. The reason for this is the speed difference between the front and rear wheels. After diagnosis of engine control system, perform the ABS memory clearance procedure of self-diagnosis system.

C: PRE-INSPECTION

Before performing diagnostics, check the following items which might affect engine problems:

1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

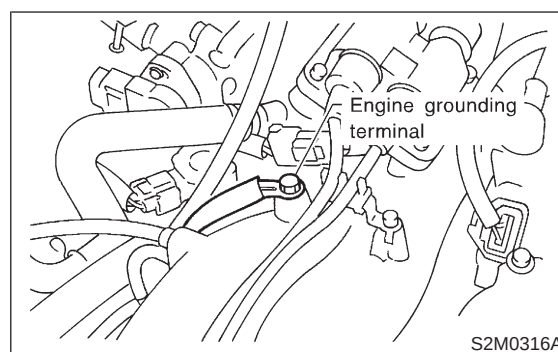
Standard voltage: 12 V

Specific gravity: Above 1.260

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

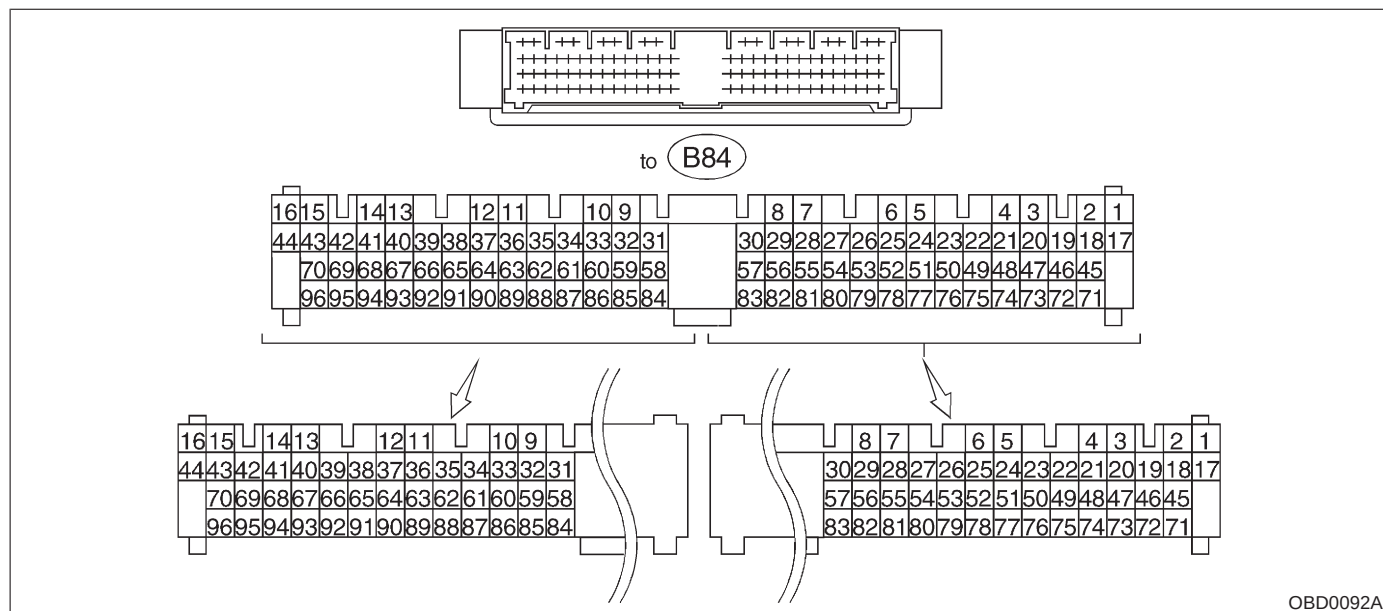
2. ENGINE GROUNDING

Make sure the engine grounding terminal is properly connected to the engine.



5. Specified Data

A: ENGINE CONTROL MODULE (ECM) I/O SIGNAL



OBD0092A

● WITHOUT ORVR MODEL

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B84	8	0	-7 — +7	Sensor output waveform
	Signal (-)	B84	29	0	0	—
	Shield	B84	54	0	0	—
Camshaft position sensor	Signal (+)	B84	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B84	28	0	0	—
	Shield	B84	54	0	0	—
Mass air flow sensor	Signal	B84	5	0 — 0.3	0.8 — 1.2	—
	Shield	B84	57	0	0	—
	GND	B84	53	0	0	—
Throttle position sensor	Signal	B84	6	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Front oxygen sensor	Signal	B84	23	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Rear oxygen sensor	Signal	B84	24	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Engine coolant temperature sensor		B84	22	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		B84	83	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.
Starter switch		B84	86	0	0	Cranking: 8 to 14
A/C switch		B84	60	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—

Ignition switch		B84	85	10 — 13	13 — 14	—
Neutral position switch (MT)		B84	82	ON: 5.0±0.5 OFF: 0		● On MT vehicles; switch is ON when gear is in neutral position.
Neutral position switch (AT)				ON: 0 OFF: 5.0±0.5		● On AT vehicles; switch is ON when shift is in “N” or “P” position
Test mode connector		B84	84	5	5	When connected: 0
Knock sensor	Signal	B84	3	2.8	2.8	—
	Shield	B84	56	0	0	
AT/MT identification		B84	81	AT: 5 MT: 0	AT: 5 MT: 0	When measuring voltage between ECM and chassis ground.
Back-up power supply		B84	39	10 — 13	13 — 14	Ignition switch “OFF”: 10 — 13
Control unit power supply		B84	1	10 — 13	13 — 14	—
			2			
Ignition control	# 1, # 2	B84	41	0	1 — 3.4	—
	# 3, # 4	B84	40	0	1 — 3.4	—
Fuel injector	# 1	B84	96	10 — 13	1 — 14	Waveform
	# 2	B84	70	10 — 13	1 — 14	Waveform
	# 3	B84	44	10 — 13	1 — 14	Waveform
	# 4	B84	16	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	B84	14	—	1 — 13	Waveform
	CLOSE end	B84	13	—	13 — 1	Waveform
Fuel pump relay control		B84	32	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		B84	31	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1		B84	74	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2		B84	73	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Self-shutoff control		B84	63	10 — 13	13 — 14	—
Malfunction indicator lamp		B84	58	—	—	Light “ON”: 1, or less Light “OFF”: 10 — 14
Engine speed output		B84	64	—	0 — 13, or more	Waveform
Torque control signal		B84	79	5	5	—
Mass air flow signal for AT		B84	47	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		B84	72	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		B84	26	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		B84	15	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		B84	71	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		B84	38	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B84	37	0 — 1.0	0 — 1.0	—
Fuel temperature sensor		B84	25	2.5 — 3.8	2.5 — 3.8	Ambient temperature: 25°C (77°F)

Fuel level sensor		B84	27	0.12 — 4.75	0.12 — 4.75	—
Fuel tank pressure sensor	Signal	B84	4	2.3 — 2.7	2.3 — 2.7	The value obtained after the fuel filler cap was removed once and recapped.
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Fuel tank pressure control solenoid valve		B84	10	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Vent control solenoid valve		B84	35	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Fed. spec. vehicle identification		B84	87	Fed.: 5 Cal.: 0	Fed.: 5 Cal.: 0	When measuring voltage between ECM and chassis ground.
AT diagnosis input signal		B84	80	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
GND (sensors)		B84	20	0	0	—
GND (injectors)		B84	69	0	0	—
			95			
GND (ignition system)		B84	94	0	0	—
GND (power supply)		B84	19	0	0	—
			46			
GND (control systems)		B84	17	0	0	—
			18			
GND (oxygen sensor heater)		B84	42	0	0	—

● **WITH ORVR MODEL**

Content		Con- nector No.	Termi- nal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	B84	8	0	-7 — +7	Sensor output waveform
	Signal (-)	B84	29	0	0	—
	Shield	B84	54	0	0	—
Camshaft position sensor	Signal (+)	B84	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B84	28	0	0	—
	Shield	B84	54	0	0	—
Mass air flow sensor	Signal	B84	5	0 — 0.3	0.8 — 1.2	—
	Shield	B84	57	0	0	—
	GND	B84	53	0	0	—
Throttle position sensor	Signal	B84	6	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power sup- ply	B84	21	5	5	—
	GND	B84	20	0	0	—
Front oxy- gen sensor	Signal	B84	23	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Rear oxy- gen sensor	Signal	B84	24	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Engine coolant tempera- ture sensor		B84	22	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		B84	83	0 or 5	0 or 5	“5” and “0” are repeatedly dis- played when vehicle is driven.
Starter switch		B84	86	0	0	Cranking: 8 to 14

A/C switch		B84	60	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B84	85	10 — 13	13 — 14	—
Neutral position switch (MT)		B84	82	ON: 5.0±0.5 OFF: 0		● On MT vehicles; switch is ON when gear is in neutral position.
Neutral position switch (AT)				ON: 0 OFF: 5.0±0.5		● On AT vehicles; switch is ON when shift is in “N” or “P” position
Test mode connector		B84	84	5	5	When connected: 0
Knock sensor	Signal	B84	3	2.8	2.8	—
	Shield	B84	56	0	0	
AT/MT identification		B84	81	AT: 5 MT: 0	AT: 5 MT: 0	When measuring voltage between ECM and chassis ground.
Back-up power supply		B84	39	10 — 13	13 — 14	Ignition switch “OFF”: 10 — 13
Control unit power supply		B84	1	10 — 13	13 — 14	—
			2			
Ignition control	# 1, # 2	B84	41	0	1 — 3.4	—
	# 3, # 4	B84	40	0	1 — 3.4	—
Fuel injector	# 1	B84	96	10 — 13	1 — 14	Waveform
	# 2	B84	70	10 — 13	1 — 14	Waveform
	# 3	B84	44	10 — 13	1 — 14	Waveform
	# 4	B84	16	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	B84	14	—	1 — 13	Waveform
	CLOSE end	B84	13	—	13 — 1	Waveform
Fuel pump relay control		B84	32	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		B84	31	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1		B84	74	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2		B84	73	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Self-shutoff control		B84	63	10 — 13	13 — 14	—
Malfunction indicator lamp		B84	58	—	—	Light “ON”: 1, or less Light “OFF”: 10 — 14
Engine speed output		B84	64	—	0 — 13, or more	Waveform
Torque control signal		B84	79	5	5	—
Mass air flow signal for AT		B84	47	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		B84	72	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		B84	26	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		B84	15	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		B84	71	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		B84	38	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B84	37	0 — 1.0	0 — 1.0	—

Fuel temperature sensor		B84	25	2.5 — 3.8	2.5 — 3.8	Ambient temperature: 25°C (77°F)
Fuel level sensor		B84	27	0.12 — 4.75	0.12 — 4.75	—
Fuel tank pressure sensor	Signal	B84	4	2.3 — 2.7	2.3 — 2.7	The value obtained after the fuel filler cap was removed once and recapped.
	Power supply	B84	21	5	5	
	GND	B84	20	0	0	
Fuel tank pressure control solenoid valve		B84	10	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Drain valve		B84	35	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Fed. spec. vehicle identification		B84	87	Fed.: 5 Cal.: 0	Fed.: 5 Cal.: 0	When measuring voltage between ECM and chassis ground.
AT diagnosis input signal		B84	80	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
GND (sensors)		B84	20	0	0	—
GND (injectors)		B84	69	0	0	—
			95			
GND (ignition system)		B84	94	0	0	—
GND (power supply)		B84	19	0	0	—
			46			
GND (control systems)		B84	17	0	0	—
			18			
GND (oxygen sensor heater)		B84	42	0	0	—

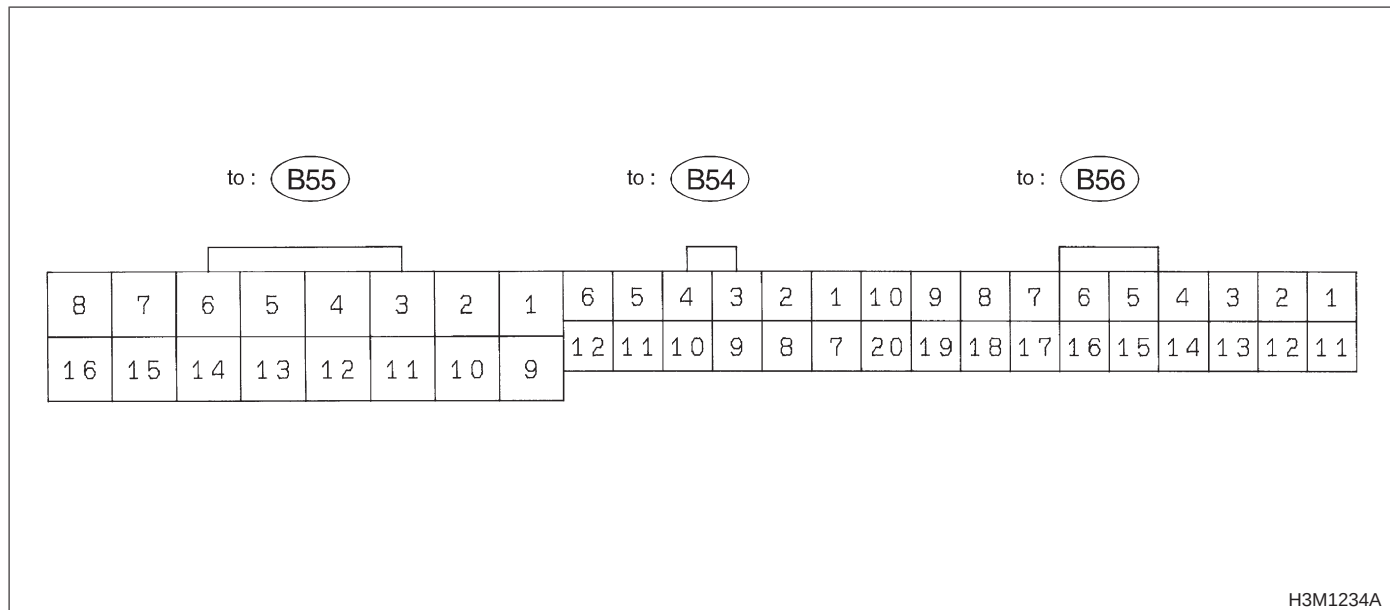
B: ENGINE CONDITION DATA

Content	Specified data
Mass air flow	2.2 — 4.2 (g/sec): Idling
	8.6 — 14.5 (g/sec): 2,500 rpm racing
Engine load	1.9 — 3.5 (%): Idling
	7.2 — 12.1 (%): 2,500 rpm racing

Measuring condition:

- After warm-up the engine.
- Gear position is in “N” or “P” position.
- A/C is turned OFF.
- All accessory switches are turned OFF.

C: TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL



NOTE:
Check with ignition switch ON.

Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B56	14	Ignition switch OFF	10 — 16
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16
		B55	1		
Inhibitor switch	“P” range switch	B56	9	Selector lever in “P” range	Less than 1
				Selector lever in any other than “P” range	More than 8
	“N” range switch	B56	8	Selector lever in “N” range	Less than 1
				Selector lever in any other than “N” range	More than 8
	“R” range switch	B56	10	Selector lever in “R” range	Less than 1
				Selector lever in any other than “R” range	More than 6
	“D” range switch	B54	1	Selector lever in “D” range	Less than 1
				Selector lever in any other than “D” range	More than 6
	“3” range switch	B54	2	Selector lever in “3” range	Less than 1
				Selector lever in any other than “3” range	More than 6
	“2” range switch	B54	3	Selector lever in “2” range	Less than 1
				Selector lever in any other than “2” range	More than 6
	“1” range switch	B54	4	Selector lever in “1” range	Less than 1
				Selector lever in any other than “1” range	More than 6
Brake switch		B56	7	Brake pedal depressed	More than 10.5
				Brake pedal released	Less than 1
ABS signal		B56	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)
AT diagnostics signal	B55	12	Ignition switch ON (with engine OFF)	Less than 1
			Ignition switch ON (with engine ON)	More than 10

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B54	8	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
Throttle position sensor power supply	B56	19	Ignition switch ON (with engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B54	10	ATF temperature 20°C (68°F)	2.9 — 4.0	2.1 k — 2.9 k
			ATF temperature 80°C (176°F)	1.0 — 1.4	275 — 375
Vehicle speed sensor 1	B54	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B56	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1 ← → More than 9	—
Engine speed signal	B54	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B56	3	When cruise control is set (SET lamp ON).	Less than 1	—
			When cruise control is not set (SET lamp OFF).	More than 6.5	
Torque control signal	B55	16	Ignition switch ON	4 — 6	—
Mass air flow signal	B54	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B55	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B55	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B55	15	Selector lever in "N" range (with throttle fully closed).	Less than 1	20 — 32
			Selector lever in "D" range (with throttle fully closed).	More than 9	
Duty solenoid A	B55	8	Throttle fully closed (with engine OFF) after warm-up.	2.0 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B55	7	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Duty solenoid B	B55	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C (AWD model only)	B55	3	Fuse on FWD switch	More than 8.5	9 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Sensor ground line 1	B54	7	—	0	Less than 1

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Sensor ground line 2	B56	20	—	0	Less than 1
System ground line	B56	1	—	0	Less than 1
Power system ground line	B55	10	—	0	Less than 1
FWD switch	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal	B56	12	—	—	—
		13	—	—	
AT diagnosis signal	B55	11	Ignition switch ON	Less than 1 ←→ More than 4	—

6. Basic Diagnostic Procedure

A: BASIC DIAGNOSTIC PROCEDURE FOR ENGINE

6A1 : CHECK ENGINE START FAILURE.

1) Ask the customer when and how the trouble occurred using the interview check list. <Ref. to 2-7 [T6C0].>

2) Start the engine.

CHECK : *Does the engine start?*

YES : Go to step **6A2**.

NO : Inspection using "8. Diagnostics for Engine Start Failure". <Ref. to 2-7 [T800].>

6A2 : CHECK ILLUMINATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).

CHECK : *Does CHECK ENGINE malfunction indicator lamp illuminate?*

YES : Go to step **6A3**.

NO : Inspection using "9. General Diagnostics Table". <Ref. to 2-7 [T900].>

6A3 : CHECK INDICATION OF DTC ON DISPLAY.

1) Turn ignition switch to OFF.

2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.

3) Turn ignition switch to ON and the Subaru Select Monitor or OBD-II general scan tool switch to ON.

4) Read DTC on the Subaru Select Monitor or OBD-II general scan tool.

NOTE:

If DTC is not shown on display although the MIL illuminates, perform diagnostics of MIL (CHECK ENGINE malfunction indicator lamp) circuit or combination meter. <Ref. to 2-7 [T700].>

CHECK : *Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?*

YES : Go to step **6A4**.

NO : Repair the related parts.

6A4 : PERFORM THE DIAGNOSIS.

1) Inspect using "10. Diagnostics Chart with Trouble Code (DTC)". <Ref. to 2-7 [T10A0].>

NOTE:

Carry out the basic check, only when DTC about automatic transmission is shown on display. <Ref. to 2-7 [T6B0].>

2) Repair the trouble cause.

3) Perform the clear memory mode. <Ref. to 2-7 [T3D0].>

4) Perform the inspection mode. <Ref. to 2-7 [T3E0].>

CHECK : *Does the Subaru Select Monitor or OBD-II general scan tool indicate DTC?*

YES : Inspect using "10. Diagnostics Chart with Trouble Code (DTC)". <Ref. to 2-7 [T10A0].>

NO : Complete the diagnosis.

B: BASIC CHECK ITEMS FOR AT

When trouble code about automatic transmission is shown on display, carry out the following basic check. After that, carry out the replacement or repair work.

1) ATF level check <Ref. to 3-2 [W1B1].>

2) Differential gear oil level check <Ref. to 3-2 [W1B2].>

3) ATF leak check <Ref. to 3-2 [W1B3].>

4) Differential gear oil leak check <Ref. to 3-2 [W1B3].>

5) Brake band adjustment <Ref. to 3-2 [W2B0].>

6) Stall test <Ref. to 3-2 [W8A0].>

7) Line pressure test <Ref. to 3-2 [W10A0].>

8) Transfer clutch pressure test <Ref. to 3-2 [W11A0].>

9) Time lag test <Ref. to 3-2 [W9A0].>

10) Road test <Ref. to 3-2 [W7A0].>

11) Shift characteristics <Ref. to 3-2 [W7A0].>

C: CHECK LIST FOR INTERVIEW**1. CHECK LIST NO. 1**

Check the following items when problem has occurred.

NOTE:

Use copies of this page for interviewing customers.

Customer's name		Engine no.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km
Vin no.			miles
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others:		
Outdoor temperature	F(°C)		
	☐ Hot ☐ Warm ☐ Cool ☐ Cold		
Place	☐ Highway ☐ Suburbs ☐ Inner city ☐ Uphill ☐ Downhill ☐ Rough road ☐ Others:		
Engine temperature	☐ Cold ☐ Warming-up ☐ After warming-up ☐ Any temperature ☐ Others:		
Engine speed	rpm		
Vehicle speed	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	Radio	☐ ON/ ☐ OFF
A/C compressor	☐ ON/ ☐ OFF	CD/Cassette	☐ ON/ ☐ OFF
Cooling fan	☐ ON/ ☐ OFF	Car phone	☐ ON/ ☐ OFF
Front wiper	☐ ON/ ☐ OFF	CB	☐ ON/ ☐ OFF
Rear wiper	☐ ON/ ☐ OFF		

2. CHECK LIST NO. 2

Check the following items about the vehicle's state when MIL turns on.

NOTE:

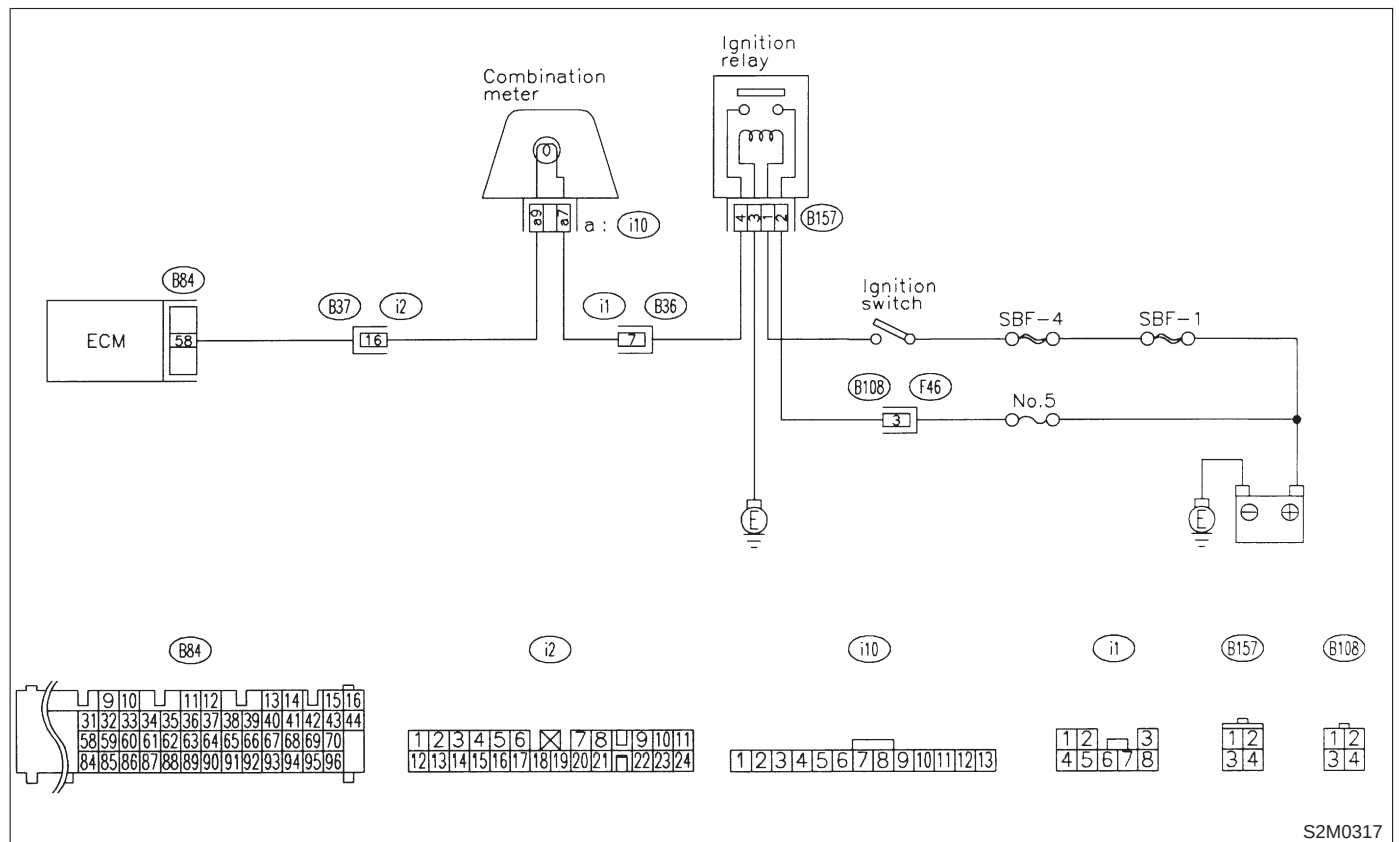
Use copies of this page for interviewing customers.

a) Other warning lights or indicators turn on. ☐ Yes/ ☐ No
☐ Low fuel warning light ☐ Charge indicator light ☐ AT diagnostics indicator light ☐ ABS warning light ☐ Engine oil pressure warning light
b) Fuel level
● Lack of gasoline: ☐ Yes/☐ No ● Indicator position of fuel gauge:
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: ☐ Yes/ ☐ No
● What:
d) Intentional connecting or disconnecting of hoses: ☐ Yes/ ☐ No
● What:
e) Installing of parts other than genuine parts: ☐ Yes/ ☐ No
● What: ● 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 ☐ No shift ☐ Excessive shift shock

7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL)

A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON.

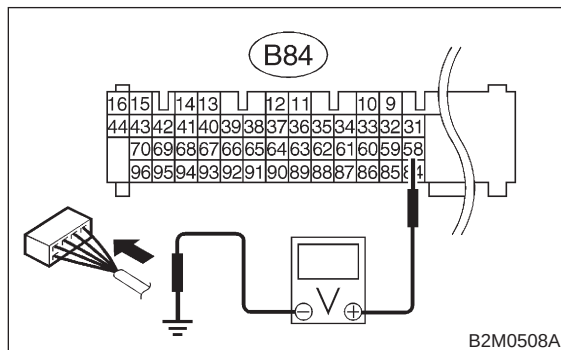
- **DIAGNOSIS:**
 - The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- **TROUBLE SYMPTOM:**
 - When ignition switch is turned ON (engine OFF), MIL does not come on.
- **WIRING DIAGRAM:**



S2M0317

7A1 : CHECK OUTPUT SIGNAL FROM ECM.

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

Connector & terminal**(B84) No. 58 (+) — Chassis ground (—):**

- CHECK** : *Is the voltage less than 1 V?*
- YES** : Go to step 7A4.
- NO** : Go to step 7A2.

7A2 : CHECK POOR CONTACT.

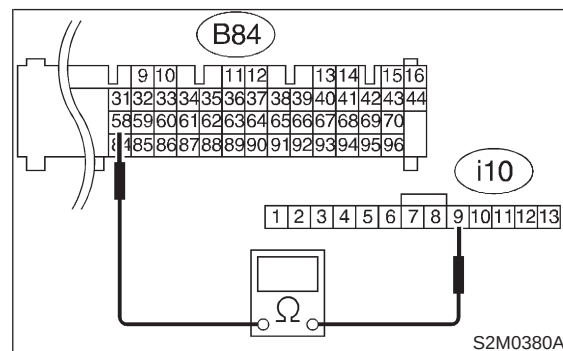
- CHECK** : *Does the MIL come on when shaking or pulling ECM connector and harness?*
- YES** : Repair poor contact in ECM connector.
- NO** : Go to step 7A3.

7A3 : CHECK ECM CONNECTOR.

- CHECK** : *Is ECM connector correctly connected?*
- YES** : Replace ECM.
- NO** : Repair connection of ECM connector.

7A4 : CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter. <Ref. to 6-2 [W8A0].>
- 3) Disconnect connector from ECM and combination meter.
- 4) Measure resistance of harness between ECM and combination meter connector.

Connector & terminal**(B84) No. 58 — (i10) No. 9:**

- CHECK** : *Is resistance less than 1 Ω?*
- YES** : Go to step 7A5.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and combination meter connector
- Poor contact in coupling connector (i2)

7A5 : CHECK POOR CONTACT.

Check poor contact in combination meter connector. <Ref. to FOREWORD [T3C1].>

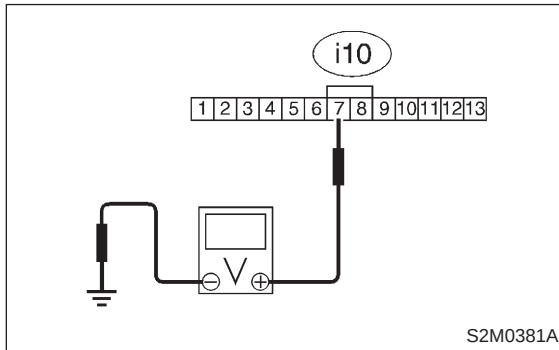
- CHECK** : *Is there poor contact in combination meter connector?*
- YES** : Repair poor contact in combination meter connector.
- NO** : Go to step 7A6.

7A6 : CHECK HARNESS BETWEEN COMBINATION METER AND IGNITION SWITCH CONNECTOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between combination meter connector and chassis ground.

Connector & terminal

(i10) No. 7 (+) — Chassis ground (-):



- CHECK** : **Is voltage more than 10 V?**
- YES** : Go to step **7A7**.
- NO** : Check the following and repair if necessary.

NOTE:

- Broken down ignition relay.
- Blown out fuse (No. 15).
- If replaced fuse (No. 15) blows easily, check the harness for short circuit of harness between fuse (No. 15) and ignition relay connector.
- Open or short circuit in harness between fuse (No. 15) and battery terminal
- Open circuit in harness between fuse (No. 15) and ignition relay connector
- Poor contact in coupling connector (i1 and B108)
- Poor contact in ignition relay connector
- Poor contact in ignition switch connector

7A7 : CHECK POOR CONTACT.

Check poor contact in combination meter connector. <Ref. to FOREWORD [T3C1].>

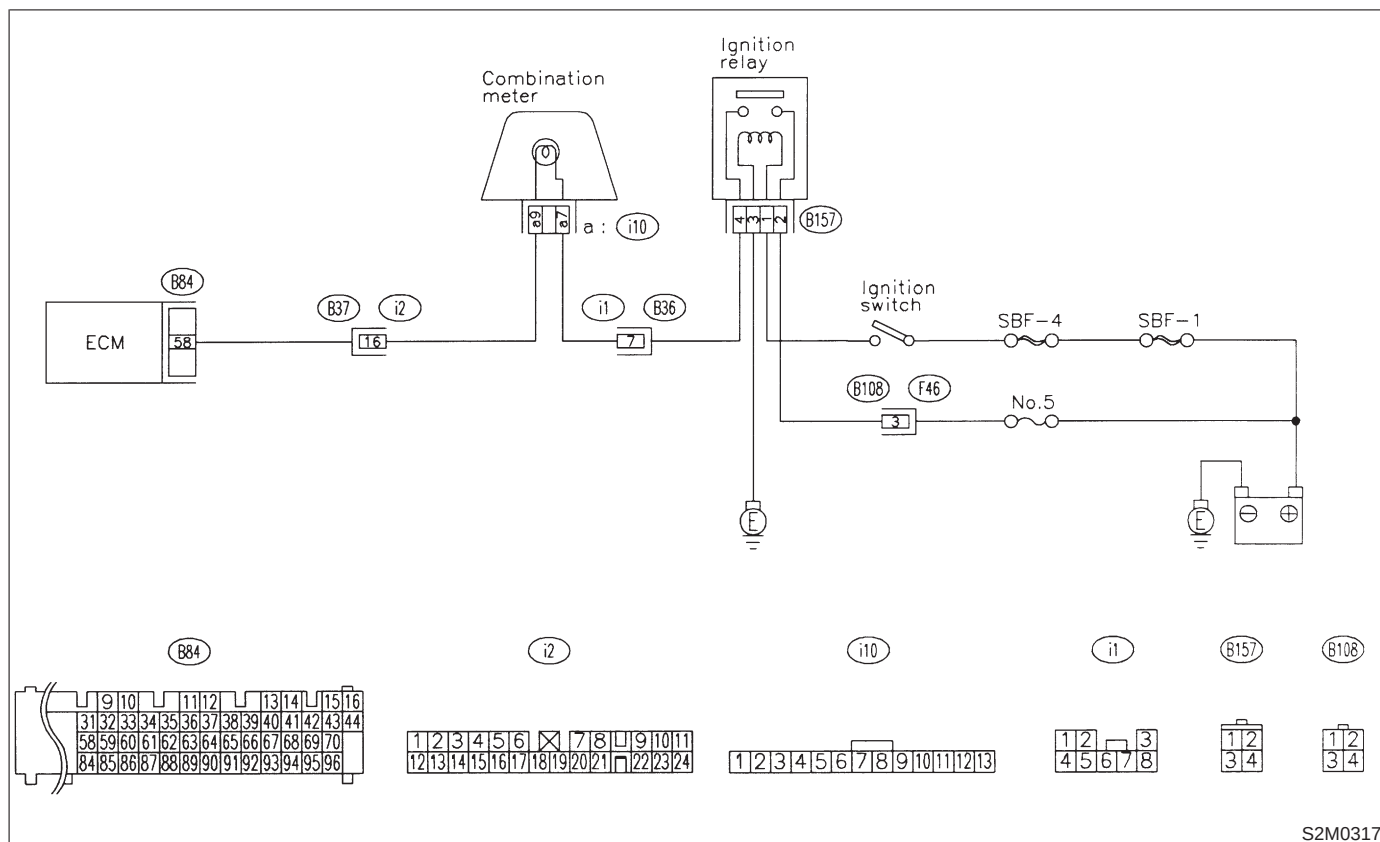
- CHECK** : **Is there poor contact in combination meter connector?**
- YES** : Repair poor contact in combination meter connector.
- NO** : Replace bulb or combination meter.

B: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT GO OFF.**• DIAGNOSIS:**

- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.

• TROUBLE SYMPTOM:

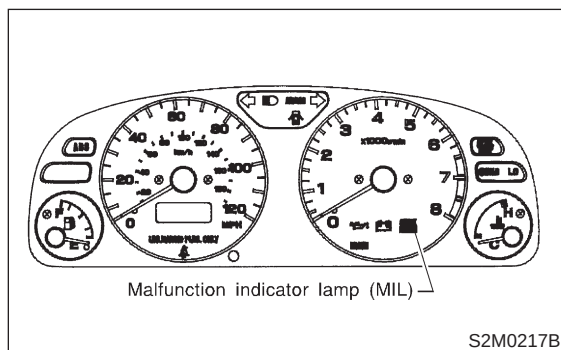
- Although MIL comes on when engine runs, trouble code is not shown on Subaru select monitor or OBD-II general scan tool display.

• WIRING DIAGRAM:

S2M0317

7B1 : CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Turn ignition switch to ON.



- CHECK** : ***Does the MIL come on?***
- YES** : Repair short circuit in harness between combination meter and ECM connector.
- NO** : Replace ECM.

C: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 Hz.

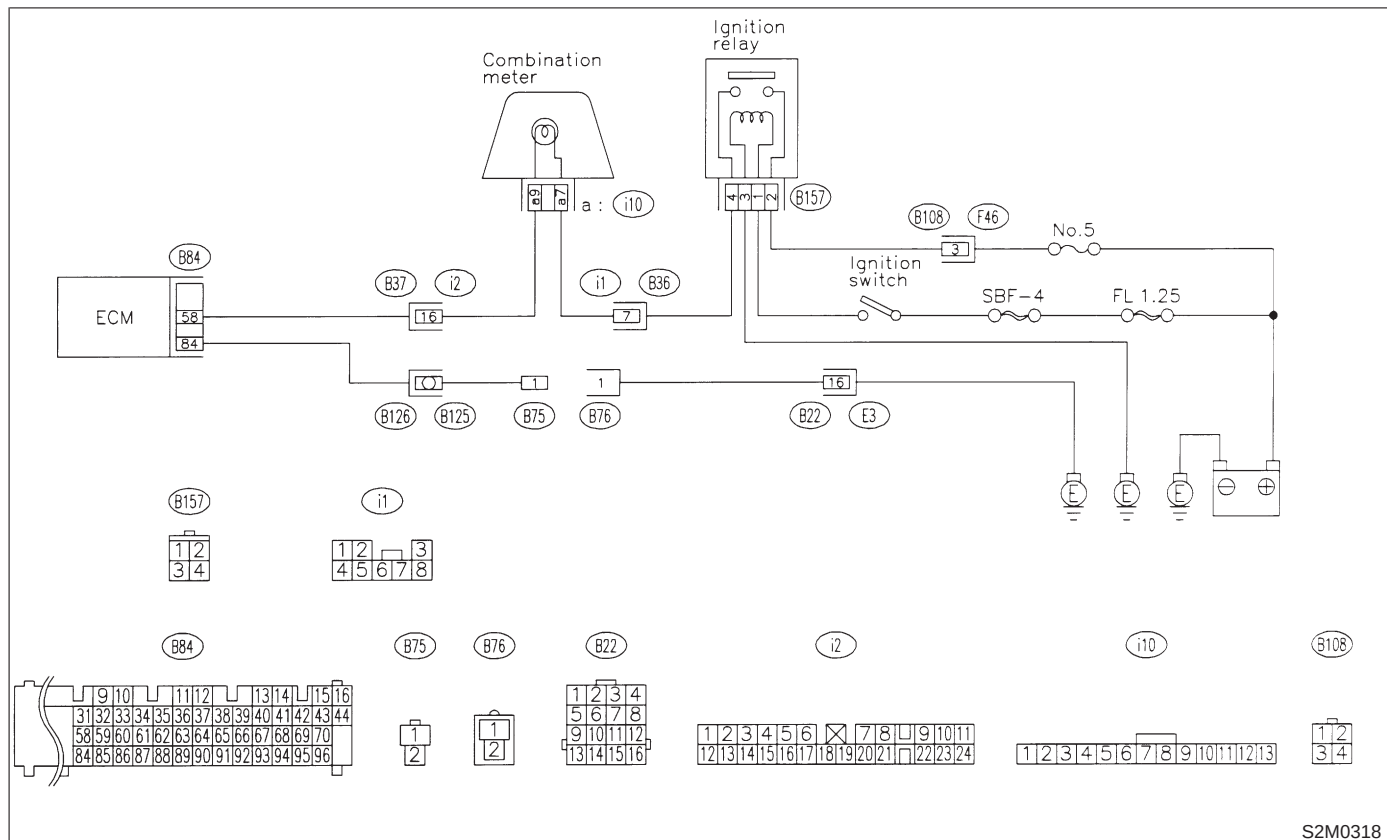
• DIAGNOSIS:

- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- Test mode connector circuit is in open.

• TROUBLE SYMPTOM:

- When inspection mode, MIL does not blink at a cycle of 3 Hz.

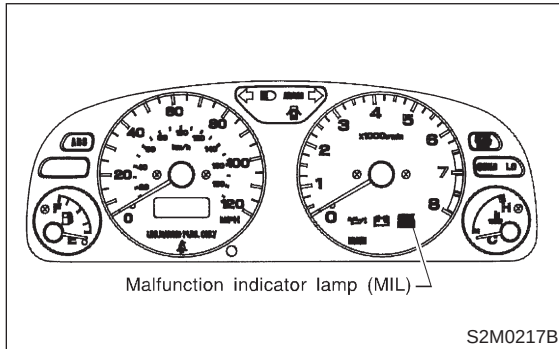
• WIRING DIAGRAM:



S2M0318

7C1 : CHECK STATUS OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).

- 1) Turn ignition switch to OFF.
- 2) Disconnect test mode connector.
- 3) Turn ignition switch to ON.

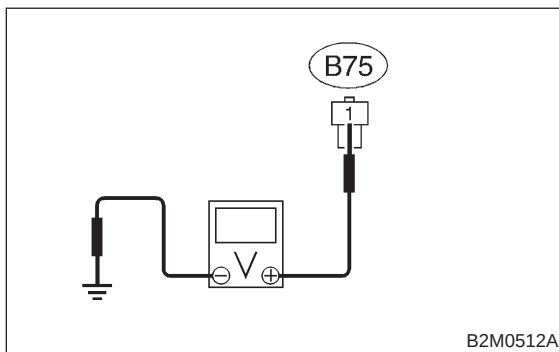


- CHECK** : Does the MIL come on?
- YES** : Go to step 7C2.
- NO** : Repair the MIL circuit. <Ref. to 2-7 [T7A0].>

7C2 : CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between test mode connector and chassis ground.

Connector & terminal
(B75) No. 1 (+) — Chassis ground (-):

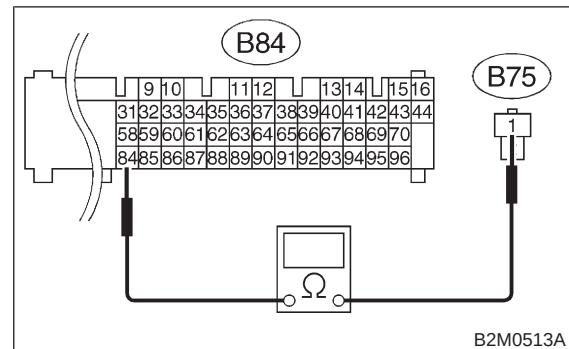


- CHECK** : Is voltage less than 1 V?
- YES** : Go to step 7C3.
- NO** : Go to step 7C5.

7C3 : CHECK HARNESS BETWEEN ECM AND TEST MODE CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and test mode connector.

Connector & terminal
(B84) No. 84 — (B75) No. 1:



- CHECK** : Is resistance less than 1 Ω?
- YES** : Go to step 7C4.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and test mode connector
- Poor contact in coupling connector (B125)

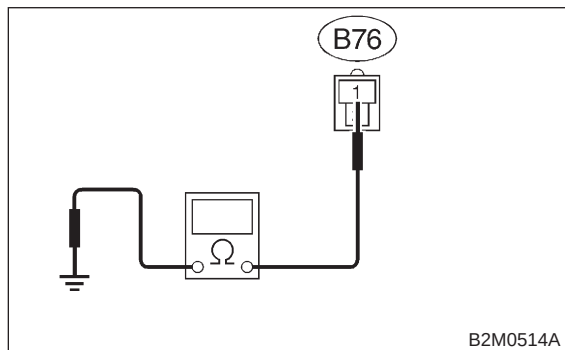
7C4 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in ECM connector?
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

7C5 : CHECK GROUND CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between test mode connector and chassis ground.

Connector & terminal**(B76) No. 1 — Chassis ground:**

- CHECK** : ***Is resistance less than 5 Ω?***
- YES** : Repair poor contact in test mode connector.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between test mode and engine grounding terminal
- Poor contact in coupling connector (B22)

D: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) REMAINS BLINKING AT A CYCLE OF 3 Hz.

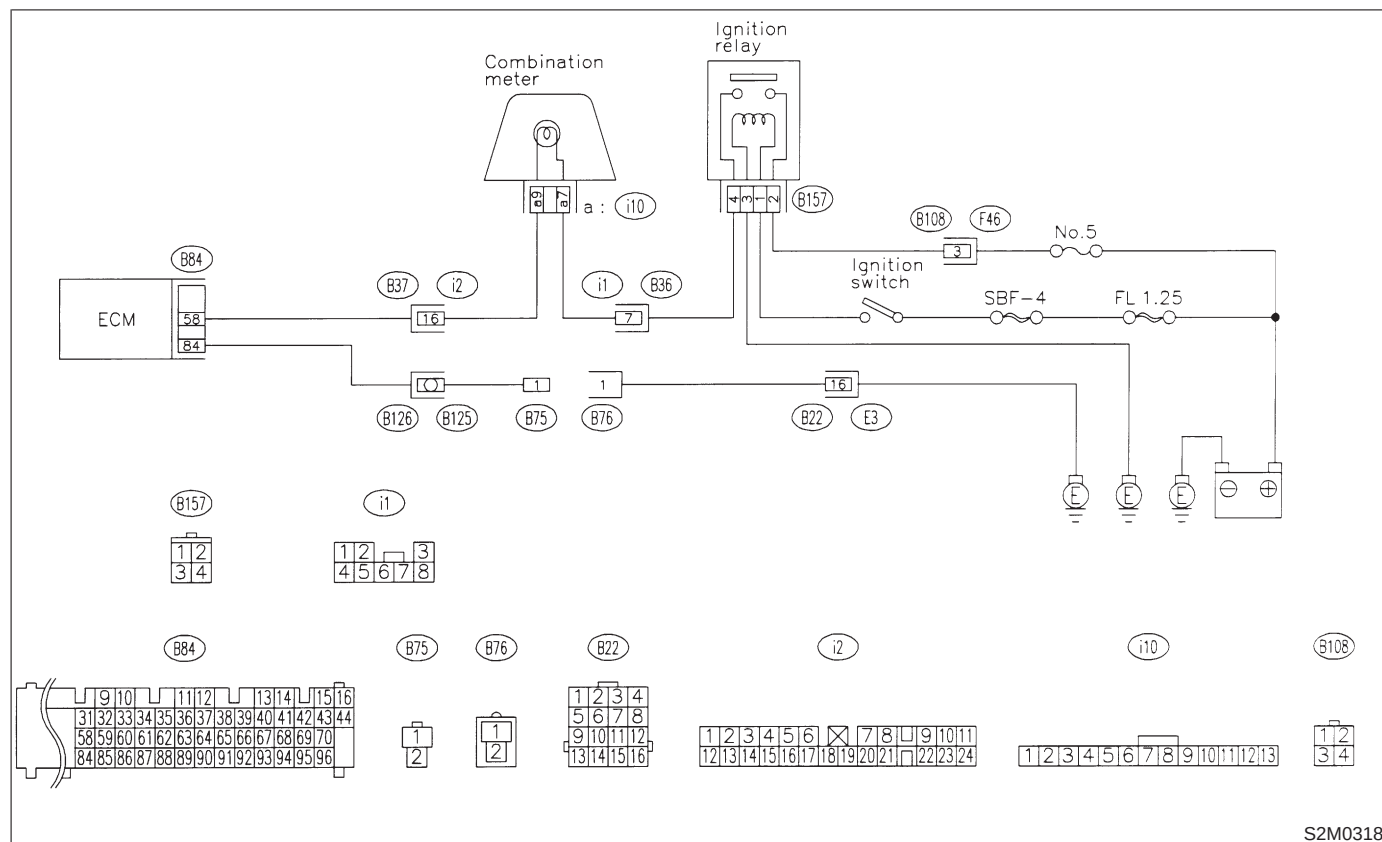
• DIAGNOSIS:

- Test mode connector circuit is shorted.

• TROUBLE SYMPTOM:

- Even though test mode connector is disconnected, MIL blinks at a cycle of 3 Hz when ignition switch is turned to ON.

• WIRING DIAGRAM:



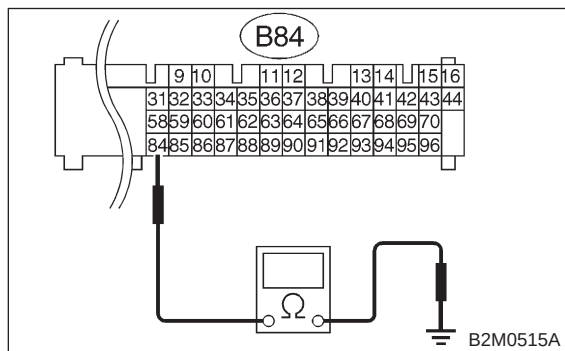
S2M0318

7D1 : CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUNDING TERMINAL.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B84) No. 84 — Chassis ground:



- CHECK** : **Is resistance less than 5 Ω ?**
- YES** : Repair short circuit in harness between ECM and test mode connector.
- NO** : Replace ECM.

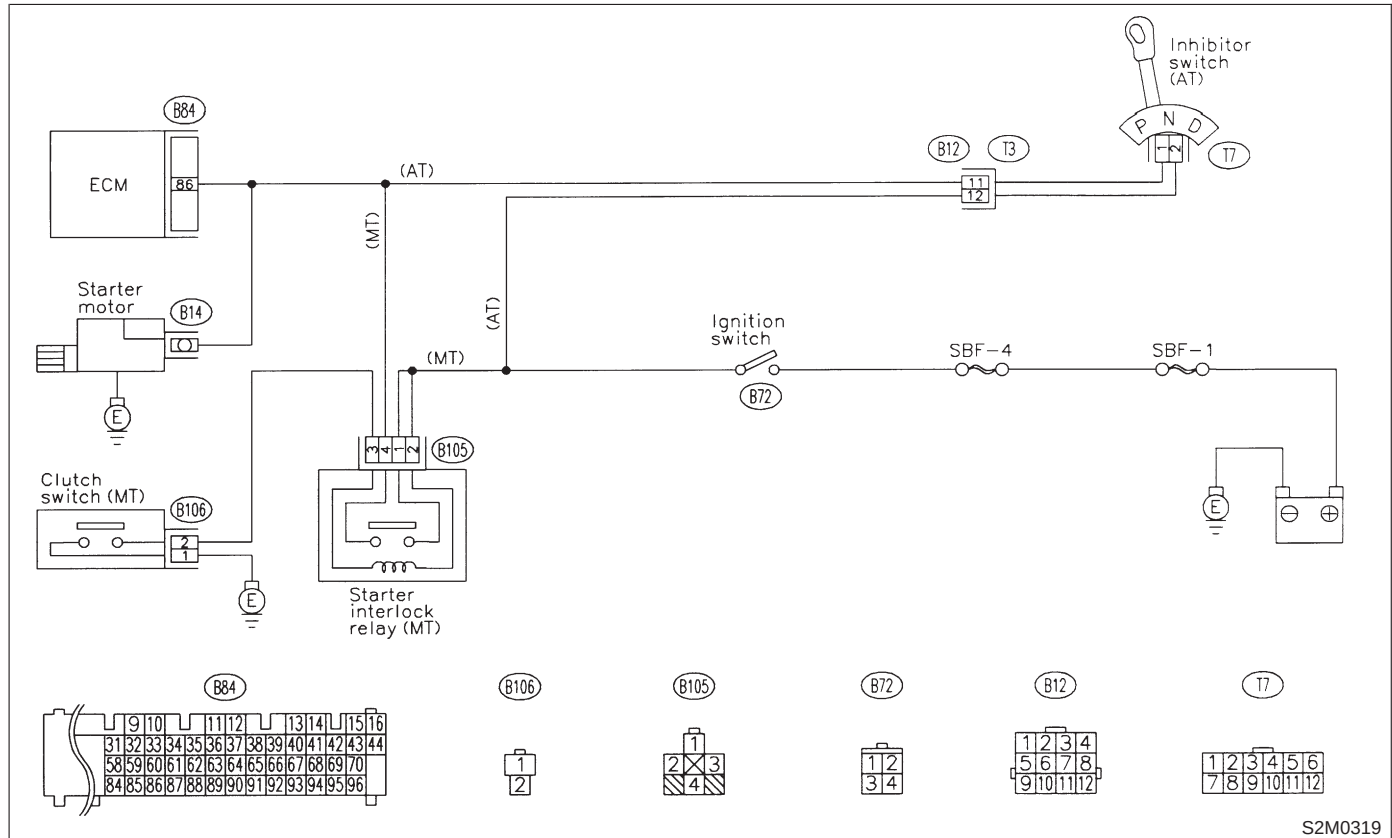
8. Diagnostics for Engine Starting Failure

A: BASIC DIAGNOSTICS CHART

1. Inspection of starter motor circuit. <Ref. to 2-7 [T8B0].>	
	↓
2. Inspection of ECM power supply and ground line. <Ref. to 2-7 [T8C0].>	
	↓
3. Inspection of ignition control system. <Ref. to 2-7 [T8D0].>	
	↓
4. Inspection of fuel pump circuit. <Ref. to 2-7 [T8E0].>	
	↓
5. Inspection of fuel injector circuit. <Ref. to 2-7 [T8F0].>	
	↓
6. Inspection of crankshaft position sensor circuit. <Ref. to 2-7 [T8G0].>	
	↓
7. Inspection of camshaft position sensor circuit. <Ref. to 2-7 [T8H0].>	
	↓
8. Inspection using Subaru select monitor or OBD-II general scan tool <Ref. to 2-7 [T10A0].> or inspection using "9. General Diagnostics Table". <Ref. to 2-7 [T900].>	

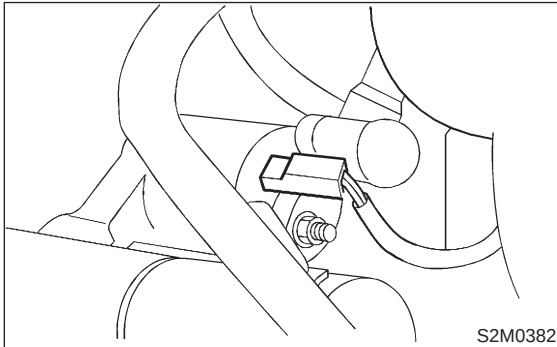
B: STARTER MOTOR CIRCUIT**CAUTION:**

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

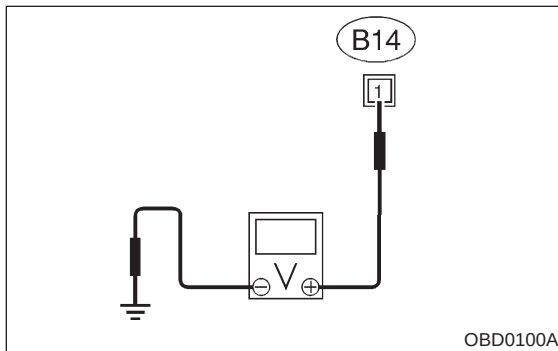
● **WIRING DIAGRAM:**

8B1 : CHECK INPUT SIGNAL FOR STARTER MOTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from starter motor.



- 3) Turn ignition switch to ST.
- 4) Measure power supply voltage between starter motor connector terminal and engine ground.

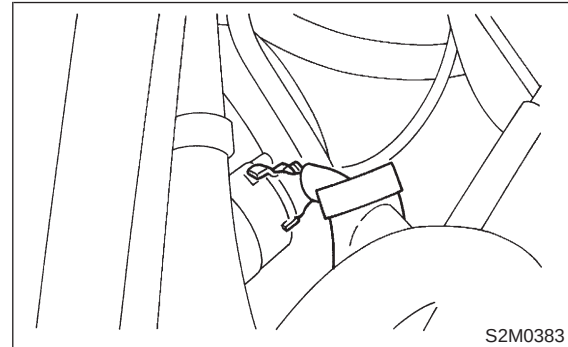
Connector & terminal**(B14) No. 1 (+) — Engine ground (-):****NOTE:**

- On AT vehicles, place the selector lever in the "P" or "N" position.
- On MT vehicles, depress the clutch pedal.

- CHECK** : **Is the voltage more than 10 V?**
- YES** : Go to step **8B2**.
- NO** : Go to step **8B3**.

8B2 : CHECK GROUND CIRCUIT OF STARTER MOTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect terminal from starter motor.



- 3) Measure resistance of ground cable between ground cable terminal and engine ground.

- CHECK** : **Is resistance less than 5 Ω?**
- YES** : Check starter motor. <Ref. to 6-1 [W100].>
- NO** : Repair open circuit of ground cable.

8B3 : CHECK FUSE (SBF NO. 1).

- 1) Turn ignition switch to OFF.
- 2) Remove SBF No. 1 from main fuse box.
- 3) Measure resistance of fuse.

- CHECK** : **Is resistance less than 1 Ω?**
- YES** : Go to step **8B4**.
- NO** : Replace SBF No. 1.

8B4 : CHECK FUSE (SBF NO. 4).

- 1) Remove SBF No. 4 from main fuse box.
- 2) Measure resistance of fuse.

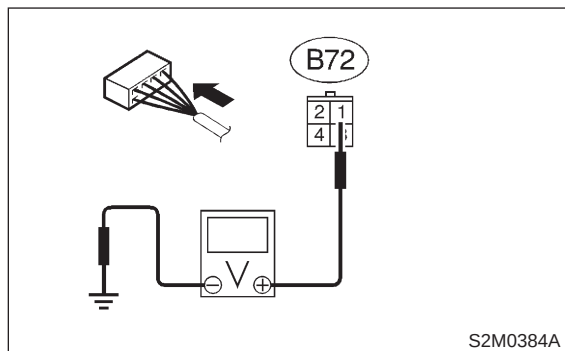
- CHECK** : **Is resistance less than 1 Ω?**
- YES** : Go to step **8B5**.
- NO** : Replace SBF No. 4.

8B5 : CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

- 1) Install SBF No. 1 and SBF No. 4 to main fuse box.
- 2) Turn ignition switch to ON.
- 3) Measure power supply voltage between ignition switch connector and chassis ground.

Connector & terminal

(B72) No. 1 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 8B6.
- NO** : Repair open circuit in harness between ignition switch and SBF No. 4 connector.

8B6 : CHECK TRANSMISSION TYPE.

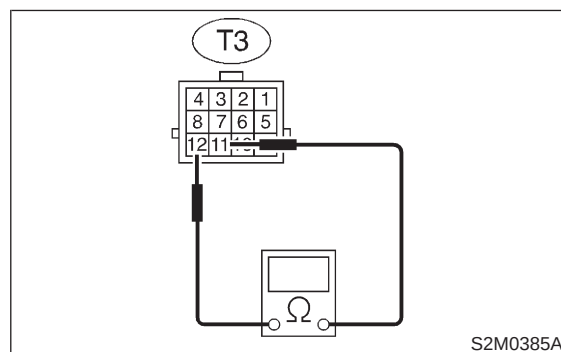
- CHECK** : Is transmission type AT?
- YES** : Go to step 8B7.
- NO** : Go to step 8B11.

8B7 : CHECK INHIBITOR SWITCH CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Place the selector lever in the "P" or "N" position.
- 3) Separate transmission harness connector.
- 4) Measure resistance between transmission harness connector receptacle's terminals.

Connector & terminal

(T3) No. 11 — No. 12:



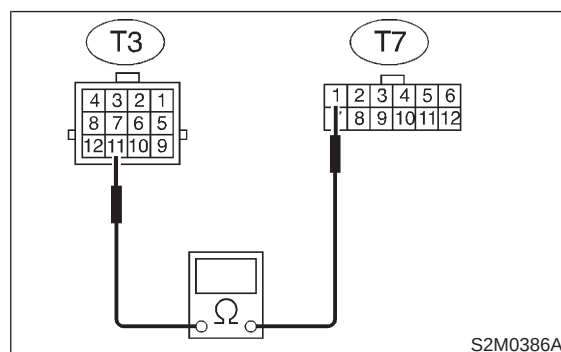
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Repair open circuit in harness between starter motor and ignition switch connector.
- NO** : Go to step 8B8.

8B8 : CHECK TRANSMISSION HARNESS.

- 1) Disconnect connector from inhibitor switch.
- 2) Measure resistance of harness between transmission harness and inhibitor switch connector.

Connector & terminal

(T3) No. 11 — (T7) No. 1:



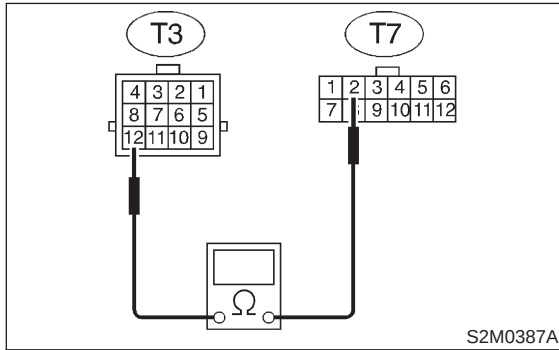
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8B9.
- NO** : Repair open circuit in harness between transmission harness and inhibitor switch connector.

8B9 : CHECK TRANSMISSION HARNESS.

Measure resistance of harness between transmission harness and inhibitor switch connector.

Connector & terminal

(T3) No. 12 — (T7) No. 2:



- CHECK** : **Is the resistance less than 1 Ω?**
- YES** : Go to step **8B10**.
- NO** : Repair open circuit in harness between transmission harness and inhibitor switch connector.

8B10 : CHECK POOR CONTACT.

Check poor contact in inhibitor switch connector.
<Ref. to FOREWORD [T3C1].>

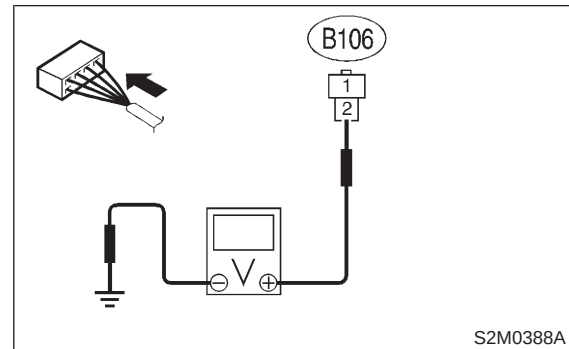
- CHECK** : **Is there poor contact in inhibitor switch connector?**
- YES** : Repair poor contact in inhibitor switch connector.
- NO** : Replace inhibitor switch.

8B11 : CHECK STARTER INTERLOCK CIRCUIT.

- 1) Turn ignition switch to "ST".
- 2) Measure voltage between clutch switch connector and chassis ground.

Connector & terminal

(B106) No. 2 (+) — Chassis ground (-):



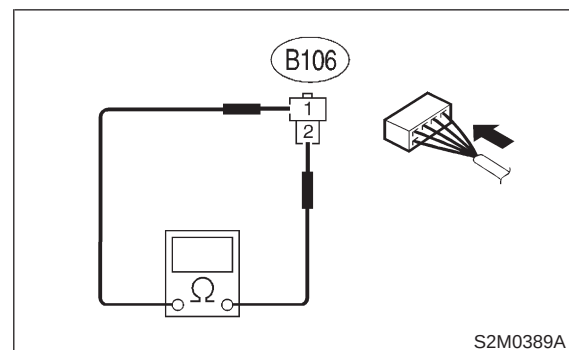
- CHECK** : **Is the voltage more than 10 V?**
- YES** : Replace starter interlock relay.
- NO** : Go to step **8B12**.

8B12 : CHECK STARTER INTERLOCK CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between clutch switch connector terminals while depressing the clutch pedal.

Connector & terminal

(B106) No. 1 — No. 2:



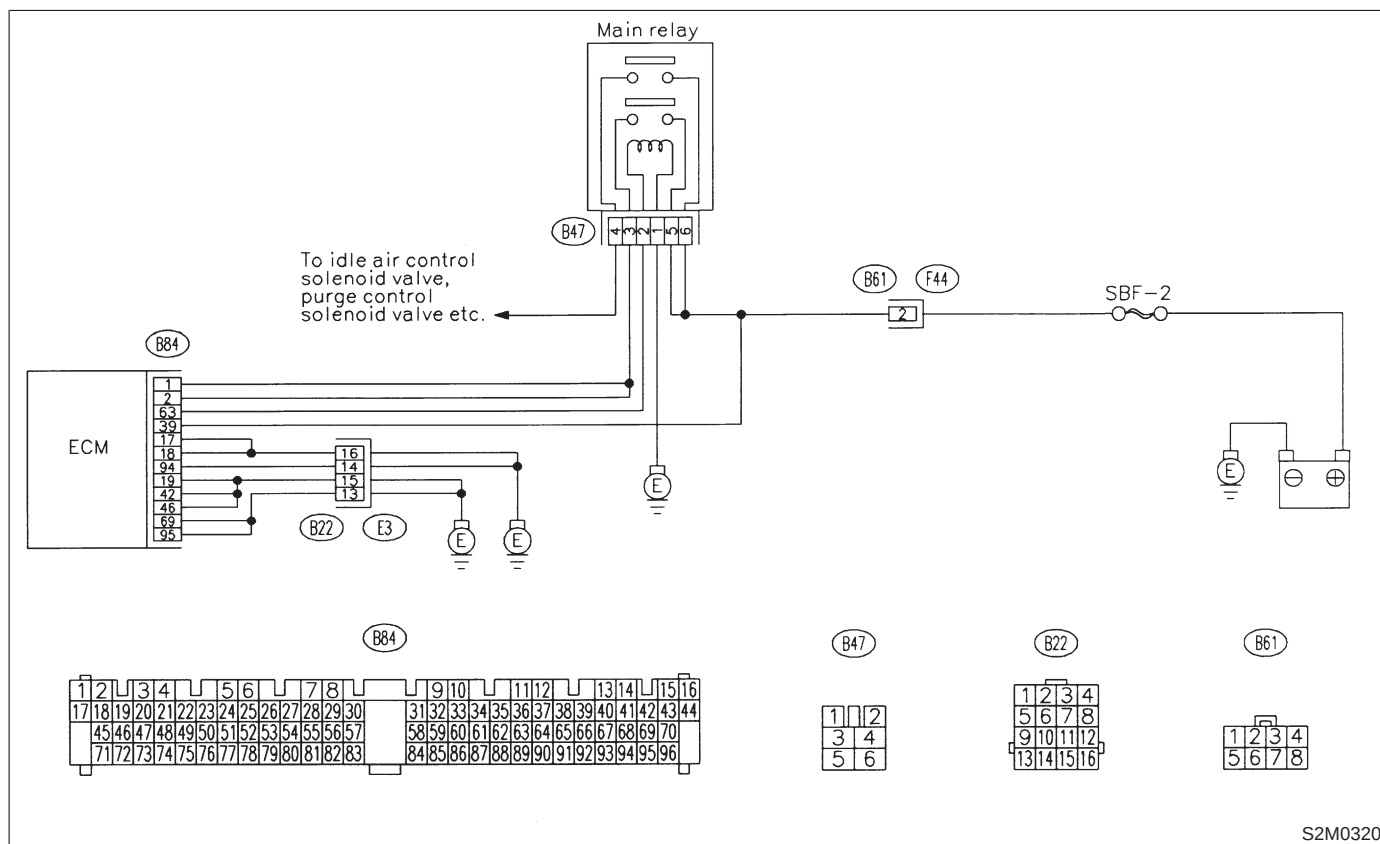
- CHECK** : **Is the resistance less than 10 Ω?**
- YES** : Repair open circuit in harness between starter motor and ignition switch connector.
- NO** : Replace clutch switch.

C: CONTROL MODULE POWER SUPPLY AND GROUND LINE

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

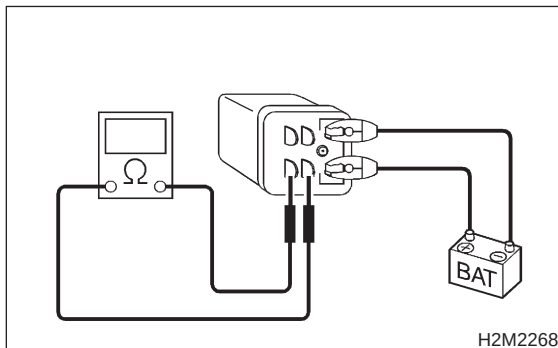
● WIRING DIAGRAM:



S2M0320

8C1 : CHECK MAIN RELAY.

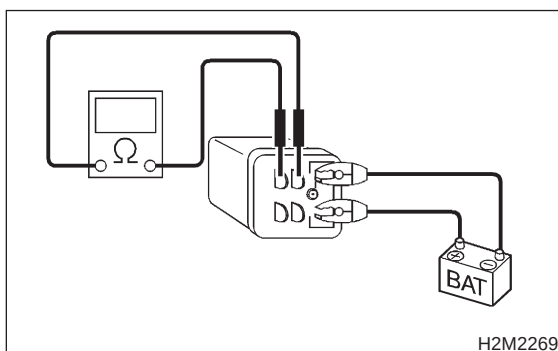
- 1) Turn the ignition switch to OFF.
- 2) Remove main relay.
- 3) Connect battery to main relay terminals No. 1 and No. 2.
- 4) Measure resistance between main relay terminals.

Terminals**No. 3 — No. 5:**

- CHECK** : Is the resistance less than 10 Ω ?
- YES** : Go to step 8C2.
- NO** : Replace main relay.

8C2 : CHECK MAIN RELAY.

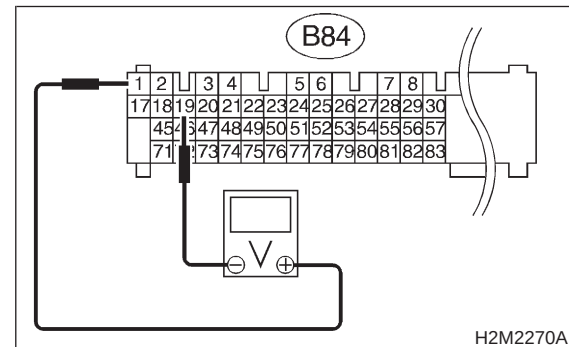
Measure resistance between main relay terminals.

Terminals**No. 4 — No. 6:**

- CHECK** : Is the resistance less than 10 Ω ?
- YES** : Go to step 8C3.
- NO** : Replace main relay.

8C3 : CHECK POWER SUPPLY CIRCUIT OF ECM.

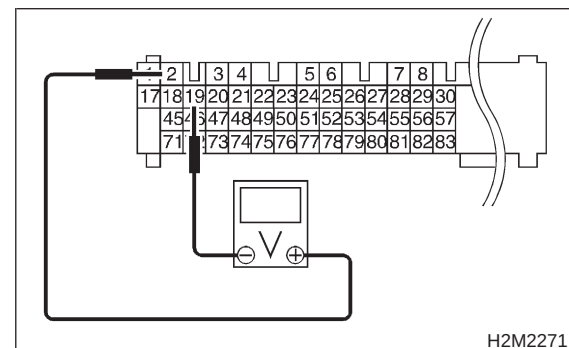
- 1) Install main relay.
- 2) Disconnect connectors from ECM.
- 3) Turn ignition switch to ON.
- 4) Measure power supply voltage between ECM connector terminals.

Connector & terminal**(B84) No. 1 (+) — No. 19 (-):**

- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 8C4.
- NO** : Repair open or ground short circuit in harness of power supply circuit.

8C4 : CHECK POWER SUPPLY CIRCUIT OF ECM.

Measure power supply voltage between ECM connector terminals.

Connector & terminal**(B84) No. 2 (+) — No. 19 (-):**

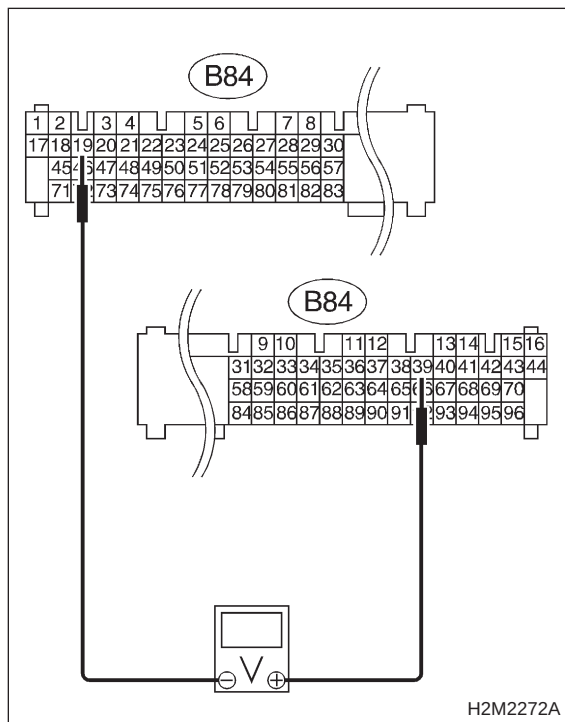
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 8C5.
- NO** : Repair open or ground short circuit in harness of power supply circuit.

8C5 : CHECK POWER SUPPLY CIRCUIT OF ECM.

Measure power supply voltage between ECM connector terminals.

Connector & terminal

(B84) No. 39 (+) — No. 19 (-):



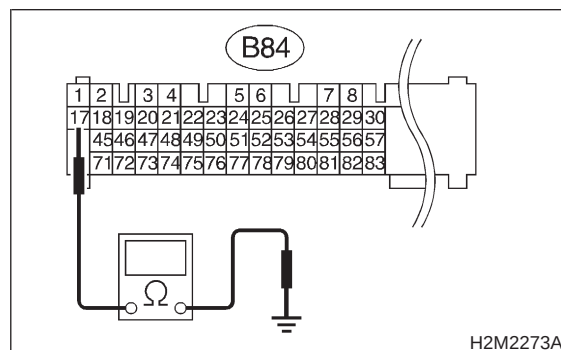
- (CHECK)** : **Is the voltage more than 10 V?**
- (YES)** : Go to step **8C6**.
- (NO)** : Repair open or ground short circuit in harness of power supply circuit.

8C6 : CHECK GROUND CIRCUIT OF ECM.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 17 — Chassis ground:



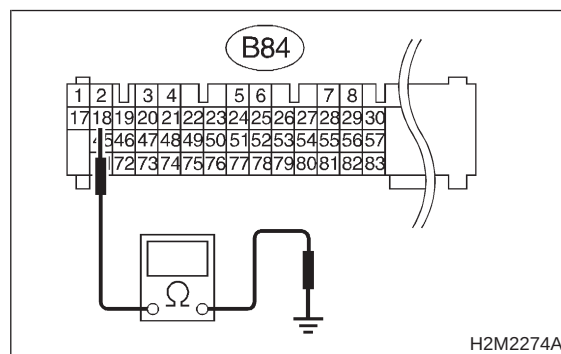
- (CHECK)** : **Is the resistance less than 5 Ω?**
- (YES)** : Go to step **8C7**.
- (NO)** : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C7 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 18 — Chassis ground:



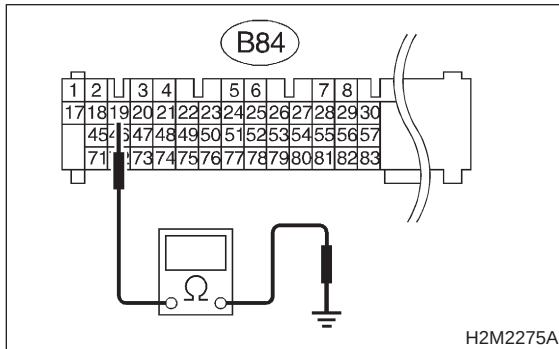
- (CHECK)** : **Is the resistance less than 5 Ω?**
- (YES)** : Go to step **8C8**.
- (NO)** : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C8 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Measure resistance of harness between ECM and chassis ground.

(B84) No. 19 — Chassis ground:



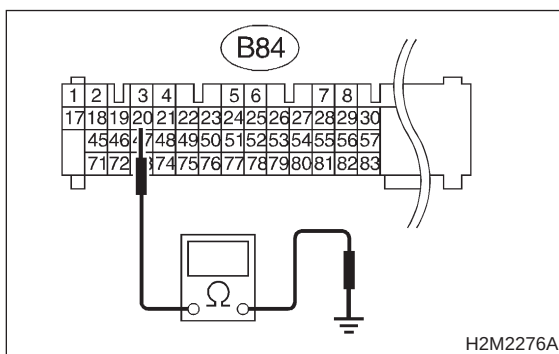
- CHECK** : Is the resistance less than 5 Ω?
- YES** : Go to step 8C9.
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C9 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 20 — Chassis ground:



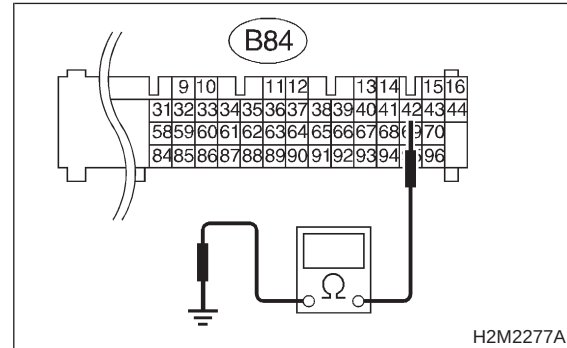
- CHECK** : Is the resistance less than 5 Ω?
- YES** : Go to step 8C10.
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C10 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 42 — Chassis ground:



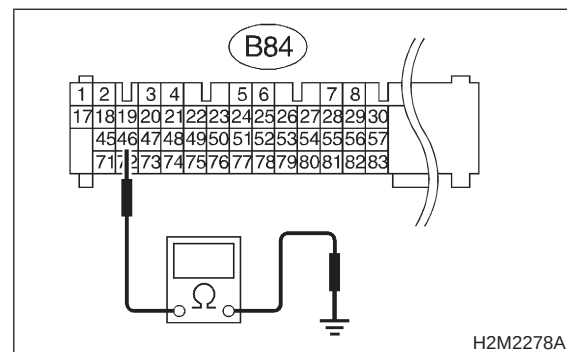
- CHECK** : Is the resistance less than 5 Ω?
- YES** : Go to step 8C11.
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C11 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 46 — Chassis ground:



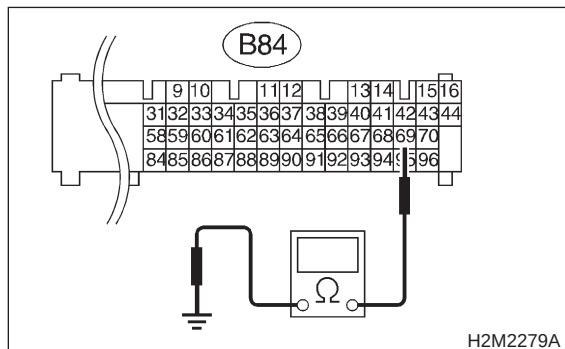
- CHECK** : Is the resistance less than 5 Ω?
- YES** : Go to step 8C12.
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C12 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 69 — Chassis ground:



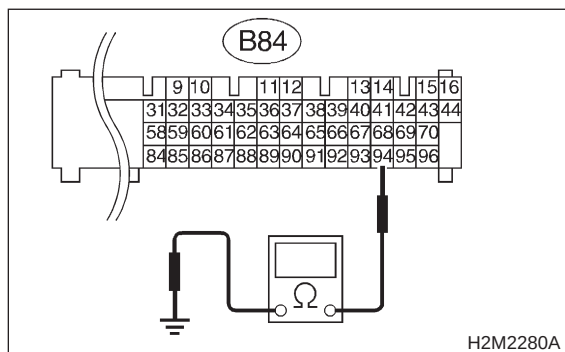
- CHECK** : **Is the resistance less than 5 Ω?**
YES : Go to step **8C13**.
NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C13 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 94 — Chassis ground:



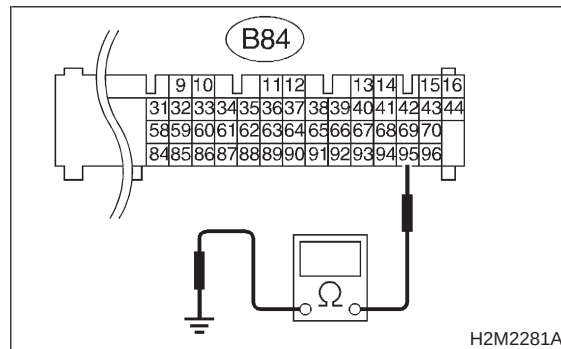
- CHECK** : **Is the resistance less than 5 Ω?**
YES : Go to step **8C14**.
NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

8C14 : CHECK GROUND CIRCUIT OF ECM.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

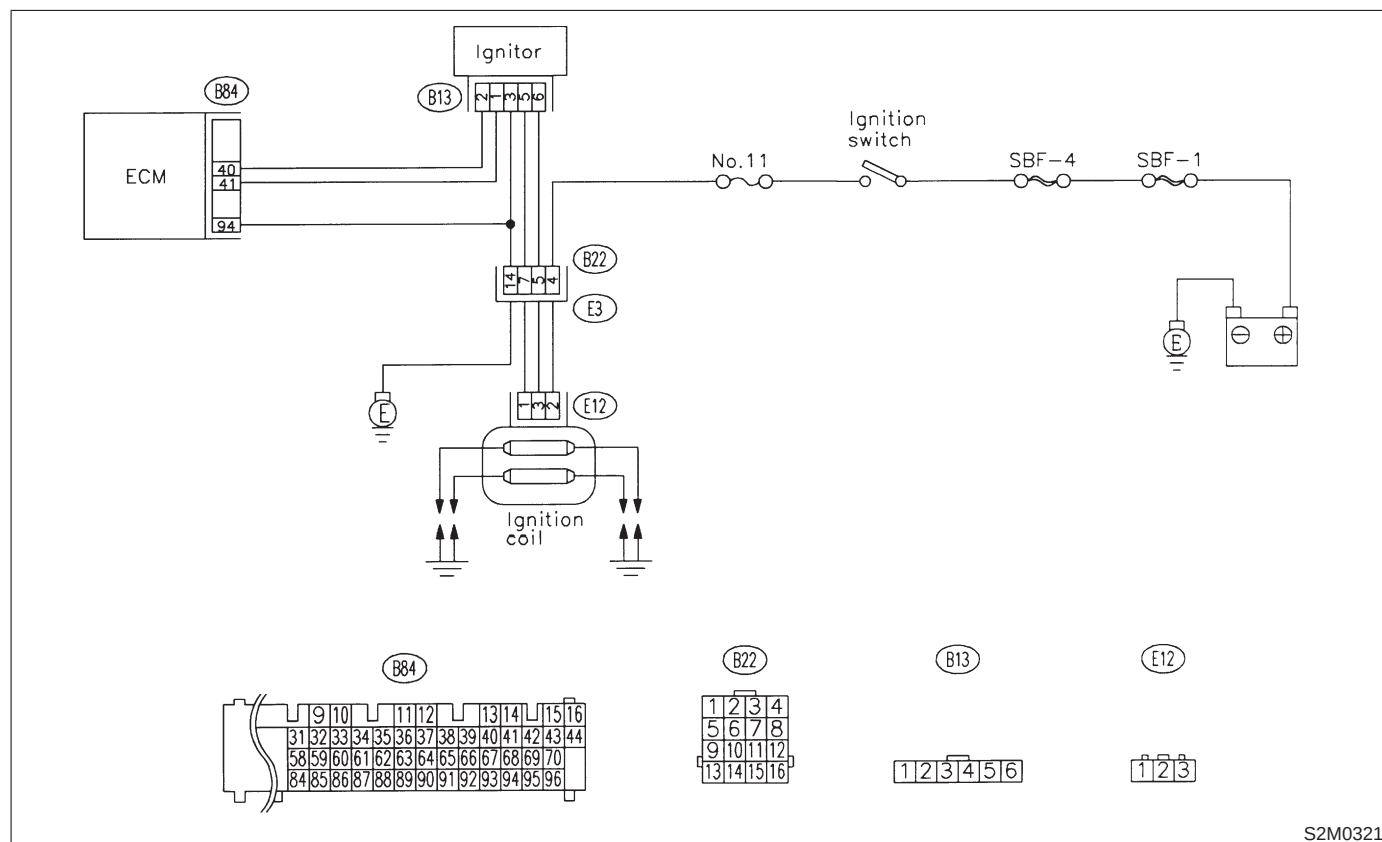
(B84) No. 95 — Chassis ground:



- CHECK** : **Is the resistance less than 5 Ω?**
YES : Check ignition control system. <Ref. to 2-7 [T8D0].>
NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

D: IGNITION CONTROL SYSTEM**CAUTION:**

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:

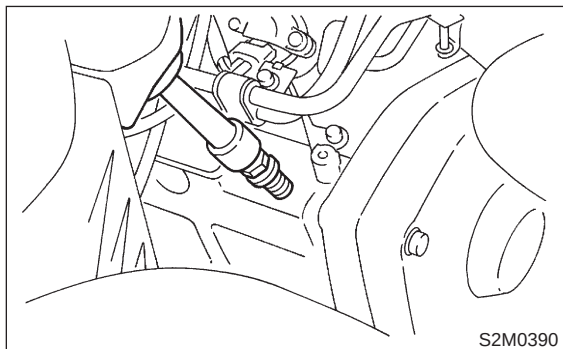
8D1 : CHECK IGNITION SYSTEM FOR SPARKS.

- 1) Remove plug cord cap from each spark plug.
- 2) Install new spark plug on plug cord cap.

CAUTION:

Do not remove spark plug from engine.

- 3) Contact spark plug's thread portion on engine.
- 4) While opening throttle valve fully, crank engine to check that spark occurs at each cylinder.



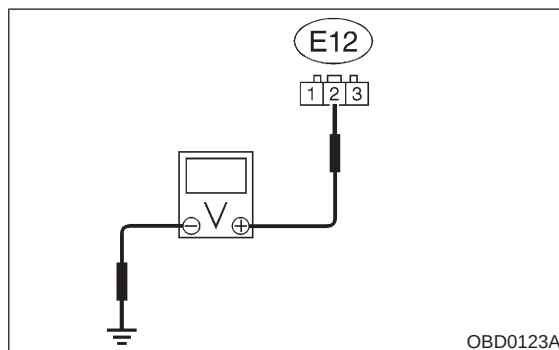
- CHECK** : **Does spark occur at each cylinder?**
- YES** : Check fuel pump system. <Ref. to 2-7 [T8E0].>
- NO** : Go to step **8D2**.

8D2 : CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ignition coil.
- 3) Turn ignition switch to ON.
- 4) Measure power supply voltage between ignition coil connector and engine ground.

Connector & terminal

(E12) No. 2 (+) — Engine ground (-):



- CHECK** : **Is the voltage more than 10 V?**
- YES** : Go to step **8D3**.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

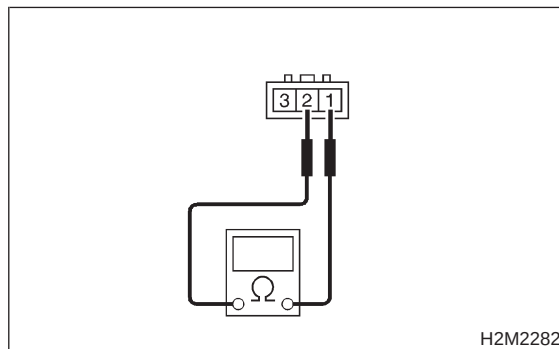
- Open circuit in harness between ignition coil and ignition switch connector
- Poor contact in coupling connector (B22)

8D3 : CHECK IGNITION COIL.

Measure resistance between ignition coil terminals to check primary coil.

Terminals

No. 2 — No. 1:



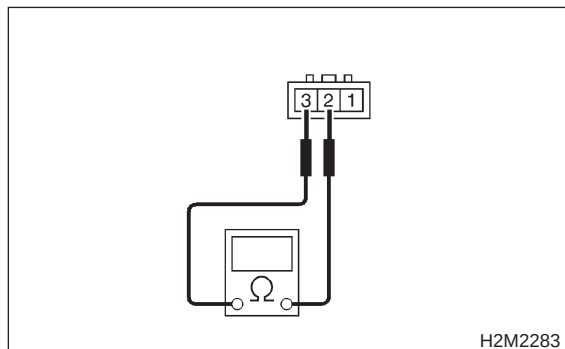
- CHECK** : **Is the resistance between 0.4 and 1.0 Ω ?**
- YES** : Go to step **8D4**.
- NO** : Replace ignition coil.

8D4 : CHECK IGNITION COIL.

Measure resistance between ignition coil terminals to check primary coil.

Terminals

No. 2 — No. 3:



CHECK : *Is the resistance between 0.4 and 1.0 Ω?*

YES : Go to step 8D5.

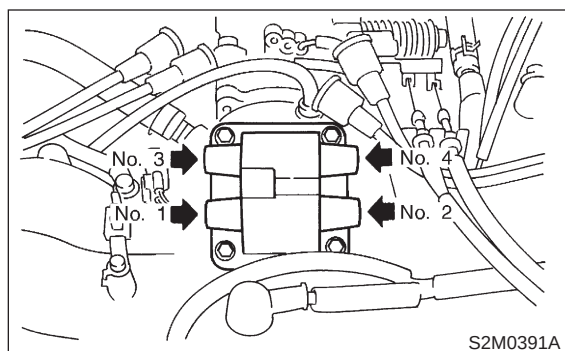
NO : Replace ignition coil.

8D5 : CHECK IGNITION COIL.

Measure resistance between spark plug cord contact portions to check secondary coil.

Terminals

No. 1 — No. 2:



CHECK : *Is the resistance between 10 and 15 Ω?*

YES : Go to step 8D6.

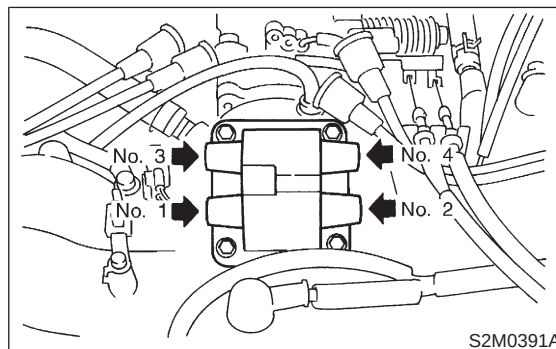
NO : Replace ignition coil.

8D6 : CHECK IGNITION COIL.

Measure resistance between spark plug cord contact portions to check secondary coil.

Terminals

No. 3 — No. 4:



CHECK : *Is the resistance between 10 and 15 Ω?*

YES : Go to step 8D7.

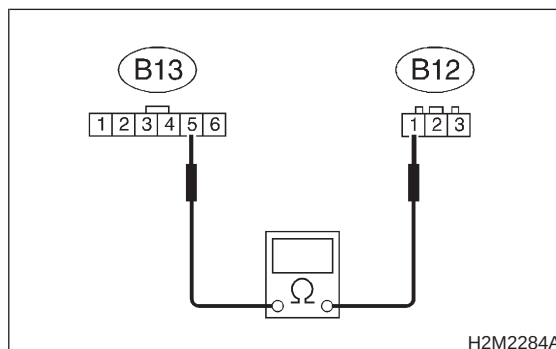
NO : Replace ignition coil.

8D7 : CHECK HARNESS BETWEEN IGNITOR AND IGNITION COIL CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ignitor.
- 3) Measure resistance of harness between ignitor coil and ignitor connector.

Connector & terminal

(B13) No. 5 — (E12) No. 1:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step 8D8.

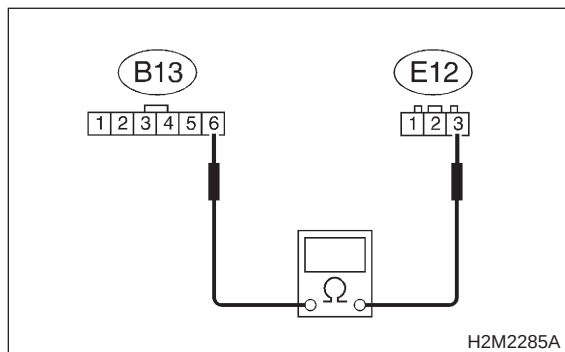
NO : Go to step 8D9.

8D8 : CHECK HARNESS BETWEEN IGNITOR AND IGNITION COIL CONNECTOR.

Measure resistance of harness between ignition coil and ignitor connector.

Connector & terminal

(B13) No. 6 — (E12) No. 3:



CHECK : *Is the resistance less than 1 Ω ?*

YES : Go to step **8D10**.

NO : Go to step **8D9**.

8D9 : CHECK POOR CONTACT.

Check poor contact in coupling connector (B22).
<Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in coupling connector (B22)?*

YES : Repair poor contact in coupling connector (B22).

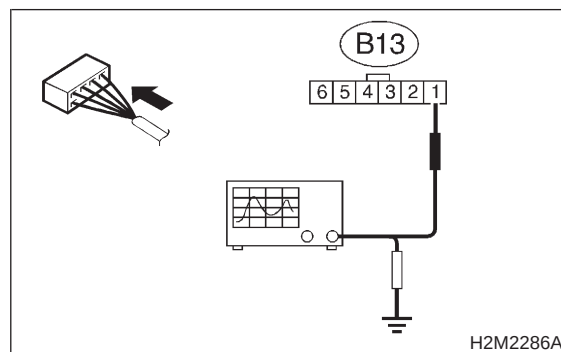
NO : Repair open circuit in harness between ignition coil and ignitor connector.

8D10 : CHECK INPUT SIGNAL FOR IGNITOR.

Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignitor connector and engine ground.

Connector & terminal:

(B13) No. 1 (+) — Engine ground (-):



CHECK : *Is the voltage more than 10 V?*

YES : Go to step **8D11**.

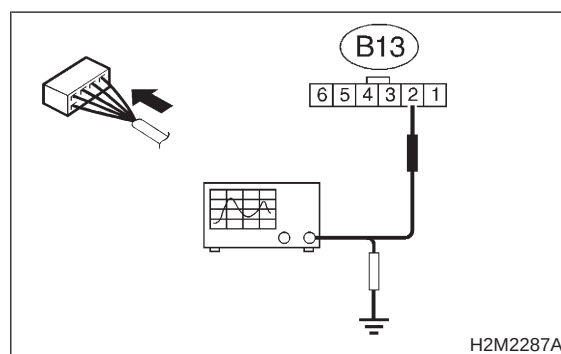
NO : Replace ignitor.

8D11 : CHECK INPUT SIGNAL FOR IGNITOR.

Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignitor connector and engine ground.

Connector & terminal:

(B13) No. 2 (+) — Engine ground (-):



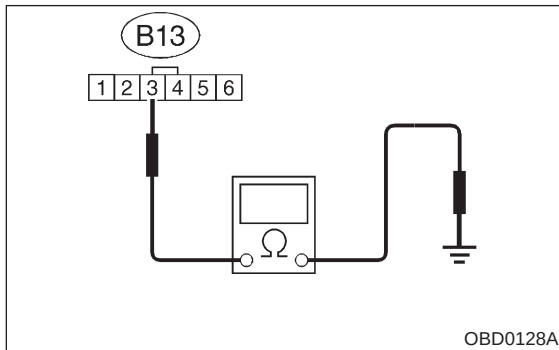
CHECK : *Is the voltage more than 10 V?*

YES : Go to step **8D12**.

NO : Replace ignitor.

8D12 : CHECK HARNESS OF IGNITOR GROUND CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ignitor and engine ground.

Connector & terminal**(B13) No. 3 — Engine ground:**

- CHECK** : Is the resistance less than 5 Ω?
- YES** : Go to step 8D13.
- NO** : Repair harness and connector.

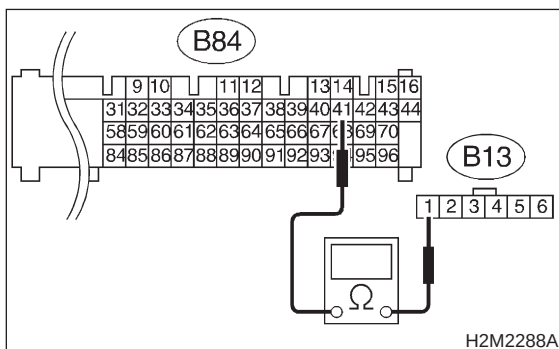
NOTE:

In this case, repair the following:

- Open circuit in harness between ignitor connector and engine grounding terminal
- Poor contact in coupling connector (B22)

8D13 : CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

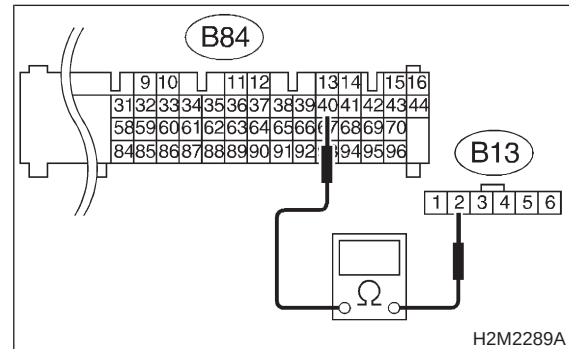
- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness between ECM and ignitor connector.

Connector & terminal**(B84) No. 41 — (B13) No. 1:**

- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8D14.
- NO** : Repair open circuit in harness between ECM and ignitor connector.

8D14 : CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

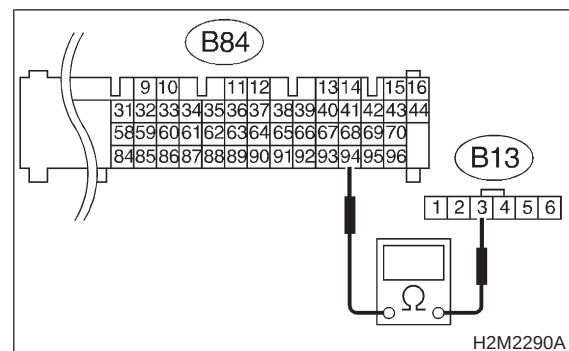
Measure resistance of harness between ECM and ignitor connector.

Connector & terminal**(B84) No. 40 — (B13) No. 2:**

- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8D15.
- NO** : Repair open circuit in harness between ECM and ignitor connector.

8D15 : CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

Measure resistance of harness between ECM and ignitor connector.

Connector & terminal**(B84) No. 94 — (B13) No. 3:**

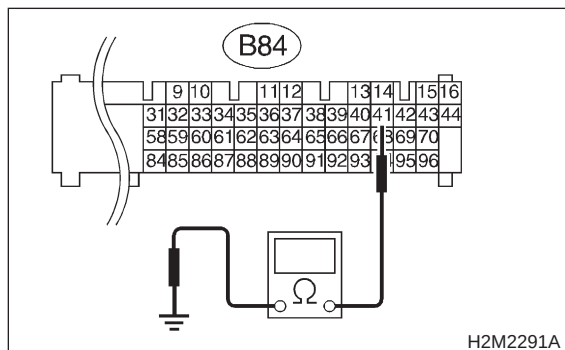
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8D16.
- NO** : Repair open circuit in harness between ECM and ignitor connector.

8D16 : CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 41 — Chassis ground:



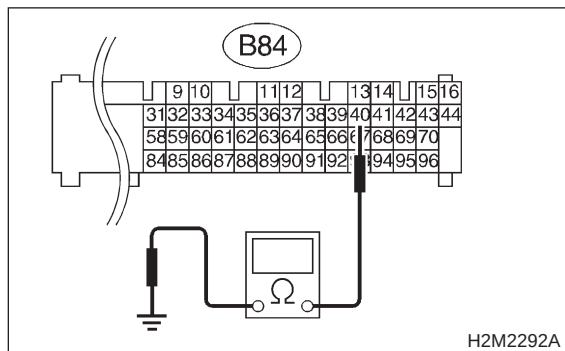
- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **8D17**.
- NO** : Repair ground short circuit in harness between ECM and ignitor connector.

8D17 : CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 40 — Chassis ground:



- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **8D18**.
- NO** : Repair ground short circuit in harness between ECM and ignitor connector.

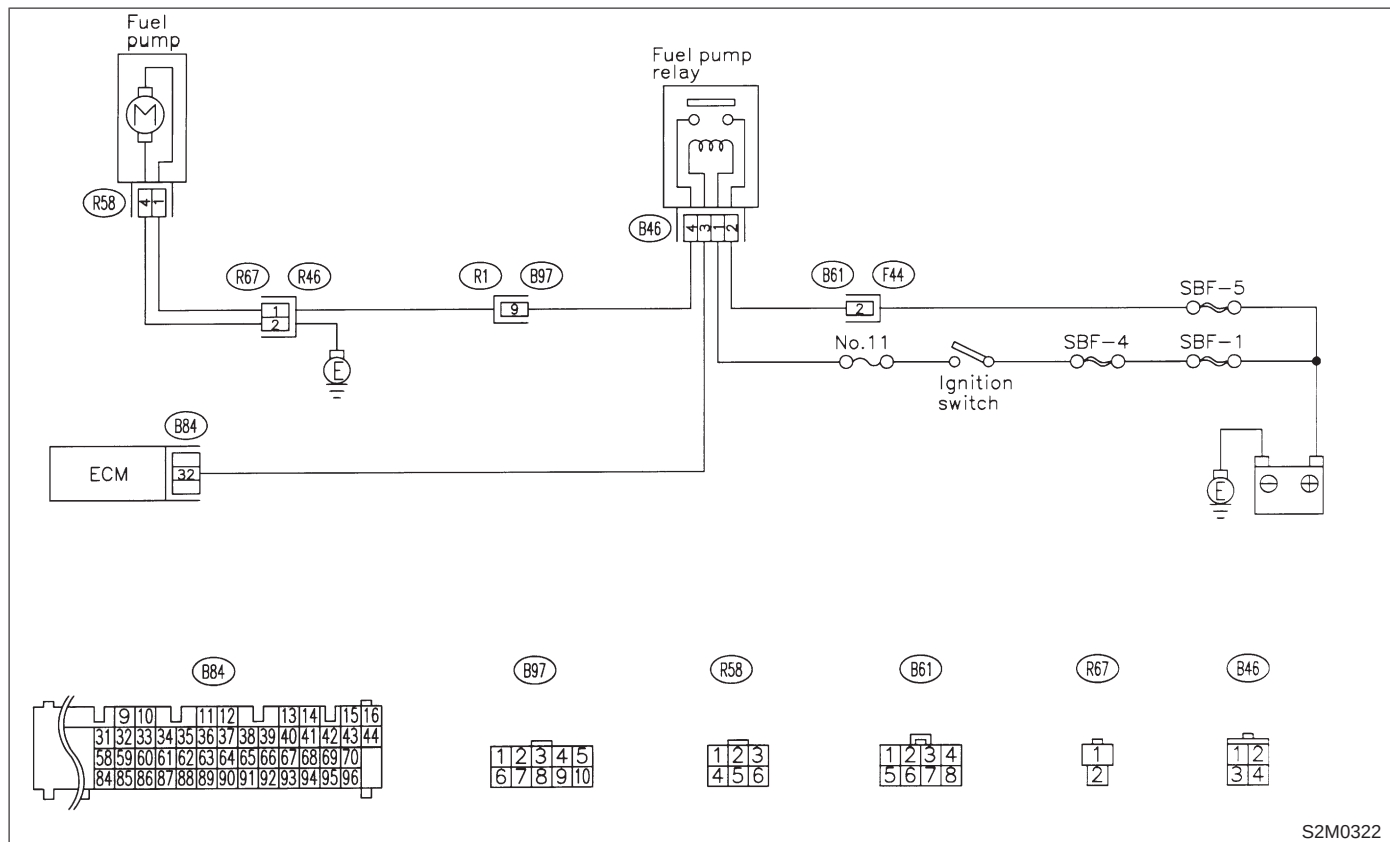
8D18 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : *Is there poor contact in ECM connector?*
- YES** : Repair poor contact in ECM connector.
- NO** : Check fuel pump circuit. <Ref. to 2-7 [T8E0].>

E: FUEL PUMP CIRCUIT**CAUTION:**

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0322

8E1 : CHECK OPERATING SOUND OF FUEL PUMP.

Make sure that fuel pump is in operation for two seconds when turning ignition switch to ON.

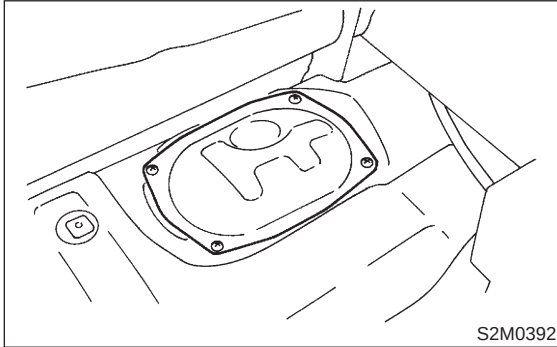
NOTE:

Fuel pump operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

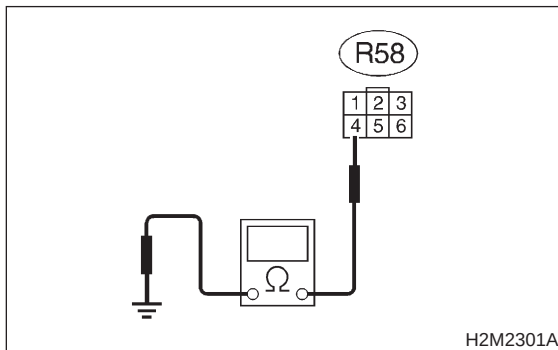
- CHECK** : **Does fuel pump produce operating sound?**
- YES** : Check fuel injector circuit. <Ref. to 2-7 [T8F0].>
- NO** : Go to step **8E2**.

8E2 : CHECK GROUND CIRCUIT OF FUEL PUMP.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel pump access hole lid located on the luggage compartment floor.



- 3) Disconnect connector from fuel pump.
- 4) Measure resistance of harness connector between fuel pump and chassis ground.

Connector & terminal**(R58) No. 4 — Chassis ground:**

- CHECK** : **Is the resistance less than 5 Ω ?**
- YES** : Go to step **8E3**.
- NO** : Repair harness and connector.

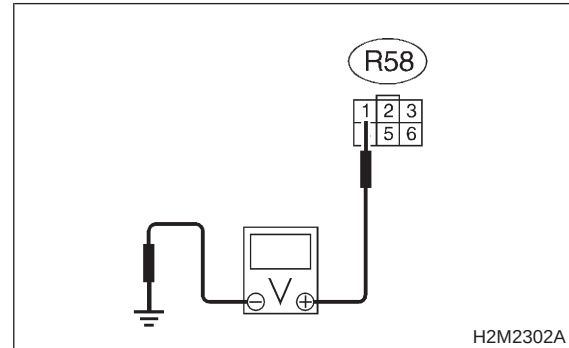
NOTE:

In this case, repair the following:

- Open circuit in harness between fuel pump connector and chassis grounding terminal
- Poor contact in coupling connector (R15)

8E3 : CHECK POWER SUPPLY TO FUEL PUMP.

- 1) Turn ignition switch to ON.
- 2) Measure voltage of power supply circuit between fuel pump connector and chassis ground.

Connector & terminal**(R58) No. 1 (+) — Chassis ground (-):**

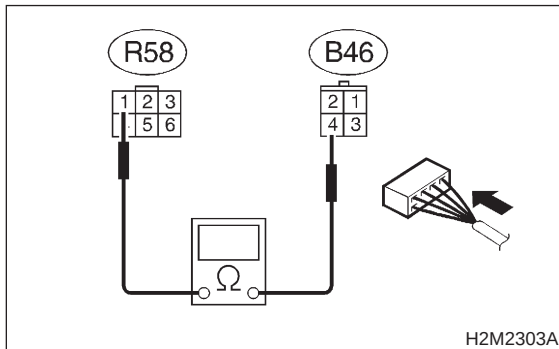
- CHECK** : **Is the voltage more than 10 V?**
- YES** : Replace fuel pump.
- NO** : Go to step **8E4**.

8E4 : CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between fuel pump and fuel pump relay connector.

Connector & terminal

(R58) No. 1 — (B46) No. 4:



- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 8E5.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

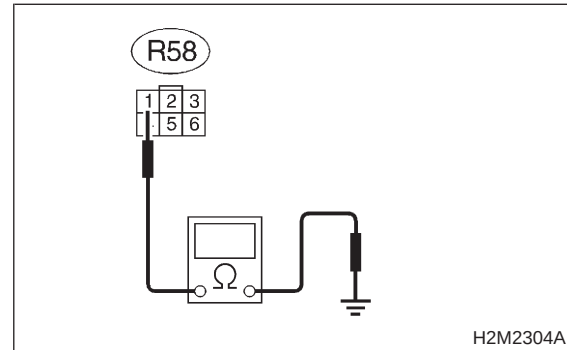
- Open circuit in harness between fuel pump and fuel pump relay connector
- Poor contact in coupling connectors (R67 and B97)

8E5 : CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.

Measure resistance of harness between fuel pump and fuel pump relay connector.

Connector & terminal

(R58) No. 1 — Chassis ground:



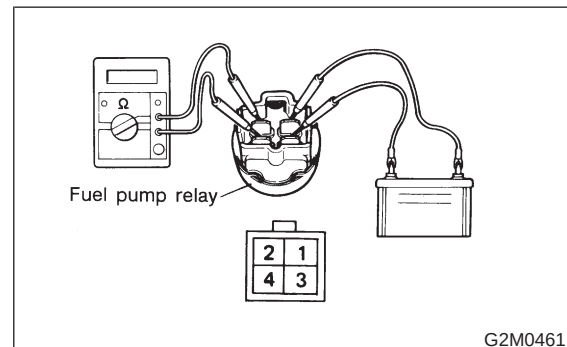
- CHECK** : Is the resistance more than 1 $M\Omega$?
- YES** : Go to step 8E6.
- NO** : Repair ground short circuit in harness between fuel pump and fuel pump relay connector.

8E6 : CHECK FUEL PUMP RELAY.

- 1) Disconnect connector from fuel pump relay.
- 2) Remove fuel pump relay from bracket.
- 3) Connect battery to fuel pump relay connector terminals No. 1 and No. 3.
- 4) Measure resistance between connector terminals of fuel pump relay.

Terminals

No. 2 — No. 4:



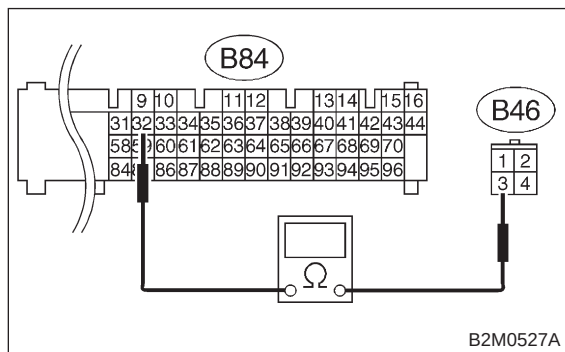
- CHECK** : Is the resistance less than 10 Ω ?
- YES** : Go to step 8E7.
- NO** : Replace fuel pump relay.

8E7 : CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.

- 1) Disconnect connectors from ECM.
- 2) Measure resistance of harness between ECM and fuel pump relay connector.

Connector & terminal

(B84) No. 32 — (B46) No. 3:



- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step 8E8.
- NO** : Repair open circuit in harness between ECM and fuel pump relay connector.

8E8 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

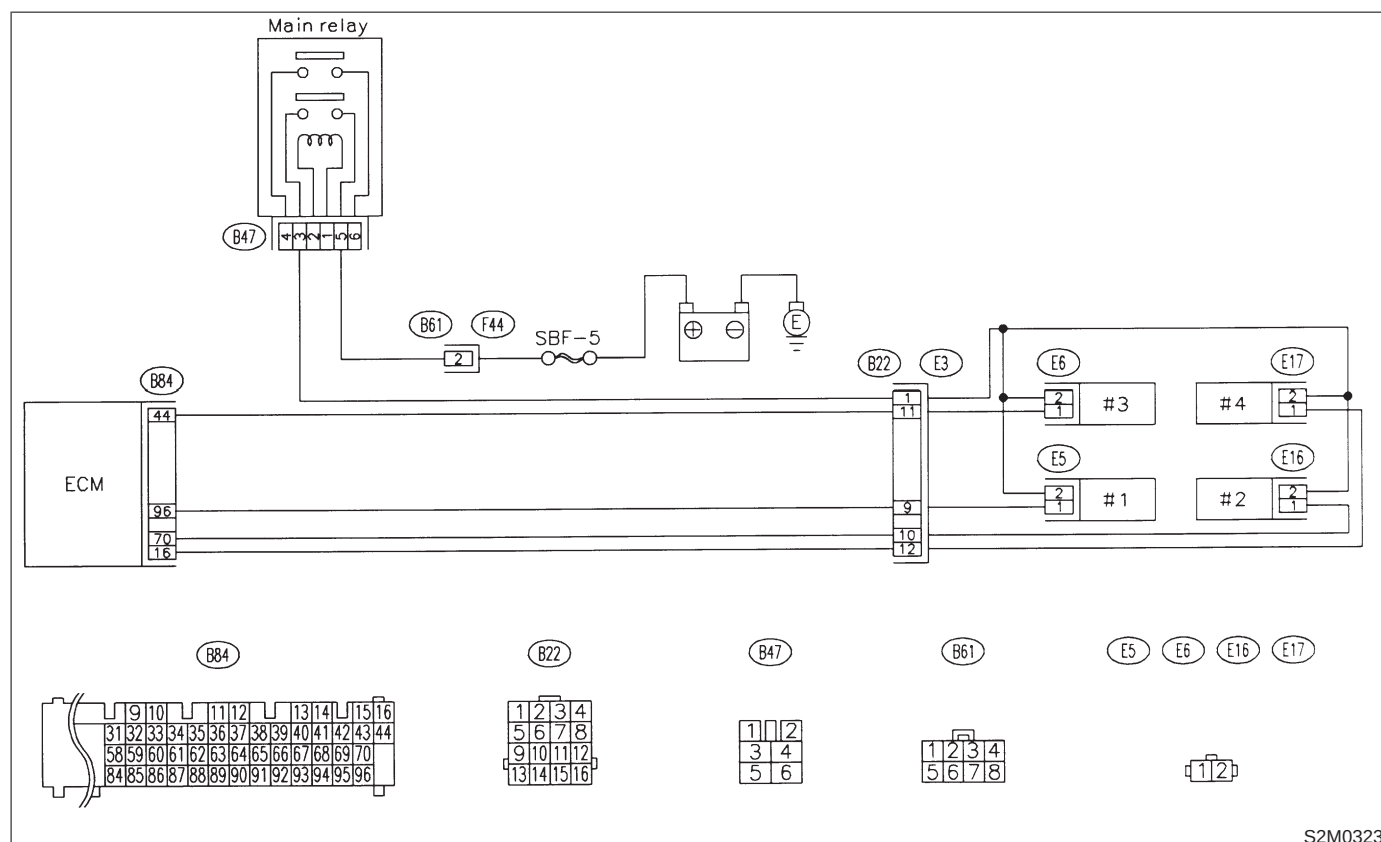
- CHECK** : *Is there poor contact in ECM connector?*
- YES** : Repair poor contact in ECM connector.
- NO** : Check fuel injector circuit. <Ref. to 2-7 [T8F0].>

F: FUEL INJECTOR CIRCUIT**CAUTION:**

- Check or repair only faulty parts.
- After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:

Check fuel injector circuit. <Ref. to 2-7 [T10AA0].> or <Ref. to 2-7 [T10AE0].>

● **WIRING DIAGRAM:**

S2M0323

G: CRANKSHAFT POSITION SENSOR CIRCUIT

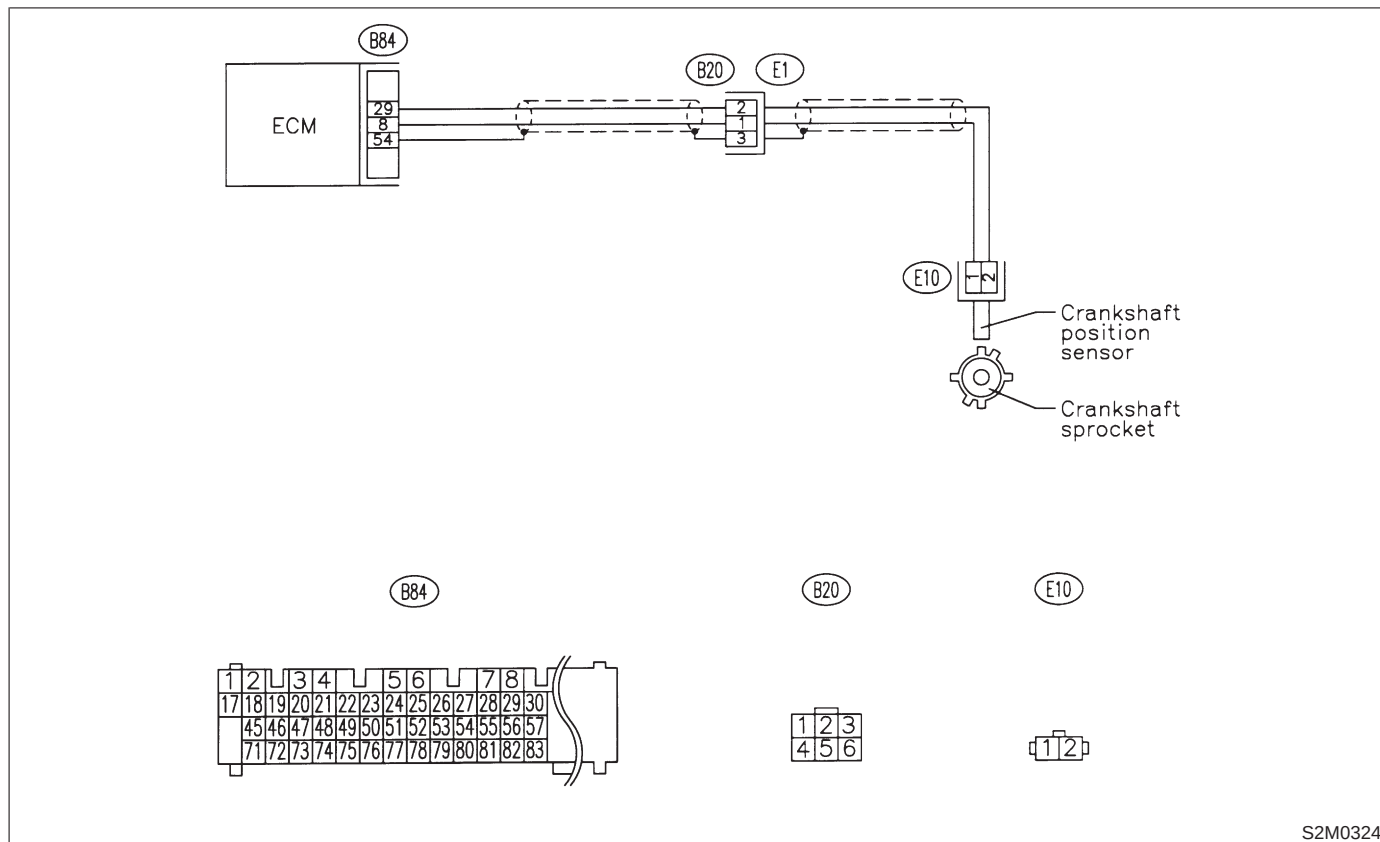
CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:

Check crankshaft position sensor circuit. <Ref. to 2-7 [T10AK0].>

● WIRING DIAGRAM:



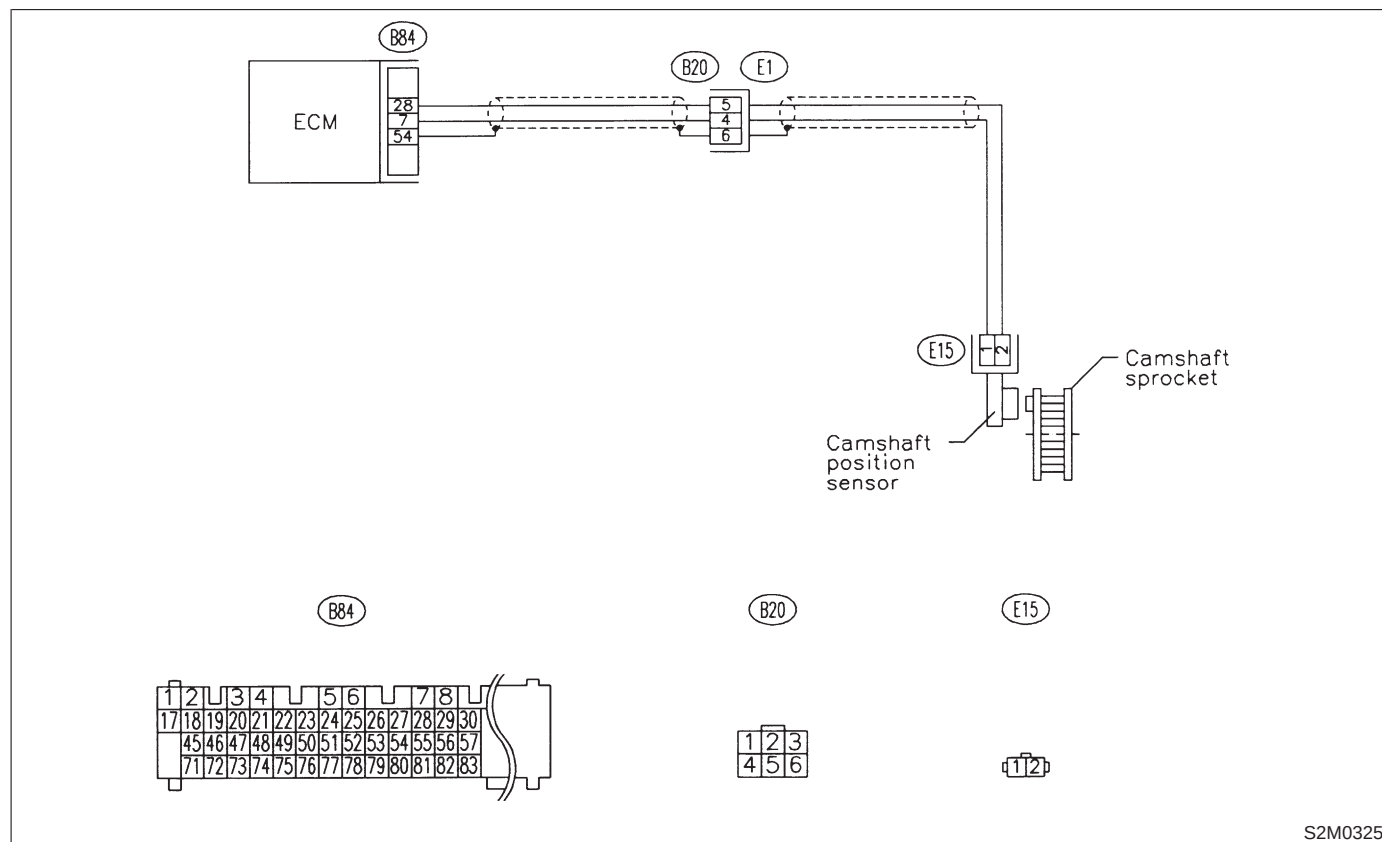
S2M0324

H: CAMSHAFT POSITION SENSOR CIRCUIT**CAUTION:**

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:

Check camshaft position sensor circuit. <Ref. to 2-7 [T10AM0].>

● **WIRING DIAGRAM:**

S2M0325

9. General Diagnostic Table

A: GENERAL DIAGNOSTICS TABLE WITH NON-CONFORMITY SYMPTOM FOR ENGINE

NOTE:

Malfunction of parts other than those listed is also possible. <Ref. to 2-3 [K100].>

Symptom	Problem parts
1. Engine stalls during idling.	1) Idle air control solenoid valve 2) Mass air flow sensor 3) Ignition parts (*1) 4) Engine coolant temperature sensor (*2) 5) Crankshaft position sensor (*3) 6) Camshaft position sensor (*3) 7) EGR valve 8) Fuel injection parts (*4)
2. Rough idling	1) Idle air control solenoid valve 2) Mass air flow sensor 3) Engine coolant temperature sensor (*2) 4) Ignition parts (*1) 5) Air intake system (*5) 6) Fuel injection parts (*4) 7) Throttle position sensor 8) Crankshaft position sensor (*3) 9) Camshaft position sensor (*3) 10) EGR valve 11) Oxygen sensor 12) Fuel pump and fuel pump relay
3. Engine does not return to idle.	1) Idle air control solenoid valve 2) Engine coolant temperature sensor 3) Accelerator cable (*6) 4) Throttle position sensor 5) Mass air flow sensor
4. Poor acceleration	1) Mass air flow sensor 2) Throttle position sensor 3) Fuel injection parts (*4) 4) Fuel pump and fuel pump relay 5) Engine coolant temperature sensor (*2) 6) Crankshaft position sensor (*3) 7) Camshaft position sensor (*3) 8) A/C switch and A/C cut relay 9) Engine torque control signal circuit 10) Ignition parts (*1)
5. Engine stalls or engine sags or hesitates at acceleration.	1) Mass air flow sensor 2) Engine coolant temperature sensor (*2) 3) Crankshaft position sensor (*3) 4) Camshaft position sensor (*3) 5) Purge control solenoid valve 6) EGR valve 7) Fuel injection parts (*4) 8) Throttle position sensor 9) Fuel pump and fuel pump relay
6. Surge	1) Mass air flow sensor 2) Engine coolant temperature sensor (*2) 3) Crankshaft position sensor (*3) 4) Camshaft position sensor (*3) 5) EGR valve 6) Fuel injection parts (*4) 7) Throttle position sensor 8) Fuel pump and fuel pump relay

Symptom	Problem parts
7. Spark knock	1) Mass air flow sensor 2) Engine coolant temperature sensor 3) Knock sensor 4) Fuel injection parts (*4) 5) Fuel pump and fuel pump relay
8. After burning in exhaust system	1) Mass air flow sensor 2) Engine coolant temperature sensor (*2) 3) Fuel injection parts (*4) 4) Fuel pump and fuel pump relay

*1: Check ignitor, ignition coil and spark plug.

*2: Indicate the symptom occurring only in cold temperatures.

*3: Ensure the secure installation.

*4: Check fuel injector, fuel pressure regulator and fuel filter.

*5: Inspect air leak in air intake system.

*6: Adjust accelerator cable.

B: GENERAL DIAGNOSTICS TABLE WITH NON-CONFORMITY SYMPTOM FOR AUTOMATIC TRANSMISSION

NOTE:

Check general diagnostics table with non-conformity symptom for automatic transmission. <Ref. to 3-2 [T1000].>

10. Diagnostic Chart with Trouble Code

A: DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC No.	Item	Index
P0101	Mass air flow sensor circuit range/performance problem (low input)	<Ref. to 2-7 [T10B0].>
P0102	Mass air flow sensor circuit low input	<Ref. to 2-7 [T10C0].>
P0103	Mass air flow sensor circuit high input	<Ref. to 2-7 [T10D0].>
P0106	Pressure sensor circuit range/performance problem	<Ref. to 2-7 [T10E0].>
P0107	Pressure sensor circuit low input	<Ref. to 2-7 [T10F0].>
P0108	Pressure sensor circuit high input	<Ref. to 2-7 [T10G0].>
P0117	Engine coolant temperature sensor circuit low input	<Ref. to 2-7 [T10H0].>
P0118	Engine coolant temperature sensor circuit high input	<Ref. to 2-7 [T10I0].>
P0121	Throttle position sensor circuit range/performance problem (high input)	<Ref. to 2-7 [T10J0].>
P0122	Throttle position sensor circuit low input	<Ref. to 2-7 [T10K0].>
P0123	Throttle position sensor circuit high input	<Ref. to 2-7 [T10L0].>
P0125	Insufficient coolant temperature for closed loop fuel control	<Ref. to 2-7 [T10M0].>
P0130	Front oxygen sensor circuit malfunction	<Ref. to 2-7 [T10N0].>
P0133	Front oxygen sensor circuit slow response	<Ref. to 2-7 [T10O0].>
P0135	Front oxygen sensor heater circuit malfunction	<Ref. to 2-7 [T10P0].>
P0136	Rear oxygen sensor circuit malfunction	<Ref. to 2-7 [T10Q0].>
P0139	Rear oxygen sensor circuit slow response	<Ref. to 2-7 [T10R0].>
P0141	Rear oxygen sensor heater circuit malfunction	<Ref. to 2-7 [T10S0].>
P0170	Fuel trim malfunction	<Ref. to 2-7 [T10T0].>
P0181	Fuel temperature sensor A circuit range/performance problem	<Ref. to 2-7 [T10U0].>
P0182	Fuel temperature sensor A circuit low input	<Ref. to 2-7 [T10V0].>
P0183	Fuel temperature sensor A circuit high input	<Ref. to 2-7 [T10W0].>
P0261	Fuel injector circuit low input - #1	<Ref. to 2-7 [T10X0].>
P0262	Fuel injector circuit high input - #1	<Ref. to 2-7 [T10AB0].>
P0264	Fuel injector circuit low input - #2	<Ref. to 2-7 [T10Y0].>

DTC No.	Item	Index
P0265	Fuel injector circuit high input - #2	<Ref. to 2-7 [T10AC0].>
P0267	Fuel injector circuit low input - #3	<Ref. to 2-7 [T10Z0].>
P0268	Fuel injector circuit high input - #3	<Ref. to 2-7 [T10AD0].>
P0270	Fuel injector circuit low input - #4	<Ref. to 2-7 [T10AA0].>
P0271	Fuel injector circuit high input - #4	<Ref. to 2-7 [T10AE0].>
P0301	Cylinder 1 misfire detected	<Ref. to 2-7 [T10AF0].>
P0302	Cylinder 2 misfire detected	<Ref. to 2-7 [T10AG0].>
P0303	Cylinder 3 misfire detected	<Ref. to 2-7 [T10AH0].>
P0304	Cylinder 4 misfire detected	<Ref. to 2-7 [T10AI0].>
P0325	Knock sensor circuit malfunction	<Ref. to 2-7 [T10AJ0].>
P0335	Crankshaft position sensor circuit malfunction	<Ref. to 2-7 [T10AK0].>
P0336	Crankshaft position sensor circuit range/performance problem	<Ref. to 2-7 [T10AL0].>
P0340	Camshaft position sensor circuit malfunction	<Ref. to 2-7 [T10AM0].>
P0341	Camshaft position sensor circuit range/performance problem	<Ref. to 2-7 [T10AN0].>
P0400	Exhaust gas recirculation flow malfunction	<Ref. to 2-7 [T10AO0].>
P0403	Exhaust gas recirculation circuit low input	<Ref. to 2-7 [T10AP0].>
P0420	Catalyst system efficiency below threshold	<Ref. to 2-7 [T10AQ0].>
P0440	Evaporative emission control system malfunction	<Ref. to 2-7 [T10AR0].>
P0441	Evaporative emission control system incorrect purge flow	<Ref. to 2-7 [T10AS0].>
P0443	Evaporative emission control system purge control valve circuit low input	<Ref. to 2-7 [T10AT0].>
P0446	Evaporative emission control system vent control low input	<Ref. to 2-7 [T10AU0].>
P0451	Evaporative emission control system pressure sensor range/performance problem	<Ref. to 2-7 [T10AV0].>
P0452	Evaporative emission control system pressure sensor low input	<Ref. to 2-7 [T10AW0].>
P0453	Evaporative emission control system pressure sensor high input	<Ref. to 2-7 [T10AX0].>
P0461	Fuel level sensor circuit range/performance problem	<Ref. to 2-7 [T10AY0].>
P0462	Fuel level sensor circuit low input	<Ref. to 2-7 [T10AZ0].>
P0463	Fuel level sensor circuit high input	<Ref. to 2-7 [T10BA0].>

DTC No.	Item	Index
P0480	Cooling fan relay 1 circuit low input	<Ref. to 2-7 [T10BB0].>
P0483	Cooling fan function problem	<Ref. to 2-7 [T10BC0].>
P0500	Vehicle speed sensor malfunction	<Ref. to 2-7 [T10BD0].>
P0505	Idle control system malfunction	<Ref. to 2-7 [T10BE0].>
P0506	Idle control system RPM lower than expected	<Ref. to 2-7 [T10BF0].>
P0507	Idle control system RPM higher than expected	<Ref. to 2-7 [T10BG0].>
P0600	Serial communication link malfunction	<Ref. to 2-7 [T10BH0].>
P0601	Internal control module memory check sum error	<Ref. to 2-7 [T10BI0].>
P0703	Brake switch input malfunction	<Ref. to 2-7 [T10BJ0].>
P0705	Transmission range sensor circuit malfunction	<Ref. to 2-7 [T10BK0].>
P0710	Transmission fluid temperature sensor circuit malfunction	<Ref. to 2-7 [T10BL0].>
P0720	Output speed sensor (vehicle speed sensor 1) circuit malfunction	<Ref. to 2-7 [T10BM0].>
P0725	Engine speed input circuit malfunction	<Ref. to 2-7 [T10BN0].>
P0731	Gear 1 incorrect ratio	<Ref. to 2-7 [T10BO0].>
P0732	Gear 2 incorrect ratio	<Ref. to 2-7 [T10BP0].>
P0733	Gear 3 incorrect ratio	<Ref. to 2-7 [T10BQ0].>
P0734	Gear 4 incorrect ratio	<Ref. to 2-7 [T10BR0].>
P0740	Torque converter clutch system malfunction	<Ref. to 2-7 [T10BS0].>
P0743	Torque converter clutch system electrical	<Ref. to 2-7 [T10BT0].>
P0748	Pressure control solenoid electrical	<Ref. to 2-7 [T10BU0].>
P0753	Shift solenoid A electrical	<Ref. to 2-7 [T10BV0].>
P0758	Shift solenoid B electrical	<Ref. to 2-7 [T10BW0].>
P0760	Shift solenoid C malfunction	<Ref. to 2-7 [T10BX0].>
P0763	Shift solenoid C electrical	<Ref. to 2-7 [T10BY0].>
P1100	Starter switch circuit low input	<Ref. to 2-7 [T10BZ0].>
P1101	Neutral position switch circuit malfunction [MT vehicles]	<Ref. to 2-7 [T10CA0].>
P1101	Neutral position switch circuit high input [AT vehicles]	<Ref. to 2-7 [T10CB0].>

DTC No.	Item	Index
P1102	Pressure sources switching solenoid valve circuit low input	<Ref. to 2-7 [T10CC0].>
P1103	Engine torque control signal circuit malfunction	<Ref. to 2-7 [T10CD0].>
P1120	Starter switch circuit high input	<Ref. to 2-7 [T10CE0].>
P1121	Neutral position switch circuit low input [AT vehicles]	<Ref. to 2-7 [T10CF0].>
P1122	Pressure sources switching solenoid valve circuit high input	<Ref. to 2-7 [T10CG0].>
P1141	Mass air flow sensor circuit range/performance problem (high input)	<Ref. to 2-7 [T10CH0].>
P1142	Throttle position sensor circuit range/performance problem (low input)	<Ref. to 2-7 [T10CI0].>
P1143	Pressure sensor circuit range/performance problem (low input)	<Ref. to 2-7 [T10CJ0].>
P1144	Pressure sensor circuit range/performance problem (high input)	<Ref. to 2-7 [T10CK0].>
P1400	Fuel tank pressure control solenoid valve circuit low input	<Ref. to 2-7 [T10CL0].>
P1420	Fuel tank pressure control solenoid valve circuit high input	<Ref. to 2-7 [T10CM0].>
P1421	Exhaust gas recirculation circuit high input	<Ref. to 2-7 [T10CN0].>
P1422	Evaporative emission control system purge control valve circuit high input	<Ref. to 2-7 [T10CO0].>
P1423	Evaporative emission control system vent control high input	<Ref. to 2-7 [T10CP0].>
P1440	Fuel tank pressure control system function problem (low input)	<Ref. to 2-7 [T10CQ0].>
P1441	Fuel tank pressure control system function problem (high input)	<Ref. to 2-7 [T10CR0].>
P1442	Fuel level sensor circuit range/performance problem 2	<Ref. to 2-7 [T10CS0].>
P1443	Evaporative emission control system vent control function problem	<Ref. to 2-7 [T10DC0].>
P1507	Idle control system malfunction (fail-safe)	<Ref. to 2-7 [T10CT0].>
P1520	Cooling fan relay 1 circuit high input	<Ref. to 2-7 [T10CU0].>
P1540	Vehicle speed sensor malfunction 2	<Ref. to 2-7 [T10CV0].>
P1700	Throttle position sensor circuit malfunction for automatic transmission	<Ref. to 2-7 [T10CW0].>
P1701	Cruise control set signal circuit malfunction for automatic transmission	<Ref. to 2-7 [T10CX0].>
P1702	Automatic transmission diagnosis input signal circuit low input	<Ref. to 2-7 [T10CY0].>
P1722	Automatic transmission diagnosis input signal circuit high input	<Ref. to 2-7 [T10CZ0].>
P1742	Automatic transmission diagnosis input signal circuit malfunction	<Ref. to 2-7 [T10DA0].>

B: DTC P0101 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

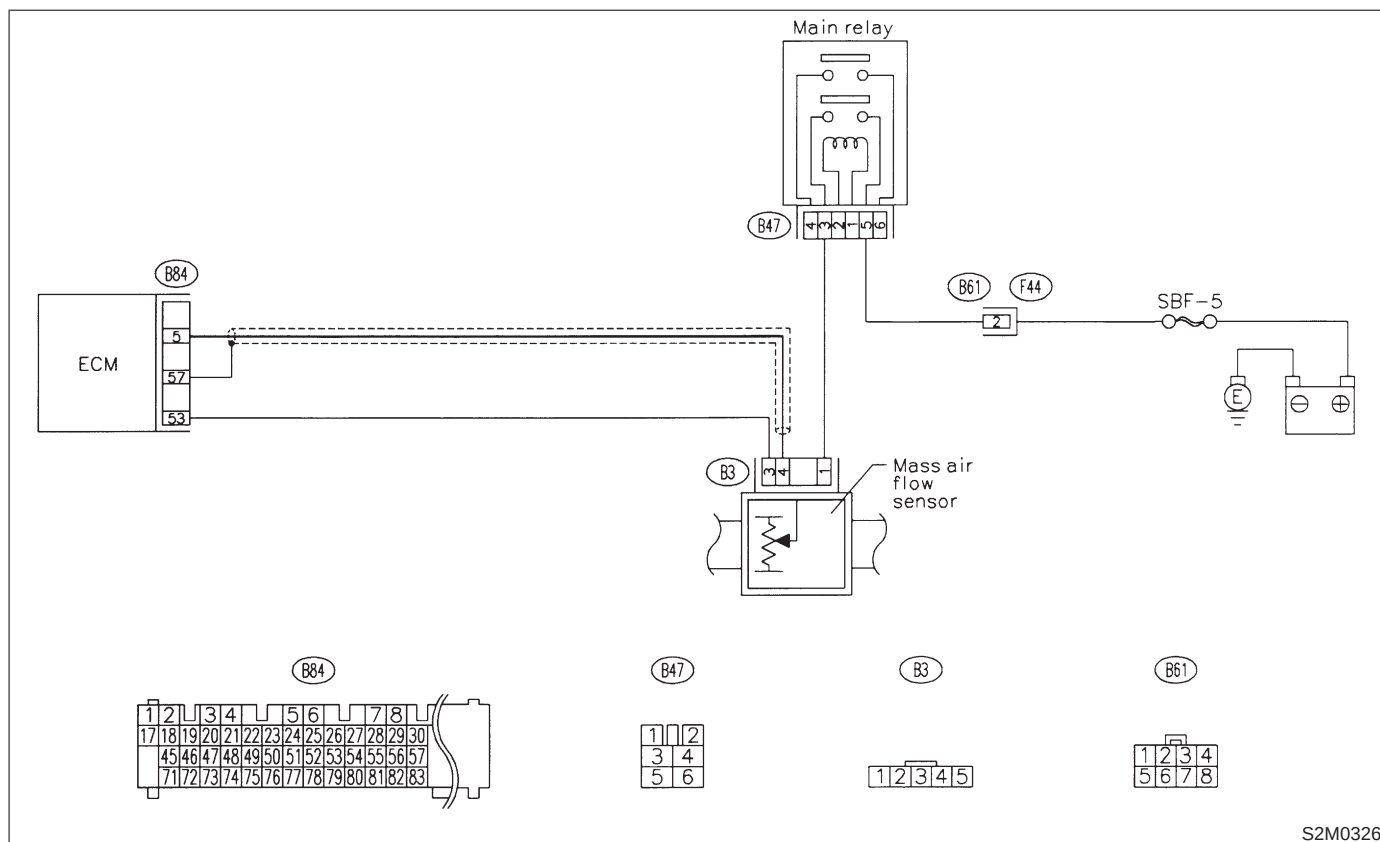
• TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



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10B1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0102 or P0103?

YES : Inspect DTC P0102 or P0103 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0101.

NO : Replace mass air flow sensor.

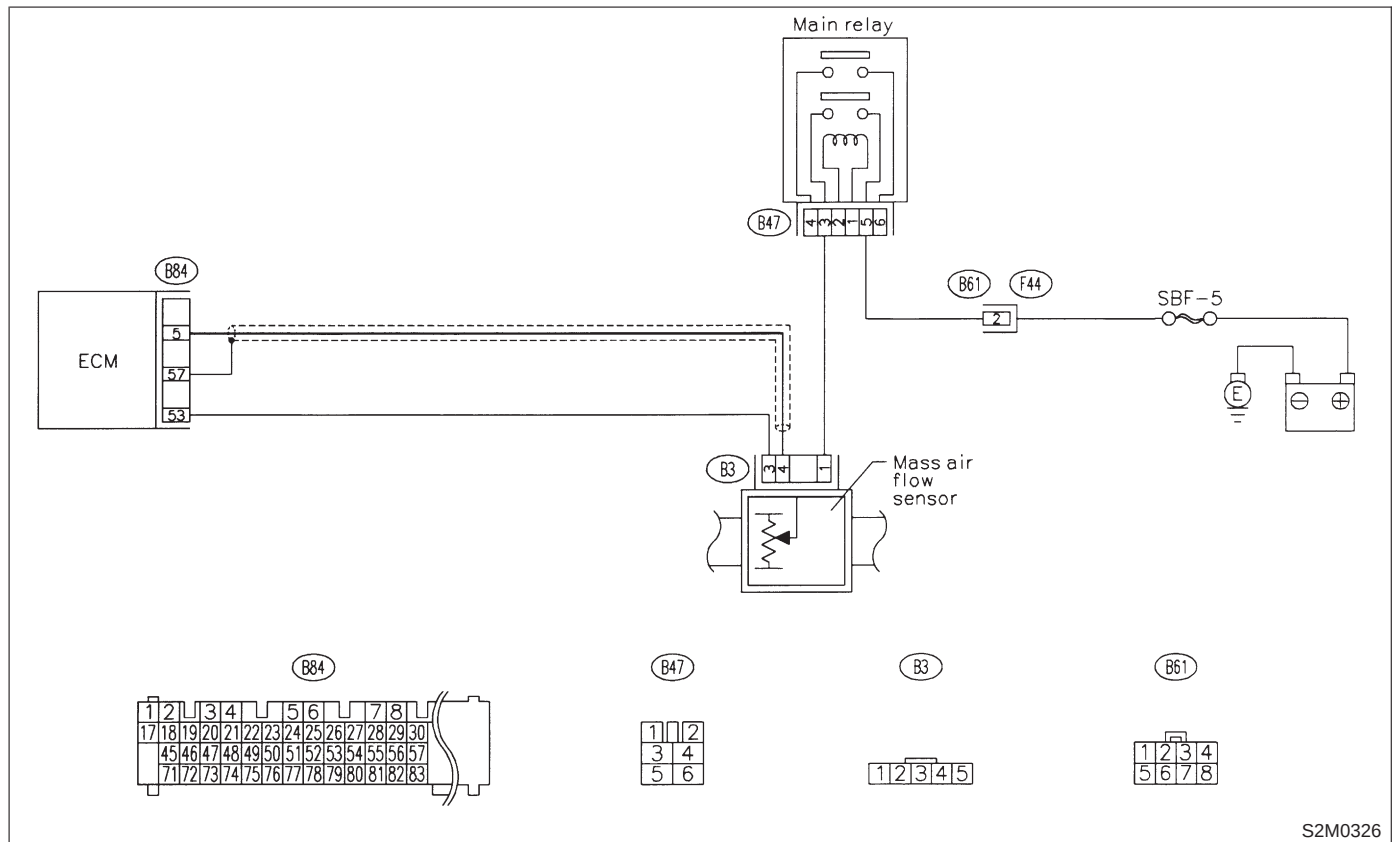
MEMO:

C: DTC P0102 — MASS AIR FLOW SENSOR CIRCUIT LOW INPUT —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

CAUTION:

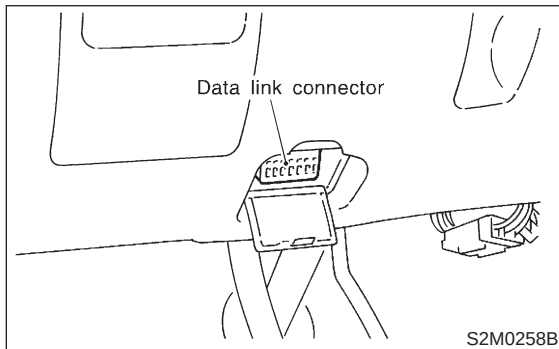
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0326

10C1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of mass air flow sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedure, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value equal to or more than 1.3 g/sec (0.172 lb/min) or 0.3 V and equal to or less than 250 g/sec (33 lb/min) or 5.0 V?**

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor.

NOTE:

In this case, repair the following:

- Open or ground short circuit in harness between mass air flow sensor and ECM connector
- Poor contact in mass air flow sensor or ECM connector

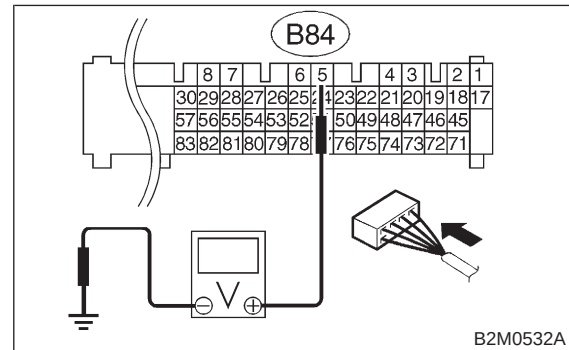
NO : Go to step **10C2**.

10C2 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground while engine is idling.

Connector & terminal

(B84) No. 5 (+) — Chassis ground (-):



CHECK : **Is the voltage less than 0.3 V?**

YES : Go to step **10C4**.

NO : Go to step **10C3**.

10C3 : CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).

Measure voltage between ECM connector and chassis ground while engine is idling.

CHECK : **Does the voltage change more than 0.3 V by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?**

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:

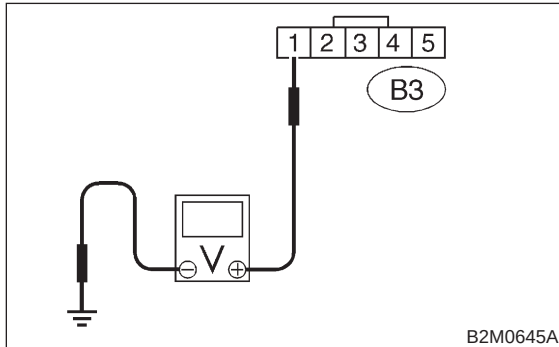
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10C4 : CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from mass air flow sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between mass air flow sensor connector and engine ground.

Connector & terminal

(B3) No. 1 (+) — Engine ground (-):



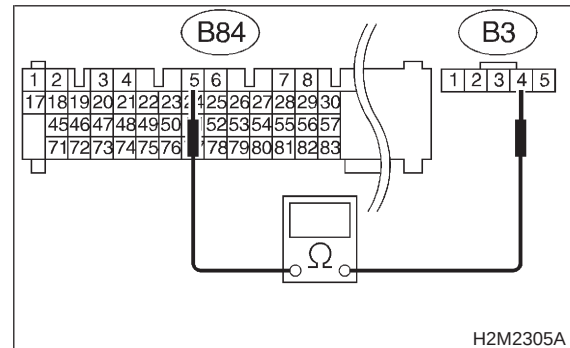
- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 10C5.
- NO** : Repair open circuit in harness between main relay and mass air flow sensor connector.

10C5 : CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and mass air flow sensor connector.

Connector & terminal

(B84) No. 5 — (B3) No. 4:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10C6.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

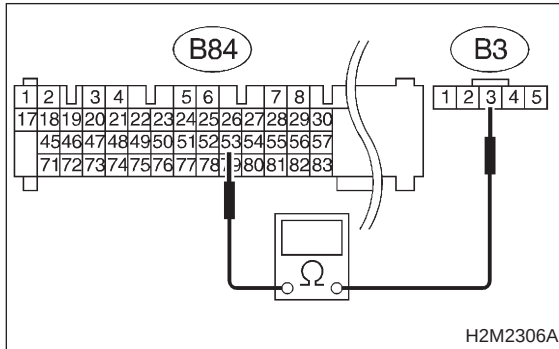
- Open circuit in harness between ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector

10C6 : CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

Measure resistance of harness between ECM and mass air flow sensor connector.

Connector & terminal

(B84) No. 53 — (B3) No. 3:



- CHECK** : **Is the resistance less than 1 Ω?**
YES : Go to step **10C7**.
NO : Repair harness and connector.

NOTE:

In this case, repair the following:

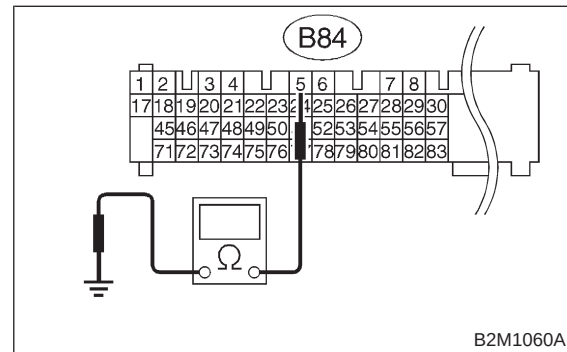
- Open circuit in harness between ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector

10C7 : CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B84) No. 5 — Chassis ground:



- CHECK** : **Is the resistance more than 1 MΩ?**
YES : Replace mass air flow sensor.
NO : Repair ground short circuit in harness between ECM and mass air flow sensor connector.

D: DTC P0103 — MASS AIR FLOW SENSOR CIRCUIT HIGH INPUT —● **DTC DETECTING CONDITION:**

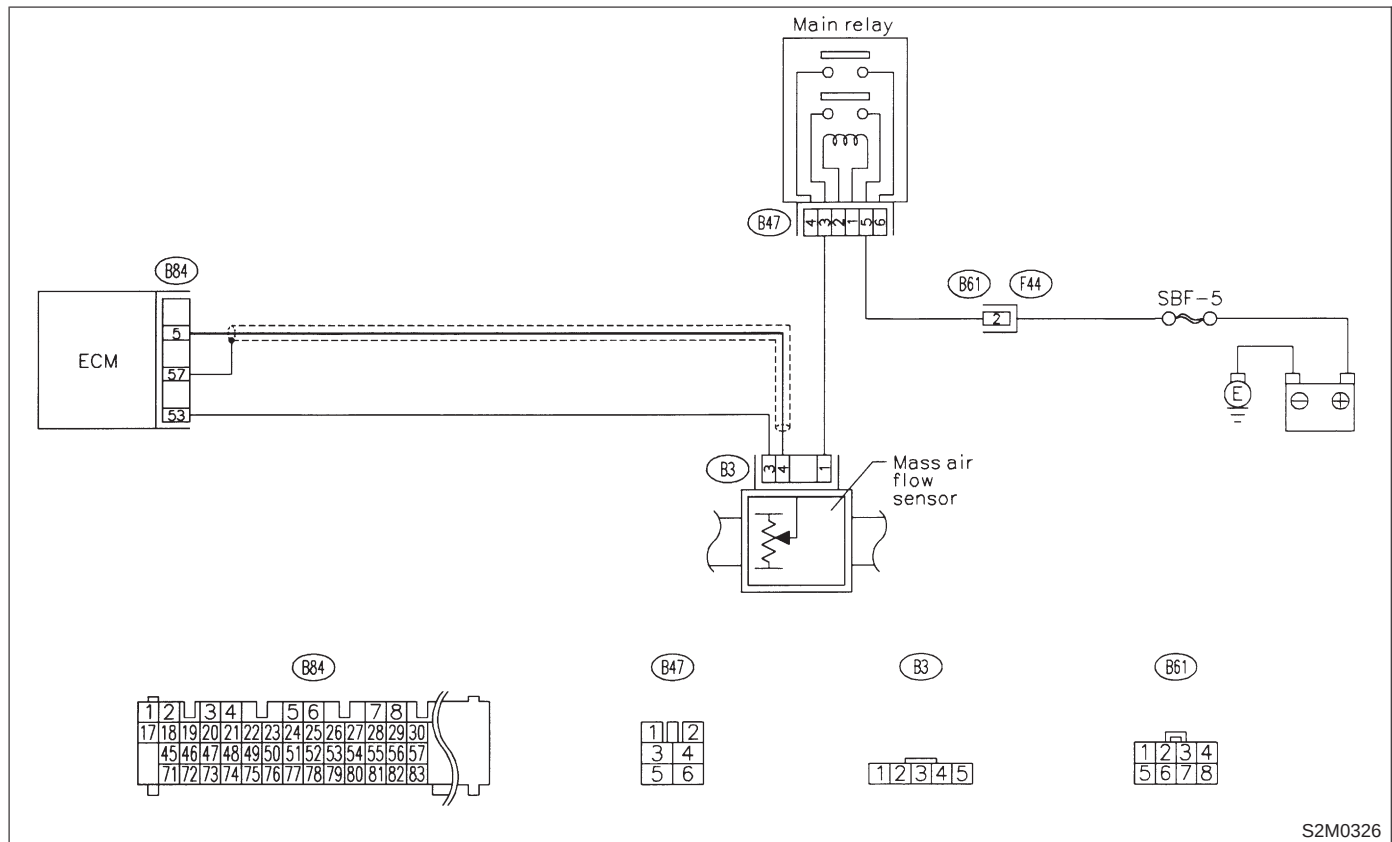
- Immediately at fault recognition

● **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

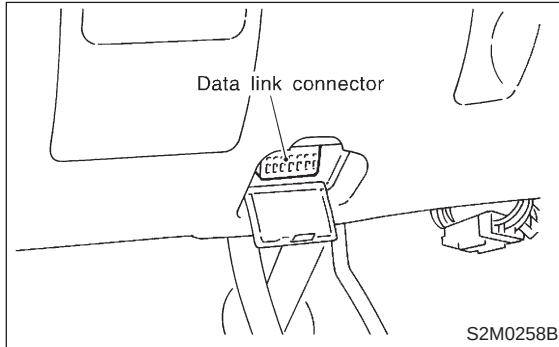
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0326

10D1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of mass air flow sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:
● Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the value equal to or more than 1.3 g/sec (0.172 lb/min) or 0.3 V and equal to or less than 250 g/sec (33 lb/min) or 5.0 V?*

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time.

NO : Go to step **10D2**.

10D2 : CHECK HARNESS BETWEEN ECM AND MASS AIR FLOW SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
- 2) Disconnect connector from mass air flow sensor.
- 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 4) Read data of mass air flow sensor signal using Subaru select monitor or OBD-II general scan tool.

NOTE:
● Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the value more than 250 g/sec (33 lb/min) or 5 V in function mode F06?*

YES : Repair battery short circuit in harness between mass air flow sensor and ECM connector. After repair, replace ECM.

NO : Replace mass air flow sensor.

E: DTC P0106 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

● DTC DETECTING CONDITION:

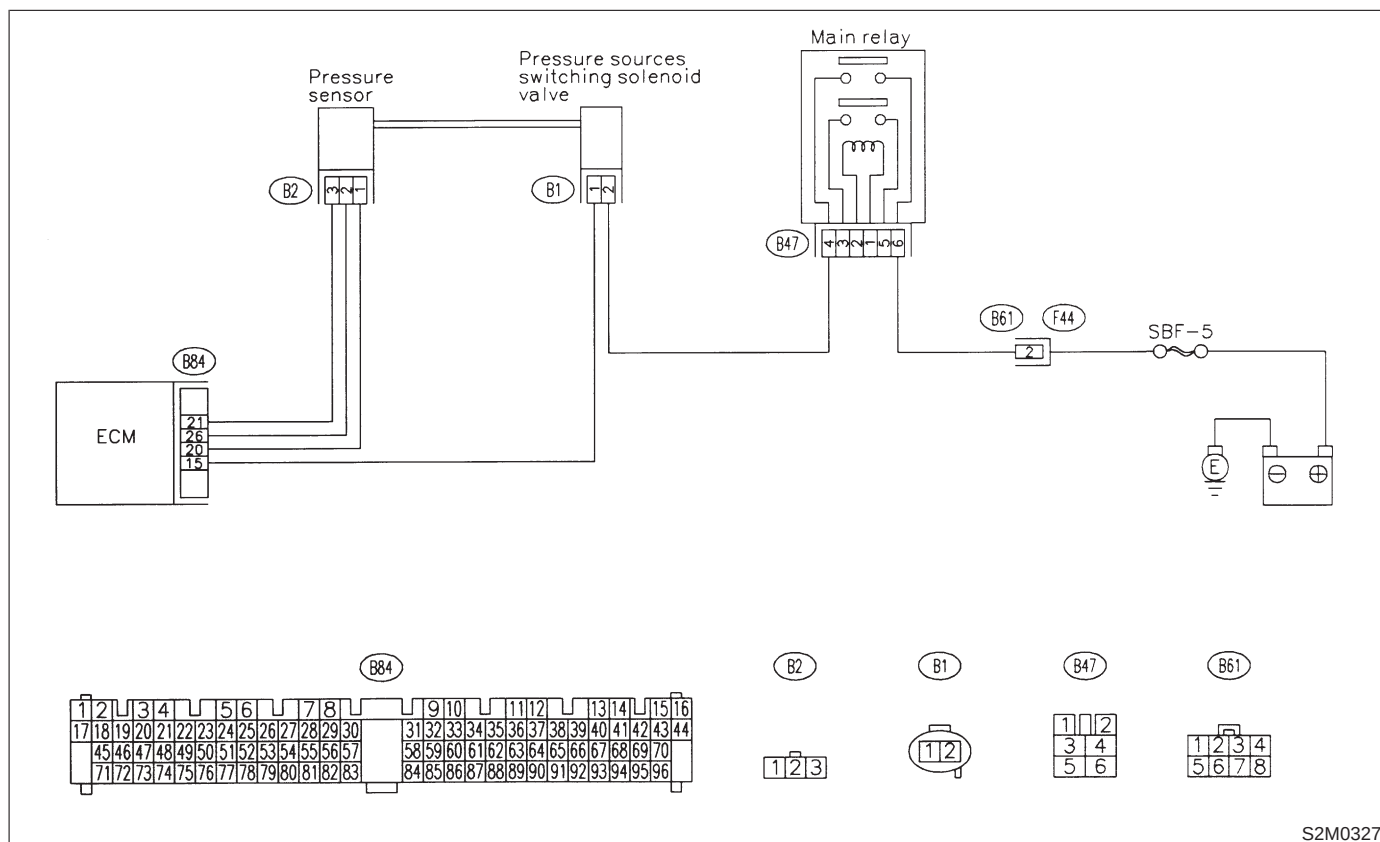
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



S2M0327

10E1 : CHECK ANY OTHER DTC ON DISPLAY.

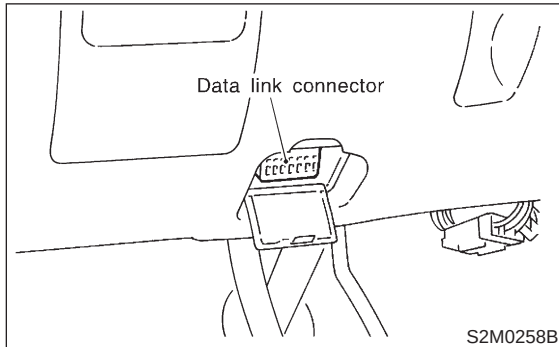
NOTE:

In this case, it is not necessary to inspect DTC P0106.

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0107, P0108, P1102 OR P1122?
- YES** : Inspect DTC P0107, P0108, P1102 OR P1122 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Go to step 10E2.

10E2 : CHECK DATA FOR CONTROL.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch ON and Subaru Select Monitor or the OBD-II general scan tool switch ON.
- 4) Start engine.
- 5) Read data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the value more than 85 kPa (638 mmHg, 25.12 inHg)?*

YES : Go to step 10E5.

NO : Go to step 10E3.

10E3 : CHECK DATA FOR CONTROL.

Read data of atmospheric absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

CHECK : *Is the value less than 32 kPa (240 mmHg, 9.45 inHg)?*

YES : Go to step 10E6.

NO : Go to step 10E4.

10E4 : CHECK DATA FOR CONTROL.

Read data of atmospheric absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

CHECK : *Is the value more than 133 kPa (998 mmHg, 39.29 inHg)?*

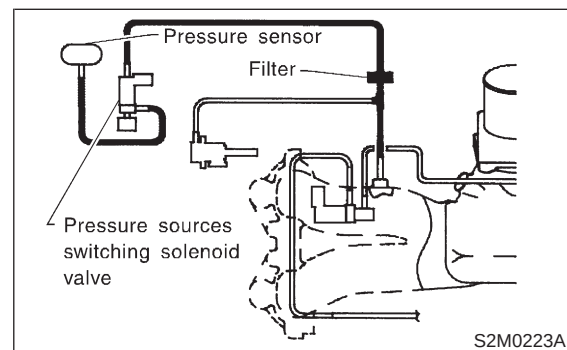
YES : Replace pressure sensor.

NO : Repair poor contact in pressure sensor connector, pressure sources switching solenoid valve connector, and ECM connector.

10E5 : CHECK VACUUM HOSES.

Check the following items.

- Disconnection of the vacuum hose from pressure sources switching solenoid valve to intake manifold
- Holes in the vacuum hose between pressure sources switching solenoid valve to intake manifold
- Clogging of the vacuum hose between pressure sources switching solenoid valve to intake manifold
- Disconnection of the vacuum hose from pressure sensor to pressure sources switching solenoid valve
- Holes in the vacuum hose between pressure sensor and pressure sources switching solenoid valve
- Clogging of the vacuum hose between pressure sensor and pressure sources switching solenoid valve
- Clogging of the filter



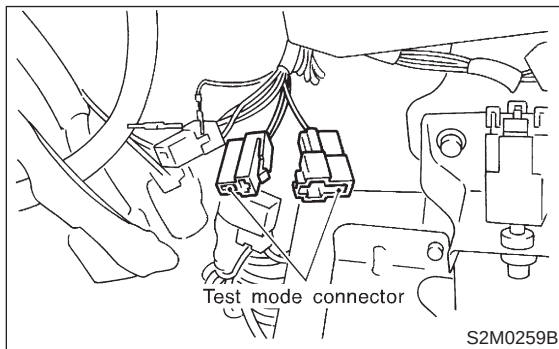
CHECK : *Is there a fault in vacuum hose?*

YES : Repair or replace hoses or filter.

NO : Go to step 10E6.

**10E6 : CHECK PRESSURE SOURCES
SWITCHING SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector.



- 3) Turn ignition switch to ON.

NOTE:

Pressure sources switching solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

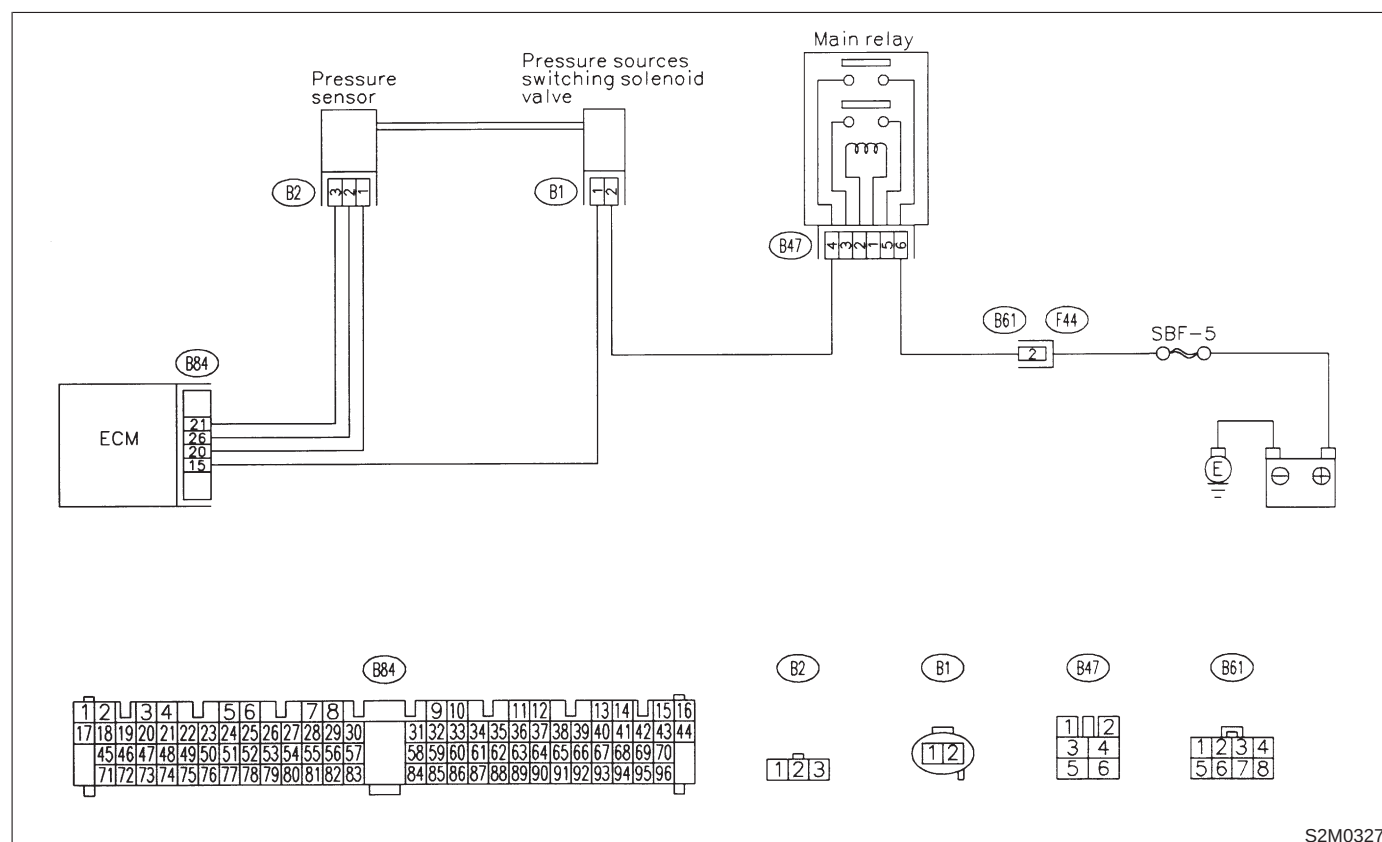
- CHECK** : ***Does pressure sources switching solenoid valve produce operating sound? (ON ⇔ OFF each 1.5 sec.)***
- YES** : Replace pressure sensor.
- NO** : Replace pressure sources switching solenoid valve.

F: DTC P0107 — PRESSURE SENSOR CIRCUIT LOW INPUT —● **DTC DETECTING CONDITION:**

- Immediately at fault recognition

CAUTION:

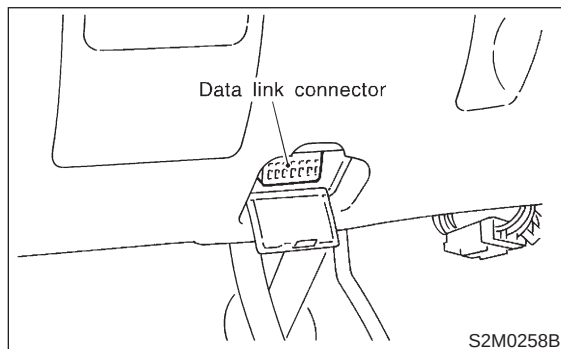
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0327

10F1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

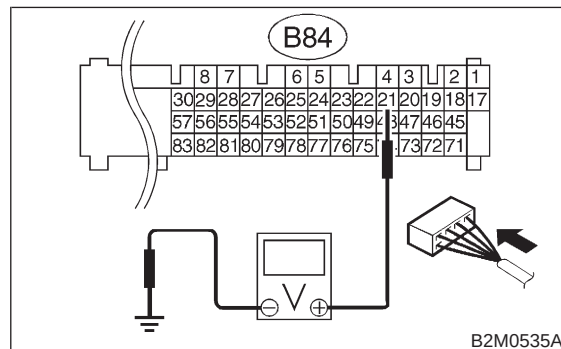
- CHECK** : *Is the value less than 0 kPa (0 mmHg, 0 inHg)?*
- YES** : Go to step **10F2**.
- NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time

10F2 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



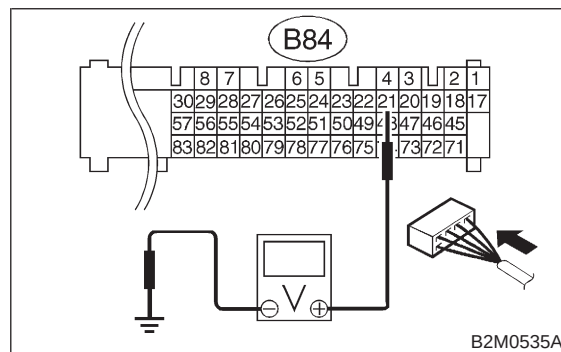
- CHECK** : *Is the voltage more than 4.5 V?*
- YES** : Go to step **10F4**.
- NO** : Go to step **10F3**.

10F3 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



- CHECK** : *Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?*
- YES** : Repair poor contact in ECM connector.
- NO** : Contact with SOA service.

NOTE:

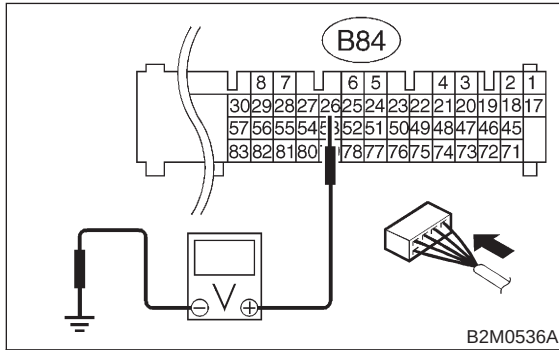
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10F4 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 26 (+) — Chassis ground (-):



- CHECK** : *Is the voltage less than 0.2 V?*
YES : Go to step 10F6.
NO : Go to step 10F5.

10F5 : CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).

Read data of atmospheric absolute pressure signal using Subaru Select Monitor.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

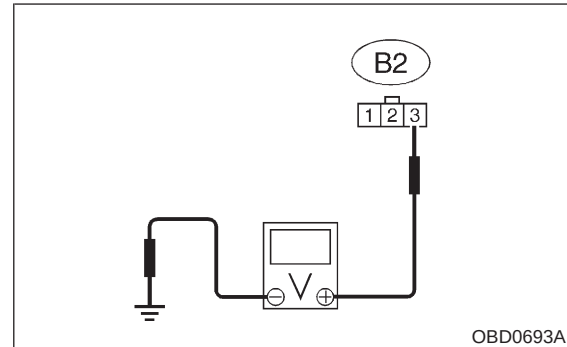
- CHECK** : *Does the value change more than 0 kPa (0 mmHg, 0 inHg) by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?*
YES : Repair poor contact in ECM connector.
NO : Go to step 10F6.

10F6 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from pressure sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between pressure sensor connector and engine ground.

Connector & terminal

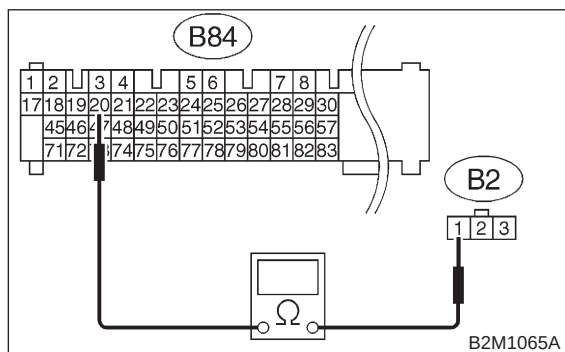
(B2) No. 3 (+) — Engine ground (-):



- CHECK** : *Is the voltage more than 4.5 V?*
YES : Go to step 10F7.
NO : Repair open circuit in harness between ECM and pressure sensor connector.

10F7 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

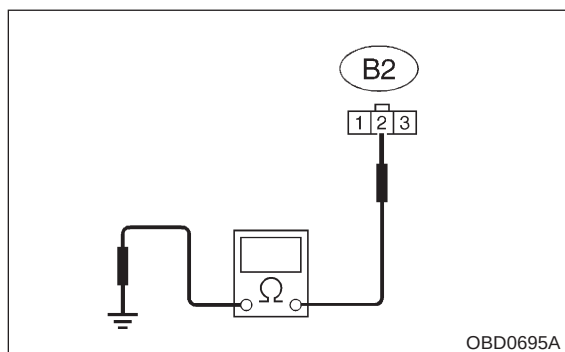
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and pressure sensor connector.

Connector & terminal
(B84) No. 20 — (B2) No. 1:


- CHECK** : *Is the resistance less than 1 Ω ?*
- YES** : Go to step **10F8**.
- NO** : Repair open circuit in harness between ECM and pressure sensor connector.

10F8 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

Measure resistance of harness between pressure sensor connector and engine ground.

Connector & terminal
(B2) No. 2 — Engine ground:


- CHECK** : *Is the resistance more than 500 $k\Omega$?*
- YES** : Go to step **10F9**.
- NO** : Repair ground short circuit in harness between ECM and pressure sensor connector.

10F9 : CHECK POOR CONTACT.

Check poor contact in pressure sensor connector.
<Ref. to FOREWORD [T3C1].>

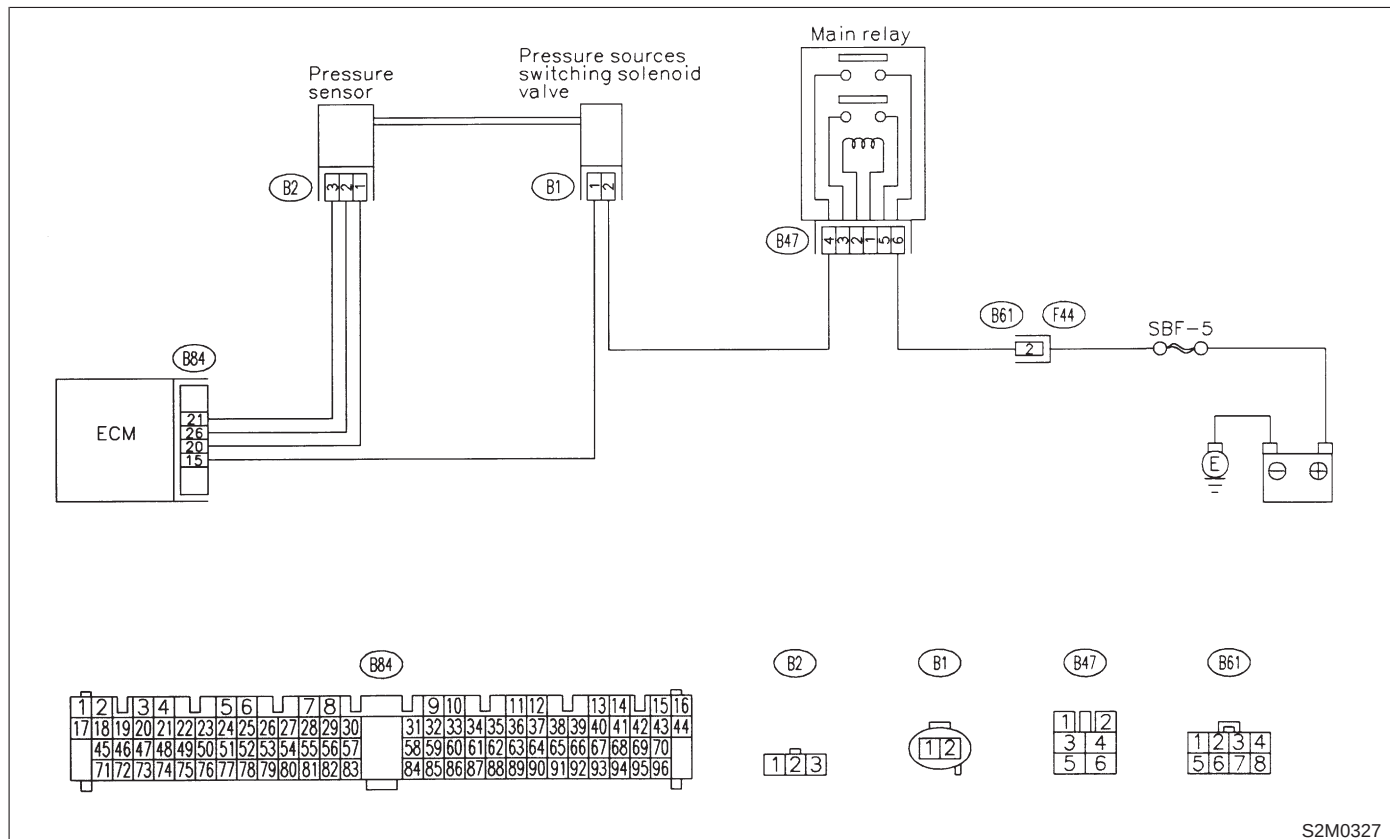
- CHECK** : *Is there poor contact in pressure sensor connector?*
- YES** : Repair poor contact in pressure sensor connector.
- NO** : Replace pressure sensor.

G: DTC P0108 — PRESSURE SENSOR CIRCUIT HIGH INPUT —**• DTC DETECTING CONDITION:**

- Immediately at fault recognition

CAUTION:

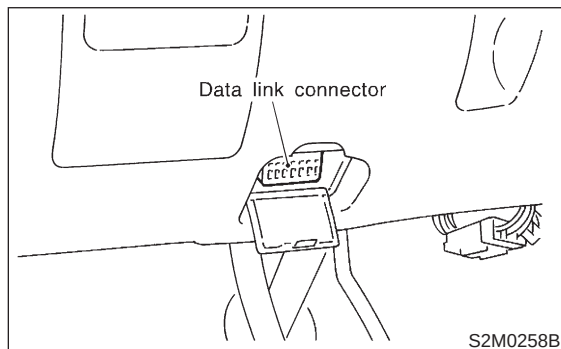
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0327

10G1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read the data of intake manifold absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value more than 140 kPa (1,050 mmHg, 41.34 inHg)?**

YES : Go to step **10G10**.

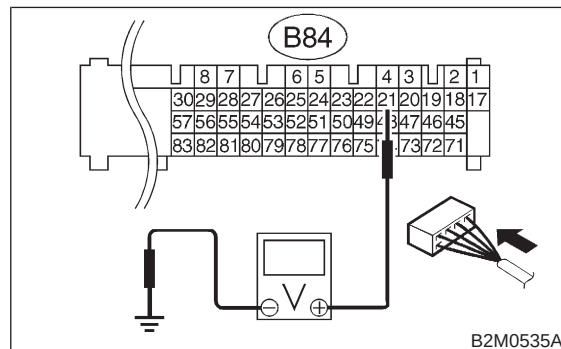
NO : Go to step **10G2**.

10G2 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



CHECK : **Is the voltage more than 4.5 V?**

YES : Go to step **10G4**.

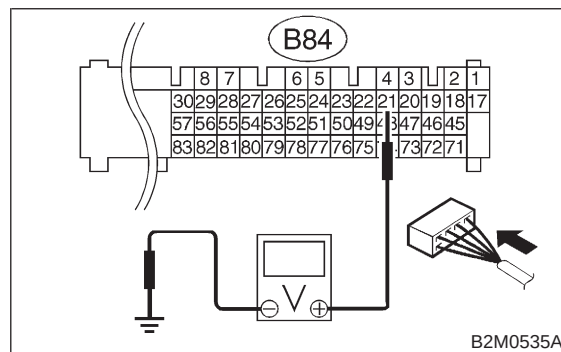
NO : Go to step **10G3**.

10G3 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



CHECK : **Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?**

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:

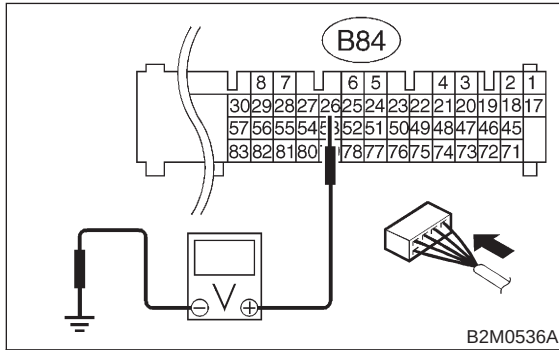
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10G4 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 26 (+) — Chassis ground (-):



CHECK : *Is the voltage less than 0.2 V?*

YES : Go to step **10G6**.

NO : Go to step **10G5**.

10G5 : CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).

Read data of atmospheric absolute pressure signal using Subaru Select Monitor.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

CHECK : *Does the value change more than 0 kPa (0 mmHg, 0 inHg) by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?*

YES : Repair poor contact in ECM connector.

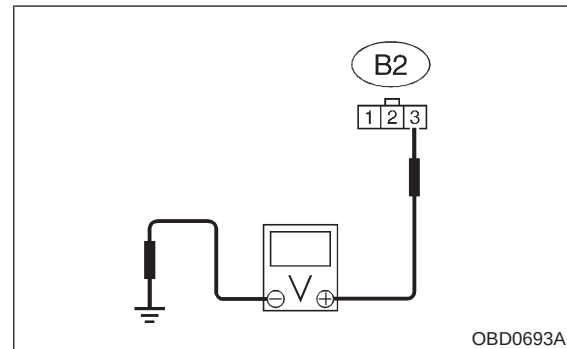
NO : Go to step **10G6**.

10G6 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from pressure sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between pressure sensor connector and engine ground.

Connector & terminal

(B2) No. 3 (+) — Engine ground (-):



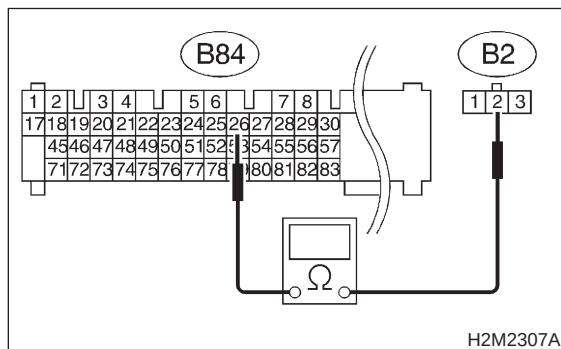
CHECK : *Is the voltage more than 4.5 V?*

YES : Go to step **10G7**.

NO : Repair open circuit in harness between ECM and pressure sensor connector.

10G7 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

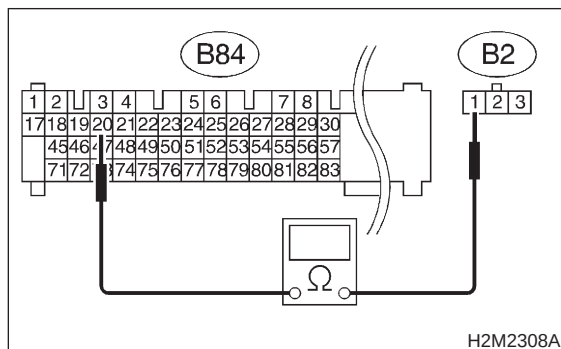
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and pressure sensor connector.

Connector & terminal
(B84) No. 26 — (B2) No. 2:


- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Go to step **10G8**.
- NO** : Repair open circuit in harness between ECM and pressure sensor connector.

10G8 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

Measure resistance of harness between ECM and pressure sensor connector.

Connector & terminal
(B84) No. 20 — (B2) No. 1:


- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Go to step **10G9**.
- NO** : Repair open circuit in harness between ECM and pressure sensor connector.

10G9 : CHECK POOR CONTACT.

Check poor contact in pressure sensor connector.
<Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in pressure sensor connector?**
- YES** : Repair poor contact in pressure sensor connector.
- NO** : Replace pressure sensor.

10G10 : CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
- 2) Disconnect connector from pressure sensor.
- 3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 4) Read data of intake manifold absolute pressure signal using Subaru select monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

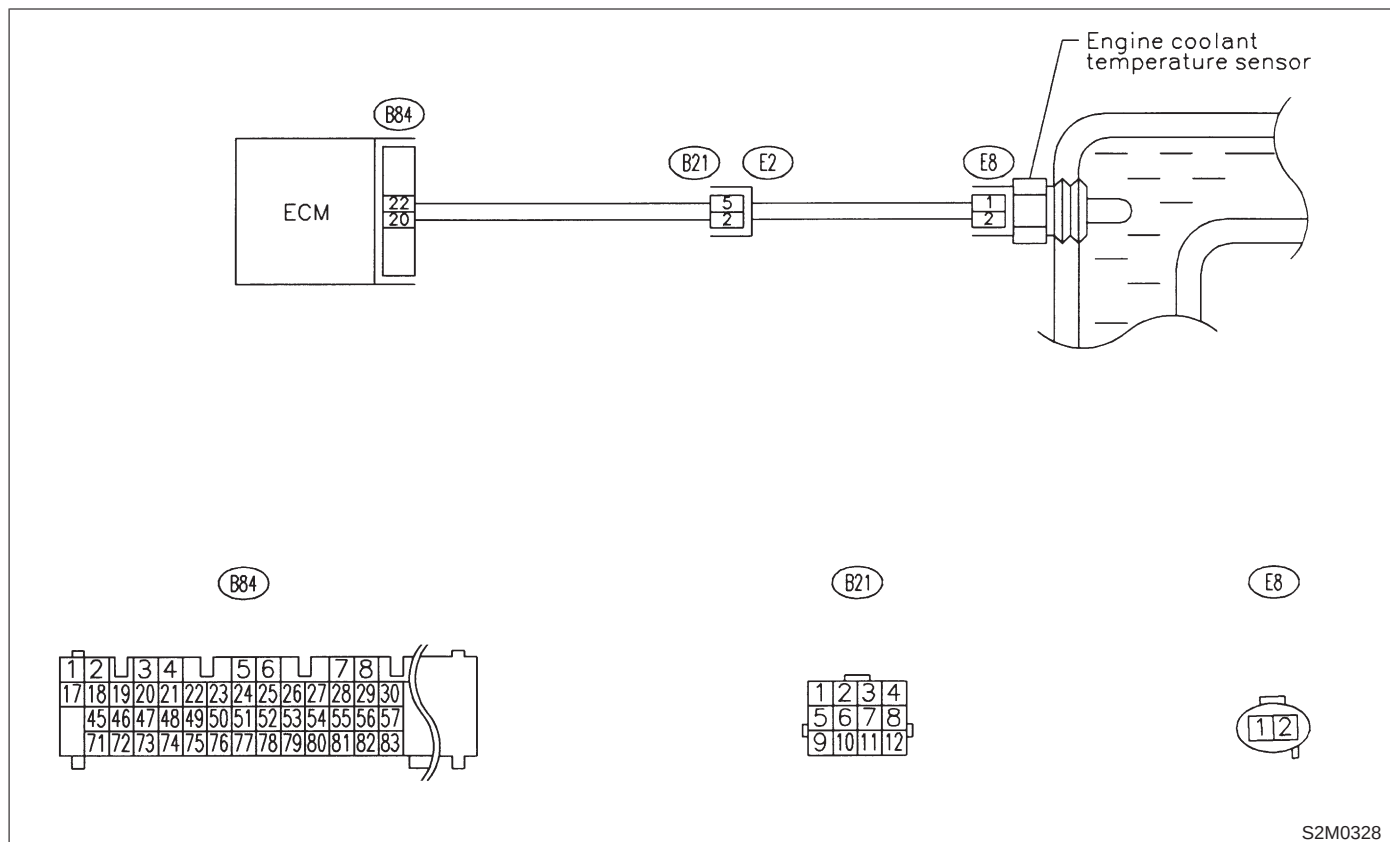
- CHECK** : **Is the value more than 140 kPa (1,050 mmHg, 41.34 inHg)?**
- YES** : Repair battery short circuit in harness between ECM and pressure sensor connector.
- NO** : Replace pressure sensor.

H: DTC P0117 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW INPUT —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Hard to start
 - Erroneous idling
 - Poor driving performance

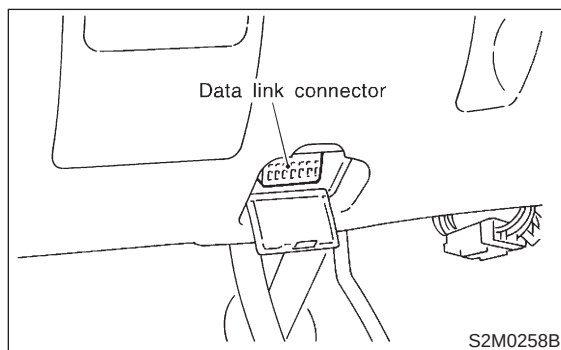
CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

10H1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the value greater than 150°C (300°F)?*

YES : Go to step 10H2.

NO : Repair poor contact.

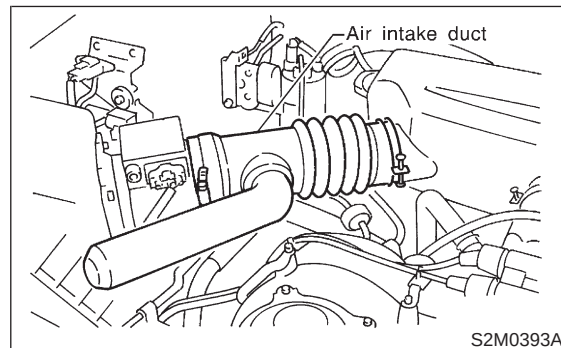
NOTE:

In this case, repair the following:

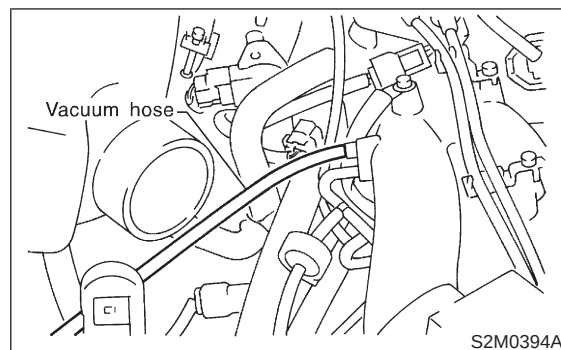
- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B21)

10H2 : CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

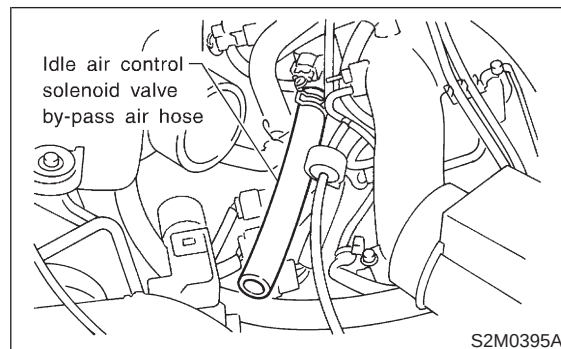
- 1) Turn ignition switch to OFF.
- 2) Remove air intake duct.



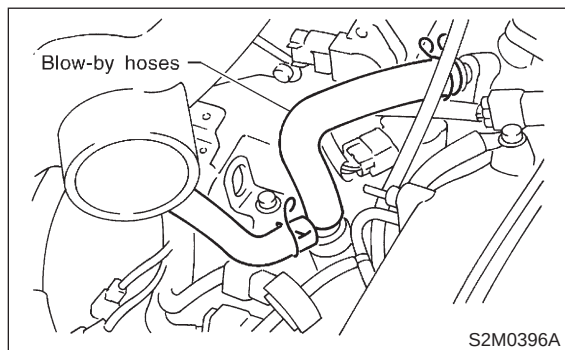
- 3) Remove vacuum hose from intake manifold.



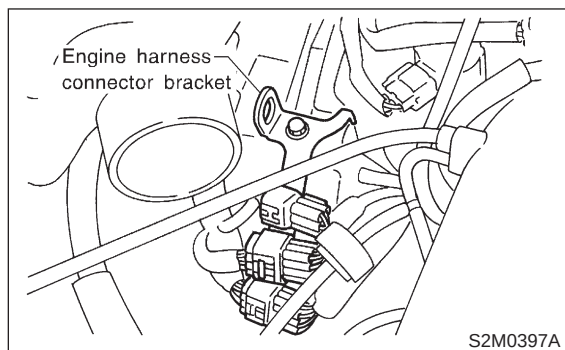
- 4) Remove idle air control solenoid valve by-pass air hose.



5) Remove blow-by hoses.



6) Remove engine harness connector bracket from cylinder block.



7) Disconnect connector from engine coolant temperature sensor.

8) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.

9) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value less than -40°C (-40°F)?**

YES : Replace engine coolant temperature sensor.

NO : Repair ground short circuit in harness between engine coolant temperature sensor and ECM connector.

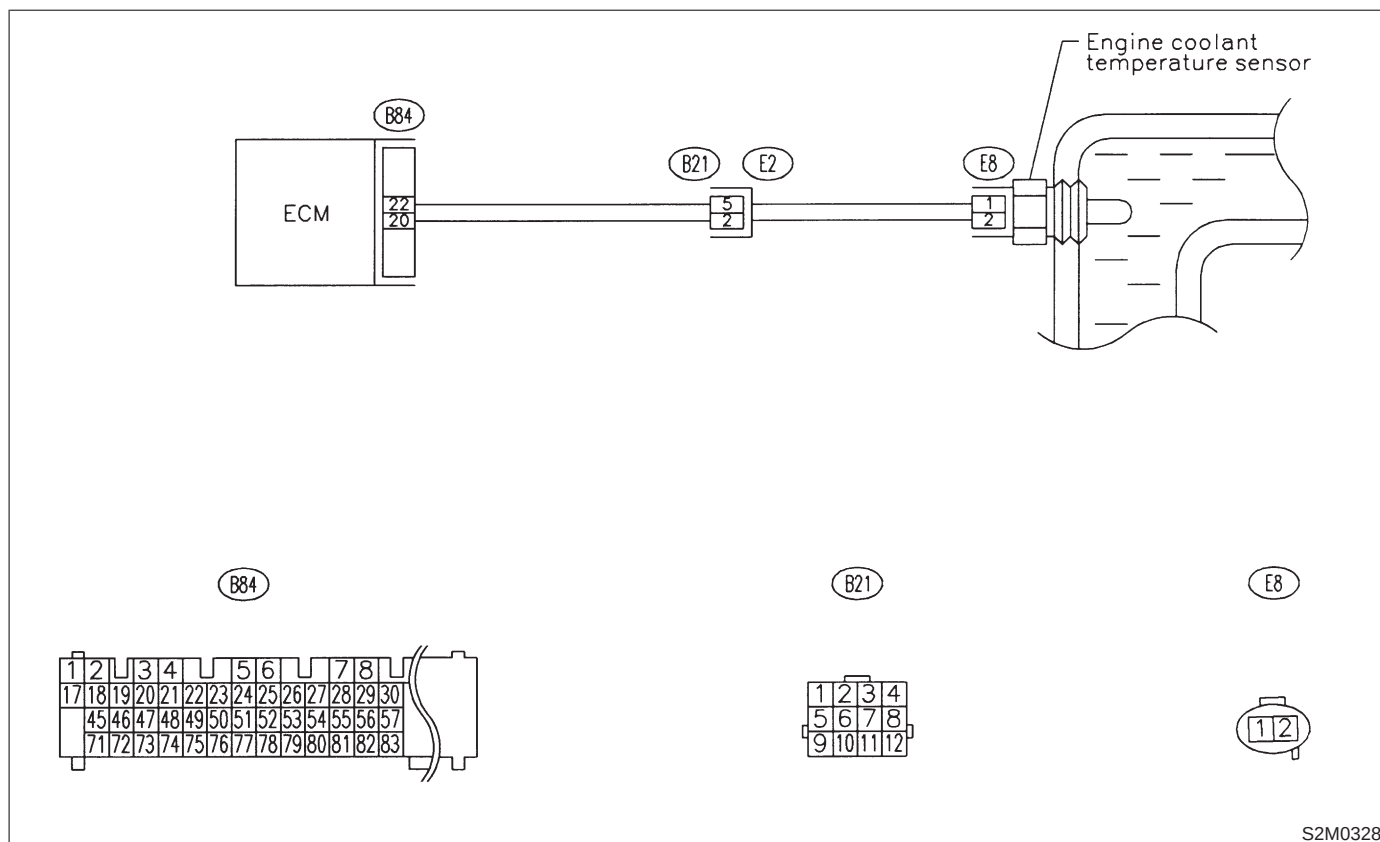
I: DTC P0118 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH INPUT —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Hard to start
 - Erroneous idling
 - Poor driving performance

CAUTION:

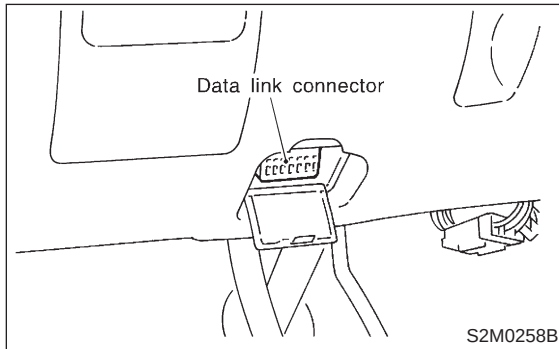
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



10I1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

- CHECK** : **Is the value less than -40°C (-40°F)?**
- YES** : Go to step **10I2**.
- NO** : Repair poor contact.

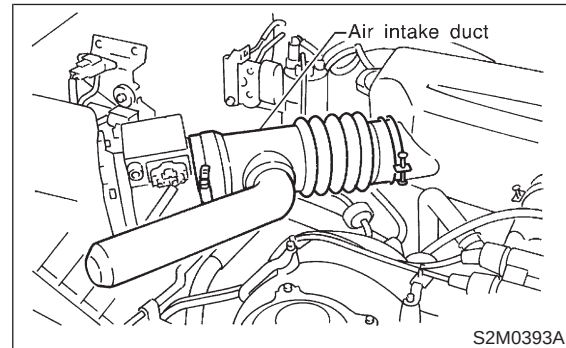
NOTE:

In this case, repair the following:

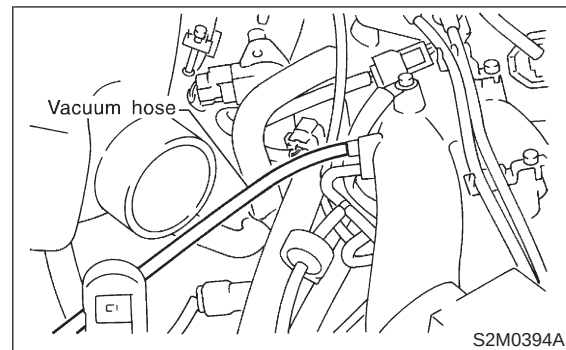
- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B21)

10I2 : CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

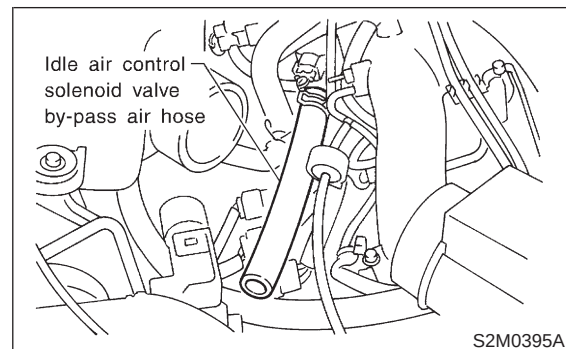
- 1) Turn ignition switch to OFF.
- 2) Remove air intake duct.



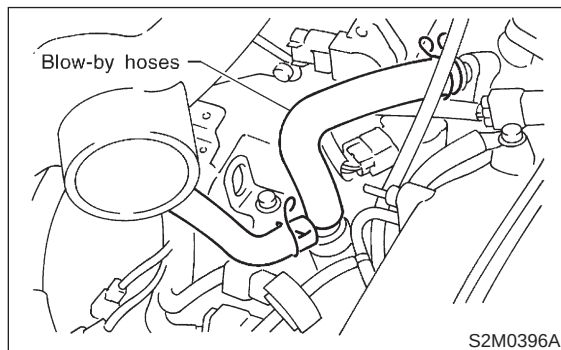
- 3) Remove vacuum hose from intake manifold.



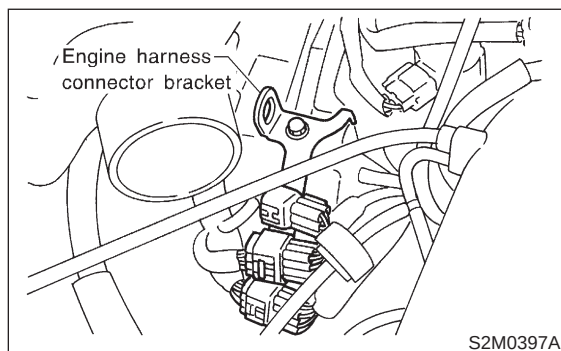
- 4) Remove idle air control solenoid valve by-pass air hose.



5) Remove blow-by hoses.



6) Remove engine harness connector bracket from cylinder block.

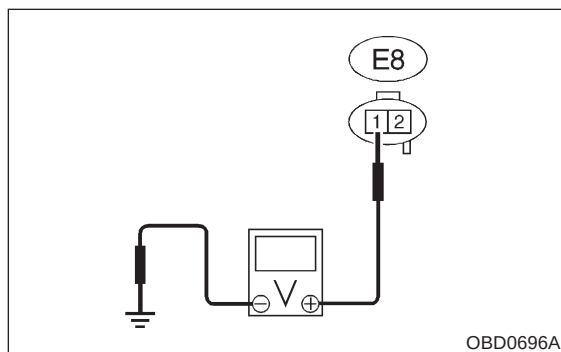


7) Disconnect connector from engine coolant temperature sensor.

8) Measure voltage between engine coolant temperature sensor connector and engine ground.

Connector & terminal

(E8) No. 1 (+) — Engine ground (-):



CHECK : Is the voltage more than 10 V?

YES : Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.

NO : Go to step 10I3.

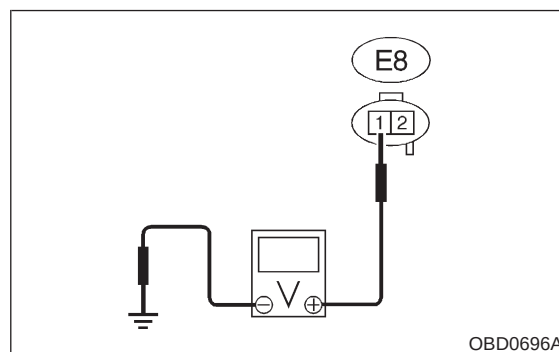
10I3 : CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to ON.

2) Measure voltage between engine coolant temperature sensor connector and engine ground.

Connector & terminal

(E8) No. 1 (+) — Engine ground (-):



CHECK : Is the voltage more than 10 V?

YES : Repair battery short circuit in harness between ECM and engine coolant temperature sensor connector.

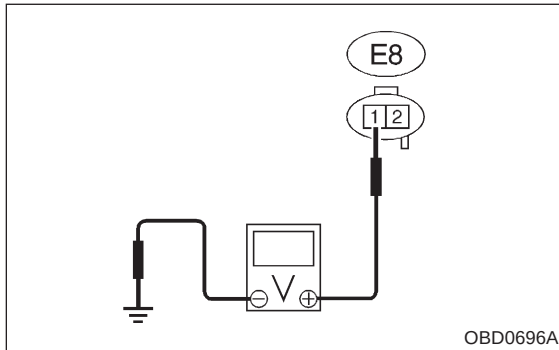
NO : Go to step 10I4.

1014 : CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

Measure voltage between engine coolant temperature sensor connector and engine ground.

Connector & terminal

(E8) No. 1 (+) — Engine ground (-):



CHECK : **Is the voltage more than 4 V?**

YES : Go to step **1015**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and engine coolant temperature sensor connector
- Poor contact in engine coolant temperature sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

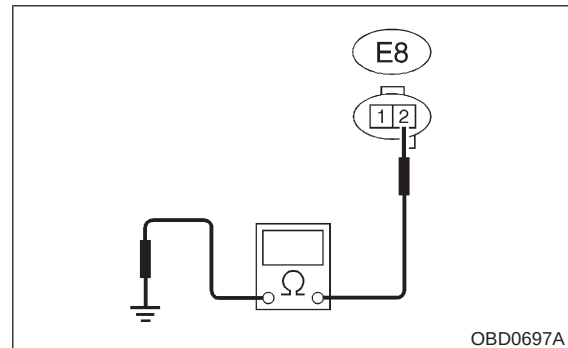
1015 : CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.

1) Turn ignition switch to OFF.

2) Measure resistance of harness between engine coolant temperature sensor connector and engine ground.

Connector & terminal

(E8) No. 2 — Engine ground:



CHECK : **Is the resistance less than 5 Ω?**

YES : Replace engine coolant temperature sensor.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and engine coolant temperature sensor connector
- Poor contact in engine coolant temperature sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

J: DTC P0121 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

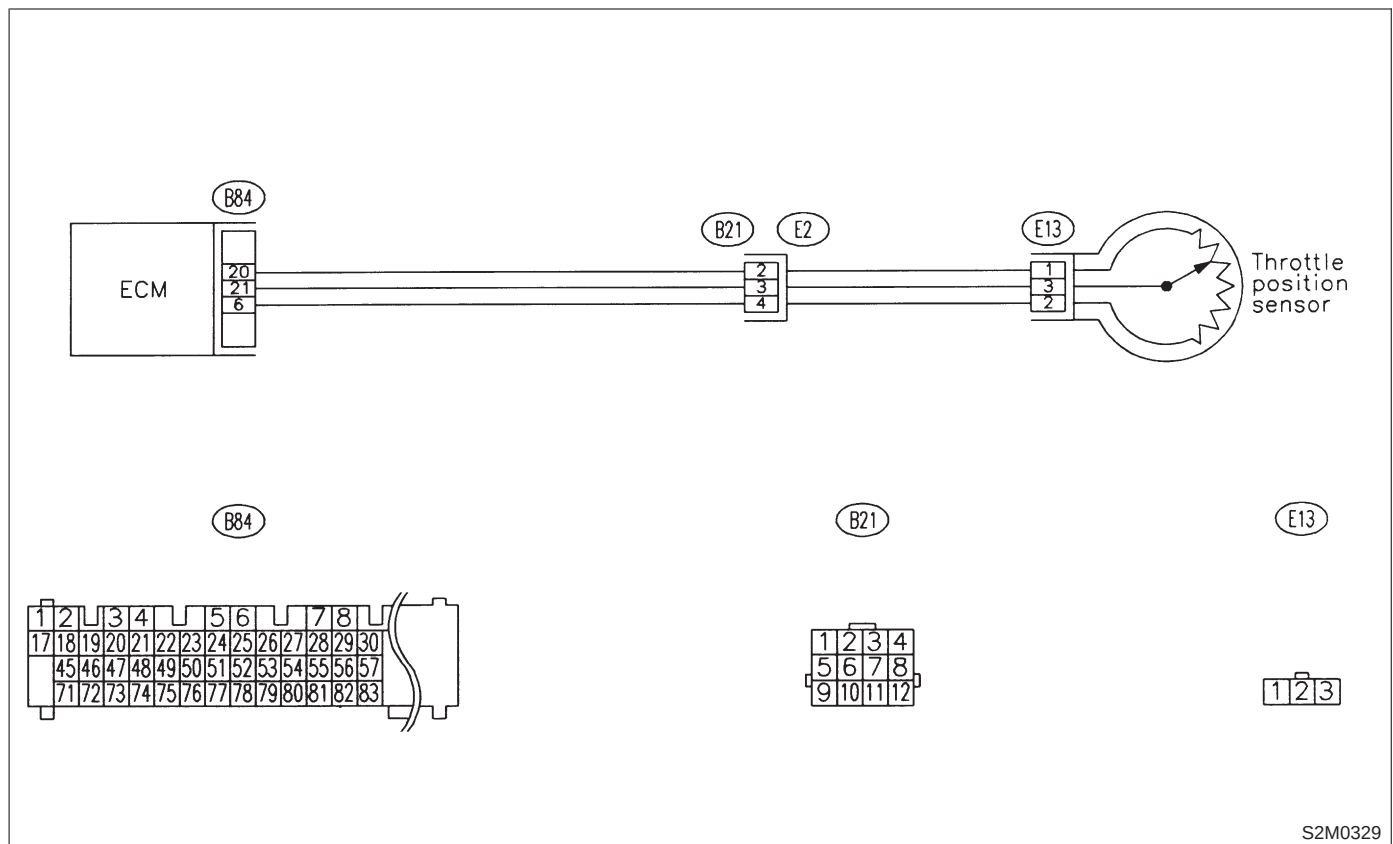
- **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

- **WIRING DIAGRAM:**



10J1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0122 or P0123?*

YES : Inspect DTC P0122 or P0123 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0121.

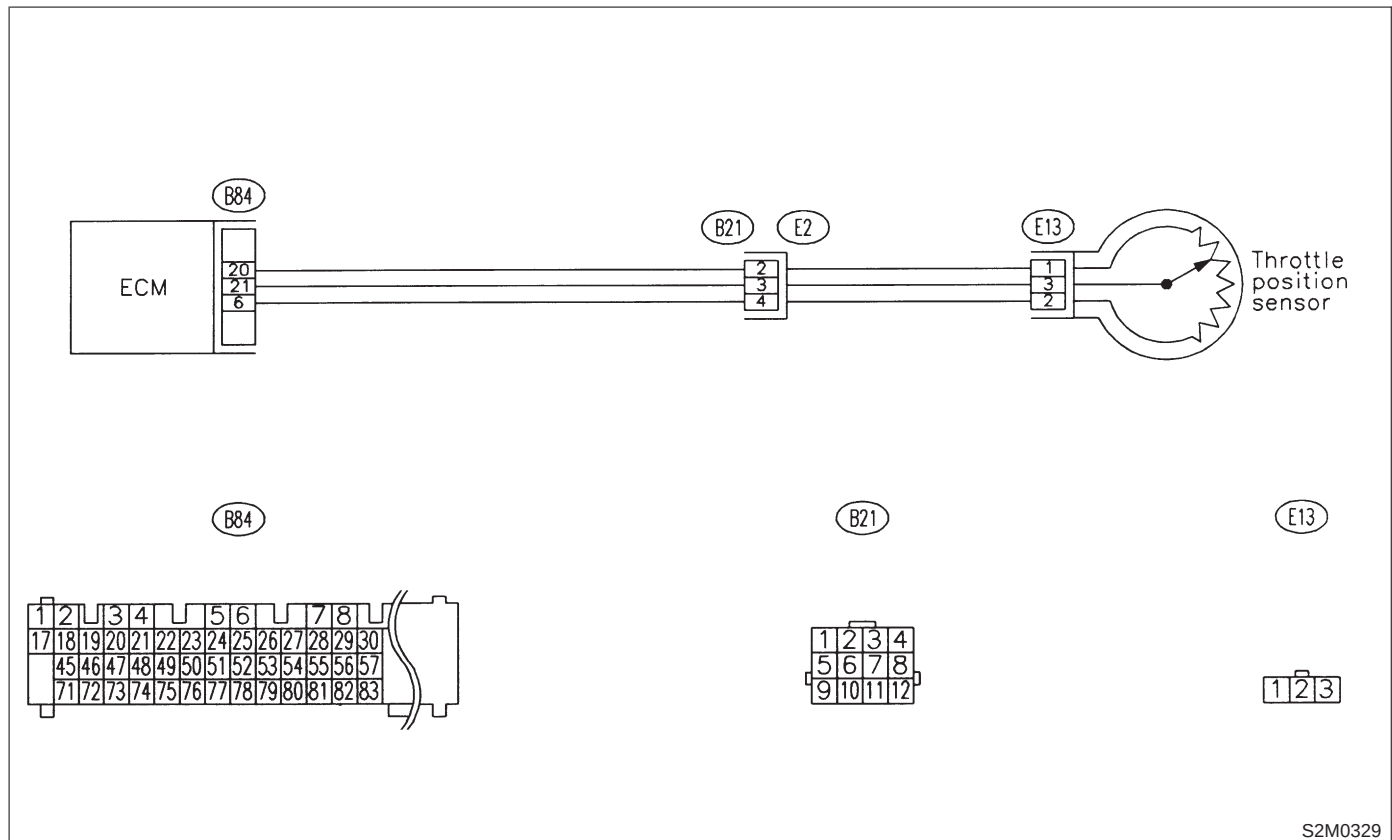
NO : Replace throttle position sensor.

K: DTC P0122 — THROTTLE POSITION SENSOR CIRCUIT LOW INPUT —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Erroneous idling
 - Engine stalls.
 - Poor driving performance

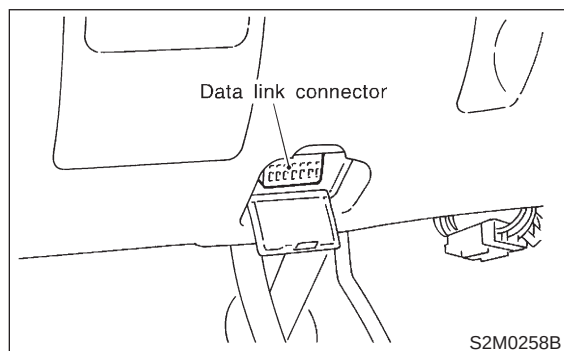
CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

10K1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value less than 0.1 V?**

YES : Go to step **10K2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:

In this case, repair the following:

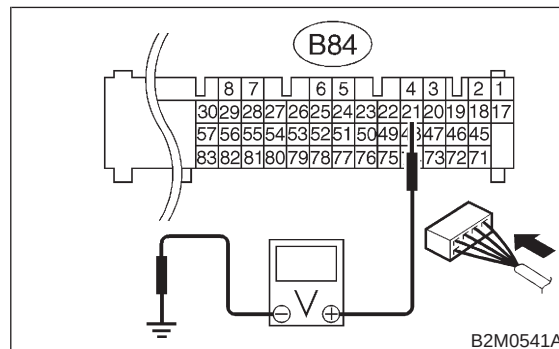
- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

10K2 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground while throttle valve is fully closed.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



CHECK : **Is the voltage more than 4.5 V?**

YES : Go to step **10K4**.

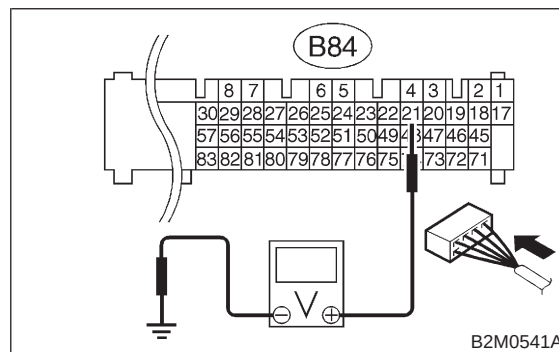
NO : Go to step **10K3**.

10K3 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



CHECK : **Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?**

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:

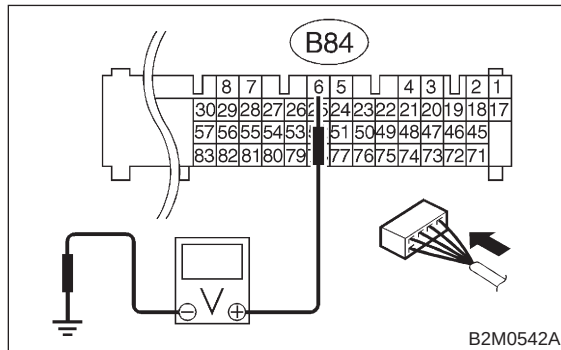
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10K4 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 6 (+) — Chassis ground (-):



- CHECK** : *Is the voltage less than 0.1 V?*
YES : Go to step 10K6.
NO : Go to step 10K5.

10K5 : CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).

Measure voltage between ECM connector and chassis ground.

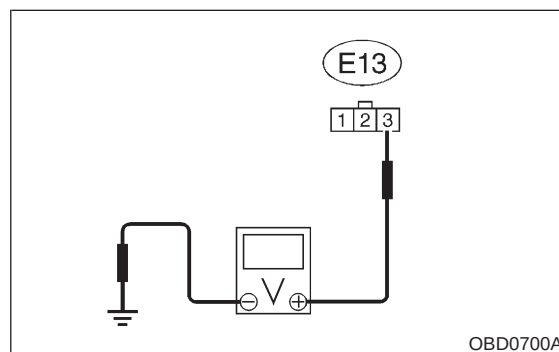
- CHECK** : *Does the voltage change more than 0.1 V by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?*
YES : Repair poor contact in ECM connector.
NO : Go to step 10K6.

10K6 : CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from throttle position sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between throttle position sensor connector and engine ground.

Connector & terminal

(E13) No. 3 (+) — Engine ground (-):



- CHECK** : *Is the voltage more than 4.5 V?*
YES : Go to step 10K7.
NO : Repair harness and connector.

NOTE:

In this case, repair the following:

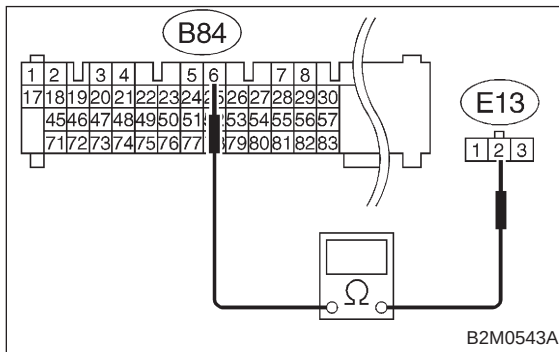
- Open circuit in harness between throttle position sensor and ECM connector
- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

10K7 : CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between ECM connector and throttle position sensor connector.

Connector & terminal

(B84) No. 6 — (E13) No. 2:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step **10K8**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

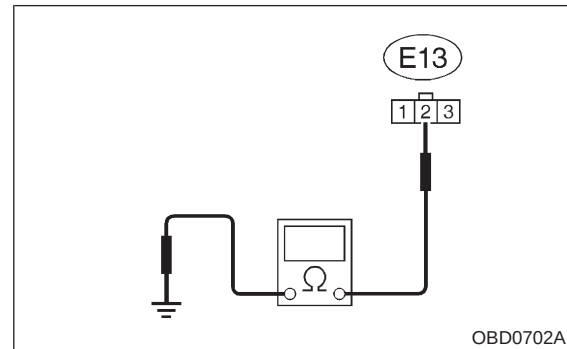
- Open circuit in harness between throttle position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in throttle position sensor connector
- Poor contact in coupling connector (B21)

10K8 : CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.

Measure resistance of harness between throttle position sensor connector and engine ground.

Connector & terminal

(E13) No. 2 — Engine ground:



CHECK : *Is the resistance less than 10 Ω?*

YES : Repair ground short circuit in harness between throttle position sensor and ECM connector.

NO : Go to step **10K9**.

10K9 : CHECK POOR CONTACT.

Check poor contact in throttle position sensor connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in throttle position sensor connector?*

YES : Repair poor contact in throttle position sensor connector.

NO : Replace throttle position sensor.

