

AUTOMATIC TRANSMISSION AND DIFFERENTIAL

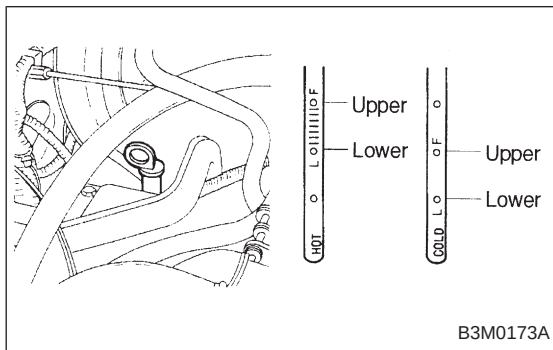
3-2

	Page
T DIAGNOSTICS AIRBAG	2
1. Supplemental Restraint System "Airbag"	2
2. Pre-inspection	2
3. Electrical Components Location	4
4. Schematic	9
5. Transmission Control Module (TCM) I/O Signal.....	10
6. Diagnostic Chart for On-board Diagnostics System.....	12
7. Diagnostics for On-board Diagnostics Failed	15
8. Diagnostic Chart with Trouble Code.....	22
9. Diagnostic Chart with Select Monitor	96
10. General Diagnostic Table.....	134

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the transmission control module (TCM).

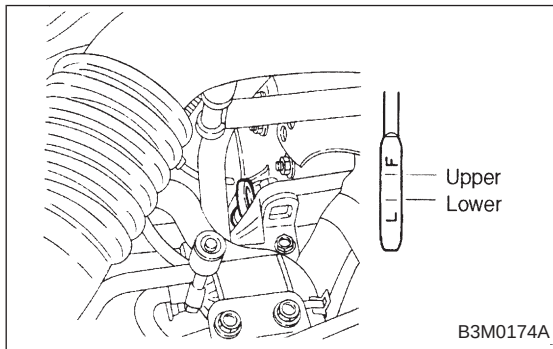
- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when performing diagnostics and servicing the TCM.



2. Pre-inspection

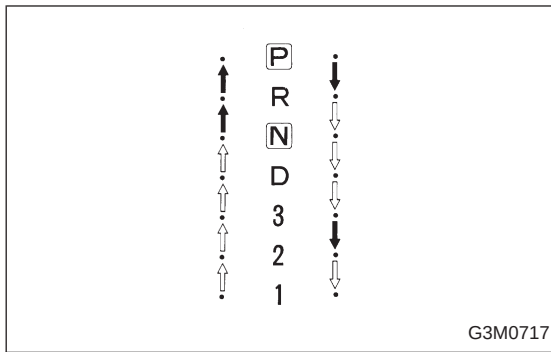
1. ATF LEVEL

Make sure that ATF level is in the specification.



2. FRONT DIFFERENTIAL OIL LEVEL

Make sure that front differential oil level is in the specification.



3. OPERATION OF SHIFT SELECTOR LEVER

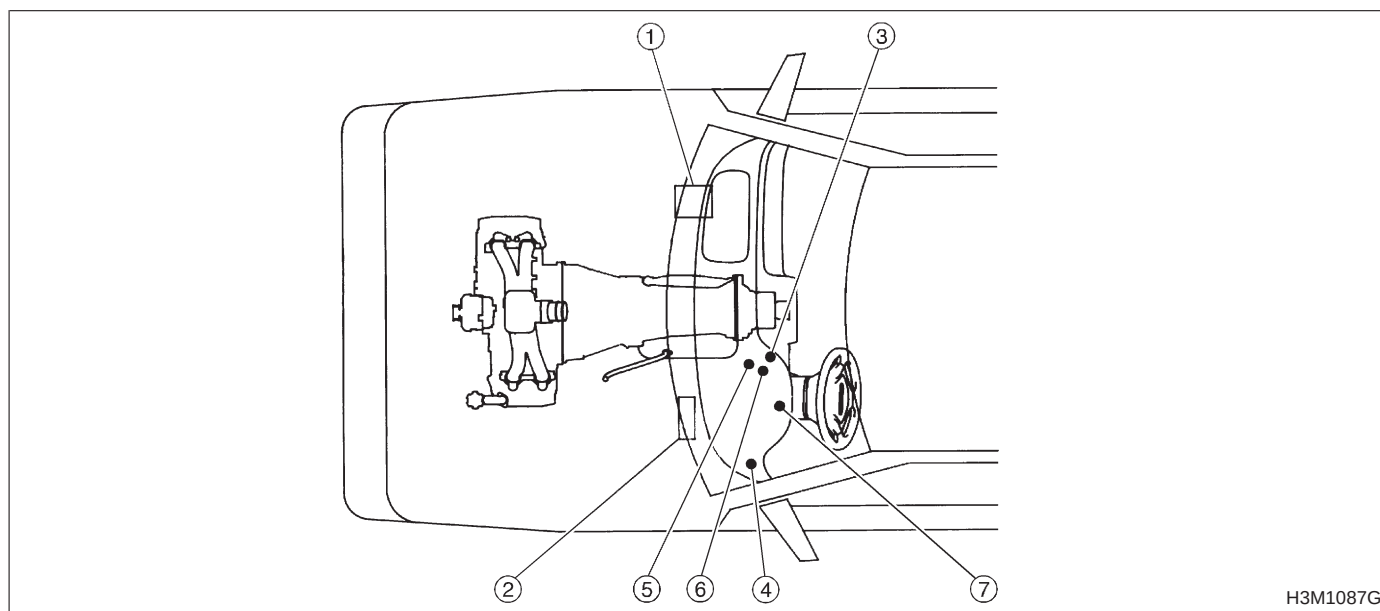
WARNING:

Stop the engine while checking operation of selector lever.

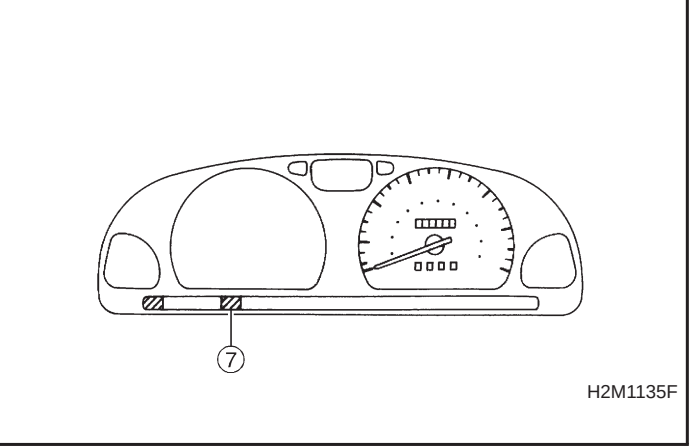