L: DTC P0123 — THROTTLE POSITION SENSOR CIRCUIT HIGH INPUT —● **DTC DETECTING CONDITION:**

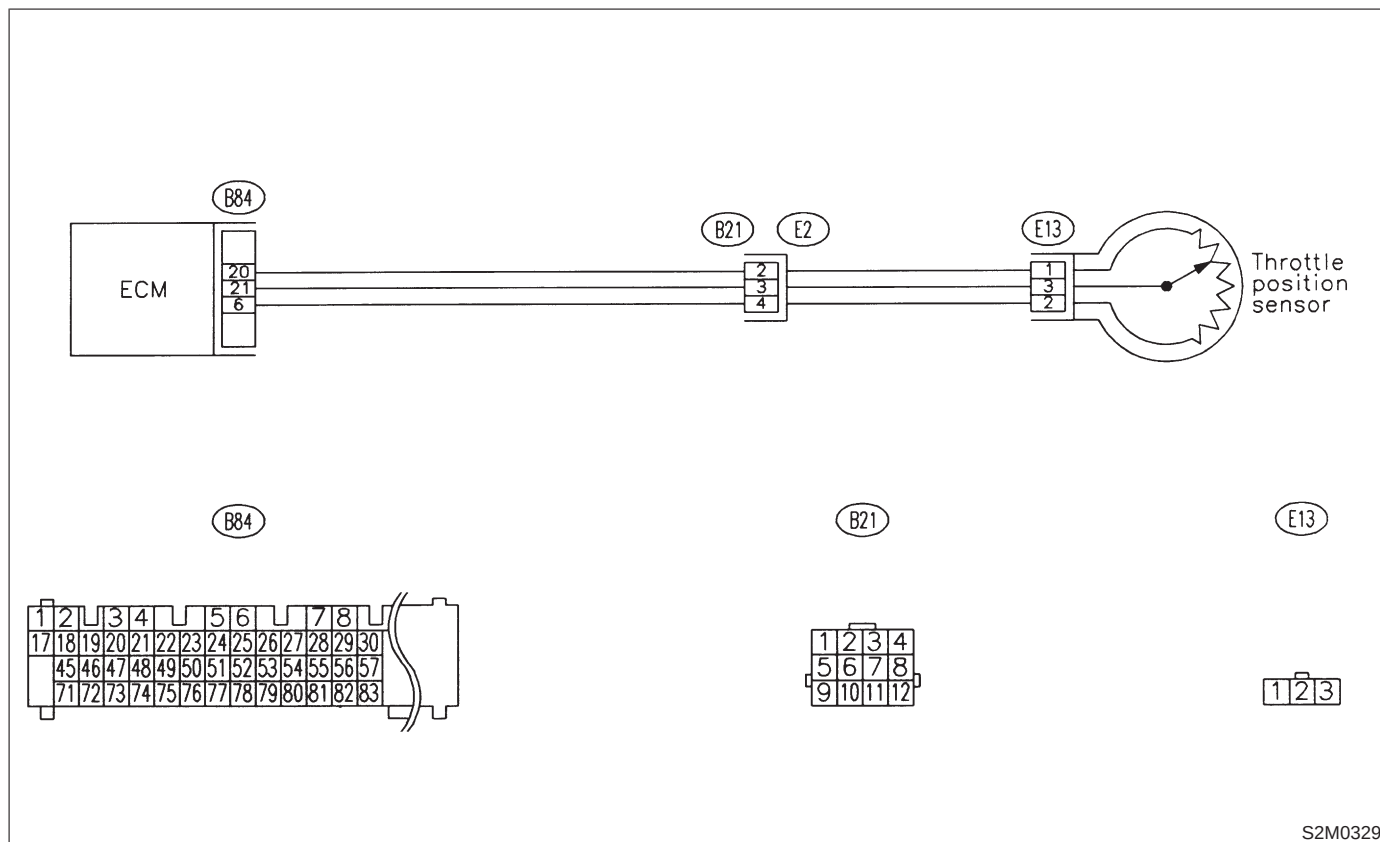
- Immediately at fault recognition

● **TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

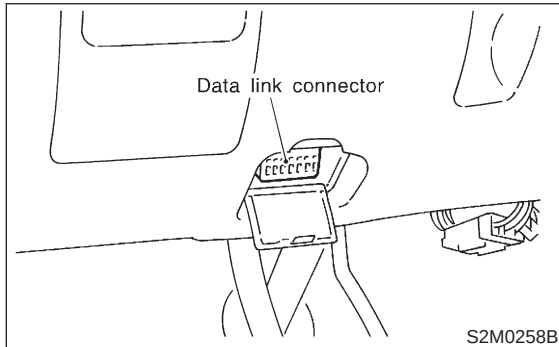
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0329

10L1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of throttle position sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the value more than 4.9 V?*

YES : Go to step **10L2**.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:

In this case, repair the following:

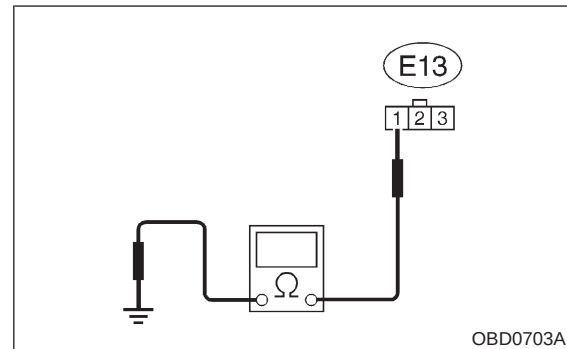
- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

10L2 : CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from throttle position sensor.
- 3) Measure resistance of harness between throttle position sensor connector and engine ground.

Connector & terminal

(E13) No. 1 — Engine ground:



CHECK : *Is the resistance less than 5 Ω ?*

YES : Go to step **10L3**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

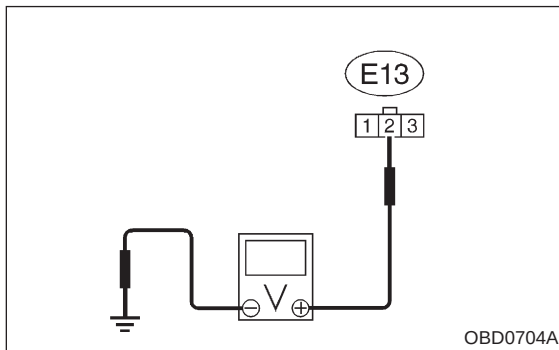
- Open circuit in harness between throttle position sensor and ECM connector
- Poor contact in coupling connector (B21)

10L3 : CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between throttle position sensor connector and engine ground.

Connector & terminal

(E13) No. 2 (+) — Engine ground (-):



- CHECK** : ***Is the voltage more than 4.9 V?***
- YES** : Repair battery short circuit in harness between throttle position sensor and ECM connector. After repair, replace ECM.
- NO** : Replace throttle position sensor.

M: DTC P0125 — INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

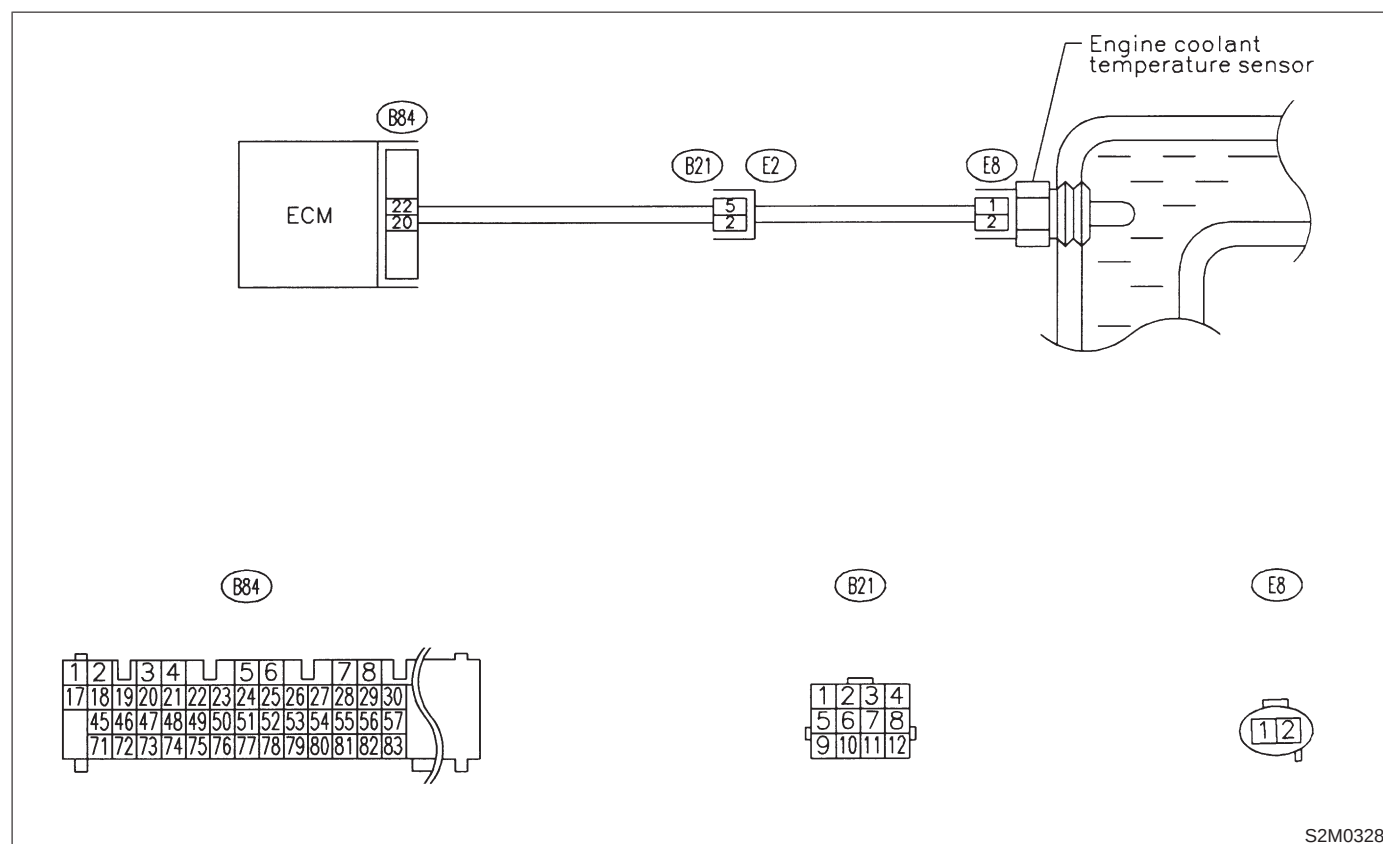
● TROUBLE SYMPTOM:

- Engine would not return to idling.

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



10M1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0117 or P0118?*

YES : Inspect DTC P0117 or P0118 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0125.

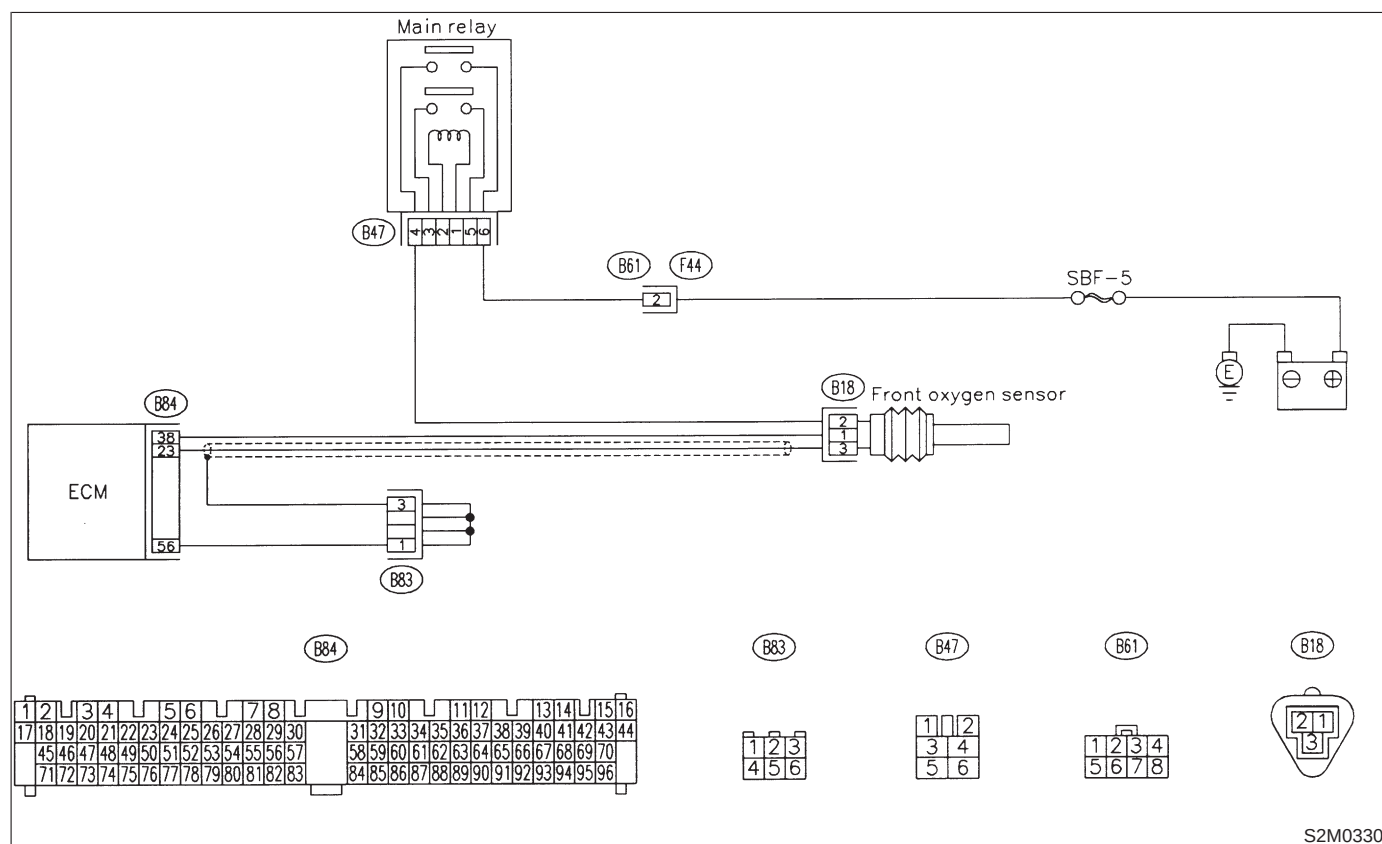
NO : Replace engine coolant temperature sensor.

N: DTC P0130 — FRONT OXYGEN SENSOR CIRCUIT MALFUNCTION —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0330

10N1 : CHECK FOR OTHER CAUSES AFFECTING EXHAUST GAS.
NOTE:

- Check for use of improper fuel.
- Check if engine oil or coolant level is extremely low.

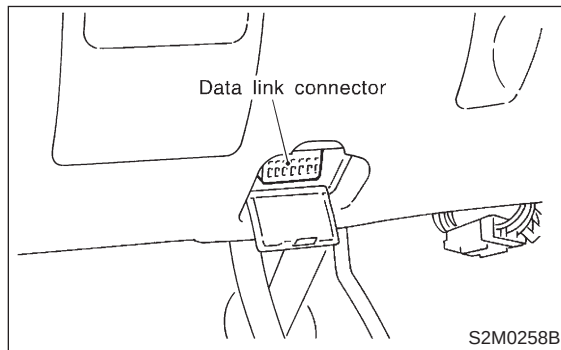
CHECK : *Is CO % more than 2 % after engine warm-up?*

YES : Check fuel system.

NO : Go to step **10N2**.

10N2 : CHECK FRONT OXYGEN SENSOR DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Start engine and Turn the Subaru Select Monitor and the OBD-II general scan tool switch to ON.
- 4) Warm-up the engine until coolant temperature is above 70°C (160°F) and keep the engine speed at 2,000 rpm to 3,000 rpm for one minute.
- 5) Read data of front oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the difference of voltage less than 0.1 V between the value of max. output and min. output with function mode F12?*

YES : Go to step 10N3.

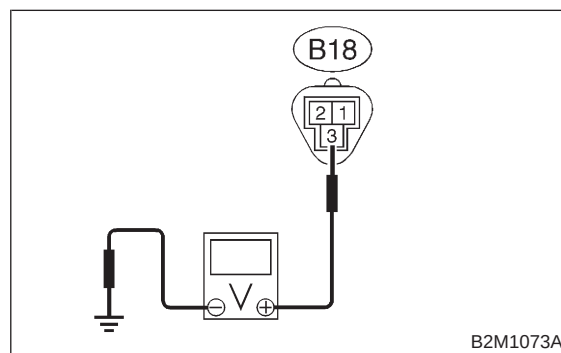
NO : Replace front oxygen sensor.

10N3 : CHECK HARNESS BETWEEN FRONT OXYGEN SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from front oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between front oxygen sensor harness connector and engine ground.

Connector & terminal

(B18) No. 3 (+) — Engine ground (-):



CHECK : *Is the voltage more than 0.2 V?*

YES : Go to step 10N4.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and front oxygen sensor connector
- Poor contact in the ECM connector

10N4 : CHECK POOR CONTACT.

Check poor contact in front oxygen sensor connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in front oxygen sensor connector?*

YES : Repair poor contact in front oxygen sensor connector.

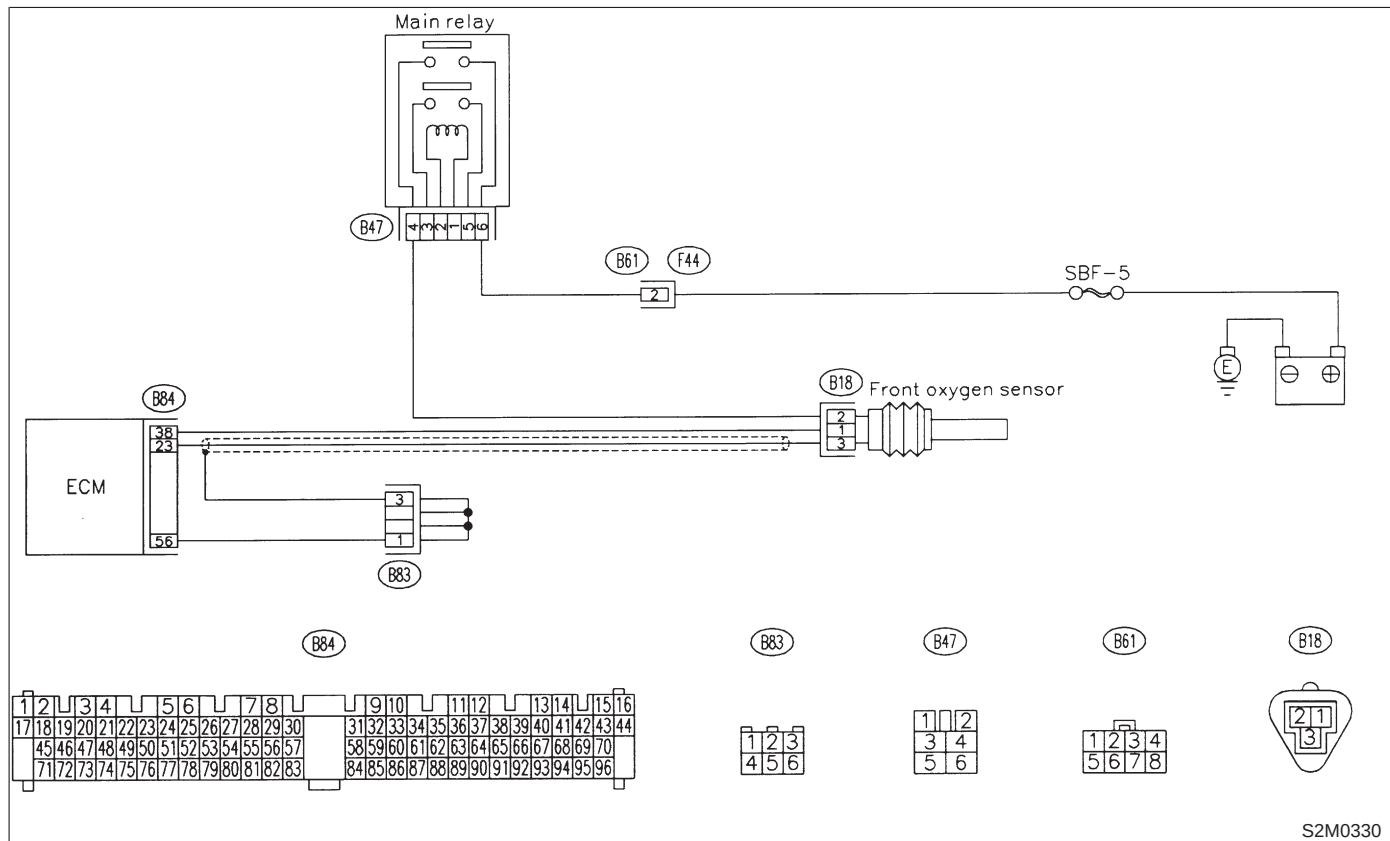
NO : Replace front oxygen sensor.

O: DTC P0133 — FRONT OXYGEN SENSOR CIRCUIT SLOW RESPONSE —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0330

1001 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130?

YES : Inspect DTC P0130 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0133.

NO : Go to step **1002**.

1002 : CHECK EXHAUST SYSTEM.

CHECK : Is there a fault in exhaust system?

YES : Repair 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

NO : Replace front oxygen sensor.

P: DTC P0135 — FRONT OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION —

● DTC DETECTING CONDITION:

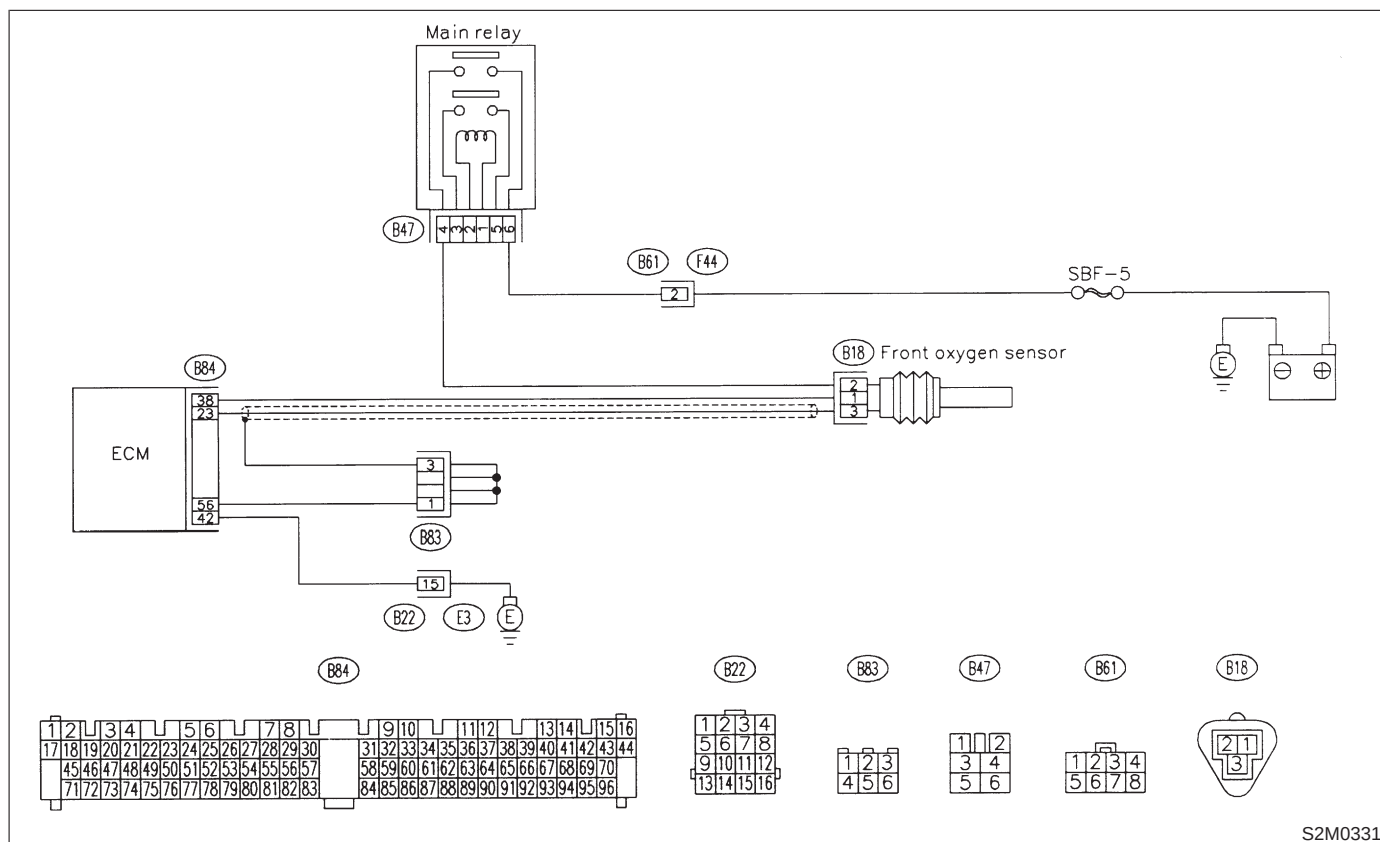
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



S2M0331

10P1 : CHECK ANY OTHER DTC ON DISPLAY.

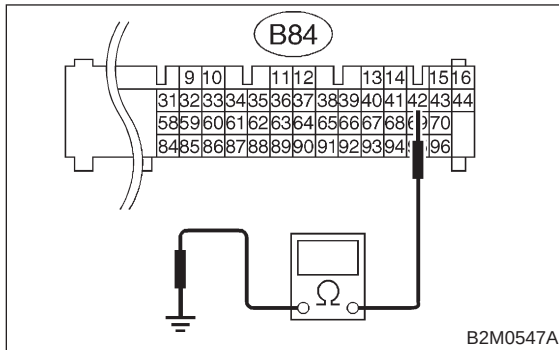
CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0135 and P0141 at the same time?

YES : Go to step 10P2.

NO : Go to step 10P3.

10P2 : CHECK GROUND CIRCUIT OF ECM.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

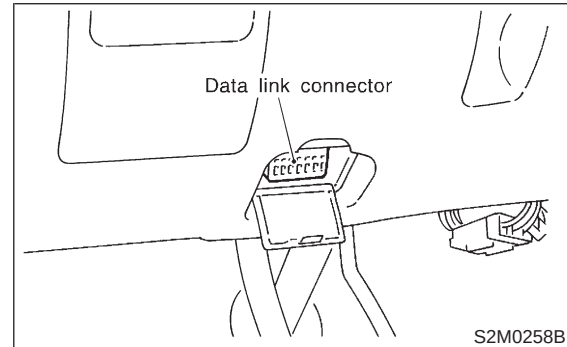
Connector & terminal**(B84) No. 42 — Chassis ground:****CHECK** : **Is the resistance less than 5 Ω?****YES** : Repair poor contact in ECM connector.**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and coupling connector (B22)
- Open circuit in harness between coupling connector (B22) and engine grounding terminal
- Poor contact in front oxygen sensor connector
- Poor contact in coupling connector (B22)

10P3 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine
- 5) Read data of front oxygen sensor heater current using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value more than 0.2 A?****YES** : Repair connector.**NOTE:**

In this case, repair the following:

- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

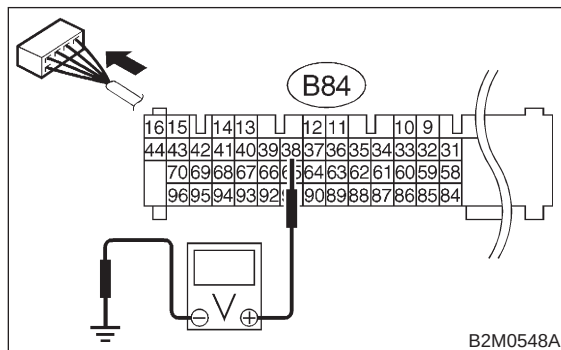
NO : Go to step **10P4**.

10P4 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Start and idle the engine.
- 2) Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 38 (+) — Chassis ground (-):



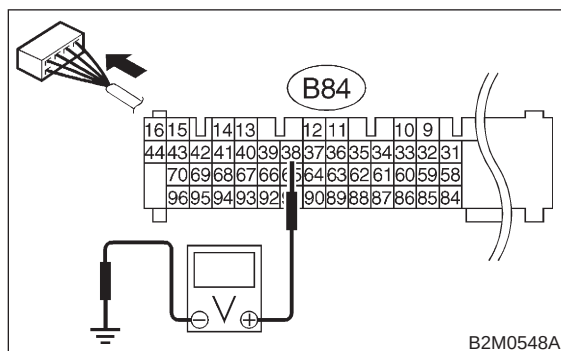
- CHECK** : *Is the voltage less than 1.0 V?*
- YES** : Go to step **10P7**.
- NO** : Go to step **10P5**.

10P5 : CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 38 (+) — Chassis ground (-):



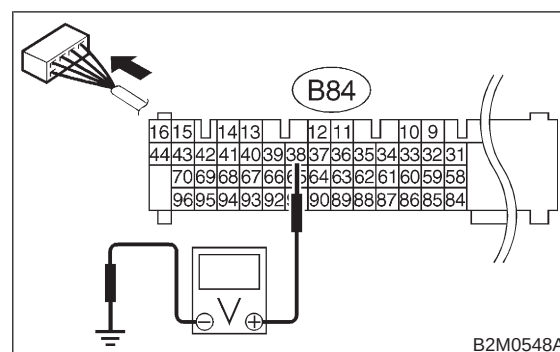
- CHECK** : *Does the voltage change less than 1.0 V by shaking harness and connector of ECM while monitoring the value with voltage meter?*
- YES** : Repair poor contact in ECM connector.
- NO** : Go to step **10P6**.

10P6 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Disconnect connector from front oxygen sensor.
- 2) Measure voltage between ECM connector and chassis ground.

Connector & terminal

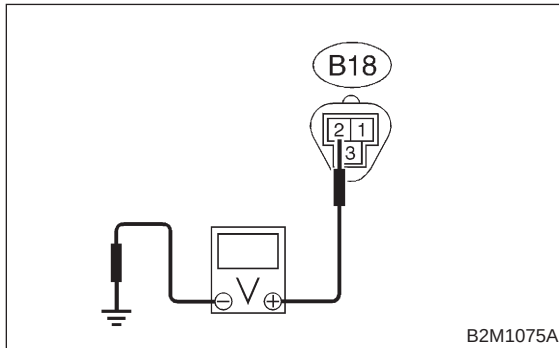
(B84) No. 38 (+) — Chassis ground (-):



- CHECK** : *Is the voltage less than 1.0 V?*
- YES** : Replace ECM.
- NO** : Repair battery short circuit in harness between ECM and front oxygen sensor connector. After repair, replace ECM.

10P7 : CHECK POWER SUPPLY TO FRONT OXYGEN SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from front oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between front oxygen sensor connector and engine ground.

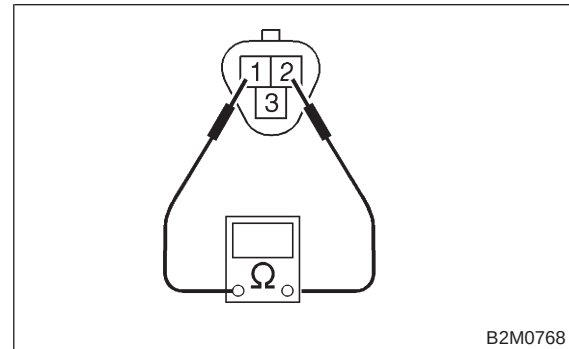
Connector & terminal**(B18) No. 2 (+) — Engine ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10P8**.**NO** : Repair power supply line.**NOTE:**

In this case, repair the following:

- Open circuit in harness between main relay and front oxygen sensor connector
- Poor contact in front oxygen sensor connector
- Poor contact in main relay connector

10P8 : CHECK FRONT OXYGEN SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between front oxygen sensor connector terminals.

Terminals**No. 1 — No. 2:****CHECK** : **Is the resistance less than 30 Ω?****YES** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between front oxygen sensor and ECM connector
- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

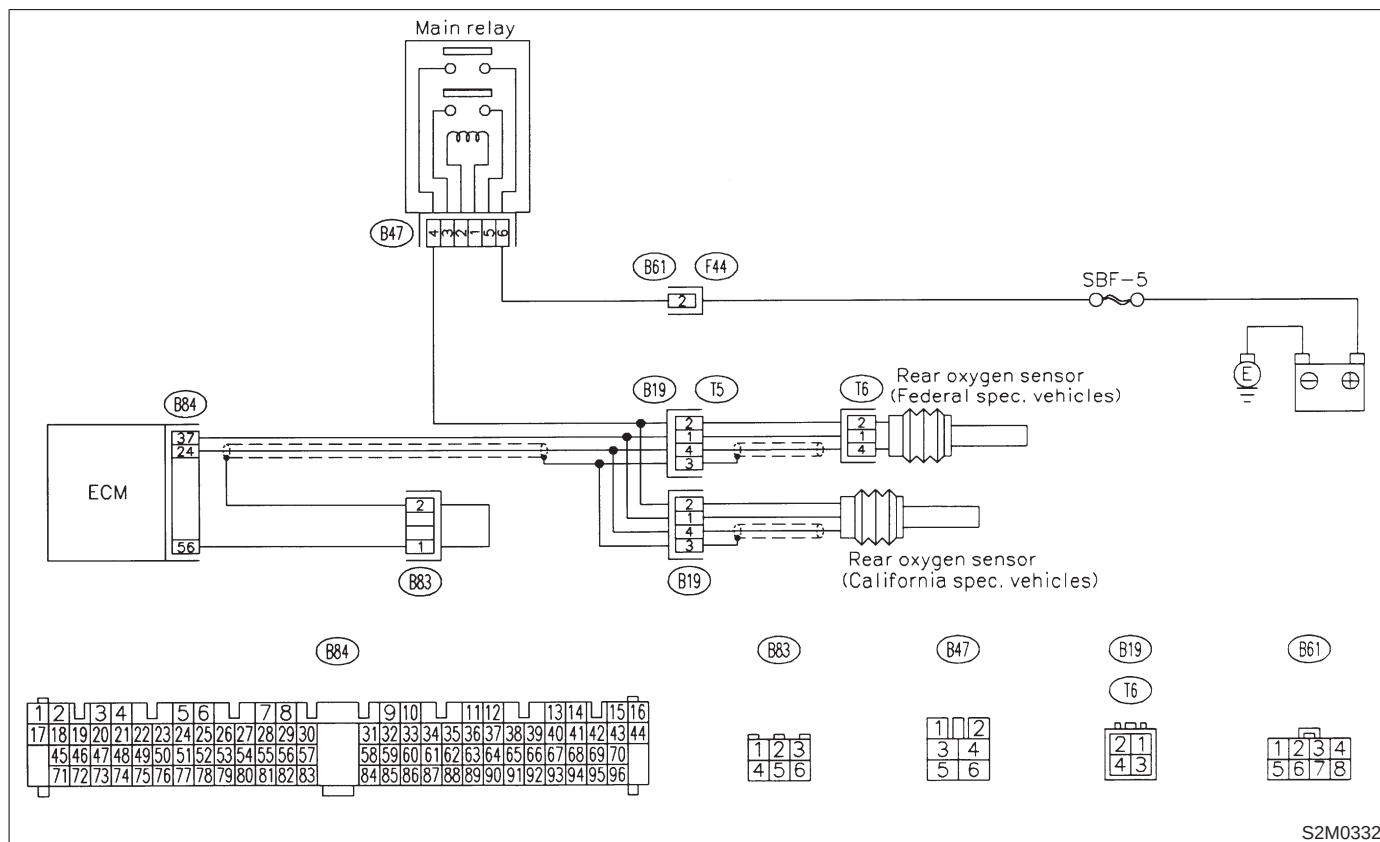
NO : Replace front oxygen sensor.

Q: DTC P0136 — REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0332

10Q1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130?

YES : Go to step 10Q2.

NO : Go to step 10Q3.

10Q2 : CHECK FAILURE CAUSE OF P0130.

Perform the step 10N1 of DTC P0130 <Ref. to 2-7 [T10N1].>.

CHECK : Is the failure cause of P0130 in the fuel system?

YES : Check fuel system.

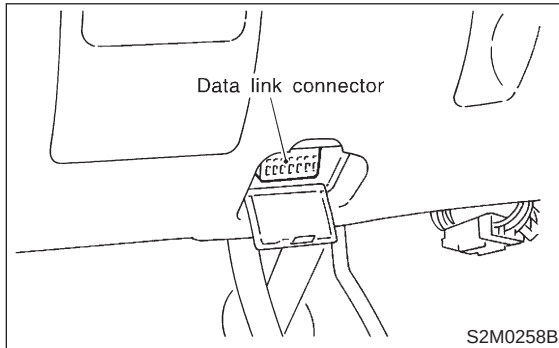
NOTE:

In this case, it is not necessary to inspect DTC P0136.

NO : Go to step 10Q3.

10Q3 : CHECK REAR OXYGEN SENSOR DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or OBD-II general scan tool to data link connector.



- 3) Start the engine, and turn Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Warm-up the engine until engine coolant temperature is above 70°C (160°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for two minutes.
- 5) Read data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Does the value fluctuate?*

YES : Go to step **10Q8**.

NO : Go to step **10Q4**.

10Q4 : CHECK REAR OXYGEN SENSOR DATA.

Read data of rear oxygen sensor signal using Subaru Select Monitor or OBD-II General Scan Tool.

CHECK : *Is the value fixed between 0.2 and 0.4 V?*

YES : Go to step **10Q5**.

NO : Replace rear oxygen sensor.

10Q5 : CHECK VEHICLE SPECIFICATION.

CHECK : *Is the vehicle California specification?*

YES : Go to step **10Q6**.

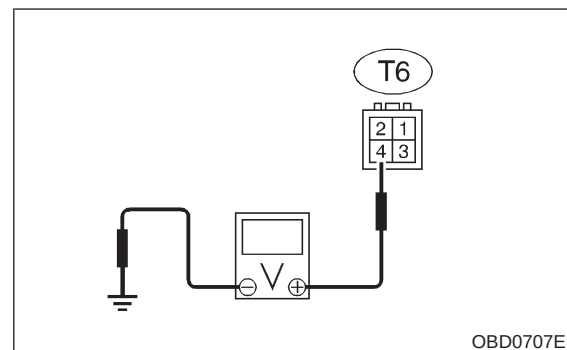
NO : Go to step **10Q7**.

10Q6 : CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from rear oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between rear oxygen sensor harness connector and engine ground or chassis ground.

Connector & terminal

(B19) No. 4 (+) — Engine ground (-):



CHECK : *Is the voltage more than 0.2 V?*

YES : Replace rear oxygen sensor.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

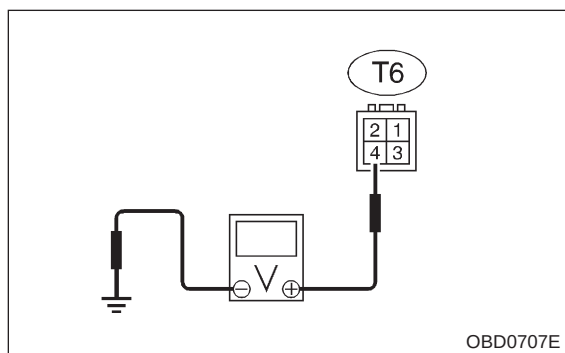
- Open circuit in harness between rear oxygen sensor and ECM connector
- Poor contact in rear oxygen sensor connector
- Poor contact in ECM connector

10Q7 : CHECK HARNESS BETWEEN REAR OXYGEN SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from rear oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between rear oxygen sensor harness connector and engine ground or chassis ground.

Connector & terminal

(T6) No. 4 (+) — Chassis ground (-):



CHECK : **Is the voltage more than 0.2 V?**

YES : Replace rear oxygen sensor.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between rear oxygen sensor and ECM connector
- Poor contact in rear oxygen sensor connector
- Poor contact in ECM connector
- Poor contact in rear oxygen sensor connecting harness connector

10Q8 : CHECK EXHAUST SYSTEM.
NOTE:

Check the following items.

- Loose installation of portions
- Damage (crack, hole etc.) of parts
- Looseness and ill fitting of parts between front oxygen sensor and rear oxygen sensor

CHECK : **Is there a fault in exhaust system?**

YES : Repair or replace faulty parts.

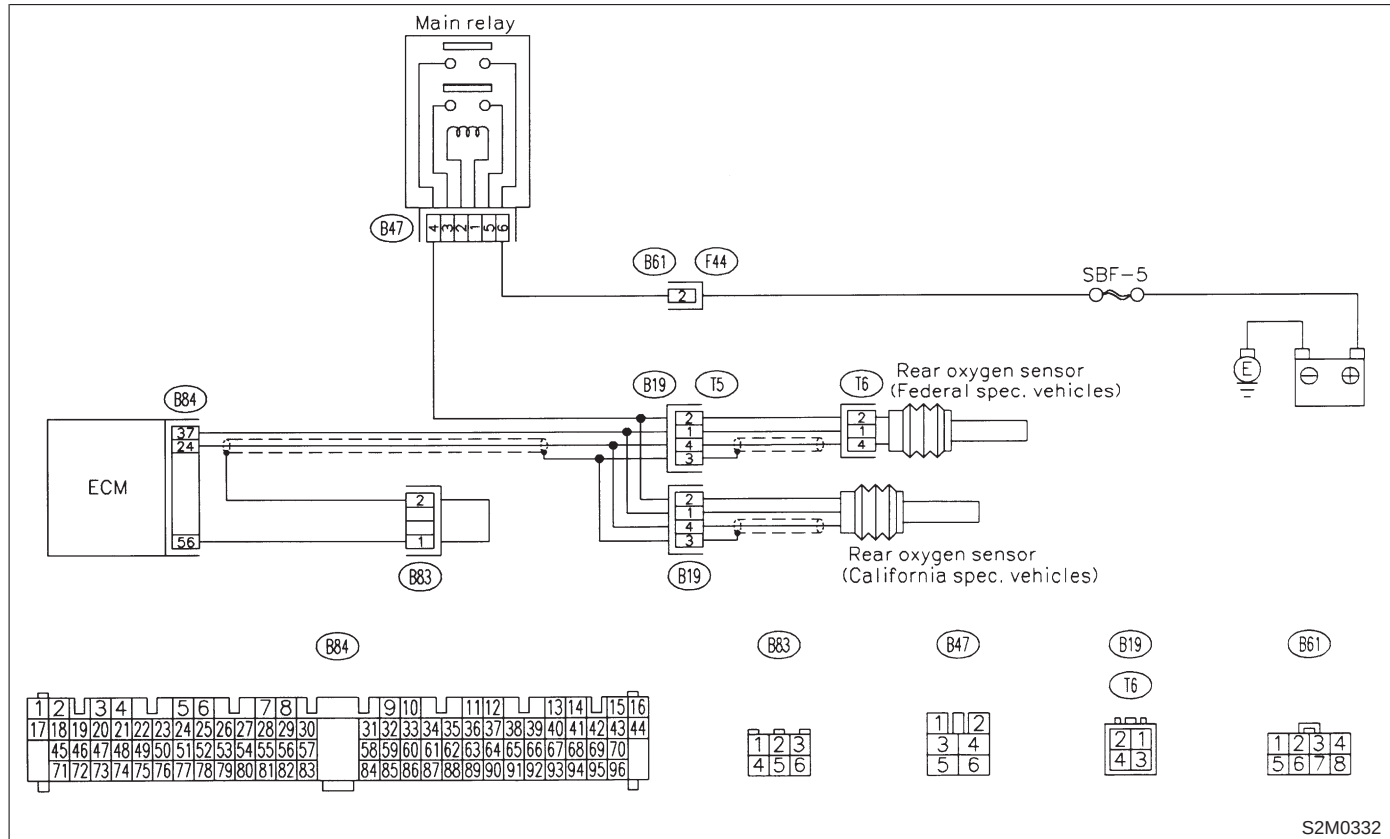
NO : Replace rear oxygen sensor.

R: DTC P0139 — REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0332

10R1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0136?

YES : Inspect DTC P0136 using "10. Diagnostics Chart with Trouble Code for LHD Vehicles". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0139.

NO : Replace rear oxygen sensor.

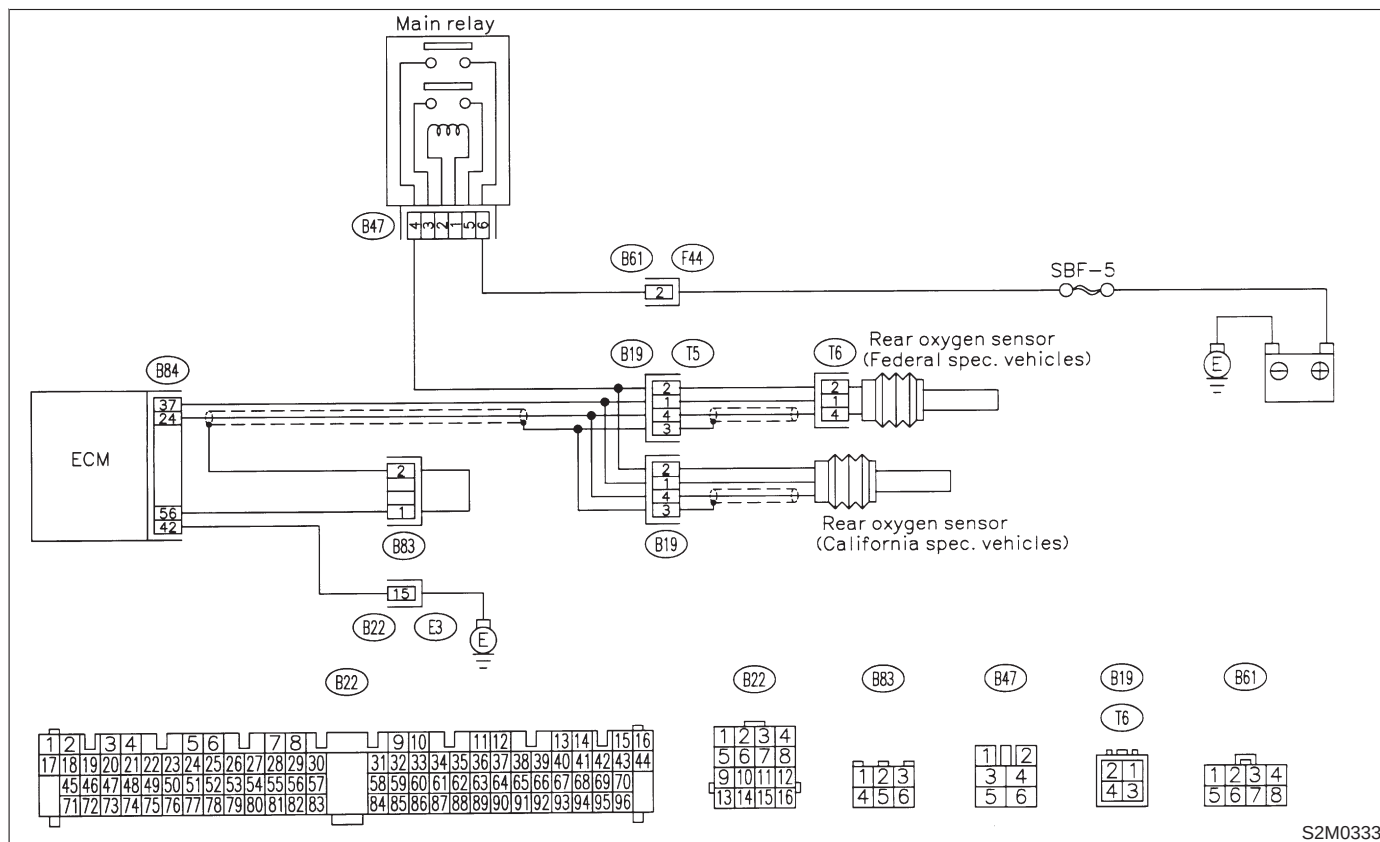
S: DTC P0141 — REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0333

10S1 : CHECK ANY OTHER DTC ON DISPLAY.

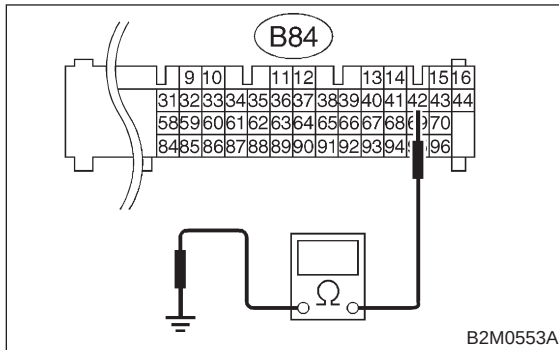
CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0141 and P0135 at the same time?

YES : Go to step 10S2.

NO : Go to step 10S3.

10S2 : CHECK GROUND CIRCUIT OF ECM.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal**(B84) No. 42 — Chassis ground:**

- CHECK** : **Is the resistance less than 5 Ω ?**
- YES** : Repair poor contact in ECM connector.
- NO** : Repair harness and connector.

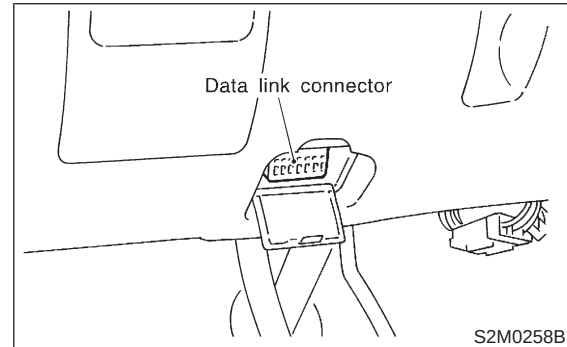
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and coupling connector (B22)
- Open circuit in harness between coupling connector (B22) and engine grounding terminal
- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector (B19)
- Poor contact in coupling connector (B22)

10S3 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of rear oxygen sensor heater current using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

- CHECK** : **Is the value more than 0.2 A?**

- YES** : Repair connector.

NOTE:

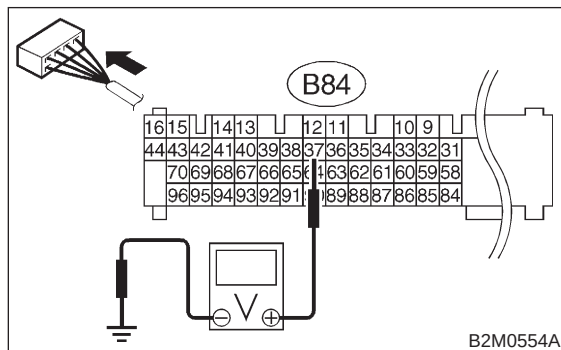
In this case, repair the following:

- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector
- Poor contact in ECM connector

- NO** : Go to step **10S4**.

10S4 : CHECK OUTPUT SIGNAL FROM ECM.

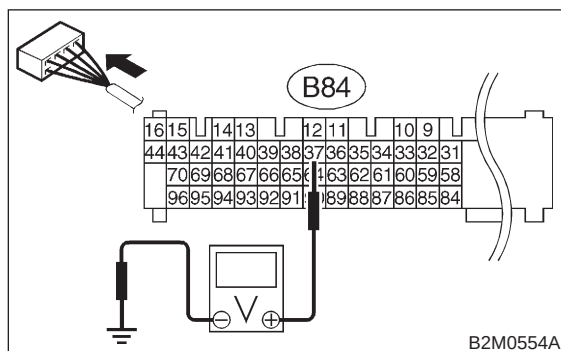
- 1) Start and idle the engine.
- 2) Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 37 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage less than 1.0 V?*
- YES** : Go to step **10S7**.
- NO** : Go to step **10S5**.

10S5 : CHECK OUTPUT SIGNAL FROM ECM.

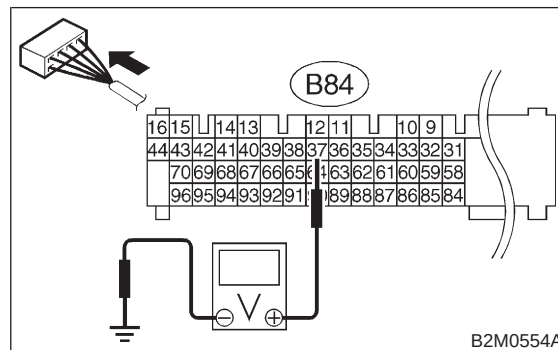
Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 37 (+) — Chassis ground (-):**

- CHECK** : *Does the voltage change less than 1.0 V by shaking harness and connector of ECM while monitoring the value with voltage meter?*
- YES** : Repair poor contact in ECM connector.
- NO** : Go to step **10S6**.

10S6 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Disconnect connector from rear oxygen sensor.
- 2) Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 37 (+) — Chassis ground (-):**

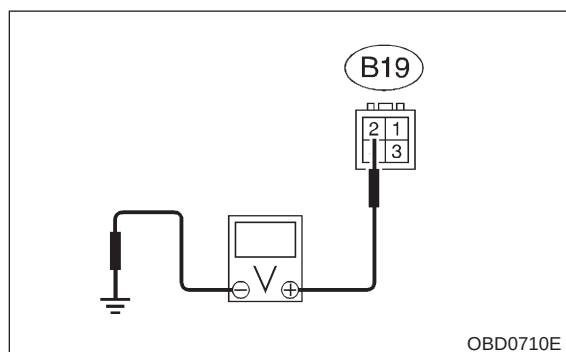
- CHECK** : *Is the voltage less than 1.0 V?*
- YES** : Replace ECM.
- NO** : Repair battery short circuit in harness between ECM and rear oxygen sensor connector. After repair, replace ECM.

10S7 : CHECK VEHICLE SPECIFICATION.

- CHECK** : *Is the vehicle California specification?*
- YES** : Go to step **10S8**.
- NO** : Go to step **10S9**.

10S8 : CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from rear oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between rear oxygen sensor connector and engine ground or chassis ground.

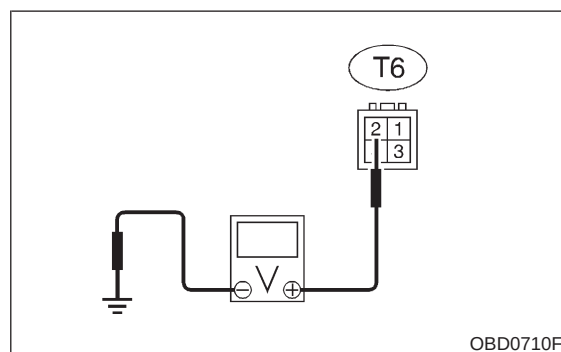
Connector & terminal**(B19) No. 2 (+) — Engine ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10S10**.**NO** : Repair power supply line.**NOTE:**

In this case, repair the following:

- Open circuit in harness between main relay and rear oxygen sensor connector
- Poor contact in rear oxygen sensor connector

10S9 : CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from rear oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between rear oxygen sensor connector and engine ground or chassis ground.

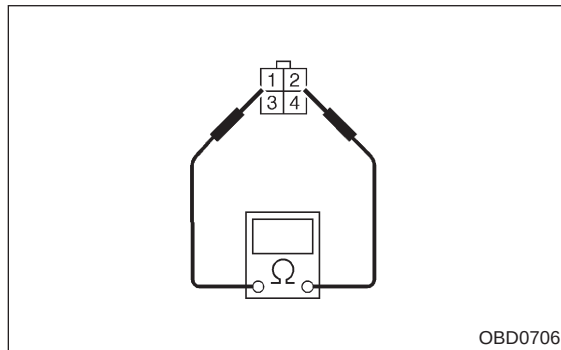
Connector & terminal**(T6) No. 2 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10S10**.**NO** : Repair power supply line.**NOTE:**

In this case, repair the following:

- Open circuit in harness between main relay and rear oxygen sensor connector
- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector

10S10 : CHECK REAR OXYGEN SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between rear oxygen sensor connector terminals.

Terminals**No. 1 — No. 2:****CHECK** : ***Is the resistance less than 30 Ω ?*****YES** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between rear oxygen sensor and ECM connector
- Poor contact in rear oxygen sensor connector
- Poor contact in ECM connector
- Poor contact in rear oxygen sensor connecting harness connector

NO : Replace rear oxygen sensor.

T: DTC P0170 — FUEL TRIM MALFUNCTION —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODE**. <Ref. to 2-7 [T3D0] and [T3E0].>

10T1 : CHECK EXHAUST SYSTEM.

CHECK : *Are there holes or loose bolts on exhaust system?*

YES : Repair exhaust system.

NO : Go to step **10T2**.

10T2 : CHECK AIR INTAKE SYSTEM.

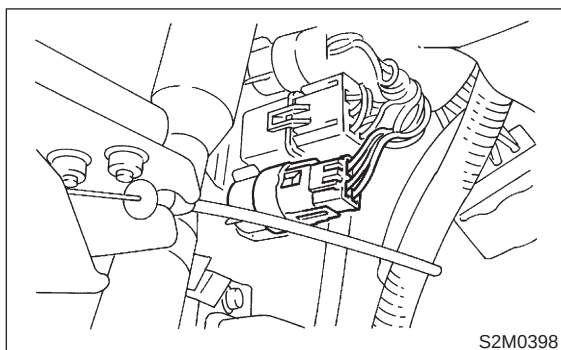
CHECK : *Are there holes, loose bolts or disconnection of hose on air intake system?*

YES : Repair air intake system.

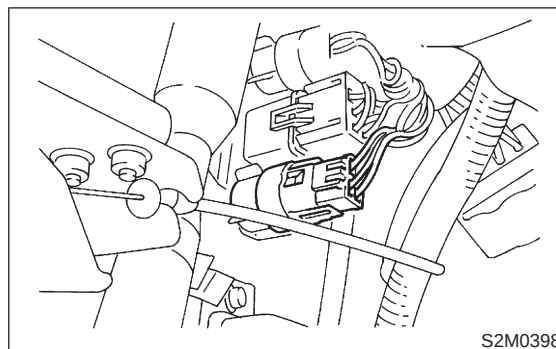
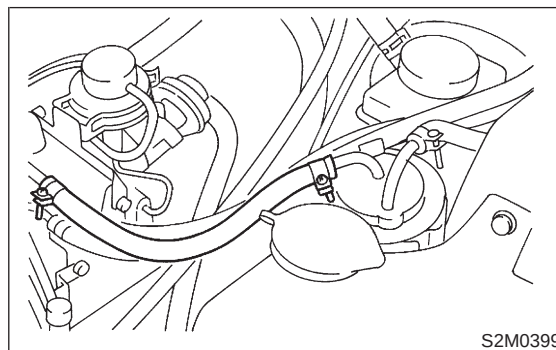
NO : Go to step **10T3**.

10T3 : CHECK FUEL PRESSURE.**1) Release fuel pressure.**

- (1) Turn ignition switch to OFF.
- (2) Disconnect connector from fuel pump relay.



- (3) Start the engine, and run it until it stalls.
- (4) After stopping the engine, crank the engine for 5 to 7 seconds to reduce fuel pressure.
- (5) Turn ignition switch to OFF.
- (6) Remove fuel filler cap.

2) Connect connector to fuel pump relay.**3) Disconnect fuel delivery hose from fuel filter, and connect fuel pressure gauge.**

- 4) Install fuel filler cap.
- 5) Start the engine and idle while gear position is neutral.

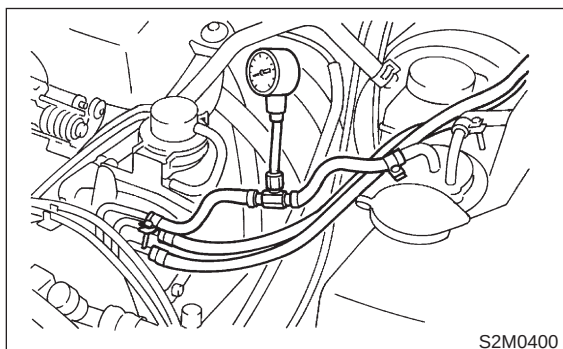
6) Measure fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.

WARNING:

Before removing fuel pressure gauge, release fuel pressure.

NOTE:

- If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.



S2M0400

CHECK : **Is fuel pressure between 226 and 275 kPa (2.3 — 2.8 kg/cm², 33 — 40 psi)?**

YES : Go to step 10T4.

NO : Repair the following items.

Fuel pressure too high	● Clogged fuel return line or bent hose
Fuel pressure too low	● Improper fuel pump discharge ● Clogged fuel supply line

10T4 : CHECK FUEL PRESSURE.

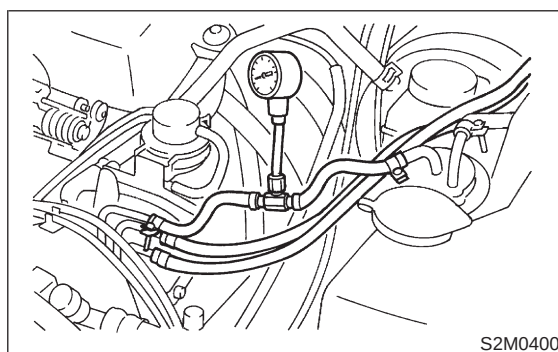
After connecting pressure regulator vacuum hose, measure fuel pressure.

WARNING:

Before removing fuel pressure gauge, release fuel pressure.

NOTE:

- If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.
- If out of specification as measured at this step, check or replace pressure regulator and pressure regulator vacuum hose.



S2M0400

CHECK : **Is fuel pressure between 157 and 206 kPa (1.6 — 2.1 kg/cm², 23 — 30 psi)?**

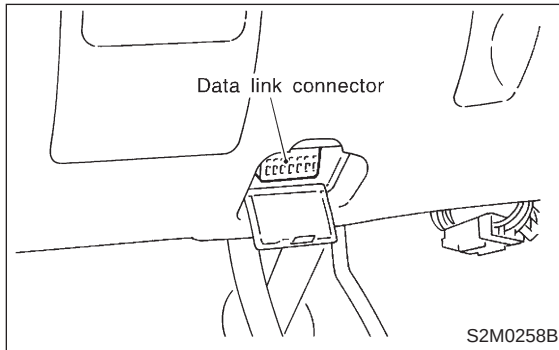
YES : Go to step 10T5.

NO : Repair the following items.

Fuel pressure too high	● Faulty pressure regulator ● Clogged fuel return line or bent hose
Fuel pressure too low	● Faulty pressure regulator ● Improper fuel pump discharge ● Clogged fuel supply line

10T5 : CHECK ENGINE COOLANT TEMPERATURE SENSOR. < REF. TO 2-7 [T10H0].> OR <REF. TO 2-7 [T10I0].>

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Start the engine and warm-up completely.
- 4) Read data of engine coolant temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor
For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>
- OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is temperature greater than 60°C (140°F)?**

YES : Go to step **10T6**.

NO : Replace engine coolant temperature sensor.

10T6 : CHECK MASS AIR FLOW SENSOR.

- 1) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).
- 2) Place the selector lever in "N" or "P" position.
- 3) Turn A/C switch to OFF.
- 4) Turn all accessory switches to OFF.
- 5) Read data of mass flow sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor
For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>
- OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

Specification:

Engine speed	Specified value
Idling	2.2 — 4.2 (g/sec)
2,500 rpm	8.6 — 14.5 (g/sec)

CHECK : **Is the voltage within the specifications?**

YES : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

NO : Replace mass air flow sensor.

- Two consecutive driving cycles with fault

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

- **WIRING DIAGRAM:**



10U1 :	CHECK ANY OTHER DTC ON DISPLAY.

YES : Inspect DTC P0182 or P0183 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

In this case, it is not necessary to inspect DTC P0181.

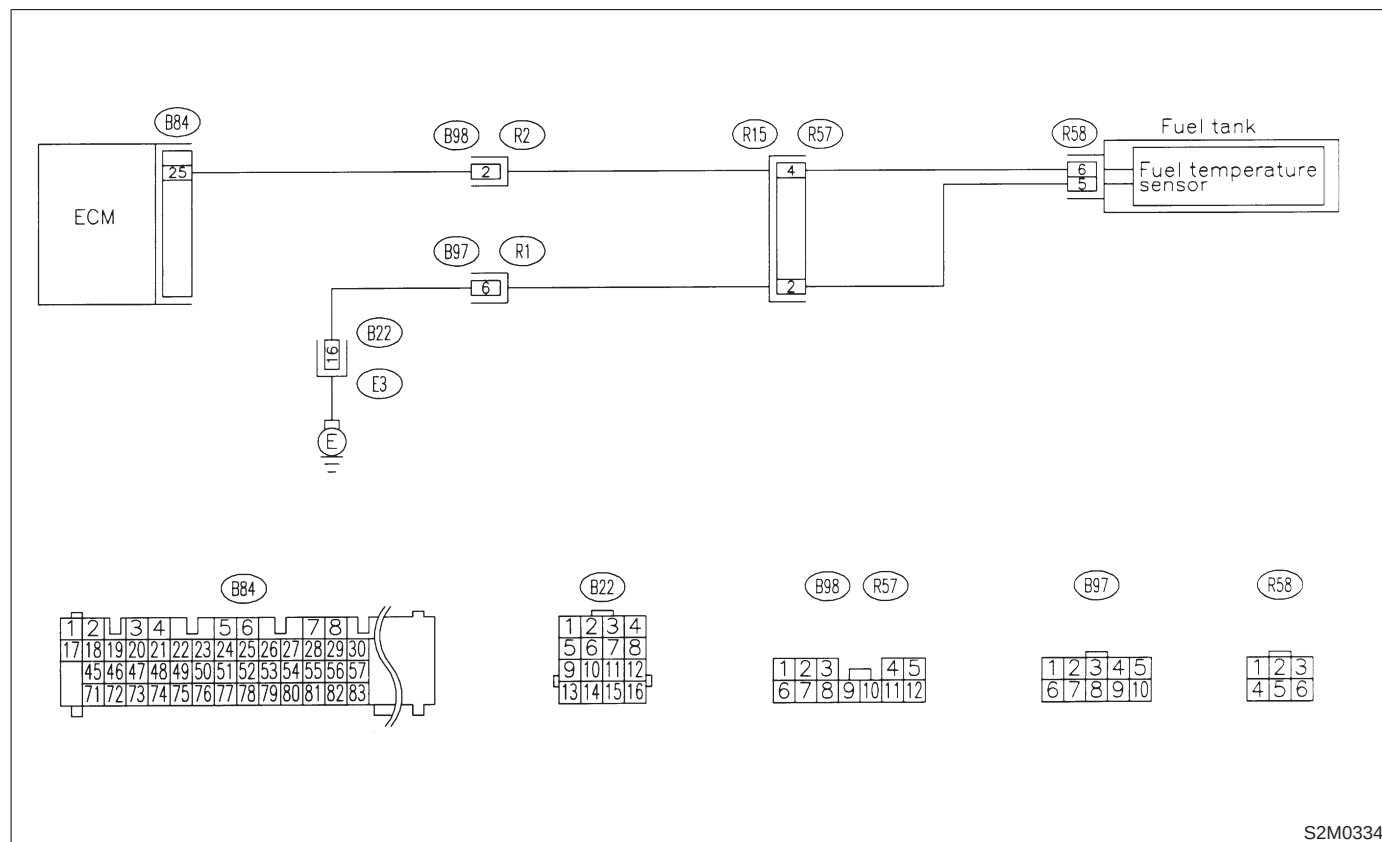
(NO) : Replace fuel temperature sensor.

V: DTC P0182 — FUEL TEMPERATURE SENSOR A CIRCUIT LOW INPUT —**● DTC DETECTING CONDITION:**

- Immediately at fault recognition

CAUTION:

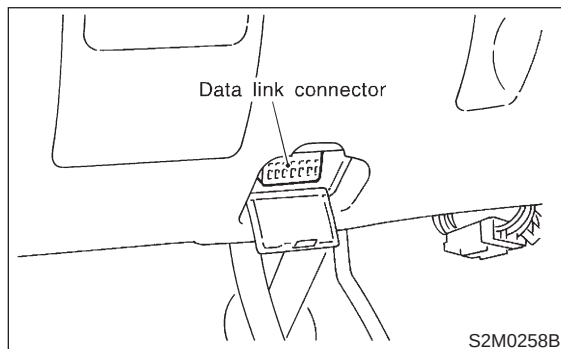
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:

S2M0334

10V1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of fuel temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:
● Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

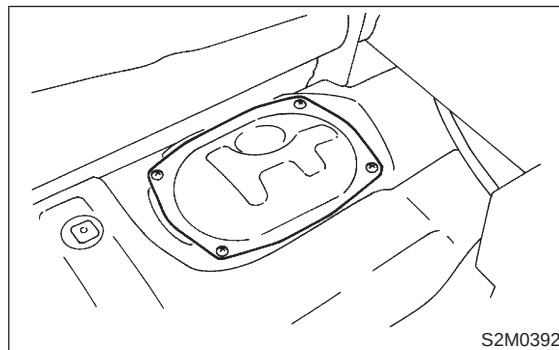
CHECK : **Is the value greater than 150°C (300°F)?**

YES : Go to step **10V2**.

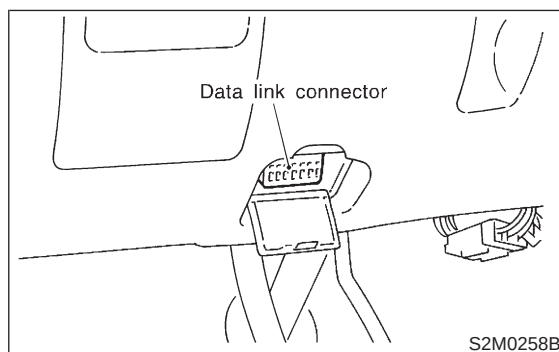
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

10V2 : CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove access hole lid.



- 3) Disconnect connector from fuel pump.
- 4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 6) Read data of fuel temperature sensor signal using Subaru Select Monitor or the OBD-II general scan tool.

NOTE:
● Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

● OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value less than -40°C (-40°F)?**

YES : Replace fuel temperature sensor.

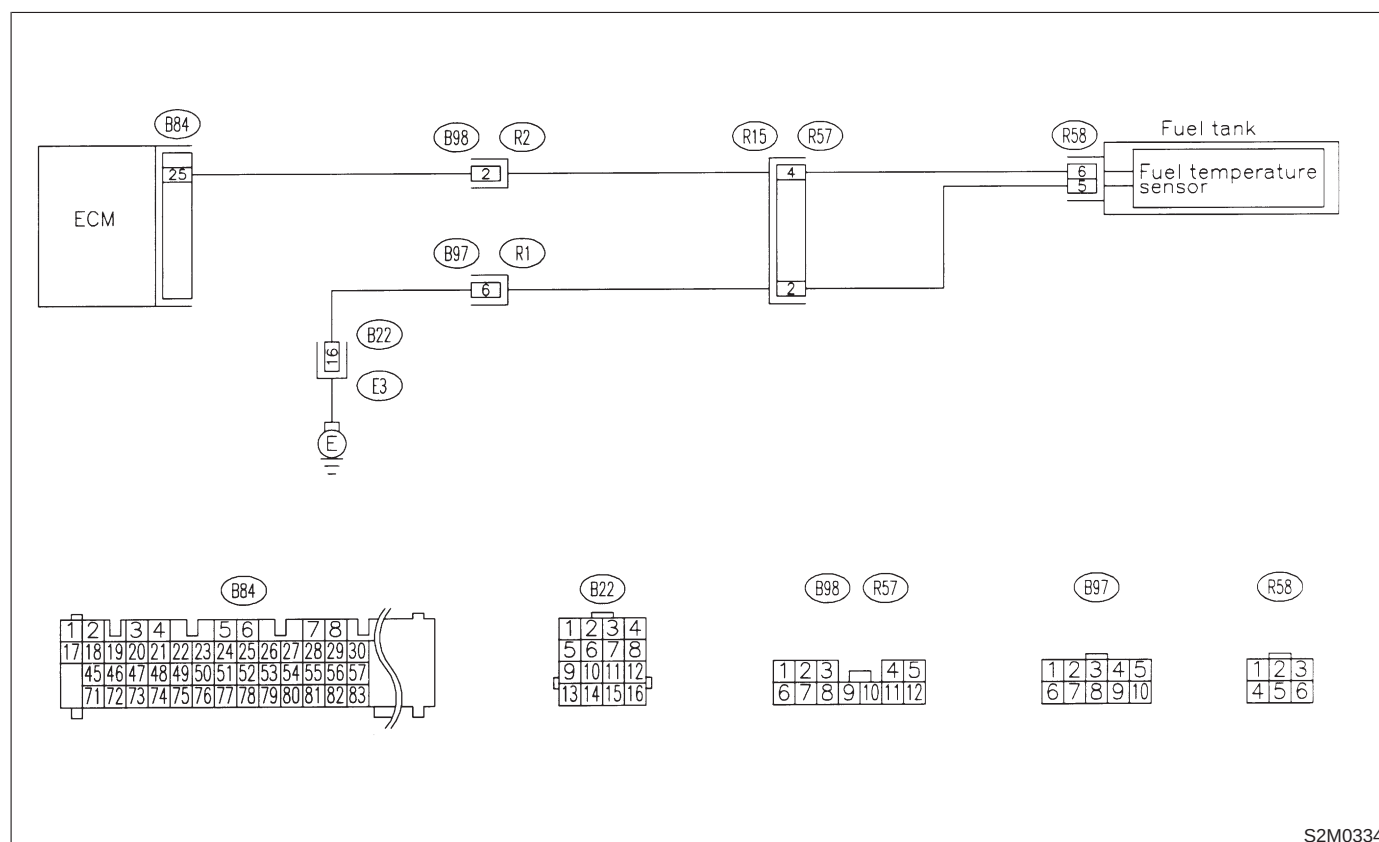
NO : Repair ground short circuit in harness between fuel pump and ECM connector.

W: DTC P0183 — FUEL TEMPERATURE SENSOR A CIRCUIT HIGH INPUT —● **DTC DETECTING CONDITION:**

- Immediately at fault recognition

CAUTION:

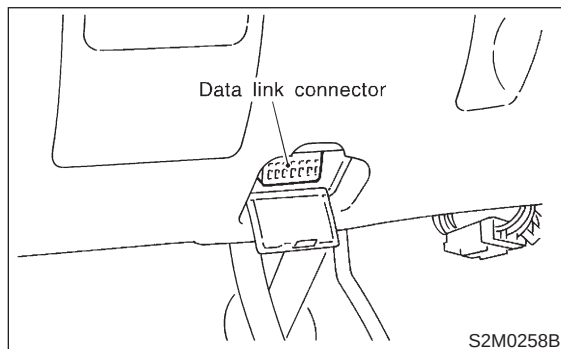
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0334

10W1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON and Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Start engine.
- 5) Read data of fuel temperature sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : **Is the value less than -40°C (-40°F)?**

YES : Go to step **10W2**.

NO : Repair poor contact.

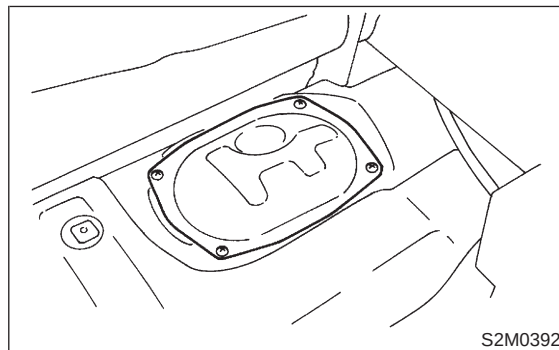
NOTE:

In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B22, B97, B98 and R57)

10W2 : CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

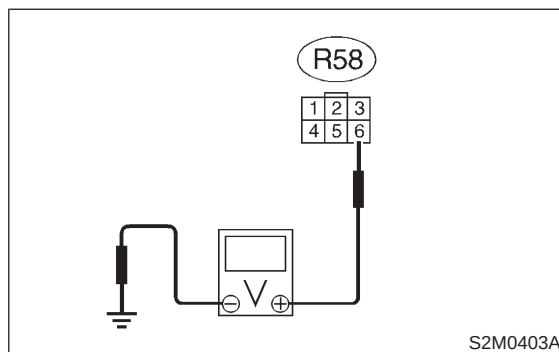
- 1) Turn ignition switch to OFF.
- 2) Remove access hole lid.



- 3) Disconnect connector from fuel pump.
- 4) Measure voltage between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 6 (+) — Chassis ground (-):



CHECK : **Is the voltage more than 10 V?**

YES : Repair battery short circuit in harness between ECM and fuel pump connector.

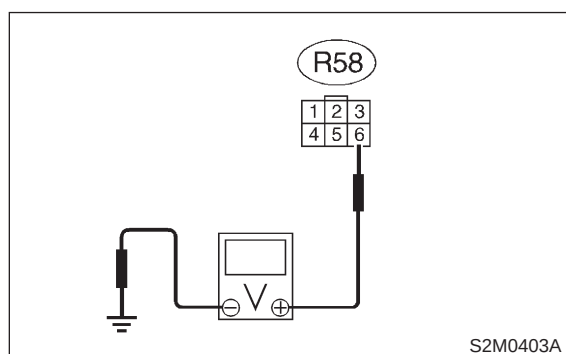
NO : Go to step **10W3**.

10W3 : CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 6 (+) — Chassis ground (-):



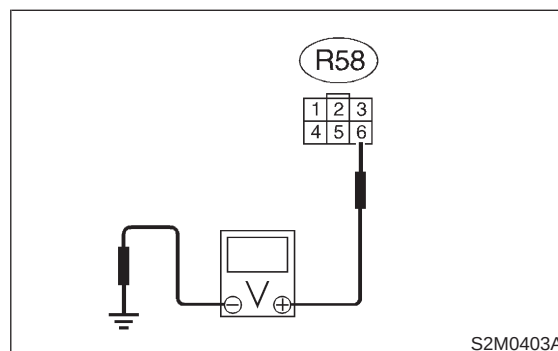
- CHECK** : **Is the voltage more than 10 V?**
- YES** : Repair battery short circuit in harness between ECM and fuel pump connector.
- NO** : Go to step **10W4**.

10W4 : CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

Measure voltage between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 2 (+) — Chassis ground (-):



- CHECK** : **Is the voltage more than 4 V?**
- YES** : Go to step **10W5**.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

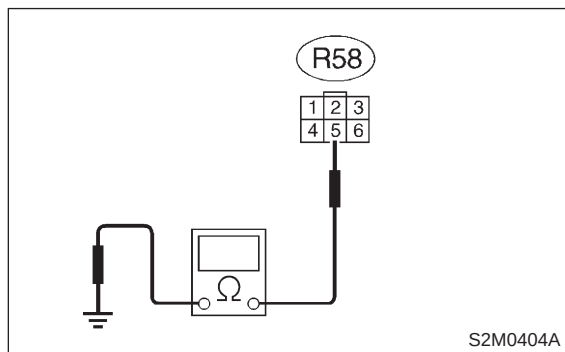
- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B98 and R57)

10W5 : CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 5 — Chassis ground:



CHECK : **Is the resistance less than 5 Ω ?**

YES : Replace fuel temperature sensor.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B22, B97 and R57)

X: DTC P0261 — FUEL INJECTOR CIRCUIT LOW INPUT - #1 —

NOTE:

For the diagnostic procedure, refer to 2-7 [T10AA1]. <Ref. to 2-7 [T10AA1].>

Y: DTC P0264 — FUEL INJECTOR CIRCUIT LOW INPUT - #2 —

NOTE:

For the diagnostic procedure, refer to 2-7 [T10AA1]. <Ref. to 2-7 [T10AA1].>

Z: DTC P0267 — FUEL INJECTOR CIRCUIT LOW INPUT - #3 —

NOTE:

For the diagnostic procedure, refer to 2-7 [T10AA1]. <Ref. to 2-7 [T10AA1].>

AA: DTC P0270 — FUEL INJECTOR CIRCUIT LOW INPUT - #4 —● **DTC DETECTING CONDITION:**

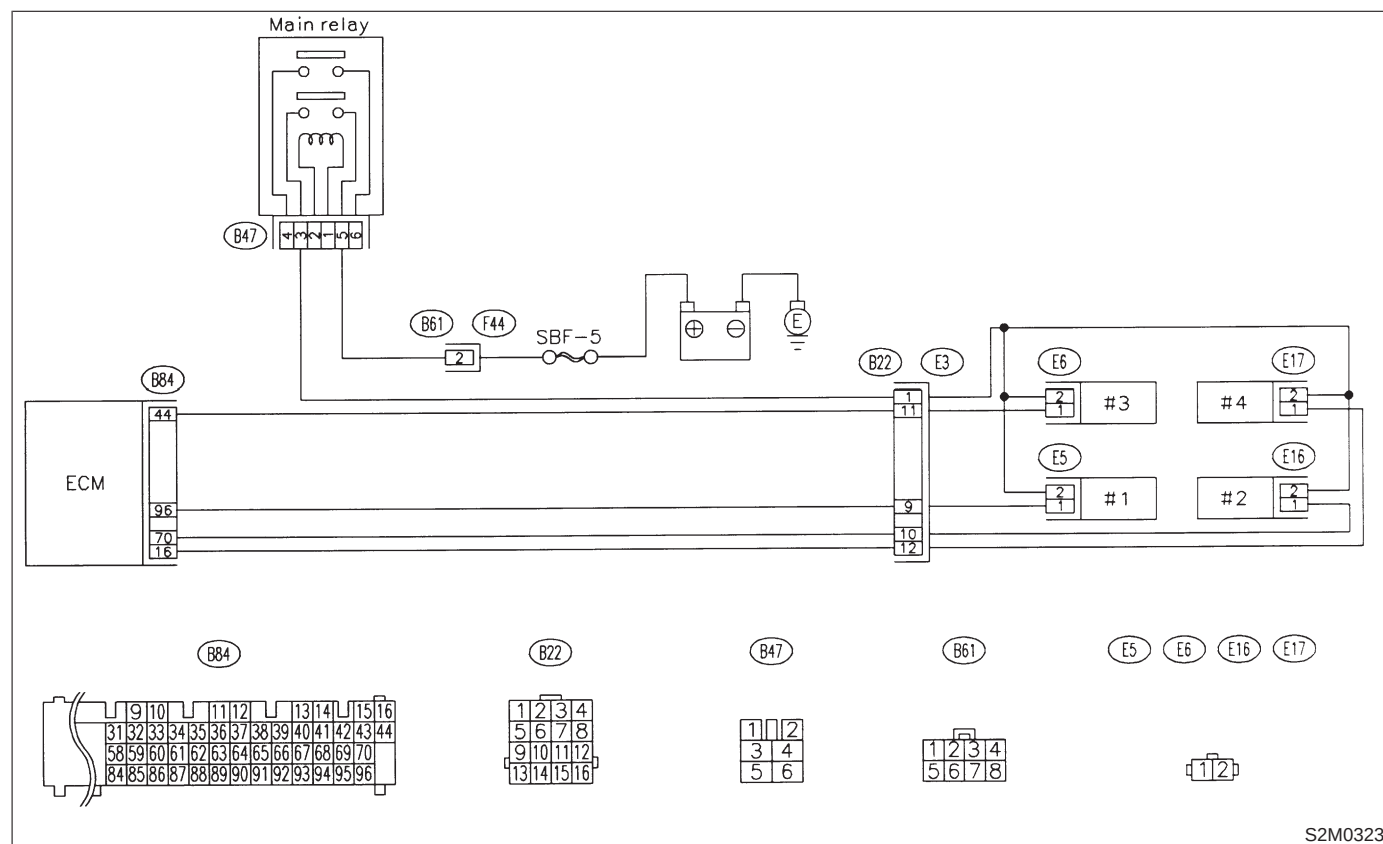
- Immediately at fault recognition

● **TROUBLE SYMPTOM:**

- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving

CAUTION:

- Check or repair only faulty cylinders.
- After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

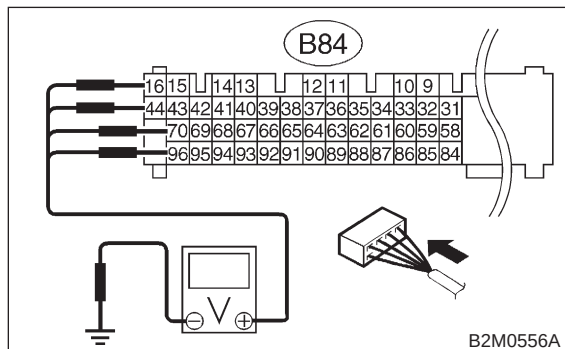
S2M0323

10AA1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM connector and chassis ground on faulty cylinders.

Connector & terminal

- #1 (B84) No. 96 (+) — Chassis ground (-):
- #2 (B84) No. 70 (+) — Chassis ground (-):
- #3 (B84) No. 44 (+) — Chassis ground (-):
- #4 (B84) No. 16 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 10AA2.
- NO** : Go to step 10AA3.

10AA2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in ECM connector?
- YES** : Repair poor contact in ECM connector.
- NO** : Contact with SOA service.

NOTE:

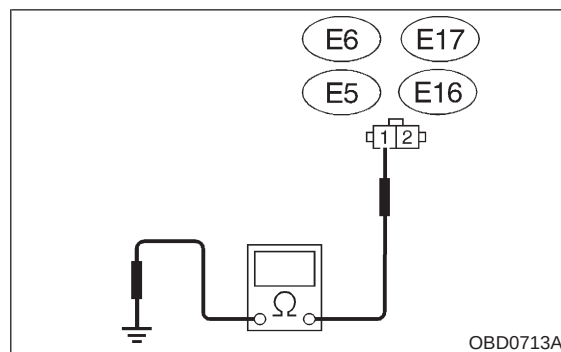
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10AA3 : CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel injector on faulty cylinders.
- 3) Measure voltage between ECM connector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 1 — Engine ground:
- #2 (E16) No. 1 — Engine ground:
- #3 (E6) No. 1 — Engine ground:
- #4 (E17) No. 1 — Engine ground:



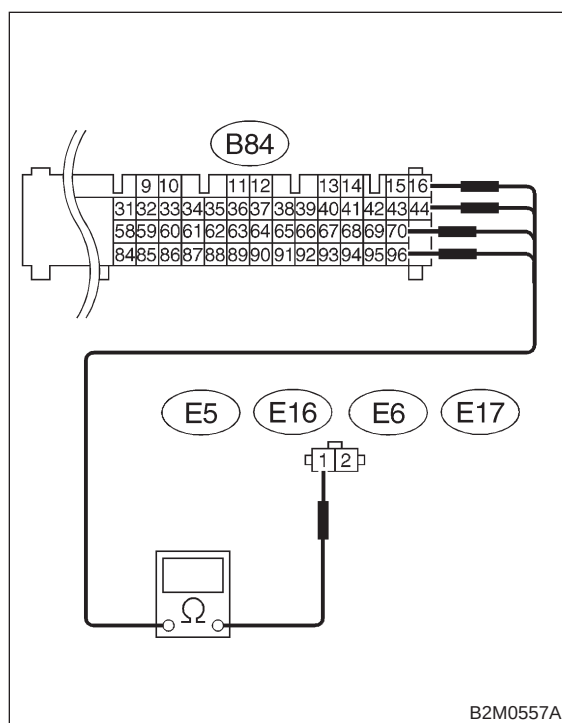
- CHECK** : Is the resistance less than 10 Ω?
- YES** : Repair ground short circuit in harness between fuel injector and ECM connector.
- NO** : Go to step 10AA4.

10AA4 : CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders.

Connector & terminal

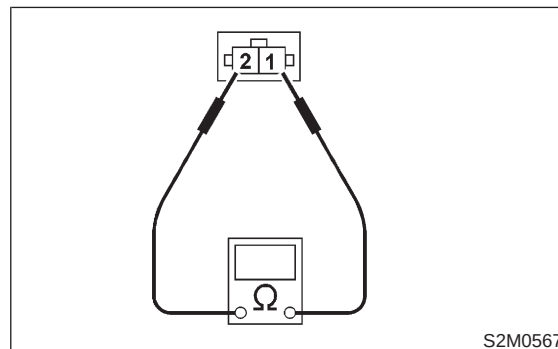
- #1 (B84) No. 96 — (E5) No. 1:
- #2 (B84) No. 70 — (E16) No. 1:
- #3 (B84) No. 44 — (E6) No. 1:
- #4 (B84) No. 16 — (E17) No. 1:


10AA5 : CHECK FUEL INJECTOR.

Measure resistance between fuel injector terminals on faulty cylinder.

Terminals

No. 1 — No. 2:



- CHECK** : *Is the resistance between 5 and 20 Ω?*
- YES** : Replace faulty fuel injector.
- NO** : Go to step **10AA6**.

- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **10AA5**.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

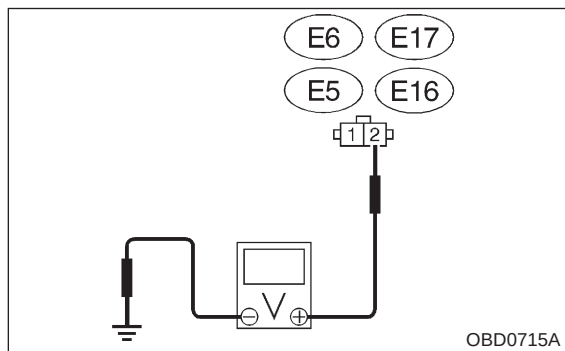
- Open circuit in harness between ECM and fuel injector connector
- Poor contact in coupling connector (B22)

10AA6 : CHECK POWER SUPPLY LINE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between fuel injector and engine ground on faulty cylinders.

Connector & terminal

- #1 (E5) No. 2 (+) — Engine ground (-):**
#2 (E16) No. 2 (+) — Engine ground (-):
#3 (E6) No. 2 (+) — Engine ground (-):
#4 (E17) No. 2 (+) — Engine ground (-):



- CHECK** : **Is the voltage more than 10 V?**
YES : Repair poor contact in all connectors in fuel injector circuit.
NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between main relay and fuel injector connector on faulty cylinders
- Poor contact in coupling connector (B22)
- Poor contact in main relay connector
- Poor contact in fuel injector connector on faulty cylinders

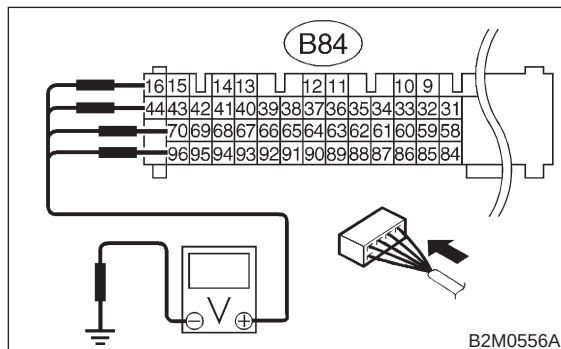
155

10AE1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM connector and chassis ground on faulty cylinders.

Connector & terminal

- #1 (B84) No. 96 (+) — Chassis ground (-):
 #2 (B84) No. 70 (+) — Chassis ground (-):
 #3 (B84) No. 44 (+) — Chassis ground (-):
 #4 (B84) No. 16 (+) — Chassis ground (-):



CHECK : Is the voltage more than 10 V?

YES : Go to step 10AE3.

NO : Go to step 10AE2.

10AE2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in ECM connector?

YES : Repair poor contact in ECM connector.

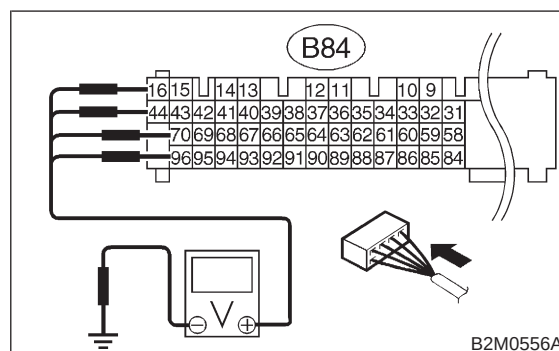
NO : Replace ECM.

10AE3 : CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel injector on faulty cylinder.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM connector and chassis ground on faulty cylinders.

Connector & terminal

- #1 (B84) No. 96 (+) — Chassis ground (-):
 #2 (B84) No. 70 (+) — Chassis ground (-):
 #3 (B84) No. 44 (+) — Chassis ground (-):
 #4 (B84) No. 16 (+) — Chassis ground (-):



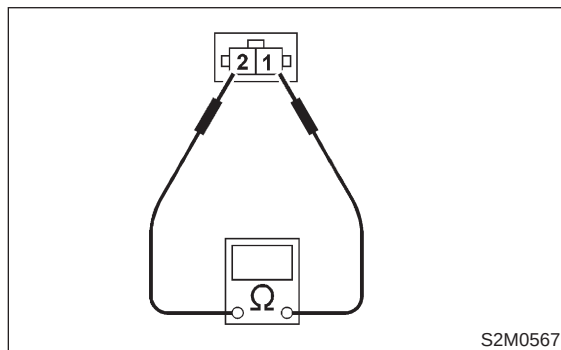
CHECK : Is the voltage more than 10 V?

YES : Repair battery short circuit in harness between ECM and fuel injector. After repair, replace ECM.

NO : Go to step 10AE4.

10AE4 : CHECK FUEL INJECTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between fuel injector terminals on faulty cylinder.

Terminals**No. 1 — No. 2:**

- CHECK** : ***Is the resistance less than 1 Ω ?***
- YES** : Replace faulty fuel injector and ECM.
- NO** : Go to step **10AE5**.

10AE5 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : ***Is there poor contact in ECM connector?***
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

AF: DTC P0301 — CYLINDER 1 MISFIRE DETECTED —**NOTE:**

For the diagnostic procedure, refer to 2-7 [T10AI1]. <Ref. to 2-7 [T10AI1].>

AG: DTC P0302 — CYLINDER 2 MISFIRE DETECTED —**NOTE:**

For the diagnostic procedure, refer to 2-7 [T10AI1]. <Ref. to 2-7 [T10AI1].>

AH: DTC P0303 — CYLINDER 3 MISFIRE DETECTED —**NOTE:**

For the diagnostic procedure, refer to 2-7 [T10AI1]. <Ref. to 2-7 [T10AI1].>

AI: DTC P0304 — CYLINDER 4 MISFIRE DETECTED —**• DTC DETECTING CONDITION:**

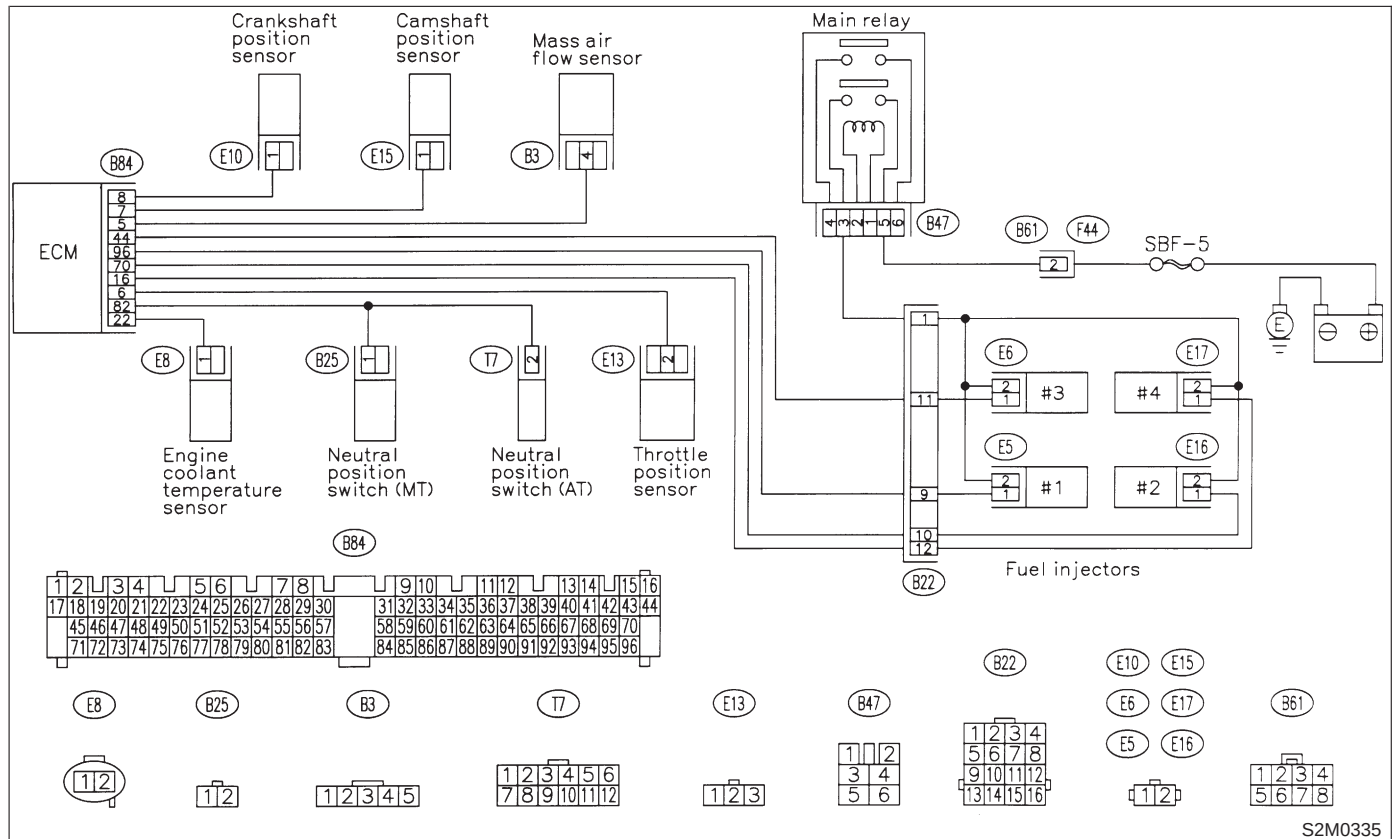
- Two consecutive driving cycles with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

• TROUBLE SYMPTOM:

- Engine stalls.
- Erroneous idling
- Rough driving

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0335

10A11 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 or P0271?

YES : Inspect DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 or P0271 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

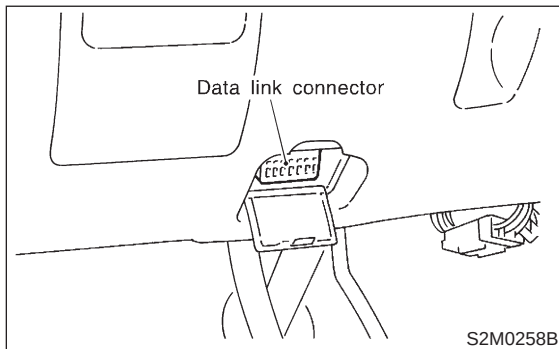
NOTE:

In this case, it is not necessary to inspect DTC P0301, P0302, P0303 and P0304.

NO : Go to step **10A12**.

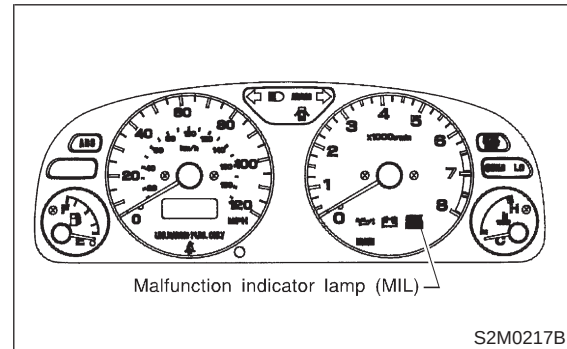
10A12 : CHECK STATUS OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to the data link connector.



- 3) Clear memory using Subaru Select Monitor. <Ref. to 2-7 [T3D0].>

- 4) Start engine, and drive the vehicle more than 10 minutes.



CHECK : Is the MIL coming on or blinking?

YES : Go to step **10A15**.

NO : Go to step **10A13**.

10A13 : CHECK AMOUNT OF FUEL.

CHECK : Has the vehicle been run empty of fuel?

YES : Finish diagnostics operation, if the engine has no abnormality.

NO : Go to step **10A14**.

10A14 : CHECK CAUSE OF MISFIRE DIAGNOSED.

CHECK : Was the cause of misfire diagnosed when the engine is running?

YES : Finish diagnostics operation, if the engine has no abnormality.

NOTE:

Ex. Remove spark plug cord, etc.

NO : Repair poor contact.

NOTE:

In this case, repair the following:

- Poor contact in ignitor connector
- Poor contact in ignition coil connector
- Poor contact in fuel injector connector on faulty cylinders
- Poor contact in ECM connector
- Poor contact in coupling connector (B22)

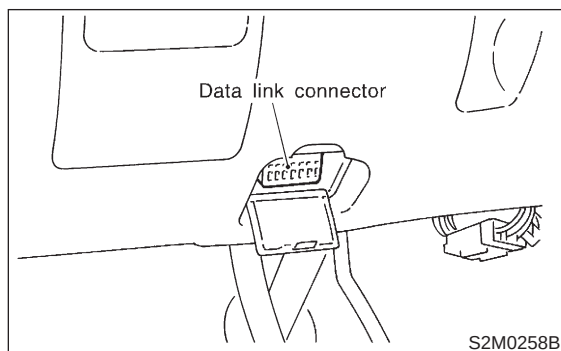
10AI5 : CHECK AIR INTAKE SYSTEM.**CHECK** : *Is there a fault in air intake system?***YES** : Repair air intake system.**NOTE:**

Check the following items:

- Are there air leaks or air suction caused by loose or dislocated nuts and bolts?
- Are there cracks or any disconnection of hoses?

NO : Go to step **10AI6**.**10AI6 : CHECK MISFIRE SYMPTOM.**

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch to ON, and turn Subaru Select Monitor or OBD-II general scan tool switch to ON.

- 4) Read diagnostic trouble code (DTC).

- Subaru Select Monitor

<Ref. to 2-7 [T3C2].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.

NOTE:

Perform diagnosis according to the items listed below.

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate only one DTC?***YES** : Go to step **10AI11**.**NO** : Go to step **10AI7**.**10AI7 : CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.****CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0301 and P0302?***YES** : Go to step **10AI12**.**NO** : Go to step **10AI8**.**10AI8 : CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.****CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0303 and P0304?***YES** : Go to step **10AI13**.**NO** : Go to step **10AI9**.**10AI9 : CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.****CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0301 and P0303?***YES** : Go to step **10AI14**.**NO** : Go to step **10AI10**.**10AI10 : CHECK DIAGNOSTIC TROUBLE CODE (DTC) ON DISPLAY.****CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0302 and P0304?***YES** : Go to step **10AI15**.**NO** : Go to step **10AI16**.**10AI11 : ONLY ONE CYLINDER****CHECK** : *Is there a fault in that cylinder?***YES** : Repair or replace faulty parts.**NOTE:**

Check the following items.

- Spark plug
- Spark plug cord
- Fuel injector
- Compression ratio

NO : Go to step **10AI17**.

10AI12 : GROUP OF #1 AND #2 CYLINDERS

CHECK : *Are there faults in #1 and #2 cylinders?*

YES : Repair or replace faulty parts.

NOTE:

- Check the following items.
 - Spark plugs
 - Fuel injectors
 - Ignition coil
- If no abnormal is discovered, check for "8. D: IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <Ref. to 2-7 [T8D0].>

NO : Go to step **10AI17**.

10AI13 : GROUP OF #3 AND #4 CYLINDERS

CHECK : *Are there faults in #3 and #4 cylinders?*

YES : Repair or replace faulty parts.

NOTE:

- Check the following items.
 - Spark plugs
 - Fuel injectors
 - Ignition coil
- If no abnormal is discovered, check for "8. D: IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to 2-7 [T8D0].>

NO : Go to step **10AI17**.

10AI14 : GROUP OF #1 AND #3 CYLINDERS

CHECK : *Are there faults in #1 and #3 cylinders?*

YES : Repair or replace faulty parts.

NOTE:

Check the following items.

- Spark plugs
- Fuel injectors
- Skipping timing belt teeth

NO : Go to step **10AI17**.

10AI15 : GROUP OF #2 AND #4 CYLINDERS

CHECK : *Are there faults in #2 and #4 cylinders?*

YES : Repair or replace faulty parts.

NOTE:

Check the following items.

- Spark plugs
- Fuel injectors
- Skipping timing belt teeth

NO : Go to step **10AI17**.

10AI16 : THE CYLINDER AT RANDOM

CHECK : *Is the engine idle rough?*

YES : Go to step **10AI17**.

NO : Go to DTC P0170. <Ref. to 2-7 [T10T3], [T10T4] and [T10T5].>

10A117 : PERFORM CONFIRMATION OF ACTUAL DRIVING PATTERN.

- 1) Conduct CLEAR MEMORY and INSPECTION MODE. <Ref. to 2-7 [T3D0] and [T3E0].>
- 2) Start and warm-up the engine until the radiator fan makes one complete rotation. (All accessory switches are OFF.)
- 3) Turn Subaru select monitor switch to ON.
- 4) Operate the LED operation mode for engine.
 - (1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - (2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
 - (3) Press the [YES] key after displayed the information of engine type.
 - (4) On the 「EGI/EMPI Diagnosis」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.
 - (5) On the 「Data Display Menu」 display screen, select the {2. 6 Data & LED Display} and press the [YES] key.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

- 5) Run at the speed of 88±5 km/h (55±3 MPH) until the LED of {EGR System Diagnosis} comes on.

NOTE:

- Keep the throttle valve opening at the same degree, since diagnosis will be interrupted when the opening varies. Diagnosis starts in 190 seconds after starting engine and takes 4 seconds.
- Put the gear to "5th" gear position (MT) or "D" range (AT) for the diagnosis.

CHECK : **Has the LED come on?**

YES : Go to step **10A118**.

NO : Go to step **10A117**.

10A118 : CHECK EGR SYSTEM.

- 1) Put up the vehicle.
- 2) Read data of maximum and minimum EGR system pressure using Subaru Select Monitor.
 - (1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.
 - (2) On the 「System Selection Menu」 display screen, select the {EGI/EMPI} and press the [YES] key.
 - (3) On the [YES] key after displayed the information of engine type.
 - (4) On the 「EGI/EMPI Diagnosis」 display screen, select the {5. Display of Diagnosis} and press the [YES] key.
 - (5) On the 「Display of Diagnosis」 display screen, select the {EGR System Diagnosis} and press the [YES] key.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

CHECK : **Is the minimum EGR system pressure value less than 1 kPa?**

YES : Clean EGR valve.

CAUTION:

Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.

NOTE:

- Remove and blow away the exhaust deposits. Make sure the valve operates smoothly and the valve seat area is completely cleaned.
- Replace EGR valve as required.

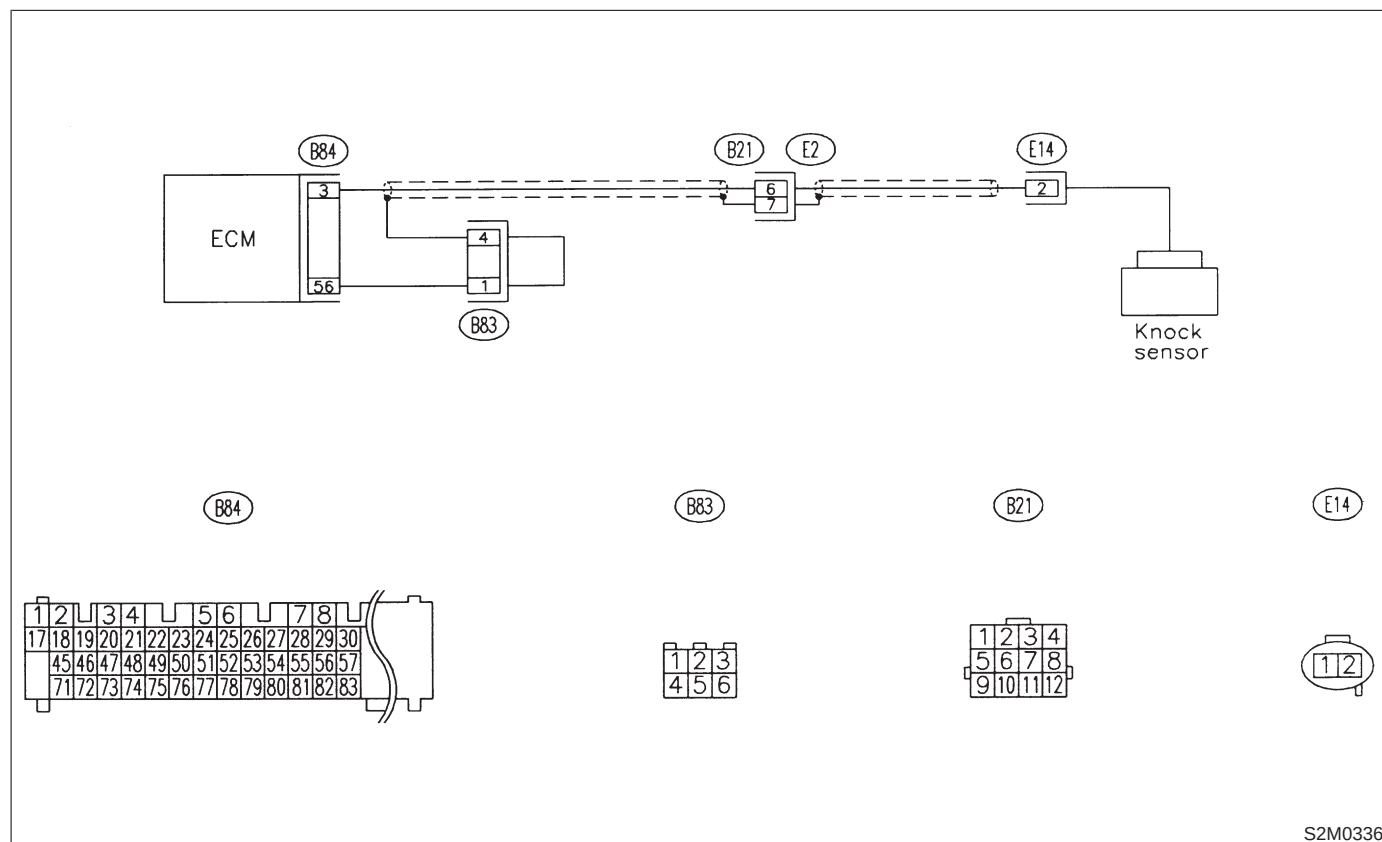
NO : Go to DTC P0170. <Ref. to 2-7 [T10T3], [T10T4] and [T10T5].>

AJ: DTC P0325 — KNOCK SENSOR CIRCUIT MALFUNCTION —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Poor driving performance
 - Knocking occurs.

CAUTION:

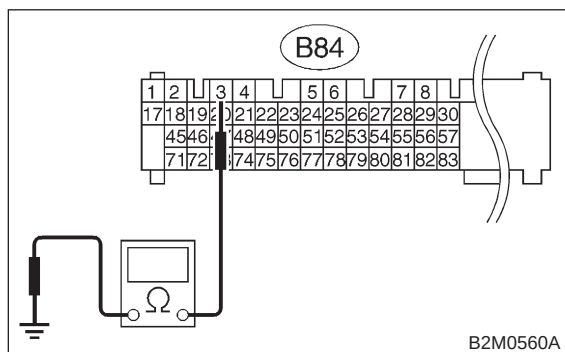
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0336

10AJ1 : CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.

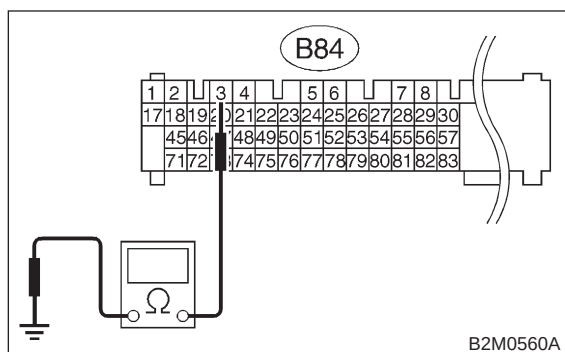
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal
(B84) No. 3 — Chassis ground:


- CHECK** : Is the resistance more than 700 k Ω ?
- YES** : Go to step 10AJ3.
- NO** : Go to step 10AJ2.

10AJ2 : CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.

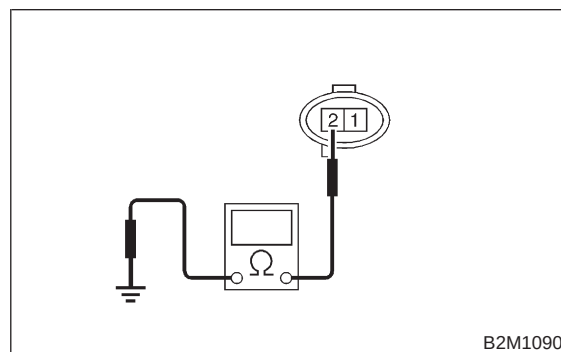
Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal
(B84) No. 3 — Chassis ground:


- CHECK** : Is the resistance less than 400 k Ω ?
- YES** : Go to step 10AJ5.
- NO** : Go to step 10AJ6.

10AJ3 : CHECK KNOCK SENSOR.

- 1) Disconnect connector from knock sensor.
- 2) Measure resistance between knock sensor connector terminal and engine ground.

Terminal
No. 2 — Engine ground:


- CHECK** : Is the resistance more than 700 k Ω ?
- YES** : Go to step 10AJ4.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

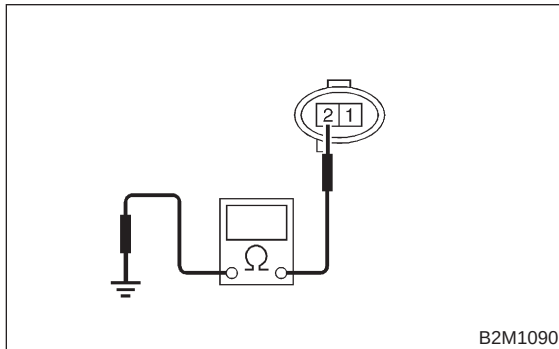
- Open circuit in harness between knock sensor and ECM connector
- Poor contact in knock sensor connector
- Poor contact in coupling connector (B21)

10AJ4 : CHECK CONDITION OF KNOCK SENSOR INSTALLATION.

- CHECK** : Is the knock sensor installation bolt tightened securely?
- YES** : Replace knock sensor.
- NO** : Tighten knock sensor installation bolt securely.

10AJ5 : CHECK KNOCK SENSOR.

- 1) Disconnect connector from knock sensor.
- 2) Measure resistance between knock sensor connector terminal and engine ground.

Terminal**No. 2 — Engine ground:**

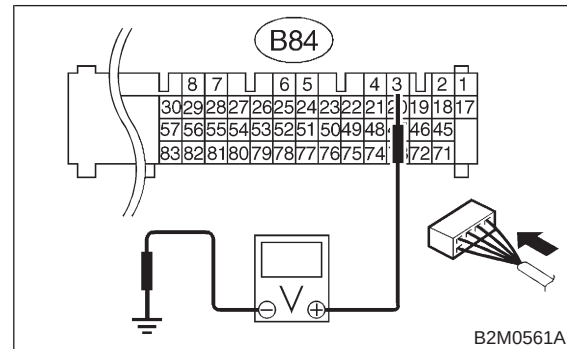
- CHECK** : **Is the resistance less than 400 kΩ?**
- YES** : Replace knock sensor.
- NO** : Repair ground short circuit in harness between knock sensor connector and ECM connector.

NOTE:

The harness between both connectors is shielded.
Repair short circuit of harness together with shield.

10AJ6 : CHECK INPUT SIGNAL FOR ECM.

- 1) Connect connector to ECM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 3 (+) — Chassis ground (-):**

- CHECK** : **Is the voltage more than 2 V?**
- YES** : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

NOTE:

In this case, repair the following:

- Poor contact in knock sensor connector
 - Poor contact in ECM connector
 - Poor contact in coupling connector (B21)
- NO** : Repair poor contact in ECM connector.

AK: DTC P0335 — CRANKSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —

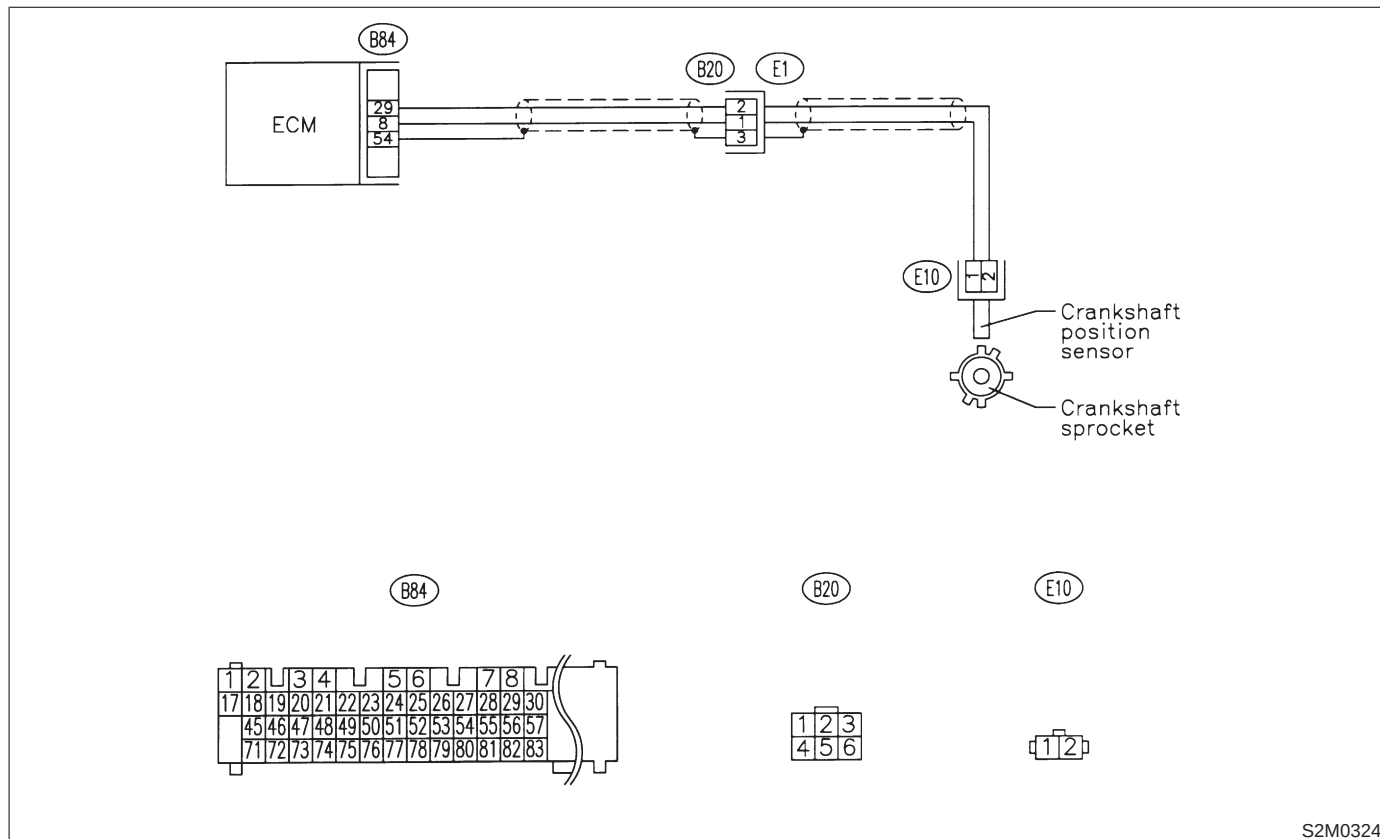
- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:

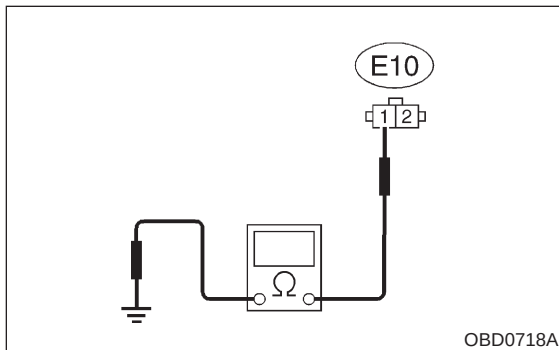


10AK1 : CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from crankshaft position sensor.
- 3) Measure resistance of harness between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 — Engine ground:



CHECK : **Is the resistance more than 100 kΩ?**

YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

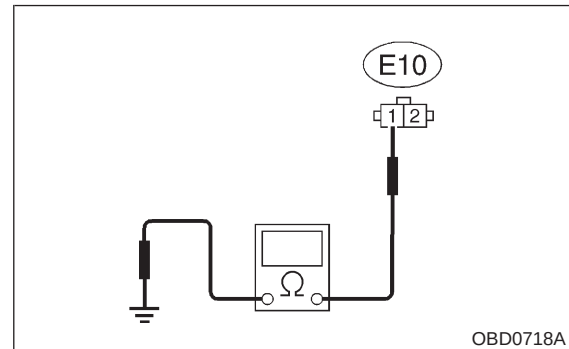
NO : Go to step **10AK2**.

10AK2 : CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.

Measure resistance of harness between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 1 — Engine ground:



CHECK : **Is the resistance less than 10 Ω?**

YES : Repair ground short circuit in harness between crankshaft position sensor and ECM connector.

NOTE:

The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.

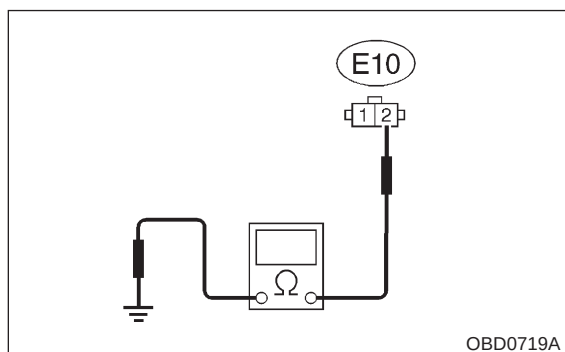
NO : Go to step **10AK3**.

10AK3 : CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.

Measure resistance of harness between crankshaft position sensor connector and engine ground.

Connector & terminal

(E10) No. 2 — Engine ground:



CHECK : *Is the resistance less than 5 Ω ?*

YES : Go to step **10AK4**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

10AK4 : CHECK CONDITION OF CRANKSHAFT POSITION SENSOR INSTALLATION.

CHECK : *Is the crankshaft position sensor installation bolt tightened securely?*

YES : Go to step **10AK5**.

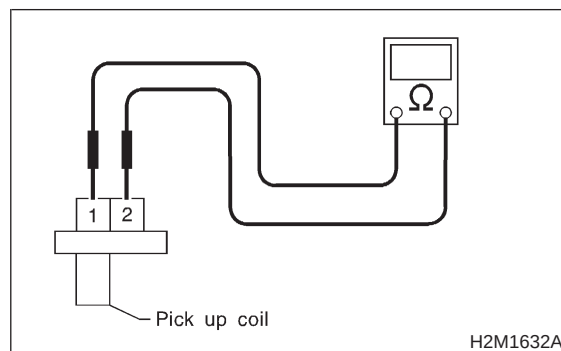
NO : Tighten crankshaft position sensor installation bolt securely.

10AK5 : CHECK OF CRANKSHAFT POSITION SENSOR.

- 1) Remove crankshaft position sensor.
- 2) Measure resistance between connector terminals of crankshaft position sensor.

Terminals

No. 1 — No. 2:



CHECK : *Is the resistance between 1 and 4 $k\Omega$?*

YES : Repair poor contact in crankshaft position sensor connector.

NO : Replace crankshaft position sensor.

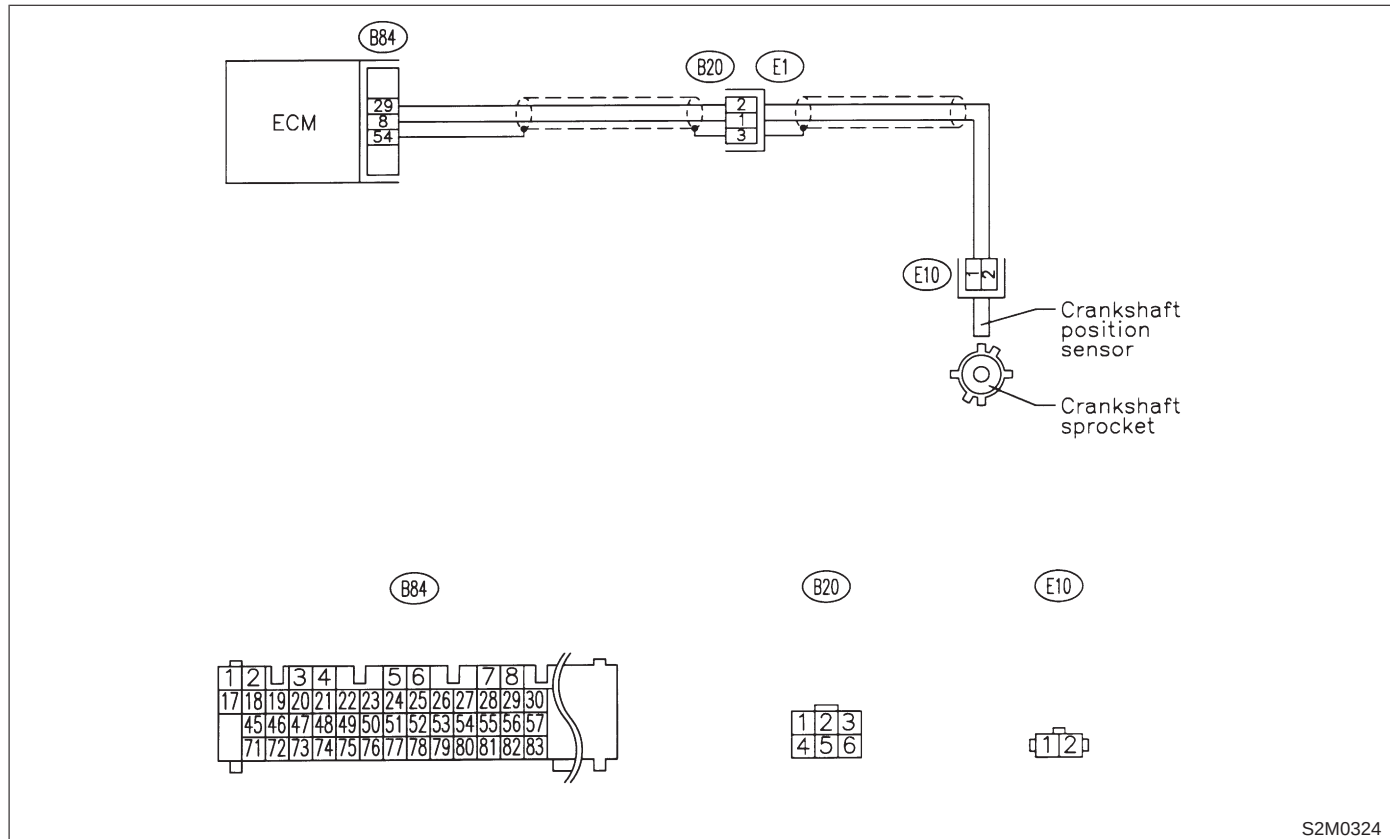
AL: DTC P0336 — CRANKSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



S2M0324

10AL1 : CHECK ANY OTHER DTC ON DISPLAY.

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0335?
- YES** : Inspect DTC P0335 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Replace crankshaft position sensor.

AM: DTC P0340 — CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION● **DTC DETECTING CONDITION:**

- Immediately at fault recognition

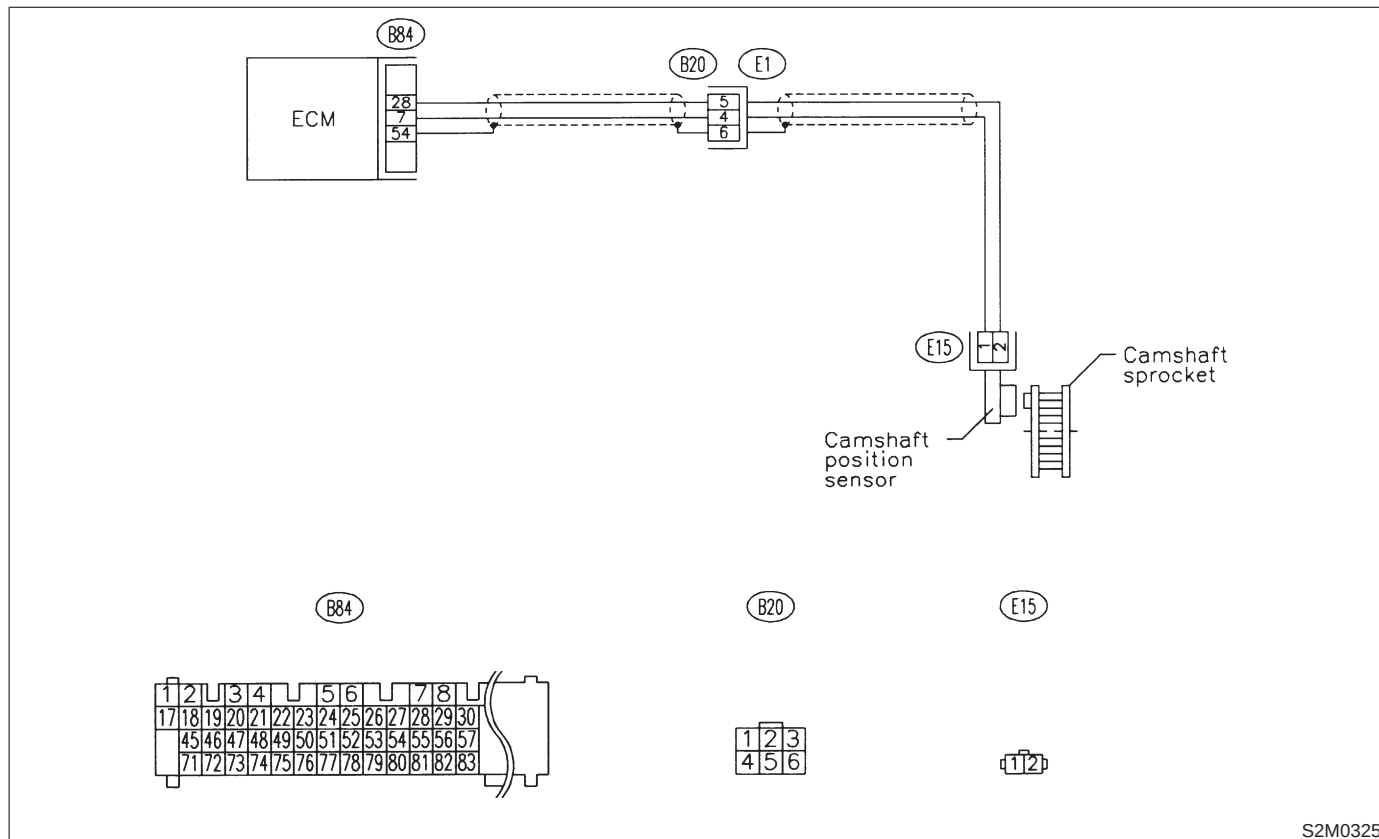
● **TROUBLE SYMPTOM:**

- Engine stalls.
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

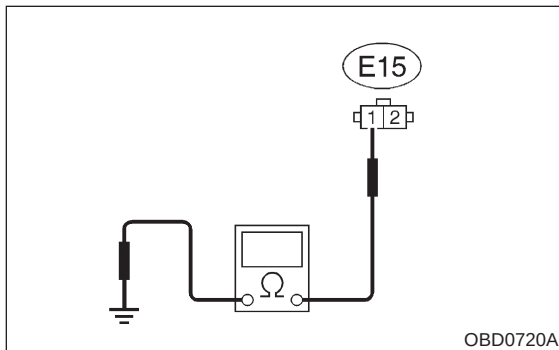
<Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0325

10AM1 : CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from camshaft position sensor.
- 3) Measure resistance of harness between camshaft position sensor connector and engine ground.

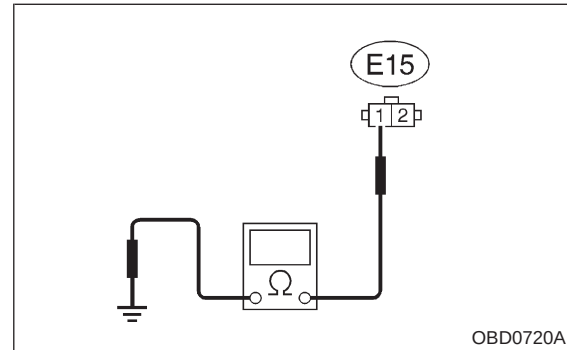
Connector & terminal
(E15) No. 1 — Engine ground:

CHECK : Is the resistance more than 100 kΩ?
YES : Repair harness and connector.
NOTE:

In this case, repair the following:

- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

NO : Go to step 10AM2.
10AM2 : CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.

Measure resistance of harness between camshaft position sensor connector and engine ground.

Connector & terminal
(E15) No. 1 — Engine ground:

CHECK : Is the resistance less than 10 Ω?
YES : Repair ground short circuit in harness between camshaft position sensor and ECM connector.
NOTE:

The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.

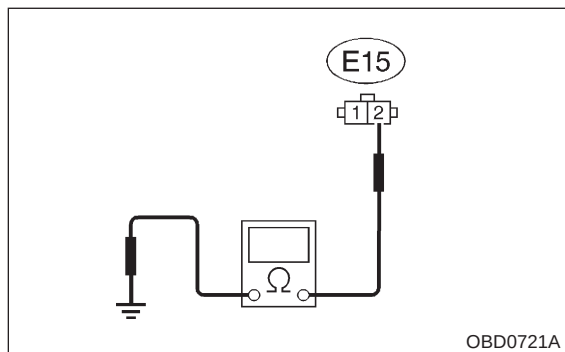
NO : Go to step 10AM3.

10AM3 : CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.

Measure resistance of harness between camshaft position sensor connector and engine ground.

Connector & terminal

(E15) No. 2 — Engine ground:



CHECK : *Is the resistance less than 5 Ω ?*

YES : Go to step **10AM4**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

10AM4 : CHECK CONDITION OF CAMSHAFT POSITION SENSOR INSTALLATION.

CHECK : *Is the camshaft position sensor installation bolt tightened securely?*

YES : Go to step **10AM5**.

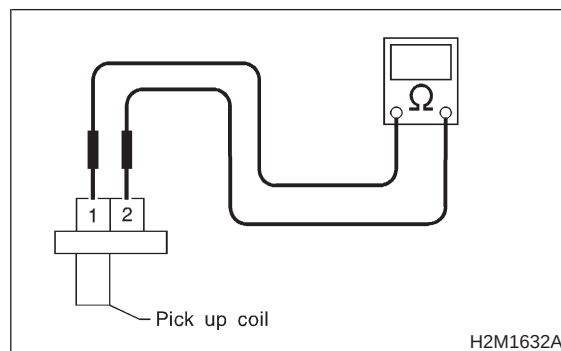
NO : Tighten camshaft position sensor installation bolt securely.

10AM5 : CHECK CAMSHAFT POSITION SENSOR.

- 1) Remove camshaft position sensor.
- 2) Measure resistance between connector terminals of camshaft position sensor.

Terminals

No. 1 — No. 2:



CHECK : *Is the resistance between 1 and 4 $k\Omega$?*

YES : Repair poor contact in camshaft position sensor connector.

NO : Replace camshaft position sensor.

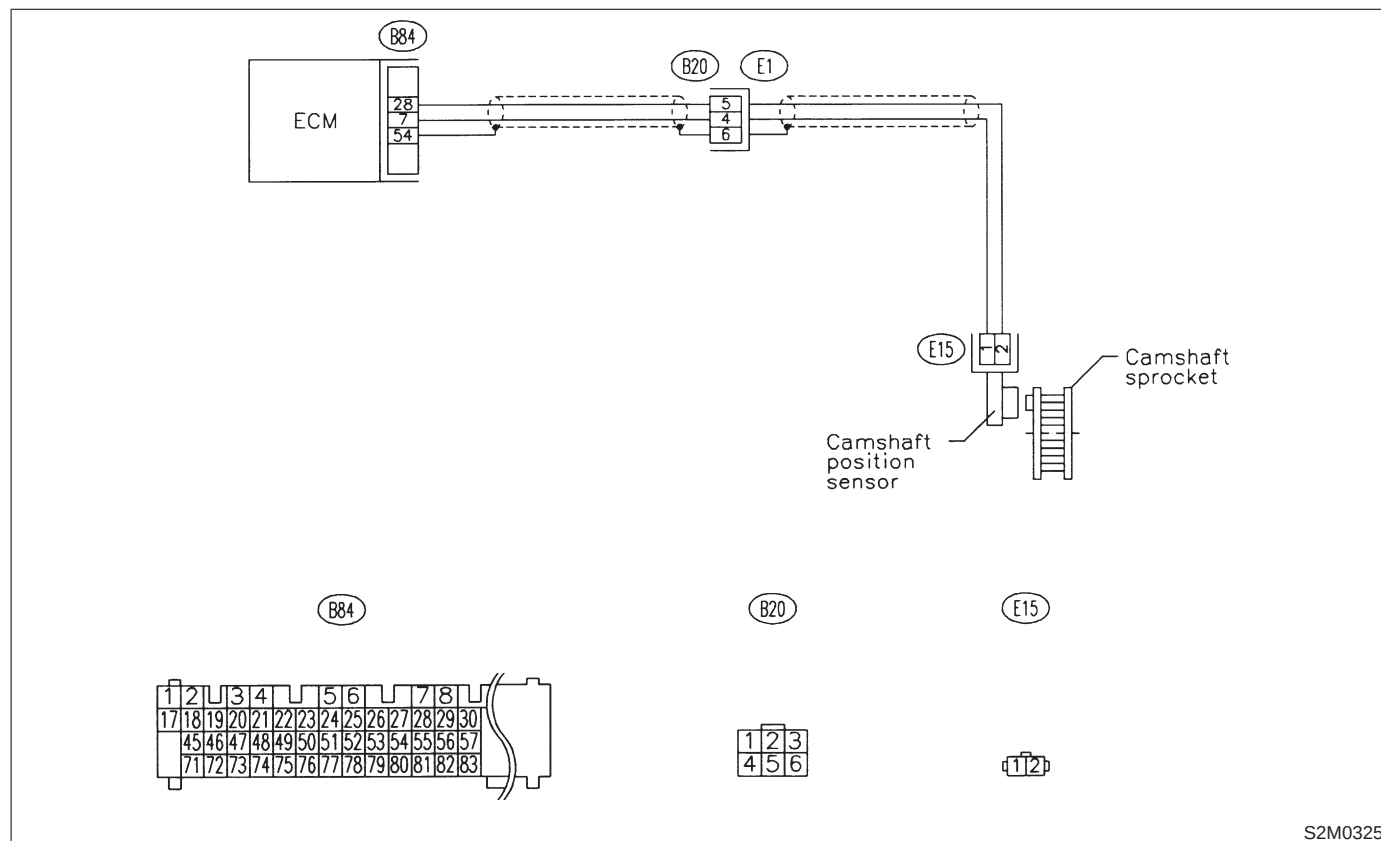
AN: DTC P0341 — CAMSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition
- **TROUBLE SYMPTOM:**
 - Engine stalls.
 - Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



AO: DTC P0400 — EXHAUST GAS RECIRCULATION FLOW MALFUNCTION**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

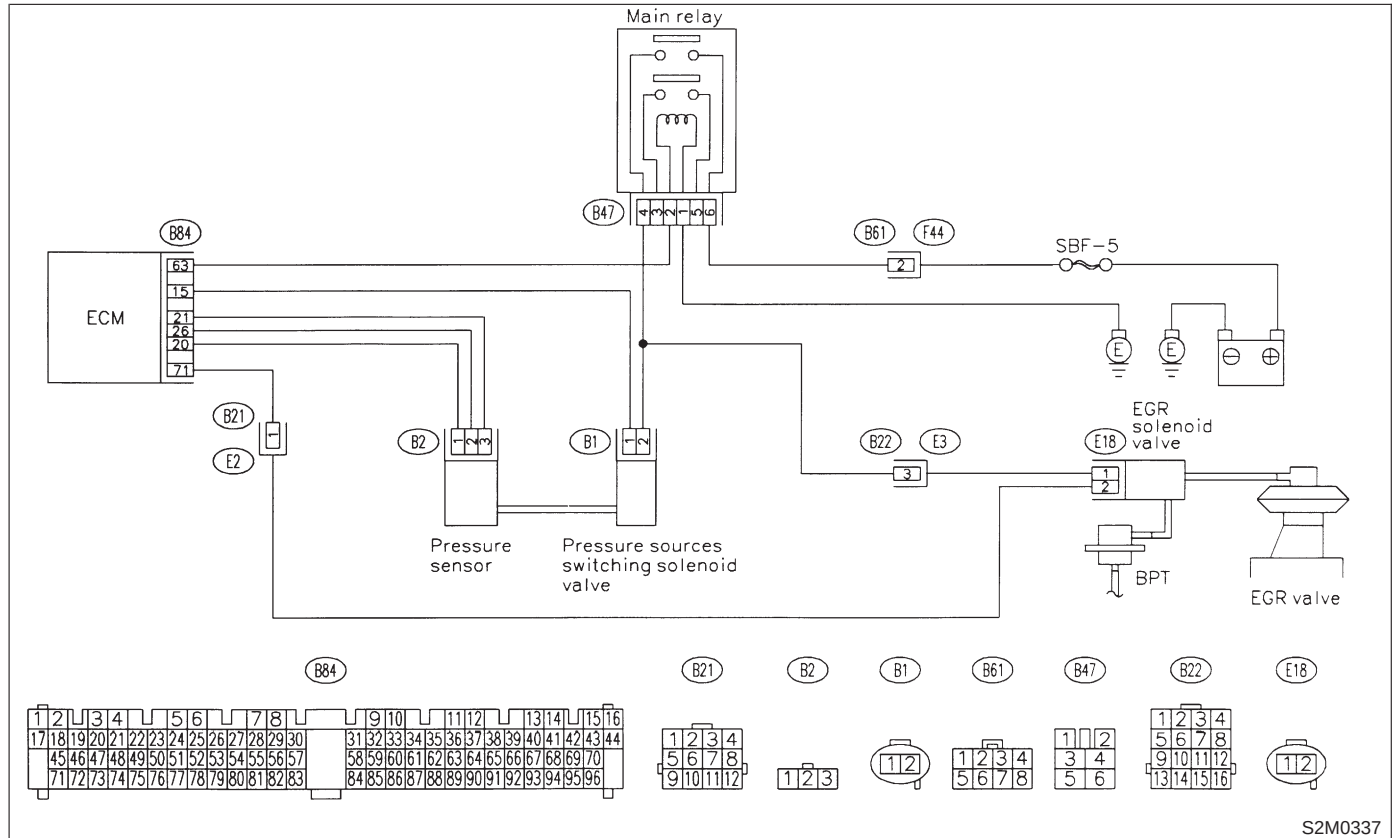
• TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

CAUTION:

Before confirmation of actual driving pattern, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0337

10A01 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P0403, P1102, P1122 or P1421?*

YES : ● Inspect DTC P0106, P0107, P0108, P0403, P1102, P1122 or P1421 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
● Manually check that EGR valve diaphragm is not stuck.

WARNING:

Be careful when checking EGR valve, since it may be extremely hot.

NOTE:

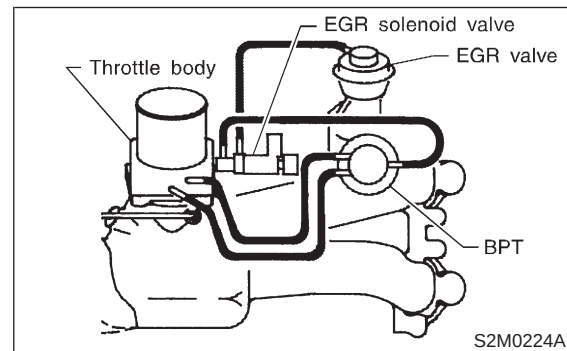
In this case, it is not necessary to inspect DTC P0400. After checking the above item, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**. <Ref. to 2-7 [T10A06].>

NO : Go to step **10A02**.

10A02 : CHECK VACUUM LINE.

Check the following items.

- Disconnection, leakage and clogging of the two vacuum hoses and pipes between throttle body and BPT
- Disconnection, leakage and clogging of the vacuum hose and pipe between EGR solenoid valve and BPT
- Disconnection, leakage and clogging of the vacuum hose between EGR solenoid valve and EGR valve
- Disconnection, leakage and clogging of BPT pressure transmitting hose



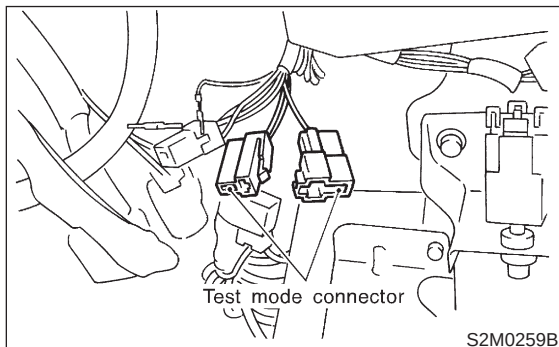
CHECK : *Is there a fault in vacuum line?*

YES : Repair or replace hoses and pipes. And after the checking and repairing, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**. <Ref. to 2-7 [T10A06].>

NO : Go to step **10A03**.

10A03 : CHECK OPERATION OF EGR SYSTEM.

- 1) Turn ignition switch to OFF.
- 2) Connect the test mode connector.



- 3) Turn ignition switch to ON.

NOTE:

EGR control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

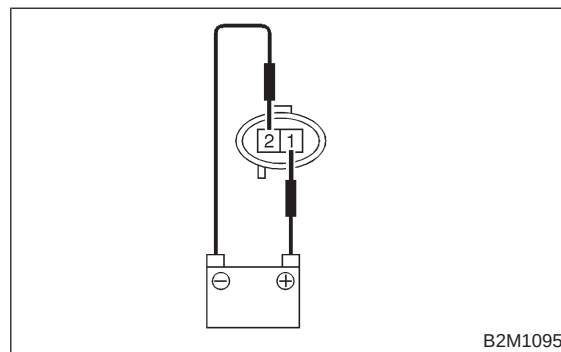
- (CHECK)** : ***Does EGR solenoid valve produce operating sound?***
- (YES)** : Go to step **10A04**.
- (NO)** : Replace EGR solenoid valve.

10A04 : CHECK EGR VALVE.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from EGR solenoid valve.
- 3) Connect 12 V battery's ground (–) terminal to one terminal of the EGR solenoid valve. Then connect 12 V battery's (0+) terminal to the other terminal of it.

CAUTION:

Do not use the 12 V battery installed in the vehicle, because the electrical system may be damaged.



- 4) Start the engine.

- (CHECK)** : ***Does EGR valve operate at a throttle valve opening of 5 to 10 degrees with visually check?***
- (YES)** : Possibly EGR valve malfunction may be due to freezing or clogging by foreign matter. At this point in time do not replace EGR valve, since it is not faulty. And after the checking, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**. <Ref. to 2-7 [T10A06].>

NOTE:

If malfunction is detected again in the confirmation of actual driving pattern, EGR valve is faulty. Go to step **10A05**.

- (NO)** : Go to step **10A05**.

10A05 : CHECK MECHANICAL TROUBLE.

Turn ignition switch to OFF.

CHECK : *Is there clogging in the gas outlets of intake manifold or cylinder head, checking by breathing into the outlets?*

YES : Repair or replace intake manifold or cylinder head. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**. <Ref. to 2-7 [T10A06].>

NO : Clean EGR valve. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**. <Ref. to 2-7 [T10A06].>

CAUTION:

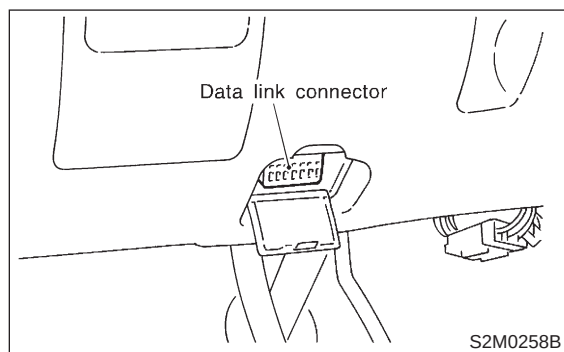
Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.

NOTE:

- Remove and blow away the exhaust deposits. Make sure the valve operates smoothly and the valve seat area is completely cleaned.
- Replace EGR valve as required.

10A06 : CONFIRMATION OF ACTUAL DRIVING PATTERN.

1) Connect Subaru select monitor to its data link connector.



2) Conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>

3) Start and warm-up the engine until the radiator fan makes one complete rotation. (All accessory switches are OFF.)

4) Turn Subaru select monitor switch to ON.

5) Operate the LED operation mode for engine.

(1) On the 「Main Menu」 display screen, select the {2. Each System Check} and press the [YES] key.

(2) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.

(3) Press the [YES] key after displayed the information of engine type.

(4) On the 「EGI/EMPI Diagnosis」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.

(5) On the 「Data Display Menu」 display screen, select the {2. 6 Data & LED Display} and press the [YES] key.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

6) Run at the speed of 88±5 km/h (55±3 MPH) until the LED of {EGR System Diagnosis} comes on.

NOTE:

- Keep the throttle valve opening at the same degree, since diagnosis will be interrupted when the opening varies. Diagnosis starts in 190 seconds after starting engine and takes 4 seconds.
- Put the gear to “5th” gear position (MT) or “D” range (AT) for the diagnosis.

7) Read DTC using Subaru select monitor.

(1) On the 「Main Menu」 display screen, select the {2. Check of Each System} and press the [YES] key.

(2) On the 「System Selection Menu」 display screen, select the {EGI/EMPi} and press the [YES] key.

(3) Press the [YES] key after displayed the information of engine type.

(4) On the 「EGI/EMPI Diagnosis」 display screen, select the {7. OBD System} and press the [YES] key.

(5) On the 「OBD Menu」 display screen, select the {6. Temporary code inspect} and press the [YES] key.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

8) Confirm the “No Temporary Diagnostic Code” indication on Subaru select monitor.

CHECK : *Does the Subaru select monitor indicate any other DTC on display?*

YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>

NO : End of diagnosis.

AP: DTC P0403 — EXHAUST GAS RECIRCULATION CIRCUIT LOW INPUT —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

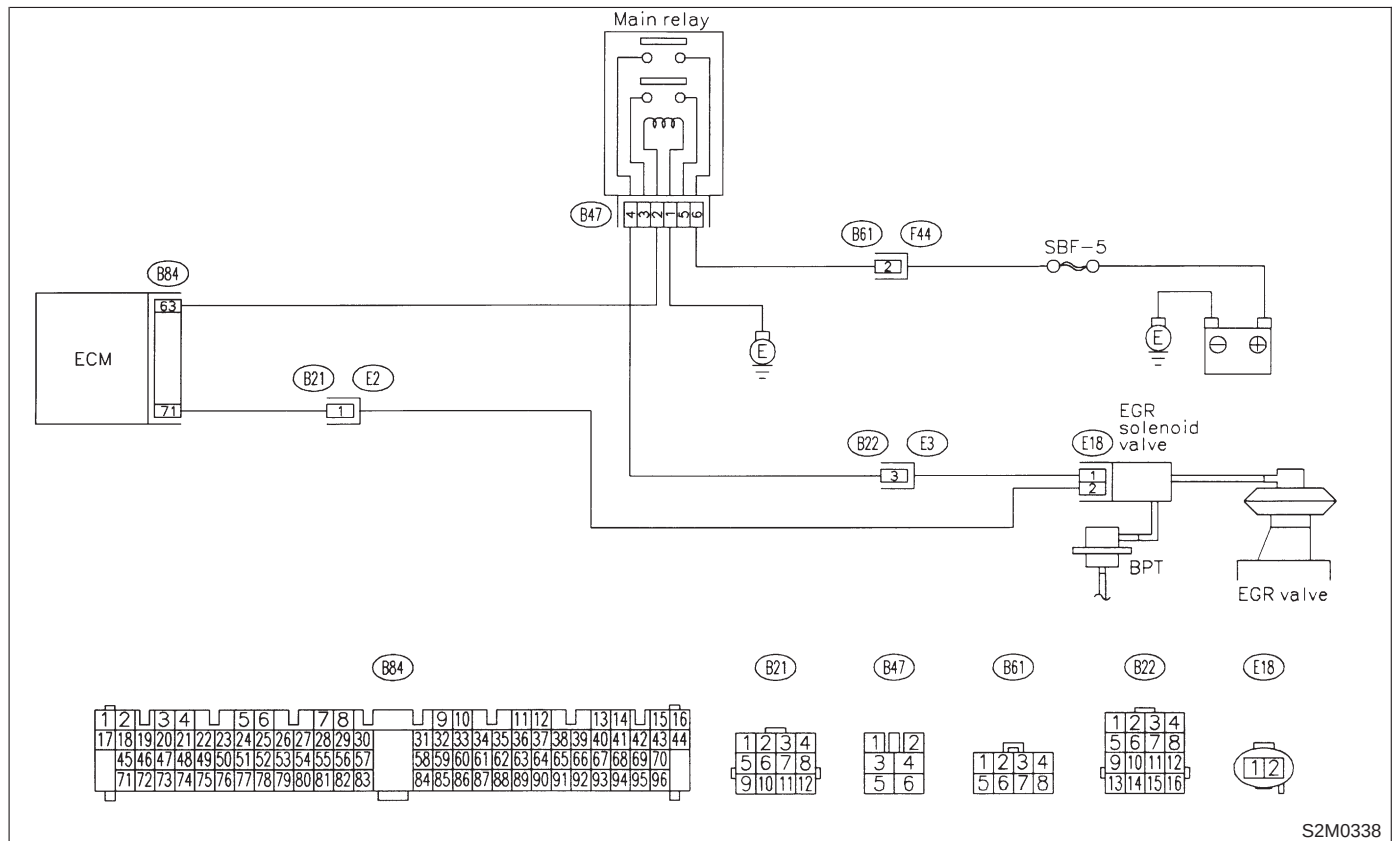
• TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

CAUTION:

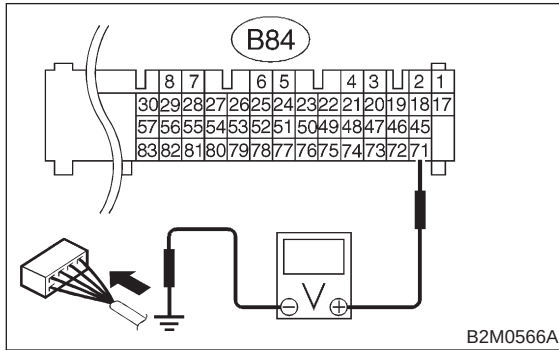
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

10AP1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 71 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10AP2**.**NO** : Go to step **10AP3**.**10AP2 : CHECK POOR CONTACT.**

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

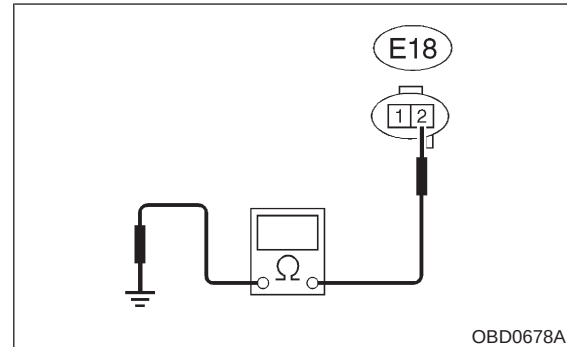
CHECK : **Is there poor contact in ECM connector?****YES** : Repair poor contact in ECM connector.**NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)**NOTE:**

In this case, repair the following:

- Poor contact in EGR solenoid valve connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21)

10AP3 : CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from EGR solenoid valve and ECM.
- 3) Measure resistance of harness between EGR solenoid valve connector and engine ground.

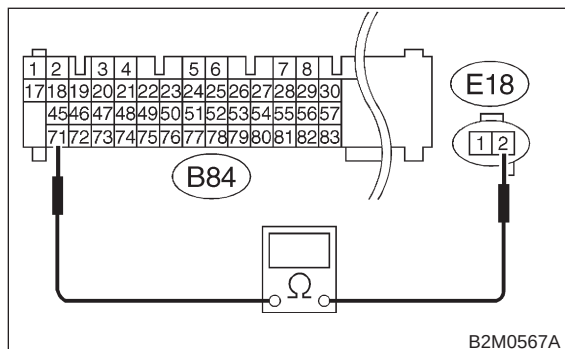
Connector & terminal**(E18) No. 2 — Engine ground:****CHECK** : **Is the resistance less than 10 Ω?****YES** : Repair ground short circuit in harness between ECM and EGR solenoid valve connector.**NO** : Go to step **10AP4**.

10AP4 : CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.

Measure resistance of harness between ECM and EGR solenoid valve connector.

Connector & terminal

(B84) No. 71 — (E18) No. 2:



CHECK : Is the voltage less than 1 Ω ?

YES : Go to step 10AP5.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

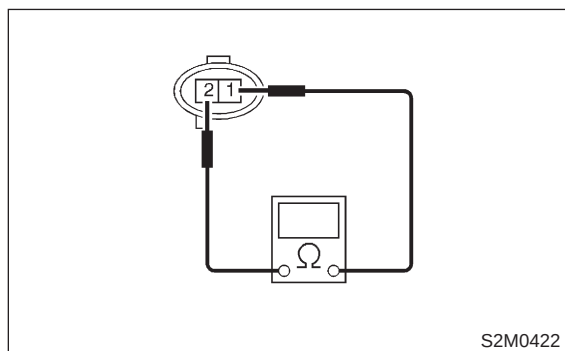
- Open circuit in harness between EGR solenoid valve and ECM connector
- Poor contact in coupling connector (B21)
- Poor contact in EGR solenoid valve connector
- Poor contact in ECM connector

10AP5 : CHECK EGR SOLENOID VALVE.

Measure resistance between EGR solenoid valve terminals.

Terminals

No. 1 — No. 2:



CHECK : Is the resistance between 10 and 100 Ω ?

YES : Go to step 10AP6.

NO : Replace EGR solenoid valve.

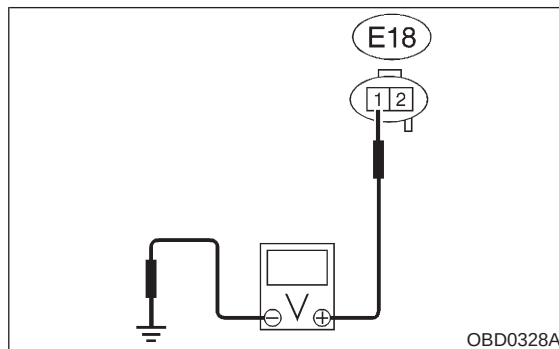
10AP6 : CHECK POWER SUPPLY TO EGR SOLENOID VALVE.

1) Turn ignition switch to ON.

2) Measure voltage between EGR solenoid valve and engine ground.

Connector & terminal

(E18) No. 1 (+) — Engine ground (-):



CHECK : Is the voltage more than 10 V?

YES : Go to step 10AP7.

NO : Repair open circuit in harness between main relay and EGR solenoid valve connector.

10AP7 : CHECK POOR CONTACT.

Check poor contact in EGR solenoid valve connector. <Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in EGR solenoid valve connector?

YES : Repair poor contact in EGR solenoid valve connector.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

AQ: DTC P0420 — CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD**• DTC DETECTING CONDITION:**

- Immediately at fault recognition (Federal spec. vehicles only)
- Two consecutive driving cycles with fault

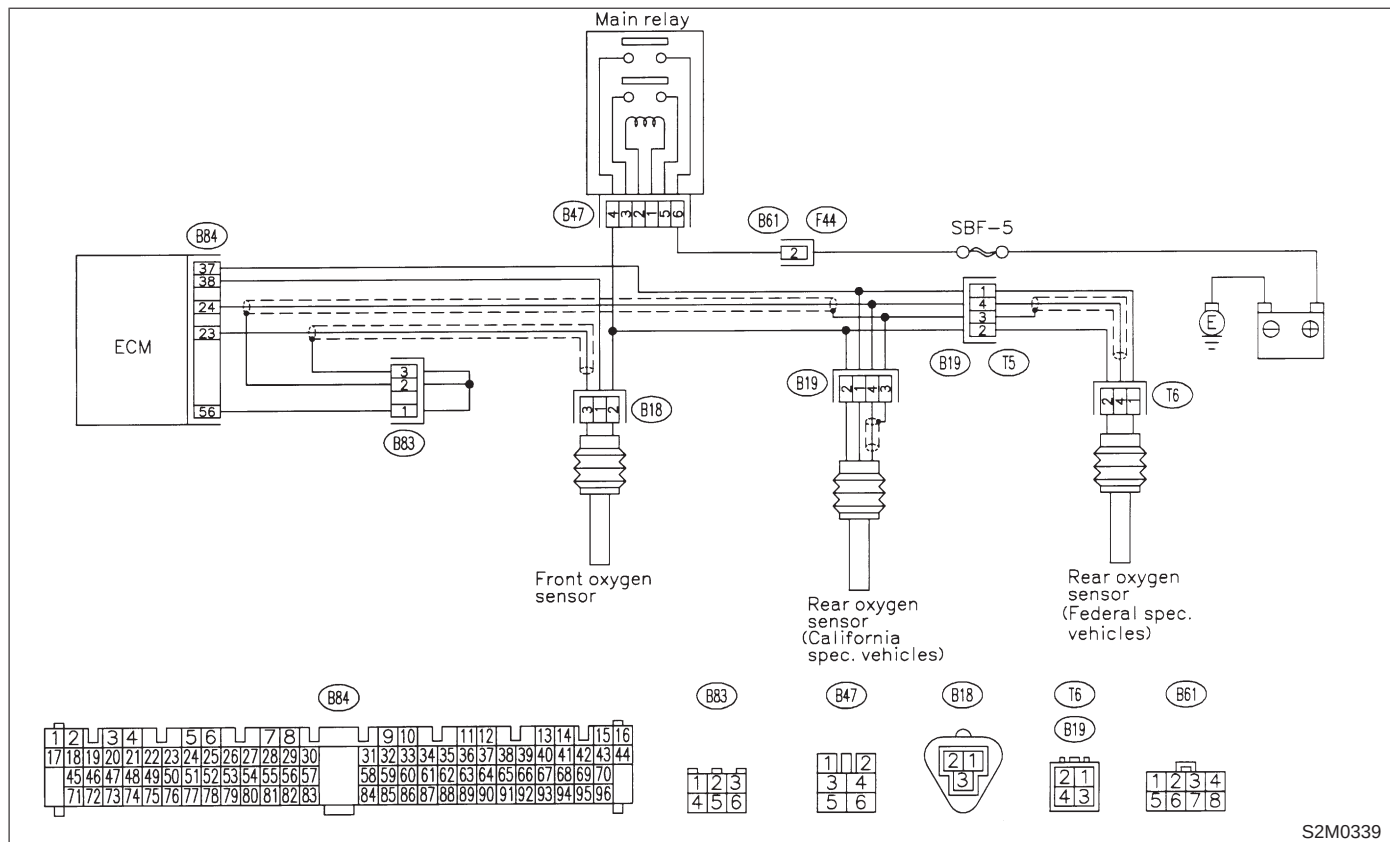
• TROUBLE SYMPTOM:

- Engine stalls.
- Idle mixture is out of specifications.

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0339

10AQ1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130, P0133, P0135, P0136, P0139 and P0141?

YES : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0420.

NO : Go to step **10AQ2**.

10AQ2 : CHECK EXHAUST SYSTEM.

Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.

NOTE:

Check the following positions.

- Between cylinder head and front exhaust pipe
- Between front exhaust pipe and front catalytic converter
- Between front catalytic converter and rear catalytic converter

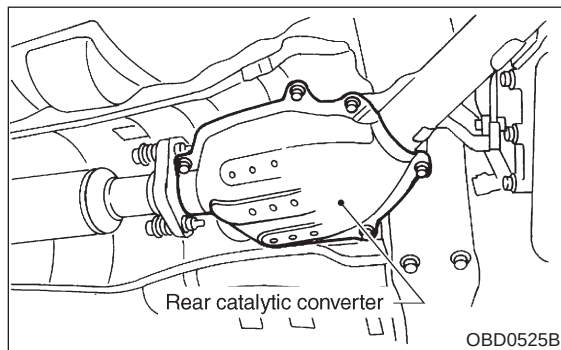
CHECK : ***Is there a fault in exhaust system?***

YES : Repair or replace exhaust system.

NO : Go to step **10AQ3**.

10AQ3 : CHECK REAR CATALYTIC CONVERTER.

Separate rear catalytic converter from rear exhaust pipe.



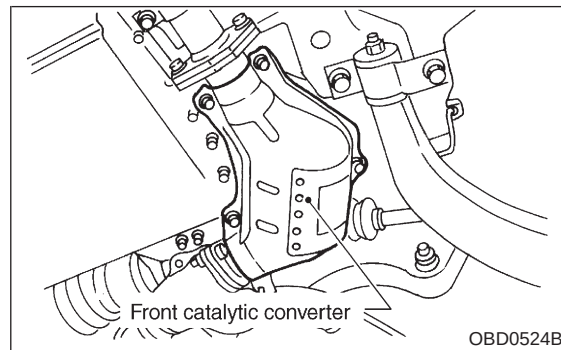
CHECK : ***Is there damage at rear face of rear catalyst?***

YES : Replace front and rear catalytic converters.

NO : Go to step **10AQ4**.

10AQ4 : CHECK FRONT CATALYTIC CONVERTER.

Remove front catalytic converter.



CHECK : ***Is there damage at rear face or front face of front catalyst?***

YES : Replace front catalytic converter.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

AR: DTC P0440 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

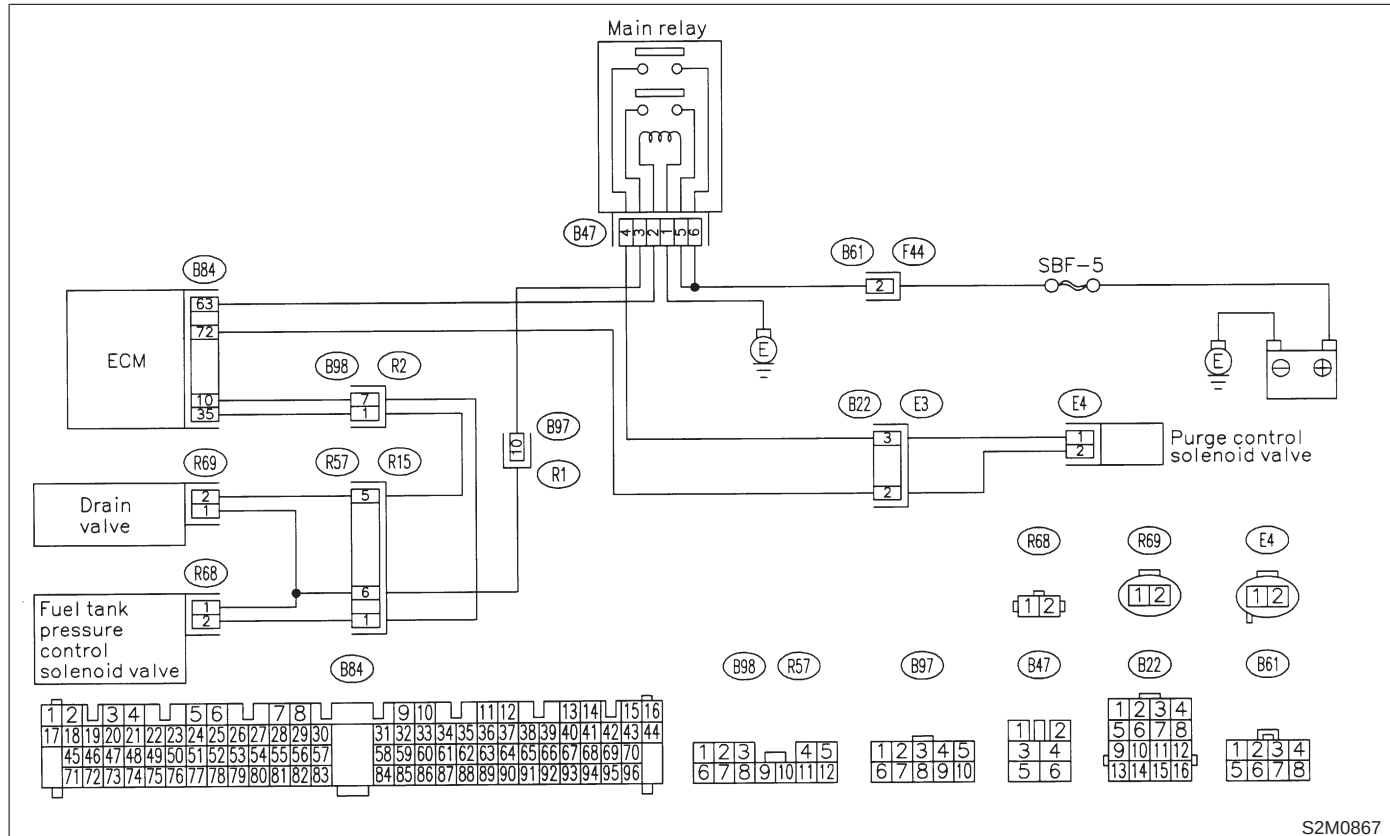
• TROUBLE SYMPTOM:

- Gasoline smell

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

• WIRING DIAGRAM:



S2M0867

10AR1 : CHECK ANY OTHER DTC ON DISPLAY.

- CHECK** : *Is there any other DTC on display?*
- YES** : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Go to step **10AR2**.

10AR2 : CHECK FUEL FILLER CAP.

- 1) Turn ignition switch to OFF.
- 2) Open the fuel flap.

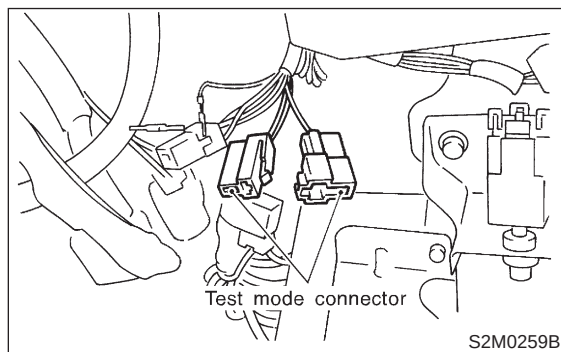
- CHECK** : *Is the fuel filler cap tightened securely?*
- YES** : Tighten fuel filler cap securely.
- NO** : Go to step **10AR3**.

10AR3 : CHECK FUEL FILLER PIPE PACKING.

- CHECK** : *Is there any damage to the seal between fuel filler cap and fuel filler pipe?*
- YES** : Repair or replace fuel filler cap and fuel filler pipe.
- NO** : Go to step **10AR4**.

10AR4 : CHECK DRAIN VALVE.

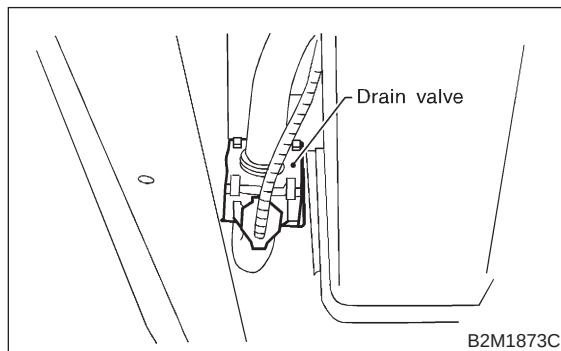
- 1) Connect test mode connector.



- 2) Turn ignition switch to ON.

NOTE:

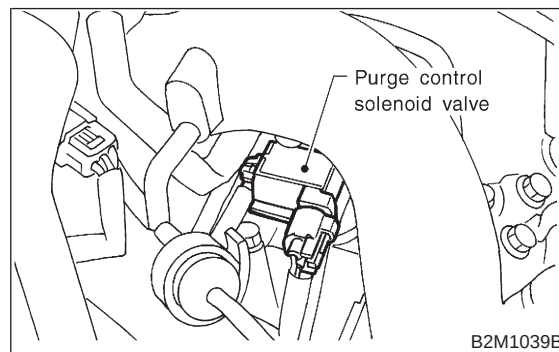
Drain valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



- CHECK** : *Does drain valve produce operating sound?*
- YES** : Go to step **10AR5**.
- NO** : Replace drain valve.

10AR5 : CHECK PURGE CONTROL SOLENOID VALVE.**NOTE:**

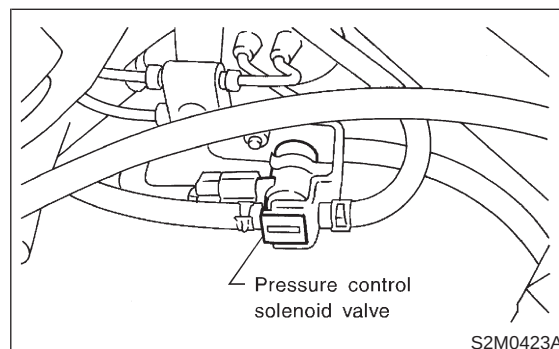
Purge control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



- CHECK** : *Does purge control solenoid valve produce operating sound?*
- YES** : Go to step **10AR6**.
- NO** : Replace purge control solenoid valve.

10AR6 : CHECK PRESSURE CONTROL SOLENOID VALVE.**NOTE:**

Pressure control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



- CHECK** : *Does pressure control solenoid valve produce operating sound?*
- YES** : Go to step **10AR7**.
- NO** : Replace pressure control solenoid valve.

10AR7 : CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Turn ignition switch to OFF.

- CHECK** : *Does fuel leak in fuel line?*
YES : Repair or replace fuel line.
NO : Go to step **10AR8**.

10AR8 : CHECK CANISTER.

- CHECK** : *Is there any damage at canister?*
YES : Repair or replace canister.
NO : Go to step **10AR9**.

10AR9 : CHECK FUEL TANK.

- CHECK** : *Is there any damage at fuel tank?*
YES : Repair or replace fuel tank.
NO : Go to step **10AR10**.

10AR10 : CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.

- CHECK** : *Are there holes, cracks, clogging or disconnections of hoses or pipes in evaporative emission control system?*
YES : Repair or replace hoses or pipes.
NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

AS: DTC P0441 — EVAPORATIVE EMISSION CONTROL SYSTEM INCORRECT PURGE FLOW —

● DTC DETECTING CONDITION:

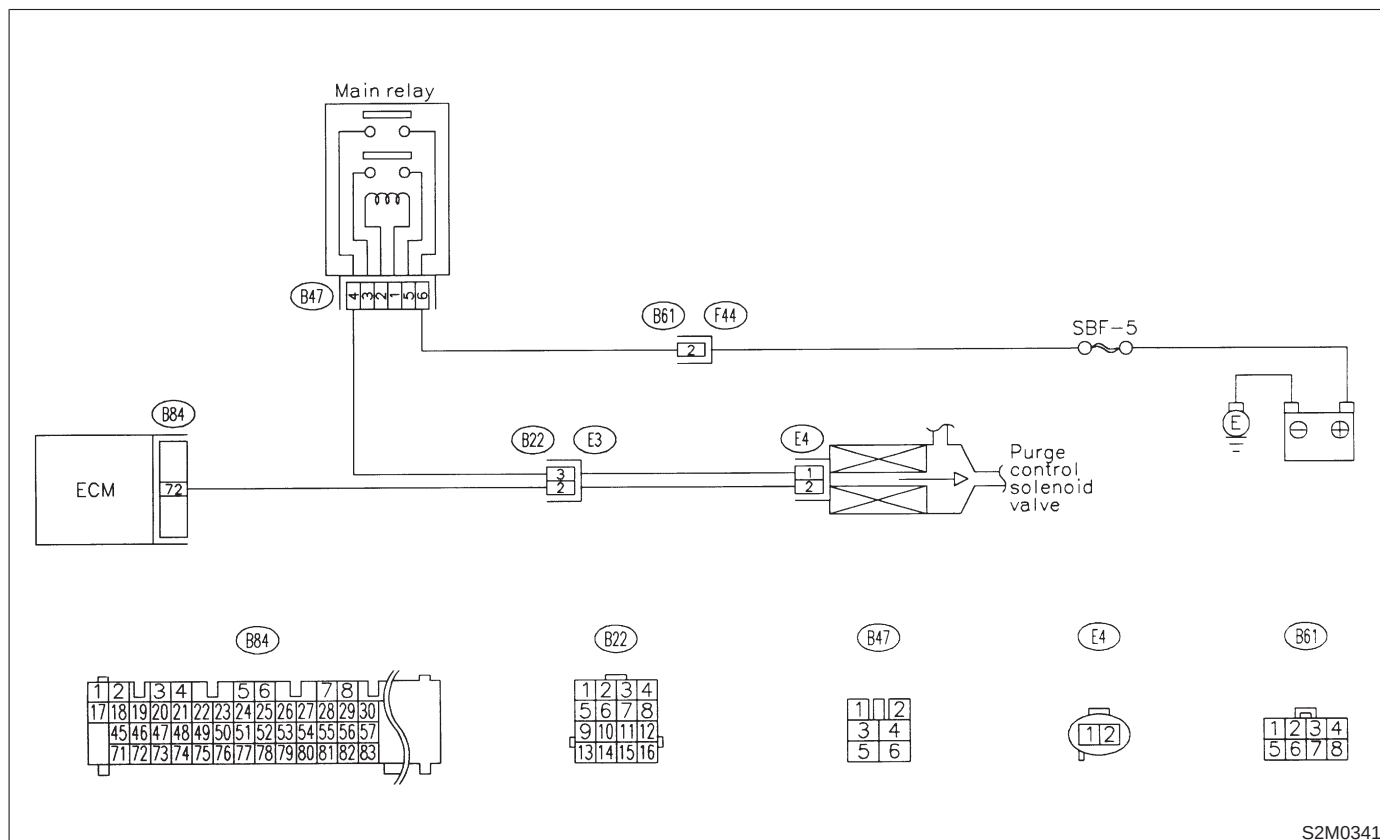
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



S2M0341

10AS1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P0443, P1102, P1122 or P1422?

YES : Inspect the relevant DTC P0106, P0107, P0108, P0443, P1102, P1122 or P1422 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

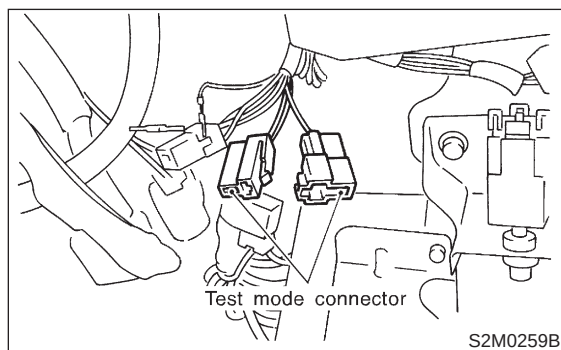
NOTE:

In this case, it is not necessary to inspect DTC P0441.

NO : Go to step **10AS2**.

10AS2 : CHECK PURGE CONTROL SOLENOID VALVE OPERATION.

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



- 3) Turn ignition switch to ON.

NOTE:

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

CHECK : *Does purge control solenoid valve produce operating sound at about 0.3 Hz?*

YES : Go to step **10AS3**.

NO : Replace purge control solenoid valve.

10AS3 : CHECK PURGE CONTROL SOLENOID VALVE.

Disconnect canister purge hose from canister.

CHECK : *Does pulsation occur by blowing through the canister purge hose?*

YES : Repair or replace evaporation line.

NOTE:

In this case, repair the following:

- Loose connections in evaporation line
- Cracks in evaporation line
- Clogging in evaporation line

NO : Replace purge control solenoid valve.

AT: DTC P0443 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT LOW INPUT —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

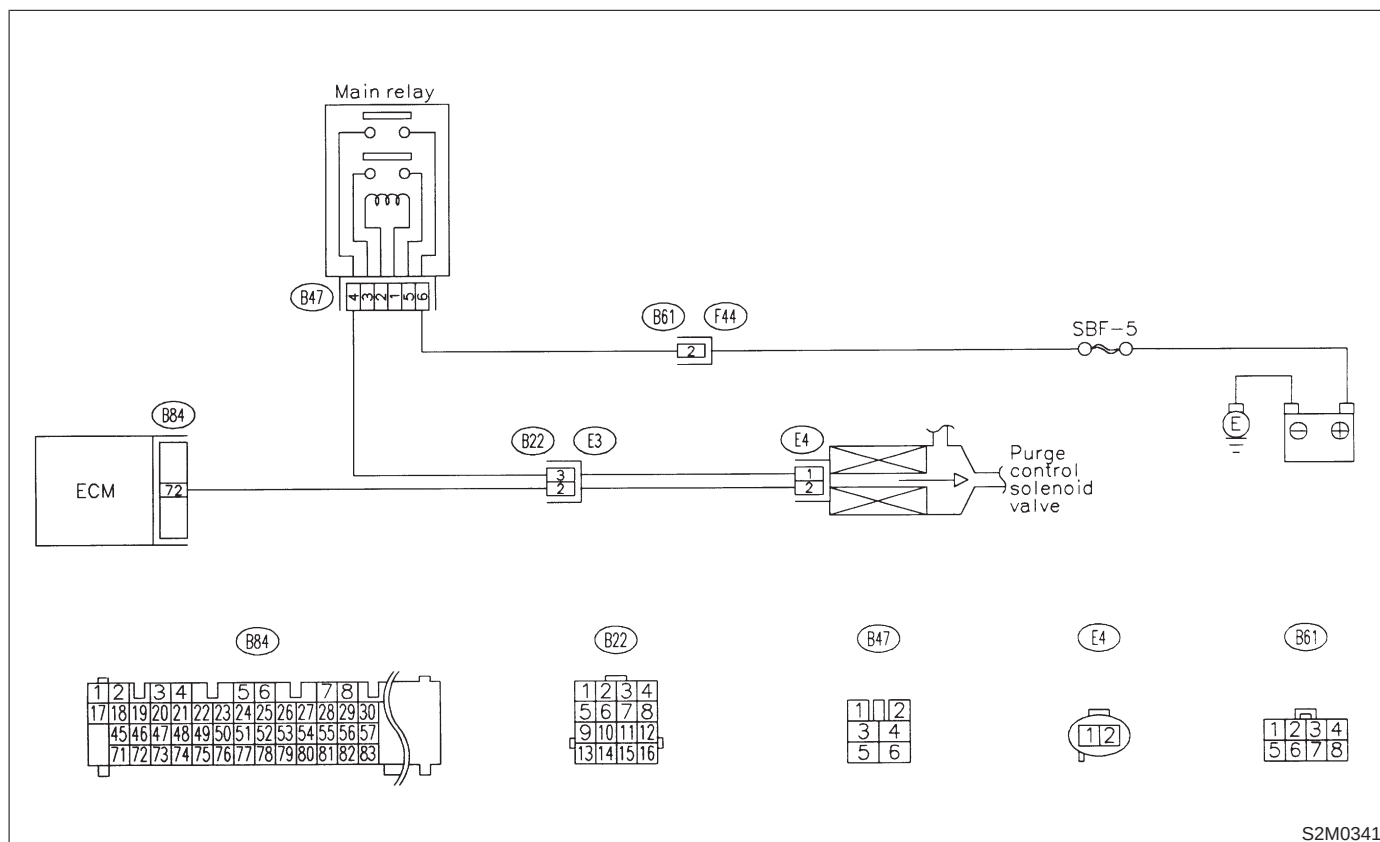
- Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

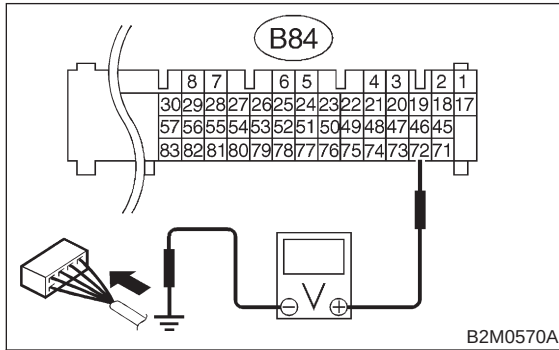
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



10AT1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 72 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?**

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with SOA service.

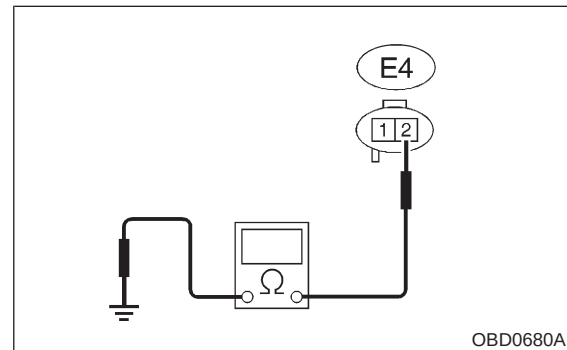
NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

NO : Go to step **10AT2**.

10AT2 : CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from purge control solenoid valve and ECM.
- 3) Measure resistance of harness between purge control solenoid valve connector and engine ground.

Connector & terminal**(E4) No. 2 — Engine ground:****CHECK** : **Is the resistance less than 10 Ω?**

YES : Repair ground short circuit in harness between ECM and purge control solenoid valve connector.

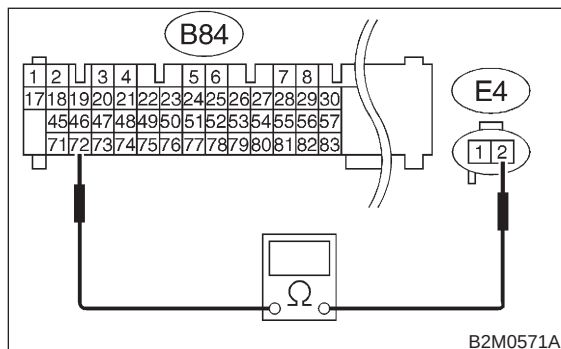
NO : Go to step **10AT3**.

10AT3 : CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

Measure resistance of harness between ECM and purge control solenoid valve of harness connector.

Connector & terminal

(B84) No. 72 — (E4) No. 2:



CHECK : **Is the resistance less than 1 Ω?**

YES : Go to step **10AT4**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

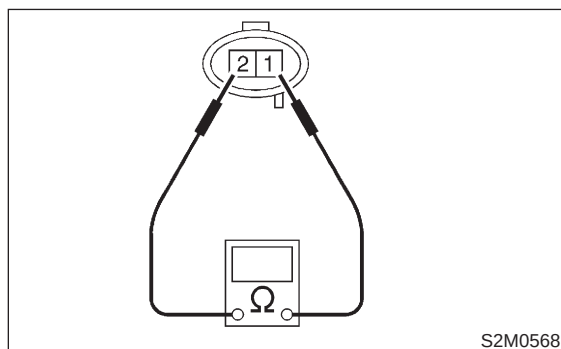
- Open circuit in harness between ECM and purge control solenoid valve connector
- Poor contact in coupling connector (B22)

10AT4 : CHECK PURGE CONTROL SOLENOID VALVE.

- 1) Remove purge control solenoid valve.
- 2) Measure resistance between purge control solenoid valve terminals.

Terminals

No. 1 — No. 2:



CHECK : **Is the resistance between 10 and 100 Ω?**

YES : Go to step **10AT5**.

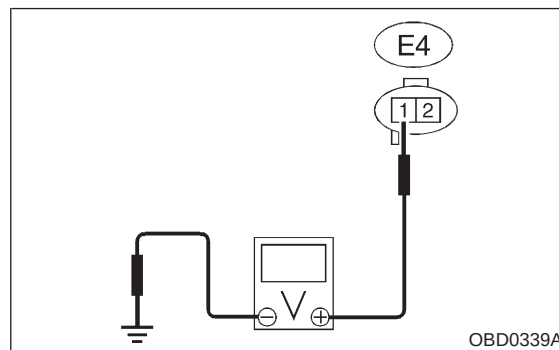
NO : Replace purge control solenoid valve.

10AT5 : CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between purge control solenoid valve and engine ground.

Connector & terminal

(E4) No. 1 (+) — Engine ground (-):



CHECK : **Is the voltage more than 10 V?**

YES : Go to step **10AT6**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between main relay and purge control solenoid valve connector
- Poor contact in coupling connector (B22)
- Poor contact in main relay connector

10AT6 : CHECK POOR CONTACT.

Check poor contact in purge control solenoid valve connector. <Ref. to FOREWORD [T3C1].>

CHECK : **Is there poor contact in purge control solenoid valve connector?**

YES : Repair poor contact in purge control solenoid valve connector.

NO : Contact with SOA service.

NOTE:

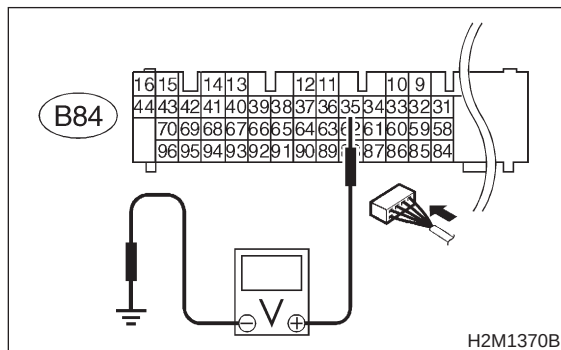
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

- **WIRING DIAGRAM:**



10AU1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 35 (+) — Chassis ground (-):**

- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step **10AU2**.
- NO** : Go to step **10AU3**.

10AU2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in ECM connector?
- YES** : Repair poor contact in ECM connector.
- NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

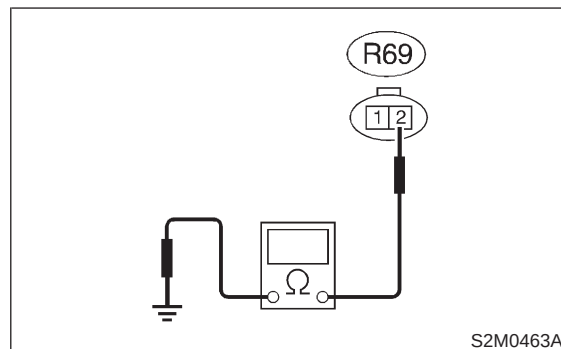
NOTE:

In this case, repair the following:

- Poor contact in drain valve connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B97, B98 and R57)

10AU3 : CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from drain valve and ECM.
- 3) Measure resistance of harness between drain valve connector and chassis ground.

Connector & terminal**(R69) No. 2 — Chassis ground:**

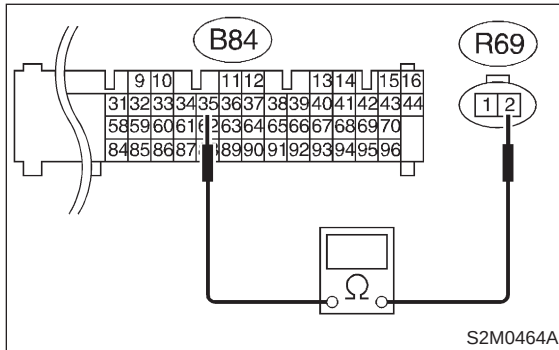
- CHECK** : Is the resistance less than 10 Ω?
- YES** : Repair ground short circuit in harness between ECM and drain valve connector.
- NO** : Go to step **10AU4**.

10AU4 : CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.

Measure resistance of harness between ECM and drain valve connector.

Connector & terminal

(B84) No. 35 — (R69) No. 2:



CHECK : Is the voltage less than 1 Ω?

YES : Go to step 10AU5.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

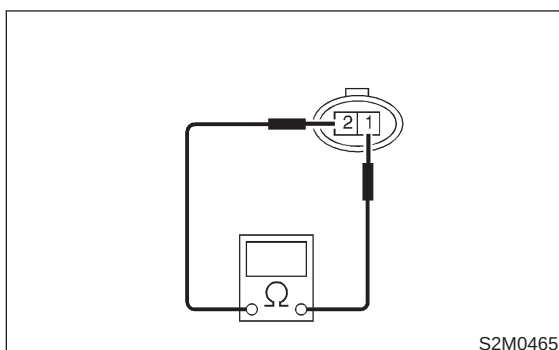
- Open circuit in harness between ECM and drain valve connector
- Poor contact in coupling connectors (B98 and R57)

10AU5 : CHECK DRAIN VALVE.

Measure resistance between drain valve terminals.

Terminals

No. 1 — No. 2:



CHECK : Is the resistance between 10 and 100 Ω?

YES : Go to step 10AU6.

NO : Replace drain valve.

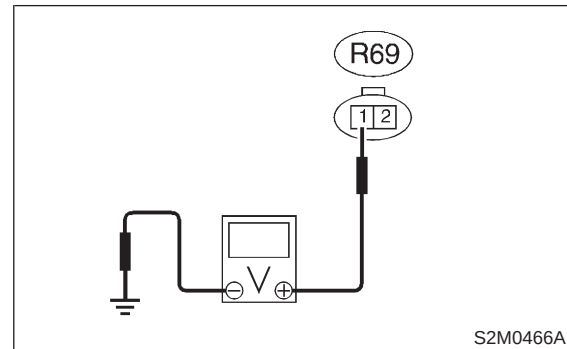
10AU6 : CHECK POWER SUPPLY TO DRAIN VALVE.

1) Turn ignition switch to ON.

2) Measure voltage between drain valve and chassis ground.

Connector & terminal

(R69) No. 1 (+) — Chassis ground (-):



CHECK : Is the voltage more than 10 V?

YES : Go to step 10AU7.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between main relay and drain valve
- Poor contact in coupling connectors (B97 and R57)
- Poor contact in main relay connector

10AU7 : CHECK POOR CONTACT.

Check poor contact in drain valve connector. <Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in drain valve connector?

YES : Repair poor contact in drain valve connector.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

AV: DTC P0451 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE PROBLEM —

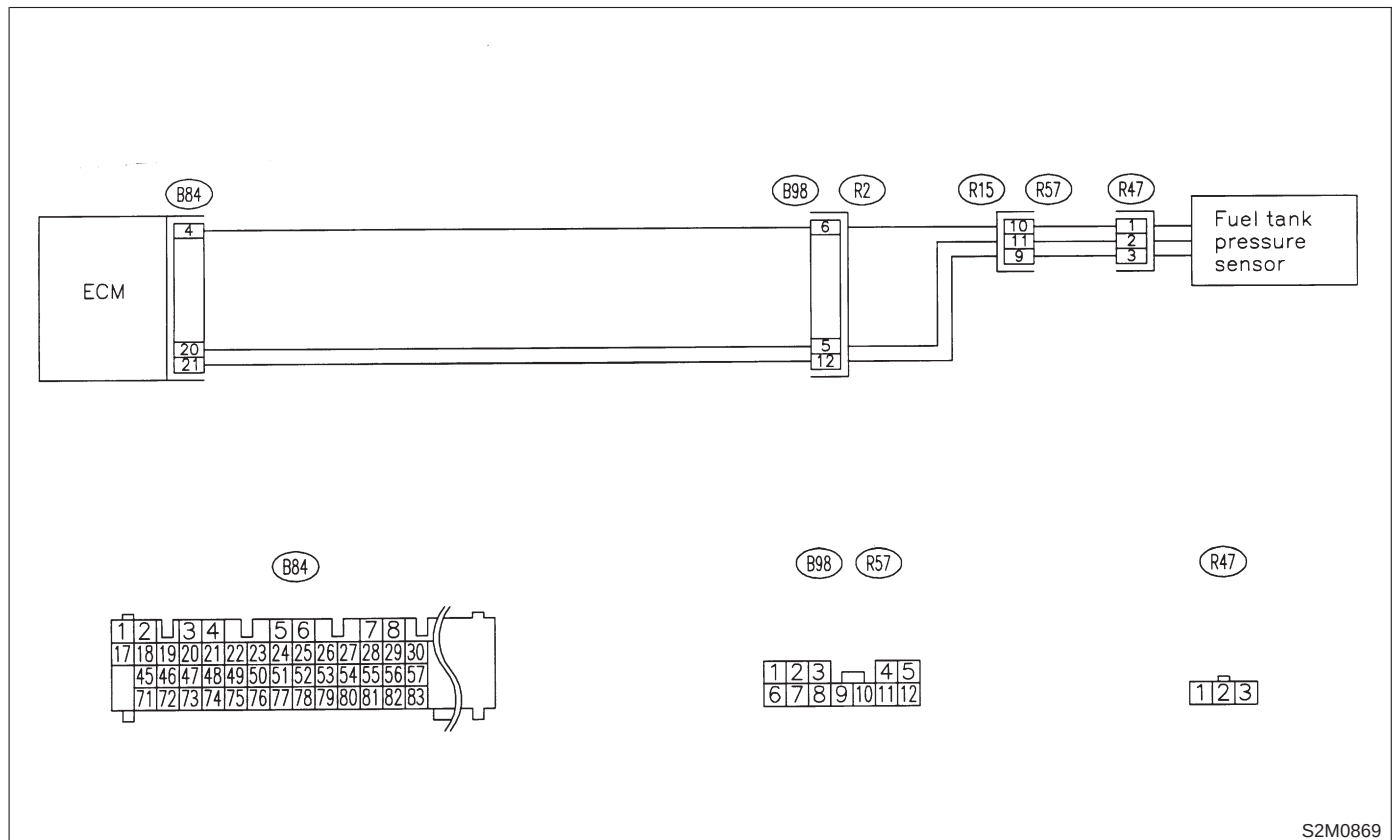
● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

● WIRING DIAGRAM:



S2M0869

10AV1 : CHECK PRESSURE/VACUUM LINE.

NOTE:

Check the following items.

- Disconnection, leakage and clogging of the vacuum hoses and pipes between fuel tank pressure sensor and fuel tank
- Disconnection, leakage and clogging of air ventilation hoses and pipes between fuel filler pipe and fuel tank

CHECK : *Is there a fault in pressure/vacuum line?*

YES : Repair or replace hoses and pipes.

NO : Replace fuel tank pressure sensor.

AW: DTC P0452 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR LOW INPUT —

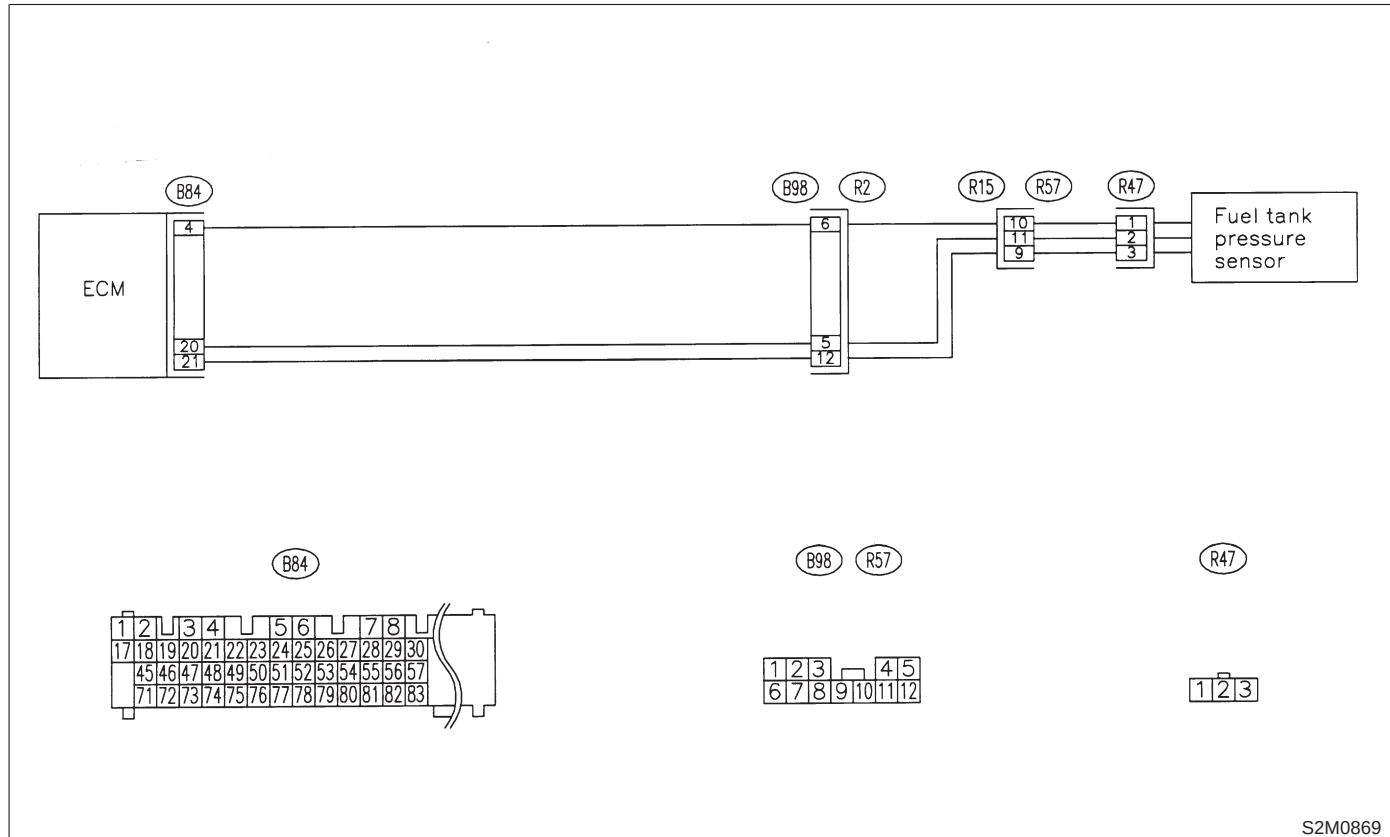
● DTC DETECTING CONDITION:

- Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

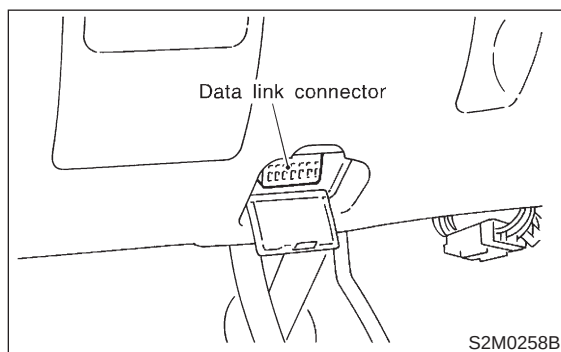
● WIRING DIAGRAM:



S2M0869

10AW1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel filler cap.
- 3) Install fuel filler cap.
- 4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 5) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 6) Read the data of fuel tank pressure sensor signal using Subaru Select Monitor or the OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

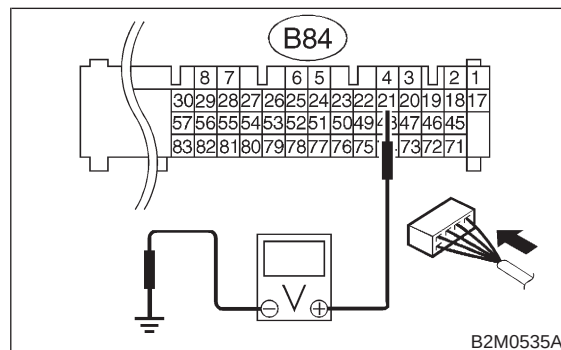
- CHECK** : *Is the value less than -2.8 kPa (-21.0 mmHg, -0.827 inHg)?*
- YES** : Go to step **10AW2**.
- NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time.

10AW2 : CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

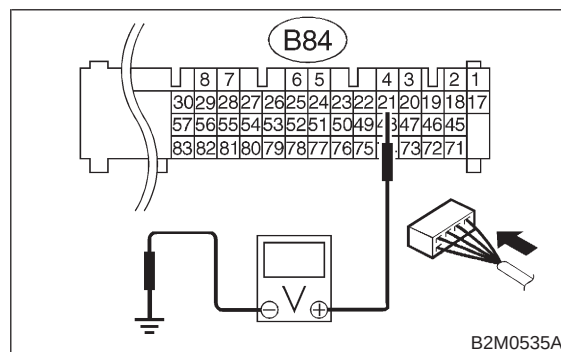
(B84) No. 21 (+) — Chassis ground (-):



- CHECK** : *Is the voltage more than 4.5 V?*
- YES** : Go to step **10AW4**.
- NO** : Go to step **10AW3**.

10AW3 : CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.

Measure voltage between ECM connector and chassis ground.



- CHECK** : *Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?*
- YES** : Repair poor contact in ECM connector.
- NO** : Contact with SOA service.

NOTE:

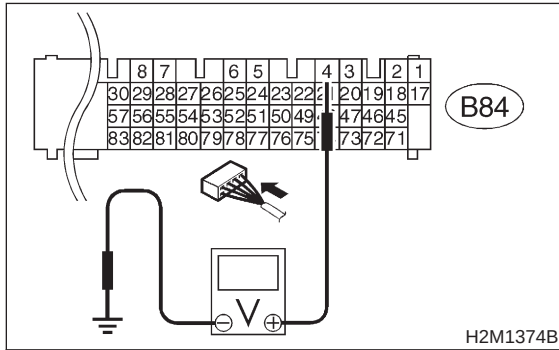
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10AW4 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 4 (+) — Chassis ground (-):



- CHECK** : *Is the voltage less than 0.2 V?*
YES : Go to step 10AW6.
NO : Go to step 10AW5.

10AW5 : CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.)

Read data of fuel tank pressure sensor signal using Subaru Select Monitor.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

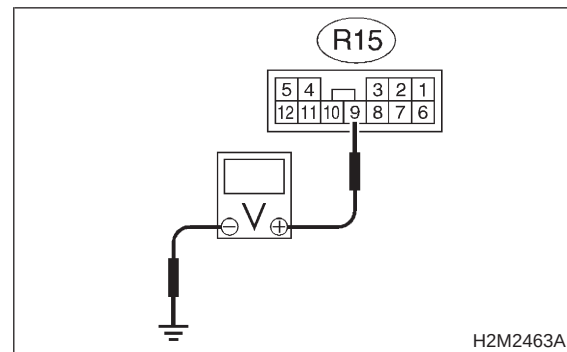
- CHECK** : *Does the value change more than -2.8 kPa (-21.0 mmHg, -0.827 inHg) by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?*
YES : Repair poor contact in ECM connector.
NO : Go to step 10AW6.

10AW6 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Remove rear seat cushion.
- 3) Separate rear wiring harness and fuel tank cord.
- 4) Turn ignition switch to ON.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between rear wiring harness connector and chassis ground.

Connector & terminal

(R15) No. 9 (+) — Chassis ground (-):



- CHECK** : *Is the voltage more than 4.5 V?*
YES : Go to step 10AW7.
NO : Repair harness and connector.

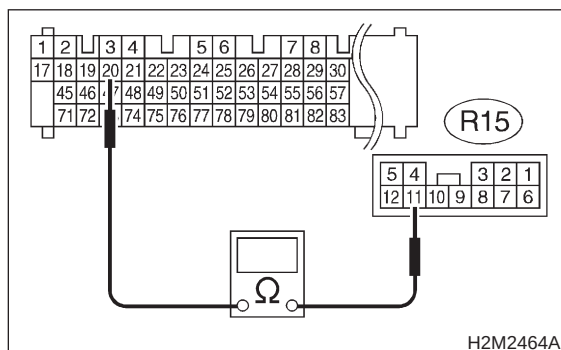
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and rear wiring harness connector (R15)
- Poor contact in coupling connector (B98)

10AW7 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and rear wiring harness connector.

Connector & terminal
(B84) No. 20 — (R15) No. 11:


- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 10AW8.
- NO** : Repair harness and connector.

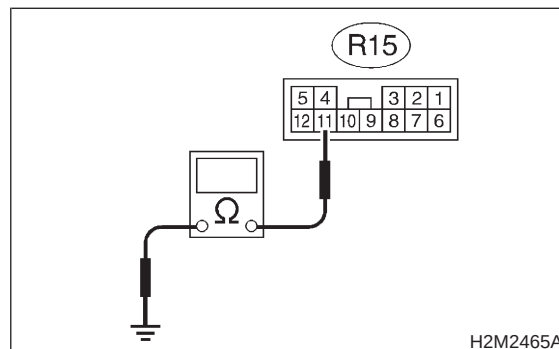
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and rear wiring harness connector (R15)
- Poor contact in coupling connector (B98)

10AW8 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

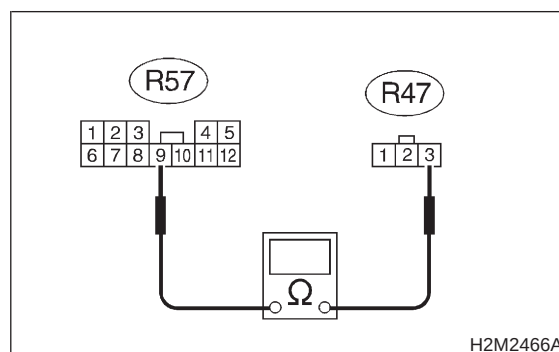
Measure resistance of harness between rear wiring harness connector and chassis ground.

Connector & terminal
(R15) No. 11 — Chassis ground:


- CHECK** : Is the resistance more than 500 $k\Omega$?
- YES** : Go to step 10AW9.
- NO** : Repair ground short circuit in harness between ECM and rear wiring harness connector (R15).

10AW9 : CHECK FUEL TANK CORD.

- 1) Remove fuel tank. <Ref. to 2-8 [W1A0].>
- 2) Disconnect connector from fuel tank pressure sensor.
- 3) Measure resistance of fuel tank cord.

Connector & terminal
(R57) No. 9 — (R47) No. 3:


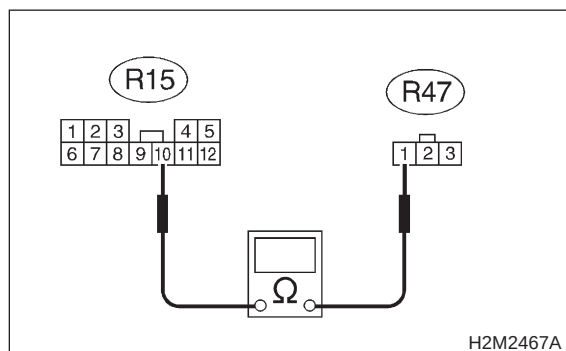
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 10AW10.
- NO** : Repair open circuit in fuel tank cord.

10AW10 : CHECK FUEL TANK CORD.

Measure resistance of fuel tank cord.

Connector & terminal

(R15) No. 10 — (R47) No. 1:



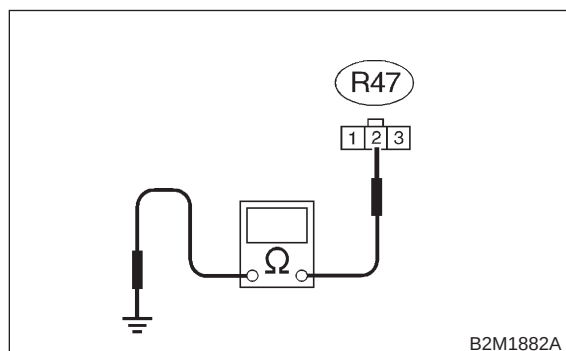
- CHECK** : **Is the resistance less than 1 Ω?**
YES : Go to step **10AW11**.
NO : Repair open circuit in fuel tank cord.

10AW11 : CHECK FUEL TANK CORD.

Measure resistance of harness between fuel tank pressure sensor connector and chassis ground.

Connector & terminal

(R47) No. 2 — Chassis ground:



- CHECK** : **Is the resistance more than 500 kΩ?**
YES : Go to step **10AW12**.
NO : Repair ground short circuit in fuel tank cord.

10AW12 : CHECK POOR CONTACT.

Check poor contact in fuel tank pressure sensor connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in fuel tank pressure sensor connector?**
YES : Repair poor contact in fuel tank pressure sensor connector.
NO : Replace fuel tank pressure sensor.

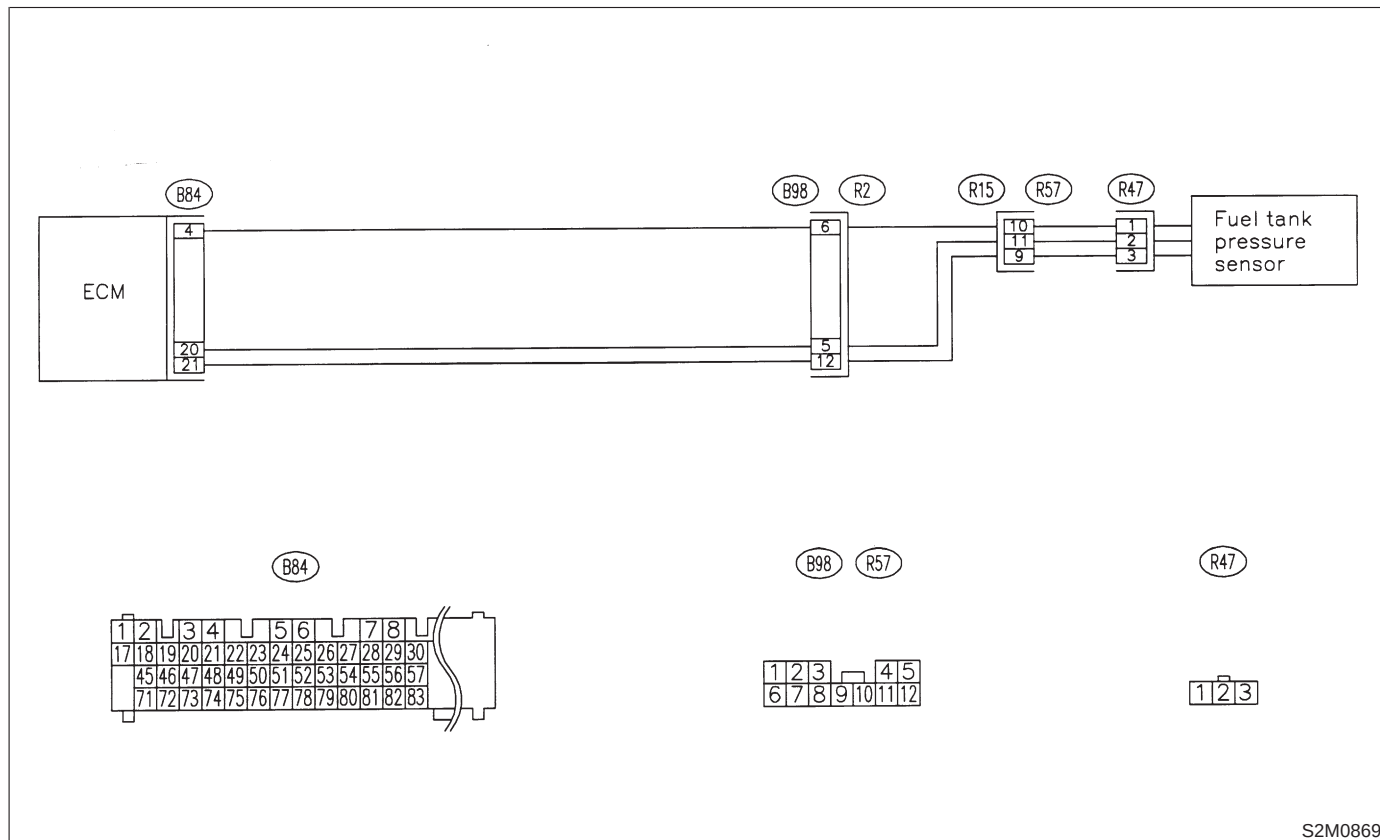
AX: DTC P0453 — EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR HIGH INPUT —

- **DTC DETECTING CONDITION:**
 - Immediately at fault recognition

CAUTION:

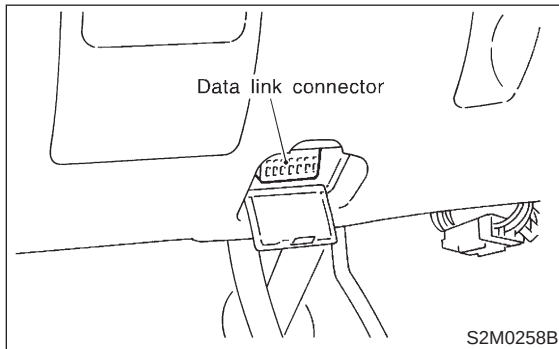
After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

- **WIRING DIAGRAM:**



10AX1 : CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel filler cap.
- 3) Install fuel filler cap.
- 4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 5) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 6) Read data of fuel tank pressure sensor signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor
For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>
- OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

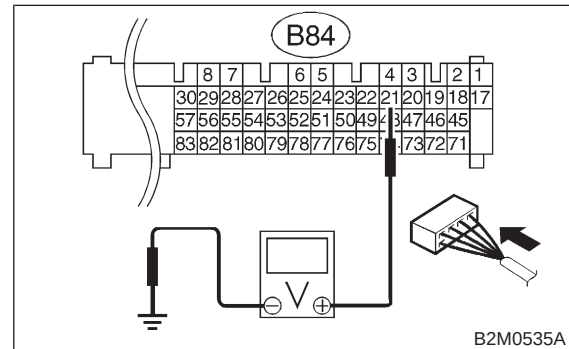
- CHECK** : *Is the value more than 2.8 kPa (21.0 mmHg, 0.827 inHg)?*
- YES** : Go to step 10AX12.
- NO** : Go to step 10AX2.

10AX2 : CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



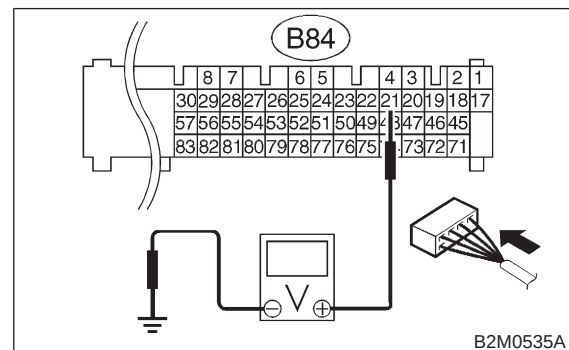
- CHECK** : *Is the voltage more than 4.5 V?*
- YES** : Go to step 10AX4.
- NO** : Go to step 10AX3.

10AX3 : CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.

Measure voltage between ECM connector and chassis ground.

Connector & terminal

(B84) No. 21 (+) — Chassis ground (-):



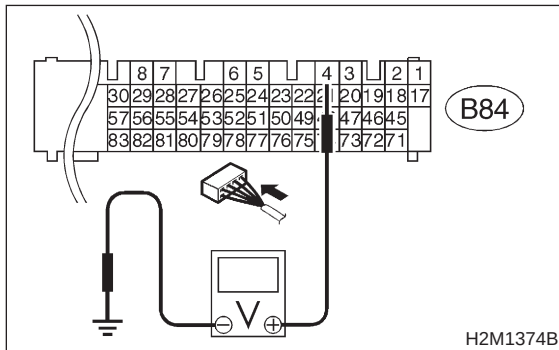
- CHECK** : *Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?*
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

10AX4 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 4 (+) — Chassis ground (-):



CHECK : **Is the voltage less than 0.2 V?**

YES : Go to step **10AX6**.

NO : Go to step **10AX5**.

10AX5 : CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.)

Read data of fuel tank pressure sensor signal using Subaru Select Monitor.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

CHECK : **Does the value change more than -2.8 kPa (-21.0 mmHg, -0.827 inHg) by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?**

YES : Repair poor contact in ECM connector.

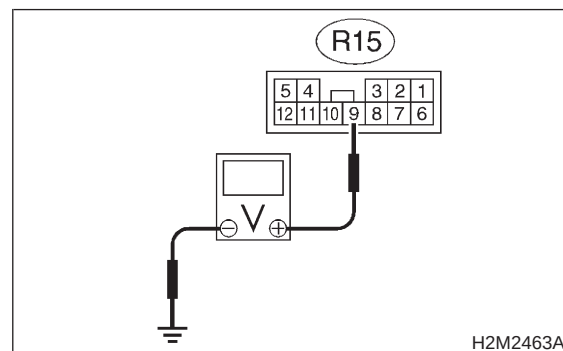
NO : Go to step **10AX6**.

10AX6 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Remove rear seat cushion.
- 3) Separate rear wiring harness and fuel tank cord.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between rear wiring harness connector and chassis ground.

Connector & terminal

(R15) No. 9 (+) — Chassis ground (-):



CHECK : **Is the voltage more than 4.5 V?**

YES : Go to step **10AX7**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

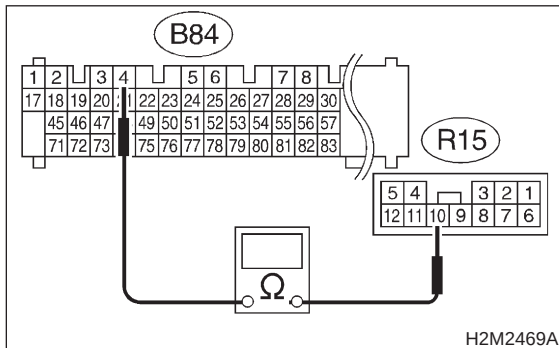
- Open circuit in harness between ECM and rear wiring harness connector (R15)
- Poor contact in coupling connector (B98)

10AX7 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and rear wiring harness connector.

Connector & terminal

(B84) No. 4 — (R15) No. 10:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10AX8.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

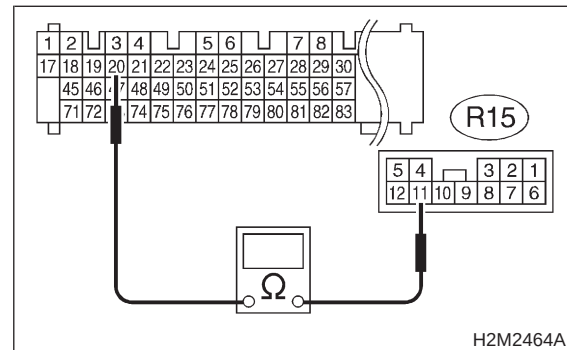
- Open circuit in harness between ECM and rear wiring harness connector (R15)
- Poor contact in coupling connector (B98)

10AX8 : CHECK HARNESS BETWEEN ECM AND COUPLING CONNECTOR IN REAR WIRING HARNESS.

Measure resistance of harness between rear wiring harness connector and chassis ground.

Connector & terminal

(B84) No. 20 — (R15) No. 11:



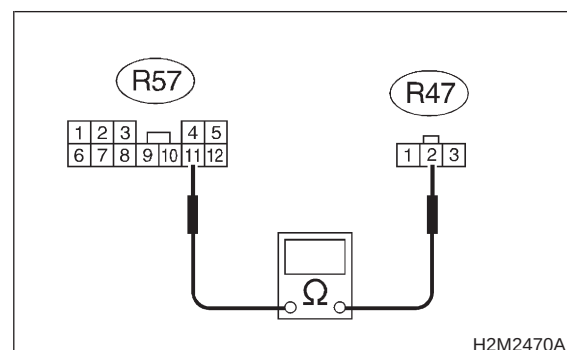
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10AX9.
- NO** : Repair ground short circuit in harness between ECM and rear wiring harness connector (R15).

10AX9 : CHECK FUEL TANK CORD.

- 1) Remove fuel tank. <Ref. to 2-8 [W1A0].>
- 2) Disconnect connector from fuel tank pressure sensor.
- 3) Measure resistance of fuel tank cord.

Connector & terminal

(R57) No. 11 — (R47) No. 2:



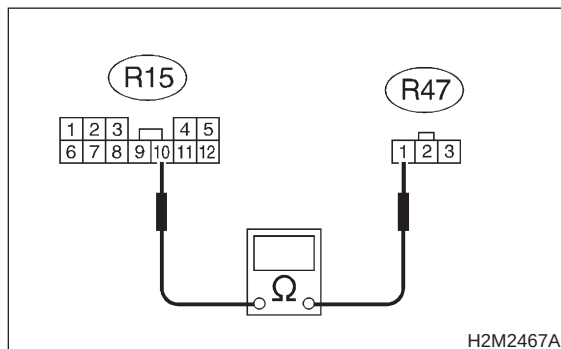
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10AX10.
- NO** : Repair open circuit in fuel tank cord.

10AX10 : CHECK FUEL TANK CORD.

Measure resistance of fuel tank cord.

Connector & terminal

(R57) No. 10 — (R47) No. 1:



- CHECK** : **Is the resistance less than 1 Ω?**
YES : Go to step **10AX10**.
NO : Repair open circuit in fuel tank cord.

10AX11 : CHECK POOR CONTACT.

Check poor contact in fuel tank pressure sensor connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in fuel tank pressure sensor connector?**
YES : Repair poor contact in fuel tank pressure sensor connector.
NO : Replace fuel tank pressure sensor.

10AX12 : CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF and Subaru Select Monitor or the OBD-II general scan tool switch to OFF.
- 2) Remove fuel tank. <Ref. to 2-8 [W1A0].>
- 3) Remove fuel tank cord from fuel tank.
- 4) Connect fuel tank cord to rear wiring harness.
- 5) Remove fuel filler cap.
- 6) Install fuel filler cap.
- 7) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 8) Read data of fuel tank pressure sensor signal using Subaru select monitor or the OBD-II general scan tool.

NOTE:

- Subaru Select Monitor
For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>
- OBD-II general scan tool
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

- CHECK** : **Is the value more than 2.8 kPa (21.0 mmHg, 0.827 inHg)?**
YES : Repair battery short circuit in harness between ECM and fuel tank pressure sensor connector.
NO : Replace fuel tank pressure sensor.

AY: DTC P0461 — FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM —

• DTC DETECTING CONDITION:

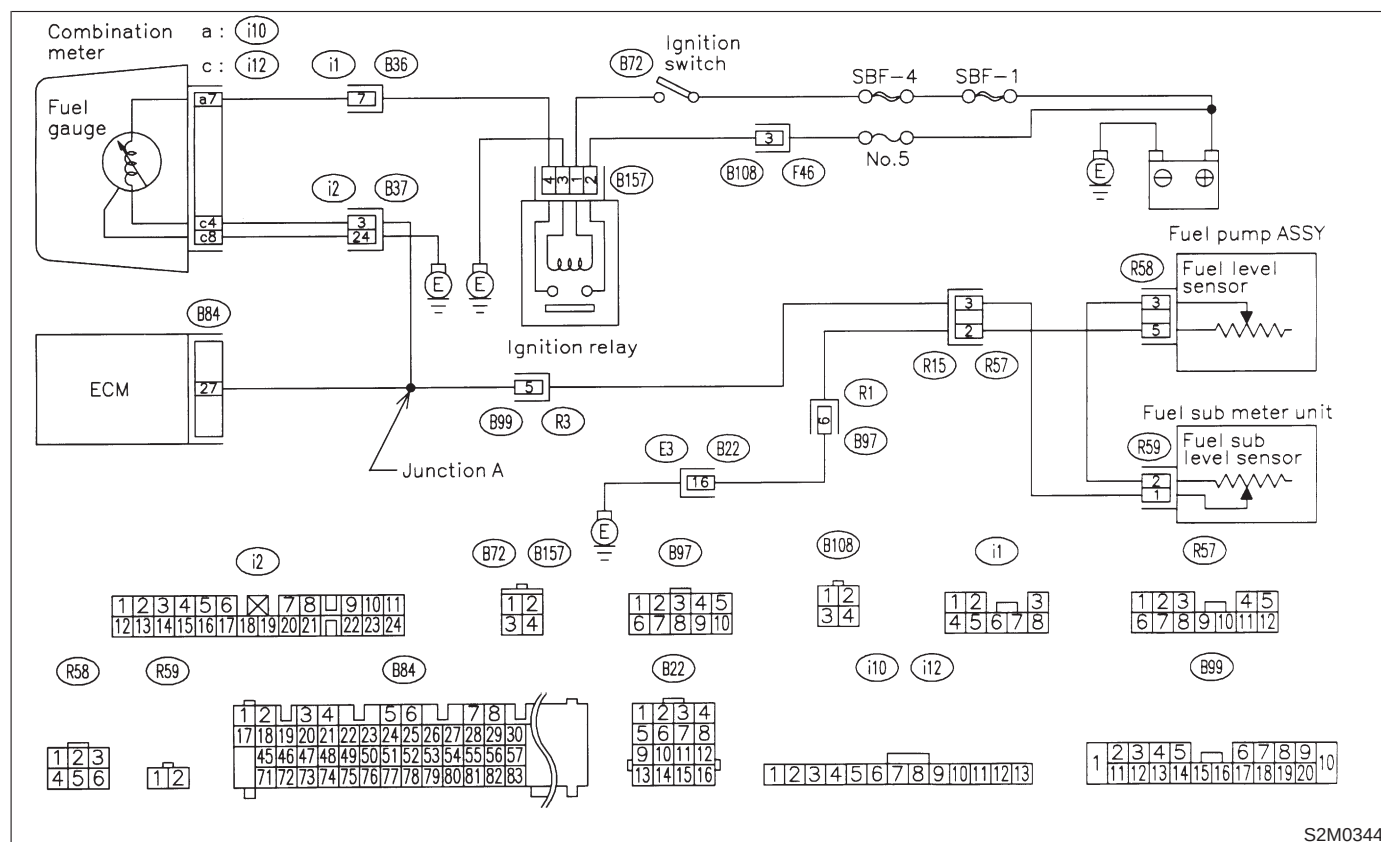
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



S2M0344

10AY1 : CHECK ANY OTHER DTC ON DISPLAY.

NOTE:

In this case, it is not necessary to inspect this trouble.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0462 or P0463?

YES : Inspect DTC P0462 or P0463 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NO : Replace fuel sending unit and fuel sub meter unit.

AZ: DTC P0462 — FUEL LEVEL SENSOR CIRCUIT LOW INPUT —

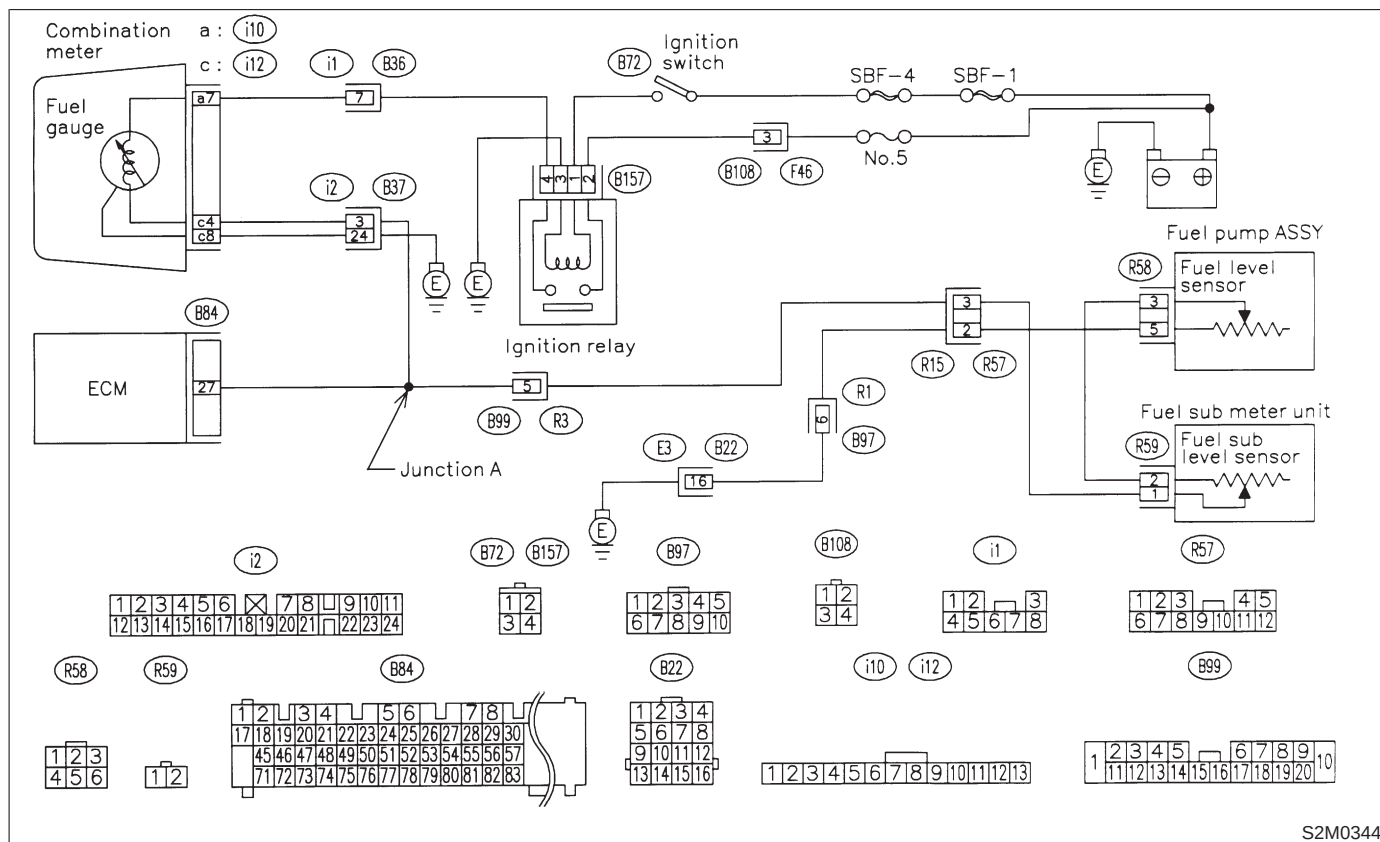
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



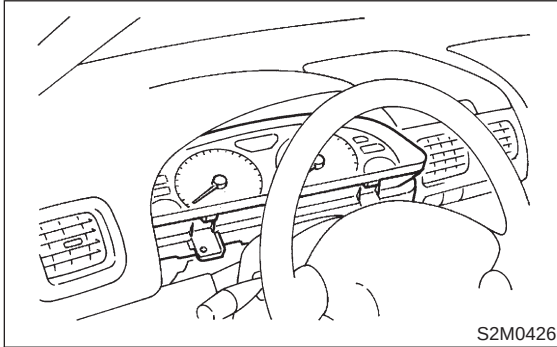
S2M0344

10AZ1 : CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.

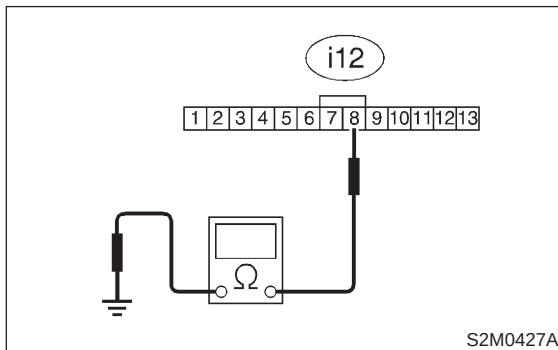
- CHECK** : Does speedometer and tachometer operate normally?
- YES** : Go to step 10AZ3.
- NO** : Go to step 10AZ2.

10AZ2 : CHECK GROUND CIRCUIT OF COMBINATION METER.

- 1) Turn ignition switch to OFF.
- 2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W8A0].>



- 3) Disconnect connector from combination meter.
- 4) Measure resistance of harness between combination meter connector and chassis ground.

Connector & terminal**(i12) No. 8 — Chassis ground:**

- (CHECK)** : **Is resistance less than 5 Ω ?**
- (YES)** : Repair or replace combination meter.
- (NO)** : Repair harness and connector.

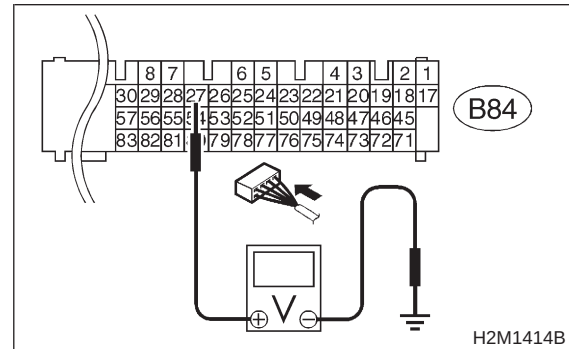
NOTE:

In this case, repair the following:

- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal
- Poor contact in coupling connector (i2)

10AZ3 : CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON. (Engine OFF)
- 2) Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 27 (+) — Chassis ground (-):**

- (CHECK)** : **Is the voltage less than 0.12 V?**
- (YES)** : Go to step 10AZ5.
- (NO)** : Go to step 10AZ4.

10AZ4 : CHECK INPUT SIGNAL FOR ECM (USING SUBARU SELECT MONITOR).

Read data of fuel level sensor signal using Subaru Select Monitor.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- (CHECK)** : **Does the value change less than 0.12 V by shaking harness and connector of ECM while monitoring the value with Subaru Select Monitor?**

- (YES)** : Repair poor contact in ECM connector.
- (NO)** : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

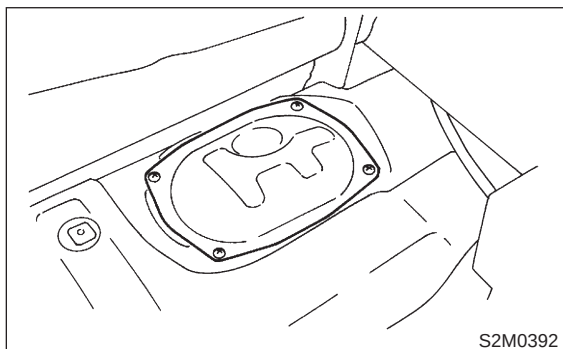
NOTE:

In this case, repair the following:

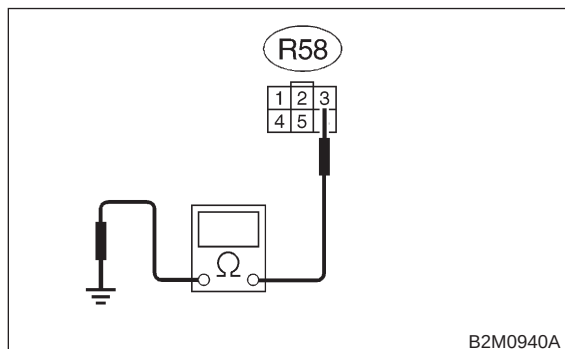
- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (i2, B22, B99, B97 and R57)

10AZ5 : CHECK HARNESS BETWEEN ECM, COMBINATION METER AND FUEL PUMP CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel pump access hole lid located on the right rear of luggage compartment floor.



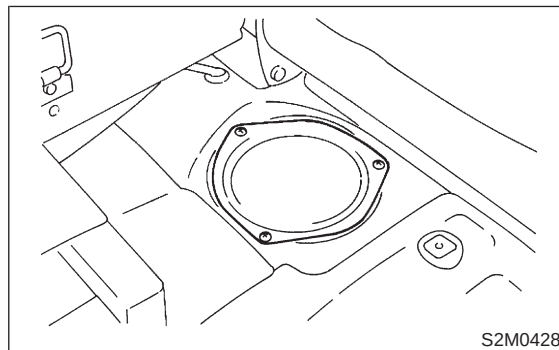
- 3) Disconnect connector from fuel pump.
- 4) Measure resistance of harness between fuel pump connector and chassis ground.

Connector & terminal
(R58) No. 3 — Chassis ground:


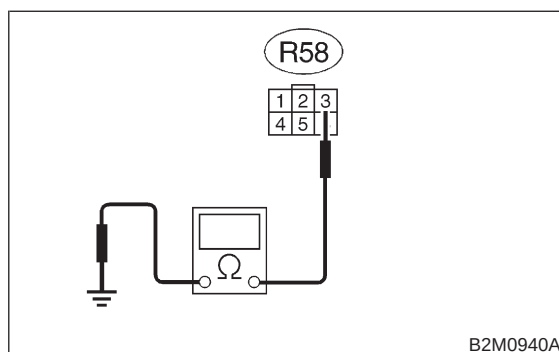
- CHECK** : Is the resistance less than 10 Ω?
- YES** : Go to step 10AZ6.
- NO** : Go to step 10AZ10.

10AZ6 : CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.

- 1) Remove service hole cover located on the left rear of luggage compartment floor.



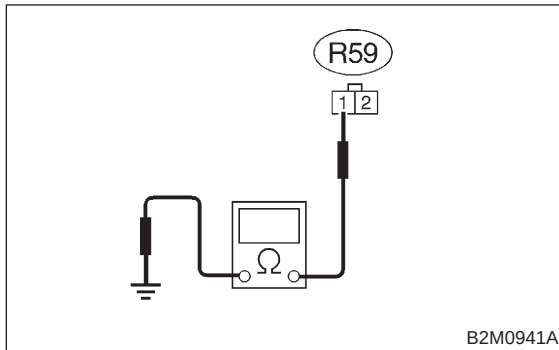
- 2) Disconnect connector from fuel sub meter unit.
- 3) Measure resistance of harness between fuel pump connector and chassis ground.

Connector & terminal
(R58) No. 3 — Chassis ground:


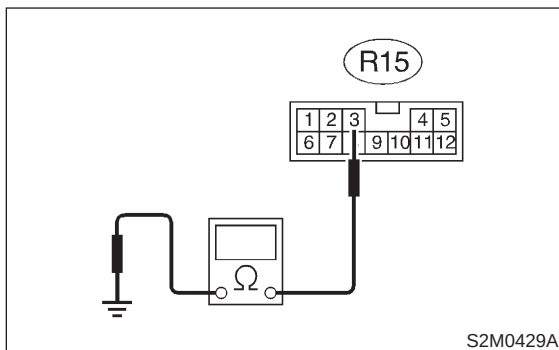
- CHECK** : Is the resistance less than 10 Ω?
- YES** : Repair ground short circuit in harness between fuel pump and fuel sub meter unit connector.
- NO** : Go to step 10AZ7.

10AZ7 : CHECK FUEL TANK CODE.

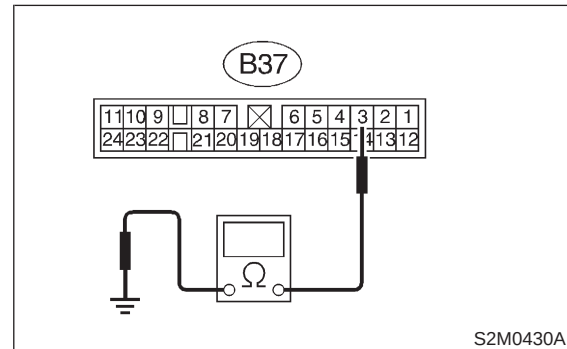
- 1) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15).
- 2) Measure resistance of harness between fuel sub meter unit connector and chassis ground.

Connector & terminal**(R59) No. 1 — Chassis ground:****CHECK** : **Is the resistance less than 10 Ω ?****YES** : Repair ground short circuit in fuel tank cord.**NO** : Go to step **10AZ8**.**10AZ8 : CHECK REAR WIRING HARNESS.**

- 1) Separate rear wiring harness connector (R3) and bulkhead wiring harness connector (B99).
- 2) Measure resistance of harness between rear wiring harness connector and chassis ground.

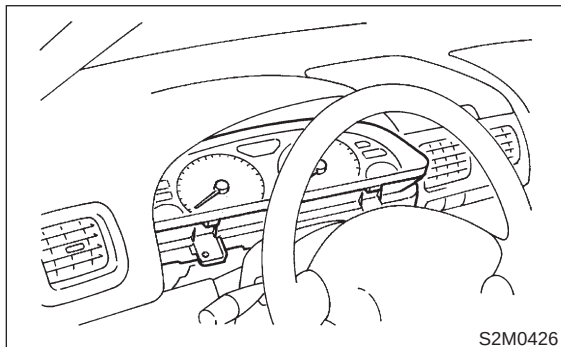
Connector & terminal**(R15) No. 3 — Chassis ground:****CHECK** : **Is the resistance less than 10 Ω ?****YES** : Repair ground short circuit in rear wiring harness.**NO** : Go to step **10AZ9**.**10AZ9 : CHECK BULKHEAD AND INSTRUMENT PANEL WIRING HARNESS.**

- 1) Separate bulkhead wiring harness connector (B37) and instrument panel wiring harness connector (i2).
- 2) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

Connector & terminal**(B37) No. 3 — Chassis ground:****CHECK** : **Is the resistance less than 10 Ω ?****YES** : Repair ground short circuit in bulkhead wiring harness.**NO** : Repair ground short circuit in instrument panel wiring harness.

10AZ10 : CHECK HARNESS BETWEEN COMBINATION METER AND FUEL PUMP CONNECTOR.

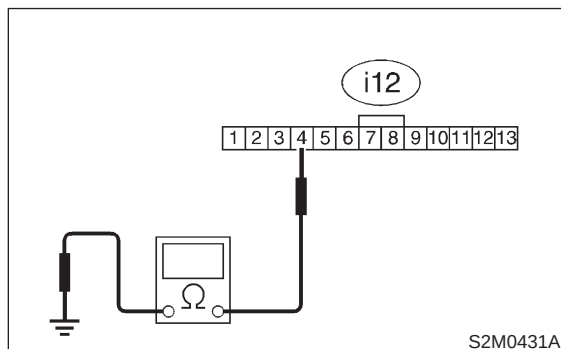
- 1) Connect connector to fuel pump.
- 2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W8A0].>



- 3) Disconnect connector from combination meter.
- 4) Measure resistance of harness between combination meter connector and chassis ground.

Connector & terminal

(i12) No. 4 — Chassis ground:



CHECK : **Is the resistance less than 200 Ω ?**

YES : Go to step **10AZ11**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between combination meter connector and junction A on rear wiring harness
- Poor contact in coupling connector (i2)

10AZ11 : CHECK COMBINATION METER.

Disconnect speedometer cable from combination meter and remove combination meter.

CHECK : **Is the fuel meter installation screw tightened securely?**

YES : Go to step **10AZ12**.

NO : Tighten fuel meter installation screw securely.

10AZ12 : CHECK PRINTED CIRCUIT PLATE.

Remove printed circuit plate assembly from combination meter assembly.

CHECK : **Is there flaw or burning on printed circuit plate assembly?**

YES : Replace printed circuit plate assembly.

NO : Replace fuel meter assembly.

BA: DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —

- **DTC DETECTING CONDITION:**

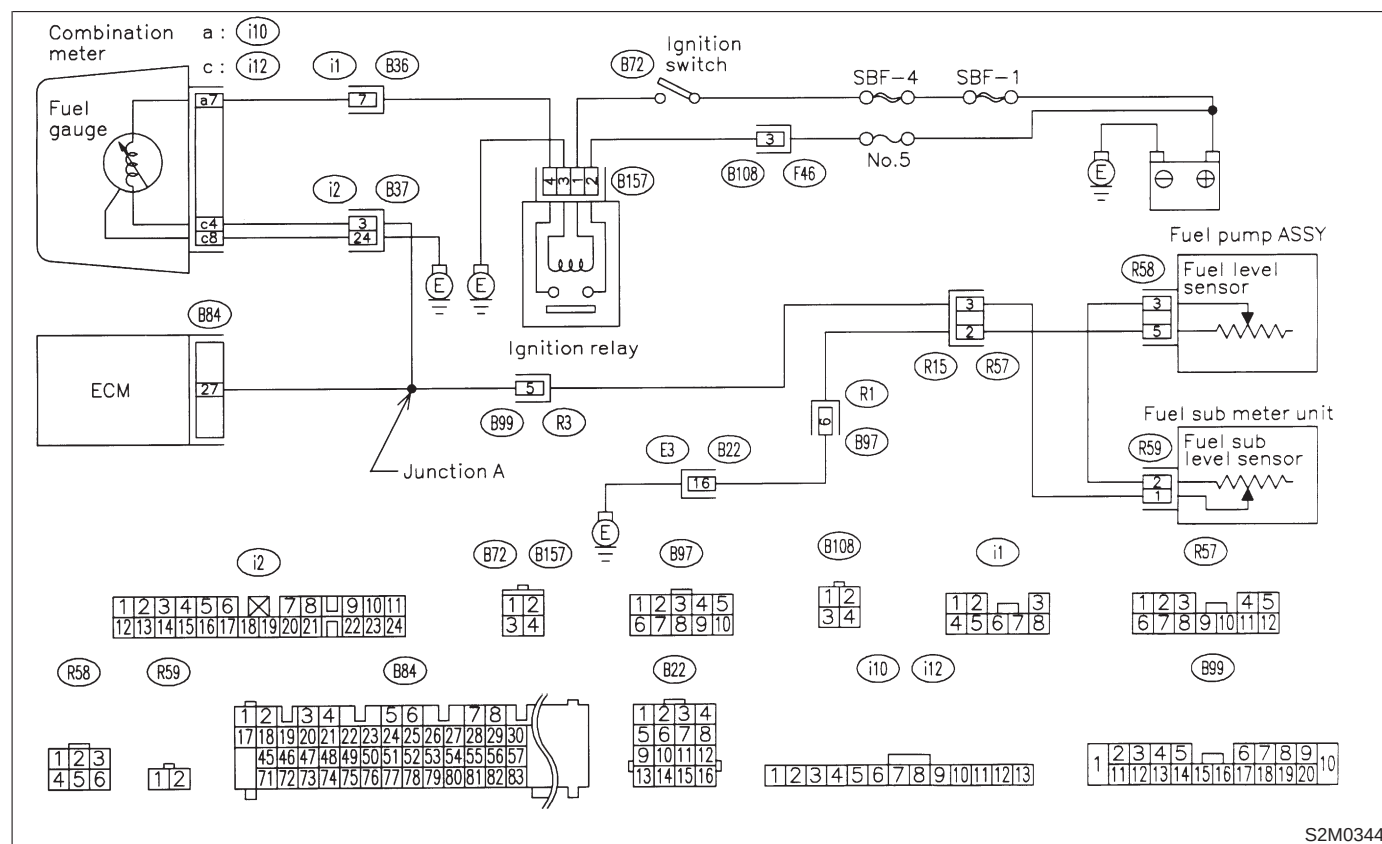
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

- **WIRING DIAGRAM:**



S2M0344

10BA1 :	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.

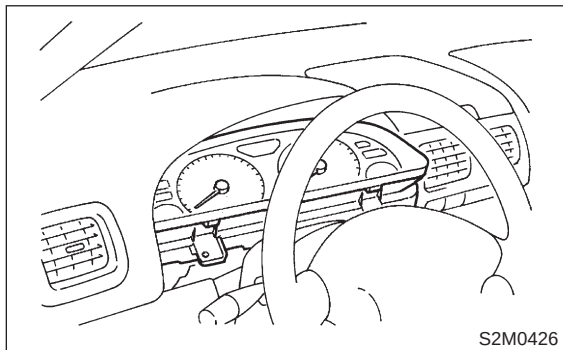
CHECK : Does speedometer and tachometer operate normally?

YES : Go to step **10BA3**.

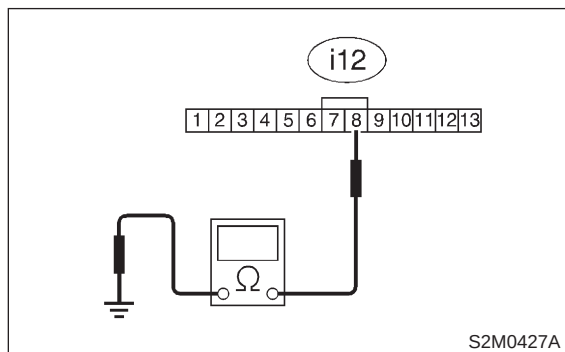
NO : Go to step **10BA2**.

10BA2 : CHECK GROUND CIRCUIT OF COMBINATION METER.

- 1) Turn ignition switch to OFF.
- 2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W8A0].>



- 3) Disconnect connector from combination meter.
- 4) Measure resistance of harness between combination meter connector and chassis ground.

Connector & terminal**(i12) No. 3 — Chassis ground:**

- CHECK** : Is resistance less than 5 Ω ?
- YES** : Repair or replace combination meter.
- NO** : Repair harness and connector.

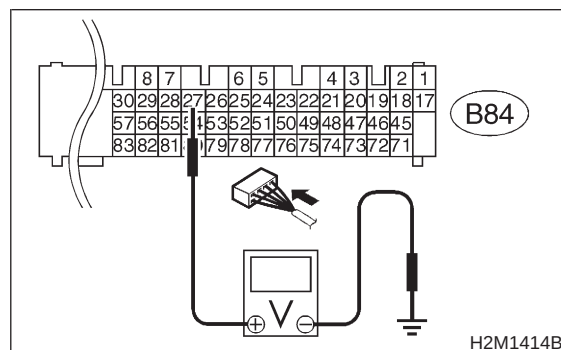
NOTE:

In this case, repair the following:

- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal

10BA3 : CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON. (Engine OFF)
- 2) Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 27 (+) — Chassis ground (-):**

- CHECK** : Is the voltage more than 4.75 V?
- YES** : Go to step 10BA4.
- NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

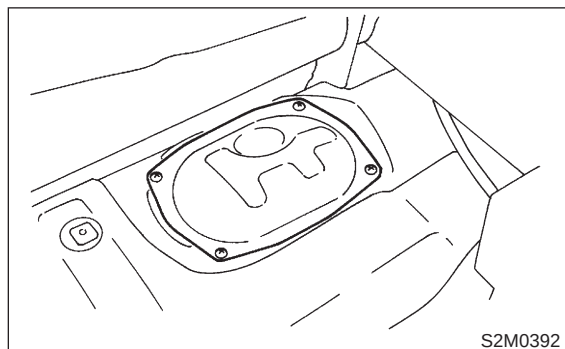
NOTE:

In this case, repair the following:

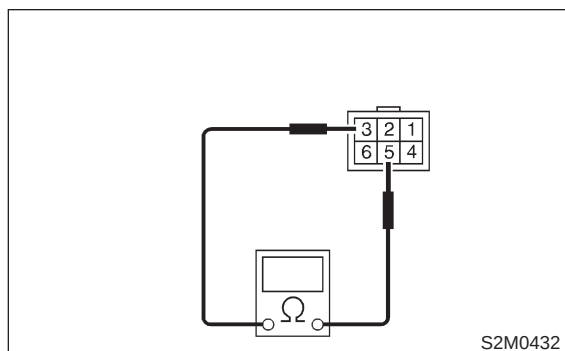
- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (i2, B22, B99, B97 and R57)

10BA4 : CHECK FUEL LEVEL SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel pump access hole lid located on the right rear of luggage compartment floor.



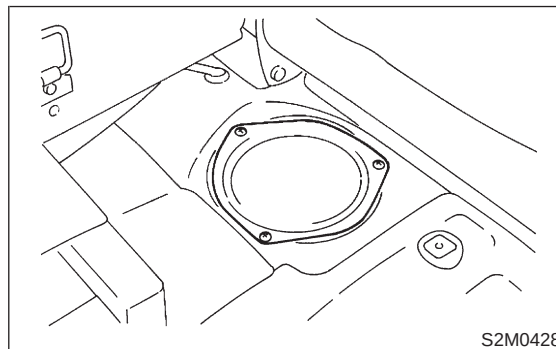
- 3) Disconnect connector from fuel pump.
- 4) Measure resistance between connector terminals of fuel pump.

Terminals**No. 3 — No. 5:**

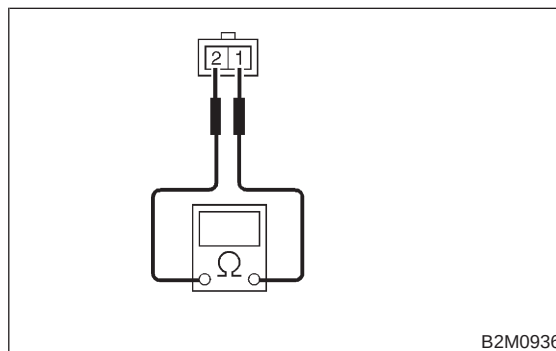
- CHECK** : Is the resistance less than 100 Ω ?
- YES** : Go to step 10BA5.
- NO** : Replace fuel sending unit.

10BA5 : CHECK FUEL SUB LEVEL SENSOR.

- 1) Remove service hole cover located on the left rear of luggage compartment floor.



- 2) Disconnect connector from fuel sub meter unit.
- 3) Measure resistance between connector terminals of fuel sub meter unit.

Terminals**No. 1 — No. 2:**

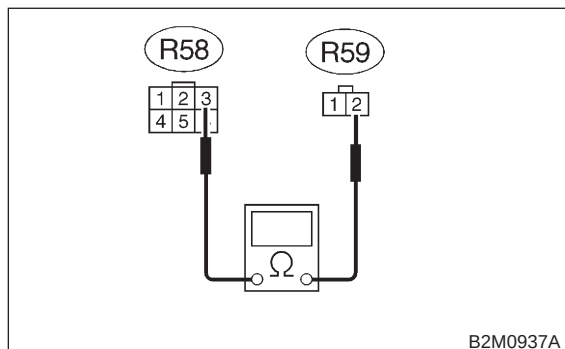
- CHECK** : Is the resistance less than 100 Ω ?
- YES** : Go to step 10BA6.
- NO** : Replace fuel sub meter unit.

10BA6 : CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.

Measure resistance of harness between fuel pump and fuel sub meter unit connector.

Connector & terminal

(R58) No. 3 — (R59) No. 2:



CHECK : **Is the resistance less than 1 Ω ?**

YES : Go to step **10BA7**.

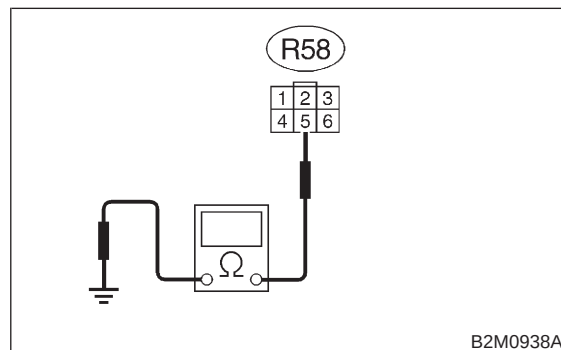
NO : Repair open circuit in harness between fuel pump and fuel sub meter unit connector.

10BA7 : CHECK GROUND CIRCUIT OF FUEL LEVEL SENSOR.

Measure resistance of harness between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 5 — Chassis ground:



CHECK : **Is the resistance less than 5 Ω ?**

YES : Go to step **10BA8**.

NO : Repair harness and connector.

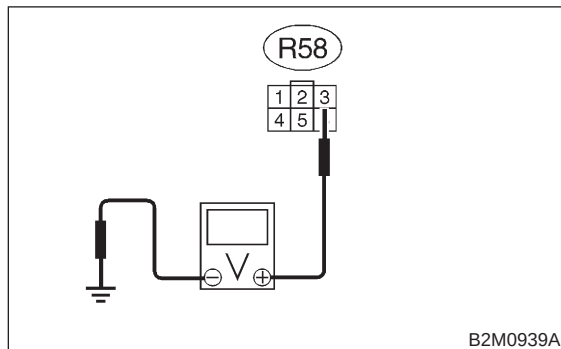
NOTE:

In this case, repair the following:

- Open circuit in harness between fuel pump connector and chassis grounding terminal
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (R57, B97 and B22)

10BA8 : CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONNECTOR.

- 1) Connect connector to fuel sub meter unit.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between fuel pump connector and chassis ground.

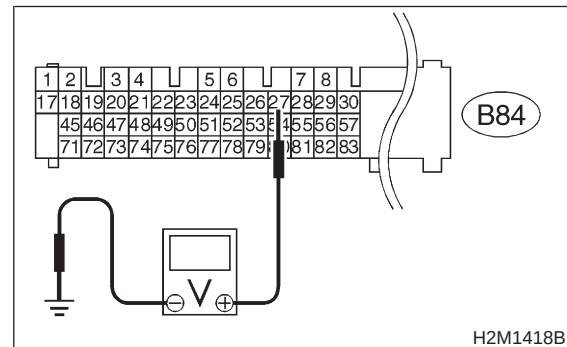
Connector & terminal**(R58) No. 3 (+) — Chassis ground (-):****CHECK** : **Is the voltage less than 1 V?****YES** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between fuel pump connector and junction A on rear wiring harness
- Poor contact in fuel sub meter unit connector
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (R57 and B99)

NO : Go to step **10BA9**.**10BA9 : CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM connector and chassis ground.

Connector & terminal**(B84) No. 27 (+) — Chassis ground (-):****CHECK** : **Is the voltage less than 1 V?****YES** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM connector and junction A on rear wiring harness
- Poor contact in coupling connector (B99)

NO : Repair connector.**NOTE:**

In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in fuel sub meter unit
- Poor contact in ECM connector

BB: DTC P0480 — COOLING FAN RELAY 1 CIRCUIT LOW INPUT —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

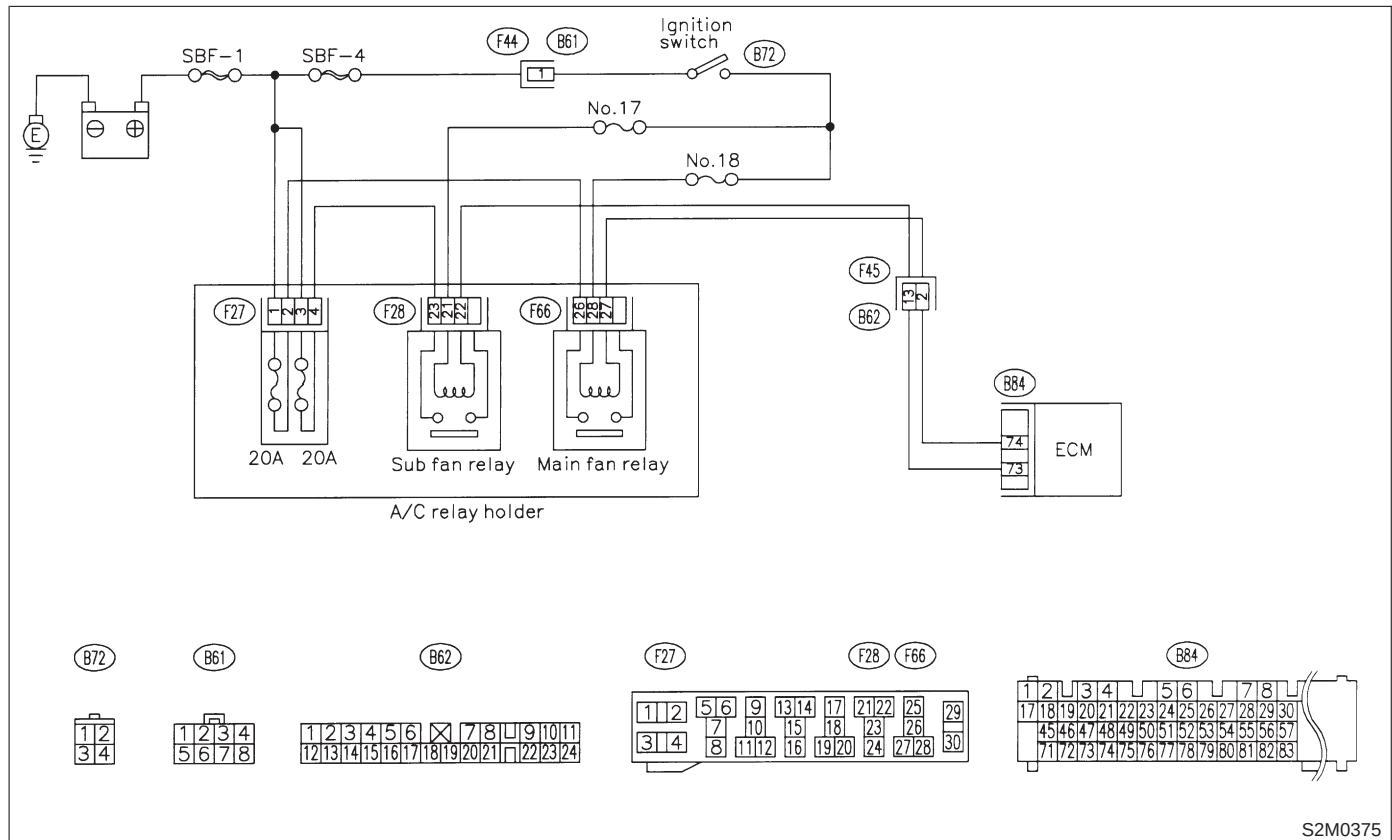
• TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODE**.

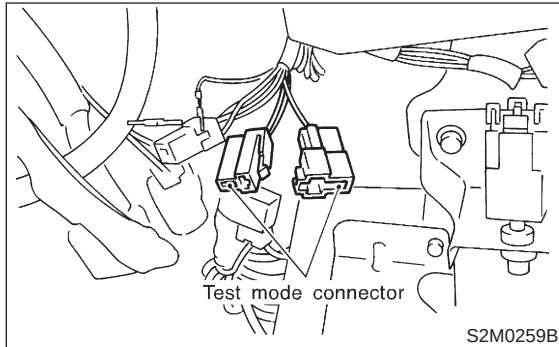
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0375

10BB1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



- 3) Turn ignition switch to ON.

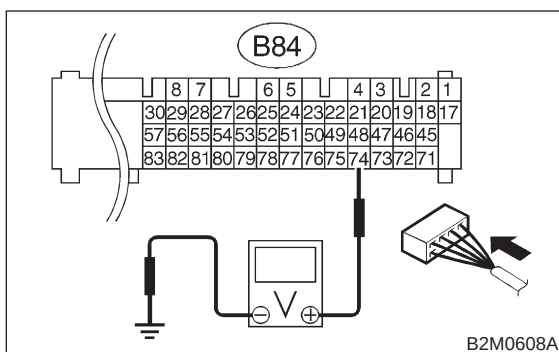
NOTE:

Radiator fan relay operation check can be executed using Subaru Select Monitor. For procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

- 4) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 74 (+) — Chassis ground (-):



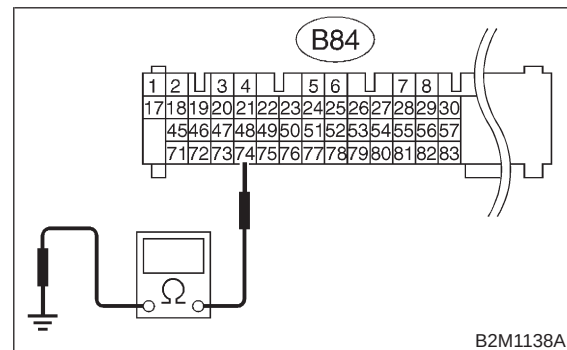
- CHECK** : Does voltage change between 0 and 10 volts?
- YES** : Repair poor contact in ECM connector.
- NO** : Go to step **10BB2**.

10BB2 : CHECK GROUND SHORT CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B84) No. 74 — Chassis ground:



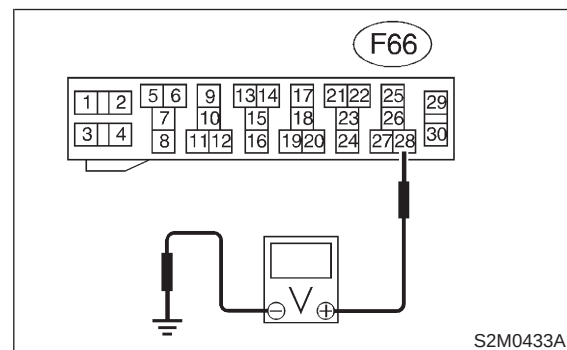
- CHECK** : Is the resistance less than 10 Ω ?
- YES** : Repair ground short circuit in radiator fan relay 1 control circuit.
- NO** : Go to step **10BB3**.

10BB3 : CHECK POWER SUPPLY FOR RELAY.

- 1) Remove main fan relay from A/C relay holder.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between main fan relay connector and chassis ground.

Connector & terminal

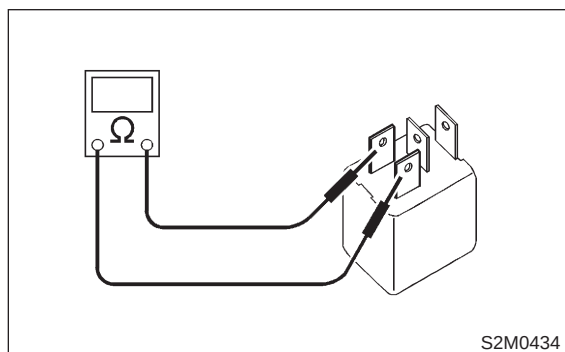
(F66) No. 28 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step **10BB4**.
- NO** : Repair open circuit in harness between ignition switch and A/C relay holder connector.

10BB4 : CHECK MAIN FAN RELAY.

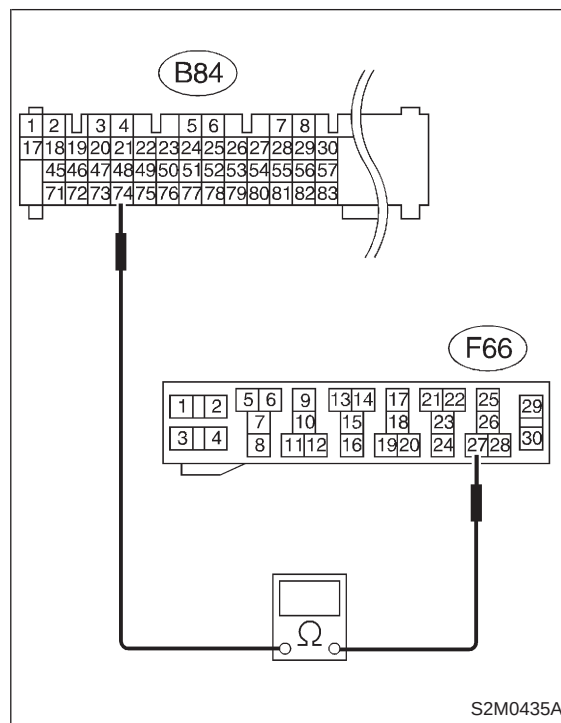
- 1) Turn ignition switch to OFF.
- 2) Measure resistance between main fan relay terminals.

Terminal**No. 27 — No. 28:**

- CHECK** : *Is the resistance between 74 and 118 Ω?*
- YES** : Go to step **10BB5**.
- NO** : Replace main fan relay.

10BB5 : CHECK OPEN CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

Measure resistance of harness between ECM and main fan relay connector.

Connector & terminal**(B84) No. 74 — (F66) No. 27:**

- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **10BB6**.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and A/C relay holder connector
- Poor contact in coupling connector (B62)

10BB6 : CHECK POOR CONTACT.

Check poor contact in ECM or main fan relay connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : *Is there poor contact in ECM or main fan relay connector?*
- YES** : Repair poor contact in ECM or main fan relay connector.
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

BC: DTC P0483 — COOLING FAN FUNCTION PROBLEM —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

- Occurrence of noise
- Overheating

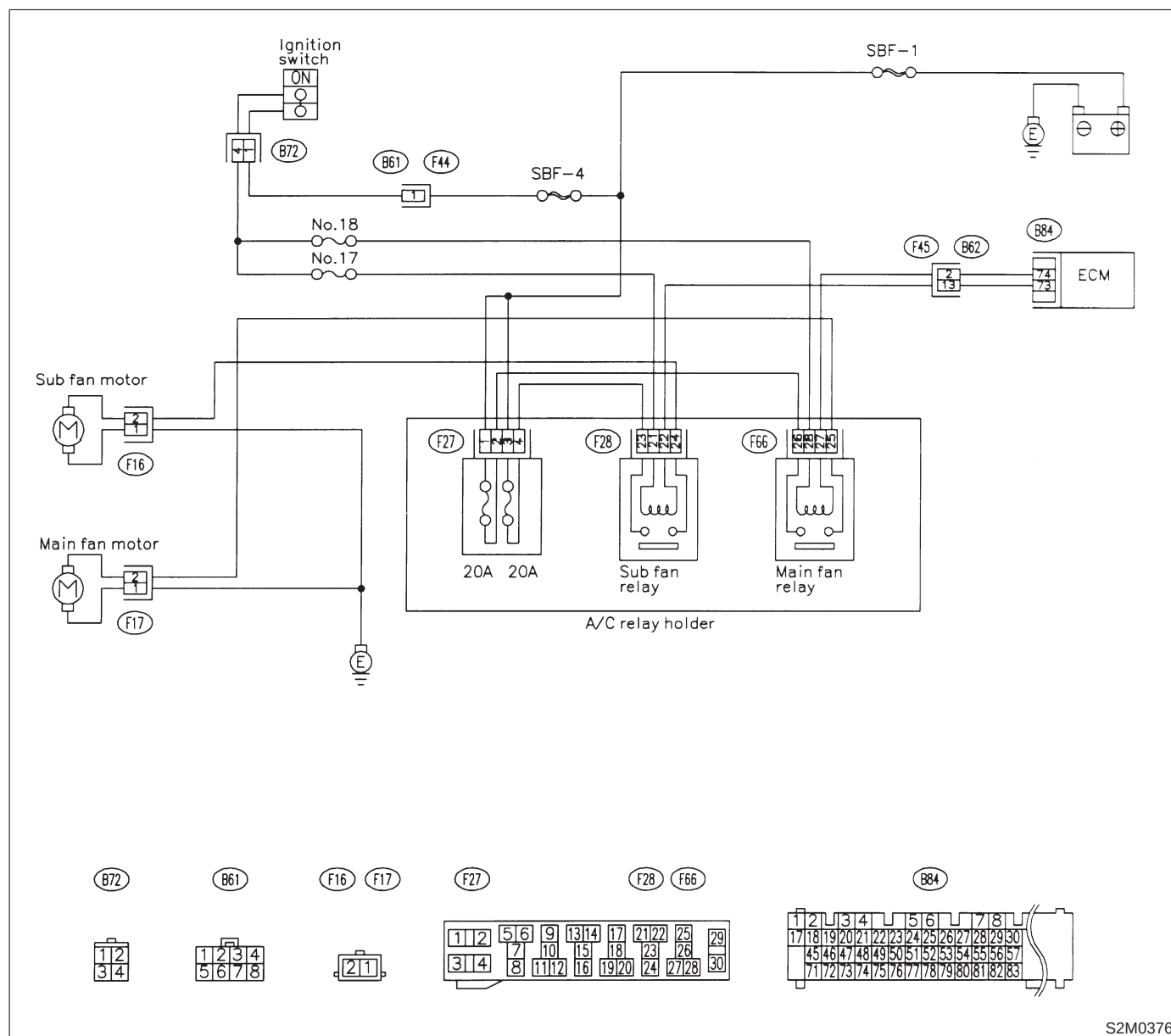
CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:

If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

• WIRING DIAGRAM:

S2M0376

10BC1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : *Is there any other DTC on display?*

YES : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NO : Check engine cooling system. <Ref. to 2-5 [T100].>

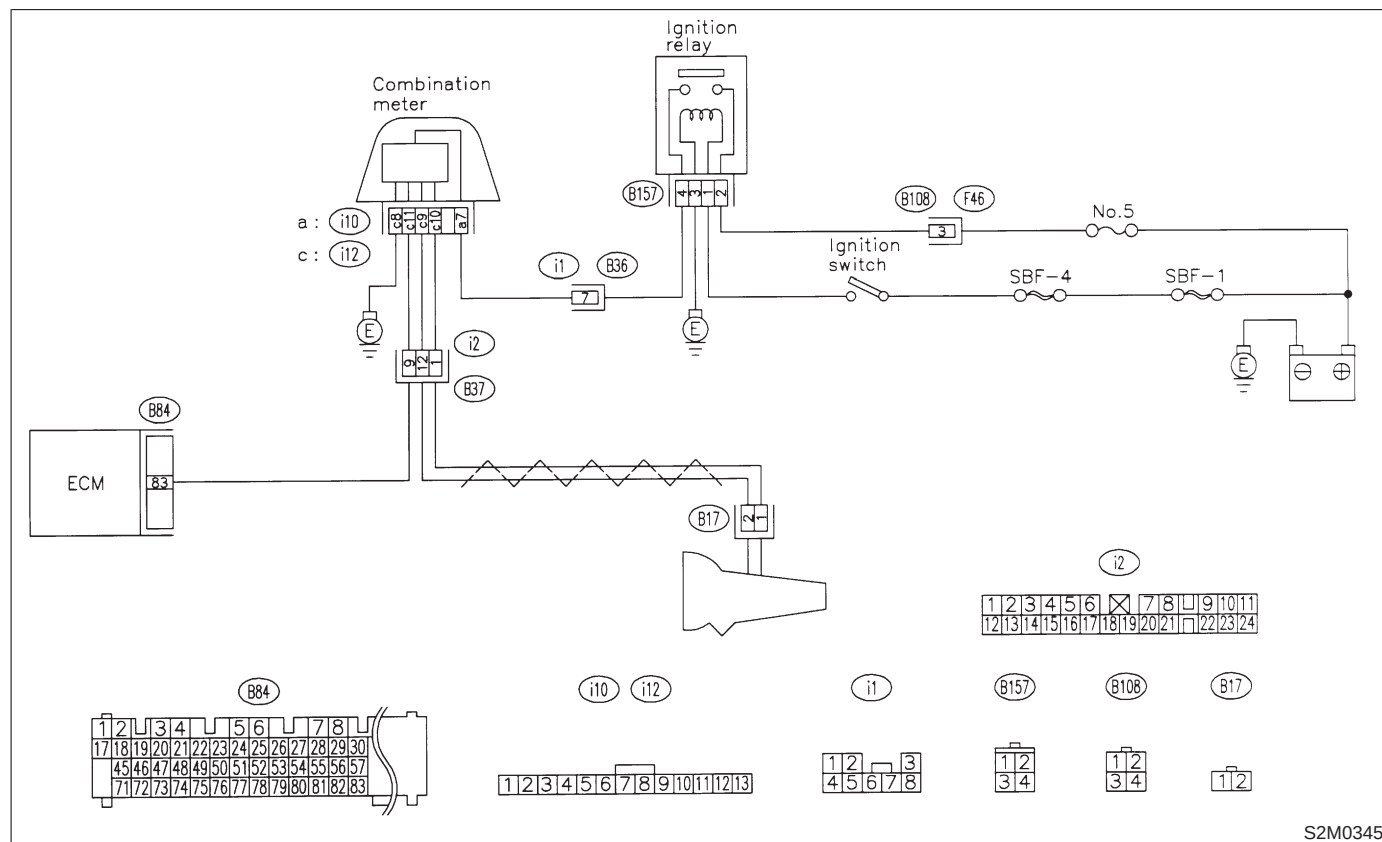
BD: DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION —● **DTC DETECTING CONDITION:**

- Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

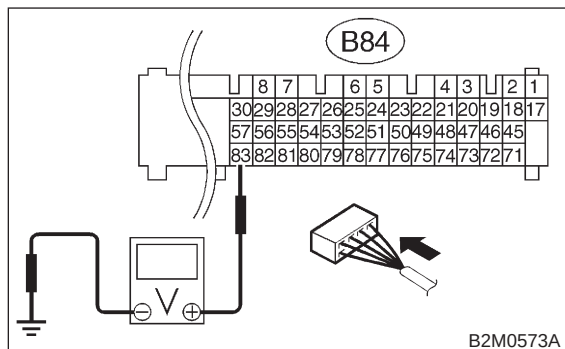
S2M0345

10BD1 : CHECK SPEEDOMETER OPERATION IN COMBINATION METER.

- CHECK** : Does speedometer operate normally?
- YES** : Go to step **10BD2**.
- NO** : Check speedometer and vehicle speed sensor 2 <Ref. to 6-2 [K2A0].>.

10BD2 : CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

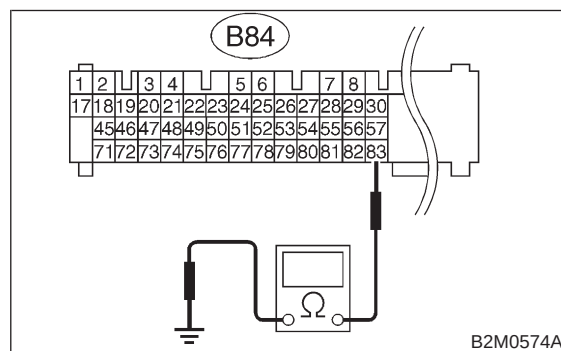
Connector & terminal
(B84) No. 83 (+) — Chassis ground (-):

CHECK : Is the voltage more than 2 V?
YES : Repair harness and connector.
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and combination meter connector
- Poor contact in ECM connector
- Poor contact in combination meter connector
- Poor contact in coupling connector (i2)

NO : Go to step 10BD3.
10BD3 : CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal
(B84) No. 83 — Chassis ground:

CHECK : Is the resistance less than 10 Ω?
YES : Repair ground short circuit in harness between ECM and combination meter connector.
NO : Repair poor contact in ECM connector.

BE: DTC P0505 — IDLE CONTROL SYSTEM MALFUNCTION —**• DTC DETECTING CONDITION:**

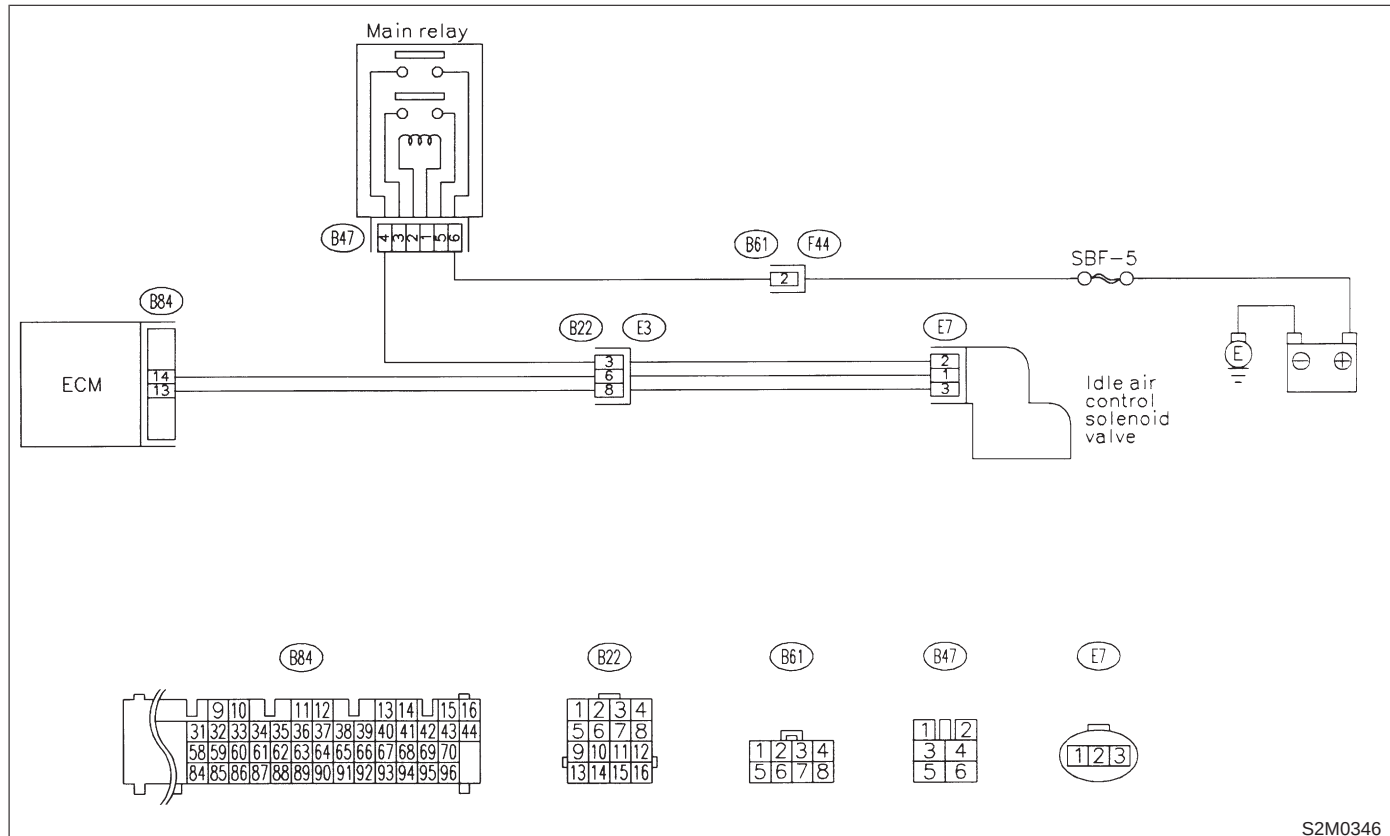
- Immediately at fault recognition

• TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Engine breathing

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0346

10BE1 : CHECK AIR INTAKE SYSTEM.

- 1) Turn ignition switch to ON.
- 2) Start engine, and idle it.
- 3) Check the following items.
 - Loose installation of intake manifold, idle air control solenoid valve and throttle body
 - Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket
 - Loose connections and cracks of idle air control solenoid valve by-pass hoses
 - Disconnections of vacuum hoses

CHECK : *Is there a fault in air intake system?*

YES : Repair or replace air intake system.

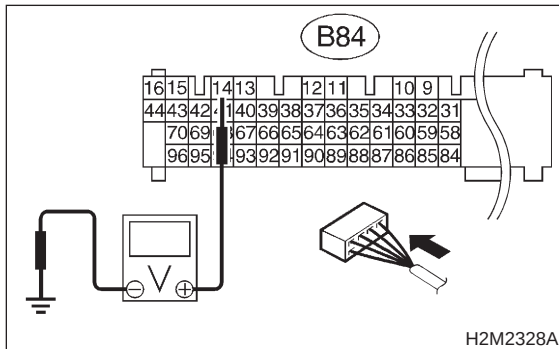
NO : Go to step **10BE2**.

10BE5 : CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 14 (+) — Chassis ground (-):



- CHECK** : **Is the voltage more than 10 V?**
- YES** : Repair battery short circuit in harness between ECM and idle air control solenoid valve connector. After repair, replace ECM.
- NO** : Go to step **10BE6**.

10BE6 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

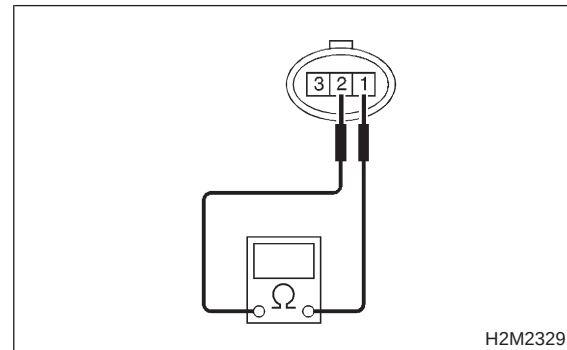
- CHECK** : **Is there poor contact in ECM connector?**
- YES** : Repair poor contact in ECM connector.
- NO** : Go to step **10BE7**.

10BE7 : CHECK IDLE AIR CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between idle air control solenoid valve connector terminals.

Terminals

No. 1 — No. 2:



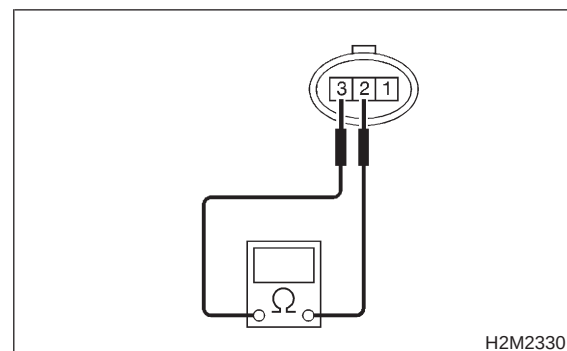
- CHECK** : **Is the resistance more than 20 Ω?**
- YES** : Replace idle air control solenoid valve.
- NO** : Go to step **10BE8**.

10BE8 : CHECK IDLE AIR CONTROL SOLENOID VALVE.

Measure resistance between idle air control solenoid valve connector terminals.

Terminals

No. 2 — No. 3:



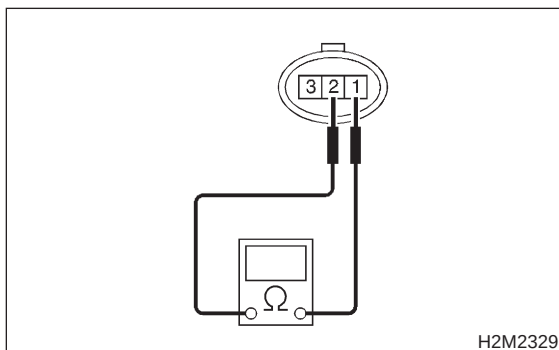
- CHECK** : **Is the resistance more than 20 Ω?**
- YES** : Replace idle air control solenoid valve.
- NO** : Go to step **10BE9**.

10BE9 : CHECK IDLE AIR CONTROL SOLENOID VALVE.

Measure resistance between idle air control solenoid valve connector terminals.

Terminals

No. 1 — No. 2:



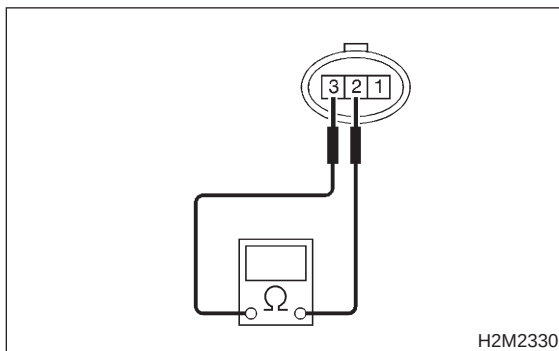
- CHECK** : *Is the resistance less than 5 Ω ?*
- YES** : Replace idle air control solenoid valve and ECM.
- NO** : Go to step **10BE10**.

10BE10 : CHECK IDLE AIR CONTROL SOLENOID VALVE.

Measure resistance between idle air control solenoid valve connector terminals.

Terminals

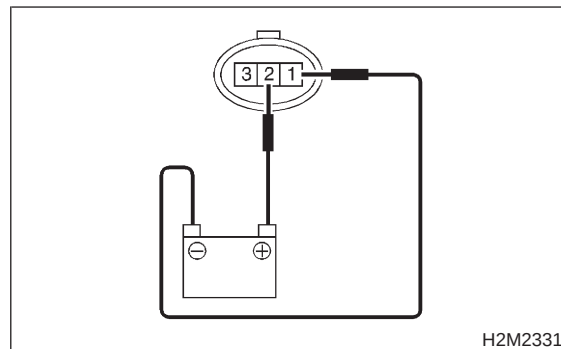
No. 2 — No. 3:



- CHECK** : *Is the resistance less than 5 Ω ?*
- YES** : Replace idle air control solenoid valve and ECM.
- NO** : Go to step **10BE11**.

10BE11 : CHECK IDLE AIR CONTROL SOLENOID VALVE.

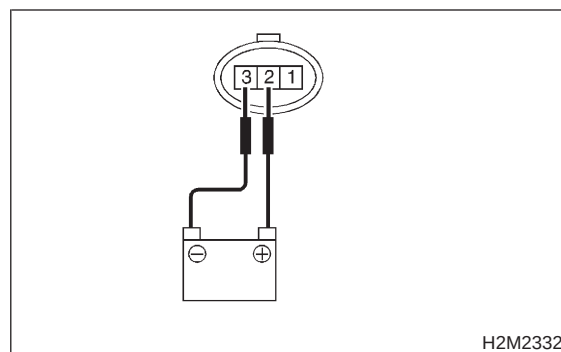
- 1) Remove idle air control solenoid valve. <Ref. to 2-7 [W13A0].>
- 2) Check operation of idle air control solenoid valve.



- CHECK** : *Is idle air control solenoid valve fully opened when applying the battery to terminals No. 2 (+) and No. 1 (-)?*
- YES** : Go to step **10BE12**.
- NO** : Clean idle air control solenoid valve. <Ref. to 2-7 [W13B0].>

10BE12 : CHECK IDLE AIR CONTROL SOLENOID VALVE.

Check operation of idle air control solenoid valve.



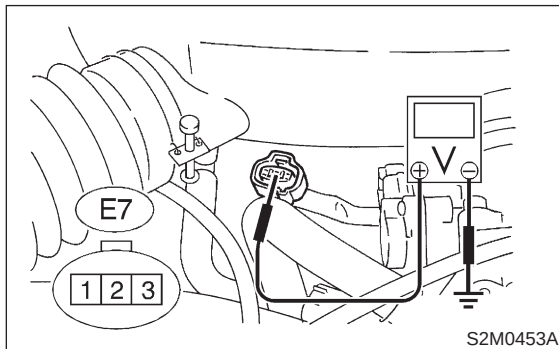
- CHECK** : *Is idle air control solenoid valve fully closed when applying the battery to terminals No. 2 (+) and No. 3 (-)?*
- YES** : Go to step **10BE13**.
- NO** : Clean idle air control solenoid valve. <Ref. to 2-7 [W13B0].>

10BE13 : CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from idle air control solenoid valve.
- 3) Disconnect connector from idle air control solenoid valve.
- 4) Measure voltage between idle air control solenoid valve and engine ground.

Connector & terminal

(E7) No. 2 (+) — Engine ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 10BE14.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

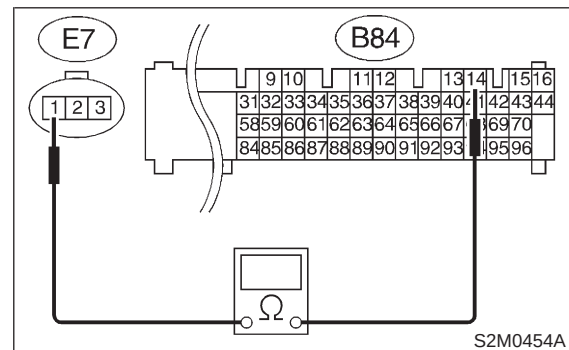
- Open circuit in harness between idle air control solenoid valve and main relay connector
- Poor contact in coupling connector (B22)

10BE14 : CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and idle air control solenoid valve connector.

Connector & terminal

(B84) No. 14 — (E7) No. 1:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10BE15.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

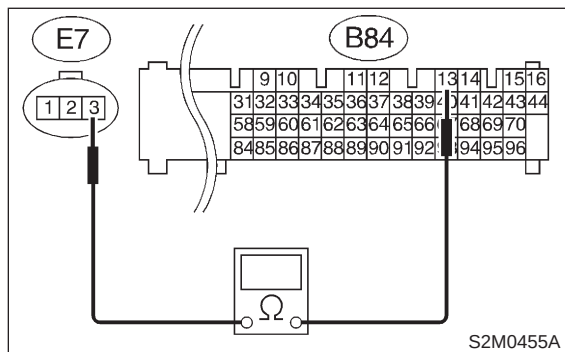
- Open circuit in harness between ECM and idle air control solenoid valve connector
- Poor contact in coupling connector (B22)

10BE15 : CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.

Measure resistance of harness between ECM and idle air control solenoid valve connector.

Connector & terminal

(B84) No. 13 — (E7) No. 3:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step **10BE16**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

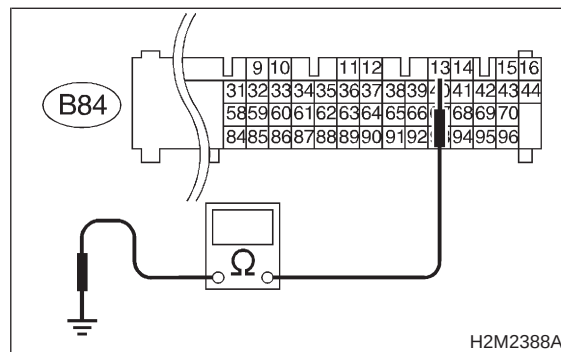
- Open circuit in harness between ECM and idle air control solenoid valve connector
- Poor contact in coupling connector (B22)

10BE16 : CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 13 — Chassis ground:



CHECK : Is the resistance less than 10 Ω ?

YES : Repair ground short circuit in harness between ECM and idle air control solenoid valve connector.

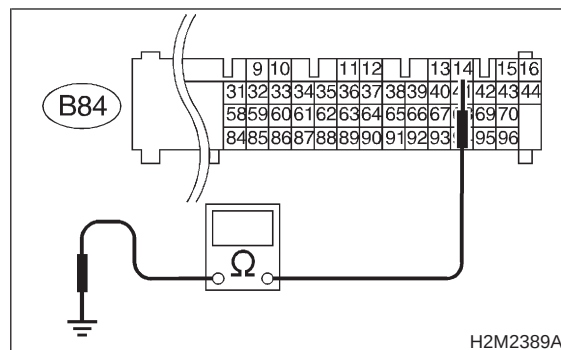
NO : Go to step **10BE17**.

10BE17 : CHECK HARNESS BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE CONNECTOR.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 14 — Chassis ground:



CHECK : Is the resistance less than 10 Ω ?

YES : Repair ground short circuit in harness between ECM and idle air control solenoid valve connector.

NO : Go to step **10BE18**.

10BE18 : CHECK POOR CONTACT.

Check poor contact in idle air control solenoid valve connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in idle air control solenoid valve connector?*

YES : Repair poor contact in idle air control solenoid valve connector.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

BF: DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

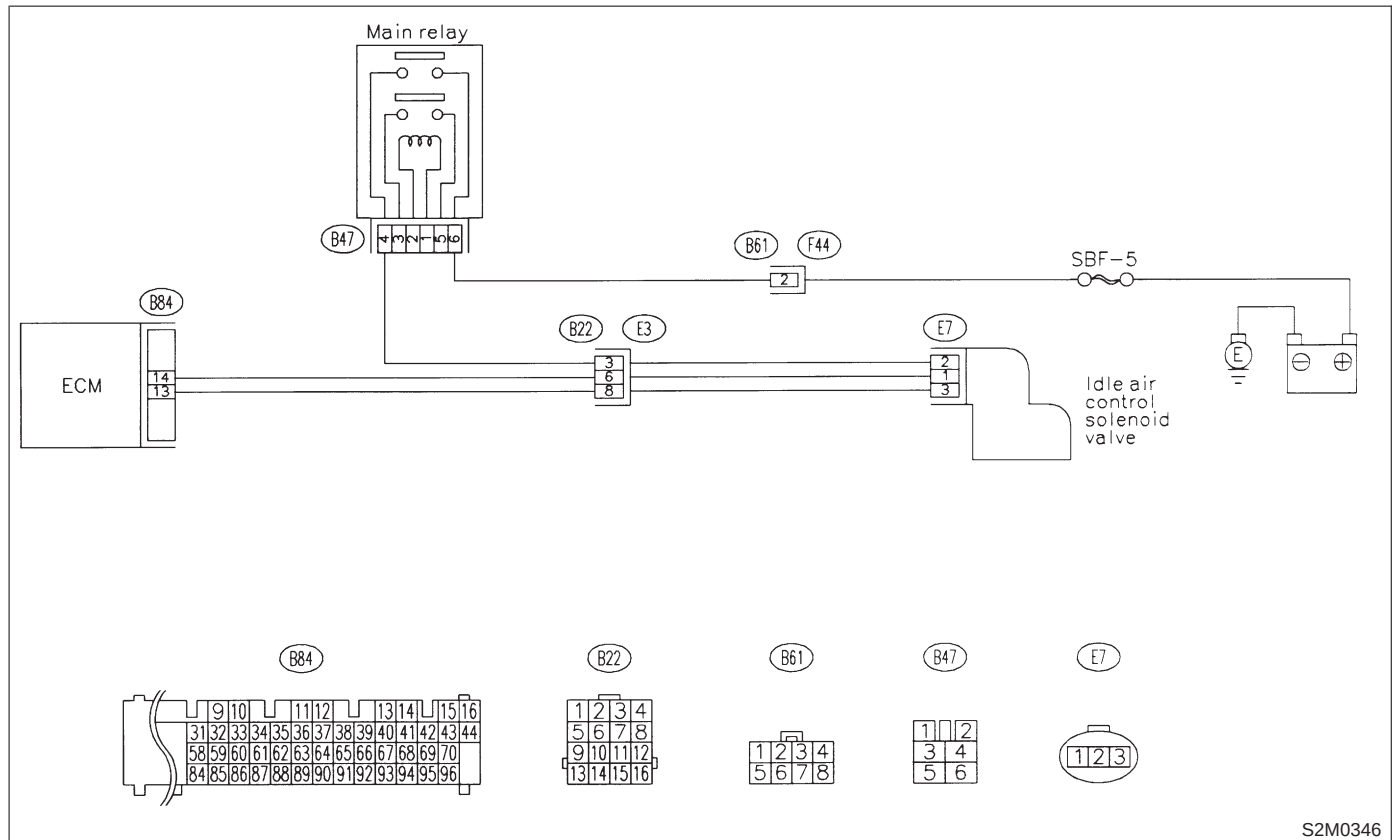
• TROUBLE SYMPTOM:

- Engine is difficult to start.
- Engine does not start.
- Erroneous idling
- Engine stalls.

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0346

10BF1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?

YES : Inspect DTC P0505 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0506.

NO : Go to step **10BF2**.

10BF2 : CHECK AIR INTAKE SYSTEM.

- 1) Turn ignition switch to ON.
- 2) Start engine, and idle it.

CHECK : Is clogging the by-pass line between by-pass hose and intake duct?

YES : Repair the by-pass line.

NO : Replace idle air control solenoid valve.

BG: DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

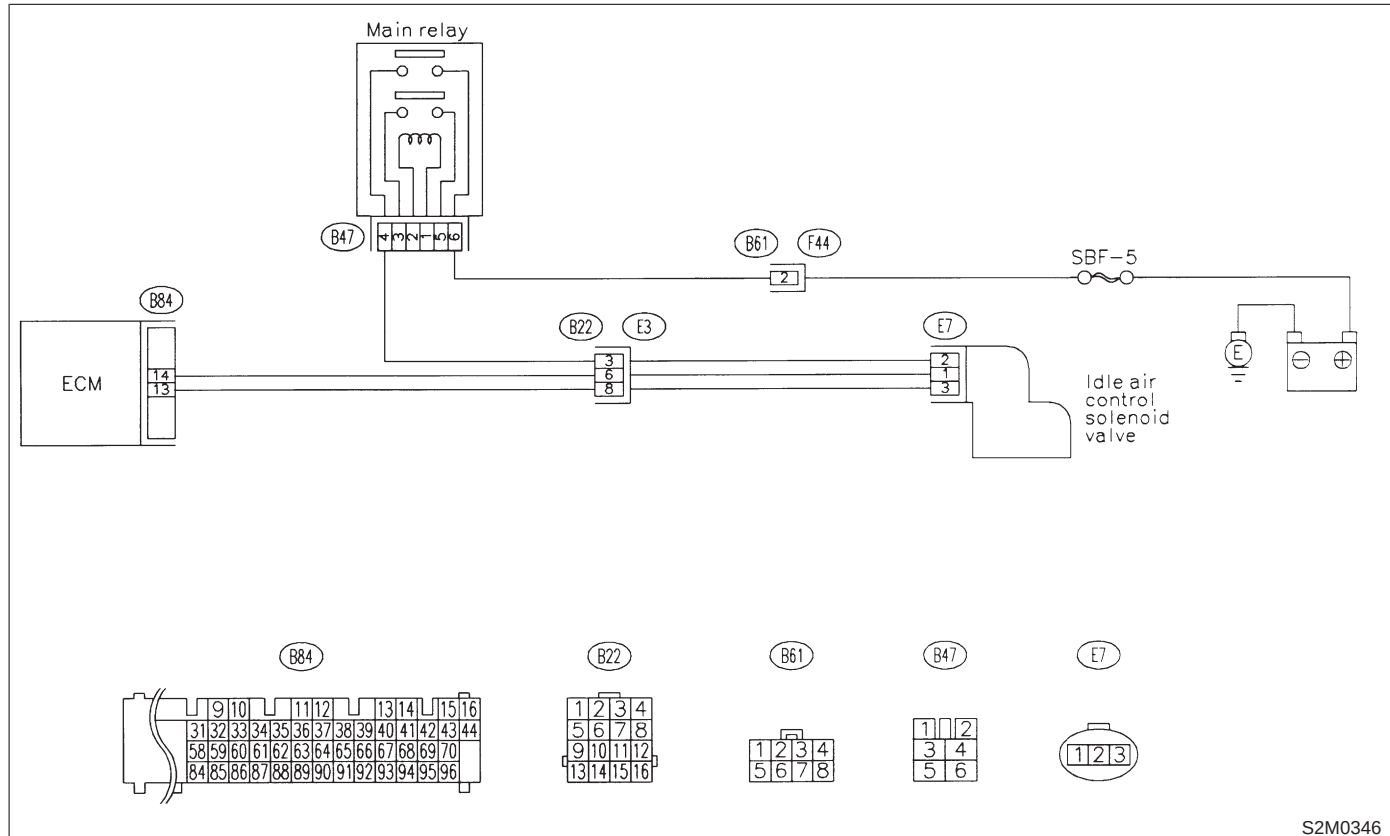
• TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0346

10BG1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?

YES : Inspect DTC P0505 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0507.

NO : Go to step **10BG2**.

10BG2 : CHECK AIR INTAKE SYSTEM.

- 1) Turn ignition switch to ON.
- 2) Start engine, and idle it.
- 3) Check the following items.
 - Loose installation of intake manifold, idle air control solenoid valve and throttle body
 - Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket
 - Loose connections and cracks of idle air control solenoid valve by-pass hoses
 - Disconnections of vacuum hoses

CHECK : Is there a fault in air intake system?

YES : Repair air suction and leaks.

NO : Replace idle air control solenoid valve.

BH: DTC P0600 — SERIAL COMMUNICATION LINK MALFUNCTION —

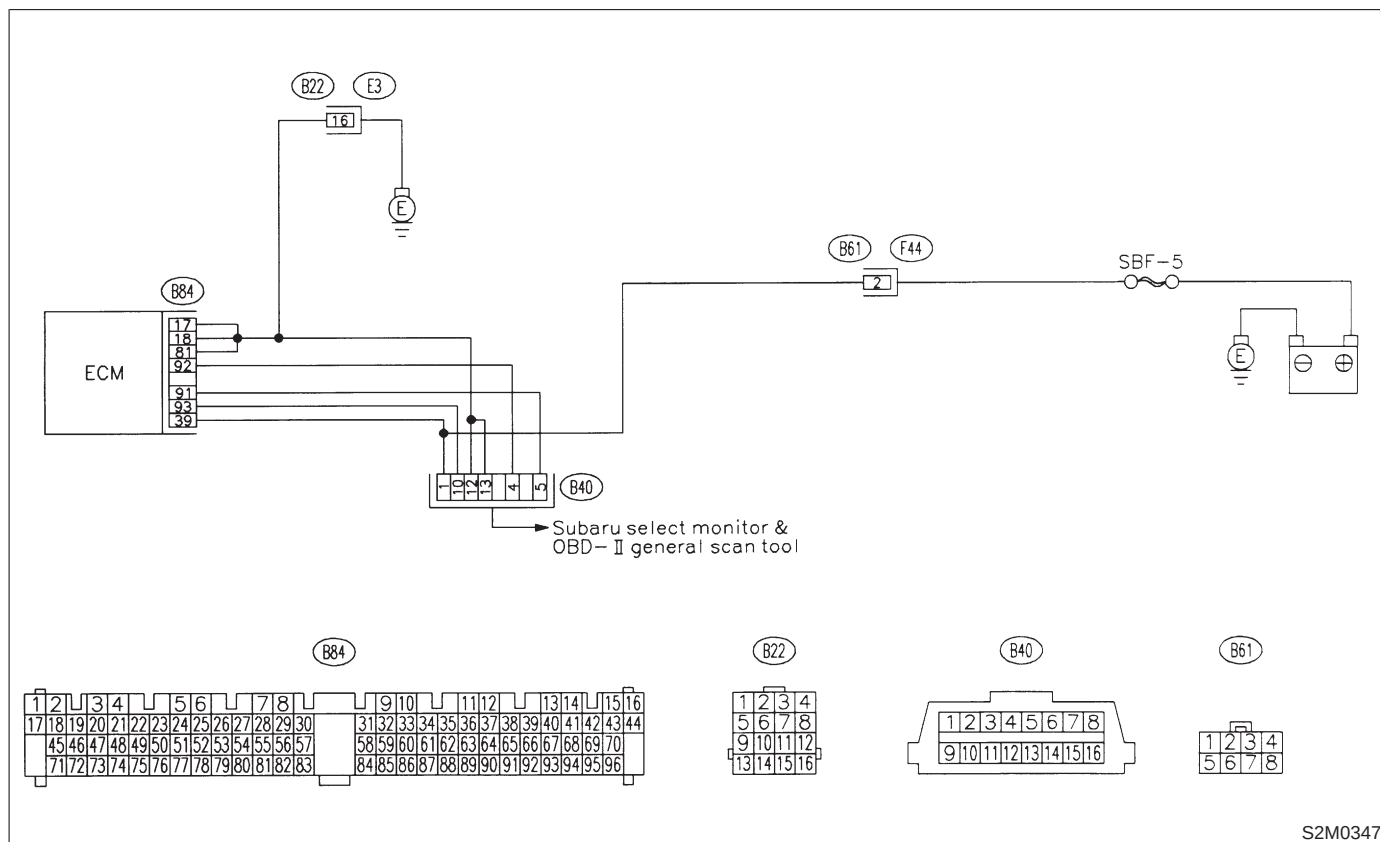
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

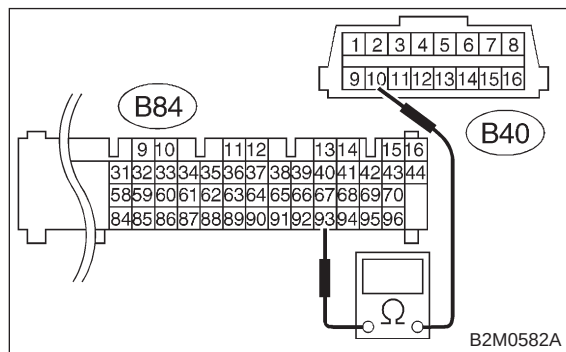
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



10BH1 : CHECK HARNESS BETWEEN ECM AND DATA LINK CONNECTOR.

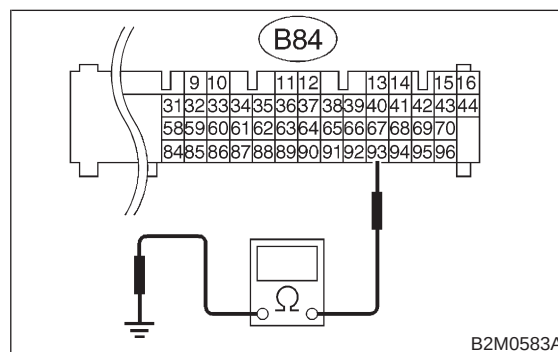
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM and data link connector.

Connector & terminal**(B84) No. 93 — (B40) No. 10:**

- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Go to step **10BH2**.
- NO** : Repair open circuit in harness between ECM and data link connector.

10BH2 : CHECK HARNESS BETWEEN ECM AND DATA LINK CONNECTOR.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal**(B84) No. 93 — Chassis ground:**

- CHECK** : **Is the resistance less than 10 Ω ?**
- YES** : Repair ground short circuit in harness between ECM and data link connector.
- NO** : Repair poor contact in ECM connector and data link connector.

BI: DTC P0601 — INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR —

CAUTION:

- **WIRING DIAGRAM:**

S2M0320

10BI1 : CHECK DTC P0601 ON DISPLAY.

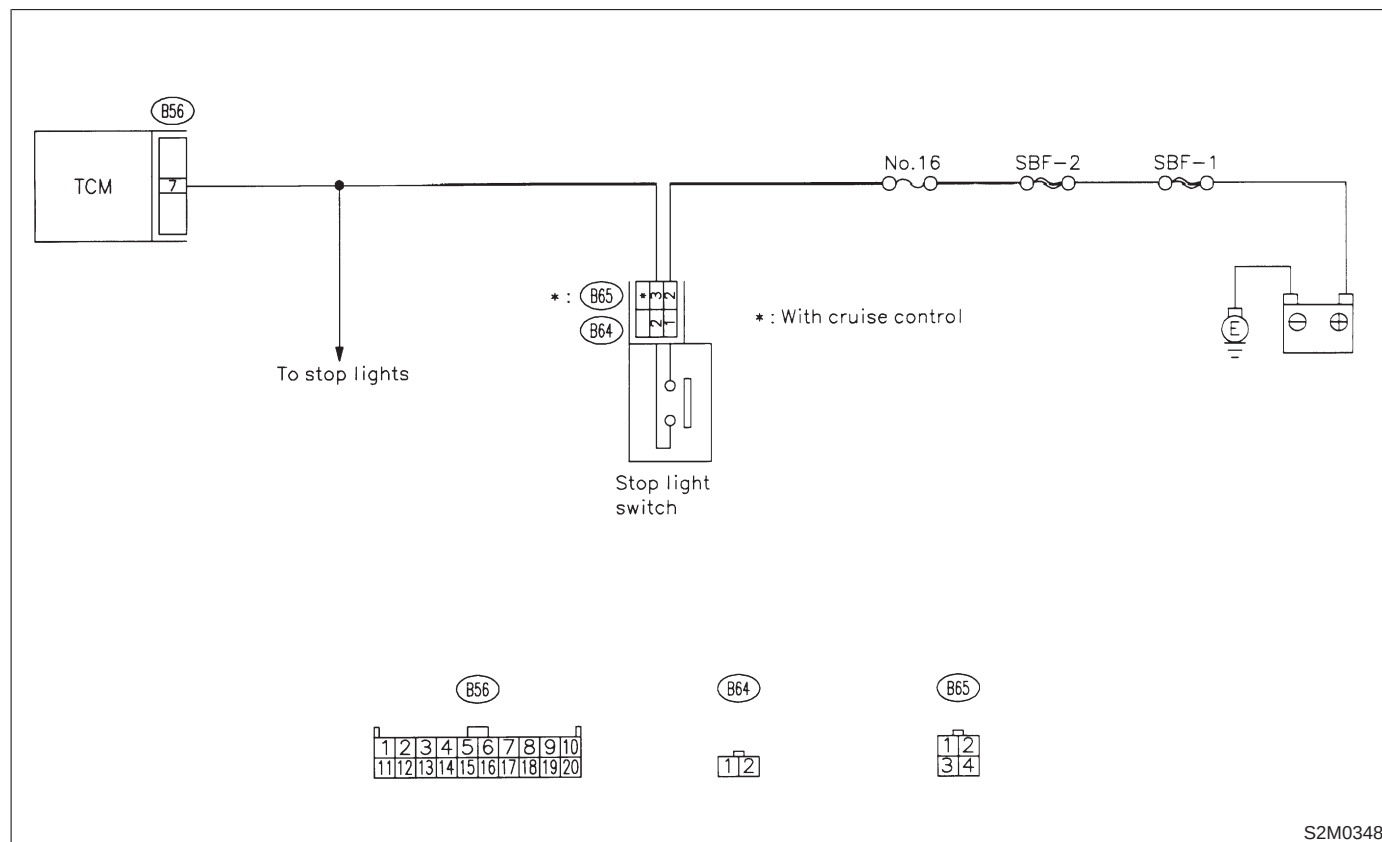
BJ: DTC P0703 — BRAKE SWITCH INPUT MALFUNCTION —● **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**
10BJ1 : CHECK OPERATION OF BRAKE LIGHT.

CHECK : Does brake light come on when depressing the brake pedal?

YES : Go to step 10BJ2.

NO : Repair or replace brake light circuit.

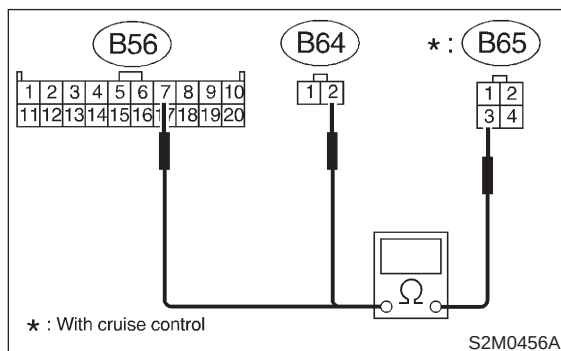
10BJ2 : CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR.

- 1) Disconnect connectors from TCM and brake light switch.
- 2) Measure resistance of harness between TCM and brake light switch connector.

Connector & terminal

(B56) No. 7 — (B64) No. 2 (Without cruise control):

(B56) No. 7 — (B65) No. 3 (With cruise control):



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10BJ3.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

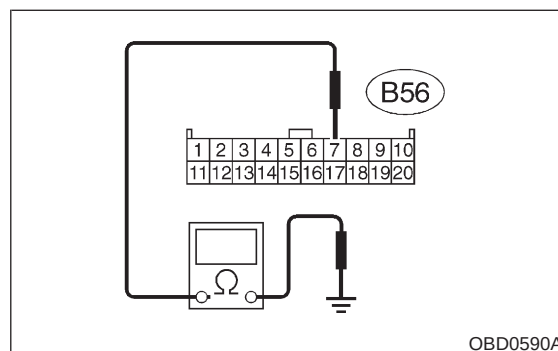
- Open circuit in harness between TCM and brake light switch connector
- Poor contact in TCM connector
- Poor contact in brake light switch connector

10BJ3 : CHECK HARNESS BETWEEN TCM AND BRAKE LIGHT SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 7 — Chassis ground:



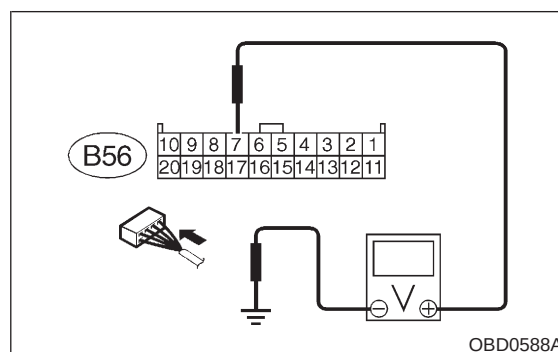
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 10BJ4.
- NO** : Repair ground short circuit in harness between TCM and brake light switch connector.

10BJ4 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and brake light switch.
- 2) Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 7 (+) — Chassis ground (-):



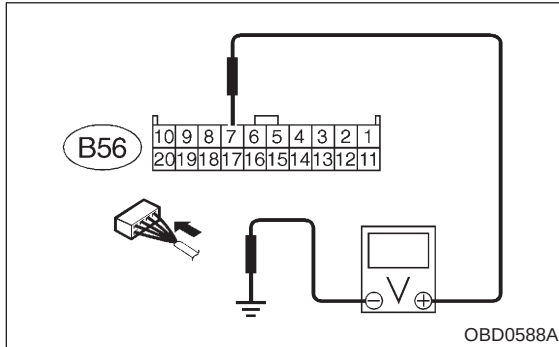
- CHECK** : Is the voltage less than 1 V when releasing the brake pedal?
- YES** : Go to step 10BJ5.
- NO** : Adjust or replace brake light switch.

10BJ5 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 7 (+) — Chassis ground (-):



CHECK : *Is the voltage more than 10 V when depressing the brake pedal?*

YES : Go to step **10BJ6**.

NO : Adjust or replace brake light switch.

10BJ6 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in TCM connector?*

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

BK: DTC P0705 — TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

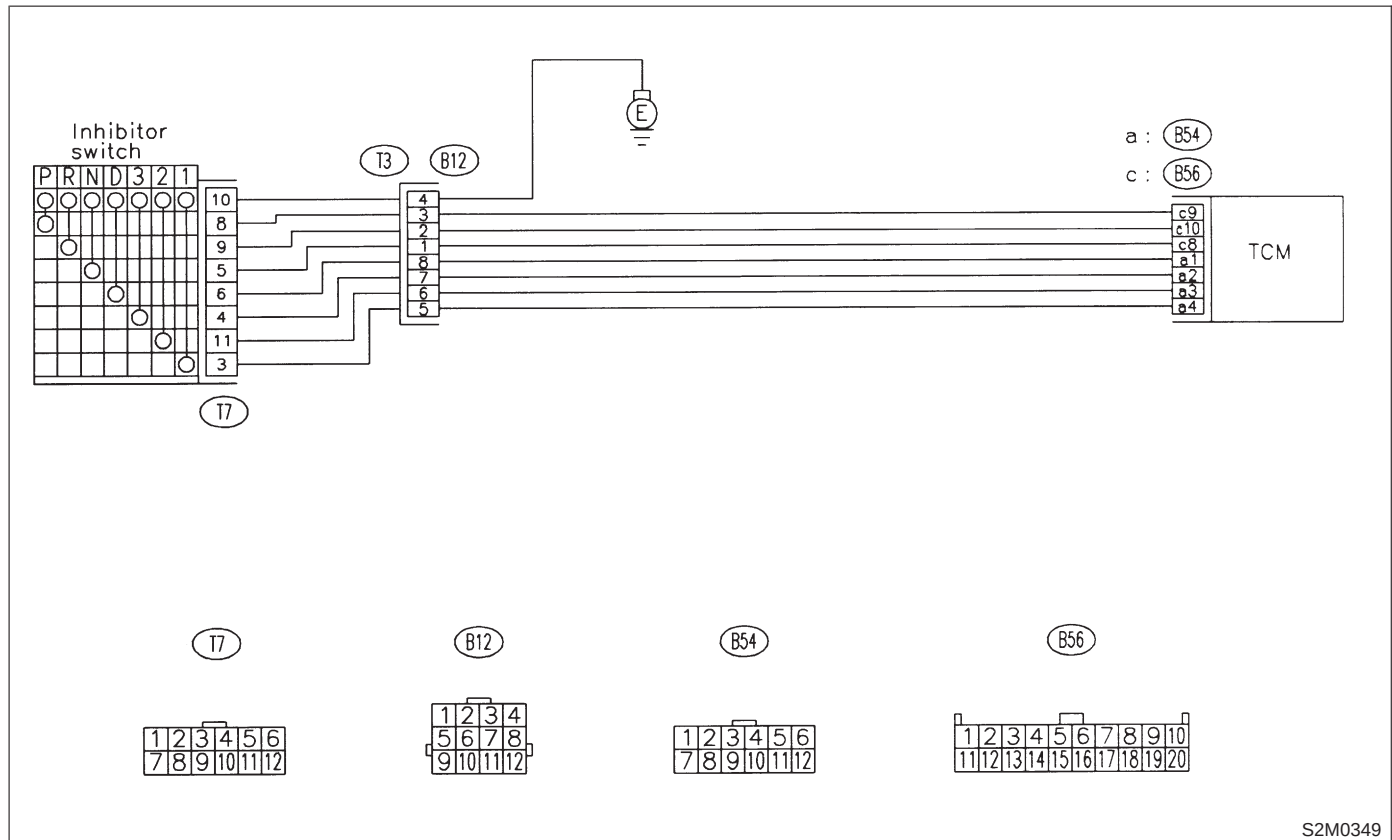
- Starter does not rotate when selector lever is in “P” or “N” range.
- Starter rotates when selector lever is in “R”, “D”, “3”, “2” or “1” range.
- Engine brake is not effected when selector lever is in “3” range.
- Shift characteristics are erroneous.

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

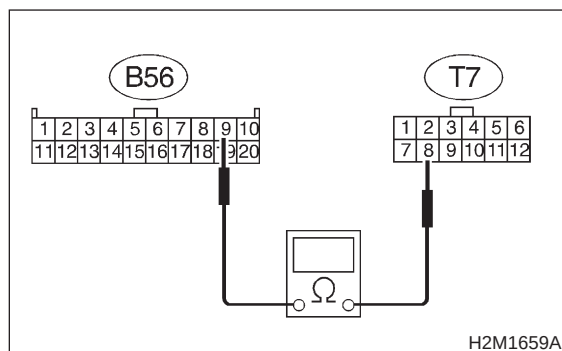
<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



10BK1 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and transmission.
- 3) Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal
(B56) No. 9 — (T7) No. 8:

CHECK : *Is the resistance less than 1 Ω?*
YES : Go to step **10BK2**.

NO : Repair harness and connector.

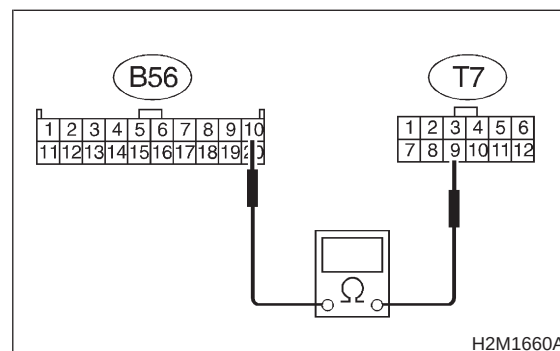
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

10BK2 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal
(B56) No. 10 — (T7) No. 9:

CHECK : *Is the resistance less than 1 Ω?*
YES : Go to step **10BK3**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

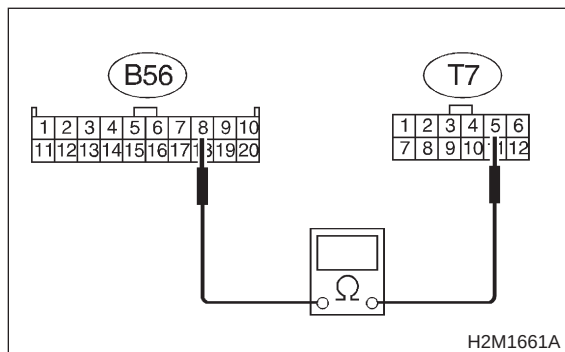
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

10BK3 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal

(B56) No. 8 — (T7) No. 5:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 10BK4.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

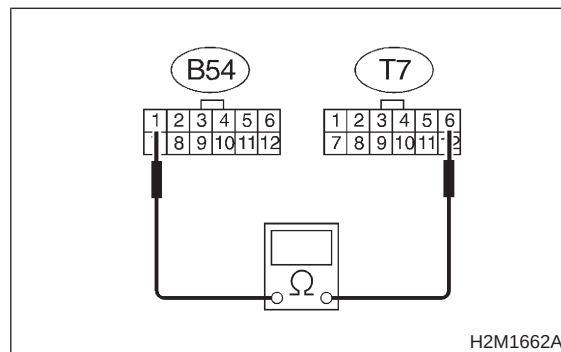
- Open circuit in harness between ECM and inhibitor switch connector.
- Poor contact in coupling connector (B12)

10BK4 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal

(B54) No. 1 — (T7) No. 6:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 10BK5.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

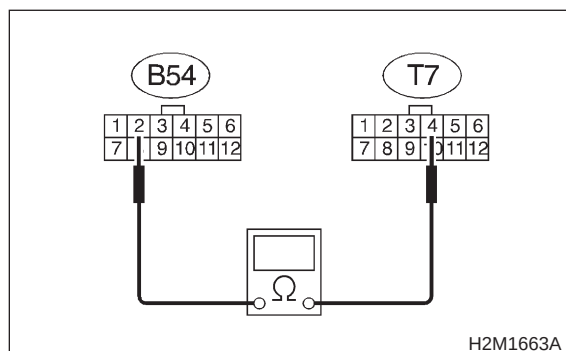
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

10BK5 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal

(B54) No. 2 — (T7) No. 4:



CHECK : **Is the resistance less than 1 Ω ?**

YES : Go to step **10BK6**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

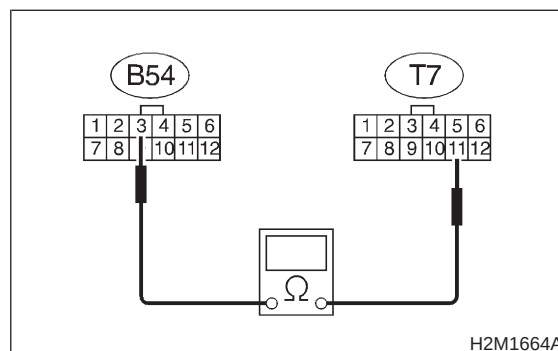
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

10BK6 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal

(B54) No. 3 — (T7) No. 11:



CHECK : **Is the resistance less than 1 Ω ?**

YES : Go to step **10BK7**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

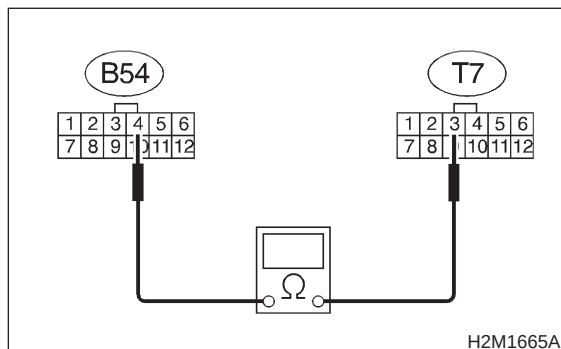
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

10BK7 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal

(B54) No. 4 — (T7) No. 3:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step **10BK8**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

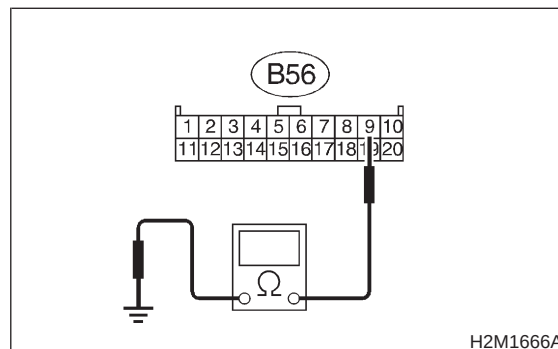
- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)

10BK8 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 9 — Chassis ground:



CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **10BK9**.

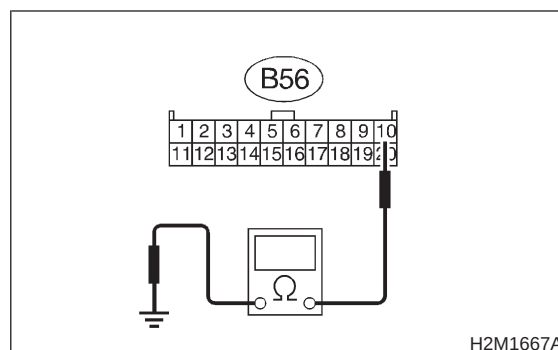
NO : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK9 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 10 — Chassis ground:



CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **10BK10**.

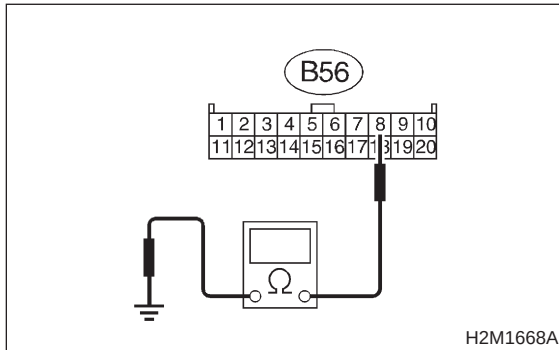
NO : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK10 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 8 — Chassis ground:



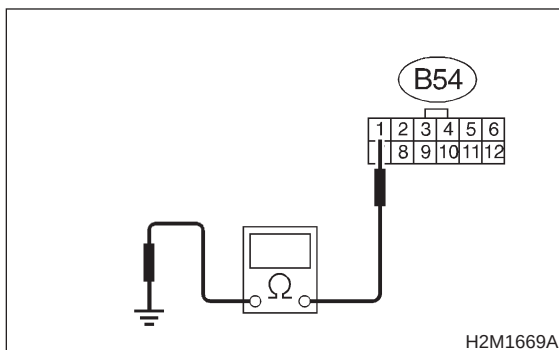
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **10BK11**.
- NO** : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK11 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 1 — Chassis ground:



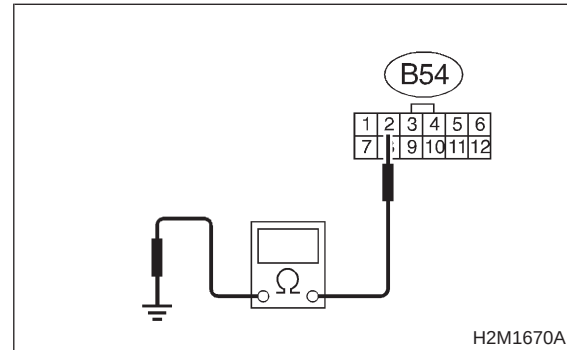
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **10BK12**.
- NO** : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK12 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 2 — Chassis ground:



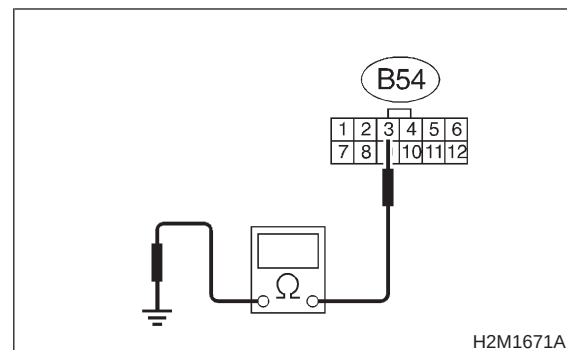
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **10BK13**.
- NO** : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK13 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 3 — Chassis ground:



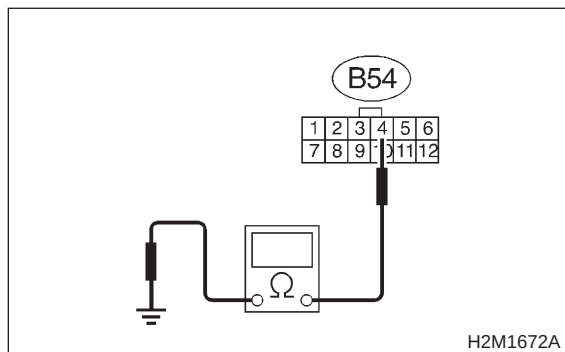
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **10BK14**.
- NO** : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK14 : CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 4 — Chassis ground:



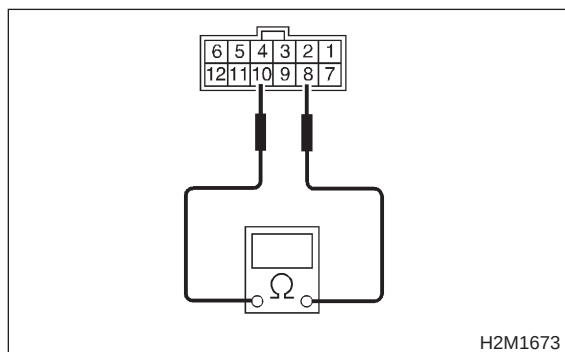
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 10BK15.
- NO** : Repair ground short circuit in harness between TCM and transmission harness connector.

10BK15 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector "P" position.

Terminals

No. 8 — No. 10



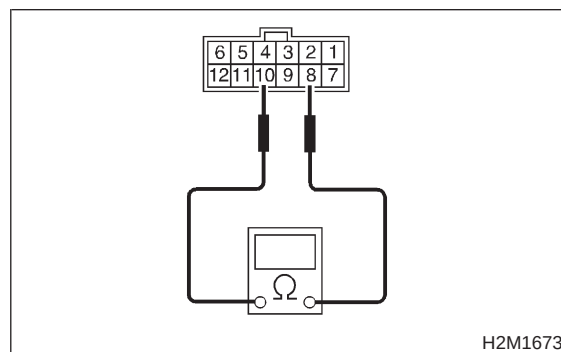
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10BK16.
- NO** : Go to step 10BK29.

10BK16 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "P" position.

Terminals

No. 8 — No. 10



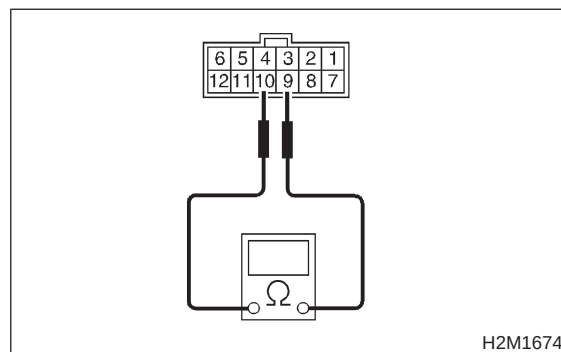
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 10BK17.
- NO** : Go to step 10BK29.

10BK17 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "R" position.

Terminals

No. 9 — No. 10



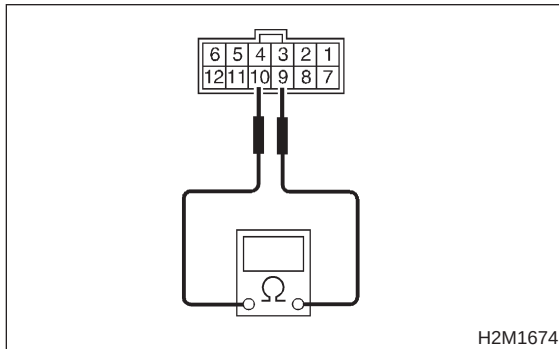
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10BK18.
- NO** : Go to step 10BK29.

10BK18 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "R" position.

Terminals

No. 9 — No. 10



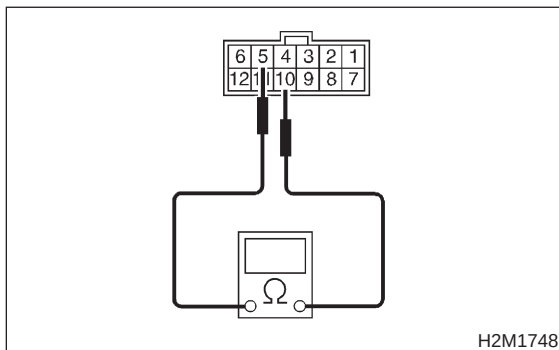
- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10BK19**.
NO : Go to step **10BK29**.

10BK19 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "N" position.

Terminals

No. 5 — No. 10



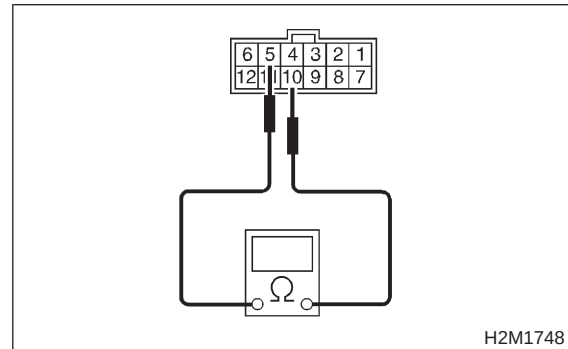
- CHECK** : *Is the resistance less than 1 Ω in "N" position?*
YES : Go to step **10BK20**.
NO : Go to step **10BK29**.

10BK20 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "N" position.

Terminals

No. 5 — No. 10



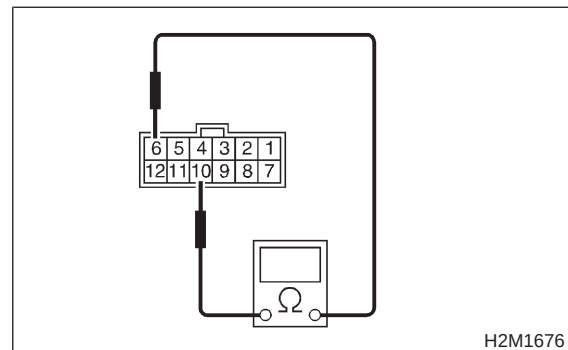
- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10BK21**.
NO : Go to step **10BK29**.

10BK21 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "D" position.

Terminals

No. 6 — No. 10



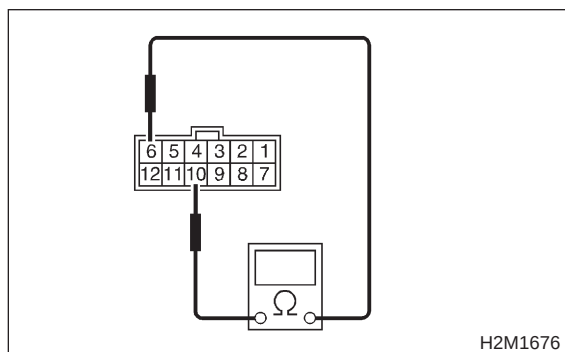
- CHECK** : *Is the resistance less than 1 Ω*
YES : Go to step **10BK22**.
NO : Go to step **10BK29**.

10BK22 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "D" position..

Terminals

No. 6 — No. 10



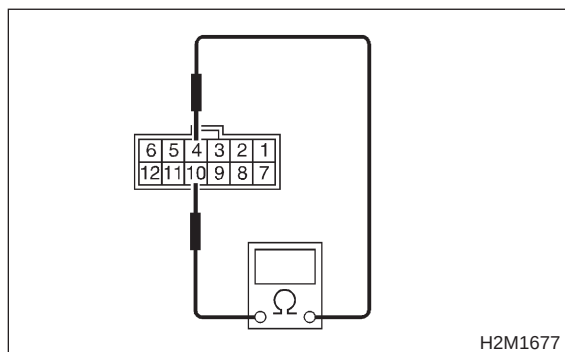
- CHECK** : *Is the resistance more than 1 Ω?*
YES : Go to step **10BK23**.
NO : Go to step **10BK29**.

10BK23 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "3" position.

Terminals

No. 4 — No. 10



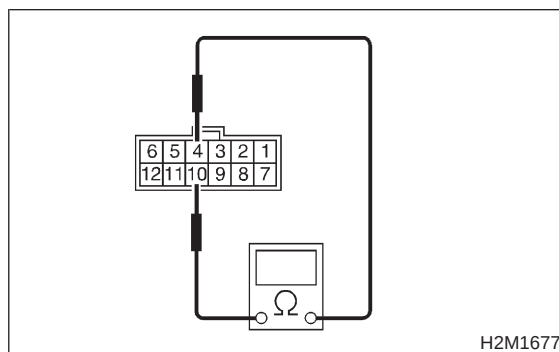
- CHECK** : *Is the resistance less than 1 Ω?*
YES : Go to step **10BK24**.
NO : Go to step **10BK29**.

10BK24 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "3" position.

Terminals

No. 4 — No. 10



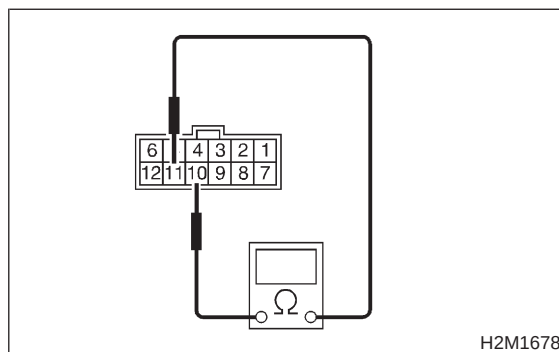
- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10BK25**.
NO : Go to step **10BK29**.

10BK25 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "2" position.

Terminals

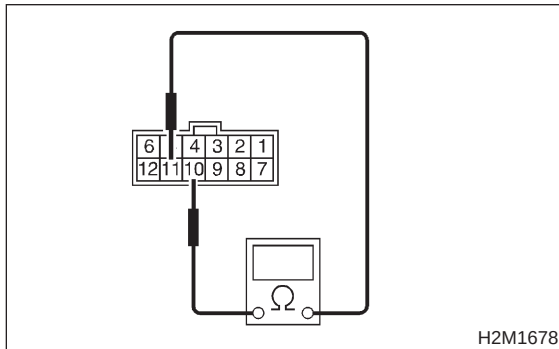
No. 11 — No. 10



- CHECK** : *Is the resistance less than 1 Ω?*
YES : Go to step **10BK26**.
NO : Go to step **10BK29**.

10BK26 : CHECK INHIBITOR SWITCH.

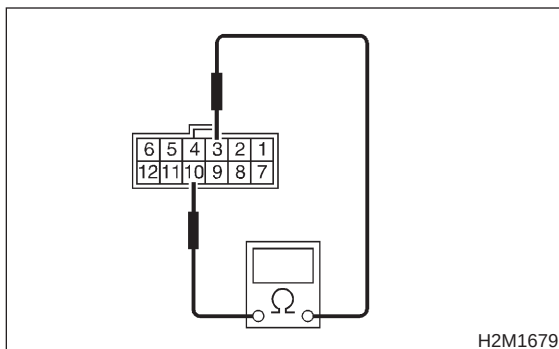
Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "2" position.

Terminals**No. 11 — No. 10**

- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10BK27**.
NO : Go to step **10BK29**.

10BK27 : CHECK INHIBITOR SWITCH.

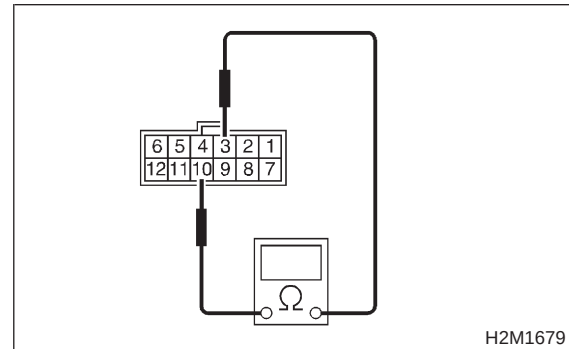
Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals**No. 3 — No. 10**

- CHECK** : *Is the resistance less than 1 Ω in "1" position?*
YES : Go to step **10BK28**.
NO : Go to step **10BK29**.

10BK28 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "1" position.

Terminals**No. 3 — No. 10**

- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10BK30**.
NO : Go to step **10BK29**.

10BK29 : CHECK SELECTOR CABLE.

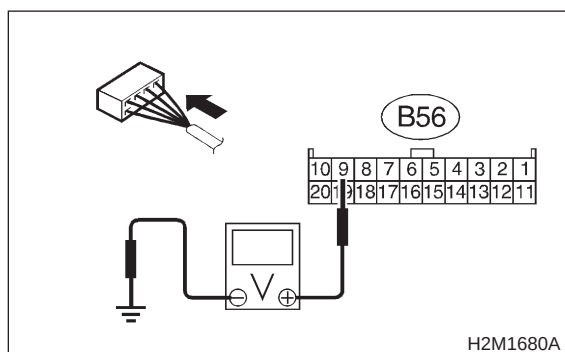
- CHECK** : *Is there faulty connection in the selector cable?*
YES : Repair connection of selector cable.
NO : Replace inhibitor switch.

10BK30 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and transmission.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground in selector lever "P" position.

Connector & terminal

(B56) No. 9 (+) — Chassis ground (-):



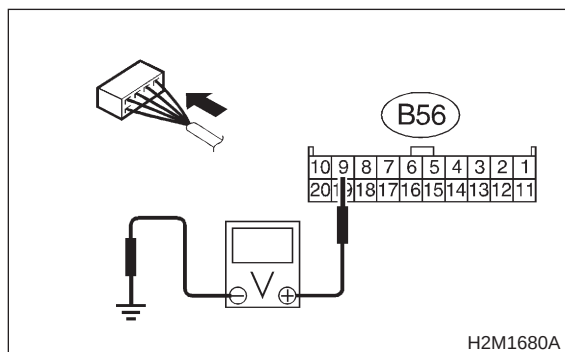
- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 10BK31.
- NO** : Go to step 10BK44.

10BK31 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "P" position.

Connector & terminal

(B56) No. 9 (+) — Chassis ground (-):



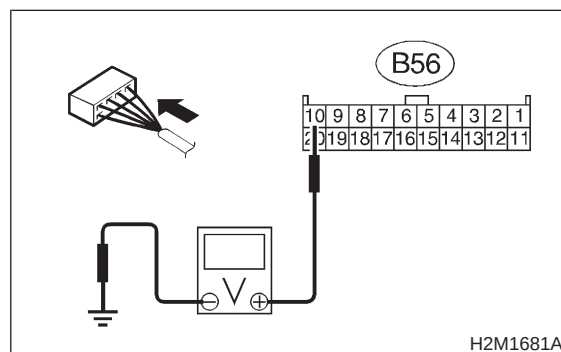
- CHECK** : Is the voltage more than 8 V?
- YES** : Go to step 10BK32.
- NO** : Go to step 10BK44.

10BK32 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever "R" position.

Connector & terminal

(B56) No. 10 (+) — Chassis ground (-):



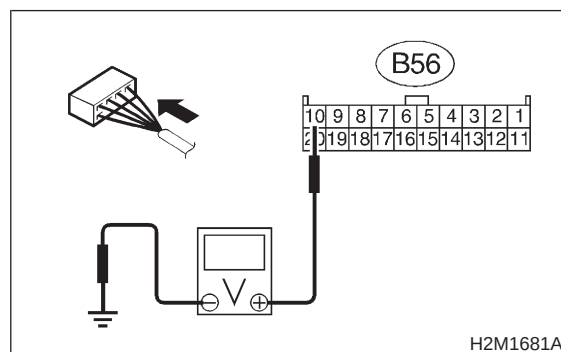
- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 10BK33.
- NO** : Go to step 10BK44.

10BK33 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "R" position.

Connector & terminal

(B56) No. 10 (+) — Chassis ground (-):



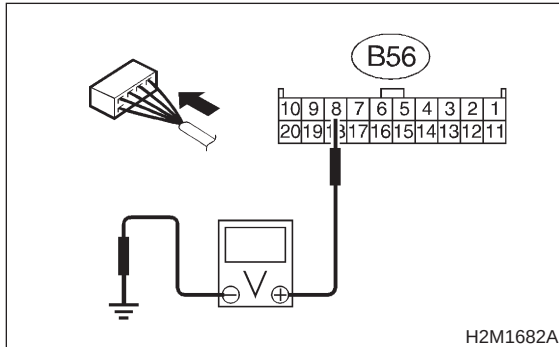
- CHECK** : Is the voltage more than 6 V?
- YES** : Go to step 10BK34.
- NO** : Go to step 10BK44.

10BK34 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever "N" position.

Connector & terminal

(B56) No. 8 (+) — Chassis ground (-):



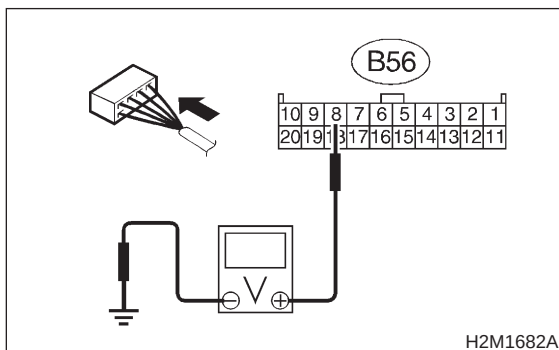
- CHECK** : Is the voltage less than 1 V?
YES : Go to step 10BK35.
NO : Go to step 10BK44.

10BK35 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "N" position.

Connector & terminal

(B56) No. 8 (+) — Chassis ground (-):



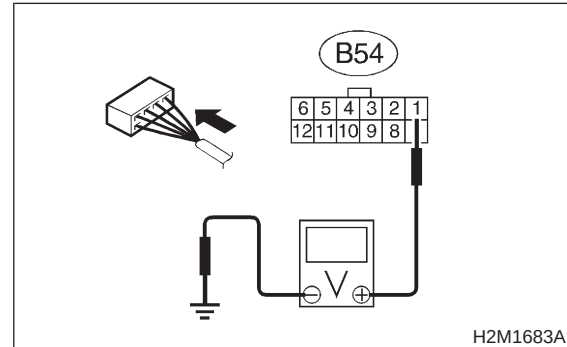
- CHECK** : Is the voltage more than 8 V?
YES : Go to step 10BK36.
NO : Go to step 10BK44.

10BK36 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever "D" position.

Connector & terminal

(B54) No. 1 (+) — Chassis ground (-):



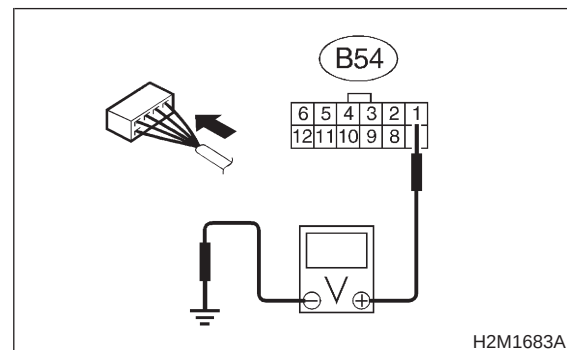
- CHECK** : Is the voltage less than 1 V?
YES : Go to step 10BK37.
NO : Go to step 10BK44.

10BK37 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "D" position.

Connector & terminal

(B54) No. 1 (+) — Chassis ground (-):



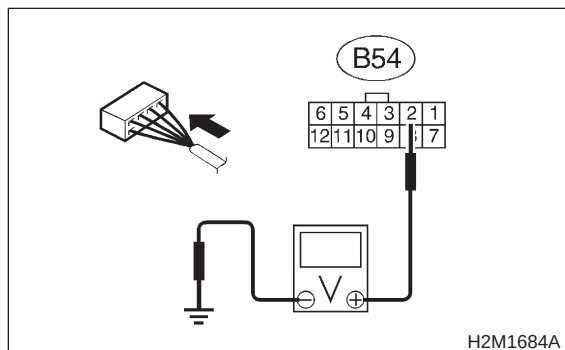
- CHECK** : Is the voltage more than 6 V?
YES : Go to step 10BK38.
NO : Go to step 10BK44.

10BK38 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever "3" position.

Connector & terminal

(B54) No. 2 (+) — Chassis ground (-):



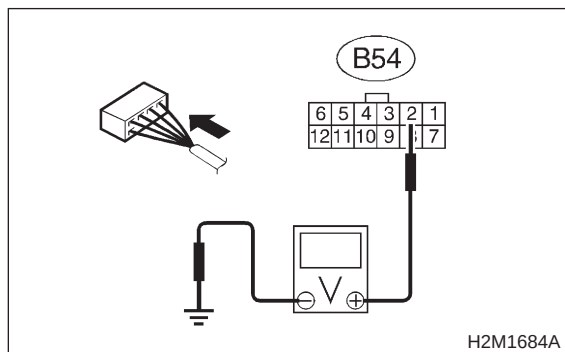
- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 10BK39.
- NO** : Go to step 10BK44.

10BK39 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "3" position.

Connector & terminal

(B54) No. 2 (+) — Chassis ground (-):



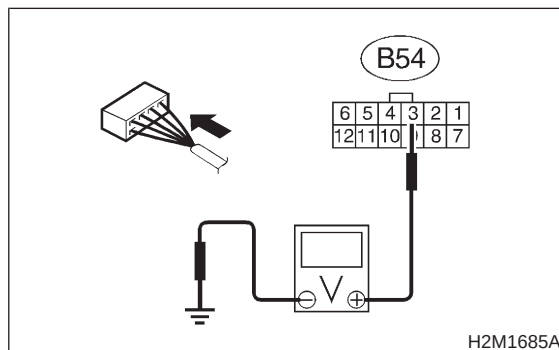
- CHECK** : Is the voltage more than 6 V?
- YES** : Go to step 10BK40.
- NO** : Go to step 10BK44.

10BK40 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever "2" position.

Connector & terminal

(B54) No. 3 (+) — Chassis ground (-):



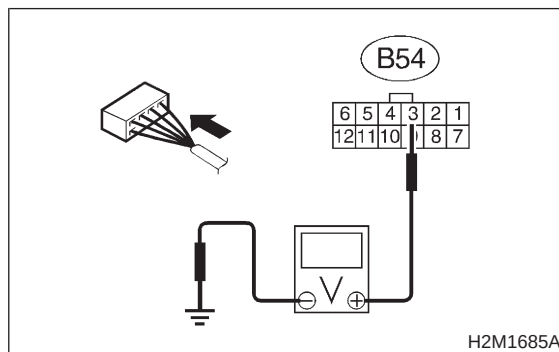
- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 10BK41.
- NO** : Go to step 10BK44.

10BK41 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "2" position.

Connector & terminal

(B54) No. 3 (+) — Chassis ground (-):



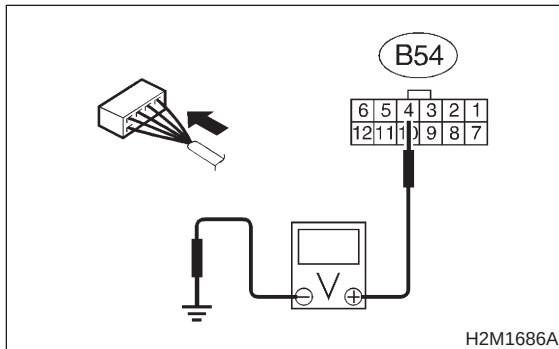
- CHECK** : Is the voltage more than 6 V?
- YES** : Go to step 10BK42.
- NO** : Go to step 10BK44.

10BK42 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever "1" position.

Connector & terminal

(B54) No. 4 (+) — Chassis ground (-):



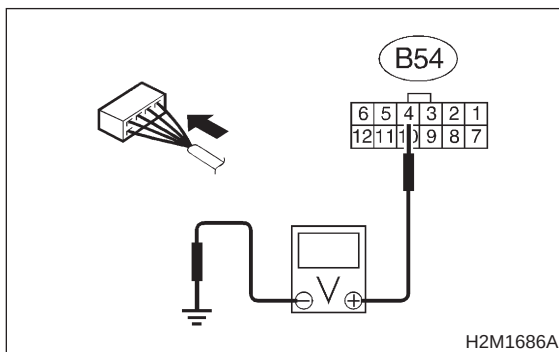
- CHECK** : *Is the voltage less than 1 V?*
YES : Go to step **10BK43**.
NO : Go to step **10BK44**.

10BK43 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground in selector lever except for "1" position.

Connector & terminal

(B54) No. 4 (+) — Chassis ground (-):



- CHECK** : *Is the voltage more than 6 V?*
YES : Repair poor contact in TCM connector.
NO : Go to step **10BK44**.

10BK44 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : *Is there poor contact in TCM connector?*
YES : Repair poor contact in TCM connector.
NO : Replace TCM.

BL: DTC P0710 — TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT MALFUNCTION —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

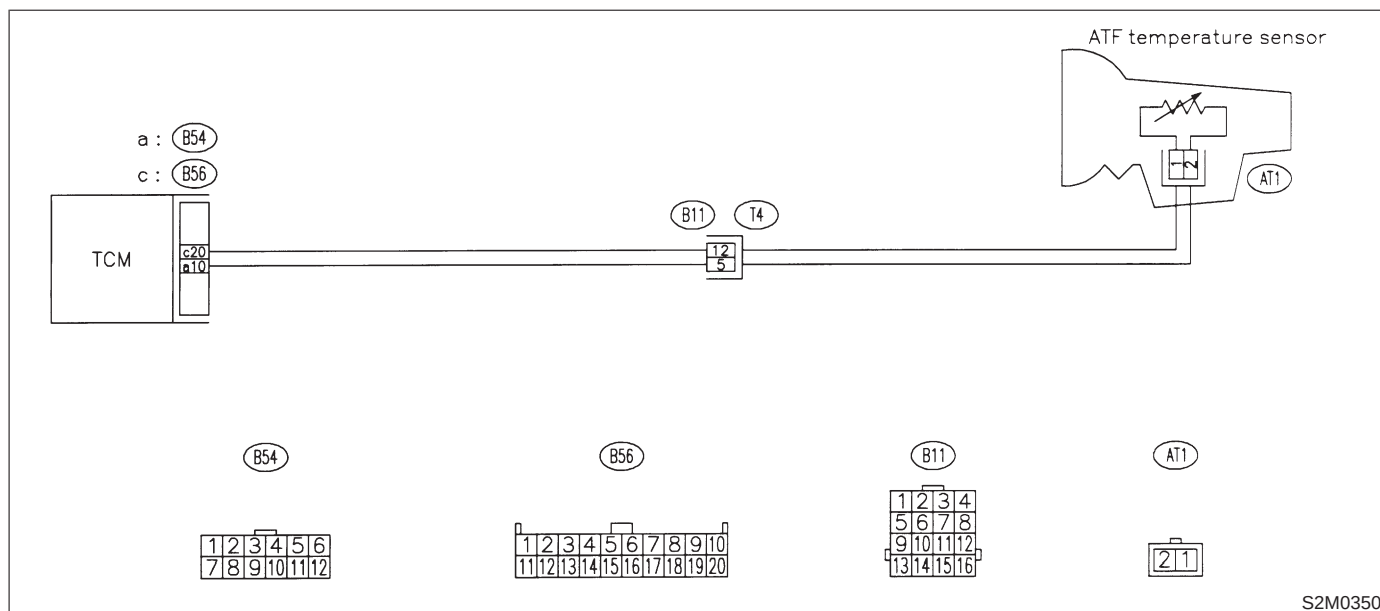
- No shift up to 4th speed (after engine warm-up)
- No lock-up (after engine warm-up)
- Excessive shift shock

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



10BL1 : CHECK DTC P0710 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0710?

YES : Check ATF temperature sensor circuit.
<Ref. to 3-2 [T8H0].>

NO : It is not necessary to inspect DTC P0710.

BM: DTC P0720 — OUTPUT SPEED SENSOR (VEHICLE SPEED SENSOR 1) CIRCUIT MALFUNCTION —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

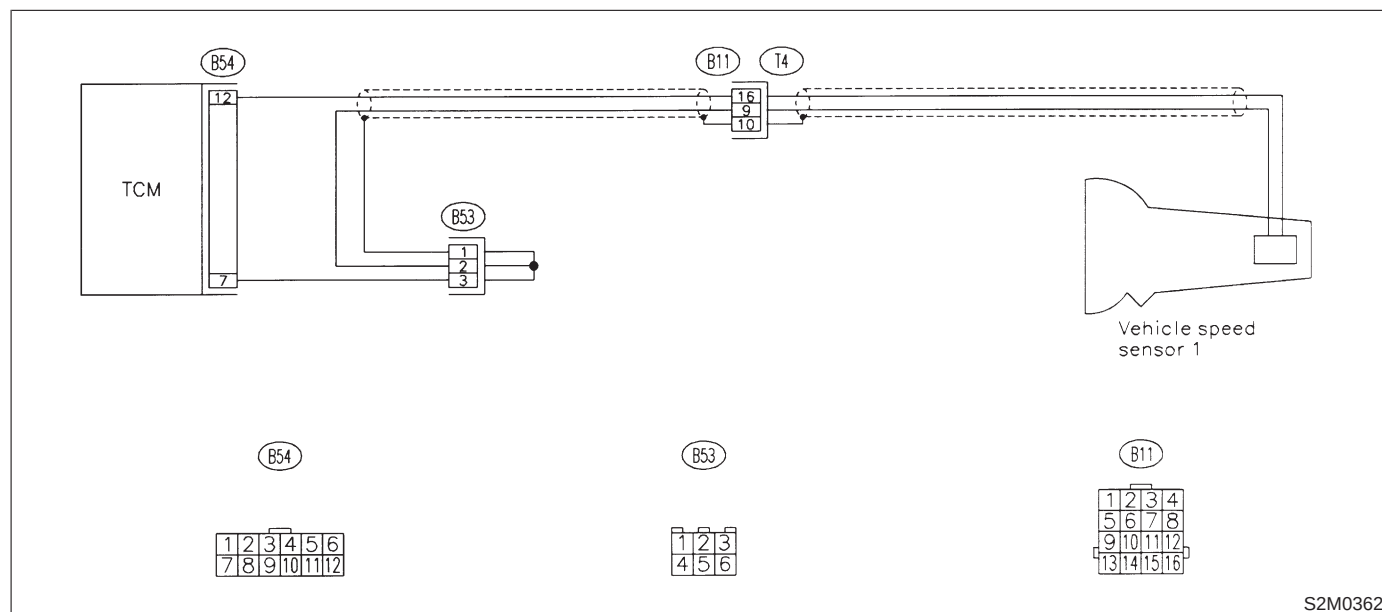
- No shift or excessive tight corner “braking”

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



10BM1 : CHECK DTC P0720 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0720?

YES : Check vehicle speed sensor 1 circuit.
<Ref. to 3-2 [T8N0].>

NO : It is not necessary to inspect DTC P0720.

BN: DTC P0725 — ENGINE SPEED INPUT CIRCUIT MALFUNCTION —**• DTC DETECTING CONDITION:**

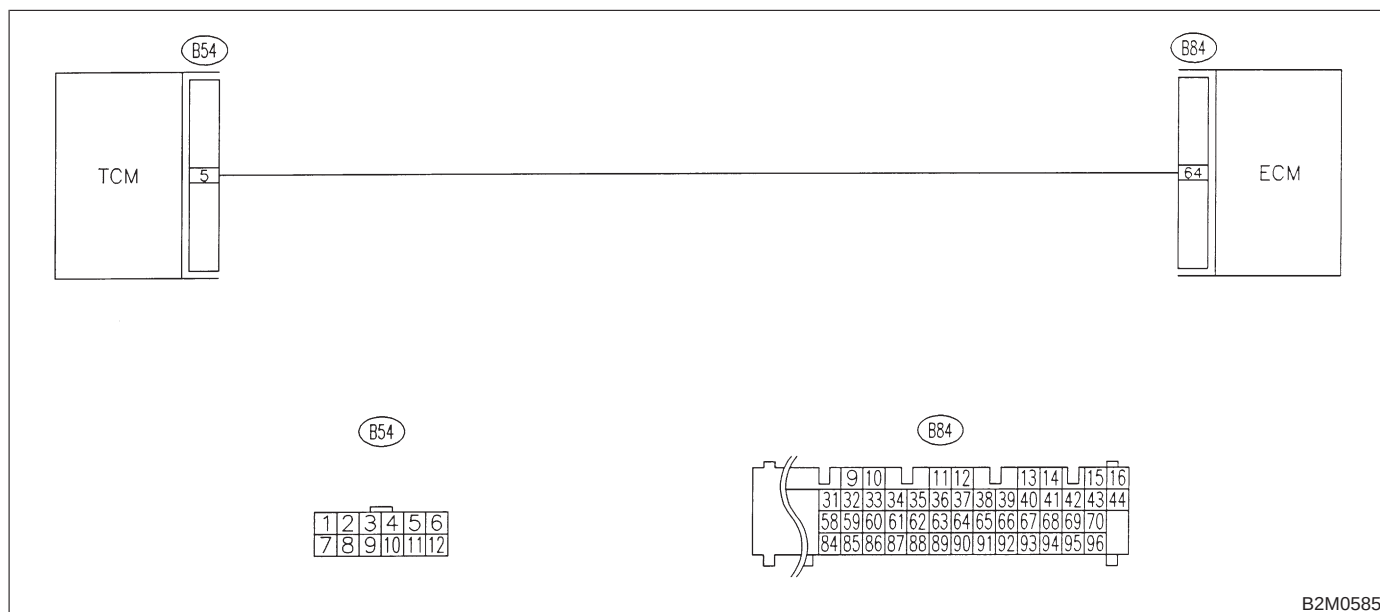
- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)
- AT diagnostic indicator light (AT OIL TEMP indicator light) remains on when vehicle speed is "0".

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:**10BN1 : CHECK DTC P0725 ON DISPLAY.**

- CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0725?*
- YES** : Check engine speed input signal circuit.
 <Ref. to 3-2 [T8J0].>
- NO** : It is not necessary to inspect DTC P0725.

BO: DTC P0731 — GEAR 1 INCORRECT RATIO —**NOTE:**

For the diagnostic procedure, refer to 2-7 [T10BR0]. <Ref. to 2-7 [T10BR0].>

BP: DTC P0732 — GEAR 2 INCORRECT RATIO —**NOTE:**

For the diagnostic procedure, refer to 2-7 [T10BR0]. <Ref. to 2-7 [T10BR0].>

BQ: DTC P0733 — GEAR 3 INCORRECT RATIO —**NOTE:**

For the diagnostic procedure, refer to 2-7 [T10BR0]. <Ref. to 2-7 [T10BR0].>

BR: DTC P0734 — GEAR 4 INCORRECT RATIO —**● DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

- Shift point too high or too low; engine brake not effected in “3” range; excessive shift shock; excessive tight corner “braking”

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

10BR3 : CHECK VEHICLE SPEED SENSOR 1 CIRCUIT.

Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T8N0].>

- CHECK** : *Is there any trouble in vehicle speed sensor 1 circuit?*
- YES** : Repair or replace vehicle speed sensor 1 circuit.
- NO** : Go to step **10BR4**.

10BR4 : CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.

Check vehicle speed sensor 2 circuit. <Ref. to 3-2 [T8O0].>

- CHECK** : *Is there any trouble in vehicle speed sensor 2 circuit?*
- YES** : Repair or replace vehicle speed sensor 2 circuit.
- NO** : Go to step **10BR5**.

10BR5 : CHECK ENGINE SPEED INPUT CIRCUIT.

Check engine speed input circuit. <Ref. to 3-2 [T8J0].>

- CHECK** : *Is there any trouble in engine speed input circuit?*
- YES** : Repair or replace engine speed input circuit.
- NO** : Go to step **10BR6**.

10BR6 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : *Is there poor contact in TCM connector?*
- YES** : Repair poor contact in TCM connector.
- NO** : Go to step **10BR7**.

10BR7 : CHECK MECHANICAL TROUBLE.

Check mechanical trouble in automatic transmission.

- CHECK** : *Is there any mechanical trouble in automatic transmission?*
- YES** : Repair or replace automatic transmission.
- NO** : Replace TCM.

BS: DTC P0740 — TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

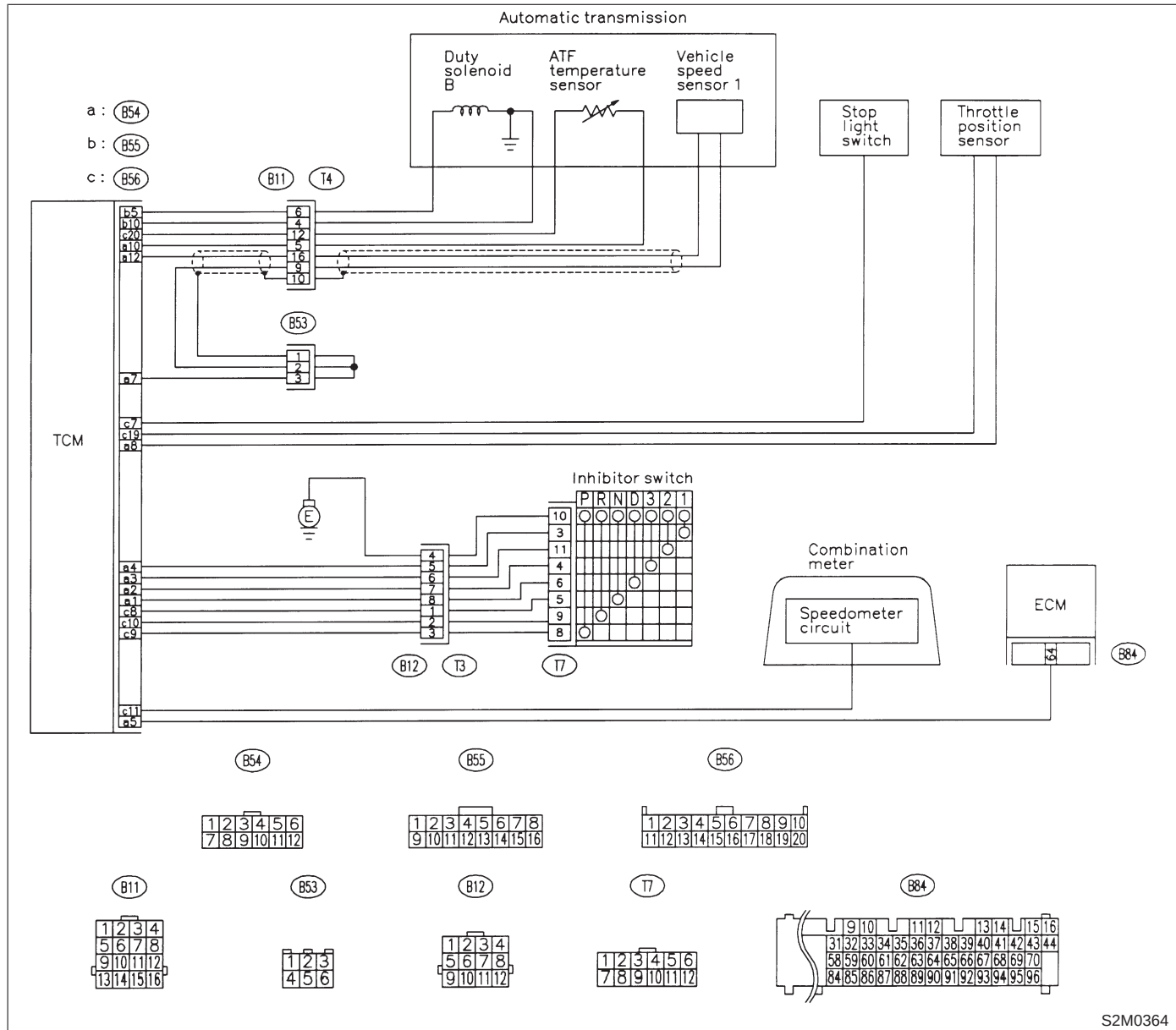
• TROUBLE SYMPTOM:

- No shift or excessive tight corner “braking”
- No shift or excessive tight corner “braking”

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0364

10BS1 : CHECK ANY OTHER DTC ON DISPLAY.

- CHECK** : *Is there any other DTC on display?*
- YES** : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Go to step **10BS2**.

10BS2 : CHECK DUTY SOLENOID B CIRCUIT.

Check duty solenoid B circuit. <Ref. to 3-2 [T8D0].>

- CHECK** : *Is there any trouble in duty solenoid B circuit?*
- YES** : Repair or replace duty solenoid B circuit.
- NO** : Go to step **10BS3**.

10BS3 : CHECK THROTTLE POSITION SENSOR CIRCUIT.

Check throttle position sensor circuit. <Ref. to 3-2 [T8M0].>

- CHECK** : *Is there any trouble in throttle position sensor circuit?*
- YES** : Repair or replace throttle position sensor circuit.
- NO** : Go to step **10BS4**.

10BS4 : CHECK VEHICLE SPEED SENSOR 1 CIRCUIT.

Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T8N0].>

- CHECK** : *Is there any trouble in vehicle speed sensor 1 circuit?*
- YES** : Repair or replace vehicle speed sensor 1 circuit.
- NO** : Go to step **10BS5**.

10BS5 : CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.

Check vehicle speed sensor 2 circuit. <Ref. to 3-2 [T8O0].>

- CHECK** : *Is there any trouble in vehicle speed sensor 2 circuit?*
- YES** : Repair or replace vehicle speed sensor 2 circuit.
- NO** : Go to step **10BS6**.

10BS6 : CHECK ENGINE SPEED INPUT CIRCUIT.

Check engine speed input circuit. <Ref. to 3-2 [T8J0].>

- CHECK** : *Is there any trouble in engine speed input circuit?*
- YES** : Repair or replace engine speed input circuit.
- NO** : Go to step **10BS7**.

10BS7 : CHECK INHIBITOR SWITCH CIRCUIT.

Check inhibitor switch circuit. <Ref. to 2-7 [T10BK0].>

- CHECK** : *Is there any trouble in inhibitor switch circuit?*
- YES** : Repair or replace inhibitor switch circuit.
- NO** : Go to step **10BS8**.

10BS8 : CHECK BRAKE LIGHT SWITCH CIRCUIT.

Check brake light switch circuit. <Ref. to 2-7 [T10BJ0].>

- CHECK** : *Is there any trouble in brake light switch circuit?*
- YES** : Repair or replace brake light switch circuit.
- NO** : Go to step **10BS9**.

10BS9 : CHECK ATF TEMPERATURE SENSOR CIRCUIT.

Check ATF temperature sensor circuit. <Ref. to 3-2 [T8H0].>

CHECK : *Is there any trouble in ATF temperature sensor circuit?*

YES : Repair or replace ATF temperature sensor circuit.

NO : Go to step **10BS10**.

10BS10 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in TCM connector?*

YES : Repair poor contact in TCM connector.

NO : Go to step **10BS11**.

10BS11 : CHECK MECHANICAL TROUBLE.

Check mechanical trouble in automatic transmission.

CHECK : *Is there any mechanical trouble in automatic transmission?*

YES : Repair or replace automatic transmission.

NO : Replace TCM.

BT: DTC P0743 — TORQUE CONVERTER CLUTCH SYSTEM (DUTY SOLENOID B) ELECTRICAL —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

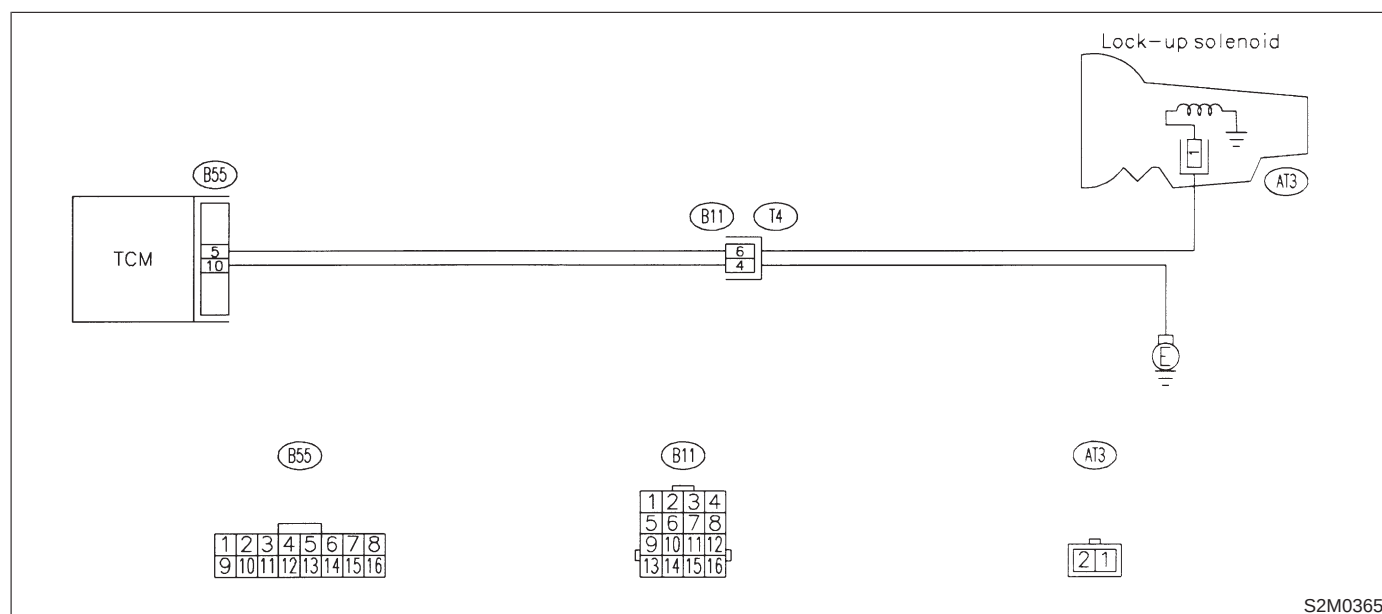
- No lock-up (after engine warm-up)

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



S2M0365

10BT1 : CHECK DTC P0743 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0743?

YES : Check duty solenoid B circuit. <Ref. to 3-2 [T8D0].>

NO : It is not necessary to inspect DTC P0743.

BU: DTC P0748 — PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

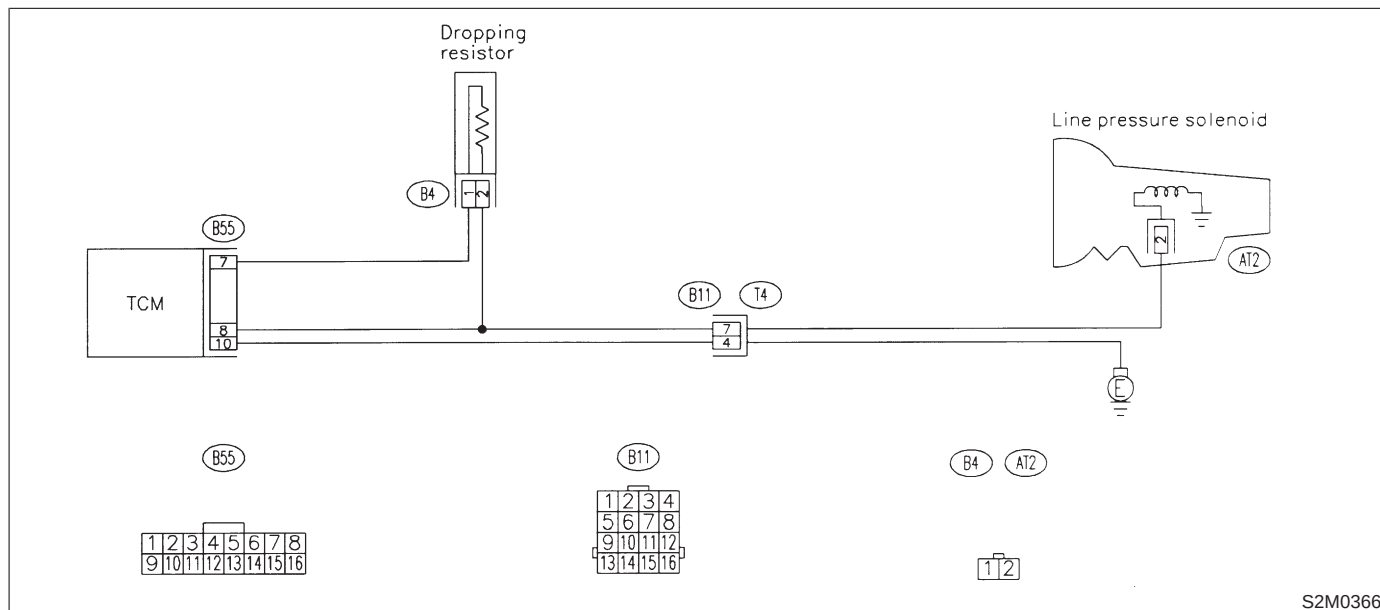
- Excessive shift shock

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



10BU1 : CHECK DTC P0748 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0748?

YES : Check duty solenoid A circuit. <Ref. to 3-2 [T8C0].>

NO : It is not necessary to inspect DTC P0748.

BV: DTC P0753 — SHIFT SOLENOID A (SHIFT SOLENOID 1) ELECTRICAL —● **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

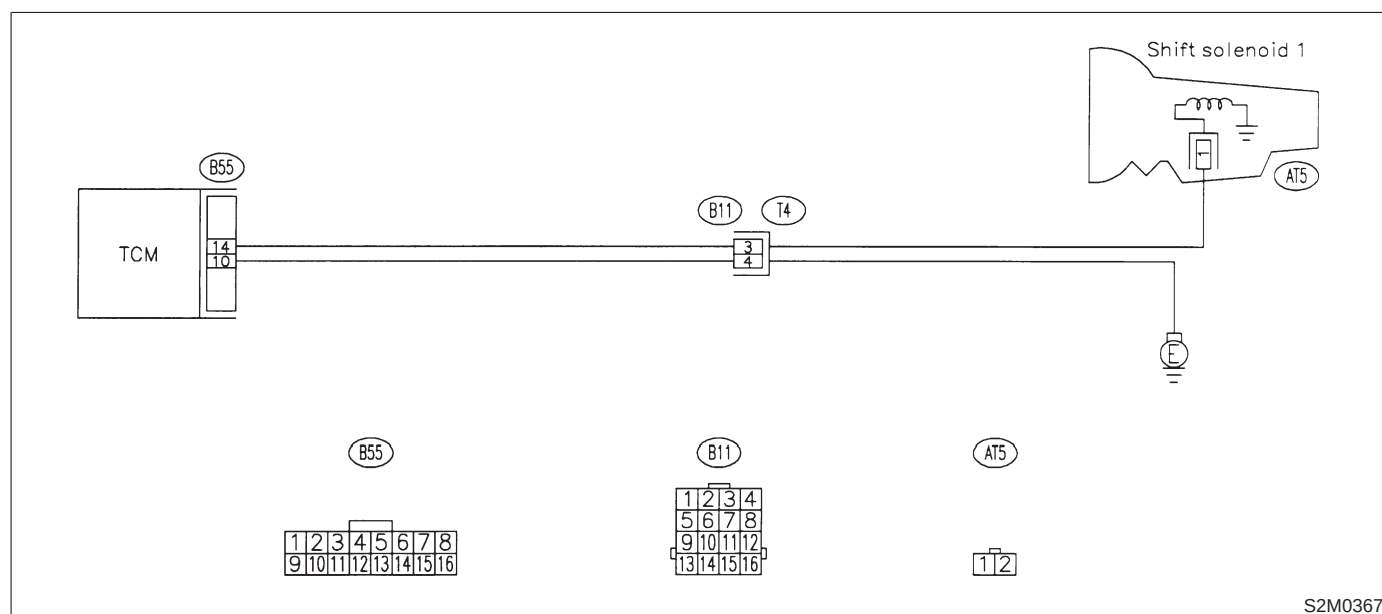
● **TROUBLE SYMPTOM:**

- No shift

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:****10BV1 : CHECK DTC P0753 ON DISPLAY.**

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0753?*

YES : Check shift solenoid 1 circuit. <Ref. to 3-2 [T8G0].>

NO : It is not necessary to inspect DTC P0753.

BW: DTC P0758 — SHIFT SOLENOID B (SHIFT SOLENOID 2) ELECTRICAL● **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

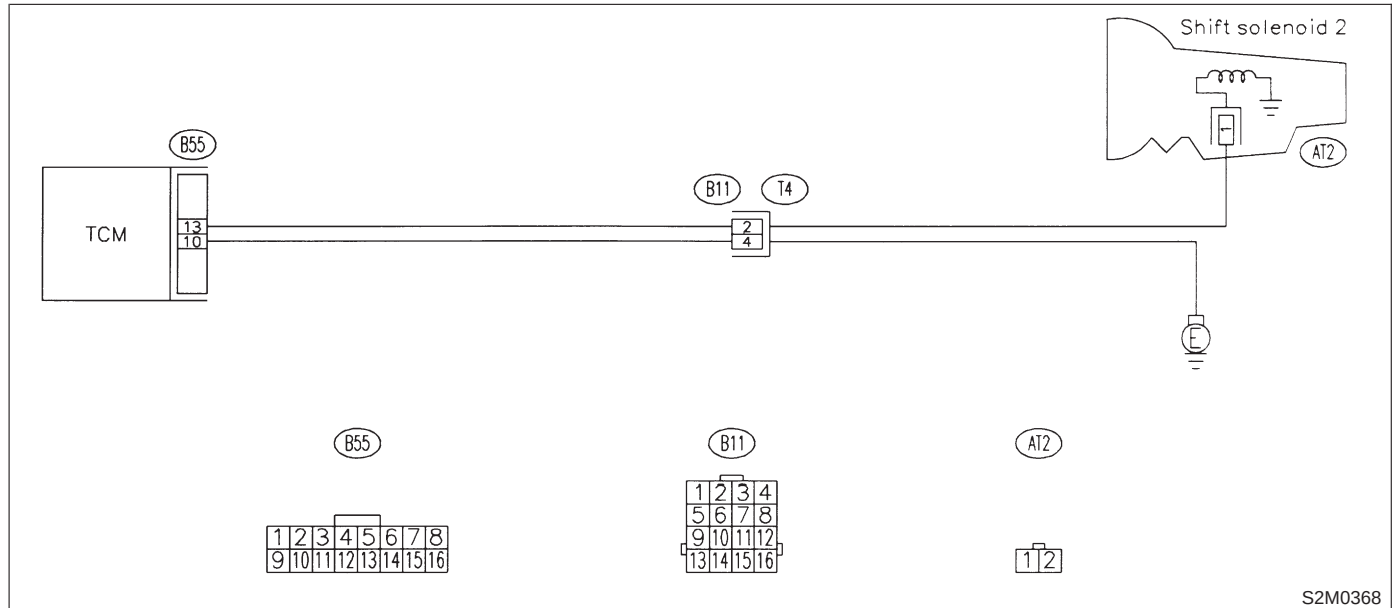
● **TROUBLE SYMPTOM:**

- No shift

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0368

10BW1 : CHECK DTC P0758 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0758?

YES : Check shift solenoid 2 circuit. <Ref. to 3-2 [T8F0].>

NO : It is not necessary to inspect DTC P0758.

BX: DTC P0760 — SHIFT SOLENOID C (SHIFT SOLENOID 3) MALFUNCTION**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

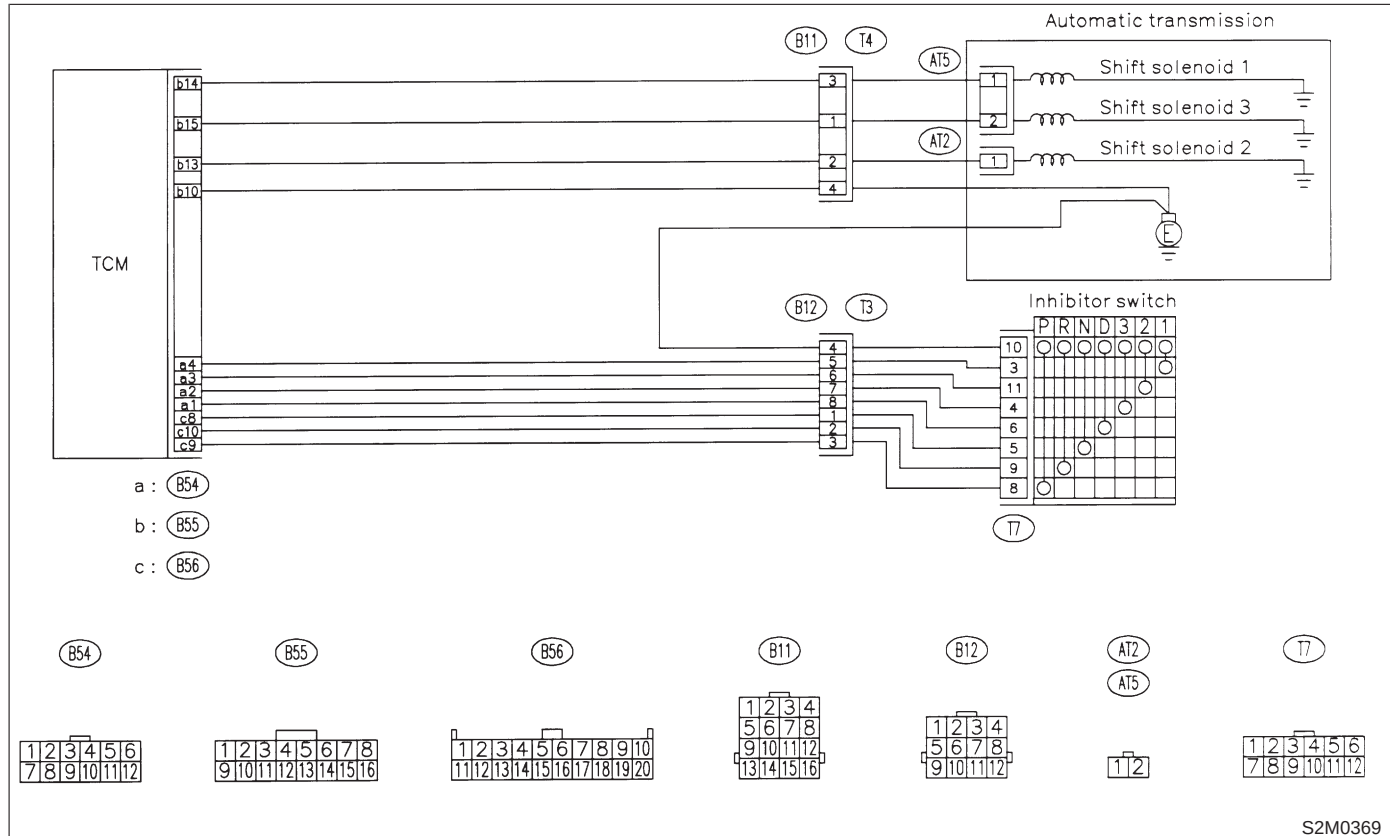
• TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in “3”

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:**10BX1 : CHECK ANY OTHER DTC ON DISPLAY.**

- CHECK** : *Is there any other DTC on display?*
- YES** : Inspect relevant DTC using “10. Diagnostics Chart with Trouble Code”. <Ref. to 2-7 [T10A0].>
- NO** : Go to step **10BX2**.

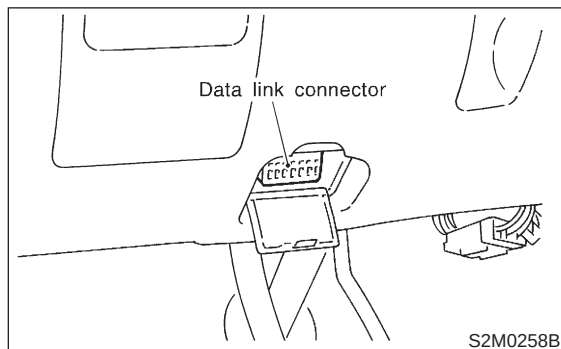
10BX2 : CHECK INHIBITOR SWITCH CIRCUIT.

Check inhibitor switch circuit. <Ref. to 2-7 [T10BK0].>

- CHECK** : *Is there any trouble in inhibitor switch circuit?*
- YES** : Repair or replace inhibitor switch circuit.
- NO** : Go to step **10BX3**.

10BX3 : CHECK GEAR POSITION.

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru select monitor to data link connector.



- 3) Lift-up or raise the vehicle and support with safety stands.

CAUTION:

On AWD models, raise all wheels off ground.

- 4) Start and warm-up the engine and transmission.
- 5) Subaru select monitor switch to ON.
- 6) Read data of gear position signal using Subaru select monitor.

(1) On the 「Main Menu」 display screen, select the {2. Check of Each System} and press the [YES] key.

(2) On the 「System Selection Menu」 display screen, select the {AT/ECVT} and press the [YES] key.

(3) Press the [YES] key after displayed the information of transmission type.

(4) On the 「E-4AT/ECVT Diagnosis」 display screen, select the {1. Current Data Display & Save} and press the [YES] key.

(5) On the 「Data Display Menu」 display screen, select the {4. 1 Data Display with Detail} and press the [YES] key.

(6) Use the scroll key to show {Gear Position} items on the display screen.

NOTE:

For detailed operation procedure, refer to the SUBARU SELECT MONITOR OPERATION MANUAL.

- 7) Move selector lever to “D” and drive the vehicle.

CHECK : *Does gear position change according to throttle position and vehicle speed?*

YES : Go to step **10BX4**.

NO : Go to step **10BX6**.

10BX4 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in TCM connector?*

YES : Repair poor contact in TCM connector.

NO : Go to step **10BX5**.

10BX5 : CHECK MECHANICAL TROUBLE.

Check mechanical trouble in automatic transmission.

CHECK : *Is there any mechanical trouble in automatic transmission?*

YES : Repair or replace automatic transmission.

NO : Replace TCM.

10BX6 : CHECK SHIFT SOLENOID 1 CIRCUIT.

Check shift solenoid 1 circuit. <Ref. to 3-2 [T8G0].>

CHECK : *Is there any trouble in shift solenoid 1 circuit?*

YES : Repair or replace shift solenoid 1 circuit.

NO : Go to step **10BX7**.

10BX7 : CHECK SHIFT SOLENOID 2 CIRCUIT.

Check shift solenoid 2 circuit. <Ref. to 3-2 [T8F0].>

CHECK : *Is there any trouble in shift solenoid 2 circuit?*

YES : Repair or replace shift solenoid 2 circuit.

NO : Go to step **10BX8**.

10BX8 : CHECK SHIFT SOLENOID 3 CIRCUIT.

Check shift solenoid 3 circuit. <Ref. to 3-2 [T8E0].>

CHECK : *Is there any trouble in shift solenoid 3 circuit?*

YES : Repair or replace shift solenoid 3 circuit.

NO : Go to step **10BX9**.

10BX9 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in TCM connector?*

YES : Repair poor contact in TCM connector.

NO : Go to step **10BX10**.

10BX10 : CHECK MECHANICAL TROUBLE.

Check mechanical trouble in automatic transmission.

CHECK : *Is there any mechanical trouble in automatic transmission?*

YES : Repair or replace automatic transmission.

NO : Replace TCM.

BY: DTC P0763 — SHIFT SOLENOID C (SHIFT SOLENOID 3) ELECTRICAL —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

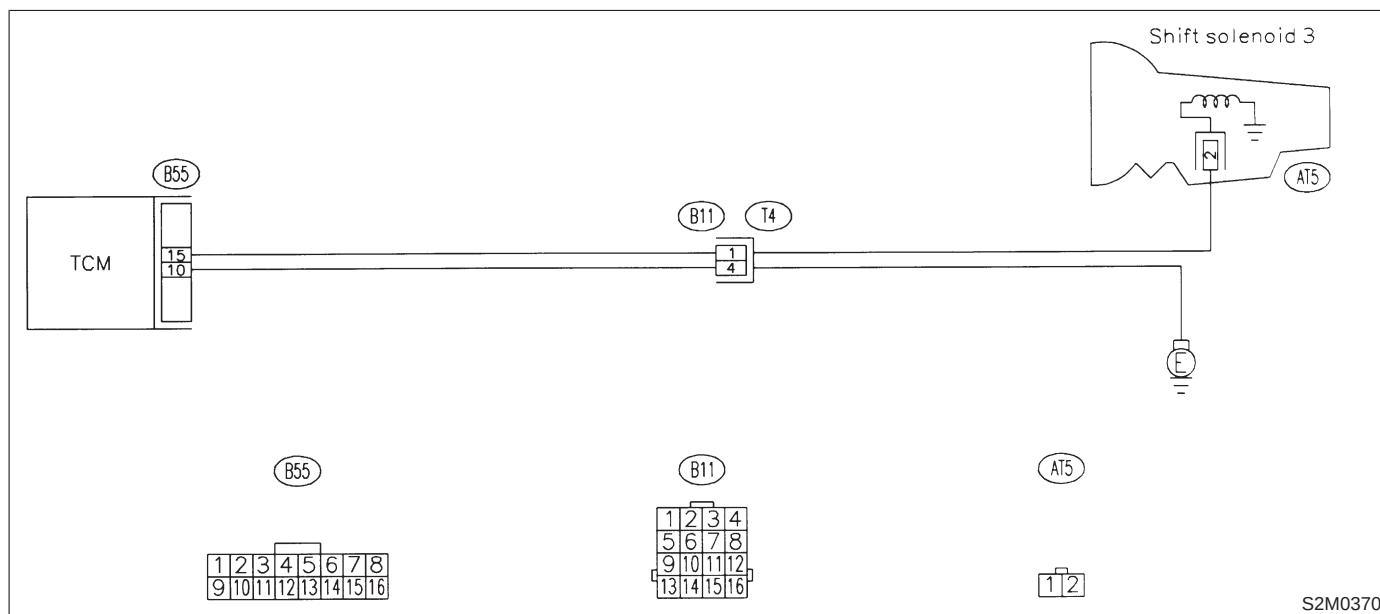
- Ineffective engine brake with selector lever in “3”

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



10BY1 : CHECK DTC P0763 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0763?

YES : Check shift solenoid 3 circuit. <Ref. to 3-2 [T8E0].>

NO : It is not necessary to inspect DTC P0763.

BZ: DTC P1100 — STARTER SWITCH CIRCUIT LOW INPUT —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

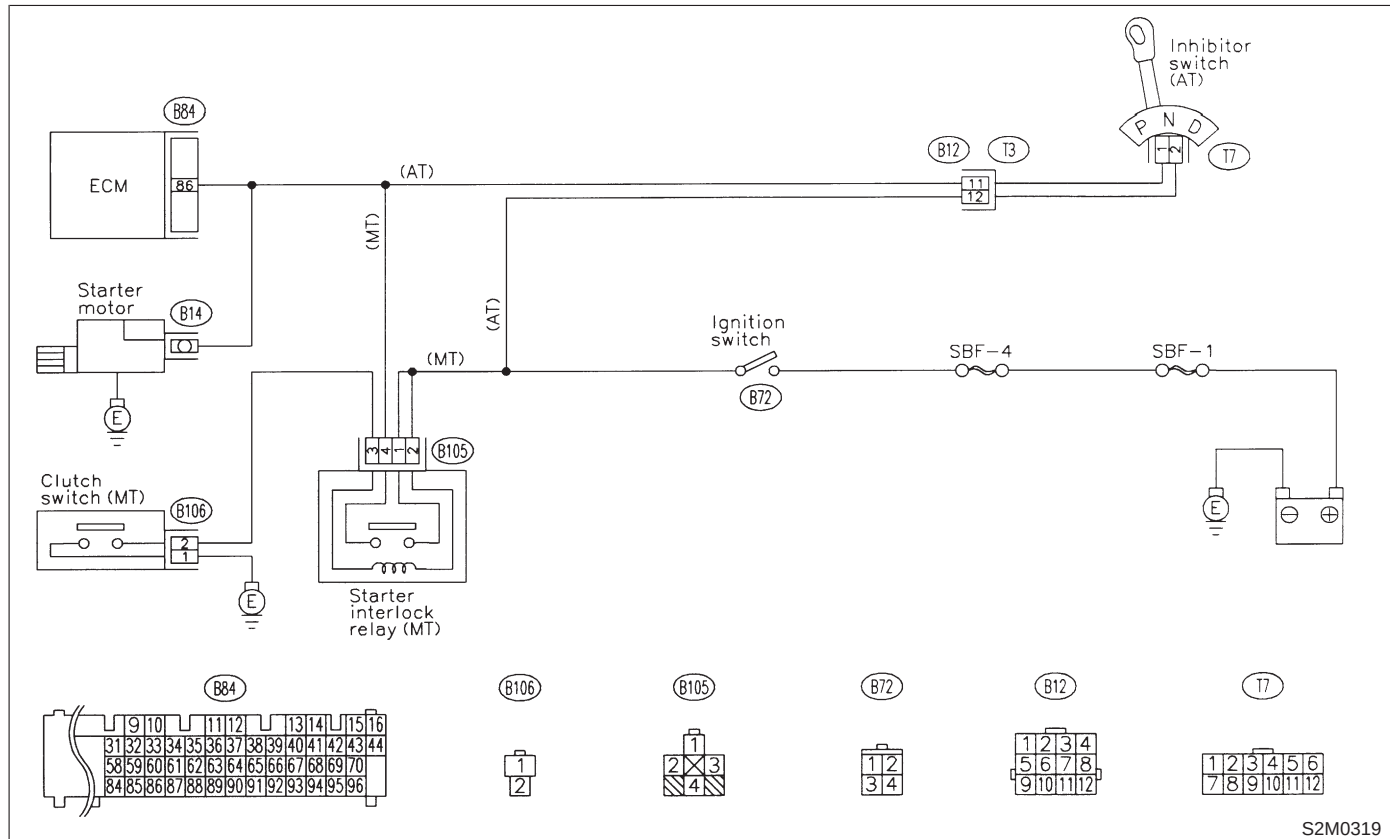
• TROUBLE SYMPTOM:

- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0319

10BZ1 : CHECK OPERATION OF STARTER MOTOR.**NOTE:**

- On AT vehicles, place the inhibitor switch in the "P" or "N" position.
- On MT vehicles, depress the clutch pedal.

CHECK : **Does starter motor operate when ignition switch to "ST"?**

YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open or ground short circuit in harness between ECM and starter motor connector.
- Poor contact in ECM connector.

NO : Check starter motor circuit. <Ref. to 2-7 [T8B0].>

CA: DTC P1101 — NEUTRAL POSITION SWITCH CIRCUIT MALFUNCTION [MT VEHICLES] —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

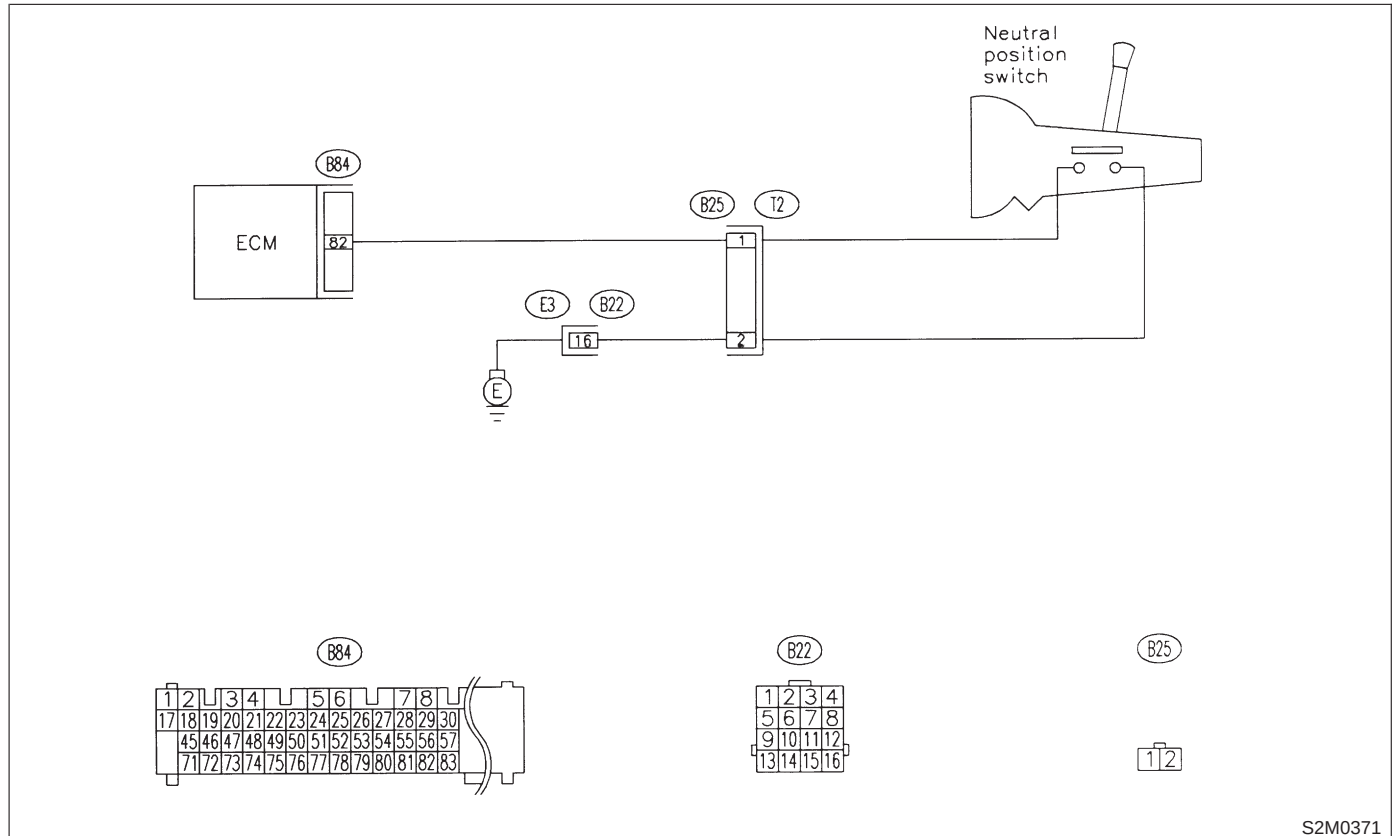
- Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

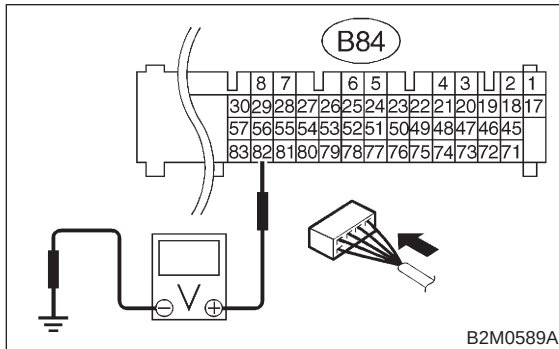
● WIRING DIAGRAM:



S2M0371

10CA1 : CHECK INPUT SIGNAL FOR ECM.

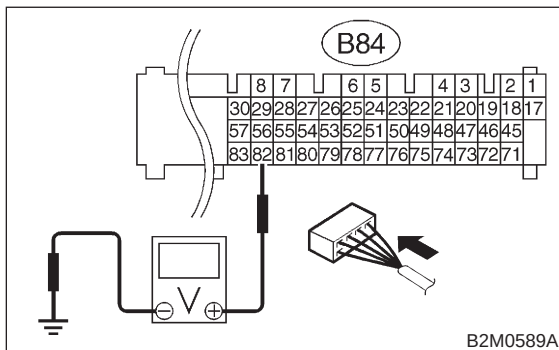
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):**

- CHECK** : **Is the voltage between 4.5 and 5.5 V in neutral position?**
- YES** : Go to step **10CA2**.
- NO** : Go to step **10CA4**.

10CA2 : CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):**

- CHECK** : **Is the voltage less than 1 V in other positions?**
- YES** : Go to step **10CA3**.
- NO** : Go to step **10CA4**.

10CA3 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

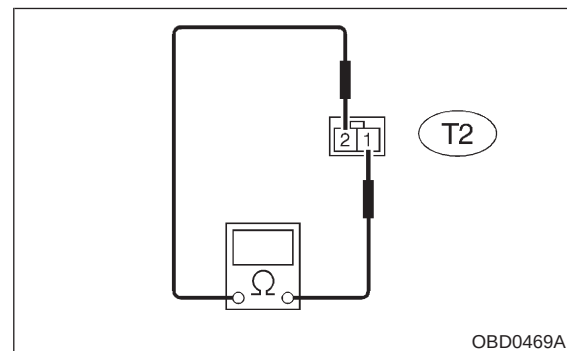
- CHECK** : **Is there poor contact in ECM connector?**
- YES** : Repair poor contact in ECM connector.
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10CA4 : CHECK NEUTRAL POSITION SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission harness.
- 3) Measure resistance between transmission harness and connector terminals.

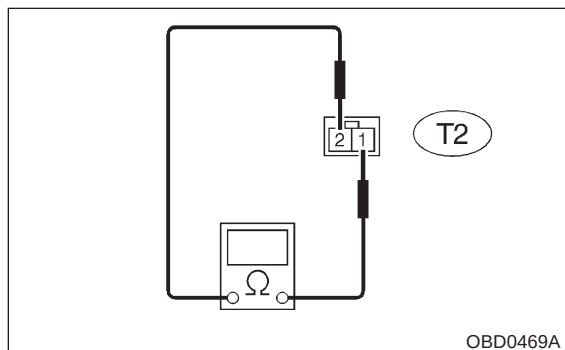
Connector & terminal**(T2) No. 1 — No. 2:**

- CHECK** : **Is the resistance more than 1 MΩ in neutral position?**
- YES** : Go to step **10CA5**.
- NO** : Repair short circuit in transmission harness or replace neutral position switch.

10CA5 : CHECK NEUTRAL POSITION SWITCH.

Measure resistance between transmission harness connector terminals.

Connector & terminal
(T2) No. 1 — No. 2:

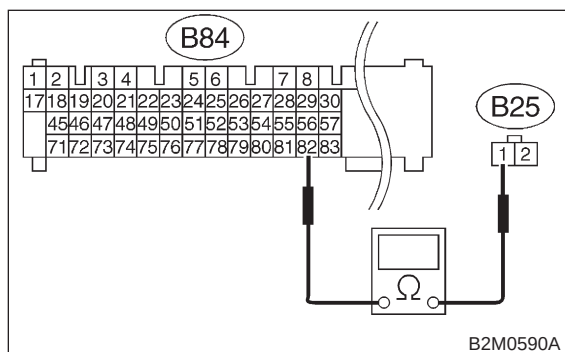


- CHECK** : Is the resistance less than 1 Ω in other positions?
- YES** : Go to step 10CA6.
- NO** : Repair open circuit in transmission harness or replace neutral position switch.

10CA6 : CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.

- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness between ECM and transmission harness connector.

Connector & terminal
(B84) No. 82 — (B25) No. 1:

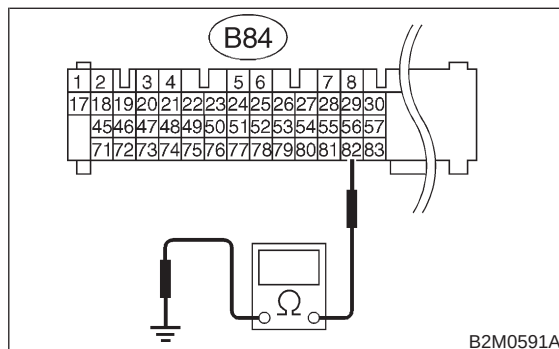


- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 10CA7.
- NO** : Repair open circuit in harness between ECM and transmission harness connector.

10CA7 : CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH CONNECTOR.

Measure resistance between ECM and chassis ground.

Connector & terminal
(B84) No. 82 — Chassis ground:

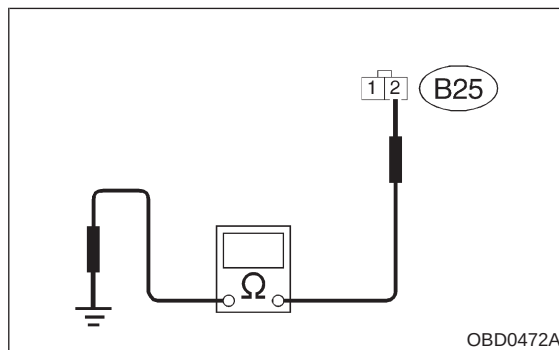


- CHECK** : Is the resistance less than 10 Ω ?
- YES** : Repair ground short circuit in harness between ECM and transmission harness connector.
- NO** : Go to step 10CA8.

10CA8 : CHECK NEUTRAL POSITION SWITCH GROUND CIRCUIT.

Measure resistance of harness between transmission harness connector and engine ground.

Connector & terminal
(B25) No. 2 — Engine ground:



- CHECK** : Is the resistance less than 5 Ω ?
- YES** : Go to step 10CA9.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between transmission harness connector and engine grounding terminal
- Poor contact in coupling connector (B22)

10CA9 : CHECK POOR CONTACT.

Check poor contact in transmission harness connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in transmission harness connector?*

YES : Repair poor contact in transmission harness connector.

NO : Replace ECM.

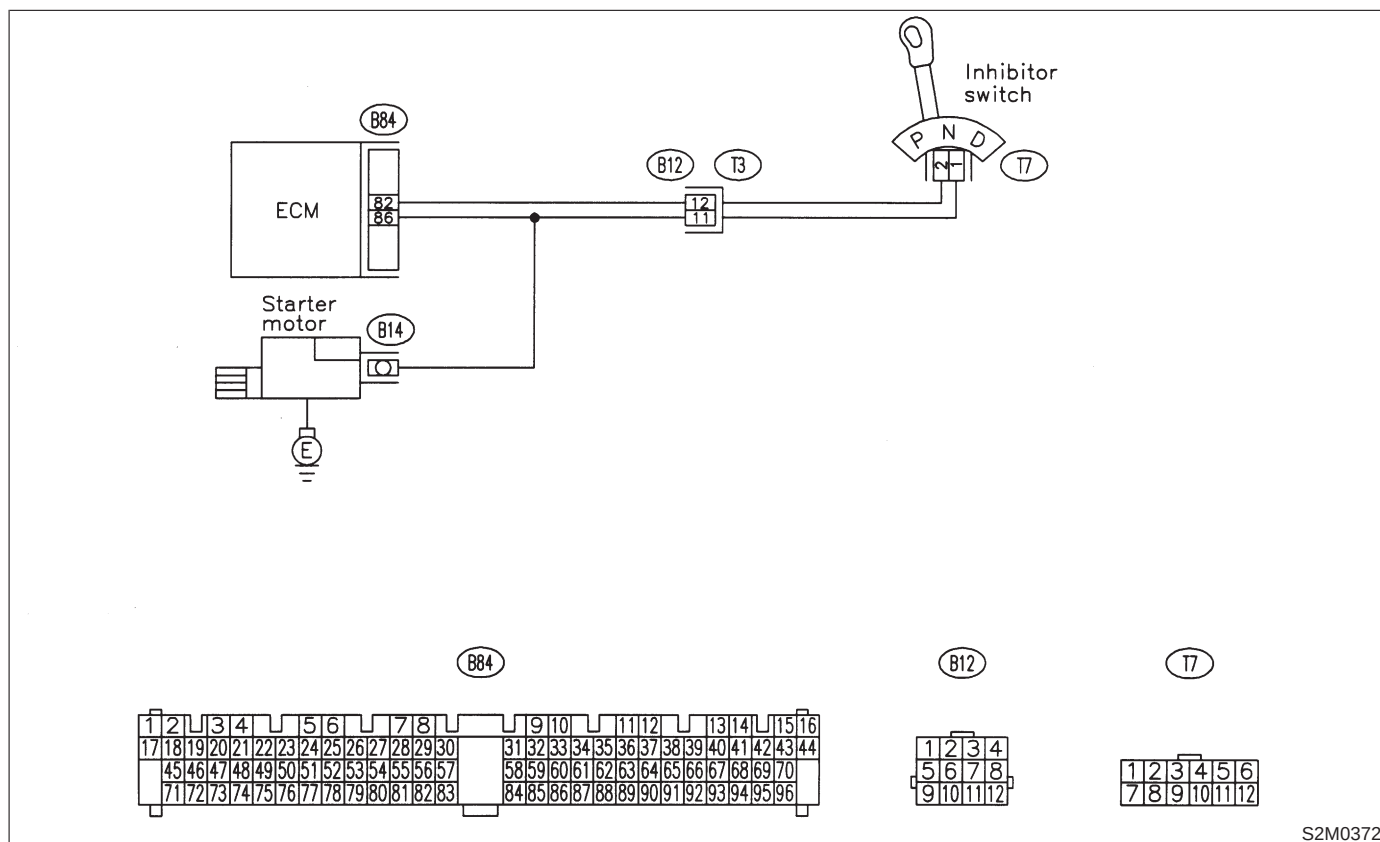
CB: DTC P1101 — NEUTRAL POSITION SWITCH CIRCUIT HIGH INPUT [AT VEHICLES] —

- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



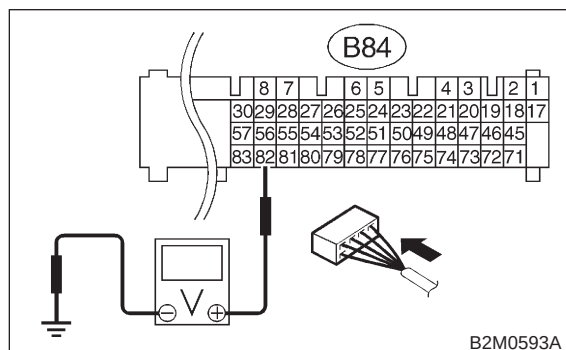
S2M0372

10CB1 : CHECK DTC P0705 ON DISPLAY.

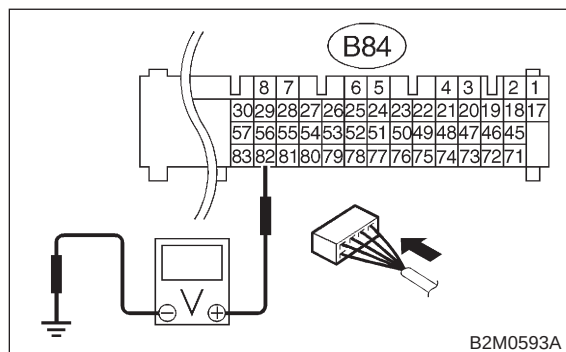
- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0705?
- YES** : Inspect DTC P0705 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Go to step **10CB2**.

10CB2 : CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground in selector lever "N" and "P" positions.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):****CHECK** : **Is the voltage less than 1 V?****YES** : Go to step **10CB3**.**NO** : Go to step **10CB5**.**10CB3 : CHECK INPUT SIGNAL FOR ECM.**

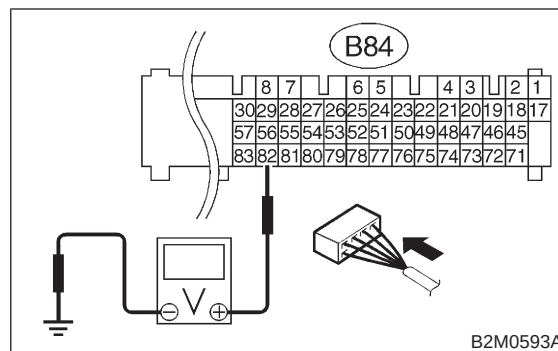
Measure voltage between ECM and chassis ground in selector lever except for "N" and "P" positions.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):****CHECK** : **Is the voltage between 4.5 and 5.5 V?****YES** : Go to step **10CB4**.**NO** : Go to step **10CB5**.**10CB4 : CHECK POOR CONTACT.**

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

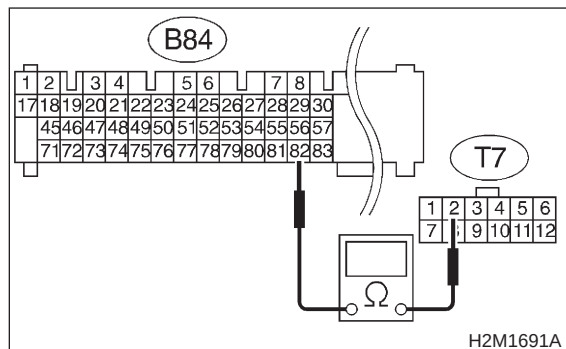
CHECK : **Is there poor contact in ECM connector?****YES** : Repair poor contact in ECM connector.**NO** : Replace ECM.**10CB5 : CHECK INPUT SIGNAL FOR ECM.**

Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Repair battery short circuit in harness between ECM and inhibitor switch connector.**NO** : Go to step **10CB6**.

10CB6 : CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and inhibitor switch.
- 3) Measure resistance of harness between ECM and inhibitor switch connector.

Connector & terminal
(B84) No. 82 — (T7) No. 2:

CHECK : Is the resistance less than 1 Ω?

YES : Go to step 10CB7.

NO : Repair harness and connector.

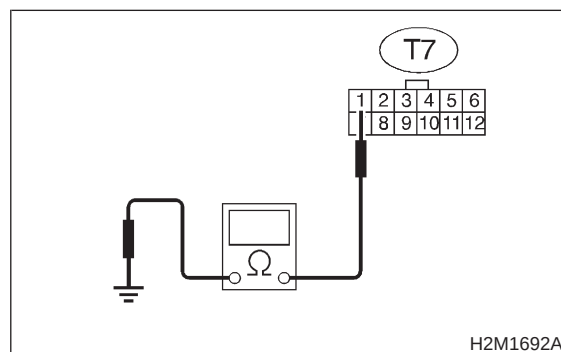
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and inhibitor switch connector
- Poor contact in coupling connector (B12)
- Poor contact in inhibitor switch connector
- Poor contact in ECM connector

10CB7 : CHECK INHIBITOR SWITCH GROUND LINE.

Measure resistance of harness between inhibitor switch connector and engine ground.

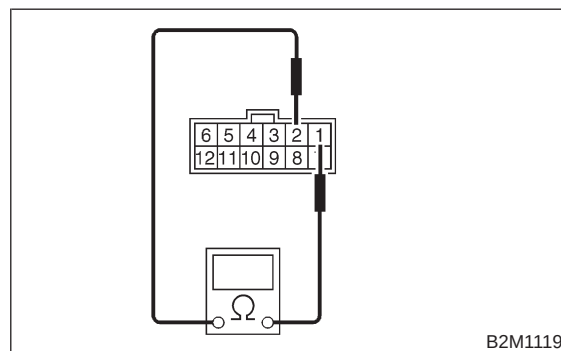
Connector & terminal
(T7) No. 1 — Engine ground:

CHECK : Is the resistance less than 5 Ω?

YES : Go to step 10CB8.

NO : Repair open circuit in inhibitor switch ground line.

10CB8 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever "N" and "P" positions.

Terminals
No. 1 — No. 2:

CHECK : Is the resistance less than 1 Ω?

YES : Go to step 10CB9.

NO : Replace inhibitor switch.

10CB9 : CHECK SELECTOR CABLE CONNECTION.

- CHECK** : *Is there any fault in selector cable connection to inhibitor switch?*
- YES** : Repair selector cable connection. <Ref. to 3-2 [W3B0].>
- NO** : Replace ECM.

CC: DTC P1102 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT LOW INPUT —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

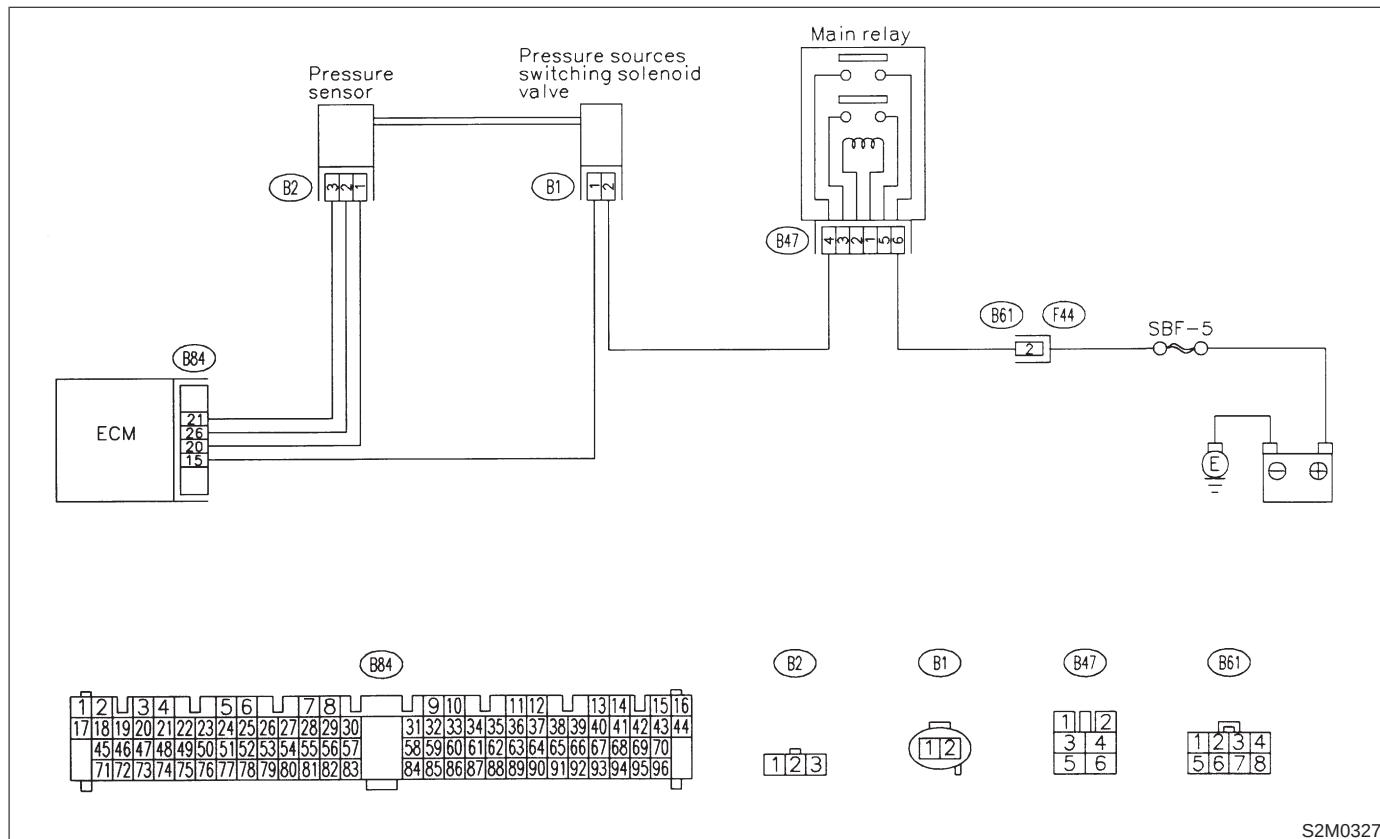
- Erroneous idling
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.

<Ref. to 2-7 [T3D0] and [T3E0].>

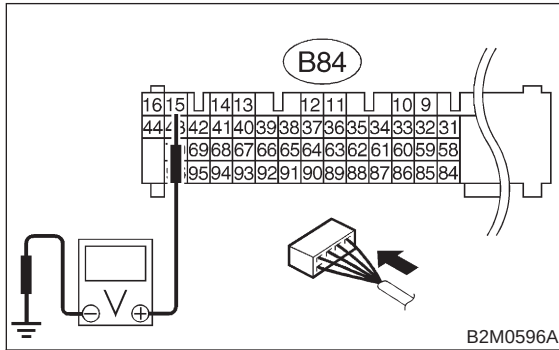
• WIRING DIAGRAM:



S2M0327

10CC1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 15 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10CC2**.**NO** : Go to step **10CC3**.**10CC2 : CHECK POOR CONTACT.**

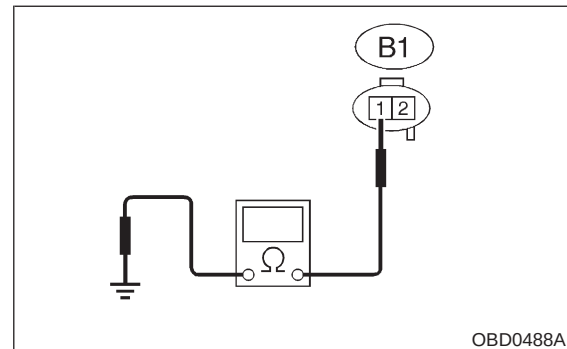
Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : **Is there poor contact in ECM connector?****YES** : Repair poor contact in ECM connector.**NO** : Contact with SOA service.**NOTE:**

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10CC3 : CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from pressure sources switching solenoid valve and ECM.
- 3) Measure resistance of harness between pressure sources switching solenoid valve connector and engine ground.

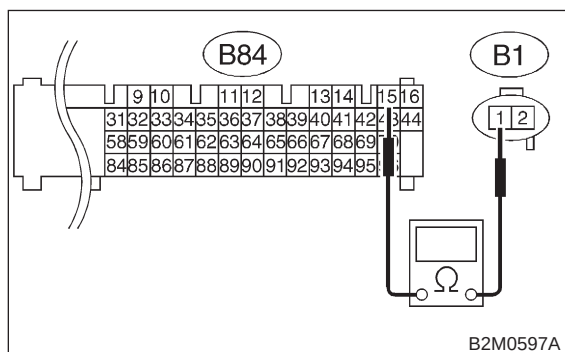
Connector & terminal**(B1) No. 1 — Engine ground:****CHECK** : **Is the resistance less than 10 Ω?****YES** : Repair ground short circuit in harness between ECM and pressure sources switching solenoid valve connector.**NO** : Go to step **10CC4**.

10CC4 : CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.

Measure resistance of harness between ECM and pressure sources switching solenoid valve connector.

Connector & terminal

(B84) No. 15 — (B1) No. 1:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 10CC5.

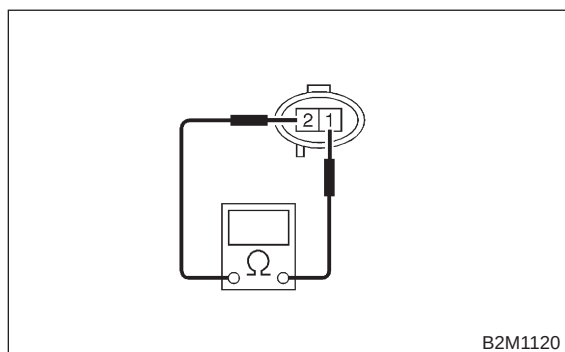
NO : Repair open circuit in harness between ECM and pressure sources switching solenoid valve connector.

10CC5 : CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.

Measure resistance between pressure sources switching solenoid valve connector terminals.

Terminals

No. 1 — No. 2:



CHECK : Is the resistance between 10 and 100 Ω ?

YES : Go to step 10CC6.

NO : Replace pressure sources switching solenoid valve.

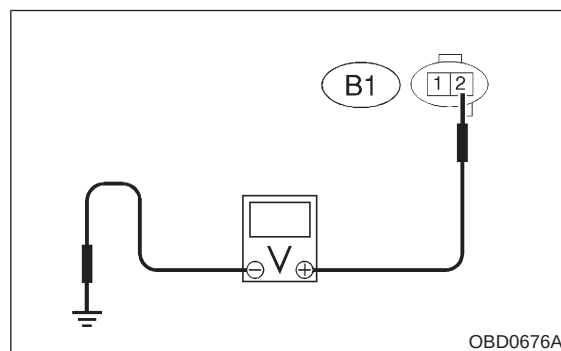
10CC6 : CHECK POWER SUPPLY TO PRESSURE SOURCES SWITCHING SOLENOID VALVE.

1) Turn ignition switch to ON.

2) Measure voltage between pressure sources switching solenoid valve harness connector and engine ground.

Connector & terminal

(B1) No. 2 (+) — Engine ground (-):



CHECK : Is the voltage more than 10 V?

YES : Go to step 10CC7.

NO : Repair open circuit in harness between main relay and pressure sources switching solenoid valve connector.

10CC7 : CHECK POOR CONTACT.

Check poor contact in pressure sources switching solenoid valve connector. <Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in pressure sources switching solenoid valve connector?

YES : Repair poor contact in pressure sources switching solenoid valve connector.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

CD: DTC P1103 — ENGINE TORQUE CONTROL SIGNAL CIRCUIT MALFUNCTION —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

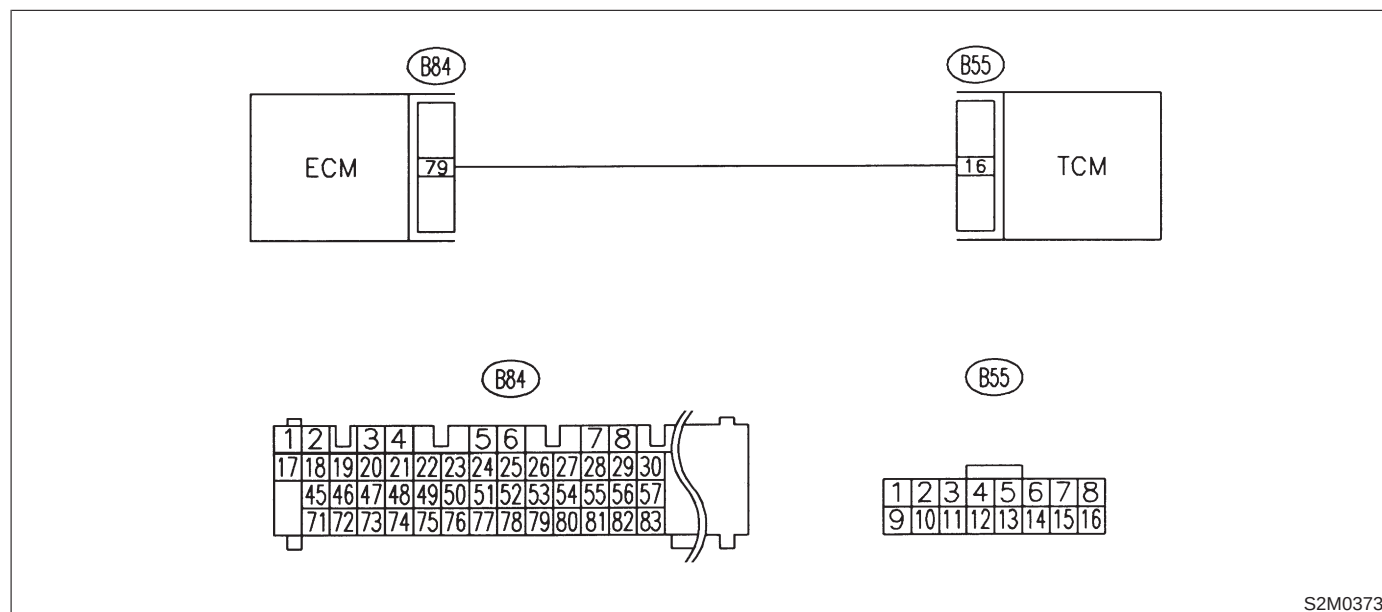
- Excessive shift shock

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

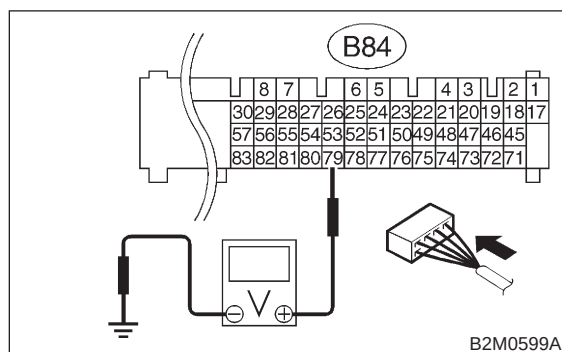


10CD1 : CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 79 (+) — Chassis ground (-):



10CD2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in ECM connector?

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

CHECK : Is the voltage more than 4.5 V?

YES : Go to step 10CD2.

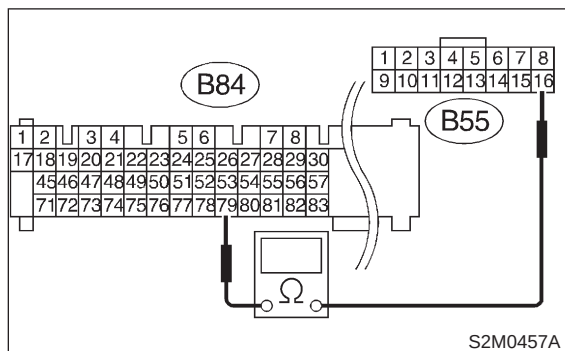
NO : Go to step 10CD3.

10CD3 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and TCM.
- 3) Measure resistance of harness between ECM and TCM connector.

Connector & terminal

(B84) No. 79 — (B55) No. 16:



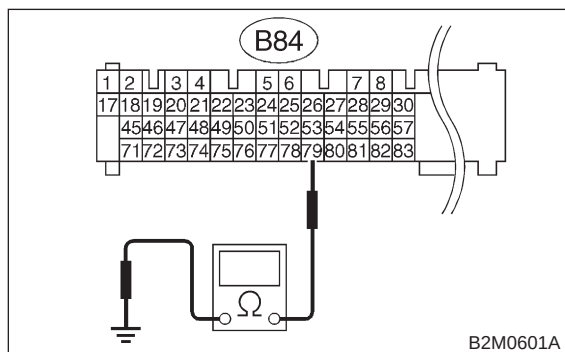
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 10CD4.
- NO** : Repair open circuit in harness between ECM and TCM connector.

10CD4 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 79 — Chassis ground:



- CHECK** : Is the resistance less than 10 Ω ?
- YES** : Repair ground short circuit in harness between ECM and TCM connector.
- NO** : Go to step 10CD5.

10CD5 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in TCM connector?
- YES** : Repair poor contact in TCM connector.
- NO** : Replace TCM.

CE: DTC P1120 — STARTER SWITCH CIRCUIT HIGH INPUT —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

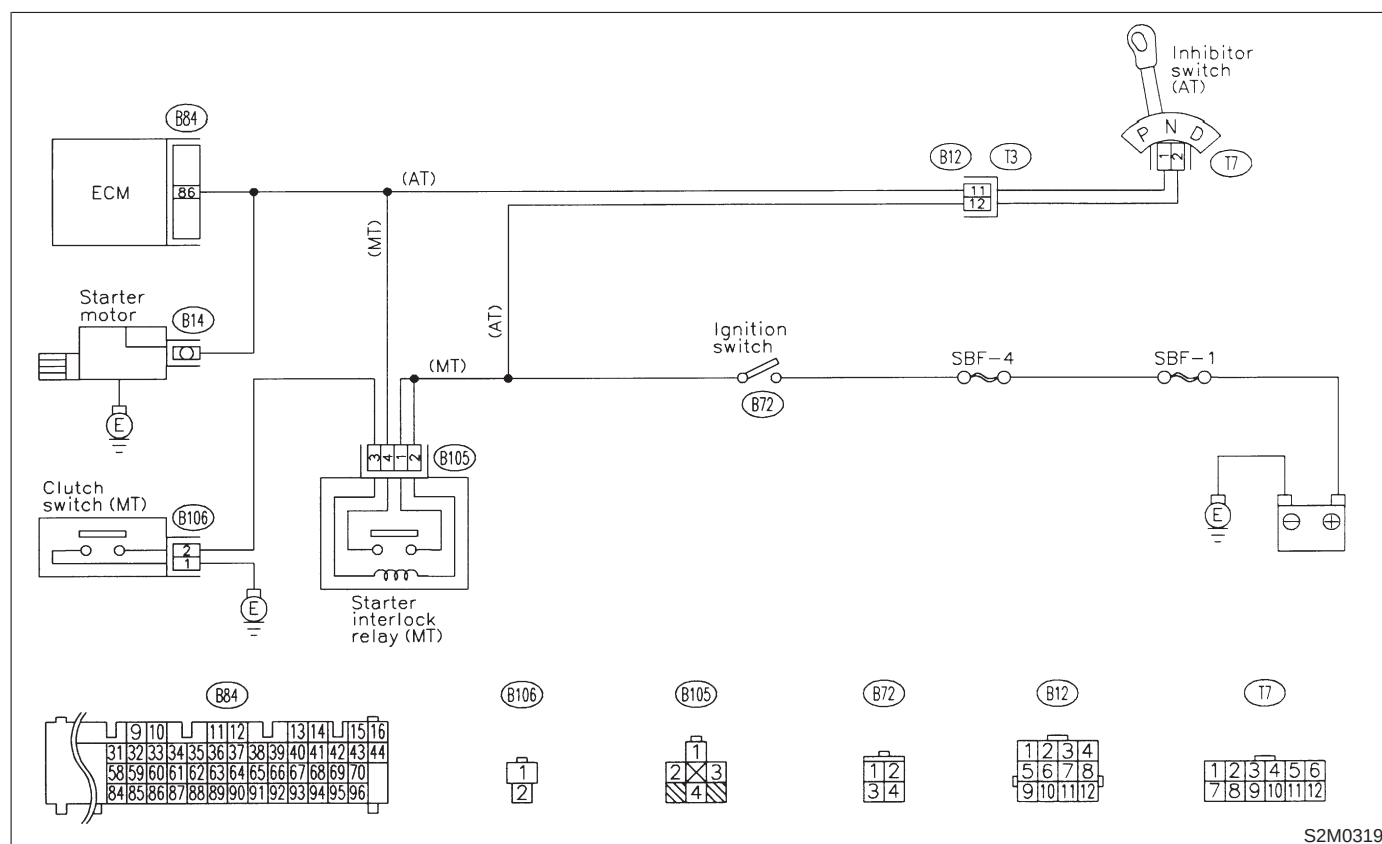
• TROUBLE SYMPTOM:

- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0319

10CE1 : CHECK OPERATION OF STARTER MOTOR.**NOTE:**

- On AT vehicles, place the inhibitor switch in each position.
- On MT vehicles, depress or release the clutch pedal.

CHECK : **Does starter motor operate when ignition switch to "ON"?**

YES : Repair battery short circuit in starter motor circuit. After repair, replace ECM.

NO : Check starter motor circuit. <Ref. to 2-7 [T8B0].>

CF: DTC P1121 — NEUTRAL POSITION SWITCH CIRCUIT LOW INPUT [AT VEHICLES] —

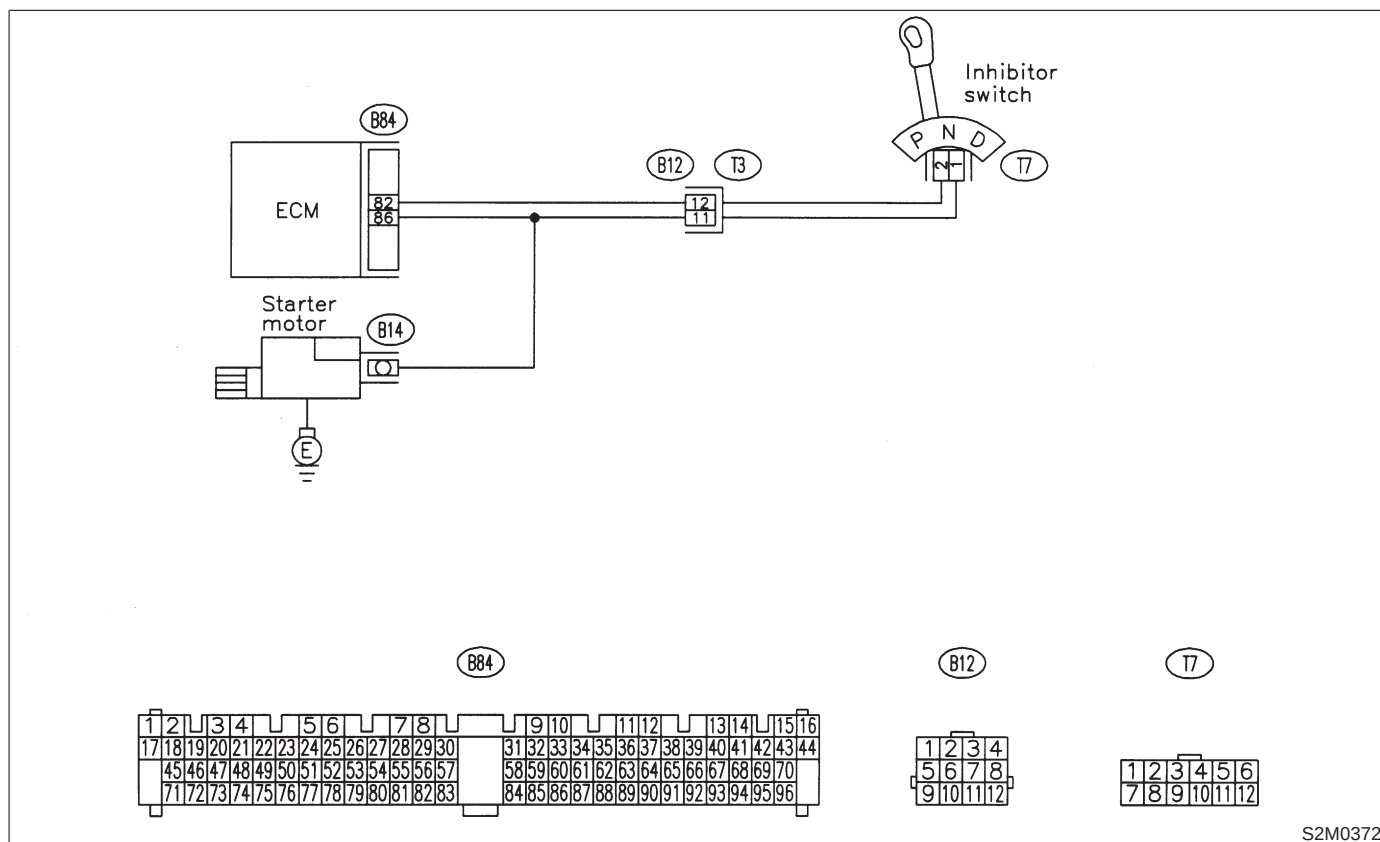
- **DTC DETECTING CONDITION:**
 - Two consecutive driving cycles with fault
- **TROUBLE SYMPTOM:**
 - Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



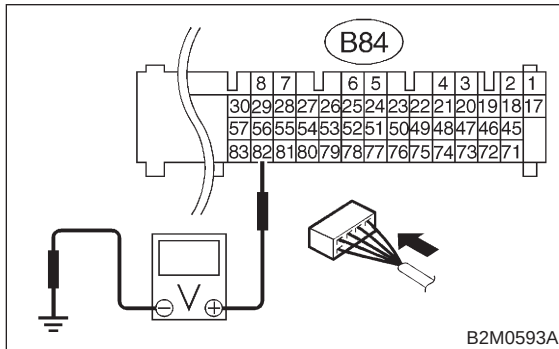
S2M0372

10CF1 : CHECK DTC P0705 ON DISPLAY.

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0705?
- YES** : Inspect DTC P0705 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Go to step **10CF2**.

10CF2 : CHECK INPUT SIGNAL FOR ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):**

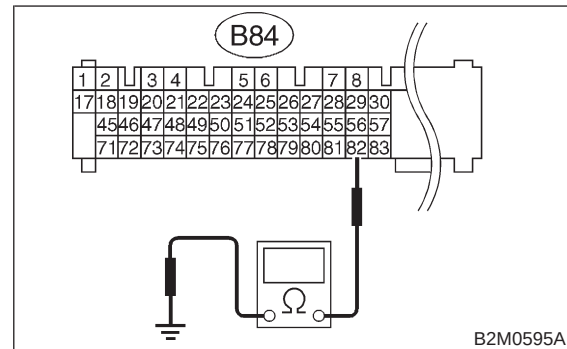
CHECK : *Is the voltage between 4.5 and 5.5 V in other positions?*

YES : Even if MIL lights up, the circuit has returned to a normal condition at this time.

NO : Go to step **10CF3**.

10CF3 : CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from ECM and transmission harness connector.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal**(B84) No. 82 — Chassis ground:**

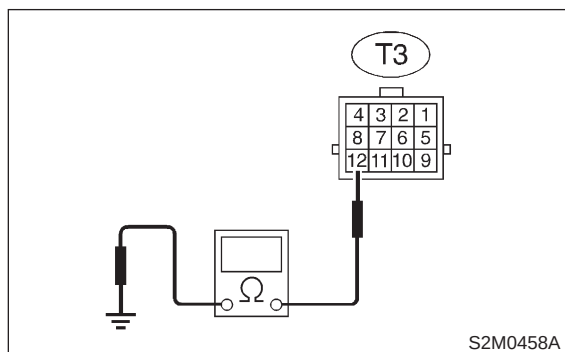
CHECK : *Is the resistance less than 10 Ω ?*

YES : Repair ground short circuit in harness between ECM and transmission harness connector.

NO : Go to step **10CF4**.

10CF4 : CHECK TRANSMISSION HARNESS CONNECTOR.

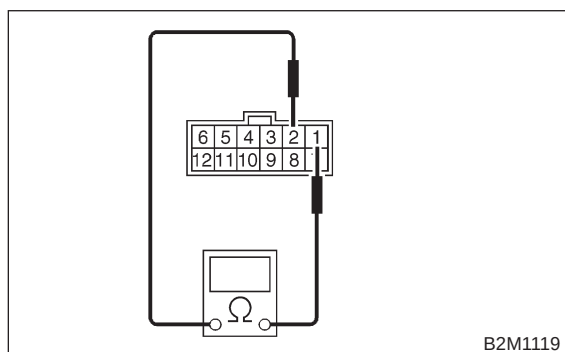
- 1) Disconnect connector from inhibitor switch.
- 2) Measure resistance of harness between transmission harness connector and engine ground.

Connector & terminal**(T3) No. 12 — Engine ground:**

- CHECK** : **Is the resistance less than 10 Ω?**
- YES** : Repair ground short circuit in harness between transmission harness and inhibitor switch connector.
- NO** : Go to step **10CF5**.

10CF5 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals in selector lever except for "N" and "P" positions.

Terminals**No. 1 — No. 2:**

- CHECK** : **Is the resistance more than 1 MΩ?**
- YES** : Go to step **10CF6**.
- NO** : Replace inhibitor switch.

10CF6 : CHECK SELECTOR CABLE CONNECTION.

- CHECK** : **Is there any fault in selector cable connection to inhibitor switch?**
- YES** : Repair selector cable connection. <Ref. to 3-2 [W3B0].>
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

CG: DTC P1122 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT HIGH INPUT —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

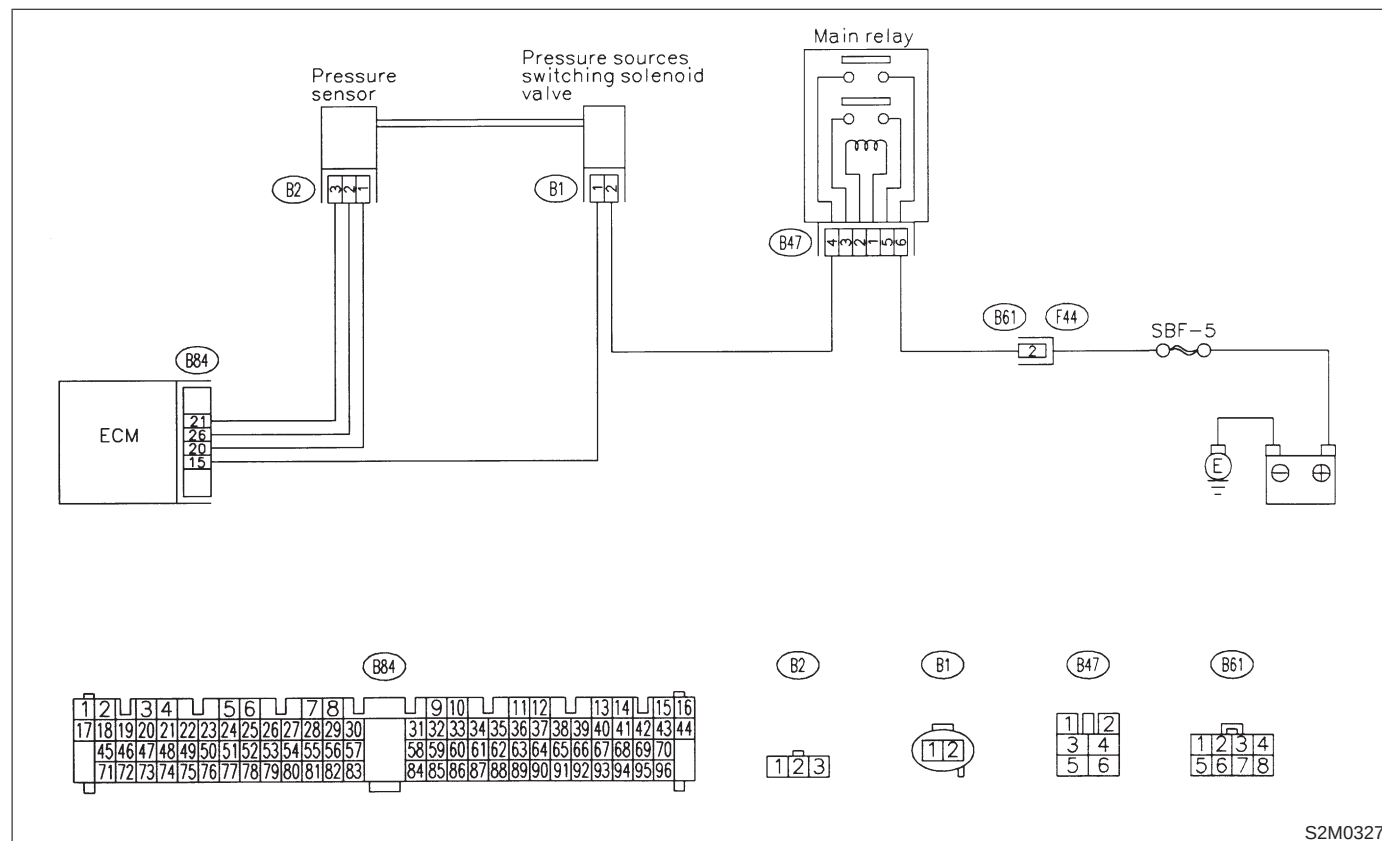
- Erroneous idling
- Failure of engine to start

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



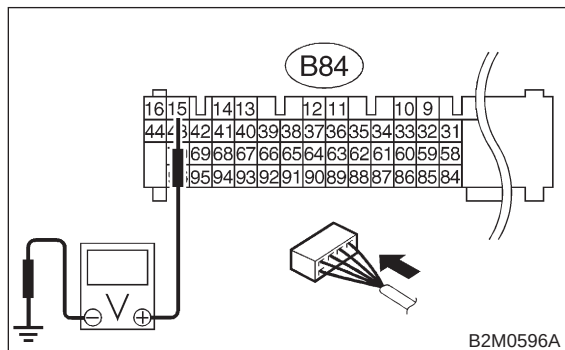
S2M0327

10CG1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 15 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 10CG3.
- NO** : Go to step 10CG2.

10CG2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

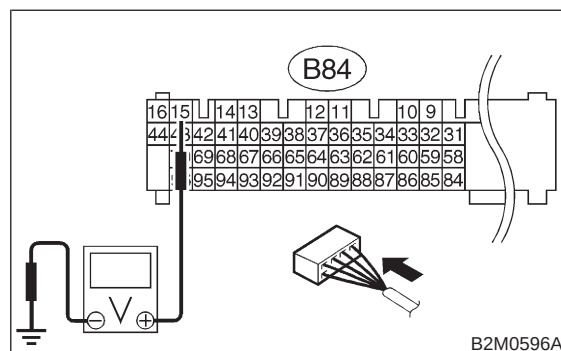
- CHECK** : Is there poor contact in ECM connector?
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

10CG3 : CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from pressure sources switching solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

Connector & terminal

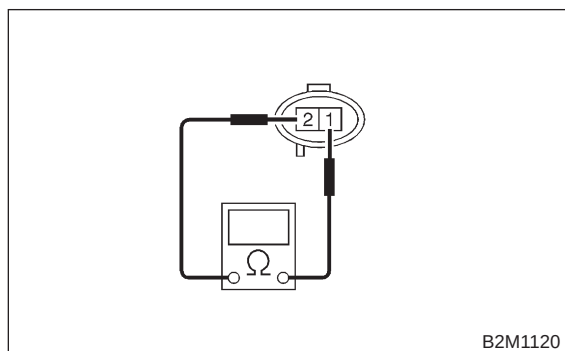
(B84) No. 15 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Repair battery short circuit in harness between ECM and pressure sources switching solenoid valve connector. After repair, replace ECM.
- NO** : Go to step 10CG4.

**10CG4 : CHECK PRESSURE SOURCES
SWITCHING SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between pressure sources switching solenoid valve connector terminals.

Terminals**No. 1 — No. 2:**

- CHECK** : ***Is the resistance less than 1 Ω ?***
- YES** : Replace pressure sources switching solenoid valve and ECM.
- NO** : Go to step **10CG5**.

10CG5 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : ***Is there poor contact in ECM connector?***
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

CH: DTC P1141 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

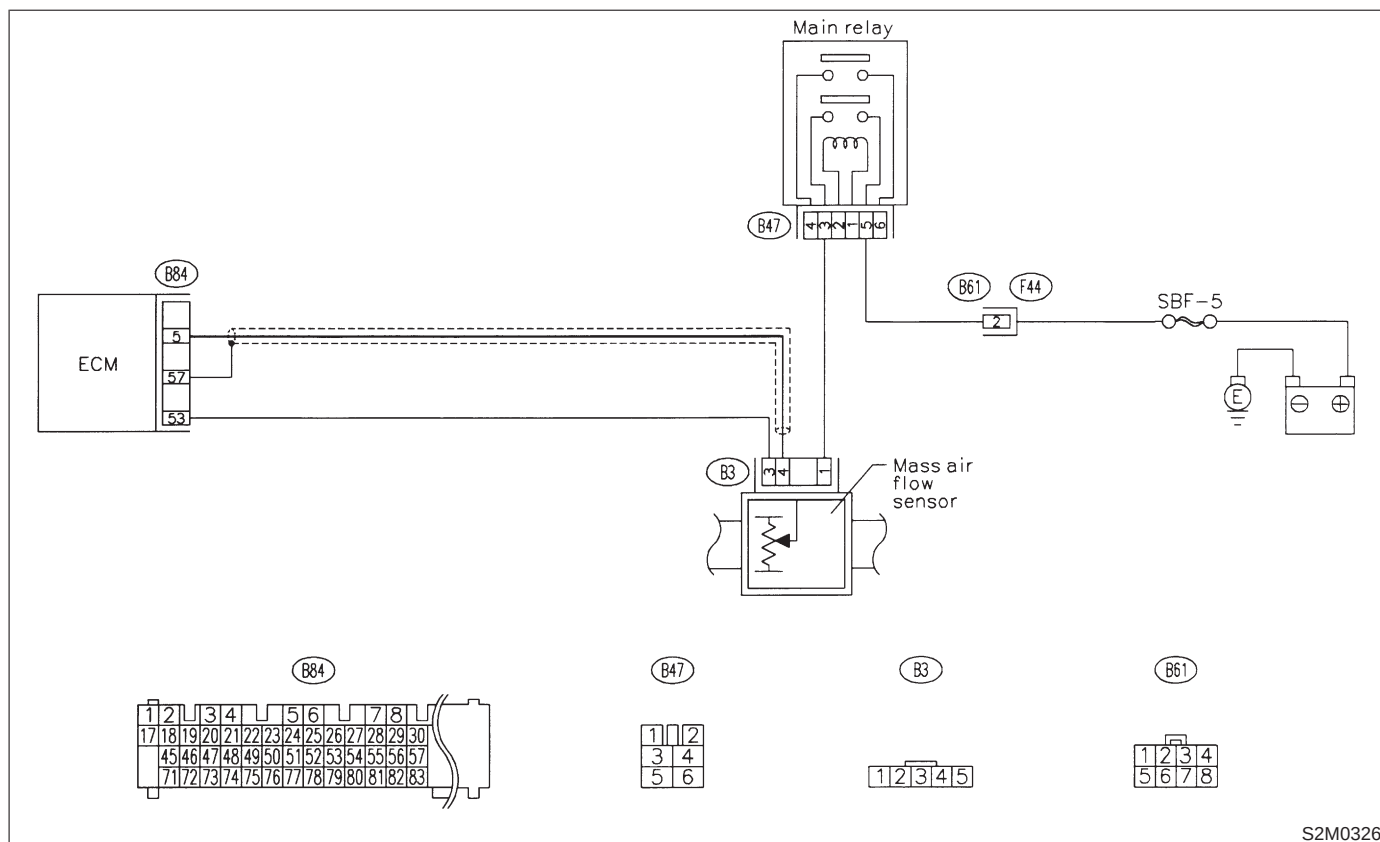
- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:



S2M0326

10CH1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0102 or P0103?

YES : Inspect DTC P0102 or P0103 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P1141.

NO : Replace mass air flow sensor.

CI: DTC P1142 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

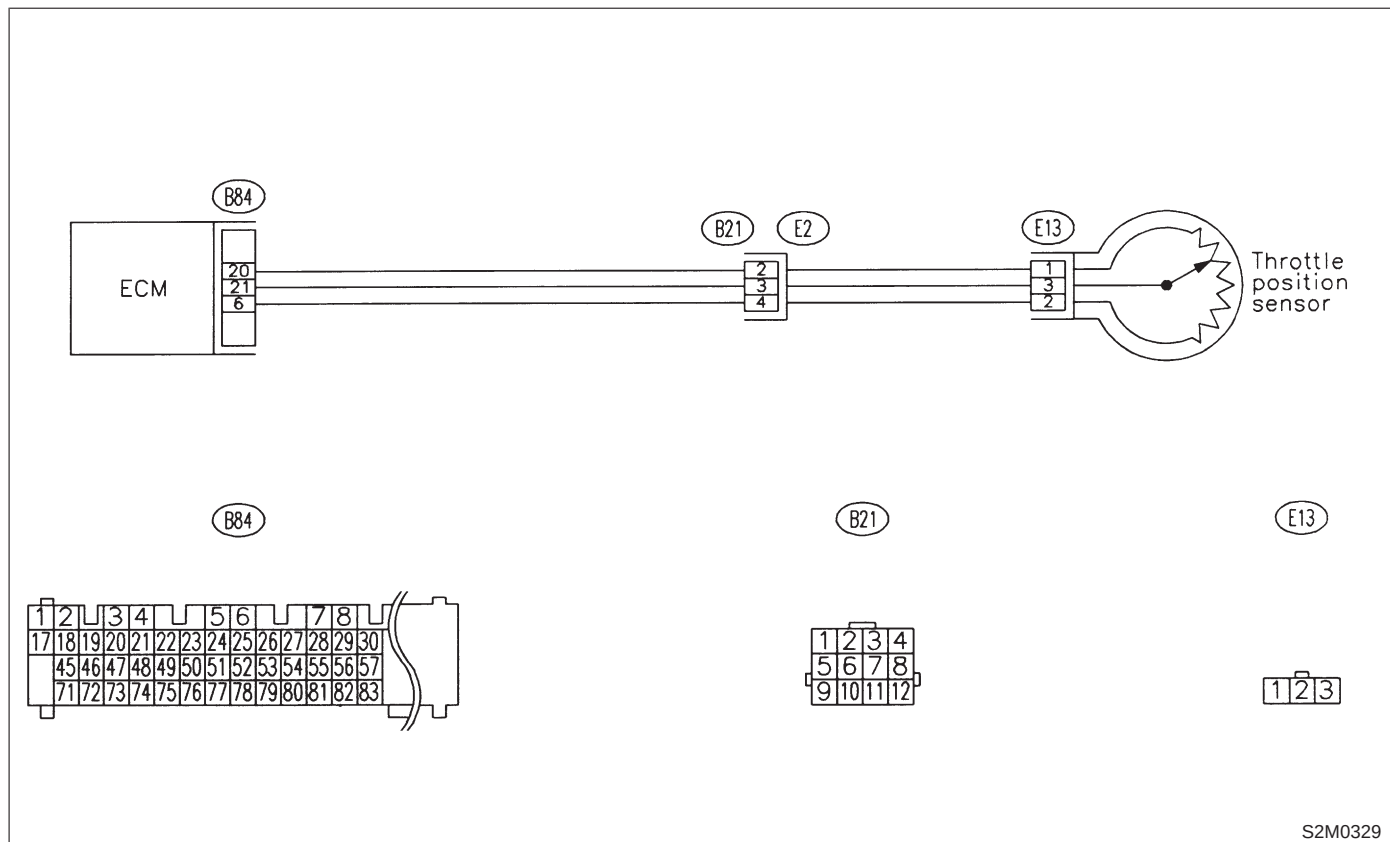
- Erroneous idling
- Engine stalls.
- Poor driving performance

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



S2M0329

10CI1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0122 or P0123?

YES : Inspect DTC P0122 or P0123 using "10. Diagnostics Chart with Trouble Code".
<Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P1142.

NO : Replace throttle position sensor.

CJ: DTC P1143 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (LOW INPUT) —

● DTC DETECTING CONDITION:

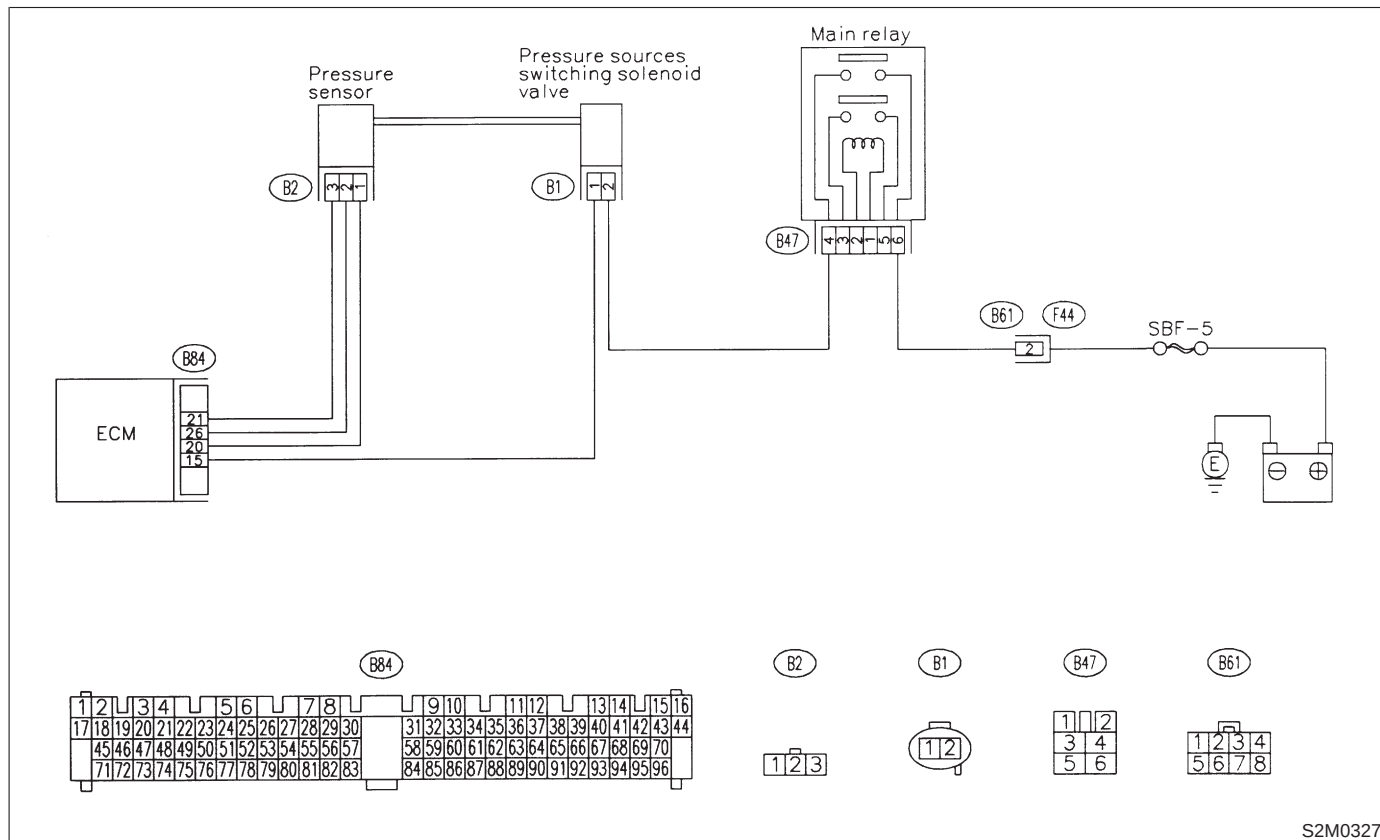
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

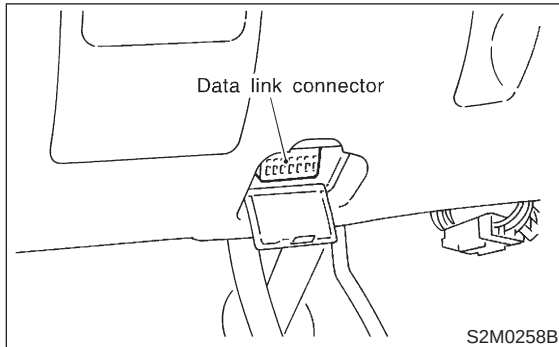
● WIRING DIAGRAM:



S2M0327

10CJ1 : CHECK DATA FOR CONTROL.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch ON and Subaru Select Monitor or the OBD-II general scan tool switch ON.
- 4) Start engine.
- 5) Read data of atmospheric absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : *Is the value less than 32 kPa (240 mmHg, 9.45 inHg)?*

YES : Go to step **10CJ3**.

NO : Go to step **10CJ2**.

10CJ2 : CHECK PRESSURE SENSOR.

- 1) Measure actual atmospheric pressure.
- 2) Read data of atmospheric absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

CHECK : *Is the difference between absolute value of Subaru Selector Monitor indication and actual atmospheric pressure greater than 10 kPa (75 mmHg, 2.95 inHg)?*

YES : Replace pressure sensor.

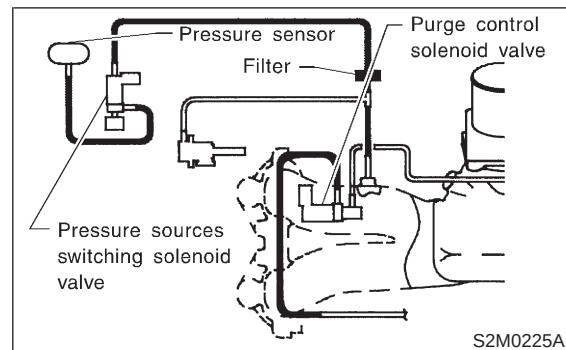
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10CJ3 : CHECK VACUUM HOSES.

Check the following item. Incorrect hose connections in line between the pressure sources switching solenoid valve and pressure sensor, intake manifold and/or CPC solenoid valve.



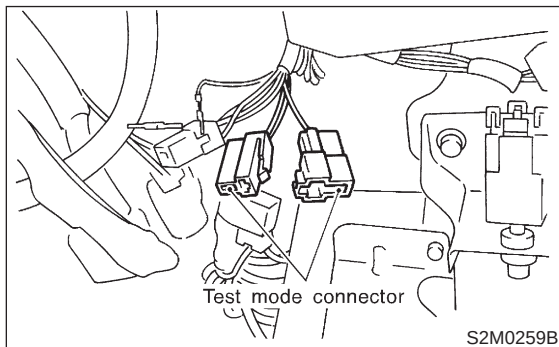
CHECK : *Is there a fault in vacuum hose?*

YES : Repair or replace hoses or filter.

NO : Go to step **10CJ4**.

**10CJ4 : CHECK PRESSURE SOURCES
SWITCHING SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector.



- 3) Turn ignition switch to ON.

NOTE:

Pressure sources switching solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

- CHECK** : ***Does pressure sources switching solenoid valve produce operating sound? (ON ↔ OFF each 1.5 sec.)***
- YES** : Replace pressure sensor.
- NO** : Replace pressure sources switching solenoid valve.

CK: DTC P1144 — PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (HIGH INPUT) —

• DTC DETECTING CONDITION:

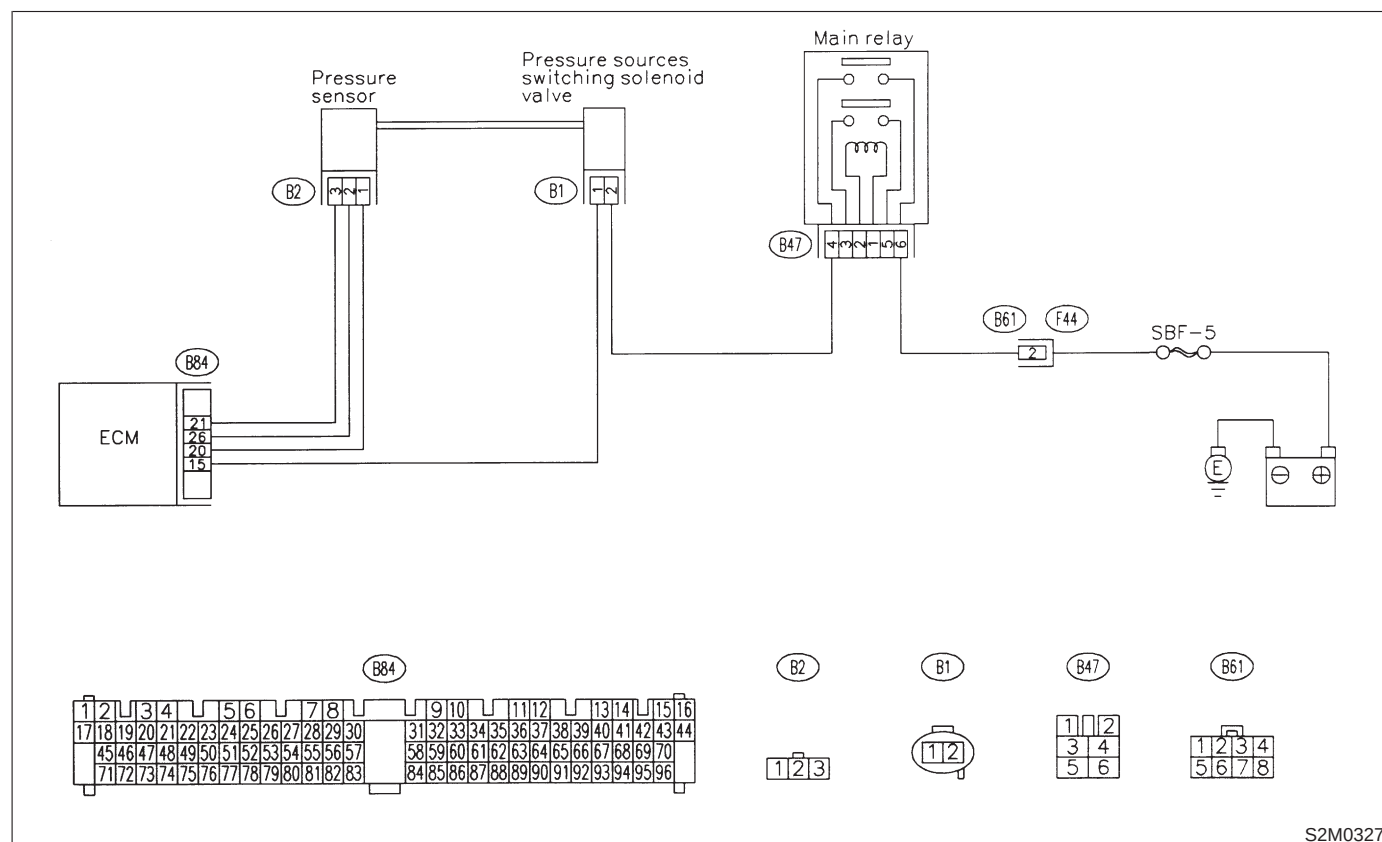
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

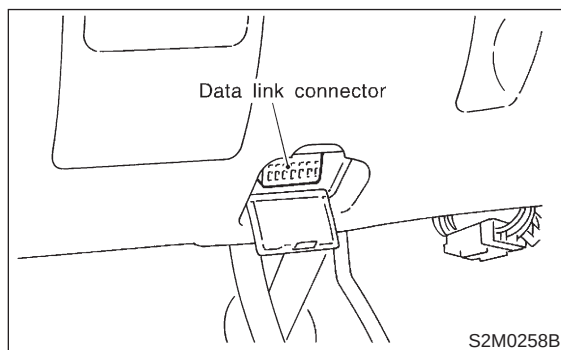
• WIRING DIAGRAM:



S2M0327

10CK1 : CHECK DATA FOR CONTROL.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.



- 3) Turn ignition switch ON and Subaru Select Monitor or the OBD-II general scan tool switch ON.
- 4) Start engine.
- 5) Read data of atmospheric absolute pressure signal using Subaru Select Monitor or OBD-II general scan tool.

NOTE:

- Subaru Select Monitor

For detailed operation procedure, refer to the "READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE". <Ref. to 2-7 [T3C4].>

- OBD-II general scan tool

For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

CHECK : ***Is the value more than 133 kPa (998 mmHg, 39.29 inHg)?***

YES : Replace pressure sensor.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

CL: DTC P1400 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW INPUT —

• DTC DETECTING CONDITION:

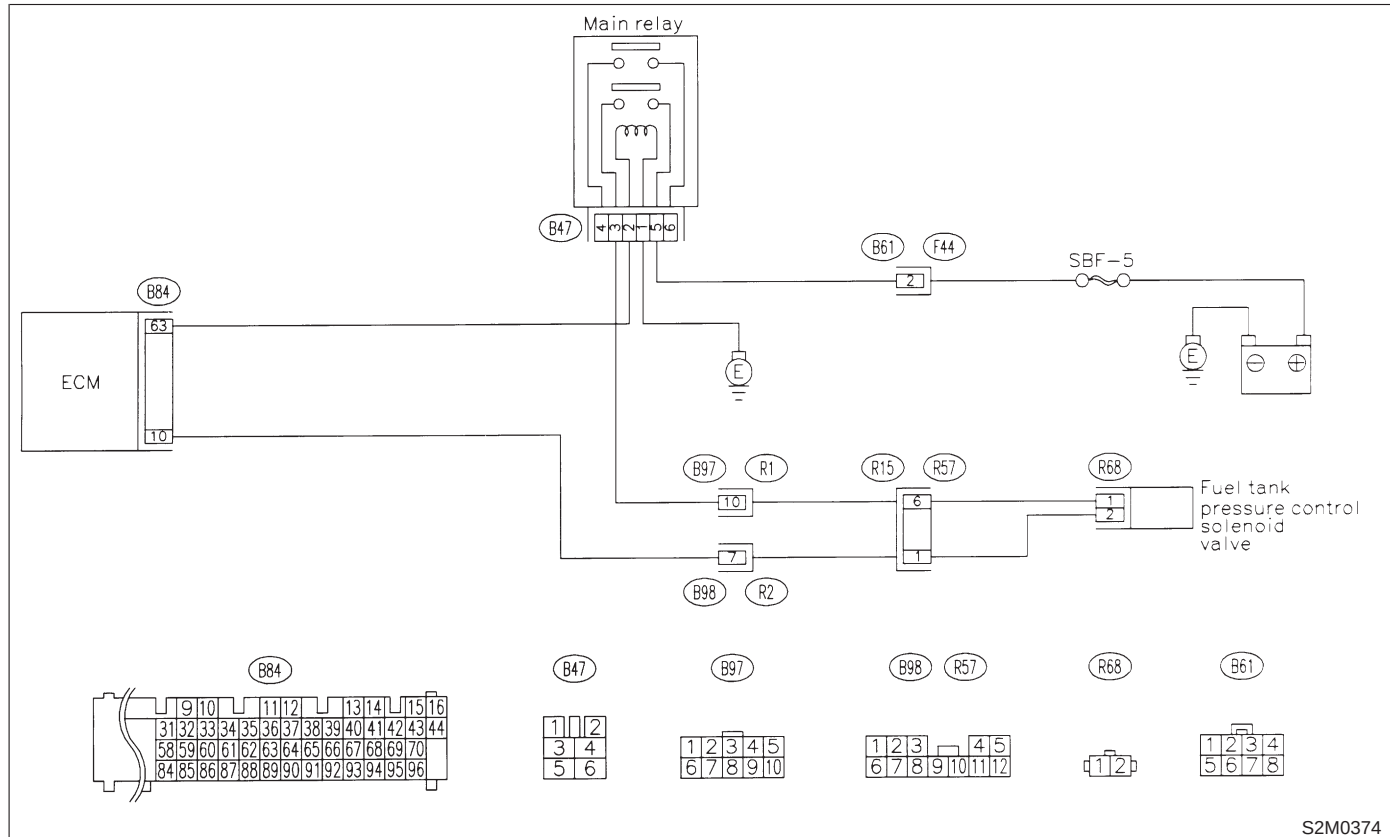
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

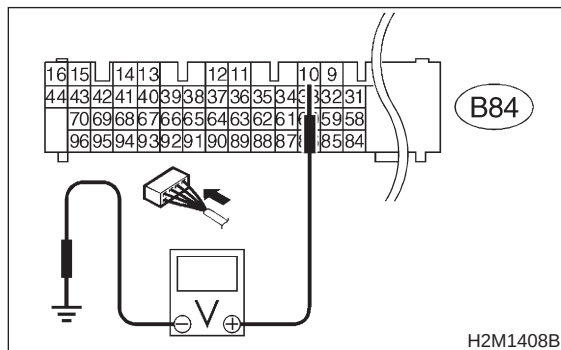
• WIRING DIAGRAM:



S2M0374

10CL1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 10 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage more than 10 V?*
- YES** : Go to step **10CL2**.
- NO** : Go to step **10CL3**.

10CL2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

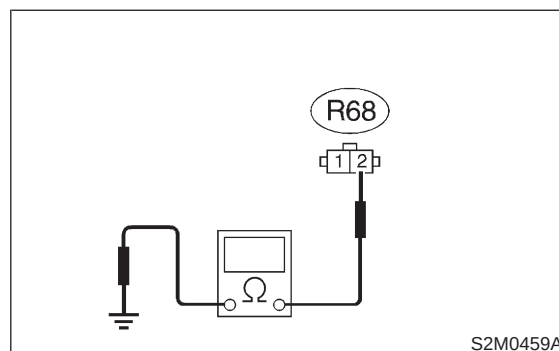
- CHECK** : *Is there poor contact in ECM connector?*
- YES** : Repair poor contact in ECM connector.
- NO** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10CL3 : CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from fuel tank pressure control solenoid valve and ECM.
- 3) Measure resistance of harness between fuel tank pressure control solenoid valve connector and chassis ground.

Connector & terminal**(R68) No. 2 — Chassis ground:**

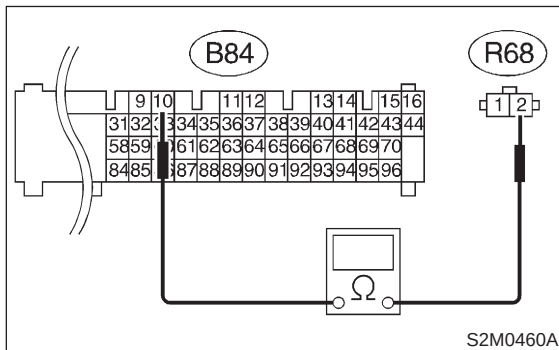
- CHECK** : *Is the resistance less than 10 Ω?*
- YES** : Repair ground short circuit in harness between ECM and fuel tank pressure control solenoid valve connector.
- NO** : Go to step **10CL4**.

10CL4 : CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

Measure resistance of harness between ECM and fuel tank pressure control solenoid valve connector.

Connector & terminal

(B84) No. 10 — (R68) No. 2:



CHECK : *Is the voltage less than 1 Ω?*

YES : Go to step **10CL5**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

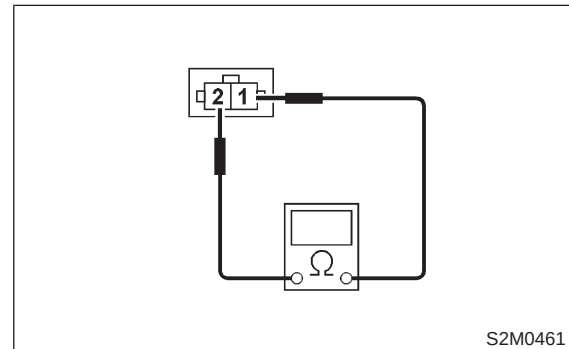
- Open circuit in harness between ECM and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B98 and R57)

10CL5 : CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

Measure resistance between fuel tank pressure control solenoid valve terminals.

Terminals

No. 1 — No. 2:



CHECK : *Is the resistance between 10 and 100 Ω?*

YES : Go to step **10CL6**.

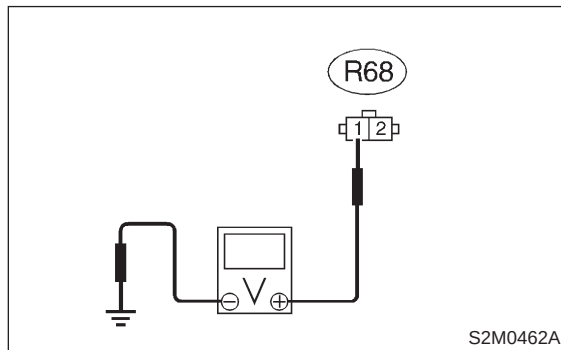
NO : Replace fuel tank pressure control solenoid valve.

10CL6 : CHECK POWER SUPPLY TO FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between fuel tank pressure control solenoid valve and chassis ground.

Connector & terminal

(R68) No. 1 (+) — Chassis ground (-):



CHECK : *Is the voltage more than 10 V?*

YES : Go to step **10CL7**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between main relay and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B97 and R57)
- Poor contact in main relay connector

10CL7 : CHECK POOR CONTACT.

Check poor contact in fuel tank pressure control solenoid valve connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in fuel tank pressure control solenoid valve connector?*

YES : Repair poor contact in fuel tank pressure control solenoid valve connector.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

CM: DTC P1420 — FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT HIGH INPUT —

● DTC DETECTING CONDITION:

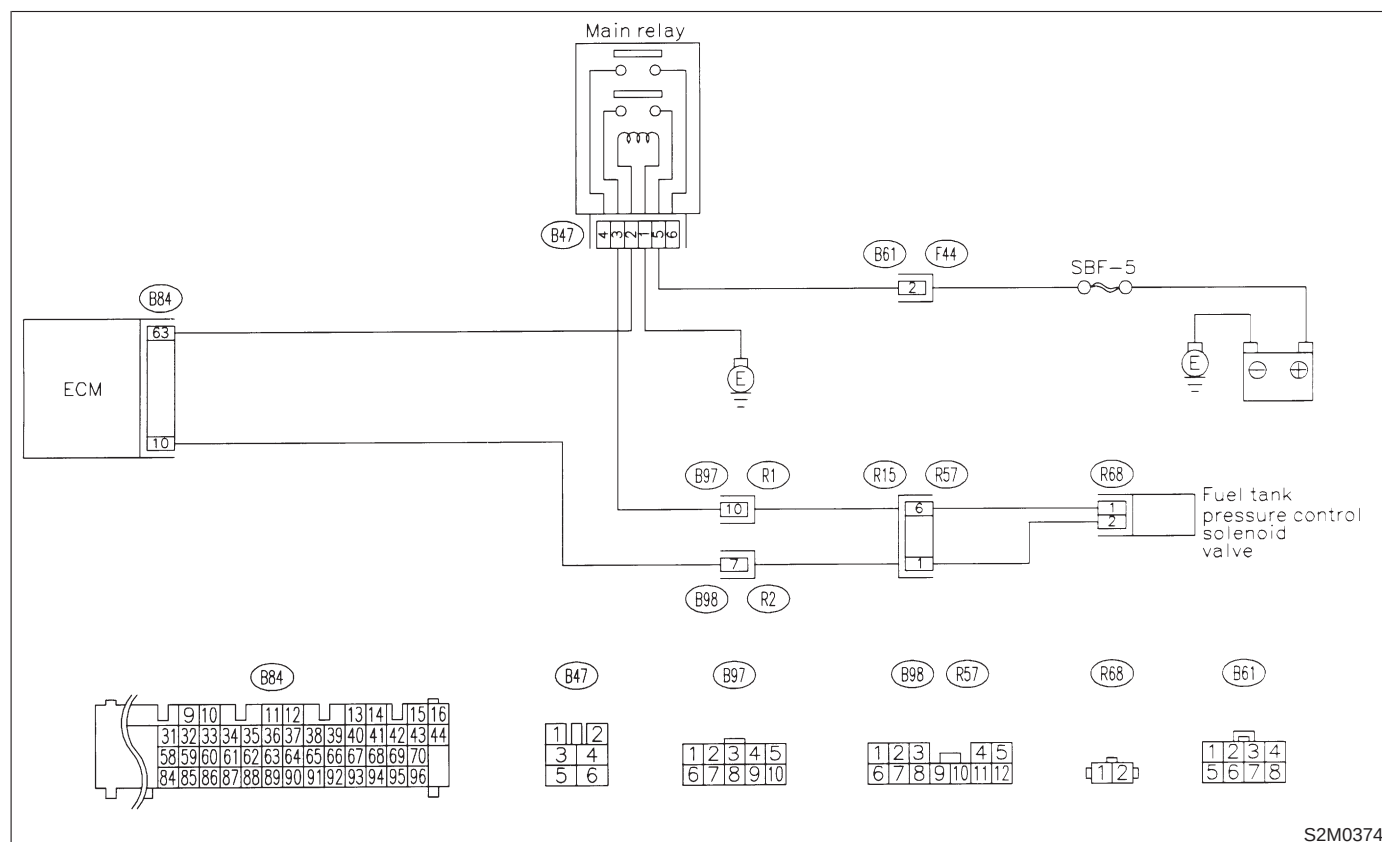
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

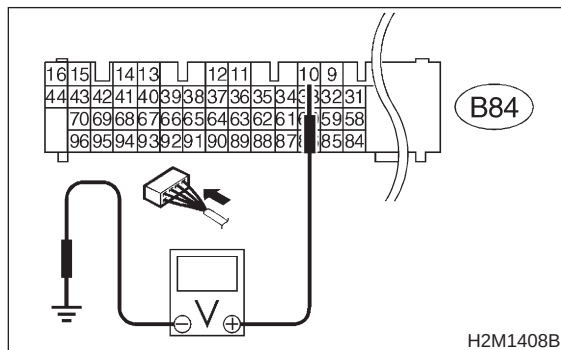
● WIRING DIAGRAM:



S2M0374

10CM1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 10 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage more than 10 V?*
- YES** : Go to step **10CM3**.
- NO** : Go to step **10CM2**.

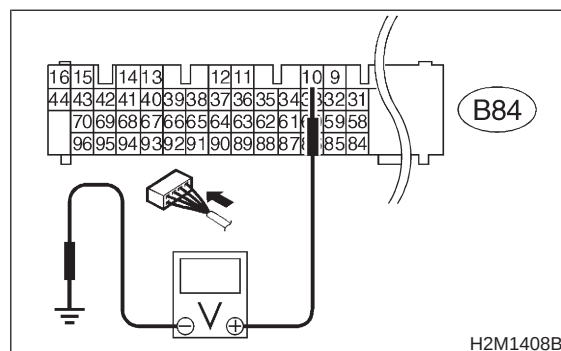
10CM2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : *Is there poor contact in ECM connector?*
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

10CM3 : CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

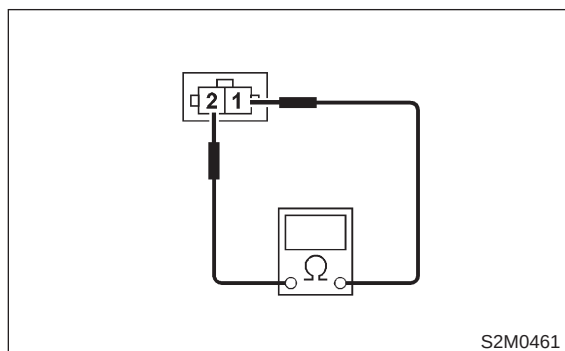
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel tank pressure control solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 10 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage more than 10 V?*
- YES** : Repair battery short circuit in harness between ECM and fuel tank pressure control solenoid valve connector. After repair, replace ECM.
- NO** : Go to step **10CM4**.

10CM4 : CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between fuel tank pressure control solenoid valve terminals.

Terminals**No. 1 — No. 2:**

- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Replace fuel tank pressure control solenoid valve and ECM.
- NO** : Go to step **10CM5**.

10CM5 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in ECM connector?**
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

CN: DTC P1421 — EXHAUST GAS RECIRCULATION CIRCUIT HIGH INPUT —

- **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

- **TROUBLE SYMPTOM:**

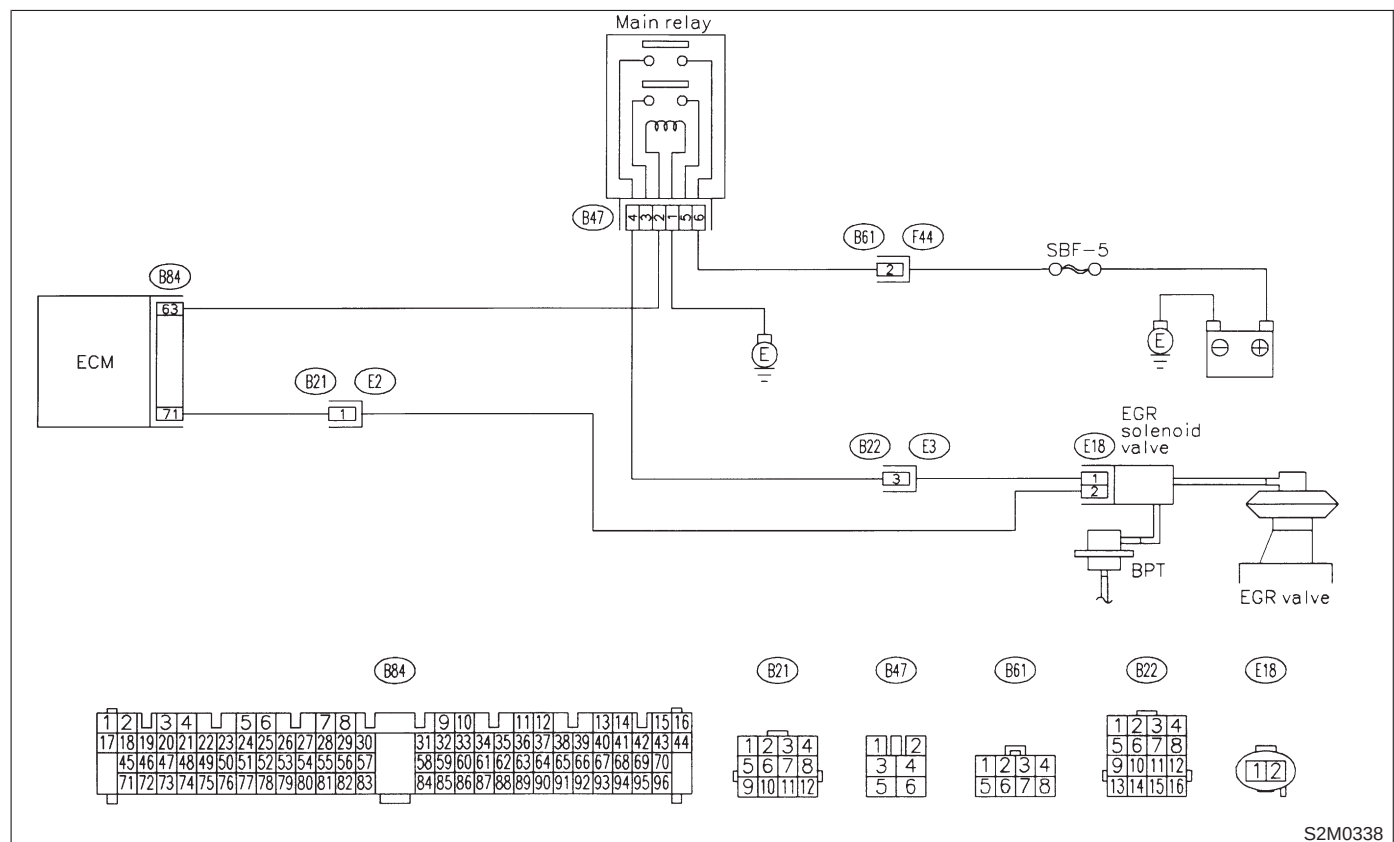
- Poor driving performance on low engine speed

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

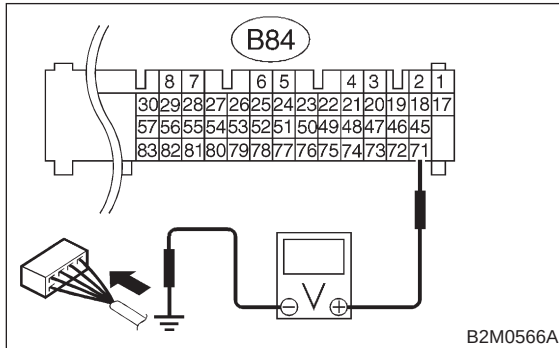
<Ref. to 2-7 [T3D0] and [T3E0].>

- **WIRING DIAGRAM:**



10CN1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 71 (+) — Chassis ground (-):**

- CHECK** : **Is the voltage more than 10 V?**
- YES** : Go to step **10CN3**.
- NO** : Go to step **10CN2**.

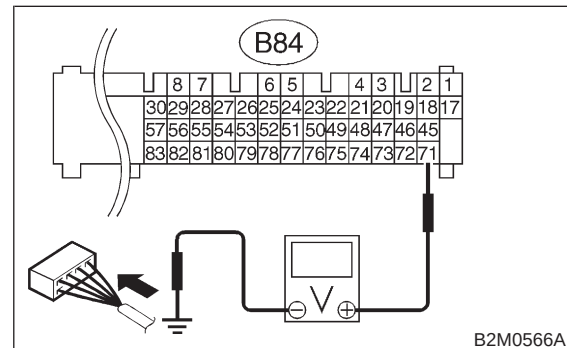
10CN2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in ECM connector?**
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

10CN3 : CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.

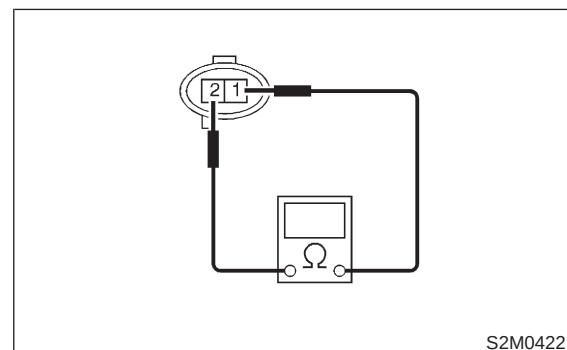
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from EGR solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 71 (+) — Chassis ground (-):**

- CHECK** : **Is the voltage more than 10 V?**
- YES** : Repair battery short circuit in harness between ECM and EGR solenoid valve connector. After repair, replace ECM.
- NO** : Go to step **10CN4**.

10CN4 : CHECK EGR SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between EGR solenoid valve terminals.

Terminals**No. 1 — No. 2:**

- CHECK** : **Is the resistance less than 1 Ω?**
- YES** : Replace EGR solenoid valve and ECM.
- NO** : Go to step **10CN5**.

10CN5 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in ECM connector?*

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

CO: DTC P1422 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT HIGH INPUT —

• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

• TROUBLE SYMPTOM:

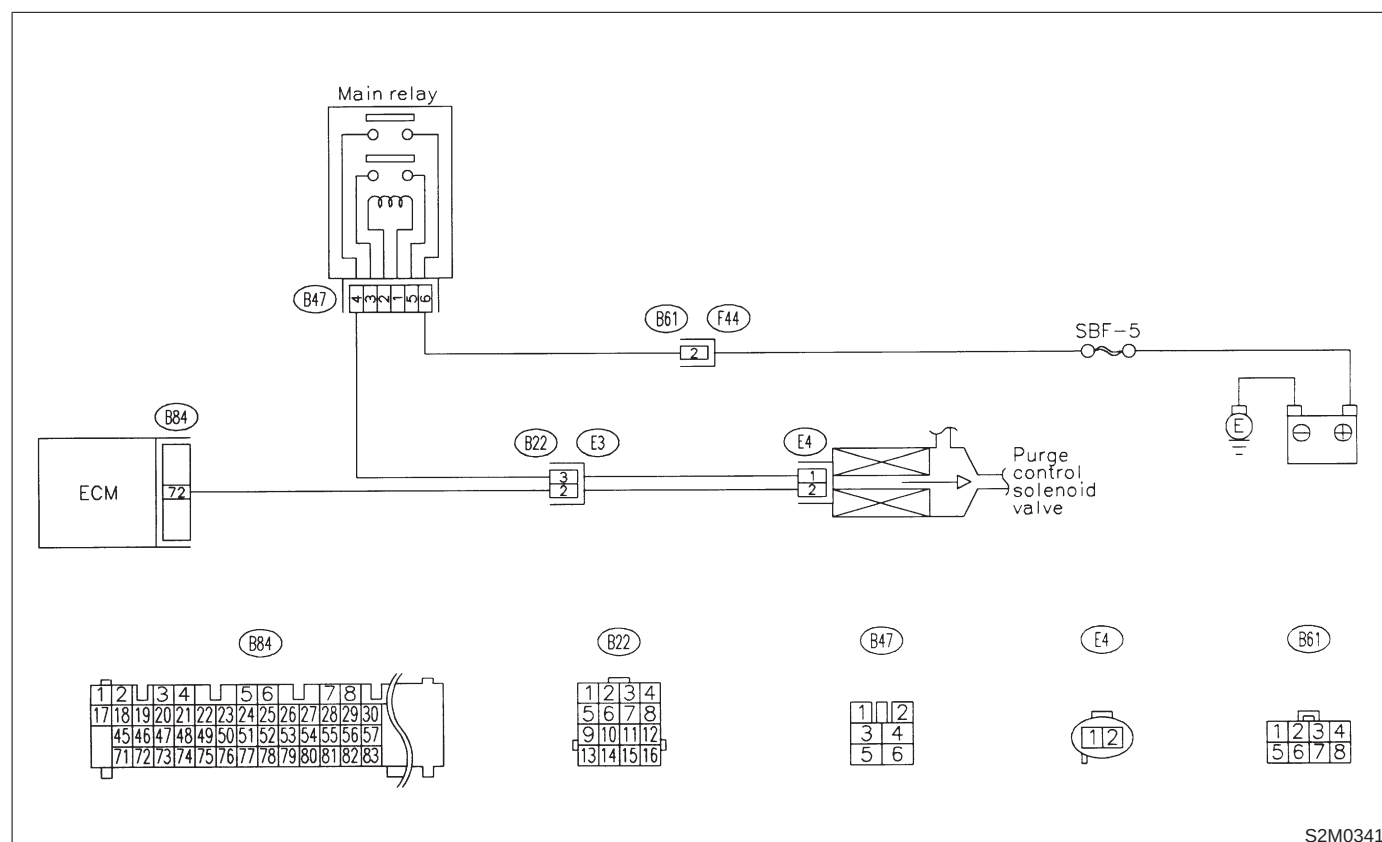
- Erroneous idling

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

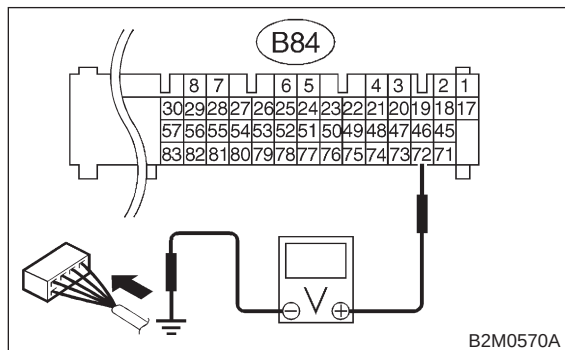
• WIRING DIAGRAM:



S2M0341

10CO1 : CHECK OUTPUT SIGNAL FROM ECM.

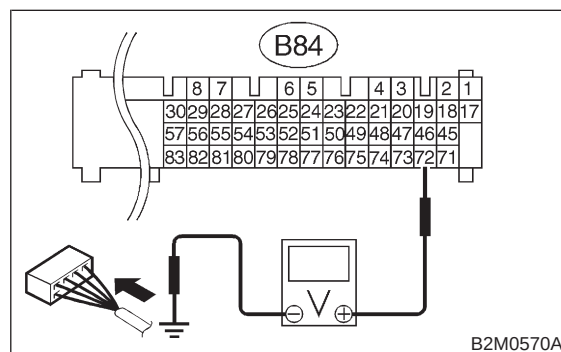
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 72 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10CO3**.**NO** : Go to step **10CO2**.**10CO2 : CHECK POOR CONTACT.**

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

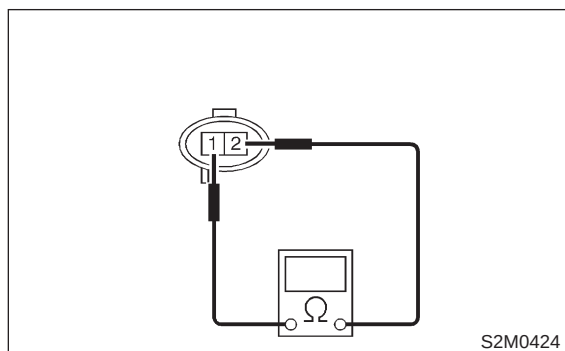
CHECK : **Is there poor contact in ECM connector?****YES** : Repair poor contact in ECM connector.**NO** : Replace ECM.**10CO3 : CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from purge control solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 72 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Repair battery short circuit in harness between ECM and purge control solenoid valve connector. After repair, replace ECM.**NO** : Go to step **10CO4**.

10C04 : CHECK PURGE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between purge control solenoid valve terminals.

Terminals**No. 1 — No. 2:**

- CHECK** : ***Is the resistance less than 1 Ω?***
- YES** : Replace purge control solenoid valve and ECM.
- NO** : Go to step **10C05**.

10C05 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : ***Is there poor contact in ECM connector?***
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

CP: DTC P1423 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL HIGH INPUT —

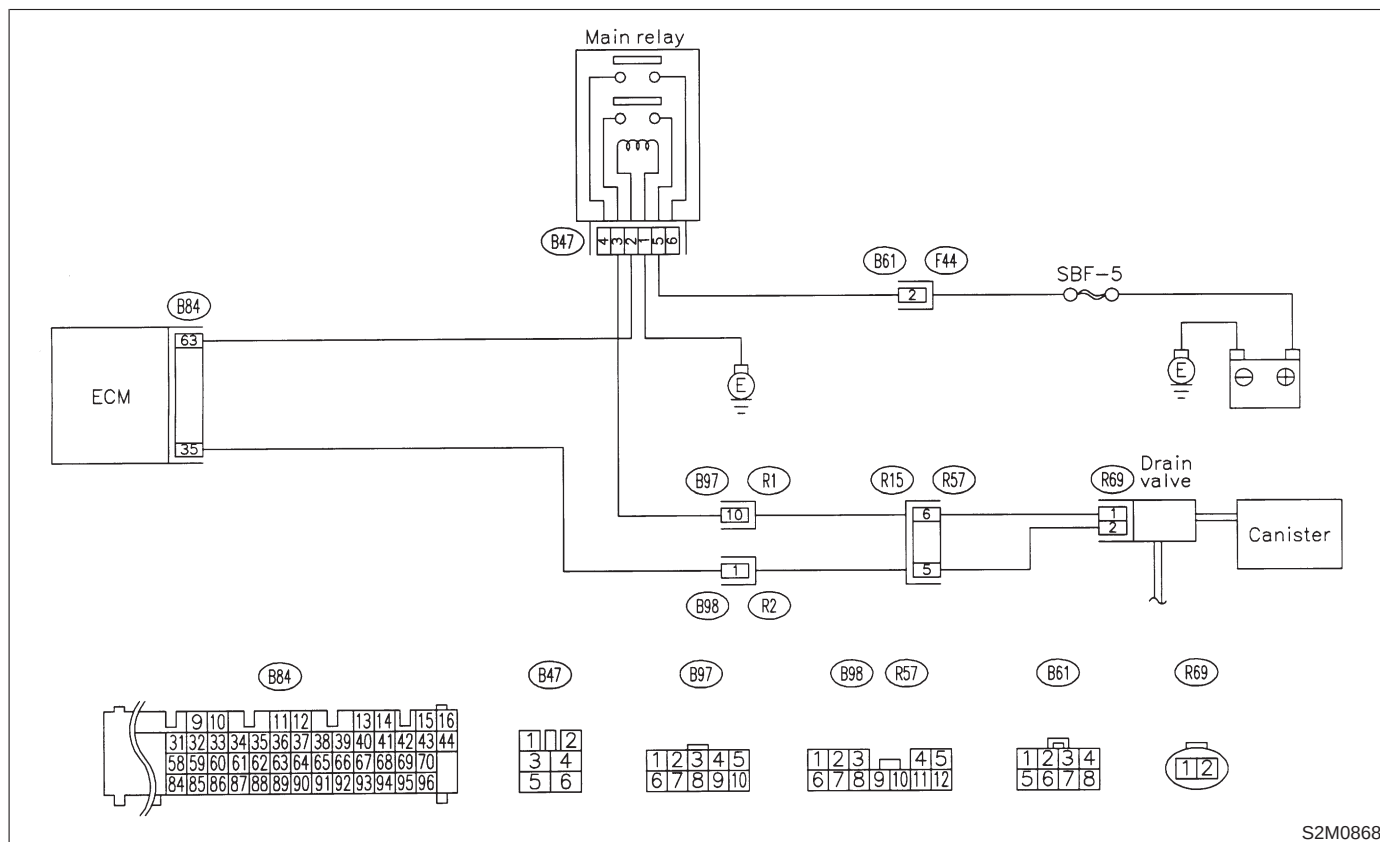
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

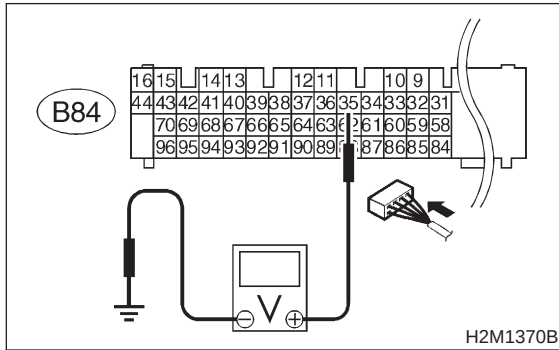
• WIRING DIAGRAM:



S2M0868

10CP1 : CHECK OUTPUT SIGNAL FROM ECM.

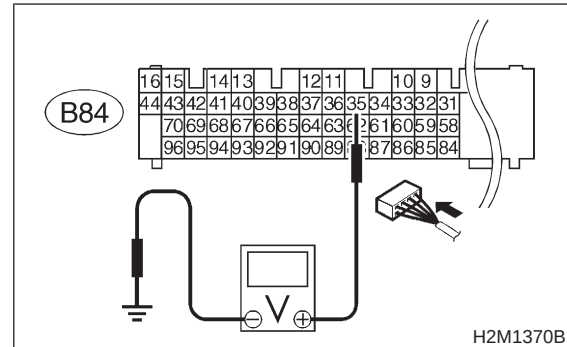
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 35 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10CP3**.**NO** : Go to step **10CP2**.**10CP2 : CHECK POOR CONTACT.**

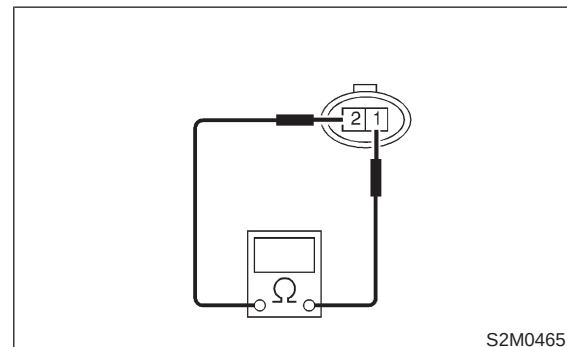
Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : **Is there poor contact in ECM connector?****YES** : Repair poor contact in ECM connector.**NO** : Replace ECM.**10CP3 : CHECK HARNESS BETWEEN DRAIN VALVE AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from drain valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 35 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Repair battery short circuit in harness between ECM and drain valve connector. After repair, replace ECM.**NO** : Go to step **10CP4**.**10CP4 : CHECK DRAIN VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between drain valve terminals.

Terminals**No. 1 — No. 2:****CHECK** : **Is the resistance less than 1 Ω?****YES** : Replace drain valve and ECM.**NO** : Go to step **10CP5**.

10CP5 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in ECM connector?*

YES : Repair poor contact in ECM connector.

NO : Replace ECM.

CQ: DTC P1440 — FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (LOW INPUT) —

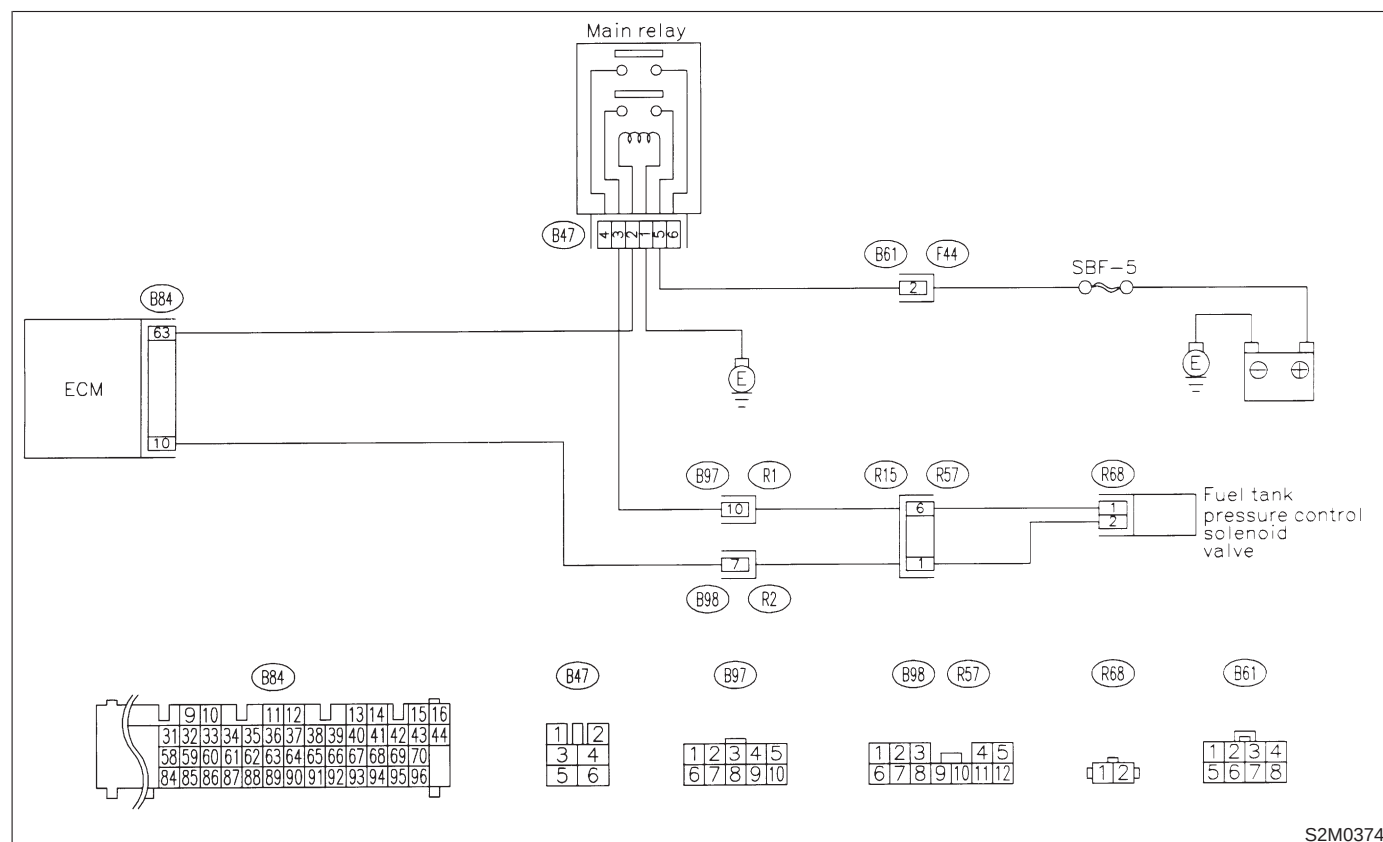
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

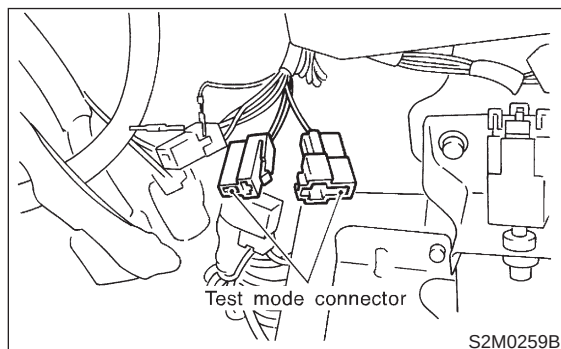
• WIRING DIAGRAM:



S2M0374

10CQ1 : CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector.



- 3) Turn ignition switch to ON.

NOTE:

Fuel tank pressure control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

- CHECK** : *Does fuel tank pressure control solenoid valve produce operating sound?*
- YES** : Go to step **10CQ2**.
- NO** : Replace fuel tank pressure control solenoid valve.

10CQ2 : CHECK FUEL FILLER CAP.

- 1) Turn ignition switch to OFF.
- 2) Open the fuel flap.

- CHECK** : *Is the fuel filler cap tightened securely?*
- YES** : Tighten fuel filler cap securely.
- NO** : Go to step **10CQ3**.

10CQ3 : CHECK FUEL FILLER PIPE SEAL.

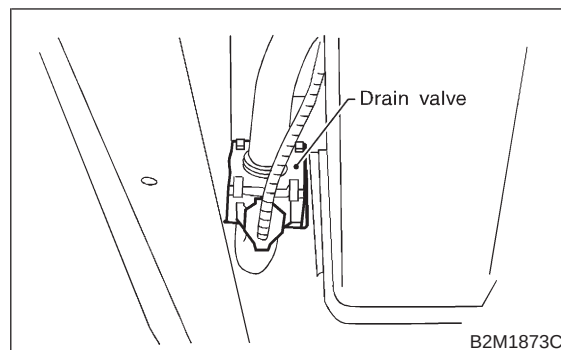
- CHECK** : *Is there any damage to the seal between fuel filler cap and fuel filler pipe?*
- YES** : Repair or replace fuel filler cap and fuel filler pipe.
- NO** : Go to step **10CQ4**.

10CQ4 : CHECK DRAIN VALVE.

Turn ignition switch to ON.

NOTE:

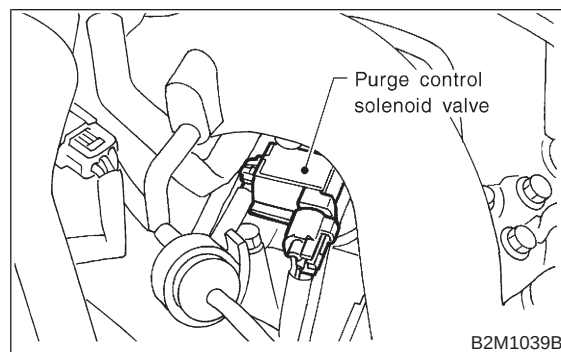
Drain valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



- CHECK** : *Does drain valve produce operating sound?*
- YES** : Go to step **10CQ5**.
- NO** : Replace drain valve.

10CQ5 : CHECK PURGE CONTROL SOLENOID VALVE.**NOTE:**

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



- CHECK** : *Does purge control solenoid valve produce operating sound?*
- YES** : Go to step **10CQ6**.
- NO** : Replace purge control solenoid valve.

10CQ6 : CHECK FUEL LINE.

Turn ignition switch to OFF.

CHECK : ***Does fuel leak in fuel line?***

YES : Repair or replace fuel line.

NO : Go to step **10CQ7**.

10CQ7 : CHECK CANISTER.

CHECK : ***Is there any damage at canister?***

YES : Repair or replace canister.

NO : Go to step **10CQ8**.

10CQ8 : CHECK FUEL TANK.

CHECK : ***Is there any damage at fuel tank?***

YES : Repair or replace fuel tank.

NO : Go to step **10CQ9**.

10CQ9 : CHECK OTHER MECHANICAL TROUBLE.

CHECK : ***Are there holes, cracks or disconnections of hoses or pipes in evaporative emission control system?***

YES : Repair or replace hoses or pipes.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

CR: P1441 — FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (HIGH INPUT) —

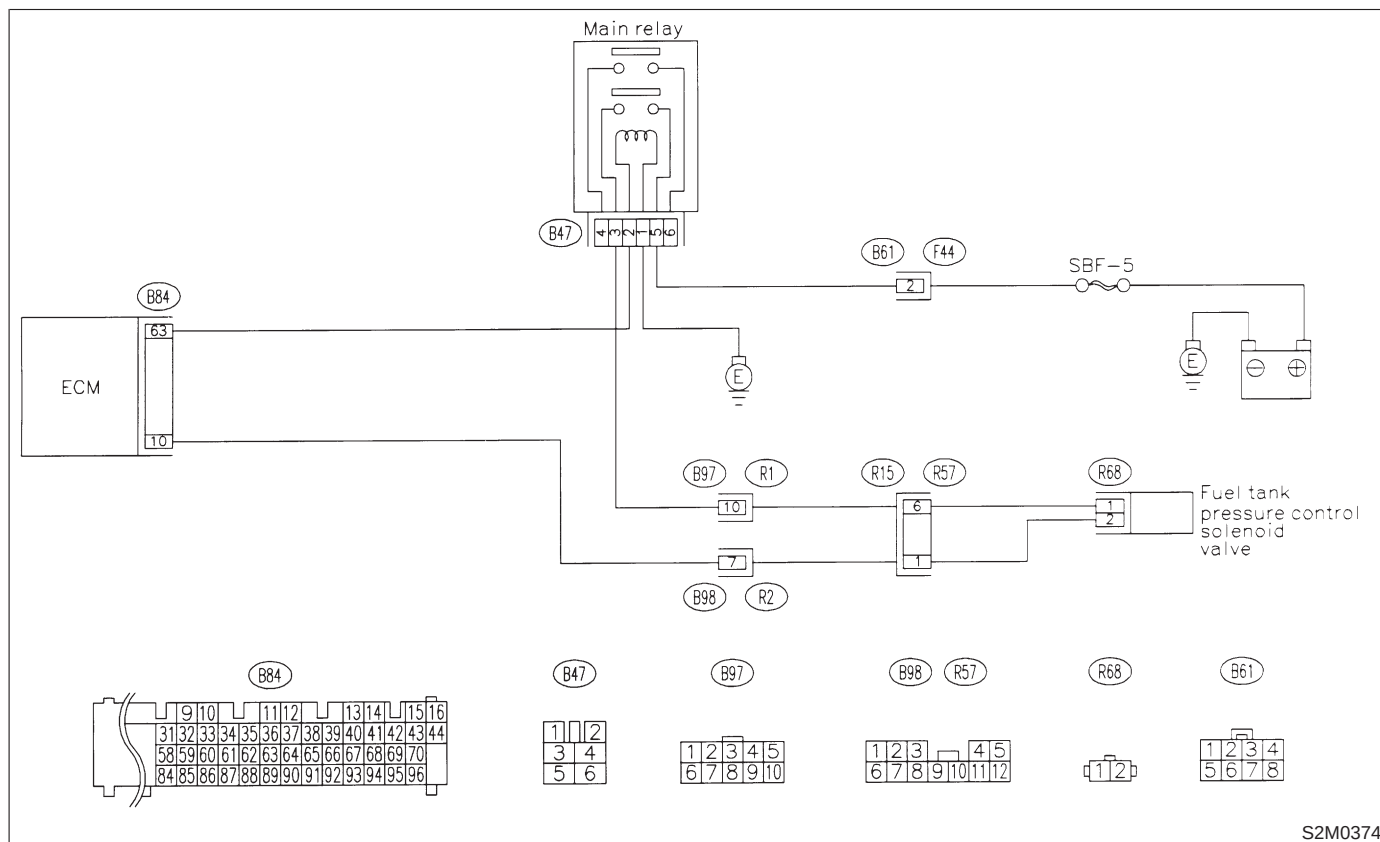
• DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

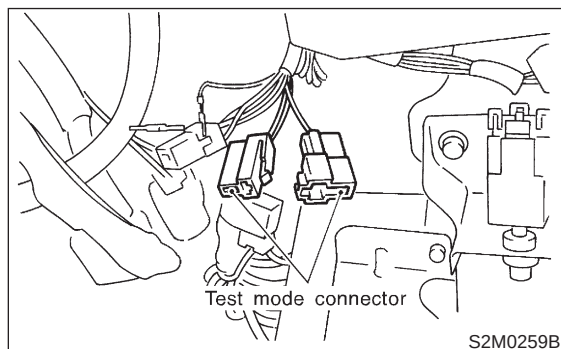
• WIRING DIAGRAM:



S2M0374

10CR1 : CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector.



- 3) Turn ignition switch to ON.

NOTE:

Fuel tank pressure control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

CHECK : *Does fuel tank pressure control solenoid valve produce operating sound?*

YES : Go to step **10CR2**.

NO : Replace fuel tank pressure control solenoid valve.

10CR2 : CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.

- 1) Turn ignition switch to OFF.
- 2) Open the fuel flap.

CHECK : *Is there any damage at fuel filler cap and fuel filler pipe?*

YES : Repair or replace fuel filler cap and fuel filler pipe.

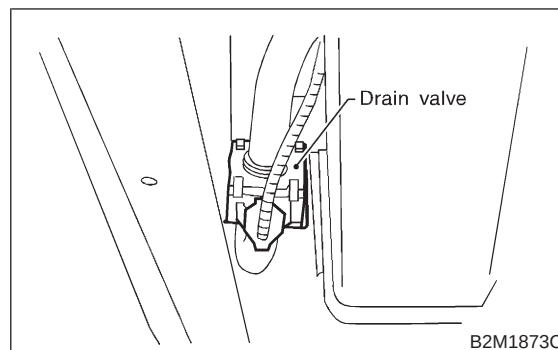
NO : Go to step **10CR3**.

10CR3 : CHECK DRAIN VALVE.

Turn ignition switch to ON.

NOTE:

Drain valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



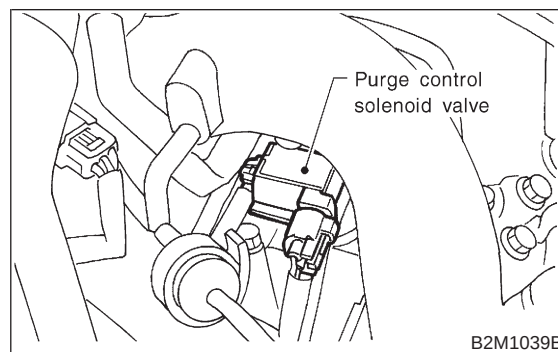
CHECK : *Does drain valve produce operating sound?*

YES : Go to step **10CR4**.

NO : Replace drain valve.

10CR4 : CHECK PURGE CONTROL SOLENOID VALVE.**NOTE:**

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



CHECK : *Does purge control solenoid valve produce operating sound?*

YES : Go to step **10CR5**.

NO : Replace purge control solenoid valve.

10CR5 : CHECK CANISTER.

Turn ignition switch to OFF.

CHECK : *Is there any damage at canister?*

YES : Repair or replace canister.

NO : Go to step **10CR6**.

10CR6 : CHECK FUEL TANK.

CHECK : *Is there any damage at fuel tank?*

YES : Repair or replace fuel tank.

NO : Go to step **10CR7**.

10CR7 : CHECK OTHER MECHANICAL TROUBLE.

CHECK : *Is there clogging of hoses or pipes in evaporative emission control system?*

YES : Repair or replace hoses or pipes.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

CS: DTC P1442 — FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM 2 —

- **DTC DETECTING CONDITION:**

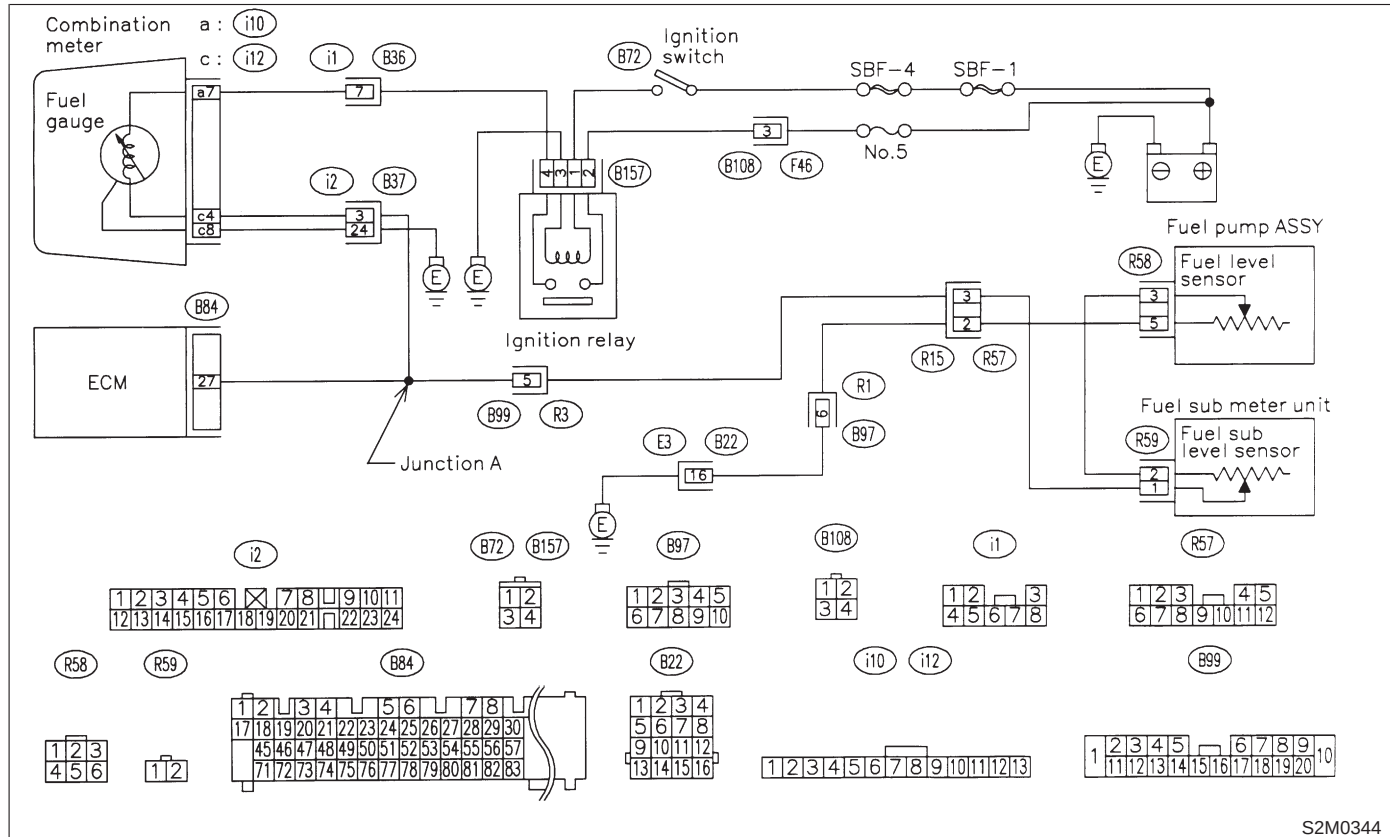
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

- **WIRING DIAGRAM:**



S2M0344

10CS1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0461, P0462 or P0463?

YES : Inspect DTC P0461, P0462 or P0463 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect this trouble.

(NO) : Replace fuel sending unit and fuel sub meter unit.

CT: DTC P1507 — IDLE CONTROL SYSTEM MALFUNCTION (FAIL-SAFE) —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

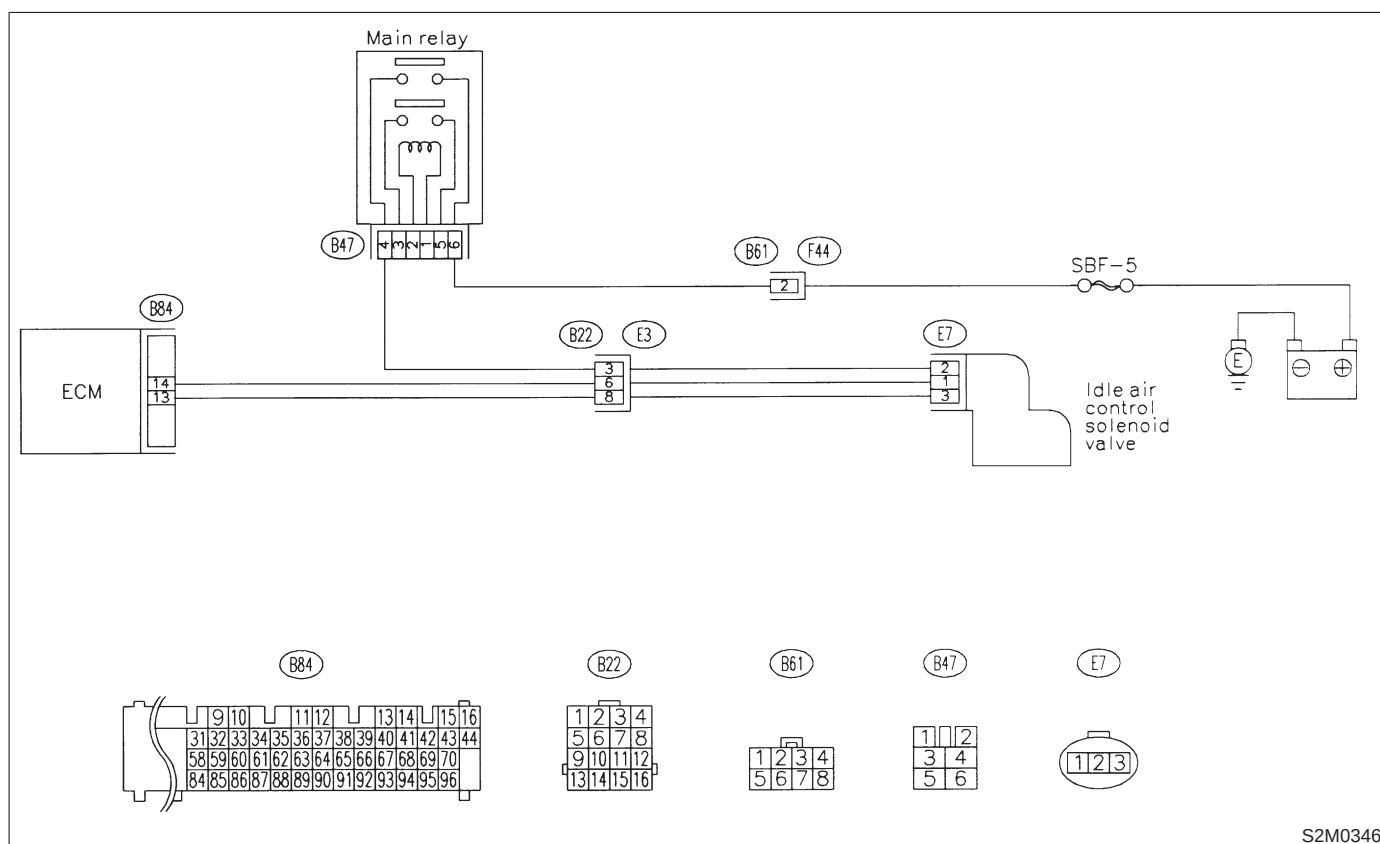
• TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

S2M0346

10CT1 : CHECK ANY OTHER DTC ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?

YES : Inspect DTC P0505 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P1507.

NO : Go to step **10CT2**.

10CT2 : CHECK AIR INTAKE SYSTEM.

- 1) Turn ignition switch to ON.
- 2) Start engine, and idle it.
- 3) Check the following items.
 - Loose installation of intake manifold, idle air control solenoid valve and throttle body
 - Cracks of intake manifold gasket, idle air control solenoid valve gasket and throttle body gasket
 - Loose connections and cracks of idle air control solenoid valve by-pass hoses
 - Disconnections of vacuum hoses

CHECK : Is there a fault in air intake system?

YES : Repair air suction and leaks.

NO : Replace idle air control solenoid valve.

CU: DTC P1520 — COOLING FAN RELAY 1 CIRCUIT HIGH INPUT —● **DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

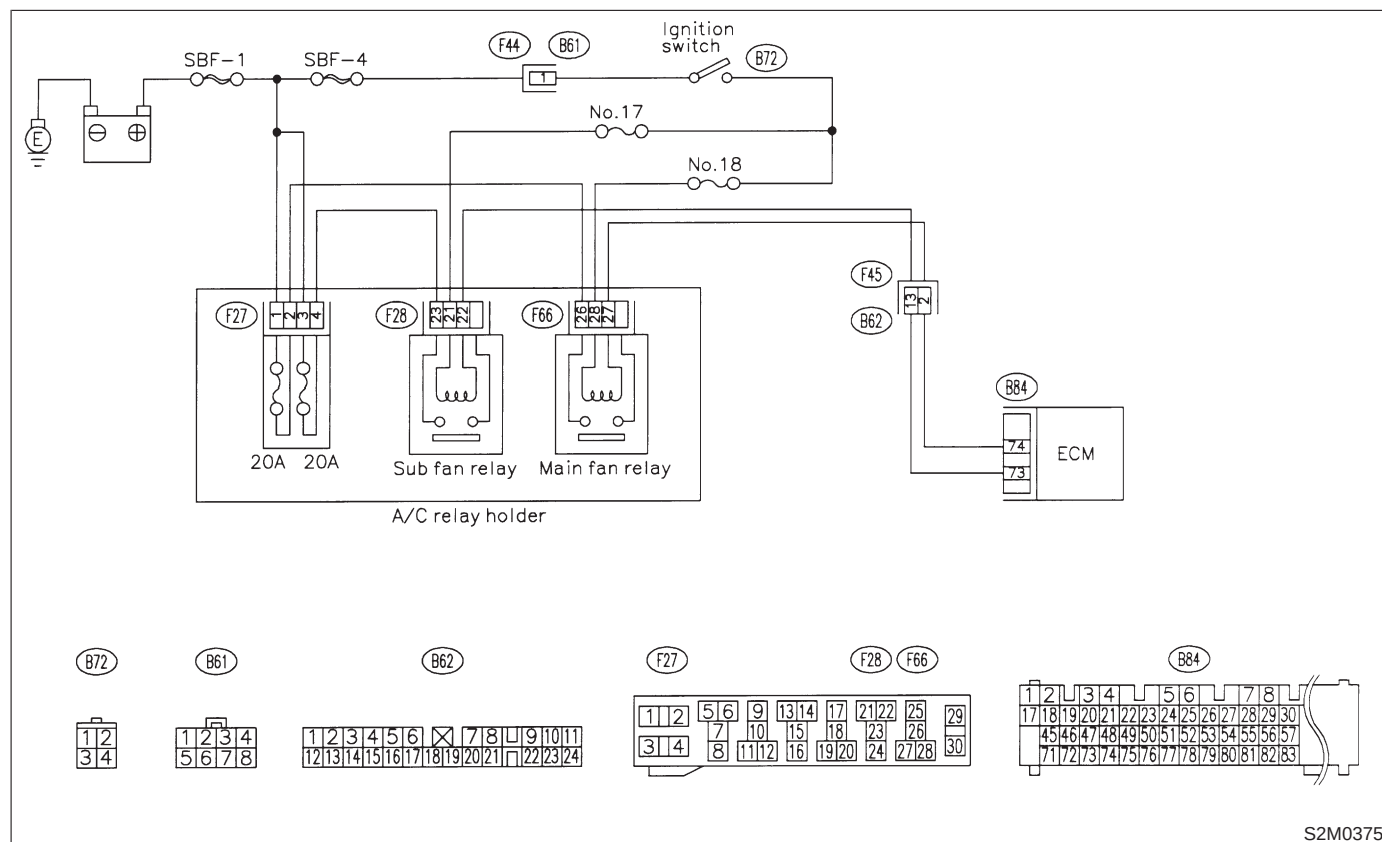
● **TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Overheating

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODE**.

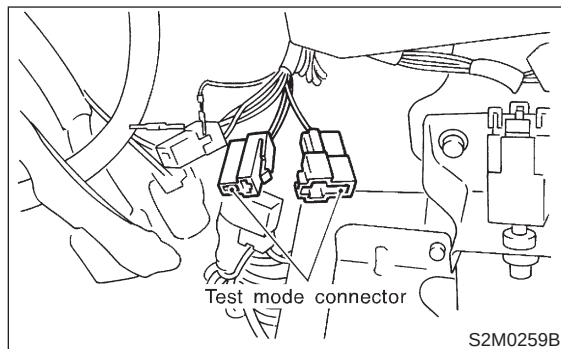
<Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

S2M0375

10CU1 : CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



- 3) Turn ignition switch to ON.

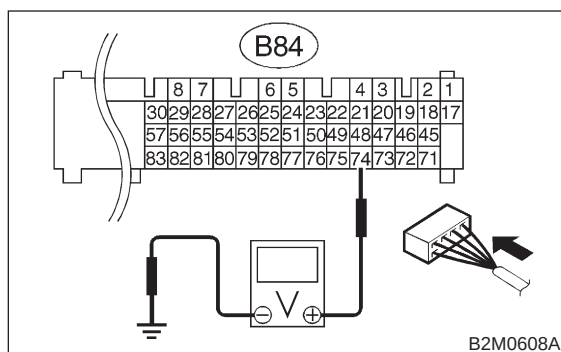
NOTE:

Radiator fan relay operation check can be executed using Subaru Select Monitor. For procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

- 4) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 74 (+) — Chassis ground (-):



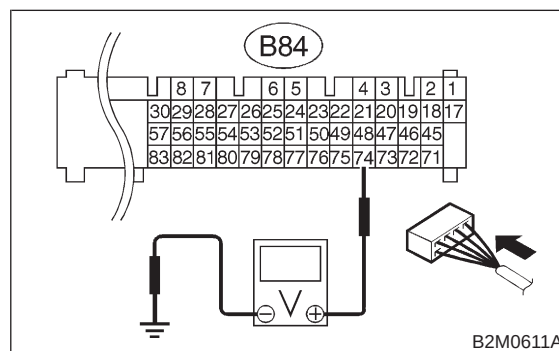
- CHECK** : Does voltage change between 0 and 10 volts?
- YES** : Even if MIL lights up, the circuit has returned to a normal condition at this time. In this case, repair poor contact in ECM connector.
- NO** : Go to step **10CU2**.

10CU2 : CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Remove main fan relay.
- 3) Disconnect test mode connector.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 74 (+) — Chassis ground (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Repair battery short circuit in radiator fan relay 1 control circuit. After repair, replace ECM.
- NO** : Go to step **10CU3**.

10CU3 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : Is there poor contact in ECM connector?
- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.

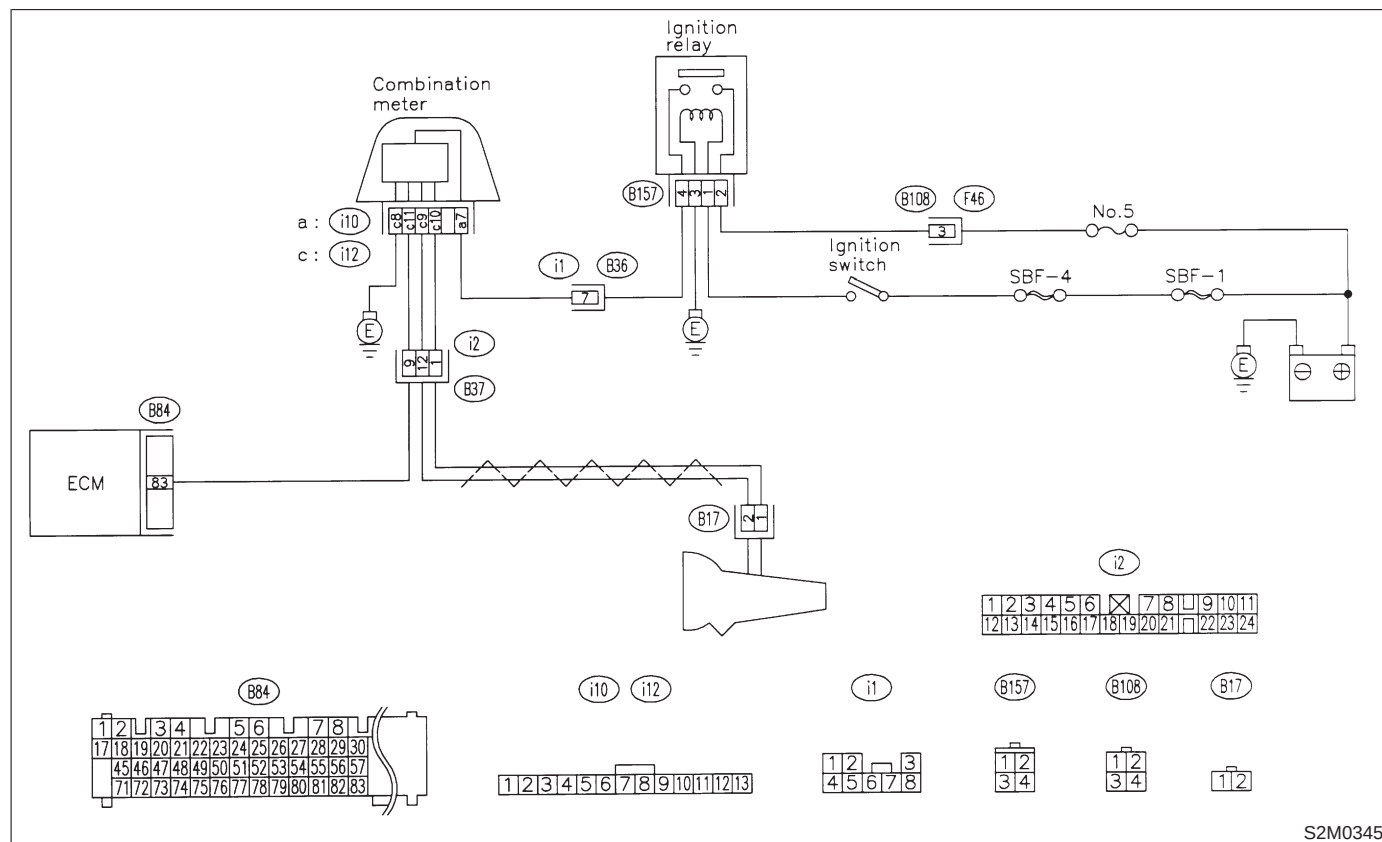
CV: DTC P1540 — VEHICLE SPEED SENSOR MALFUNCTION 2 —**• DTC DETECTING CONDITION:**

- Immediately at fault recognition

CAUTION:

After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

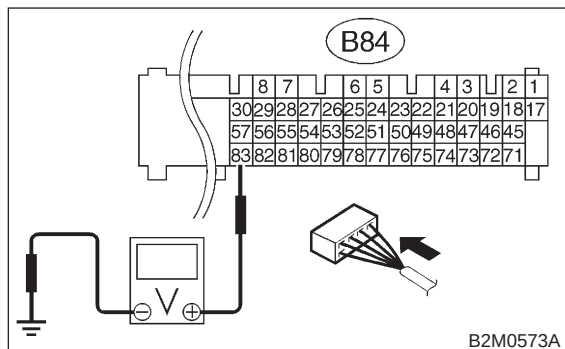
S2M0345

10CV1 : CHECK SPEEDOMETER OPERATION IN COMBINATION METER.

- CHECK** : Does speedometer operate normally?
- YES** : Go to step **10CV2**.
- NO** : Check speedometer and vehicle speed sensor 2. <Ref. to 6-2 [K2A0].>

10CV2 : CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

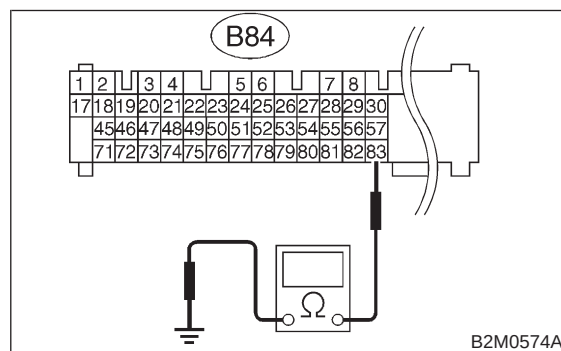
Connector & terminal
(B84) No. 83 (+) — Chassis ground (-):

CHECK : Is the voltage more than 2 V?
YES : Repair harness and connector.
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and combination meter connector
- Poor contact in ECM connector
- Poor contact in combination meter connector
- Poor contact in coupling connector (i2)

NO : Go to step 10CV3.
10CV3 : CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal
(B84) No. 83 — Chassis ground:

CHECK : Is the resistance less than 10 Ω?
YES : Repair ground short circuit in harness between ECM and combination meter connector.
NO : Repair poor contact in ECM connector.

CW: DTC P1700 — THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION —

● DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

● TROUBLE SYMPTOM:

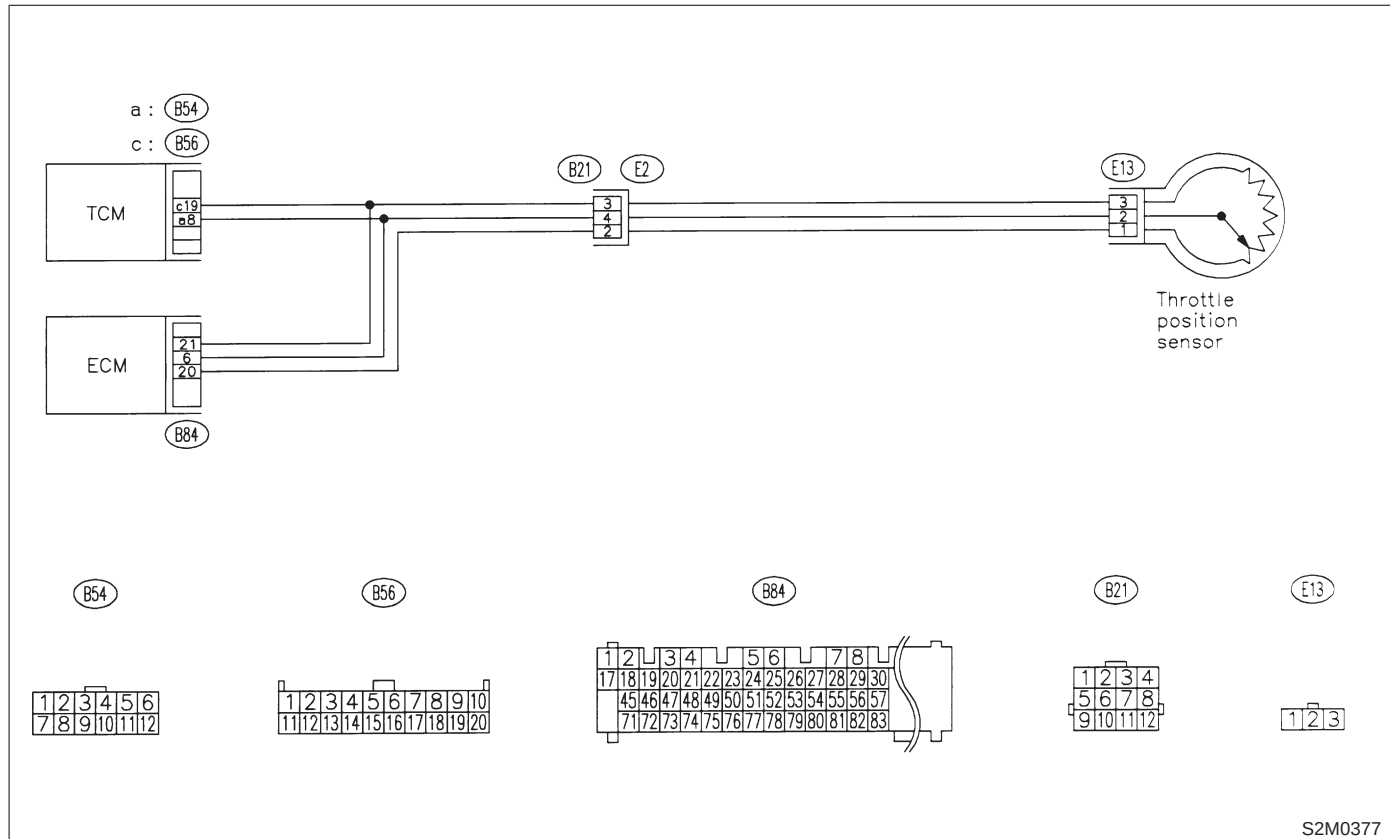
- Shift point too high or too low; engine brake not effected in “3” range; excessive shift shock; excessive tight corner “braking”

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



10CW1 : CHECK DTC P1700 ON DISPLAY.

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P1700?
- YES** : Check throttle position sensor circuit.
<Ref. to 3-2 [T8M0].>
- NO** : It is not necessary to inspect DTC P1700.

CX: DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION —

• DTC DETECTING CONDITION:

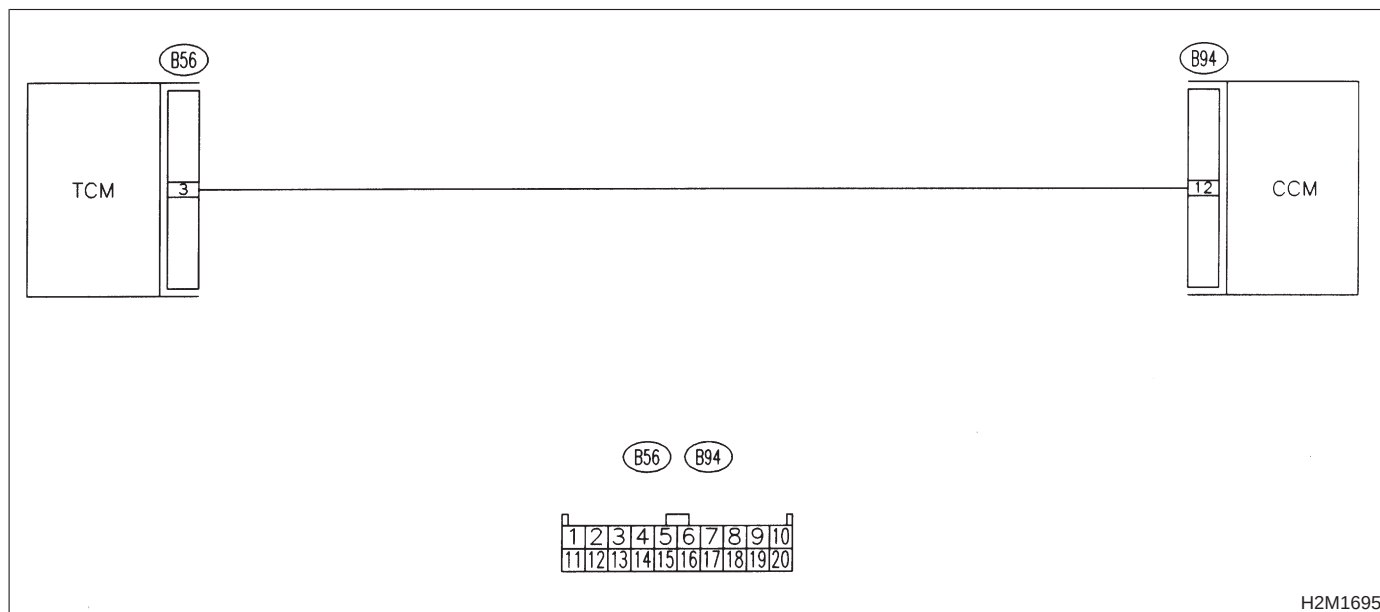
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:

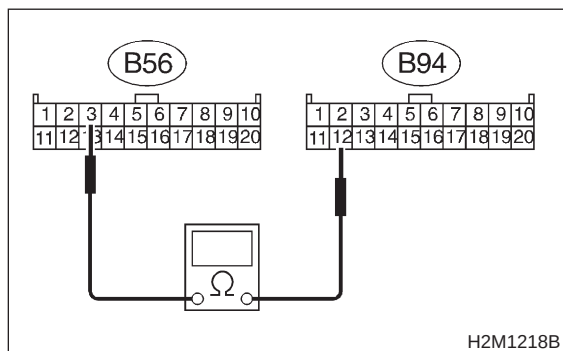


10CX1 : CHECK HARNESS BETWEEN TCM AND CCM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and CCM.
- 3) Measure resistance of harness between TCM and CCM connector.

Connector & terminal

(B56) No. 3 — (B94) No. 12:



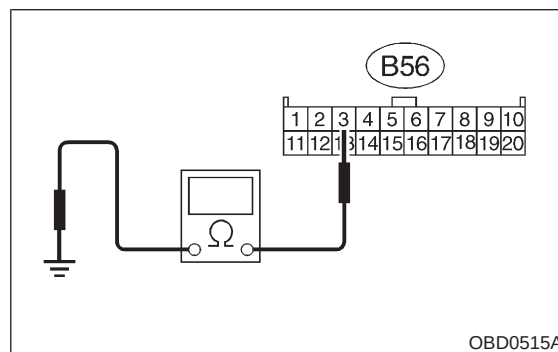
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 10CX2.
- NO** : Repair open circuit in harness between TCM and CCM connector.

10CX2 : CHECK HARNESS BETWEEN TCM AND CCM CONNECTOR.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 3 — Chassis ground:



- CHECK** : Is the resistance less than 10 Ω?
- YES** : Repair ground short circuit in harness between TCM and CCM connector.
- NO** : Go to step 10CX3.

10CX3 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connector to TCM and CCM.
- 2) Lift-up the vehicle or set the vehicle on free rollers.

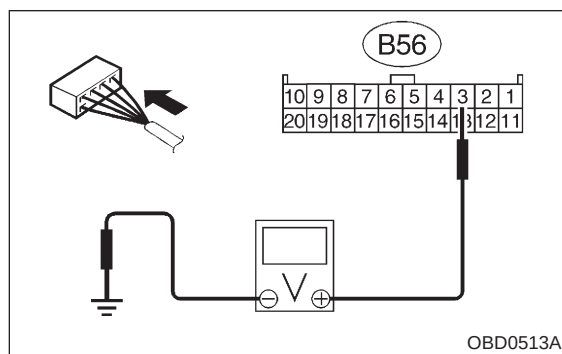
CAUTION:

On AWD models, raise all wheels off ground.

- 3) Start the engine.
- 4) Cruise control main switch to ON.
- 5) Move selector lever to "D" and slowly increase vehicle speed to 50 km/h (31 MPH).
- 6) Cruise control set switch to ON.
- 7) Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 3 (+) — Chassis ground (-):



- CHECK** : **Is the voltage less than 1 V?**
- YES** : Go to step **10CX4**.
- NO** : Check cruise control set circuit. <Ref. to 6-2 [T600].>

10CX4 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in TCM connector?**
- YES** : Repair poor contact in TCM connector.
- NO** : Replace TCM.

CY: DTC P1702 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT LOW INPUT —

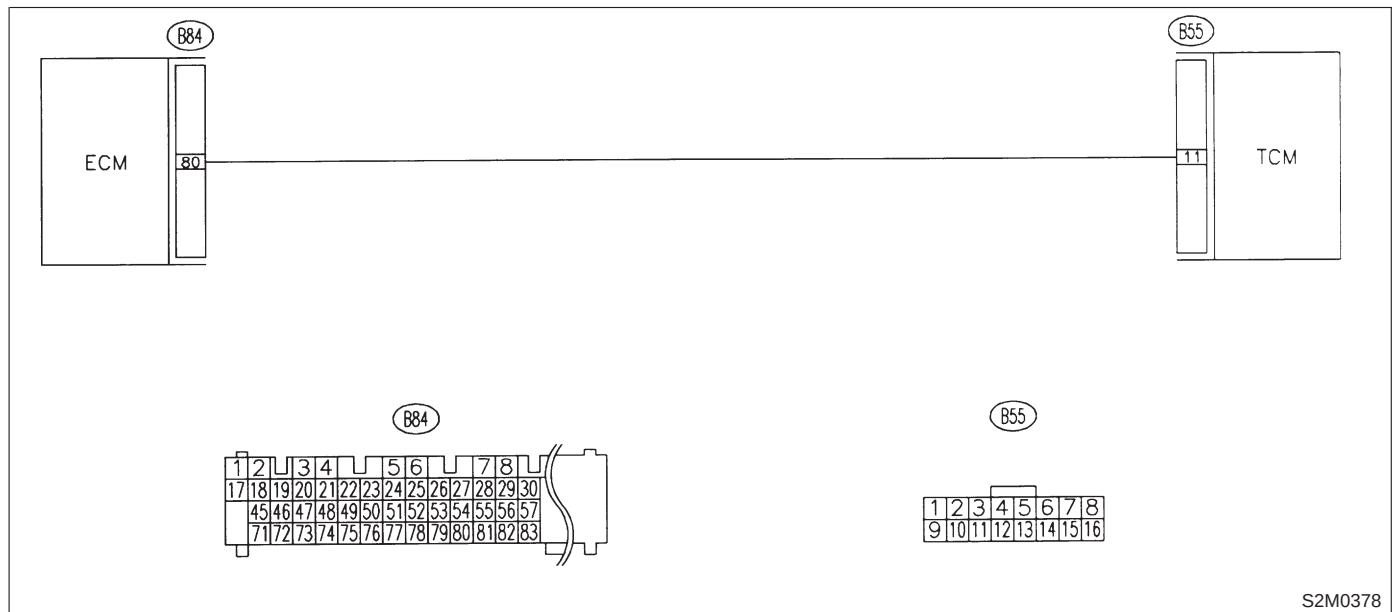
- DTC DETECTING CONDITION:
 - Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

- WIRING DIAGRAM:



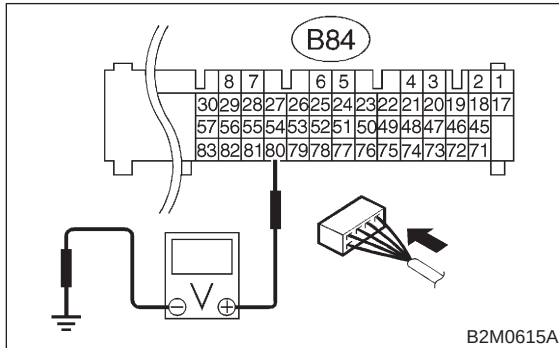
S2M0378

10CY1 : CHECK TRANSMISSION TYPE.

- CHECK** : *Is transmission type AT?*
- YES** : Go to step **10CY2**.
- NO** : Check AT/MT identification circuit. <Ref. to 2-7 [T10DB0].>

10CY2 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

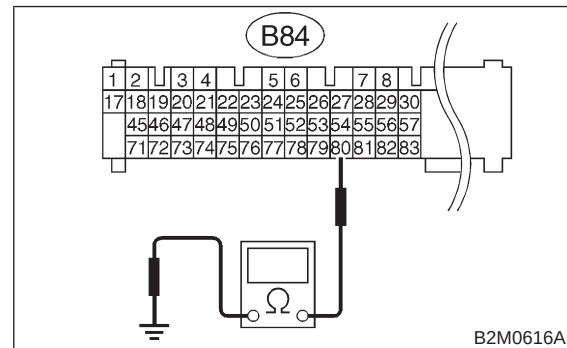
Connector & terminal**(B84) No. 80 (+) — Chassis ground (-):****CHECK** : **Is the voltage less than 1 V?****YES** : Go to step **10CY3**.**NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time.**NOTE:**

In this case, repair the following:

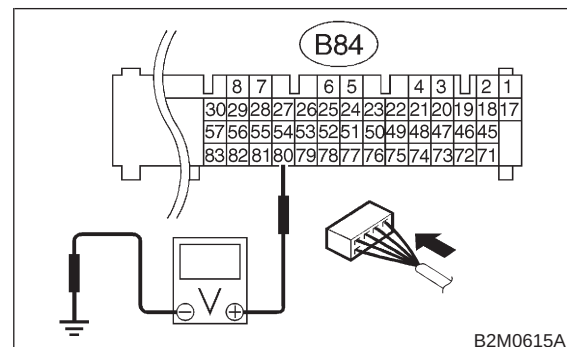
- Poor contact in ECM connector
- Poor contact in TCM connector

10CY3 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM and TCM.
- 3) Measure resistance of harness between ECM and chassis ground.

Connector & terminal**(B84) No. 80 — Chassis ground:****CHECK** : **Is the resistance less than 10 Ω?****YES** : Repair ground short circuit in harness between ECM and TCM connector.**NO** : Go to step **10CY4**.**10CY4 : CHECK OUTPUT SIGNAL FROM ECM.**

- 1) Connect connector to ECM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 80 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 5 V?****YES** : Replace TCM.**NO** : Contact SOA service.**NOTE:**

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

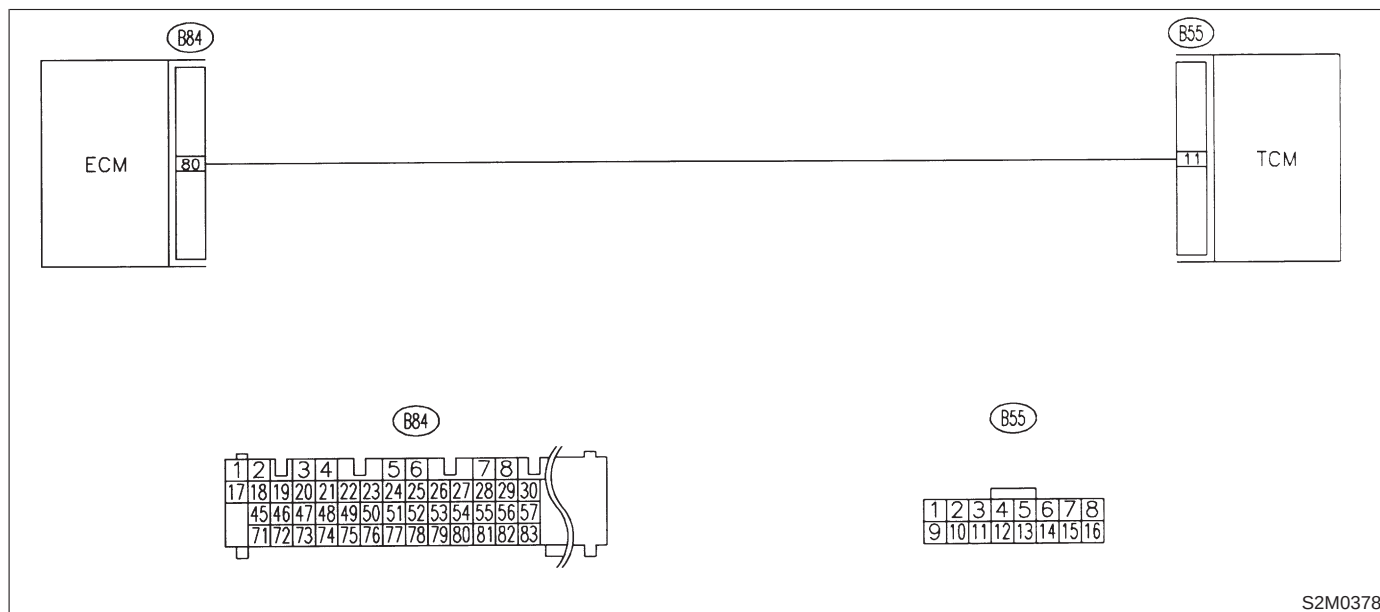
CZ: DTC P1722 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT HIGH INPUT —**• DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

• WIRING DIAGRAM:**10CZ1 : CHECK TRANSMISSION TYPE.**

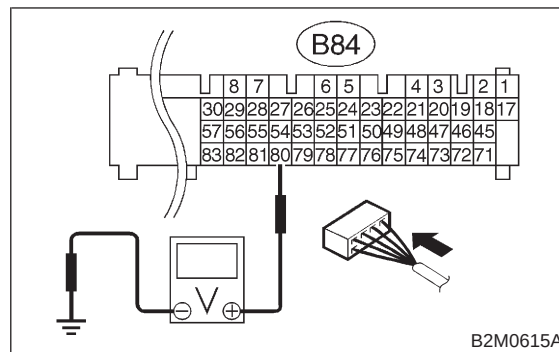
- CHECK** : *Is transmission type AT?*
- YES** : Go to step **10CZ2**.
- NO** : Check AT/MT identification circuit. <Ref. to 2-7 [T10DB0].>

10CZ2 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 80 (+) — Chassis ground (-):



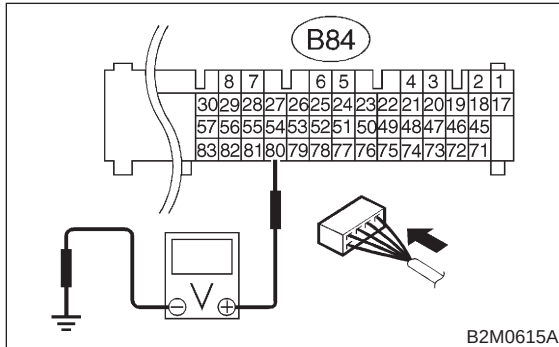
- CHECK** : *Is the voltage more than 10 V?*
- YES** : Repair battery short circuit in harness between ECM and TCM connector. After repair, replace ECM.
- NO** : Go to step **10CZ3**.

10CZ3 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 80 (+) — Chassis ground (-):



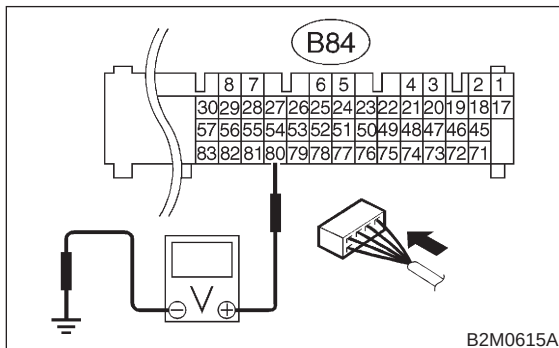
- CHECK** : **Is the voltage more than 4 V?**
YES : Go to step **10CZ6**.
NO : Go to step **10CZ4**.

10CZ4 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 80 (+) — Chassis ground (-):



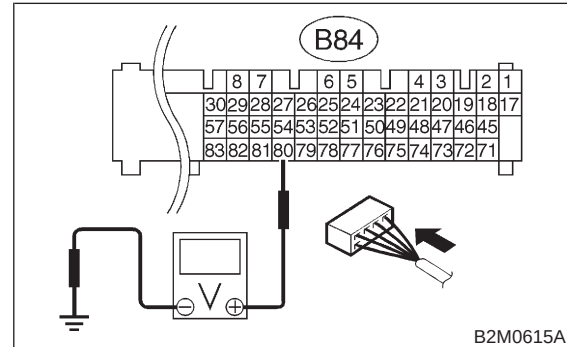
- CHECK** : **Is the voltage less than 1 V?**
YES : Repair poor contact in ECM connector.
NO : Go to step **10CZ5**.

10CZ5 : CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 80 (+) — Chassis ground (-):



- CHECK** : **Does the voltage change from 1 V to 4 V while monitoring the value with voltage meter?**
YES : Even if MIL lights up, the circuit has returned to a normal condition at this time.

NOTE:

In this case, repair the following:

- Poor contact in ECM connector
- Poor contact in TCM connector

NO : Contact with SOA service.

NOTE:

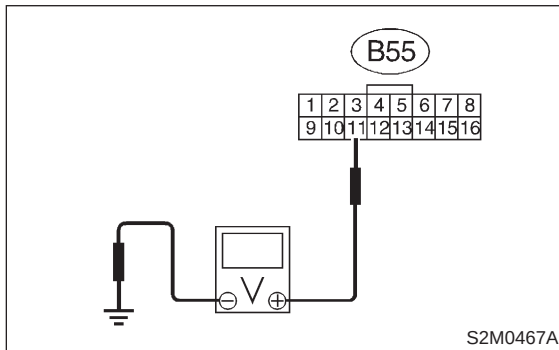
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

10CZ6 : CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B55) No. 11 (+) — Chassis ground (-):



- CHECK** : **Is the voltage more than 4 V?**
- YES** : Go to step **10CZ7**.
- NO** : Repair open circuit in harness between ECM and TCM connector.

10CZ7 : CHECK POOR CONTACT.

Check poor contact in TCM connector. <Ref. to FOREWORD [T3C1].>

- CHECK** : **Is there poor contact in TCM connector?**
- YES** : Repair poor contact in TCM connector.
- NO** : Check TCM power supply line and grounding line.

DA: DTC P1742 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT MALFUNCTION —

● DTC DETECTING CONDITION:

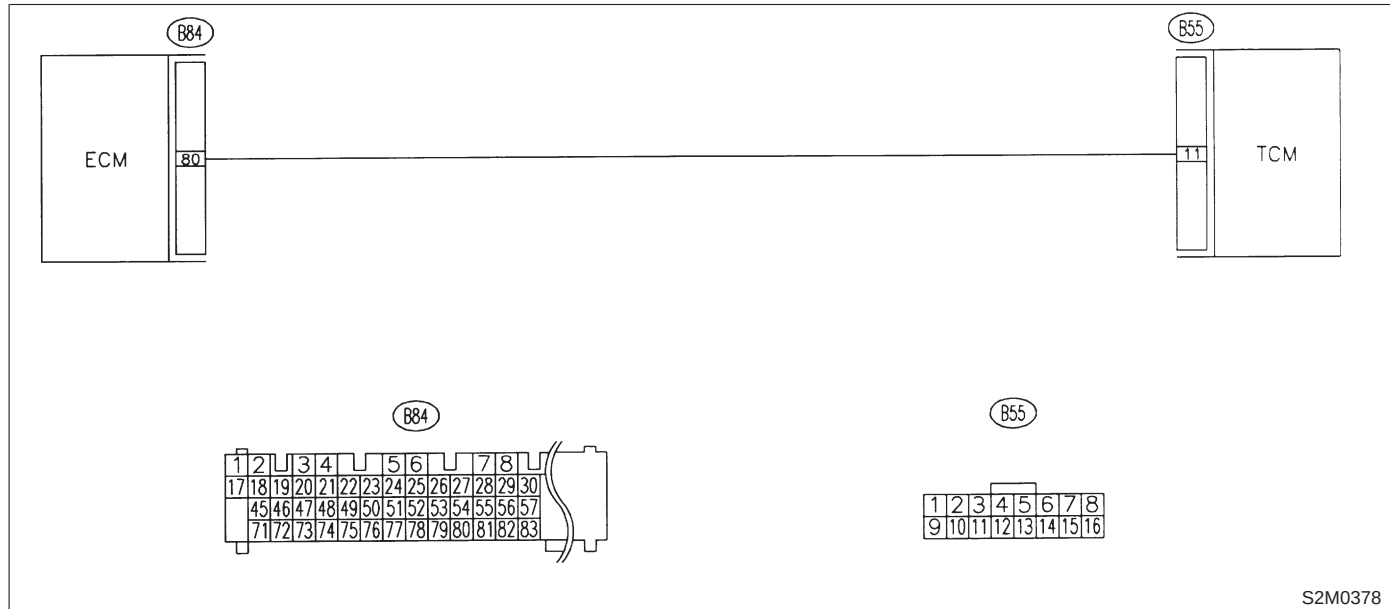
- Two consecutive driving cycles with fault

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7 [T3D0] and [T3E0].>

● WIRING DIAGRAM:



S2M0378

10DA1 : CHECK TRANSMISSION TYPE.

- CHECK** : *Is transmission type AT?*
- YES** : Go to step **10DA2**.
- NO** : Check AT/MT identification circuit. <Ref. to 2-7 [T10DB0].>

10DA2 : CHECK DRIVING CONDITION.

- 1) Start and warm-up the engine until the radiator fan makes one complete rotation.
- 2) Drive the vehicle.

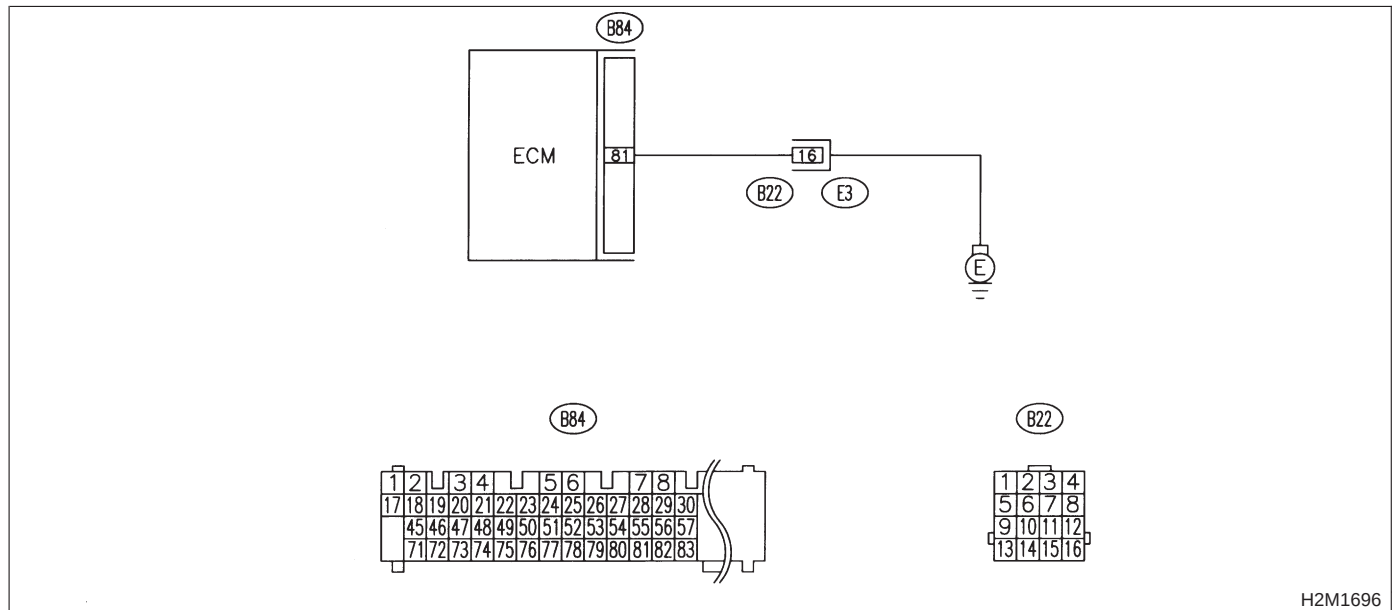
- CHECK** : *Is AT shift control functioning properly?*
- YES** : Go to step **10DA3**.
- NO** : Replace TCM.

10DA3 : CHECK ACCESSORY.

- CHECK** : *Are car phone and/or CB installed on vehicle?*
- YES** : Repair grounding line of car phone or CB system.
- NO** : Replace TCM.

DB: — AT/MT IDENTIFICATION CIRCUIT MALFUNCTION [MT VEHICLES] —**CAUTION:**

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
 <Ref. to 2-7 [T3D0] and [T3E0].>

● **WIRING DIAGRAM:**

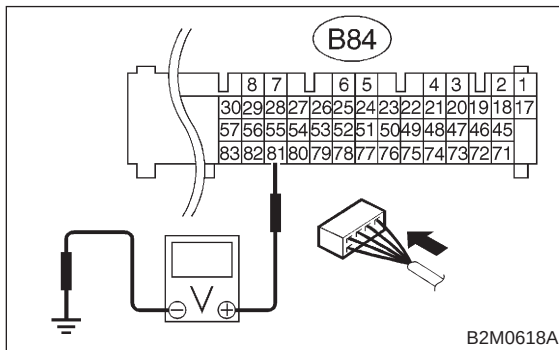
H2M1696

10DB1 : CHECK HARNESS BETWEEN ECM CONNECTOR AND CHASSIS GROUND.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 81 (+) — Chassis ground (-):



CHECK : **Is the voltage more than 2 V?**

YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM connector and engine grounding terminal
- Poor contact in engine grounding terminal
- Poor contact in coupling connector (B22)

NO : Go to step **10DB2**.

10DB2 : CHECK POOR CONTACT.

Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

CHECK : **Is there poor contact in ECM connector?**

YES : Repair poor contact in ECM connector.

NO : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

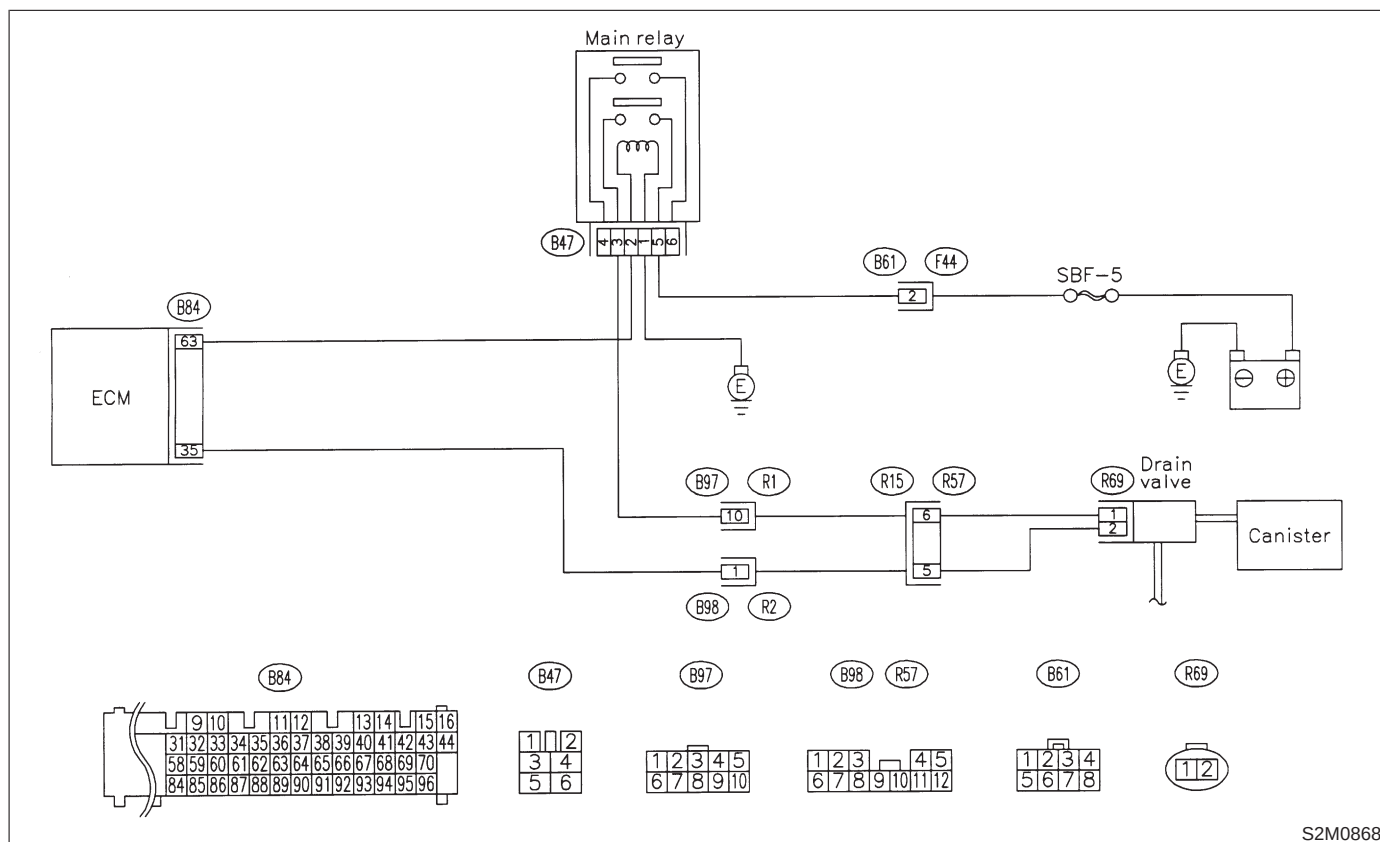
DC: DTC P1443 — EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL FUNCTION PROBLEM —

- **DTC DETECTING CONDITION:**
 - Immediately after fault occurrence
- **TROUBLE SYMPTOM:**
 - Improper fuel supply

CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY MODE <Ref. to 2-7 [T3D0].> and INSPECTION MODE <Ref. to 2-7 [T3E0].>.

● WIRING DIAGRAM:



S2M0868

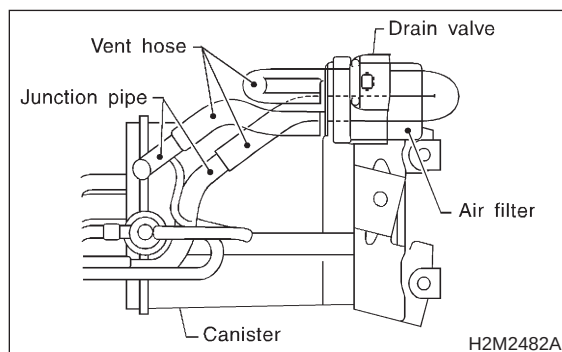
10DC1 : CHECK ANY OTHER DTC ON DISPLAY.

- CHECK** : *Is there any other DTC on display?*
- YES** : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>
- NO** : Go to step **10DC2**.

10DC2 : CHECK VENT LINE HOSES.

Check the following items.

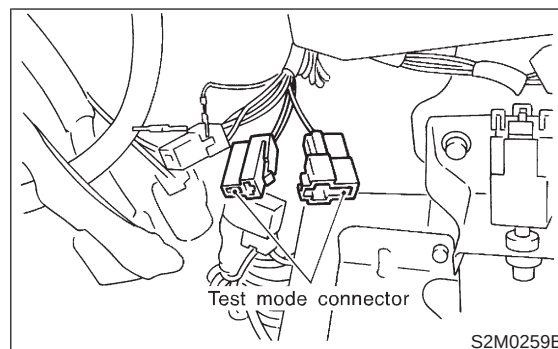
- Clogging of vent hoses between canister and drain valve
- Clogging of vent hose between drain valve and air filter
- Clogging of vent hose between air filter and junction pipe
- Clogging of junction pipe
- Clogging of air filter



- CHECK** : **Is there a fault in vent line?**
- YES** : Repair or replace the faulty part.
- NO** : Go to step **10DC3**.

10DC3 : CHECK DRAIN VALVE OPERATION.

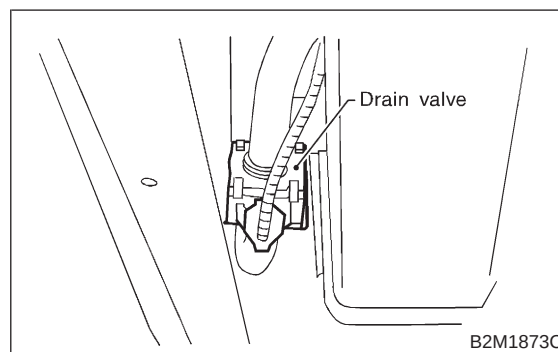
- 1) Turn ignition switch to OFF.
- 2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



- 3) Turn ignition switch to ON.

NOTE:

Drain valve operation check can also be executed using Subaru Select Monitor. For the procedure, refer to the "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>



- CHECK** : **Does drain valve produce operating sound?**
- YES** : Contact with SOA service.

NOTE:

Inspection by DTM is required, because probable cause is deterioration of multiple parts.

- NO** : Replace drain valve.

MEMO:

3-2 [T100] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the transmission control module (TCM).

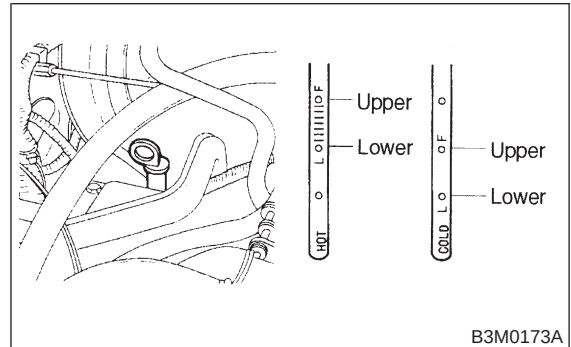
CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when performing diagnostics and servicing the TCM.

2. Pre-inspection

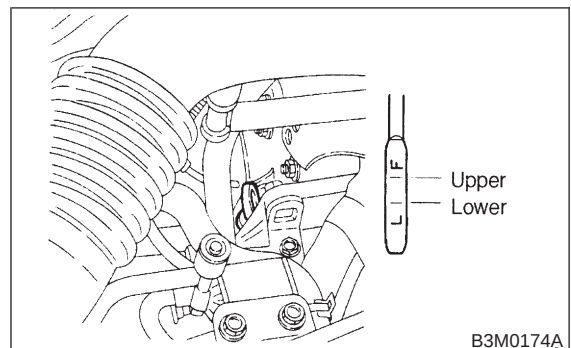
A: ATF LEVEL

Make sure that ATF level is in the specification.



B: FRONT DIFFERENTIAL OIL LEVEL

Make sure that front differential oil level is in the specification.



3-2 [T100] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the transmission control module (TCM).

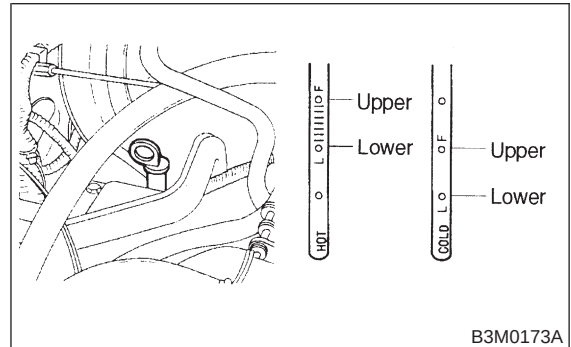
CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when performing diagnostics and servicing the TCM.

2. Pre-inspection

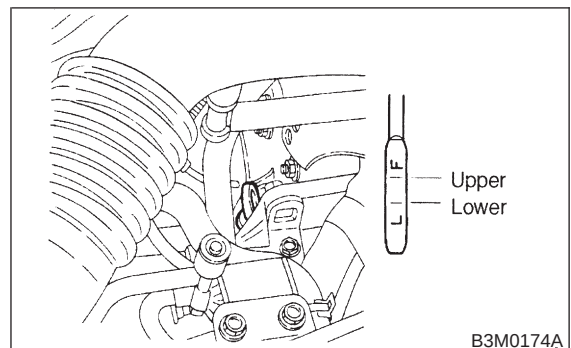
A: ATF LEVEL

Make sure that ATF level is in the specification.



B: FRONT DIFFERENTIAL OIL LEVEL

Make sure that front differential oil level is in the specification.

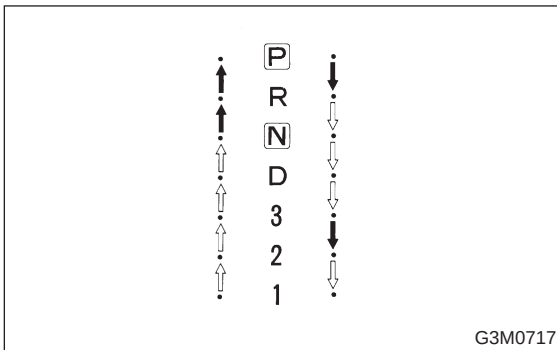


C: OPERATION OF SHIFT SELECTOR LEVER

WARNING:

Stop the engine while checking operation of selector lever.

- 1) Check that selector lever does not move from "N" to "R" without pushing the button.
- 2) Check that selector lever does not move from "R" to "P" without pushing the button.
- 3) Check that selector lever does not move from "P" to "R" without pushing the button.
- 4) Check that selector lever does not move from "3" to "2" without pushing the button.

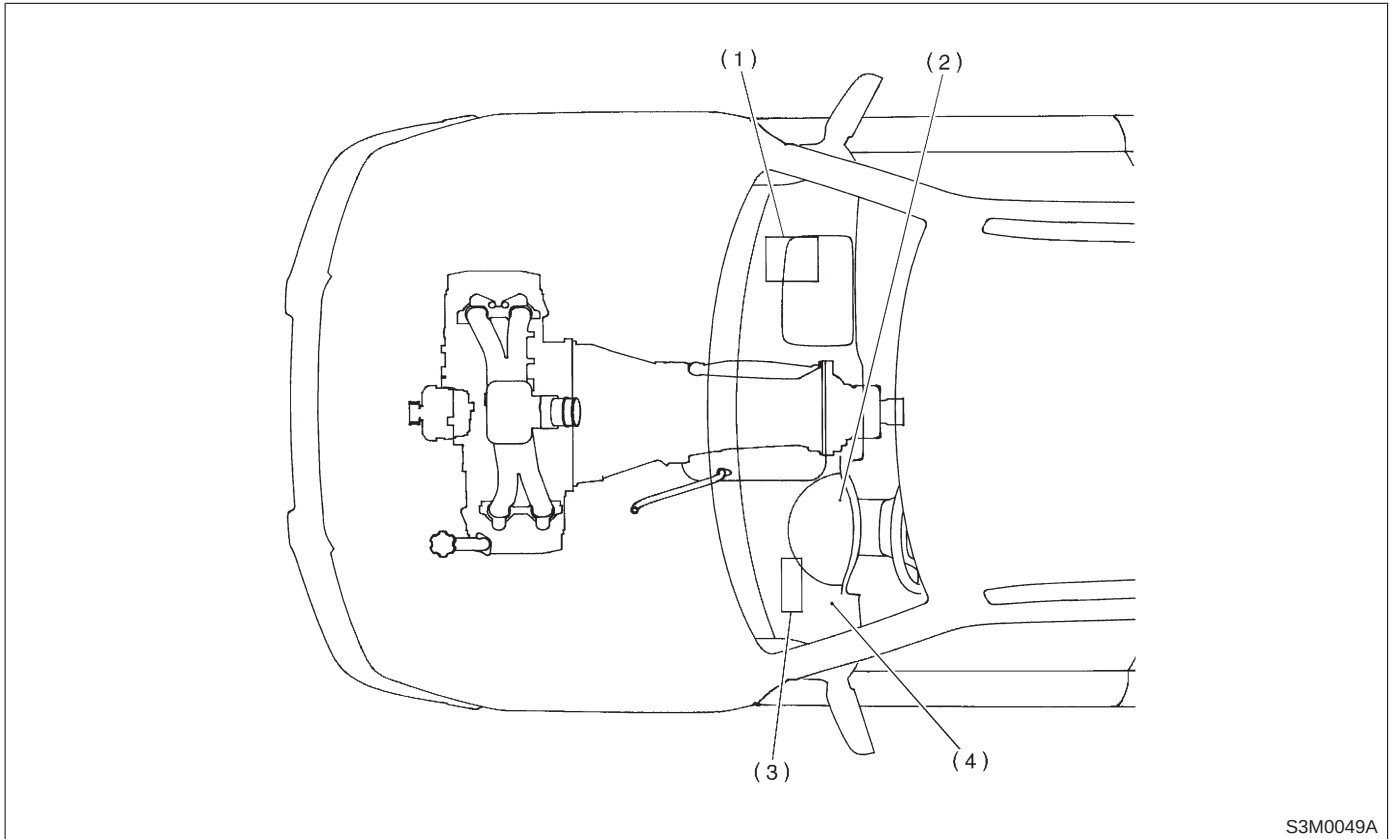


3-2 [T3A0] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

3. Electrical Components Location

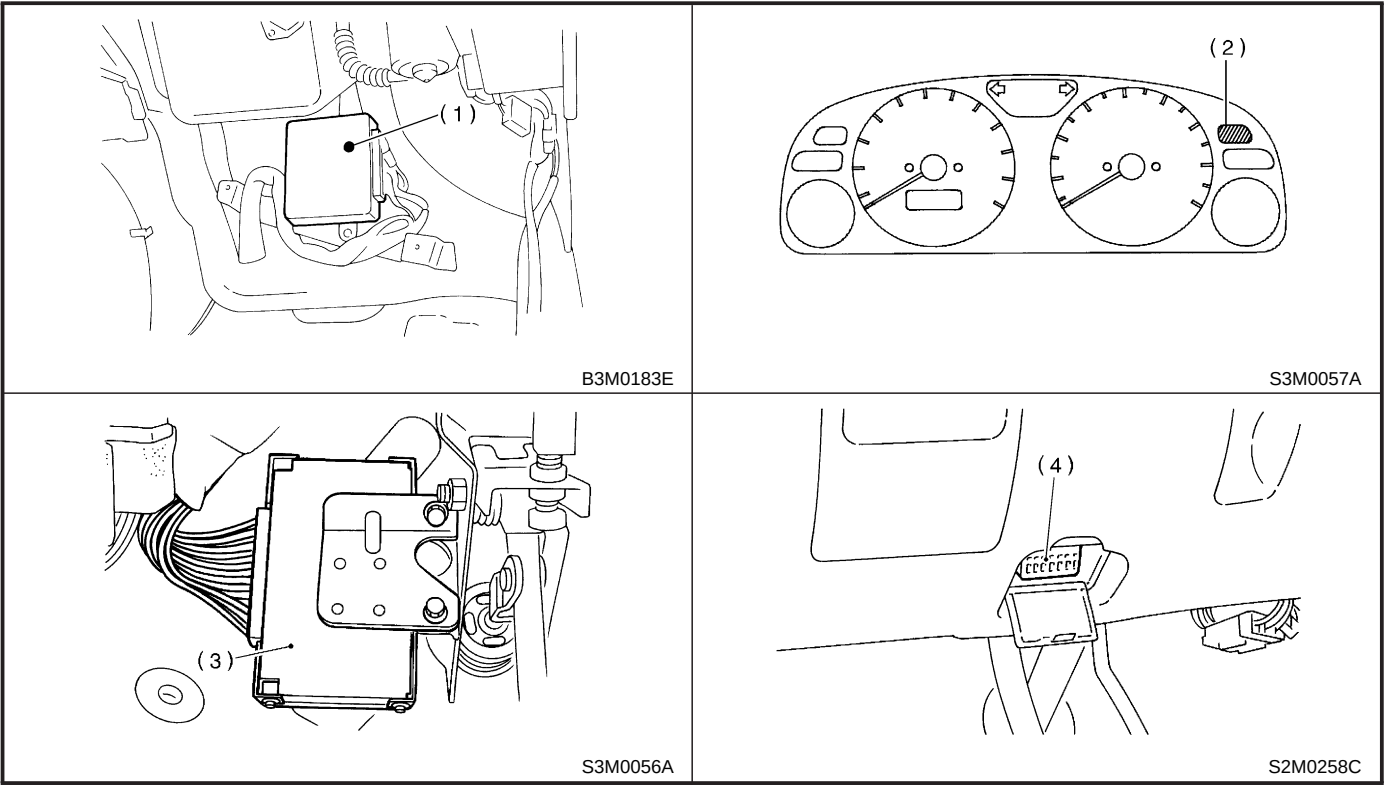
3. Electrical Components Location

A: MODULE

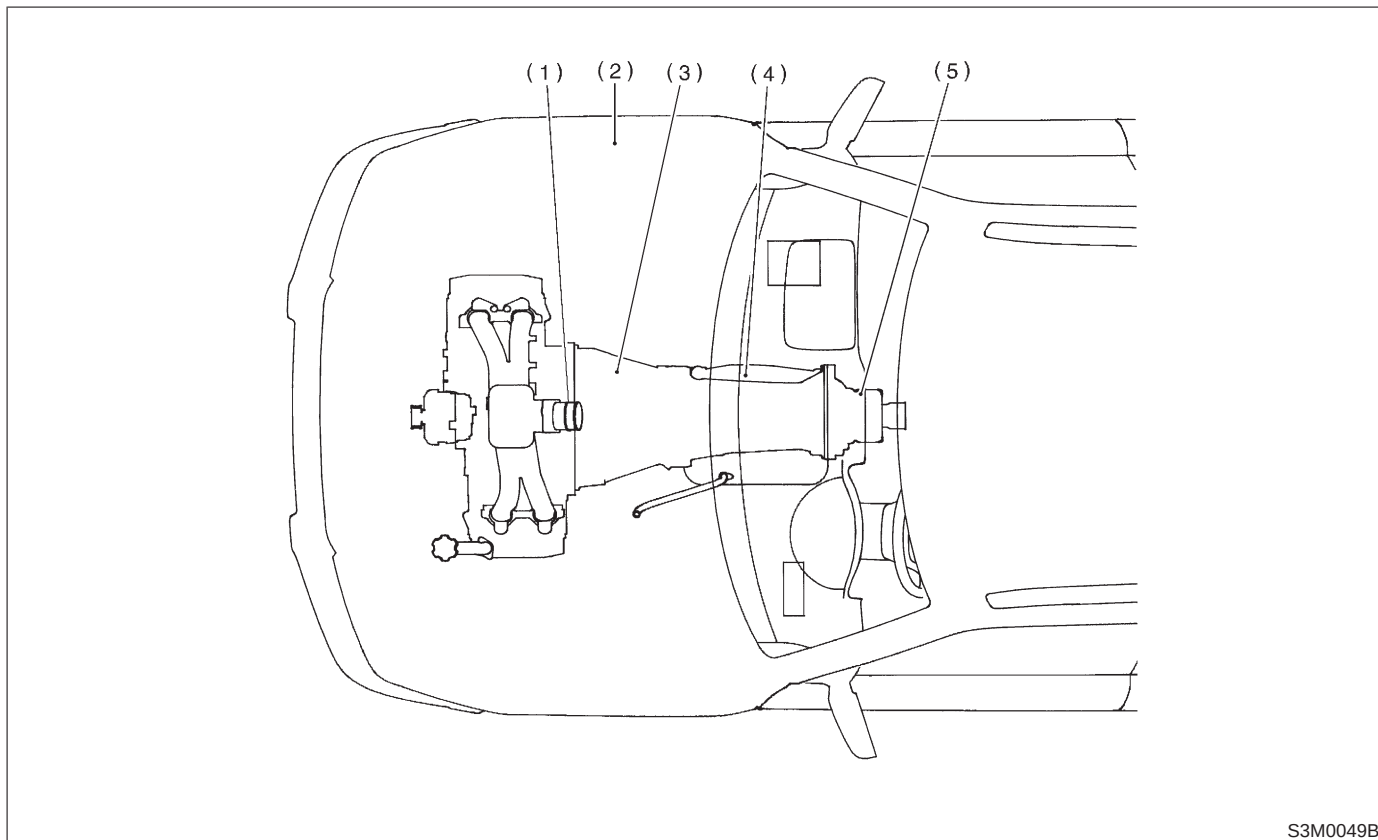


S3M0049A

(1) ECM	(3) TCM	(4) Data link connector (for Subaru select monitor and OBD-II general scan tool)
(2) AT OIL TEMP indicator light (AT diagnostic indicator light)		



B: SENSOR

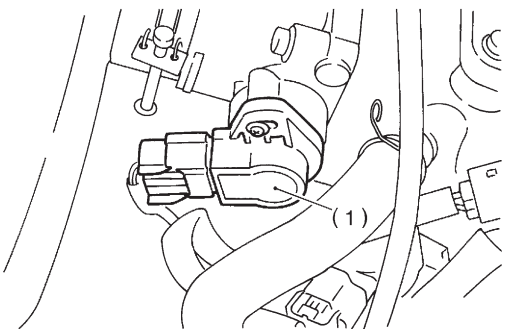
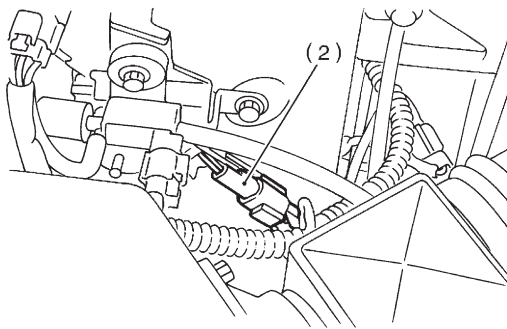
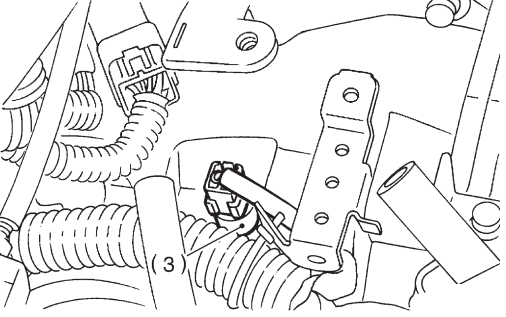
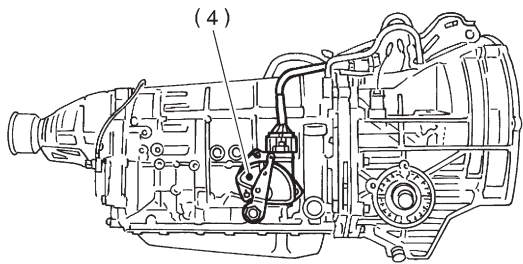
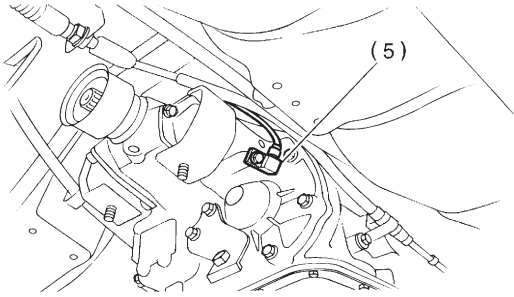


S3M0049B

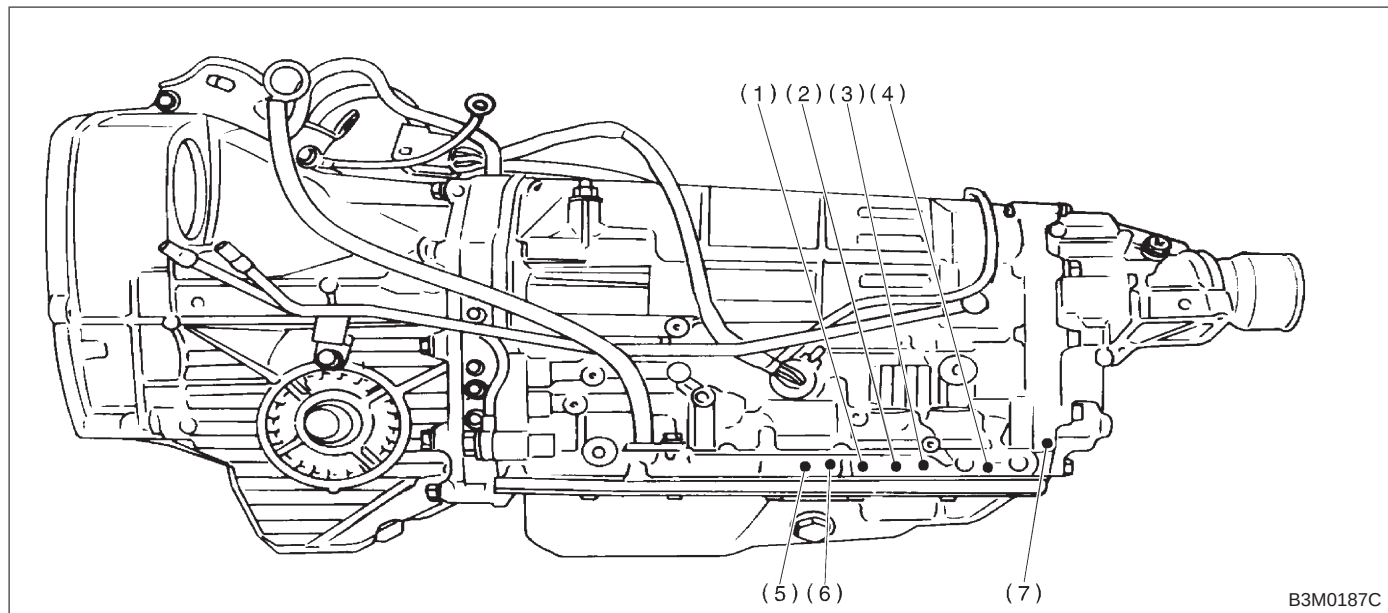
(1) Throttle position sensor
(2) Dropping resistor

(3) Vehicle speed sensor 2
(4) Inhibitor switch

(5) Vehicle speed sensor 1

 S2M0262B	 S3M0059A
 S3M0058A	 B2M1043J
 B3M0184G	SUBARU.

C: SOLENOID



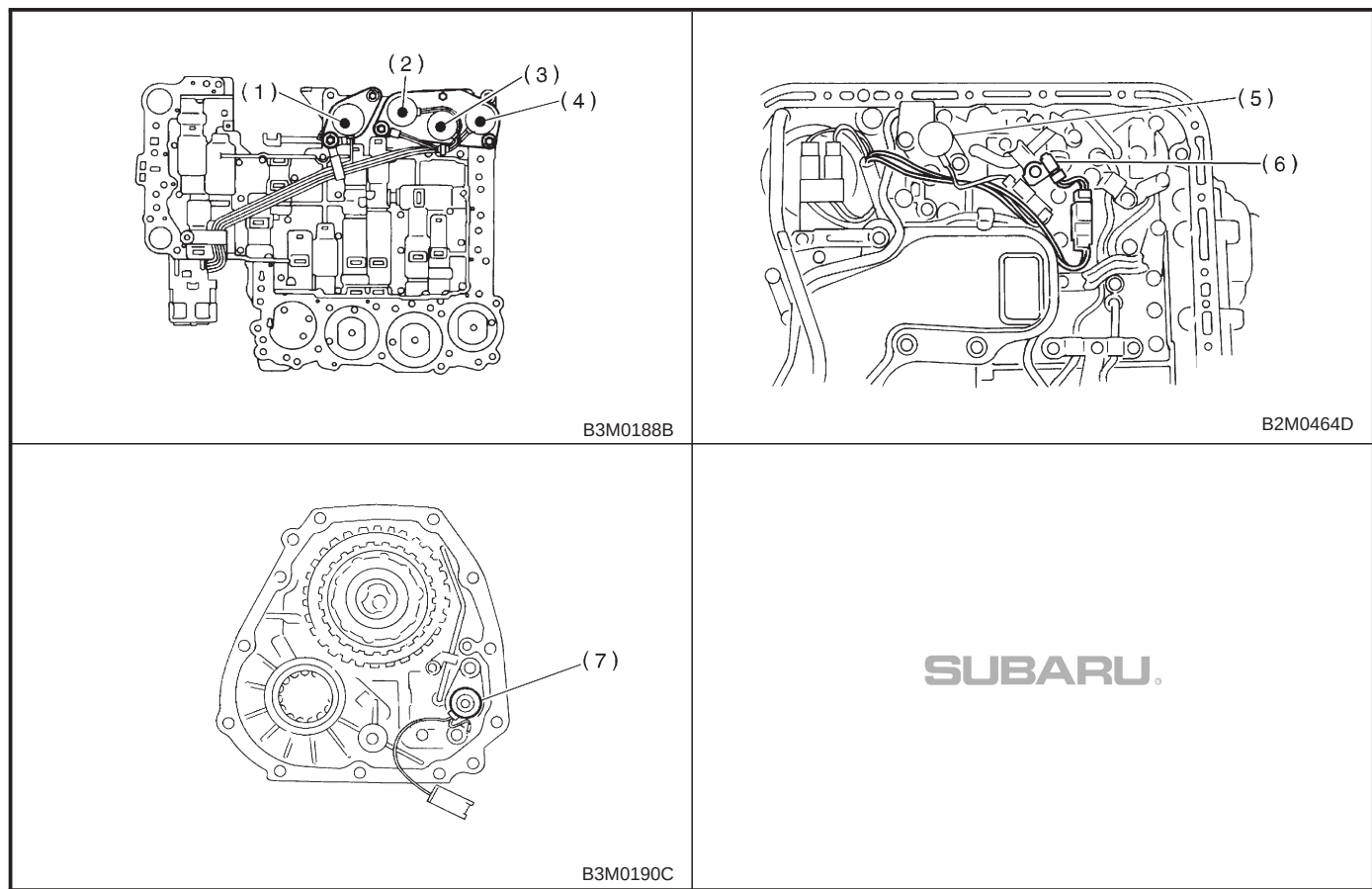
- (1) Duty solenoid A

(2) Solenoid 2

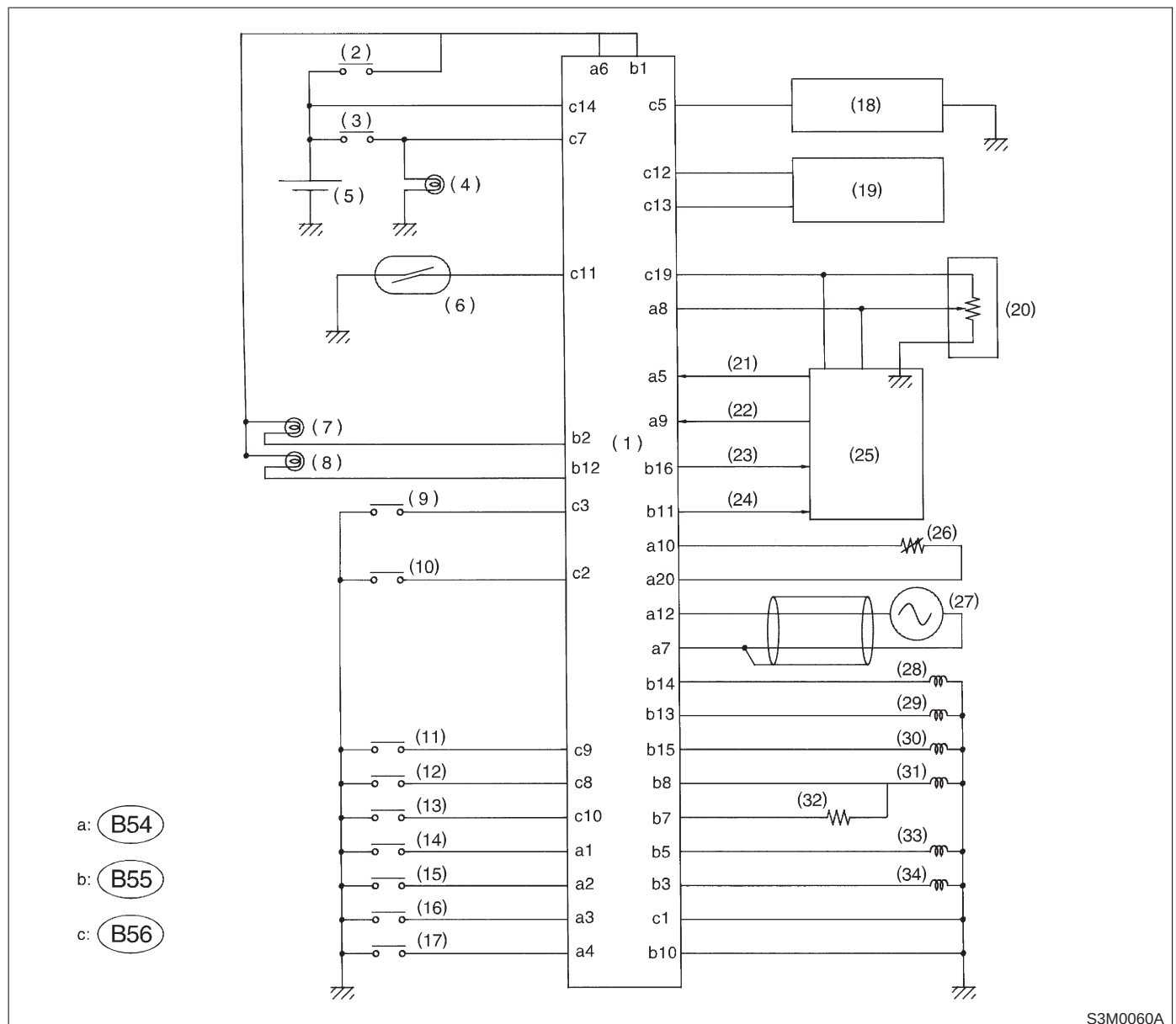
(3) Solenoid 1
- (4) Solenoid 3

(5) Duty solenoid B

(6) ATF temperature sensor
- (7) Duty solenoid C (AWD)



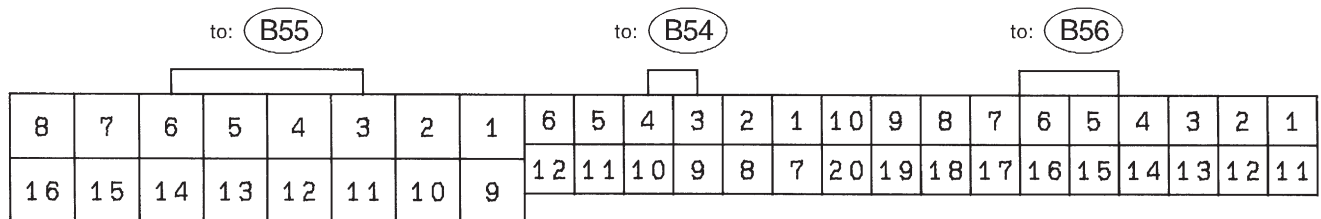
4. Schematic



3-2 [T500] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

5. Transmission Control Module (TCM) I/O Signal

5. Transmission Control Module (TCM) I/O Signal



S3M0061A

Check with ignition switch ON.						
Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Back-up power supply		B56	14	Ignition switch OFF	10 — 16	—
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16	—
		B55	1			
Inhibitor switch	“P” range switch	B56	9	Select lever in “P” range	Less than 1	—
				Select lever in any other than “P” range (except “N” range)	More than 8	
	“N” range switch	B56	8	Select lever in “N” range	Less than 1	—
				Select lever in any other than “N” range (except “P” range)	More than 8	
	“R” range switch	B56	10	Select lever in “R” range	Less than 1	—
				Select lever in any other than “R” range	More than 6	
	“D” range switch	B54	1	Select lever in “D” range	Less than 1	—
				Select lever in any other than “D” range	More than 6	
	“3” range switch	B54	2	Select lever in “3” range	Less than 1	—
				Select lever in any other than “3” range	More than 6	
	“2” range switch	B54	3	Select lever in “2” range	Less than 1	—
				Select lever in any other than “2” range	More than 6	
	“1” range switch	B54	4	Select lever in “1” range	Less than 1	—
				Select lever in any other than “1” range	More than 6	
Brake switch		B56	7	Brake pedal depressed.	More than 10.5	—
				Brake pedal released.	Less than 1	
ABS signal		B56	5	ABS switch ON	Less than 1	—
				ABS switch OFF	More than 6.5	

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
AT diagnostic signal	B55	12	Ignition switch ON (With engine OFF)	Less than 1	—
			Ignition switch ON (With engine ON)	More than 10	
Throttle position sensor	B54	8	Throttle fully closed.	0.5±0.2	—
			Throttle fully open.	4.6±0.3	
Throttle position sensor power supply	B56	19	Ignition switch ON (With engine OFF)	5.05±0.25	—
ATF temperature sensor	B54	10	ATF temperature 20°C (68°F)	3.45±0.55	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	1.2±0.2	272 — 374
Vehicle speed sensor 1	B54	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B56	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1↔More than 9	—
Engine speed signal	B54	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B56	3	When cruise control is set (SET lamp ON).	Less than 1	—
			When cruise control is not set (SET lamp OFF).	More than 6.5	
Torque control signal	B55	16	Ignition switch ON	5±1	—
Mass air flow signal	B54	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B55	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B55	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B55	15	Select lever in "N" range (with throttle fully closed).	Less than 1	20 — 32
			Select lever in "D" range (with throttle fully closed).	More than 9	
Duty solenoid A	B55	8	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B55	7	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Duty solenoid B	B55	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C	B55	3	Fuse on FWD switch	More than 8.5	9 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Sensor ground line 1	B54	7	—	0	Less than 1
Sensor ground line 2	B56	20	—	0	Less than 1

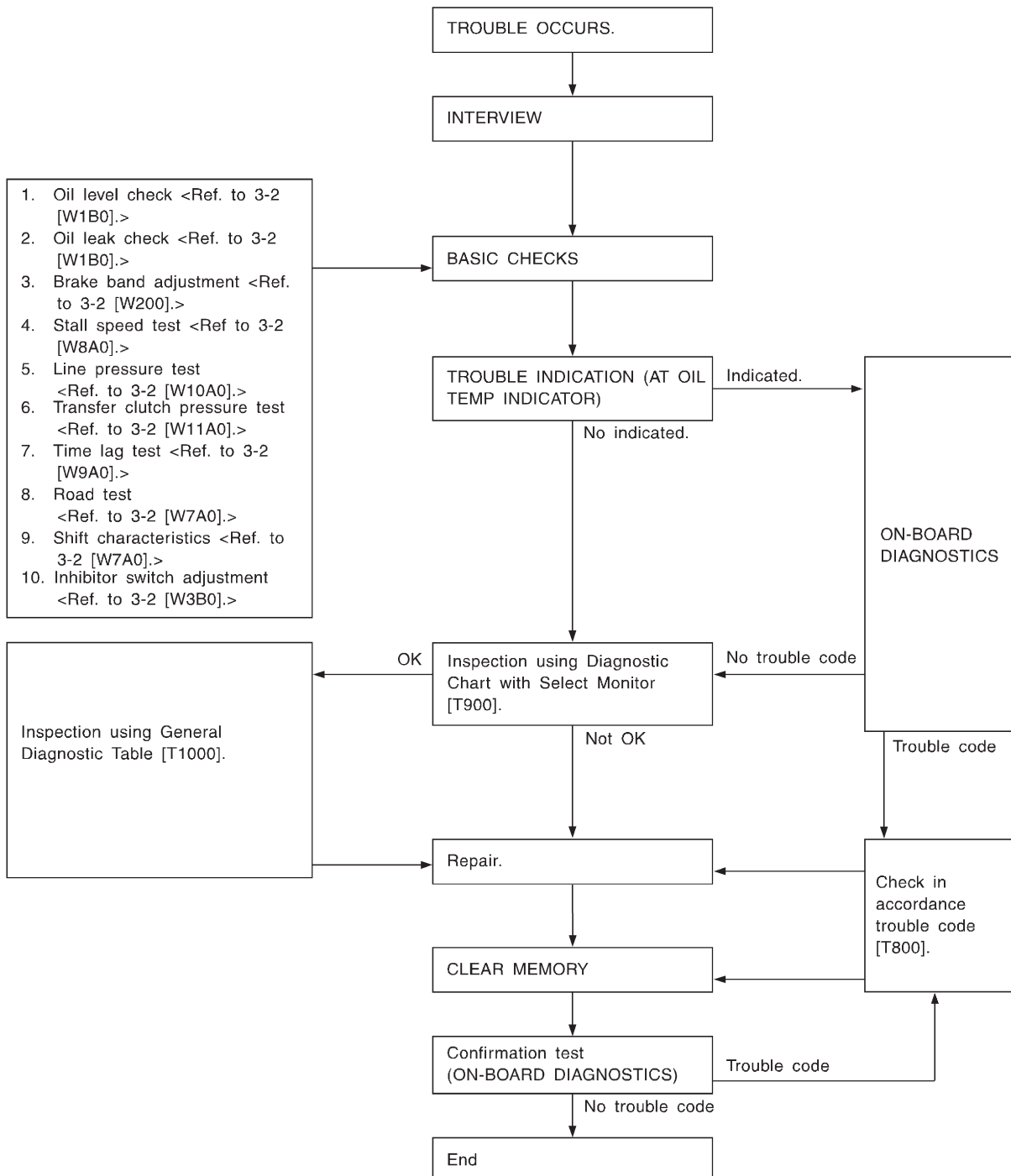
3-2 [T500] **AUTOMATIC TRANSMISSION AND DIFFERENTIAL**

5. Transmission Control Module (TCM) I/O Signal

Check with ignition switch ON.					
Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
System ground line	B56	1	—	0	Less than 1
Power system ground line	B55	10	—	0	Less than 1
FWD switch	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	

6. Diagnostic Chart for On-board Diagnostics System

A: BASIC DIAGNOSTICS PROCEDURE

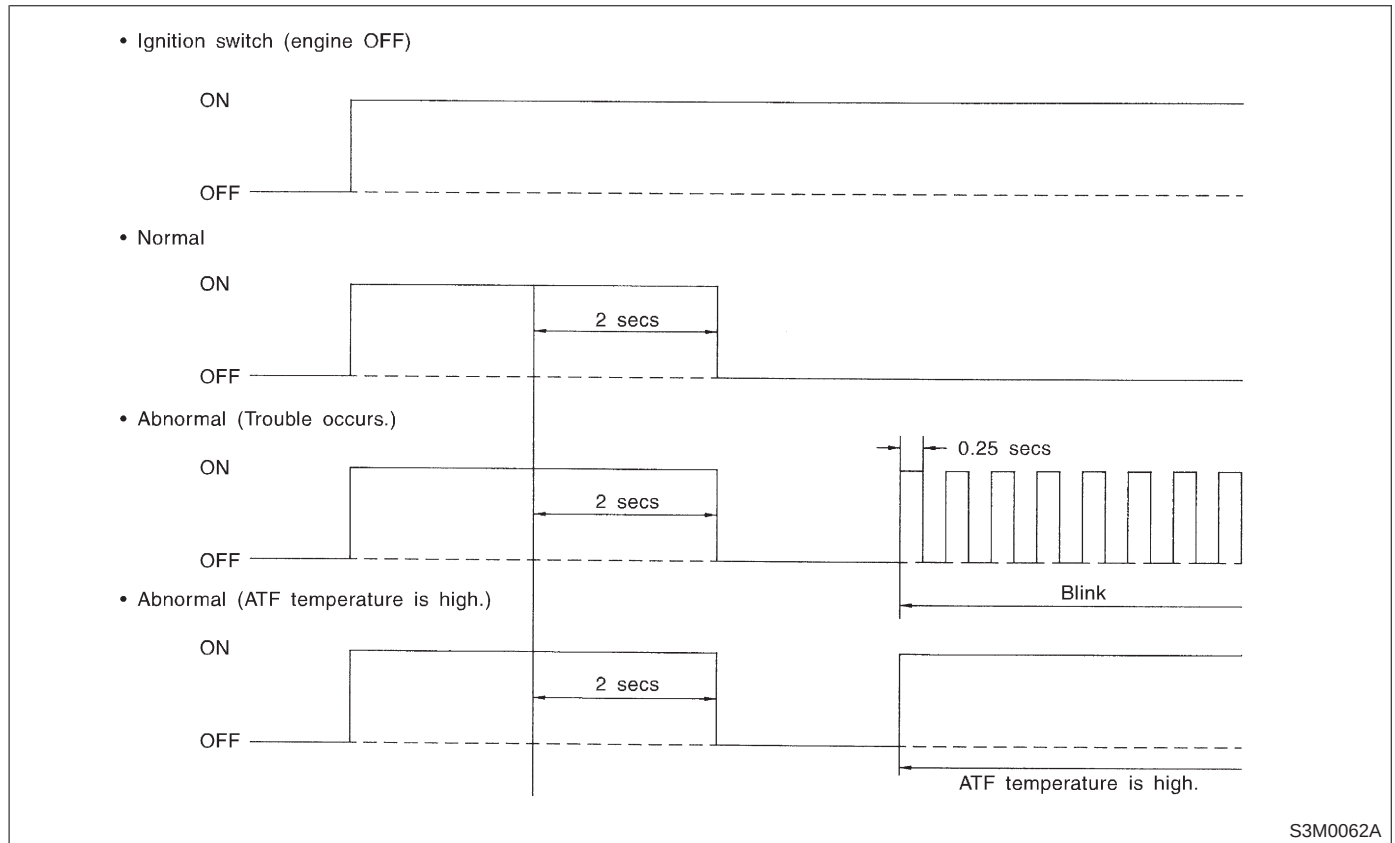


B: ABNORMAL DISPLAY ON AT OIL TEMP INDICATOR

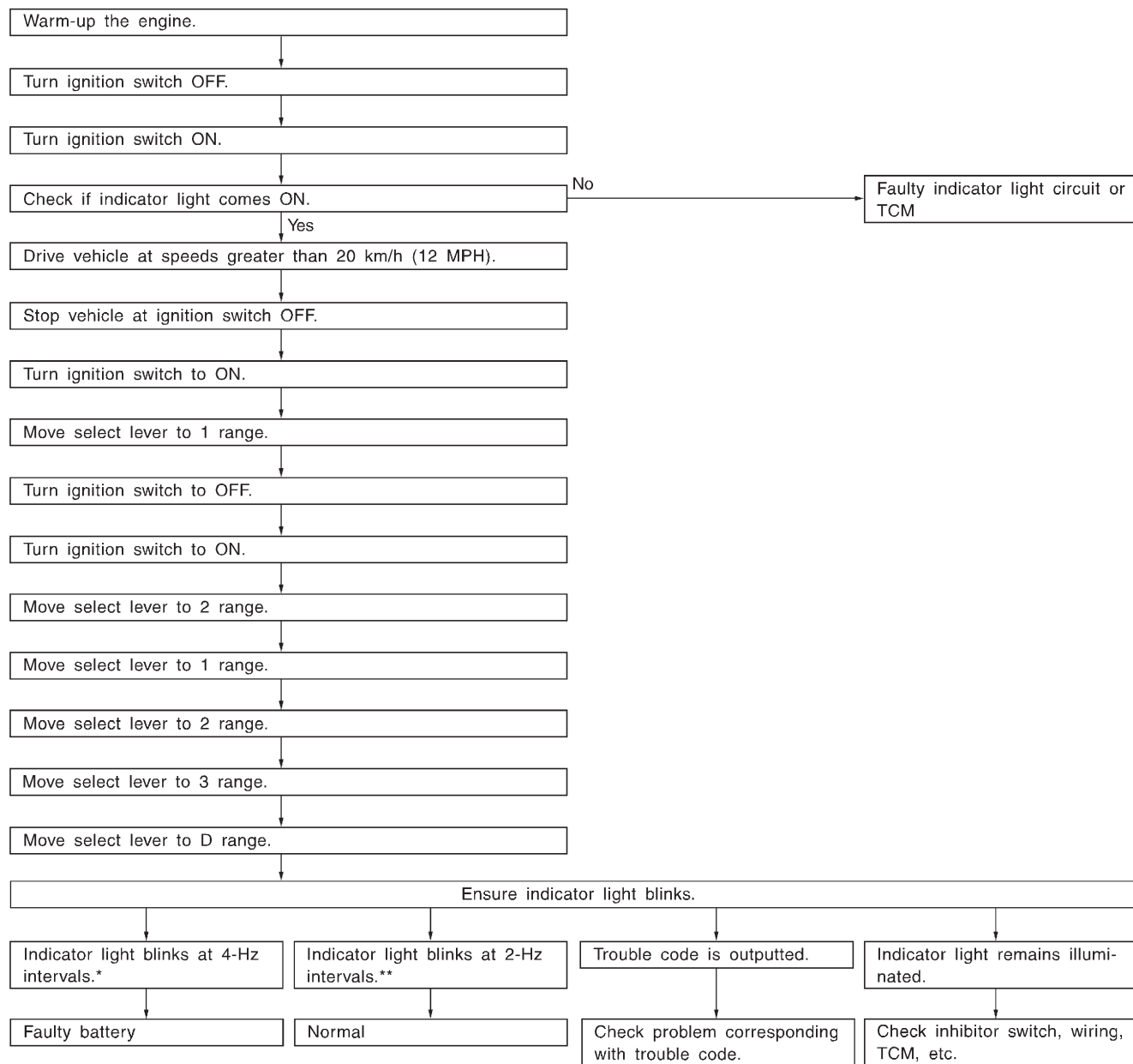
When any on-board diagnostics item is malfunctioning, the display on the AT OIL TEMP indicator lamp blinks from the time the malfunction is detected after starting the engine until the ignition switch is turned OFF. The malfunctioning part or unit can be determined by a trouble code during on-board diagnostics operation. Problems which occurred previously can also be identified

through the memory function. If the AT OIL TEMP indicator does not show a problem (although a problem is occurring), the problem can be determined by checking the performance characteristics of each sensor using the select monitor. Indicator signal is as shown in the figure.

WARNING:
Warning can be noticed only when the engine is initially started.



C: ON-BOARD DIAGNOSTICS



* : Blinks every 0.125 (1/8) seconds (until ignition switch is turned OFF).

** : Blinks every 0.25 (1/4) seconds (until ignition switch is turned OFF).

7. Diagnostics for On-board Diagnostics Failed

A: AT OIL TEMP INDICATOR LIGHT

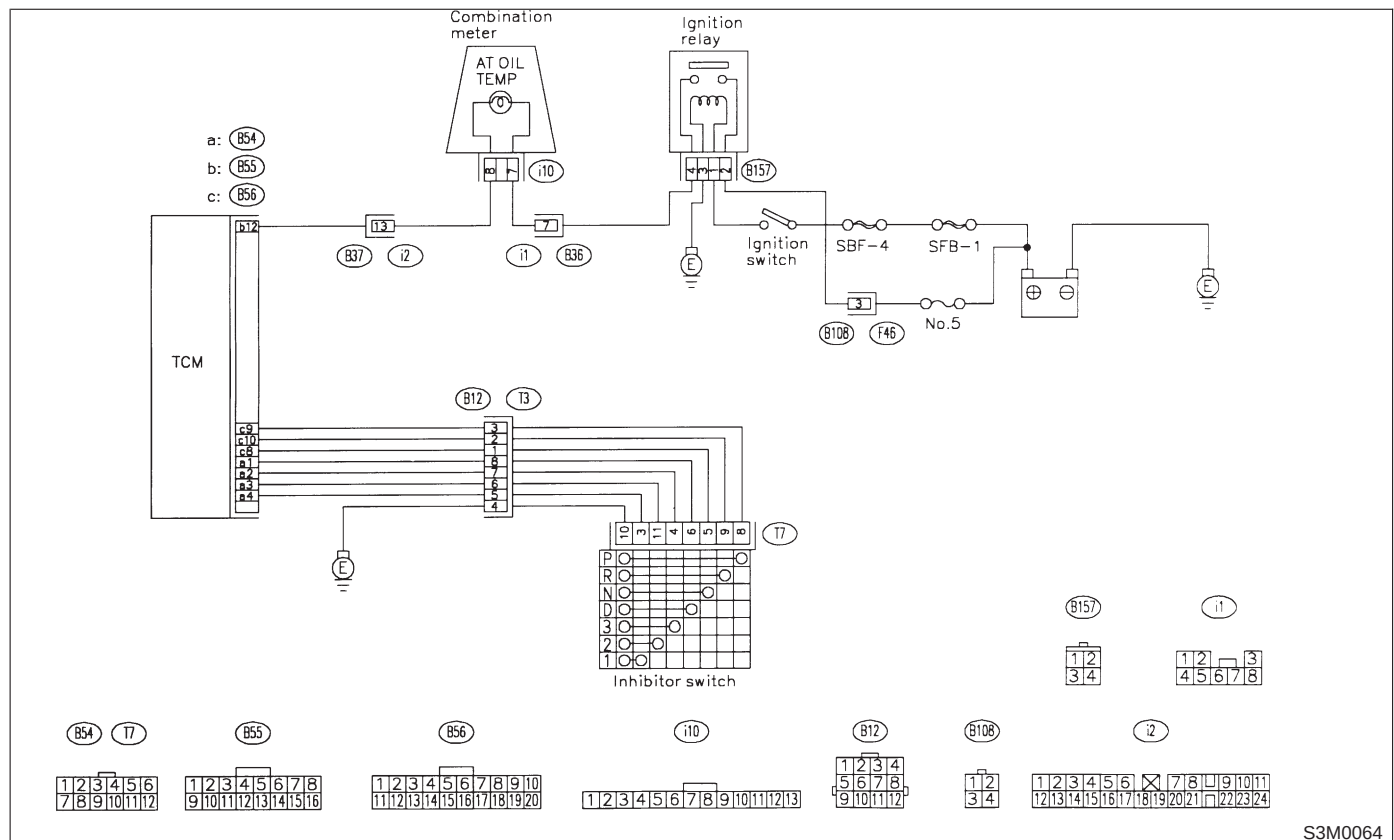
DIAGNOSIS:

The AT OIL TEMP indicator light circuit is open or shorted.

TROUBLE SYMPTOM:

- When ignition switch is turned to ON (engine OFF), AT OIL TEMP indicator light does not illuminate.
- When on-board diagnostics is performed, AT OIL TEMP indicator light remains illuminated.

WIRING DIAGRAM:



7A1 : CHECK AT OIL TEMP INDICATOR LIGHT.

Turn ignition switch to ON (engine OFF).

CHECK : Does AT OIL TEMP indicator light illuminate?

YES : Go to step 7A2.

NO : Go to step 7A3.

7A2 : CHECK AT OIL TEMP INDICATOR LIGHT.

Perform on-board diagnostics. <Ref. to 3-2 [T6C0].>

CHECK : Does AT OIL TEMP indicator light blink?

YES : A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM, inhibitor switch and combination meter.

NO : Go to step 7A8.

7A3 : CHECK FUSE (NO. 5).

Remove fuse (No. 5).

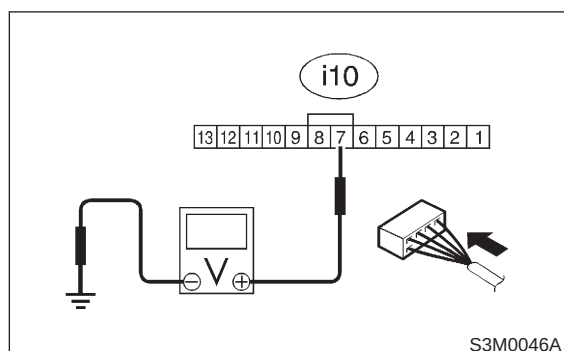
- CHECK** : *Is the fuse (No. 5) blown out?*
- YES** : Replace fuse (No. 5). If replaced fuse (No. 5) is blown out easily, repair short circuit in harness between fuse (No. 5) and combination meter.
- NO** : Go to step **7A4**.

7A4 : CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND IGNITION SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter.
- 3) Turn ignition switch to ON (engine OFF).
- 4) Measure voltage between combination meter connector and chassis ground.

Connector & terminal

(i10) No. 7 (+) — Chassis ground (-):



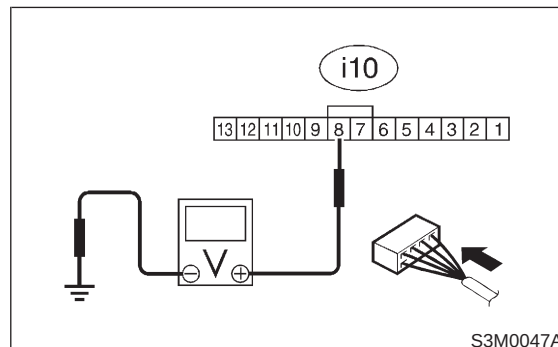
- CHECK** : *Is voltage more than 10 V?*
- YES** : Go to step **7A5**.
- NO** : Repair open circuit in harness between combination meter and fuse.

7A5 : CHECK COMBINATION METER.

Measure voltage between combination meter connector and chassis ground.

Connector & terminal

(i10) No. 8 (+) — Chassis ground (-):



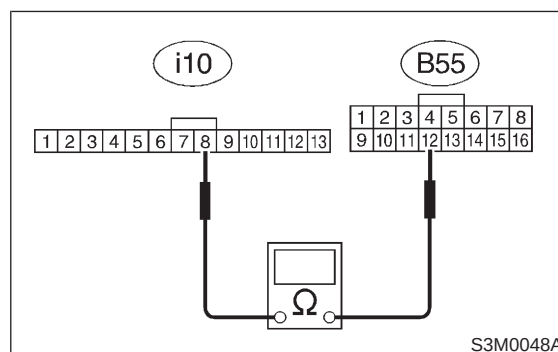
- CHECK** : *Is voltage less than 1 V?*
- YES** : Go to step **7A6**.
- NO** : Replace bulb or combination meter.

7A6 : CHECK OPEN CIRCUIT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and combination meter connector.
- 3) Measure resistance of harness between TCM and combination meter.

Connector & terminal

(B55) No. 12 — (i10) No. 8:



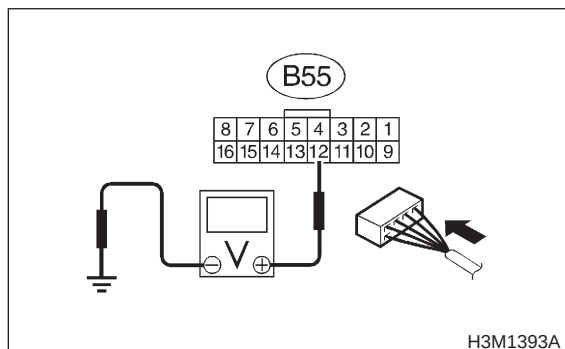
- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **7A7**.
- NO** : Repair open circuit in harness between TCM and combination meter, and poor contact in coupling connector.

7A7 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and combination meter.
- 3) Install combination meter.
- 4) Turn ignition switch to ON (engine OFF).
- 5) Measure voltage between TCM connector and chassis ground.

Connector & terminal

(B55) No. 12 (+) — Chassis ground (-):



- CHECK** : **Is the voltage less than 1 V?**
- YES** : Even if AT OIL TEMP indicator lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.
- NO** : Replace TCM.

7A8 : CHECK INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
 - 2) Connect Subaru Select Monitor to data link connector.
 - 3) Turn ignition switch to ON.
 - 4) Subaru Select Monitor to ON.
 - 5) Read data of range switch using Subaru Select Monitor.
- Range switch is indicated in ON ⇔ OFF.

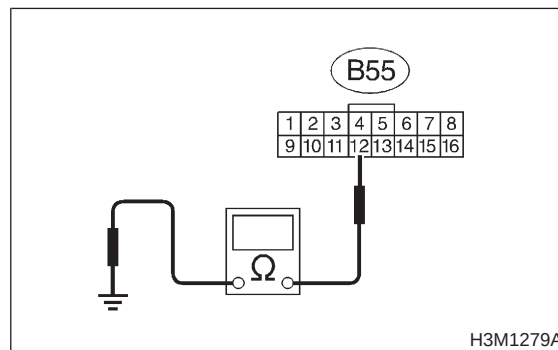
- CHECK** : **When each range is selected, does LED of Subaru Select Monitor light up?**
- YES** : Go to step 7A9.
- NO** : Check inhibitor switch circuit. <Ref. to 3-2 [T9T0].>

7A9 : CHECK SHORT CIRCUIT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM.
- 3) Remove combination meter.
- 4) Disconnect connector from combination meter.
- 5) Measure resistance of harness connector between TCM and combination meter.

Connector & terminal/specified resistance

(B55) No. 12 — Chassis ground:

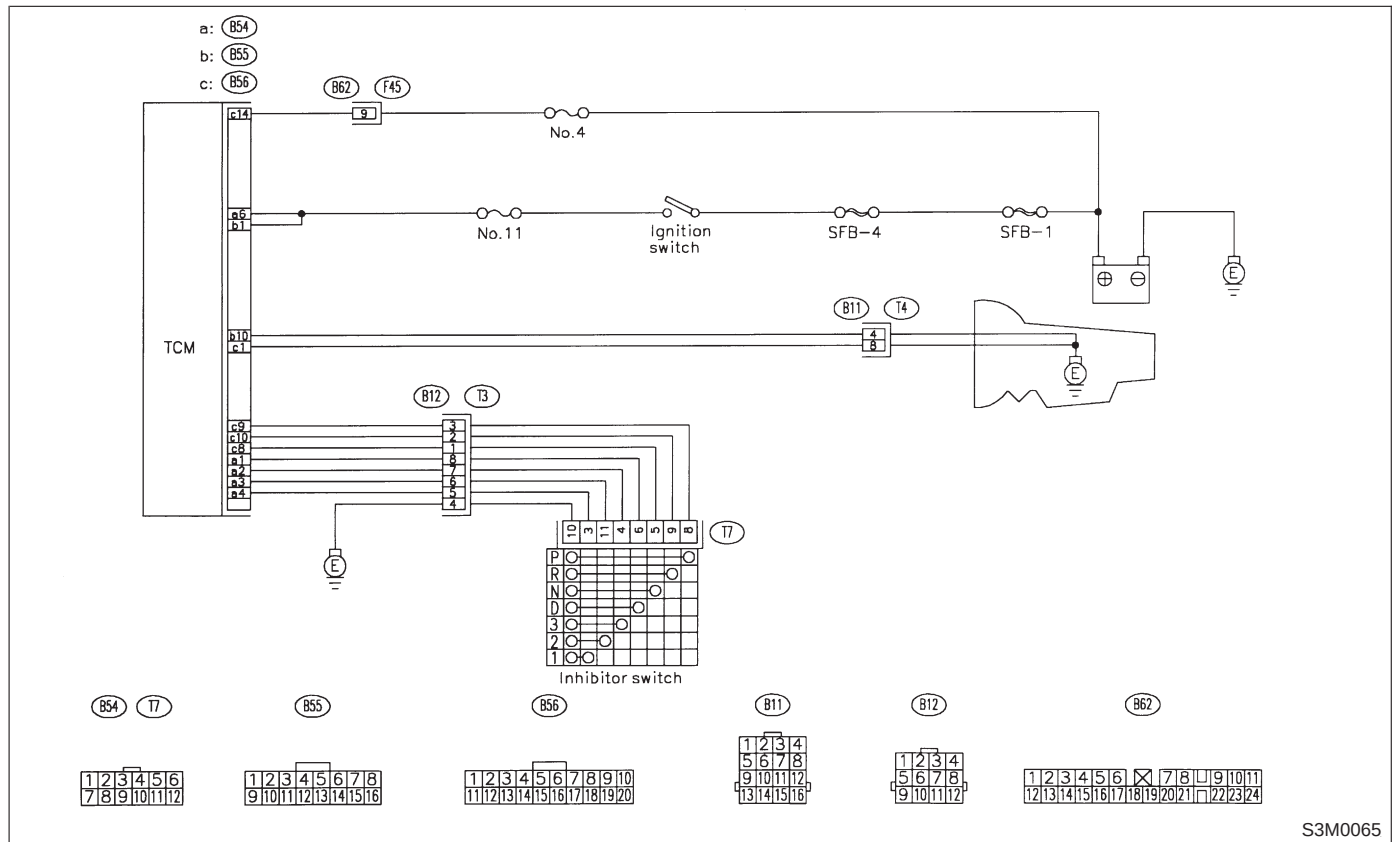


- CHECK** : **Is the resistance less than 1 MΩ?**
- YES** : Replace TCM.
- NO** : Repair short circuit in harness between combination meter connector and TCM connector.

MEMO:

B: CONTROL MODULE POWER SUPPLY AND GROUND LINE

WIRING DIAGRAM:



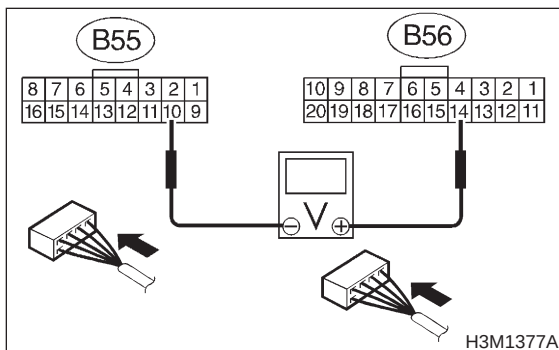
S3M0065

7B1 : CHECK BACK-UP POWER SUPPLY CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Measure back-up power supply voltage between TCM connector terminal.

Connector & terminal

(B56) No. 14 (+) — (B55) No. 10 (-):



H3M1377A

- CHECK** : Is the voltage more than 10 V?
- YES** : Go to step 7B3.
- NO** : Go to step 7B2.

7B2 : CHECK FUSE (NO. 4).

Remove fuse (No. 4).

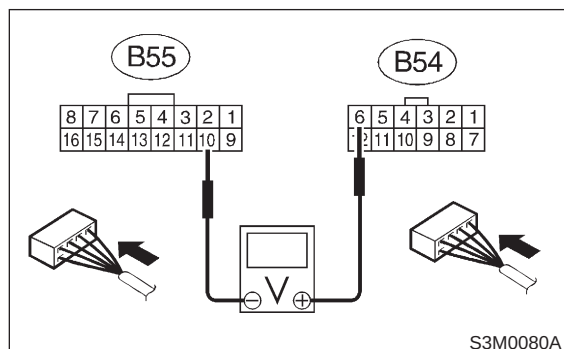
- CHECK** : Is the fuse (No. 4) blown out?
- YES** : Replace fuse (No. 4). If replaced fuse (No. 4) has blown out easily, repair short circuit in harness between fuse (No. 4) and TCM.
- NO** : Repair open circuit in harness between fuse (No. 4) and TCM, and poor contact in coupling connector.

7B3 : CHECK IGNITION POWER SUPPLY CIRCUIT.

- 1) Turn ignition switch to ON (engine OFF).
- 2) Measure ignition power supply voltage between TCM connector terminal.

Connector & terminal

(B54) No. 6 (+) — (B55) No. 10 (-):



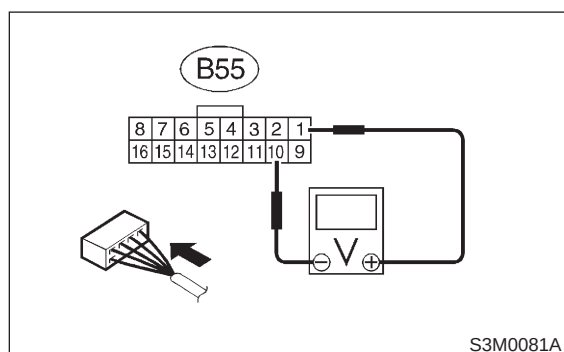
- CHECK** : **Is the voltage more than 10 V?**
- YES** : Go to step **7B4**.
- NO** : Go to step **7B5**.

7B4 : CHECK IGNITION POWER SUPPLY CIRCUIT.

- 1) Turn ignition switch to ON (engine OFF).
- 2) Measure ignition power supply voltage between TCM connector terminal.

Connector & terminal

(B55) No. 1 (+) — No. 10 (-):



- CHECK** : **Is the voltage more than 10 V?**
- YES** : Go to step **7B6**.
- NO** : Go to step **7B5**.

7B5 : CHECK FUSE (NO. 11).

Remove fuse (No. 11).

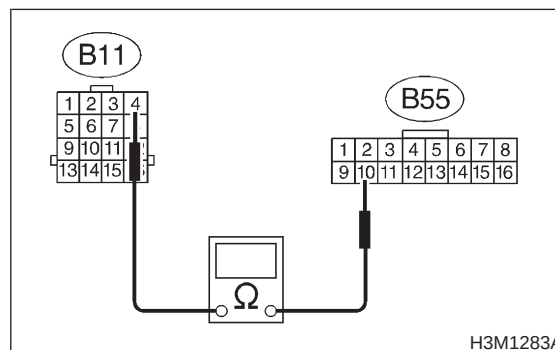
- CHECK** : **Is the fuse (No. 11) blown out?**
- YES** : Replace fuse (No. 11). If replaced fuse (No. 11) has blown out easily, repair short circuit in harness between fuse (No. 11) and TCM.
- NO** : Repair open circuit in harness between fuse (No. 11) and TCM, and poor contact in coupling connector.

7B6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and transmission.
- 3) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:



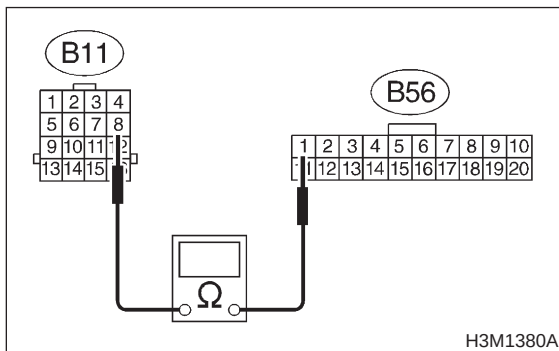
- CHECK** : **Is the resistance less than 1 Ω?**
- YES** : Go to step **7B7**.
- NO** : Repair open circuit in harness between TCM and transmission harness connector.

7B7 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B56) No. 1 — (B11) No. 8:



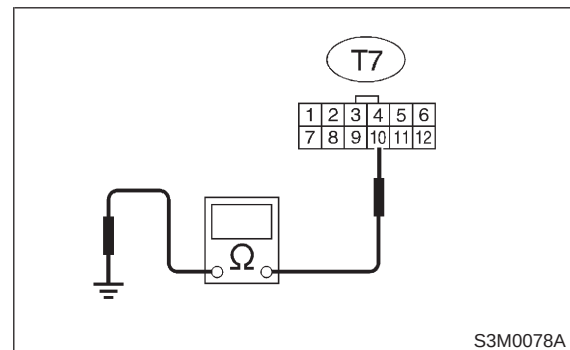
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 7B8.
- NO** : Repair open circuit in harness between TCM and transmission harness connector.

7B8 : CHECK HARNESS CONNECTOR BETWEEN INHIBITOR SWITCH AND CHASSIS GROUND.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from inhibitor switch.
- 3) Measure resistance of harness between inhibitor switch side connector and chassis ground.

Connector & terminal

(T7) No. 10 — Chassis ground:



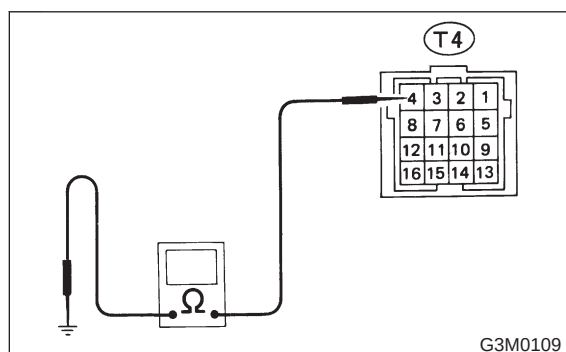
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 7B9.
- NO** : Repair open circuit in harness between chassis ground and inhibitor side connector, and poor contact in coupling connector.

7B9 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND TRANSMISSION GROUND.

- 1) Drain automatic transmission fluid.
- 2) Remove oil pan.
- 3) Measure resistance of harness between transmission and transmission ground.

Connector & terminal

(T4) No. 4 — Transmission ground:



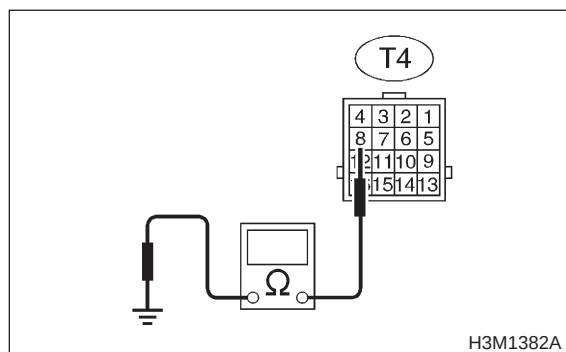
- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **7B9**.
- NO** : Repair open circuit in harness between transmission and transmission ground.

7B10 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND TRANSMISSION GROUND.

Measure resistance of harness between transmission and transmission ground.

Connector & terminal

(T4) No. 8 — Transmission ground:



- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **7B11**.
- NO** : Repair open circuit in harness between transmission and transmission ground.

7B11 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in control module power supply and ground line?*

YES : Repair poor contact and ground terminal.

NO : Replace TCM.

3-2 [T8A1] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

8. Diagnostic Chart with Trouble Code

A: LIST OF TROUBLE CODE

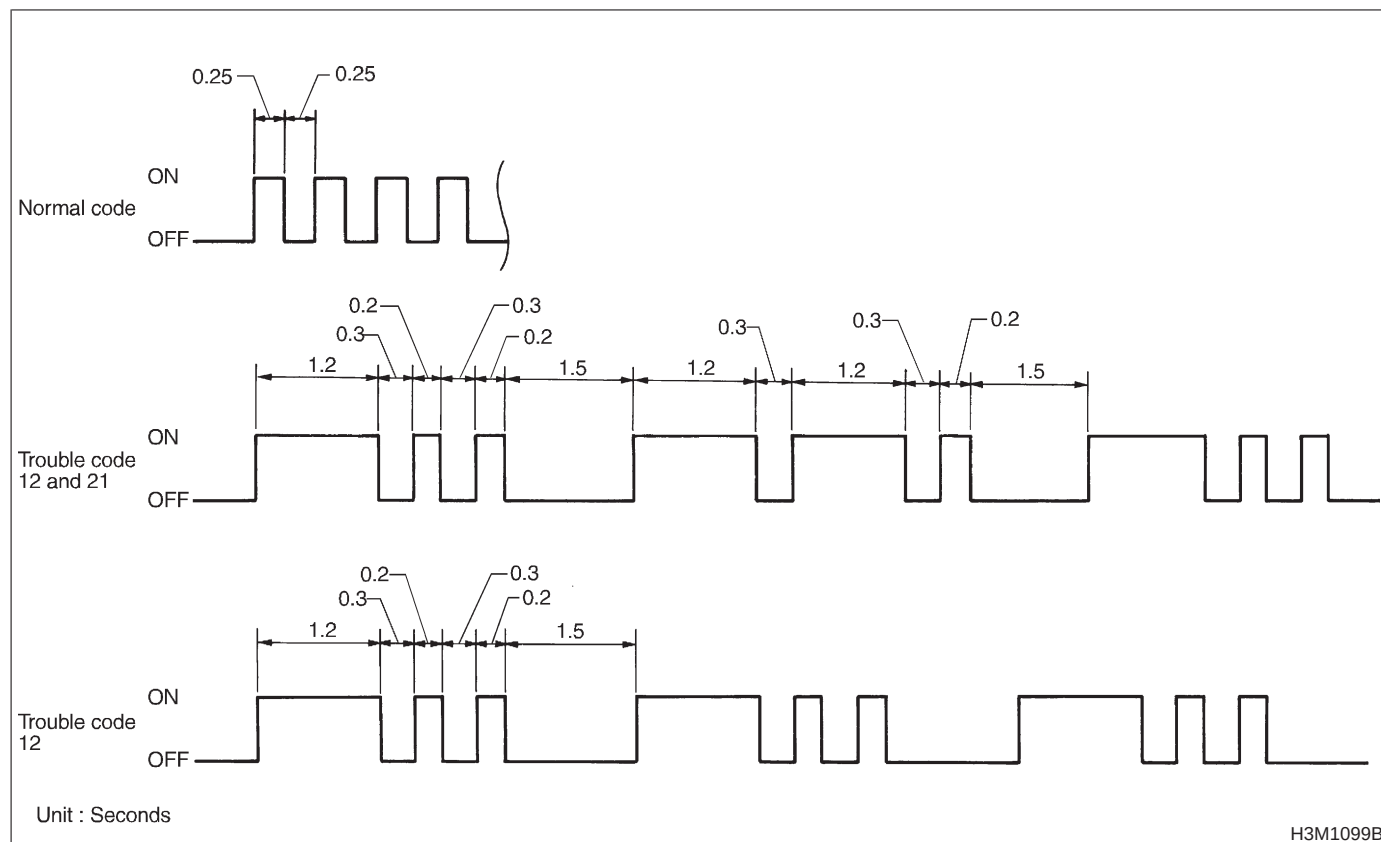
1. TROUBLE CODE

Trouble code	Item	Content of diagnosis	Title index No.
11	Duty solenoid A	Detects open or shorted drive circuit, as well as valve seizure.	<Ref. to [T8C0].>
12	Duty solenoid B	Detects open or shorted drive circuit, as well as valve seizure.	<Ref. to [T8D0].>
13	Shift solenoid 3	Detects open or shorted drive circuit, as well as valve seizure.	<Ref. to [T8E0].>
14	Shift solenoid 2	Detects open or shorted drive circuit, as well as valve seizure.	<Ref. to [T8F0].>
15	Shift solenoid 1	Detects open or shorted drive circuit, as well as valve seizure.	<Ref. to [T8G0].>
21	ATF temperature sensor	Detects open or shorted input signal circuit.	<Ref. to [T8H0].>
22	Mass air flow signal	Detects open or shorted input signal circuit.	<Ref. to [T8I0].>
23	Engine speed signal	Detects open or shorted input signal circuit.	<Ref. to [T8J0].>
24	Duty solenoid C	Detects open or shorted drive circuit, as well as valve seizure.	<Ref. to [T8K0].>
25	Torque control signal	Detects open or shorted input signal circuit.	<Ref. to [T8L0].>
31	Throttle position sensor	Detects open or shorted input signal circuit.	<Ref. to [T8M0].>
32	Vehicle speed sensor 1	Detects open or shorted input signal circuit.	<Ref. to [T8N0].>
33	Vehicle speed sensor 2	Detects open or shorted input signal circuit.	<Ref. to [T8O0].>

2. HOW TO READ TROUBLE CODE OF INDICATOR LIGHT

The AT OIL TEMP indicator light flashes the code corresponding to the faulty part.

The long segment (1.2 sec on) indicates a "ten", and the short segment (0.2 sec on) signifies a "one".



B: CLEAR MEMORY

Current trouble codes shown on the display are cleared by turning the ignition switch OFF after conducting on-board diagnostics operation. Previous trouble codes, however, cannot be cleared since they are stored in the TCM memory which is operating on the back-up power supply. These trouble codes can be cleared by removing the specified fuse (Main fuse box).

CLEAR MEMORY:

Removal of No. 4 fuse (for at least one minute)

- The No. 4 fuse is located in the line to the memory back-up power supply of the TCM. Removal of this fuse clears the previous trouble codes stored in the TCM memory.
- Be sure to remove the No. 4 fuse for at least the specified length of time. Otherwise, trouble codes may not be cleared.

C: TROUBLE CODE 11 — DUTY SOLENOID A —

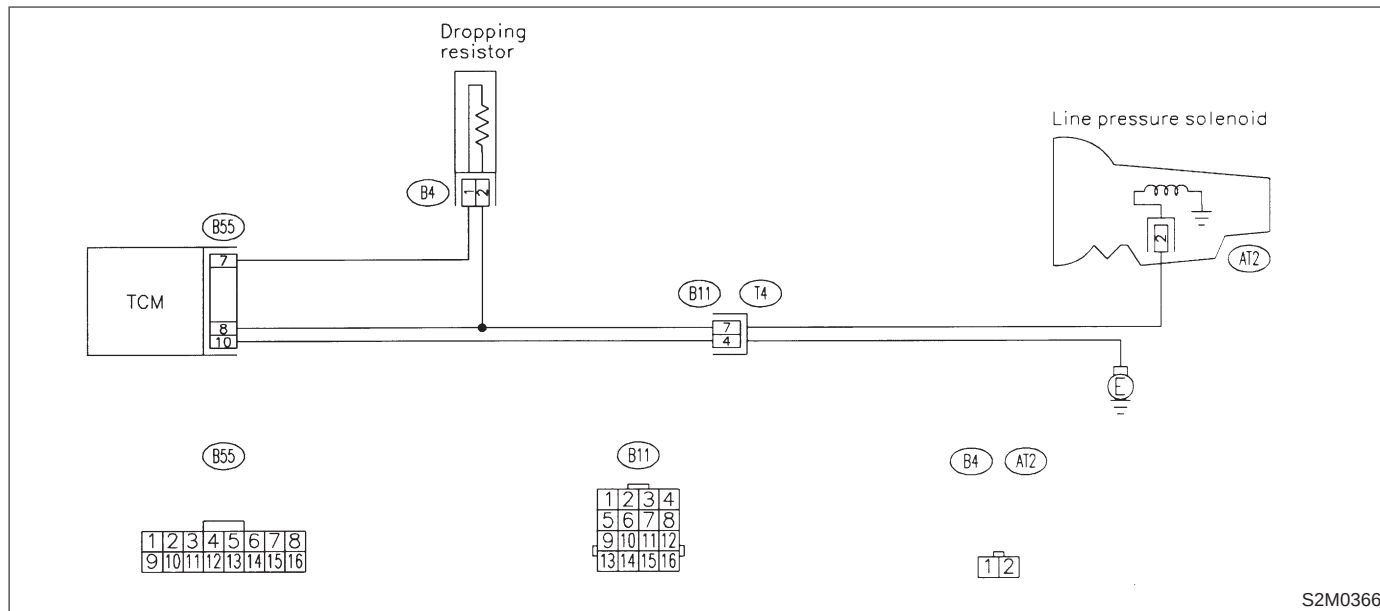
DIAGNOSIS:

Output signal circuit of duty solenoid A or resistor is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



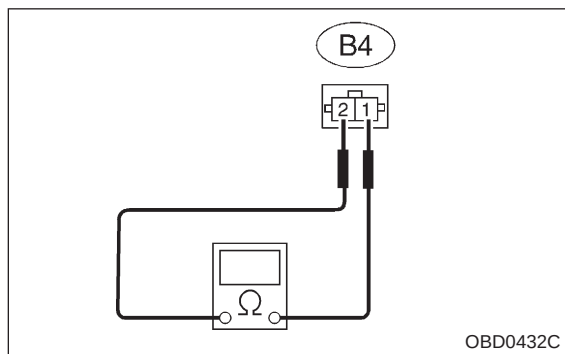
S2M0366

8C1 : CHECK RESISTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from dropping resistor.
- 3) Measure resistance between dropping resistor terminal.

Terminals

(B4) No. 1 — No. 2:



OBD0432C

CHECK : Is the resistance between 9 and 15 Ω ?

YES : Go to step 8C2.

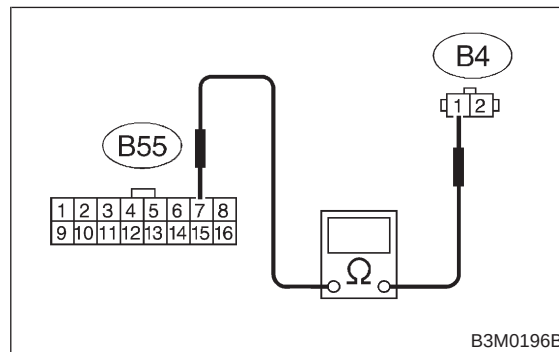
NO : Replace dropping resistor.

8C2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM connector and dropping resistor connector.

Connector & terminal

(B55) No. 7 — (B4) No. 1:



B3M0196B

CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 8C3.

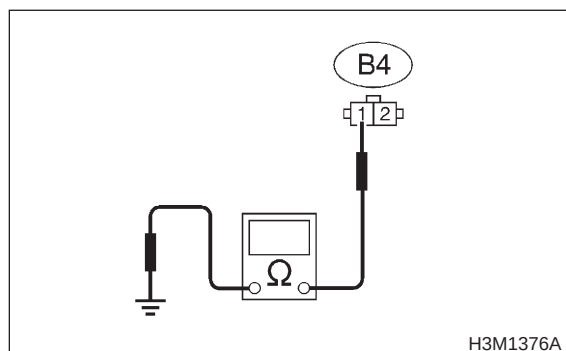
NO : Repair open circuit in harness between TCM and dropping resistor connector.

8C3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.

Measure resistance of harness between dropping resistor connector and chassis ground.

Connector & terminal

(B4) No. 1 — Chassis ground:



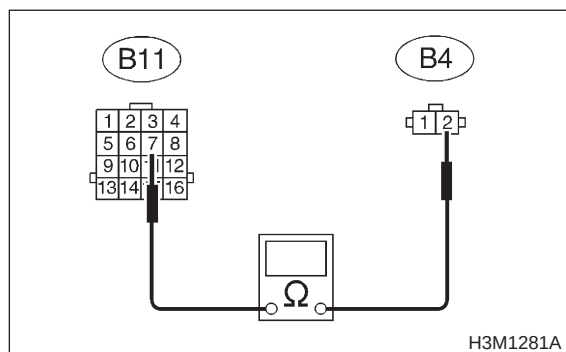
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **8C4**.
- NO** : Repair short circuit in harness between TCM and dropping resistor connector.

8C4 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.

- 1) Remove air intake chamber.
- 2) Disconnect connector from transmission.
- 3) Measure resistance of harness between transmission and dropping resistor connector.

Connector & terminal

(B4) No. 2 — (B11) No. 7:



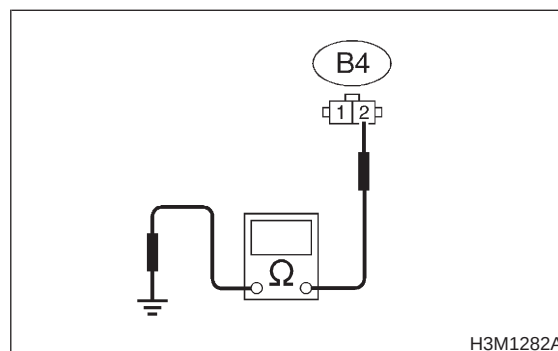
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step **8C5**.
- NO** : Repair open circuit in harness between dropping resistor and transmission connector.

8C5 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.

Measure resistance of harness between dropping resistor connector and chassis ground.

Connector & terminal

(B4) No. 2 — Chassis ground:



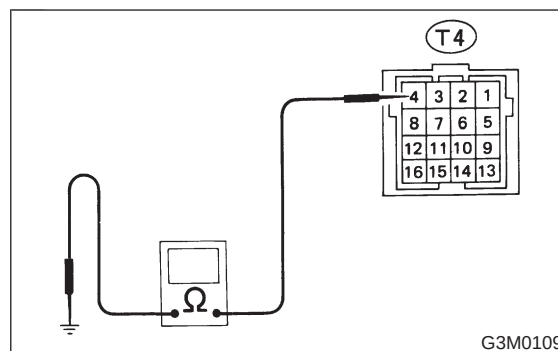
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **8C6**.
- NO** : Repair short circuit in harness between dropping resistor and transmission connector.

8C6 : CHECK DUTY SOLENOID A GROUND LINE.

Measure resistance between transmission connector and transmission ground.

Connector & terminal

(T4) No. 4 — Transmission ground:



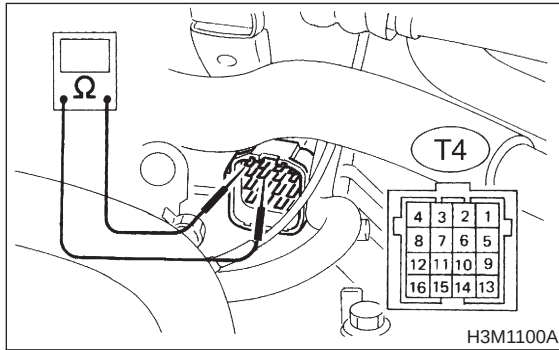
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step **8C7**.
- NO** : Repair open circuit in transmission harness.

8C7 : CHECK DUTY SOLENOID A.

Measure resistance between transmission connector receptacle's terminals.

Terminal

(T4) No. 7 — No. 4:



CHECK : Is the resistance between 1.5 and 4.5 Ω ?

YES : Go to step 8C8.

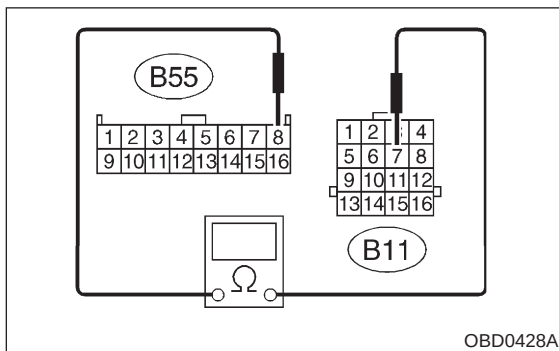
NO : Go to step 8C20.

8C8 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 8 — (B11) No. 7:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 8C9.

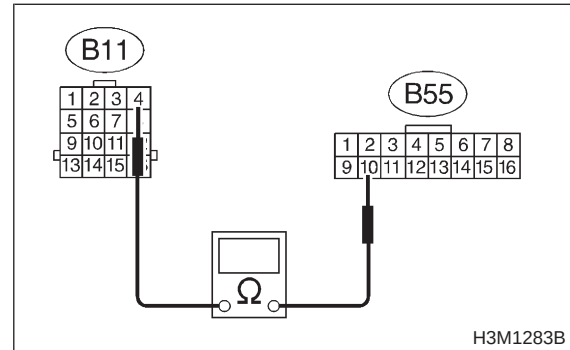
NO : Repair open circuit in harness between TCM and transmission connector.

8C9 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 8C10.

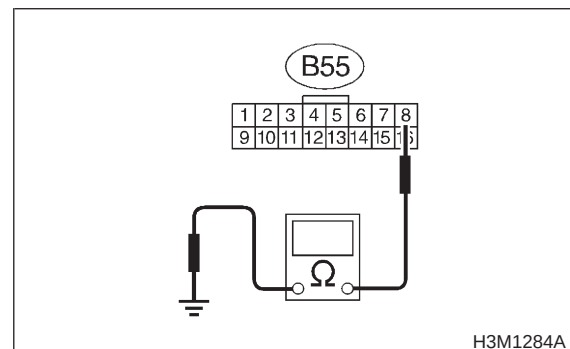
NO : Repair open circuit in harness between TCM and transmission connector.

8C10 : CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B55) No. 8 — Chassis ground:



CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 8C11.

NO : Repair short circuit in harness between TCM and transmission connector.

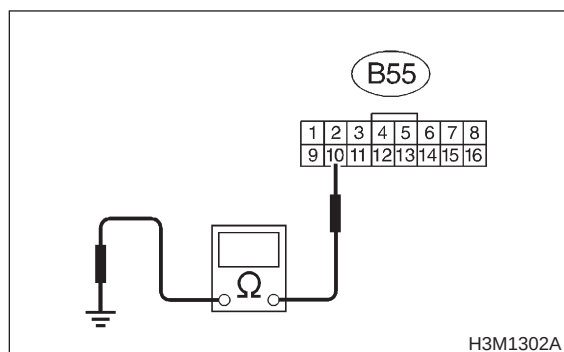
8C11 : PREPARE SUBARU SELECT MONITOR.

- CHECK** : *Do you have a Subaru Select Monitor?*
- YES** : Go to step **8C17**.
- NO** : Go to step **8C12**.

8C12 : CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal
(B55) No. 10 — Chassis ground:



- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **8C13**.
- NO** : Repair short circuit harness between TCM and transmission connector.

8C13 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

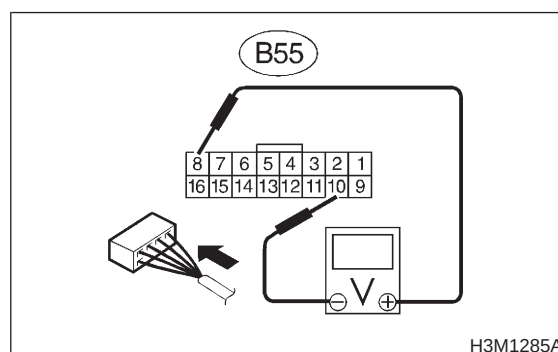
- 1) Connect connectors to TCM, transmission and dropping resistor.
- 2) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Turn ignition switch to ON (engine OFF).
- 4) Move selector lever to "N".
- 5) Measure voltage between TCM connector terminal.

Connector & terminal
(B55) No. 8 (+) — No. 10 (-):



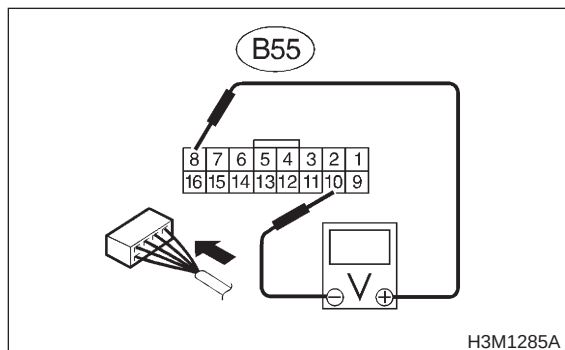
- CHECK** : *Is the voltage between 1.5 and 4.0 V with throttle fully closed?*
- YES** : Go to step **8C14**.
- NO** : Go to step **8C19**.

8C14 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

Measure voltage between TCM connector terminal.

Connector & terminal

(B55) No. 8 (+) — No. 10 (-):



CHECK : Is the voltage less than 1 V with throttle fully open?

YES : Go to step 8C15.

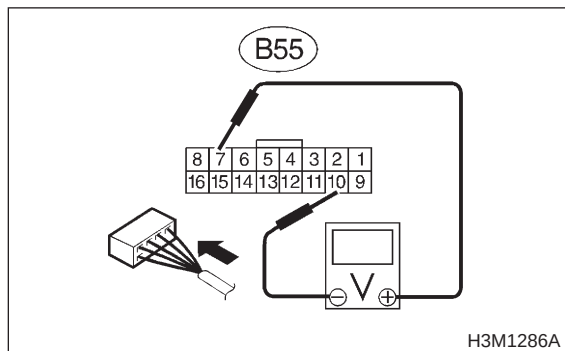
NO : Go to step 8C19.

8C15 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

Measure voltage between TCM connector terminal.

Connector & terminal

(B55) No. 7 (+) — No. 10 (-):



CHECK : Is the voltage more than 8.5 V with throttle fully closed?

YES : Go to step 8C16.

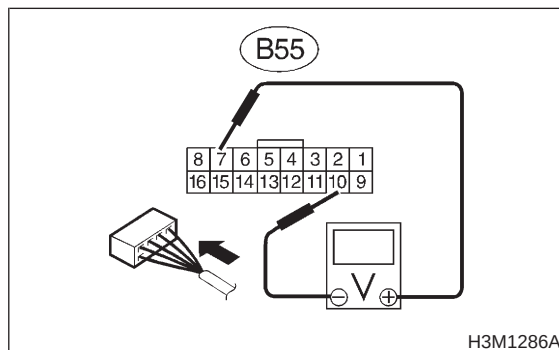
NO : Go to step 8C19.

8C16 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

Measure voltage between TCM connector terminal.

Connector & terminal

(B55) No. 7 (+) — No. 10 (-):



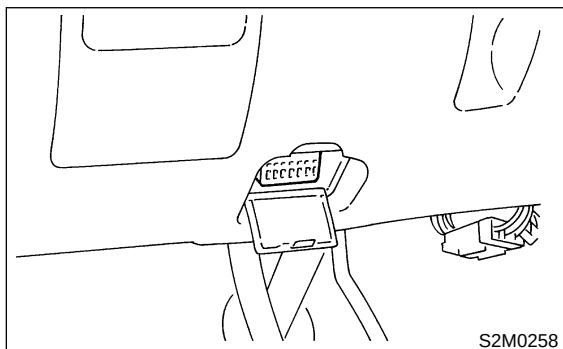
CHECK : Is the voltage less than 1 V with throttle fully open?

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to step 8C19.

8C17 : CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and transmission.
- 2) Connect Subaru Select Monitor to data link connector.



- 3) Start the engine, and turn Subaru Select Monitor switch to ON.
- 4) Warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Stop the engine and turn ignition switch to ON (engine OFF).
- 6) Move selector lever to "N".
- 7) Read data of duty solenoid A using Subaru Select Monitor.
- Line pressure duty is indicated in "%".
- 8) Throttle is fully closed.

- CHECK** : *Is the value 100%?*
- YES** : Go to step **8C18**.
- NO** : Go to step **8C19**.

8C18 : CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.

- 1) Turn ignition switch to ON (Engine OFF).
- 2) Throttle is fully open.

- CHECK** : *Is the value between 10 and 20%?*
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.
- NO** : Go to step **8C19**.

8C19 : CHECK POOR CONTACT.

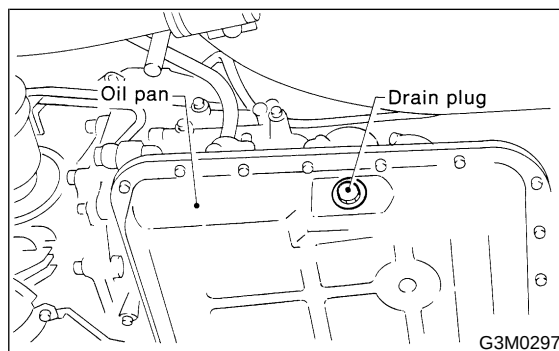
- CHECK** : *Is there poor contact in duty solenoid A circuit?*
- YES** : Repair poor contact.
- NO** : Replace TCM.

8C20 : CHECK DUTY SOLENOID A (IN TRANSMISSION).

- 1) Remove transmission connector from bracket.
- 2) Drain automatic transmission fluid.

CAUTION:

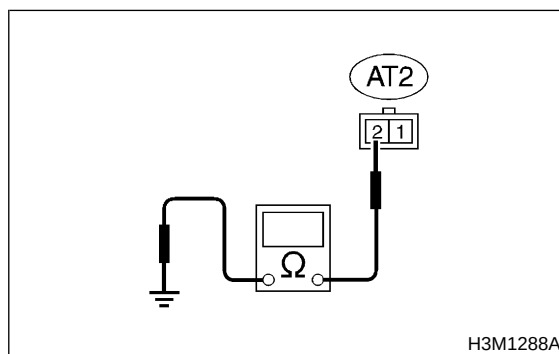
Do not drain the automatic transmission fluid until it cools down.



- 3) Remove oil pan, and disconnect connector from duty solenoid A.
- 4) Measure resistance between duty solenoid A connector and transmission ground.

Connector & terminal

(AT2) No. 2 — Transmission ground:



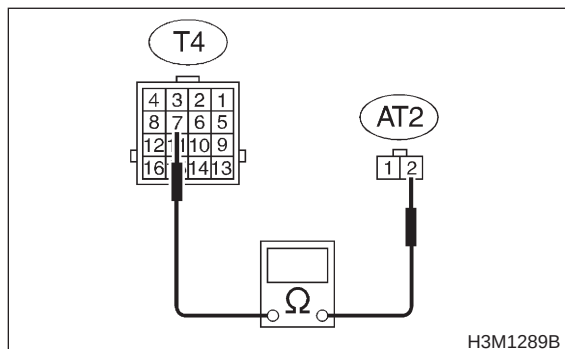
- CHECK** : *Is the resistance between 1.5 and 4.5 Ω?*
- YES** : Go to step **8C21**.
- NO** : Replace duty solenoid A.

8C21 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DUTY SOLENOID A.

Measure resistance of harness between duty solenoid A and transmission connector.

Connector & terminal

(T4) No. 7 — (AT2) No. 2:



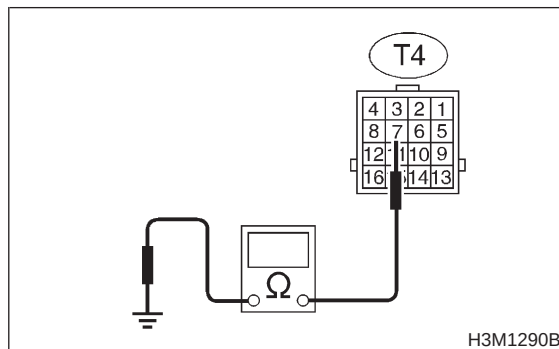
- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Go to step **8C22**.
- NO** : Repair open circuit in harness between duty solenoid A and transmission connector.

8C22 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DUTY SOLENOID A.

Measure resistance of harness between transmission connector and transmission ground.

Connector & terminal

(T4) No. 7 — Transmission ground:



- CHECK** : **Is the resistance more than 1 $M\Omega$?**
- YES** : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in duty solenoid A and transmission connector.
- NO** : Repair short circuit in harness between duty solenoid A and transmission connector.

MEMO:

D: TROUBLE CODE 12 — DUTY SOLENOID B —

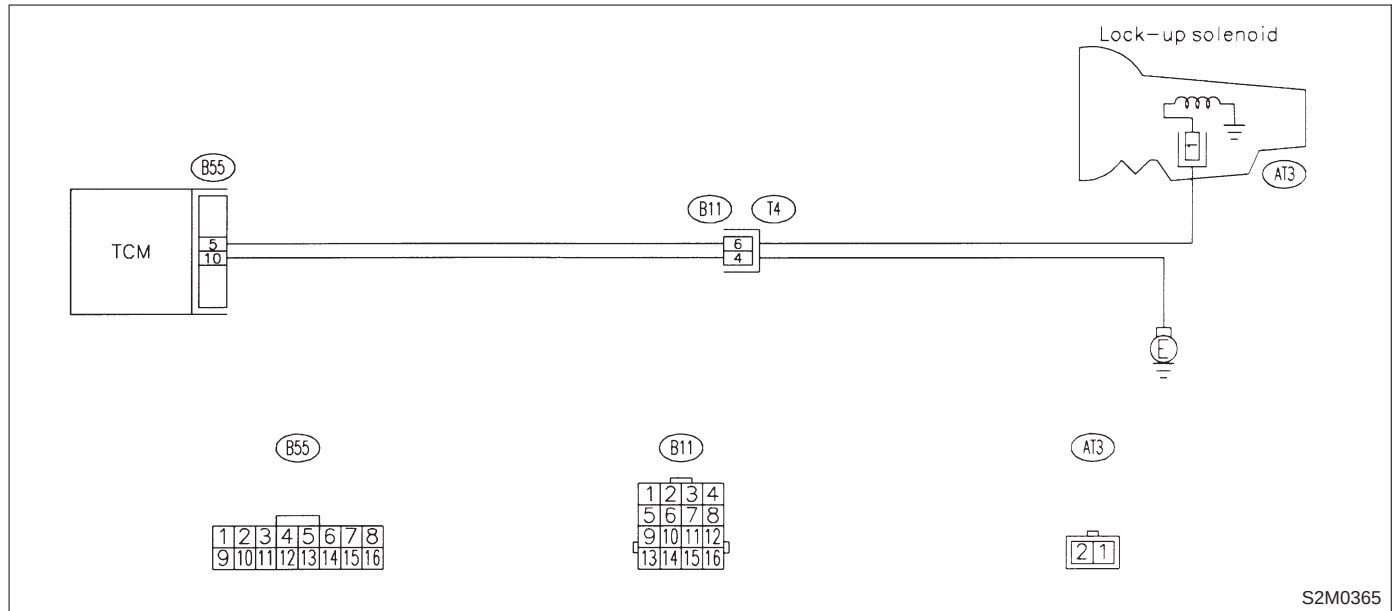
DIAGNOSIS:

Output signal circuit of duty solenoid B is open or shorted.

TROUBLE SYMPTOM:

No "lock-up" (after engine warm-up).

WIRING DIAGRAM:



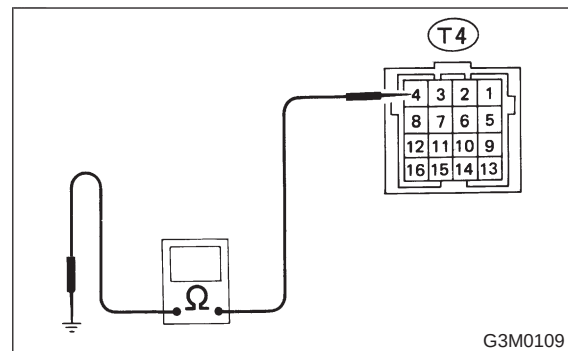
8D1 : CHECK TROUBLE CODE.

- CHECK** : *Do multiple trouble codes appear in the on-board diagnostics test mode?*
- YES** : Go to another trouble code.
- NO** : Go to step **8D2**.

8D2 : CHECK DUTY SOLENOID B GROUND LINE.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission.
- 4) Measure resistance between transmission connector receptacle's terminals.

Connector & terminal
(T4) No. 4 — Chassis ground:



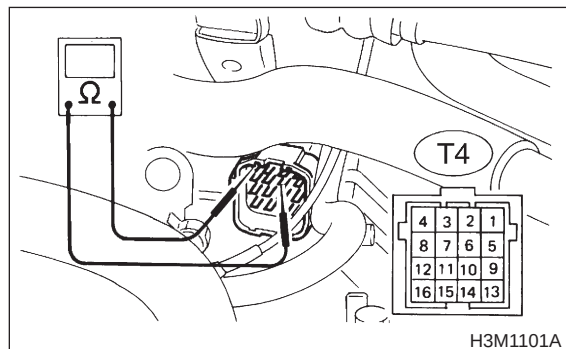
- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **8D3**.
- NO** : Repair open circuit in transmission harness.

8D3 : CHECK DUTY SOLENOID B.

Measure resistance between transmission connector receptacle's terminals.

Connector & terminal

(T4) No. 6 — No. 4:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step 8D4.

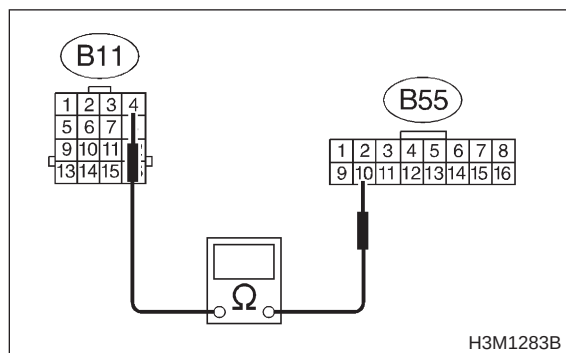
NO : Go to step 8D14.

8D4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:



CHECK : *Is the resistance than 1 Ω?*

YES : Go to step 8D5.

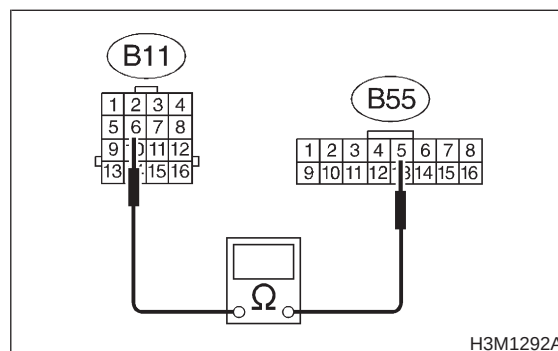
NO : Repair open circuit in harness between TCM and transmission connector.

8D5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness connector between TCM and transmission.

Connector & terminal

(B55) No. 5 — (B11) No. 6:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step 8D6.

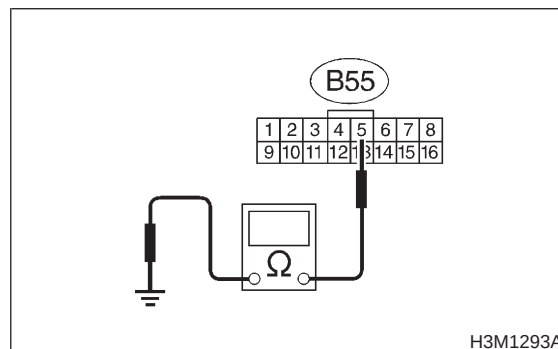
NO : Repair open circuit in harness between TCM and transmission connector.

8D6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness connector between TCM and chassis ground.

Connector & terminal

(B55) No. 5 — Chassis ground:



CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step 8D7.

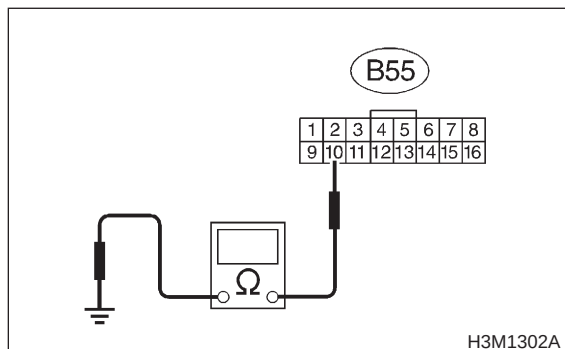
NO : Repair short circuit in harness between TCM and transmission connector.

8D7 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness connector between TCM and chassis ground.

Connector & terminal

(B55) No. 10 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8D8.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8D8 : PREPARE SUBARU SELECT MONITOR.

- CHECK** : Do you have a Subaru Select Monitor?
- YES** : Go to step 8D11.
- NO** : Go to step 8D9.

8D9 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up the vehicle and place safety stand.

CAUTION:

Make sure that all wheels are raised off floor.

- 4) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Move selector lever to "D" and slowly increase vehicle speed to 75 km/h (47 m/h). Wheels will lock-up.

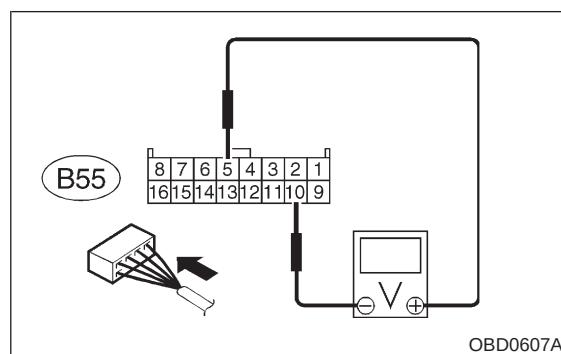
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 6) Measure voltage between TCM connector terminals.

Connector & terminal

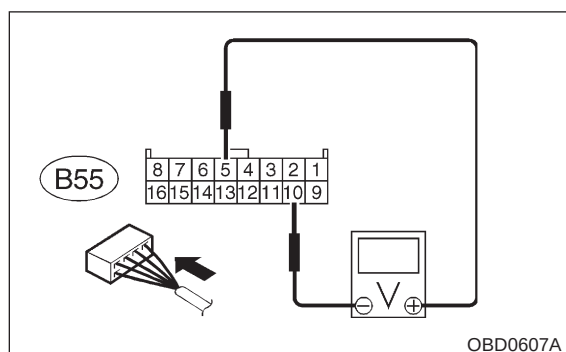
(B55) No. 5 (+) — No. 10 (-):



- CHECK** : Is the voltage more than 8.5 V?
- YES** : Go to step 8D10.
- NO** : Go to step 8D13.

8D10 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Return the engine to idling speed and move selector lever to "N".
- 2) Measure voltage between TCM connector terminals.

Connector & terminal**(B55) No. 5 (+) — No. 10 (-):****CHECK : Is the voltage less than 0.5 V?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

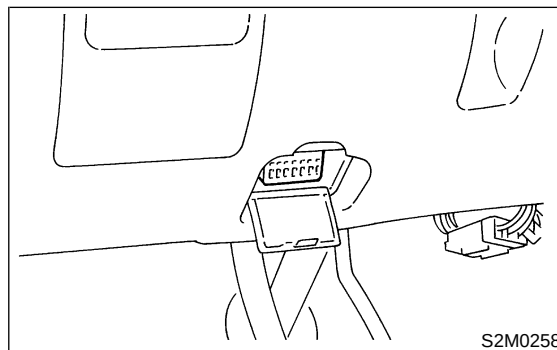
NO : Go to step **8D13**.

8D11 : CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up the vehicle and place safety stand.

CAUTION:**Make sure that all wheels are raised off floor.**

- 4) Connect Subaru Select Monitor to data link connector.



- 5) Start the engine, and turn Subaru Select Monitor switch to ON.
- 6) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 7) Read data of duty solenoid B using Subaru Select Monitor.

● Lock-up duty is indicated in "%".

- 8) Move selector lever to "D" and slowly increase vehicle speed to 75 km/h (47 m/h). Wheels will lock-up.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : Is the value 95%?

YES : Go to step **8D12**.

NO : Go to step **8D13**.

8D12 : CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.

Return the engine to idling speed and move selector lever to "N".

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : **Is the value 5%?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to step **8D13**.

8D13 : CHECK POOR CONTACT.

CHECK : **Is there poor contact in duty solenoid B circuit?**

YES : Repair poor contact.

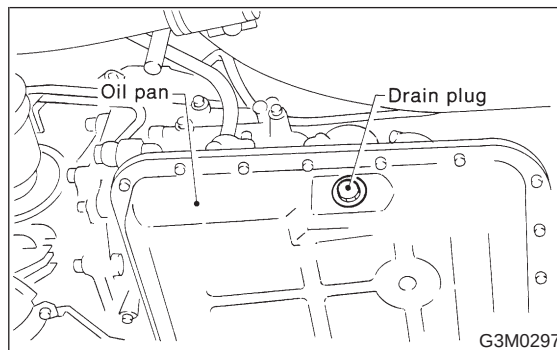
NO : Replace TCM.

8D14 : CHECK DUTY SOLENOID B (IN TRANSMISSION).

- 1) Remove transmission connector from bracket.
- 2) Drain automatic transmission fluid.

CAUTION:

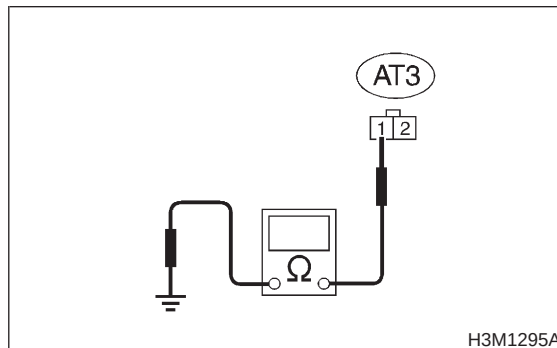
Do not drain the automatic transmission fluid until it cools down.



- 3) Remove oil pan, and disconnect connector from duty solenoid B.
- 4) Measure resistance between duty solenoid B connector and transmission ground.

Connector & terminal

(AT3) No. 1 — Transmission ground:



CHECK : **Is the resistance between 9 and 17 Ω ?**

YES : Go to step **8D15**.

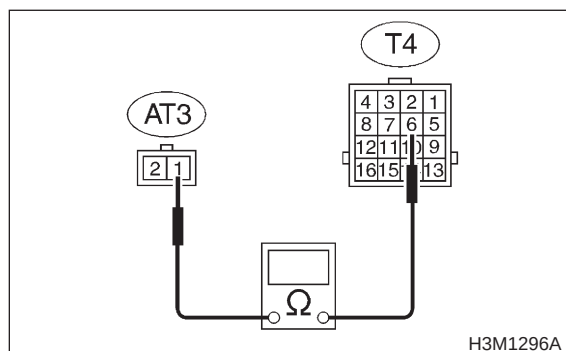
NO : Replace duty solenoid B.

8D15 : CHECK HARNESS CONNECTOR BETWEEN DUTY SOLENOID B AND TRANSMISSION.

Measure resistance of harness between duty solenoid B and transmission connector.

Connector & terminal

(T4) No. 6 — (AT3) No. 1:



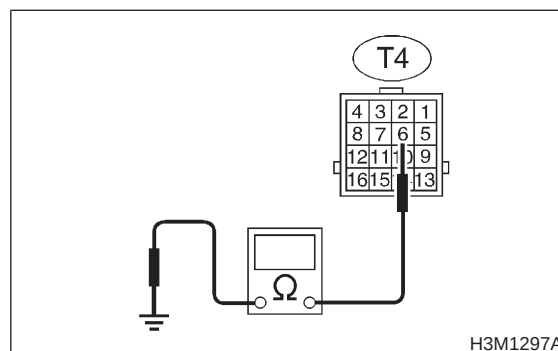
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8D16.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8D16 : CHECK HARNESS CONNECTOR BETWEEN DUTY SOLENOID B AND TRANSMISSION.

Measure resistance of harness between transmission connector and transmission ground.

Connector & terminal

(T4) No. 6 — Transmission ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in duty solenoid B and transmission.
- NO** : Repair short circuit in harness between TCM and transmission connector.

E: TROUBLE CODE 13 — SHIFT SOLENOID 3 —

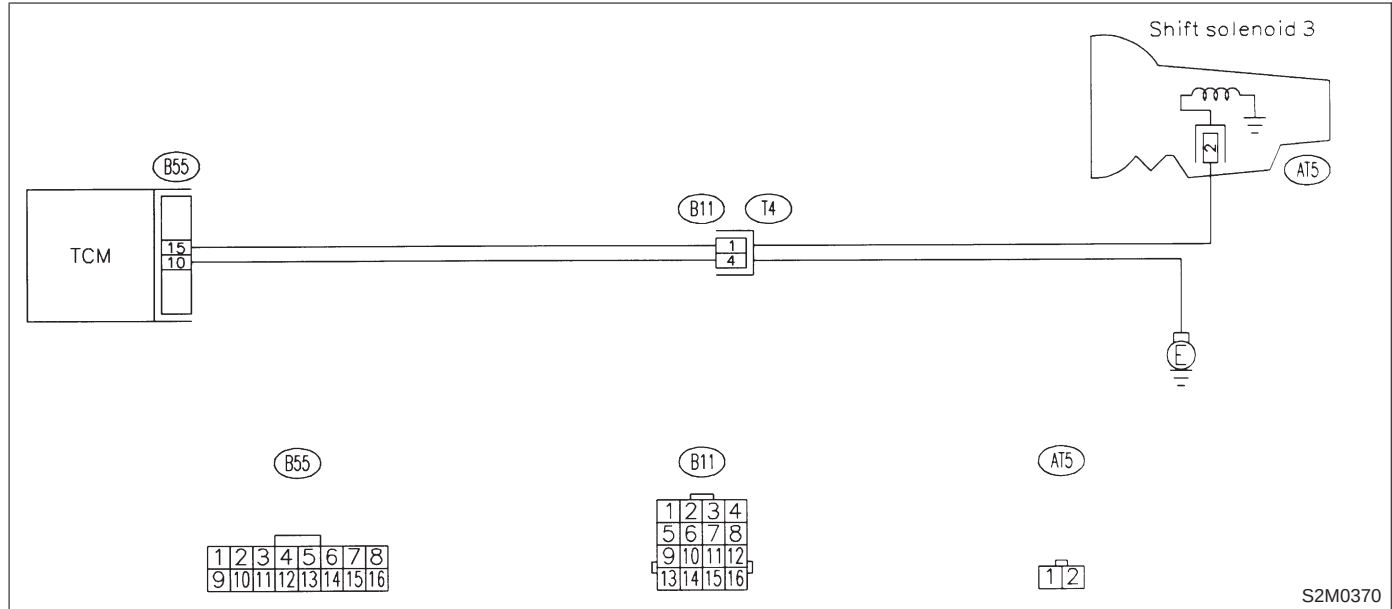
DIAGNOSIS:

Output signal circuit of shift solenoid 3 is open or shorted.

TROUBLE SYMPTOM:

Ineffective engine brake with shift lever in "3".

WIRING DIAGRAM:

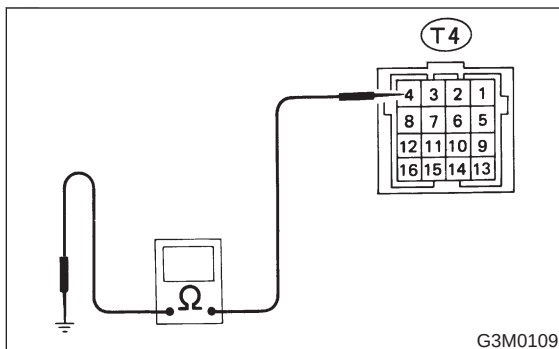


8E1 : CHECK SHIFT SOLENOID 3 GROUND LINE.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission.
- 4) Measure resistance between transmission connector and transmission ground.

Connector & terminal

(T4) No. 4 — Chassis ground:



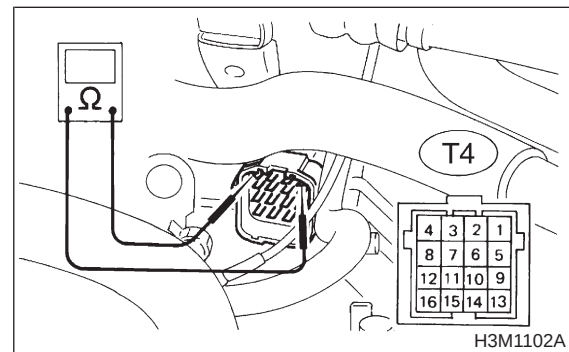
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8E2.
- NO** : Repair open circuit in transmission harness.

8E2 : CHECK SHIFT SOLENOID 3.

Measure resistance between transmission connector terminals.

Connector & terminal

(T4) No. 1 — No. 4:



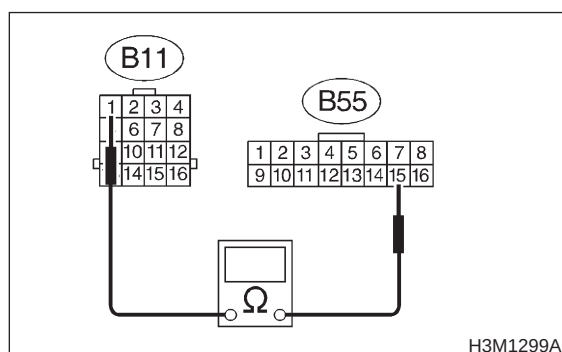
- CHECK** : Is the resistance between 20 and 32 Ω?
- YES** : Go to step 8E3.
- NO** : Go to step 8E10.

8E3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 15 — (B11) No. 1:



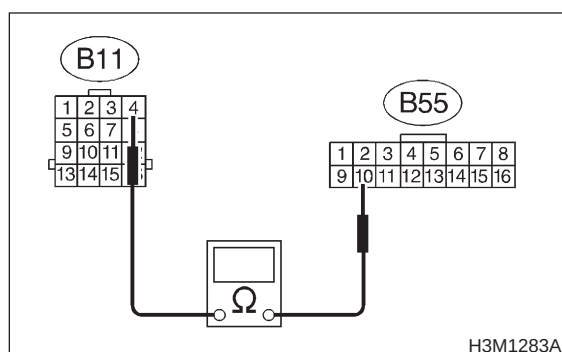
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 8E4.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8E4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:



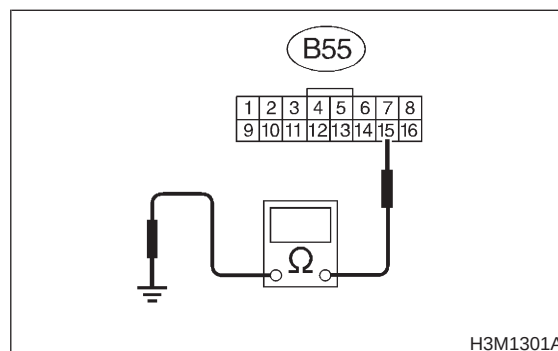
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 8E5.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8E5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B55) No. 15 — Chassis ground:



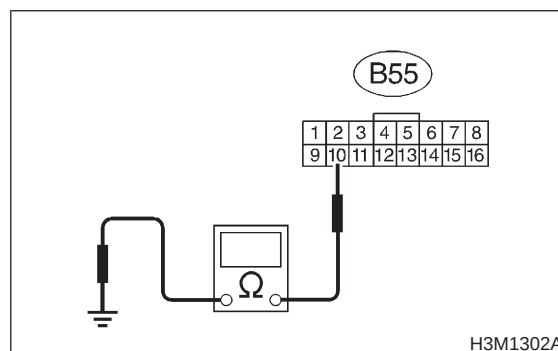
- CHECK** : Is the resistance more than 1 $M\Omega$?
- YES** : Go to step 8E6.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8E6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B55) No. 10 — Chassis ground:



- CHECK** : Is the resistance more than 1 $M\Omega$?
- YES** : Go to step 8E7.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8E7 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

Raise all wheels off ground.

- 4) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Move selector lever to "2", and slowly increase vehicle speed to 35 km/h (22 m/h).

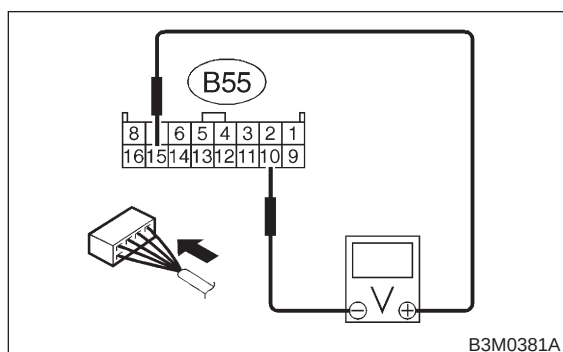
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 6) Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 15 (+) — No. 10 (-):



- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 8E8.
- NO** : Go to step 8E9.

8E8 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Move selector lever to "D", and slowly increase vehicle speed to 65 km/h (41 m/h).

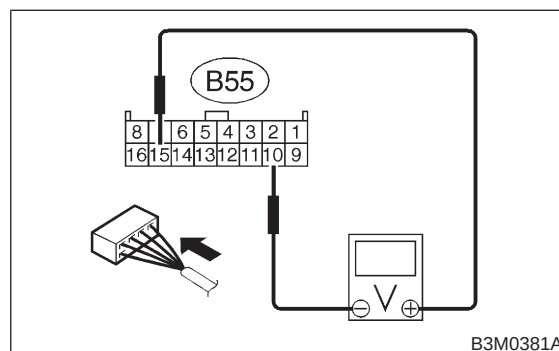
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 2) Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 15 (+) — No. 10 (-):



- CHECK** : Is the voltage more than 10 V?
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.
- NO** : Go to step 8E9.

8E9 : CHECK POOR CONTACT.

- CHECK** : Is there poor contact in shift solenoid 3 circuit?
- YES** : Repair poor contact.
- NO** : Replace TCM.

8E10 : CHECK SHIFT SOLENOID 3 (IN TRANSMISSION).

- 1) Remove transmission connector from bracket.
- 2) Lift-up or raise the vehicle and support with safety stand.

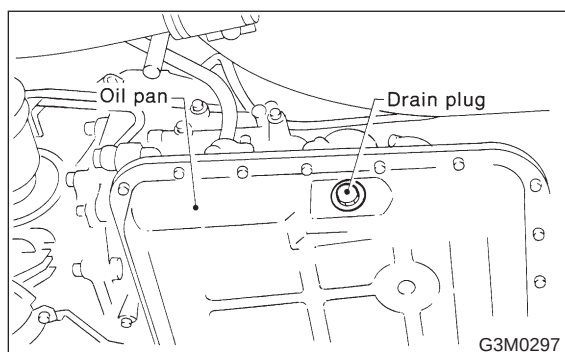
CAUTION:

Raise all wheels off ground.

- 3) Drain automatic transmission fluid.

CAUTION:

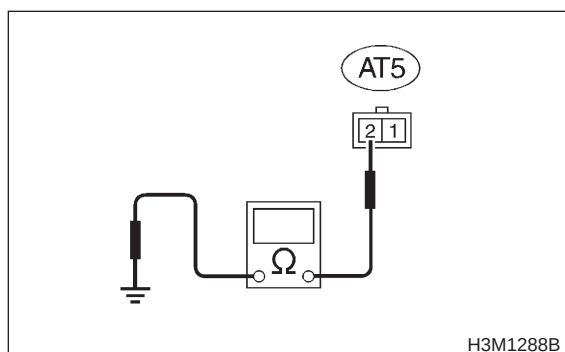
Do not drain the automatic transmission fluid until it cools down.



- 4) Remove oil pan, and disconnect connector from shift solenoid 3.
- 5) Measure resistance between shift solenoid 3 connector and transmission ground.

Connector & terminal

(AT5) No. 2 — Transmission ground:



CHECK : *Is the resistance between 20 and 32 Ω?*

YES : Go to step **8E11**.

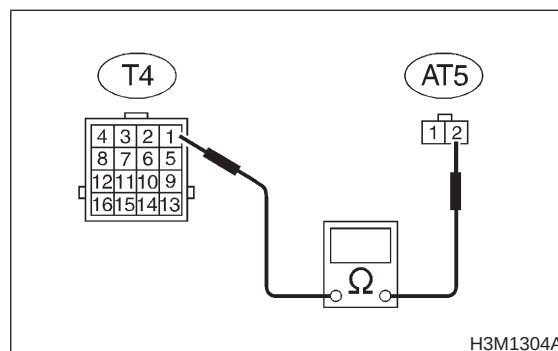
NO : Replace shift solenoid assembly.

8E11 : CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 3 AND TRANSMISSION.

Measure resistance of harness between shift solenoid 3 and transmission connector.

Connector & terminal

(AT5) No. 2 — (T4) No. 1:



CHECK : *Is the resistance less than 1 Ω?*

YES : Go to step **8E12**.

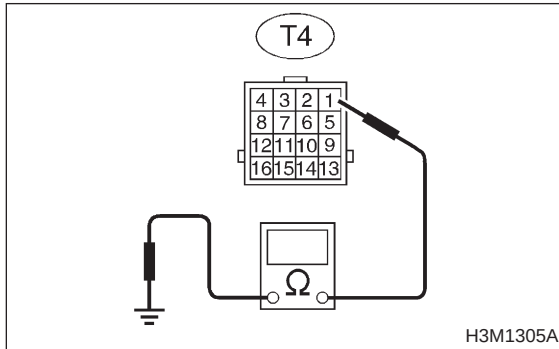
NO : Repair open circuit in harness between shift solenoid 3 and transmission connector.

8E12 : CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 3 AND TRANSMISSION.

Measure resistance of harness between shift solenoid 3 connector and transmission ground.

Connector & terminal

(T4) No. 1 — Transmission ground:



- CHECK** : **Is the resistance more than 1 MΩ?**
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in shift solenoid 3 and transmission.
- NO** : Repair short circuit harness between TCM and transmission connector.

MEMO:

F: TROUBLE CODE 14 — SHIFT SOLENOID 2 —

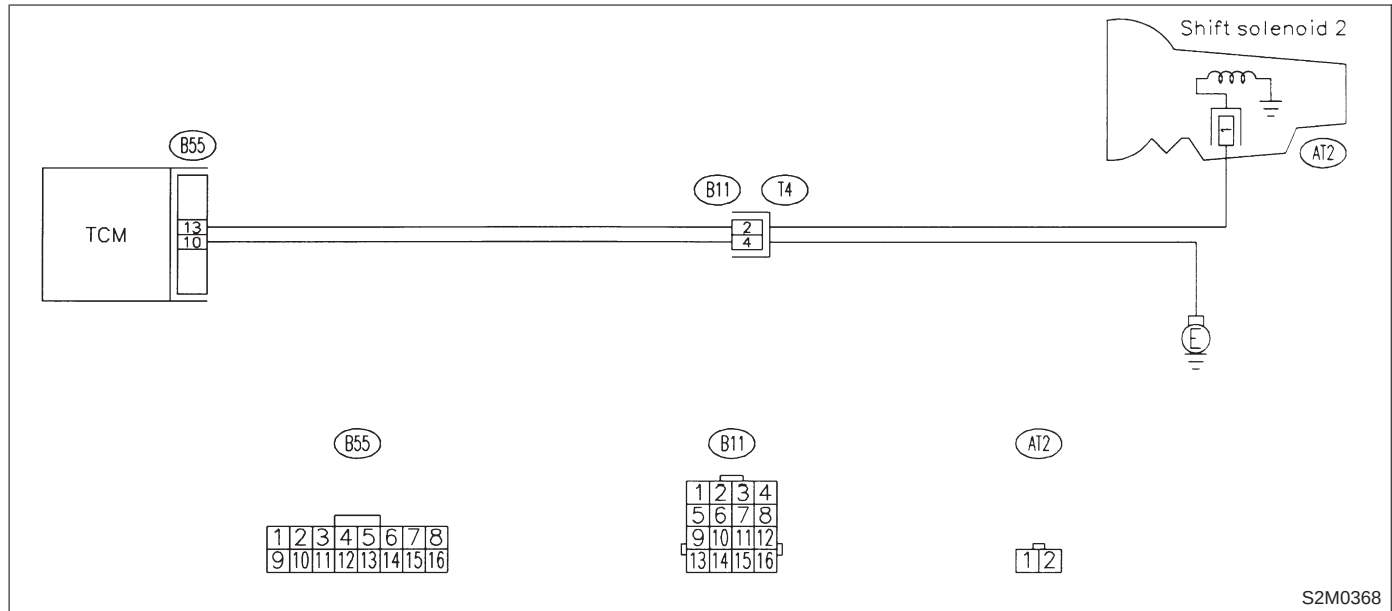
DIAGNOSIS:

Output signal circuit of shift solenoid 2 is open or shorted.

TROUBLE SYMPTOM:

Does not shift.

WIRING DIAGRAM:

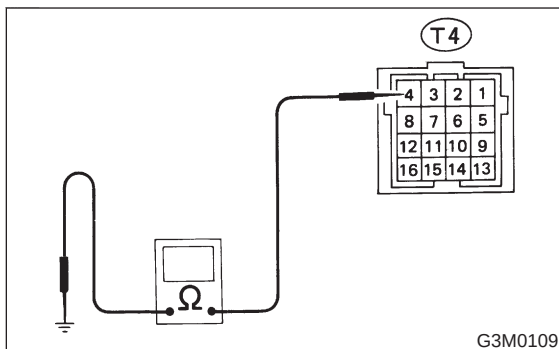


8F1 : CHECK SHIFT SOLENOID 2 GROUND LINE.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission.
- 4) Measure resistance between transmission connector and transmission ground.

Connector & terminal

(T4) No. 4 — Chassis ground:



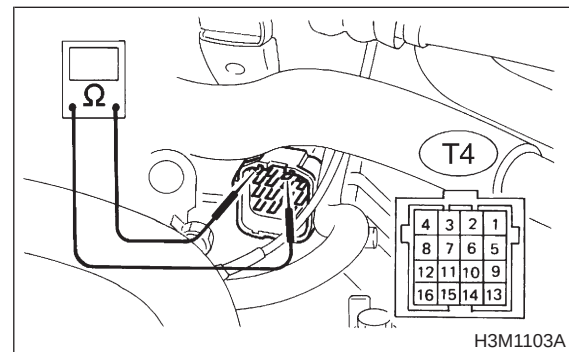
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8F2.
- NO** : Repair open circuit in transmission harness.

8F2 : CHECK SHIFT SOLENOID 2.

Measure resistance between transmission connector terminals.

Connector & terminal

(T4) No. 2 — No. 4:



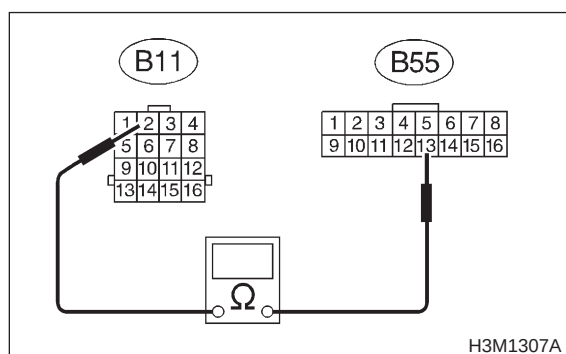
- CHECK** : Is the resistance between 20 and 32 Ω?
- YES** : Go to step 8F3.
- NO** : Go to step 8F9.

8F3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and shift solenoid 2 connector.

Connector & terminal

(B55) No. 13 — (B11) No. 2:



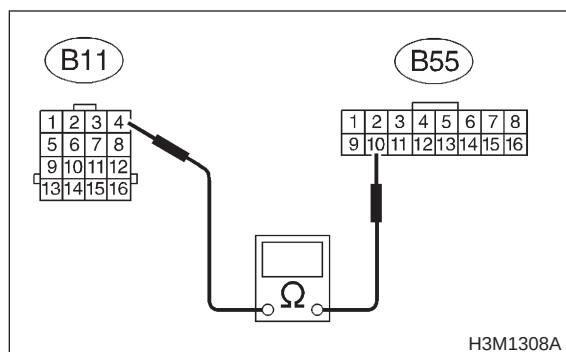
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 8F4.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8F4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and shift solenoid 2 connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:



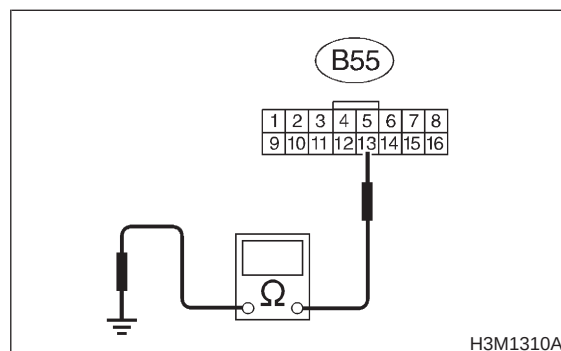
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 8F5.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8F5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B55) No. 13 — Chassis ground:



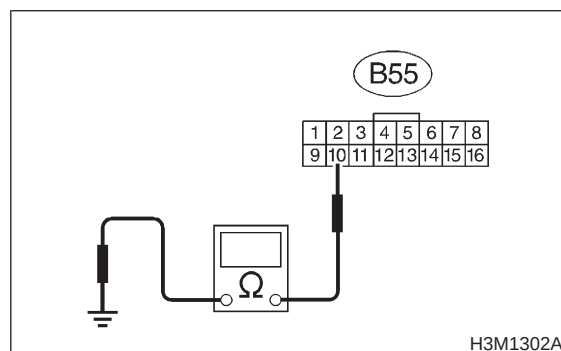
- CHECK** : Is the resistance more than 1 $M\Omega$?
- YES** : Go to step 8F6.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8F6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B55) No. 10 — Chassis ground:



- CHECK** : Is the resistance more than 1 $M\Omega$?
- YES** : Go to step 8F7.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8F7 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

Raise all wheels off ground.

- 4) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Move selector lever to "D", and slowly increase vehicle speed to 50 km/h (31 m/h).

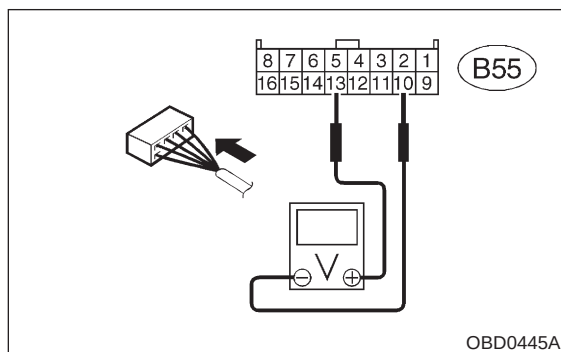
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 6) Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 13 (+) — No. 10 (-):



- CHECK** : Is the voltage 9 V → 1 V?
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.
- NO** : Go to step **8F8**.

8F8 : CHECK POOR CONTACT.

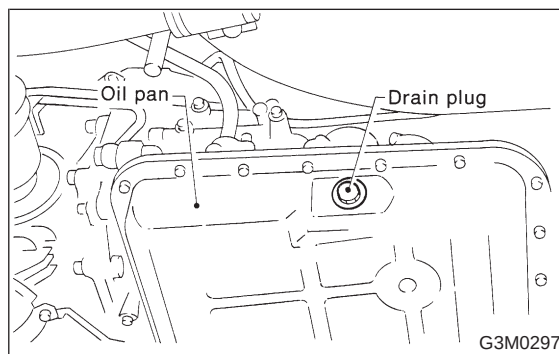
- CHECK** : Is there poor contact in shift solenoid 2 circuit?
- YES** : Repair poor contact.
- NO** : Replace TCM.

8F9 : CHECK SHIFT SOLENOID 2 (IN TRANSMISSION).

- 1) Remove transmission connector from bracket.
- 2) Drain automatic transmission fluid.

CAUTION:

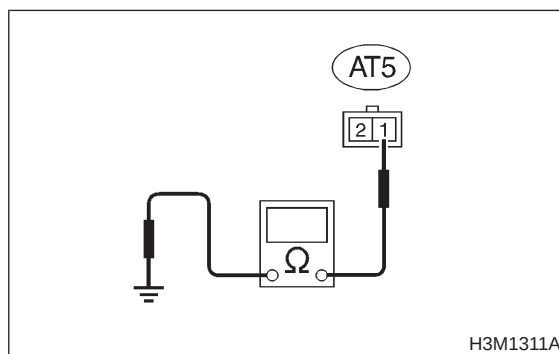
Do not drain the automatic transmission fluid until it cools down.



- 3) Remove oil pan, and disconnect connector from shift solenoid 2.
- 4) Measure resistance between shift solenoid 2 connector and transmission ground.

Connector & terminal

(AT2) No. 1 — Transmission ground:



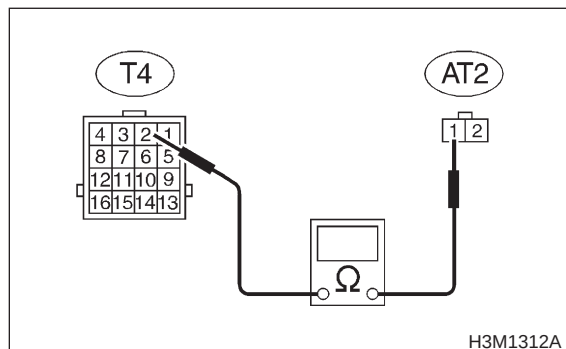
- CHECK** : Is the resistance between 20 and 32 Ω?
- YES** : Go to step **8F10**.
- NO** : Replace shift solenoid assembly.

8F10 : CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.

Measure resistance of harness between shift solenoid 2 and transmission connector.

Connector & terminal

(AT2) No. 1 — (T4) No. 2:



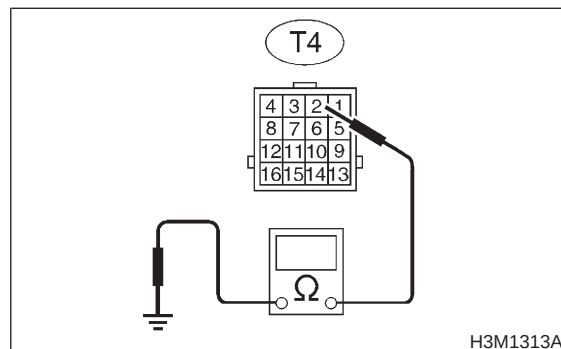
- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Go to step **8F11**.
- NO** : Repair open circuit in harness between shift solenoid 2 and transmission connector.

8F11 : CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.

Measure resistance of harness between shift solenoid 2 connector and transmission ground.

Connector & terminal

(T4) No. 2 — Transmission ground:



- CHECK** : **Is the resistance more than 1 $M\Omega$?**
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.
- NO** : Repair short circuit harness between TCM and transmission connector.

G: TROUBLE CODE 15 — SHIFT SOLENOID 1 —

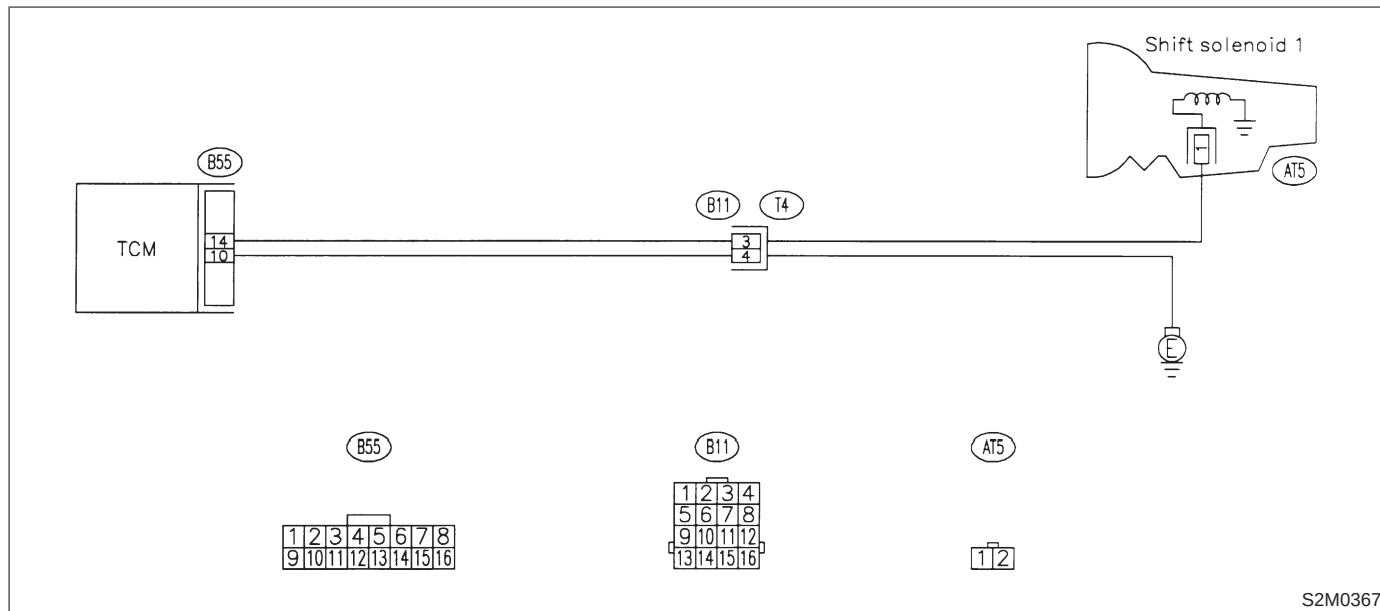
DIAGNOSIS:

Output signal circuit of shift solenoid 1 is open or shorted.

TROUBLE SYMPTOM:

Does not shift.

WIRING DIAGRAM:

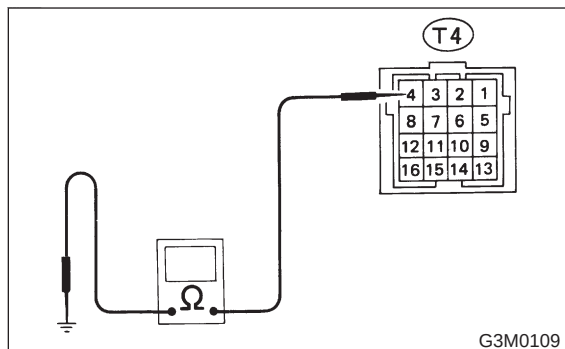


8G1 : CHECK SHIFT SOLENOID 1 GROUND LINE.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission.
- 4) Measure resistance between transmission connector and transmission ground.

Connector & terminal

(T4) No. 4 — Chassis ground:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8G2.
- NO** : Repair open circuit in transmission harness.

8G2 : CHECK SHIFT SOLENOID 1.

Measure resistance between transmission connector terminals.

Connector & terminal

(T4) No. 3 — No. 4:



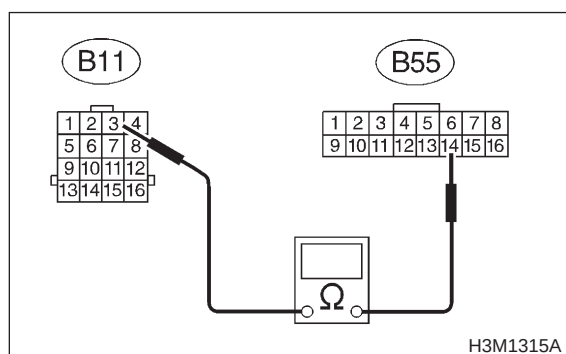
- CHECK** : Is the resistance between 20 and 32 Ω?
- YES** : Go to step 8G3.
- NO** : Go to step 8G9.

8G3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and shift solenoid 1 connector.

Connector & terminal

(B55) No. 14 — (B11) No. 3:



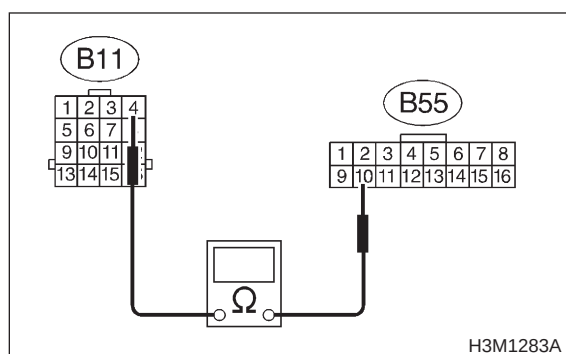
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8G4.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8G4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and shift solenoid 1 connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:



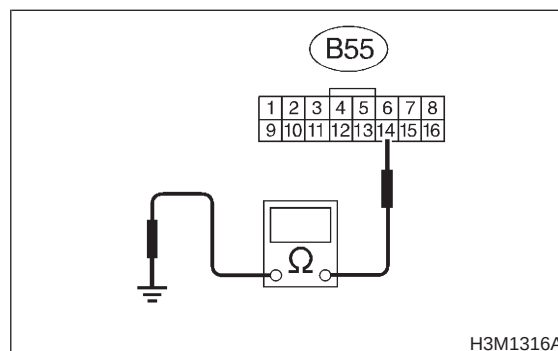
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8G5.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8G5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B55) No. 14 — Chassis ground:



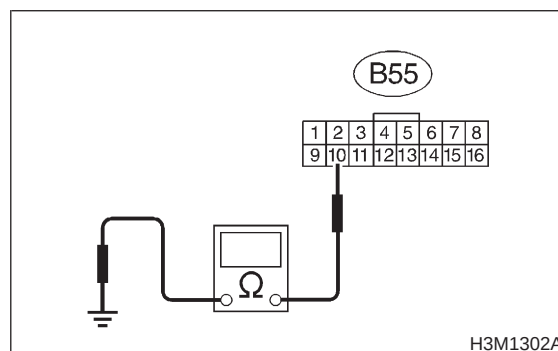
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8G6.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8G6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness TCM connector and transmission ground.

Connector & terminal

(B55) No. 10 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8G7.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8G7 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

Raise all wheels off ground.

- 4) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Move selector lever to "D", and slowly increase vehicle speed to 50 km/h (31 m/h).

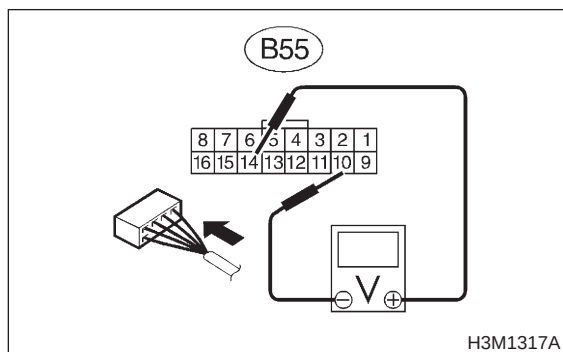
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 6) Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 14 (+) — No. 10 (-):



- (CHECK)** : **Is the voltage 1 V → 9 V?**
- (YES)** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.
- (NO)** : Go to step **8G8**.

8G8 : CHECK POOR CONTACT.

- (CHECK)** : **Is there poor contact in shift solenoid 1 circuit?**
- (YES)** : Repair poor contact.
- (NO)** : Replace TCM.

8G9 : CHECK SHIFT SOLENOID 1 (IN TRANSMISSION).

- 1) Remove transmission connector from bracket.
- 2) Lift-up or raise the vehicle and support with safety stand.

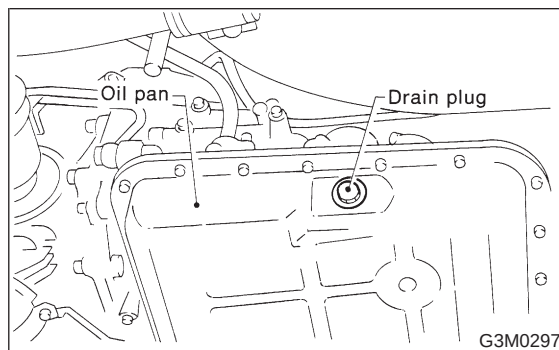
CAUTION:

Raise all wheels off ground.

- 3) Drain automatic transmission fluid.

CAUTION:

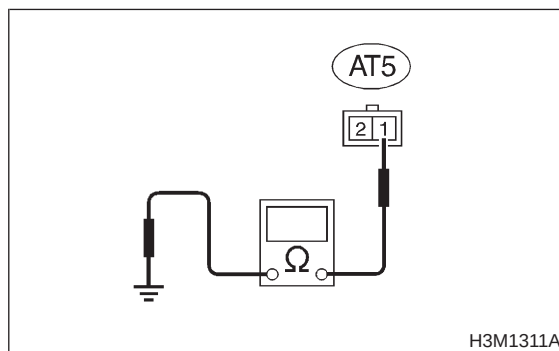
Do not drain the automatic transmission fluid until it cools down.



- 4) Remove oil pan, and disconnect connector from shift solenoid 1.
- 5) Measure resistance between shift solenoid 1 connector and transmission ground.

Connector & terminal

(AT5) No. 1 — Transmission ground:



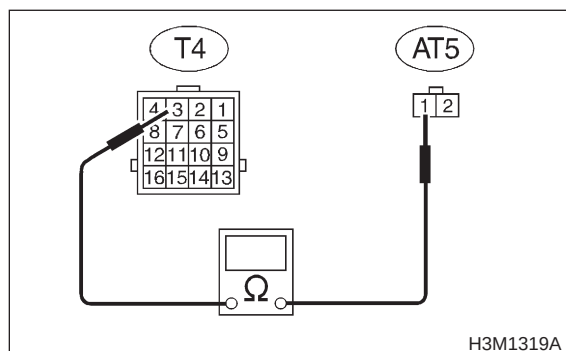
- (CHECK)** : **Is the resistance between 20 and 32 Ω?**
- (YES)** : Go to step **8G10**.
- (NO)** : Replace shift solenoid assembly.

8G10 : CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.

Measure resistance of harness between shift solenoid 1 and transmission connector.

Connector & terminal

(AT5) No. 1 — (T4) No. 3:



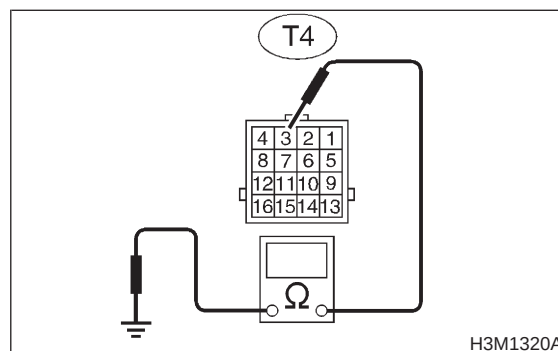
- CHECK** : **Is the resistance less than 1 Ω?**
- YES** : Go to step **8G11**.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8G11 : CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.

Measure resistance of harness between shift solenoid 1 connector and transmission ground.

Connector & terminal

(T4) No. 3 — Transmission ground:



- CHECK** : **Is the resistance more than 1 MΩ?**
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in shift solenoid 1 and transmission.
- NO** : Repair short circuit harness between TCM and transmission connector.

H: TROUBLE CODE 21 — ATF TEMPERATURE SENSOR —

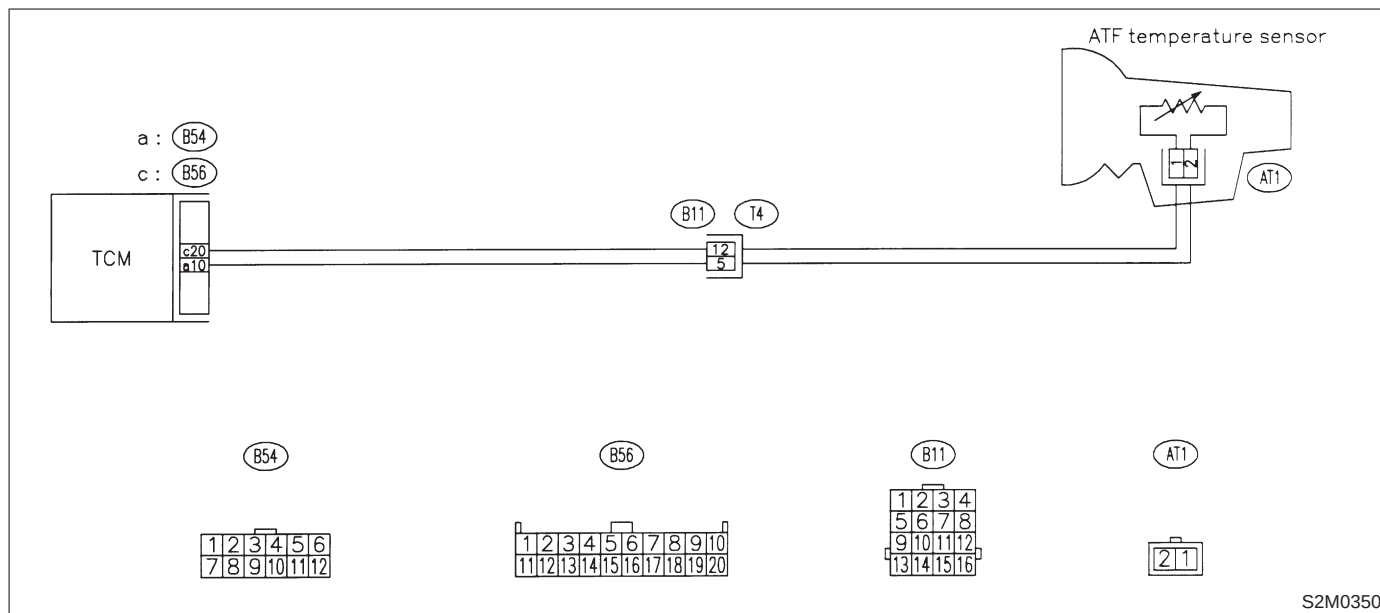
DIAGNOSIS:

Input signal circuit of TCM to ATF temperature sensor is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



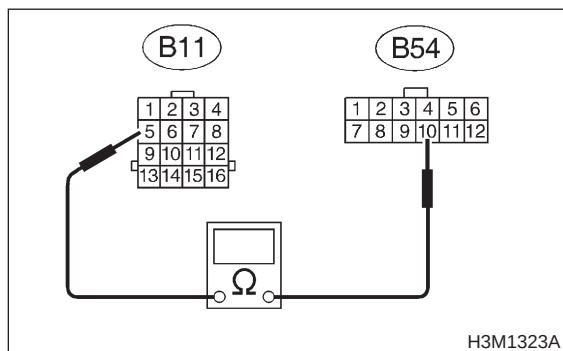
S2M0350

8H1 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission and TCM.
- 4) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B54) No. 10 — (B11) No. 5:



H3M1323A

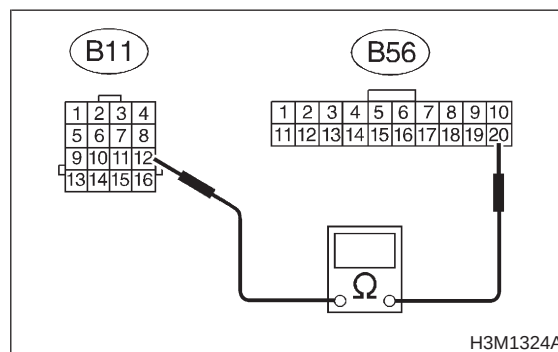
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8H2.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8H2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B56) No. 20 — (B11) No. 12:



H3M1324A

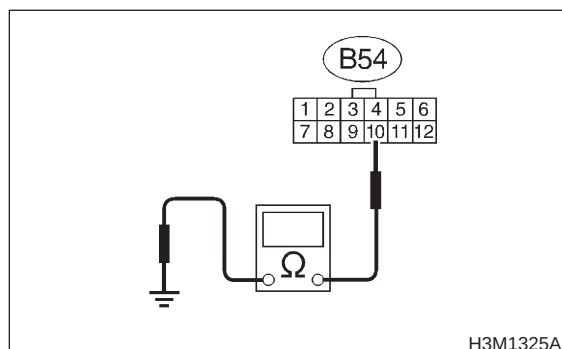
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8H3.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8H3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B54) No. 10 — Chassis ground:



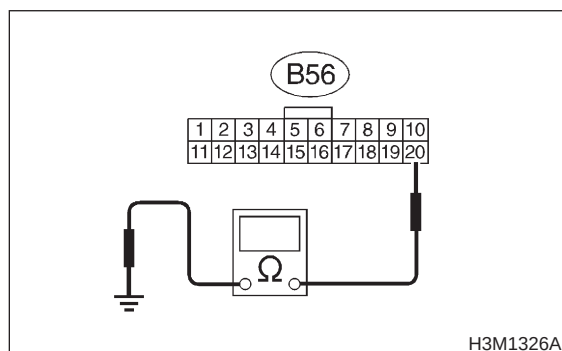
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8H4.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8H4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.

Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal

(B56) No. 20 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8H5.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8H5 : CHECK ATF TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to transmission and TCM.
- 3) Turn ignition switch to ON and start engine.
- 4) Warm-up the transmission until ATF temperature reaches to 80°C (176°F).

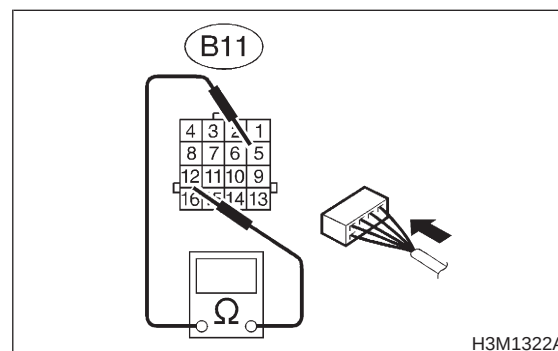
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Measure resistance between transmission connector terminals.

Connector & terminal

(B11) No. 12 — No. 5:



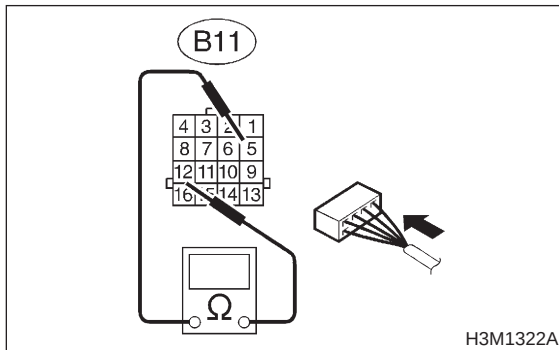
- CHECK** : Is the resistance between 272 and 374 Ω?
- YES** : Go to step 8H6.
- NO** : Go to step 8H13.

8H6 : CHECK ATF TEMPERATURE SENSOR.

- 1) Turn ignition switch to ON (engine OFF).
- 2) Measure resistance between transmission connector terminals.

Connector & terminal

(B11) No. 12 — No. 5:



CHECK : Does the resistance value increase while the ATF temperature decreases?

YES : Go to step 8H7.

NO : Go to step 8H13.

8H7 : PREPARE SUBARU SELECT MONITOR.

CHECK : Do you have a Subaru Select Monitor?

YES : Go to step 8H10.

NO : Go to step 8H8.

8H8 : CHECK INPUT SIGNAL FOR TCM.

- 1) Warm-up the transmission until ATF temperature is about 80°C (176°F).

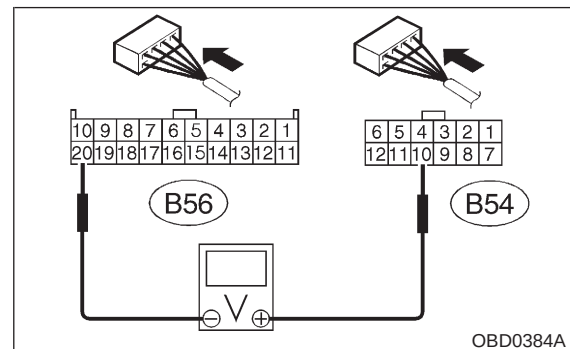
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 2) Measure voltage between TCM connector terminal.

Connector & terminal

(B54) No. 10 (+) — (B56) No. 20 (-):



CHECK : Is the voltage between 2.9 and 4.0 V?

YES : Go to step 8H9.

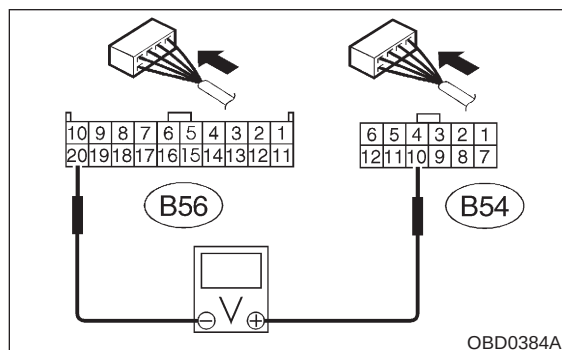
NO : Go to step 8H12.

8H9 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to ON (engine OFF).
- 2) Measure voltage between TCM connector terminal.

Connector & terminal

(B54) No. 10 (+) — (B56) No. 20 (-):



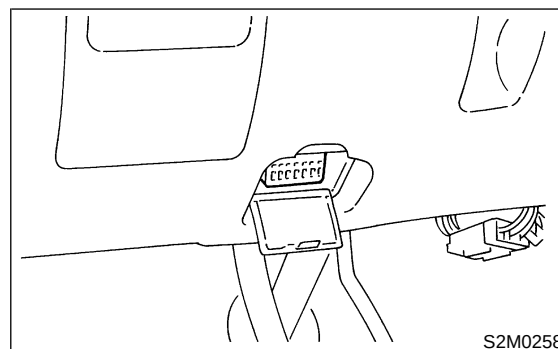
CHECK : **Is the voltage between 1.0 and 1.4 V?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.

NO : Go to step **8H12**.

8H10 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Start the engine, and turn Subaru Select Monitor switch to ON.
- 5) Warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 6) Read data of ATF temperature using Subaru Select Monitor.

● ATF temperature is indicated in "°F" or "°C".

CHECK : **Is the ATF temperature between 70 and 110°C (158 and 230°F).**

YES : Go to step **8H11**.

NO : Go to step **8H12**.

8H11 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

Turn ignition switch to ON (engine OFF).

CHECK : **Does the ATF temperature gradually decrease?**

YES : Even if "AT OIL TEMP" light up, the circuit has returned to a normal condition at this time. Temporary poor contact of the connector or harness may be the case. Repair harness or contact in the ATF temperature sensor and transmission connector.

NO : Go to step **8H12**.

8H12 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in ATF temperature sensor circuit?*

YES : Repair poor contact.

NO : Replace TCM.

8H13 : CHECK ATF TEMPERATURE SENSOR (IN TRANSMISSION).

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Lift-up the vehicle and place safety stand.

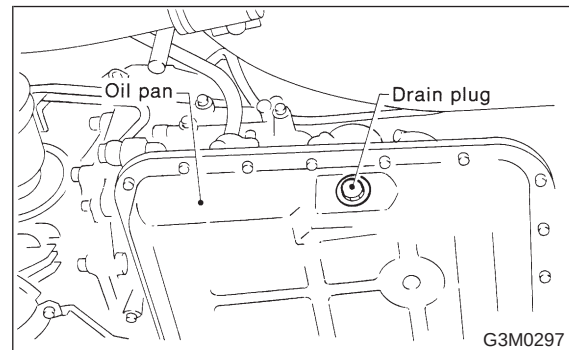
CAUTION:

Make sure that all wheels are raised off floor.

- 5) Drain automatic transmission fluid.

CAUTION:

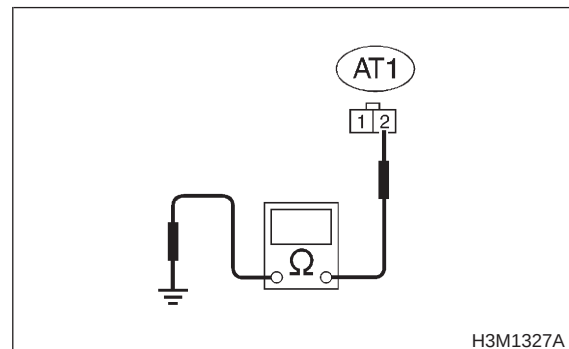
Do not drain the automatic transmission fluid until it cools down.



- 6) Remove oil pan, and disconnect connector from ATF temperature sensor connector.
- 7) Measure resistance between ATF temperature sensor connector and transmission ground.

Connector & terminal

(AT1) No. 2 — Transmission ground:



CHECK : *Is the resistance between 1.5 and 4.5 Ω ?*

YES : Go to step 8H14.

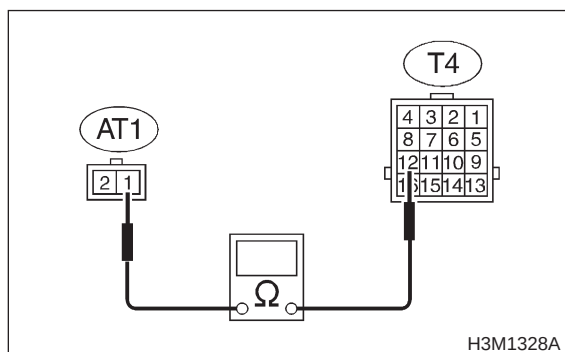
NO : Replace ATF temperature sensor.

8H14 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.

- 1) Disconnect connector from transmission.
- 2) Measure resistance of harness between ATF temperature sensor and transmission connector.

Connector & terminal

(T4) No. 12 — (AT1) No. 1:



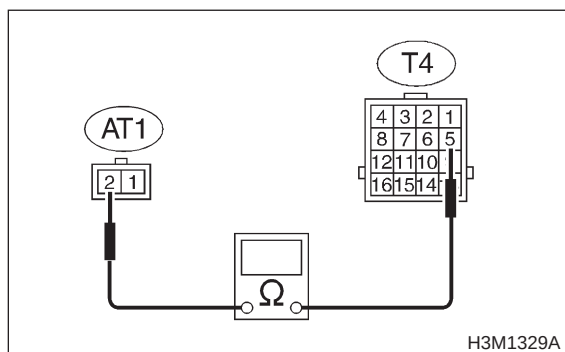
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8H15.
- NO** : Repair open circuit in harness between ATF temperature sensor and transmission connector.

8H15 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.

Measure resistance of harness between ATF temperature sensor and transmission connector.

Connector & terminal

(T4) No. 5 — (AT1) No. 2:



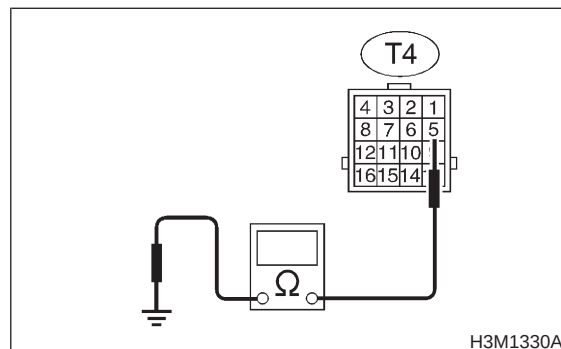
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8H16.
- NO** : Repair open circuit in harness between ATF temperature sensor and transmission connector.

8H16 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.

Measure resistance of harness between transmission connector and transmission ground.

Connector & terminal

(T4) No. 5 — Transmission ground:



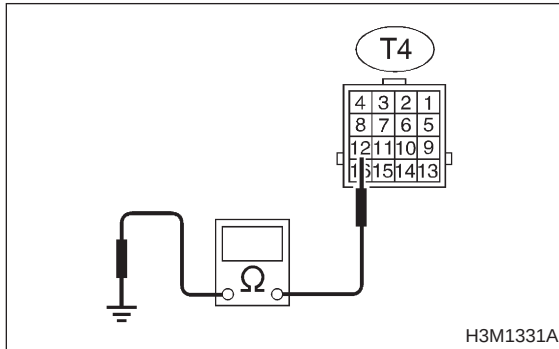
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8H17.
- NO** : Repair short circuit in harness between ATF temperature sensor and transmission connector.

8H17 : CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.

Measure resistance of harness between transmission connector and transmission ground.

Connector & terminal

(T4) No. 12 — Transmission ground:



CHECK : **Is the resistance more than 1 MΩ?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the ATF temperature sensor and transmission connector.

NO : Repair short circuit in harness between ATF temperature sensor and transmission connector.

MEMO:

I: TROUBLE CODE 22 — MASS AIR FLOW SIGNAL —

DIAGNOSIS:

Input signal circuit of TCM from ECM is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:

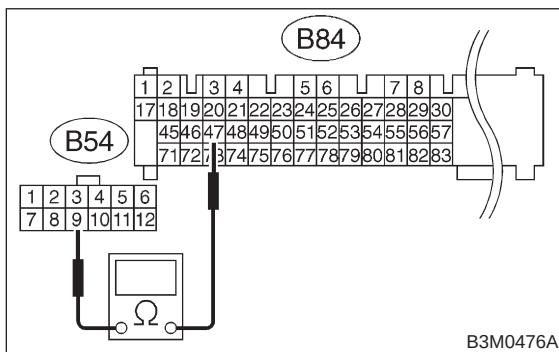


8I1 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness between TCM and ECM connector.

Connector & terminal

(B54) No. 9 — (B84) No. 47:



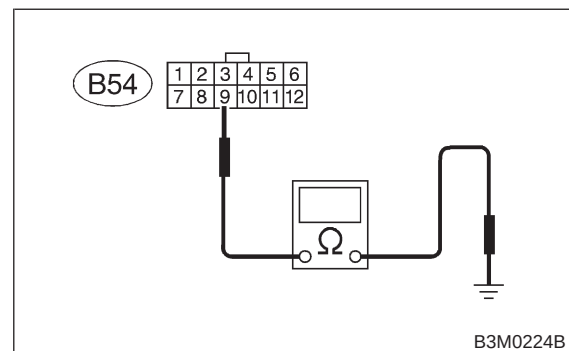
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8I2.
- NO** : Repair open circuit in harness between TCM and ECM connector.

8I2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal

(B54) No. 9 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8I3.
- NO** : Repair short circuit in harness between TCM and ECM connector.

813 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step **815**.

NO : Go to step **814**.

814 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and ECM.
- 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

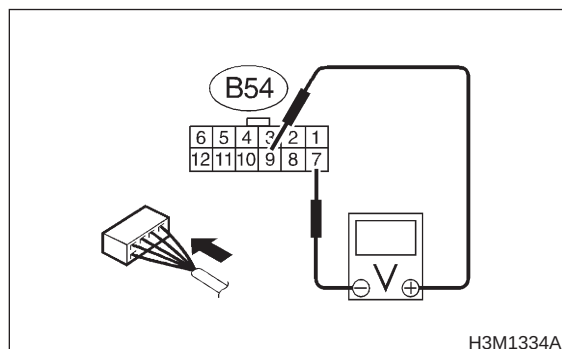
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Engine idling.
- 4) Measure voltage between TCM connectors.

Connector & terminal

(B54) No. 9 (+) — No. 7 (-):



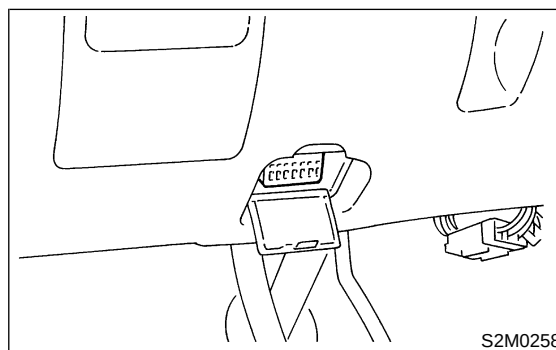
CHECK : *Is the voltage between 0.5 and 1.2 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step **816**.

815 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to OFF.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Start the engine, and turn Subaru Select monitor switch to ON.
- 5) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
- 6) Engine idling.
- 7) Read data of mass air flow signal using Subaru Select Monitor.

● Display shows mass air flow signal value sent from ECM.

CHECK : *Is the value between 0.5 and 1.2 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step **816**.

816 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in mass air flow signal circuit?*

YES : Repair poor contact.

NO : Replace TCM.

J: TROUBLE CODE 23 — ENGINE SPEED SIGNAL —

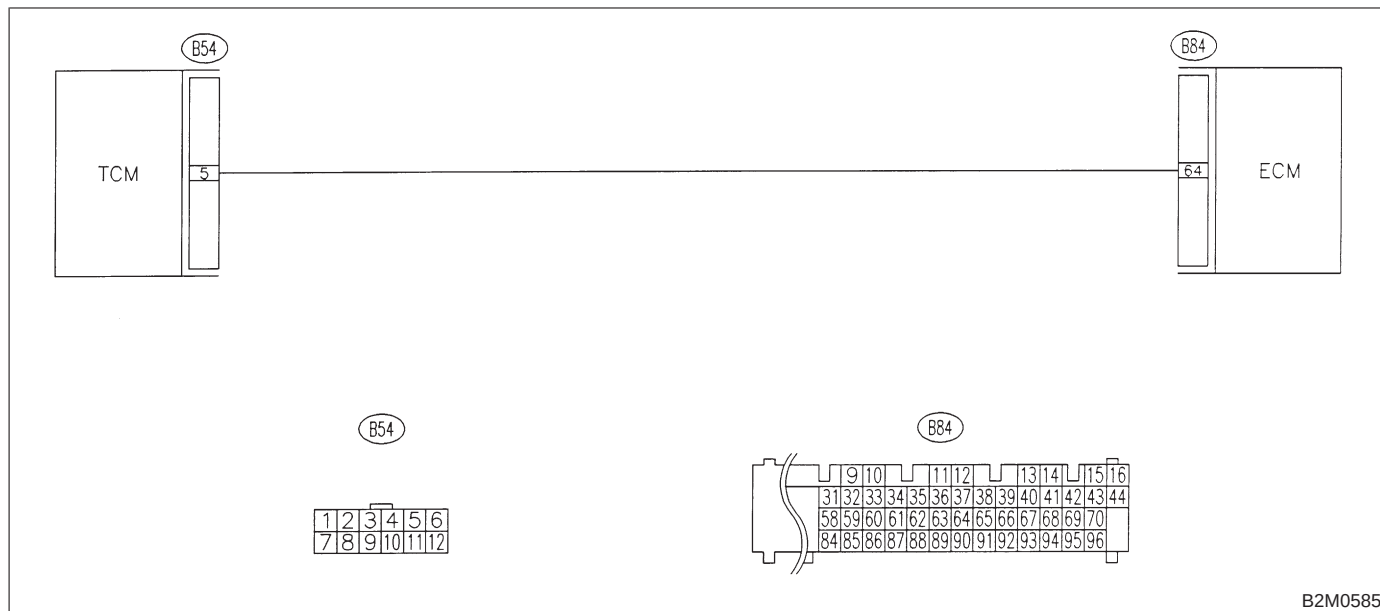
DIAGNOSIS:

Engine speed input signal circuit is open or shorted.

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up).
- AT OIL TEMP indicator remains on when vehicle speed is "0".

WIRING DIAGRAM:

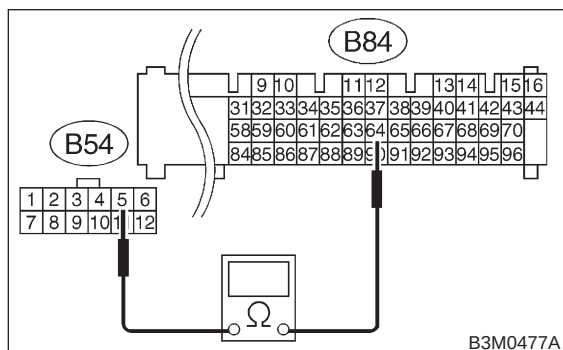


8J1 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness between TCM and ECM connector.

Connector & terminal

(B54) No. 5 — (B84) No. 64:



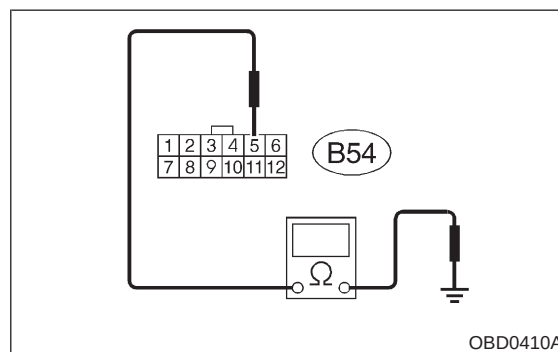
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8J2.
- NO** : Repair open circuit in harness between TCM and ECM connector.

8J2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal

(B54) No. 5 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8J3.
- NO** : Repair short circuit in harness between TCM and ECM connector.

8J3 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step **8J5**.

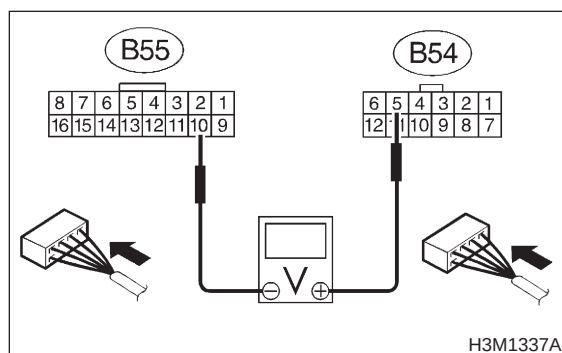
NO : Go to step **8J4**.

8J4 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to ON (engine OFF).
- 3) Measure voltage between TCM connectors.

Connector & terminal

(B54) No. 5 (+) — (B55) No. 10 (-):



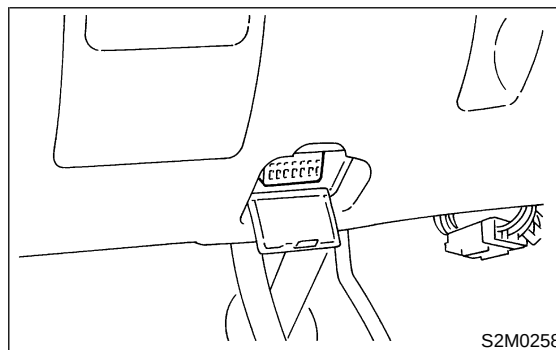
CHECK : *Is the voltage more than 10.5 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step **8J6**.

8J5 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and ECM.
- 2) Connect Subaru Select Monitor to data link connector.



- 3) Start the engine, and turn Subaru Select Monitor switch to ON.
 - 4) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
 - 5) Engine idling.
 - 6) Read data of engine speed using Subaru Select Monitor.
- Display shows engine speed signal value sent from ECM.

CHECK : *Is the revolution value the same as the tachometer reading shown on the combination meter?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step **8J6**.

8J6 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in engine speed signal circuit?*

YES : Repair poor contact.

NO : Go to step **8J7**.

8J7 : CONFIRM TROUBLE CODE 23.

CHECK : *Replace ECM with a new one. Does the trouble code appear again, after the memory has been cleared?*

YES : Replace TCM.

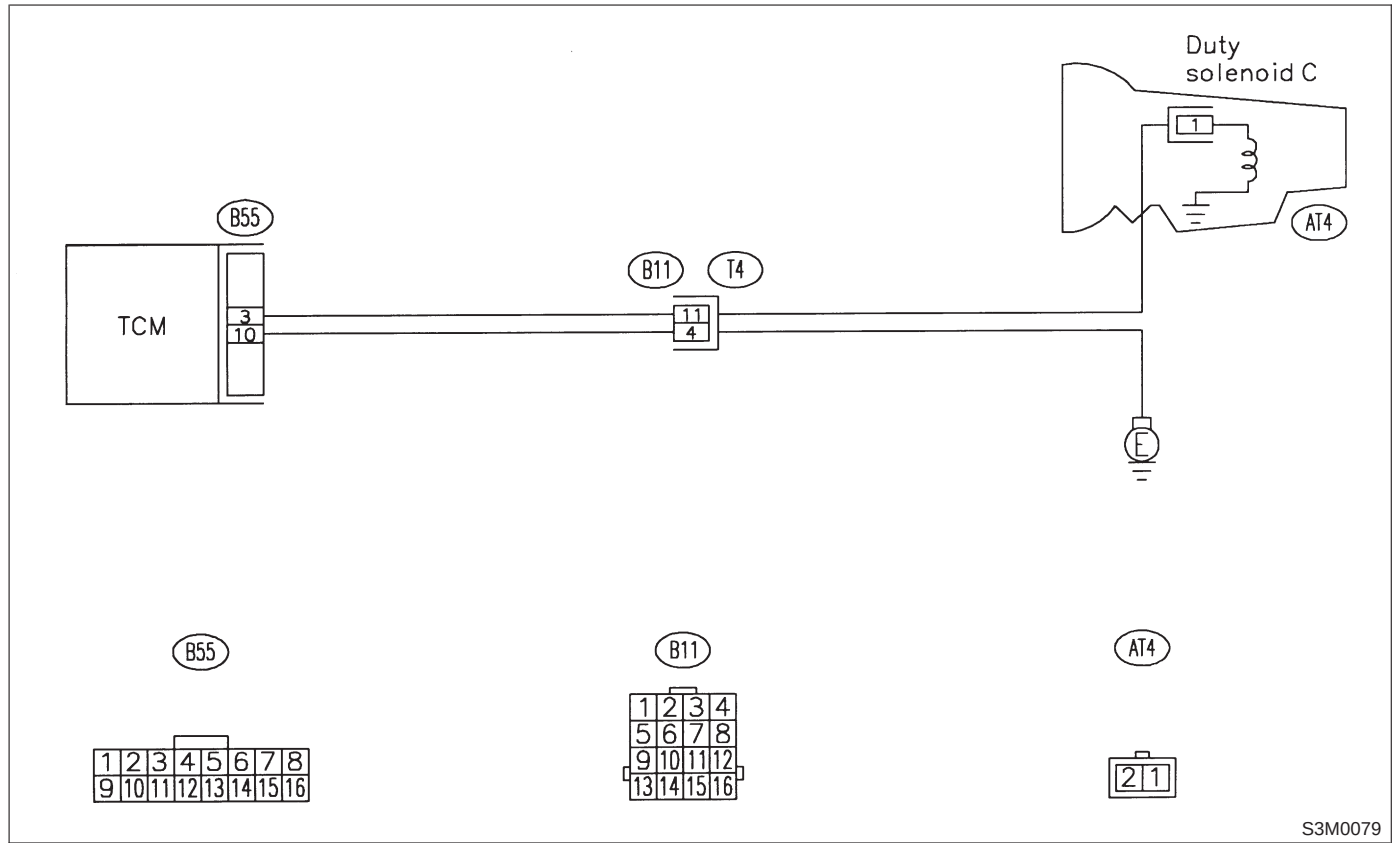
NO : Replace ECM.

K: TROUBLE CODE 24 — DUTY SOLENOID C —

DIAGNOSIS:
 Output signal circuit of duty solenoid C is open or shorted.

TROUBLE SYMPTOM:
 Excessive “braking” in tight corners.

WIRING DIAGRAM:



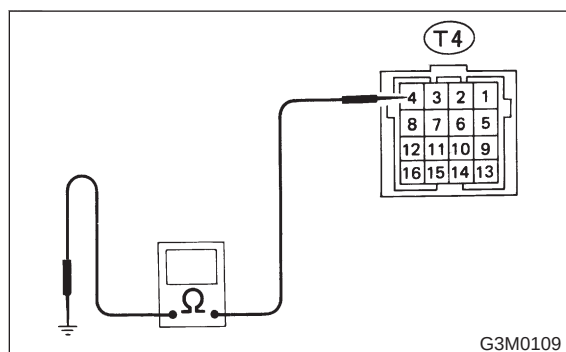
S3M0079

8K1 : CHECK DUTY SOLENOID C GROUND LINE.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission.
- 4) Measure resistance between transmission connector and transmission ground.

Connector & terminal

(T4) No. 4 — Chassis ground:



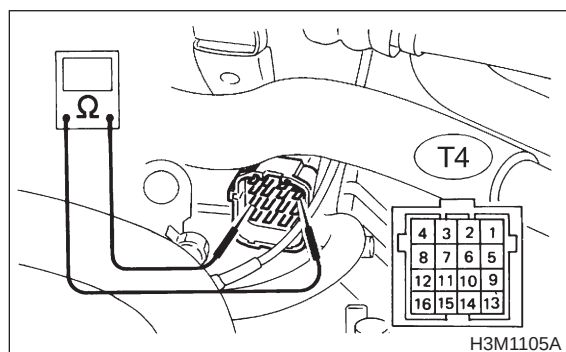
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8K2.
- NO** : Repair open circuit in transmission harness.

8K2 : CHECK DUTY SOLENOID C.

Measure resistance between transmission connector and transmission terminals.

Connector & terminal

(T4) No. 11 — No. 4:



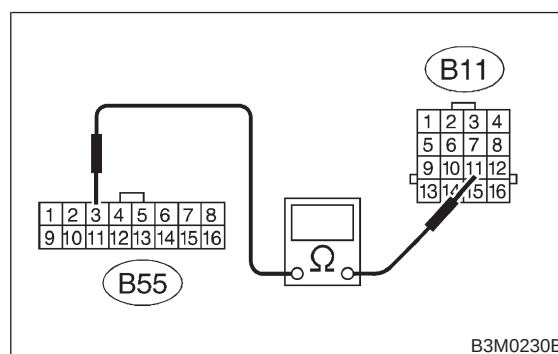
- CHECK** : Is the resistance between 9 and 17 Ω?
- YES** : Go to step 8K3.
- NO** : Go to step 8K13.

8K3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B55) No. 3 — (B11) No. 11:



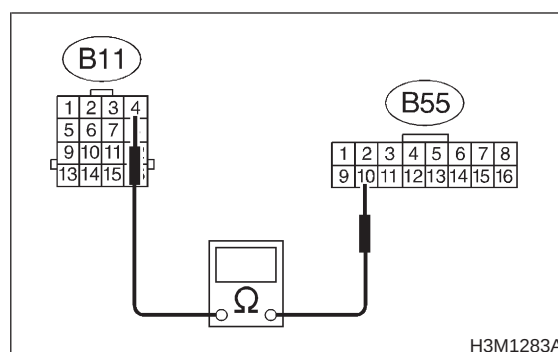
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8K4.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8K4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance harness connector between TCM and transmission connector.

Connector & terminal

(B55) No. 10 — (B11) No. 4:

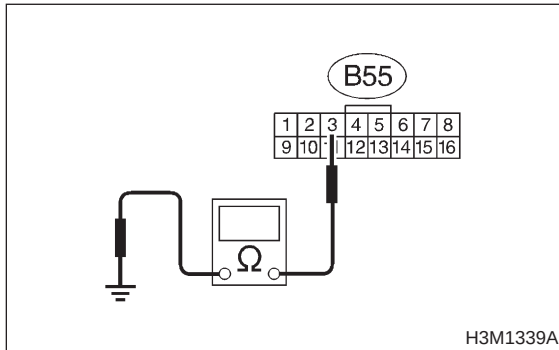


- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8K5.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8K5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance harness connector between TCM and chassis ground.

Connector & terminal
(B55) No. 3 — Chassis ground:

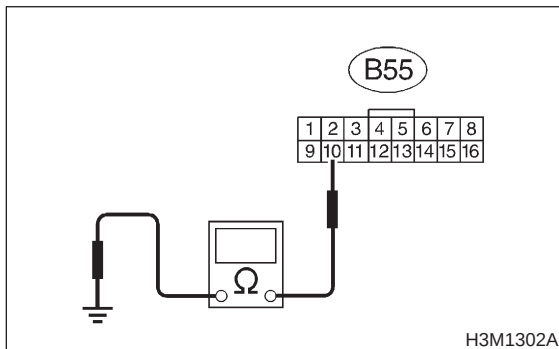


- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8K6.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8K6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance harness connector between TCM and chassis ground.

Connector & terminal
(B55) No. 10 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8K7.
- NO** : Repair short circuit in harness between TCM and transmission connector.

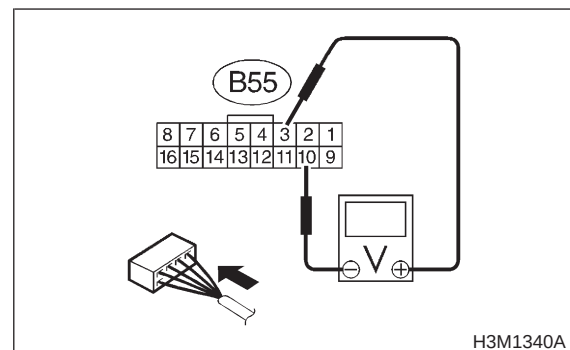
8K7 : PREPARE SUBARU SELECT MONITOR.

- CHECK** : Do you have a Subaru Select Monitor?
- YES** : Go to step 8K10.
- NO** : Go to step 8K8.

8K8 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Turn ignition switch to ON (engine OFF).
- 4) Throttle is fully closed.
- 5) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 3 (+) — No. 10 (-):



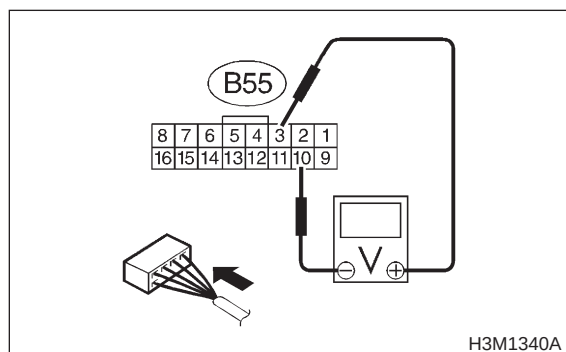
- CHECK** : Is the voltage less than 1 V in "P" range?
- YES** : Go to step 8K9.
- NO** : Go to step 8K12.

8K9 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 3 (+) — No. 10 (-):



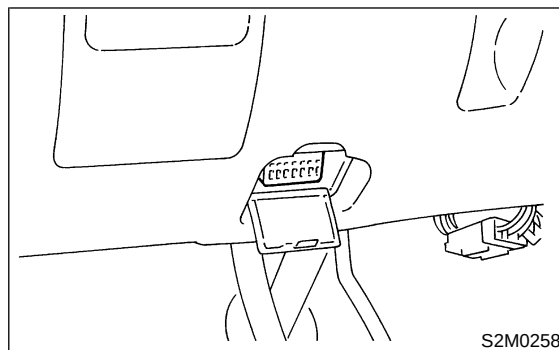
CHECK : **Is the voltage between 5 and 7 V in "D" range?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the duty solenoid C and TCM connector.

NO : Go to step **8K12**.

8K10 : CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Turn ignition switch to ON (engine OFF) and turn Subaru Select Monitor switch to ON.
- 5) Move selector lever to "D" with throttle fully open (vehicle speed 0 km/h or 0 m/h).
- 6) Read data of duty solenoid C using Subaru Select Monitor.

- Duty solenoid C is indicated in "%".

CHECK : **Is the value between 5 and 10%?**

YES : Go to step **8K11**.

NO : Go to step **8K12**.

8K11 : CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.

- 1) Set FWD mode.
- 2) Throttle fully closed.

CHECK : **Is the value 95%?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the duty solenoid C and TCM connector.

NO : Go to step **8K12**.

8K12 : CHECK POOR CONTACT.

CHECK : **Is there poor contact in duty solenoid C circuit?**

YES : Repair poor contact.

NO : Replace TCM.

8K13 : CHECK DUTY SOLENOID C (IN TRANSMISSION).

1) Lift-up the vehicle and place safety stand.

CAUTION:

Make sure that all wheels are raised off floor.

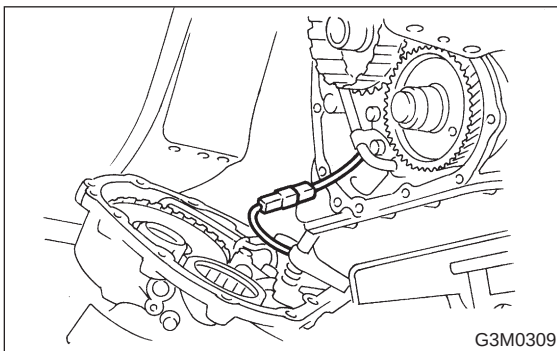
2) Drain automatic transmission fluid.

CAUTION:

Do not drain the automatic transmission fluid until it cools down.

3) Remove extension case, and disconnect connector from duty solenoid C.

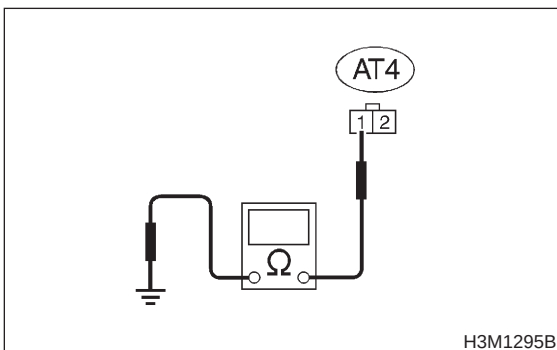
<Ref. to 3-2 [W6A0].>



4) Measure resistance between duty solenoid C connector and transmission ground.

Connector & terminal

(AT4) No. 1 — Transmission ground:



CHECK : Is the resistance between 9 and 17 Ω?

YES : Go to step 8K14.

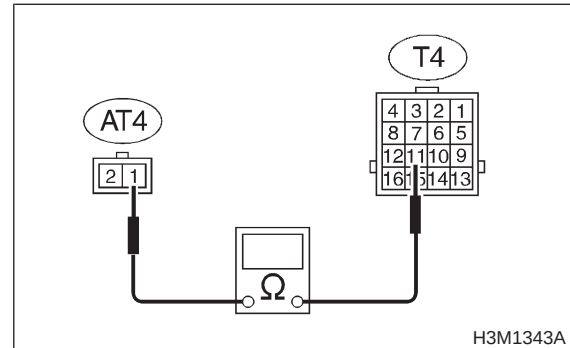
NO : Replace duty solenoid C.

8K14 : CHECK HARNESS CONNECTOR BETWEEN DUTY SOLENOID C AND TRANSMISSION.

Measure resistance of harness between duty solenoid C and transmission connector.

Connector & terminal

(T4) No. 11 — (AT4) No. 1:



CHECK : Is the resistance less than 1 Ω?

YES : Go to step 8K15.

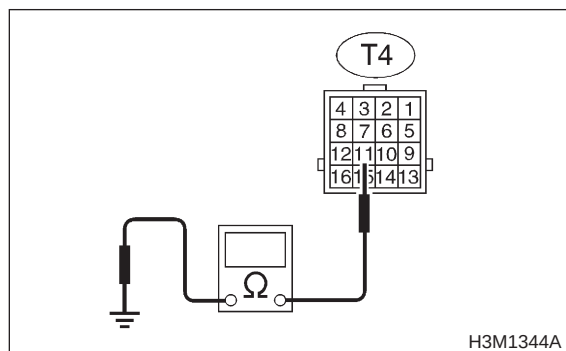
NO : Repair open circuit in harness between duty solenoid C and transmission connector.

**8K15 : CHECK HARNESS CONNECTOR
BETWEEN DUTY SOLENOID C AND
TRANSMISSION.**

Measure resistance of harness between transmis-
sion connector and transmission ground.

Connector & terminal

(T4) No. 11 — Transmission ground:



CHECK : **Is the resistance more than 1 MΩ?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the duty solenoid C and transmission connector.

NO : Repair short circuit in harness between duty solenoid C and transmission connector.

L: TROUBLE CODE 25 — TORQUE CONTROL SIGNAL —

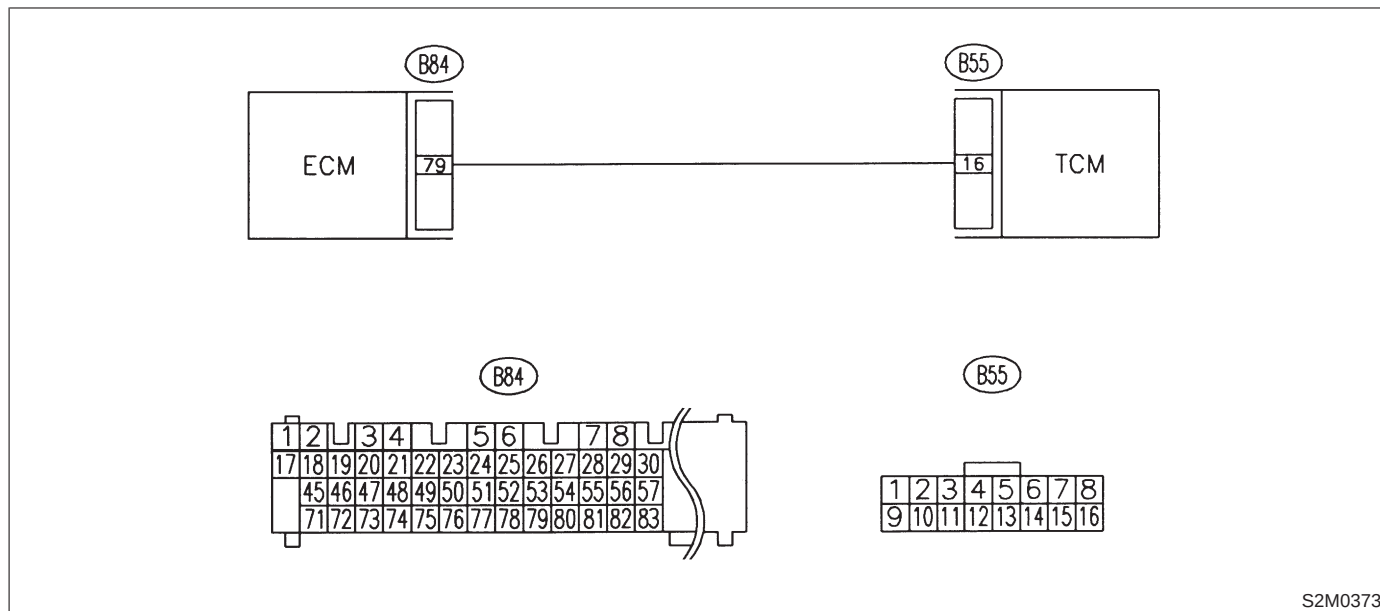
DIAGNOSIS:

- Torque control signal is not emitted from TCM.
- The signal circuit is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:

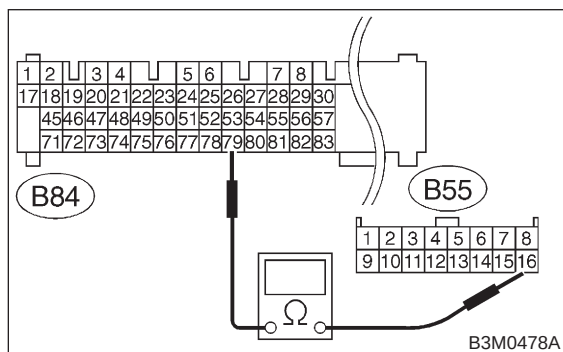


8L1 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness between TCM and ECM connector.

Connector & terminal

(B55) No. 16 — (B84) No. 79:



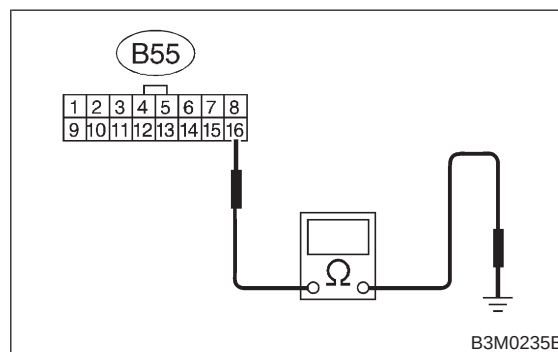
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8L2.
- NO** : Repair open circuit in harness between TCM and ECM connector.

8L2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal

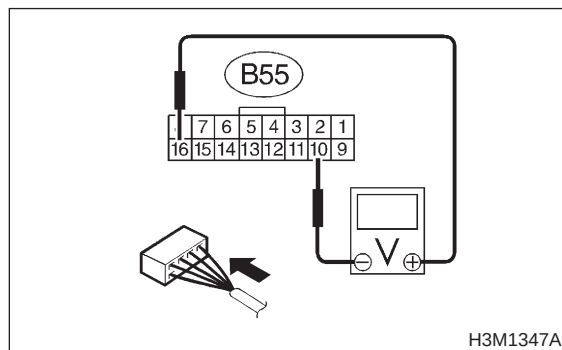
(B55) No. 16 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8L3.
- NO** : Repair short circuit in harness between TCM and ECM connector.

8L3 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to ON (engine OFF).
- 3) Measure voltage between TCM connector terminals.

Connector & terminal**(B55) No. 16 (+) — No. 10 (-):****CHECK : Is the voltage between 4 and 6 V?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.

NO : Go to step **8L4**.

8L4 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in torque control signal circuit?*

YES : Repair poor contact.

NO : Go to step **8L5**.

8L5 : CONFIRM TROUBLE CODE 25.

CHECK : *Replace ECM with a new one. Does the trouble code appear again, after the memory has been cleared?*

YES : Replace TCM.

NO : Replace ECM.

M: TROUBLE CODE 31 — THROTTLE POSITION SENSOR —

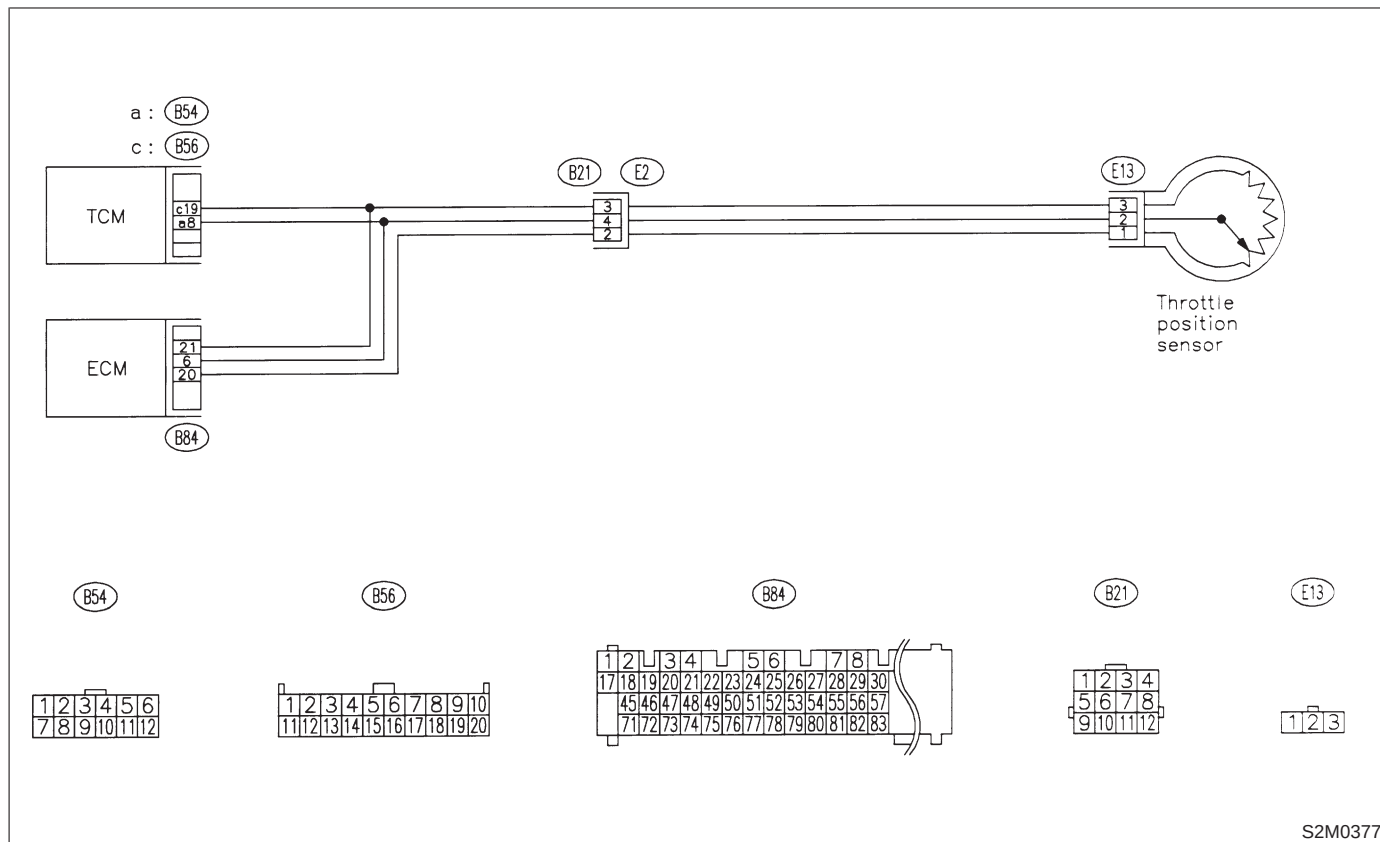
DIAGNOSIS:

Input signal circuit of throttle position sensor is open or shorted.

TROUBLE SYMPTOM:

Shift point too high or too low; engine brake not effected in “3” range: excessive shift shock; excessive tight corner “braking”.

WIRING DIAGRAM:



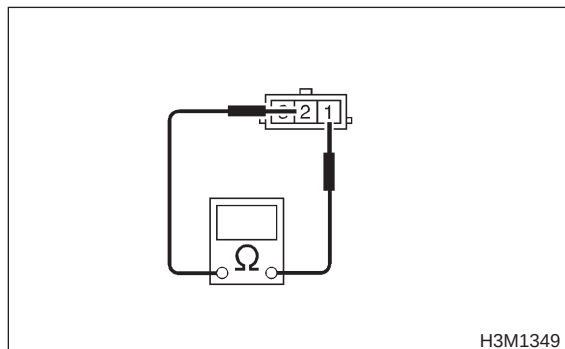
S2M0377

8M1 : CHECK THROTTLE POSITION SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from throttle position sensor.
- 4) Measure resistance between throttle position sensor connector receptacle's terminals.

Terminals

No. 1 — No. 2:



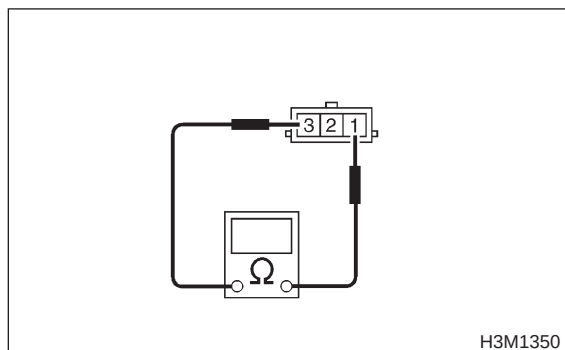
- CHECK** : Is the resistance between 0.3 and 0.7 kΩ?
- YES** : Go to step 8M2.
- NO** : Replace throttle position sensor.

8M2 : CHECK THROTTLE POSITION SENSOR.

Measure resistance between throttle position sensor connector receptacle's terminals.

Terminals

No. 1 — No. 3:



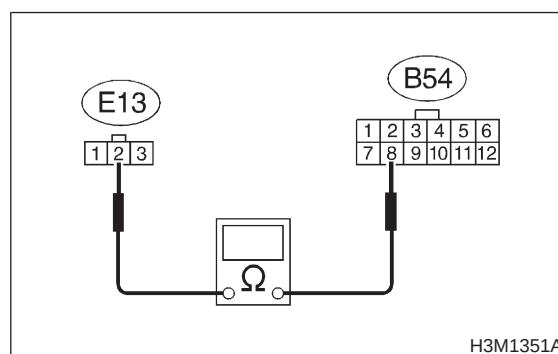
- CHECK** : Is the resistance between 3.5 and 6.5 kΩ?
- YES** : Go to step 8M3.
- NO** : Replace throttle position sensor.

8M3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and throttle position sensor connector.

Connector & terminal

(B54) No. 8 — (E13) No. 2:



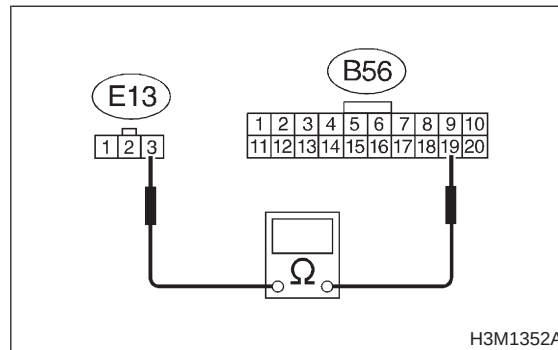
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8M4.
- NO** : Repair open circuit in harness between TCM and throttle position sensor connector.

8M4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.

Measure resistance of harness between TCM and throttle position sensor connector.

Connector & terminal

(B56) No. 19 — (E13) No. 3:



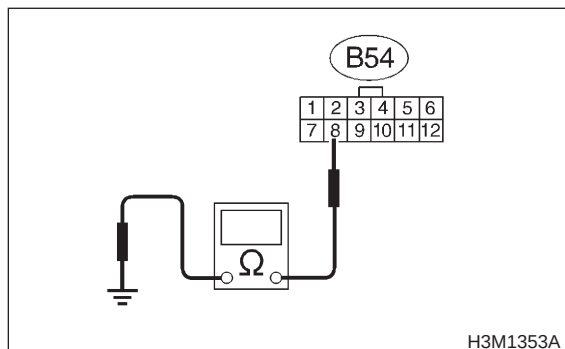
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8M5.
- NO** : Repair open circuit in harness between TCM and throttle position sensor connector.

8M5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.

Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal

(B54) No. 8 — Chassis ground:



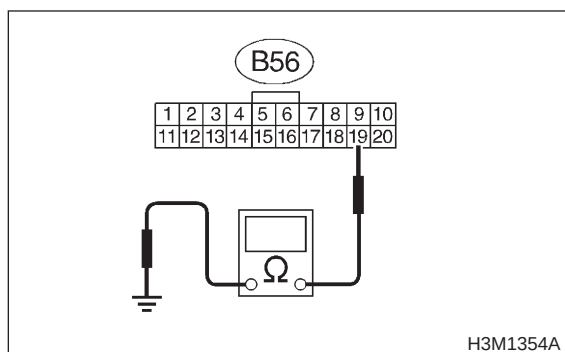
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8M6.
- NO** : Repair short circuit in harness between TCM and throttle position sensor connector.

8M6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.

Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal

(B56) No. 19 — Chassis ground:



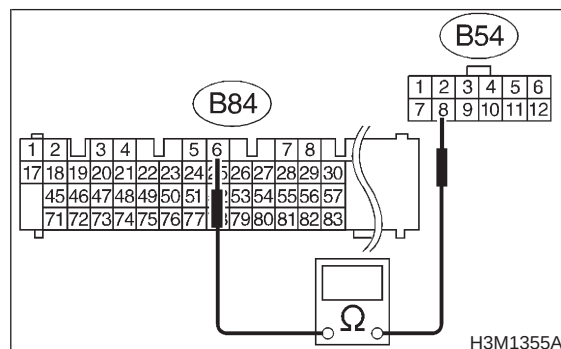
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8M7.
- NO** : Repair short circuit in harness between TCM and throttle position sensor connector.

8M7 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness between TCM and ECM connector.

Connector & terminal

(B54) No. 8 — (B84) No. 6:



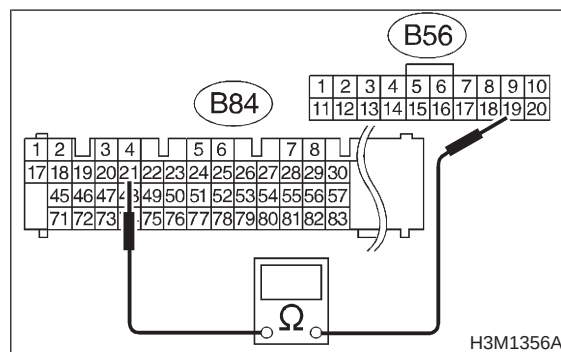
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8M8.
- NO** : Repair open circuit in harness between TCM and ECM connector.

8M8 : CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

Measure resistance of harness between TCM and ECM connector.

Connector & terminal

(B56) No. 19 — (B84) No. 21:



- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 8M9.
- NO** : Repair open circuit in harness between TCM and ECM connector.

8M9 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step 8M12.

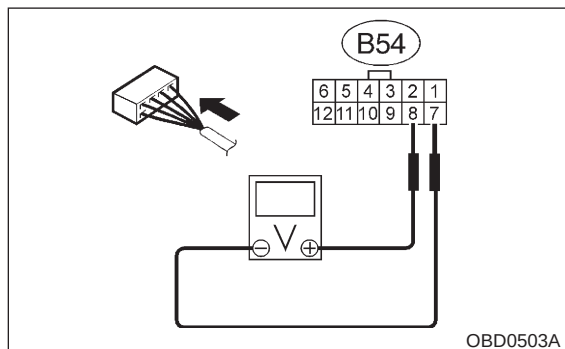
NO : Go to step 8M10.

8M10 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM, throttle position sensor and ECM.
- 2) Install air intake chamber.
- 3) Turn ignition switch to ON (engine OFF).
- 4) Measure voltage between TCM connector terminals.

Connector & terminal

(B54) No. 8 (+) — No. 7 (-):



CHECK : *Is the voltage between 0.3 and 0.7 V in throttle fully closed?*

YES : Go to step 8M11.

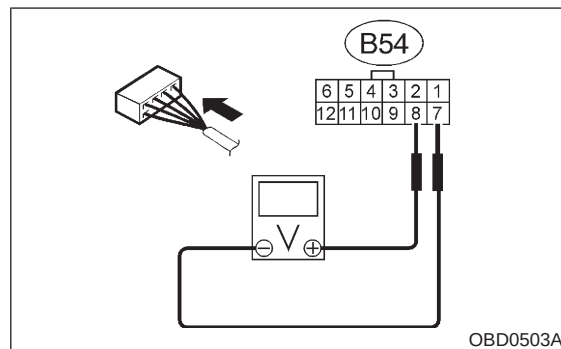
NO : Go to step 8M16.

8M11 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM connector terminals.

Connector & terminal

(B54) No. 8 (+) — No. 7 (-):



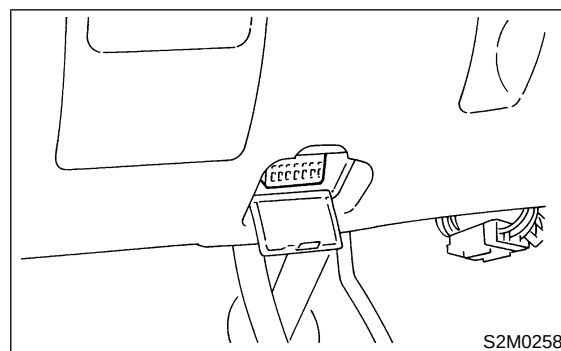
CHECK : *Is the voltage between 4.3 and 4.9 V with throttle fully open?*

YES : Go to step 8M14.

NO : Go to step 8M16.

8M12 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM, throttle position sensor and ECM.
- 2) Install air intake chamber.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Turn ignition switch to ON (engine OFF).
- 5) Turn Subaru Select Monitor switch to ON.
- 6) Throttle fully closed.
- 7) Read data of throttle position sensor using Subaru Select Monitor.
- Throttle position sensor input signal is indicated.

CHECK : *Is the value voltage between 0.3 and 0.7 V?*

YES : Go to step 8M13.

NO : Go to step 8M16.

8M13 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

Throttle fully open.

NOTE:

Must be changed correspondingly with accelerator pedal operation (from "released" to "depressed" position).

CHECK : *Is the value voltage between 4.3 and 4.9 V ?*

YES : Go to step **8M14**.

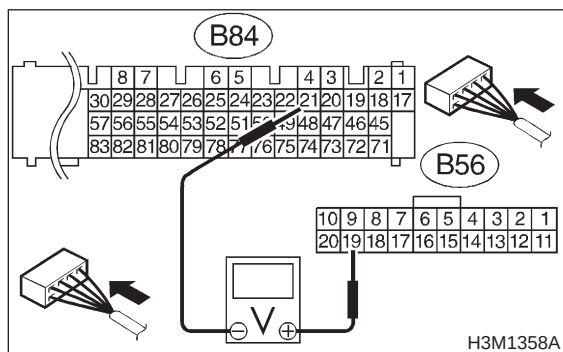
NO : Go to step **8M16**.

8M14 : CHECK INPUT SIGNAL FOR TCM (THROTTLE POSITION SENSOR POWER SUPPLY).

Measure voltage between TCM connector terminals.

Connector & terminal

(B56) No. 19 (+) — (B84) No. 21 (-):



CHECK : *Is the voltage between 5.02 and 5.22 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in throttle position sensor circuit.

NO : Go to step **8M16**.

8M15 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR (THROTTLE POSITION SENSOR POWER SUPPLY).

Read data of throttle position sensor power supply using Subaru Select Monitor.

● Throttle position sensor power supply voltage is indicated.

CHECK : *Is the value voltage between 5.02 and 5.22 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in throttle position sensor circuit.

NO : Go to step **8M16**.

8M16 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in throttle position sensor circuit?*

YES : Repair poor contact.

NO : Replace TCM.

MEMO:

N: TROUBLE CODE 32 — VEHICLE SPEED SENSOR 1 —

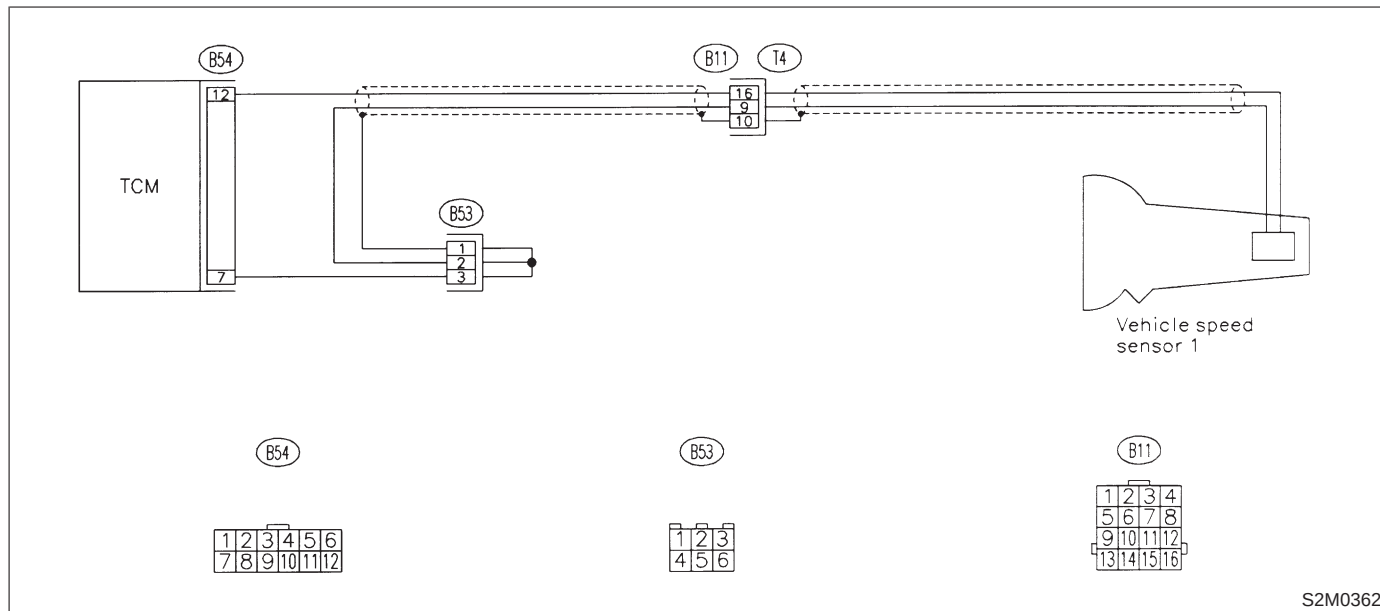
DIAGNOSIS:

Input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

No lock-up or excessive tight corner “braking”.

WIRING DIAGRAM:

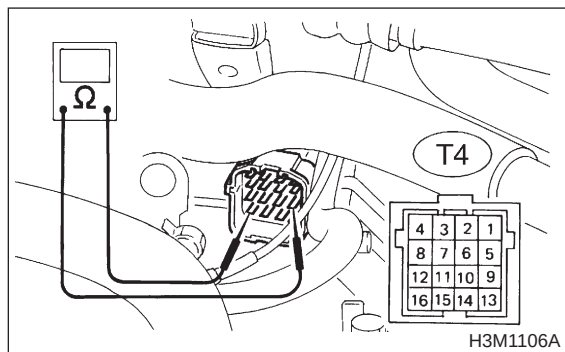


8N1 : CHECK VEHICLE SPEED SENSOR 1.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake chamber.
- 3) Disconnect connector from transmission.
- 4) Measure resistance between transmission connector receptacle's terminals.

Connector & terminal

(T4) No. 16 — No. 9:



CHECK : Is the resistance between 450 and 720 Ω ?

YES : Go to step 8N2.

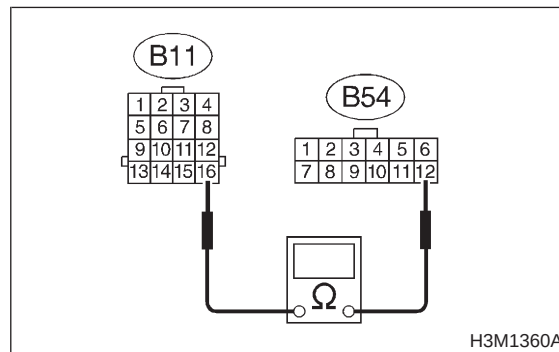
NO : Replace vehicle speed sensor 1.

8N2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Disconnect connector from TCM.
- 2) Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B54) No. 12 — (B11) No. 16:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 8N3.

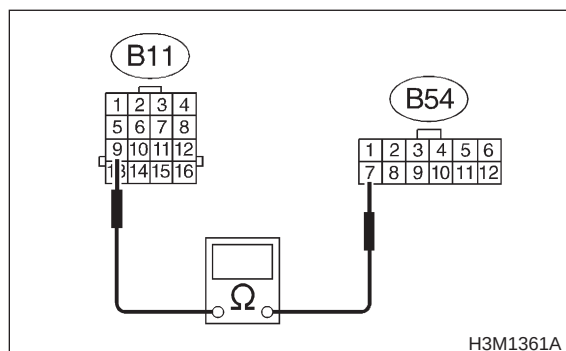
NO : Repair open circuit in harness between TCM and transmission connector.

8N3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B54) No. 7 — (B11) No. 9:



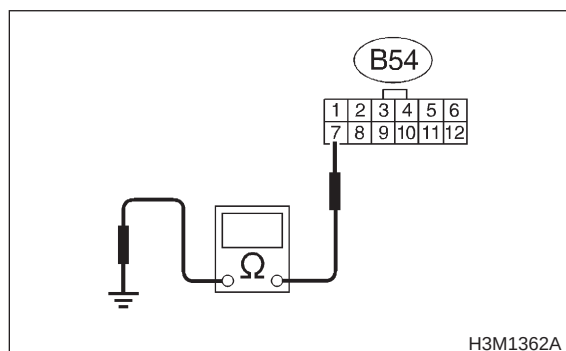
- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **8N4**.
- NO** : Repair open circuit in harness between TCM and transmission connector.

8N4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B54) No. 7 — Chassis ground:



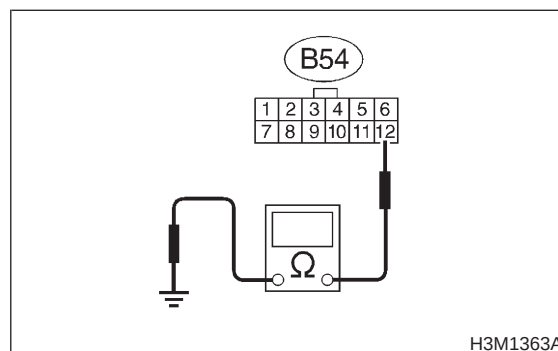
- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **8N5**.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8N5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

Measure resistance of harness between TCM and transmission connector.

Connector & terminal

(B54) No. 12 — Chassis ground:



- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **8N6**.
- NO** : Repair short circuit in harness between TCM and transmission connector.

8N6 : CHECK OSCILLOSCOPE.

- CHECK** : *Do you have oscilloscope?*
- YES** : Go to step **8N10**.
- NO** : Go to step **8N7**.

8N7 : PREPARE SUBARU SELECT MONITOR.

- CHECK** : *Do you have a Subaru Select Monitor?*
- YES** : Go to step **8N9**.
- NO** : Go to step **8N8**.

8N8 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up or raise the vehicle and place safety stands.

CAUTION:

Raise all wheels off floor.

- 4) Start the engine and set vehicle in 20 km/h (12 m/h) condition.

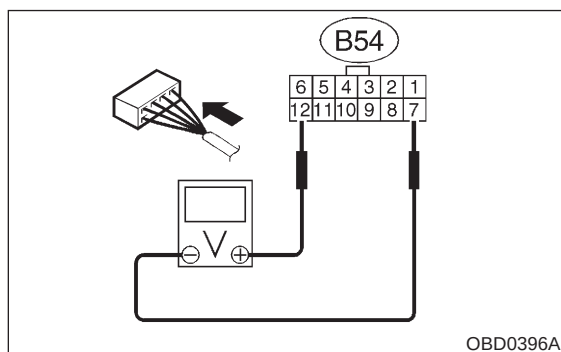
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 5) Measure voltage between TCM connector terminals.

Connector & terminal

(B54) No. 12 (+) — No. 7 (-):



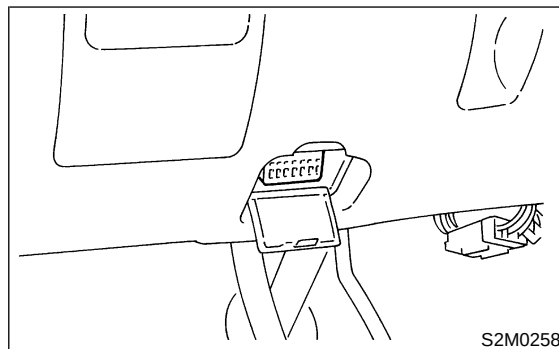
CHECK : **Is the voltage more than AC 1 V?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.

NO : Go to step **8N11**.

8N9 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Connect Subaru Select Monitor to data link connector.



- 4) Lift-up or raise the vehicle and place safety stands.

CAUTION:

Raise all wheels off floor.

- 5) Turn ignition switch to ON and turn Subaru Select Monitor switch to ON.
- 6) Start the engine.
- 7) Read data of vehicle speed using Subaru Select Monitor.

- Compare speedometer with Subaru Select Monitor indications.

- Vehicle speed is indicated in "km/h" or "MPH".

- 8) Slowly increase vehicle speed to 60 km/h or 37 MPH.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : **Does the speedometer indication increase as the Subaru Select Monitor data increases?**

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.

NO : Go to step **8N11**.

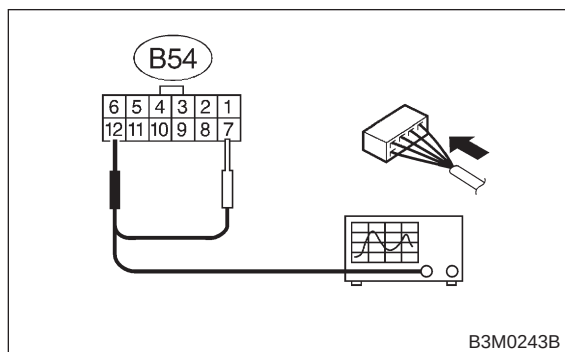
8N10 : CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.

- 1) Connect connectors to TCM and transmission.
- 2) Install air intake chamber.
- 3) Lift-up or raise the vehicle and place safety stands.

CAUTION:

Raise all wheels off floor.

- 4) Set oscilloscope to TCM connector terminals. Position probe; (B54) No. 12 Earth lead; (B54) No. 7

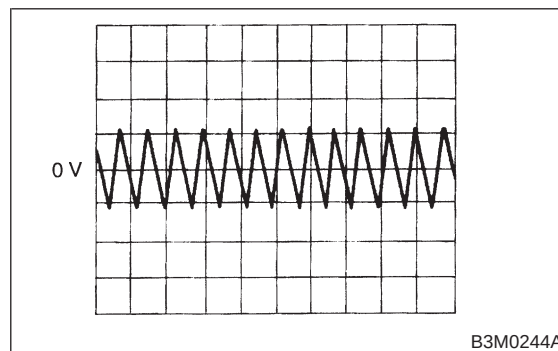


- 5) Start the engine and set vehicle in 20 km/h (12 m/h) condition.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 6) Measure signal voltage indicated on oscilloscope.



CHECK : *Is the signal voltage more than AC 1 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.

NO : Go to step **8N11**.

8N11 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in vehicle speed sensor 1 circuit?*

YES : Repair poor contact.

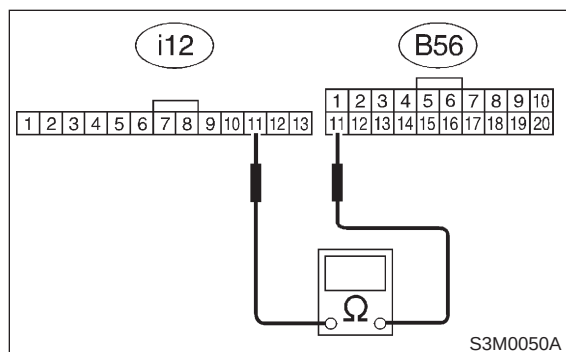
NO : Replace TCM.

802 : CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter.
- 3) Disconnect connectors from TCM and combination meter.
- 4) Measure resistance of harness between TCM and combination meter connector.

Connector & terminal

(B56) No. 11 — (i12) No. 11:



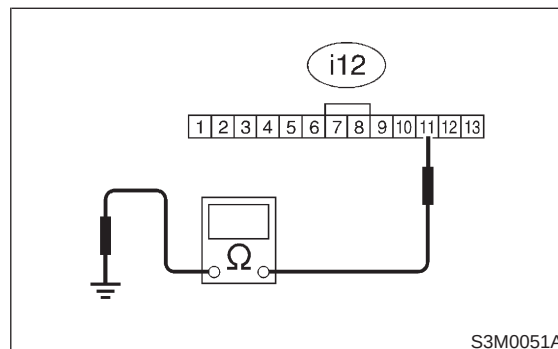
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 803.
- NO** : Repair open circuit in harness between TCM and combination meter connector, and poor contact in coupling connector.

803 : CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.

Measure resistance of harness between combination meter and chassis ground.

Connector & terminal

(i12) No. 11 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 804.
- NO** : Repair short circuit in harness between TCM and combination meter connector.

804 : CHECK VEHICLE SPEED SENSOR 2.

- 1) Install combination meter.
- 2) Connect connector to TCM.
- 3) Lift-up the vehicle and place safety stand.

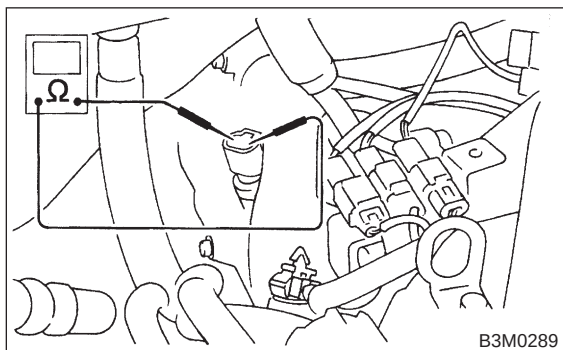
CAUTION:

Raise all wheels off floor.

- 4) Disconnect connector from vehicle speed sensor 2.
- 5) Measure resistance between terminals of vehicle speed sensor 2.

Terminals

No. 1 — No. 2:



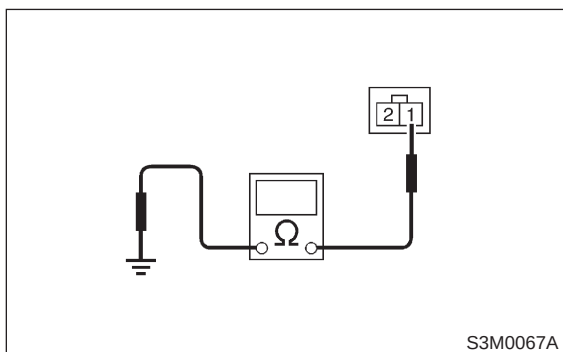
- CHECK** : Is the resistance between 350 and 450 Ω?
- YES** : Go to step 805.
- NO** : Replace vehicle speed sensor 2.

805 : CHECK VEHICLE SPEED SENSOR 2.

Measure resistance between terminals of vehicle speed sensor 2.

Terminals

No. 1 — Transmission ground:



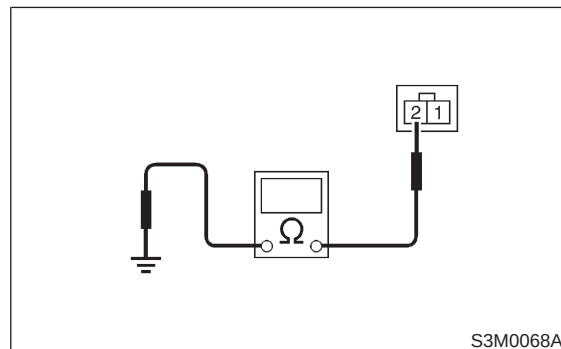
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 806.
- NO** : Replace vehicle speed sensor 2.

806 : CHECK VEHICLE SPEED SENSOR 2.

Measure resistance between terminals of vehicle speed sensor 2.

Terminals

No. 2 — Transmission ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 807.
- NO** : Replace vehicle speed sensor 2.

807 : CHECK OSCILLOSCOPE.

- CHECK** : Do you have oscilloscope?
- YES** : Go to step 809.
- NO** : Go to step 808.

808 : CHECK VEHICLE SPEED SENSOR 2.

1) Start the engine and set vehicle in 20 km/h (12 MPH) condition.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to 4-4 [T6D2].>

2) Measure output signal of vehicle speed sensor 2.

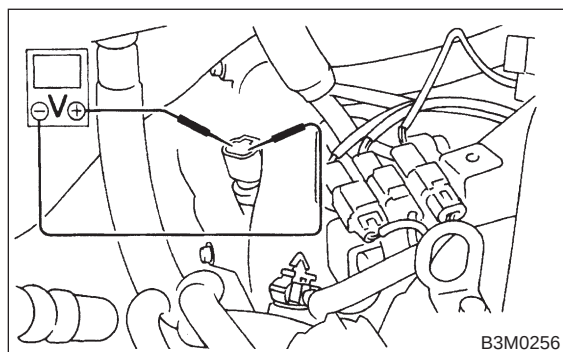
WARNING:

Be careful not to be caught up by the running wheels.

3) Measure voltage between terminals of vehicle speed sensor 2.

Terminals

No. 1 — No. 2:



- CHECK** : **Is the voltage more than AC 2 V?**
- YES** : Go to step **8010**.
- NO** : Replace vehicle speed sensor 2.

809 : CHECK VEHICLE SPEED SENSOR 2 USING OSCILLOSCOPE.

- 1) Install combination meter.
- 2) Connect connector to TCM.
- 3) Lift-up the vehicle and place safety stand.

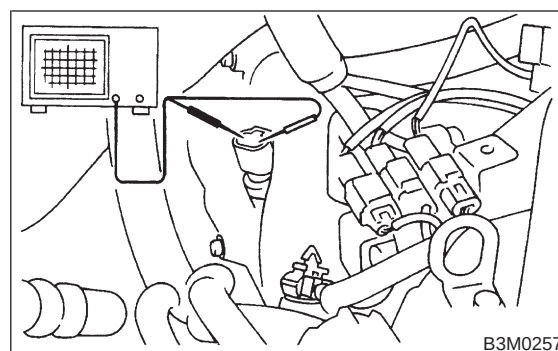
WARNING:

Make sure that all wheels are raised off floor.

- 4) Set oscilloscope to vehicle speed sensor 2.

Terminals

No. 1 — No. 2:

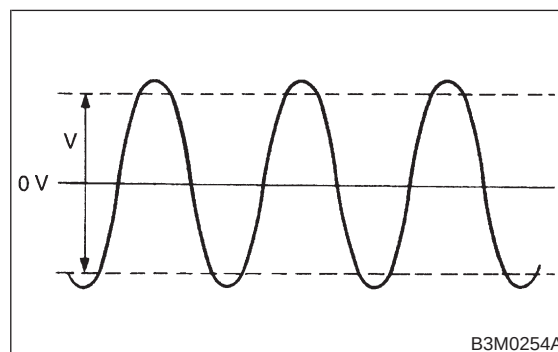


- 5) Start the engine, and drive the wheels slowly.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to 4-4 [T6D2].>

- 6) Measure signal voltage indicated on oscilloscope.



- CHECK** : **Is the voltage more than AC 2 V?**
- YES** : Go to step **8013**.
- NO** : Replace vehicle speed sensor 2.

8010 : PREPARE SUBARU SELECT MONITOR.

CHECK : *Do you have a Subaru Select Monitor?*

YES : Go to step **8012**.

NO : Go to step **8011**.

8011 : CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and combination meter.
- 2) Install combination meter.
- 3) Lift-up the vehicle and place safety stand.

CAUTION:

Make sure that all wheels are raised off floor.

- 4) Start the engine, and set vehicle in 10 km/h (6 m/h).

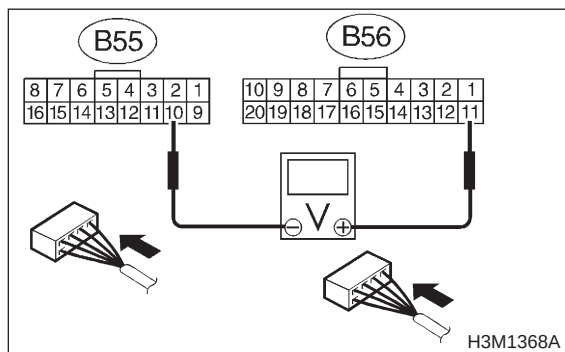
NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

- 5) Measure voltage between TCM connector terminals.

Connector & terminal

(B56) No. 11 (+) — (B55) No. 10 (-):



CHECK : *Is the voltage less than 1 V ⇔ more than 9 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.

NO : Go to step **8014**.

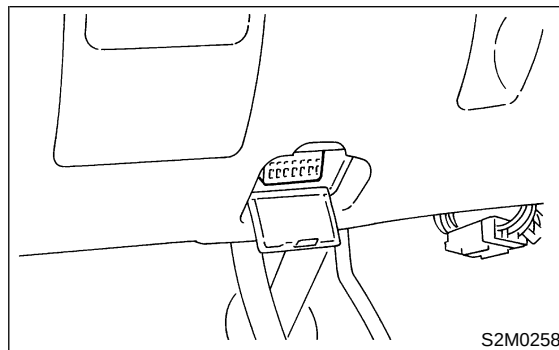
8012 : CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.

- 1) Connect connectors to TCM and combination meter.
- 2) Install combination meter.
- 3) Lift-up the vehicle and place safety stand.

CAUTION:

Make sure that all wheels are raised off floor.

- 4) Connect Subaru Select Monitor to data link connector.



- 5) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
- 6) Start the engine, and drive all wheels.
- 7) Read data of vehicle speed using Subaru Select Monitor.

- Compare speedometer with Subaru Select Monitor indications.

- Vehicle speed is indicated in "km/h" or "MPH".

- 8) Slowly increase vehicle speed to 60 km/h or 37 MPH.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : *Does the speedometer indication increase as the Subaru Select Monitor data increases?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.

NO : Go to step **8014**.

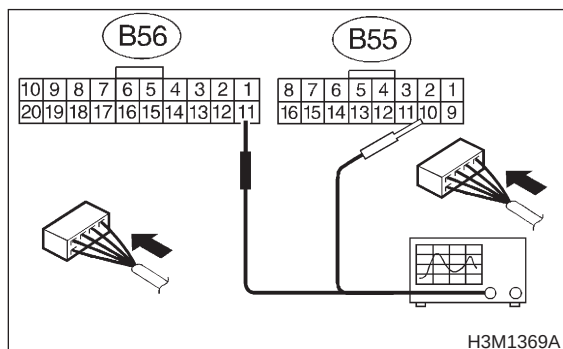
8013 : CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.

- 1) Connect connectors to TCM and combination meter.
- 2) Install combination meter.
- 3) Lift-up or raise the vehicle and place safety stands.

CAUTION:

Raise all wheels off floor.

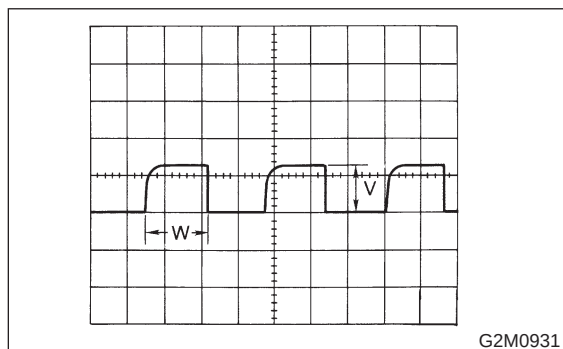
- 4) Set oscilloscope to TCM connector terminals. Positive probe; (B56) No. 11
- Earth lead; (B55) No. 10



- 5) Start the engine.
- 6) Shift on the gear position, and keep the vehicle speed at constant.
- 7) Measure signal voltage indicated on oscilloscope.

NOTE:

- If vehicle speed increases, the width of amplitude (W) decreases.
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>



tact of the connector or harness may be the cause. Repair harness or connector in the TCM.

NO : Go to step 8014.

8014 : CHECK POOR CONTACT.

CHECK : *Is there poor contact in vehicle speed sensor 2 circuit?*

YES : Repair poor contact.

NO : Replace TCM.

CHECK : *Is the voltage more than AC 2 V?*

YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor con-

9. Diagnostic Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART

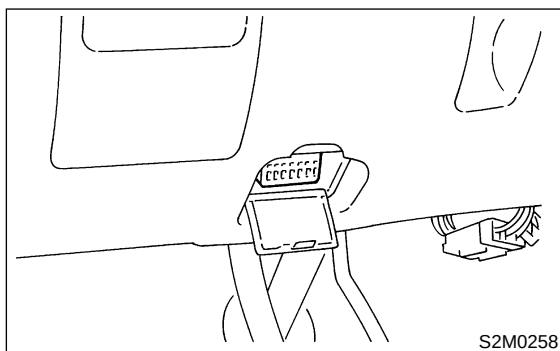
If no trouble codes appear in the on-board diagnostics operation (although problems have occurred or are occurring), measure performance characteristics of sensors, actuators, etc., in the Subaru Select Monitor and compare with the "basic data" to determine the cause of problems.

- 1) Trouble occurs.
- 2) No trouble codes appear in on-board diagnostics operation.
- 3) Measure each item using Subaru Select Monitor.
- 4) Compare measured values with basic data.
- 5) Determine item which is outside basic data specifications.
- 6) Check sensor and actuator affected.

B: BATTERY VOLTAGE

9B1 : CHECK BATTERY VOLTAGE.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to data link connector.



- 3) Start the engine, and engine idling after warm-up.
- 4) Turn Subaru Select Monitor switch to ON.
- 5) Read data of battery voltage using Subaru Select Monitor.

- Battery voltage applied to TCM.

CHECK : *Is voltage between 10 and 16 V?*

YES : Go to step VEHICLE SPEED SENSOR 1. <Ref. to 3-2 [T9C0].>

NO : Check battery voltage and specification of electrolyte, regulating voltage under no loads and generator (as a single unit).

C: CHECK VEHICLE SPEED SENSOR 1.

9C1 : CHECK VEHICLE SPEED SENSOR 1.

- 1) Lift-up the vehicle and place safety stand.

CAUTION:

Make sure that all wheels are raised off floor.

- 2) Read data of vehicle speed #1 using Subaru Select Monitor.

- Compare speedometer with Subaru Select Monitor indications.
- Vehicle speed is indicated in "MPH" or "km/h".

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : *Does the speedometer indication increase as the Subaru Select Monitor data increases?*

YES : Go to step VEHICLE SPEED SENSOR 2. <Ref. to 3-2 [T9D1].>

NO : Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T8N0].>

D: CHECK VEHICLE SPEED SENSOR 2.

9D1 : CHECK VEHICLE SPEED SENSOR 2.

Read data of vehicle speed #2 using Subaru Select Monitor.

- Compare speedometer with Subaru Select Monitor indications.
- Vehicle speed is indicated in "MPH" or "km/h".

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : *Does the speedometer indication increase as the Subaru Select Monitor data increases?*

YES : Go to step ENGINE SPEED SIGNAL. <Ref. to 3-2 [T9E0].>

NO : Check vehicle speed sensor 2 circuit. <Ref. to 3-2 [T8O0].>

E: CHECK ENGINE SPEED SIGNAL.**9E1 : CHECK ENGINE SPEED SIGNAL.**

- 1) Turn A/C switch to OFF (with A/C models).
- 2) Warm-up the engine until engine coolant temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Read data of engine speed using Subaru Select Monitor.

- Engine speed is indicated in "rpm".

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : *Does the tachometer revolution increase as the Subaru Select Monitor revolution data increases?*

YES : Go to step ATF TEMPERATURE SENSOR. <Ref. to 3-2 [T9F0].>

NO : Check engine speed signal circuit. <Ref. to 3-2 [T8J0].>

F: CHECK ATF TEMPERATURE SENSOR.**9F1 : CHECK AT OIL TEMP WARNING LIGHT.**

CHECK : *Does the AT OIL TEMP warning light remain on 2 seconds after the engine has been started?*

YES : Go to step 9F2.

NO : Check ATF temperature sensor and combination meter circuit. <Ref. to 3-2 [T8H0].>

9F2 : CHECK ATF TEMPERATURE SENSOR.

- 1) Read data of ATF temperature using Subaru Select Monitor.

- ATF temperature is indicated in "°F" or "°C".

- 2) Warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 3) Turn ignition switch to ON (engine OFF).

CHECK : *Does the ATF temperature change from 176°F (80°C)?*

YES : Go to step THROTTLE POSITION SENSOR. <Ref. to 3-2 [T9G0].>

NO : Check ATF temperature sensor circuit. <Ref. to 3-2 [T8H0].>

G: CHECK THROTTLE POSITION SENSOR.**9G1 : CHECK INPUT SIGNAL FOR TCM.**

Read data of throttle position sensor using Subaru Select Monitor.

- Throttle position sensor input signal is indicated.

CHECK : *Is voltage between 0.3 and 0.7 V when the accelerator pedal is completely released?*

YES : Go to step 9G2.

NO : Check throttle position sensor circuit. <Ref. to 3-2 [T8M0].>

9G2 : CHECK INPUT SIGNAL FOR TCM.

CHECK : *Is voltage between 4.4 and 4.8 V when the accelerator pedal is completely depressed?*

YES : Go to step 9G3.

NO : Check throttle position sensor circuit. <Ref. to 3-2 [T8M0].>

9G3 : CHECK INPUT SIGNAL FOR TCM.

CHECK : *Does voltage decrease smoothly when the accelerator pedal is fully depressed and then fully released?*

YES : Go to step GEAR POSITION. <Ref. to 3-2 [T9H0].>

NO : Check throttle position sensor circuit. <Ref. to 3-2 [T8M0].>

H: CHECK GEAR POSITION.**9H1 : CHECK GEAR POSITION.**

1) Lift-up the vehicle and place safety stand.

CAUTION:

Make sure that all wheels are raised off floor.

2) Start the engine.

3) Move select lever to "D", and drive vehicle.

4) Read data of gear position using Subaru Select Monitor.

- Gear position is indicated.

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : *Does the transmission gear correspond to the gear which is shown on display?*

YES : Go to step LINE PRESSURE DUTY. <Ref. to 3-2 [T9I0].>

NO : Check shift solenoid 1 and shift solenoid 2 signal circuit. <Ref. to 3-2 [T8G0].> and <Ref. to 3-2 [T8F0].>

I: CHECK LINE PRESSURE DUTY.**9I1 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

1) Warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

2) Stop the engine and turn ignition switch to ON (engine OFF).

3) Move selector lever to "N".

4) Read data of line pressure duty ratio using Subaru Select Monitor.

- Line pressure duty is indicated in "%".

CHECK : *Does the Subaru Select Monitor indicate 100% when the accelerator pedal is completely released?*

YES : Go to step 9I2.

NO : Go to step 9I4.

9I2 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

CHECK : *Does the Subaru Select Monitor indicate between 10 and 20% when the accelerator pedal is completely depressed?*

YES : Go to step 9I3.

NO : Go to step 9I4.

9I3 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

CHECK : *Does the Subaru Select Monitor change smoothly when the accelerator pedal is fully depressed and then fully released?*

YES : Go to step LOCK-UP DUTY. <Ref. to 3-2 [T9J0].>

NO : Go to step 9I4.

9I4 : CHECK THROTTLE POSITION SENSOR.**NOTE:**

For the diagnostics procedure on throttle position sensor circuit, <Ref. to 3-2 [T9G0].>

CHECK : *Is there any trouble in throttle position sensor circuit?*

YES : Repair or replace throttle position sensor circuit, <Ref. to 3-2 [T8M0].>

NO : Go to step **9I5**.

9I5 : CHECK ENGINE SPEED SIGNAL.**NOTE:**

For the diagnostics procedure on engine speed signal circuit, <Ref. to 3-2 [T9E0].>

CHECK : *Is there any trouble in engine speed signal circuit?*

YES : Repair or replace engine speed signal circuit, <Ref. to 3-2 [T8J0].>

NO : Go to step **9I6**.

9I6 : CHECK ATF TEMPERATURE SENSOR.**NOTE:**

For the diagnostics procedure on ATF temperature sensor circuit, <Ref. to 3-2 [T9F1].>

CHECK : *Is there any trouble in ATF temperature sensor circuit?*

YES : Repair or replace ATF temperature sensor circuit, <Ref. to 3-2 [T8H0].>

NO : Go to step **9I7**.

9I7 : CHECK INHIBITOR SWITCH.

1) Turn ignition switch and Subaru Select Monitor to ON.

2) Read data of range switch using Subaru Select Monitor.

● Range switch is indicated in ON ⇔ OFF.

CHECK : *When each range is selected, does LED of the range switch on Subaru Select Monitor light up?*

YES : Go to step LOCK-UP DUTY. <Ref. to 3-2 [T9J0].>

NO : Check inhibitor switch circuit. <Ref. to 3-2 [T9T0].>

J: CHECK LOCK-UP DUTY.**9J1 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

Read data of lock-up duty ratio using Subaru Select Monitor.

● Lock-up duty ratio is indicated in “%”.

CHECK : *Does the Subaru Select Monitor indicate 5%?*

YES : Go to step **9J2**.

NO : Go to step **9J3**.

9J2 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

Move selector lever to “D” and slowly increase vehicle speed to 75 km/h (47 m/h).

NOTE:

The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2].>

CHECK : *Does the Subaru Select Monitor indicate 95%?*

YES : Go to step TRANSFER DUTY RATIO. <Ref. to 3-2 [T9K0].>

NO : Go to step **9J3**.

9J3 : CHECK THROTTLE POSITION SENSOR.**NOTE:**

For the diagnostics procedure on throttle position sensor circuit, <Ref. to 3-2 [T9G0].>

CHECK : *Is there any trouble in throttle position sensor circuit?*

YES : Repair or replace throttle position sensor circuit, <Ref. to 3-2 [T8M0].>

NO : Go to step **9J4**.

9J4 : CHECK VEHICLE SPEED SENSOR 1.**NOTE:**

For the diagnostics procedure on vehicle speed sensor 1 circuit, <Ref. to 3-2 [T9C0].>

- CHECK** : ***Is there any trouble in vehicle speed sensor 1 circuit?***
- YES** : Repair or replace vehicle speed sensor 1 circuit, <Ref. to 3-2 [T8N0].>
- NO** : Go to step **9J5**.

9J5 : CHECK VEHICLE SPEED SENSOR 2.**NOTE:**

For the diagnostics procedure on vehicle speed sensor 2 circuit, <Ref. to 3-2 [T9D0].>

- CHECK** : ***Is there any trouble in vehicle speed sensor 2 circuit?***
- YES** : Repair or replace vehicle speed sensor 2 circuit, <Ref. to 3-2 [T8O0].>
- NO** : Go to step **9J6**.

9J6 : CHECK ENGINE SPEED SIGNAL.**NOTE:**

For the diagnostics procedure on engine speed signal circuit, <Ref. to 3-2 [T9E0].>

- CHECK** : ***Is there any trouble in engine speed signal circuit?***
- YES** : Repair or replace engine speed signal circuit, <Ref. to 3-2 [T8K0].>
- NO** : Go to step **9J7**.

9J7 : CHECK INHIBITOR SWITCH.

Read data of range switch using Subaru Select Monitor.

- Range switch is indicated in ON ⇔ OFF.

- CHECK** : ***When each range is selected, does LED of the range switch on Subaru Select Monitor light up?***
- YES** : Go to step TRANSFER DUTY. <Ref. to 3-2 [T9K0].>
- NO** : Check inhibitor switch circuit. <Ref. to 3-2 [T9T0].>

K: CHECK TRANSFER DUTY.**9K1 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

- 1) Turn ignition switch to ON (engine OFF).
 - 2) Move selector lever to "D".
 - 3) Read data of transfer duty ratio using Subaru Select Monitor.
- Transfer duty ratio is indicated in "%".

- CHECK** : ***Does the duty ratio change in response to the depress-release motion of the accelerator pedal?***
- YES** : Go to step **9K2**.
- NO** : Go to step **9K3**.

9K2 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Turn ignition switch to OFF.
 - 2) Set FWD mode.
 - 3) Turn ignition switch to ON (engine OFF).
- CHECK** : ***Does the Subaru Select Monitor indicate 95%?***
- YES** : Go to step THROTTLE POSITION SENSOR POWER SUPPLY. <Ref. to 3-2 [T9L0].>
- NO** : Go to step **9K3**.

9K3 : CHECK THROTTLE POSITION SENSOR CIRCUIT.**NOTE:**

For the diagnostics procedure on throttle position sensor circuit, <Ref. to 3-2 [T9G0].>

- CHECK** : ***Is there any trouble in throttle position sensor circuit?***
- YES** : Repair or replace throttle position sensor circuit, <Ref. to 3-2 [T8M0].>
- NO** : Go to step **9K4**.

9K4 : CHECK VEHICLE SPEED SENSOR 1.**NOTE:**

For the diagnostics procedure on vehicle speed sensor 1 circuit, <Ref. to 3-2 [T9C0].>

- CHECK** : ***Is there any trouble in vehicle speed sensor 1 circuit?***
- YES** : Repair or replace vehicle speed sensor 1 circuit, <Ref. to 3-2 [T8N0].>
- NO** : Go to step **9K5**.

9K5 : CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.**NOTE:**

For the diagnostics procedure on vehicle speed sensor 2 circuit, <Ref. to 3-2 [T9D0].>

- CHECK** : *Is there any trouble in vehicle speed sensor 2 circuit?*
- YES** : Repair or replace vehicle speed sensor 2 circuit, <Ref. to 3-2 [T8O0].>
- NO** : Go to step **9K6**.

9K6 : CHECK ATF TEMPERATURE SENSOR.**NOTE:**

For the diagnostics procedure on ATF temperature sensor circuit, <Ref. to 3-2 [T9F1].>

- CHECK** : *Is there any trouble in ATF temperature sensor circuit?*
- YES** : Repair or replace ATF temperature sensor circuit, <Ref. to 3-2 [T8H0].>
- NO** : Go to step **9K7**.

9K7 : CHECK INHIBITOR SWITCH.

Read data of range switch using Subaru Select Monitor.

- Range switch is indicated in ON ⇔ OFF.

- CHECK** : *When each range is selected, does LED of range switch on Subaru Select Monitor light up?*
- YES** : Go to step **9K8**.
- NO** : Check inhibitor switch circuit. <Ref. to 3-2 [T9T0].>

9K8 : CHECK ABS SIGNAL.

1) Start the engine, and turn Subaru Select Monitor switch to ON.

2) Read data of ABS signal using Subaru Select Monitor.

- ABS switch is indicated in ON ⇔ OFF.

- CHECK** : *Does the LED of ABS switch light up?*
- YES** : Check ABS signal circuit. <Ref. to 4-4 [T10A0].>, <Ref. to 4-4 [T10U0].>
- NO** : Go to step THROTTLE POSITION SENSOR POWER SUPPLY. <Ref. to 3-2 [T9L0].>

L: CHECK THROTTLE POSITION SENSOR POWER SUPPLY.**9L1 : CHECK THROTTLE POSITION POWER SUPPLY.**

Read data of throttle position sensor power supply using Subaru Select Monitor.

- Throttle position sensor power supply voltage is indicated.

- CHECK** : *Is the value fixed between 5.02 and 5.22 V?*
- YES** : Go to step MASS AIR FLOW SIGNAL. <Ref. to 3-2 [T9M0].>
- NO** : Check throttle position sensor power supply circuit. <Ref. to 3-2 [T8M0].>

M: CHECK MASS AIR FLOW SIGNAL.**9M1 : CHECK INPUT SIGNAL FOR TCM.**

- Start the engine.
- Warm-up the engine until engine coolant temperature is above 80°C (176°F).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- Engine idling after warm-up.
- Move selector lever to "N".
- Read data of mass air flow signal using Subaru Select Monitor.
- Display shows mass air flow signal value sent from ECM.

- CHECK** : *Does voltage change in response to the depress-release motion of the accelerator pedal?*
- YES** : Go to step **9M2**.
- NO** : Check mass air flow signal circuit. <Ref. to 3-2 [T8I0].>

9M2 : CHECK ECM.

- CHECK** : *Has trouble been eliminated after ECM replacement?*
- YES** : Replace ECM.
- NO** : Go to step **9M3**.

3-2 [T9M3] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

9. Diagnostic Chart with Select Monitor

9M3 : CHECK TCM.

NOTE:

Install former ECM.

CHECK : *Has trouble been eliminated after
TCM replacement?*

YES : Replace TCM.

NO : Go to step FWD SWITCH. <Ref. to 3-2
[T9N0].>

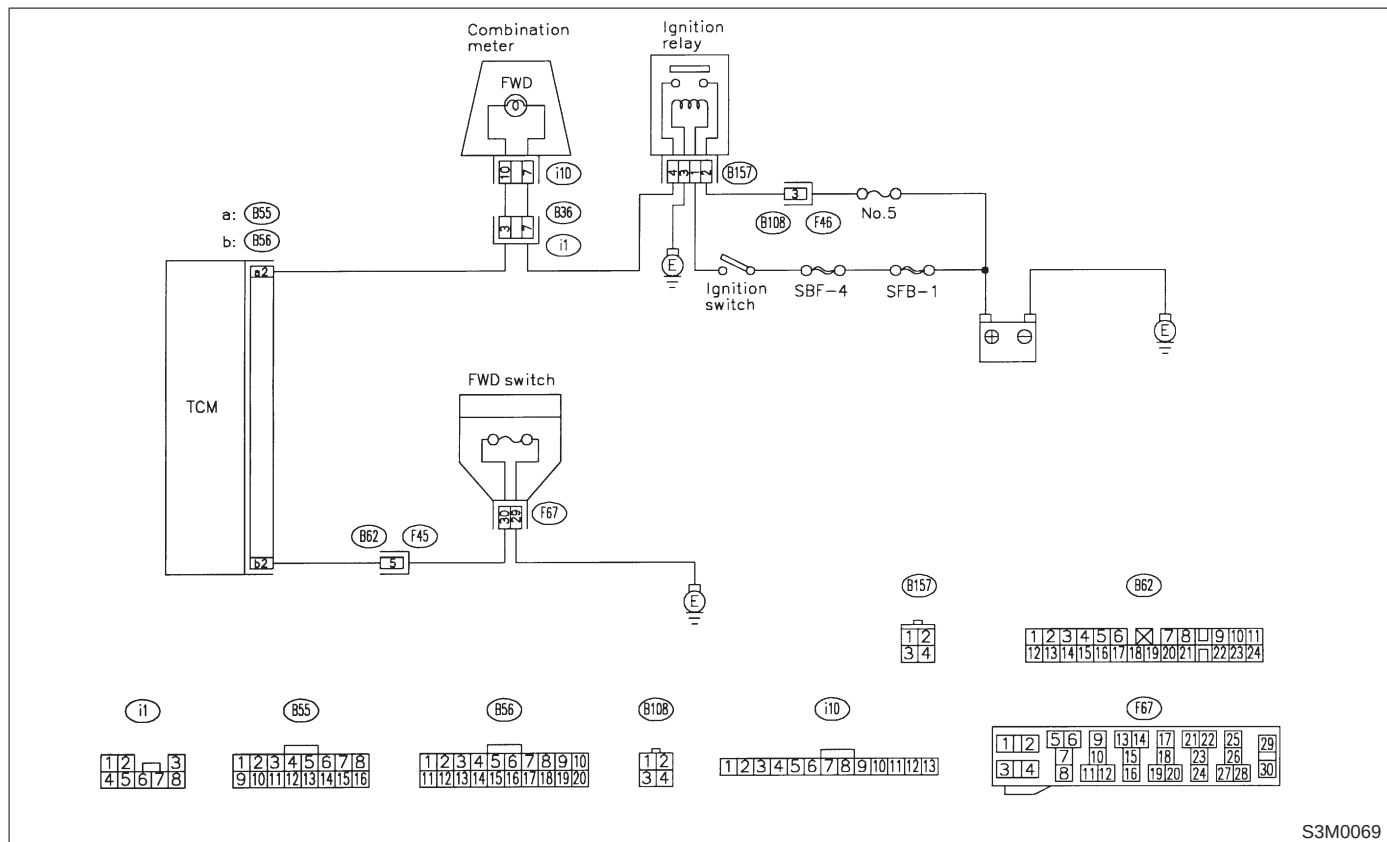
MEMO:

N: CHECK FWD SWITCH.

DIAGNOSIS:

- LED does not come on even if FWD switch is ON.
- FWD switch circuit is open or short.

WIRING DIAGRAM:



S3M0069

9N1 : CHECK FWD SWITCH.

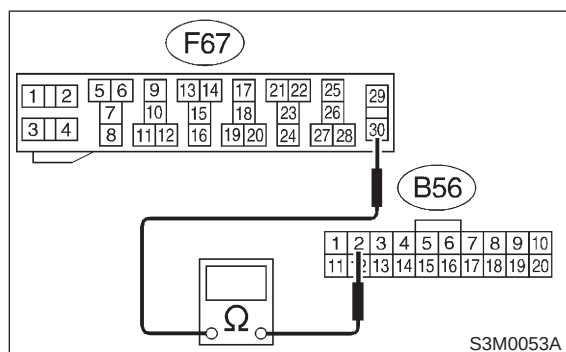
- CHECK** : When fuse is inserted to FWD switch, does LED light up?
- YES** : Go to step KICK-DOWN SWITCH. <Ref. to 3-2 [T900].>
- NO** : Go to step 9N2.

9N2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND FWD SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and FWD switch.
- 3) Measure resistance of harness between TCM and FWD switch connector.

Connector & terminal

(B56) No. 2 — (F67) No. 30:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 9N3.

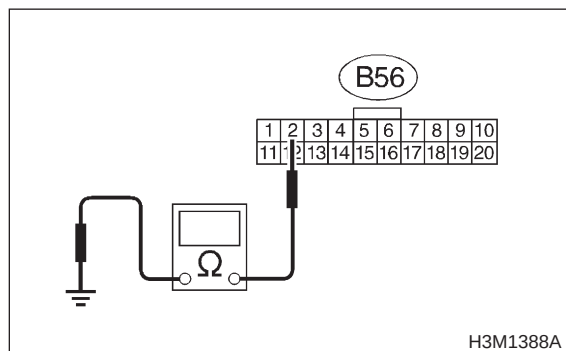
NO : Repair open circuit in harness between TCM and FWD switch connector and poor contact in coupling connector.

9N3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND FWD SWITCH.

Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal

(B56) No. 2 — Chassis ground:



CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to step 9N4.

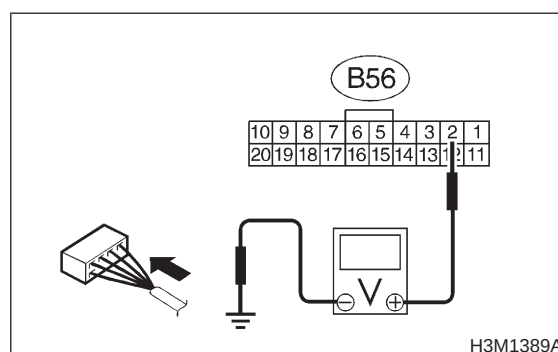
NO : Repair short circuit in harness connector between TCM and chassis ground.

9N4 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and FWD switch.
- 3) Turn ignition switch to ON.
- 4) Measure signal voltage for TCM while installing the fuse to FWD switch connector.

Connector & terminal

(B56) No. 2 (+) — Chassis ground (-):



CHECK : Is the voltage less than 1 V in FWD switch while installing?

YES : Go to step 9N5.

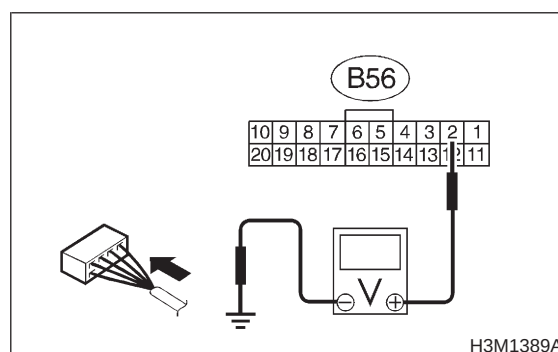
NO : Go to step 9N10.

9N5 : CHECK INPUT SIGNAL FOR TCM.

Measure signal voltage for TCM while removing the fuse from FWD switch connector.

Connector & terminal

(B56) No. 2 (+) — Chassis ground (-):



CHECK : Is the voltage more than 10 V in FWD switch while removing?

YES : Go to step 9N6.

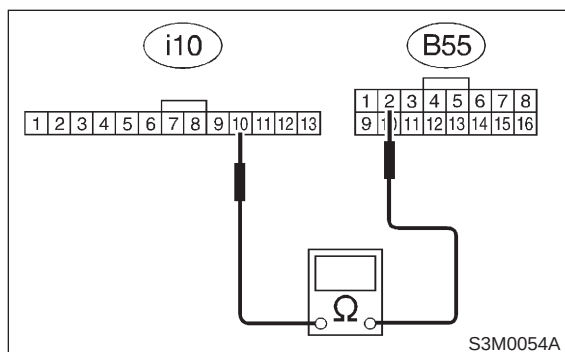
NO : Replace TCM.

9N6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter.
- 3) Disconnect connector from TCM and combination meter.
- 4) Measure resistance of harness between TCM and diagnosis connector.

Connector & terminal

(B55) No. 2 — (i10) No. 10:



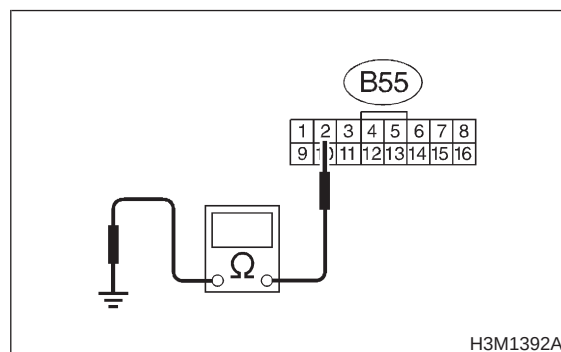
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 9N7.
- NO** : Repair open circuit in harness between TCM and combination meter and poor contact in coupling connector.

9N7 : CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.

Measure resistance of harness connector between TCM and chassis ground to make sure that circuit does not short.

Connector & terminal

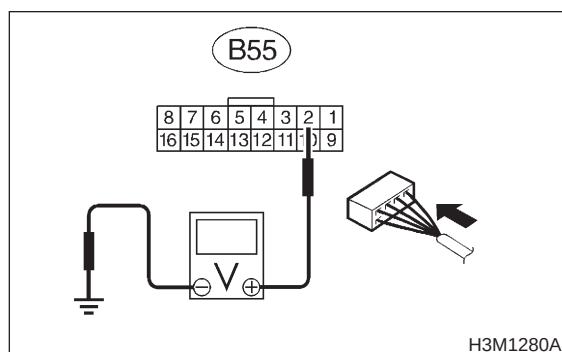
(B55) No. 2 — Chassis ground:



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 9N8.
- NO** : Repair short circuit in harness between TCM and combination meter connector.

9N8 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

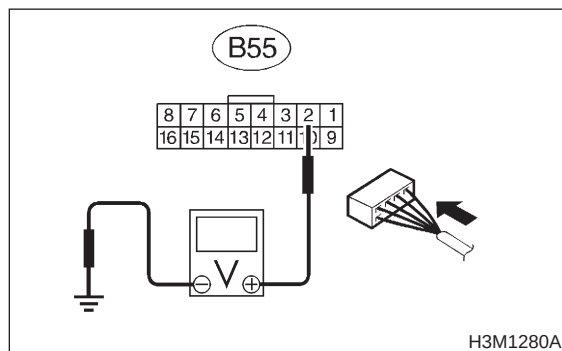
- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and combination meter.
- 3) Install combination meter.
- 4) Turn ignition switch to ON.
- 5) Measure signal voltage for TCM while installing and removing the fuse to FWD switch connector.

Connector & terminal**(B55) No. 2 — Chassis ground:**

- CHECK** : *Is the voltage less than 1 V in FWD switch while installing?*
- YES** : Go to step **9N9**.
- NO** : Go to step **9N10**.

9N9 : CHECK OUTPUT SIGNAL EMITTED FROM TCM.

Measure signal voltage for TCM while removing the fuse from FWD switch connector.

Connector & terminal**(B55) No. 2 — Chassis ground:**

- CHECK** : *Is the voltage more than 10 V in FWD switch while removing?*
- YES** : Go to step **9N10**.
- NO** : Replace TCM.

9N10 : CHECK POOR CONTACT.

- CHECK** : *Is there poor contact in FWD switch circuit?*
- YES** : Repair poor contact.
- NO** : Replace TCM.

O: CHECK KICK DOWN SWITCH.**9O1 : CHECK KICK DOWN SWITCH.**

- CHECK** : *Does the LED of kick down switch light up?*
- YES** : Replace TCM.
- NO** : Go to step BREAK SWITCH. <Ref. to 3-2 [T9P0].>

P: CHECK BRAKE SWITCH.**9P1 : CHECK BRAKE SWITCH.**

- CHECK** : *When the brake pedal is depressed, does LED light up?*
- YES** : Go to step ABS SWITCH. <Ref. to 3-2 [T9Q0].>
- NO** : Check brake switch circuit. <Ref. to 2-7 [T10BJ0].>

Q: CHECK ABS SWITCH.**9Q1 : CHECK ABS SWITCH.**

- CHECK** : *Does the LED of ABS switch light up?*
- YES** : Check ABS switch circuit. <Ref. to 4-4 [T10A0].>, <Ref. to 4-4 [T10U0].>
- NO** : Go to step CRUISE CONTROL SWITCH. <Ref. to 3-2 [T9R0].>

R: CHECK CRUISE CONTROL SWITCH.**9R1 : CHECK CRUISE CONTROL SWITCH.**

- CHECK** : *When cruise control is set, does LED light up?*
- YES** : Go to step POWER MODE SWITCH. <Ref. to 3-2 [T9S0].>
- NO** : Check cruise control set circuit. <Ref. to 2-7 [T10CX0].>

S: CHECK POWER MODE SWITCH.

9S1 : CHECK POWER MODE SWITCH.

CHECK : *Does the LED of power mode switch light up?*

YES : Replace TCM.

NO : Go to step N/P RANGE SWITCH. <Ref. to 3-2 [T9T0].>

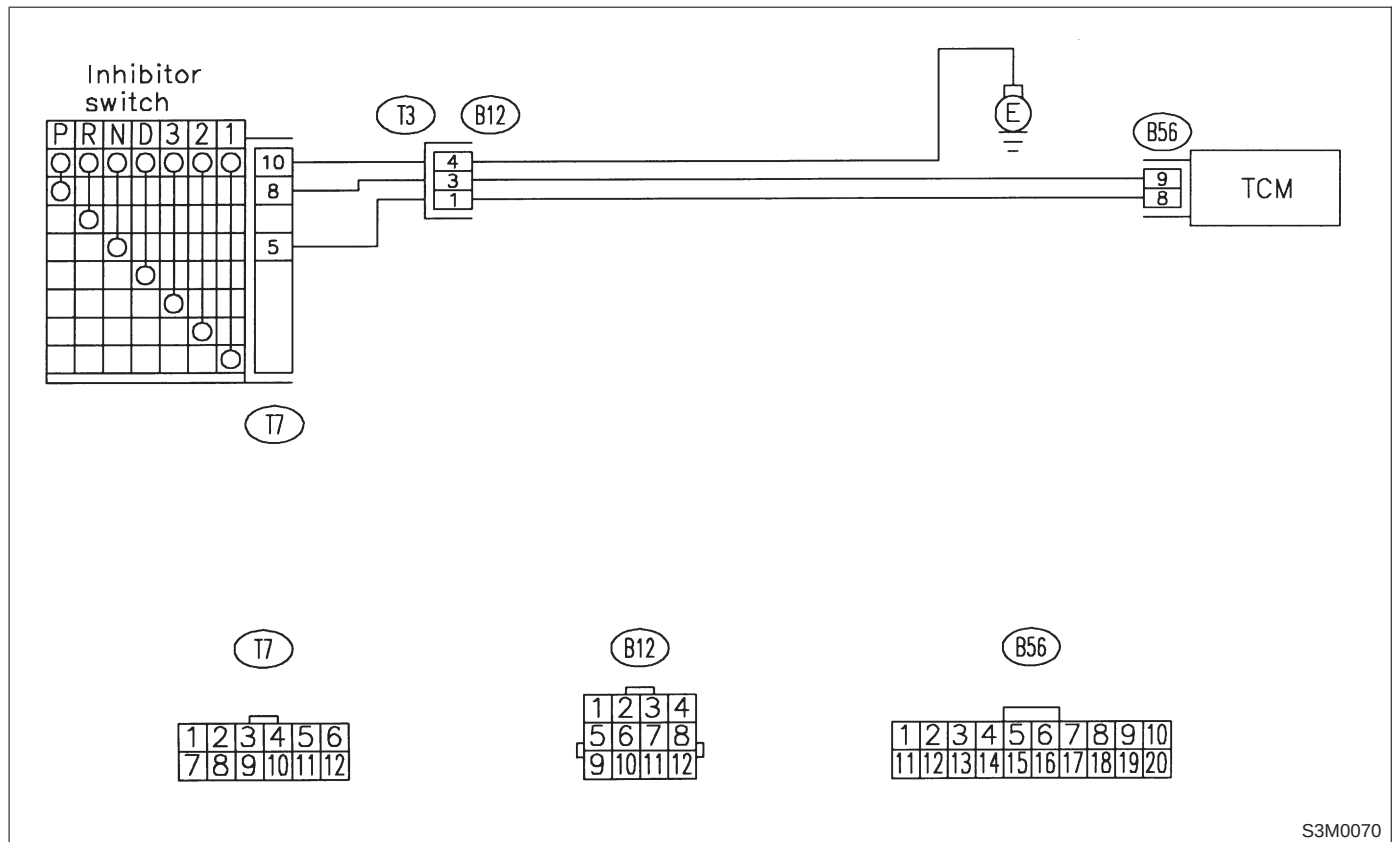
MEMO:

T: CHECK "N/P" RANGE SWITCH.

DIAGNOSIS:

Input signal circuit of "P" or "N" range is open or shorted.

WIRING DIAGRAM:



S3M0070

9T1 : CHECK "P" RANGE SWITCH.

- CHECK** : When "P" range is selected, does LED light up?
- YES** : Go to step 9T2.
- NO** : Go to step 9T3.

9T2 : CHECK "N" RANGE SWITCH.

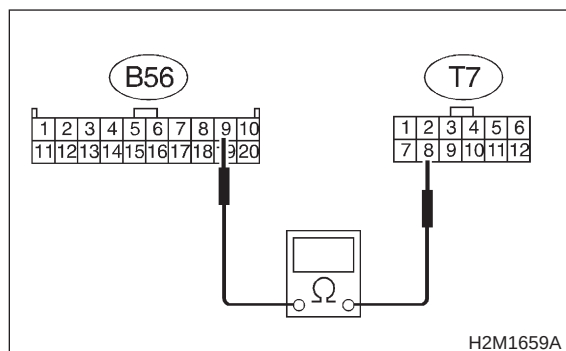
- CHECK** : When the "N" range is selected, does LED light up?
- YES** : Go to step "R" RANGE SWITCH. <Ref. to 3-2 [T9U0].>
- NO** : Go to step 9T4.

9T3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B56) No. 9 — (T7) No. 8:



CHECK : Is the resistance less than 1 Ω?

YES : Go to step 9T5.

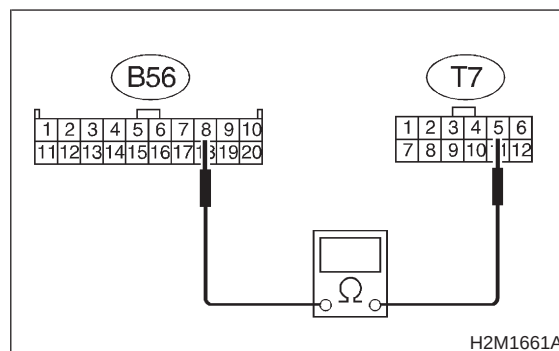
NO : Repair open circuit in harness between TCM and inhibitor switch connector, and poor contact in coupling connector.

9T4 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B56) No. 8 — (T7) No. 5:



CHECK : Is the resistance less than 1 Ω?

YES : Go to step 9T6.

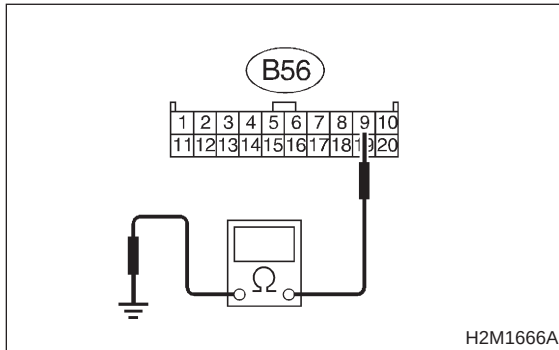
NO : Repair open circuit in harness between TCM and inhibitor switch connector, and poor contact in coupling connector.

9T5 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 9 — Chassis ground:



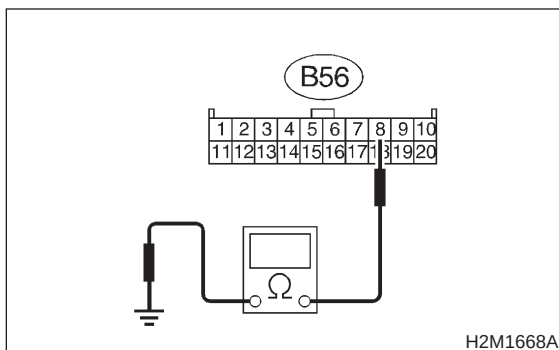
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 9T7.
- NO** : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9T6 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 8 — Chassis ground:



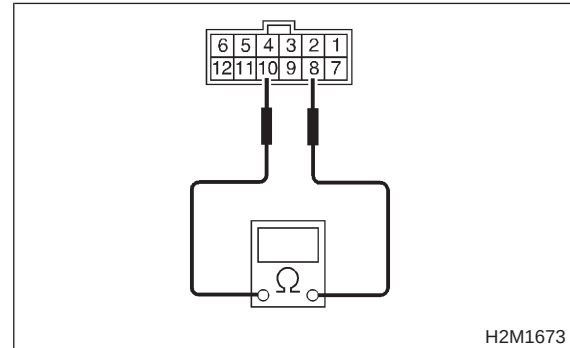
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 9T9.
- NO** : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9T7 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 8 — No. 10



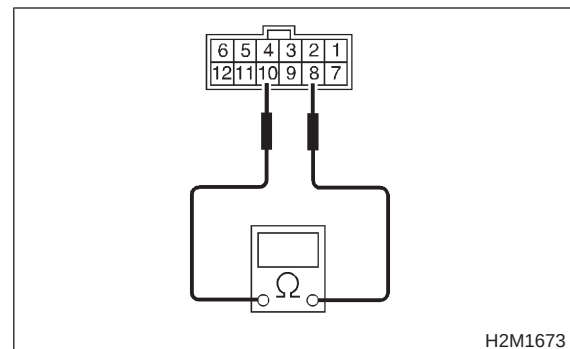
- CHECK** : Is the resistance less than 1 Ω in "P" range?
- YES** : Go to step 9T8.
- NO** : Go to step 9T16.

9T8 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 8 — No. 10



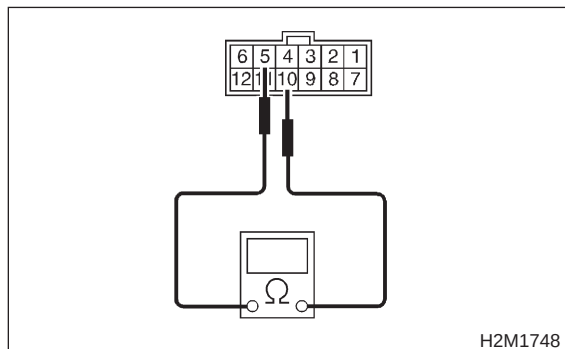
- CHECK** : Is the resistance more than 1 MΩ in other ranges?
- YES** : Go to step 9T11.
- NO** : Go to step 9T16.

9T9 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 5 — No. 10



CHECK : *Is the resistance less than 1 Ω in “N” range?*

YES : Go to step 9T10.

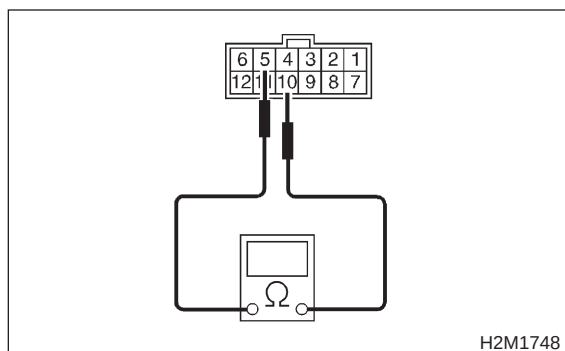
NO : Go to step 9T16.

9T10 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 5 — No. 10



CHECK : *Is the resistance more than 1 MΩ in other ranges?*

YES : Go to step 9T13.

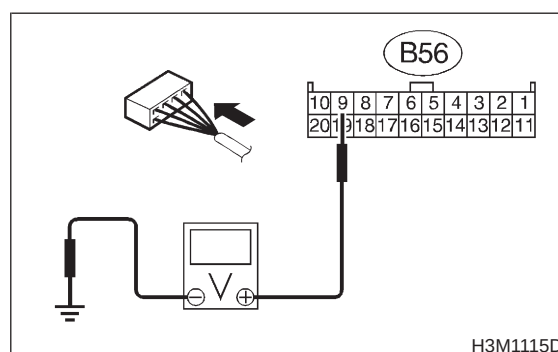
NO : Go to step 9T16.

9T11 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 9 — Chassis ground:



CHECK : *Is the voltage less than 1 V in “P” range?*

YES : Go to step 9T12.

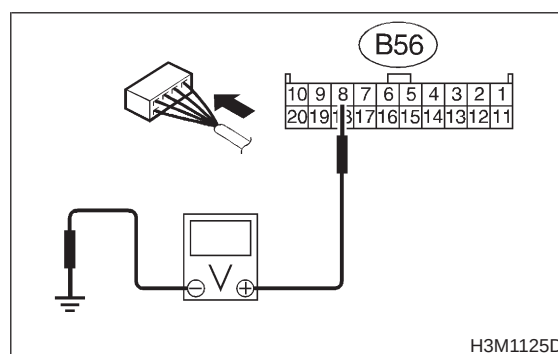
NO : Go to step 9T15.

9T12 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 9 — Chassis ground:



CHECK : *Is the voltage more than 8 V in other ranges?*

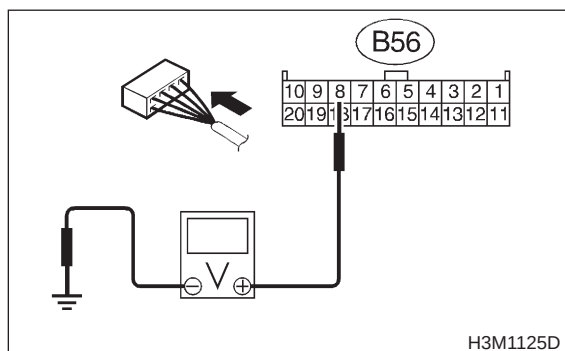
YES : Go to step 9T15.

NO : Go to step 9T16.

9T13 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal
(B56) No. 8 — Chassis ground:

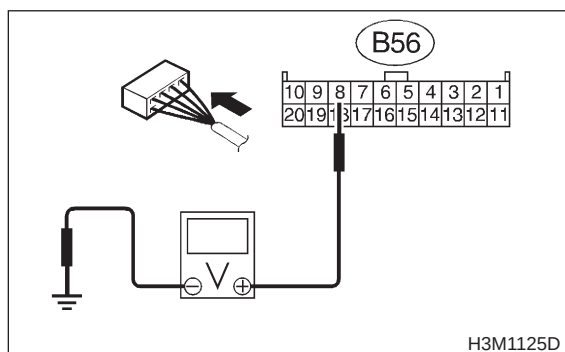


- CHECK** : *Is the voltage less than 1 V in “N” range?*
- YES** : Go to step 9T14.
- NO** : Go to step 9T15.

9T14 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal
(B56) No. 8 — Chassis ground:



- CHECK** : *Is the voltage more than 8 V in other ranges?*
- YES** : Go to step 9T15.
- NO** : Go to step 9T16.

9T15 : CHECK POOR CONTACT.

- CHECK** : *Is there poor contact in “N/P” range switch circuit?*
- YES** : Repair poor contact.
- NO** : Replace TCM.

9T16 : CHECK SELECTOR CABLE.

- CHECK** : *Is there faulty connection in the selector cable?*
- YES** : Repair connection of selector cable.
- NO** : Replace inhibitor switch.

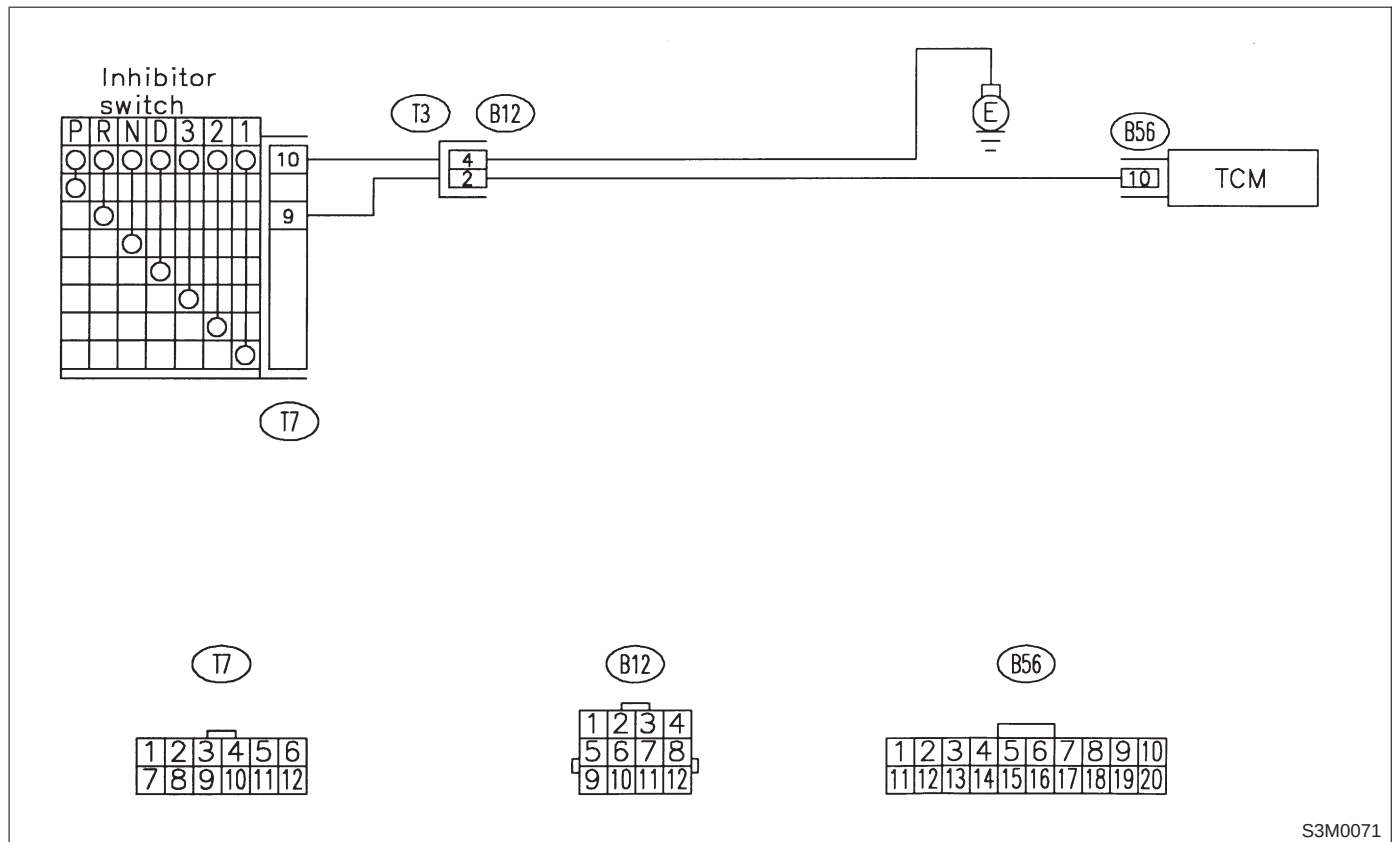
MEMO:

U: CHECK “R” RANGE SWITCH.

DIAGNOSIS:

Input signal circuit of “R” range is open or shorted.

WIRING DIAGRAM:



S3M0071

9U1 : CHECK “R” RANGE SWITCH.

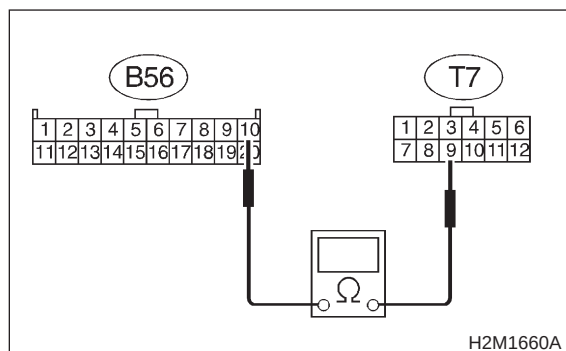
- CHECK** : *When the “R” range is selected, does LED light up?*
- YES** : Go to step “D” RANGE SWITCH. <Ref. to 3-2 [T9V0].>
- NO** : Go to step **9U2**.

9U2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B56) No. 10 — (T7) No. 9:



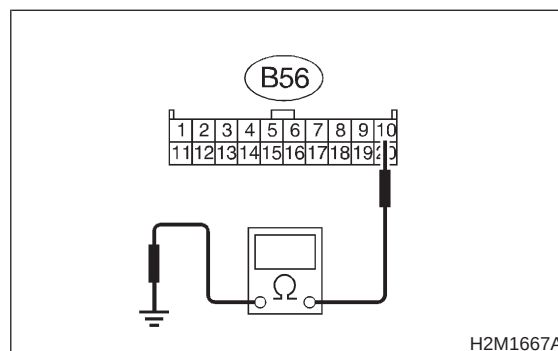
- CHECK** : Is the resistance less than 1 Ω ?
- YES** : Go to step 9U3.
- NO** : Repair open circuit in harness between TCM and inhibitor switch connector, and poor contact in coupling connector.

9U3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B56) No. 10 — Chassis ground:



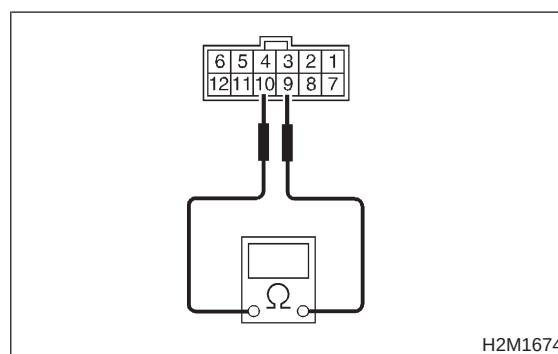
- CHECK** : Is the resistance more than 1 $M\Omega$?
- YES** : Go to step 9U4.
- NO** : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9U4 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 9 — No. 10



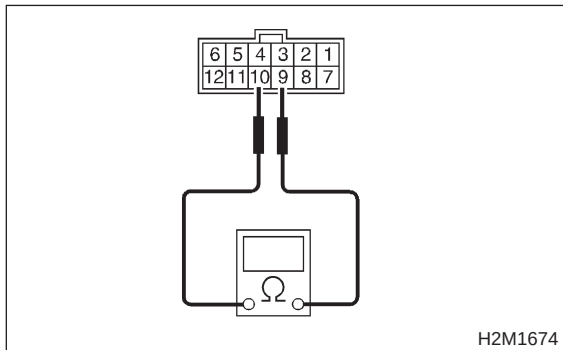
- CHECK** : Is the resistance less than 1 Ω in "R" range?
- YES** : Go to step 9U5.
- NO** : Go to step 9U9.

9U5 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 9 — No. 10



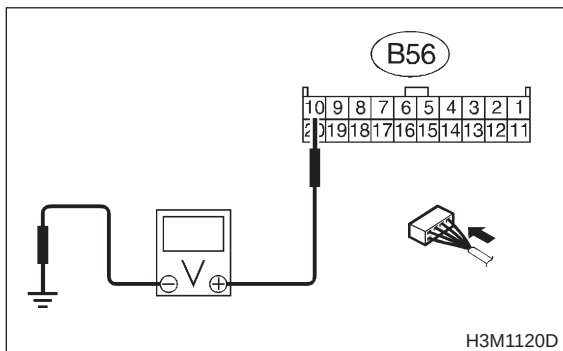
- CHECK** : Is the resistance more than 1 MΩ in other ranges?
- YES** : Go to step 9U6.
- NO** : Go to step 9U9.

9U6 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 10 — Chassis ground:



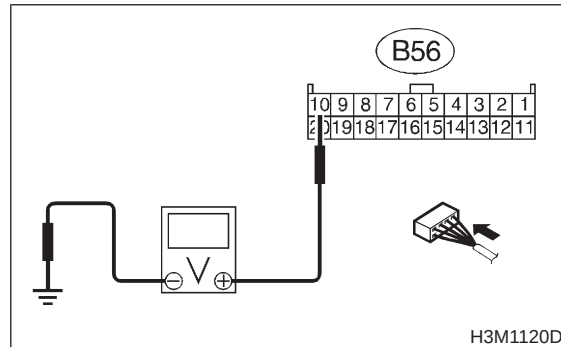
- CHECK** : Is the voltage less than 1 V in "R" range?
- YES** : Go to step 9U7.
- NO** : Go to step 9U8.

9U7 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B56) No. 10 — Chassis ground:



- CHECK** : Is the voltage more than 6 V in other ranges?
- YES** : Go to step 9U8.
- NO** : Go to step 9U9.

9U8 : CHECK POOR CONTACT.

- CHECK** : Is there poor contact in "R" range switch circuit?
- YES** : Repair poor contact.
- NO** : Replace TCM.

9U9 : CHECK SELECTOR CABLE.

- CHECK** : Is there faulty connection in the selector cable?
- YES** : Repair connection of selector cable.
- NO** : Replace inhibitor switch.

MEMO:

V: CHECK "D" RANGE SWITCH.

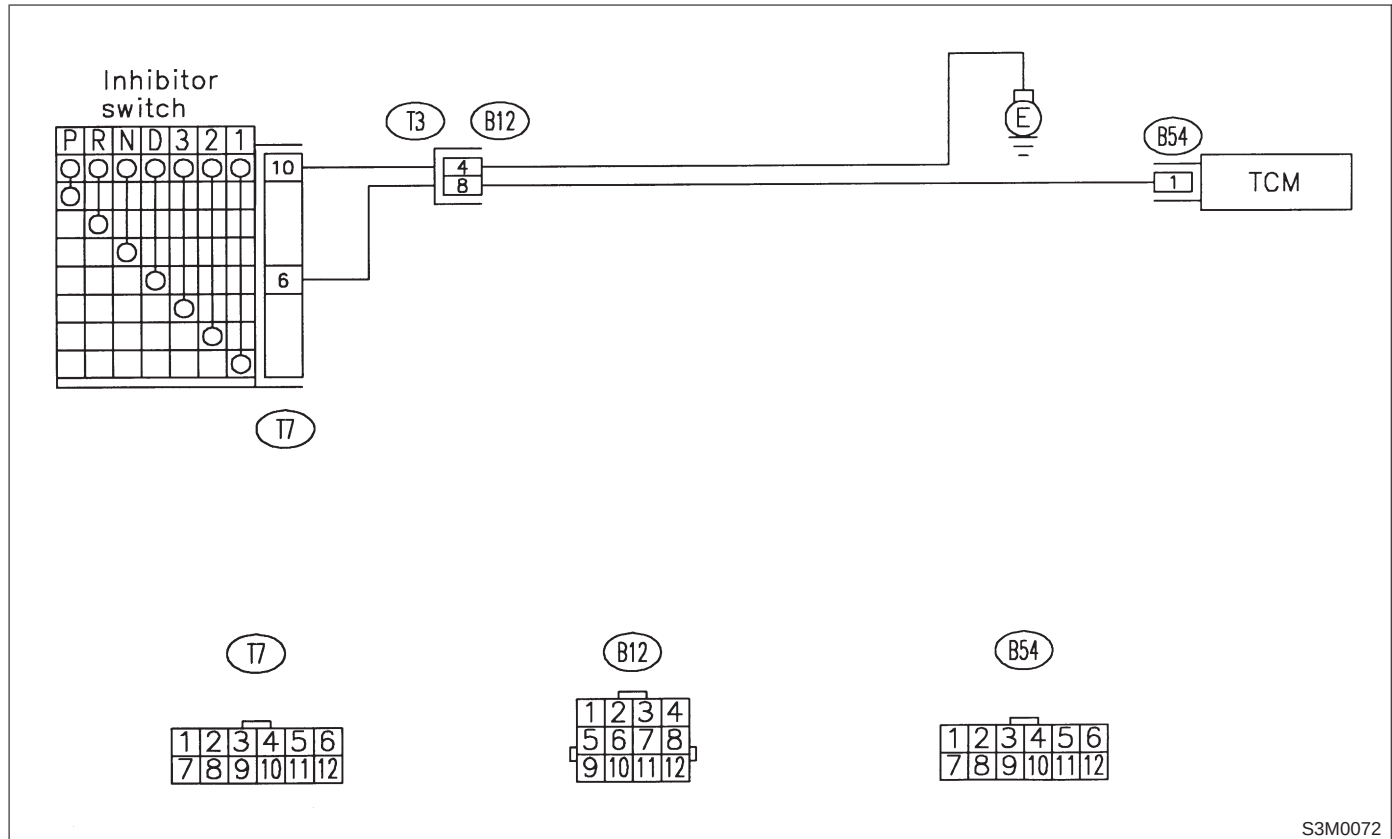
DIAGNOSIS:

Input signal circuit of "D" range is open or shorted.

TROUBLE SYMPTOM:

Shift characteristics are erroneous.

WIRING DIAGRAM:



S3M0072

9V1 : CHECK "D" RANGE SWITCH.

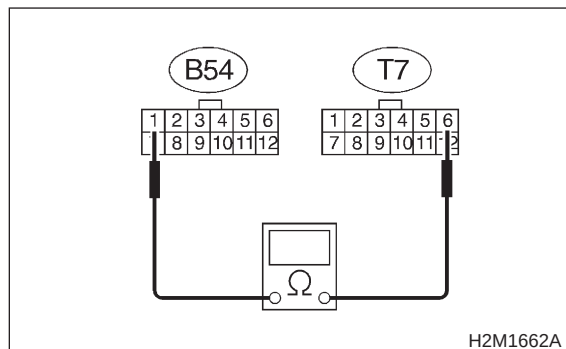
- CHECK** : *When the "D" range is selected, does LED light up?*
- YES** : Go to step "3" RANGE SWITCH. <Ref. to 3-2 [T9W0].>
- NO** : Go to step 9V2.

9V2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B54) No. 1 — (T7) No. 6:



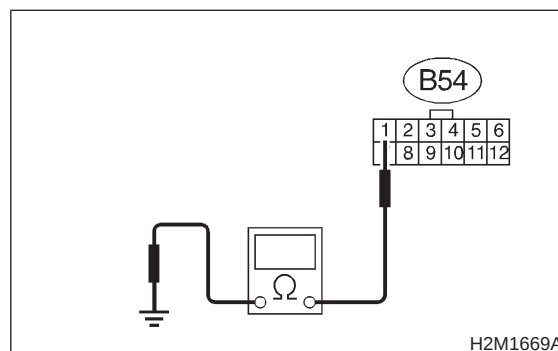
- CHECK** : *Is the resistance less than 1 Ω?*
- YES** : Go to step **9V3**.
- NO** : Repair open circuit in harness between TCM and inhibitor switch connector, and poor contact in coupling connector.

9V3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 1 — Chassis ground:



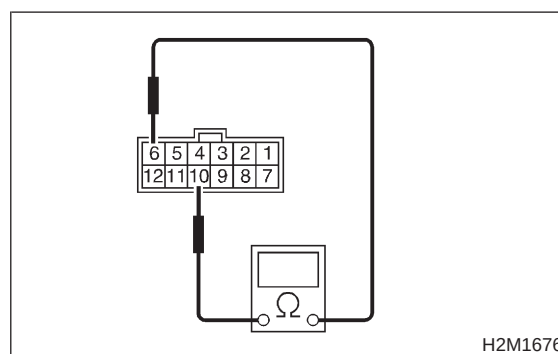
- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **9V4**.
- NO** : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9V4 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 6 — No. 10



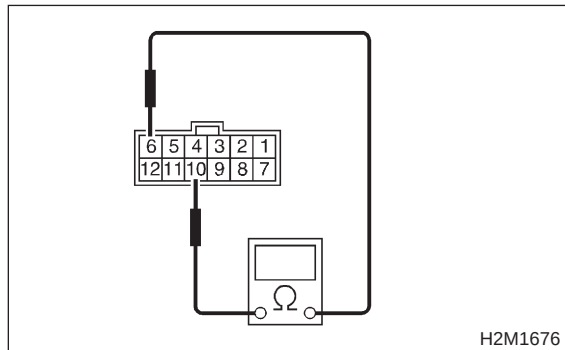
- CHECK** : *Is the resistance less than 1 Ω in "D" range?*
- YES** : Go to step **9V5**.
- NO** : Go to step **9V9**.

9V5 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 6 — No. 10



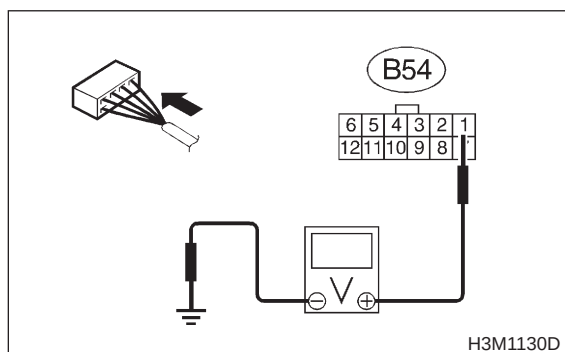
- CHECK** : Is the resistance more than 1 MΩ in other ranges?
- YES** : Go to step 9V6.
- NO** : Go to step 9V9.

9V6 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 1 — Chassis ground:



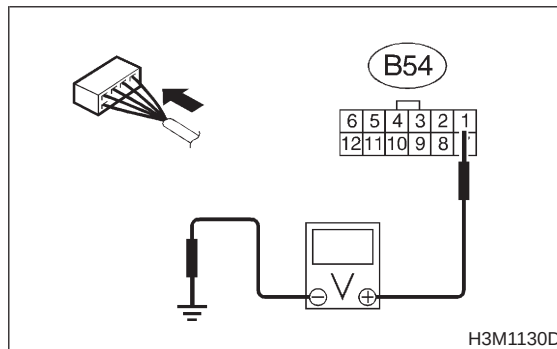
- CHECK** : Is the voltage less than 1 V in "D" range?
- YES** : Go to step 9V7.
- NO** : Go to step 9V8.

9V7 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 1 — Chassis ground:



- CHECK** : Is the voltage more than 6 V in other ranges?
- YES** : Go to step 9V8.
- NO** : Go to step 9V9.

9V8 : CHECK POOR CONTACT.

- CHECK** : Is there poor contact in "D" range switch circuit?
- YES** : Repair poor contact.
- NO** : Replace TCM.

9V9 : CHECK SELECTOR CABLE.

- CHECK** : Is there faulty connection in the selector cable?
- YES** : Repair connection of selector cable.
- NO** : Replace inhibitor switch.

MEMO:

W: CHECK "3" RANGE SWITCH.

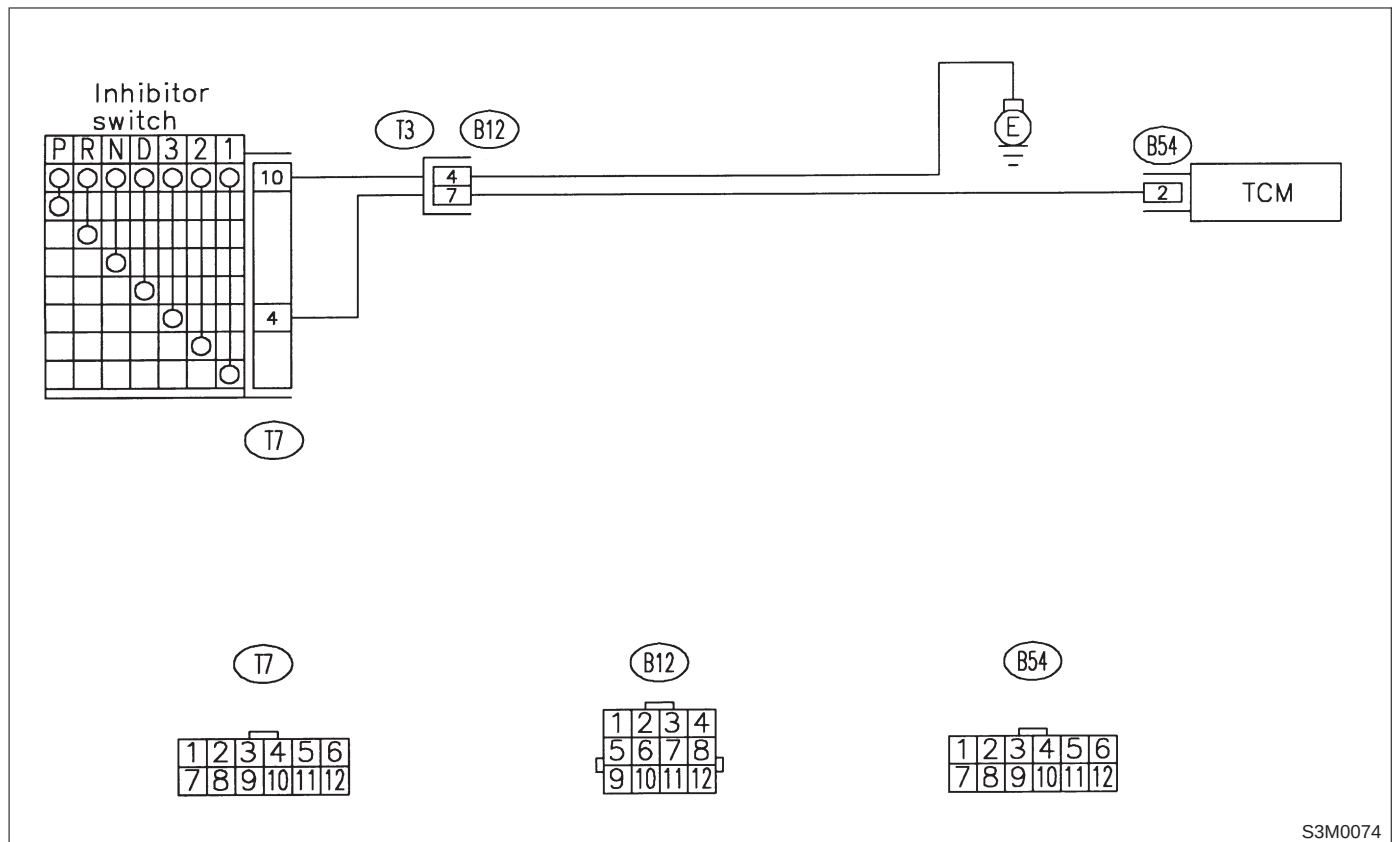
DIAGNOSIS:

Input signal circuit of "3" range is open or shorted.

TROUBLE SYMPTOM:

- Shift characteristics are erroneous.
- Engine brake is not effected when selector lever is in "3" range.

WIRING DIAGRAM:



S3M0074

9W1 : CHECK "3" RANGE SWITCH.

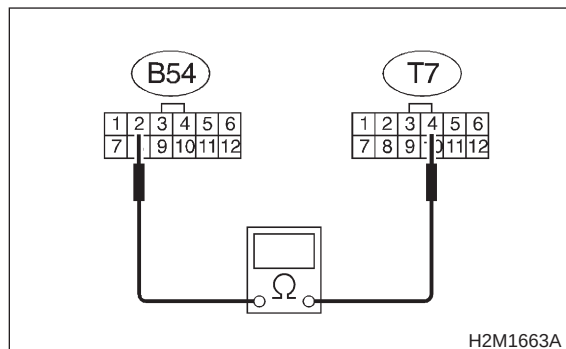
- CHECK** : *When the "3" range is selected, does LED light up?*
- YES** : Go to step "2" RANGE SWITCH. <Ref. to 3-2 [T9X0].>
- NO** : Go to step **9W2**.

9W2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B54) No. 2 — (T7) No. 4:



CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 9W3.

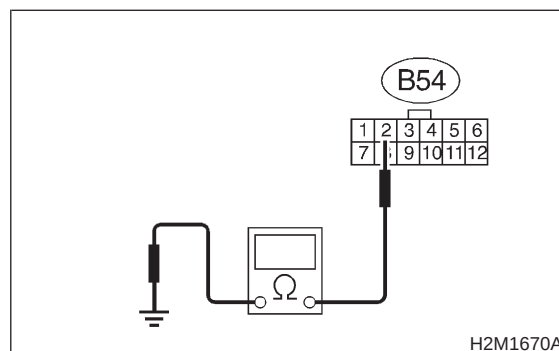
NO : Repair open circuit in harness between TCM and inhibitor switch connector and poor contact in coupling connector.

9W3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 2 — Chassis ground:



CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 9W4.

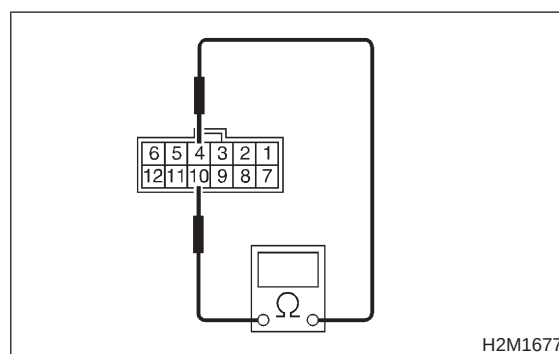
NO : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9W4 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 4 — No. 10



CHECK : Is the resistance less than 1 Ω in "3" range?

YES : Go to step 9W5.

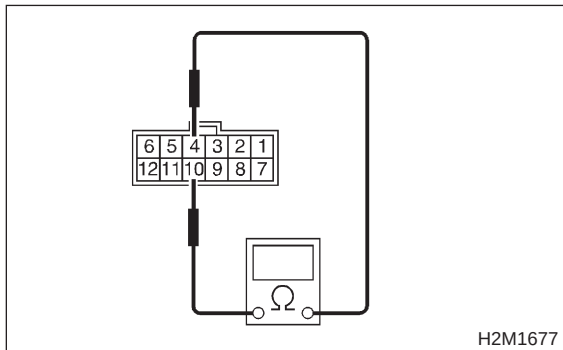
NO : Go to step 9W9.

9W5 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 4 — No. 10



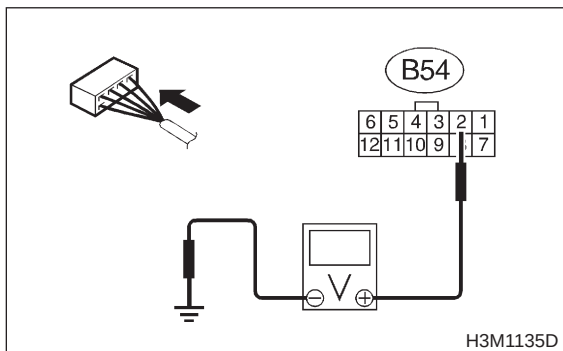
- CHECK** : Is the resistance more than 1 MΩ in other ranges?
- YES** : Go to step 9W6.
- NO** : Go to step 9W9.

9W6 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 2 — Chassis ground:



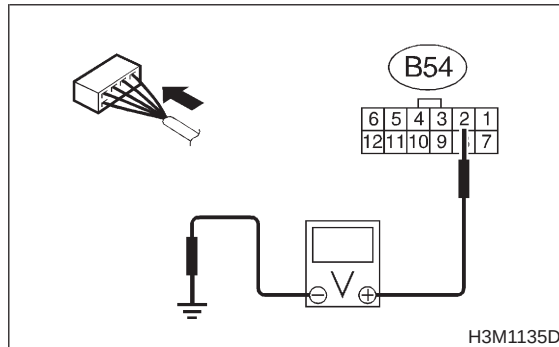
- CHECK** : Is the voltage less than 1 V in "3" range?
- YES** : Go to step 9W7.
- NO** : Go to step 9W8.

9W7 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 2 — Chassis ground:



- CHECK** : Is the voltage more than 6 V in other ranges?
- YES** : Go to step 9W8.
- NO** : Go to step 9W9.

9W8 : CHECK POOR CONTACT.

- CHECK** : Is there poor contact in "3" range switch circuit?
- YES** : Repair poor contact.
- NO** : Replace TCM.

9W9 : CHECK SELECTOR CABLE.

- CHECK** : Is there faulty connection in the selector cable?
- YES** : Repair connection of selector cable.
- NO** : Replace inhibitor switch.

MEMO:

X: CHECK "2" RANGE SWITCH.

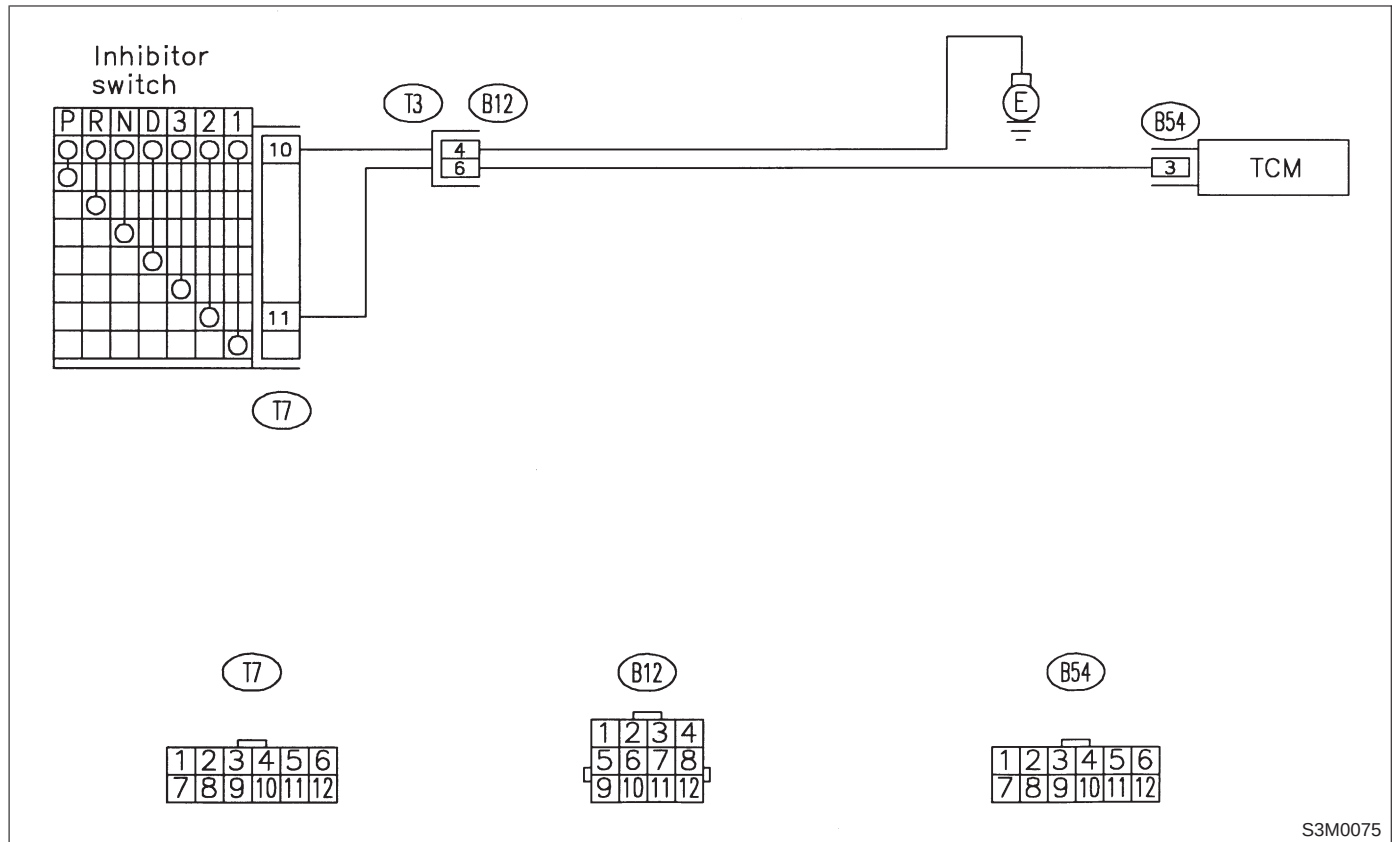
DIAGNOSIS:

Input signal circuit of "2" range is open or shorted.

TROUBLE SYMPTOM:

- Shift characteristics are erroneous.
- Engine brake is not effected when selector lever is in "2" range.

WIRING DIAGRAM:



S3M0075

9X1 : CHECK "2" RANGE SWITCH.

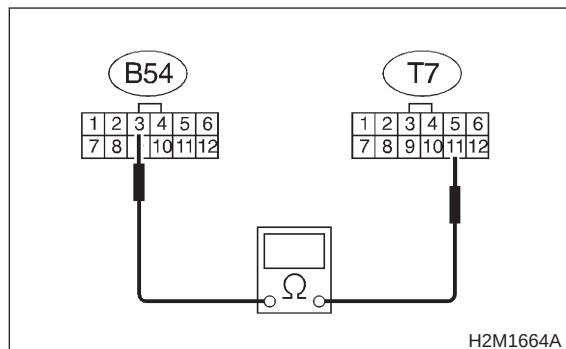
- CHECK** : When the "2" range is selected, does LED light up?
- YES** : Go to step "1" RANGE SWITCH. <Ref. to 3-2 [T9Y0].>
- NO** : Go to step 9X2.

9X2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B54) No. 3 — (T7) No. 11:



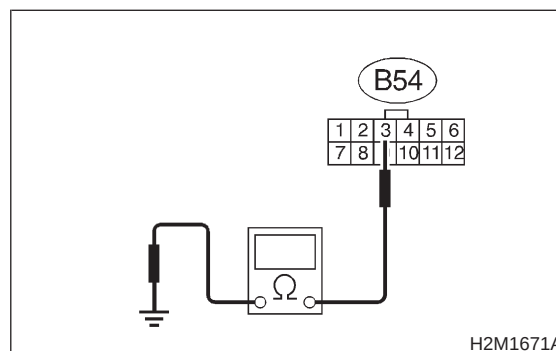
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 9X3.
- NO** : Repair open circuit in harness between TCM and inhibitor switch connector, and poor contact in coupling connector.

9X3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 3 — Chassis ground:



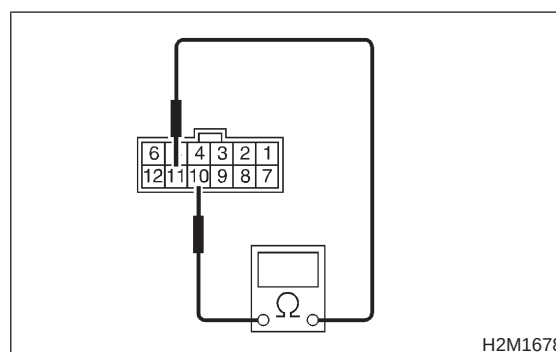
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 9X4.
- NO** : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9X4 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 11 — No. 10



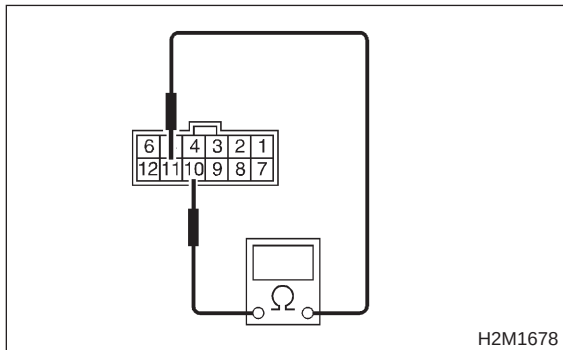
- CHECK** : Is the resistance less than 1 Ω in "2" range?
- YES** : Go to step 9X5.
- NO** : Go to step 9X9.

9X5 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 11 — No. 10



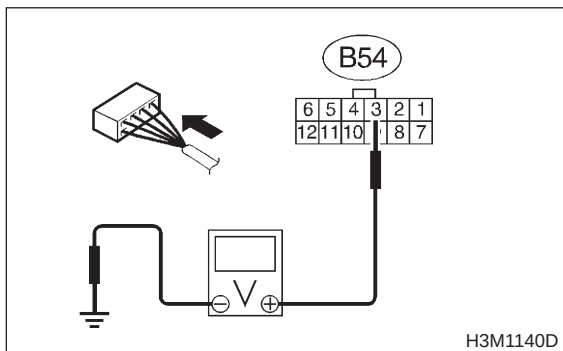
- CHECK** : *Is the resistance more than 1 MΩ in other ranges?*
- YES** : Go to step 9X6.
- NO** : Go to step 9X9.

9X6 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 3 — Chassis ground:



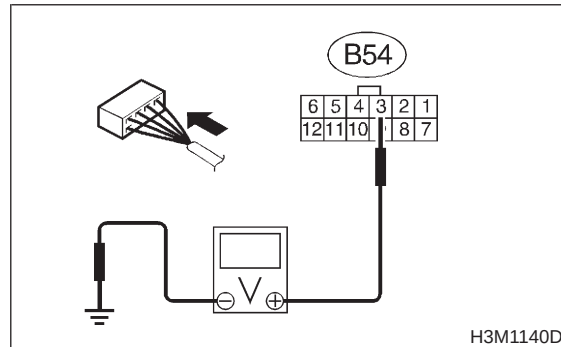
- CHECK** : *Is the voltage less than 1 V in "2" range?*
- YES** : Go to step 9X7.
- NO** : Go to step 9X8.

9X7 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 3 — Chassis ground:



- CHECK** : *Is the voltage more than 6 V in other ranges?*
- YES** : Go to step 9X8.
- NO** : Go to step 9X9.

9X8 : CHECK POOR CONTACT.

- CHECK** : *Is there poor contact in "2" range switch circuit?*
- YES** : Repair poor contact.
- NO** : Replace TCM.

9X9 : CHECK SELECTOR CABLE.

- CHECK** : *Is there faulty connection in the selector cable?*
- YES** : Repair connection of selector cable.
- NO** : Replace inhibitor switch.

MEMO:

Y: CHECK "1" RANGE SWITCH.

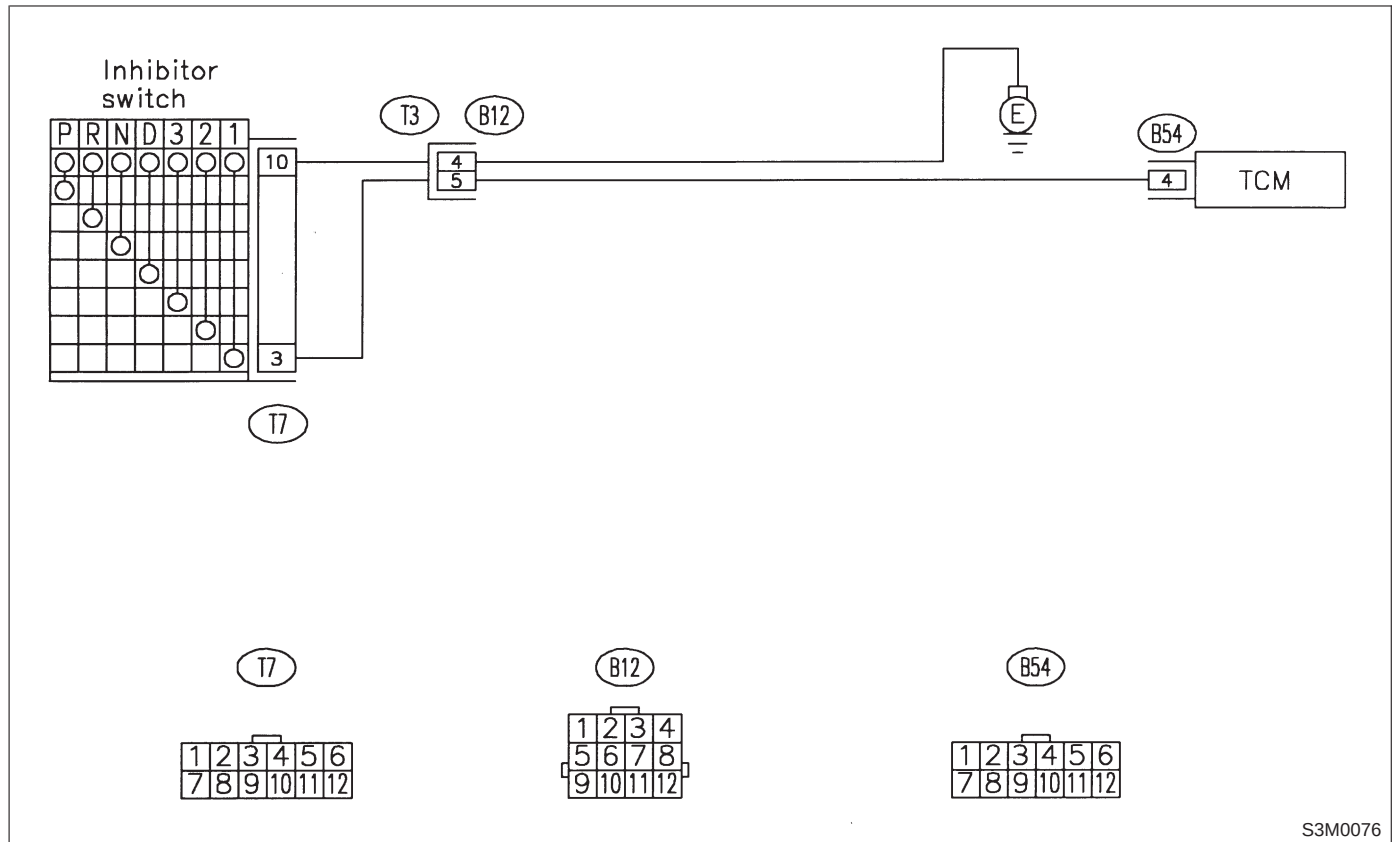
DIAGNOSIS:

Input signal circuit of "1" range is open or shorted.

TROUBLE SYMPTOM:

- Shift characteristics are erroneous.
- Engine brake is not effected when selector lever is in "1" range.

WIRING DIAGRAM:



S3M0076

9Y1 : CHECK "1" RANGE SWITCH.

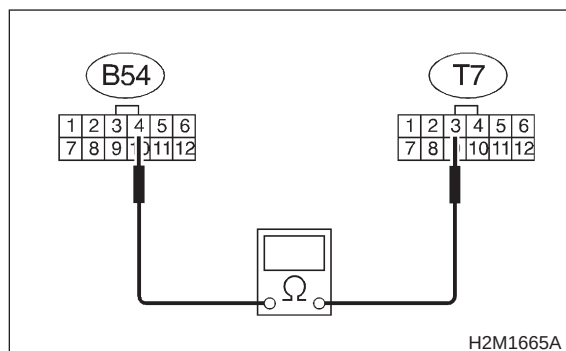
- CHECK** : When the "1" range is selected, does LED light up?
- YES** : Go to step HOLD SWITCH. <Ref. to 3-2 [T9Z0].>
- NO** : Go to step 9Y2.

9Y2 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and inhibitor switch.
- 3) Measure resistance of harness between TCM and inhibitor switch connector.

Connector & terminal

(B54) No. 4 — (T7) No. 3:



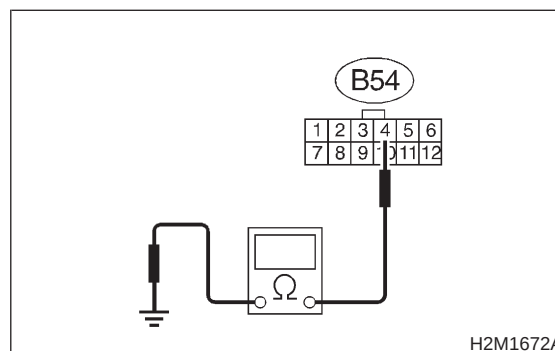
- CHECK** : Is the resistance less than 1 Ω?
- YES** : Go to step 9Y3.
- NO** : Repair open circuit in harness between TCM and inhibitor switch connector and poor contact in coupling connector.

9Y3 : CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

Measure resistance of harness between TCM and chassis ground.

Connector & terminal

(B54) No. 4 — Chassis ground:



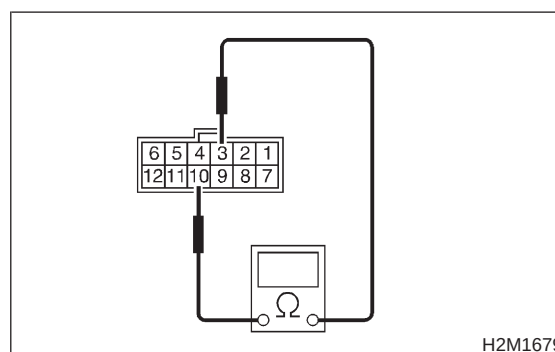
- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 9Y4.
- NO** : Repair ground short circuit in harness between TCM and inhibitor switch connector.

9Y4 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 3 — No. 10



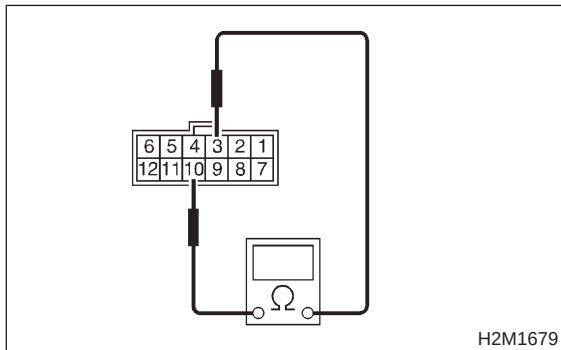
- CHECK** : Is the resistance less than 1 Ω in "1" range?
- YES** : Go to step 9Y5.
- NO** : Go to step 9Y9.

9Y5 : CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 3 — No. 10



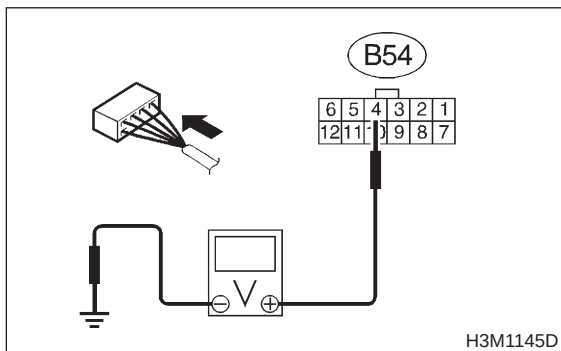
- CHECK** : *Is the resistance more than 1 MΩ in other ranges?*
- YES** : Go to step 9Y6.
- NO** : Go to step 9Y9.

9Y6 : CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and inhibitor switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 4 — Chassis ground:



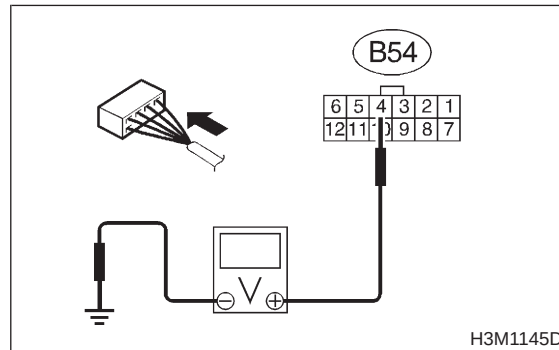
- CHECK** : *Is the voltage less than 1 V in "1" range?*
- YES** : Go to step 9Y7.
- NO** : Go to step 9Y8.

9Y7 : CHECK INPUT SIGNAL FOR TCM.

Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 4 — Chassis ground:



- CHECK** : *Is the voltage more than 6 V in other ranges?*
- YES** : Go to step 9Y8.
- NO** : Go to step 9Y9.

9Y8 : CHECK POOR CONTACT.

- CHECK** : *Is there poor contact in "1" range switch circuit?*
- YES** : Repair poor contact.
- NO** : Replace TCM.

9Y9 : CHECK SELECTOR CABLE.

- CHECK** : *Is there faulty connection in the selector cable?*
- YES** : Repair connection of selector cable.
- NO** : Replace inhibitor switch.

Z: CHECK HOLD SWITCH.

9Z1 : CHECK HOLD SWITCH.

- CHECK** : *Does the LED of hold switch mode light up?*
- YES** : Replace TCM.
- NO** : Go to step SHIFT SOLENOID 1. <Ref. to 3-2 [T9AA0].>

AA: CHECK SHIFT SOLENOID 1.**9AA1 : CHECK SHIFT SOLENOID 1.**

- CHECK** : *Does the LED of shift solenoid 1 light up?*
- YES** : Go to step SHIFT SOLENOID 2. <Ref. to 3-2 [T9AB0].>
- NO** : Check shift solenoid 1 circuit. <Ref. to 3-2 [T8G0].>

AB: CHECK SHIFT SOLENOID 2.**9AB1 : CHECK SHIFT SOLENOID 2.**

- CHECK** : *Does the LED of shift solenoid 2 light up?*
- YES** : Go to step OVERRUNNING SOLENOID. <Ref. to 3-2 [T9AC0].>
- NO** : Check shift solenoid 2 circuit. <Ref. to 3-2 [T8F0].>

AC: CHECK OVERRUNNING SOLENOID.**9AC1 : CHECK OVERRUNNING SOLENOID.**

- CHECK** : *Does the LED of overrunning solenoid light up?*
- YES** : Check overrunning solenoid circuit. <Ref. to 3-2 [T8E0].>
- NO** : Go to step ATF TEMPERATURE WARNING LAMP. <Ref. to 3-2 [T9AD0].>

AD: CHECK ATF TEMPERATURE WARNING LAMP.**9AD1 : CHECK ATF TEMPERATURE WARNING LAMP.**

Turn ignition switch to ON (engine OFF).

- CHECK** : *Does temperature warning lamp light up?*
- YES** : Go to step HOLD LAMP. <Ref. to 3-2 [T9AE0].>
- NO** : Check ATF temperature warning lamp circuit. <Ref. to 3-2 [T7A0].>

AE: CHECK HOLD LAMP.**9AE1 : CHECK HOLD LAMP.**

- CHECK** : *Does the LED of hold lamp light up?*
- YES** : Replace TCM.
- NO** : Go to step FWD MODE LAMP. <Ref. to 3-2 [T9AF0].>

AF: CHECK FWD LAMP.**9AF1 : CHECK FWD LAMP.**

- CHECK** : *Does the LED of FWD lamp light up?*
- YES** : Check FWD lamp circuit. <Ref. to 3-2 [T9N0].>
- NO** : Go to step TORQUE CONTROL SIGNAL. <Ref. to 3-2 [T9AG0].>

AG: CHECK TORQUE CONTROL SIGNAL.**9AG1 : CHECK TORQUE CONTROL SIGNAL.**

Turn ignition switch to ON (engine ON).

- CHECK** : *Does the LED of torque control signal light up?*
- YES** : Check torque control signal circuit. <Ref. to 3-2 [T8L0].>
- NO** : Go to step General Diagnostic Table. <Ref. to 3-2 [T1000].>

3-2 [T1000] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

10. General Diagnostic Table

10. General Diagnostic Table

Symptom	Problem parts
Starter does not rotate when select lever is in "P" or "N"; starter rotates when select lever is in "R", "D", "3" or "2".	1) Inhibitor switch 2) Select cable 3) Select lever 4) Starter motor and harness
Abnormal noise when select lever is in "P" or "N".	1) Strainer 2) Duty solenoid C 3) Oil pump 4) Drive plate 5) ATF level too high or too low
Hissing noise occurs during standing start.	1) Strainer 2) ATF level too high or too low
Noise occurs while driving in "D1".	1) Final gear 2) Planetary gear
Noise occurs while driving in "D2".	3) Reduction gear 4) Differential gear oil level too high or too low
Noise occurs while driving in "D3".	1) Final gear 2) Low & reverse brake 3) Reduction gear 4) Differential gear oil level too high or too low
Noise occurs while driving in "D4".	1) Final gear 2) Low & reverse brake 3) Planetary gear 4) Reduction gear 5) Differential gear oil level too high or too low
Engine stalls while shifting from one range to another.	1) Control valve 2) Lock-up damper 3) Engine performance
Vehicle moves when select lever is in "N".	1) Control module 2) Inhibitor switch 3) Forward clutch
Shock occurs when select lever is moved from "N" to "D".	1) Control module 2) Accumulator ("N" to "D") 3) Control valve 4) ATF deterioration 5) Dropping resistor
Excessive time lag occurs when select lever is moved from "N" to "D".	1) Control module 2) Control valve 3) Forward clutch 4) Duty solenoid A 5) Forward clutch seal ring 6) Front gasket transmission case
Shock occurs when select lever is moved from "N" to "R".	1) Control module 2) Accumulator (4A) 3) Control valve 4) ATF deterioration 5) Dropping resistor
Excessive time lag occurs when select lever is moved from "N" to "R".	1) Control valve 2) Low & reverse clutch 3) Reverse clutch 4) Duty solenoid A 5) Forward clutch seal ring 6) Front gasket transmission case
Vehicle does not start in any shift range (engine stalls).	1) Parking brake mechanism 2) Planetary gear

Symptom	Problem parts
Vehicle does not start in any shift range (engine revving up).	1) Strainer 2) Duty solenoid A 3) Control valve 4) Drive pinion 5) Hypoid gear 6) Axle shaft 7) Differential gear 8) Oil pump 9) Input shaft 10) Output shaft 11) Planetary gear 12) Drive plate 13) ATF level too low 14) Front gasket transmission case
Vehicle does not start in "R" range only (engine revving up).	1) Select cable 2) Select lever 3) Control valve 4) Low & reverse clutch 5) Reverse clutch
Vehicle does not start in "R" range only (engine stalls).	1) Forward clutch 2) Band brake 3) Planetary gear 4) Parking brake mechanism
Vehicle does not start in "D", "3" or "2" range only (engine revving up).	1) Forward clutch 2) One-way clutch (1-2)
Vehicle does not start in "D", "3", "2" or "1" range only (engine revving up).	1) Forward clutch
Vehicle does not start in "D", "3", "2" or "1" range only (engine stalls).	1) Reverse clutch
Vehicle starts in "R" range only (engine revving up).	1) Control valve
Acceleration during standing starts is poor (high stall rpm).	1) Control valve 2) Forward clutch 3) Reverse clutch 4) ATF level too low 5) Front gasket transmission case
Acceleration during standing starts is poor (low stall rpm).	1) Oil pump 2) Torque converter one-way clutch 3) Engine performance
Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).	1) Control module 2) Control valve 3) High clutch 4) Brake band 5) Planetary gear
Acceleration is poor when select lever is in "R" (normal stall rpm).	1) Control module 2) Overrunning clutch 3) High clutch 4) Brake band 5) Planetary gear
No shift occurs from 1st to 2nd gear.	1) Control module 2) Vehicle speed sensor 1 3) Vehicle speed sensor 2 4) Throttle position sensor 5) Shift solenoid 1 6) Shift solenoid 2 7) Control valve 8) Brake band

3-2 [T1000] AUTOMATIC TRANSMISSION AND DIFFERENTIAL

10. General Diagnostic Table

Symptom	Problem parts
No shift occurs from 2nd to 3rd gear.	1) Control module 2) Control valve 3) High clutch 4) One-way clutch (3-4)
No shift occurs from 3rd to 4th gear.	1) Control module 2) Accumulator (3R) 3) ATF temperature sensor 4) Control valve 5) Band brake
Engine brake is not effected when select lever is in "3" range.	1) Inhibitor switch 2) Control module 3) Throttle position sensor 4) Control valve 5) Shift solenoid 3
Engine brake is not effected when select lever is in "3" or "2" range.	1) Control valve 2) Overrunning clutch
Engine brake is not effected when select lever is in "1" range.	1) Control valve 2) Low & reverse brake clutch
Shift characteristics are erroneous.	1) Inhibitor switch 2) Control module 3) Vehicle speed sensor 1 4) Vehicle speed sensor 2 5) Throttle position sensor 6) Control valve
No lock-up occurs.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Control valve 5) Lock-up facing 6) Engine speed signal
Parking brake is not effected.	1) Select cable
Shift lever cannot be moved or is hard to move from "P" range.	2) Select lever 3) Parking mechanism
ATF spurts out.	1) ATF level too high
Differential oil spurts out.	1) Differential gear oil too high
Differential oil level changes excessively.	1) Seal pipe 2) Double oil seal
Odor is produced from ATF supply pipe.	1) Transfer clutch 2) Forward clutch 3) Overrunning clutch 4) High clutch 5) Band brake 6) Low & reverse clutch 7) Reverse clutch 8) Lock-up facing 9) ATF deterioration
Shock occurs from 1st to 2nd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (2A) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Band brake 8) ATF deterioration 9) Engine performance 10) Dropping resistor

Symptom	Problem parts
Slippage occurs from 1st to 2nd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (2A) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Band brake
Shock occurs from 2nd to 3rd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (3R) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) High clutch 8) Band brake 9) ATF deterioration 10) Engine performance 11) Dropping resistor
Slippage occurs from 2nd to 3rd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (3R) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) High clutch 8) Band brake
Shock occurs from 3rd to 4th gear.	1) Control module 2) Throttle position sensor 3) Accumulator 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Overrunning clutch 8) Band brake 9) ATF deterioration 10) Engine performance
Slippage occurs from 3rd to 4th gear.	1) Control module 2) Throttle position sensor 3) Accumulator 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Band brake
Shock occurs when select lever is moved from "3" to "2" range.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) Overrunning clutch 7) Band brake 8) ATF deterioration
Shock occurs when select lever is moved from "D" to "1" range.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) ATF deterioration 7) Low & reverse brake

Symptom	Problem parts
Shock occurs when select lever is moved from "2" to "1" range.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) Low & reverse clutch 7) ATF deterioration
Shock occurs when accelerator pedal is released at medium speeds.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) Lock-up damper 7) Engine performance
Vibration occurs during straight-forward operation.	1) Control module 2) Duty solenoid B 3) Lock-up facing 4) Lock-up damper
Vibration occurs during turns (tight corner "braking" phenomenon).	1) Control module 2) Vehicle speed sensor 1 3) Vehicle speed sensor 2 4) Throttle position sensor 5) ATF temperature sensor 6) Transfer clutch 7) Transfer valve 8) Duty solenoid C 9) ATF deterioration
Front wheel slippage occurs during standing starts.	1) Control module 2) Vehicle speed sensor 2 3) FWD switch 4) Throttle position sensor 5) ATF temperature sensor 6) Control valve 7) Transfer clutch 8) Transfer valve 9) Transfer pipe 10) Duty solenoid C 11) Transfer clutch hub
Vehicle is not set in FWD mode.	1) Control module 2) FWD switch 3) Transfer clutch 4) Transfer valve 5) Duty solenoid C
Select lever is hard to move.	1) Select cable 2) Select lever 3) Detent spring 4) Manual plate
Select lever is too high to move (unreasonable resistance).	1) Detent spring 2) Manual plate
Select lever slips out of operation during acceleration or while driving on rough terrain.	1) Select cable 2) Select lever 3) Detent spring 4) Manual plate

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the ABS sensor, ABS control module and hydraulic control unit.

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when servicing the ABS sensor, ABS control module and hydraulic control unit.

2. Pre-inspection

Before performing diagnostics, check the following items which might affect ABS problems:

A: MECHANICAL INSPECTION

1. POWER SUPPLY

- 1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V, or more

Specific gravity: Above 1.260

- 2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

2. BRAKE FLUID

- 1) Check brake fluid level.
- 2) Check brake fluid leakage.

3. BRAKE DRAG

Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S100].>, <Ref. to 4-2 [S200].>

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3. BRAKE DRAG

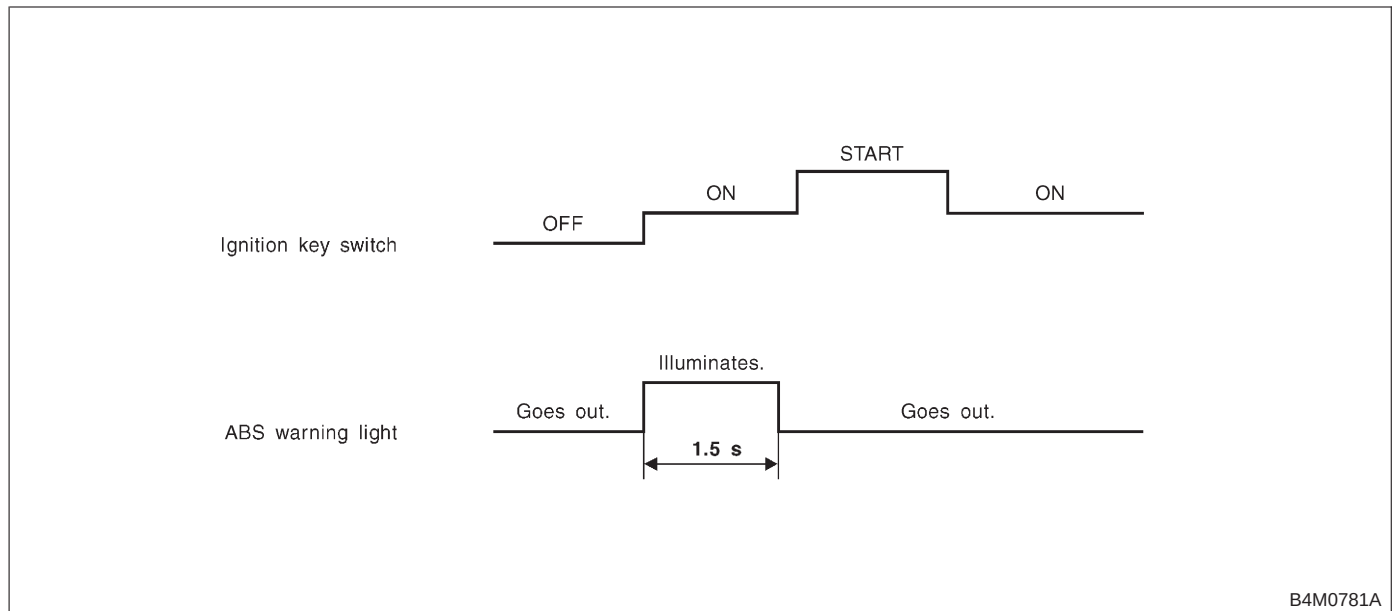
Check brake drag. <Ref. to 4-4 [K100].>

4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].>

5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S100].>, <Ref. to 4-2 [S200].>

B: ELECTRICAL INSPECTION**1. WARNING LIGHT ILLUMINATION PATTERN**

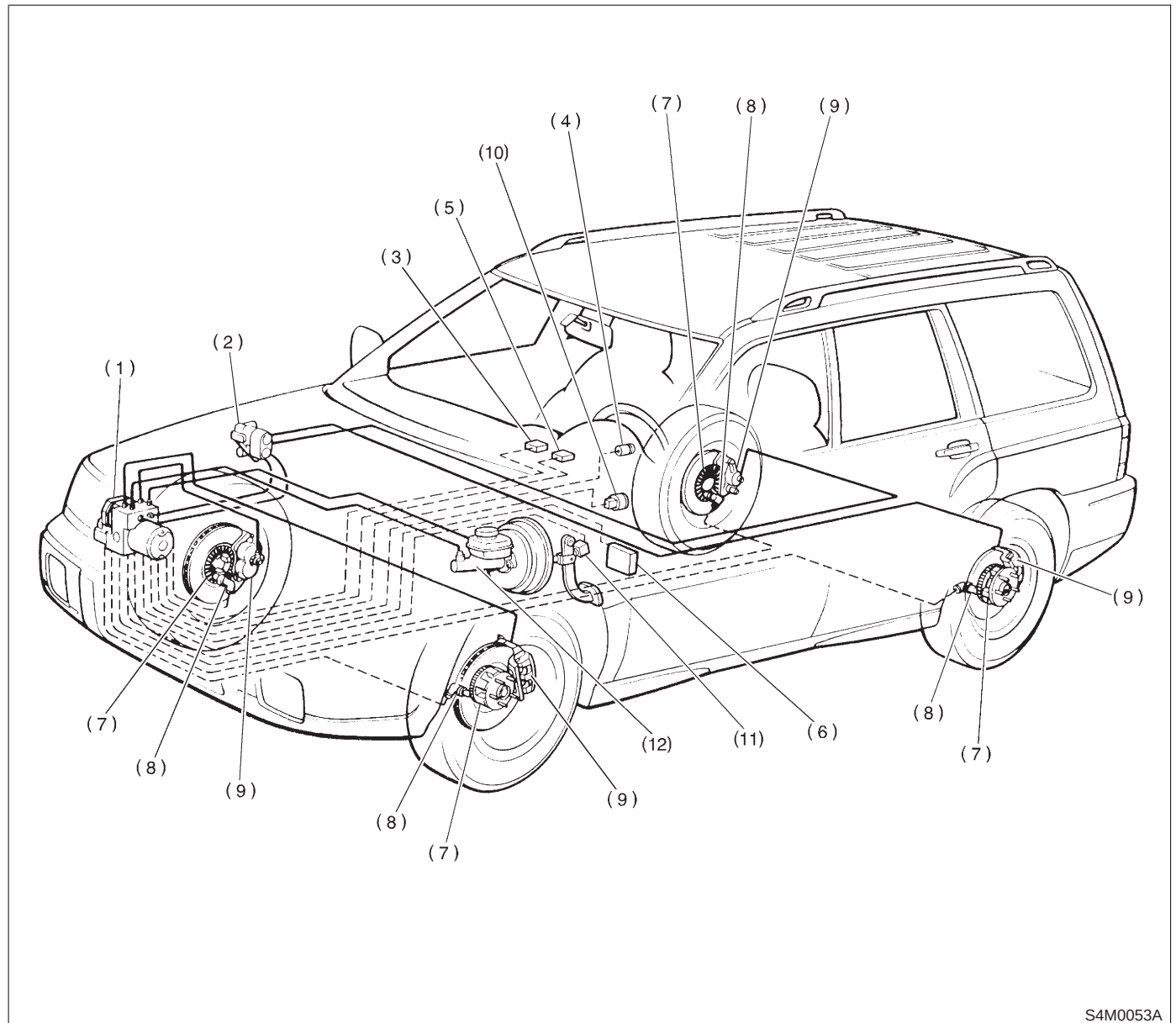
1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.

2) When the ABS warning light remains constantly OFF, repair the ABS warning light circuit or diagnosis circuit. <Ref. to 4-4 [T7A0].>

NOTE:

Even though the ABS warning light does not go out 1.5 seconds after it illuminates, the ABS system operates normally when the warning light goes out while driving at approximately 12 km/h (7 MPH). However, the Anti-lock brakes do not work while the ABS warning light is illuminated.

3. Electrical Components Location

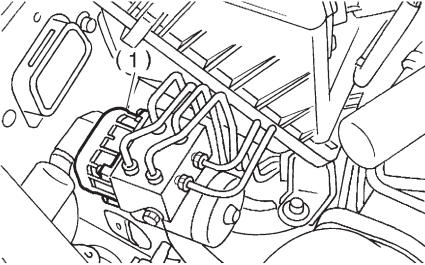
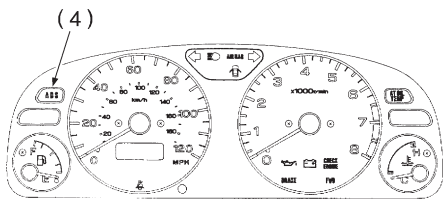
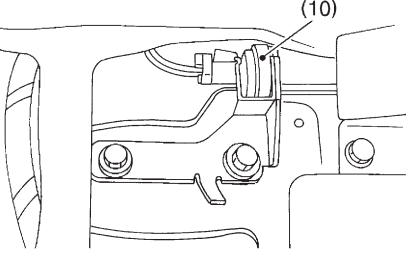
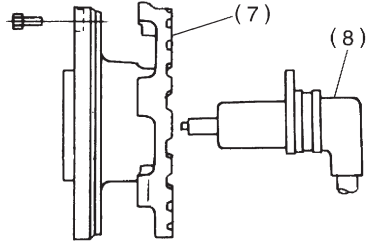
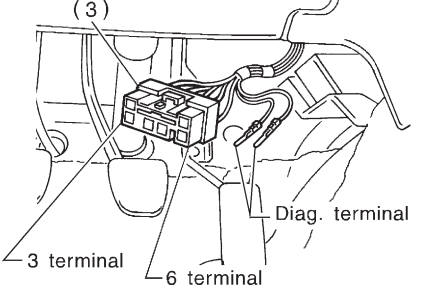
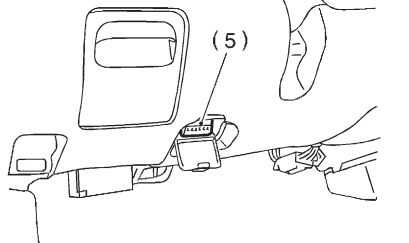


S4M0053A

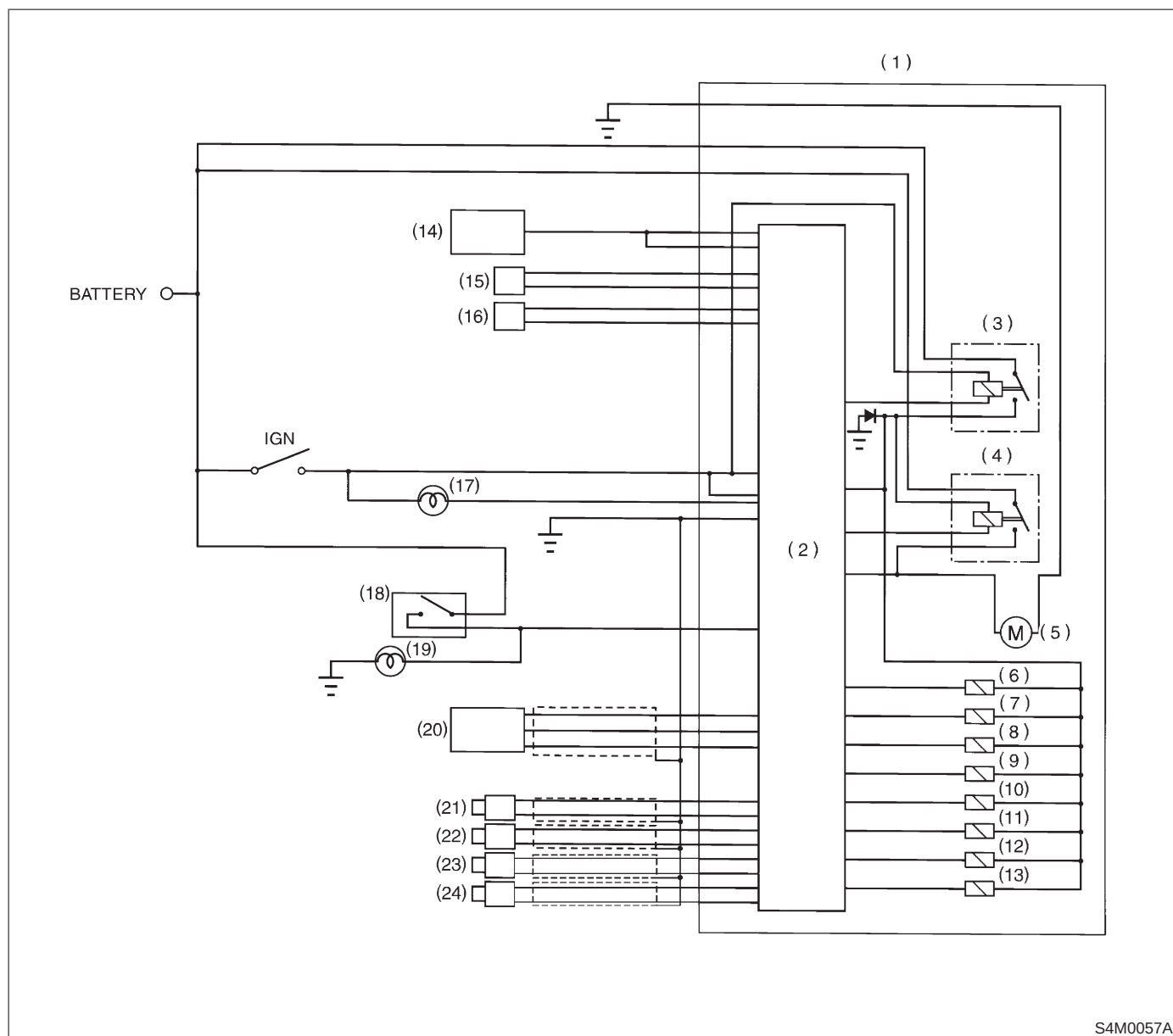
- (1) ABS control module and hydraulic control unit (ABSCM&H/U)
- (2) Proportioning valve
- (3) Diagnosis connector
- (4) ABS warning light

- (5) Data link connector (for Subaru select monitor)
- (6) Transmission control module (only AT vehicle)
- (7) Tone wheel

- (8) ABS sensor
- (9) Wheel cylinder
- (10) G sensor
- (11) Brake switch
- (12) Master cylinder

 B4M1226B	 S4M0054A	 S4M0055A
 B4M0646E	 B4M0231E	 S4M0056A

4. Schematic



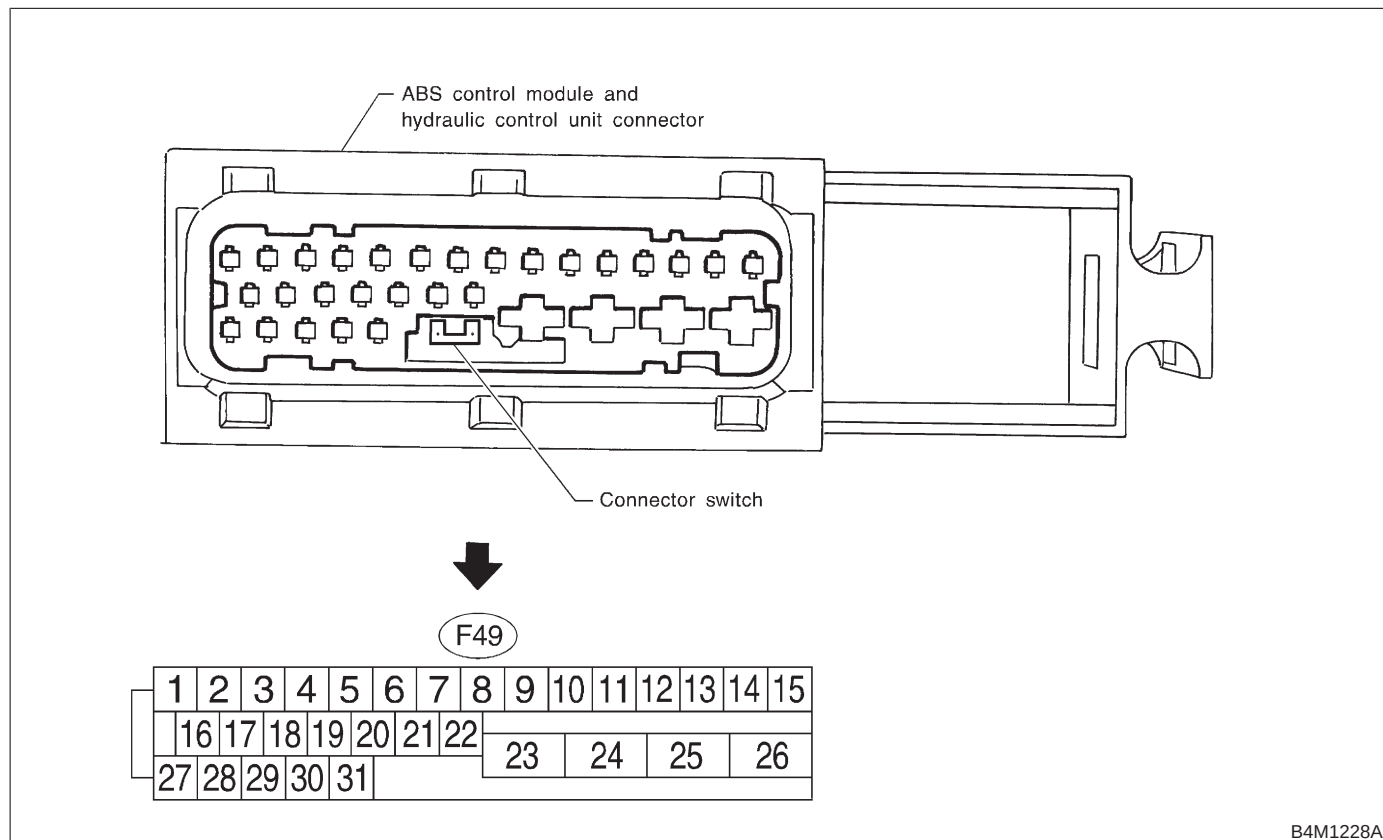
S4M0057A

(1) ABS control module and hydraulic control unit (ABSCM&H/U)	(9) Front right outlet solenoid valve	(17) ABS warning light
(2) ABS control module area	(10) Rear left inlet solenoid valve	(18) Stop light switch
(3) Valve relay	(11) Rear left outlet solenoid valve	(19) Stop light
(4) Motor relay	(12) Rear right inlet solenoid valve	(20) G sensor
(5) Motor	(13) Rear right outlet solenoid valve	(21) Front left ABS sensor
(6) Front left inlet solenoid valve	(14) Transmission control module (only AT model)	(22) Front right ABS sensor
(7) Front left outlet solenoid valve	(15) Diagnosis connector	(23) Rear left ABS sensor
(8) Front right inlet solenoid valve	(16) Data link connector	(24) Rear right ABS sensor

MEMO:

5. Control Module I/O Signal

A: I/O SIGNAL VOLTAGE



B4M1228A

NOTE:

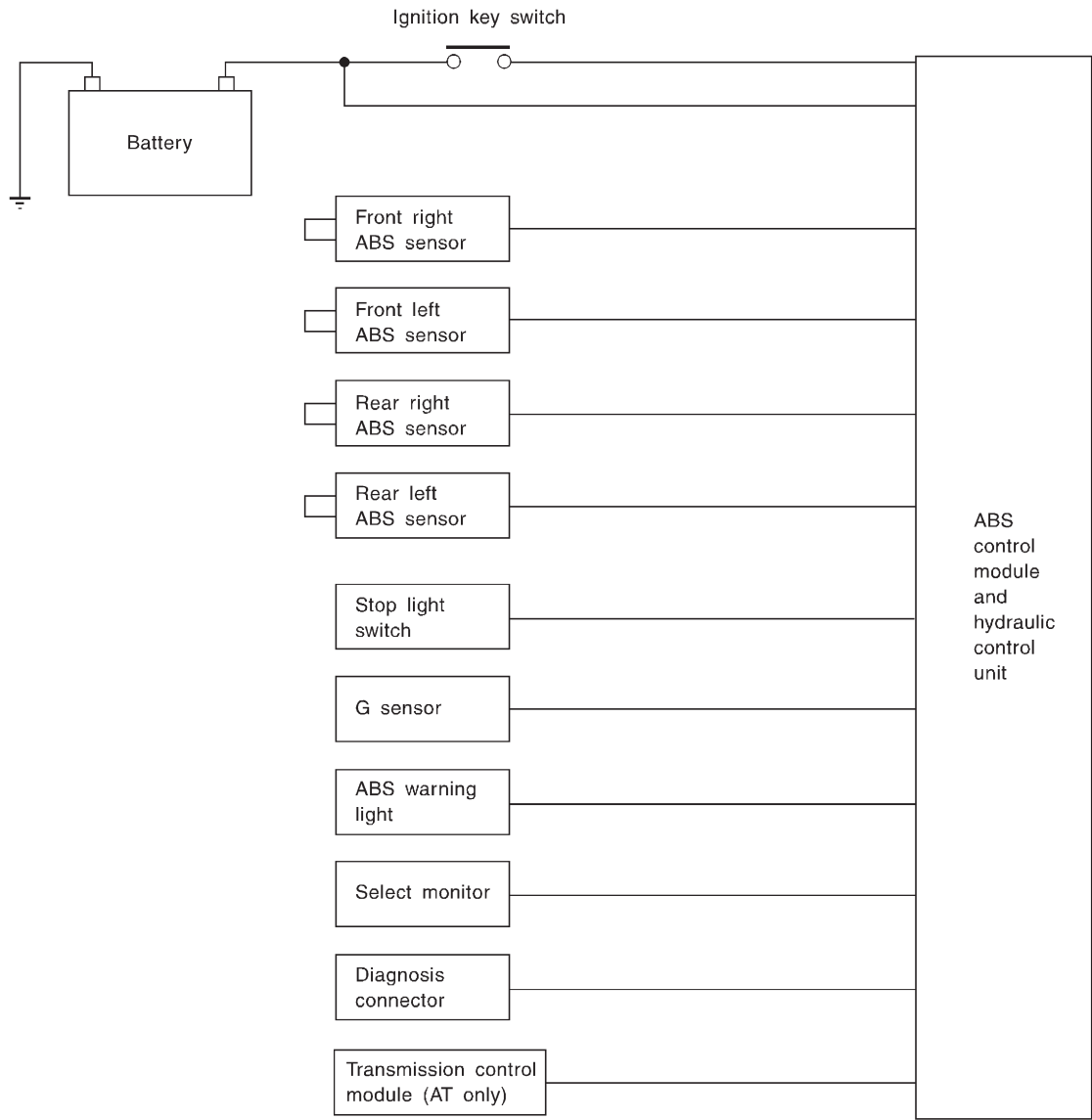
- The terminal numbers in the ABS control module and hydraulic control unit connector are as shown in the figure.
- When the connector is removed from the ABSCM&H/U, the connector switch closes the circuit between terminal No. 21 and No. 23. The ABS warning light illuminates.

Contents		Terminal No. (+)—(—)	Input/Output signal
			Measured value and measuring conditions
ABS sensor*2 (Wheel speed sensor)	Front left wheel	9—10	0.12 — 1 V (When it is 20 Hz.)
	Front right wheel	11—12	
	Rear left wheel	7—8	
	Rear right wheel	14—15	
Valve relay power supply		24—23	10 — 15 V when ignition switch is ON.
Motor relay power supply		25—23	10 — 15 V when ignition switch is ON.
G sensor*2 (AWD model only)	power supply	30—28	4.75 — 5.25 V
	ground	28	—
	output	6—28	2.3±0.2 V when vehicle is in horizontal position.
Stop light switch*1		2—23	Less than 1.5 V when the stop light is OFF and, 10 — 15 V when the stop light is ON.
ABS warning light*2		21—23	Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 15 V after 1.5 seconds.
AT ABS signal*2 (AT model only)		31—23	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
ABS operation signal monitor*2		3—23	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
Select monitor*2	Data is received.	20—23	Less than 1.5 V when no data is received.
	Data is sent.	5—23	4.75 — 5.25 V when no data is sent.
ABS diagnosis connector*2	Terminal No. 3	29—23	10 — 15 V when ignition switch is ON.
	Terminal No. 6	4—23	10 — 15 V when ignition switch is ON.
Power supply*1		1—23	10 — 15 V when ignition switch is ON.
Grounding line		23	—
Grounding line		26	—

*1: Measure the I/O signal voltage after removing the connector from the ABSCM&H/U terminal.

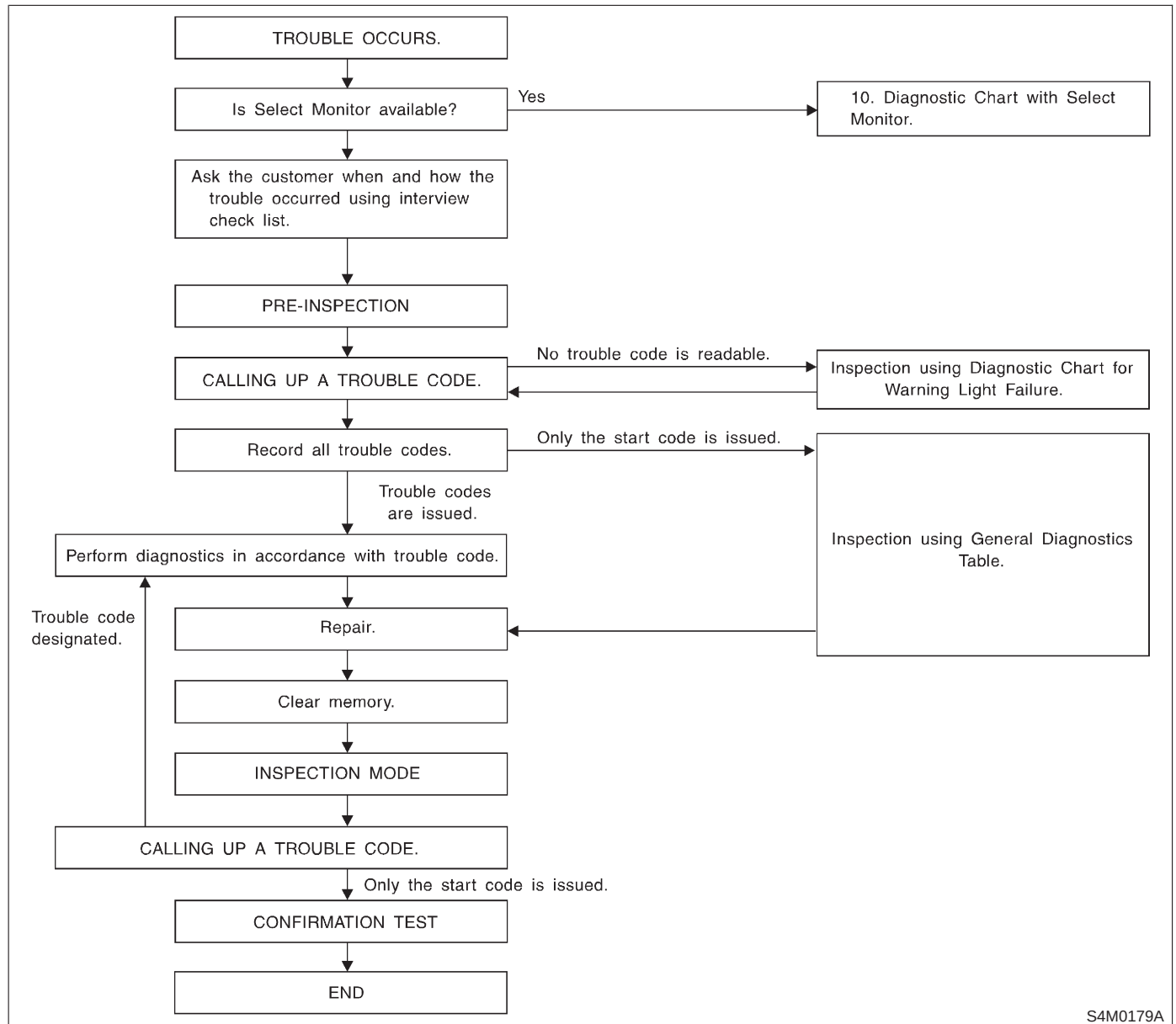
*2: Measure the I/O signal voltage at connector (F2) or (F1).

B: I/O SIGNAL DIAGRAM



6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



S4M0179A

CAUTION:

Remove foreign matter (dust, water, etc.) from the ABSCM&H/U connector during removal and installation.

NOTE:

- To check harness for broken wires or short circuits, shake it while holding it or the connector.
- When ABS warning light illuminates, read and record trouble code indicated by ABS warning light.

B: CHECK LIST FOR INTERVIEW

Check The Following Items About The Vehicle's State.

1. THE STATE OF THE ABS WARNING LIGHT

ABS warning light comes on.	☐ Always ☐ Sometimes ☐ Only once ☐ Does not come on ● When / how long does it come on?:		
Ignition key position	☐ LOCK ☐ ACC ☐ ON (before starting engine) ☐ START ☐ On after starting (Engine is running) ☐ On after starting (Engine is stop)		
Timing	☐ Immediately after ignition is ON. ☐ Immediately after ignition starts.		
	☐ When advancing	km/h to km/h MPH to MPH	
	☐ While traveling at a constant speed	km/h	MPH
	☐ When decelerating	km/h to km/h MPH to MPH	
	☐ When turning to right	Steering angle :	deg
		Steering time :	sec
	☐ When turning to left	Steering angle :	deg
		Steering time :	sec
	☐ When moving other electrical parts		
	● Parts name : ● Operating condition :		

2. SYMPTOMS

ABS operating condition	☐ Performs no work.		
	☐ Operates only when abruptly applying brakes.	Vehicle speed :	km/h MPH
	● How to step on brake pedal :		
	a) Operating time :	sec	
	b) Operating noise : ☐ Produce / ☐ Does not produce		
	● What kind of noise?	☐ Knock ☐ Gong gong ☐ Bong ☐ Buzz ☐ Gong gong buzz ☐ Others :	
	c) Reaction force of brake pedal		
		☐ Stick ☐ Press down once with a clunk ☐ Press and released ☐ Others :	

Behavior of vehicle	a) Directional stability cannot be obtained or steering arm refuses to work when applying brakes : ☐ Yes / ☐ No	
	● When :	☐ Vehicle turns to right ☐ Vehicle turns to left ☐ Spins ☐ Others :
	b) Directional stability cannot be obtained or steering arm refuses to work when accelerating : ☐ Yes / ☐ No	
	● When :	☐ Vehicle turns to right ☐ Vehicle turns to left ☐ Spins ☐ Others :
	c) Brakes are out of order : ☐ Yes / ☐ No	
	● What :	☐ Braking distance is long ☐ Brakes lock or drag ☐ Pedal stroke is long ☐ Pedal sticks ☐ Others :
	d) Poor acceleration : ☐ Yes / ☐ No	
	● What :	☐ Fails to accelerate ☐ Engine stalls ☐ Others :
	e) Occurrence of vibration : ☐ Yes / ☐ No	
	● Where ● What kind :	
f) Occurrence of abnormal noise : ☐ Yes / ☐ No		
● Where ● What kind :		
g) Occurrence of other phenomena : ☐ Yes / ☐ No		
● What kind :		

3. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	a) Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Others :
	b) Ambient temperature	F(°C)
	c) Road	☐ Urban area ☐ Suburbs ☐ Highway ☐ General road ☐ Ascending slope ☐ Descending slope ☐ Paved road ☐ Gravel road ☐ Muddy road ☐ Sandy place ☐ Others :
	d) Road surface	☐ Dry ☐ Wet ☐ New-fallen snow ☐ Compressed snow ☐ Frozen slope ☐ Others :

Condition	a) Brakes	Deceleration : g	
		☐ Continuous / ☐ Intermittent	
	b) Accelerator	Acceleration : g	
		☐ Continuous / ☐ Intermittent	
	c) Vehicle speed	km/h	MPH
		☐ Advancing ☐ Accelerating ☐ Reducing speed ☐ Low speed ☐ Turning ☐ Others :	
	d) Tire inflation pressure	Front RH tire : kPa	
		Front LH tire : kPa	
		Rear RH tire : kPa	
		Rear LH tire : kPa	
	e) Degree of wear	Front RH tire :	
		Front LH tire :	
		Rear RH tire :	
		Rear LH tire :	
	f) Genuine parts are used. : ☐ Yes / ☐ No		
	g) Chain is passed around tires. : ☐ Yes / ☐ No		
	h) T tire is used. : ☐ Yes / ☐ No		
i) Condition of suspension alignment :			
j) Loading state :			
k) Repair parts are used. : ☐ Yes / ☐ No			
● What :			
l) Others :			

C: INSPECTION MODE

Reproduce the condition under which the problem has occurred as much as possible.

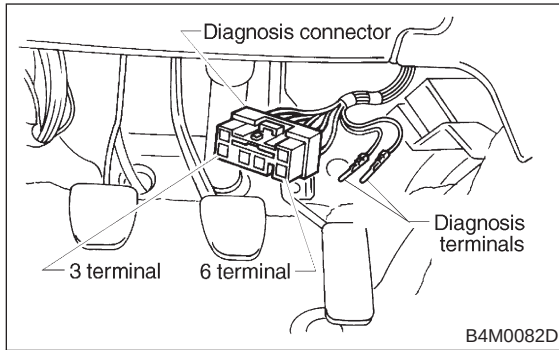
Drive the vehicle at a speed more than 40 km/h (25 MPH) for at least one minute.

D: TROUBLE CODES

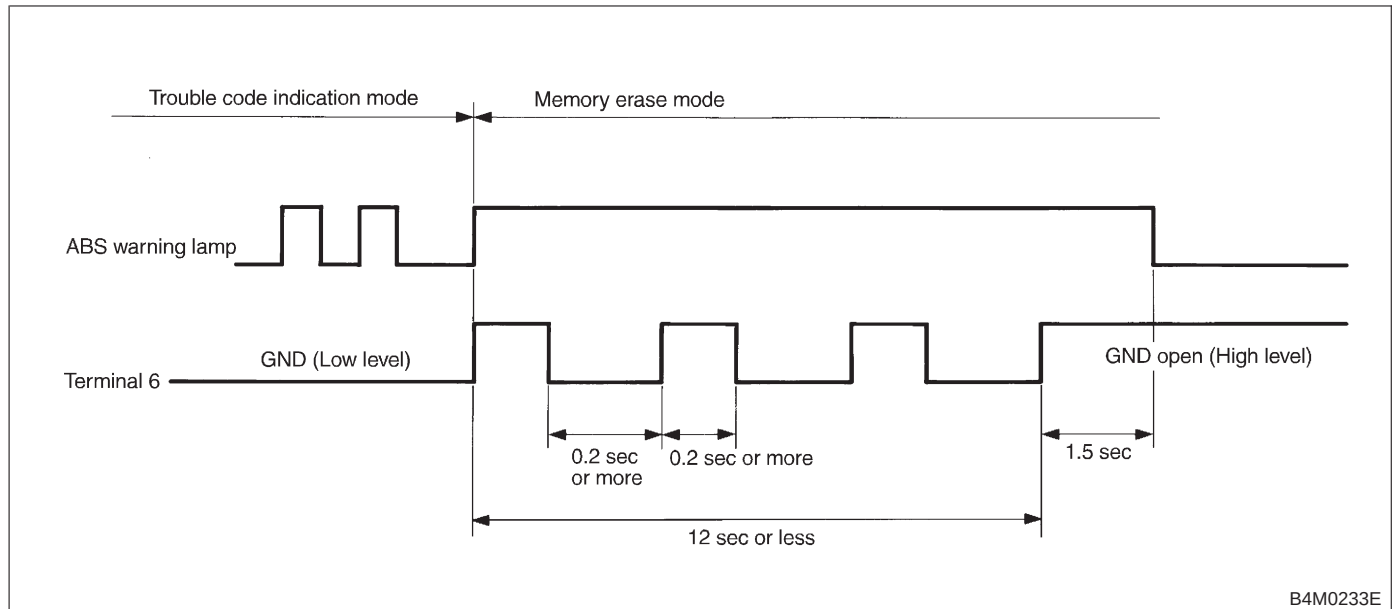
When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEPROM as a trouble code. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)

2. CLEARING MEMORY

1) After calling up a trouble code, disconnect diagnosis connector terminal 6 from diagnosis terminal.



2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 6 and diagnosis terminal for at least 0.2 seconds each time.



NOTE:

After diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

MEMO:

7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure

A: ABS WARNING LIGHT DOES NOT COME ON.

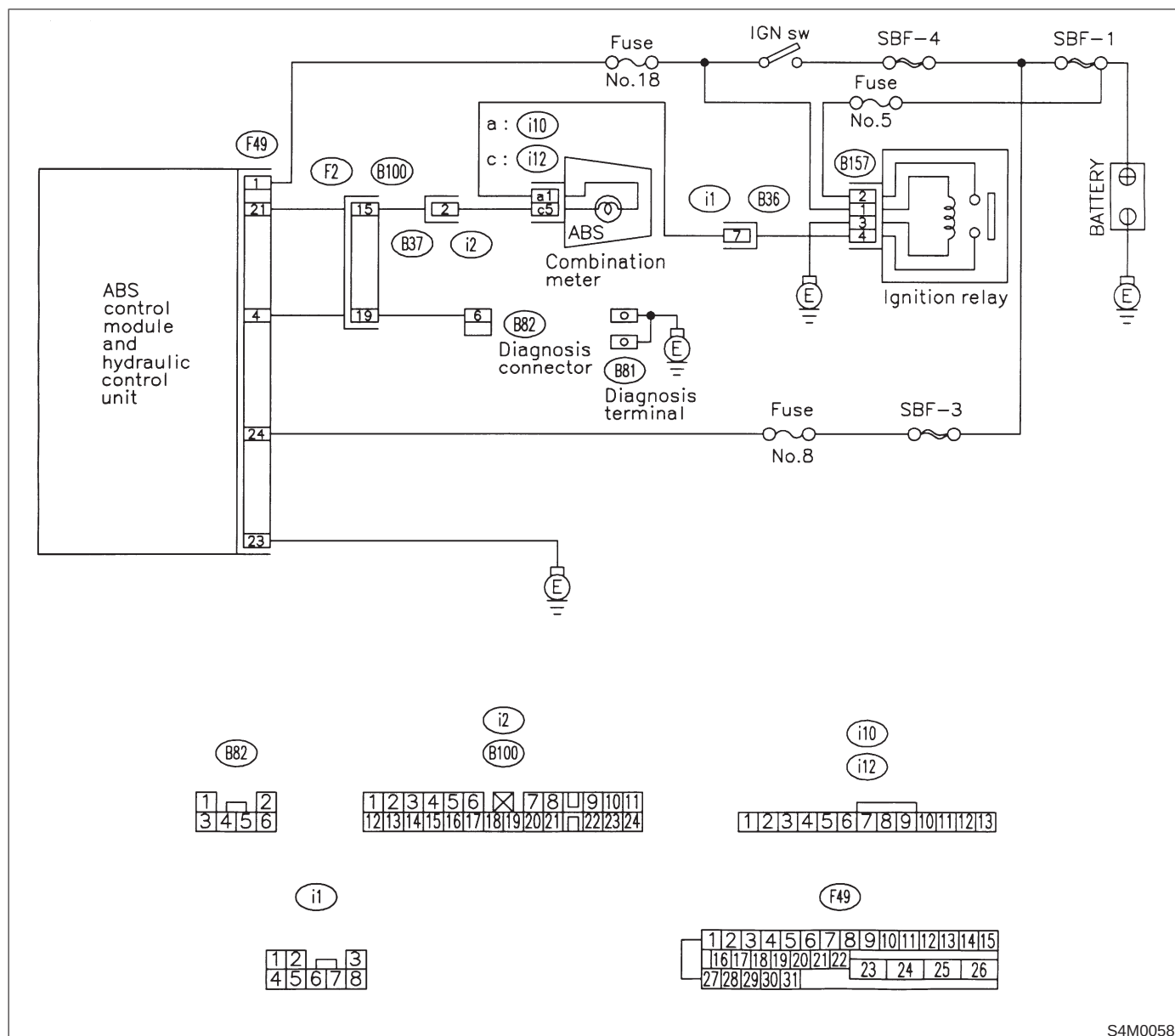
DIAGNOSIS:

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

- When ignition switch is turned ON (engine OFF), ABS warning light does not come on

WIRING DIAGRAM:



S4M0058

7A1 : CHECK IF OTHER WARNING LIGHTS TURN ON.

Turn ignition switch to ON (engine OFF).

- CHECK** : *Do other warning lights turn on?*
YES : Go to step 7A2.
NO : Repair combination meter.

7A2 : CHECK ABS WARNING LIGHT BULB.

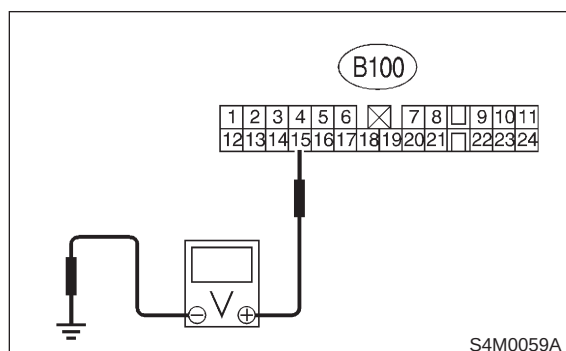
- 1) Turn ignition switch to OFF.
- 2) Remove combination meter.
- 3) Remove ABS warning light bulb from combination meter.

- CHECK** : *Is ABS warning light bulb OK?*
YES : Go to step 7A3.
NO : Replace ABS warning light bulb.

7A3 : CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

- 1) Disconnect connector (B100) from connector (F2).
- 2) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 15 (+) — Chassis ground (-):

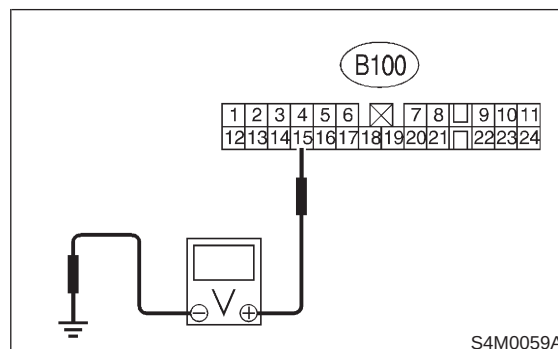


- CHECK** : *Is the voltage less than 3 V?*
YES : Go to step 7A4.
NO : Repair warning light harness.

7A4 : CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between connector (B100) and chassis ground.

Connector & terminal
(B100) No. 15 (+) — Chassis ground (-):

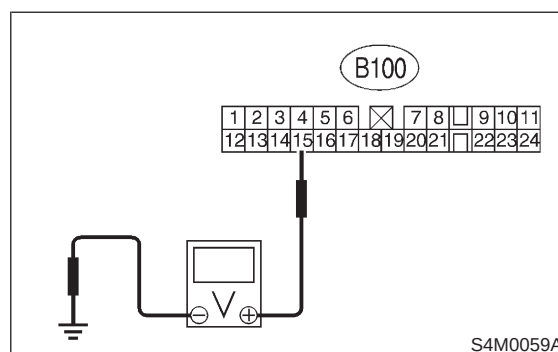


- CHECK** : *Is voltage less than 3 V?*
YES : Go to step 7A5.
NO : Repair warning light harness.

7A5 : CHECK WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Install ABS warning light bulb from combination meter.
- 3) Install combination meter.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between connector (B100) and chassis ground.

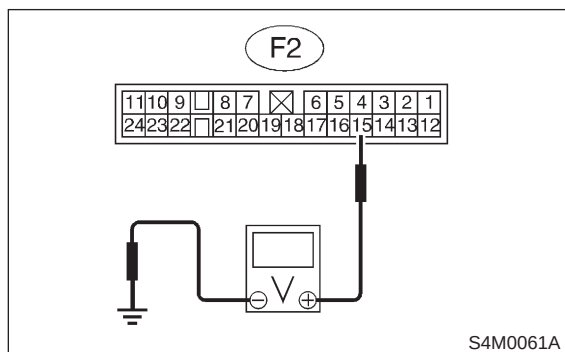
Connector & terminal
(B100) No. 15 (+) — Chassis ground (-):



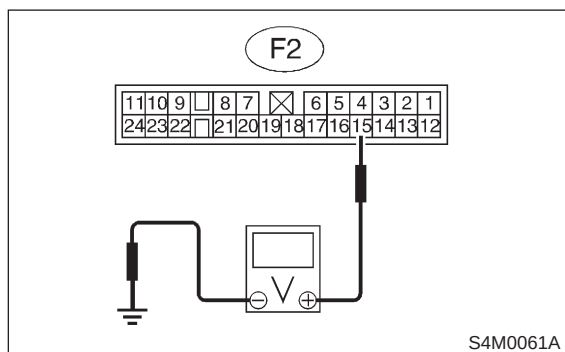
- CHECK** : *Is voltage between 10 V and 15 V?*
YES : Go to step 7A6.
NO : Repair wiring harness.

7A6 : CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.

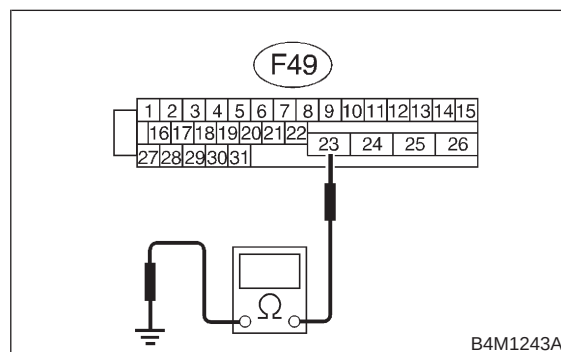
- 1) Turn ignition switch to OFF.
- 2) Measure voltage between connector (F2) and chassis ground.

Connector & terminal**(F2) No. 15 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 3 V?**YES** : Go to step 7A7.**NO** : Repair wiring harness.**7A7 : CHECK BATTERY SHORT OF ABS WARNING LIGHT HARNESS.**

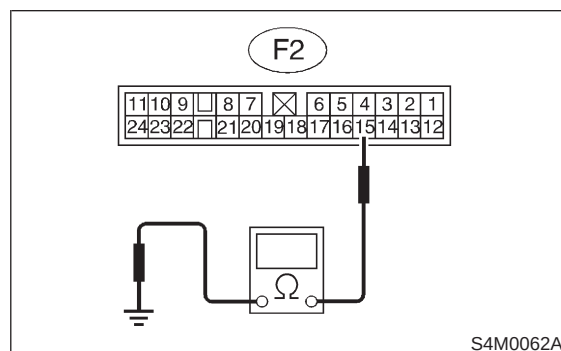
- 1) Turn ignition switch to ON.
- 2) Measure voltage between connector (F2) and chassis ground.

Connector & terminal**(F2) No. 15 (+) — Chassis ground (-):****CHECK** : Is voltage less than 3 V?**YES** : Go to step 7A8.**NO** : Repair wiring harness.**7A8 : CHECK GROUND CIRCUIT OF ABSCM&H/U.**

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal**(F49) No. 23 — GND:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 7A9.**NO** : Repair ABSCM&H/U ground harness.**7A9 : CHECK WIRING HARNESS.**

Measure resistance between connector (F2) and chassis ground.

Connector & terminal**(F2) No. 15 — Chassis ground:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 7A10.**NO** : Repair harness/connector.

7A10 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connectors between combination meter and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

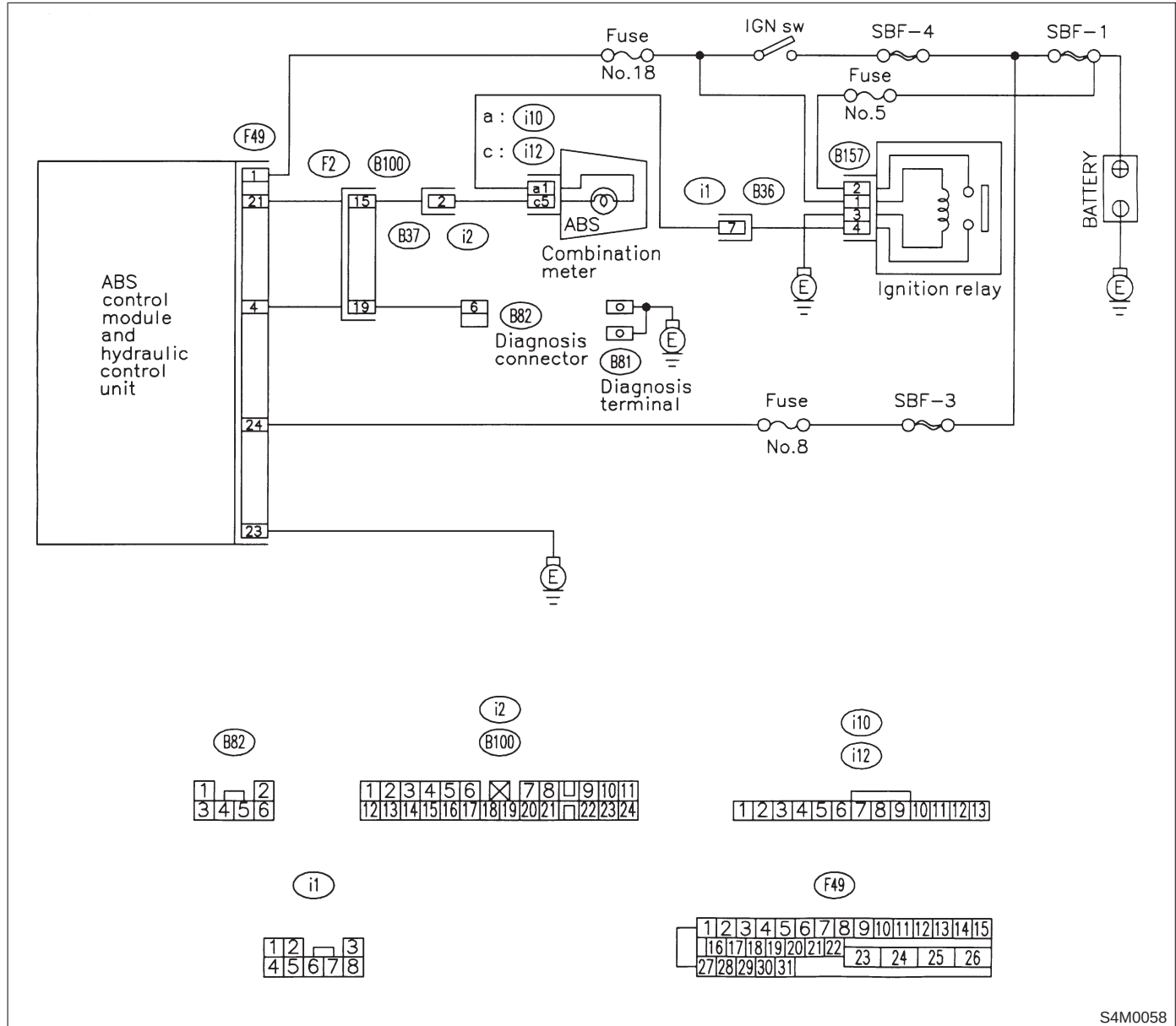
NO : Replace ABSCM&H/U.

B: ABS WARNING LIGHT DOES NOT GO OFF.**DIAGNOSIS:**

- ABS warning light circuit is open or shorted.

TROUBLE SYMPTOM:

- When starting the engine and while ABS warning light is kept ON.

WIRING DIAGRAM:

S4M0058

7B1 : CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.

Turn ignition switch to OFF.

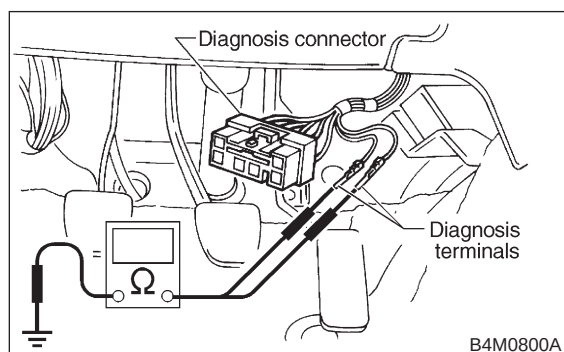
CHECK : *Is ABSCM&H/U connector inserted into ABSCM until the clamp locks onto it?*

YES : Go to step 7B2.

NO : Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.

7B2 : CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.



Terminals

Diagnosis terminal (A) — Chassis ground:

Diagnosis terminal (B) — Chassis ground:

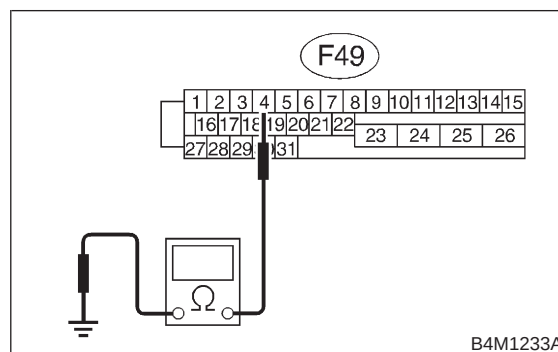
CHECK : *Is the resistance less than 0.5 Ω?*

YES : Go to step 7B3.

NO : Repair diagnosis terminal harness.

7B3 : CHECK DIAGNOSIS LINE.

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal (B81) to diagnosis connector (B82) No. 6.
- 3) Disconnect connector from ABSCM&H/U.
- 4) Measure resistance between ABSCM&H/U connector and chassis ground.



Connector & terminal

(F49) No. 4 — Chassis ground:

CHECK : *Is the resistance less than 0.5 Ω?*

YES : Go to step 7B4.

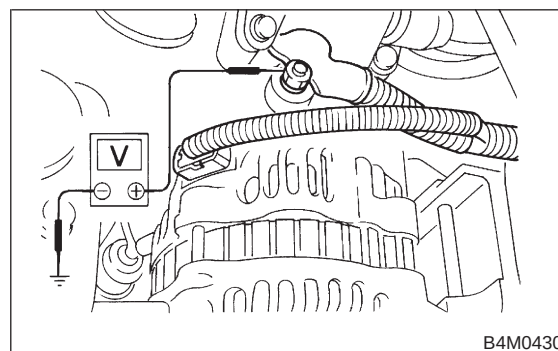
NO : Repair harness connector between ABSCM&H/U and diagnosis connector.

7B4 : CHECK GENERATOR.

- 1) Start the engine.
- 2) Idle the engine.
- 3) Measure voltage between generator and chassis ground.

Terminal

Generator B terminal (+) — Chassis ground (-):



CHECK : *Is the voltage between 10 and 15 V?*

YES : Go to step 7B5.

NO : Repair generator.

7B5 : CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK : *Is there poor contact at battery terminal?*

YES : Repair battery terminal.

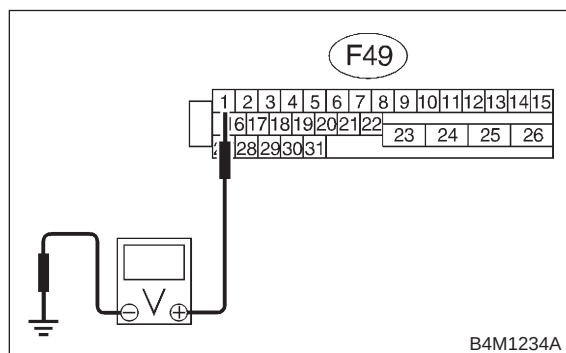
NO : Go to step **7B6**.

7B6 : CHECK POWER SUPPLY OF ABSCM.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Start engine.
- 3) Idle the engine.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



CHECK : *Is the voltage between 10 and 15 V?*

YES : Go to step **7B7**.

NO : Repair ABSCM&H/U power supply circuit.

7B7 : CHECK WIRING HARNESS.

- 1) Disconnect connector (F2) from connector (B100).
- 2) Turn ignition switch to ON.

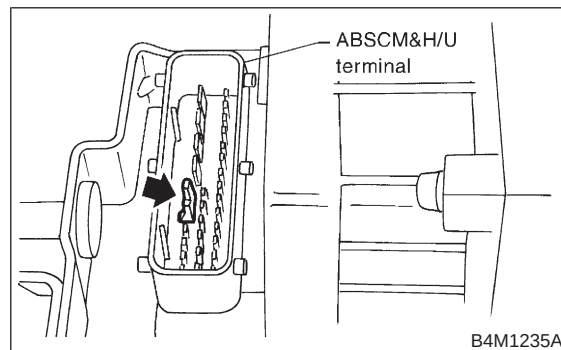
CHECK : *Does the ABS warning light remain off?*

YES : Go to step **7B8**.

NO : Repair front wiring harness.

7B8 : CHECK PROJECTION AT ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Check for broken projection at the ABSCM&H/U terminal.



CHECK : *Are the projection broken?*

YES : Go to step **7B9**.

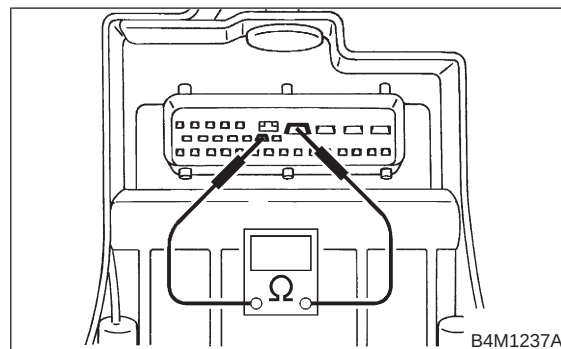
NO : Replace ABSCM&H/U.

7B9 : CHECK ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminal

No. 21 — No. 23:



CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **7B10**.

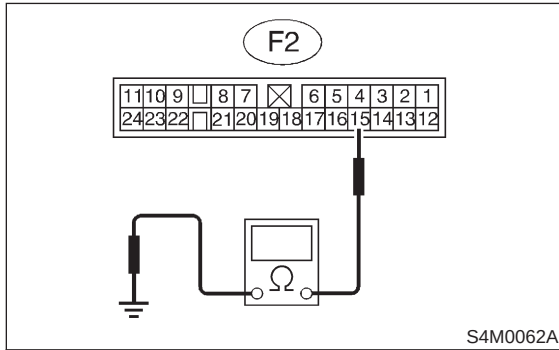
NO : Replace ABSCM&H/U.

7B10 : CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal

(F2) No. 15 — Chassis ground:



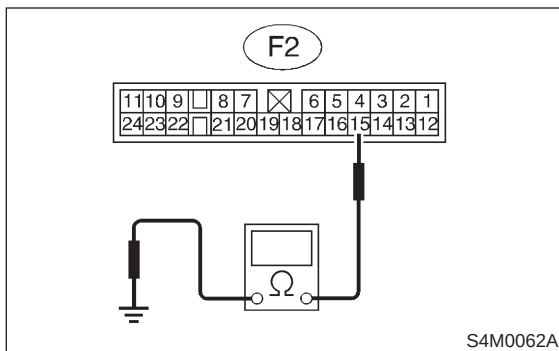
- CHECK** : *Is the resistance less than 0.5 Ω ?*
- YES** : Go to step **7B11**.
- NO** : Repair harness.

7B11 : CHECK WIRING HARNESS.

- 1) Connect connector to ABSCM&H/U.
- 2) Measure resistance between connector (F2) and chassis ground.

Connector & terminal

(F2) No. 15 — Chassis ground:



- CHECK** : *Is the resistance more than 1 M Ω ?*
- YES** : Go to step **7B12**.
- NO** : Repair harness.

7B12 : CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

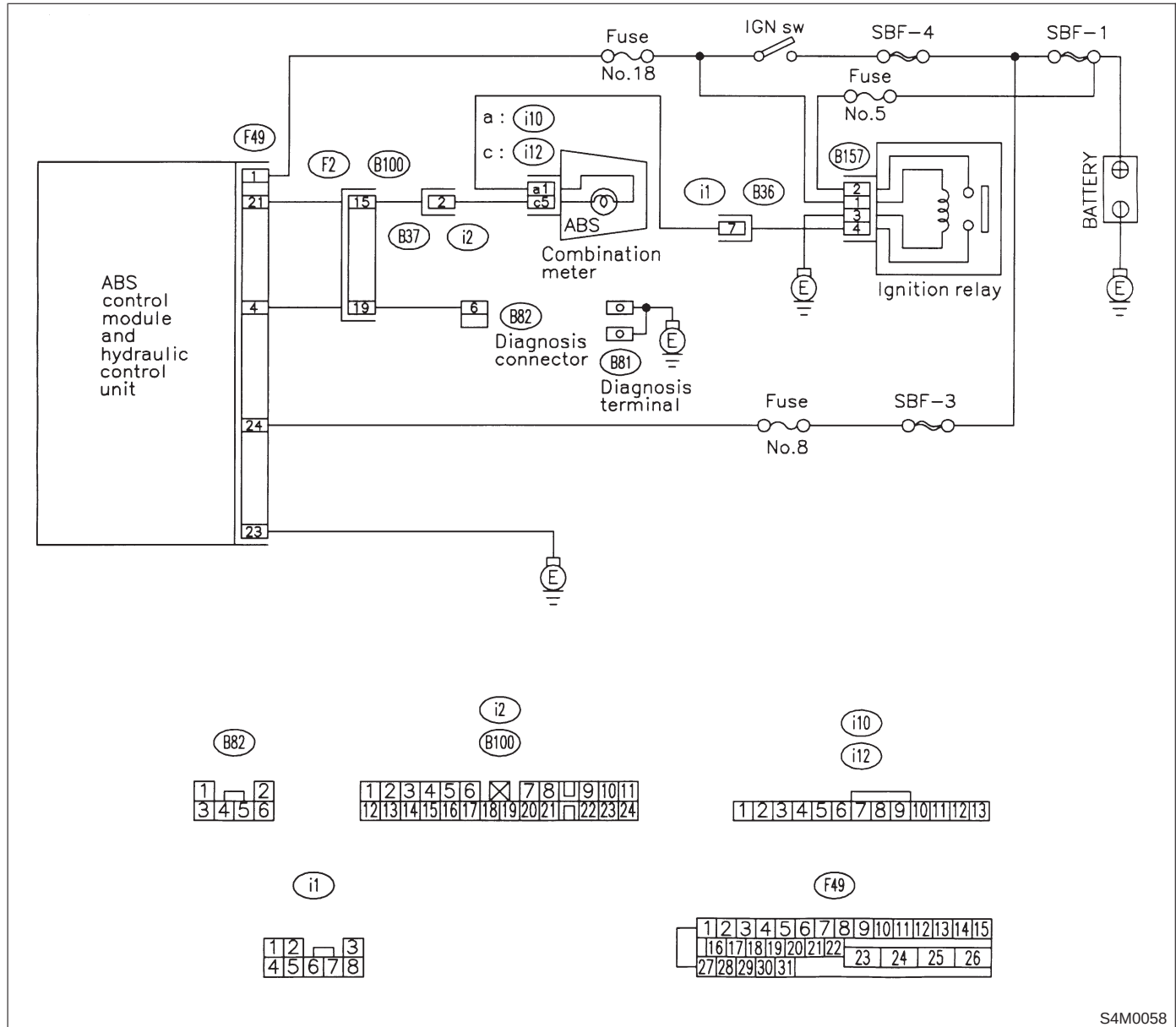
- CHECK** : *Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Replace ABSCM&H/U.

C: TROUBLE CODE DOES NOT APPEAR.**DIAGNOSIS:**

- Diagnosis circuit is open.

TROUBLE SYMPTOM:

- The ABS warning light turns on or off normally but the start code cannot be read out in the diagnostic mode.

WIRING DIAGRAM:

S4M0058

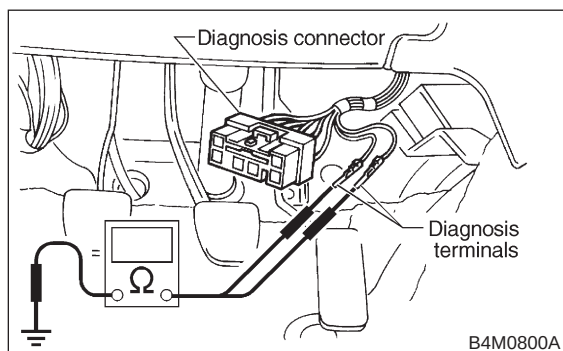
7C1 : CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

Terminals

Diagnosis terminal (A) — Chassis ground:

Diagnosis terminal (B) — Chassis ground:



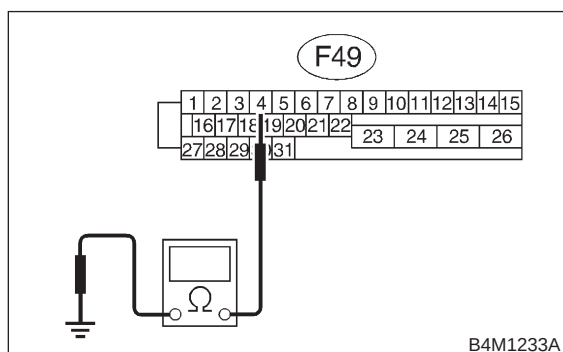
- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 7C2.
- NO** : Repair diagnosis terminal harness.

7C2 : CHECK DIAGNOSIS LINE.

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal (B81) to diagnosis connector (B82) No. 6.
- 3) Disconnect connector from ABSCM&H/U.
- 4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 4 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 7C3.
- NO** : Repair harness connector between ABSCM&H/U and diagnosis connector.

7C3 : CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.

- CHECK** : Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].>
- YES** : Repair connector.
- NO** : Replace ABSCM&H/U.

8. Diagnostics Chart with Trouble Code by ABS Warning Light

A: LIST OF TROUBLE CODE

Trouble code	Contents of diagnosis		Ref. to
11	Start code ● Trouble code is shown after start code. ● Only start code is shown in normal condition.		—
21	Abnormal ABS sensor (Open circuit or input voltage too high)	Front right ABS sensor	<Ref. to 4-4 [T8B0].>
23		Front left ABS sensor	<Ref. to 4-4 [T8C0].>
25		Rear right ABS sensor	<Ref. to 4-4 [T8D0].>
27		Rear left ABS sensor	<Ref. to 4-4 [T8E0].>
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front right ABS sensor	<Ref. to 4-4 [T8F0].>
24		Front left ABS sensor	<Ref. to 4-4 [T8G0].>
26		Rear right ABS sensor	<Ref. to 4-4 [T8H0].>
28		Rear left ABS sensor	<Ref. to 4-4 [T8I0].>
29		Any one of four	<Ref. to 4-4 [T8J0].>
31	Abnormal solenoid valve circuit(s) in ABS control module and hydraulic unit	Front right inlet valve	<Ref. to 4-4 [T8K0].>
32		Front right outlet valve	<Ref. to 4-4 [T8O0].>
33		Front left inlet valve	<Ref. to 4-4 [T8L0].>
34		Front left outlet valve	<Ref. to 4-4 [T8P0].>
35		Rear right inlet valve	<Ref. to 4-4 [T8M0].>
36		Rear right outlet valve	<Ref. to 4-4 [T8Q0].>
37		Rear left inlet valve	<Ref. to 4-4 [T8N0].>
38		Rear left outlet valve	<Ref. to 4-4 [T8R0].>
41	Abnormal ABS control module		<Ref. to 4-4 [T8S0].>
42	Source voltage is abnormal.		<Ref. to 4-4 [T8T0].>
44	A combination of AT control abnormal		<Ref. to 4-4 [T8U0].>
51	Abnormal valve relay		<Ref. to 4-4 [T8V0].>
52	Abnormal motor and/or motor relay		<Ref. to 4-4 [T8W0].>
54	Abnormal stop light switch		<Ref. to 4-4 [T8X0].>
56	Abnormal G sensor output voltage		<Ref. to 4-4 [T8Y0].>

MEMO:

B: TROUBLE CODE 21 (FRONT RH)

C: TROUBLE CODE 23 (FRONT LH)

D: TROUBLE CODE 25 (REAR RH)

E: TROUBLE CODE 27 (REAR LH)

— ABNORMAL ABS SENSOR (OPEN CIRCUIT OR INPUT VOLTAGE TOO HIGH) —

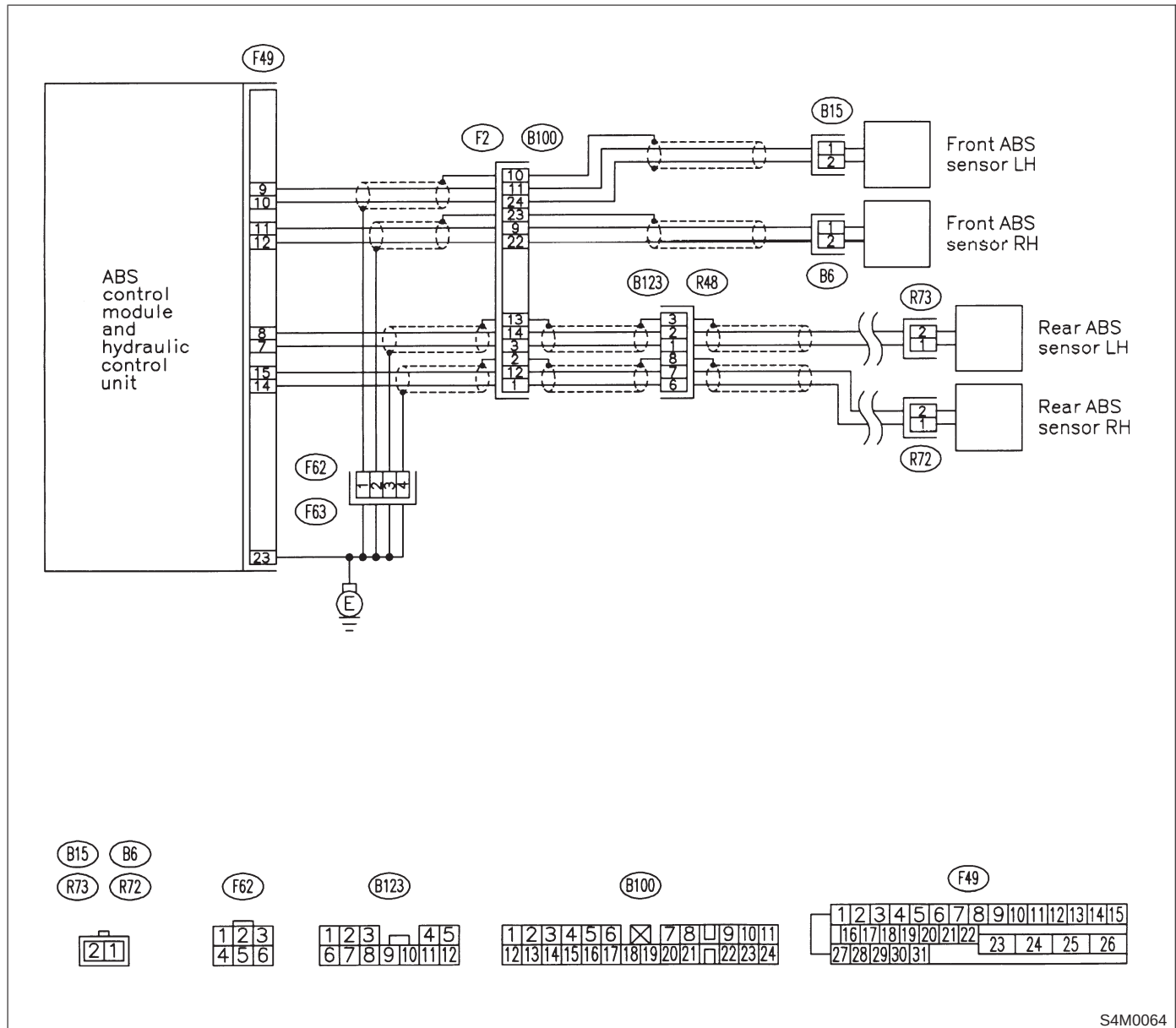
DIAGNOSIS:

- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0064

8E1 : CHECK ABS SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance of ABS sensor connector terminals.

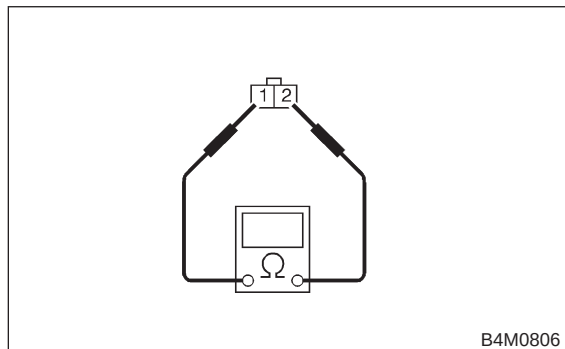
Terminal

Front RH No. 1 — No. 2:

Front LH No. 1 — No. 2:

Rear RH No. 1 — No. 2:

Rear LH No. 1 — No. 2:



- CHECK** : Is the resistance between 0.8 and 1.2 kΩ?
- YES** : Go to step 8E2.
- NO** : Replace ABS sensor.

8E2 : CHECK BATTERY SHORT OF ABS SENSOR.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Measure voltage between ABS sensor and chassis ground.

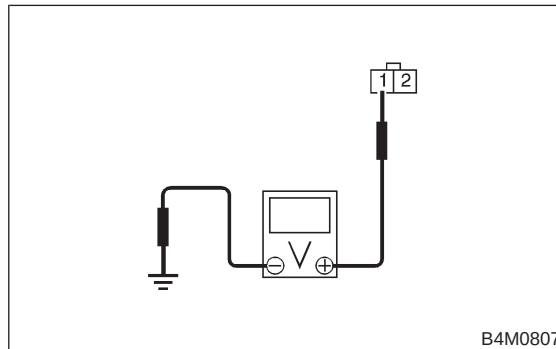
Terminal

Front RH No. 1 (+) — Chassis ground (-):

Front LH No. 1 (+) — Chassis ground (-):

Rear RH No. 1 (+) — Chassis ground (-):

Rear LH No. 1 (+) — Chassis ground (-):



- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 8E3.
- NO** : Replace ABS sensor.

8E3 : CHECK BATTERY SHORT OF ABS SENSOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABS sensor and chassis ground.

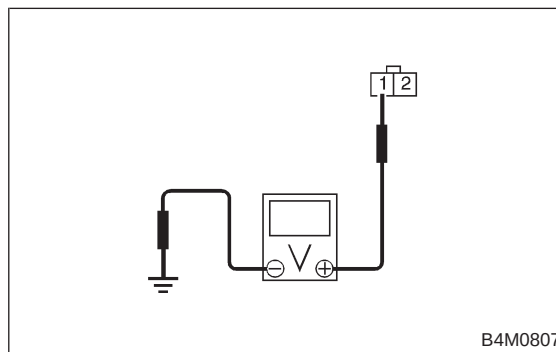
Terminal

Front RH No. 1 (+) — Chassis ground (-):

Front LH No. 1 (+) — Chassis ground (-):

Rear RH No. 1 (+) — Chassis ground (-):

Rear LH No. 1 (+) — Chassis ground (-):



- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 8E4.
- NO** : Replace ABS sensor.

8E4 : CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to ABS sensor.
- 3) Measure resistance between ABSCM&H/U connector terminals.

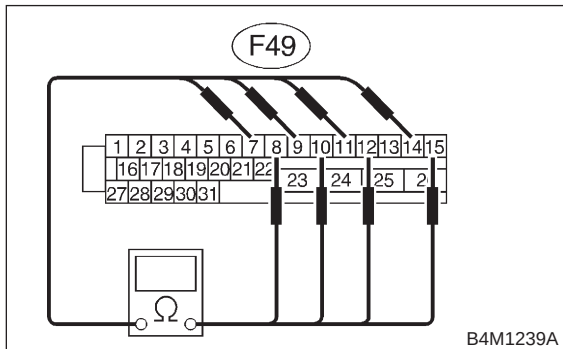
Connector & terminal

Trouble code 21 / (F49) No. 11 — No. 12:

Trouble code 23 / (F49) No. 9 — No. 10:

Trouble code 25 / (F49) No. 14 — No. 15:

Trouble code 27 / (F49) No. 7 — No. 8:



CHECK : **Is the resistance between 0.8 and 1.2 kΩ?**

YES : Go to step **8E5**.

NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

8E5 : CHECK BATTERY SHORT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

Trouble code 21 / (F49) No. 11 (+) —

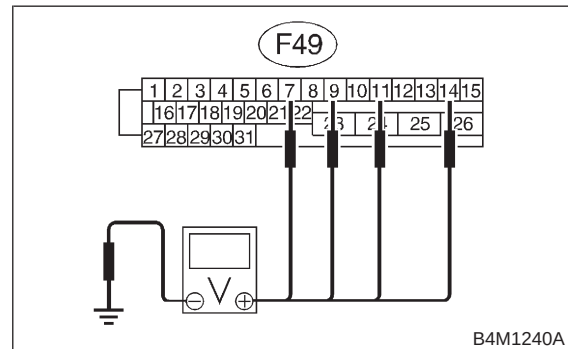
Chassis ground (-):

Trouble code 23 / (F49) No. 9 (+) — Chassis ground (-):

Trouble code 25 / (F49) No. 14 (+) —

Chassis ground (-):

Trouble code 27 / (F49) No. 7 (+) — Chassis ground (-):



CHECK : **Is the voltage less than 1 V?**

YES : Go to step **8E6**.

NO : Repair harness between ABSCM&H/U and ABS sensor.

8E6 : CHECK BATTERY SHORT OF HARNESS.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

Trouble code 21 / (F49) No. 11 (+) —

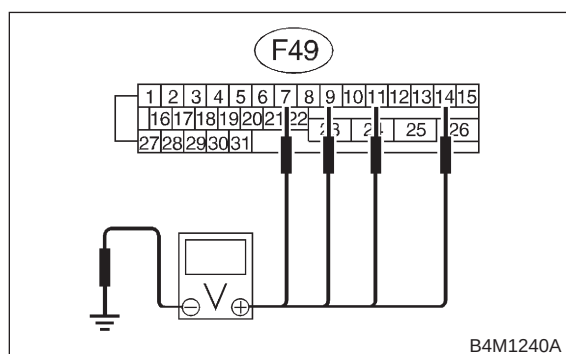
Chassis ground (-):

Trouble code 23 / (F49) No. 9 (+) — Chassis ground (-):

Trouble code 25 / (F49) No. 14 (+) —

Chassis ground (-):

Trouble code 27 / (F49) No. 7 (+) — Chassis ground (-):



- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step 8E7.
- NO** : Repair harness between ABSCM&H/U and ABS sensor.

8E7 : CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

- CHECK** : Are the ABS sensor installation bolts tightened securely?
- YES** : Go to step 8E8.
- NO** : Tighten ABS sensor installation bolts securely.

8E8 : CHECK INSTALLATION OF TONE WHEEL.

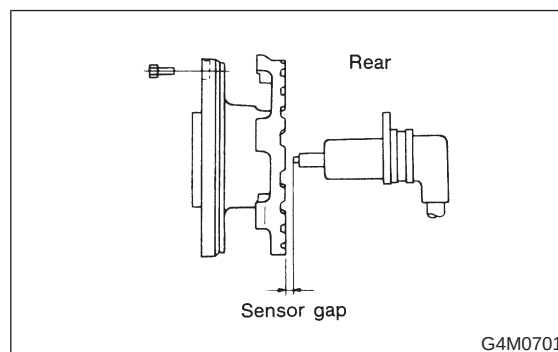
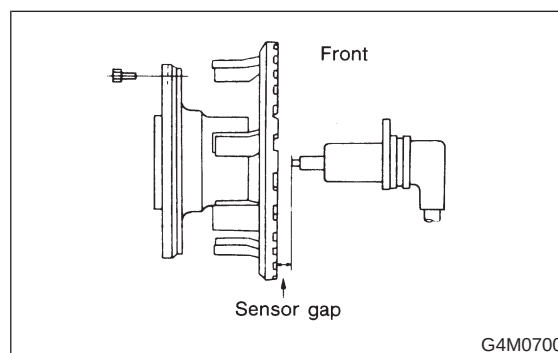
Tightening torque:

13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

- CHECK** : Are the tone wheel installation bolts tightened securely?
- YES** : Go to step 8E9.
- NO** : Tighten tone wheel installation bolts securely.

8E9 : CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

- CHECK** : Is the gap within the specifications?
- YES** : Go to step 8E10.
- NO** : Adjust the gap.

NOTE:

Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8E10 : CHECK HUB RUNOUT.

Measure hub runout.

CHECK : *Is the runout less than 0.05 mm (0.0020 in)?*

YES : Go to step **8E11**.

NO : Repair hub.

8E11 : CHECK GROUND SHORT OF ABS SENSOR.

- 1) Turn ignition switch to ON.
- 2) Measure resistance between ABS sensor and chassis ground.

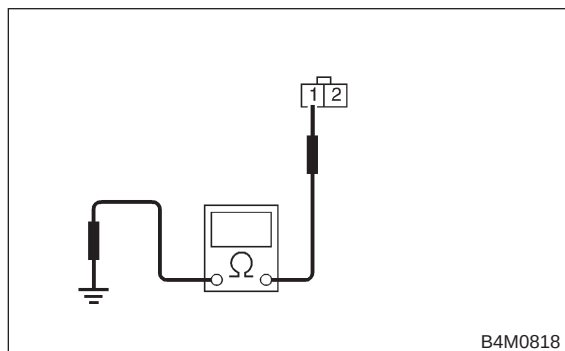
Terminal

Front RH No. 1 — Chassis ground:

Front LH No. 1 — Chassis ground:

Rear RH No. 1 — Chassis ground:

Rear LH No. 1 — Chassis ground:



CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **8E12**.

NO : Replace ABS sensor and ABSCM&H/U.

8E12 : CHECK GROUND SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to ABS sensor.
- 3) Measure resistance between ABSCM&H/U connector terminal and chassis ground.

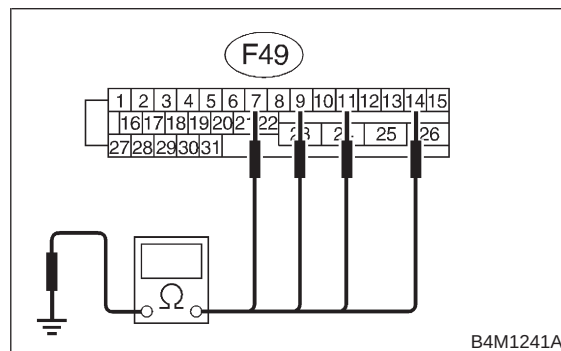
Connector & terminal

Trouble code 21 / (F49) No. 11 — Chassis ground:

Trouble code 23 / (F49) No. 9 — Chassis ground:

Trouble code 25 / (F49) No. 14 — Chassis ground:

Trouble code 27 / (F49) No. 7 — Chassis ground:



CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **8E13**.

NO : Repair harness between ABSCM&H/U and ABS sensor.
Replace ABSCM&H/U.

8E13 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1]. >*

YES : Repair connector.

NO : Go to step **8E14**.

8E14 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **8E15**.

8E15 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:

Check harness and connectors between ABSCM&H/U and ABS sensor.

F: TROUBLE CODE 22 (FRONT RH)

G: TROUBLE CODE 24 (FRONT LH)

H: TROUBLE CODE 26 (REAR RH)

I: TROUBLE CODE 28 (REAR LH)

— ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

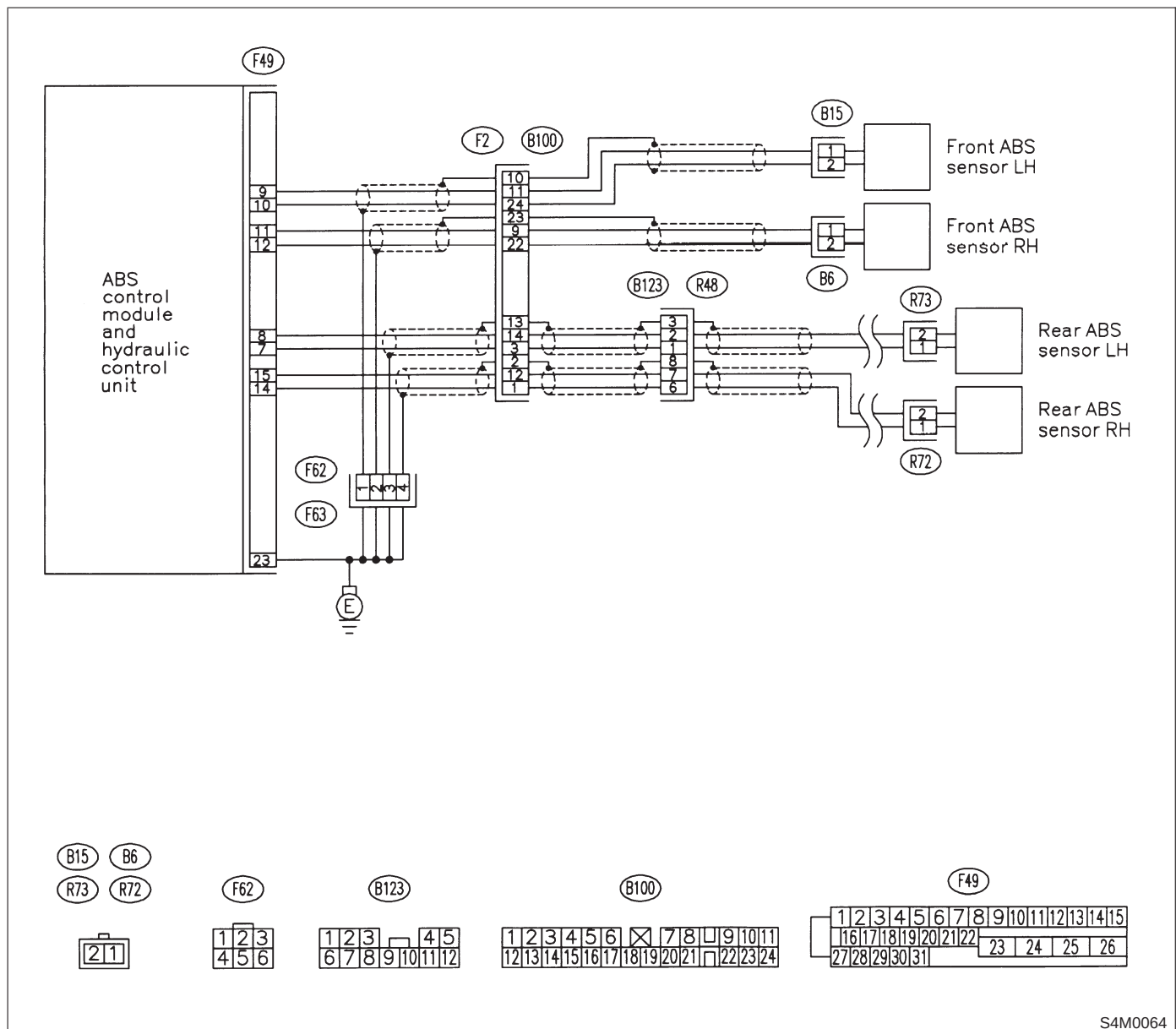
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0064

811 : CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

- CHECK** : Are the ABS sensor installation bolts tightened securely?
- YES** : Go to step 812.
- NO** : Tighten ABS sensor installation bolts securely.

812 : CHECK INSTALLATION OF TONE WHEEL.

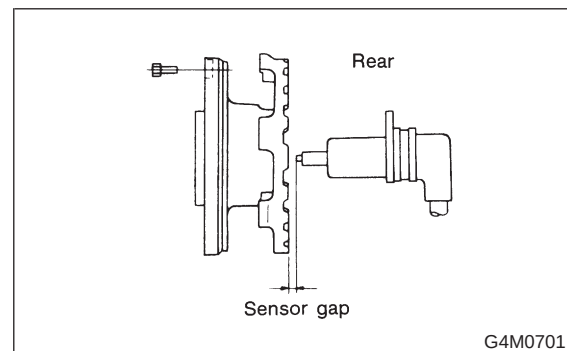
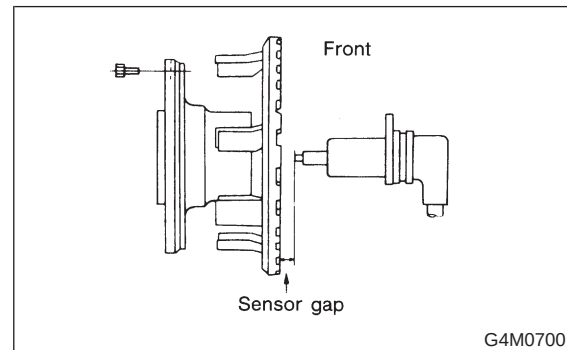
Tightening torque:

13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

- CHECK** : Are the tone wheel installation bolts tightened securely?
- YES** : Go to step 813.
- NO** : Tighten tone wheel installation bolts securely.

813 : CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

- CHECK** : Is the gap within the specifications?
- YES** : Go to step 814.
- NO** : Adjust the gap.

NOTE:

Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

814 : CHECK OSCILLOSCOPE.

- CHECK** : Is an oscilloscope available?
- YES** : Go to step 815.
- NO** : Go to step 816.

815 : CHECK ABS SENSOR SIGNAL.

- 1) Raise all four wheels of ground.
- 2) Turn ignition switch OFF.
- 3) Connect the oscilloscope to the connector (B100).
- 4) Turn ignition switch ON.
- 5) Rotate wheels and measure voltage at specified frequency.

NOTE:

When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

Connector & terminal

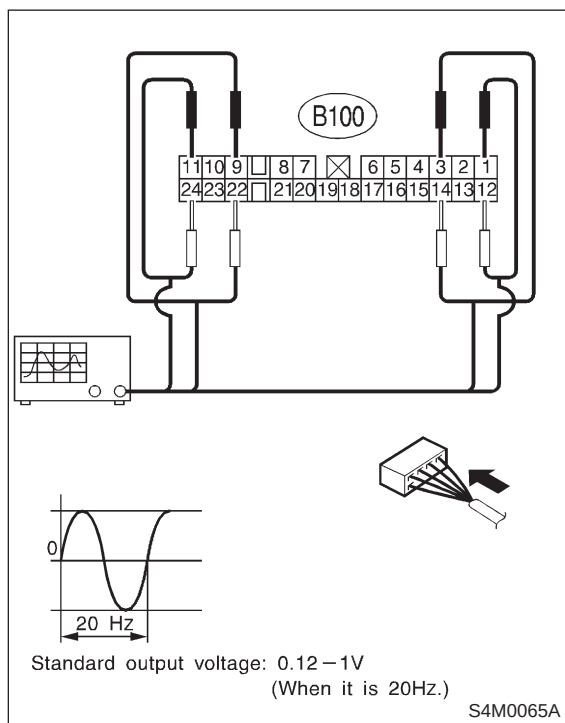
Trouble code 22 / (B100) No. 9 (+) — No. 22 (-):

Trouble code 24 / (B100) No. 11 (+) — No. 24 (-):

Trouble code 26 / (B100) No. 1 (+) — No. 12 (-):

Trouble code 28 / (B100) No. 3 (+) — No. 14 (-):

Specified voltage: 0.12 — 1 V (When it is 20 Hz.)



CHECK : *Is oscilloscope pattern smooth, as shown in figure?*

YES : Go to step 819.

NO : Go to step 816.

816 : CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor or drum from hub in accordance with trouble code.

CHECK : *Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?*

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step 817.

817 : CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : *Are there broken or damaged in the ABS sensor pole piece or the tone wheel?*

YES : Replace ABS sensor or tone wheel.

NO : Go to step 818.

818 : CHECK HUB RUNOUT.

Measure hub runout.

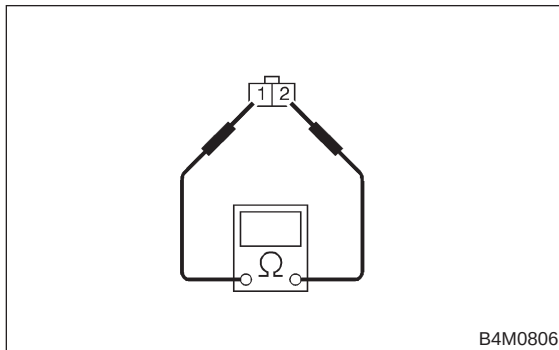
CHECK : *Is the runout less than 0.05 mm (0.0020 in)?*

YES : Go to step 819.

NO : Repair hub.

8I9 : CHECK RESISTANCE OF ABS SENSOR.

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminals.

Terminal**Front RH No. 1 — No. 2:****Front LH No. 1 — No. 2:****Rear RH No. 1 — No. 2:****Rear LH No. 1 — No. 2:**

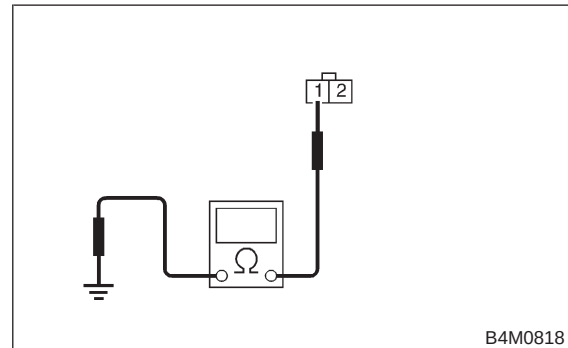
CHECK : *Is the resistance between 0.8 and 1.2 kΩ?*

YES : Go to step **8I10**.

NO : Replace ABS sensor.

8I10 : CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

Terminal**Front RH No. 1 — Chassis ground:****Front LH No. 1 — Chassis ground:****Rear RH No. 1 — Chassis ground:****Rear LH No. 1 — Chassis ground:**

CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **8I11**.

NO : Replace ABS sensor.

8I11 : CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

- 1) Connect connector to ABS sensor.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance at ABSCM&H/U connector terminals.

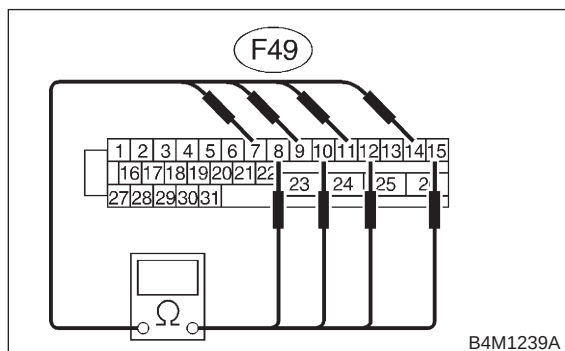
Connector & terminal

Trouble code 22 / (F49) No. 11 — No. 12:

Trouble code 24 / (F49) No. 9 — No. 10:

Trouble code 26 / (F49) No. 14 — No. 15:

Trouble code 28 / (F49) No. 7 — No. 8:



CHECK : Is the resistance between 0.8 and 1.2 kΩ?

YES : Go to step 8I12.

NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

8I12 : CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

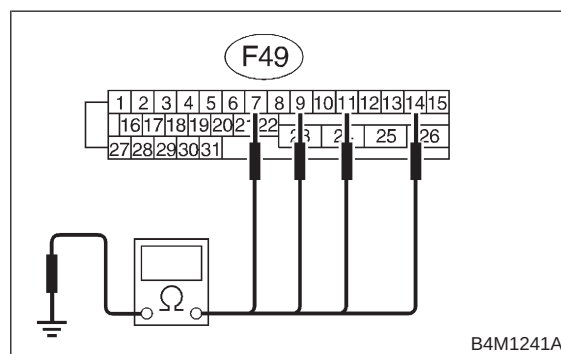
Connector & terminal

Trouble code 22 / (F49) No. 11 — Chassis ground:

Trouble code 24 / (F49) No. 9 — Chassis ground:

Trouble code 26 / (F49) No. 14 — Chassis ground:

Trouble code 28 / (F49) No. 7 — Chassis ground:



CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8I13.

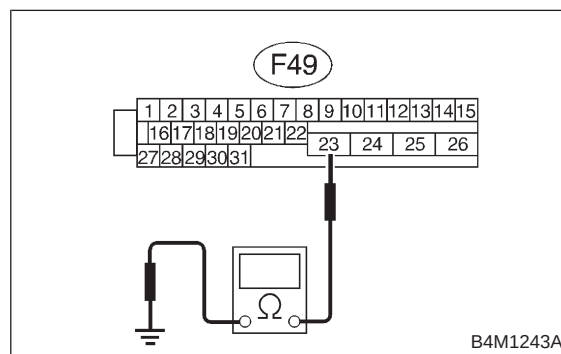
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

8I13 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal

(F49) No. 23 — GND:



CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 8I14.

NO : Repair ABSCM&H/U ground harness.

8I14 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1]. >*

YES : Repair connector.

NO : Go to step **8I15**.

8I15 : CHECK SOURCES OF SIGNAL NOISE.

CHECK : *Is the car telephone or the wireless transmitter properly installed?*

YES : Go to step **8I16**.

NO : Properly install the car telephone or the wireless transmitter.

8I16 : CHECK SOURCES OF SIGNAL NOISE.

CHECK : *Are noise sources (such as an antenna) installed near the sensor harness?*

YES : Install the noise sources apart from the sensor harness.

NO : Go to step **8I17**.

8I17 : CHECK SHIELD CIRCUIT.

- 1) Connect all connectors.
- 2) Measure resistance between shield connector and chassis ground.

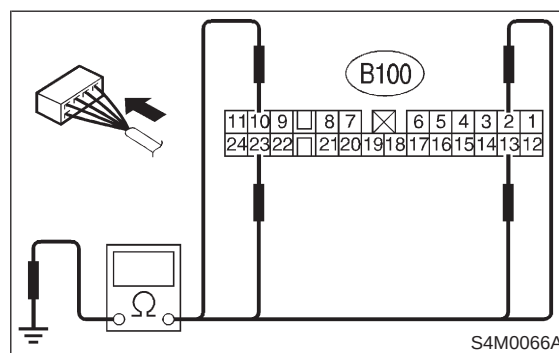
Connector & terminal

Trouble code 22 / (B100) No. 23 — Chassis ground:

Trouble code 24 / (B100) No. 10 — Chassis ground:

Trouble code 26 / (B100) No. 2 — Chassis ground:

Trouble code 28 / (B100) No. 13 — Chassis ground:



CHECK : *Is the resistance less than 0.5 Ω?*

YES : Go to step **8I18**.

NO : Repair shield harness.

8I18 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **8I19**.

8I19 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

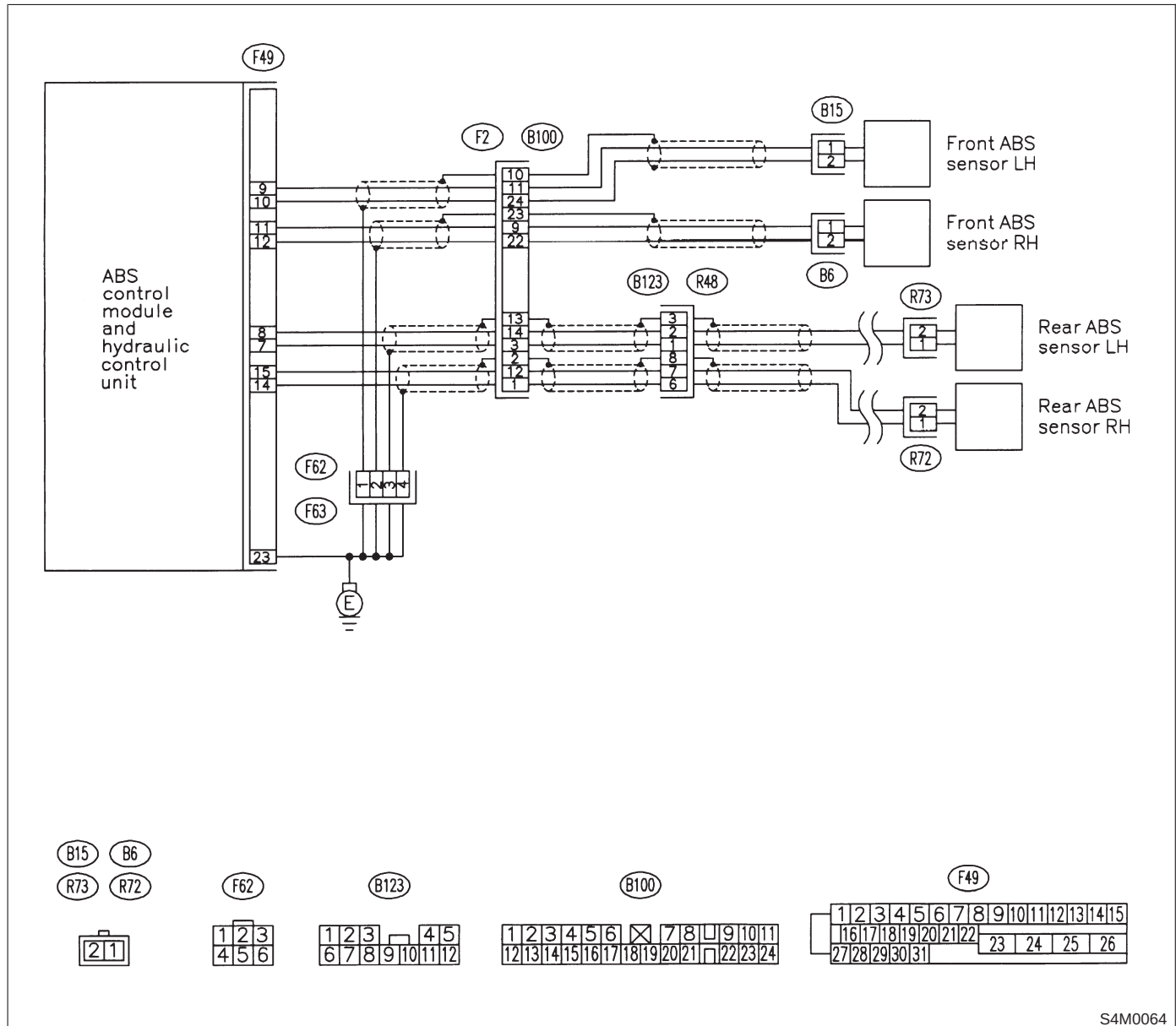
NO : A temporary noise interference.

J: TROUBLE CODE 29**— ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —****DIAGNOSIS:**

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

S4M0064

8J1 : CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

- CHECK** : Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.
- YES** : The ABS is normal. Erase the trouble code.

NOTE:

When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.

- NO** : Go to step 8J2.

8J2 : CHECK TIRE SPECIFICATIONS.

- CHECK** : Are the tire specifications correct?
- YES** : Go to step 8J3.
- NO** : Replace tire.

8J3 : CHECK WEAR OF TIRE.

- CHECK** : Is the tire worn excessively?
- YES** : Replace tire.
- NO** : Go to step 8J4.

8J4 : CHECK TIRE PRESSURE.

- CHECK** : Is the tire pressure correct?
- YES** : Go to step 8J5.
- NO** : Adjust tire pressure.

8J5 : CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

- CHECK** : Are the ABS sensor installation bolts tightened securely?
- YES** : Go to step 8J6.
- NO** : Tighten ABS sensor installation bolts securely.

8J6 : CHECK INSTALLATION OF TONE WHEEL.

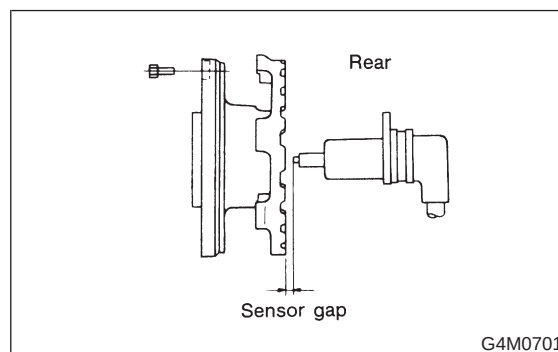
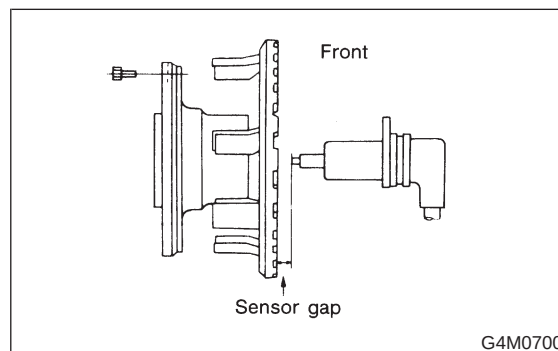
Tightening torque:

13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

- CHECK** : Are the tone wheel installation bolts tightened securely?
- YES** : Go to step 8J7.
- NO** : Tighten tone wheel installation bolts securely.

8J7 : CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

- CHECK** : Is the gap within the specifications?
- YES** : Go to step 8J8.
- NO** : Adjust the gap.

NOTE:

Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

8J8 : CHECK OSCILLOSCOPE.**CHECK** : *Is an oscilloscope available?***YES** : Go to step **8J9**.**NO** : Go to step **8J10**.**8J9 : CHECK ABS SENSOR SIGNAL.**

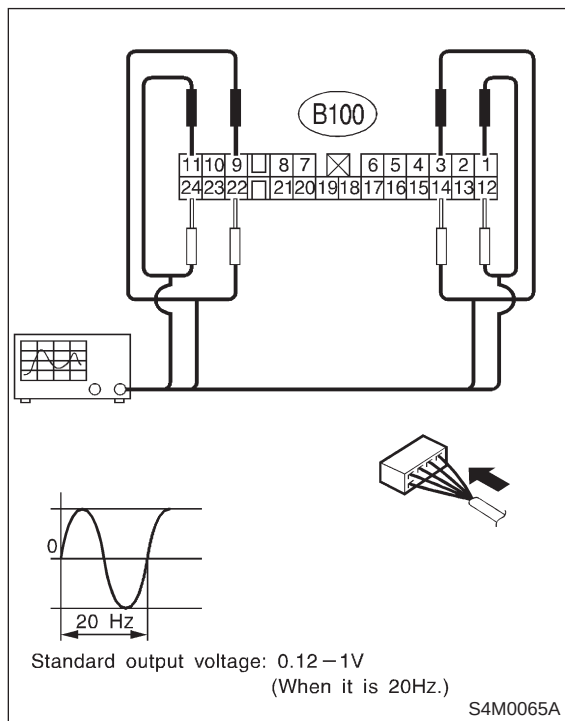
- 1) Raise all four wheels of ground.
- 2) Turn ignition switch OFF.
- 3) Connect the oscilloscope to the connector (B100).
- 4) Turn ignition switch ON.
- 5) Rotate wheels and measure voltage at specified frequency.

NOTE:

When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

Connector & terminal**(B100) No. 9 (+) — No. 22 (–) (Front RH):****(B100) No. 11 (+) — No. 24 (–) (Front LH):****(B100) No. 1 (+) — No. 12 (–) (Rear RH):****(B100) No. 3 (+) — No. 14 (–) (Rear LH):**

Specified voltage: 0.12 — 1 V (When it is 20 Hz.)

**CHECK** : *Is oscilloscope pattern smooth, as shown in figure?***YES** : Go to step **8J13**.**NO** : Go to step **8J10**.**8J10 : CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.**

Remove disc rotor from hub.

CHECK : *Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?***YES** : Thoroughly remove dirt or other foreign matter.**NO** : Go to step **8J11**.**8J11 : CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.****CHECK** : *Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?***YES** : Replace ABS sensor or tone wheel.**NO** : Go to step **8J12**.**8J12 : CHECK HUB RUNOUT.**

Measure hub runout.

CHECK : *Is the runout less than 0.05 mm (0.0020 in)?***YES** : Go to step **8J13**.**NO** : Repair hub.**8J13 : CHECK ABSCM&H/U.**

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Erase the memory.
- 4) Perform inspection mode.
- 5) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?***YES** : Replace ABSCM&H/U.**NO** : Go to step **8J14**.**8J14 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.****CHECK** : *Are other trouble codes being output?***YES** : Proceed with the diagnosis corresponding to the trouble code.**NO** : A temporary poor contact.

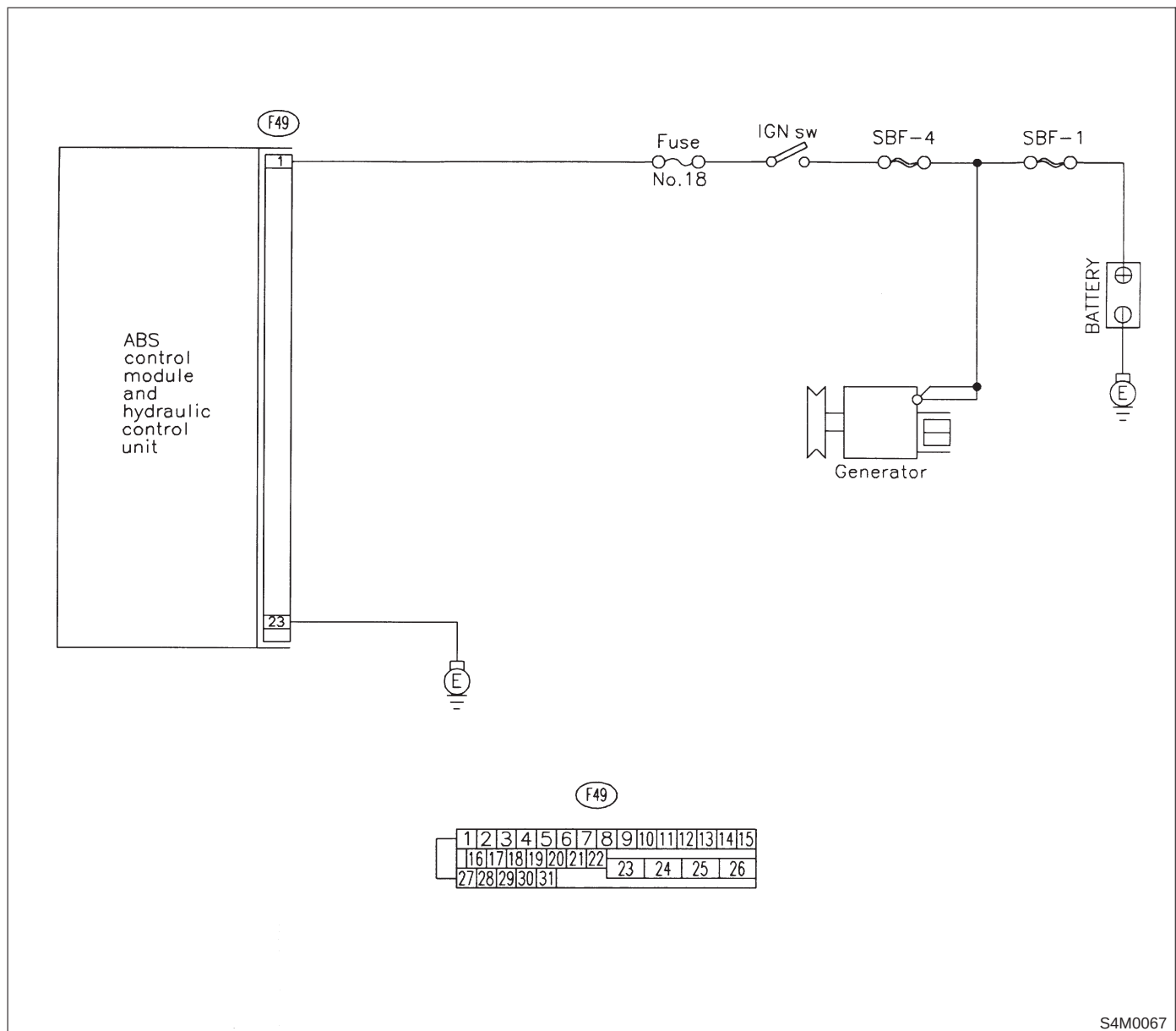
MEMO:

K: TROUBLE CODE 31 (FRONT RH)**L: TROUBLE CODE 33 (FRONT LH)****M: TROUBLE CODE 35 (REAR RH)****N: TROUBLE CODE 37 (REAR LH)****— ABNORMAL INLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U —****DIAGNOSIS:**

- Faulty harness/connector
- Faulty inlet solenoid valve in ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

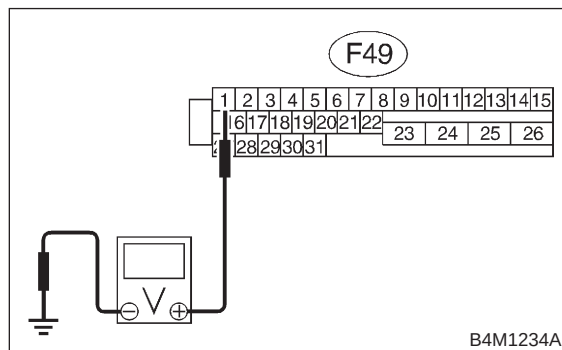
WIRING DIAGRAM:

8N1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



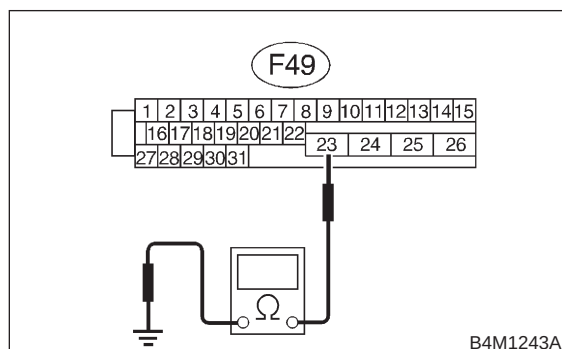
- CHECK** : *Is the voltage between 10 V and 15 V?*
- YES** : Go to step **8N2**.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

8N2 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step **8N3**.
- NO** : Repair ABSCM&H/U ground harness.

8N3 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1]. >*
- YES** : Repair connector.
- NO** : Go to step **8N4**.

8N4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
 - 2) Erase the memory.
 - 3) Perform inspection mode.
 - 4) Read out the trouble code.
- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **8N5**.

8N5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

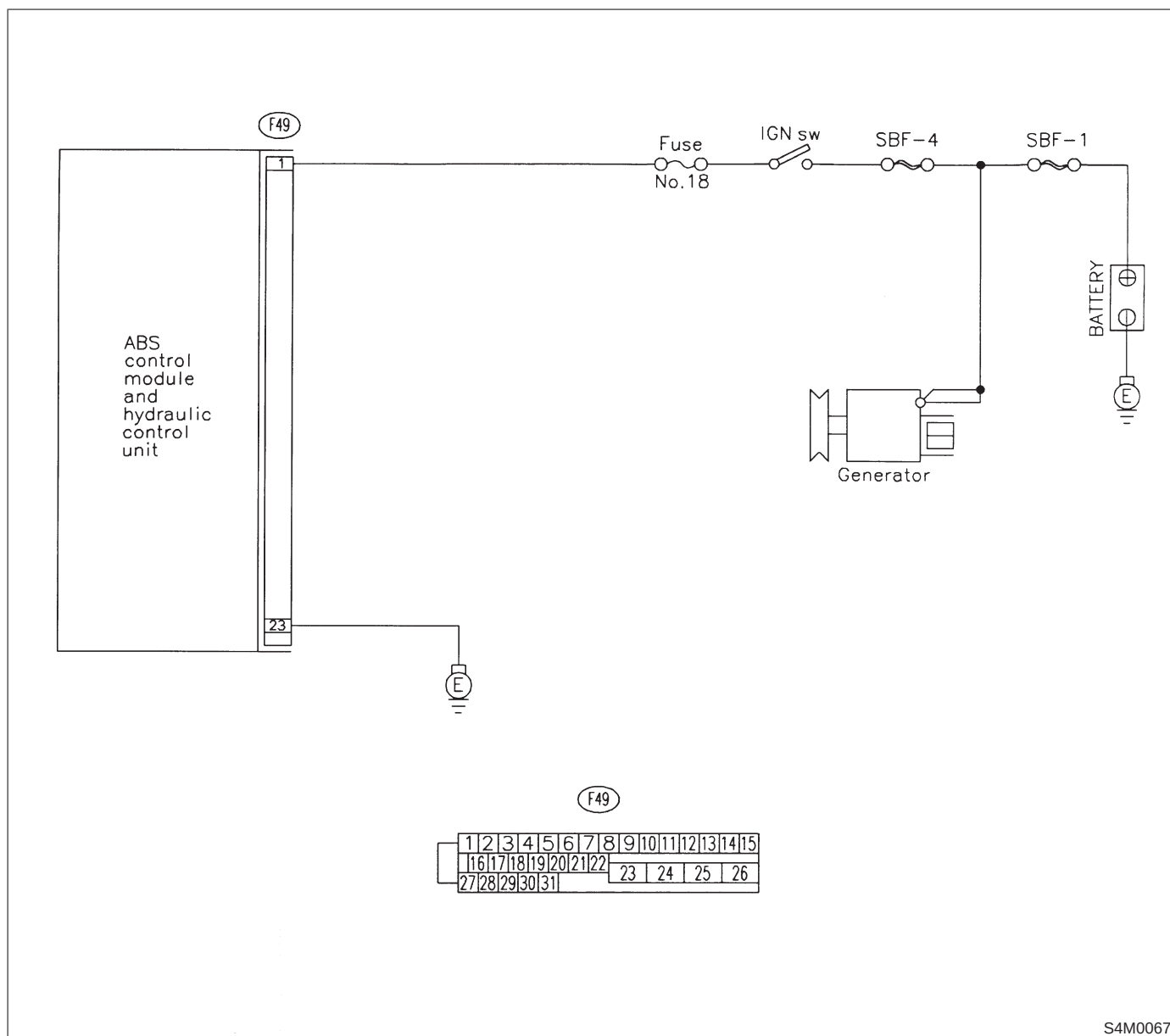
- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

O: TROUBLE CODE 32 (FRONT RH)**P: TROUBLE CODE 34 (FRONT LH)****Q: TROUBLE CODE 36 (REAR RH)****R: TROUBLE CODE 38 (REAR LH)****— ABNORMAL OUTLET SOLENOID VALVE CIRCUIT(S) IN ABSCM&H/U —****DIAGNOSIS:**

- Faulty harness/connector
- Faulty outlet solenoid valve in ABSCM&H/U

TROUBLE SYMPTOM:

- ABS does not operate.

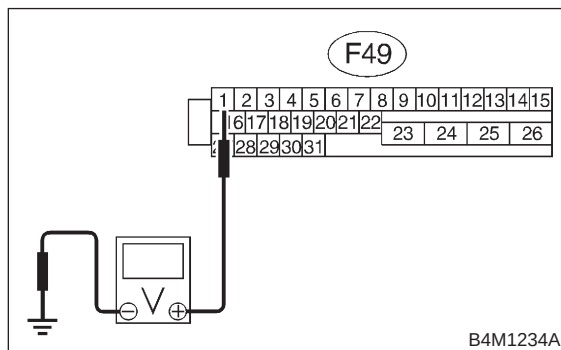
WIRING DIAGRAM:

8R1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



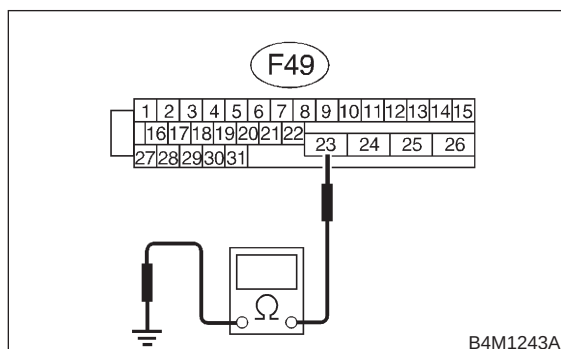
- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8R2.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

8R2 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 8R3.
- NO** : Repair ABSCM&H/U ground harness.

8R3 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1]. >
- YES** : Repair connector.
- NO** : Go to step 8R4.

8R4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
 - 2) Erase the memory.
 - 3) Perform inspection mode.
 - 4) Read out the trouble code.
- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCM&H/U.
- NO** : Go to step 8R5.

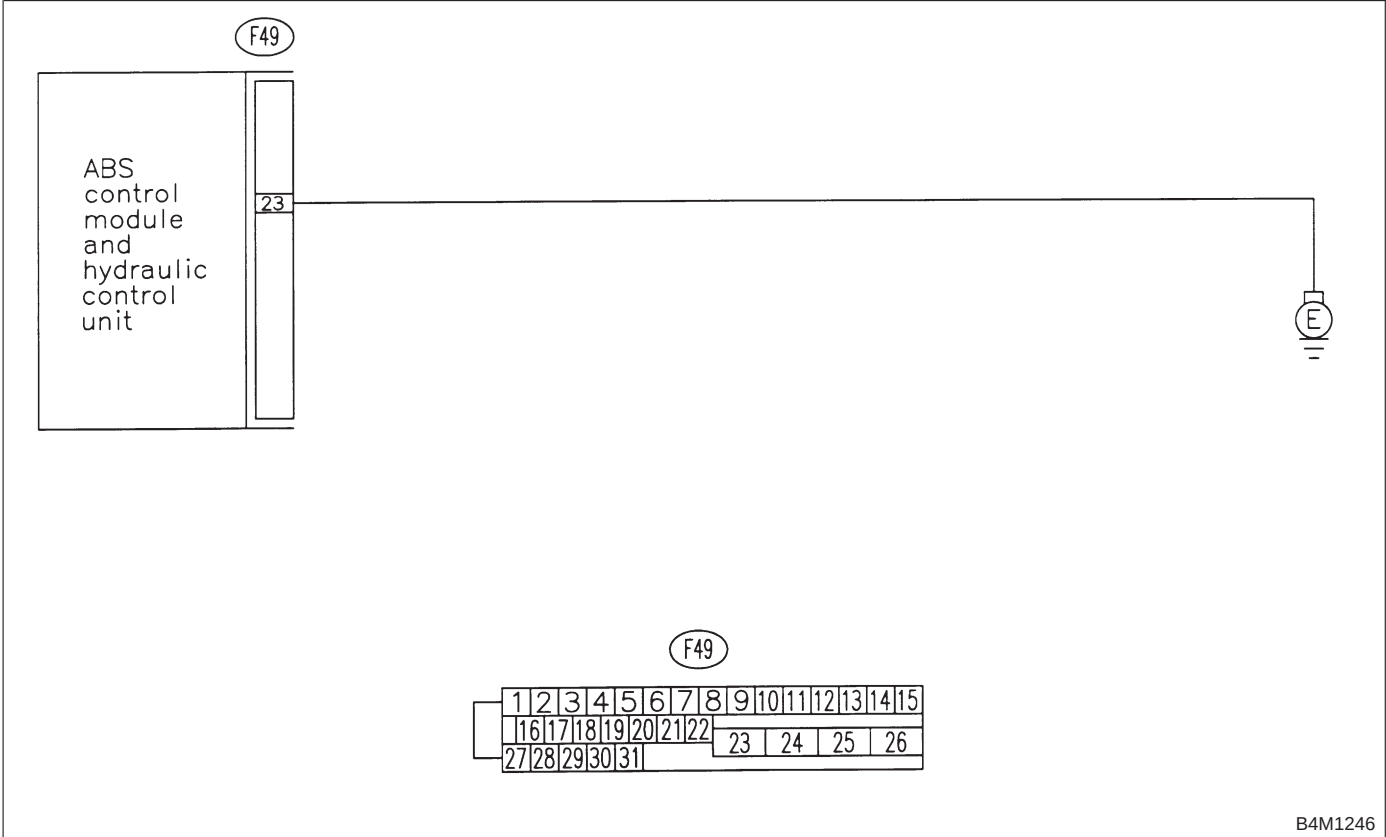
8R5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : Are other trouble codes being output?
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

S: TROUBLE CODE 41

— ABNORMAL ABS CONTROL MODULE —

- DIAGNOSIS:
- Faulty ABSCM&H/U.
- TROUBLE SYMPTOM:
- ABS does not operate.
- WIRING DIAGRAM:

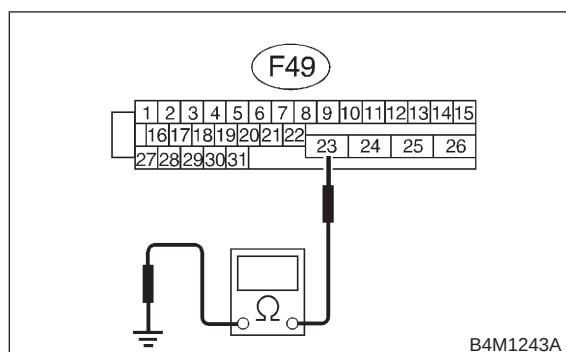


8S1 : CHECK GROUND CIRCUIT OF ABSCm&H/U.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCm&H/U.
- 3) Measure resistance between ABSCm&H/U and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 8S2.
- NO** : Repair ABSCm&H/U ground harness.

8S2 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : Is there poor contact in connectors between battery, ignition switch and ABSCm&H/U? <Ref. to FOREWORD [T3C1]. >
- YES** : Repair connector.
- NO** : Go to step 8S3.

8S3 : CHECK SOURCES OF SIGNAL NOISE.

- CHECK** : Is the car telephone or the wireless transmitter properly installed?
- YES** : Go to step 8S4.
- NO** : Properly install the car telephone or the wireless transmitter.

8S4 : CHECK SOURCES OF SIGNAL NOISE.

- CHECK** : Are noise sources (such as an antenna) installed near the sensor harness?
- YES** : Install the noise sources apart from the sensor harness.
- NO** : Go to step 8S5.

8S5 : CHECK ABSCm&H/U.

- 1) Connect all connectors.
 - 2) Erase the memory.
 - 3) Perform inspection mode.
 - 4) Read out the trouble code.
- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCm&H/U.
- NO** : Go to step 8S6.

8S6 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : Are other trouble codes being output?
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

DIAGNOSIS:

- TROUBLE SYMPTOM:**

- ABS does not operate.

WIRING DIAGRAM:

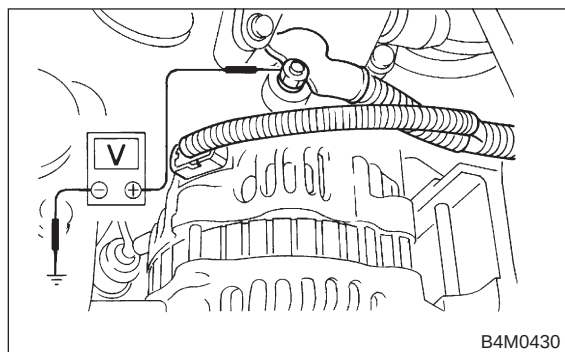


8T1 : CHECK GENERATOR.

- 1) Start engine.
- 2) Idling after warm-up.
- 3) Measure voltage between generator B terminal and chassis ground.

Terminal

Generator B terminal — Chassis ground:



- CHECK** : Is the voltage between 10 V and 17 V?
- YES** : Go to step 8T2.
- NO** : Repair generator.

8T2 : CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

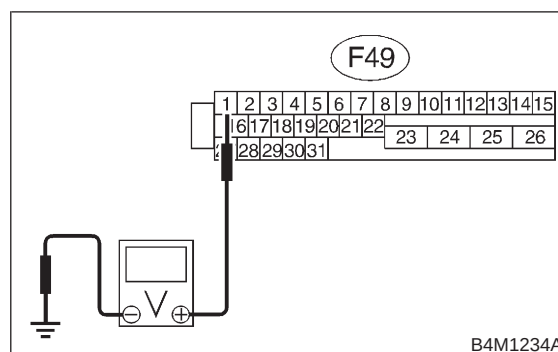
- CHECK** : Are the positive and negative battery terminals tightly clamped?
- YES** : Go to step 8T3.
- NO** : Tighten the clamp of terminal.

8T3 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



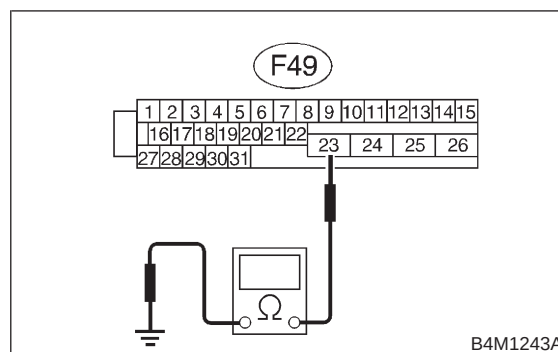
- CHECK** : Is the voltage between 10 V and 17 V?
- YES** : Go to step 8T4.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

8T4 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 8T5.
- NO** : Repair ABSCM&H/U ground harness.

8T5 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1]. >*

YES : Repair connector.

NO : Go to step **8T6**.

8T6 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **8T7**.

8T7 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

U: TROUBLE CODE 44

— A COMBINATION OF AT CONTROL ABNORMAL —

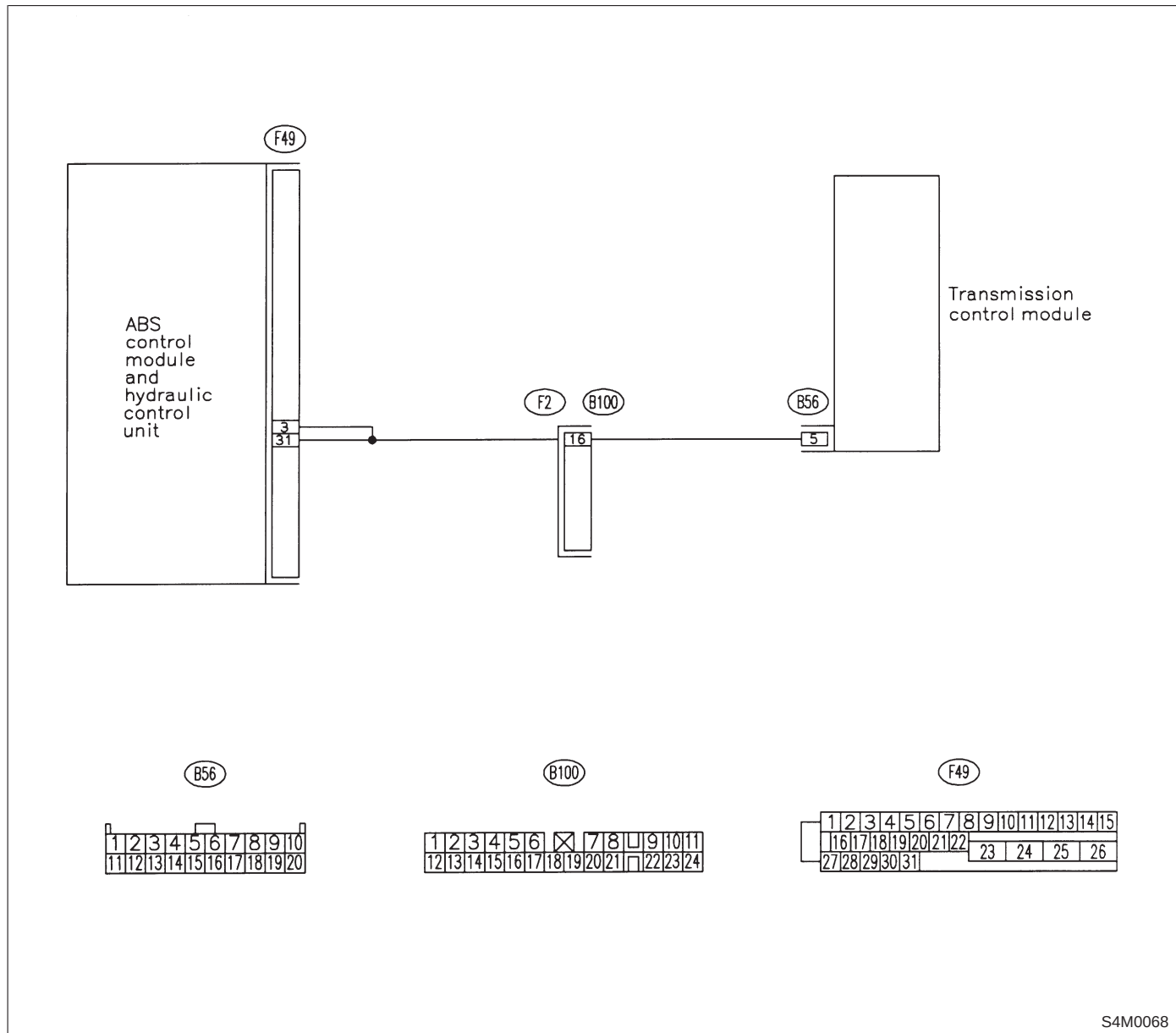
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

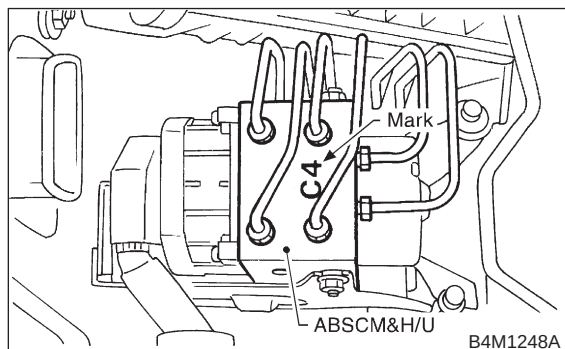
WIRING DIAGRAM:



S4M0068

8U1 : CHECK SPECIFICATIONS OF THE ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.



Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : Is an ABSCM&H/U for AT model installed on a MT model?

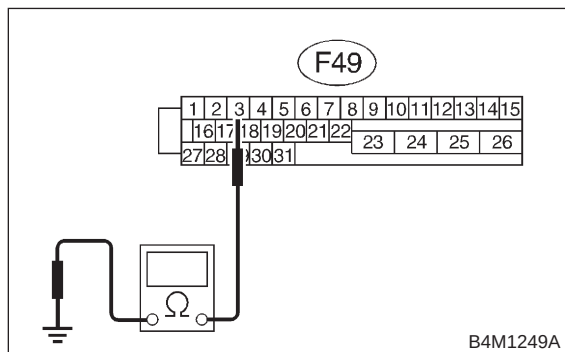
YES : Replace ABSCM&H/U.

NO : Go to step 8U2.

8U2 : CHECK GROUND SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from TCM.
- 3) Disconnect connector from ABSCM&H/U.
- 4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 — Chassis ground:



CHECK : Is the resistance more than 1 MΩ?

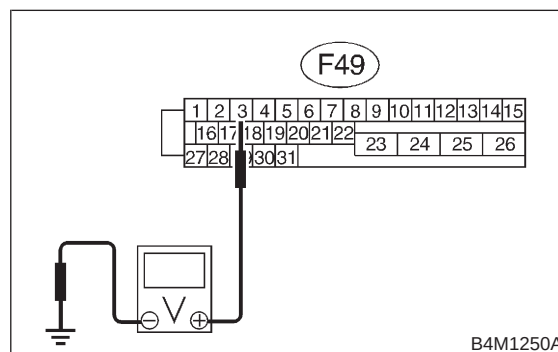
YES : Go to step 8U3.

NO : Repair harness between TCM and ABSCM&H/U.

8U3 : CHECK BATTERY SHORT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (-):



CHECK : Is the voltage less than 1 V?

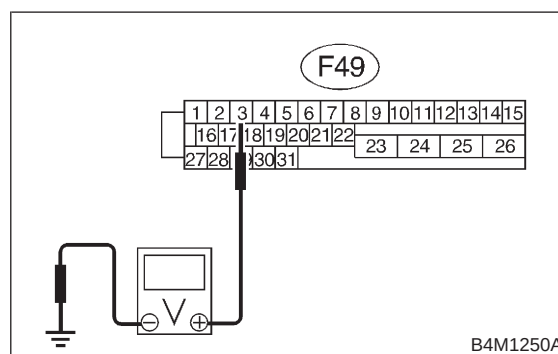
YES : Go to step 8U4.

NO : Repair harness between TCM and ABSCM&H/U.

8U4 : CHECK BATTERY SHORT OF HARNESS.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 3 (+) — Chassis ground (-):



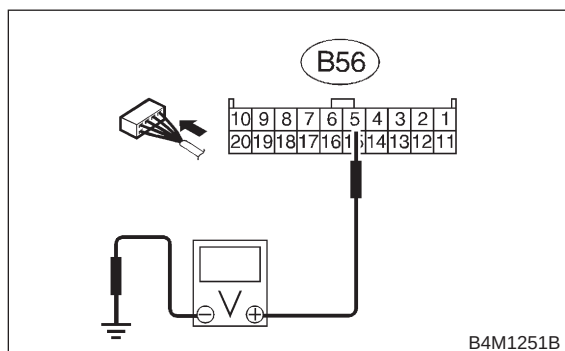
CHECK : Is the voltage less than 1 V?

YES : Go to step 8U5.

NO : Repair harness between TCM and ABSCM&H/U.

8U5 : CHECK TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors to TCM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM connector terminal and chassis ground.

Connector & terminal**(B56) No. 5 (+) — Chassis ground (-):**

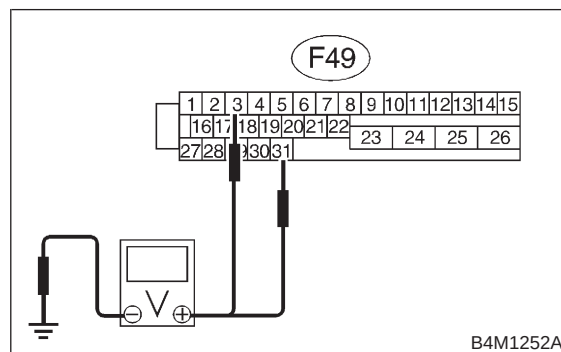
- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8U7.
- NO** : Go to step 8U6.

8U6 : CHECK AT.

- CHECK** : Is the AT functioning normally?
- YES** : Replace TCM.
- NO** : Repair AT.

8U7 : CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 3 (+) — Chassis ground (-):****(F49) No. 31 (+) — Chassis ground (-):**

- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8U8.
- NO** : Repair harness/connector between TCM and ABSCM&H/U.

8U8 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : Is there poor contact in connectors between TCM and ABSCM&H/U?
<Ref. to FOREWORD [T3C1]. >
- YES** : Repair connector.
- NO** : Go to step 8U9.

8U9 : CHECK ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Erase the memory.
- 4) Perform inspection mode.
- 5) Read out the trouble code.

- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCM&H/U.
- NO** : Go to step 8U10.

8U10 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

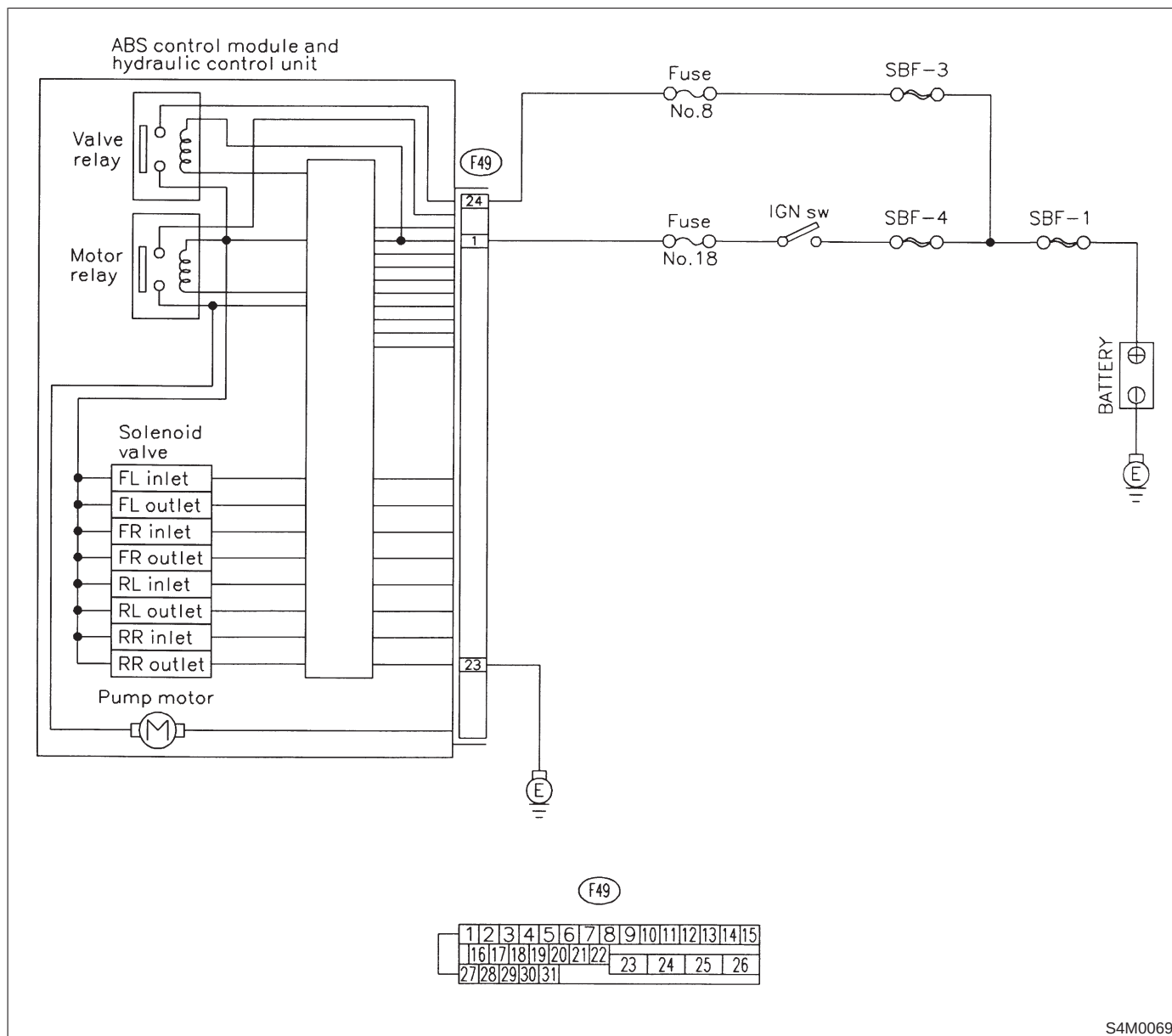
- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

V: TROUBLE CODE 51**— ABNORMAL VALVE RELAY —****DIAGNOSIS:**

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

S4M0069

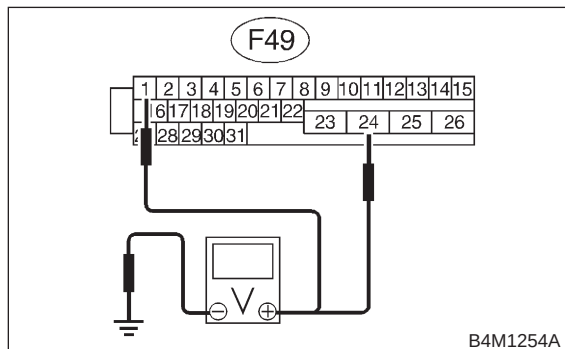
8V1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Run the engine at idle.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):



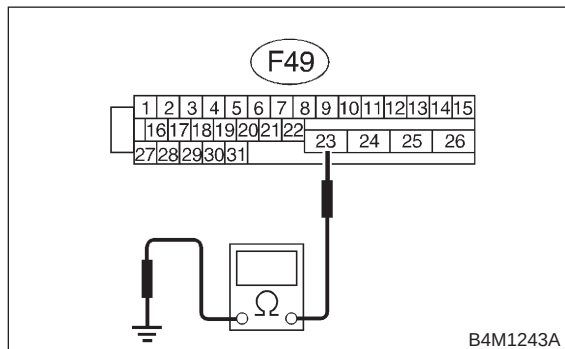
- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8V2.
- NO** : Repair harness connector between battery and ABSCM&H/U.

8V2 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



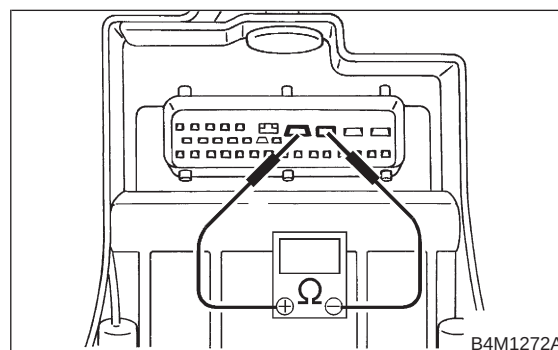
- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 8V3.
- NO** : Repair ABSCM&H/U ground harness.

8V3 : CHECK VALVE RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U and terminals.

Terminals

No. 23 (+) — No. 24 (-):



- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step 8V4.
- NO** : Replace ABSCM&H/U.

8V4 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1]. >
- YES** : Repair connector.
- NO** : Go to step 8V5.

8V5 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCM&H/U.
- NO** : Go to step 8V6.

8V6 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

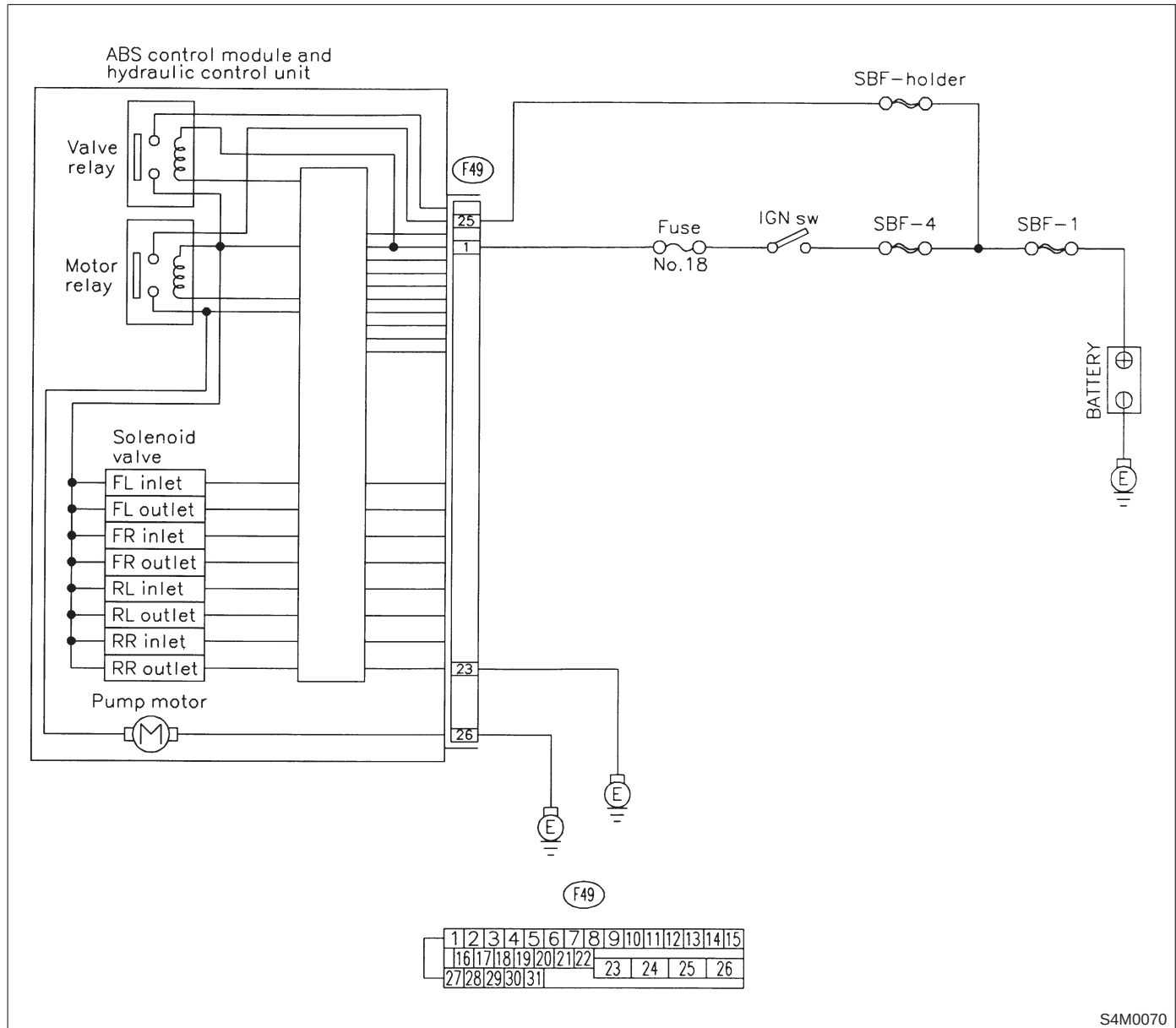
MEMO:

W: TROUBLE CODE 52**— ABNORMAL MOTOR AND/OR MOTOR RELAY —****DIAGNOSIS:**

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

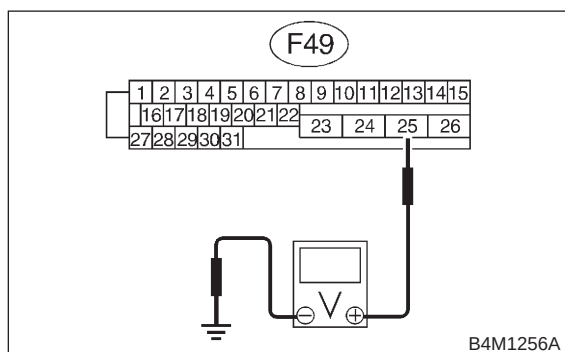
S4M0070

8W1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 25 (+) — Chassis ground (-):



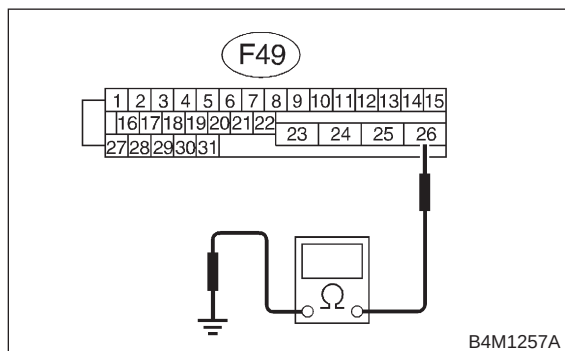
- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8W2.
- NO** : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF-holder.

8W2 : CHECK GROUND CIRCUIT OF MOTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 26 — Chassis ground:



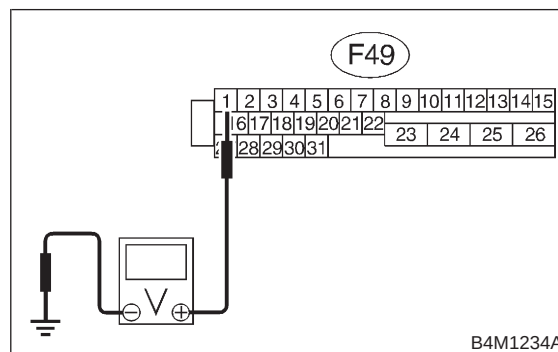
- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 8W3.
- NO** : Repair ABSCM&H/U ground harness.

8W3 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Run the engine at idle.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



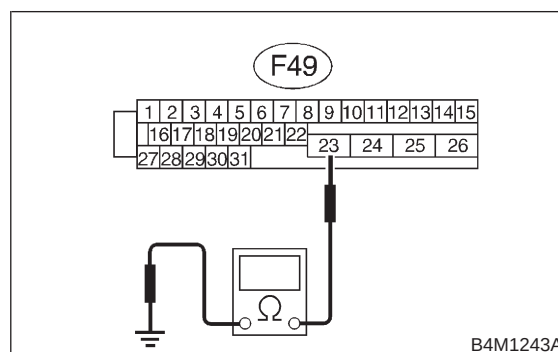
- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8W4.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

8W4 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 8W5.
- NO** : Repair ABSCM&H/U ground harness.

8W5 : CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W14D1].>

NOTE:

Use the diagnosis connector to operate the sequence control.

CHECK : *Can motor revolution noise (buzz) be heard when carrying out the sequence control?*

YES : Go to step **8W6**.

NO : Replace ABSCM&H/U.

8W6 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1]. >*

YES : Repair connector.

NO : Go to step **8W7**.

8W7 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **8W8**.

8W8 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

X: TROUBLE CODE 54

— ABNORMAL STOP LIGHT SWITCH —

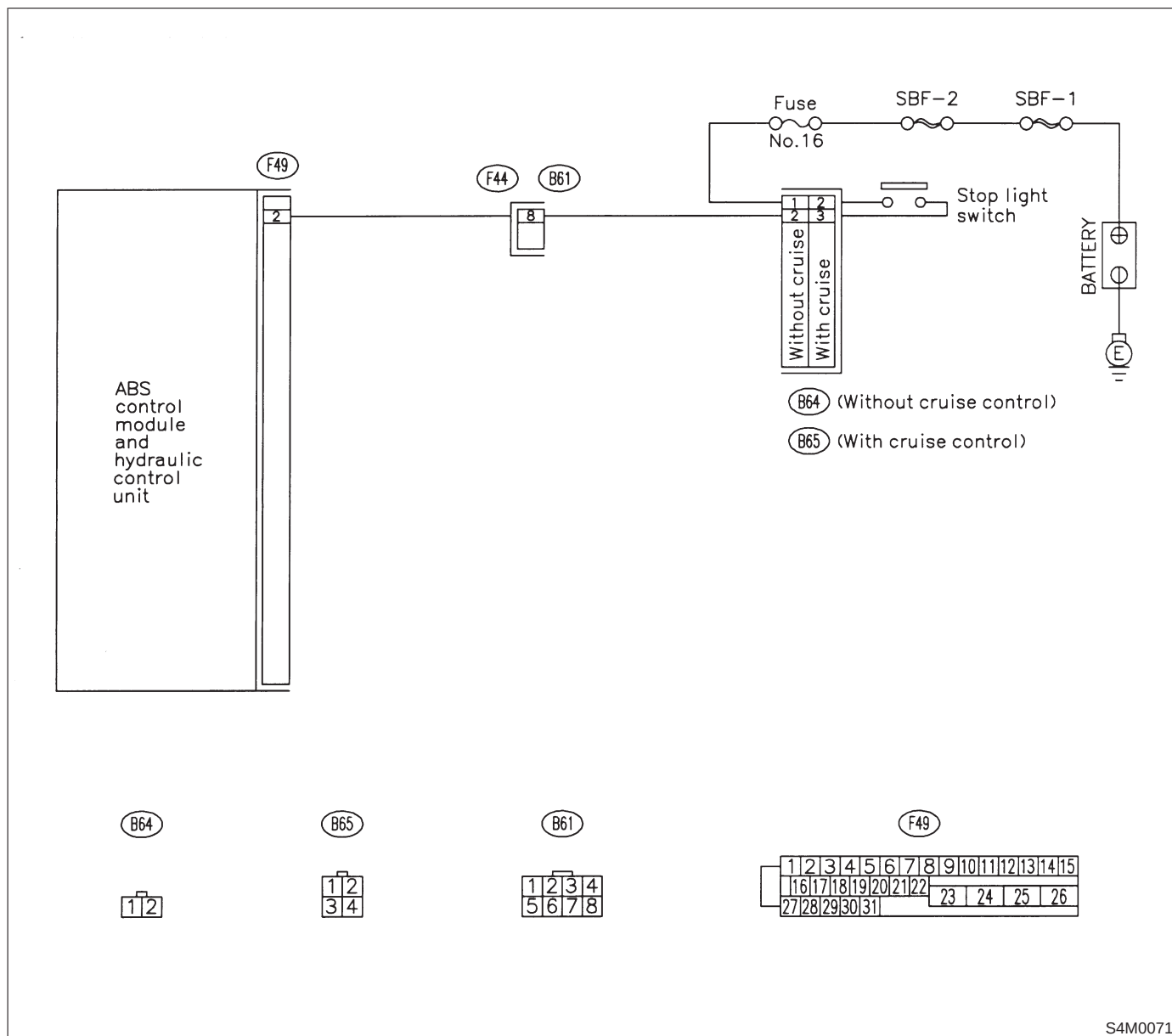
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0071

8X1 : CHECK STOP LIGHTS COME ON.

Depress the brake pedal.

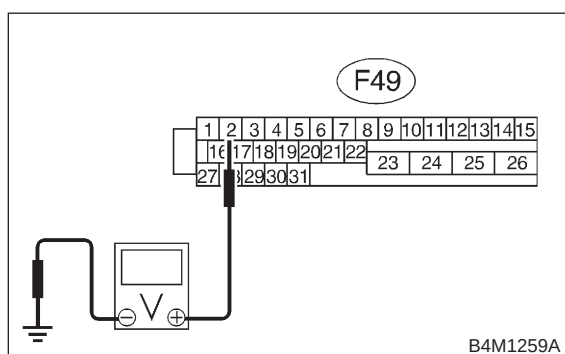
- CHECK** : *Do stop lights come on?*
- YES** : Go to step **8X2**.
- NO** : Repair stop lights circuit.

8X2 : CHECK OPEN CIRCUIT IN HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Depress brake pedal.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 2 (+) — Chassis ground (-):



- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 8X3.
- NO** : Repair harness between stop light switch and ABSCM&H/U.

8X3 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1]. >
- YES** : Repair connector.
- NO** : Go to step 8X4.

8X4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCM&H/U.
- NO** : Go to step 8X5.

8X5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

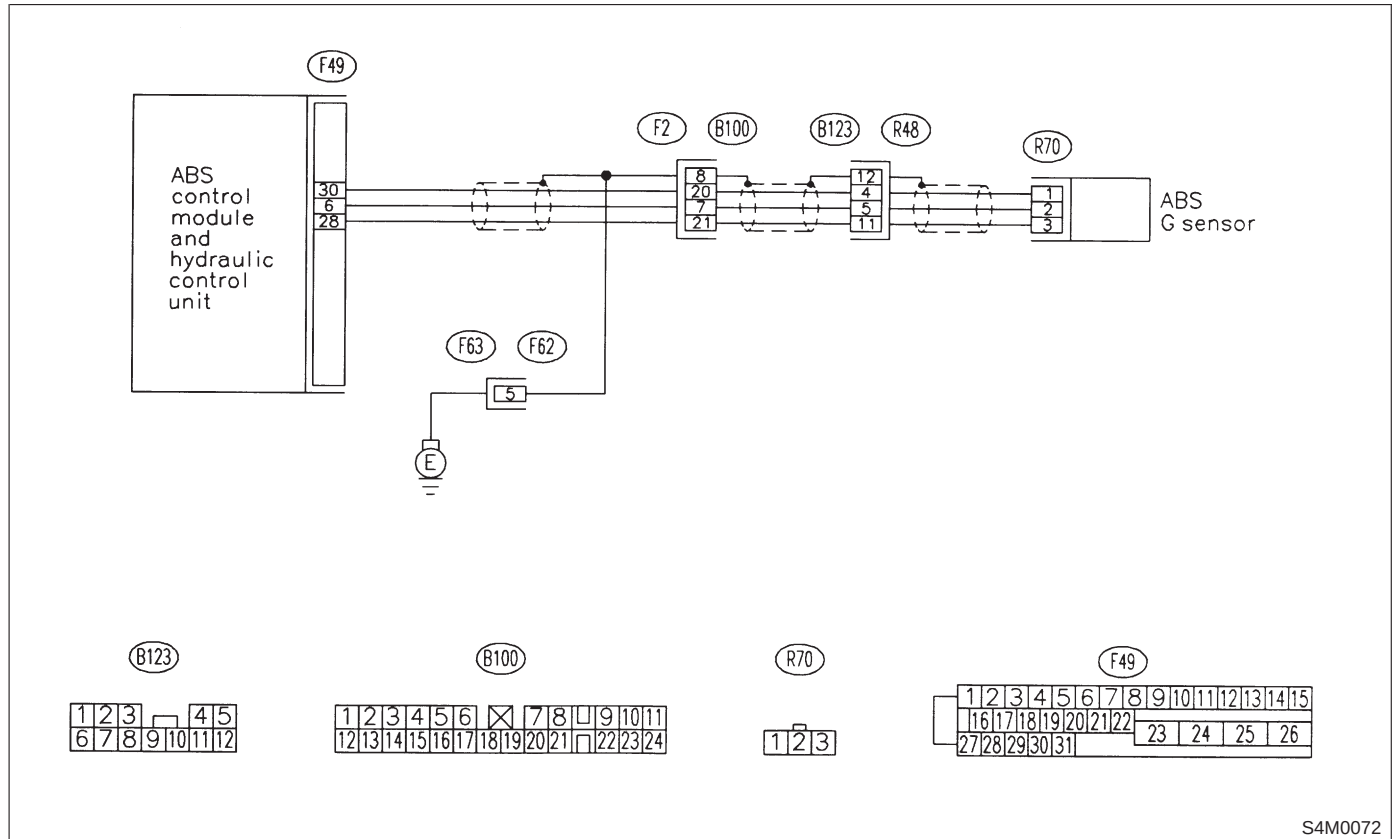
- CHECK** : Are other trouble codes being output?
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

Y: TROUBLE CODE 56**— ABNORMAL G SENSOR OUTPUT VOLTAGE —****DIAGNOSIS:**

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

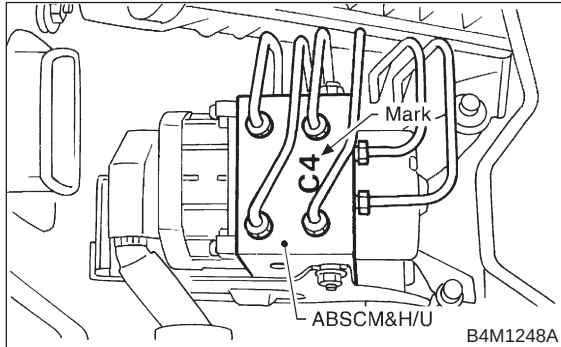
S4M0072

8Y1 : CHECK ALL FOUR WHEELS FOR FREE TURNING.

- CHECK** : *Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?*
- YES** : The ABS is normal. Erase the trouble code.
- NO** : Go to step **8Y2**.

8Y2 : CHECK SPECIFICATIONS OF ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.



Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : Is an ABSCM for AWD model installed on a FWD model?

YES : Replace ABSCM&H/U.

CAUTION:

Be sure to turn ignition switch to OFF when removing ABSCM&H/U.

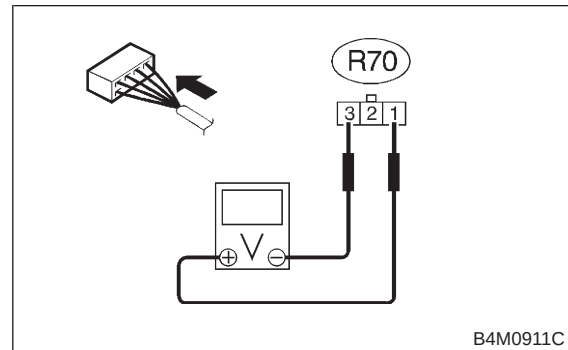
NO : Go to step 8Y3.

8Y3 : CHECK INPUT VOLTAGE OF G SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Disconnect G sensor from body. (Do not disconnect connector.)
- 4) Turn ignition switch to ON.
- 5) Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) No. 1 (+) — No. 3 (-):



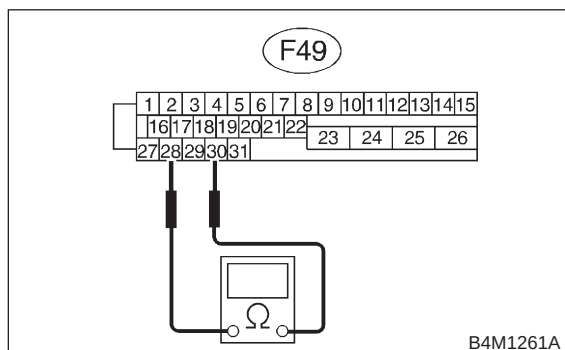
CHECK : Is the voltage between 4.75 and 5.25 V?

YES : Go to step 8Y4.

NO : Repair harness/connector between G sensor and ABSCM&H/U.

8Y4 : CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:


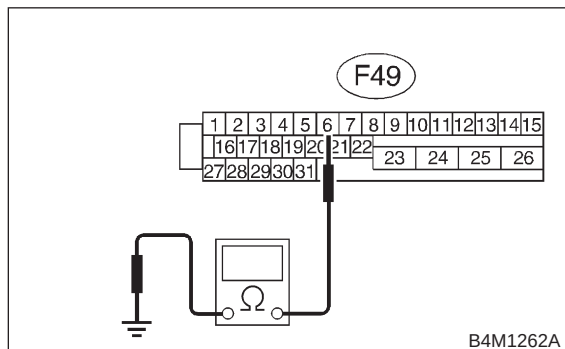
CHECK : Is the resistance between 4.3 and 4.9 kΩ?

YES : Go to step 8Y5.

NO : Repair harness/connector between G sensor and ABSCM&H/U.

8Y5 : CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

- 1) Disconnect connector from G sensor.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 — Chassis ground:


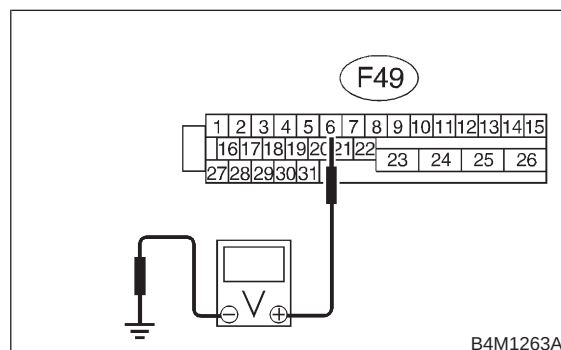
CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8Y6.

NO : Repair harness between G sensor and ABSCM&H/U.

8Y6 : CHECK BATTERY SHORT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (-):


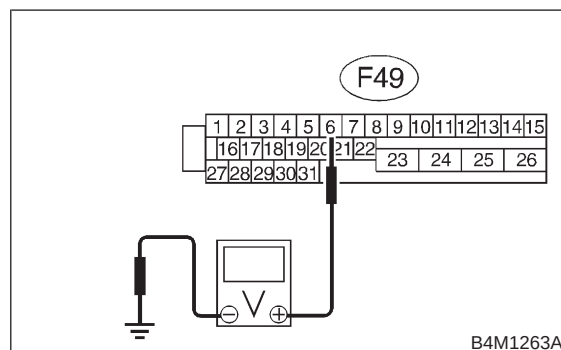
CHECK : Is the voltage less than 1 V?

YES : Go to step 8Y7.

NO : Repair harness between G sensor and ABSCM&H/U.

8Y7 : CHECK BATTERY SHORT OF HARNESS.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 (+) — Chassis ground (-):


CHECK : Is the voltage less than 1 V?

YES : Go to step 8Y8.

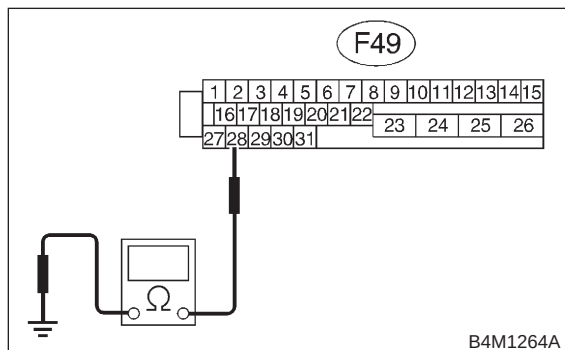
NO : Repair harness between G sensor and ABSCM&H/U.

8Y8 : CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 28 — Chassis ground:



CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8Y9.

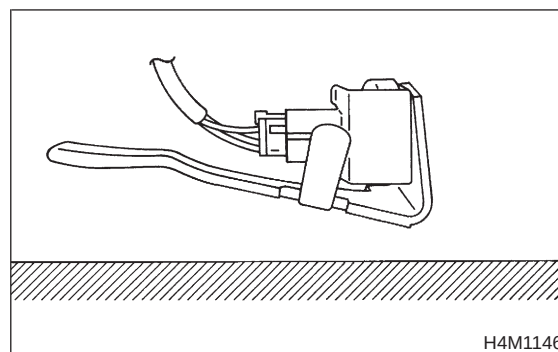
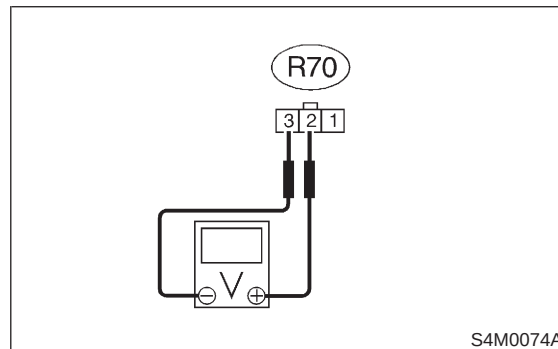
NO : Repair harness between G sensor and ABSCM&H/U.
Replace ABSCM&H/U.

8Y9 : CHECK G SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove G sensor from vehicle.
- 3) Connect connector to G sensor.
- 4) Connect connector to ABSCM&H/U.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) No. 2 (+) — No. 3 (-):



CHECK : Is the voltage between 2.1 and 2.4 V when G sensor is horizontal?

YES : Go to step 8Y10.

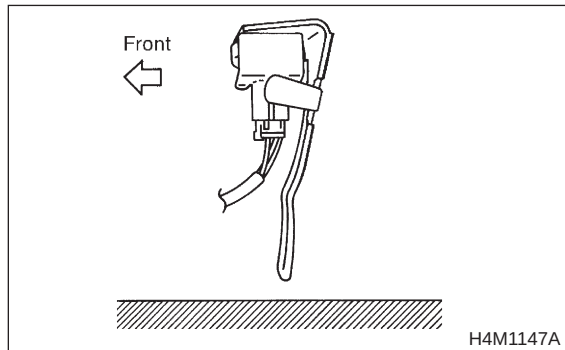
NO : Replace G sensor.

8Y10 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) No. 2 (+) — No. 3 (-):



CHECK : *Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?*

YES : Go to step 8Y11.

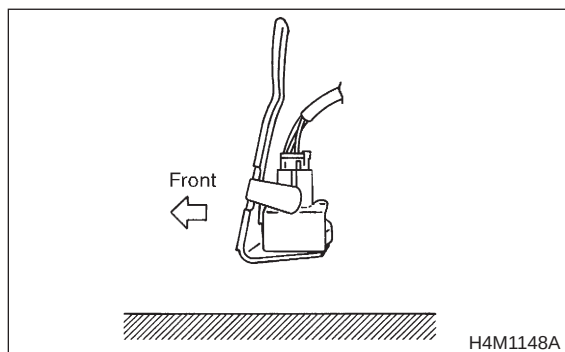
NO : Replace G sensor.

8Y11 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) No. 2 (+) — No. 3 (-):



CHECK : *Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?*

YES : Go to step 8Y12.

NO : Replace G sensor.

8Y12 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1]. >*

YES : Repair connector.

NO : Go to step 8Y13.

8Y13 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step 8Y14.

8Y14 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

9. Select Monitor Function Mode

Applicable cartridge of select monitor: No. 24082AA010

NOTE:

For basic handling of the select monitor, refer to its Operation Manual.

A: LIST OF FUNCTION MODE

1. ANALOG DATA ARE DISPLAYED

Display screen	Contents to be monitored
FR wheel speed	Wheel speed detected by the Front Right ABS sensor is displayed in km/h or mile/h.
FL wheel speed	Wheel speed detected by the Front Left ABS sensor is displayed in km/h or mile/h.
RR wheel speed	Wheel speed detected by the Rear Right ABS sensor is displayed in km/h or mile/h.
RL wheel speed	Wheel speed detected by the Rear Left ABS sensor is displayed in km/h or mile/h.
Stop light switch	Stop light switch monitor voltage is displayed.
G sensor output voltage	Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.

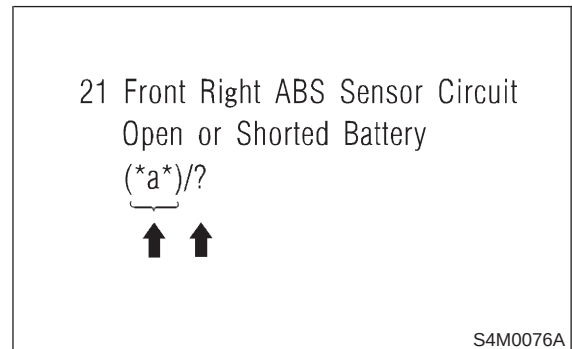
2. ON/OFF DATA ARE DISPLAYED

Display screen	Contents to be monitored
Stop light switch	Stop light switch signal
Valve relay signal	Valve relay signal
Motor relay signal	Motor relay signal
ABS signal to TCM	ABS operation signal from ABS control module to TCM
ABS warning light	ABS warning light
Valve relay monitor	Valve relay operation monitor signal
Motor relay monitor	Motor relay operation monitor signal
CCM signal	ABS operation signal from ABS control module to TCM

3. TROUBLE CODES ARE DISPLAYED

A maximum of 3 trouble codes are displayed in order of occurrence.

- If a particular trouble code is not properly stored in memory (due to a drop in ABSCM&H/U power supply, etc.) when a problem occurs, the trouble code, followed by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.



- *a* refers to the troubles in order of occurrence (Latest, Old, Older and Reference).

Display screen	Contents to be monitored
Latest	The most recent trouble code appears on the select monitor display.
Old	The second most recent trouble code appears on the select monitor display.
Older	The third most recent trouble code appears on the select monitor display.
Reference	A specified period of time preceding trouble code appears on the select monitor display.

4. CLEAR MEMORY

Display screen	Contents to be monitored
Clear memory?	Function of clearing trouble code and freeze frame data.

5. ABS SEQUENCE CONTROL

Display screen	Contents to be monitored	Ref. to
ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	<Ref. to 4-4 [W14D2].>

6. FREEZE FRAME DATA

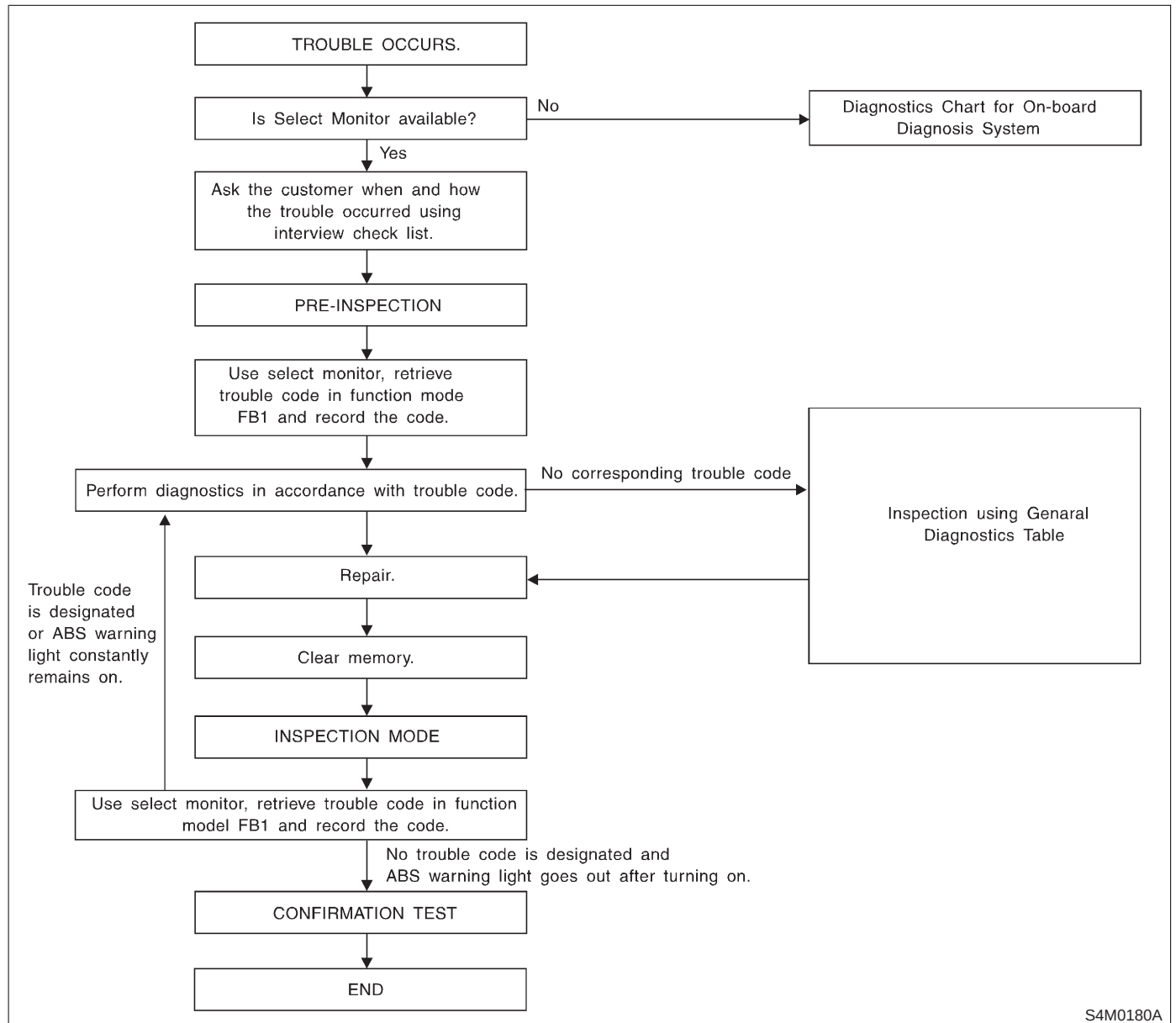
NOTE:

- Data stored at the time of trouble occurrence is shown on display.
- Each time trouble occurs, the latest information is stored in the freeze frame data in memory.
- If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a trouble code, preceded by a question mark "?", appears on the select monitor display. This shows it may be an unreliable reading.

Display screen	Contents to be monitored
FR wheel speed	Wheel speed detected by the Front Right ABS sensor is displayed in km/h or mile/h.
FL wheel speed	Wheel speed detected by the Front Left ABS sensor is displayed in km/h or mile/h.
RR wheel speed	Wheel speed detected by the Rear Right ABS sensor is displayed in km/h or mile/h.
RL wheel speed	Wheel speed detected by the Rear Left ABS sensor is displayed in km/h or mile/h.
ABSCM power voltage	Power (in volts) supplied to ABSCM&H/U appears on the select monitor display.
G sensor output voltage	Refers to vehicle acceleration detected by the analog G sensor. It appears on the select monitor display in volts.
Motor relay monitor	Motor relay operation monitor signal
Stop light switch	Stop light switch signal
ABS signal to TCM	ABS operation signal from ABS control module to TCM
ABS-AT control	ABS operation signal from ABS control module to TCM
ABS operation signal	ABS operation signal

10. Diagnostics Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART



CAUTION:

Remove foreign matter (dust, water, etc.) from the ABSCM&H/U connector during removal and installation.

NOTE:

To check harness for broken wires or short circuits, shake it while holding it or the connector.

B: LIST OF DIAGNOSTIC TROUBLE CODE

Code	Display screen	Contents of diagnosis	Ref. to
—	Communication for initializing impossible	Select monitor communication failure	<Ref. to 4-4 [T10C0].>
—	No trouble code	Although no trouble code appears on the select monitor display, the ABS warning light remains on.	<Ref. to 4-4 [T10D0].>
21	Open or short circuit in front right ABS sensor circuit	Open or short circuit in front right ABS sensor circuit	<Ref. to 4-4 [T10E0].>
22	Front right ABS sensor abnormal signal	Front right ABS sensor abnormal signal	<Ref. to 4-4 [T10I0].>
23	Open or short circuit in front left ABS sensor circuit	Open or short circuit in front left ABS sensor circuit	<Ref. to 4-4 [T10F0].>
24	Front left ABS sensor abnormal signal	Front left ABS sensor abnormal signal	<Ref. to 4-4 [T10J0].>
25	Open or short circuit in rear right ABS sensor circuit	Open or short circuit in rear right ABS sensor circuit	<Ref. to 4-4 [T10G0].>
26	Rear right ABS sensor abnormal signal	Rear right ABS sensor abnormal signal	<Ref. to 4-4 [T10K0].>
27	Open or short circuit in rear left ABS sensor circuit	Open or short circuit in rear left ABS sensor circuit	<Ref. to 4-4 [T10H0].>
28	Rear left ABS sensor abnormal signal	Rear left ABS sensor abnormal signal	<Ref. to 4-4 [T10L0].>
29	Abnormal ABS sensor signal on any one of four sensor	Abnormal ABS sensor signal on any one of four	<Ref. to 4-4 [T10M0].>
31	Front right inlet valve malfunction	Front right inlet valve malfunction	<Ref. to 4-4 [T10N0].>
32	Front right outlet valve malfunction	Front right outlet valve malfunction	<Ref. to 4-4 [T10R0].>
33	Front left inlet valve malfunction	Front left inlet valve malfunction	<Ref. to 4-4 [T10O0].>
34	Front left outlet valve malfunction	Front left outlet valve malfunction	<Ref. to 4-4 [T10S0].>
35	Rear right inlet valve malfunction	Rear right inlet valve malfunction	<Ref. to 4-4 [T10P0].>
36	Rear right outlet valve malfunction	Rear right outlet valve malfunction	<Ref. to 4-4 [T10T0].>
37	Rear left inlet valve malfunction	Rear left inlet valve malfunction	<Ref. to 4-4 [T10Q0].>
38	Rear left outlet valve malfunction	Rear left outlet valve malfunction	<Ref. to 4-4 [T10U0].>
41	ABS control module malfunction	ABS control module and hydraulic control unit malfunction	<Ref. to 4-4 [T10V0].>
42	Power supply voltage too low	Power supply voltage too low	<Ref. to 4-4 [T10W0].>
42	Power supply voltage too high	Power supply voltage too high	<Ref. to 4-4 [T10X0].>
44	ABS-AT control (Non Controlled)	ABS-AT control (Non Controlled)	<Ref. to 4-4 [T10Y0].>
44	ABS-AT control (Controlled)	ABS-AT control (Controlled)	<Ref. to 4-4 [T10Z0].>
51	Valve relay malfunction	Valve relay malfunction	<Ref. to 4-4 [T10AA0].>
51	Valve relay ON failure	Valve relay ON failure	<Ref. to 4-4 [T10AB0].>
52	Open circuit in motor relay circuit	Open circuit in motor relay circuit	<Ref. to 4-4 [T10AC0].>

Code	Display screen	Contents of diagnosis	Ref. to
52	Motor relay ON failure	Motor relay ON failure	<Ref. to 4-4 [T10AD0].>
52	Motor malfunction	Motor malfunction	<Ref. to 4-4 [T10AE0].>
54	Stop light switch signal circuit malfunction	Stop light switch signal circuit malfunction	<Ref. to 4-4 [T10AF0].>
56	Open or short circuit in G sensor circuit	Open or short circuit in G sensor circuit	<Ref. to 4-4 [T10AG0].>
56	Battery short in G sensor circuit	Battery short in G sensor circuit	<Ref. to 4-4 [T10AH0].>
56	Abnormal G sensor high μ output	Abnormal G sensor high μ output	<Ref. to 4-4 [T10AI0].>
56	Detection of G sensor stick	Detection of G sensor stick	<Ref. to 4-4 [T10AJ0].>

NOTE:

High μ means high friction coefficient against road surface.

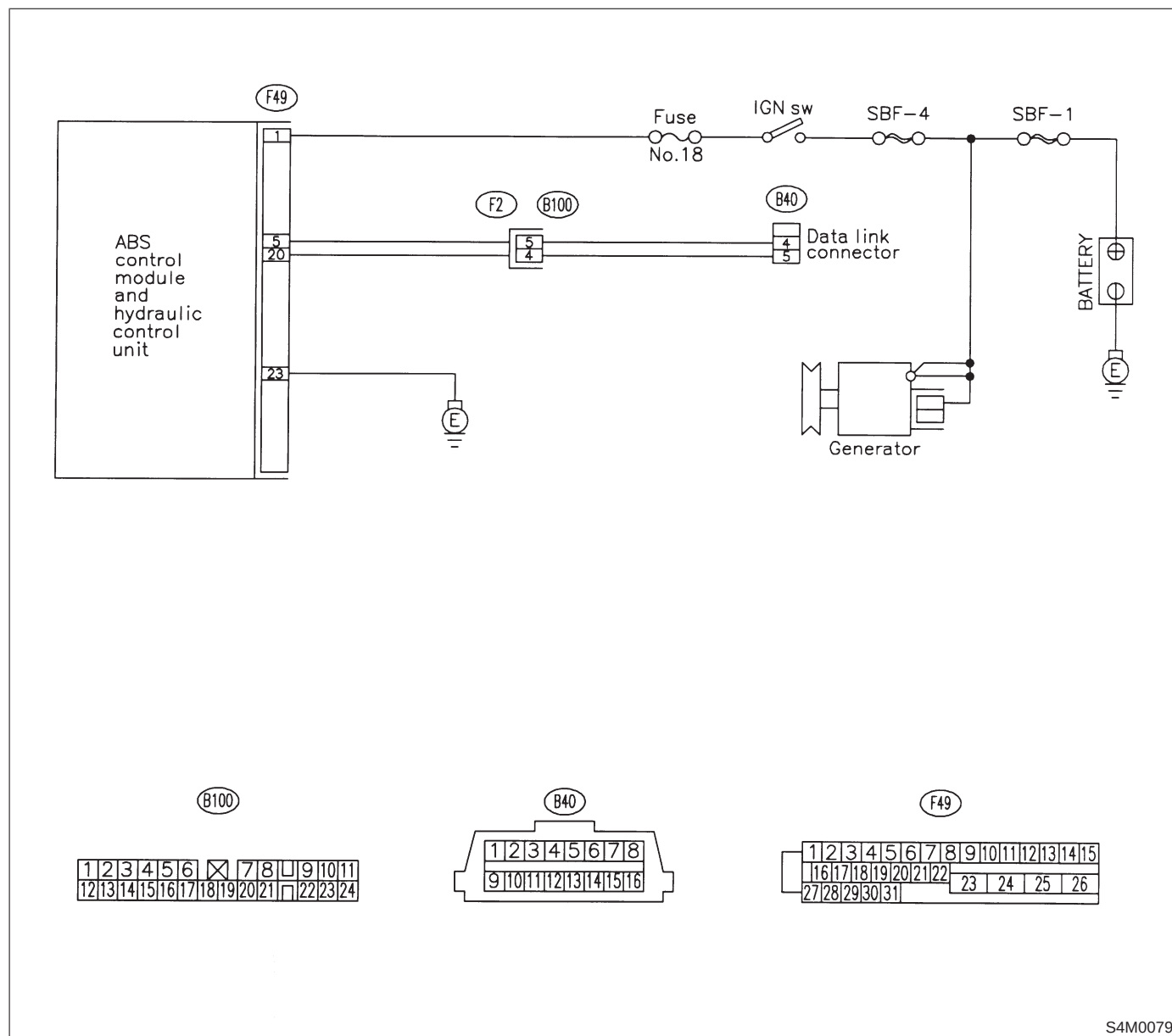
MEMO:

C: COMMUNICATION FOR INITIALIZING IMPOSSIBLE**— SELECT MONITOR COMMUNICATION FAILURE —****DIAGNOSIS:**

- Faulty harness connector

TROUBLE SYMPTOM:

- ABS warning light remains on.

WIRING DIAGRAM:

S4M0079

10C1 : CHECK IGNITION SWITCH.

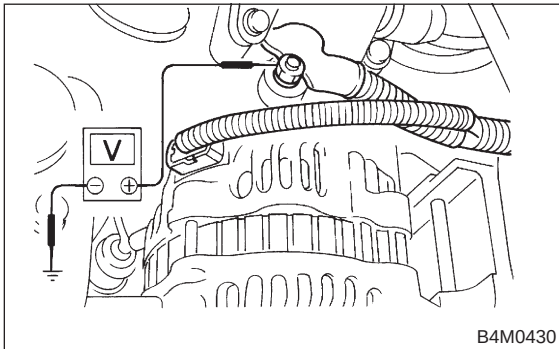
- CHECK** : *Is ignition switch ON?*
- YES** : Go to step **10C2**.
- NO** : Turn ignition switch ON, and select ABS/TCS mode using the select monitor.

10C2 : CHECK GENERATOR.

- 1) Start the engine.
- 2) Idle the engine.
- 3) Measure voltage between generator and chassis ground.

Terminal

Generator B terminal (+) — Chassis ground (-):



- CHECK** : *Is the voltage between 10 and 15 V?*
- YES** : Go to step **10C3**.
- NO** : Repair generator.

10C3 : CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

- CHECK** : *Is there poor contact at battery terminal?*
- YES** : Repair battery terminal.
- NO** : Go to step **10C4**.

10C4 : CHECK COMMUNICATION OF SELECT MONITOR.

Using the select monitor, check whether communication to other system (such as engine, AT, etc.) can be executed normally.

- CHECK** : *Are the name and year of the system displayed on the select monitor?*
- YES** : Go to step **10C5**.
- NO** : Repair select monitor communication cable and connector.

10C5 : CHECK INSTALLATION OF ABSCM&H/U CONNECTOR.

Turn ignition switch to OFF.

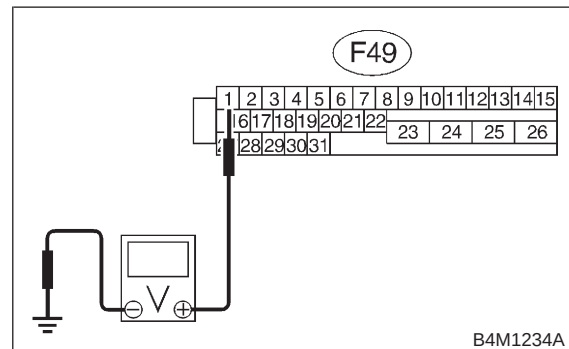
- CHECK** : *Is ABSCM&H/U connector inserted into ABSCM&H/U until the clamp locks onto it?*
- YES** : Go to step **10C6**.
- NO** : Insert ABSCM&H/U connector into ABSCM&H/U until the clamp locks onto it.

10C6 : CHECK POWER SUPPLY OF ABSCM&H/U.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Start engine.
- 3) Idle the engine.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



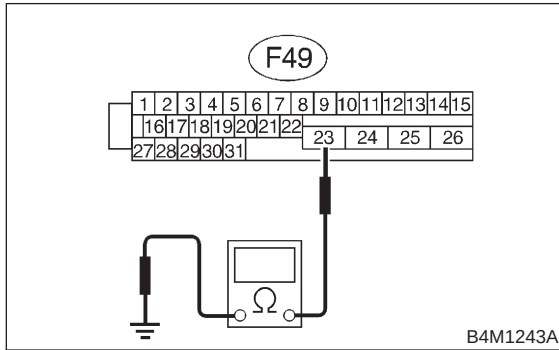
- CHECK** : *Is the voltage between 10 and 15 V?*
- YES** : Go to step **10C7**.
- NO** : Repair ABSCM&H/U power supply circuit.

10C7 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Repair harness/connector between ABSCM&H/U and select monitor.
- NO** : Go to step 10C8.

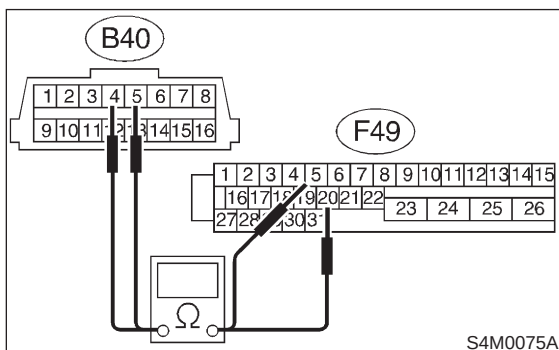
10C8 : CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND DATA LINK CONNECTOR.

- 1) Turn ignition switch OFF.
- 2) Measure resistance between ABSCM&H/U connector and data link connector.

Connector & terminal

(F49) No. 20 — (B40) No. 5:

(F49) No. 5 — (B40) No. 4:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Repair harness and connector between ABSCM&H/U and data link connector.
- NO** : Go to step 10C9.

10C9 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : Is there poor contact in connectors between ABSCM&H/U and data link connector? <Ref. to FOREWORD [T3C1].>

- YES** : Repair connector.
- NO** : Replace ABSCM&H/U.

MEMO:

D: NO TROUBLE CODE

— ALTHOUGH NO TROUBLE CODE APPEARS ON THE SELECT MONITOR DISPLAY, THE ABS WARNING LIGHT REMAINS ON. —

DIAGNOSIS:

- ABS warning light circuit is shorted.

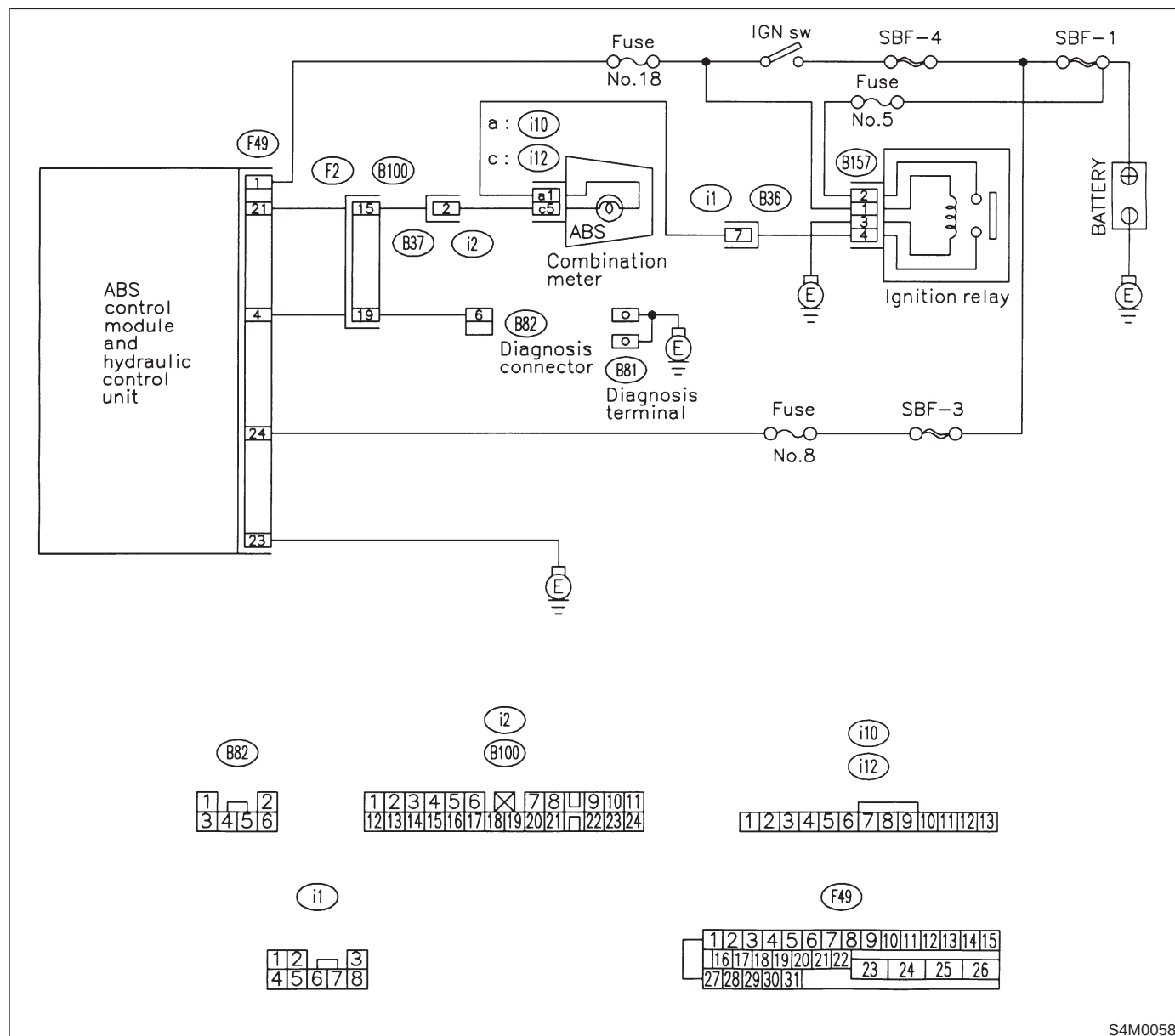
TROUBLE SYMPTOM:

- ABS warning light remains on.
- NO TROUBLE CODE displayed on the select monitor.

NOTE:

When the ABS warning light is OFF and "NO TROUBLE CODE" is displayed on the select monitor, the system is in normal condition.

WIRING DIAGRAM:



S4M0058

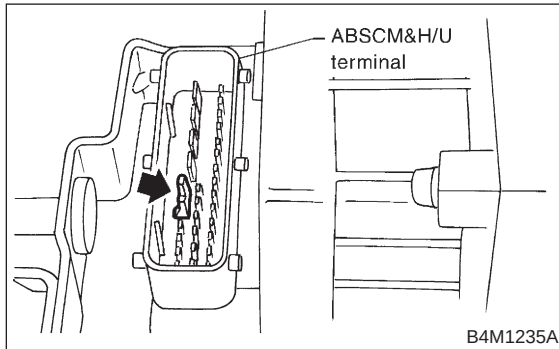
10D1 : CHECK WIRING HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (F2) from connector (B100).
- 3) Turn ignition switch to ON.

- CHECK** : *Does the ABS warning light remain off?*
- YES** : Go to step **10D2**.
- NO** : Repair front wiring harness.

10D2 : CHECK PROJECTION AT ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Check for broken projection at the ABSCM&H/U terminal.



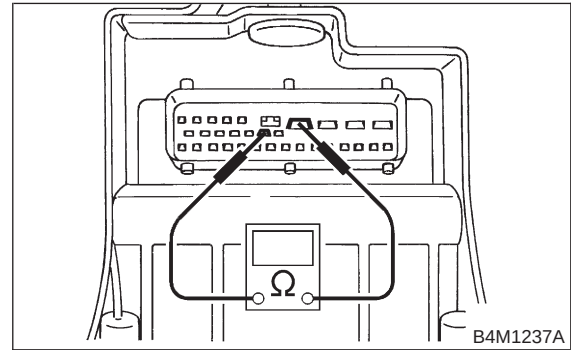
- CHECK** : *Are the projection broken?*
- YES** : Go to step **10D3**.
- NO** : Replace ABSCM&H/U.

10D3 : CHECK ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals

No. 21 — No. 23:



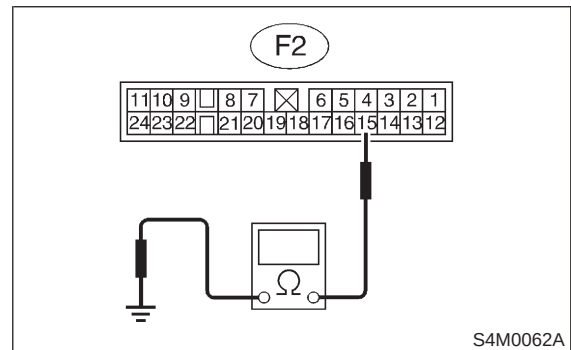
- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **10D4**.
- NO** : Replace valve relay.

10D4 : CHECK WIRING HARNESS.

Measure resistance between connector (F2) and chassis ground.

Connector & terminal

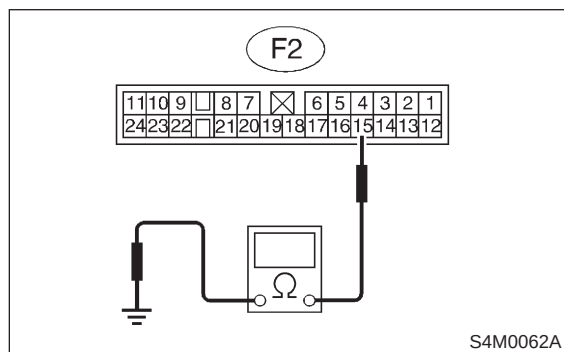
(F2) No. 15 — Chassis ground:



- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step **10D5**.
- NO** : Repair harness.

10D5 : CHECK WIRING HARNESS.

- 1) Connect connector to ABSCM&H/U.
- 2) Measure resistance between connector (F2) and chassis ground.

Connector & terminal**(F2) No. 15 — Chassis ground:****CHECK** : *Is the resistance more than 1 MΩ?***YES** : Go to step **10D6**.**NO** : Repair harness.**10D6 : CHECK POOR CONTACT IN ABSCM&H/U CONNECTOR.****CHECK** : *Is there poor contact in ABSCM&H/U connector? <Ref. to FOREWORD [T3C1].>***YES** : Repair connector.**NO** : Replace ABSCM&H/U.

MEMO:

E: TROUBLE CODE 21 OPEN OR SHORT CIRCUIT IN FRONT RIGHT ABS SENSOR CIRCUIT

F: TROUBLE CODE 23 OPEN OR SHORT CIRCUIT IN FRONT LEFT ABS SENSOR CIRCUIT

G: TROUBLE CODE 25 OPEN OR SHORT CIRCUIT IN REAR RIGHT ABS SENSOR CIRCUIT

H: TROUBLE CODE 27 OPEN OR SHORT CIRCUIT IN REAR LEFT ABS SENSOR CIRCUIT

— ABNORMAL ABS SENSOR (OPEN OR SHORT CIRCUIT IN ABS SENSOR CIRCUIT) —

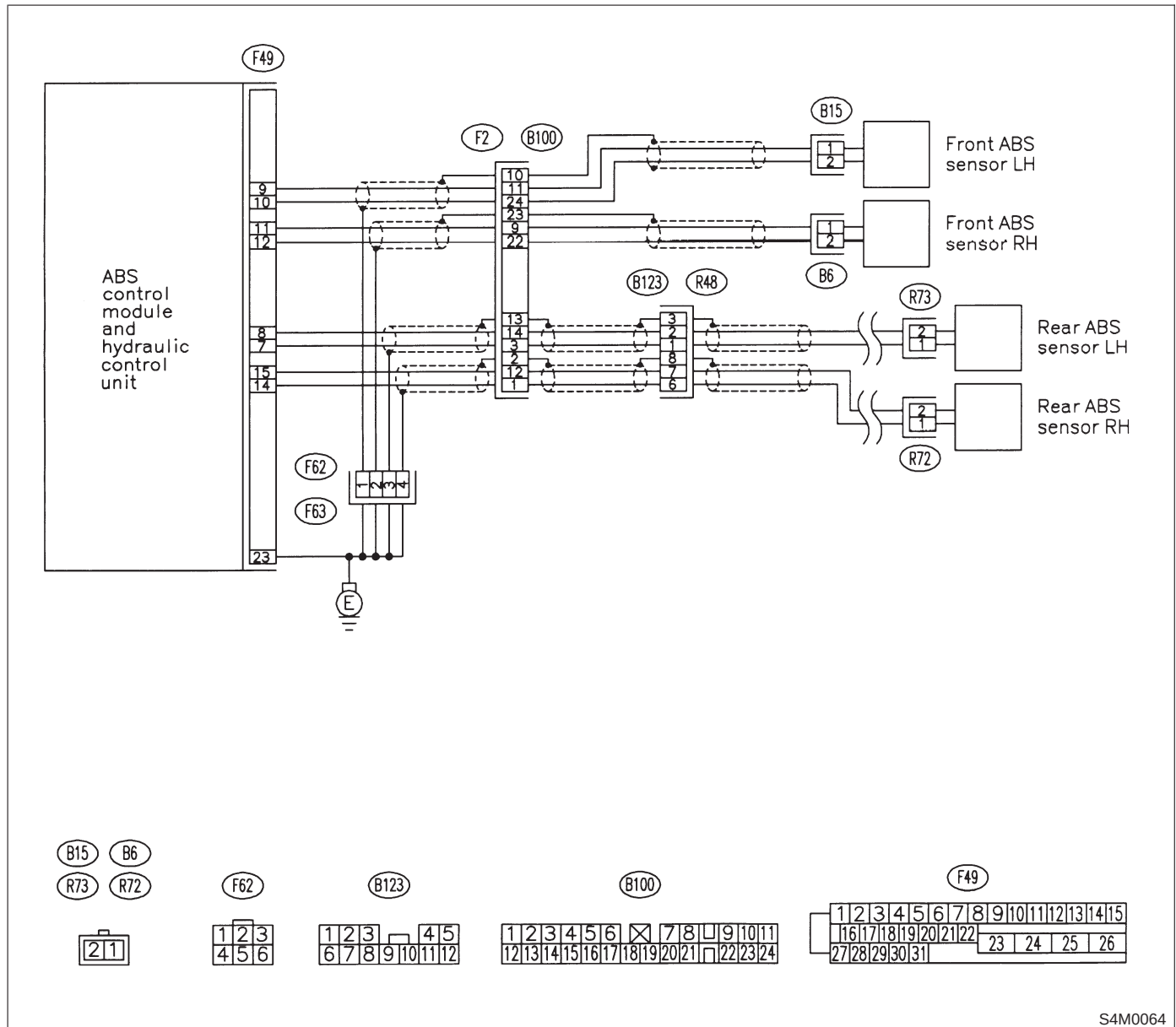
DIAGNOSIS:

- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0064

10H1 : CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

1) Select "Current data display & Save" on the select monitor.

2) Read the ABS sensor output corresponding to the faulty system in the select monitor data display mode.

CHECK : *Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?*

YES : Go to step 10H2.

NO : Go to step 10H9.

10H2 : CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK : *Are the ABS sensor installation bolts tightened securely?*

YES : Go to step 10H3.

NO : Tighten ABS sensor installation bolts securely.

10H3 : CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:

13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

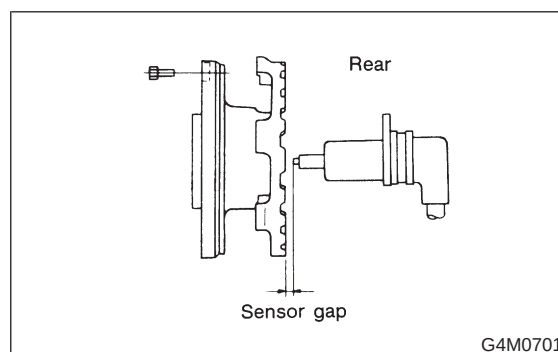
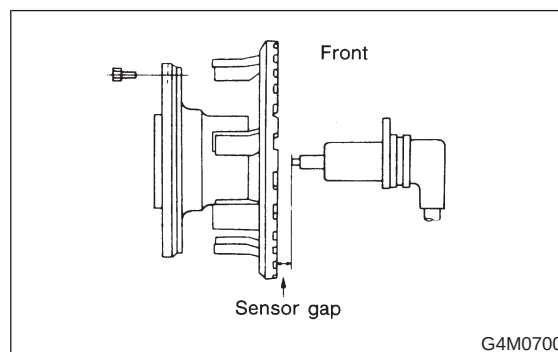
CHECK : *Are the tone wheel installation bolts tightened securely?*

YES : Go to step 10H4.

NO : Tighten tone wheel installation bolts securely.

10H4 : CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

CHECK : *Is the gap within the specifications?*

YES : Go to step 10H5.

NO : Adjust the gap.

NOTE:

Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10H5 : CHECK HUB RUNOUT.

Measure hub runout.

CHECK : *Is the runout less than 0.05 mm (0.0020 in)?*

YES : Go to step 10H6.

NO : Repair hub.

10H6 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step 10H7.

10H7 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step 10H8.

10H8 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:

Check harness and connectors between ABSCM&H/U and ABS sensor.

10H9 : CHECK ABS SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance of ABS sensor connector terminals.

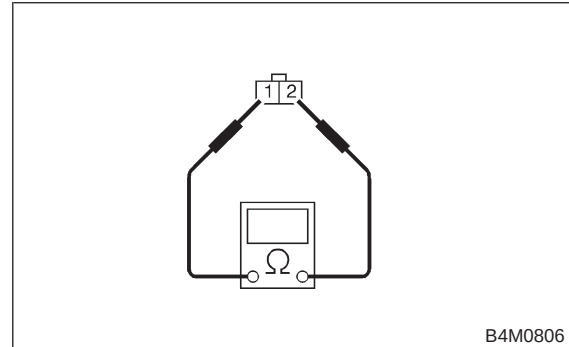
Terminal

Front RH No. 1 — No. 2:

Front LH No. 1 — No. 2:

Rear RH No. 1 — No. 2:

Rear LH No. 1 — No. 2:



CHECK : *Is the resistance between 0.8 and 1.2 kΩ?*

YES : Go to step 10H10.

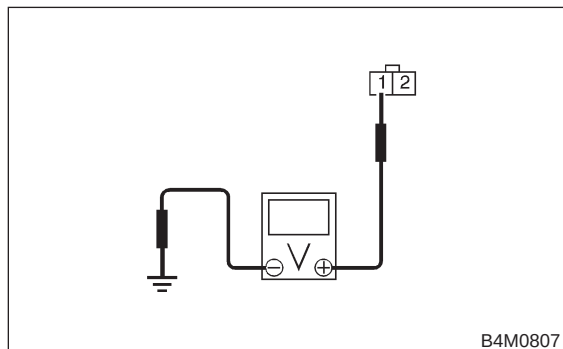
NO : Replace ABS sensor.

10H10 : CHECK BATTERY SHORT OF ABS SENSOR.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Measure voltage between ABS sensor and chassis ground.

Terminal

Front RH No. 1 (+) — Chassis ground (-):
Front LH No. 1 (+) — Chassis ground (-):
Rear RH No. 1 (+) — Chassis ground (-):
Rear LH No. 1 (+) — Chassis ground (-):



CHECK : Is the voltage less than 1 V?

YES : Go to step 10H11.

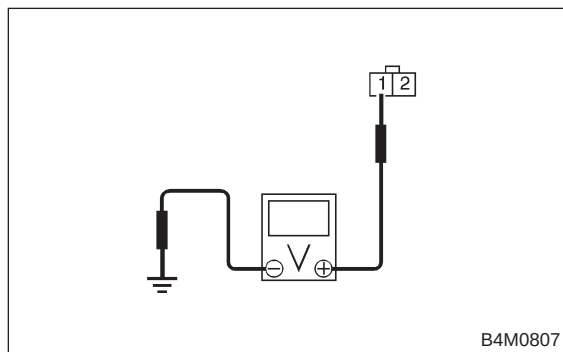
NO : Replace ABS sensor.

10H11 : CHECK BATTERY SHORT OF ABS SENSOR.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABS sensor and chassis ground.

Terminal

Front RH No. 1 (+) — Chassis ground (-):
Front LH No. 1 (+) — Chassis ground (-):
Rear RH No. 1 (+) — Chassis ground (-):
Rear LH No. 1 (+) — Chassis ground (-):



CHECK : Is the voltage less than 1 V?

YES : Go to step 10H12.

NO : Replace ABS sensor.

10H12 : CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to ABS sensor.
- 3) Measure resistance between ABSCM&H/U connector terminals.

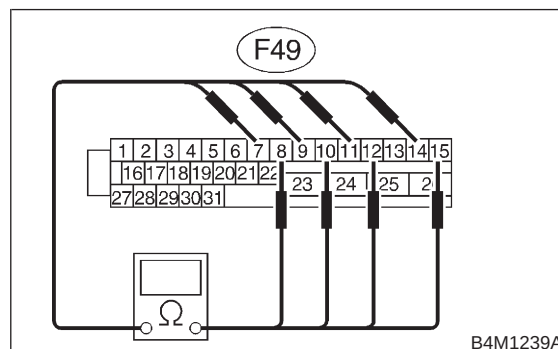
Connector & terminal

Trouble code 21 / (F49) No. 11 — No. 12:

Trouble code 23 / (F49) No. 9 — No. 10:

Trouble code 25 / (F49) No. 14 — No. 15:

Trouble code 27 / (F49) No. 7 — No. 8:



CHECK : Is the resistance between 0.8 and 1.2 kΩ?

YES : Go to step 10H13.

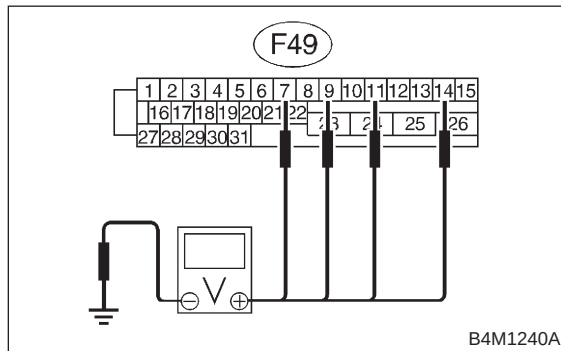
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

**10H13 : CHECK BATTERY SHORT OF HAR-
NESS.**

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

**Trouble code 21 / (F49) No. 11 (+) —
Chassis ground (-):**
**Trouble code 23 / (F49) No. 9 (+) — Chas-
sis ground (-):**
**Trouble code 25 / (F49) No. 14 (+) —
Chassis ground (-):**
**Trouble code 27 / (F49) No. 7 (+) — Chas-
sis ground (-):**



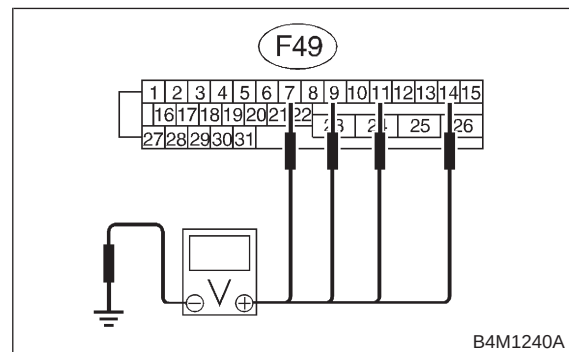
- CHECK** : **Is the voltage less than 1 V?**
YES : Go to step **10H14**.
NO : Repair harness between ABSCM&H/U and ABS sensor.

**10H14 : CHECK BATTERY SHORT OF HAR-
NESS.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

**Trouble code 21 / (F49) No. 11 (+) —
Chassis ground (-):**
**Trouble code 23 / (F49) No. 9 (+) — Chas-
sis ground (-):**
**Trouble code 25 / (F49) No. 14 (+) —
Chassis ground (-):**
**Trouble code 27 / (F49) No. 7 (+) — Chas-
sis ground (-):**



- CHECK** : **Is the voltage less than 1 V?**
YES : Go to step **10H15**.
NO : Repair harness between ABSCM&H/U and ABS sensor.

**10H15 : CHECK INSTALLATION OF ABS
SENSOR.**
Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

- CHECK** : **Are the ABS sensor installation bolts
tightened securely?**
YES : Go to step **10H16**.
NO : Tighten ABS sensor installation bolts
securely.

10H16 : CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:

$13 \pm 3 \text{ N}\cdot\text{m}$ ($1.3 \pm 0.3 \text{ kg}\cdot\text{m}$, $9 \pm 2.2 \text{ ft}\cdot\text{lb}$)

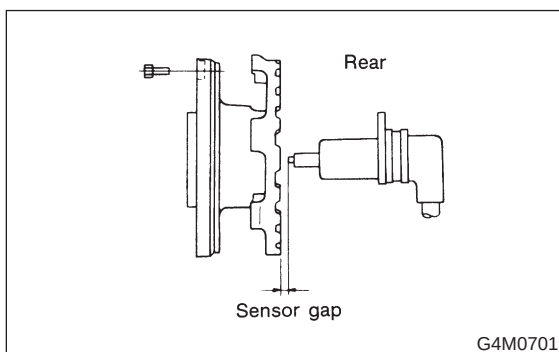
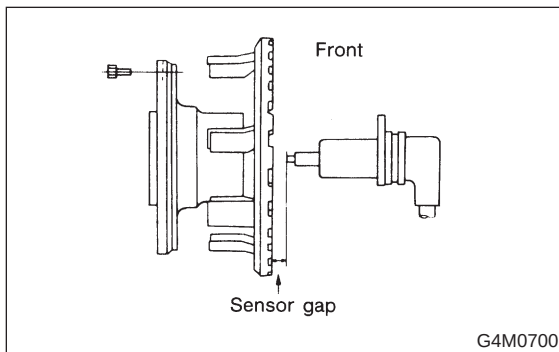
CHECK : Are the tone wheel installation bolts tightened securely?

YES : Go to step 10H17.

NO : Tighten tone wheel installation bolts securely.

10H17 : CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

CHECK : Is the gap within the specifications?

YES : Go to step 10H18.

NO : Adjust the gap.

NOTE:

Adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10H18 : CHECK HUB RUNOUT.

Measure hub runout.

CHECK : Is the runout less than 0.05 mm (0.0020 in)?

YES : Go to step 10H19.

NO : Repair hub.

10H19 : CHECK GROUND SHORT OF ABS SENSOR.

1) Turn ignition switch to ON.

2) Measure resistance between ABS sensor and chassis ground.

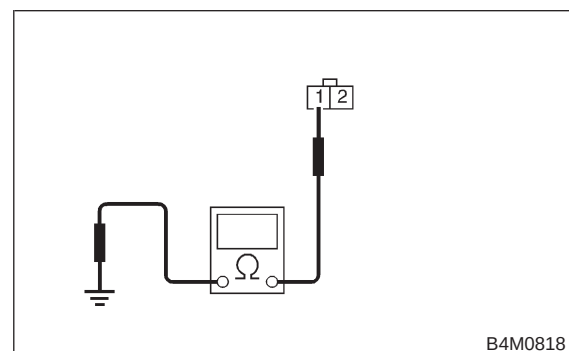
Terminal

Front RH No. 1 — Chassis ground:

Front LH No. 1 — Chassis ground:

Rear RH No. 1 — Chassis ground:

Rear LH No. 1 — Chassis ground:



CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10H20.

NO : Replace ABS sensor and ABSCM&H/U.

10H20 : CHECK GROUND SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to ABS sensor.
- 3) Measure resistance between ABSCM&H/U connector terminal and chassis ground.

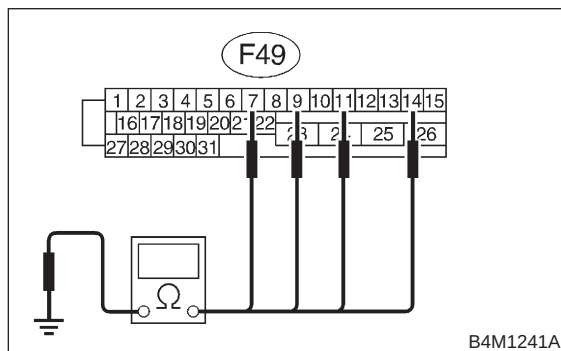
Connector & terminal

Trouble code 21 / (F49) No. 11 — Chassis ground:

Trouble code 23 / (F49) No. 9 — Chassis ground:

Trouble code 25 / (F49) No. 14 — Chassis ground:

Trouble code 27 / (F49) No. 7 — Chassis ground:



- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **10H21**.
- NO** : Repair harness between ABSCM&H/U and ABS sensor.
And replace ABSCM&H/U.

10H21 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Go to step **10H22**.

10H22 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10H23**.

10H23 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

NOTE:

Check harness and connectors between ABSCM&H/U and ABS sensor.

I: TROUBLE CODE 22 FRONT RIGHT ABS SENSOR ABNORMAL SIGNAL
 J: TROUBLE CODE 24 FRONT LEFT ABS SENSOR ABNORMAL SIGNAL
 K: TROUBLE CODE 26 REAR RIGHT ABS SENSOR ABNORMAL SIGNAL
 L: TROUBLE CODE 28 REAR LEFT ABS SENSOR ABNORMAL SIGNAL

— ABNORMAL ABS SENSOR (ABS SENSOR ABNORMAL SIGNAL) —

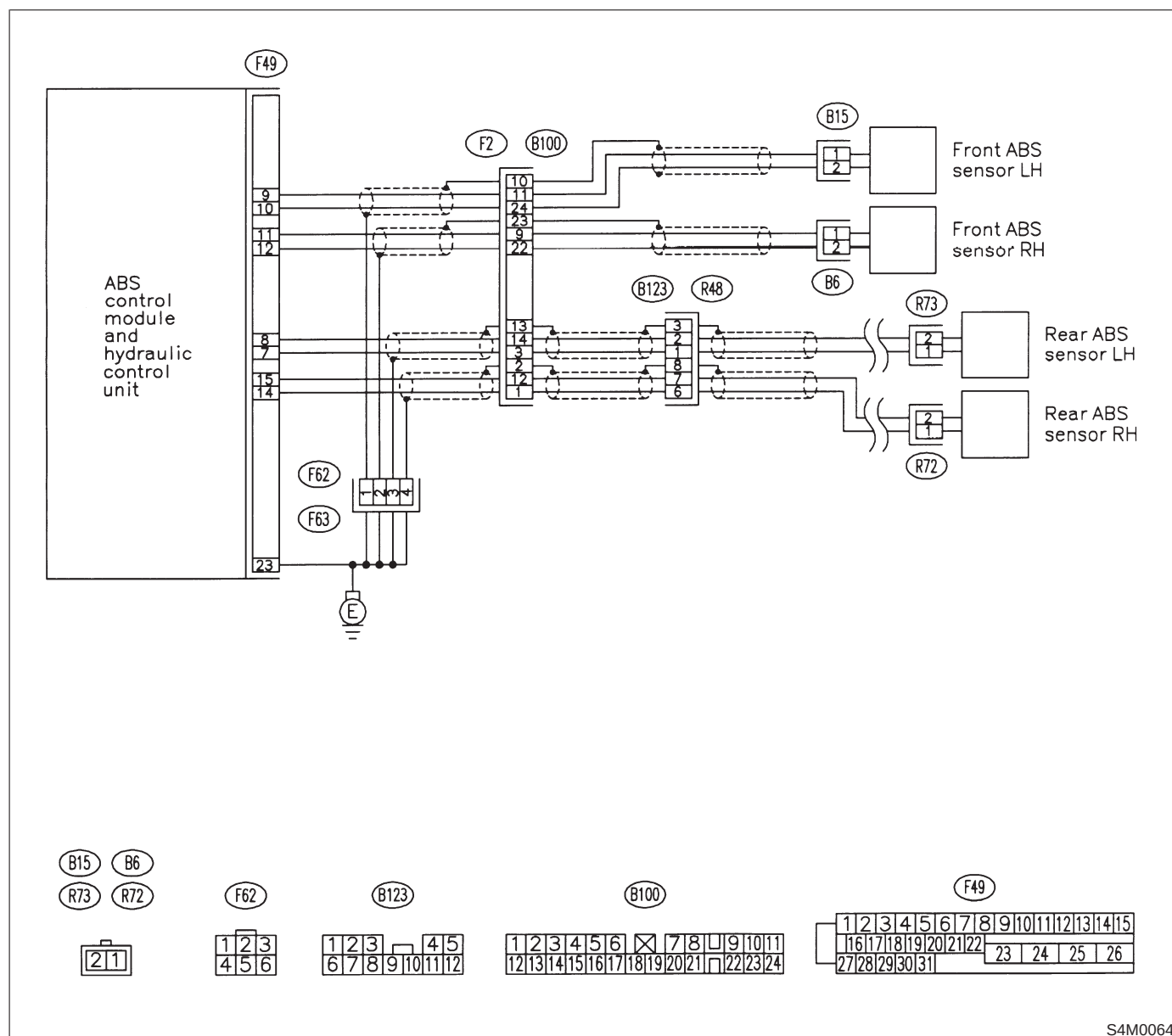
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0064

10L1 : CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.

- 1) Select "Current data display & Save" on the select monitor.
- 2) Read the ABS sensor output corresponding to the faulty system in the select monitor data display mode.

CHECK : *Does the speed indicated on the display change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position?*

YES : Go to step 10L2.

NO : Go to step 10L8.

10L2 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connectors between ABSCM&H/U and ABS sensor?*

YES : Repair connector.

NO : Go to step 10L3.

10L3 : CHECK SOURCES OF SIGNAL NOISE.

CHECK : *Is the car telephone or the wireless transmitter properly installed?*

YES : Go to step 10L4.

NO : Properly install the car telephone or the wireless transmitter.

10L4 : CHECK SOURCES OF SIGNAL NOISE.

CHECK : *Are noise sources (such as an antenna) installed near the sensor harness?*

YES : Install the noise sources apart from the sensor harness.

NO : Go to step 10L5.

10L5 : CHECK SHIELD CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Measure resistance between shield connector and chassis ground.

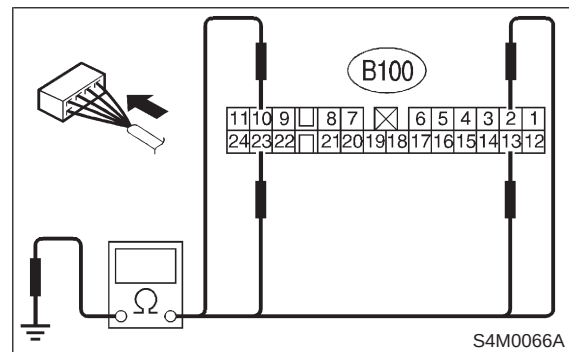
Connector & terminal

Trouble code 22 / (B100) No. 23 — Chassis ground:

Trouble code 24 / (B100) No. 10 — Chassis ground:

Trouble code 26 / (B100) No. 2 — Chassis ground:

Trouble code 28 / (B100) No. 13 — Chassis ground:



CHECK : *Is the resistance less than 0.5 Ω?*

YES : Go to step 10L6.

NO : Repair shield harness.

10L6 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step 10L7.

10L7 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary noise interference.

10L8 : CHECK INSTALLATION OF ABS SENSOR.
Tightening torque:
 $32 \pm 10 \text{ N}\cdot\text{m}$ ($3.3 \pm 1.0 \text{ kg}\cdot\text{m}$, $24 \pm 7 \text{ ft}\cdot\text{lb}$)

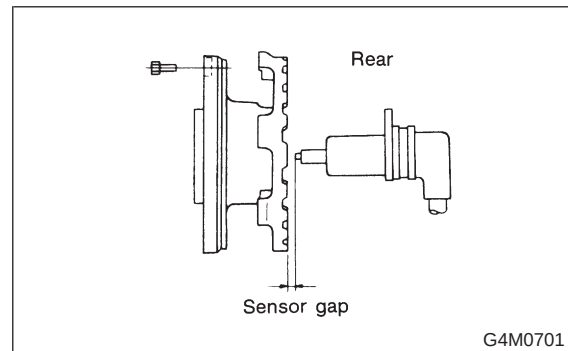
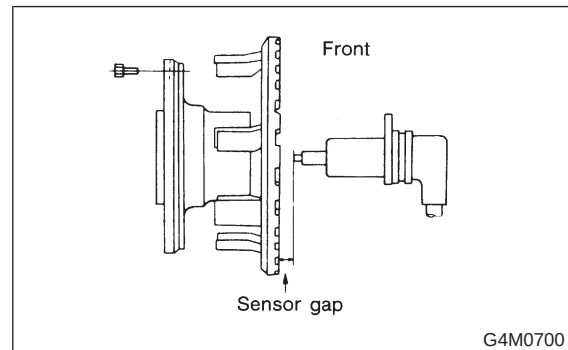
- CHECK** : Are the ABS sensor installation bolts tightened securely?
- YES** : Go to step **10L9**.
- NO** : Tighten ABS sensor installation bolts securely.

10L9 : CHECK INSTALLATION OF TONE WHEEL.
Tightening torque:
 $13 \pm 3 \text{ N}\cdot\text{m}$ ($1.3 \pm 0.3 \text{ kg}\cdot\text{m}$, $9 \pm 2.2 \text{ ft}\cdot\text{lb}$)

- CHECK** : Are the tone wheel installation bolts tightened securely?
- YES** : Go to step **10L10**.
- NO** : Tighten tone wheel installation bolts securely.

10L10 : CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

- CHECK** : Is the gap within the specifications?
- YES** : Go to step **10L11**.
- NO** : Adjust the gap.

NOTE:

Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10L11 : CHECK OSCILLOSCOPE.

- CHECK** : Is an oscilloscope available?
- YES** : Go to step **10L12**.
- NO** : Go to step **10L13**.

10L12 : CHECK ABS SENSOR SIGNAL.

- 1) Raise all four wheels of ground.
- 2) Turn ignition switch OFF.
- 3) Connect the oscilloscope to the connector (B100) in accordance with trouble code.
- 4) Turn ignition switch ON.
- 5) Rotate wheels and measure voltage at specified frequency.

NOTE:

When this inspection is completed, the ABSCM&H/U sometimes stores the trouble code 29.

Connector & terminal

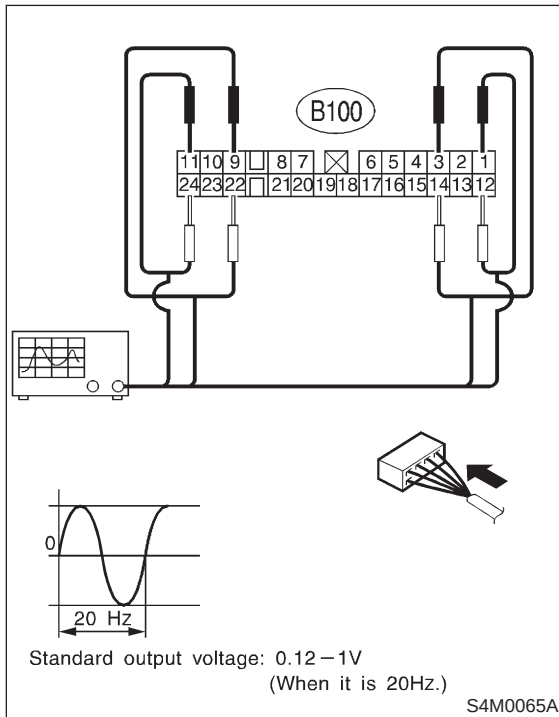
Trouble code 22 / (B100) No. 9 (+) — No. 22 (-):

Trouble code 24 / (B100) No. 11 (+) — No. 24 (-):

Trouble code 26 / (B100) No. 1 (+) — No. 12 (-):

Trouble code 28 / (B100) No. 3 (+) — No. 14 (-):

Specified voltage: 0.12 — 1 V (When it is 20 Hz.)



CHECK : *Is oscilloscope pattern smooth, as shown in figure?*

YES : Go to step **10L16**.

NO : Go to step **10L13**.

10L13 : CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor or drum from hub in accordance with trouble code.

CHECK : *Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?*

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step **10L14**.

10L14 : CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : *Are there broken or damaged in the ABS sensor pole piece or the tone wheel?*

YES : Replace ABS sensor or tone wheel.

NO : Go to step **10L15**.

10L15 : CHECK HUB RUNOUT.

Measure hub runout.

CHECK : *Is the runout less than 0.05 mm (0.0020 in)?*

YES : Go to step **10L16**.

NO : Repair hub.

10L16 : CHECK RESISTANCE OF ABS SENSOR.

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminals.

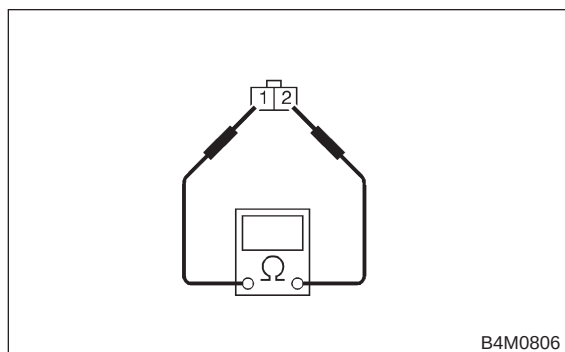
Terminal

Front RH No. 1 — No. 2:

Front LH No. 1 — No. 2:

Rear RH No. 1 — No. 2:

Rear LH No. 1 — No. 2:



CHECK : **Is the resistance between 0.8 and 1.2 kΩ?**

YES : Go to step **10L17**.

NO : Replace ABS sensor.

10L17 : CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

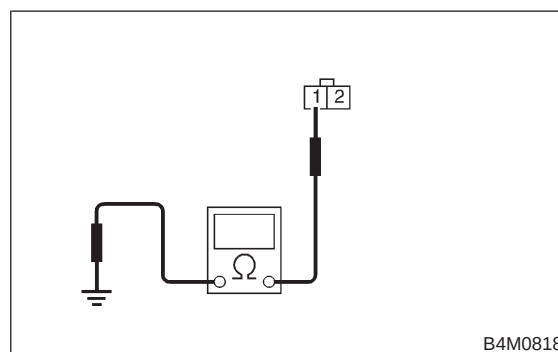
Terminal

Front RH No. 1 — Chassis ground:

Front LH No. 1 — Chassis ground:

Rear RH No. 1 — Chassis ground:

Rear LH No. 1 — Chassis ground:



CHECK : **Is the resistance more than 1 MΩ?**

YES : Go to step **10L18**.

NO : Replace ABS sensor.

10L18 : CHECK HARNESS/CONNECTOR BETWEEN ABSCM&H/U AND ABS SENSOR.

- 1) Connect connector to ABS sensor.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance at ABSCM&H/U connector terminals.

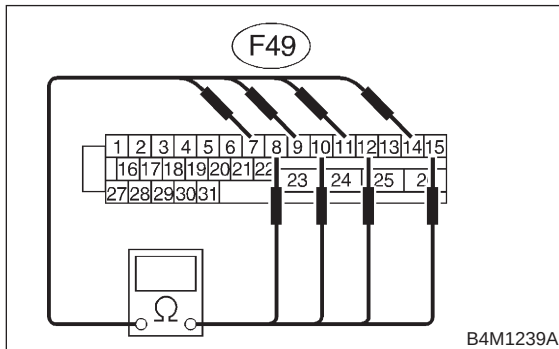
Connector & terminal

Trouble code 22 / (F49) No. 11 — No. 12:

Trouble code 24 / (F49) No. 9 — No. 10:

Trouble code 26 / (F49) No. 14 — No. 15:

Trouble code 28 / (F49) No. 7 — No. 8:



CHECK : Is the resistance between 0.8 and 1.2 kΩ?

YES : Go to step 10L19.

NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

10L19 : CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM&H/U connector and chassis ground.

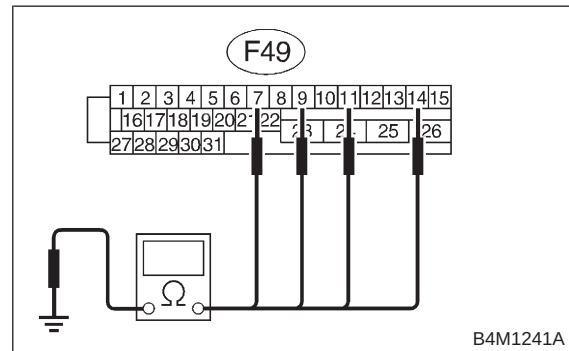
Connector & terminal

Trouble code 22 / (F49) No. 11 — Chassis ground:

Trouble code 24 / (F49) No. 9 — Chassis ground:

Trouble code 26 / (F49) No. 14 — Chassis ground:

Trouble code 28 / (F49) No. 7 — Chassis ground:



CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10L20.

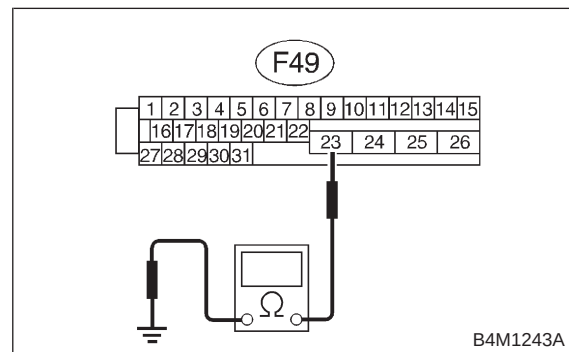
NO : Repair harness/connector between ABSCM&H/U and ABS sensor.

10L20 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal

(F49) No. 23 — GND:



CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 10L21.

NO : Repair ABSCM&H/U ground harness.

10L21 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connectors between ABSCM&H/U and ABS sensor? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Go to step 10L22.

10L22 : CHECK SOURCES OF SIGNAL NOISE.

- CHECK** : *Is the car telephone or the wireless transmitter properly installed?*
- YES** : Go to step 10L23.
- NO** : Properly install the car telephone or the wireless transmitter.

10L23 : CHECK SOURCES OF SIGNAL NOISE.

- CHECK** : *Are noise sources (such as an antenna) installed near the sensor harness?*
- YES** : Install the noise sources apart from the sensor harness.
- NO** : Go to step 10L24.

10L24 : CHECK SHIELD CIRCUIT.

- 1) Connect all connectors.
- 2) Measure resistance between shield connector and chassis ground.

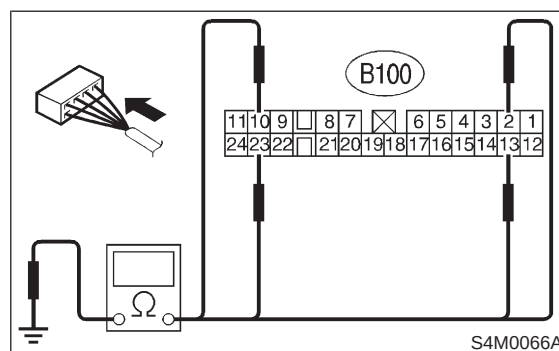
Connector & terminal

Trouble code 22 / (B100) No. 23 — Chassis ground:

Trouble code 24 / (B100) No. 10 — Chassis ground:

Trouble code 26 / (B100) No. 2 — Chassis ground:

Trouble code 28 / (B100) No. 13 — Chassis ground:



- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step 10L25.
- NO** : Repair shield harness.

10L25 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
 - 2) Erase the memory.
 - 3) Perform inspection mode.
 - 4) Read out the trouble code.
- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step 10L26.

10L26 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary noise interference.

MEMO:

M: TROUBLE CODE 29 ABNORMAL ABS SENSOR SIGNAL ON ANY ONE OF FOUR SENSOR

— ABNORMAL ABS SENSOR SIGNAL ON ANY ONE OF FOUR —

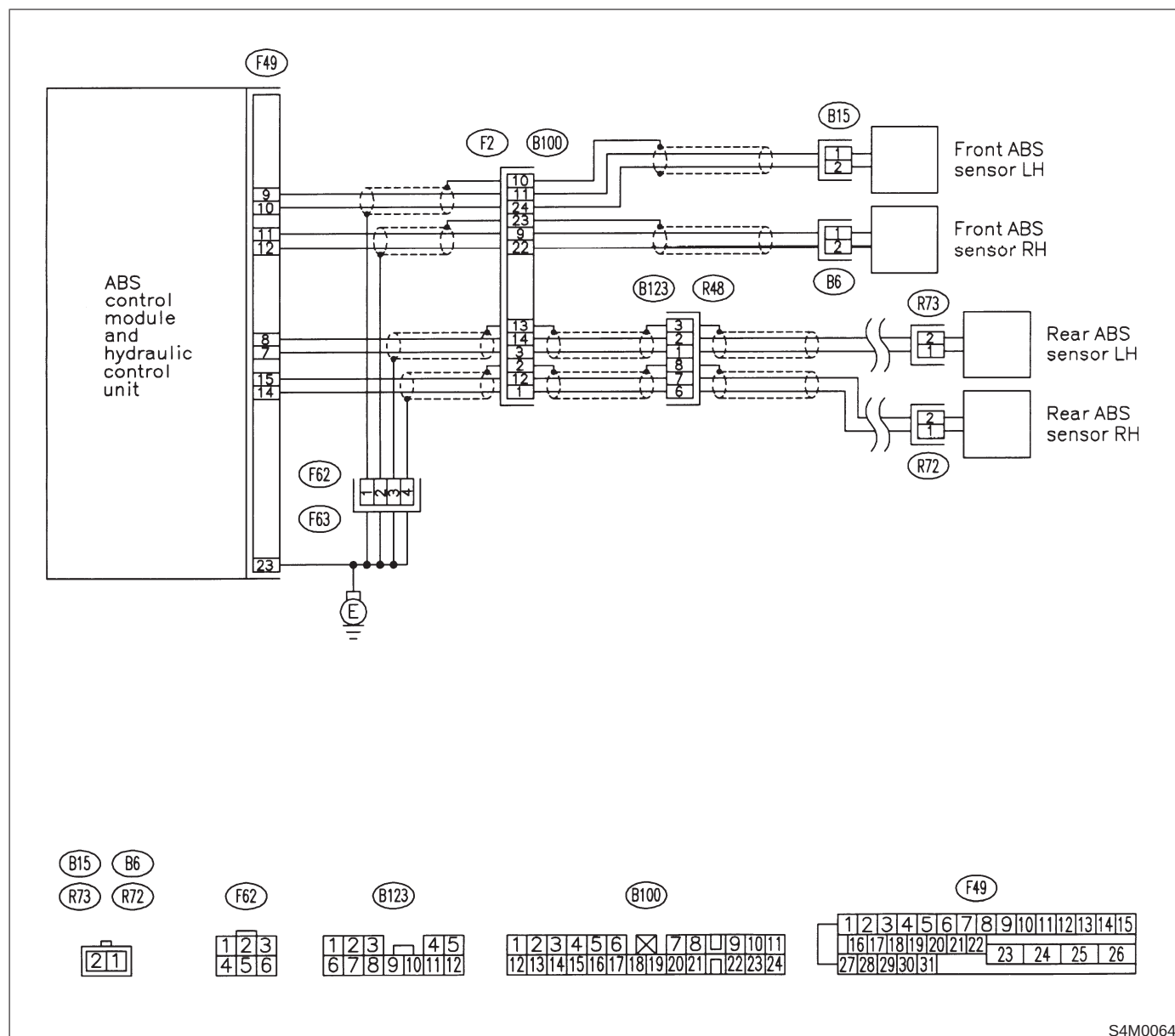
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0064

10M1 : CHECK IF THE WHEELS HAVE TURNED FREELY FOR A LONG TIME.

CHECK : Check if the wheels have been turned freely for more than one minute, such as when the vehicle is jacked-up, under full-lock cornering or when tire is not in contact with road surface.

YES : The ABS is normal. Erase the trouble code.

NOTE:

When the wheels turn freely for a long time, such as when the vehicle is towed or jacked-up, or when steering wheel is continuously turned all the way, this trouble code may sometimes occur.

NO : Go to step **10M2**.

10M2 : CHECK TIRE SPECIFICATIONS.

Turn ignition switch to OFF.

CHECK : Are the tire specifications correct?

YES : Go to step **10M3**.

NO : Replace tire.

10M3 : CHECK WEAR OF TIRE.

CHECK : Is the tire worn excessively?

YES : Replace tire.

NO : Go to step **10M4**.

10M4 : CHECK TIRE PRESSURE.

CHECK : Is the tire pressure correct?

YES : Go to step **10M5**.

NO : Adjust tire pressure.

10M5 : CHECK INSTALLATION OF ABS SENSOR.

Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK : Are the ABS sensor installation bolts tightened securely?

YES : Go to step **10M6**.

NO : Tighten ABS sensor installation bolts securely.

10M6 : CHECK INSTALLATION OF TONE WHEEL.

Tightening torque:

13±3 N·m (1.3±0.3 kg-m, 9±2.2 ft-lb)

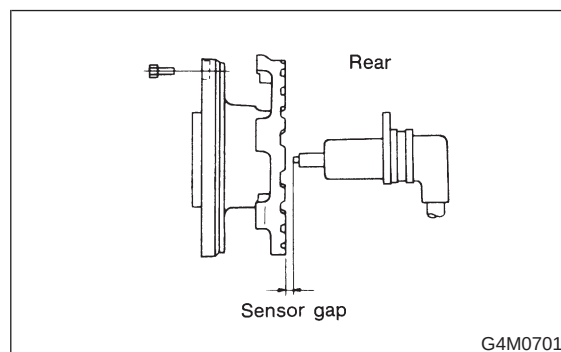
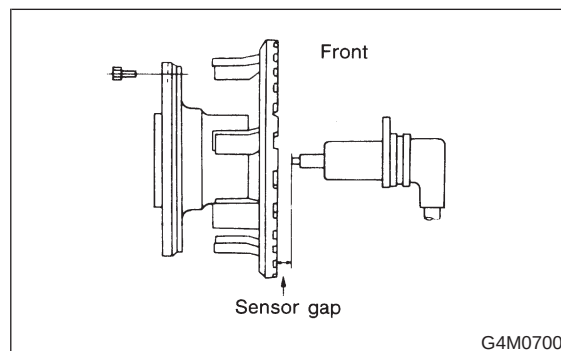
CHECK : Are the tone wheel installation bolts tightened securely?

YES : Go to step **10M7**.

NO : Tighten tone wheel installation bolts securely.

10M7 : CHECK ABS SENSOR GAP.

Measure tone wheel to pole piece gap over entire perimeter of the wheel.



	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

CHECK : Is the gap within the specifications?

YES : Go to step **10M8**.

NO : Adjust the gap.

NOTE:

Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

10M8 : CHECK OSCILLOSCOPE.

CHECK : *Is an oscilloscope available?*

YES : Go to step 10M9.

NO : Go to step 10M10.

10M9 : CHECK ABS SENSOR SIGNAL.

- 1) Raise all four wheels of ground.
- 2) Turn ignition switch OFF.
- 3) Connect the oscilloscope to the connector (B100) in accordance with trouble code.
- 4) Turn ignition switch ON.
- 5) Rotate wheels and measure voltage at specified frequency.

NOTE:

When this inspection is completed, the ABSCM&H/U sometimes stores the trouble code 29.

Connector & terminal

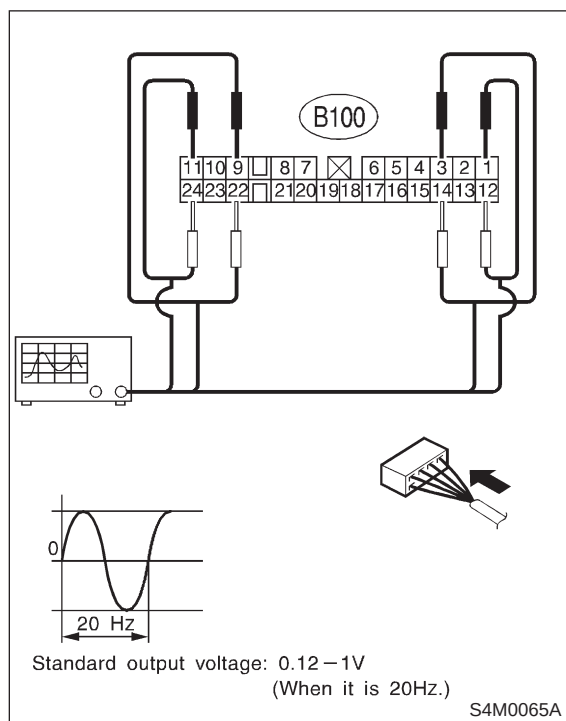
(B100) No. 9 (+) — No. 22 (–) (Front RH):

(B100) No. 11 (+) — No. 24 (–) (Front LH):

(B100) No. 1 (+) — No. 12 (–) (Rear RH):

(B100) No. 3 (+) — No. 14 (–) (Rear LH):

Specified voltage: 0.12 — 1 V (When it is 20 Hz.)



CHECK : *Is oscilloscope pattern smooth, as shown in figure?*

YES : Go to step 10M13.

NO : Go to step 10M10.

10M10 : CHECK CONTAMINATION OF ABS SENSOR OR TONE WHEEL.

Remove disc rotor from hub.

CHECK : *Is the ABS sensor pole piece or the tone wheel contaminated by dirt or other foreign matter?*

YES : Thoroughly remove dirt or other foreign matter.

NO : Go to step 10M11.

10M11 : CHECK DAMAGE OF ABS SENSOR OR TONE WHEEL.

CHECK : *Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?*

YES : Replace ABS sensor or tone wheel.

NO : Go to step 10M12.

10M12 : CHECK HUB RUNOUT.

Measure hub runout.

CHECK : *Is the runout less than 0.05 mm (0.0020 in)?*

YES : Go to step 10M13.

NO : Repair hub.

10M13 : CHECK ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Erase the memory.
- 4) Perform inspection mode.
- 5) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step 10M14.

10M14 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

N: TROUBLE CODE 31 FRONT RIGHT INLET VALVE MALFUNCTION

O: TROUBLE CODE 33 FRONT LEFT INLET VALVE MALFUNCTION

P: TROUBLE CODE 35 REAR RIGHT INLET VALVE MALFUNCTION

Q: TROUBLE CODE 37 REAR LEFT INLET VALVE MALFUNCTION

— INLET SOLENOID VALVE MALFUNCTION —

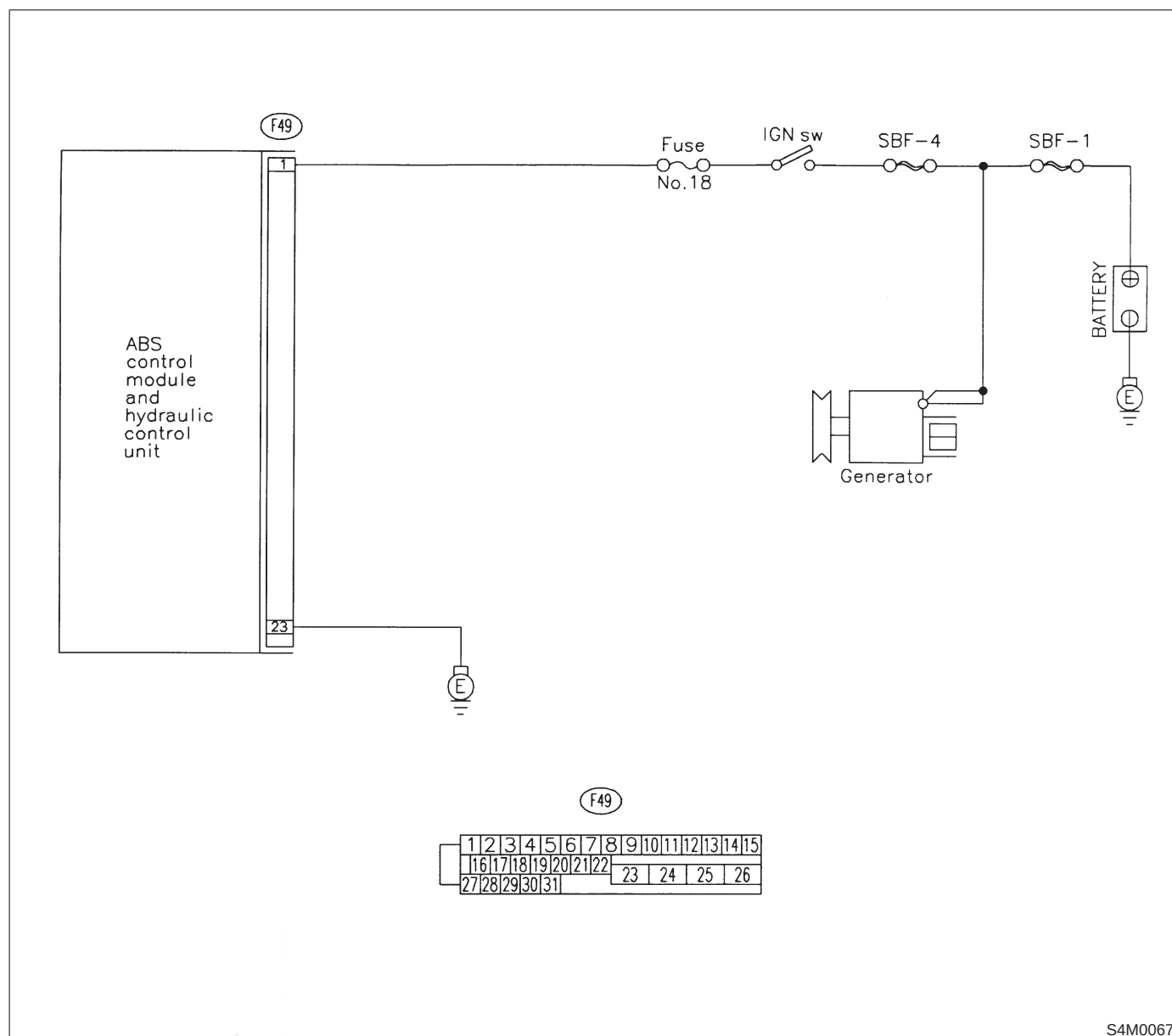
DIAGNOSIS:

- Faulty harness/connector
- Faulty inlet solenoid valve

TROUBLE SYMPTOM:

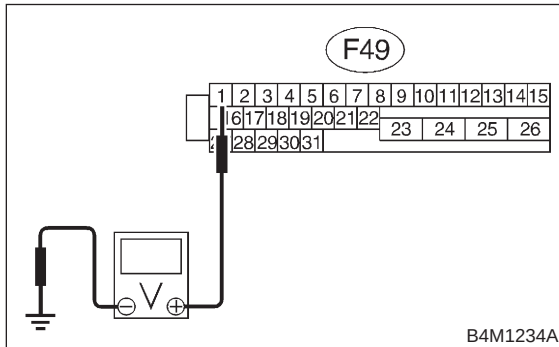
- ABS does not operate.

WIRING DIAGRAM:



10Q1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

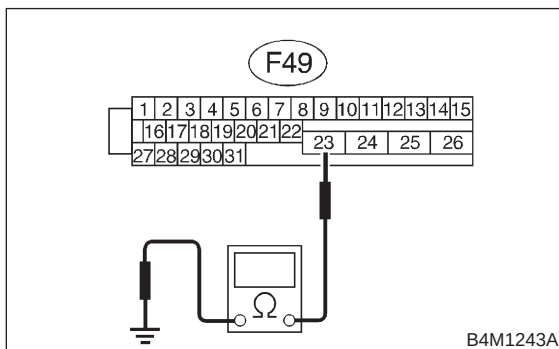
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Run the engine at idle.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 1 (+) — Chassis ground (-):**

- (CHECK)** : *Is the voltage between 10 V and 15 V?*
- (YES)** : Go to step **10Q2**.
- (NO)** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

10Q2 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 23 — Chassis ground:**

- (CHECK)** : *Is the resistance less than 0.5 Ω?*
- (YES)** : Go to step **10Q3**.
- (NO)** : Repair ABSCM&H/U ground harness.

10Q3 : CHECK POOR CONTACT IN CONNECTORS.

(CHECK) : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

- (YES)** : Repair connector.
- (NO)** : Go to step **10Q4**.

10Q4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

(CHECK) : *Is the same trouble code as in the current diagnosis still being output?*

- (YES)** : Replace ABSCM&H/U.
- (NO)** : Go to step **10Q5**.

10Q5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

(CHECK) : *Are other trouble codes being output?*

- (YES)** : Proceed with the diagnosis corresponding to the trouble code.
- (NO)** : A temporary poor contact.

R: TROUBLE CODE 32 FRONT RIGHT OUTLET VALVE MALFUNCTION

S: TROUBLE CODE 34 FRONT LEFT OUTLET VALVE MALFUNCTION

T: TROUBLE CODE 36 REAR RIGHT OUTLET VALVE MALFUNCTION

U: TROUBLE CODE 38 REAR LEFT OUTLET VALVE MALFUNCTION

— OUTLET SOLENOID VALVE MALFUNCTION —

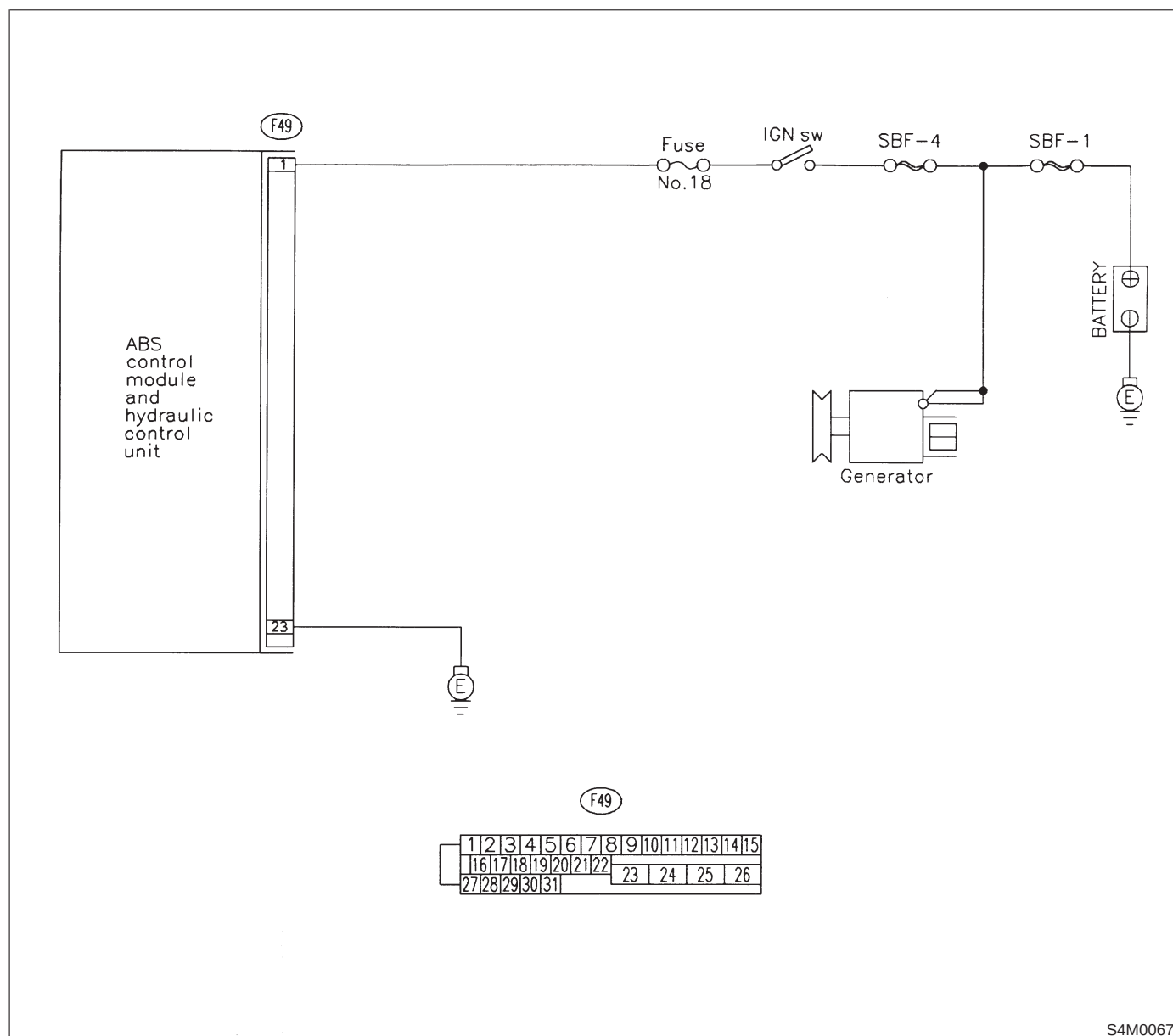
DIAGNOSIS:

- Faulty harness/connector
- Faulty outlet solenoid valve

TROUBLE SYMPTOM:

- ABS does not operate.

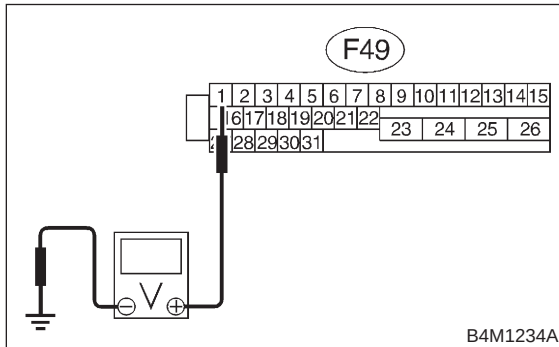
WIRING DIAGRAM:



S4M0067

10U1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

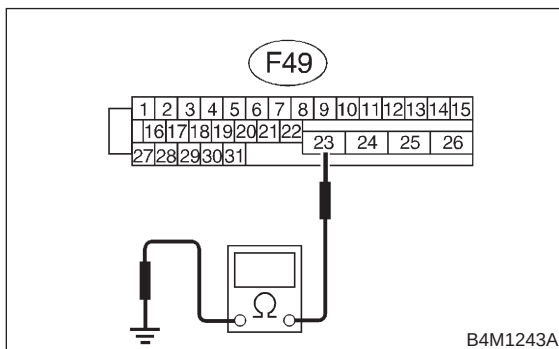
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Run the engine at idle.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 1 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage between 10 V and 15 V?*
- YES** : Go to step **10U2**.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

10U2 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 23 — Chassis ground:**

- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step **10U3**.
- NO** : Repair ABSCM&H/U ground harness.

10U3 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

- YES** : Repair connector.
- NO** : Go to step **10U4**.

10U4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10U5**.

10U5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

V: TROUBLE CODE 41 ABS CONTROL MODULE MALFUNCTION

— ABS CONTROL MODULE AND HYDRAULIC CONTROL UNIT MALFUNCTION—

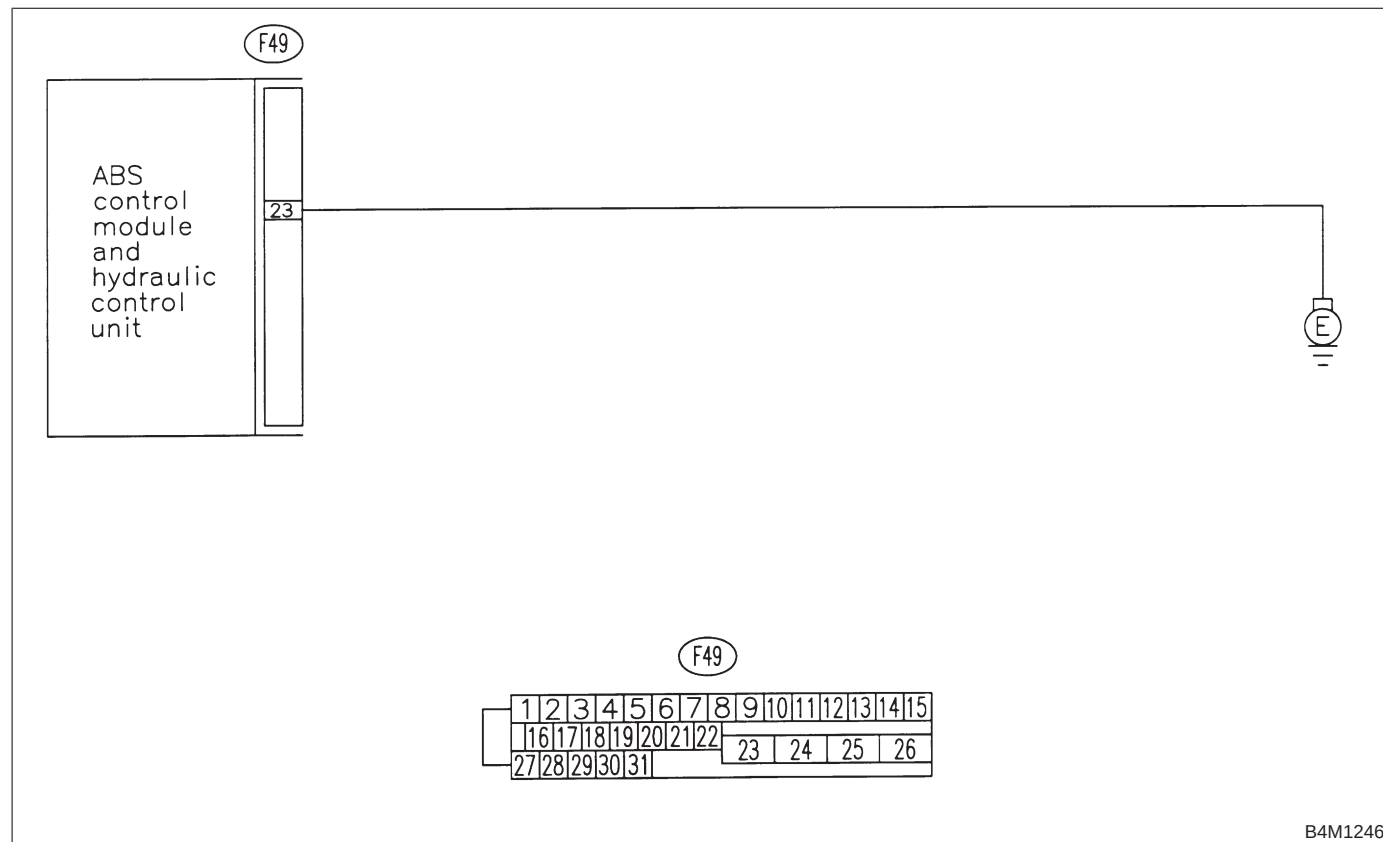
DIAGNOSIS:

- Faulty ABSCM&H/U

TROUBLE SYMPTOM:

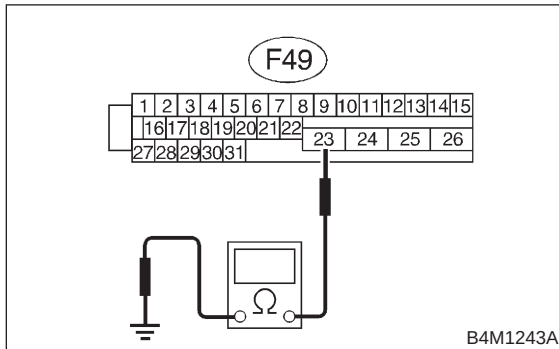
- ABS does not operate.

WIRING DIAGRAM:



10V1 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance between ABSCM&H/U and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:


- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step **10V2**.
- NO** : Repair ABSCM&H/U ground harness.

10V2 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connectors between battery, ignition switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Go to step **10V3**.

10V3 : CHECK SOURCES OF SIGNAL NOISE.

- CHECK** : *Is the car telephone or the wireless transmitter properly installed?*
- YES** : Go to step **10V4**.
- NO** : Properly install the car telephone or the wireless transmitter.

10V4 : CHECK SOURCES OF SIGNAL NOISE.

- CHECK** : *Are noise sources (such as an antenna) installed near the sensor harness?*
- YES** : Install the noise sources apart from the sensor harness.
- NO** : Go to step **10V5**.

10V5 : CHECK ABSCM&H/U.

- 1) Turn ignition switch to OFF.
 - 2) Connect all connectors.
 - 3) Erase the memory.
 - 4) Perform inspection mode.
 - 5) Read out the trouble code.
- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10V6**.

10V6 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

W: TROUBLE CODE 42 POWER SUPPLY VOLTAGE TOO LOW

— POWER SUPPLY VOLTAGE TOO LOW —

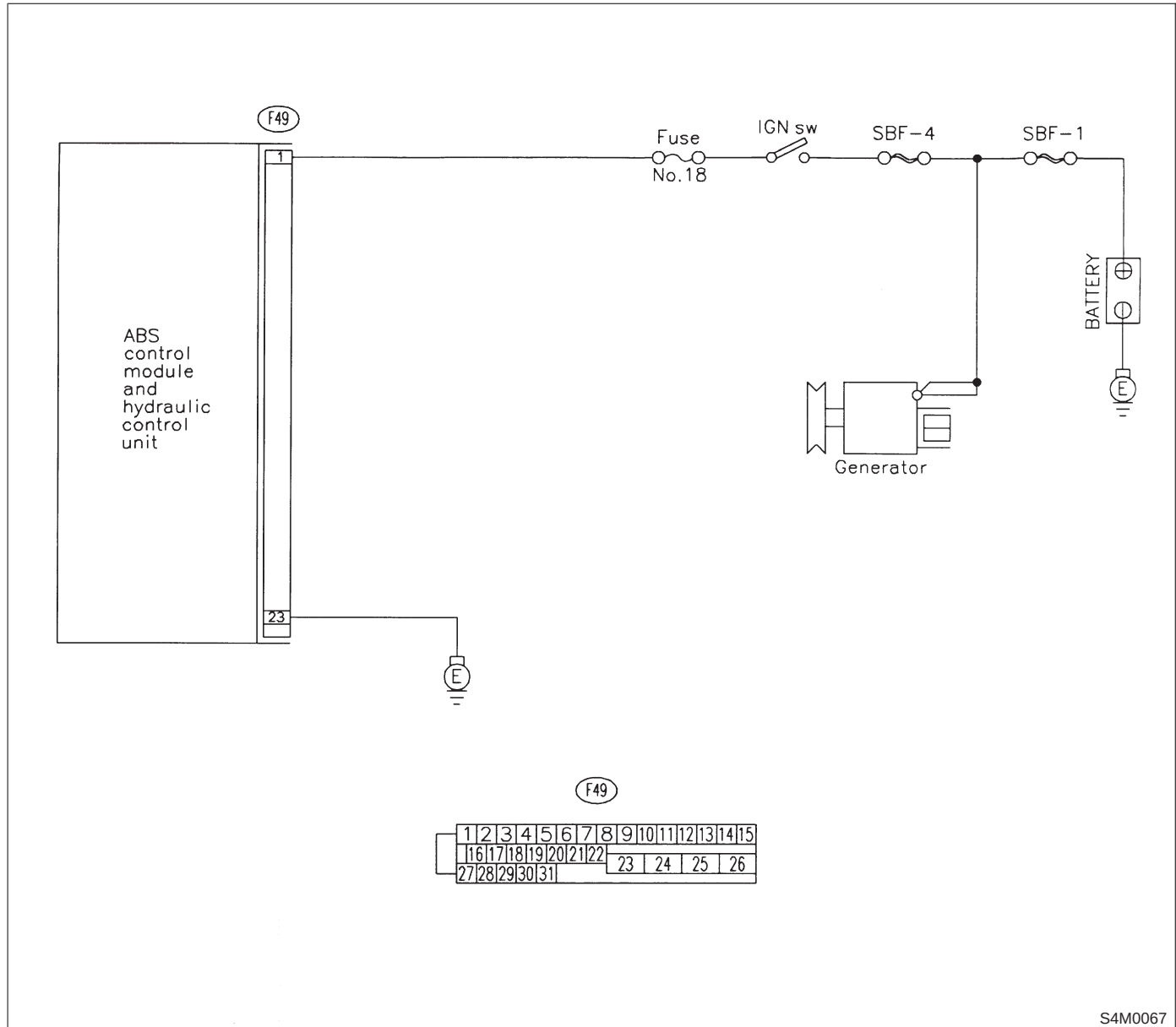
DIAGNOSIS:

- Power source voltage of the ABSCM&H/U is low.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

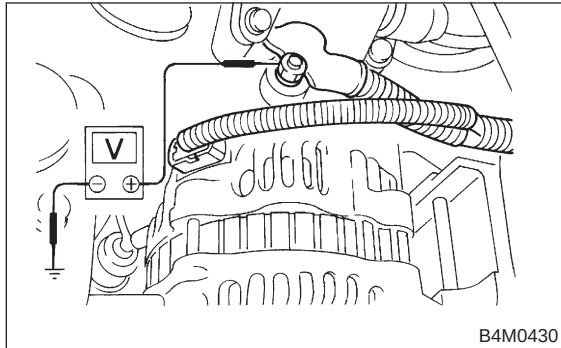


10W1 : CHECK GENERATOR.

- 1) Start engine.
- 2) Idling after warm-up.
- 3) Measure voltage between generator B terminal and chassis ground.

Terminal

Generator B terminal — Chassis ground:



- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 10W2.
- NO** : Repair generator.

10W2 : CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

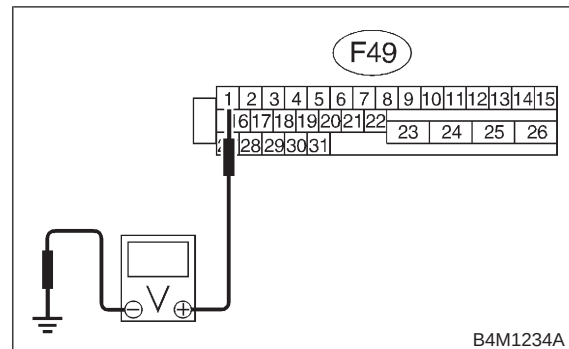
- CHECK** : Are the positive and negative battery terminals tightly clamped?
- YES** : Go to step 10W3.
- NO** : Tighten the clamp of terminal.

10W3 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



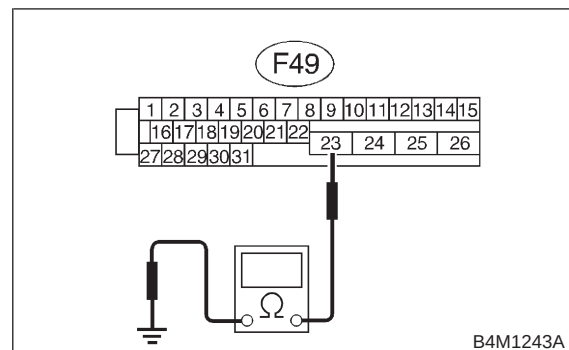
- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 10W4.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

10W4 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 10W5.
- NO** : Repair ABSCM&H/U ground harness.

10W5 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10W6**.

10W6 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10W7**.

10W7 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

X: TROUBLE CODE 42 POWER SUPPLY VOLTAGE TOO HIGH

— POWER SUPPLY VOLTAGE TOO HIGH —

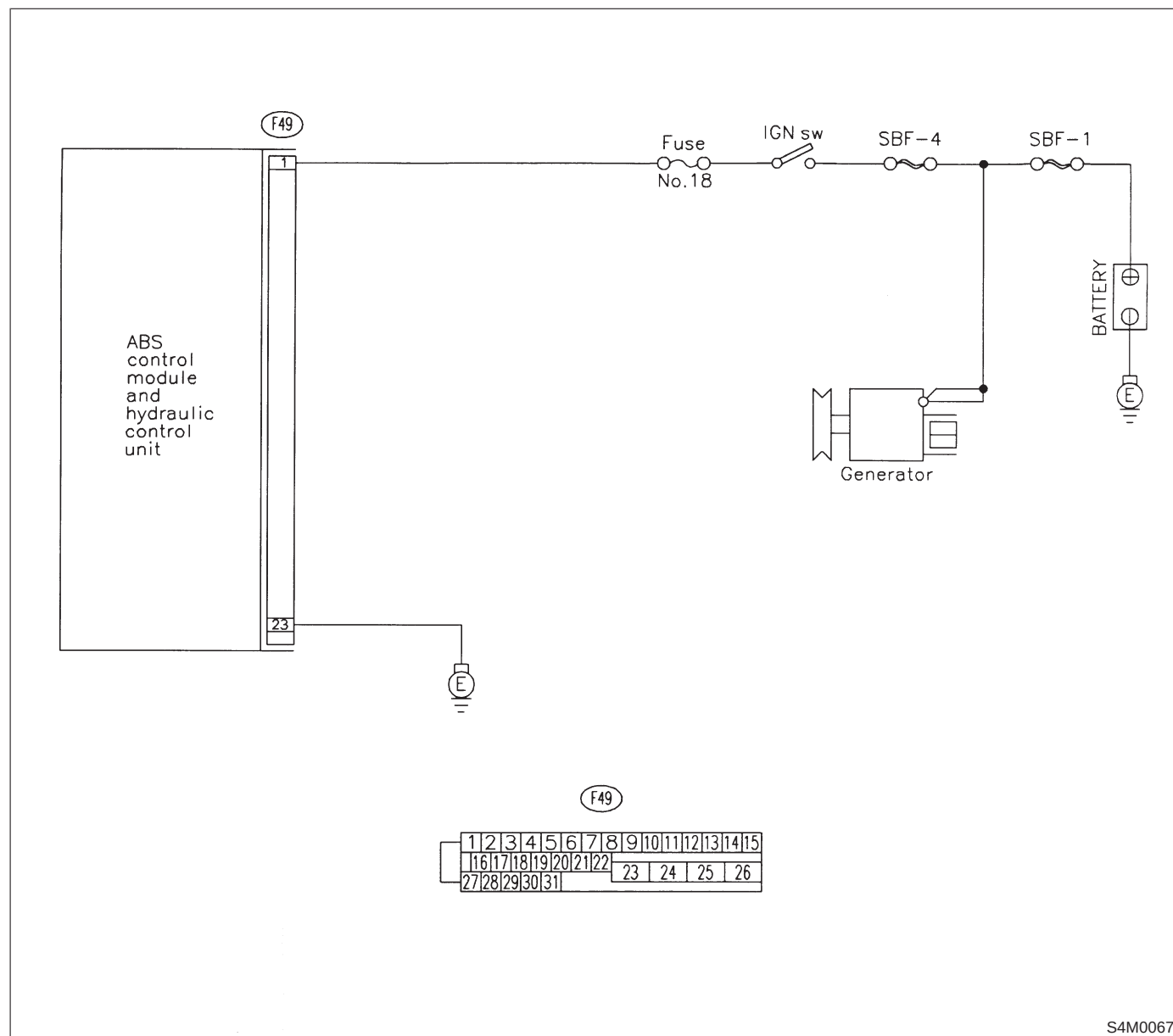
DIAGNOSIS:

- Power source voltage of the ABSCM&H/U is high.

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

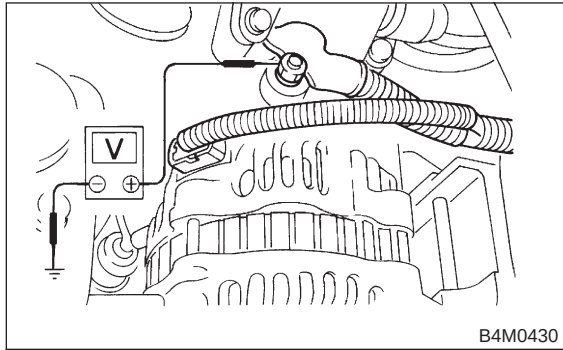


10X1 : CHECK GENERATOR.

- 1) Start engine.
- 2) Idling after warm-up.
- 3) Measure voltage between generator B terminal and chassis ground.

Terminal

Generator B terminal — Chassis ground:



- CHECK** : *Is the voltage between 10 V and 17 V?*
- YES** : Go to step **10X2**.
- NO** : Repair generator.

10X2 : CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

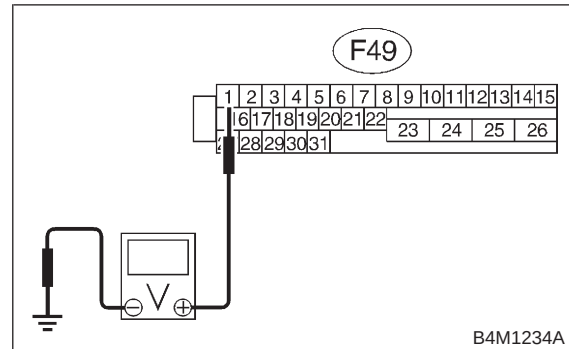
- CHECK** : *Are the positive and negative battery terminals tightly clamped?*
- YES** : Go to step **10X3**.
- NO** : Tighten the clamp of terminal.

10X3 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

- 1) Disconnect connector from ABSCM&H/U.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 1 (+) — Chassis ground (-):



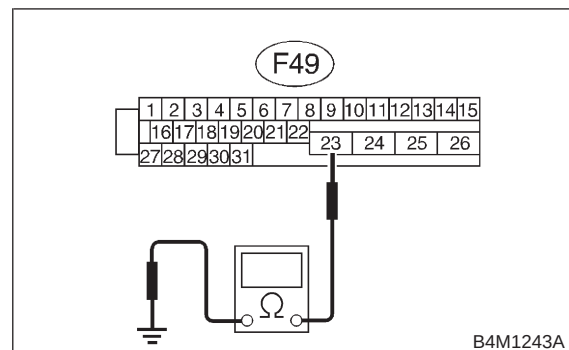
- CHECK** : *Is the voltage between 10 V and 17 V?*
- YES** : Go to step **10X4**.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

10X4 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 23 — Chassis ground:



- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step **10X5**.
- NO** : Repair ABSCM&H/U ground harness.

10X5 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10X6**.

10X6 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10X7**.

10X7 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

Y: TROUBLE CODE 44 ABS-AT CONTROL (NON CONTROLLED)

— ABS-AT CONTROL (NON CONTROLLED) —

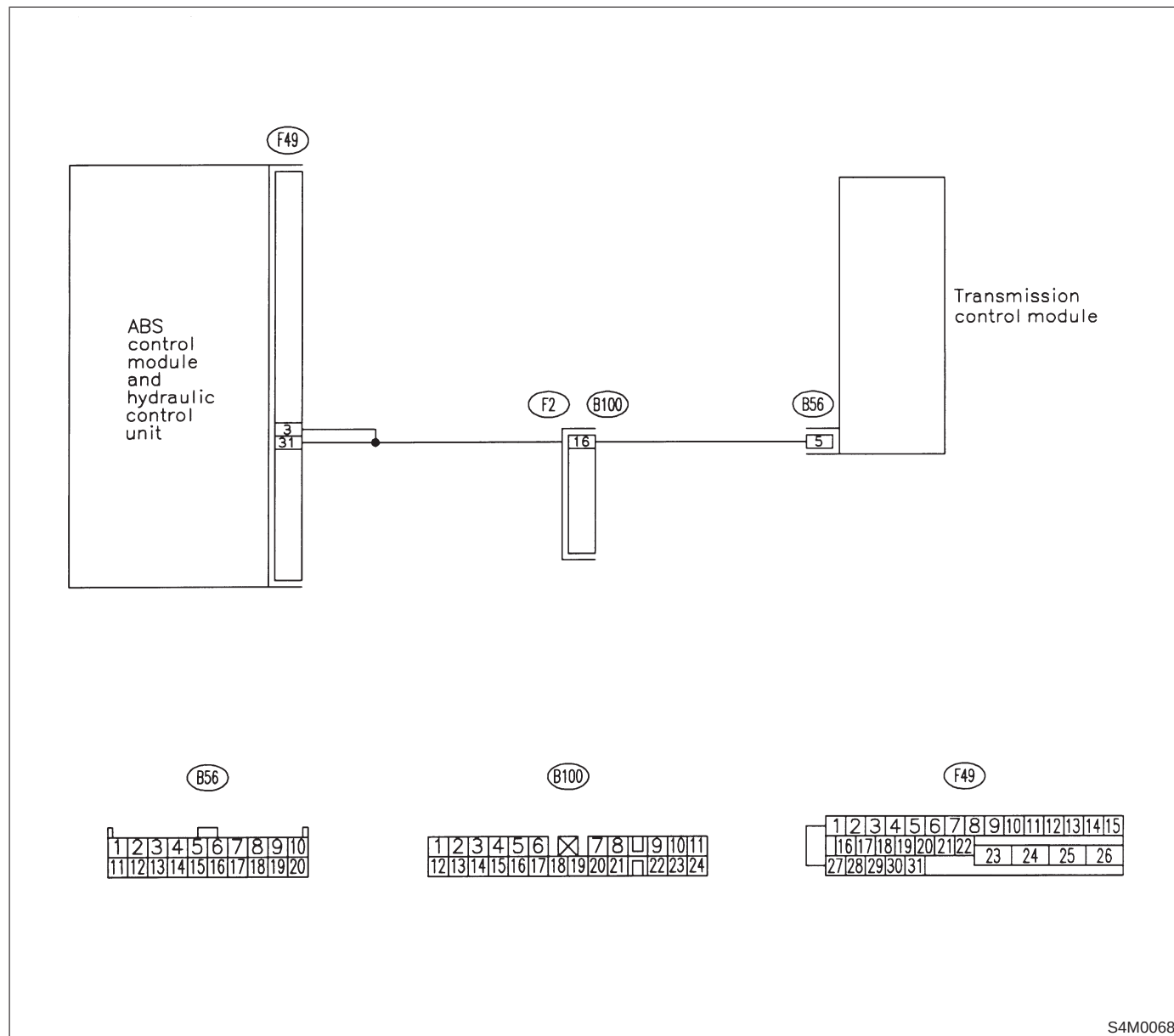
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

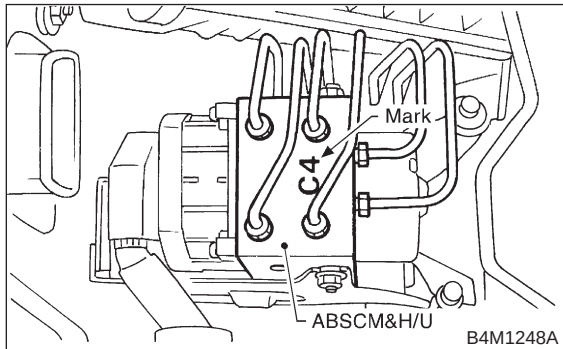
- ABS does not operate.

WIRING DIAGRAM:



10Y1 : CHECK SPECIFICATIONS OF THE ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.



Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : Is an ABSCM&H/U for AT model installed on a MT model?

YES : Replace ABSCM&H/U.

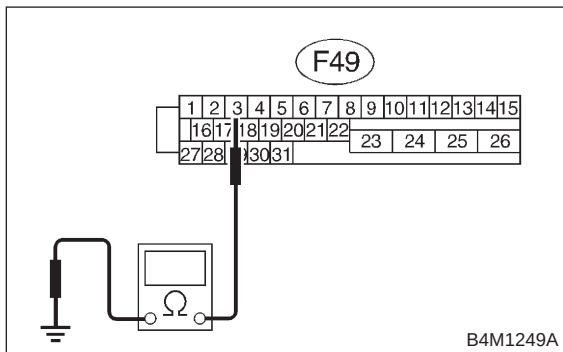
NO : Go to step 10Y2.

10Y2 : CHECK GROUND SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from TCM.
- 3) Disconnect connector from ABSCM&H/U.
- 4) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 3 — Chassis ground:



CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10Y3.

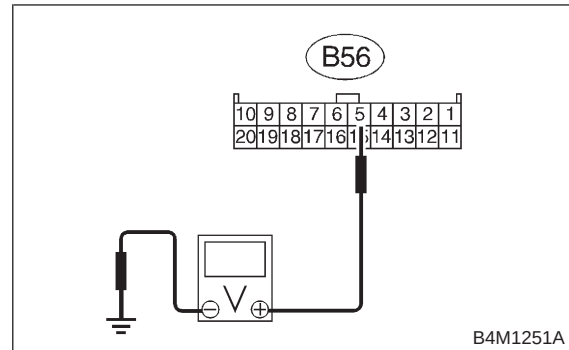
NO : Repair harness between TCM and ABSCM&H/U.

10Y3 : CHECK TCM.

- 1) Connect all connectors to TCM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between TCM connector terminal and chassis ground.

Connector & terminal

(B55) No. 5 (+) — Chassis ground (-):



CHECK : Is the voltage between 10 V and 15 V?

YES : Go to step 10Y5.

NO : Go to step 10Y4.

10Y4 : CHECK AT.

CHECK : Is the AT functioning normally?

YES : Replace TCM.

NO : Repair AT.

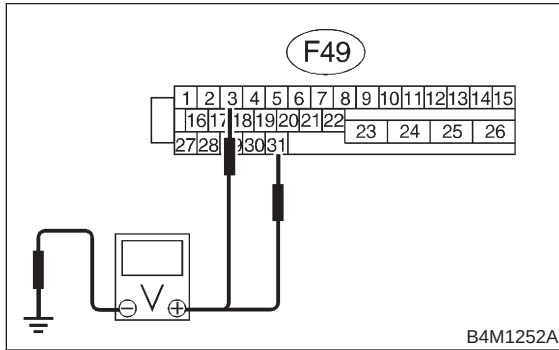
10Y5 : CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):



CHECK : *Is the voltage more than 10 V?*

YES : Go to step **10Y6**.

NO : Repair harness/connector between AT control module and ABSCM&H/U.

10Y6 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between AT control module and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10Y7**.

10Y7 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10Y8**.

10Y8 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

Z: TROUBLE CODE 44 ABS-AT CONTROL (CONTROLLED)

— ABS-AT CONTROL (CONTROLLED) —

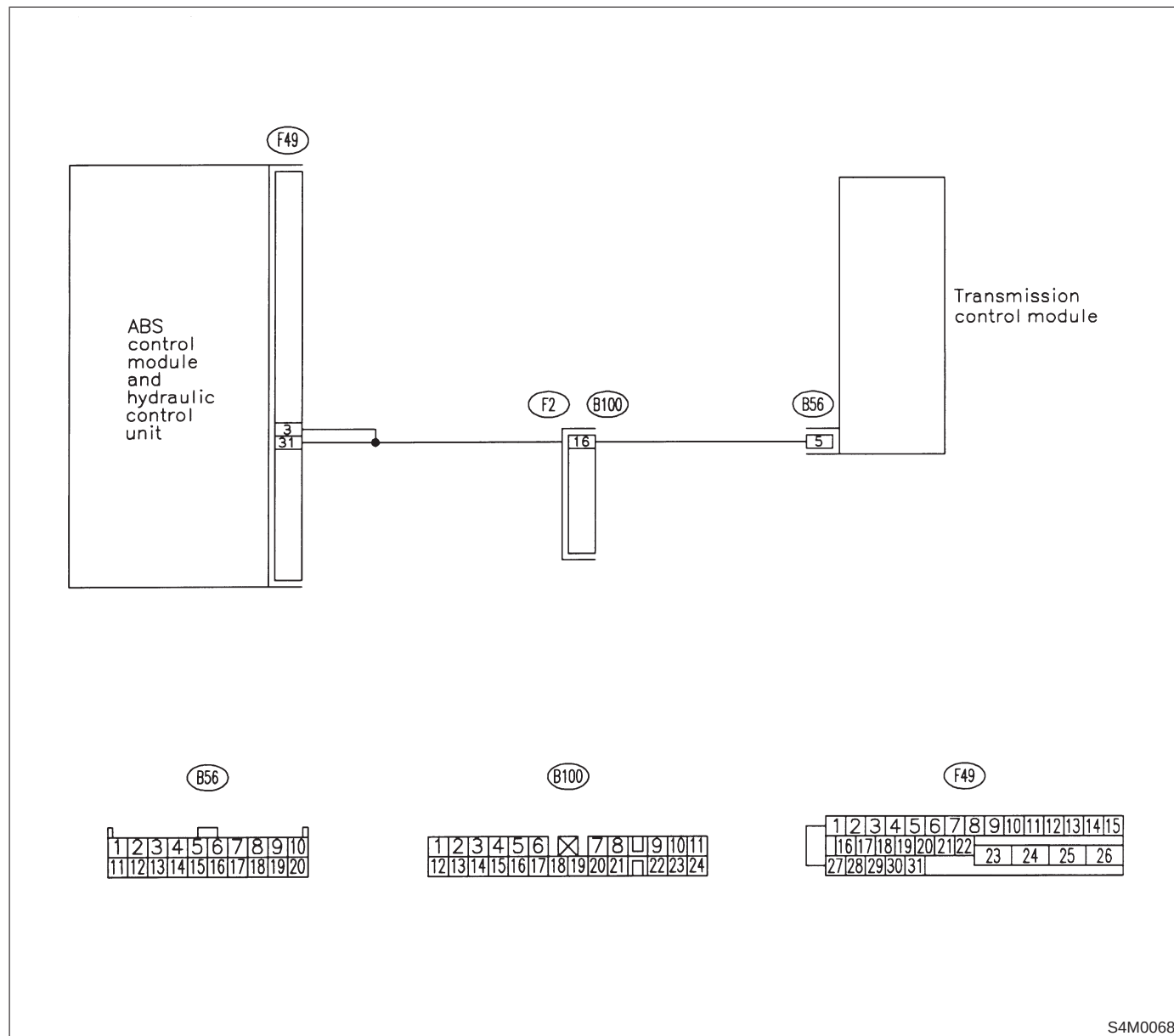
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

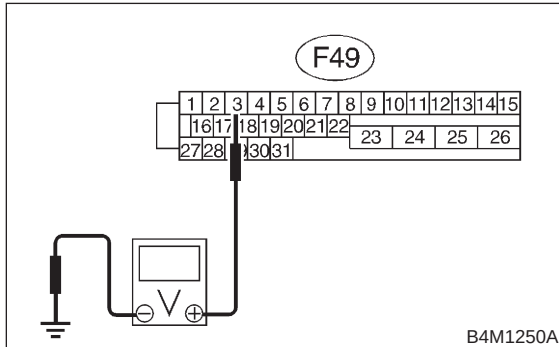
- ABS does not operate.

WIRING DIAGRAM:

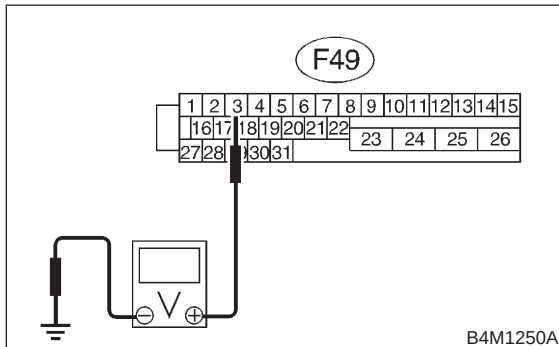


**10Z1 : CHECK BATTERY SHORT OF HAR-
NESS.**

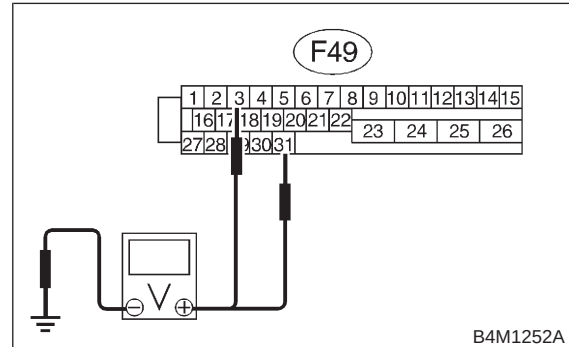
- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from AT control module.
- 3) Disconnect connector from ABSCM&H/U.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 3 (+) — Chassis ground (-):****CHECK** : **Is the voltage less than 1 V?****YES** : Go to step **10Z2**.**NO** : Repair harness between AT control module and ABSCM&H/U.**10Z2 : CHECK BATTERY SHORT OF HAR-
NESS.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 3 (+) — Chassis ground (-):****CHECK** : **Is the voltage less than 1 V?****YES** : Go to step **10Z3**.**NO** : Repair harness between AT control module and ABSCM&H/U.**10Z3 : CHECK OPEN CIRCUIT OF HAR-
NESS.**

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors to TCM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 3 (+) — Chassis ground (-):****(F49) No. 31 (+) — Chassis ground (-):****CHECK** : **Is the voltage between 10 V and 13 V?****YES** : Go to step **10Z4**.**NO** : Repair harness/connector between TCM and ABSCM&H/U.**10Z4 : CHECK POOR CONTACT IN CON-
NECTORS.**

Turn ignition switch to OFF.

CHECK : **Is there poor contact in connectors between AT control module and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>****YES** : Repair connector.**NO** : Go to step **10Z5**.**10Z5 : CHECK ABSCM&H/U.**

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : **Is the same trouble code as in the current diagnosis still being output?****YES** : Replace ABSCM&H/U.**NO** : Go to step **10Z6**.

**10Z6 : CHECK ANY OTHER TROUBLE
CODES APPEARANCE.**

- CHECK** : *Are other trouble codes being out-
put?*
- YES** : Proceed with the diagnosis correspond-
ing to the trouble code.
- NO** : A temporary poor contact.

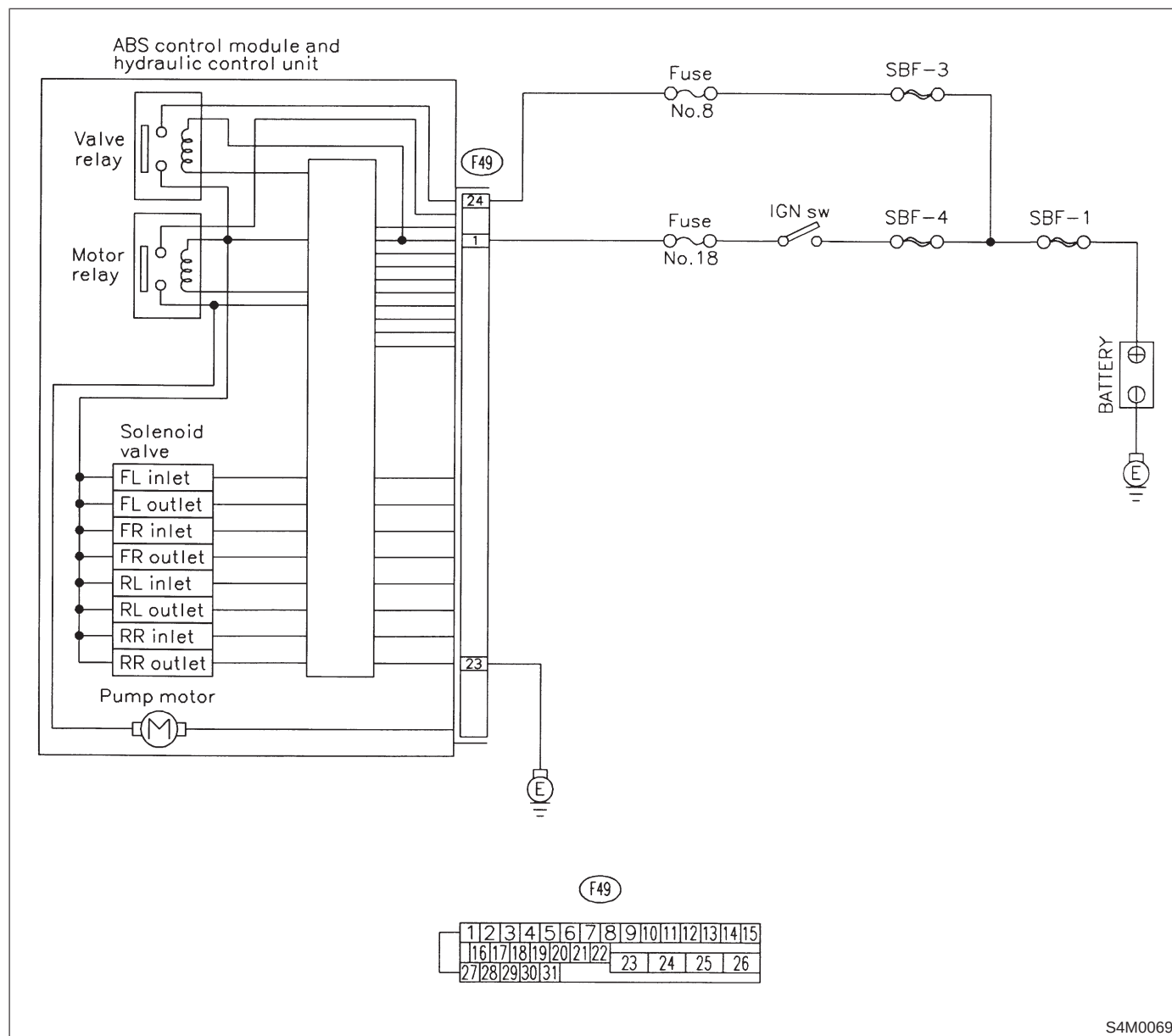
MEMO:

AA: TROUBLE CODE 51 VALVE RELAY MALFUNCTION**— VALVE RELAY MALFUNCTION —****DIAGNOSIS:**

- Faulty valve relay

TROUBLE SYMPTOM:

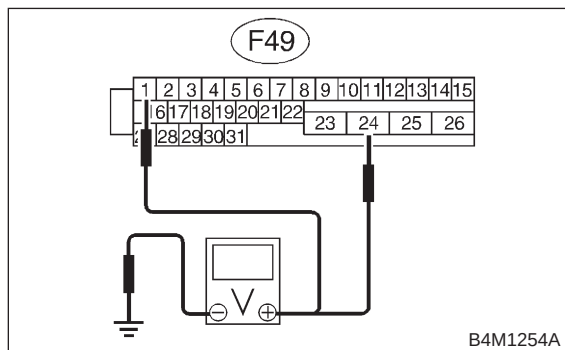
- ABS does not operate.

WIRING DIAGRAM:

S4M0069

10AA1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

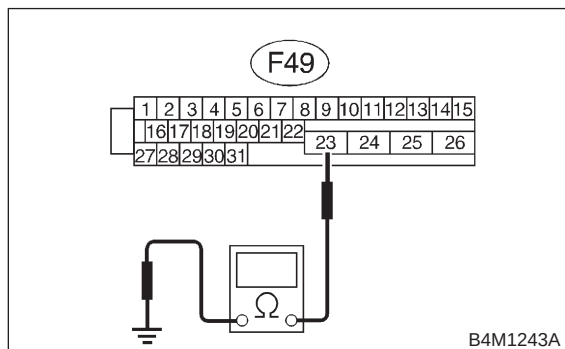
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Run the engine at idle.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 1 (+) — Chassis ground (-):****(F49) No. 24 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage between 10 V and 15 V?*
- YES** : Go to step **10AA2**.
- NO** : Repair harness connector between battery and ABSCM&H/U.

10AA2 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 23 — Chassis ground:**

- CHECK** : *Is the resistance less than 0.5 Ω?*
- YES** : Go to step **10AA3**.
- NO** : Repair ABSCM&H/U ground harness.

10AA3 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Go to step **10AA4**.

10AA4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10AA5**.

10AA5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

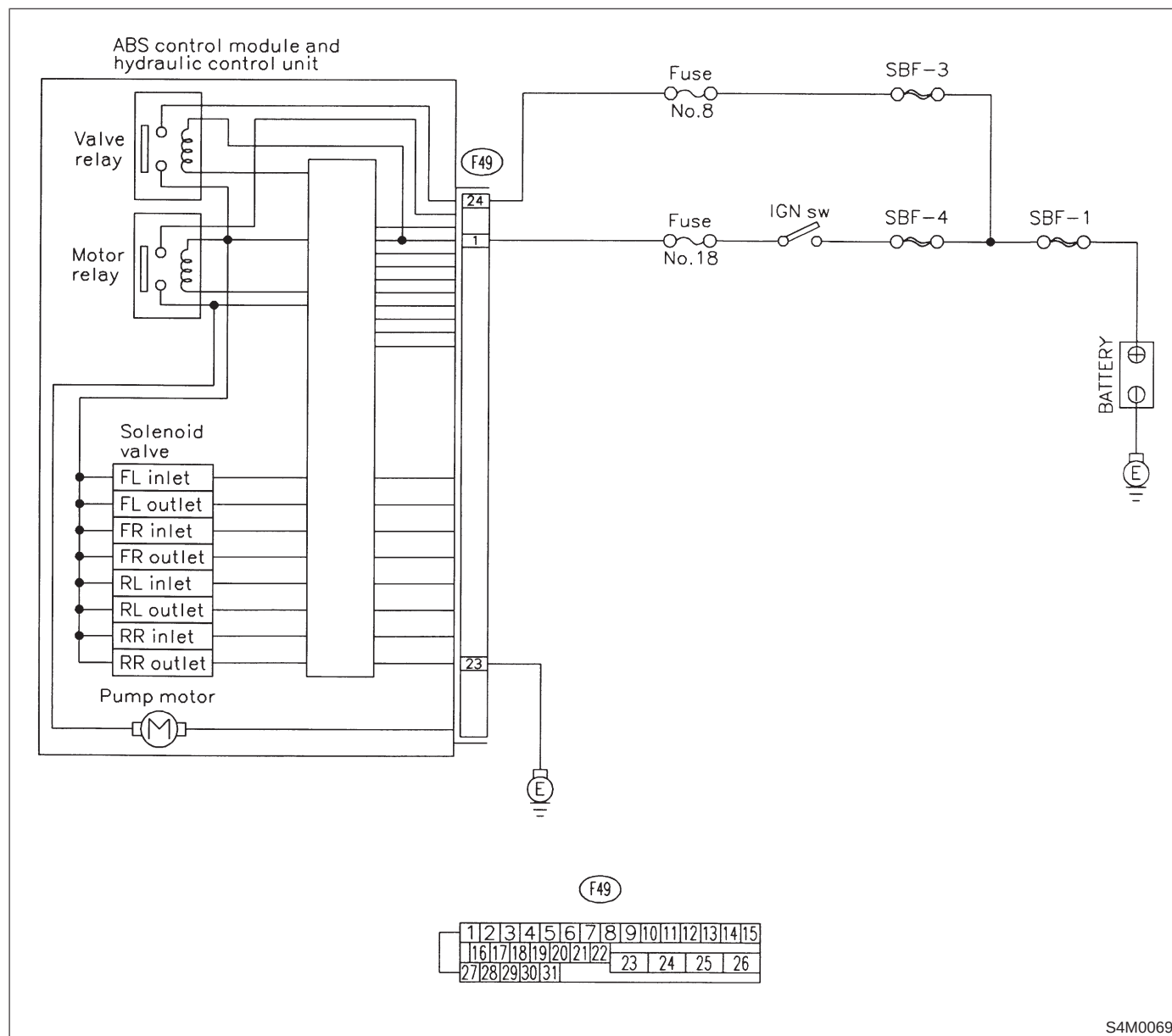
- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

AB: TROUBLE CODE 51 VALVE RELAY ON FAILURE**— VALVE RELAY ON FAILURE —****DIAGNOSIS:**

- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

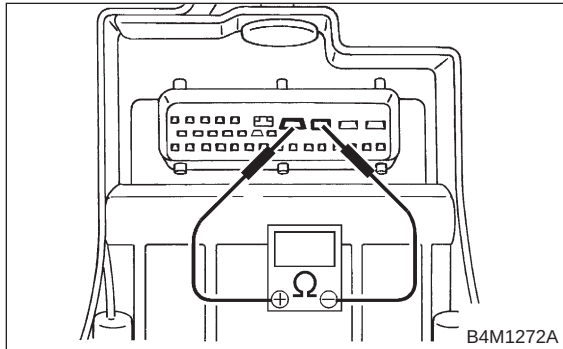
WIRING DIAGRAM:

10AB1 : CHECK VALVE RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals

No. 23 (+) — No. 24 (-):



- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10AB2**.
NO : Replace ABSCM&H/U.

10AB2 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connectors between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*
YES : Repair connector.
NO : Go to step **10AB3**.

10AB3 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
YES : Replace ABSCM&H/U.
NO : Go to step **10AB4**.

10AB4 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

AC: TROUBLE CODE 52 OPEN CIRCUIT IN MOTOR RELAY CIRCUIT

— OPEN CIRCUIT IN MOTOR RELAY CIRCUIT —

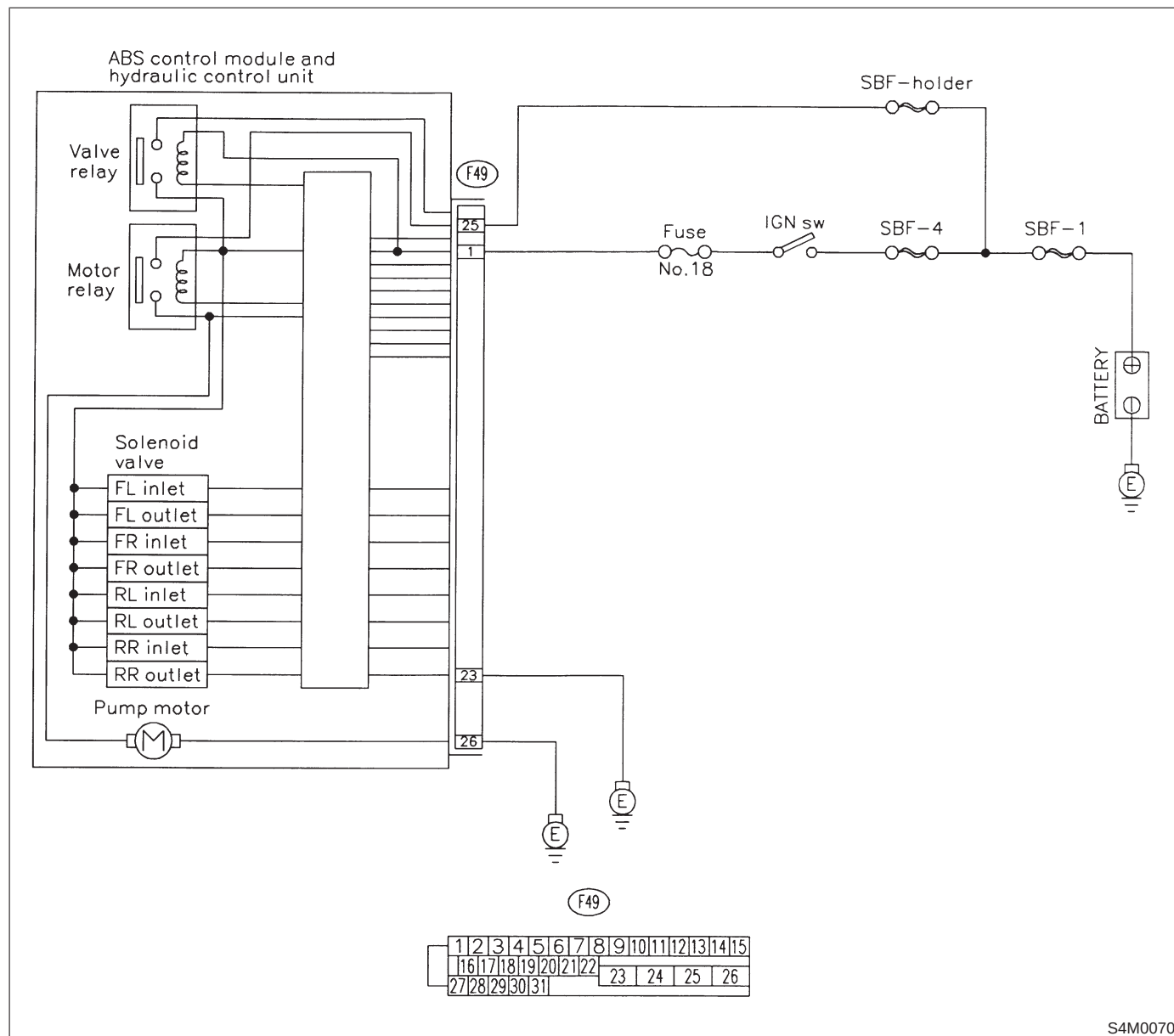
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

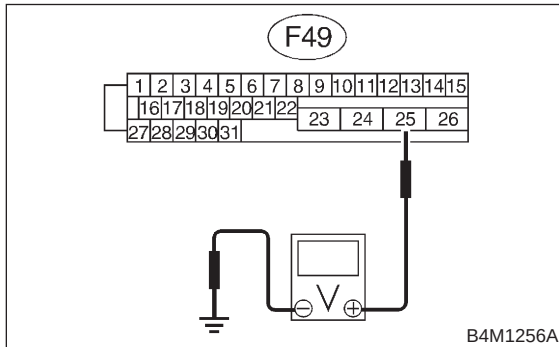
WIRING DIAGRAM:



S4M0070

10AC1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

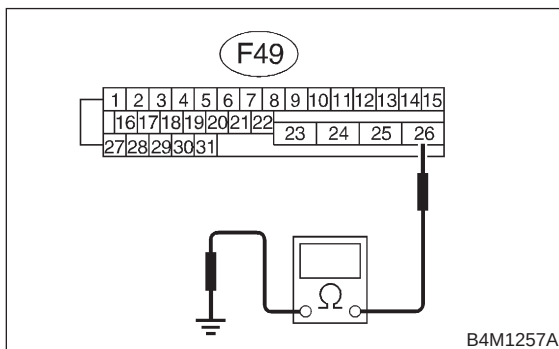
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 25 (+) — Chassis ground (-):**

- CHECK** : Is the voltage between 10 V and 13 V?
- YES** : Go to step **10AC2**.
- NO** : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.

10AC2 : CHECK GROUND CIRCUIT OF MOTOR.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 26 — Chassis ground:**

- CHECK** : Is the resistance less than 0.5 Ω ?
- YES** : Go to step **10AC3**.
- NO** : Repair ABSCM&H/U ground harness.

10AC3 : CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W14D1].>

NOTE:

Use the diagnosis connector to operate the sequence control.

- CHECK** : Can motor revolution noise (buzz) be heard when carrying out the check sequence?
- YES** : Go to step **10AC4**.
- NO** : Replace ABSCM&H/U.

10AC4 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

- CHECK** : Is there poor contact in connector between hydraulic unit, relay box and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>
- YES** : Repair connector.
- NO** : Go to step **10AC5**.

10AC5 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10AC6**.

10AC6 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

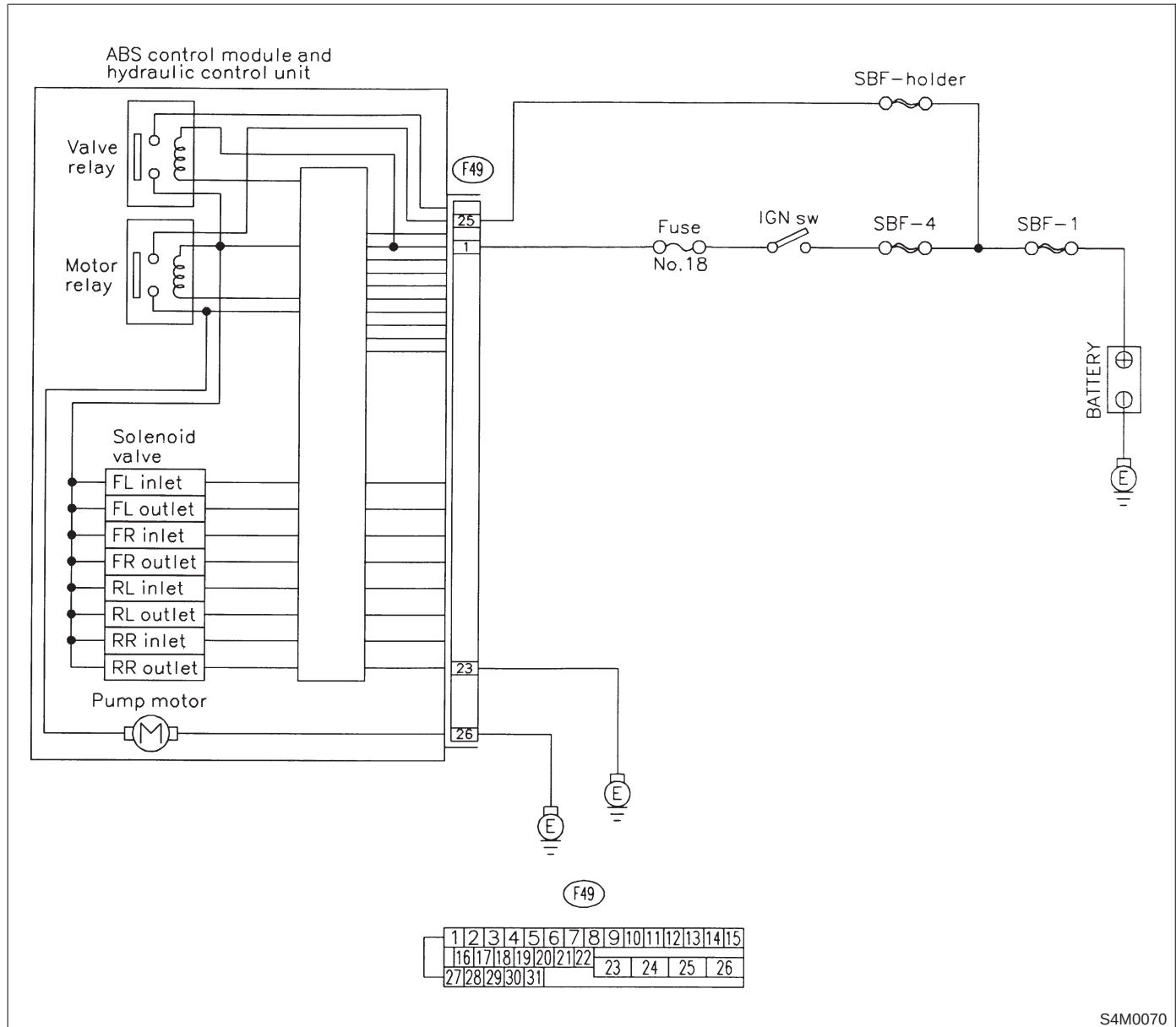
- CHECK** : Are other trouble codes being output?
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

AD: TROUBLE CODE 52 MOTOR RELAY ON FAILURE**— MOTOR RELAY ON FAILURE —****DIAGNOSIS:**

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

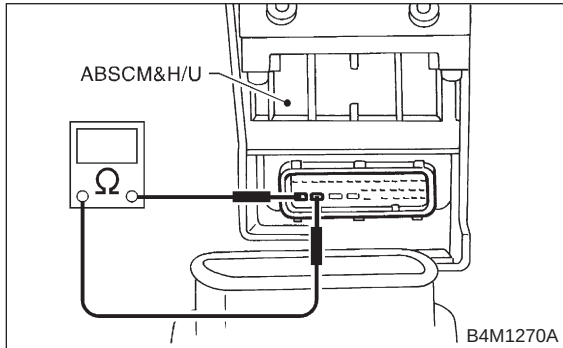
S4M0070

10AD1 : CHECK MOTOR RELAY IN ABSCM&H/U.

Measure resistance between ABSCM&H/U terminals.

Terminals

No. 25 — No. 26:



- CHECK** : *Is the resistance more than 1 MΩ?*
YES : Go to step **10AD2**.
NO : Replace ABSCM&H/U.

10AD2 : CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W14D1].>

NOTE:

Use the diagnosis connector to operate the sequence control.

- CHECK** : *Can motor revolution noise (buzz) be heard when carrying out the sequence control?*
YES : Go to step **10AD3**.
NO : Replace ABSCM&H/U.

10AD3 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

- CHECK** : *Is there poor contact in connector between hydraulic unit, relay box and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*
YES : Repair connector.
NO : Go to step **10AD4**.

10AD4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
YES : Replace ABSCM&H/U.
NO : Go to step **10AD5**.

10AD5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
YES : Proceed with the diagnosis corresponding to the trouble code.
NO : A temporary poor contact.

AE: TROUBLE CODE 52 MOTOR MALFUNCTION

— MOTOR MALFUNCTION —

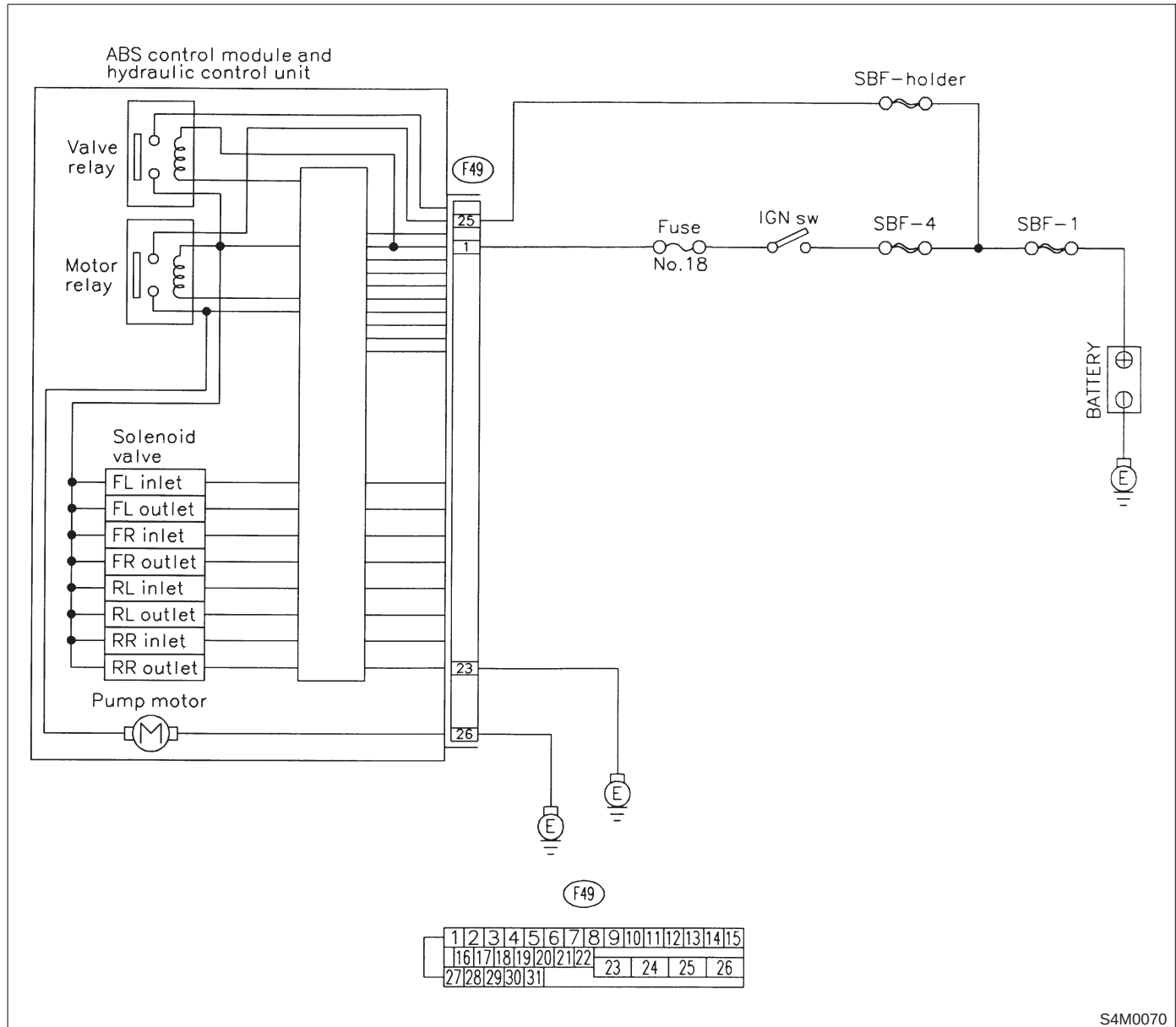
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

TROUBLE SYMPTOM:

- ABS does not operate.

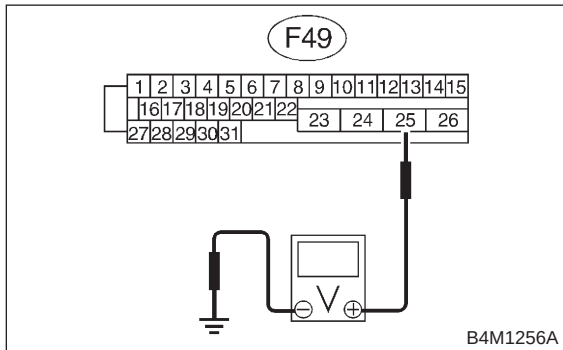
WIRING DIAGRAM:



S4M0070

10AE1 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

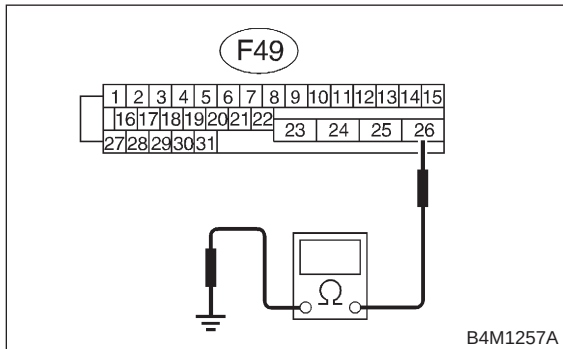
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 25 (+) — Chassis ground (-):


- CHECK** : Is the voltage between 10 V and 13 V?
- YES** : Go to step 10AE2.
- NO** : Repair harness/connector between battery and ABSCM&H/U and check fuse SBF6.

10AE2 : CHECK GROUND CIRCUIT OF MOTOR.

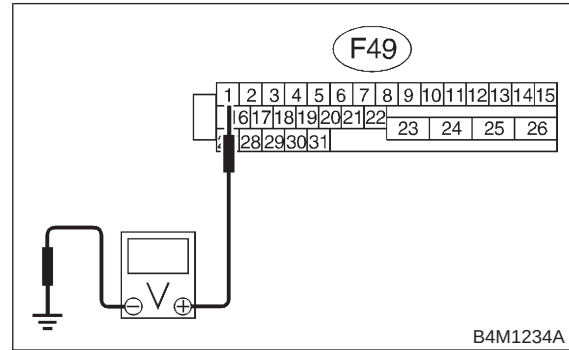
- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 26 — Chassis ground:


- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 10AE3.
- NO** : Repair ABSCM&H/U ground harness.

10AE3 : CHECK INPUT VOLTAGE OF ABSCM&H/U.

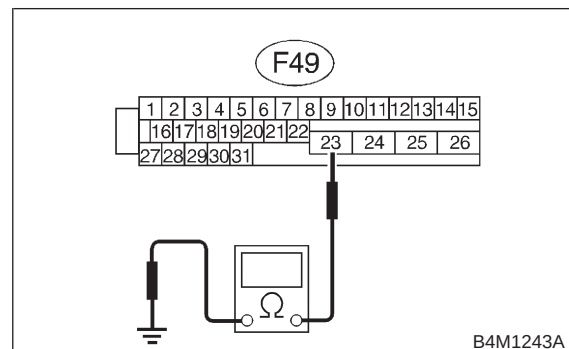
- 1) Run the engine at idle.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 1 (+) — Chassis ground (-):


- CHECK** : Is the voltage between 10 V and 15 V?
- YES** : Go to step 10AE4.
- NO** : Repair harness connector between battery, ignition switch and ABSCM&H/U.

10AE4 : CHECK GROUND CIRCUIT OF ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 23 — Chassis ground:


- CHECK** : Is the resistance less than 0.5 Ω?
- YES** : Go to step 10AE5.
- NO** : Repair ABSCM&H/U ground harness.

10AE5 : CHECK MOTOR OPERATION.

Operate the sequence control. <Ref. to 4-4 [W14D1].>

NOTE:

Use the diagnosis connector to operate the sequence control.

CHECK : *Can motor revolution noise (buzz) be heard when carrying out the sequence control?*

YES : Go to step **10AE6**.

NO : Replace hydraulic unit.

10AE6 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between generator, battery and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10AE7**.

10AE7 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10AE8**.

10AE8 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

MEMO:

AF: TROUBLE CODE 54 STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION

— STOP LIGHT SWITCH SIGNAL CIRCUIT MALFUNCTION —

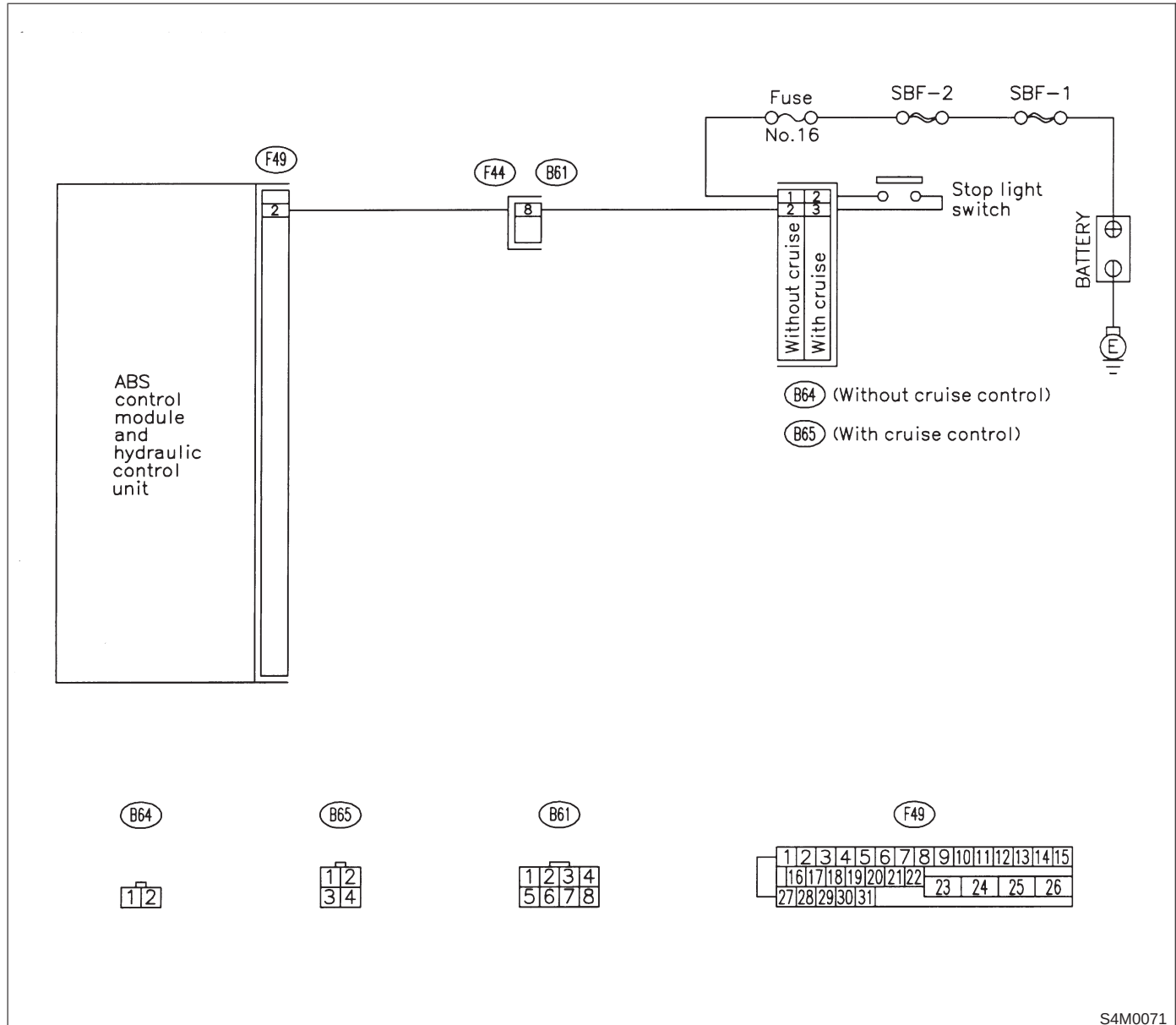
DIAGNOSIS:

- Faulty stop light switch

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0071

10AF1 : CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

- 1) Select "Current data display & Save" on the select monitor.
- 2) Release the brake pedal.
- 3) Read the stop light switch output in the select monitor data display.

- CHECK** : *Is the reading indicated on monitor display less than 1.5 V?*
- YES** : Go to step **10AF2**.
- NO** : Go to step **10AF3**.

10AF2 : CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

- 1) Depress the brake pedal.
- 2) Read the stop light switch output in the select monitor data display.

- CHECK** : *Is the reading indicated on monitor display between 10 V and 15 V?*
- YES** : Go to step **10AF5**.
- NO** : Go to step **10AF3**.

10AF3 : CHECK IF STOP LIGHTS COME ON.

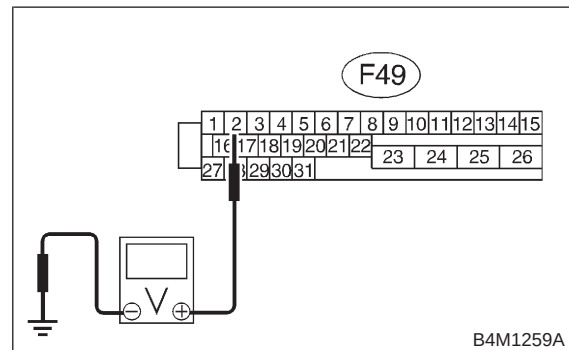
Depress the brake pedal.

- CHECK** : *Do stop lights turn on?*
- YES** : Go to step **10AF4**.
- NO** : Repair stop lights circuit.

10AF4 : CHECK OPEN CIRCUIT IN HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Depress brake pedal.
- 4) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 2 — Chassis ground:



- CHECK** : *Is the voltage between 10 V and 15 V?*
- YES** : Go to step **10AF5**.
- NO** : Repair harness between stop light switch and ABSCM&H/U connector.

10AF5 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connector between stop light switch and ABSCM&H/U? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Go to step **10AF6**.

10AF6 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10AF7**.

10AF7 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

MEMO:

AG: TROUBLE CODE 56 OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT

— OPEN OR SHORT CIRCUIT IN G SENSOR CIRCUIT —

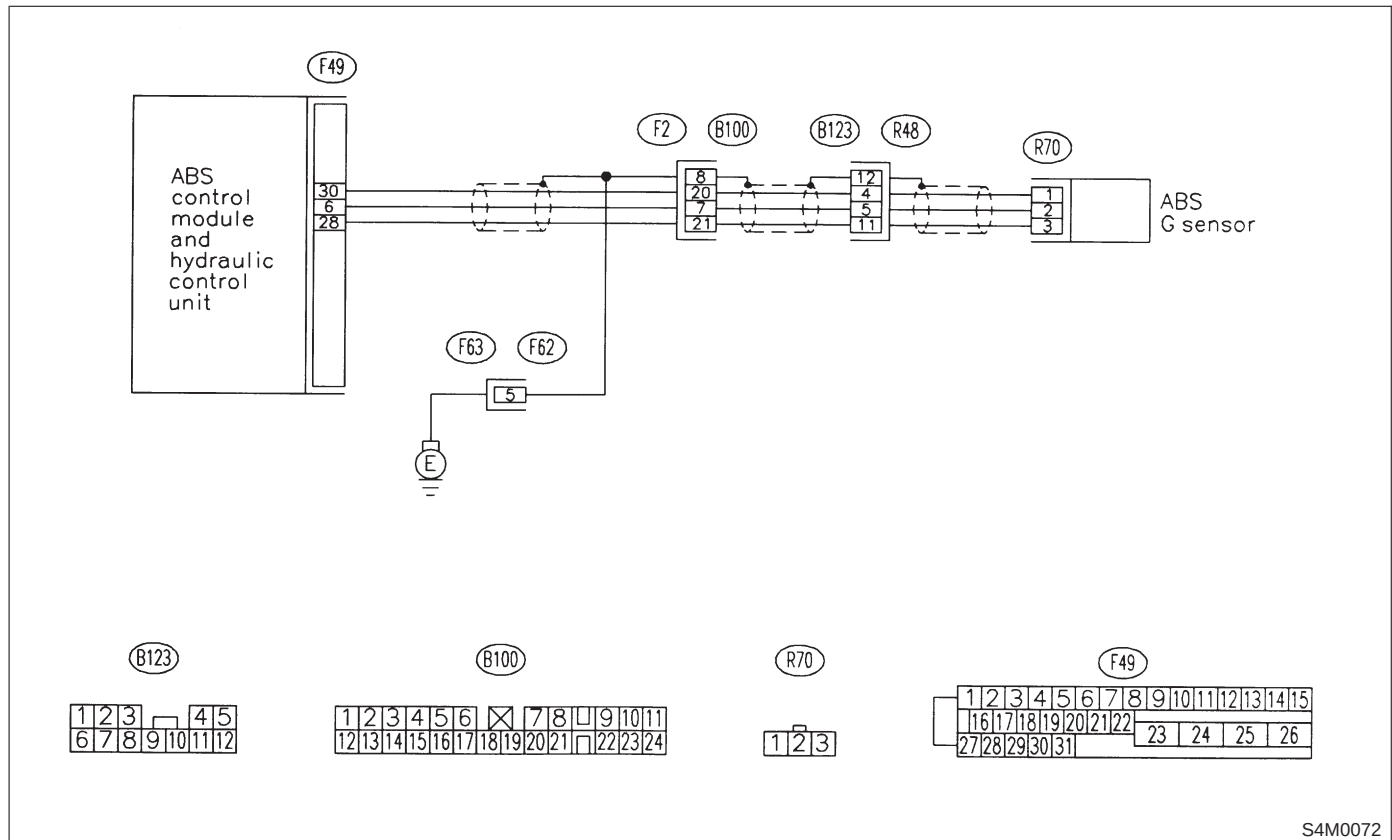
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

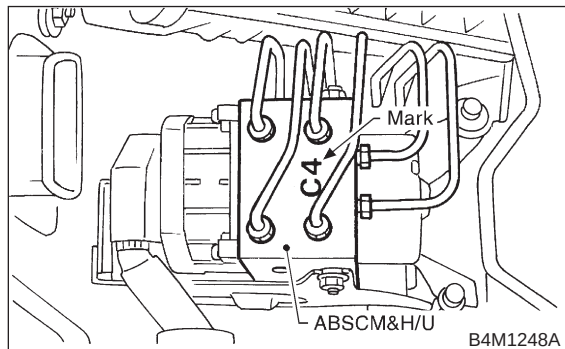
WIRING DIAGRAM:



S4M0072

10AG1 : CHECK SPECIFICATIONS OF ABSCM&H/U.

Check specifications of the mark to the ABSCM&H/U.



Mark	Model
C3	AWD AT
C4	AWD MT

CHECK : *Is an ABSCM for AWD model installed on a FWD model?*

YES : Replace ABSCM&H/U.

CAUTION:

Be sure to turn ignition switch to OFF when removing ABSCM&H/U.

NO : Go to step 10AG2.

10AG2 : CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- 1) Select "Current data display & Save" on the select monitor.
- 2) Read the G sensor output in select monitor data display.

CHECK : *Is the G sensor output on the monitor display between 2.1 and 2.5 V when the G sensor is in horizontal position?*

YES : Go to step 10AG3.

NO : Go to step 10AG6.

10AG3 : CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step 10AG4.

10AG4 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step 10AG5.

10AG5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

10AG6 : CHECK FREEZE FRAME DATA.

- 1) Select "Freeze frame data" on the select monitor.
- 2) Read front right wheel speed on the select monitor display.

CHECK : *Is the front right wheel speed on monitor display 0 km?*

YES : Go to step 10AG7.

NO : Go to step 10AG15.

10AG7 : CHECK FREEZE FRAME DATA.

Read front left wheel speed on the select monitor display.

CHECK : *Is the front left wheel speed on monitor display 0 km?*

YES : Go to step 10AG8.

NO : Go to step 10AG15.

10AG8 : CHECK FREEZE FRAME DATA.

Read rear right wheel speed on the select monitor display.

CHECK : *Is the rear right wheel speed on monitor display 0 km?*

YES : Go to step 10AG9.

NO : Go to step 10AG15.

10AG9 : CHECK FREEZE FRAME DATA.

Read rear left wheel speed on the select monitor display.

- CHECK** : *Is the rear left wheel speed on monitor display 0 km?*
- YES** : Go to step **10AG10**.
- NO** : Go to step **10AG15**.

10AG10 : CHECK FREEZE FRAME DATA.

Read G sensor output on the select monitor display.

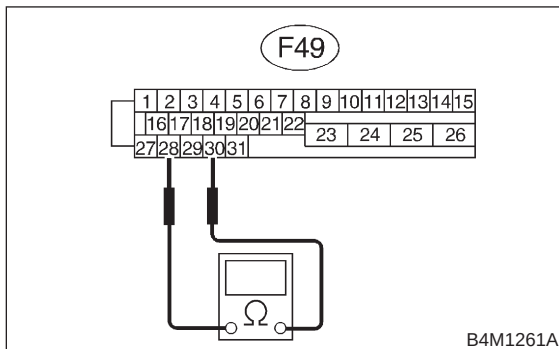
- CHECK** : *Is the G sensor output on monitor display more than 3.65 V?*
- YES** : Go to step **10AG11**.
- NO** : Go to step **10AG15**.

10AG11 : CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal

(F49) No. 30 — No. 28:



- CHECK** : *Is the resistance between 4.3 and 4.9 kΩ?*
- YES** : Go to step **10AG12**.
- NO** : Repair harness/connector between G sensor and ABSCM&H/U.

10AG12 : CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : *Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>*
- YES** : Repair connector.
- NO** : Go to step **10AG13**.

10AG13 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

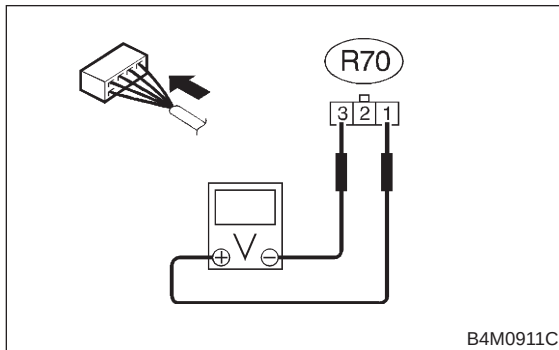
- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10AG14**.

10AG14 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

10AG15 : CHECK INPUT VOLTAGE OF G SENSOR.

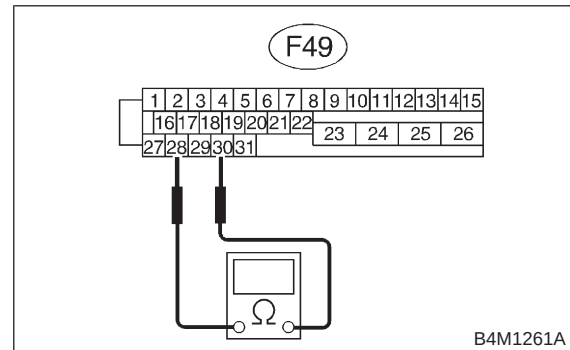
- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Disconnect G sensor from body. (Do not disconnect connector.)
- 4) Turn ignition switch to ON.
- 5) Measure voltage between G sensor connector terminals.

Connector & terminal
(R70) No. 1 (+) — No. 3 (-):


- CHECK** : Is the voltage between 4.75 and 5.25 V?
- YES** : Go to step **10AG16**.
- NO** : Repair harness/connector between G sensor and ABSCM&H/U.

10AG16 : CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

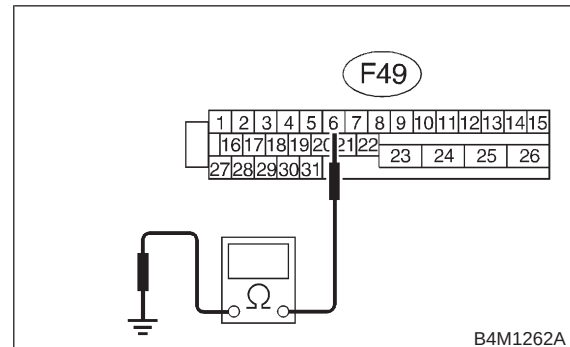
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal
(F49) No. 30 — No. 28:


- CHECK** : Is the resistance between 4.3 and 4.9 kΩ?
- YES** : Go to step **10AG17**.
- NO** : Repair harness/connector between G sensor and ABSCM&H/U.

10AG17 : CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

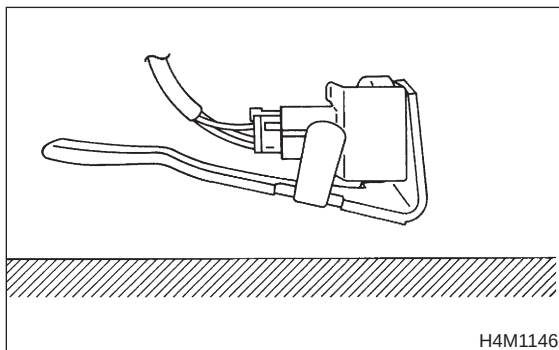
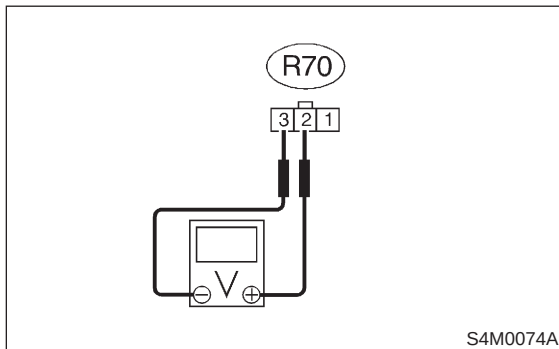
- 1) Disconnect connector from G sensor.
- 2) Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal
(F49) No. 6 — Chassis ground:


- CHECK** : Is the resistance more than 1 MΩ?
- YES** : Go to step **10AG18**.
- NO** : Repair harness between G sensor and ABSCM&H/U.

10AG18 : CHECK G SENSOR.

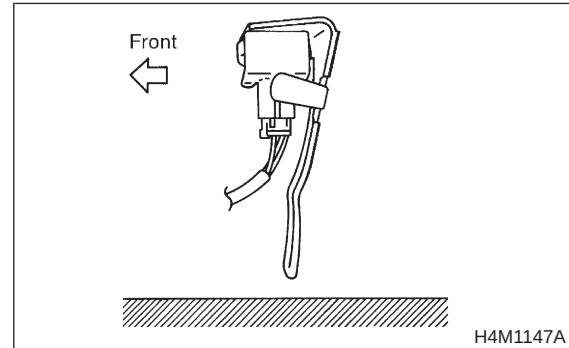
- 1) Connect connector to G sensor.
- 2) Connect connector to ABSCM&H/U.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) No. 2 (+) — No. 3 (-):**

- CHECK** : *Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?*
- YES** : Go to step **10AG19**.
- NO** : Replace G sensor.

10AG19 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

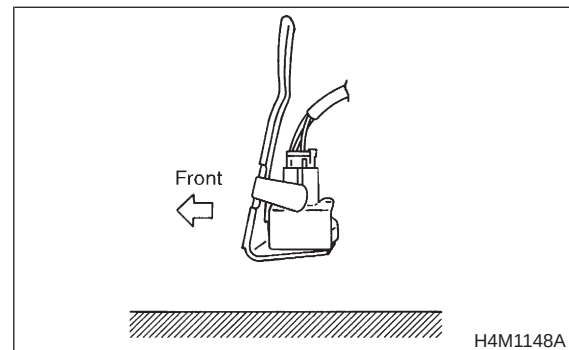
Connector & terminal**(R70) No. 2 (+) — No. 3 (-):**

- CHECK** : *Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?*

- YES** : Go to step **10AG20**.
- NO** : Replace G sensor.

10AG20 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal**(P11) No. 2 (+) — No. 3 (-):**

- CHECK** : *Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?*

- YES** : Go to step **10AG21**.
- NO** : Replace G sensor.

10AG21 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10AG22**.

10AG22 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10AG23**.

10AG23 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AH: TROUBLE CODE 56 BATTERY SHORT IN G SENSOR CIRCUIT

— BATTERY SHORT IN G SENSOR CIRCUIT —

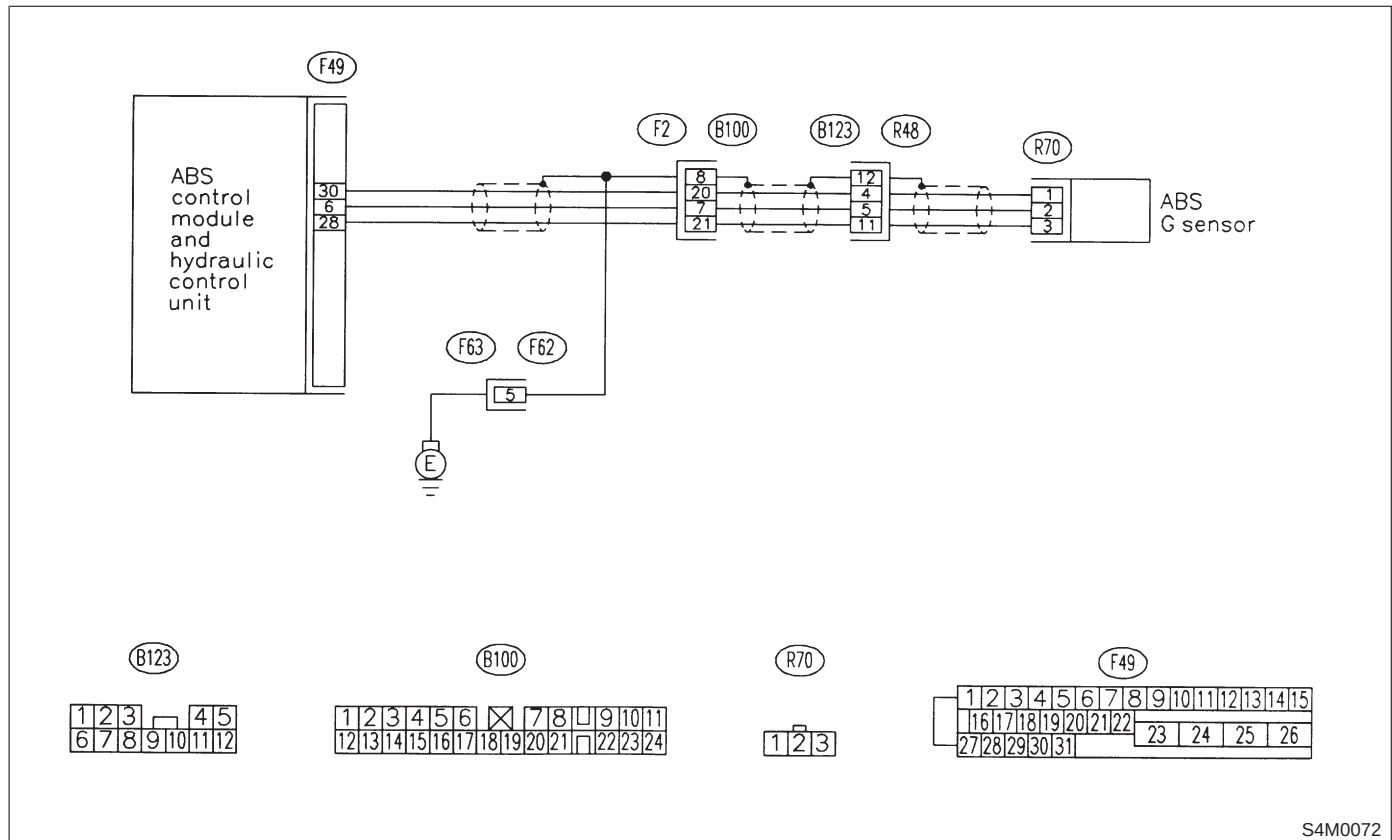
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0072

10AH1 : CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- 1) Select "Current data display & Save" on the select monitor.
- 2) Read G sensor output on the select monitor display.

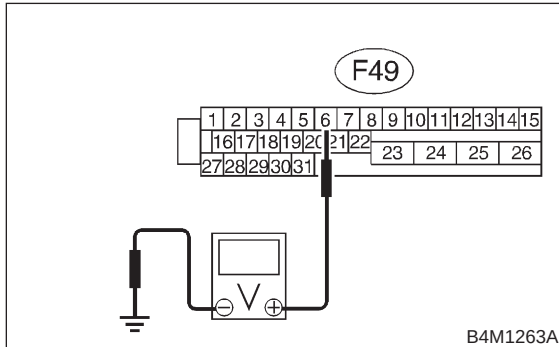
CHECK : *Is the G sensor output on monitor display between 2.1 and 2.5 V when the G sensor is in horizontal position?*

YES : Replace ABSCM&H/U.

NO : Go to step **10AH2**.

10AH2 : CHECK BATTERY SHORT OF HARNESS.

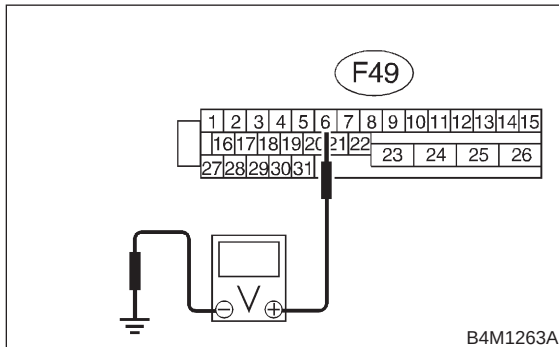
- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Disconnect connector from G sensor.
- 4) Disconnect connector from ABSCM&H/U.
- 5) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 6 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage less than 1 V?*
- YES** : Go to step **10AH3**.
- NO** : Repair harness between G sensor and ABSCM&H/U.

10AH3 : CHECK BATTERY SHORT OF HARNESS.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 6 (+) — Chassis ground (-):**

- CHECK** : *Is the voltage less than 1 V?*
- YES** : Go to step **10AH4**.
- NO** : Repair harness between G sensor and ABSCM&H/U.

10AH4 : CHECK ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Erase the memory.
- 4) Perform inspection mode.
- 5) Read out the trouble code.

- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10AH5**.

10AH5 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

AI: TROUBLE CODE 56 ABNORMAL G SENSOR HIGH μ OUTPUT

— ABNORMAL G SENSOR HIGH μ OUTPUT —

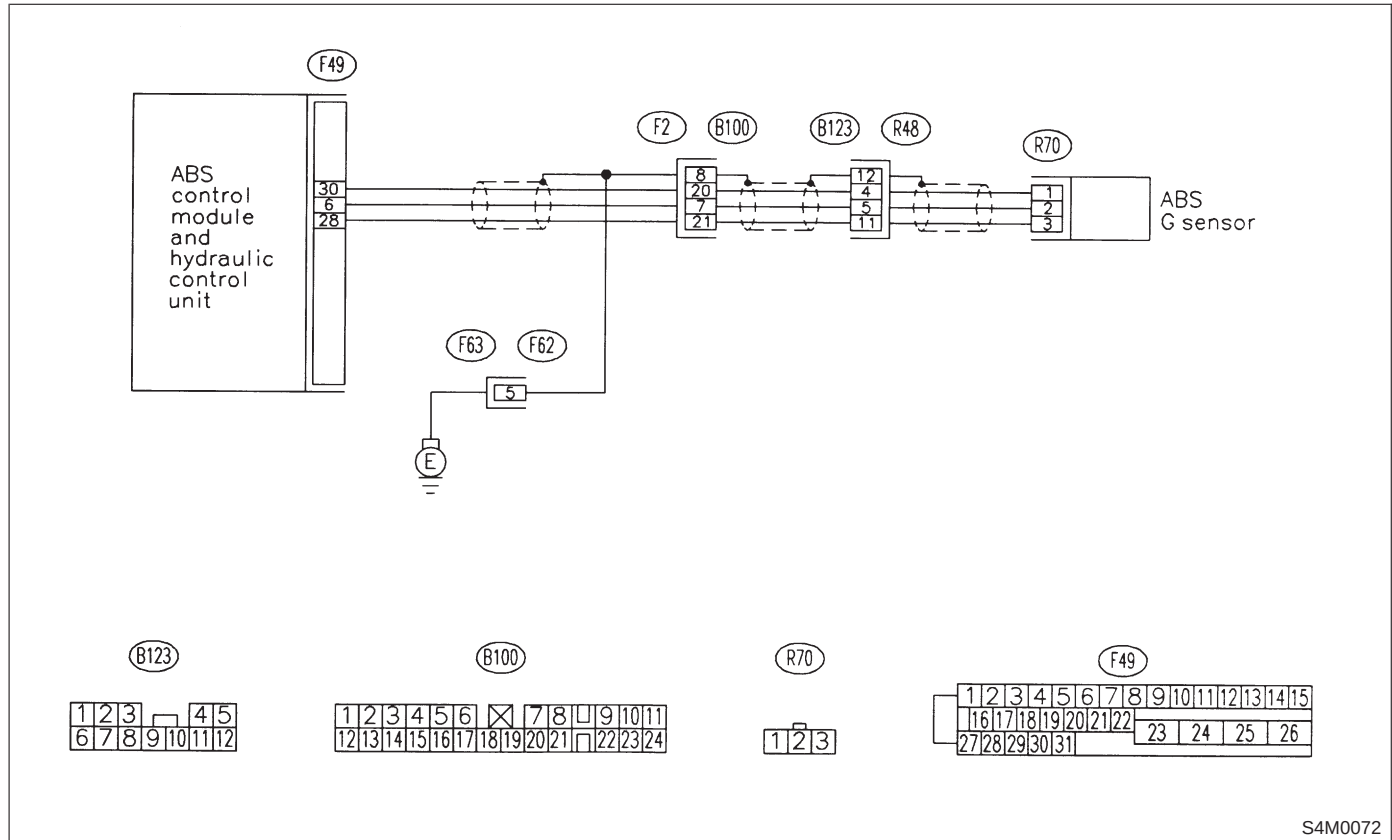
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0072

10AI1 : CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- Select "Current data display & Save" on the select monitor.
- Read G sensor output on the select monitor display.

CHECK : Is the G sensor output on monitor display 2.3 ± 0.2 V when the G sensor is in horizontal position?

YES : Go to step 10AI2.

NO : Go to step 10AI6.

10AI2 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 10AI3.

10A13 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

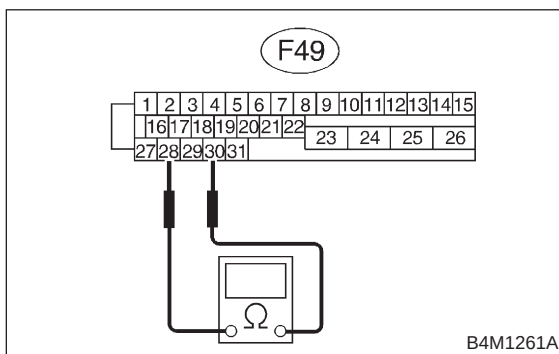
- CHECK** : *Is the same trouble code as in the current diagnosis still being output?*
- YES** : Replace ABSCM&H/U.
- NO** : Go to step **10A14**.

10A14 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

- CHECK** : *Are other trouble codes being output?*
- YES** : Proceed with the diagnosis corresponding to the trouble code.
- NO** : A temporary poor contact.

10A15 : CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

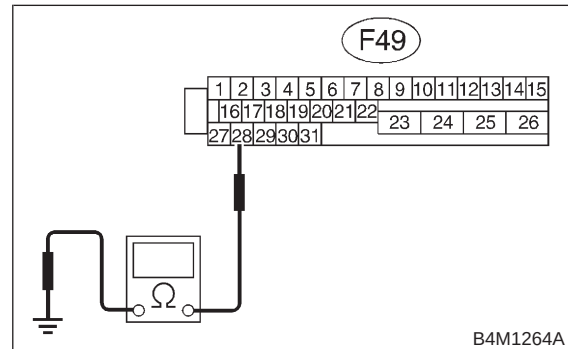
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal**(F49) No. 30 — No. 28:**

- CHECK** : *Is the resistance between 4.3 and 4.9 kΩ?*
- YES** : Go to step **10A16**.
- NO** : Repair harness/connector between G sensor and ABSCM&H/U.

10A16 : CHECK GROUND SHORT OF HARNESS.

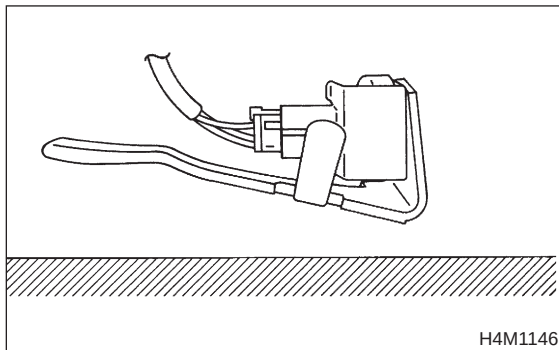
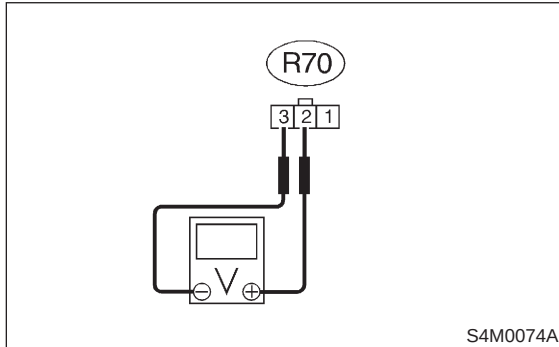
Measure resistance between ABSCM&H/U connector and chassis ground.

Connector & terminal**(F49) No. 28 — Chassis ground:**

- CHECK** : *Is the resistance more than 1 MΩ?*
- YES** : Go to step **10A17**.
- NO** : Repair harness between G sensor and ABSCM&H/U.
Replace ABSCM&H/U.

10AI7 : CHECK G SENSOR.

- 1) Remove console box.
- 2) Remove G sensor from vehicle.
- 3) Connect connector to G sensor.
- 4) Connect connector to ABSCM&H/U.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between G sensor connector terminals.

Connector & terminal**(P11) No. 2 (+) — No. 3 (-):**

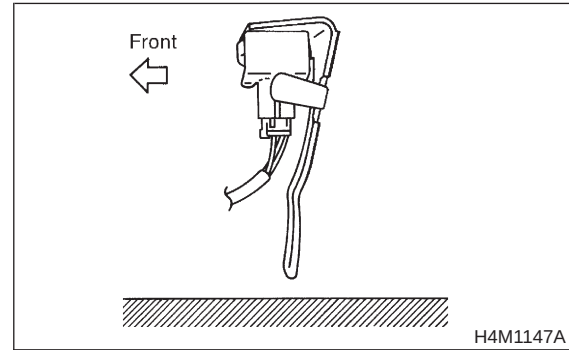
CHECK : *Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?*

YES : Go to step **10AI8**.

NO : Replace G sensor.

10AI8 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) No. 2 (+) — No. 3 (-):**

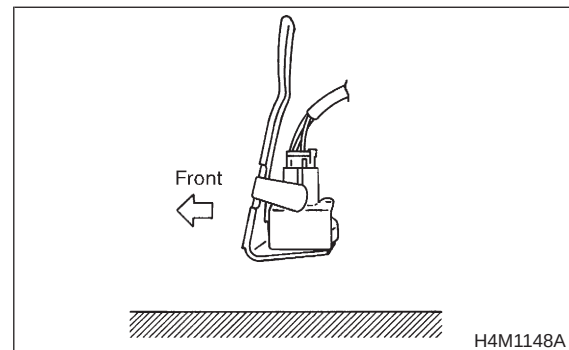
CHECK : *Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?*

YES : Go to step **10AI9**.

NO : Replace G sensor.

10AI9 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) No. 2 (+) — No. 3 (-):**

CHECK : *Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?*

YES : Go to step **10AI10**.

NO : Replace G sensor.

10AI10 : CHECK ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Erase the memory.
- 4) Perform inspection mode.
- 5) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10AI11**.

10AI11 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

AJ: TROUBLE CODE 56 DETECTION OF G SENSOR STICK

— DETECTION OF G SENSOR STICK —

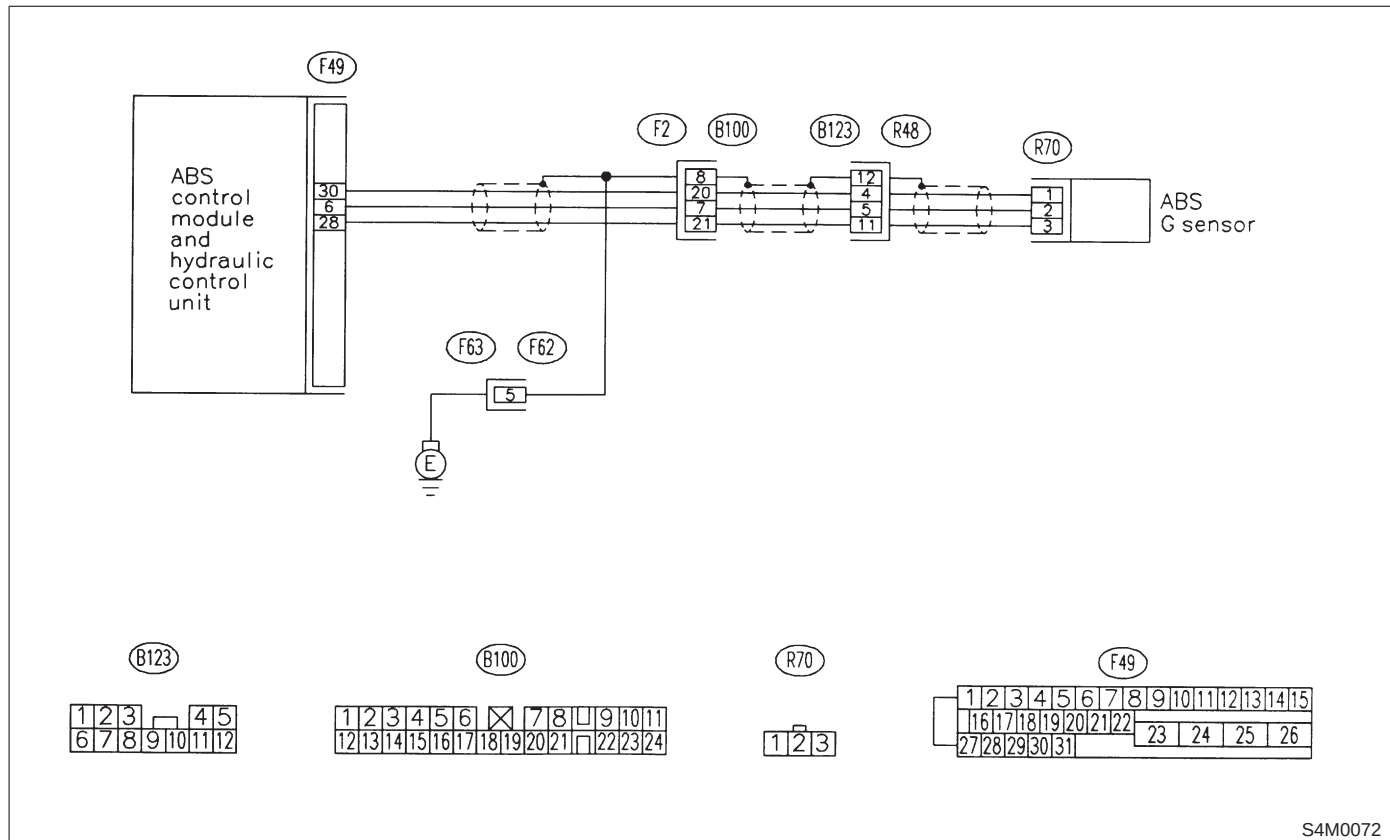
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



S4M0072

10AJ1 : CHECK ALL FOUR WHEELS FOR FREE TURNING.

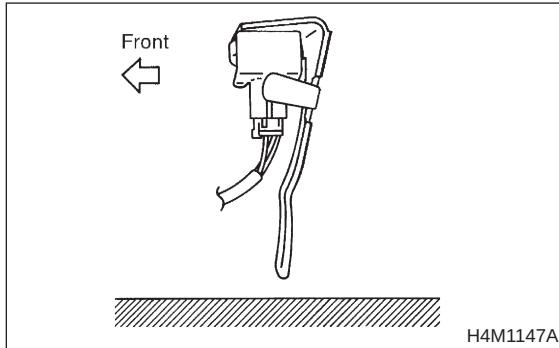
- CHECK** : *Have the wheels been turned freely such as when the vehicle is lifted up, or operated on a rolling road?*
- YES** : The ABS is normal. Erase the trouble code.
- NO** : Go to step 10AJ2.

10AJ2 : CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- 1) Select "Current data display & Save" on the select monitor.
 - 2) Read the select monitor display.
- CHECK** : *Is the G sensor output on the monitor display between 2.1 and 2.5 V when the vehicle is in horizontal position?*
- YES** : Go to step 10AJ3.
- NO** : Go to step 10AJ8.

10AJ3 : CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Remove G sensor from vehicle. (Do not disconnect connector.)
- 4) Turn ignition switch to ON.
- 5) Select "Current data display & Save" on the select monitor.
- 6) Read the select monitor display.



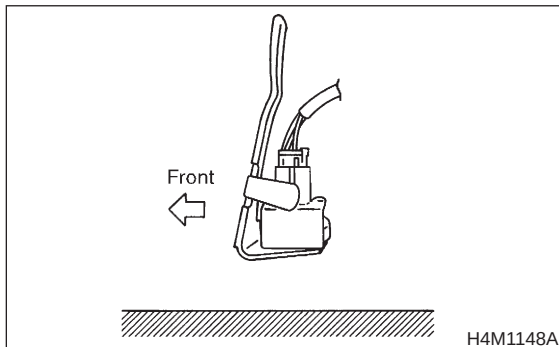
CHECK : *Is the G sensor output on the monitor display between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?*

YES : Go to step **10AJ4**.

NO : Replace G sensor.

10AJ4 : CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

Read the select monitor display.



CHECK : *Is the G sensor output on the monitor display between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?*

YES : Go to step **10AJ5**.

NO : Replace G sensor.

10AJ5 : CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between ABSCM&H/U and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10AJ6**.

10AJ6 : CHECK ABSCM&H/U.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10AJ7**.

10AJ7 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

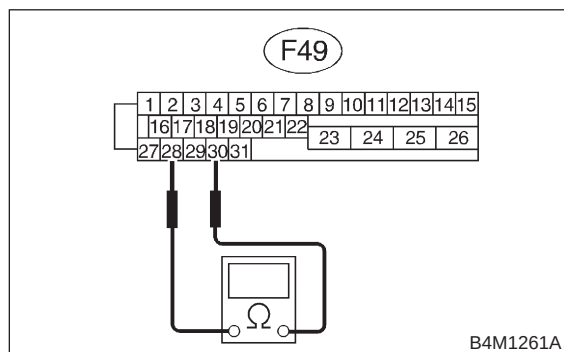
NO : A temporary poor contact.

10AJ8 : CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM&H/U.
- 3) Measure resistance between ABSCM&H/U connector terminals.

Connector & terminal

(F49) No. 30 — No. 28:



CHECK : Is the resistance between 4.3 and 4.9 kΩ?

YES : Go to step 10AJ9.

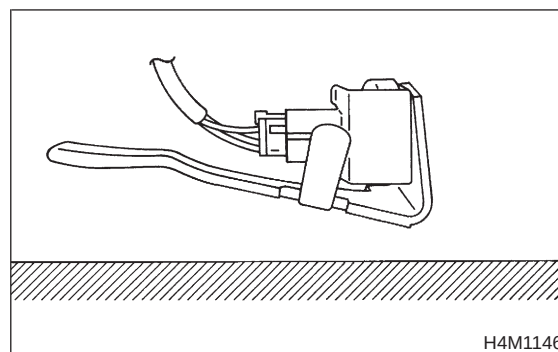
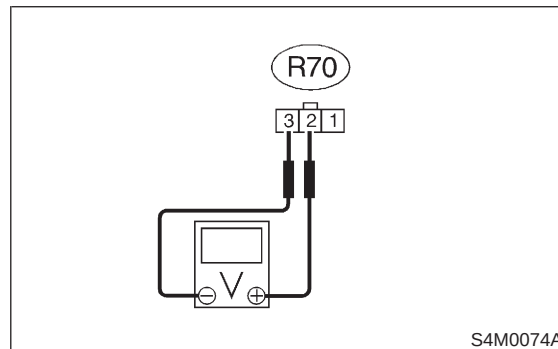
NO : Repair harness/connector between G sensor and ABSCM&H/U.

10AJ9 : CHECK G SENSOR.

- 1) Remove console box.
- 2) Remove G sensor from vehicle.
- 3) Connect connector to G sensor.
- 4) Connect connector to ABSCM&H/U.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between G sensor connector terminals.

Connector & terminal

(P11) No. 2 (+) — No. 1 (-):



CHECK : Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?

YES : Go to step 10AJ10.

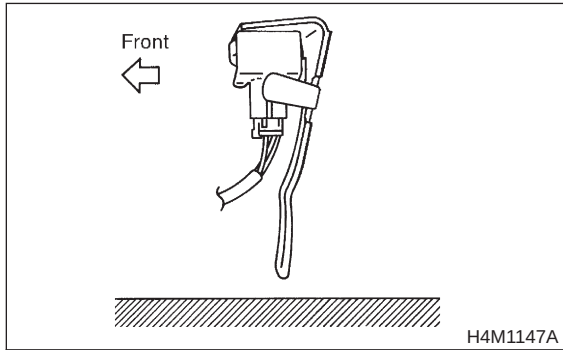
NO : Replace G sensor.

10AJ10 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal

(P11) No. 2 (+) — No. 1 (-):



CHECK : *Is the voltage between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?*

YES : Go to step **10AJ11**.

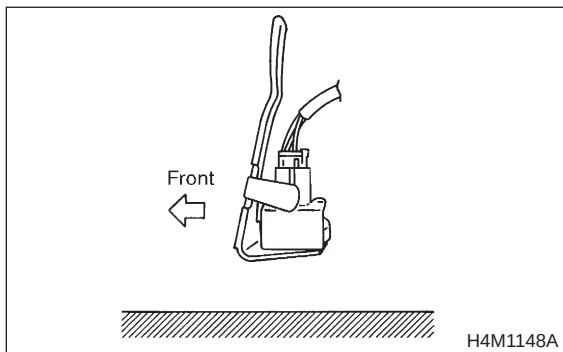
NO : Replace G sensor.

10AJ11 : CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal

(P11) No. 2 (+) — No. 1 (-):



CHECK : *Is the voltage between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?*

YES : Go to step **10AJ12**.

NO : Replace G sensor.

10AJ12 : CHECK ABSCM&H/U.

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors.
- 3) Erase the memory.
- 4) Perform inspection mode.
- 5) Read out the trouble code.

CHECK : *Is the same trouble code as in the current diagnosis still being output?*

YES : Replace ABSCM&H/U.

NO : Go to step **10AJ13**.

10AJ13 : CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

11. General Diagnostics Table

A: SYMPTOMS AND PROBABLE CAUSES

Symptom		Probable faulty units/parts
Vehicle instability during braking	Vehicle pulls to either side.	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Brake (caliper & piston, pads) ● Wheel alignment ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections ● Road surface (uneven, camber)
	Vehicle spins.	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Brake (pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
Poor braking	Long braking/stopping distance	● ABSCM&H/U (solenoid valve) ● Brake (pads) ● Air in brake line ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
	Wheel locks.	● ABSCM&H/U (solenoid valve, motor) ● ABS sensor ● Incorrect wiring or piping connections
	Brake dragging	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Master cylinder ● Brake (caliper & piston) ● Parking brake ● Axle & wheels ● Brake pedal play
	Long brake pedal stroke	● Air in brake line ● Brake pedal play
	Vehicle pitching	● Suspension play or fatigue (reduced damping) ● Incorrect wiring or piping connections ● Road surface (uneven)
	Unstable or uneven braking	● ABSCM&H/U (solenoid valve) ● ABS sensor ● Brake (caliper & piston, pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections ● Road surface (uneven)
Vibration and/or noise (while driving on slippery roads)	Excessive pedal vibration	● Incorrect wiring or piping connections ● Road surface (uneven)
	Noise from ABSCM&H/U	● ABSCM&H/U (mount bushing) ● ABS sensor ● Brake piping
	Noise from front of vehicle	● ABSCM & H/U (mount bushing) ● ABS sensor ● Master cylinder ● Brake (caliper & piston, pads, rotor) ● Brake piping ● Brake booster & check valve ● Suspension play or fatigue
	Noise from rear of vehicle	● ABS sensor ● Brake (caliper & piston, pads, rotor) ● Parking brake ● Brake piping ● Suspension play or fatigue

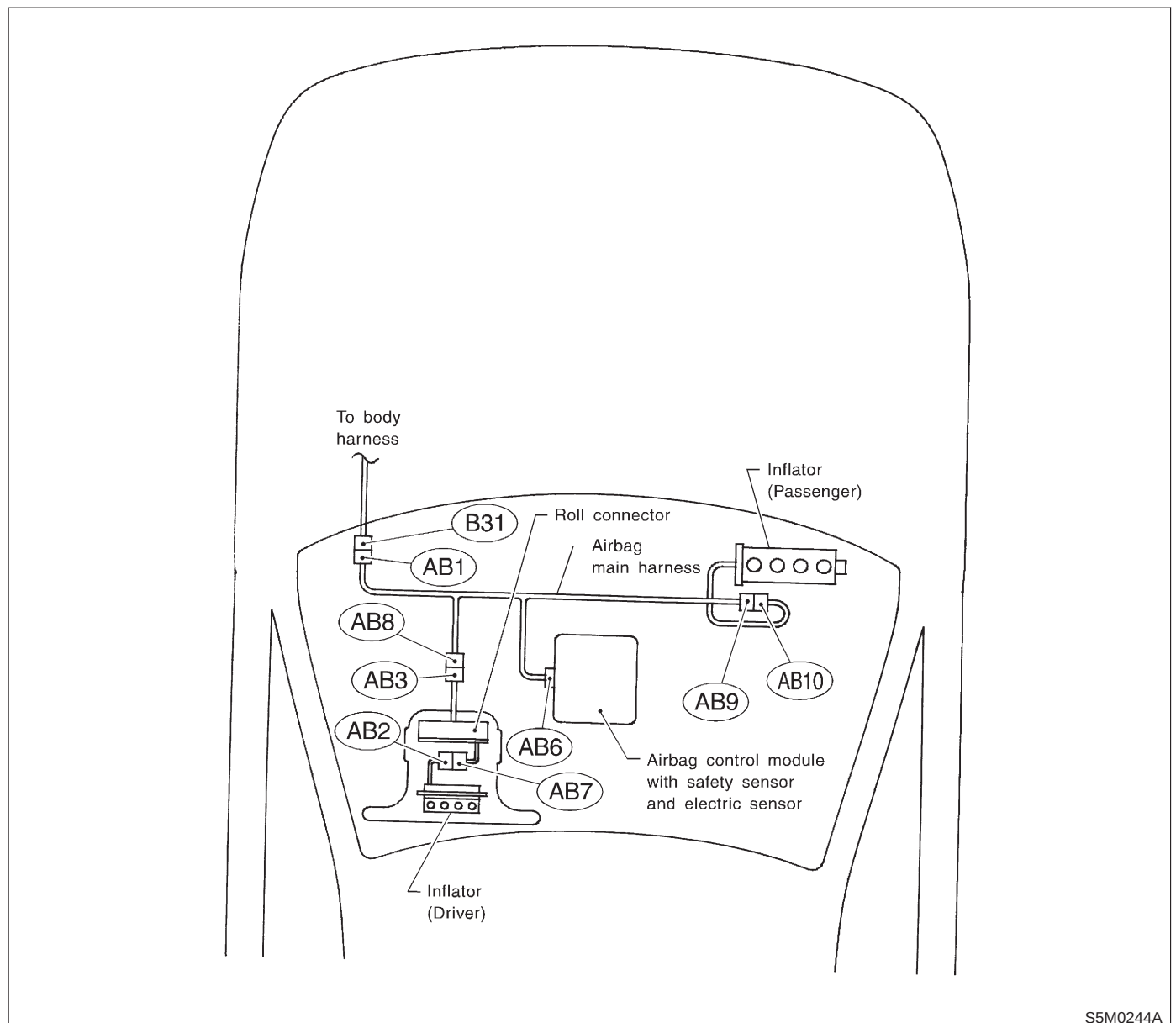
**B: CHECKING THE HYDRAULIC
UNIT OPERATION****11B1 : PREPARING THE BRAKE TESTER.**

CHECK : *Is the brake tester available?*

YES : CHECKING THE HYDRAULIC UNIT
ABS OPERATION WITH BRAKE
TESTER <Ref. to 4-4 [W14C2].>

NO : CHECKING THE HYDRAULIC UNIT
ABS OPERATION BY PRESSURE
GAUGE <Ref. to 4-4 [W14C1].>

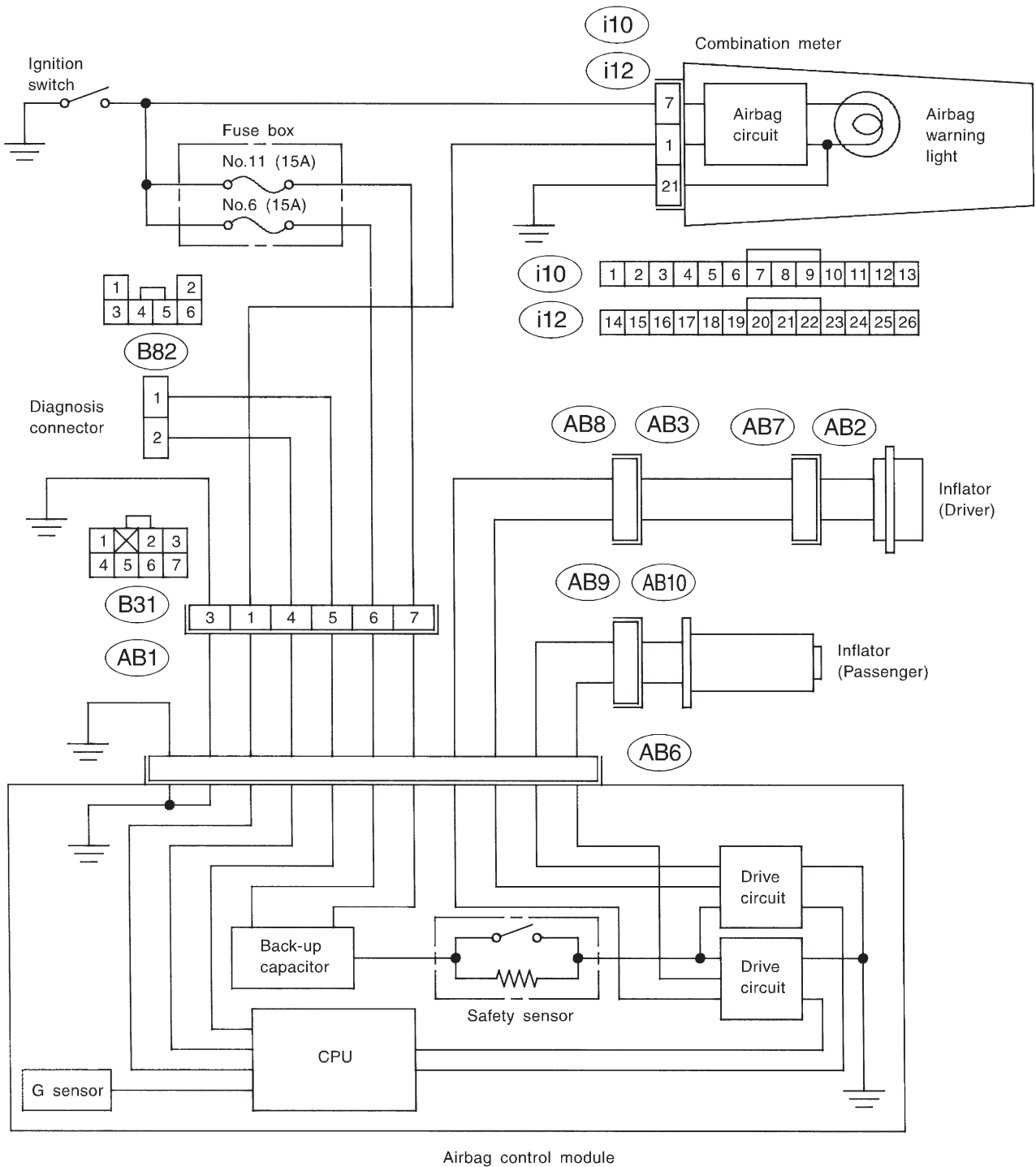
1. Electrical Components Location



S5M0244A

Connector No.	(AB1)	(AB2)	(AB3)	(AB6)	(AB7)	(AB8)	(AB9)	(AB10)
Pole	7	2	2	20	2	2	2	2
Color	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Male/Female	Male	Male	Male	Female	Female	Female	Female	Male

2. Schematic



S5M0245A

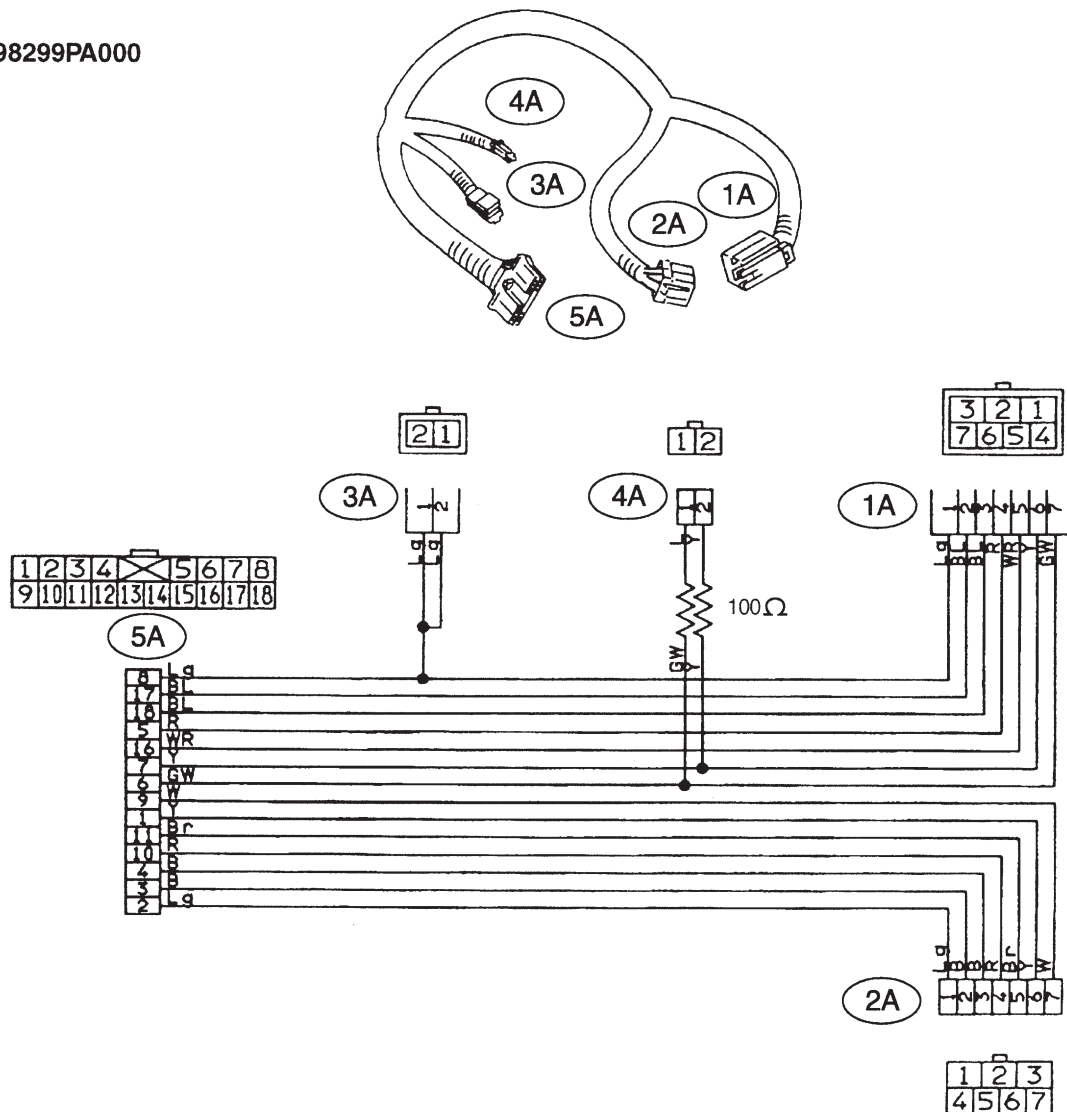
3. Tools for Diagnostics

CAUTION:

Be sure to use specified test harness A, E, F and G when measuring voltage, resistance, etc. of AIRBAG system component parts.

A: TEST HARNESS A

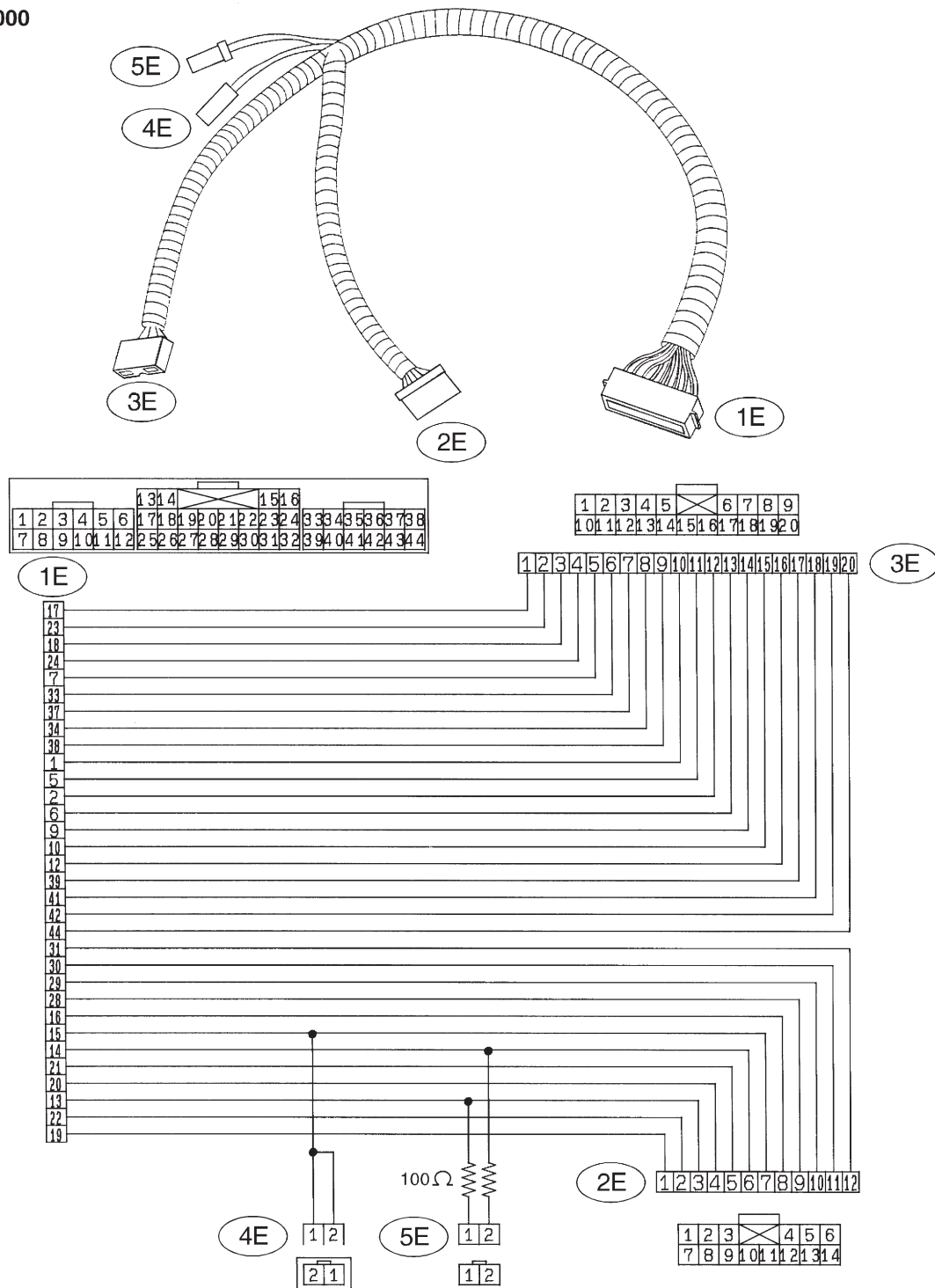
PN 98299PA000



B5M0112A

B: TEST HARNESS E

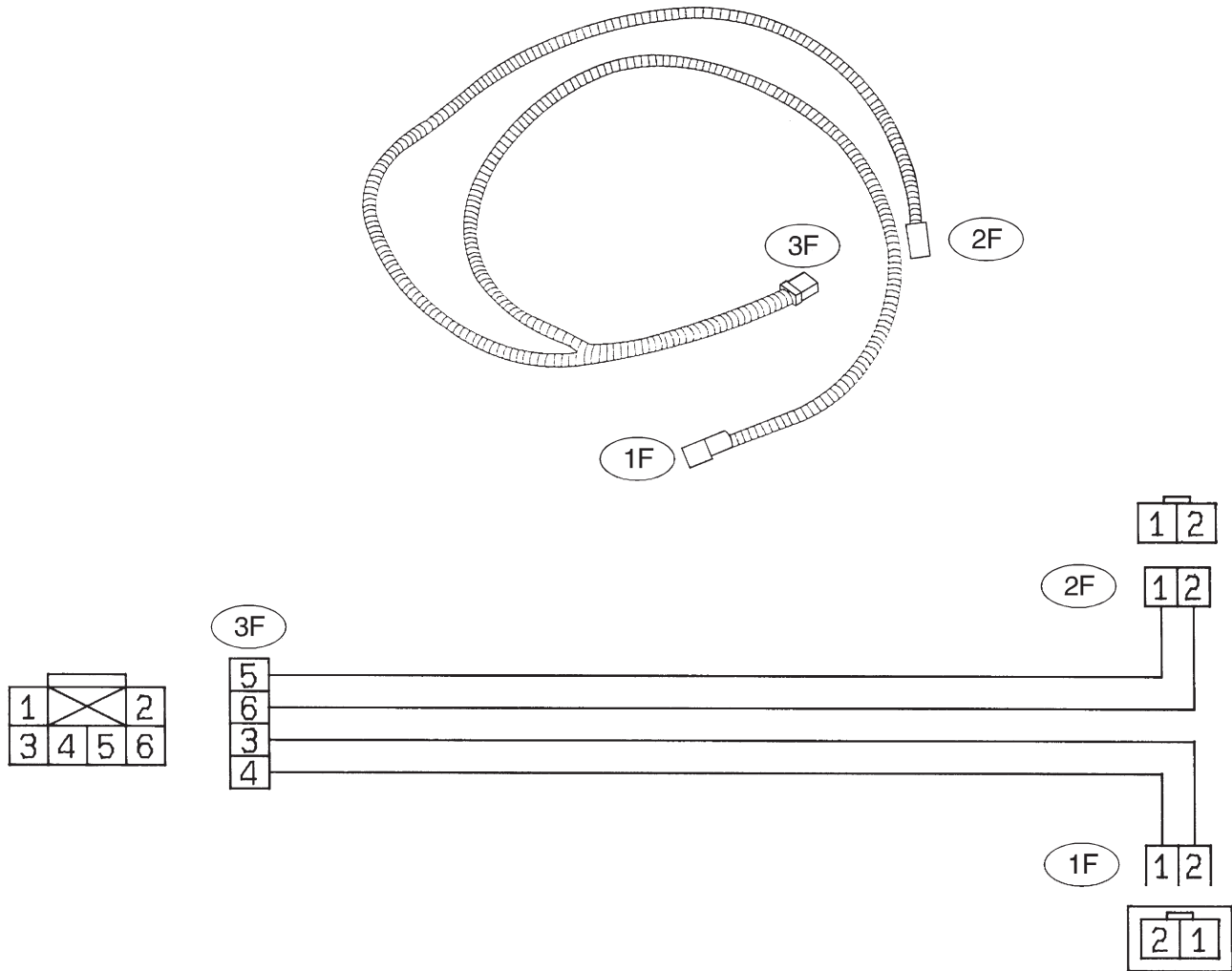
PN 98299FC000



S5M0246A

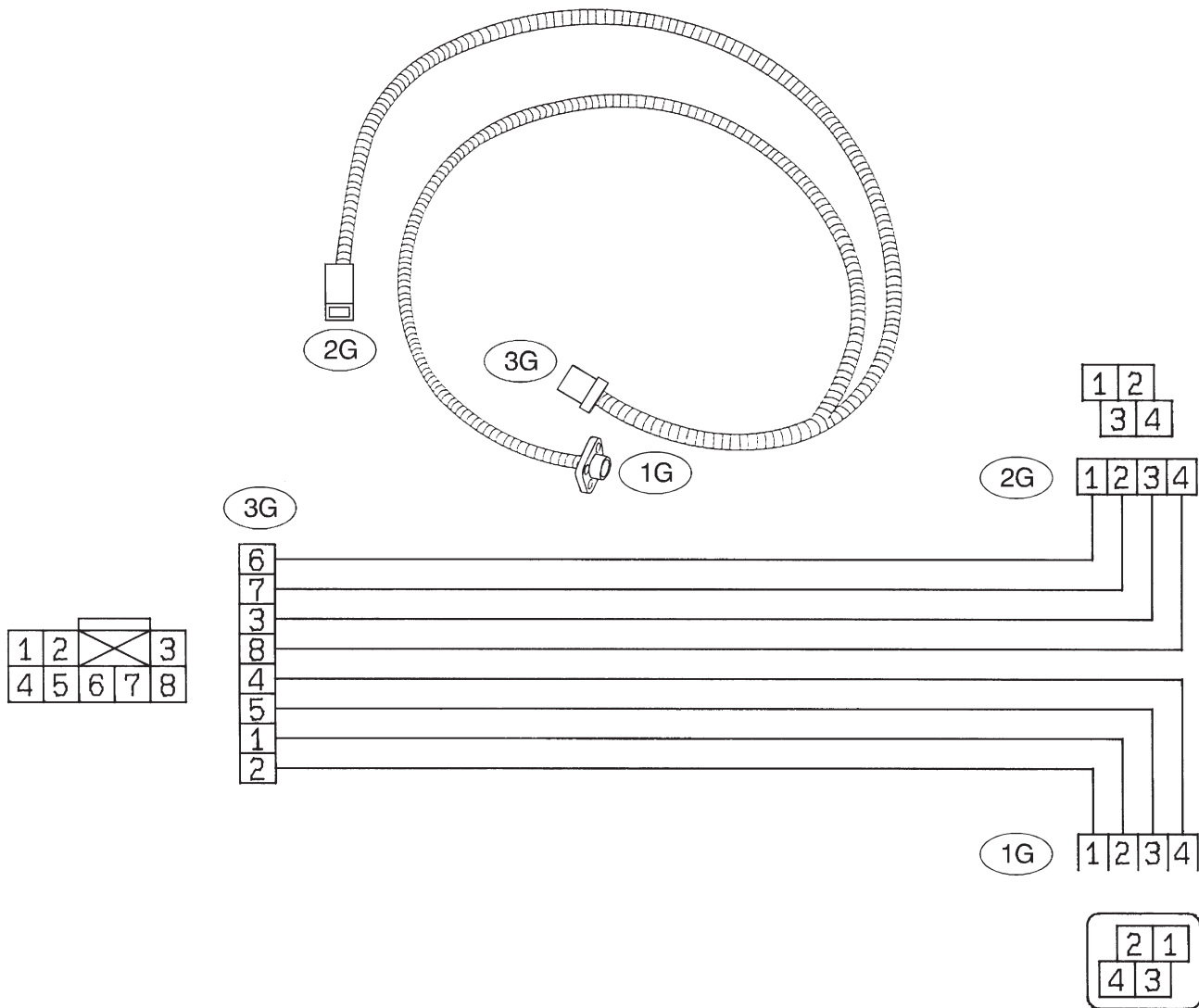
C: TEST HARNESS F

PN 98299FC010



S5M0247A

PN 98299FC020

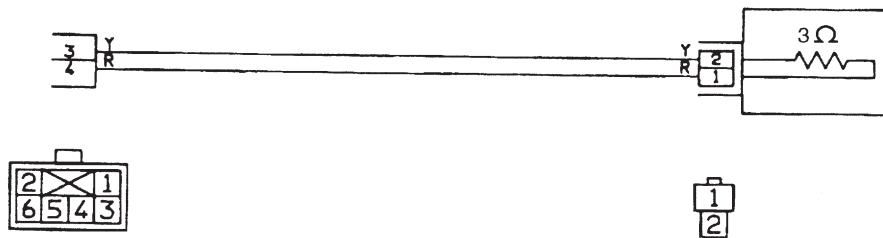
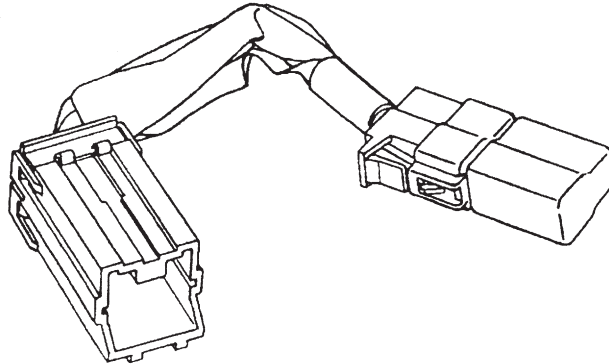


S5M0248A

E: AIRBAG RESISTOR

The airbag resistor is used during diagnostics. The airbag resistor has the same resistance as the airbag module and thus provides safety when used instead of the airbag module. It also makes it possible to finish, diagnostics in less time.

PN 98299PA040



B5M0114A

4. Diagnostics Chart for On-board Diagnostic System

A: BASIC DIAGNOSTICS PROCEDURE

4A1 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Airbag warning light comes ON.
- 2) Turn ignition switch to ON (engine OFF).
- 3) Check airbag warning light illuminates.

CHECK : *Does airbag warning light stay ON after about 7 seconds or remain OFF, or come back ON after 30 seconds?*

YES : Repair and replace. <Ref. to 5-5 [T4D0].>

NO : Go to step 4A2.

4A2 : CHECK TROUBLE CODE INDICATES.

Perform ON-BOARD DIAGNOSTICS. <Ref. to 5-5 [T4B0].>

CHECK : *Does trouble code indicate? <Ref. to 5-5 [T5A0].>*

YES : Repair and replace. <Ref. to 5-5 [T5Q0].> Then Go to step 4A3.

NO : Repair and replace. <Ref. to 5-5 [T5R0].> Then Go to step 4A3.

4A3 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to ON (engine OFF).
- 2) Check airbag warning light illuminates.

CHECK : *Does airbag warning light stay ON after about 7 seconds or come back ON after 30 seconds?*

YES : Repair and replace. <Ref. to 5-5 [T4D0].>

NO : Go to step 4A4.

4A4 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

Check airbag warning light illuminates.

CHECK : *Does airbag warning light come ON for about 7 seconds, then go out and stay out?*

YES : Perform clear memory. <Ref. to 5-5 [T4C0].>

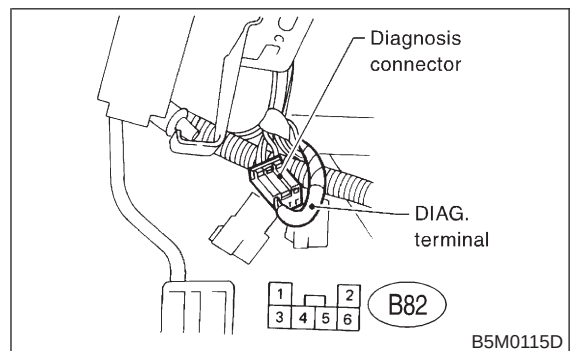
NO : Go to step 4A1.

B: ON-BOARD DIAGNOSTIC

When the airbag system is in functioning condition, the airbag warning light will remain on for about 7 seconds and go out when the ignition switch is set to ON.

If there is any malfunction, the airbag warning light will either stay on or off continuously. In such cases, perform on-board diagnostic in accordance with the specified procedure to determine trouble codes.

- 1) Turn ignition switch ON (with engine OFF).
- 2) Connect DIAG. terminal to No. 1 terminal of diagnosis connector located inside lower cover.



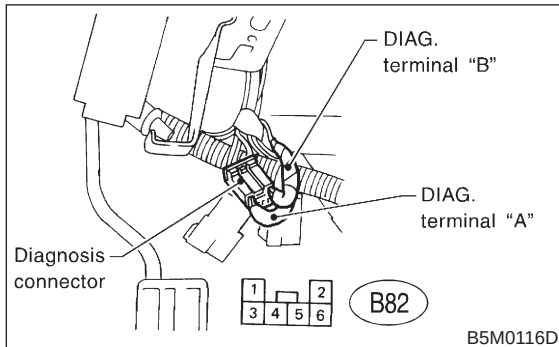
- 3) Check in accordance with the trouble code indicated by the AIRBAG warning light, and record the trouble codes.

- 4) Turn the ignition switch "OFF" and remove the DIAG. terminal from No.1 terminal of diagnosis connector.

C: CLEAR MEMORY

After eliminating problem as per trouble code, clear memory as follows:

- 1) Make sure ignition switch is ON (and engine off). Connect one DIAG. terminal "A" on diagnosis connector terminal No. 1.
While warning light is flashing, connect the other DIAG. terminal "B" on terminal No. 2 for at least three seconds.



- 2) After memory is cleared, normal warning light flashing rate resumes. (Warning light flashes every 0.6 seconds ON-OFF operation.) Memory cannot be cleared if any problem exists.
3) After clear memory and then DIAG. terminals "A" and "B", extract from diagnosis connector.

D: DIAGNOSTICS PROCEDURE

4D1 : CHECK TROUBLE CODE INDICATES.

- 1) Perform on-board diagnostic. <Ref. to 5-5 [T4B0].>
2) Check trouble code indicates.

- CHECK** : **Are trouble codes 4, 12, 13, 22, 34, 41, 42, or 43 indicated? <Ref. to 5-5 [T5A2].>**
- YES** : Go to step 4D2.
- NO** : Perform diagnostics and repair according to indicated trouble code. <Ref. to 5-5 [T5A0].> Then Go to step 4D10.

4D2 : CHECK TROUBLE CODE INDICATES.

Check trouble code indicates.

- CHECK** : **Are trouble codes 4, 22, 34, 42 indicated? <Ref. to 5-5 [T5A2].>**
- YES** : Go to step 4D3.
- NO** : Go to step 4D7.

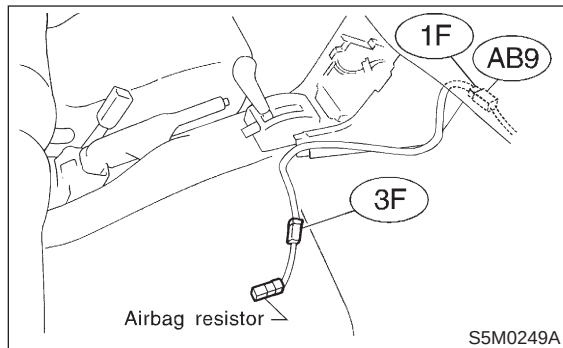
4D3 : CHECK TROUBLE CODE INDICATES.

Check trouble code indicates.

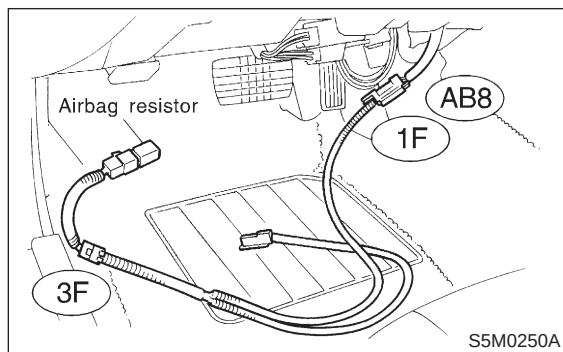
- CHECK** : **Are trouble codes 12, 13, 41, 43 indicated? <Ref. to 5-5 [T5A2].>**
- YES** : Go to step 4D4.
- NO** : Go to step 4D8.

4D4 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to OFF. Disconnect battery ground cable, and wait 20 seconds.
- 2) Remove glove box <Ref. to 5-4 [W1A0].> and disconnect passenger's airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].>
- 3) Connect test harness F connector (1F) to (AB9).
- 4) Connect airbag resistor to test harness F connector (3F).



- 5) Remove lower cover panel <Ref. to 5-4 [W1A0].> and connect test harness F connector (1F) to (AB8) with airbag resistor attached to test harness F connector (3F).



- 6) Connect battery ground cable and turn ignition switch to ON.
- 7) Check airbag warning light illuminates.

NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

CHECK : *Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?*

YES : Go to step 4D5.

NO : Perform diagnostics and repair according to indicated trouble code. <Ref. to

5-5 [T5A0].> Then Go to step 4D10.

4D5 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to OFF. Disconnect battery ground cable, and wait 20 seconds.
- 2) Connect passenger's airbag module connector (AB9) to (AB10).
- 3) Connect battery ground cable and turn ignition switch to ON.
- 4) Check airbag warning light illuminates.

NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

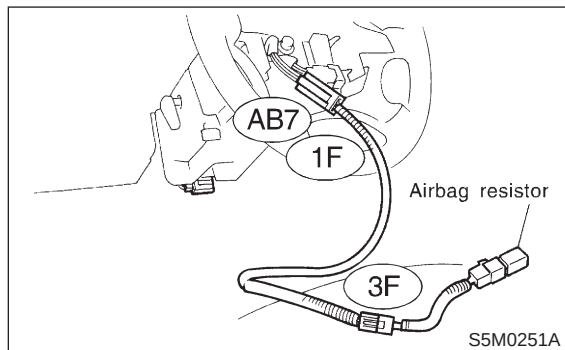
CHECK : *Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?*

YES : Go to step 4D6.

NO : Replace with a new passenger's airbag module. <Ref. to 5-5 [W3A2].> Then Go to step 4D5.

4D6 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to "OFF". Disconnect battery ground cable, and wait 20 seconds.
- 2) Connect connector (AB8) to (AB3).
- 3) Remove driver's airbag module and connect test harness F connector (1F) to (AB7). <Ref. to 5-5 [W3A1].>
- 4) Connect airbag resistor to test harness F connector (3F).



- 5) Connect battery ground cable and turn ignition switch to ON.
- 6) Check airbag warning light illuminates.

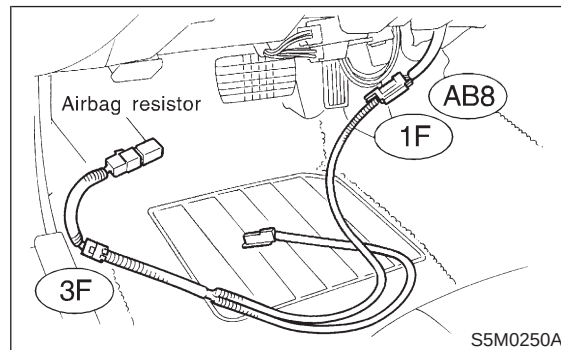
NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

- CHECK** : **Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?**
- YES** : Replace with a new driver's airbag module. <Ref. to 5-5 [W3A1].> Then Go to step **4D10**.
- NO** : Replace with a new combination switch. <Ref. to 5-5 [W600].> and install driver's airbag module. <Ref. to 5-5 [W3A1].> Then Go to step **4D9**.

4D7 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to OFF. Disconnect battery ground cable, and wait 20 seconds.
- 2) Remove lower cover panel and connect test harness F connector (1F) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness F connector (3F).



- 3) Connect battery ground cable and turn ignition switch to ON.
- 4) Check airbag warning light illuminates.

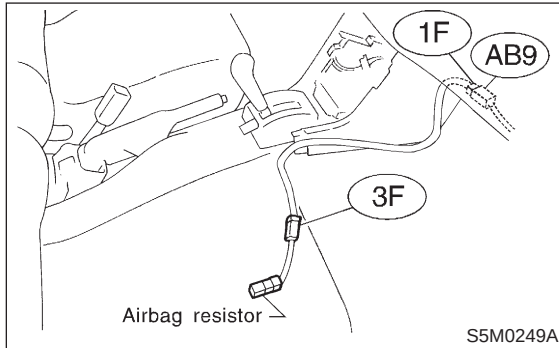
NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

- CHECK** : **Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?**
- YES** : Go to step **4D6**.
- NO** : Perform diagnostics and repair according to indicated trouble code. <Ref. to 5-5 [T5A0].> Then Go to step **4D10**.

4D8 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to OFF. Disconnect battery ground cable, and wait 20 seconds.
- 2) Disconnect passenger's airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].>
- 3) Connect test harness F connector (1F) to (AB9).
- 4) Connect airbag resistor to test harness F connector (3F).



- 5) Connect battery ground cable and turn ignition switch to ON.
- 6) Check airbag warning light illuminates.

NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

- CHECK** : *Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?*
- YES** : Replace with a new passenger's airbag module. <Ref. to 5-5 [W3A2].> Then Go to step **4D10**.
- NO** : Perform diagnostics and repair according to indicated trouble code. <Ref. to 5-5 [T5A0].> Then Go to step **4D10**.

4D9 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Connect battery ground cable and turn ignition switch to ON.
- 2) Check airbag warning light illuminates.

NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

- CHECK** : *Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?*
- YES** : Perform clear memory. <Ref. to 5-5 [T4C0].>
- NO** : Replace with a new driver's airbag module. <Ref. to 5-5 [W3A1].> Then Go to step **4D10**.

4D10 : CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Connect battery ground cable and turn ignition switch to ON.
- 2) Check airbag warning light illuminates.

NOTE:

In some cases the airbag warning light will go OFF after about 7 seconds but will turn ON again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.

- CHECK** : *Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds?*
- YES** : Perform clear memory. <Ref. to 5-5 [T4C0].>
- NO** : Then Go to step **4D1**.

5. Diagnostics Chart with Trouble Code

A: TROUBLE CODES

1. LIST OF TROUBLE CODES

Trouble code/ Contents of troubles	Memory function	Contents of diagnosis	Index No.
04	Provided.	● Airbag main harness circuit is shorted. ● Passenger's airbag module harness circuit is shorted. ● Airbag control module is faulty.	<Ref. to 5-5 [T5B0].>
11	Provided.	● Airbag control module is faulty. ● Airbag main harness circuit is open. ● Fuse No. 6 (in joint box) is blown. ● Body harness circuit is open.	<Ref. to 5-5 [T5C0].>
12	Provided.	● Airbag main harness circuit is open. ● Driver's airbag module harness circuit is open. ● Roll connector circuit is open. ● Airbag control module is faulty.	<Ref. to 5-5 [T5D0].>
13	Provided.	● Airbag main harness circuit is shorted. ● Driver's airbag module harness is shorted. ● Roll connector circuit is shorted. ● Airbag control module is faulty.	<Ref. to 5-5 [T5E0].>
14	Not provided.	(AB6) is not connected properly to airbag control module.	<Ref. to 5-5 [T5F0].>
21	Provided.	Airbag control module is faulty.	<Ref. to 5-5 [T5G0].>
22	Provided.	● Airbag main harness circuit is open. ● Passenger's airbag module harness circuit is open. ● Airbag control module is faulty.	<Ref. to 5-5 [T5H0].>
31	Not provided.	● Airbag control module is faulty. ● Airbag main harness circuit is open. ● Fuse No. 11 (in joint box) is blown. ● Body harness circuit is open.	<Ref. to 5-5 [T5I0].>
33	Provided.	Airbag module is inflated.	<Ref. to 5-5 [T5J0].>
34	Provided.	● Passenger's airbag main harness circuit is shorted to power supply. ● Passenger's airbag module harness is shorted to power supply. ● Airbag control module is faulty.	<Ref. to 5-5 [T5K0].>
41	Provided.	● Driver's airbag main harness circuit is shorted to ground. ● Driver's airbag module harness circuit is shorted to ground. ● Roll connector circuit is shorted to ground. ● Airbag control module is faulty.	<Ref. to 5-5 [T5L0].>
42	Provided.	● Passenger's airbag main harness circuit is shorted to ground. ● Passenger's airbag module harness circuit is shorted to ground. ● Airbag control module is faulty.	<Ref. to 5-5 [T5M0].>
43	Provided.	● Driver's airbag main harness circuit is shorted to power supply. ● Driver's airbag module harness is shorted to power supply. ● Roll connector is shorted to power supply. ● Airbag control module is faulty.	<Ref. to 5-5 [T5N0].>

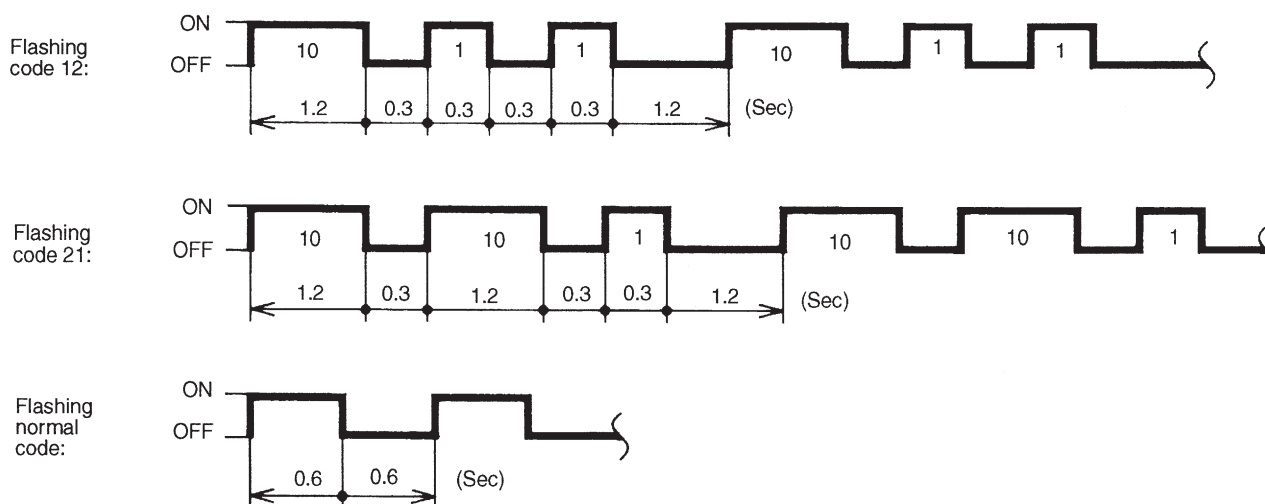
Trouble code/ Contents of troubles	Memory function	Contents of diagnosis	Index No.
Airbag warning light remains on.	Not provided.	● Airbag warning light is faulty. ● Airbag control module to airbag warning light harness circuit is shorted or open. ● Grounding circuit is faulty. ● Airbag control module is faulty. ● (AB1) and (B31) are not connected properly. ● (AB6) is not connected properly to airbag control module.	<Ref. to 5-5 [T5O0].>
Airbag warning light remains off.	Not provided.	● Fuse No. 5 (in main fuse box) is blown. ● Body harness circuit is open. ● Airbag warning light is faulty. ● Airbag main harness is faulty. ● Airbag control module is faulty.	<Ref. to 5-5 [T5P0].>
Warning light indicates trouble code, then normal code. (Flashing trouble code.)	Provided.	Airbag system component parts are faulty.	<Ref. to 5-5 [T5Q0].>
Warning light indicates trouble code, then normal code. (Flashing normal code.)	Not provided.	● Airbag connector is faulty. ● Fuse No. 11 (in joint box) is blown. ● Airbag main harness is faulty. ● Airbag control module is faulty. ● Body harness is faulty.	<Ref. to 5-5 [T5R0].>

2. HOW TO READ TROUBLE CODES

The AIRBAG warning light flashes a code corresponding to the faulty parts.

The long segment (1.2 sec on) indicates a “ten”, and the short segment (0.3 sec on) indicates a “one”.

Example:



B5M0117A

B: TROUBLE CODE 04**DIAGNOSIS:**

- Airbag main harness circuit is shorted.
- Airbag module harness (Passenger) circuit is shorted.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

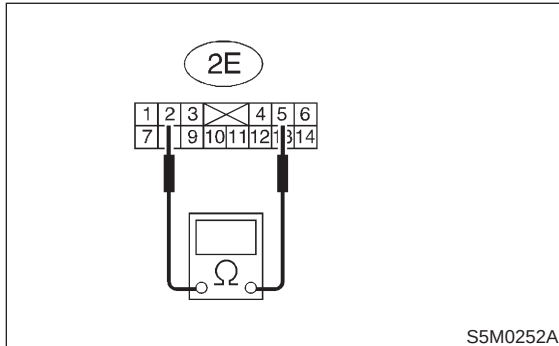
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

5B1 : AIRBAG MAIN HARNESS INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).
- 2) Measure resistance between test harness E connector (2E) terminal.

Connector & terminal

(2E) No. 2 — (2E) No. 5:



CHECK : Is resistance more than 10 kΩ?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

C: TROUBLE CODE 11**DIAGNOSIS:**

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 6 is blown. (In joint box)
- Body harness circuit is open.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

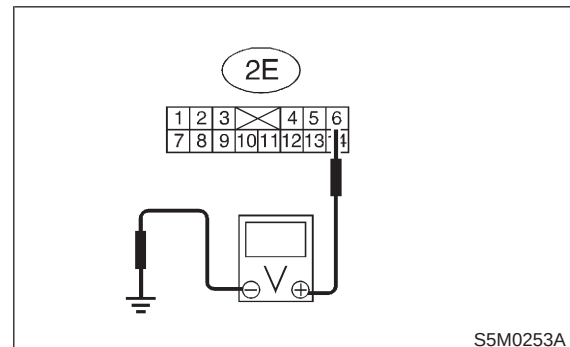
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

5C1 : AIRBAG CONTROL MODULE INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].> and connect it to test harness E connector (1E).
- 2) Connect battery ground cable and turn ignition switch "ON". (engine off)
- 3) Measure voltage across connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 6 (+) — Chassis ground (-):



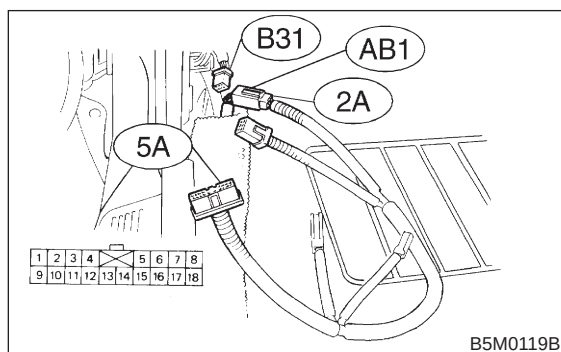
CHECK : Is voltage more than 10 V?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Go to step 5C2.

5C2 : AIRBAG MAIN HARNESS INSPECTION

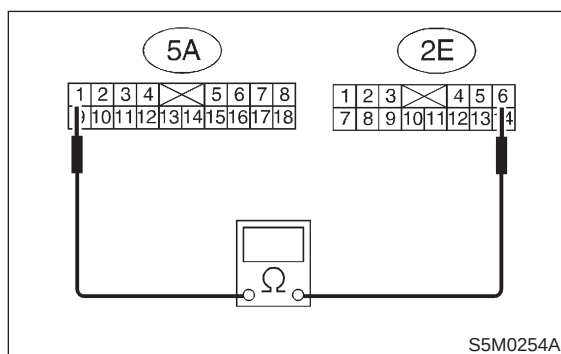
- 1) Go to following procedure after performing diagnostics on airbag system as per diagnosis procedure under "5C1 AIRBAG CONTROL MODULE INSPECTION" <Ref. to 5-5 [T5C1].> previously outlined.
- 2) Turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.
- 3) Disconnect body harness connector (B31) from connector (AB1) at front lower pillar, and connect connector (AB1) to test harness A connector (2A).



- 4) Measure resistance between test harness A connector (5A) terminal and test harness E connector (2E) terminal.

Connector & terminal

(5A) No. 1 — (2E) No. 6:



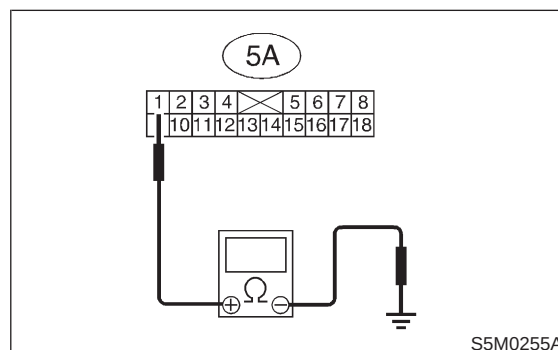
- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 5C3.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5C3 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between (5A) connector terminal and chassis ground.

Connector & terminal

(5A) No. 1 (+) — Chassis ground (-):



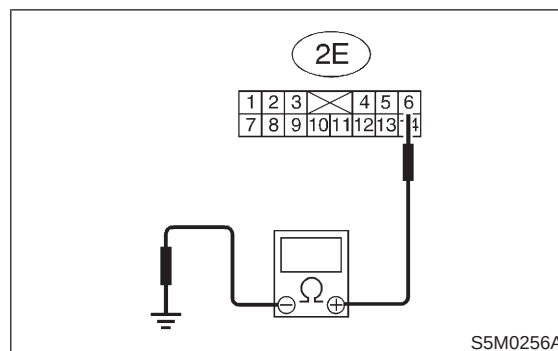
- CHECK** : Is resistance more than 10 kΩ?
- YES** : Go to step 5C4.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5C4 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between (2E) connector terminal and chassis ground.

Connector & terminal

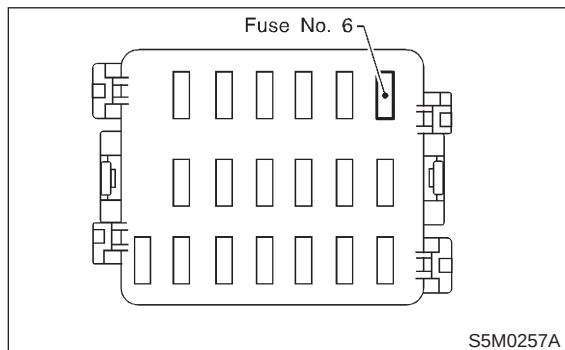
(2E) No. 6 (+) — Chassis ground (-):



- CHECK** : Is resistance more than 10 kΩ?
- YES** : Go to step 5C5.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5C5 : FUSE NO. 6 (IN JOINT BOX) INSPECTION

- 1) Turn ignition switch "OFF".
- 2) Remove and visually check fuse No. 6 (in joint box).



- CHECK** : **Is fuse No. 6 blown?**
- YES** : Replace fuse No. 6 if fuse No. 6 blows again, repair body harness.
- NO** : Repair body harness.

D: TROUBLE CODE 12
DIAGNOSIS:

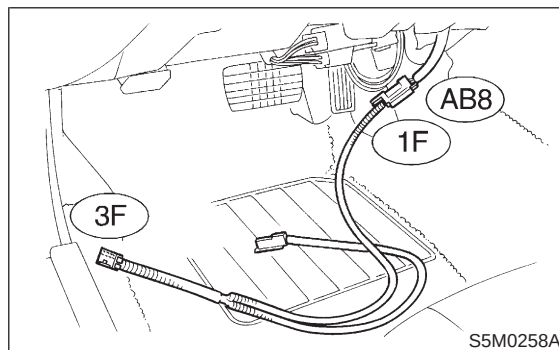
- Airbag main harness circuit is open.
- Airbag module harness (Driver) circuit is open.
- Roll connector circuit is open.
- Airbag control module is faulty.

CAUTION:

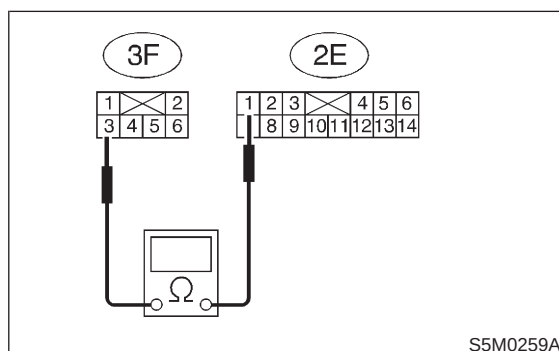
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

5D1 : AIRBAG MAIN HARNESS INSPECTION

- 1) Remove lower cover panel <Ref. to 5-4 [W1A0].>, and connect connector (AB8) below steering column to test harness F connector (1F).



- 2) Disconnect connector (AB6) <Ref. to 5-5 [W5A0].> from airbag control module, and connect it to test harness E connector (1E) terminal.
- 3) Measure resistance between test harness E connector (2E) and test harness F connector (3F) terminals.

**Connector & terminal
(2E) No. 1 — (3F) No. 3:**


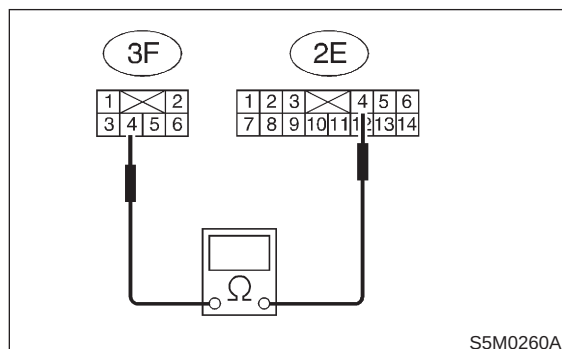
- CHECK** : **Is resistance less than 10 Ω?**
- YES** : Go to step 5D2.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5D2 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between test harness E connector (2E) and test harness F connector (3F) terminals.

Connector & terminal

(2E) No. 4 — (3F) No. 4:



CHECK : Is resistance less than 10 Ω?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

E: TROUBLE CODE 13

DIAGNOSIS:

- Airbag main harness circuit is shorted.
- Airbag module harness (Driver) is shorted.
- Roll connector circuit is shorted.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

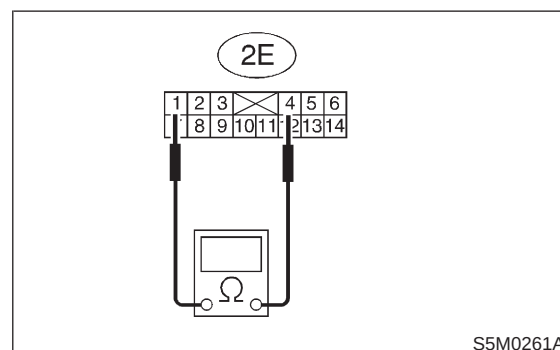
5E1 : AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).

2) Measure resistance between test harness E connector (2E) terminal.

Connector & terminal

(2E) No. 1 — (2E) No. 4:



CHECK : Is resistance more than 10 kΩ?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

F: TROUBLE CODE 14

DIAGNOSIS:

(AB6) is not connected properly to airbag control module.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

5F1 : CHECK POOR CONTACT IN CONNECTOR (AB6).

Check connector (AB6) connected to airbag control module. <Ref. to 5-5 [W5A0].>

CHECK : Is there poor contact in connector (AB6)?

YES : Repair poor contact in connector (AB6).

NO : Replace airbag control module. <Ref. to 5-5 [W5A0].>

G: TROUBLE CODE 21**DIAGNOSIS:**

Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5 [W5A0].>

5G1 : CHECK IF TROUBLE CODE 21 IS INDICATED.

Confirm flashing trouble code according to "BASIC DIAGNOSTICS PROCEDURE". <Ref. to 5-5 [T4A0].>

- CHECK** : **Is airbag warning light trouble code 21 indicated?**
- YES** : Replace airbag control module. <Ref. to 5-5 [W5A0].>
- NO** : Perform clear memory. <Ref. to 5-5 [T4C0].>

H: TROUBLE CODE 22**DIAGNOSIS:**

- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.

CAUTION:

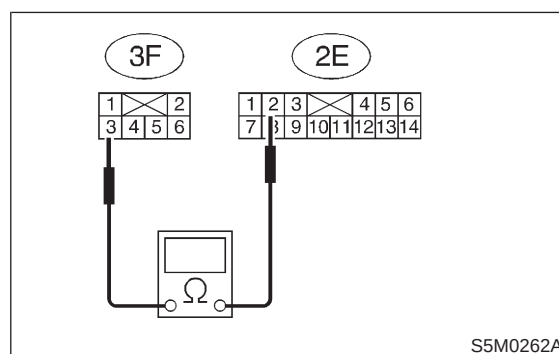
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

5H1 : AIRBAG MAIN HARNESS INSPECTION

- 1) Remove glove box. <Ref. to 5-4 [W1A0].>
- 2) Disconnect connector (AB9) and (AB10) <Ref. to 5-5 [W3A2].> and connect connector (AB9) to test harness F connector (1F).
- 3) Disconnect connector (AB6) <Ref. to 5-5 [W5A0].> from airbag control module, and connect it to test harness E connector (1E) terminal.
- 4) Measure resistance between test harness E connector (2E) and test harness F connector (3F) terminals.

Connector & terminal

(2E) No. 2 — (3F) No. 3:



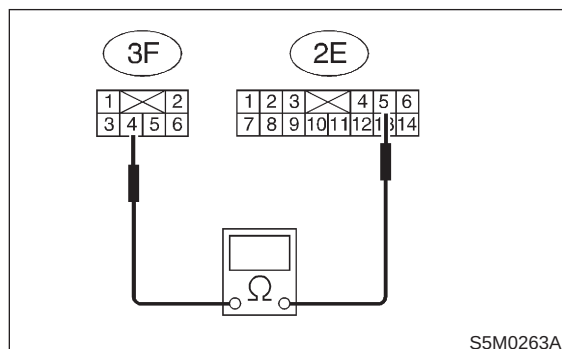
- CHECK** : **Is resistance less than 10 Ω?**
- YES** : Go to step 5H2.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5H2 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between test harness E connector (2E) and test harness F connector (3F) terminals.

Connector & terminal

(2E) No. 5 — (3F) No. 4:



CHECK : Is resistance less than 10 Ω?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

I: TROUBLE CODE 31

DIAGNOSIS:

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 11 is blown. (In joint box)
- Body harness circuit is open.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

5I1 : AIRBAG CONTROL MODULE INSPECTION

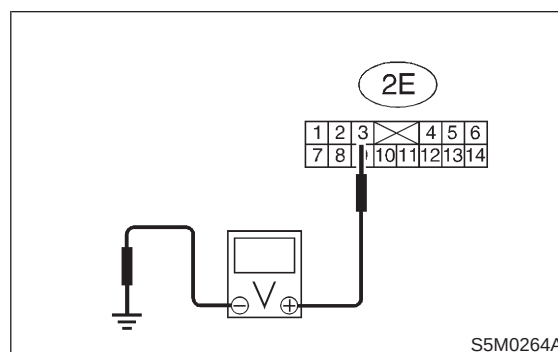
1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).

2) Connect battery ground cable and turn ignition switch "ON" (engine off).

3) Measure voltage across connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 3 (+) — Chassis ground (-):



CHECK : Is voltage more than 10 V?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Go to step 5I2.

5I2 : AIRBAG MAIN HARNESS INSPECTION

1) Go to following procedure after performing diagnostics on airbag system as per diagnosis procedure under "5I1 AIRBAG CONTROL MODULE INSPECTION" <Ref. to 5-5 [T5I1].> previously outlined.

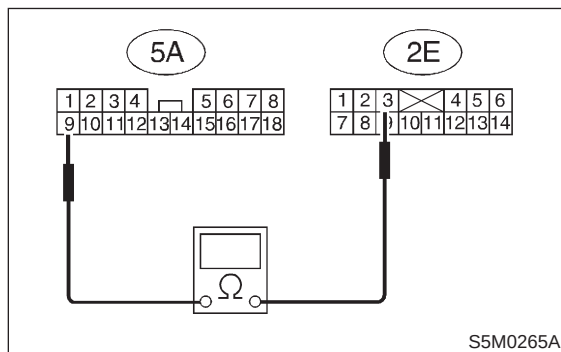
2) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

3) Disconnect connector (AB1) from body harness connector (B31) at front lower pillar (driver side), and connect connector (AB1) to test harness A connector (2A).

4) Measure resistance between test harness A connector (5A) and test harness E connector (2E) terminals.

Connector & terminal

(5A) No. 9 — (2E) No. 3:



CHECK : **Is resistance less than 10 Ω?**

YES : Go to step 5I3.

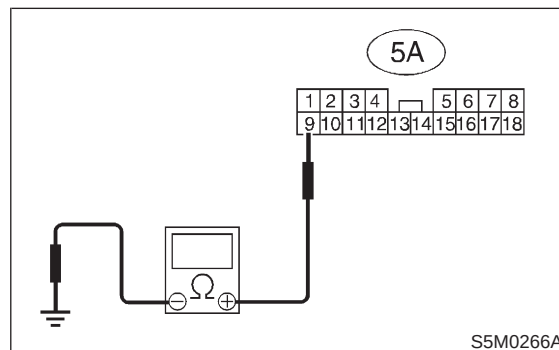
NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5I3 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between each terminal of connectors (5A) and chassis ground.

Connector & terminal

(5A) No. 9 (+) — Chassis ground (-):



CHECK : **Is resistance more than 10 kΩ?**

YES : Go to step 5I4.

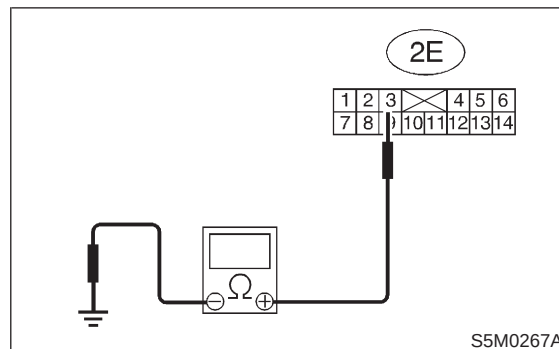
NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5I4 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between each terminal of connectors (2E) and chassis ground.

Connector & terminal

(2E) No. 3 (+) — Chassis ground (-):



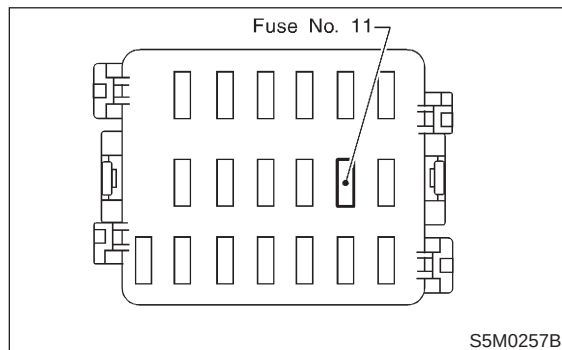
CHECK : **Is resistance more than 10 kΩ?**

YES : Go to step 5I5.

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5I5 : FUSE NO. 11 (IN JOINT BOX) INSPECTION

Make sure ignition switch is turned "OFF", then remove and visually check fuse No. 11 (in joint box).



- CHECK** : *Is fuse No. 11 blown?*
- YES** : Replace fuse No. 11. If fuse No. 11 blows again, repair body harness.
- NO** : Repair body harness.

J: TROUBLE CODE 33

DIAGNOSIS:

Airbag module is inflated.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5 [W5A0].>

5J1 : CHECK IF TROUBLE CODE 33 IS INDICATED.

Confirm flashing trouble code according to "BASIC DIAGNOSTICS PROCEDURE". <Ref. to 5-5 [T4A0].>

- CHECK** : *Is airbag warning light trouble code 33 indicated?*
- YES** : Replace airbag control module. <Ref. to 5-5 [W5A0].>
- NO** : Perform clear memory. <Ref. to 5-5 [T4C0].>

K: TROUBLE CODE 34

DIAGNOSIS:

- Airbag main harness circuit (Passenger) is shorted to power supply.
- Airbag module harness (Passenger) is shorted to power supply.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.

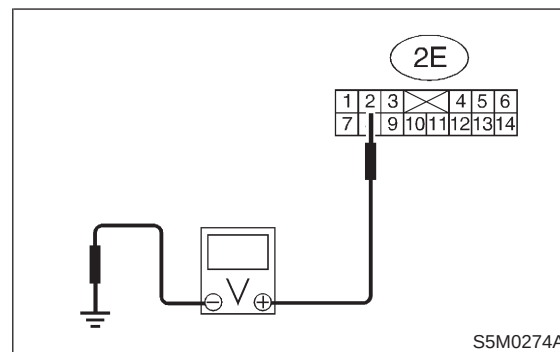
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

5K1 : AIRBAG MAIN HARNESS INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).
- 2) Connect battery ground cable and turn ignition switch "ON" (engine off).
- 3) Measure voltage across each test harness E connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 2 (+) — Chassis ground (-):



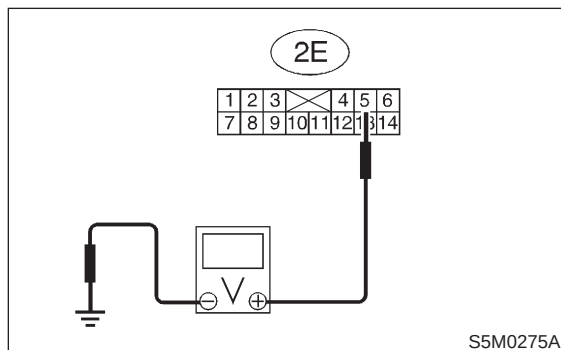
- CHECK** : *Is voltage less than 1 V?*
- YES** : Go to step 5K2.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5K2 : AIRBAG MAIN HARNESS INSPECTION

Measure voltage across each test harness E connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 5 (+) — Chassis ground (-):



- CHECK** : **Is voltage less than 1 V?**
- YES** : Replace airbag control module. <Ref. to 5-5 [W5A0].>
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

L: TROUBLE CODE 41
DIAGNOSIS:

- Airbag main harness circuit (Driver) is shorted to ground.
- Airbag module harness (Driver) is shorted to ground.
- Roll connector circuit is shorted to ground.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

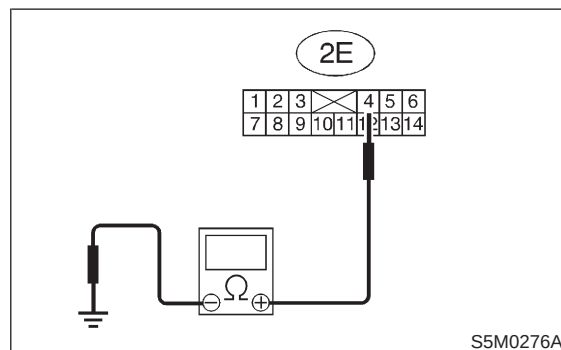
5L1 : AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).

2) Measure resistance between test harness E connector (2E) terminals and chassis ground.

Connector & terminal

(2E) No. 4 (+) — Chassis ground (-):



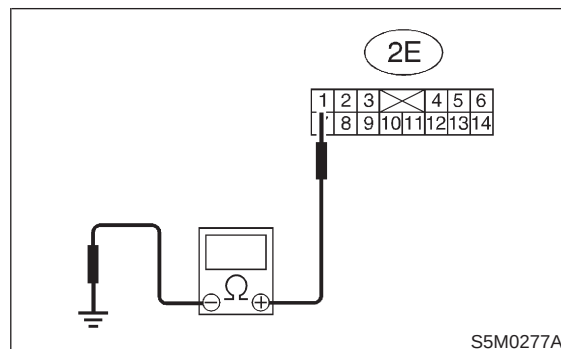
- CHECK** : **Is resistance more than 200 Ω?**
- YES** : Go to step **5L2**.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5L2 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between test harness E connector (2E) terminals and chassis ground.

Connector & terminal

(2E) No. 1 (+) — Chassis ground (-):



- CHECK** : **Is resistance more than 200 Ω?**
- YES** : Replace airbag control module. <Ref. to 5-5 [W5A0].>
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

M: TROUBLE CODE 42

DIAGNOSIS:

- Airbag main harness circuit (Passenger) is shorted to ground.
- Airbag module harness circuit (Passenger) is shorted to ground.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

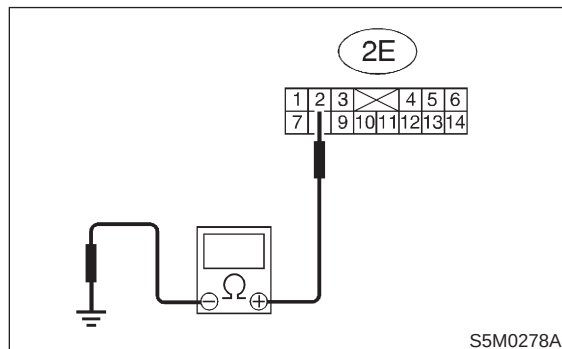
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

5M1 : AIRBAG MAIN HARNESS INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).
- 2) Measure resistance between test harness E connector (2E) terminals and chassis ground.

Connector & terminal

(2E) No. 2 (+) — Chassis ground (-):



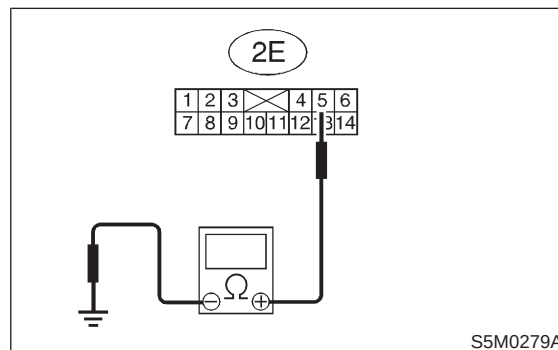
- CHECK** : Is resistance more than 200 Ω?
- YES** : Go to step 5M2.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5M2 : AIRBAG MAIN HARNESS INSPECTION

Measure resistance between test harness E connector (2E) terminals and chassis ground.

Connector & terminal

(2E) No. 5 (+) — Chassis ground (-):



- CHECK** : Is resistance more than 200 Ω?
- YES** : Replace airbag control module. <Ref. to 5-5 [W5A0].>
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

N: TROUBLE CODE 43

DIAGNOSIS:

- Airbag main harness circuit (Driver) is shorted to power supply.
- Airbag module harness (Driver) is shorted to power supply.
- Roll connector is shorted to power supply.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.

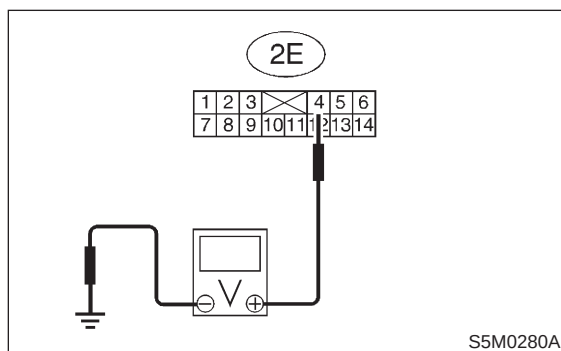
After 20 seconds elapse, remove instrument panel lower cover, and disconnect (AB3) and (AB8), (AB9) and (AB10).

5N1 : AIRBAG MAIN HARNESS INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).
- 2) Connect battery ground cable and turn ignition switch "ON" (engine off).
- 3) Measure voltage across each test harness E connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 4 (+) — Chassis ground (-):



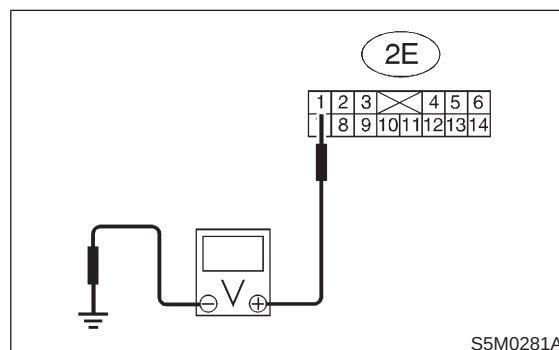
- CHECK** : **Is voltage less than 1 V?**
- YES** : Go to step **5N2**.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

5N2 : AIRBAG MAIN HARNESS INSPECTION

Measure voltage across each test harness E connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 1 (+) — Chassis ground (-):



- CHECK** : **Is voltage less than 1 V?**
- YES** : Replace airbag control module. <Ref. to 5-5 [W5A0].>
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

O: AIRBAG WARNING LIGHT REMAINS ON.
DIAGNOSIS:

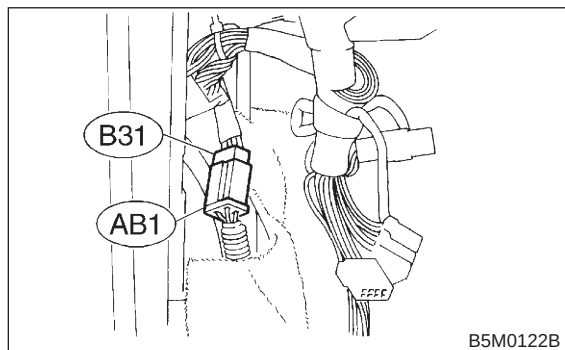
- Airbag warning light is faulty.
- Airbag control module to airbag warning light harness circuit is shorted or open.
- Grounding circuit is faulty.
- Airbag control module is faulty.
- (AB1) and (B31) are not connected properly.
- (AB6) is not connected properly to airbag control module.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

501 : CHECK POOR CONTACT IN CONNECTORS (AB1) AND (B31).

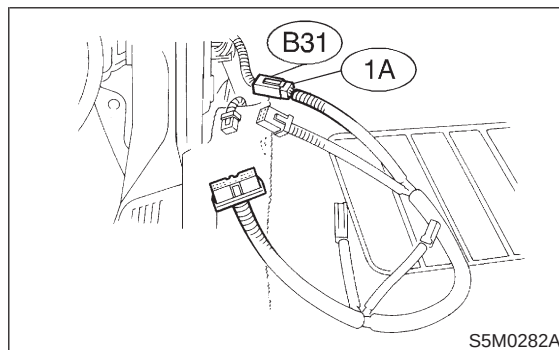
- 1) Remove front pillar lower trim (Driver side).
- 2) Check poor contact in connectors (AB1) and (B31).



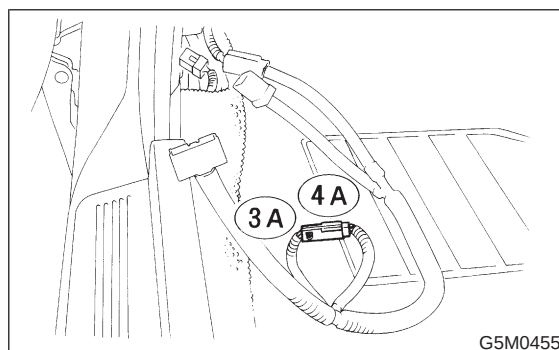
- CHECK** : *Is there poor contact in double lock of connectors (AB1) and (B31)?*
- YES** : Repair poor contact in double lock of connectors (AB1) and (B31).
- NO** : Go to step **502**.

502 : INSPECTION OF AIRBAG WARNING LIGHT

- 1) Turn ignition switch "OFF" and connect body harness connector (B31) to test connector A connector (1A).



- 2) Connect battery ground cable and turn ignition switch "ON", (engine off) and connect connectors (3A) and (4A).



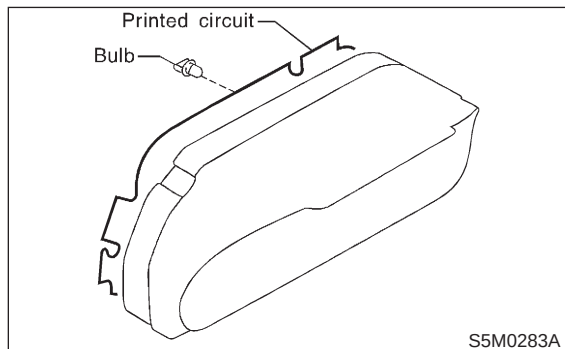
- CHECK** : *Does the airbag warning light come off?*
- YES** : Go to step **504**.
- NO** : Go to step **503**.

503 : INSPECTION OF BODY HARNESS

Check body harness.

NOTE:

After problem has been eliminated, disconnect connectors (3A) and (4A).



- CHECK** : *Is there anything unusual to body harness?*
- YES** : Repair body harness.
- NO** : Replace airbag warning light bulb <Ref. to 6-2 [W8B0].> or combination meter printed circuit.

504 : CHECK POOR CONTACT IN CONNECTOR (AB6).

Check connector (AB6) connected to airbag control module. <Ref. to 5-5 [W5A0].>

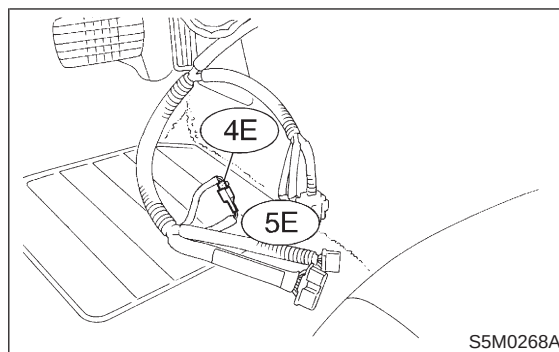
- CHECK** : *Is there poor contact in connector (AB6)?*
- YES** : Repair poor contact in connector (AB6).
- NO** : Go to step **505**.

505 : INSPECTION OF AIRBAG MAIN HARNESS

- 1) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds, and re-connect connectors (AB1) and (B31).
- 2) Remove instrument panel lower cover and disconnect (AB3) with (AB8), then disconnect connector (AB6) from airbag control module, <Ref. to 5-5 [W5A0].> and connect it to test harness E connector (1E).
- 3) Connect battery ground cable and turn ignition switch "ON", (engine off) and connect connectors (4E) and (5E).

NOTE:

After problem has been eliminated, disconnect connectors (4E) and (5E).



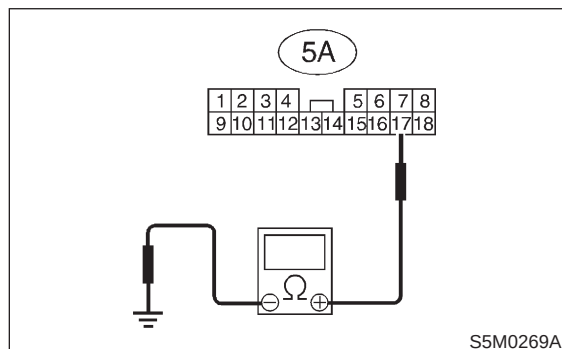
- CHECK** : *Does the airbag warning light come on?*
- YES** : Go to step **506**.
- NO** : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

506 : GROUNDING CIRCUIT INSPECTION

- 1) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
- 2) Disconnect connector (AB1) from body harness connector (B31), and connect connector (B31) to test harness A connector (1A).
- 3) Measure resistance between connector (5A) terminal and chassis ground.

Connector & terminal

(5A) No. 17 (+) — Chassis ground (-):



CHECK : Is resistance less than 10 Ω?

YES : Go to step 507.

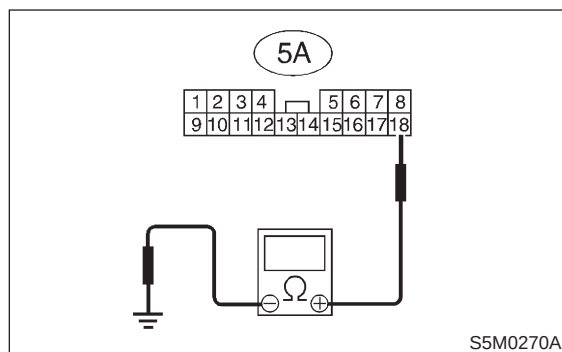
NO : Repair body grounding circuit.

507 : GROUNDING CIRCUIT INSPECTION

Measure resistance between connector (5A) terminal and chassis ground.

Connector & terminal

(5A) No. 18 (+) — Chassis ground (-):



CHECK : Is resistance less than 10 Ω?

YES : Go to step 508.

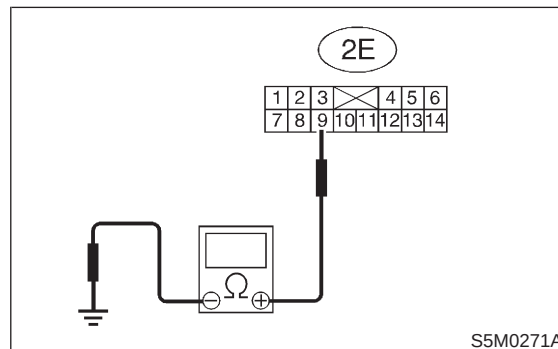
NO : Repair body grounding circuit.

508 : INSPECTION OF AIRBAG MAIN HARNESS

- 1) Connect connectors (AB1) and (B31). Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].>, and connect it to test harness E connector (1E).
- 2) Measure resistance between each test harness E connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 9 (+) — Chassis ground (-):



CHECK : Is resistance less than 10 Ω?

YES : Go to step 509.

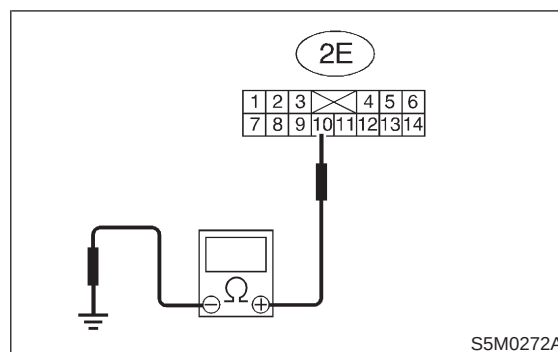
NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

509 : INSPECTION OF AIRBAG MAIN HARNESS

Measure resistance between each test harness E connector (2E) terminal and chassis ground.

Connector & terminal

(2E) No. 10 (+) — Chassis ground (-):



CHECK : Is resistance less than 10 Ω?

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

P: AIRBAG WARNING LIGHT REMAINS OFF.**DIAGNOSIS:**

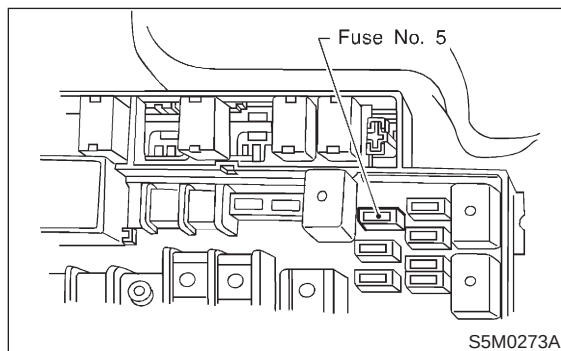
- Fuse No. 5 is blown. (In main fuse box)
- Body harness circuit is open.
- Airbag warning light is faulty.
- Airbag main harness is faulty.
- Airbag control module is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds.

5P1 : FUSE NO. 5 (IN MAIN FUSE BOX) INSPECTION

Remove and visually check fuse No. 5 (In main fuse box).



- CHECK** : *Is fuse No. 5 blown?*
- YES** : Replace fuse No. 5. If fuse No. 5 blows again, Go to step **5P2**.
- NO** : Go to step **5P2**.

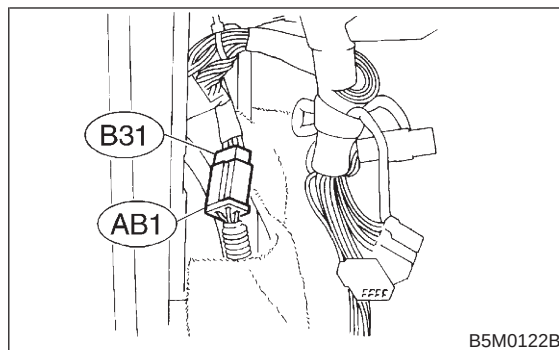
5P2 : BODY HARNESS INSPECTION

Turn ignition switch "ON" (engine off) to make sure other warning lights (in combination meter) illuminate.

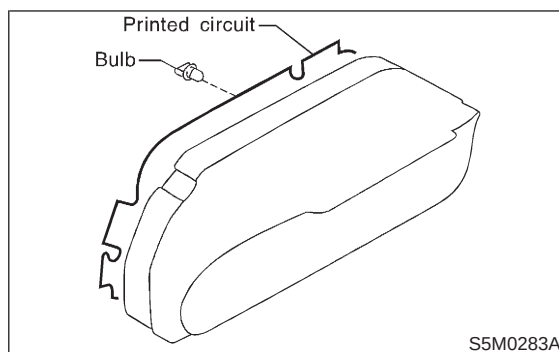
- CHECK** : *Do all the warning lights (in combination meter) except airbag warning light come on?*
- YES** : Go to step **5P3**.
- NO** : Repair body harness.

5P3 : AIRBAG WARNING LIGHT MODULE (IN COMBINATION METER) INSPECTION

- 1) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
- 2) Disconnect body harness connector (B31) from connector (AB1).



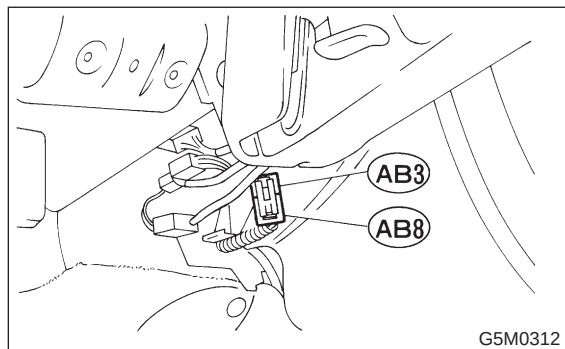
- 3) Connect battery ground cable and turn ignition switch "ON" (engine off) to make sure airbag warning light illuminates.



- CHECK** : *Does the airbag warning light come on?*
- YES** : Go to step **5P4**.
- NO** : Replace airbag warning light bulb <Ref. to 6-2 [W8B0].> or combination meter printed circuit.

5P4 : AIRBAG MAIN HARNESS INSPECTION

- 1) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.
- 2) Connect body harness connector (B31) and connector (AB1).
- 3) Disconnect connectors (AB3) and (AB8) below steering column. <Ref. to 5-5 [M2E2].>



- 4) Disconnect connector (AB6) from airbag control module. <Ref. to 5-5 [W5A0].>
- 5) Connect battery ground cable and turn ignition switch "ON" to make sure airbag warning light illuminates.

CHECK : ***Does the airbag warning light come on?***

YES : Replace airbag control module. <Ref. to 5-5 [W5A0].>

NO : Replace airbag main harness. <Ref. to 5-5 [W4A0].>

Q: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE. (FLASHING TROUBLE CODE.)

DIAGNOSIS:

Airbag system component parts are faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable, and then wait at least 20 seconds.

5Q1 : AIRBAG COMPONENT PARTS APPEARANCE INSPECTION

1) Conduct on-board diagnostic and call up trouble codes stored in memory. <Ref. to 5-5 [T4B0].>

2) Select trouble code required to check airbag component parts from those listed in table and reproduce symptom.

Trouble codes	Check parts	Index. No.
04	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W300].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>
11	● Fuse No. 6 ● Airbag main harness ● Airbag control module ● Body harness	<Ref. to 5-5 [T5C5].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].> —
12	● Roll connector ● Airbag module (Driver) ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W600].> <Ref. to 5-5 [W300].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>
13	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W300].> <Ref. to 5-5 [W600].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>
21	● Airbag control module	<Ref. to 5-5 [W500].>
22	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W300].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>
33	● Airbag control module	<Ref. to 5-5 [W500].>
34	● Airbag main harness ● Airbag module (Passenger) ● Airbag control module	<Ref. to 5-5 [W400].> <Ref. to 5-5 [W300].> <Ref. to 5-5 [W500].>
41	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W300].> <Ref. to 5-5 [W600].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>
42	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W300].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>
43	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	<Ref. to 5-5 [W300].> <Ref. to 5-5 [W600].> <Ref. to 5-5 [W400].> <Ref. to 5-5 [W500].>

3) Conduct appearance inspection on parts selected.

NOTE:

Also check connector terminals, wiring harness, case, etc. for damage.

appearance of airbag component parts?

YES

: Replace faulty airbag component parts.

NO

: Go to step 5Q2.

CHECK : Is there anything unusual about the

5Q2 : AIRBAG COMPONENT PARTS VIBRATION INSPECTION

- 1) Gently shake check parts (to determine faults.).
- 2) To check airbag module or roll connector, turn and tilt steering wheel.

CAUTION:

Do not shake or vibrate airbag control module.

CHECK : *Does the component malfunction again when shaking?*

YES : Replace faulty airbag component parts.

NO : Go to step 5Q3.

5Q3 : SHOWERING INSPECTION TO BODY

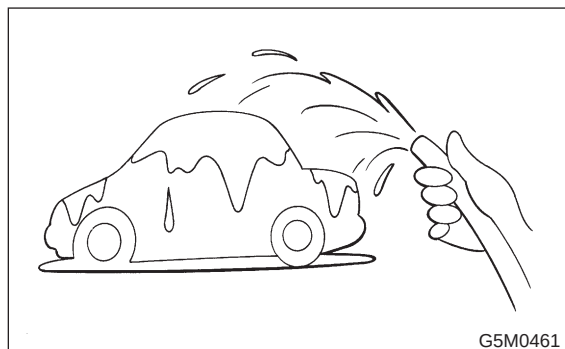
Spray water on vehicle body.

CAUTION:

Do not directly spray water on airbag components.

NOTE:

Also check wiring harnesses as water may leak along them and get airbag component parts wet.



CHECK : *Does water leak into the passenger compartment when showering vehicle?*

YES : Replace faulty airbag component parts.

NO : Perform clear memory. <Ref. to 5-5 [T4C0].>

R: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE. (FLASHING NORMAL CODE.)

DIAGNOSIS:

- Airbag connector is faulty.
- Fuse No. 11 is blown. (In joint box)
- Airbag main harness is faulty.
- Airbag control module is faulty.
- Body harness is faulty.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable, and then wait at least 20 seconds.

5R1 : AIRBAG CONNECTOR APPEARANCE INSPECTION

Conduct appearance inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5 [T100].>

NOTE:

Check terminals, case and wiring harnesses for damage.

CHECK : *Is there anything unusual about the appearance of connectors (AB2) through (AB8)?*

YES : Replace faulty airbag component parts.

NO : Go to step 5R2.

5R2 : AIRBAG CONNECTOR VIBRATION INSPECTION

Conduct vibration inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5 [T100].>

NOTE:

Gently shake each airbag connector.

CHECK : *Do the connectors (AB2) through (AB8) malfunction again when shaking?*

YES : Replace faulty airbag component parts.

NO : Go to step 5R3.

5R3 : SHOWERING INSPECTION TO BODY

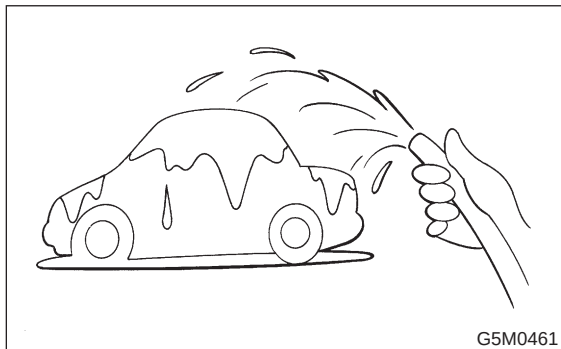
Spray water on vehicle body.

CAUTION:

Do not directly spray water on airbag components.

NOTE:

If leaks are noted, also check wiring harnesses as water may leak along them and wet airbag connectors.



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CHECK : ***Does water leak into the passenger compartment when showering vehicle?***

YES : Replace faulty airbag component parts.

NO : Go to step 5R4.

5R4 : FUSE NO. 11 (IN JOINT BOX), AIRBAG MAIN HARNESS, AIRBAG CONTROL MODULE, BODY HARNESS APPEARANCE INSPECTION

Conduct appearance inspection on fuse No. 11 <Ref. to 5-5 [T5I5].>, airbag main harness <Ref. to 5-5 [W4A0].>, airbag control module <Ref. to 5-5 [W5A0].> and body harness.

NOTE:

Also check connectors, terminals, wiring harness and case for damage.

CHECK : ***Is there anything unusual about the appearance of fuse No. 11, airbag main harness, airbag control module or body harness?***

YES : Replace faulty airbag component parts.

NO : Go to step 5R5.

5R5 : FUSE NO. 11 (IN JOINT BOX), AIRBAG MAIN HARNESS, BODY HARNESS VIBRATION INSPECTION

Conduct vibration inspection on fuse No. 11, airbag main harness and body harness.

CAUTION:

Do not shake or vibrate airbag control module.

NOTE:

Gently shake each part.

CHECK : ***Do fuse No. 11, airbag main harness or body harness malfunction again when shaking?***

YES : Replace faulty airbag component parts.

NO : Go to step 5R6.

5R6 : SHOWERING INSPECTION TO BODY

Spray water on vehicle body.

CAUTION:

Do not directly spray water on each part.

NOTE:

If leaks are noted, check wiring harnesses as water may leak along them and get parts wet.



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CHECK : ***Does water leak into the passenger compartment when showering vehicle?***

YES : Replace faulty airbag component parts.

NO : Go to step 5R7.

**5R7 : WARNING LIGHT ILLUMINATION
CHECK**

Turn ignition switch "ON" (engine off) and observe airbag warning light.

CHECK : *Does the airbag warning light come on for about 7 seconds, then go out and stay out?*

YES : Perform clear memory. <Ref. to 5-5 [T4C0].>

NO : Go to "DIAGNOSTICS PROCEDURE". <Ref. to 5-5 [T4D0].>

6-2 [T100] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

1. Supplemental Restraint System "Airbag"

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the cruise control module and cruise control command switch.

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the cruise control module and cruise control command switch.

2. Pre-inspection

A: FUNCTION TESTS

Conduct road tests by selecting a smooth, flat road or use free rollers for road test simulation.

1. CRUISE CONTROL MAIN SWITCH

- 1) Turn ignition switch to ON.
- 2) Check that cruise control main switch indicator light comes on when main switch is pressed (ON).
- 3) Check that main switch indicator light goes out when main switch is pressed again (OFF).
- 4) Turn ignition switch to OFF with main switch ON (indicated by illumination). Turn ignition switch ON again to ensure that main switch indicator light remains OFF.

2. CRUISE CONTROL COMMAND SWITCH

- 1) Check that cruise control command switch is properly set in "SET/COAST", "RESUME/ACCEL", or "CANCEL" mode.
- 2) Also check that command switch returns to the original position when released.

3. CONSTANT SPEED TEST

- 1) Turn cruise control main switch to ON.
- 2) Drive the vehicle at a speed greater than 40 km/h (25 MPH).
- 3) Press command switch to set in "SET/COAST" mode.
- 4) Ensure that vehicle is maintained at the speed set when command switch was pressed.

4. ACCELERATION TEST

- 1) Set vehicle speed at a speed greater than 40 km/h (25 MPH).
- 2) Ensure that vehicle continues to accelerate while holding command switch in "RESUME/ACCEL" mode, and that vehicle maintains that optional speed when command switch is released.

5. DECELERATION TEST

- 1) Set vehicle speed at an optional speed greater than 40 km/h (25 MPH).
- 2) Ensure that vehicle continues to decelerate while holding command switch in "SET/COAST" mode, and that it maintains that optional speed when command switch is released.

NOTE:

When vehicle speed reaches the lower speed limit of 30 km/h (19 MPH) during deceleration, cruise control will be released.

6-2 [T100] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

1. Supplemental Restraint System "Airbag"

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the cruise control module and cruise control command switch.

CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the cruise control module and cruise control command switch.

2. Pre-inspection

A: FUNCTION TESTS

Conduct road tests by selecting a smooth, flat road or use free rollers for road test simulation.

1. CRUISE CONTROL MAIN SWITCH

- 1) Turn ignition switch to ON.
- 2) Check that cruise control main switch indicator light comes on when main switch is pressed (ON).
- 3) Check that main switch indicator light goes out when main switch is pressed again (OFF).
- 4) Turn ignition switch to OFF with main switch ON (indicated by illumination). Turn ignition switch ON again to ensure that main switch indicator light remains OFF.

2. CRUISE CONTROL COMMAND SWITCH

- 1) Check that cruise control command switch is properly set in "SET/COAST", "RESUME/ACCEL", or "CANCEL" mode.
- 2) Also check that command switch returns to the original position when released.

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- 1) Turn cruise control main switch to ON.
- 2) Drive the vehicle at a speed greater than 40 km/h (25 MPH).
- 3) Press command switch to set in "SET/COAST" mode.
- 4) Ensure that vehicle is maintained at the speed set when command switch was pressed.

4. ACCELERATION TEST

- 1) Set vehicle speed at a speed greater than 40 km/h (25 MPH).
- 2) Ensure that vehicle continues to accelerate while holding command switch in "RESUME/ACCEL" mode, and that vehicle maintains that optional speed when command switch is released.

5. DECELERATION TEST

- 1) Set vehicle speed at an optional speed greater than 40 km/h (25 MPH).
- 2) Ensure that vehicle continues to decelerate while holding command switch in "SET/COAST" mode, and that it maintains that optional speed when command switch is released.

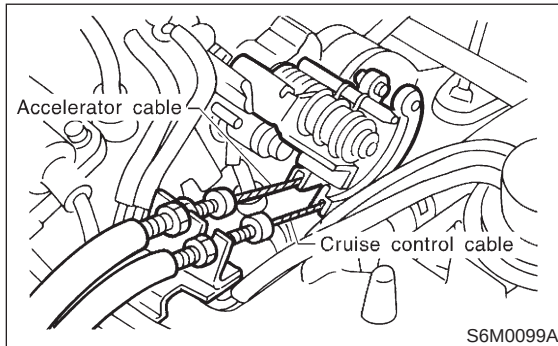
NOTE:

When vehicle speed reaches the lower speed limit of 30 km/h (19 MPH) during deceleration, cruise control will be released.

B: CRUISE CONTROL CABLE

2B1 : CHECK CRUISE CONTROL CABLE.

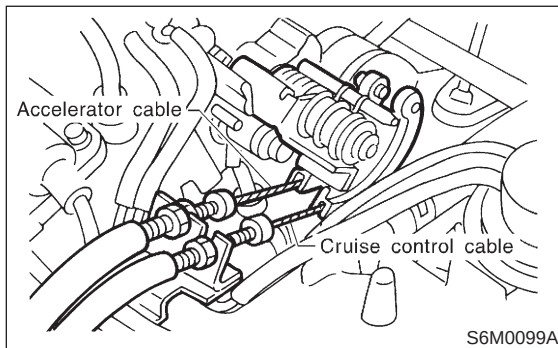
Check cruise control cable installation.



- CHECK** : *Is the cruise control cable securely installed to the left of the accelerator cable?*
- YES** : Go to step 2B2.
- NO** : Install cruise control cable securely. Go to step 2B2.

2B2 : CHECK ACCELERATOR CABLE.

Check function of accelerator cable.



- CHECK** : *Does the accelerator cable throttle cam move when the cruise control throttle is moved by hand?*
- YES** : Repair accelerator cable throttle cam. Go to step 2B3.
- NO** : Go to step 2B3.

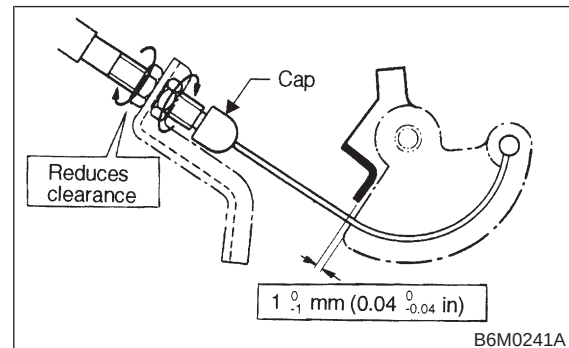
2B3 : CHECK THROTTLE CAM.

Check function of throttle cam.

- CHECK** : *Does the throttle cam move smoothly?*
- YES** : Go to step 2B4.
- NO** : Repair throttle cam. Go to step 2B4.

2B4 : CHECK CABLE FREE PLAY.

Ensure that throttle cam-to-lever clearance is within specifications.



- CHECK** : *Is throttle cam-to-lever clearance between 0 and 1 mm (0 and 0.04 in)?*
- YES** : Go to step 2C1.
- NO** : Adjust cable end by adjusting nuts. Go to step 2C1.

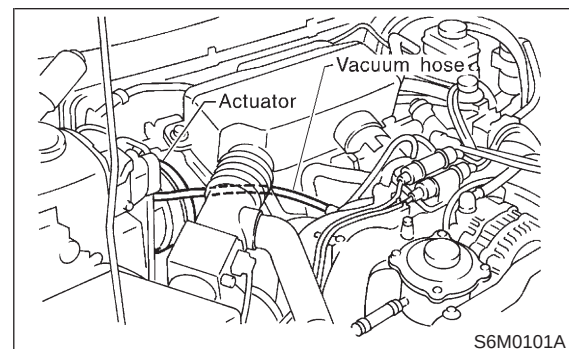
NOTE:

Ensure that cap is positioned in groove.

C: VACUUM HOSE

2C1 : CHECK VACUUM HOSE VISUALLY.

Check vacuum hose (which connects actuator and intake manifold).

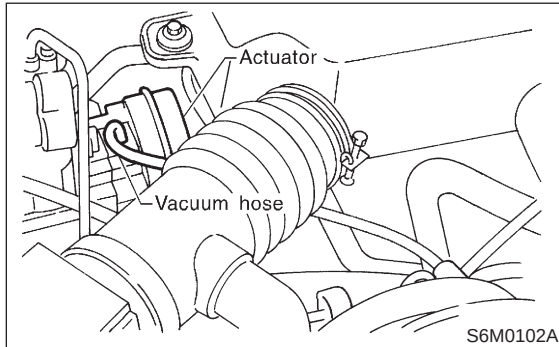


- CHECK** : *Is there disconnection or cracks in vacuum hose?*
- YES** : Replace vacuum hose. Go to step 2D1.
- NO** : Go to step 2D1.

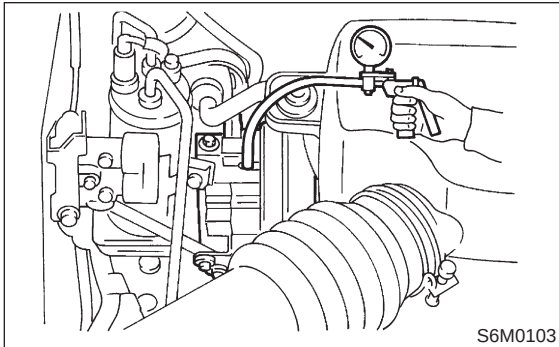
D: ACTUATOR

2D1 : CHECK FUNCTION OF ACTUATOR.

- 1) Disconnect vacuum hose from actuator.



- 2) Connect vacuum pump as shown in figure.



- 3) Make sure that cruise control cable moves smoothly and quickly when a vacuum pressure of 40.0 kPa (300 mmHg, 11.81 inHg) is applied to actuator.

- CHECK** : Does cruise control cable have a stroke of 35 mm (1.38 in)?
- YES** : Go to step 2D2.
- NO** : Replace actuator. Go to step 2D2.

NOTE:

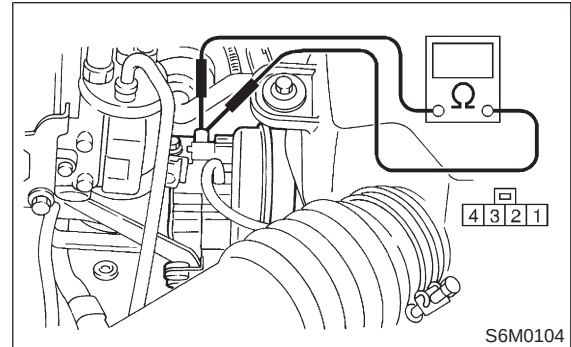
- When vacuum pressure is released from condition 3) above, make sure the cable returns to its original position smoothly and quickly.
- After inspection, disconnect vacuum pump and connect vacuum hose.

2D2 : MEASURE RESISTANCE OF VALVE.

- 1) Disconnect connector from actuator.
- 2) Measure resistance between terminals of actuator.

Terminals

No. 2 — No. 3:



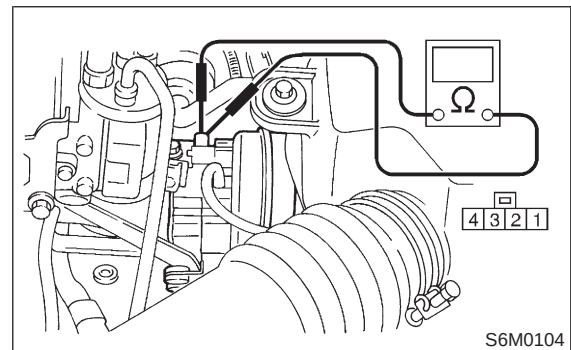
- CHECK** : Is resistance less than 100 Ω ?
- YES** : Go to step 2D3.
- NO** : Replace actuator.

2D3 : MEASURE RESISTANCE OF VALVE.

Measure resistance between terminals of actuator.

Terminals

No. 2 — No. 1:



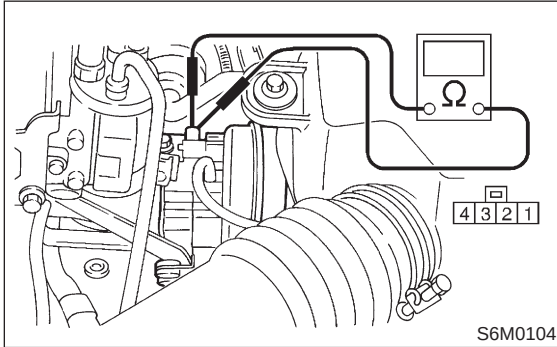
- CHECK** : Is resistance less than 69 Ω ?
- YES** : Go to step 2D4.
- NO** : Replace actuator.

2D4 : MEASURE RESISTANCE OF VALVE.

Measure resistance between terminals of actuator.

Terminals

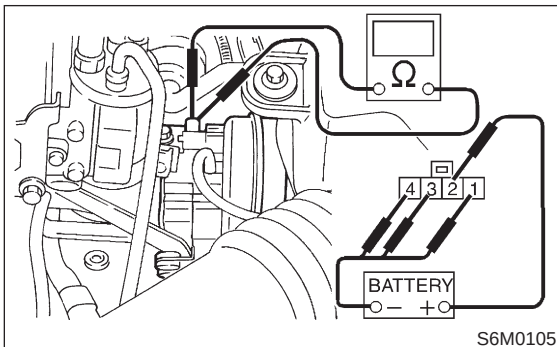
No. 2 — No. 4:



- CHECK** : *Is resistance less than 69 Ω ?*
YES : Go to step 2D5.
NO : Replace actuator.

2D5 : CHECK FOR LEAKAGE AND STICKING OF VALVES.

- 1) Disconnect connector from actuator.
- 2) Make sure that cruise control cable moves smoothly when connecting + (positive) battery cable to terminal No. 2 and - (negative) battery cable to terminals No. 1, 3 and 4 of actuator connector.



- CHECK** : *Does cruise control cable have a stroke of 35 mm (1.38 in) within 3 seconds?*
YES : Go to step 2D6.
NO : Replace actuator. Go to step 2D6.

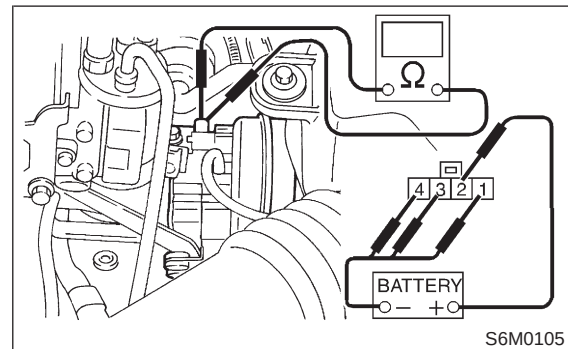
2D6 : CHECK FOR LEAKAGE AND STICKING OF VALVES.

When the battery cable is disconnected from former condition <Ref. to 6-2 [T2D5].> Step 2), make sure the cable returns to its original position smoothly.

- CHECK** : *Does cruise control cable get back to its original position within 1.5 seconds?*
YES : Go to step 2D7.
NO : Replace actuator. Go to step 2D7.

2D7 : CHECK CABLE MOVEMENT.

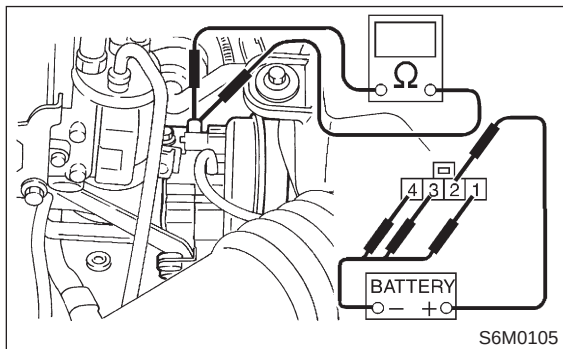
Connect + (positive) battery cable to terminal No. 2 and - (negative) battery cable to terminals No. 1, 3 and 4 of actuator connector.



- CHECK** : *Does cruise control perform pull operation?*
YES : Go to step 2D8.
NO : Replace actuator. Go to step 2D8.

2D8 : CHECK CABLE MOVEMENT.

Connect + (positive) battery cable to terminal No. 2 and - (negative) battery cable to terminals No. 1 and 4 of actuator connector.



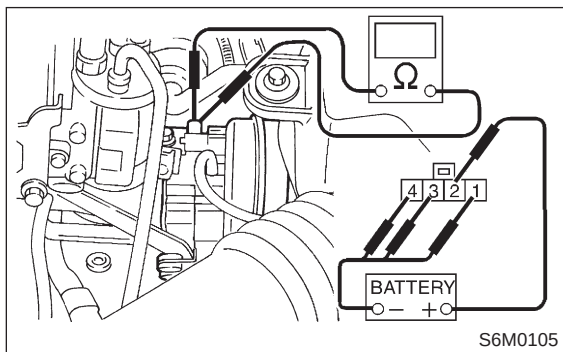
CHECK : *Does cruise control perform hold operation?*

YES : Go to step 2D9.

NO : Replace actuator. Go to step 2D9.

2D9 : CHECK CABLE MOVEMENT.

Connect + (positive) battery cable to terminal No. 2 and - (negative) battery cable to terminal No. 4 of actuator connector.



CHECK : *Does cruise control perform release operation?*

YES : Go to step 2E1.

NO : Replace actuator. Go to step 2E1.

E: POWER SUPPLY**2E1 : CHECK BATTERY.**

Measure battery specific gravity of electrolyte.

CHECK : *Is battery specific gravity more than 1.250?*

YES : Go to step 2E2.

NO : Charge or replace battery. Go to step 2E2.

2E2 : CHECK FUSES, CONNECTORS AND HARNESSSES.

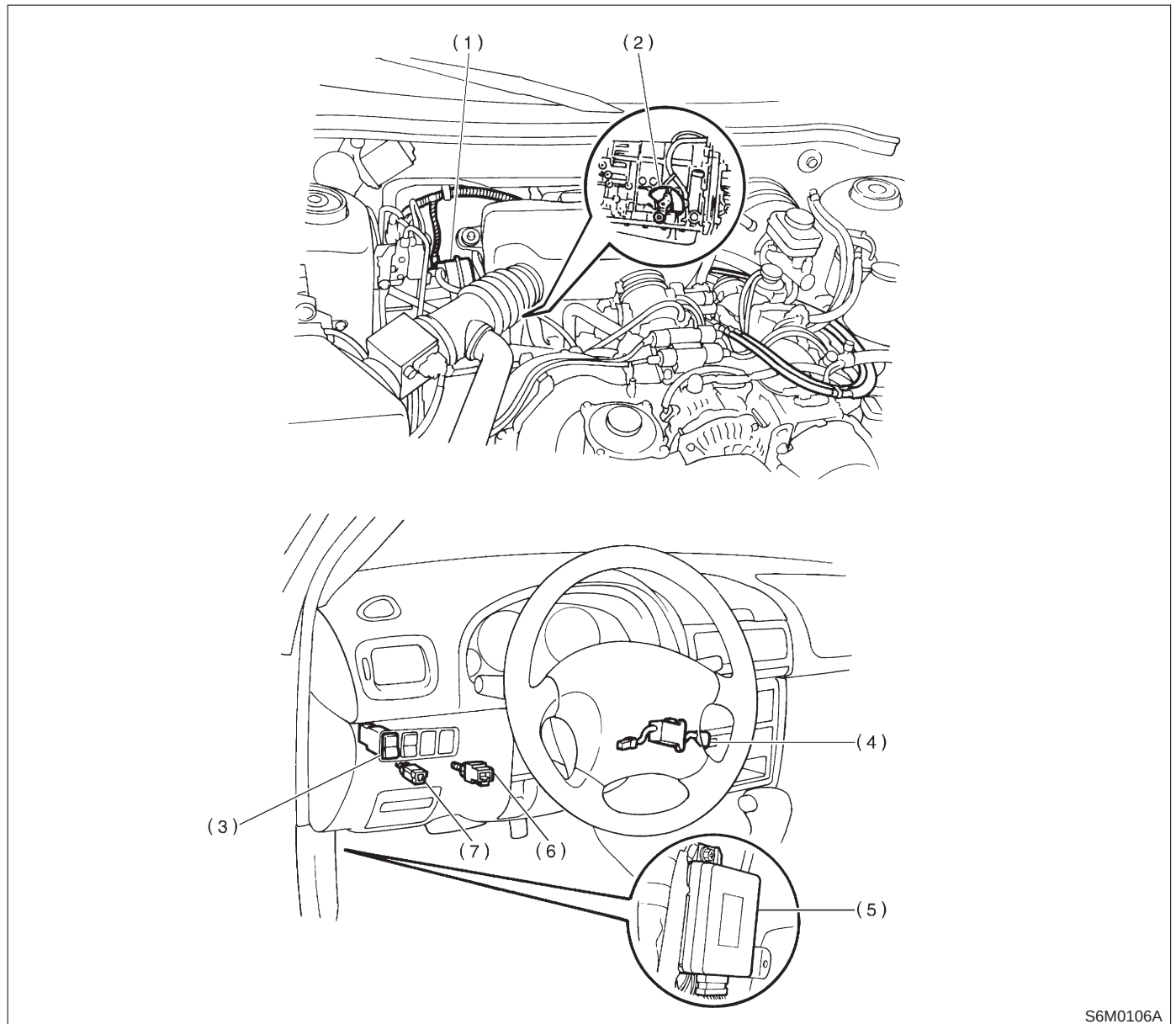
Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

CHECK : *Is there anything unusual about the appearance of main fuse, fuse, harness, connector and grounding?*

YES : Repair or replace faulty parts. End of pre-inspection.

NO : End of pre-inspection.

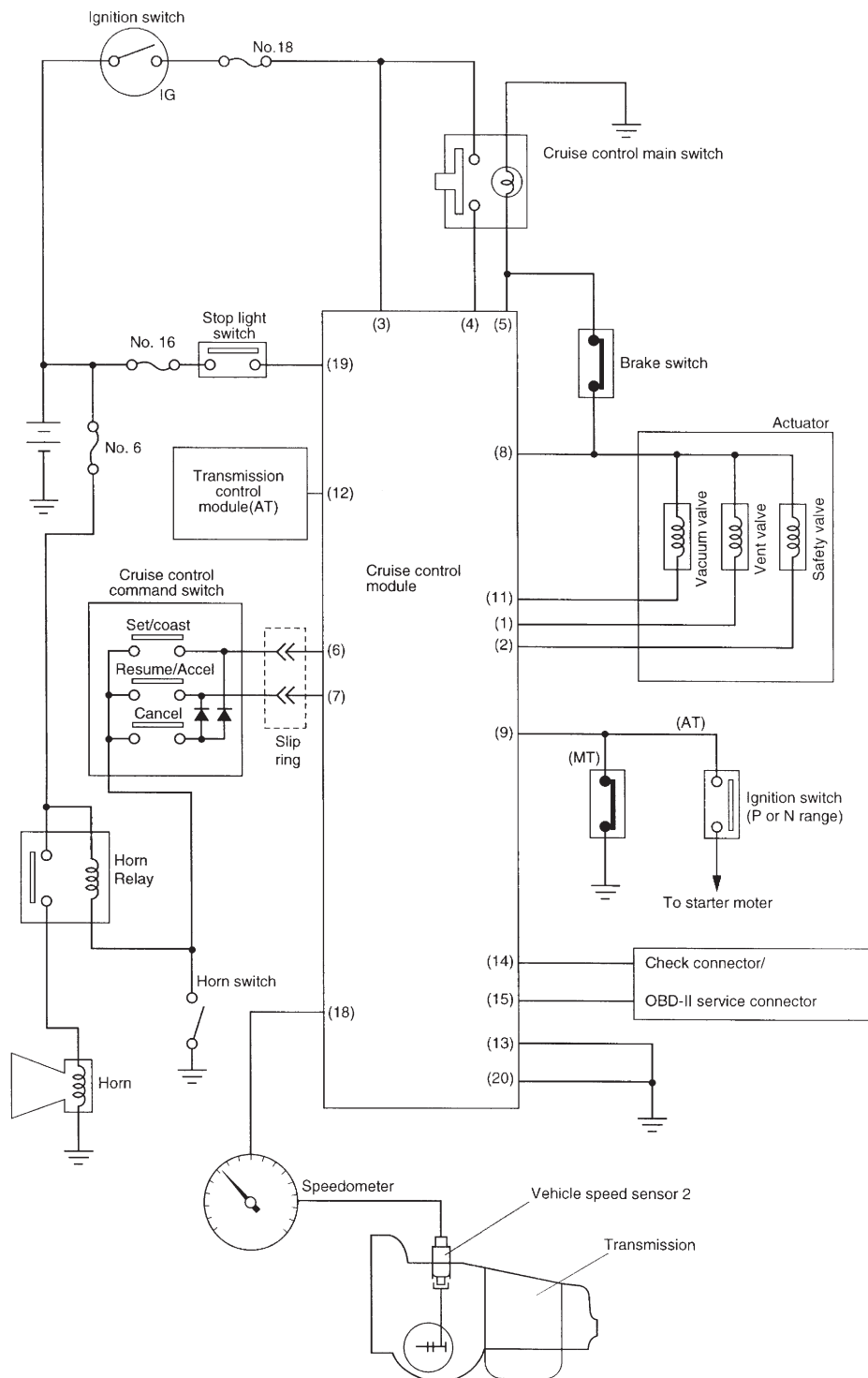
3. Electrical Components Location



S6M0106A

(1) Actuator (with valves)	(4) Cruise control command switch	(7) Clutch switch (MT)
(2) Inhibitor switch (AT)	(5) Cruise control module	
(3) Cruise control main switch	(6) Stop and brake switch	

4. Schematic

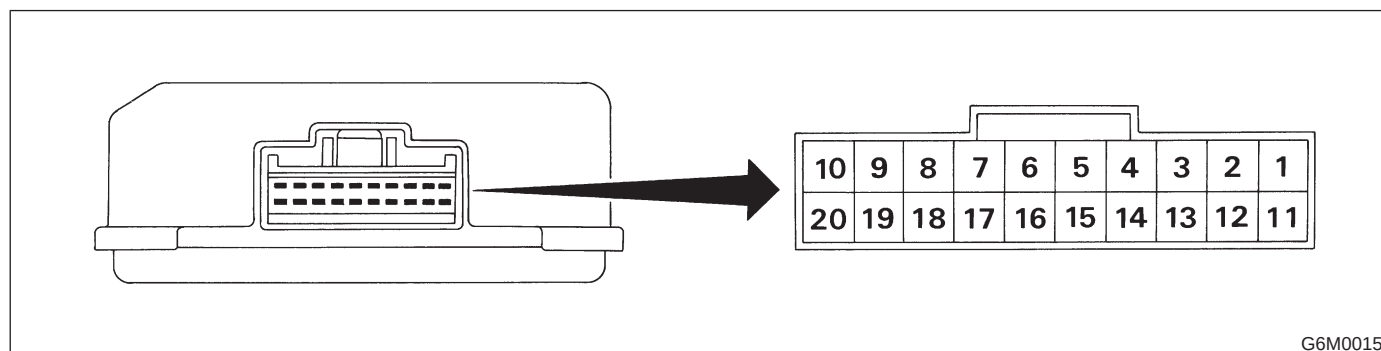


MEMO:

6-2 [T500] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

5. Control Module I/O Signal

5. Control Module I/O Signal



Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Vent valve	1	- Power supply is ON when vehicle is stopped. - ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating.
Safety valve	2	- Power supply is ON when vehicle is stopped. - ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating.
Ignition switch	3	- Battery voltage is present when ignition switch is turned ON. "0" volt is present when ignition switch is turned OFF.
Cruise control main switch	4	- Battery voltage is present when main power is turned ON. "0" volt is present when main power is turned OFF.
Power supply to vacuum valve, vent valve, safety valve and indicator light	5	- Battery voltage is present when main power is turned ON. "0" volt is present when main power is turned OFF.
SET/COAST switch	6	- Battery voltage is present when command switch is turned to SET/COAST position. "0" volt is present when command switch is released.
RESUME/ACCEL switch	7	- Battery voltage is present when command switch is turned to RESUME/ACCEL position. "0" volt is present when command switch is released.
Brake switch	8	Set selector lever to any position other than "P" or "N" position (AT) / leave clutch pedal released (MT), while cruise control main switch is turned ON. Then check that; - Battery voltage is present when brake pedal is released. "0" volt is present when brake pedal is depressed, or - Battery voltage is present when clutch pedal is released (MT). "0" volt is present when clutch pedal is depressed (MT). - Battery voltage is present when selector lever is in any position other than "P" or "N" position (AT). "0" volt is present when selector lever is set to "P" or "N" position (AT).
Clutch switch (MT)/ Inhibitor switch (AT)	9	- Battery voltage is present when clutch pedal is released (MT). "0" volt is present when clutch pedal is depressed (MT). - Battery voltage is present when selector lever is in any position other than "P" or "N" position (AT). "0" volt is present when selector lever is set to "P" or "N" position (AT).
Vacuum valve	11	- Power supply is ON when vehicle is stopped. - ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating.
Set signal to transmission control module (AT)	12	TCM emits a ground-level signal while driving vehicle at least 40 km/h (25 MPH) with SET switch ON.
Ground	13	—
Check connector/ OBD-II service connector	14	—
Check connector/ OBD-II service connector	15	—

Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Vehicle speed sensor 2	18	Lift-up the vehicle until all four wheels are raised off ground, and then rotate any wheel manually. Approx. 5 and 0 volt pulse signals are alternately input to cruise control module.
Stop light switch	19	Turn ignition switch to OFF. Then check that; ● Battery voltage is present when brake pedal is depressed. ● "0" volt is present when brake pedal is released.
Ground	20	—
NOTE: Voltage at terminals 1, 2, 11 and 12 cannot be checked unless vehicle is driving by cruise control operation.		

6-2 [T6A1] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

6. Diagnostics Chart for On-board Diagnosis System

6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTIC PROCEDURE

6A1 : CHECK CRUISE CONTROL MAIN SWITCH.

- 1) Trouble occurs.
- 2) Perform pre-inspection. <Ref. to 6-2 [T200].>
- 3) Check cruise control main switch.

CHECK : *Does cruise control main switch turn ON?*

YES : Go to step 6A2.

NO : Go to "Diagnostics Chart for Power Line". <Ref. to 6-2 [T700].>

6A2 : CHECK CRUISE SPEED IS SET.

CHECK : *Does cruise speed properly set while driving at minimum of 40 km/h (25 MPH)?*

YES : Go to step 6A3.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

6A3 : CHECK CRUISE CONTROL IS RELEASED.

CHECK : *Does cruise control properly release during operation?*

YES : Go to step 6A4.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

6A4 : CHECK CRUISE SPEED IS HELD WITHIN SET SPEED.

CHECK : *Does cruise speed hold within set speed ± 3 km/h (2 MPH)?*

YES : Go to step 6A5.

NO : Go to pre-inspection of actuator. <Ref. to 6-2 [T2D0].>

6A5 : CHECK RESUME/ACCEL SWITCH.

CHECK : *Does RESUME/ACCEL switch function properly?*

YES : Go to step 6A6.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

6A6 : CHECK SET/COAST SWITCH.

CHECK : *Does SET/COAST switch function properly?*

YES : Go to step 6A7.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

6A7 : CHECK CANCEL SWITCH.

CHECK : *Does CANCEL switch function properly?*

YES : Go to step 6A8.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

6A8 : CHECK CRUISE SPEED IS RELEASED.

CHECK : *Does cruise speed release when brake pedal is depressed?*

YES : Go to step 6A9.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

6A9 : CHECK CRUISE SPEED IS RELEASED.

CHECK : *Does cruise speed release when clutch pedal is depressed?*

YES : Cruise control system is in correct order.

NO : Go to "Diagnostics Chart with Trouble Code". <Ref. to 6-2 [T800].>

B: ON-BOARD DIAGNOSIS WITH SELECT MONITOR

1. GENERAL

The on-board diagnosis function of the cruise control system uses an external select monitor.

The on-board diagnosis function operates in two categories, which are used depending on the type of problems;

NOTE:

Select monitor cartridge:

No. 24082AA010

1) Cruise cancel conditions diagnosis

(1) This category of diagnosis requires actual vehicle driving in order to determine the cause, (as when cruise speed is cancelled during driving although cruise cancel condition is not entered).

(2) Cruise control module memory stores the cancel condition (Code No.) which occurred during driving. When there are plural cancel conditions (Code No.), they are shown on the select monitor.

CAUTION:

● The cruise control memory stores not only the cruise “cancel” which occurred (although “cancel” operation is not entered by the driver), but also the “cancel” condition input by the driver.

● The content of memory is cleared when ignition switch or cruise main switch is turned OFF.

2) Real-time diagnosis

The real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.

(1) Vehicle cannot be driven at cruise speed because problems occurs in the cruise control system or its associated circuits.

(2) Monitor the signal conditions from switches and sensors.

2. CRUISE CANCEL CONDITIONS DIAGNOSIS

1) Connect select monitor.

2) Start the engine and turn cruise control main switch to ON.

3) Set select monitor in “All System Diagnosis” mode.

NOTE:

The diagnostic code is also shown in the “Each System Check” mode. This mode is called up on the “Cruise Control Diagnosis” screen by selecting the item “Cancel Code(s) Display”.

4) Drive vehicle at least 40 km/h (25 MPH) with cruise speed set.

5) If cruise speed is canceled itself (without doing any cancel operations), a diagnostic code will appear on select monitor display.

CAUTION:

● A diagnostic code will also appear when cruise cancel is effected by driver. Do not confuse.

● Have a co-worker ride in vehicle to assist in diagnosis during driving.

NOTE:

Diagnostic code will be cleared by turning ignition switch or cruise control main switch to OFF.

3. REAL-TIME DIAGNOSIS

1) Connect select monitor.

2) Turn ignition switch and cruise control main switch to ON.

3) Select the “Current Data Display & Save” mode on the select monitor “Cruise Control Diagnosis” screen.

4) Ensure that normal indication is displayed when controls are operated as indicated below:

● Depress/release the brake pedal. (Stop light switch and brake switch turn ON.)

● Turn ON the “SET/COAST” switch.

● Turn ON the “RESUME/ACCEL” switch.

● Depress/release the clutch pedal. (MT)

● Set the selector lever to P or N. (AT)

6-2 [T7A1] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

7. Diagnostics Chart for Power Line

7. Diagnostics Chart for Power Line

A: BASIC DIAGNOSTICS PROCEDURE

7A1 : DRIVE AT CRUISE SPEED.

CHECK : *Can cruise speed be set?*

YES : Go to "CHECK INDICATOR AND CIRCUIT IN CRUISE CONTROL MAIN SWITCH". <Ref. to 6-2 [T7B0].>

NO : Go to "CHECK CRUISE CONTROL MAIN SWITCH". <Ref. to 6-2 [T7C0].>

B: CHECK INDICATOR AND CIRCUIT IN CRUISE CONTROL MAIN SWITCH

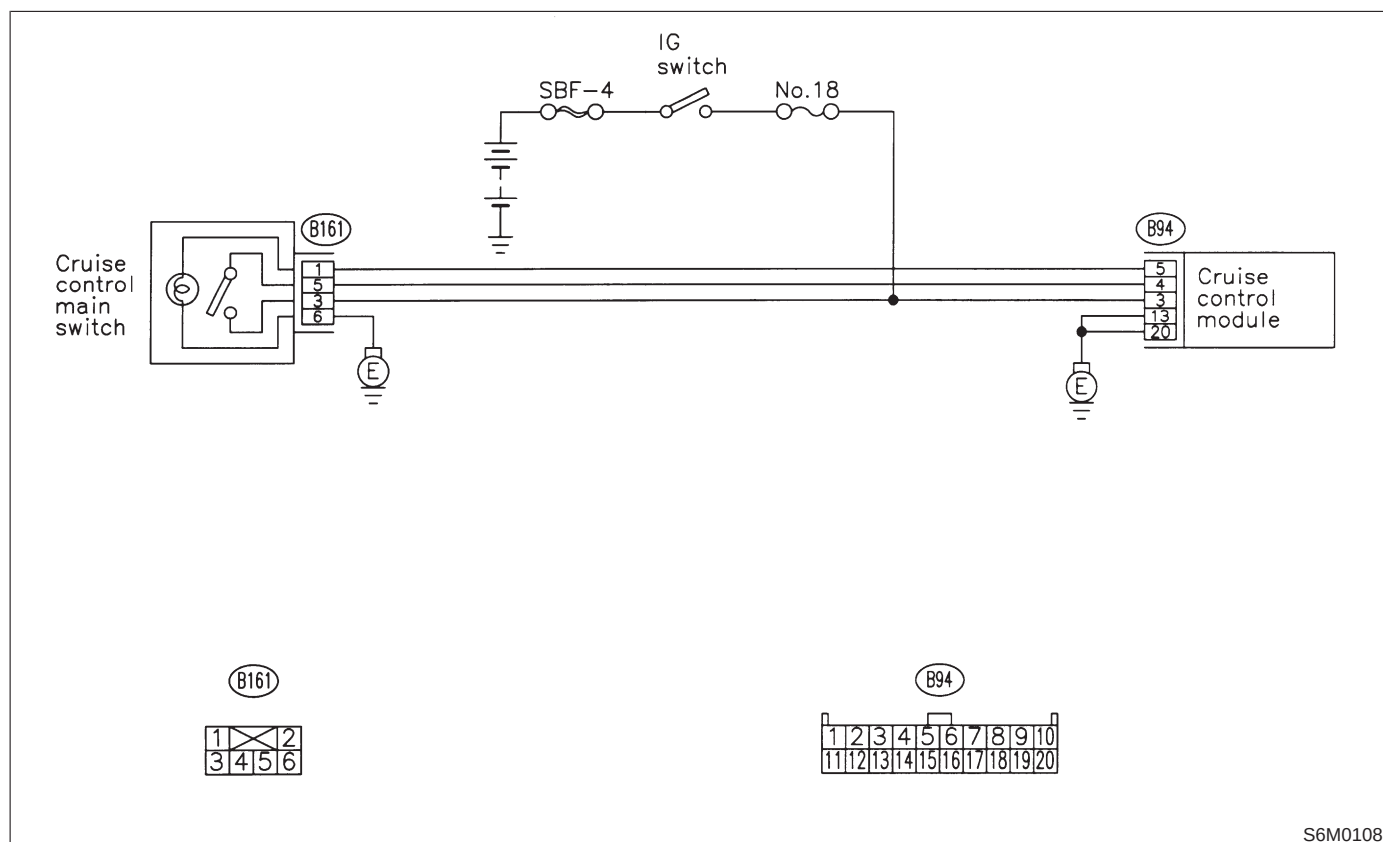
DIAGNOSIS:

- Bulb failure or open harness of the indicator circuit in the cruise control main switch.

TROUBLE SYMPTOM:

- Cruise control can be set, normally indicator does not come on. (When main switch is pressed.)

WIRING DIAGRAM:



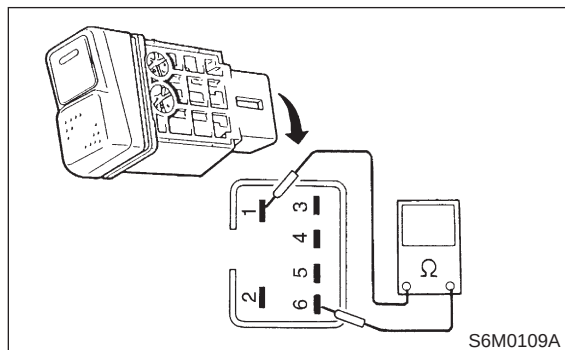
S6M0108

7B1 : CHECK CRUISE CONTROL MAIN SWITCH.

- 1) Remove cruise control main switch.
- 2) Measure resistance between cruise control main switch terminals.

Terminals

No. 1 — No. 6:



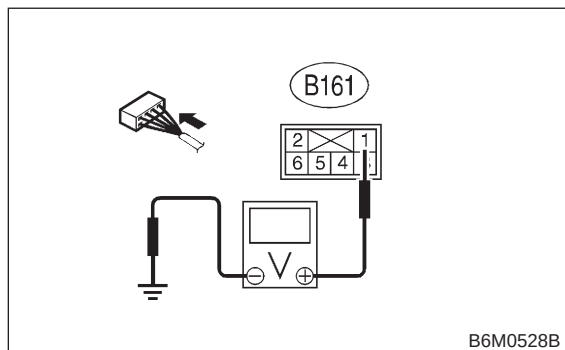
- CHECK** : Is resistance between 10 and 80 Ω ?
- YES** : Go to step 7B2.
- NO** : Replace switch illumination bulb.

7B2 : CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT.

- 1) Turn the ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Measure voltage between cruise control main switch connector and the chassis ground.

Connector & terminal

(B161) No. 1 (+) — Chassis ground (-):



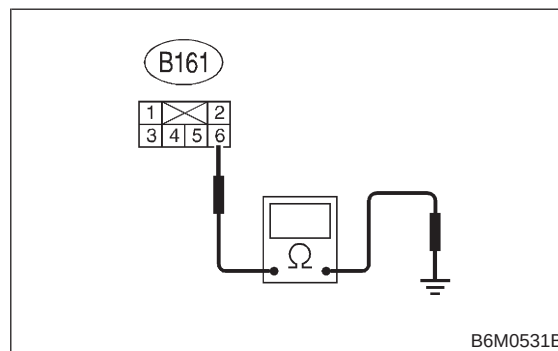
- CHECK** : Is voltage more than 10 V?
- YES** : Go to step 7B3.
- NO** : Repair or replace wiring harness.

7B3 : CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT.

- 1) Turn the ignition switch and cruise control main switch to OFF.
- 2) Remove the connector from the cruise control main switch.
- 3) Measure resistance of ground circuit between the cruise control main switch connector and chassis ground.

Connector & terminal

(B161) No. 6 (+) — Chassis ground (-):



- CHECK** : Is resistance less than 10 Ω ?
- YES** : Replace cruise control module.
- NO** : Repair or replace wiring harness.

C: CHECK CRUISE CONTROL MAIN SWITCH

DIAGNOSIS:

- Faulty cruise control main switch, or open harness.

TROUBLE SYMPTOM:

- Cruise control main switch is not turned ON and cruise control cannot be set.

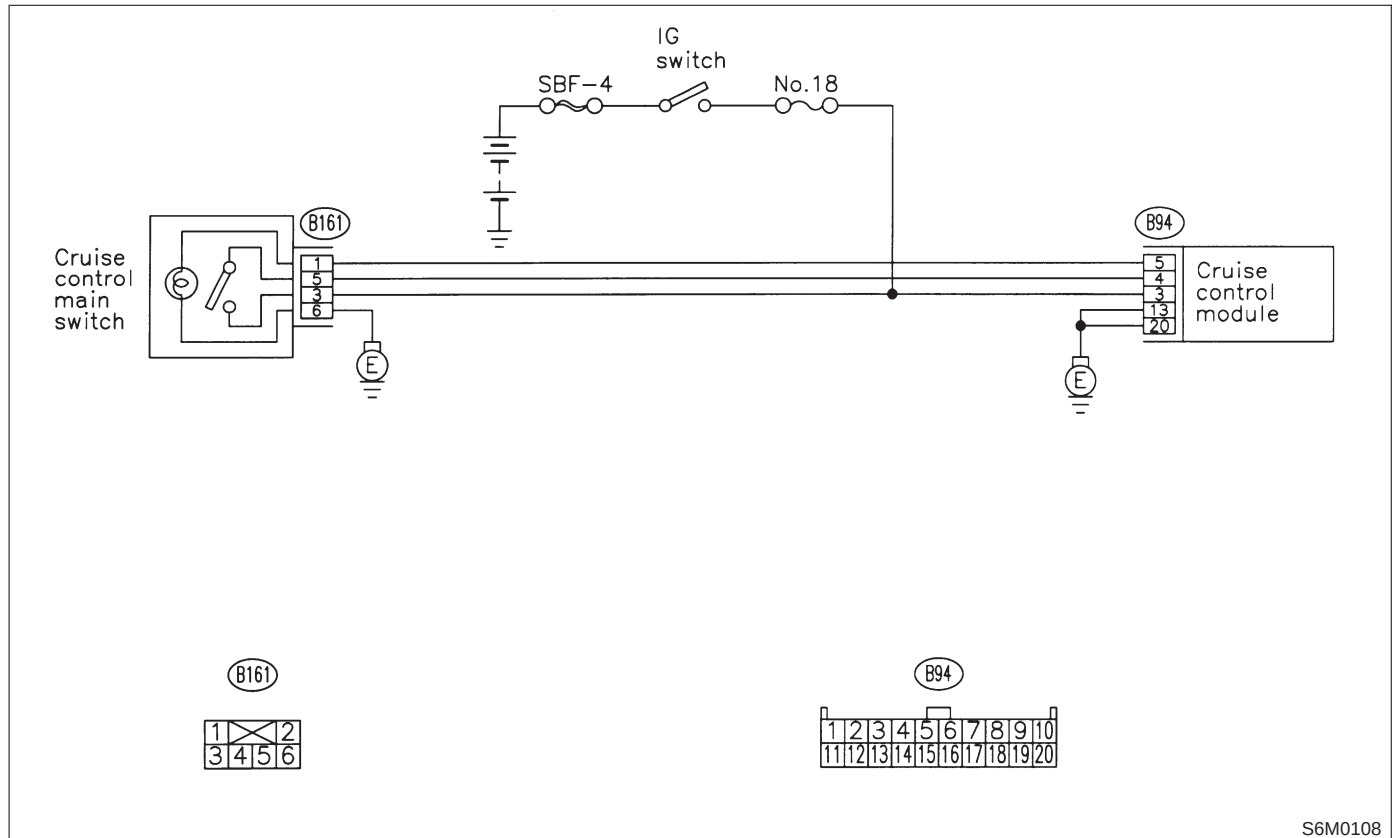
NOTE:

When the main relay (built-in cruise control module) operates, the main switch circuit is in normal condition.

The main relay operation can be checked by hearing the operation sounds.

This operation sounds will be heard when ignition switch and cruise control main switch is turned to ON.

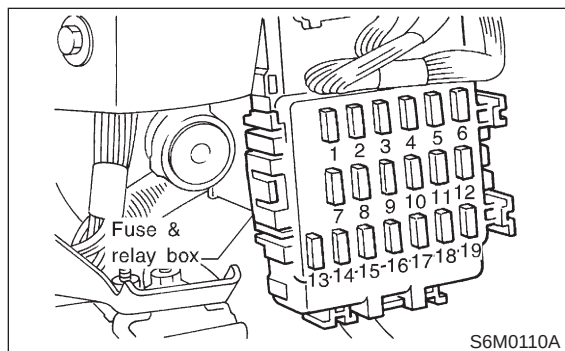
WIRING DIAGRAM:



S6M0108

7C1 : CHECK FUSE.

Check fuse No. 18.



- CHECK** : Is fuse No. 18 blown?
YES : Replace fuse No. 18. Go to step 7C2.
NO : Go to step 7C2.

7C2 : CHECK POWER SUPPLY.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between fuse & relay box connector and chassis ground.

Connector & terminal

(B152) No. 5 (+) — Chassis ground (-):

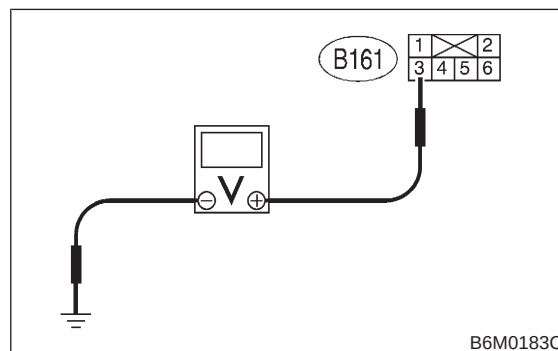
- CHECK** : Is voltage more than 10 V?
YES : Go to step 7C3.
NO : Replace fuse No. 18. When fuse No. 18 is blown again, repair shorted parts of circuit.

7C3 : CHECK CRUISE CONTROL MAIN SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Remove cruise control main switch and disconnect connector.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between cruise control main switch connector and chassis ground.

Connector & terminal

(B161) No. 3 (+) — Chassis ground (-):



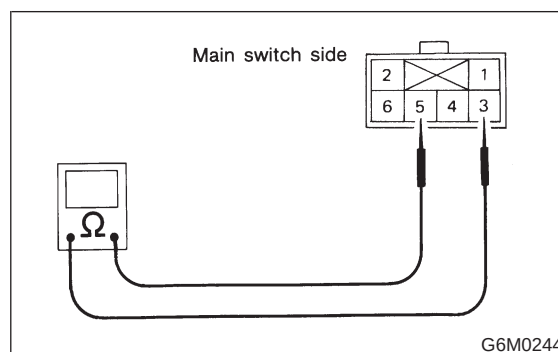
- CHECK** : Is voltage more than 10 V?
YES : Go to step 7C4.
NO : Replace cruise control main switch.

7C4 : CHECK CRUISE CONTROL MAIN SWITCH.

Measure resistance between cruise control main switch terminals.

Terminals

No. 3 — No. 5:



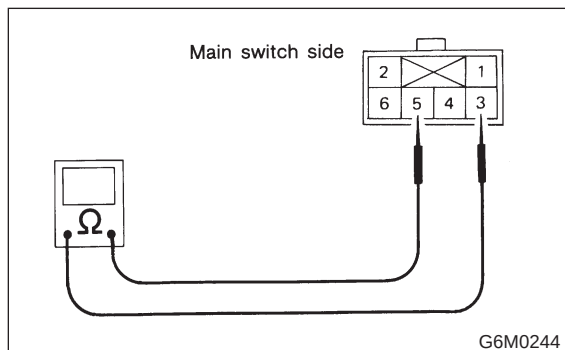
- CHECK** : Is resistance less than 10 Ω ? (When switch is ON.)
YES : Go to step 7C5.
NO : Replace cruise control main switch.

7C5 : CHECK CRUISE CONTROL MAIN SWITCH.

Measure resistance between cruise control main switch terminals.

Terminals

No. 3 — No. 5:



CHECK : Is resistance less than 1 MΩ? (When switch is OFF.)

YES : Go to step 7C6.

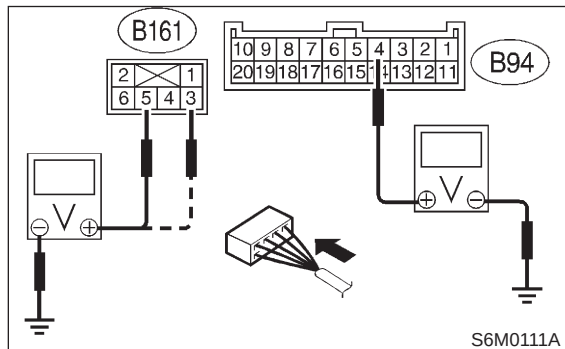
NO : Replace cruise control main switch.

7C6 : CHECK HARNESS BETWEEN CRUISE CONTROL MAIN SWITCH CONNECTOR AND CHASSIS GROUND.

- 1) Connect connector.
- 2) Turn ignition switch to ON.
- 3) Turn cruise control main switch to ON.
- 4) Measure voltage between terminal of cruise control main switch and chassis ground.

Connector & terminal

(B161) No. 3 (+) — Chassis ground (-):



CHECK : Is voltage more than 10 V?

YES : Go to step 7C7.

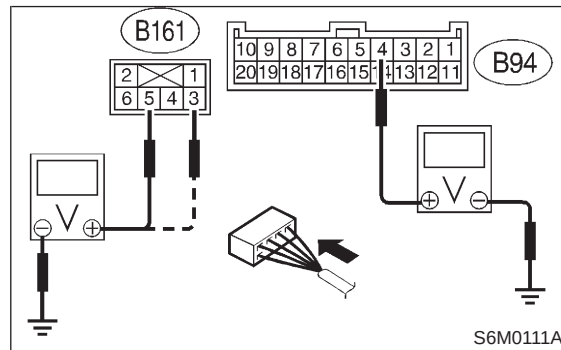
NO : Repair or replace wiring harness.

7C7 : CHECK HARNESS BETWEEN CRUISE CONTROL MAIN SWITCH CONNECTOR AND CHASSIS GROUND.

Measure voltage between terminal of cruise control main switch chassis ground.

Connector & terminal

(B161) No. 5 (+) — Chassis ground (-):



CHECK : Is voltage more than 10 V?

YES : Go to step 7C8.

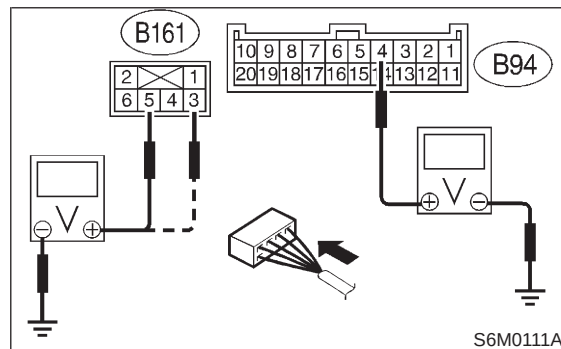
NO : Repair or replace wiring harness.

7C8 : CHECK HARNESS BETWEEN CRUISE CONTROL MODULE CONNECTOR AND CHASSIS GROUND.

Measure voltage between terminal of cruise control module and chassis ground.

Connector & terminal

(B94) No. 4 (+) — Chassis ground (-):



CHECK : Is voltage more than 10 V?

YES : Replace cruise control module.

NO : Repair or replace wiring harness.

NOTE:

Depress cruise control main switch with fingers while measuring voltage between (B161) No. 5 and chassis ground.

MEMO:

6-2 [T8A0] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

8. Diagnostics Chart with Diagnostic Code

8. Diagnostics Chart with Diagnostic Code

A: DIAGNOSTIC CODE LIST

Diagnostic code	Item	Contents of diagnosis	Index No.
11	BRAKE SW/STOP SW	Input signals from brake switch "OFF", stop light switch "ON" (Brake pedal is depressed.)	<Ref. to 6-2 [T8B0].>
12	CLUTCH SW/INHIBITOR SW	Input signals from clutch switch "OFF" (MT), or inhibitor switch "P or N" (AT) [Clutch pedal is depressed (MT), or selector lever is set to P or N position (AT).]	<Ref. to 6-2 [T8C0].>
13	LOW SPEED LIMIT	Low-speed control limiter	<Ref. to 6-2 [T8D0].>
14	CANCEL SW	Input signal from cancel switch (faulty SET/COAST switch or RESUME/ACCEL switch)	<Ref. to 6-2 [T8E0].>
21	VACUUM VALVE	Faulty vacuum valve or valve drive system	<Ref. to 6-2 [T8F0].>
22	VENT 2 VALVE	Faulty vent 2 valve or valve drive system	<Ref. to 6-2 [T8F0].>
23	VENT 1 VALVE	Faulty vent 1 valve or valve drive system	<Ref. to 6-2 [T8F0].>
24	SPEED SENSOR	Faulty vehicle speed sensor 2	<Ref. to 6-2 [T8D0].>
25	CONTROL MODULE	Faulty CPU RAM included in cruise control module	<Ref. to 6-2 [T8G0].>

B: DIAGNOSTIC CODE 11 (BRAKE SWITCH, STOP LIGHT SWITCH)

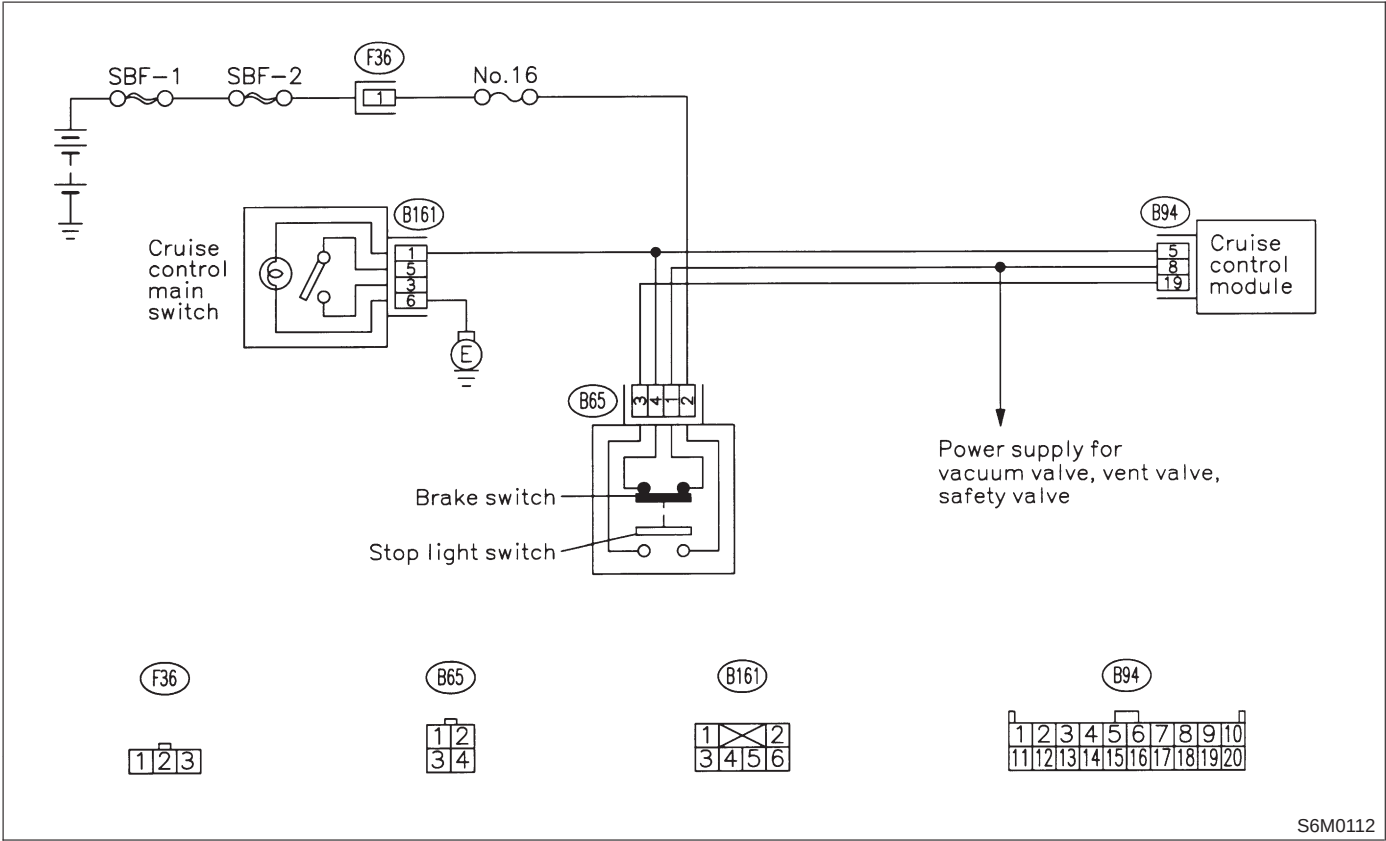
DIAGNOSIS:

- Failure or disconnection of the stop light switch and brake switch.

TROUBLE SYMPTOM:

- Cruise control cannot be set.

WIRING DIAGRAM:



6-2 [T8B1] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

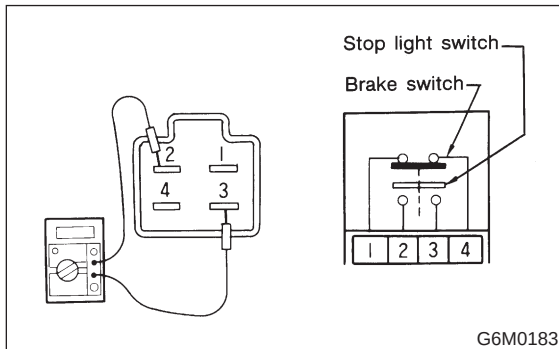
8. Diagnostics Chart with Diagnostic Code

8B1 : CHECK BRAKE SWITCH.

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "Current Data Display & Save" mode.
- 5) Depress the brake pedal and check signals for proper operation.
 - (1) The Stop Lamp Switch shown on the display turns from "OFF" to "ON".
 - (2) The Brake Switch shown on the display turns from "OFF" to "ON".
- 6) Release the brake pedal.
- 7) Remove connector of stop and brake switch.
- 8) Check circuit between brake switch terminal.

Terminals

No. 1 — No. 4: (Brake switch)



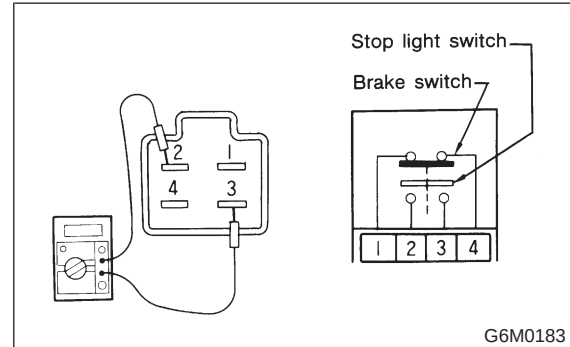
- CHECK** : *Is resistance less than 1 Ω ? (When brake pedal is released.)*
- YES** : Go to step 8B2.
- NO** : Replace brake and stop light switch.

8B2 : CHECK BRAKE SWITCH.

Check circuit between brake switch terminal.

Terminals

No. 1 — No. 4: (Brake switch)



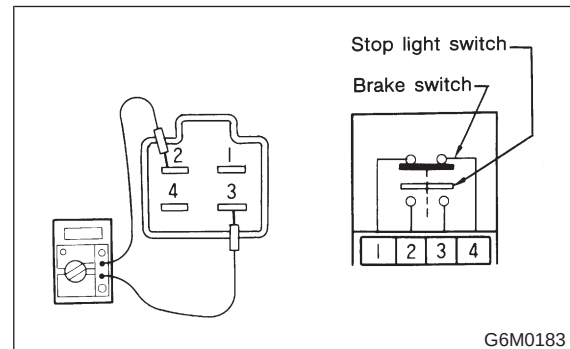
- CHECK** : *Is resistance more than 1 M Ω ? (When brake pedal is depressed.)*
- YES** : Go to step 8B3.
- NO** : Replace brake and stop light switch.

8B3 : CHECK STOP LIGHT SWITCH.

Check circuit between stop light switch terminal.

Terminals

No. 2 — No. 3: (Stop light switch)



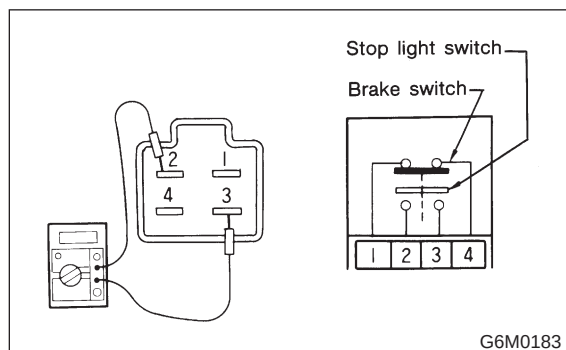
- CHECK** : *Is resistance more than 1 M Ω ? (When brake pedal is released.)*
- YES** : Go to step 8B4.
- NO** : Replace brake and stop light switch.

8B4 : CHECK STOP LIGHT SWITCH.

Check circuit between stop light switch terminal.

Terminals

No. 2 — No. 3: (Stop light switch)



CHECK : ***Is resistance less than 1 Ω ? (When brake pedal is depressed.)***

YES : Replace cruise control module.

NO : Replace brake and stop light switch.

MEMO:

C: DIAGNOSTIC CODE 12 (CLUTCH SWITCH, INHIBITOR SWITCH)

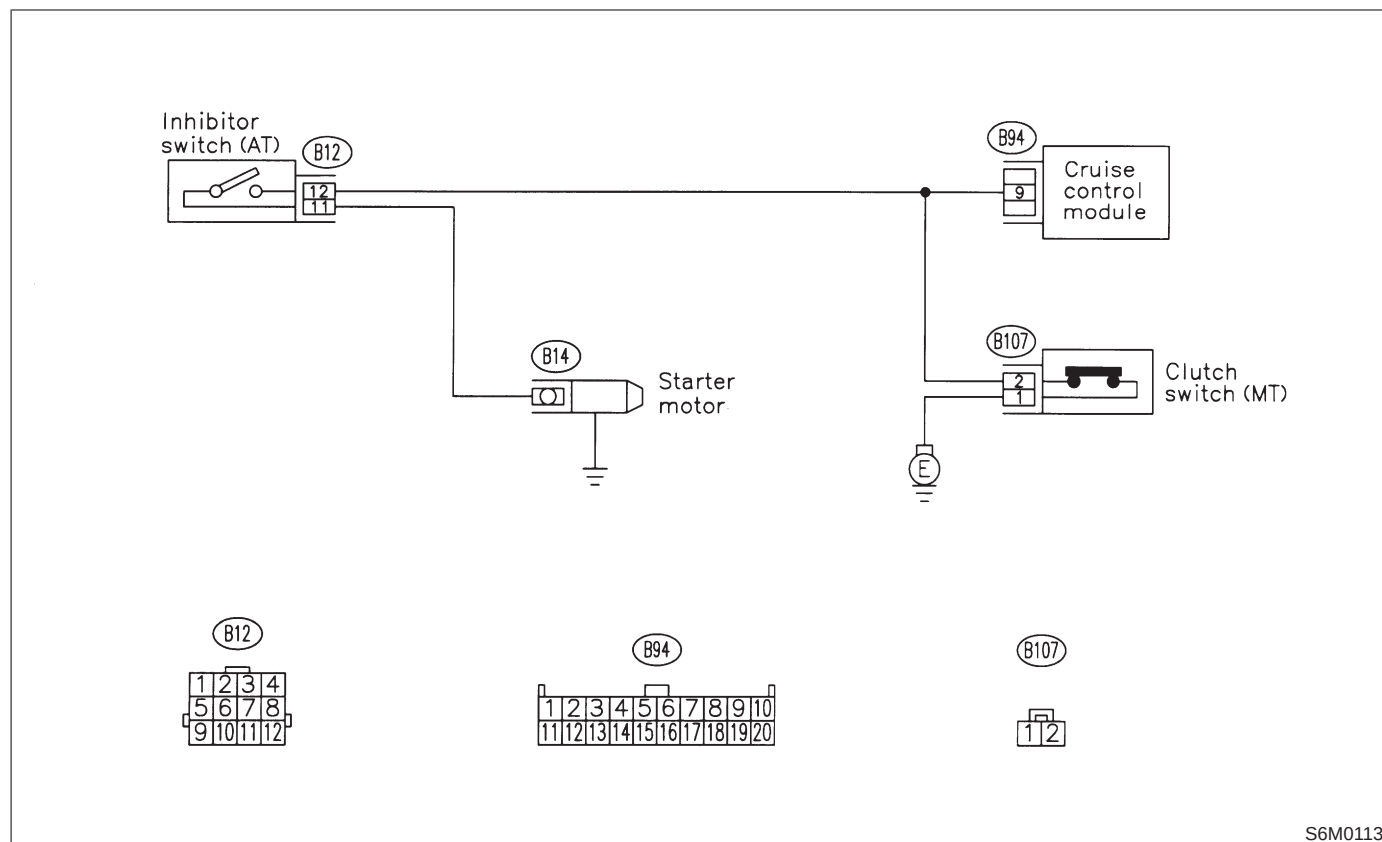
DIAGNOSIS:

- Failure or disconnection of the clutch switch. (MT)
- Failure or disconnection of the inhibitor switch. (AT)

TROUBLE SYMPTOM:

- Cruise control cannot be set.

WIRING DIAGRAM:



S6M0113

6-2 [T8C1] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

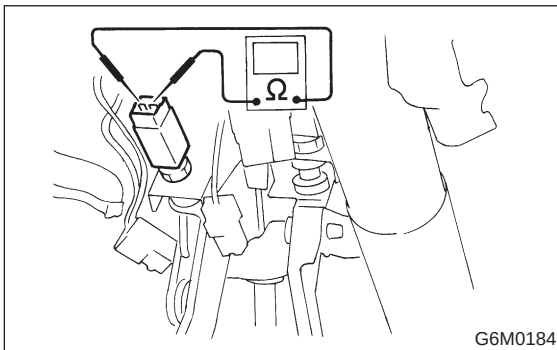
8. Diagnostics Chart with Diagnostic Code

8C1 : CHECK CLUTCH SWITCH. (MT)

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "Current Data Display & Save" mode.
- 5) Depress the clutch pedal and check signal for proper operation. (MT)
The Clutch/Inhibitor Switch shown on the display turns from "ON" to "OFF".
- 6) Disconnect connector of clutch switch.
- 7) Check continuity of the clutch switch.

Terminals

No. 1 — No. 2:



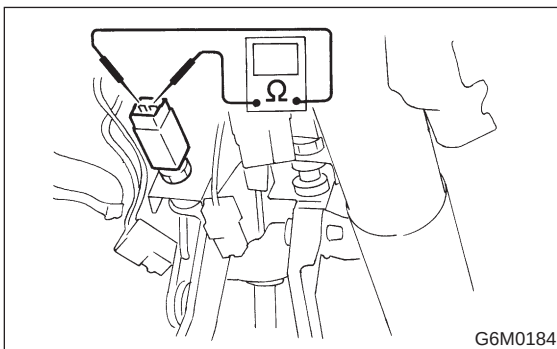
- CHECK** : Is resistance less than 10 Ω? (When clutch pedal is released.)
- YES** : Go to step 8C2.
- NO** : Replace clutch switch.

8C2 : CHECK CLUTCH SWITCH. (MT)

Check continuity of the clutch switch.

Terminals

No. 1 — No. 2:



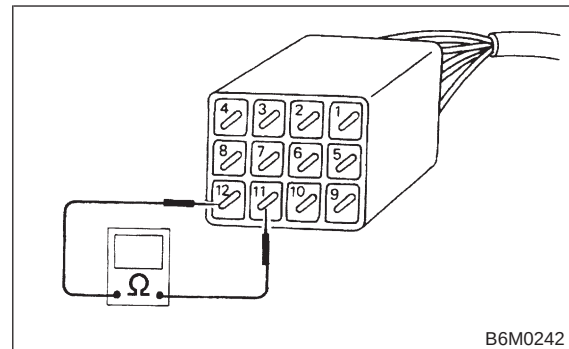
- CHECK** : Is resistance more than 1 MΩ? (When clutch pedal is depressed.)
- YES** : Replace cruise control module.
- NO** : Replace clutch switch.

8C3 : CHECK INHIBITOR SWITCH. (AT)

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "Current Data Display & Save" mode.
- 5) Set the selector lever from P or N position to D position and check signal for proper operation. (AT)
The Clutch/Inhibitor Switch shown on the display turns from "ON" to "OFF".
- 6) Set the selector lever to P or N position.
- 7) Disconnect connector of inhibitor switch.
- 8) Check continuity of the inhibitor switch.

Terminals

No. 11 — No. 12:



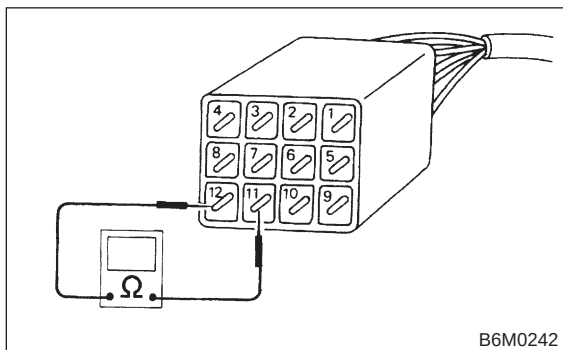
- CHECK** : Is resistance less than 10 Ω? (When selector lever is in P or N.)
- YES** : Go to step 8C4.
- NO** : Replace inhibitor switch. Repair inhibitor switch wiring harness.

8C4 : CHECK INHIBITOR SWITCH. (AT)

Check continuity of the inhibitor switch.

Terminals

No. 11 — No. 12:



- CHECK** : *Is resistance more than 1 MΩ? (When selector lever is not in P or N.)*
- YES** : Replace cruise control module.
- NO** : Replace inhibitor switch. Repair inhibitor switch wiring harness.

MEMO:

D: DIAGNOSTIC CODE 13 AND 24 (VEHICLE SPEED SENSOR 2 SYSTEM)

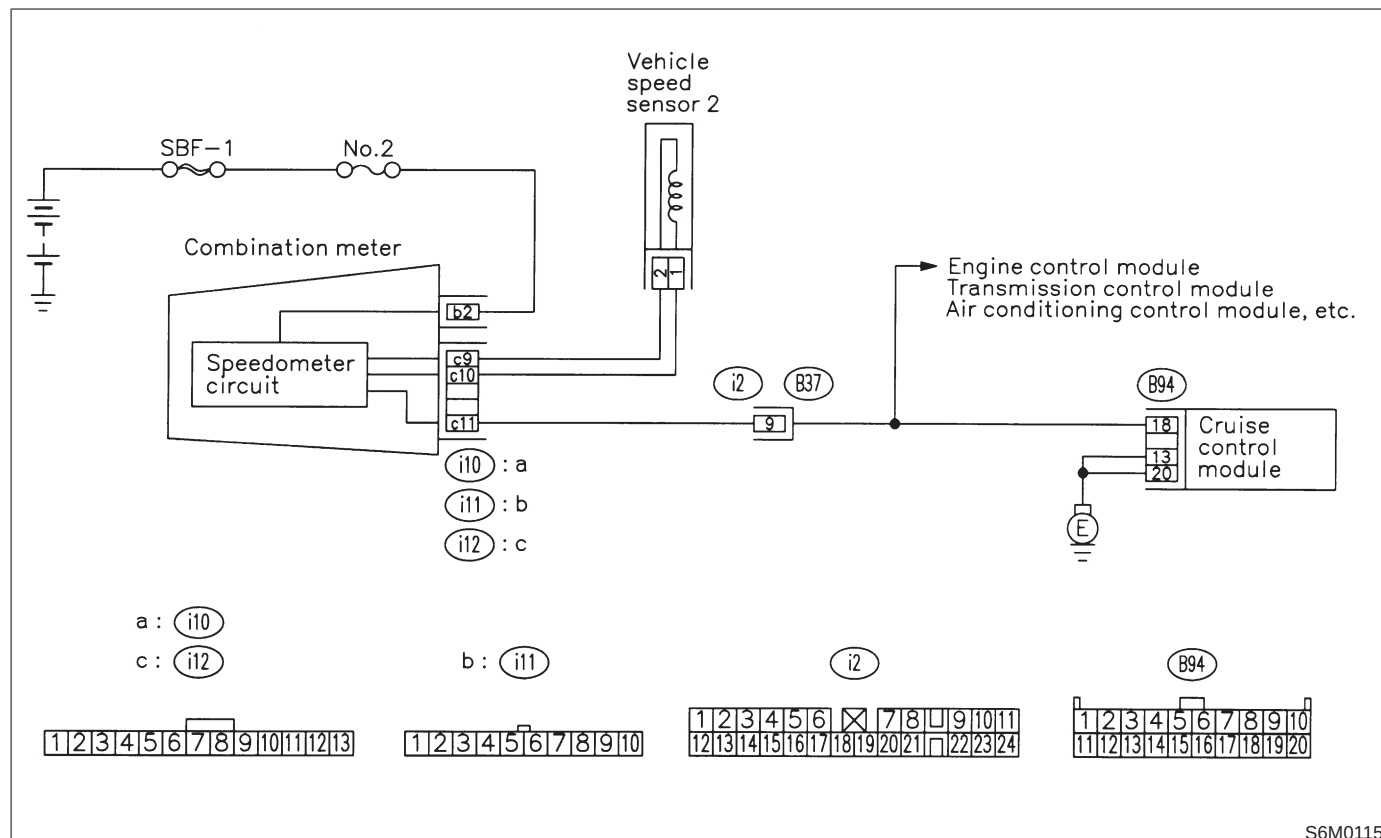
DIAGNOSIS:

- Disconnection or short circuit of vehicle speed sensor 2 system.

TROUBLE SYMPTOM:

- Cruise control cannot be set. (Cancelled immediately.)

WIRING DIAGRAM:



8D1 : CHECK OPERATION OF SPEEDOMETER.

Make sure that speedometer indicates the vehicle speed by driving the vehicle.

CHECK : *Does speedometer indicate vehicle speed by driving vehicle?*

YES : Go to step 8D2.

NO : Repair combination meter circuit.

8D2 : CHECK INPUT SIGNAL FOR CRUISE CONTROL MODULE.

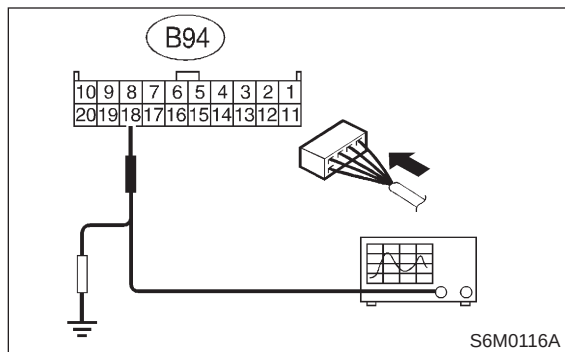
WARNING:

Be careful not to be caught up by the running wheels.

- 1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
- 2) Set oscilloscope to cruise control module connector terminals.
- 3) Start the engine.
- 4) Shift on the gear position, and keep the vehicle speed at constant.
- 5) Measure signal voltage.

Connector & terminal

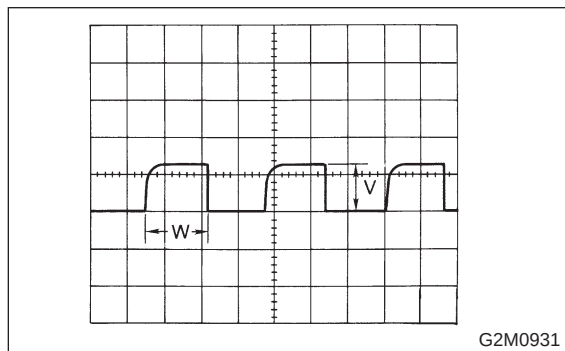
(B94) No. 18 (+) — Chassis ground (-):



- CHECK** : **Is the voltage more than 2 V?**
- YES** : Replace cruise control module.
- NO** : Go to step **8D3**.

NOTE:

- If the vehicle speed increases, the width of amplitude (W) decreases.

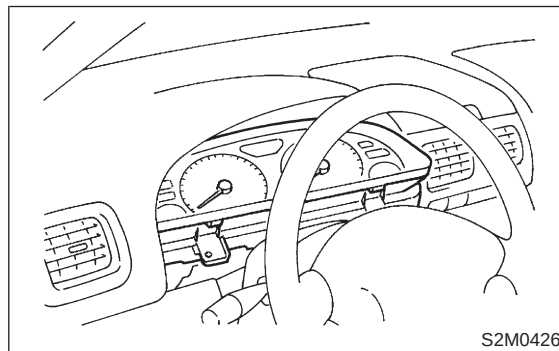


- If oscilloscope is not available, check input signal (vehicle speed signal) by using a select monitor. (Refer to the procedure as described below.)
- Using the select monitor:
 - 1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
 - 2) Turn ignition switch to OFF and set select monitor.

- 3) Turn ignition switch to ON.
- 4) Turn cruise control main switch to ON.
- 5) Set select monitor in "Current Data Display & Save" mode.
- 6) Drive the vehicle at speed greater than 40 km/h (25 MPH).
- 7) Check that vehicle speed indication on select monitor and speedometer are equal.
- When there is a disconnection or short circuit in the harness between the meter and the cruise control module, the indicated value will be 0 to 1.0 km/h (0 to 0.6 MPH).

8D3 : PERFORM A CIRCUIT TEST BETWEEN COMBINATION METER AND CRUISE CONTROL MODULE.

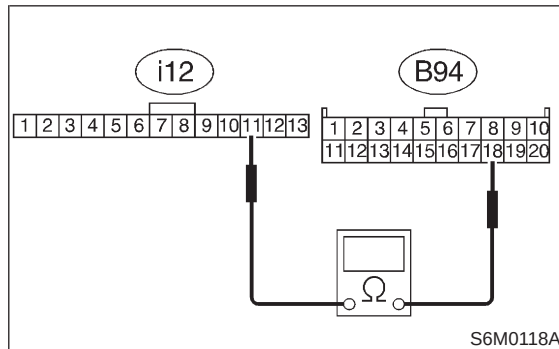
- 1) Turn ignition switch to OFF.
- 2) Remove combination meter.



- 3) Disconnect connector from cruise control module.
- 4) Measure resistance of harness connector between combination meter and cruise control module.

Connector & terminal

(i12) No. 11 — (B94) No. 18:



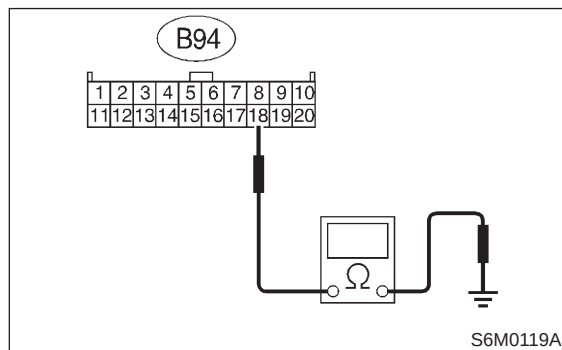
- CHECK** : **Is resistance less than 10 Ω?**
- YES** : Go to step **8D4**.
- NO** : Repair or replace harness connector.

8D4 : PERFORM A CIRCUIT TEST BETWEEN COMBINATION METER AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control module and chassis ground to make sure that circuit does not short.

Connector & terminal

(B94) No. 18 (+) — Chassis ground (-):



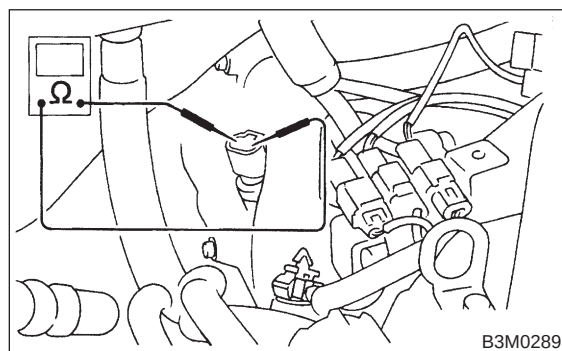
- CHECK** : Is resistance more than 1 MΩ?
- YES** : Go to step 8D5.
- NO** : Repair or replace harness connector.

8D5 : CHECK VEHICLE SPEED SENSOR 2.

- 1) Disconnect connector from vehicle speed sensor 2.
- 2) Measure resistance between terminals of vehicle speed sensor 2.

Terminals

No. 1 — No. 2:



- CHECK** : Is resistance between 350 and 450 Ω?
- YES** : Go to step 8D6.
- NO** : Replace vehicle speed sensor 2.

8D6 : CHECK VEHICLE SPEED SENSOR 2.

- 1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.

WARNING:

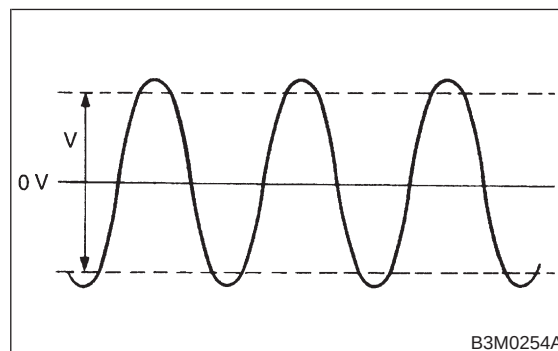
Be careful not to be caught up by the running wheels.

- 2) Drive the vehicle at speed greater than 20 km/h (12 MPH).
- 3) Measure voltage between terminals of vehicle speed sensor 2.

NOTE:

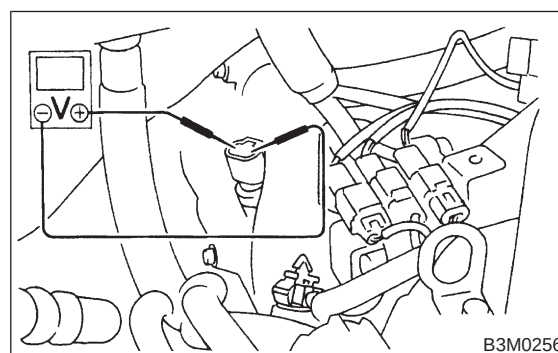
Using an oscilloscope:

- (1) Turn ignition switch to OFF.
- (2) Set oscilloscope to vehicle speed sensor 2.
- (3) Drive the vehicle at speed greater than 20 km/h (12 MPH).
- (4) Measure signal voltage.



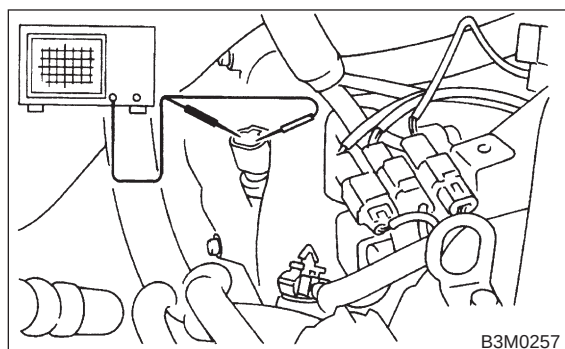
Terminals

No. 1 — No. 2:



6-2 [T8D6] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

8. Diagnostics Chart with Diagnostic Code



- CHECK** : ***Is voltage more than 2 V?***
- YES** : Repair or replace combination meter circuit.
- NO** : Replace vehicle speed sensor 2.

E: DIAGNOSTIC CODE 14 (SET/COAST SWITCH, RESUME/ACCEL SWITCH, CANCEL SWITCH)

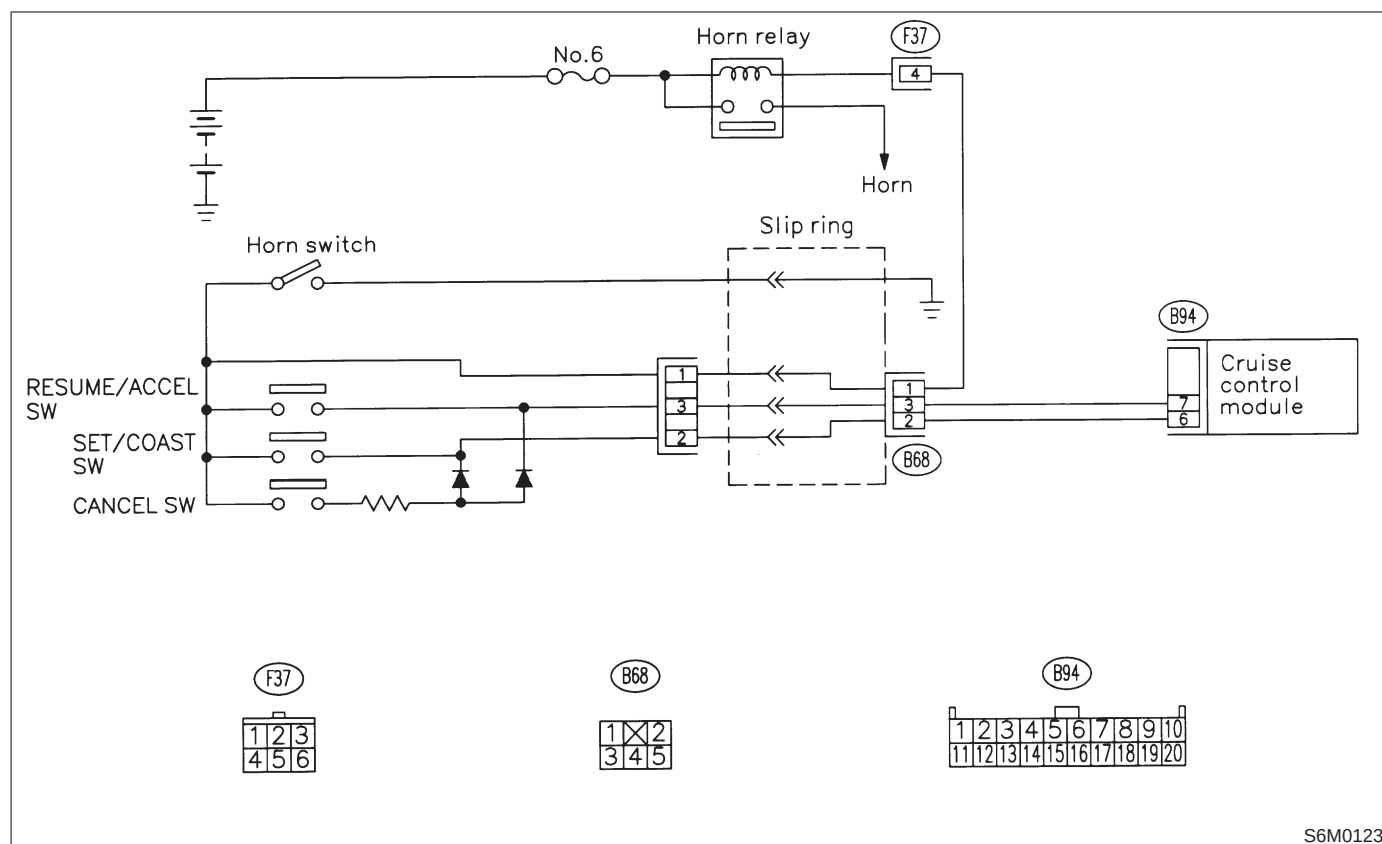
DIAGNOSIS:

- Short circuit inside the SET SW and RESUME SW.

TROUBLE SYMPTOM:

- Cruise control cannot be set. (Cancelled immediately.)

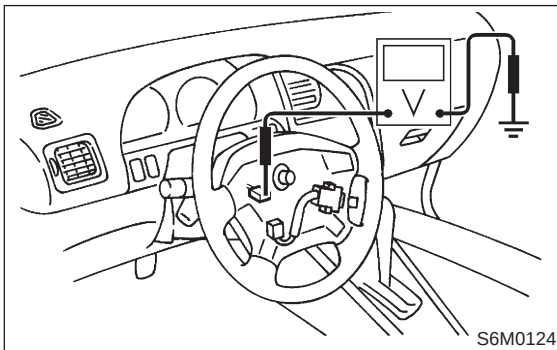
WIRING DIAGRAM:



S6M0123

8E1 : CHECK POWER SUPPLY.

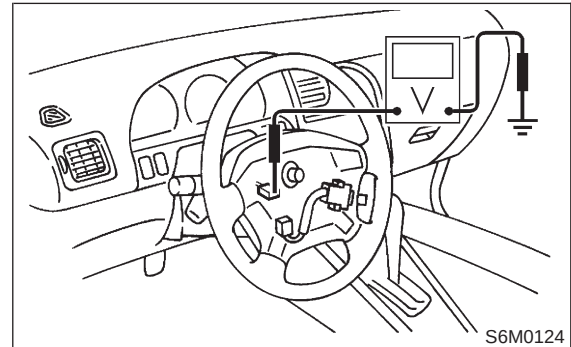
- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Set select monitor in "Current Data Display & Save" mode.
- 4) Check signals for proper operation.
 - (1) When pushing the SET/COAST switch:
The SET/COAST switch shown on the display turns from "OFF" to "ON".
 - (2) When pushing the RESUME/ACCEL switch:
The RESUME/ACCEL switch shown on the display turns from "OFF" to "ON".
- 5) Turn ignition switch to OFF.
- 6) Disconnect connector from cruise control command switch.
- 7) Turn ignition switch to ON.
- 8) Measure voltage between cruise control command switch connector and chassis ground.

Terminals**No. 1 (+) — Chassis ground (-):**

- CHECK** : **Is voltage more than 10 V?**
- YES** : Go to step **8E2**.
- NO** : Repair or replace wiring harness between fuse & relay box and cruise control command switch.

8E2 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

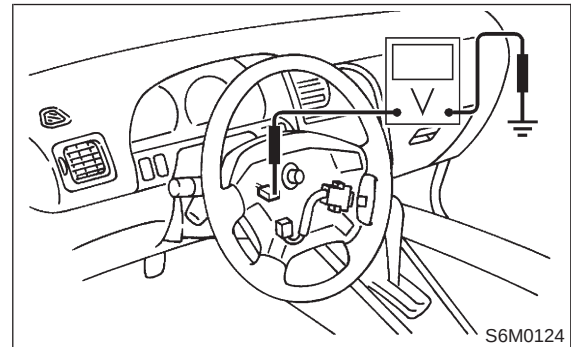
- 1) Turn ignition switch to OFF.
- 2) Connect connector of cruise control command switch.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between cruise control command switch connector and chassis ground.

Terminals**No. 2 (+) — Chassis ground (-):**

- CHECK** : **Is voltage more than 10 V? (When SET/COAST switch is ON.)**
- YES** : Go to step **8E3**.
- NO** : Replace cruise control command switch.

8E3 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

Measure voltage between cruise control command switch connector and chassis ground.

Terminals**No. 3 (+) — Chassis ground (-):**

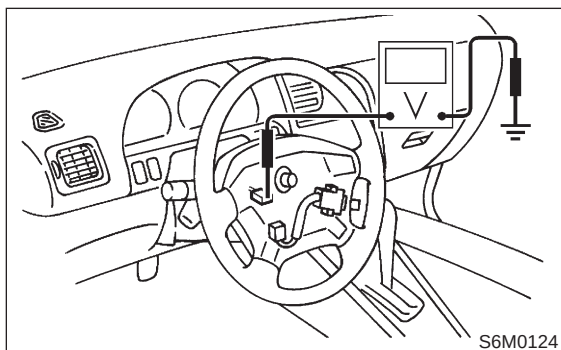
- CHECK** : **Is voltage more than 10 V? (When RESUME/ACCEL switch is ON.)**
- YES** : Go to step **8E4**.
- NO** : Replace cruise control command switch.

8E4 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

Measure voltage between cruise control command switch connector and chassis ground.

Terminals

No. 2 (+) — Chassis ground (-):



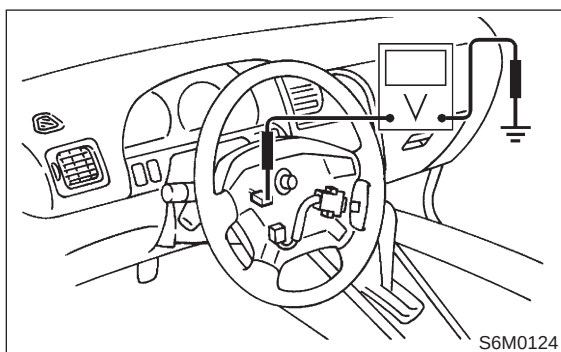
- CHECK** : Is voltage more than 10 V? (When CANCEL switch is ON.)
- YES** : Go to step 8E5.
- NO** : Replace cruise control command switch.

8E5 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

Measure voltage between cruise control command switch connector and chassis ground.

Terminals

No. 3 (+) — Chassis ground (-):



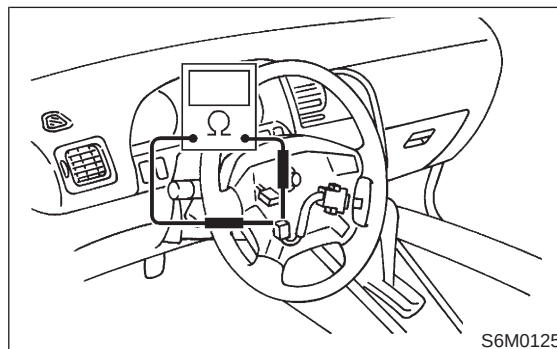
- CHECK** : Is voltage more than 10 V? (When CANCEL switch is ON.)
- YES** : Go to step 8E6.
- NO** : Replace cruise control command switch.

8E6 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from cruise control command switch.
- 3) Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 2:



- CHECK** : Is resistance less than 10 Ω? (When SET/COAST switch is ON.)
- YES** : Go to step 8E7.
- NO** : Replace cruise control command switch.

6-2 [T8E7] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

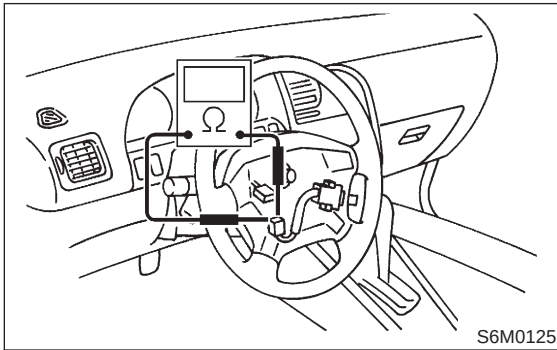
8. Diagnostics Chart with Diagnostic Code

8E7 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 2:



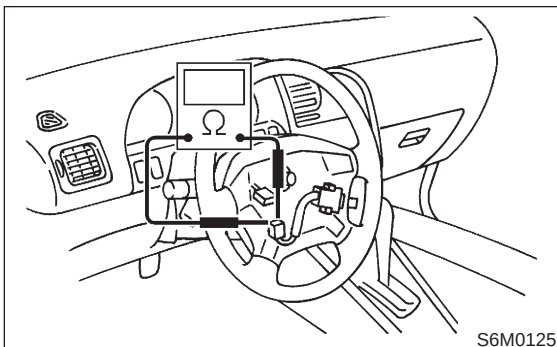
- CHECK** : *Is resistance more than 1 MΩ? (When SET/COAST switch is OFF.)*
- YES** : Go to step 8E8.
- NO** : Replace cruise control command switch.

8E8 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 3:



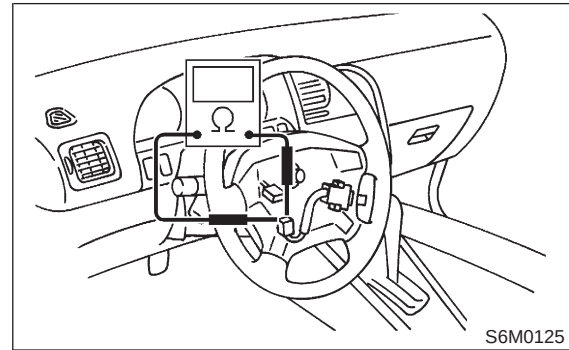
- CHECK** : *Is resistance less than 10 Ω? (When RESUME/ACCEL switch is ON.)*
- YES** : Go to step 8E9.
- NO** : Replace cruise control command switch.

8E9 : CHECK THE CRUISE CONTROL COMMAND SWITCH.

Measure resistance between terminals of cruise control command switch connector (switch side) to check the switch operation.

Terminals

No. 1 — No. 3:



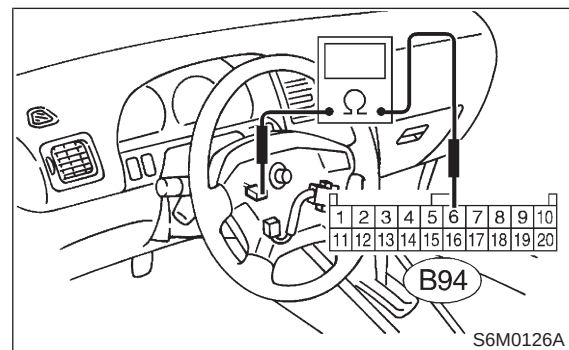
- CHECK** : *Is resistance more than 1 MΩ? (When RESUME/ACCEL switch is OFF.)*
- YES** : Go to step 8E10.
- NO** : Replace cruise control command switch.

8E10 : CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL COMMAND SWITCH AND CRUISE CONTROL MODULE.

- 1) Disconnect connector from cruise control module.
- 2) Measure resistance of harness connector between cruise control command switch and cruise control module.

Connector & terminal

No. 2 (command switch) — (B94) No. 6:



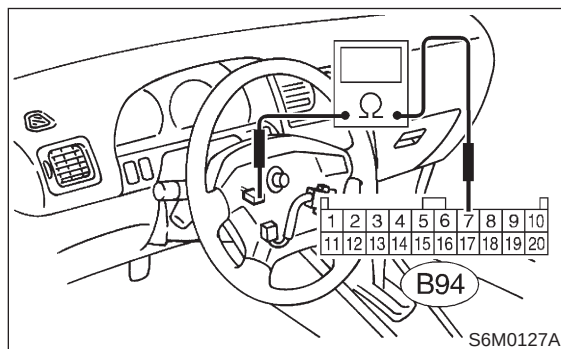
- CHECK** : *Is resistance less than 10 Ω?*
- YES** : Go to step 8E11.
- NO** : Repair or replace wiring harness.

8E11 : CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL COMMAND SWITCH AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control command switch and cruise control module.

Connector & terminal

No. 3 (command switch) — (B94) No. 7:



CHECK

: **Is resistance less than 10 Ω?**

YES

: Replace cruise control module.

NO

: Repair or replace wiring harness.

MEMO:

F: DIAGNOSTIC CODE 21, 22 AND 23 (VACUUM VALVE, VENT 2 VALVE, VENT 1 VALVE)

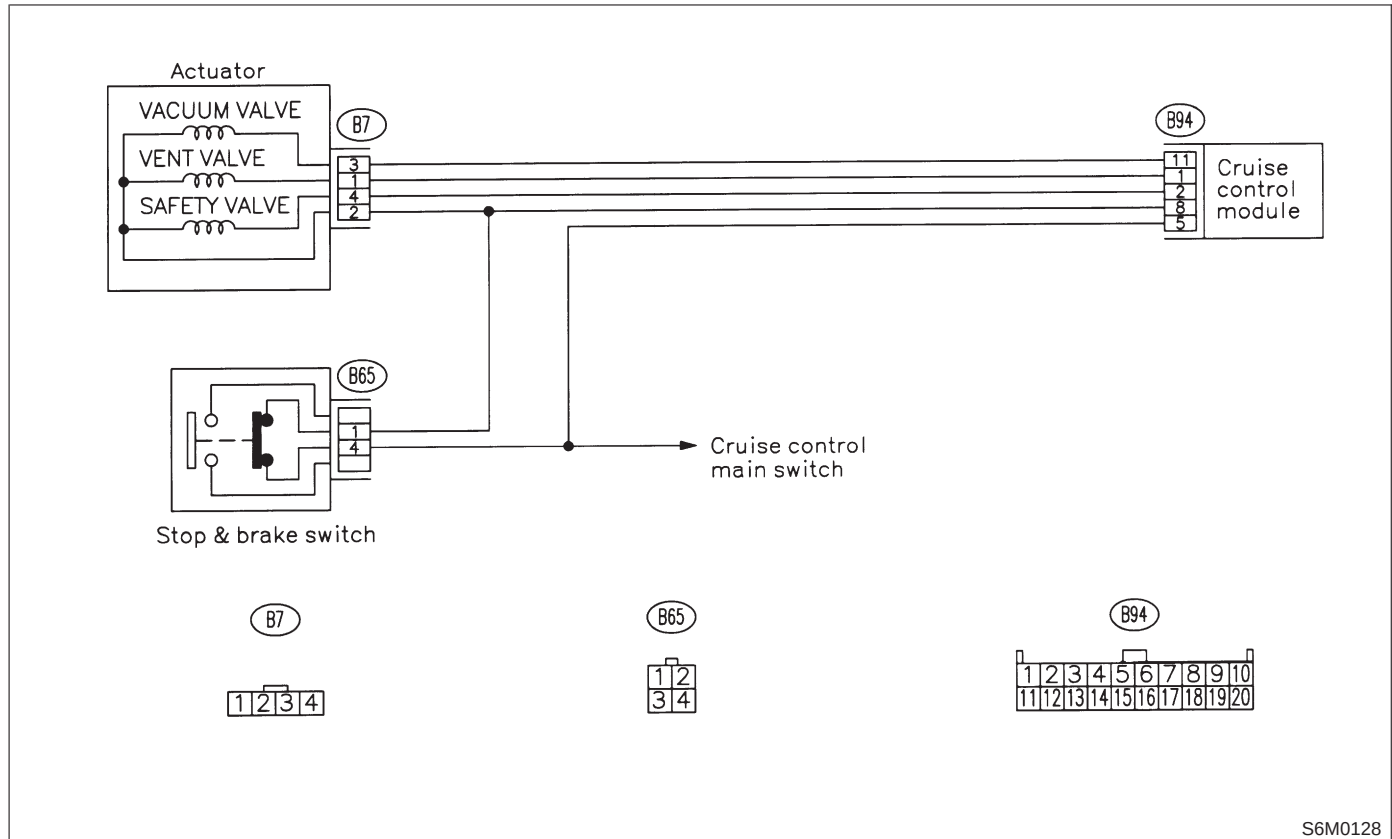
DIAGNOSIS:

- Open or poor contact of vacuum valve, vent 2 valve and vent 1 valve.

TROUBLE SYMPTOM:

- Cruise control cannot be set. (Cancels immediately.)

WIRING DIAGRAM:



S6M0128

6-2 [T8F1] BODY ELECTRICAL SYSTEM (CRUISE CONTROL)

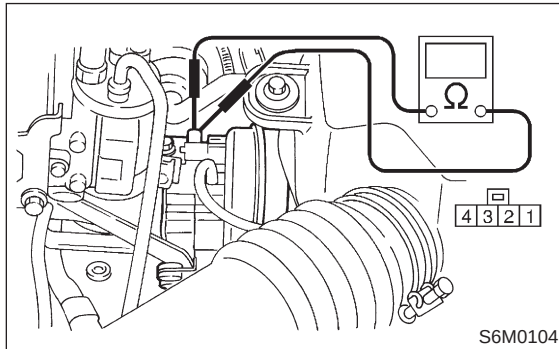
8. Diagnostics Chart with Diagnostic Code

8F1 : MEASURE RESISTANCE OF VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE.

- 1) Disconnect connector from actuator.
- 2) Measure resistance of vacuum valve, vent 2 valve and vent 1 valve.

Terminals

No. 2 — No. 3:



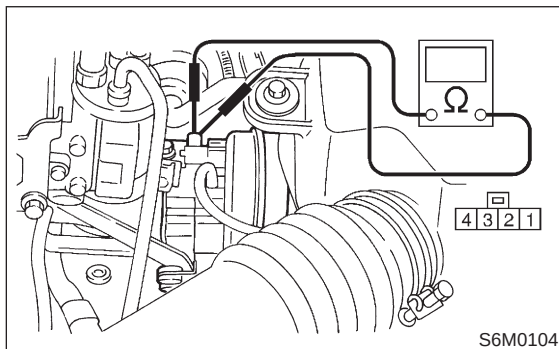
- CHECK** : Is resistance less than 22 Ω ?
- YES** : Go to step 8F2.
- NO** : Replace actuator.

8F2 : MEASURE RESISTANCE OF VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE.

Measure resistance of vacuum valve, vent 2 valve and vent 1 valve.

Terminals

No. 2 — No. 1:



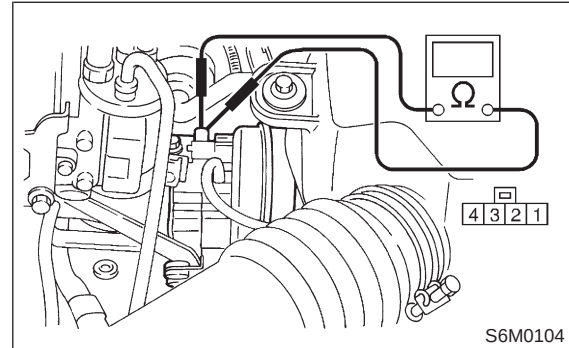
- CHECK** : Is resistance less than 55 Ω ?
- YES** : Go to step 8F3.
- NO** : Replace actuator.

8F3 : MEASURE RESISTANCE OF VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE.

Measure resistance of vacuum valve, vent 2 valve and vent 1 valve.

Terminals

No. 2 — No. 4:



- CHECK** : Is resistance less than 55 Ω ?
- YES** : Go to step 8F4.
- NO** : Replace actuator.

8F4 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR (VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE) AND CRUISE CONTROL MODULE.

8F5 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR (VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE) AND CRUISE CONTROL MODULE.

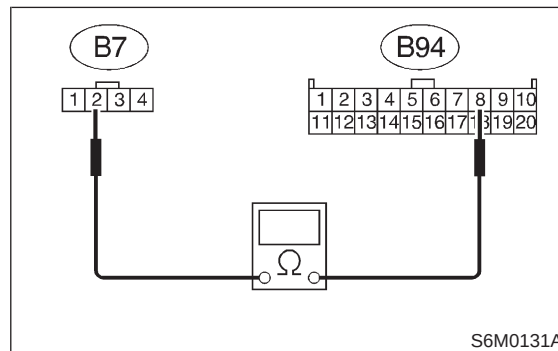
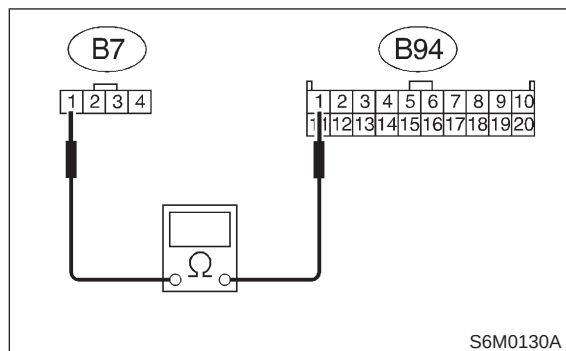
- 1) Disconnect connector from cruise control module.
- 2) Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal
(B7) No. 2 — (B94) No. 8:

Connector & terminal

(B7) No. 1 — (B94) No. 1:



- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 8F5.
- NO** : Repair or replace wiring harness between actuator and cruise control module.

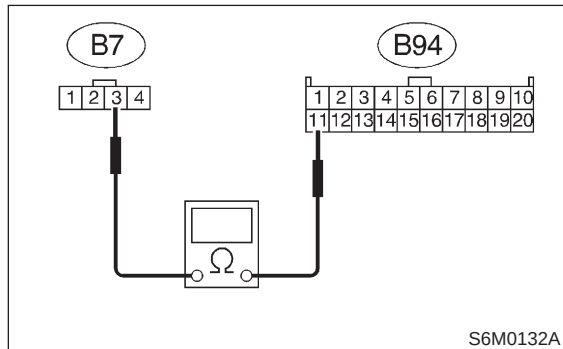
- CHECK** : Is resistance less than 10 Ω?
- YES** : Go to step 8F6.
- NO** : Repair or replace wiring harness between actuator and cruise control module.

8F6 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR (VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE) AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal

(B7) No. 3 — (B94) No. 11:



CHECK : **Is resistance less than 10 Ω?**

YES : Go to step **8F7**.

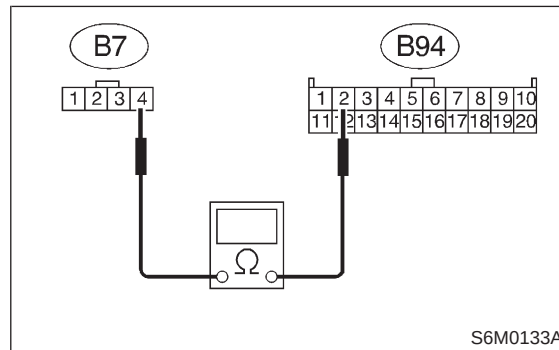
NO : Repair or replace wiring harness between actuator and cruise control module.

8F7 : PERFORM A CIRCUIT TEST IN HARNESS BETWEEN ACTUATOR (VACUUM VALVE, VENT 2 VALVE AND VENT 1 VALVE) AND CRUISE CONTROL MODULE.

Measure resistance of harness connector between cruise control module, vacuum valve, vent 2 valve and vent 1 valve.

Connector & terminal

(B7) No. 4 — (B94) No. 2:



CHECK : **Is resistance less than 10 Ω?**

YES : Replace cruise control module.

NO : Repair or replace wiring harness between actuator and cruise control module.

G: DIAGNOSTIC CODE 25 (CRUISE CONTROL MODULE BUILT-IN RELAY, CPU RAM)

DIAGNOSIS:

- Poor welding of built-in relay of cruise control module.
- Failure of built-in CPU RAM of cruise control module.

TROUBLE SYMPTOM:

- Cruise control is canceled and memorized cruise speed is also canceled.
- Once cruise control is canceled, cruise control cannot be set until the ignition switch and cruise control main switch turns OFF, and then turns ON again.

NOTE:

Check input/output signal and vehicle speed signal with select monitor. When signals are in good condition, failure is in cruise control module. (Check power supply and ground conditions of cruise control module.)

9. Diagnostics Chart with Select Monitor

A: FUNCTION MODE

NOTE:

Applicable select monitor cartridge:

No. 24082AA010

Select the "Cruise Control" system using the select monitor and set the "Current Data Display & Save" mode. The following parameters will then appear on the display.

● Vehicle Speed

The current vehicle speed is shown on the display.

● Stop Lamp Switch

When the brake pedal is depressed, the stop lamp switch shown on the display turns from "OFF" to "ON".

● Brake Switch

When the brake pedal is depressed, the brake switch shown on the display turns from "OFF" to "ON".

● "SET/COAST" Switch

When the cruise control command switch is placed in the "SET/COAST" position, the SET/COAST switch shown on the display turns from "OFF" to "ON".

● "RESUME/ACCEL" Switch

When the cruise control command switch is placed in the "RESUME/ACCEL" position, the RESUME/ACCEL switch shown on the display turns from "OFF" to "ON".

● Clutch/Inhibitor Switch

When the clutch pedal is depressed, the clutch/inhibitor switch shown on the display turns from "ON" to "OFF". (MT models)

When the selector lever is moved from the "N" or "P" position to any other position, the clutch/inhibitor switch shown on the display turns from "ON" to "OFF".

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MEMO:

1. Important Safety Notice

- Providing appropriate service and repair is a matter of great importance in the serviceman's safety maintenance and safe operation, function and performance which the SUBARU vehicle possesses.
- In case the replacement of parts or replenishment of consumables is required, genuine SUBARU parts whose parts numbers are designated or their equivalents must be utilized.
- It must be made well known that the safety of the serviceman and the safe operation of the vehicle would be jeopardized if he used any service parts, consumables, special tools and work procedure manuals which are not approved or designated by SUBARU.

2. How to Use This Manual

● This Service Manual is divided into four volumes by section so that it can be used with ease at work. Refer to the Table of Contents, select and use the necessary section.

- GENERAL INFORMATION SECTION
- REPAIR SECTION
- DIAGNOSTICS SECTION
- WIRING DIAGRAM SECTION

● The description of each area is provided with four types of titles different in size as shown below. The Title No. or Symbol prefixes each title in order that the construction of the article and the flow of explanation can be easily understood.

[Example of each title]

● Area title:	T. DIAGNOSTICS
● Large title (Heading):	1. Diagnostics Chart with Select Monitor (to denote the main item of explanation.)
● Medium title (Section):	A: BASIC DIAGNOSTICS CHART (to denote the type of work in principle.)
● Small title (Sub-section):	1. CHECK INPUT SIGNAL FOR ECM (to denote a derivative item of explanation.)

- The Title Index No. is indicated on the top left (or right) side of the page as the book is opened. This is useful for retrieving the necessary portion.

(Example of usage)

Refer to 3 - 2 [T 5 A 0]

Small title (Sub-section)
Medium title (Section)
Large title (Heading)
DIAGNOSTICS
Chapter no.

Example of title placement
Title index No.

Medium title

Large title

AUTOMATIC TRANSMISSION AND DIFFERENTIAL [T5A1] 3-2

5. Diagnostic Chart with Trouble Code

5. Diagnostic Chart with Trouble Code

A: TROUBLE CODE 11
— DUTY SOLENOID A —

DIAGNOSIS:
Output signal circuit of duty solenoid A or resistor is open or shorted

TROUBLE SYMPTOM:
Excessive shift shock

1 Measure signal voltage output emitted from TCM. Not OK → Repair TCM terminal poor contact. (Replace TCM.)

OK →

2 Check harness and connectors between TCM and duty solenoid A and TCM and resistor. Not OK → Repair or replace harness/connector.

OK →

Repair TCM terminal poor contact. (Replace TCM.)

1. MEASURE SIGNAL VOLTAGE OUTPUT EMITTED FROM TCM.

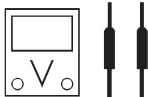
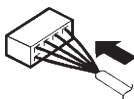
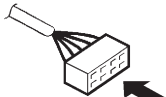
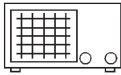
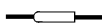
1) Warm-up the engine and transmission.
2) Ignition switch ON (Engine OFF)
3) Move shift lever to "N"
4) While opening and closing throttle valve, measure voltage between TCM connector and body.

Connector & terminal / Specified resistance:
(B52) No. 11—No. 13 /
1.5—4.0 V (Throttle is fully closed.)
0.5 V, max. (Throttle is fully open.)

Small title

G3M0106

- In this manual, the following symbols are used.

Character	Description
 B0M0002	Circuit tester ● Voltage measurement
 B0M0003	Circuit tester ● Resistance measurement
 B0M0004	The arrow indicates that insertion of the probe or numbering of the connector pins is made from the side.
 B0M0005	The arrow indicates that insertion of the probe or numbering of the connector pins is made from the side.
 B0M0006	Oscilloscope
 B0M0007	Oscilloscope positive probe
 B0M0008	Oscilloscope earth head

- **WARNING, CAUTION, NOTE**

WARNING:	Indicates the item which must be observed precisely during performance of maintenance services in order to avoid injury to the mechanics and other persons.
CAUTION:	Indicates that item which must be followed precisely during performance of maintenance services so as to avoid damage and breakage to the vehicle and its parts and components.
NOTE:	Indicates the hints, knacks, etc. which make the maintenance job easier.

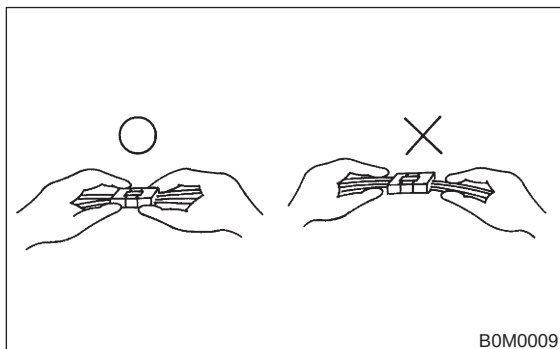
3. Basic Checks

A: DISCONNECTING CONNECTORS

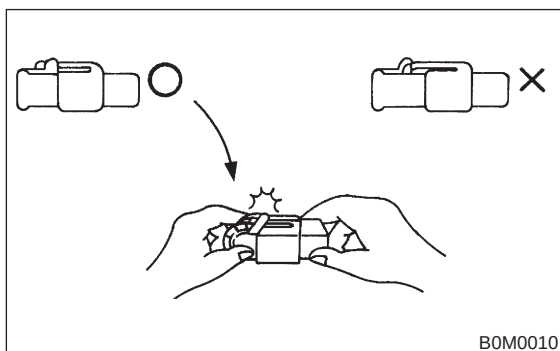
- Always hold the connector itself.

CAUTION:

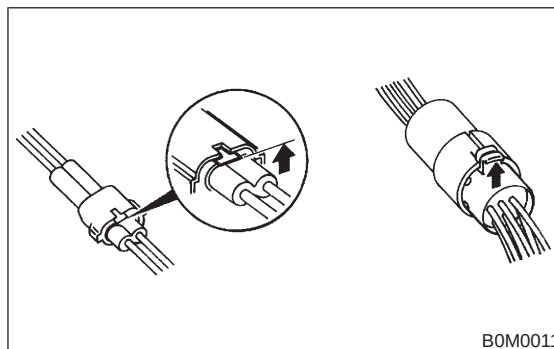
Don't pull the harness.



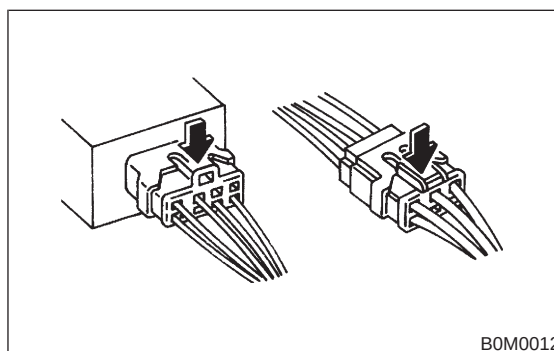
- Inspect a connector by pushing it all the way in. If the connector is equipped with a locking device, push it in until a clicking sound is heard.



- To disconnect a locking connector, first release the lock, then pull the connector off.
<Unlock by pulling the locking tab.>

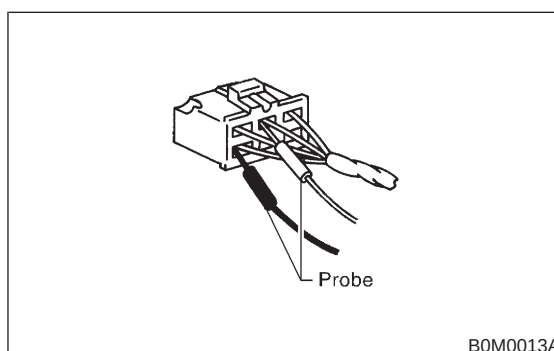


<Unlock by pushing the locking tab.>

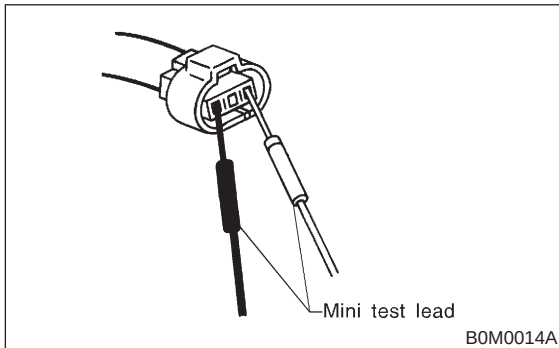


B: INSERTING A PROBE

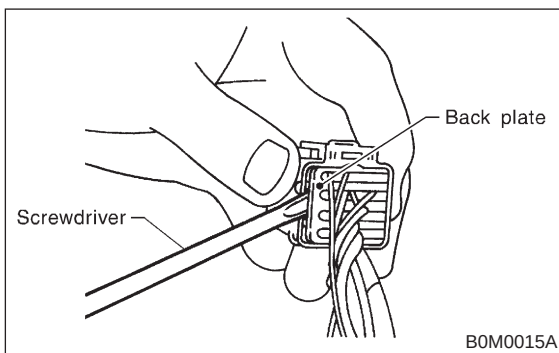
- Generally, probes are inserted into connectors from the rear side (wire side).
- When removing the shock protector take care not to deform it; this also applies to waterproof connectors, which cannot be tested from the wire side.



- Connectors equipped with shock protectors must be checked with a mini probe (thin), or it will be necessary to remove the shock protector.



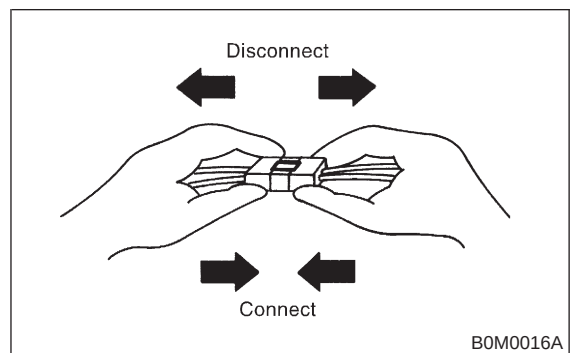
- When the connector has a back plate, remove the plate after removing the projection of the plate first. (Be careful not to use excessive force, since the terminals might brake off.)



C: CHECKING FOR POOR CONTACT ON PLUG-IN CONNECTORS

1. POOR CONTACT

Poor contact is frequently caused by corroded terminals, dirt, foreign substances, weak contact points between male and female connectors, etc. Quite often a plug with poor contact will work perfectly again after it has been pulled off and reconnected. If harness and connector checks do not reveal any defect, it can be assumed that an intermittent contact in a connector is the source of trouble.

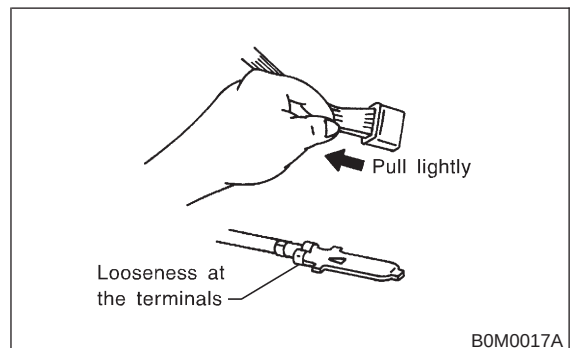


2. VISUAL INSPECTION

- Disconnect the two connector halves.
- Check the connector pins for signs of corrosion or foreign material.
- Check the connector for loose and damaged terminals, and make sure they are set correctly in the connector.

NOTE:

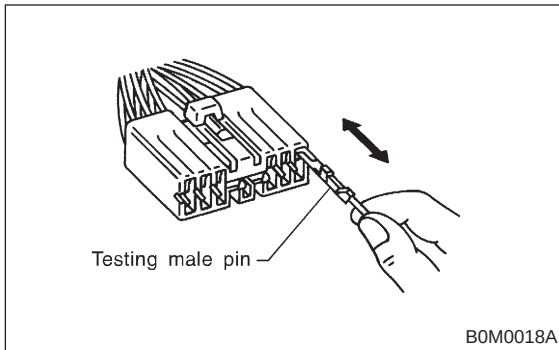
When the harness is pulled lightly, the terminals should not come out.



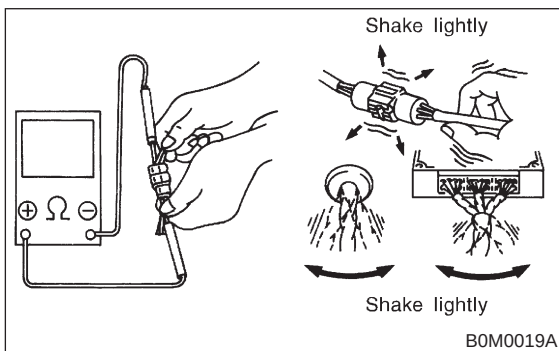
4) Insert the male pin of the connector into the female pin, then pull it out.

NOTE:

If one of the pins allows to pull out easily, it is a likely source of a malfunction.



5) Shake lightly the connector and the harness, and check for sudden changes in voltage or resistance.

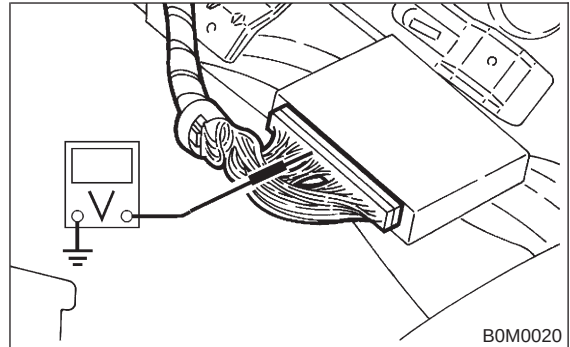


4. Diagnosis and Checking Procedure Using Instruments

A: USING A CIRCUIT TESTER

1. VOLTAGE CHECK (range set to DC V)

Connect the positive probe to the terminal to be tested, and the negative probe to body ground. (or the ground terminal of the ECM)



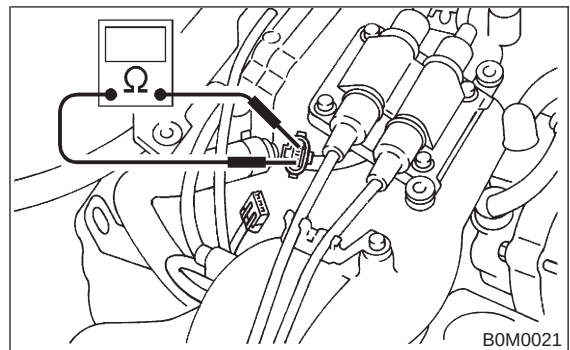
2. CHECKING THE CONNECTION (range set to Ω)

Measure the resistance and check for open or shorted wire in the harness or the connector.

NOTE:

This check must be carried out with both connectors disconnected.

(This avoids by-passing the connection through other circuits.)



1) Check for open circuit. (range: $\Omega \times 1K$)

Measure the resistance between the respective pins in both connectors.

Specified resistance:

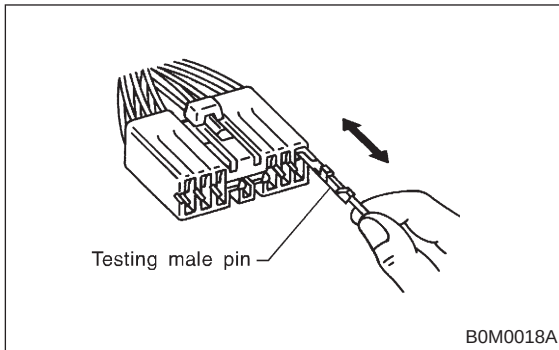
More than 1 M Ω (No continuity) Open circuit

Less than 10 Ω (Continuity) O.K.

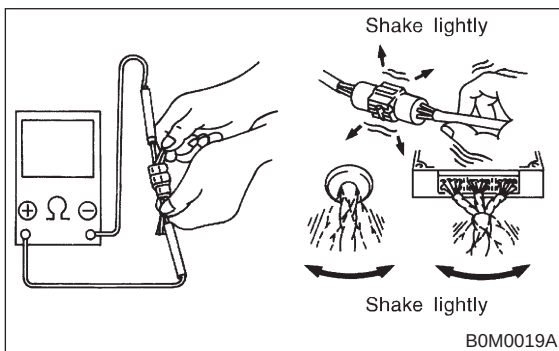
4) Insert the male pin of the connector into the female pin, then pull it out.

NOTE:

If one of the pins allows to pull out easily, it is a likely source of a malfunction.



5) Shake lightly the connector and the harness, and check for sudden changes in voltage or resistance.

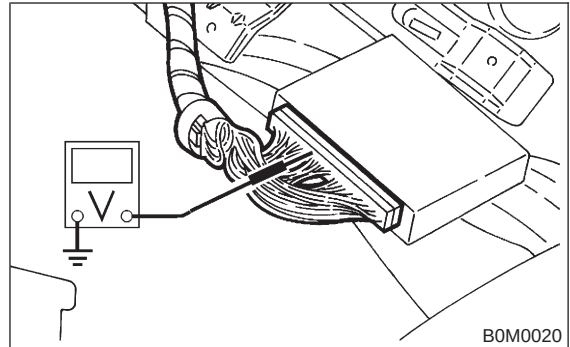


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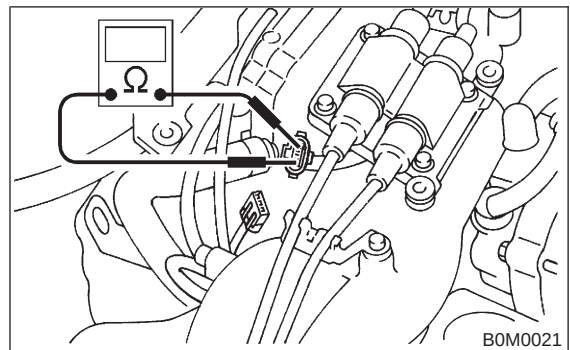
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Measure the resistance and check for open or shorted wire in the harness or the connector.

NOTE:

This check must be carried out with both connectors disconnected.

(This avoids by-passing the connection through other circuits.)



1) Check for open circuit. (range: $\Omega \times 1K$)

Measure the resistance between the respective pins in both connectors.

Specified resistance:

More than 1 M Ω (No continuity) Open circuit

Less than 10 Ω (Continuity) O.K.

2) Check for correct insulation value. (range: $\Omega \times 1K$)

Measure the resistance between the pins in both connectors, as well as between the suspected pin and the body. (body short)

Specified resistance:

More than 1 M Ω (No continuity) O.K.

Less than 10 Ω (Continuity) Short circuit

3) Resistance measurement (range set to Ω)

Measuring the internal resistance of sensors, solenoid valves etc. to check the operating condition of components.

NOTE:

- Select the appropriate range for measuring the internal resistance, or the measurement will result in an incorrect reading.
- Before changing the measurement range the gauge must be reset to zero.

B: USING A SUBARU SELECT MONITOR

With this testing procedure the defective component can be determined by directly monitoring input/output signals of the ECM or the trouble codes.

1. FEATURES

- A variety of data can be checked without movements from the drivers seat, passenger's seat or from outside the vehicle.
- This unit allows the identification of the type of malfunction, for example whether the cause is an open or shorted wire in the input/output signal line, or whether the breakdown of a component is caused by a lack of maintenance.

2. DIAGNOSIS

- Refer to the reference values for input/output and control data to determine whether the malfunction is caused by a worn out component, an open wire, a short etc.
- Perform the diagnostics procedure as described in chapter "Check based on trouble codes" by monitoring the trouble codes.

NOTE:

It will be easier to determine a malfunction if the vehicle data for normal conditions are available for comparison.

C: USING AN OSCILLOSCOPE

A malfunction can be determined by displaying the waveforms of input/output signals on the oscilloscope.

1. DIAGNOSIS

A simple comparison of the waveforms may lead to an incorrect diagnosis. To exactly determine the sources of the malfunction it will be necessary to determine them under consideration about information other than waveforms.

2. APPLYING INPUT/OUTPUT SIGNALS

Connect the probe directly with the terminal of the signal.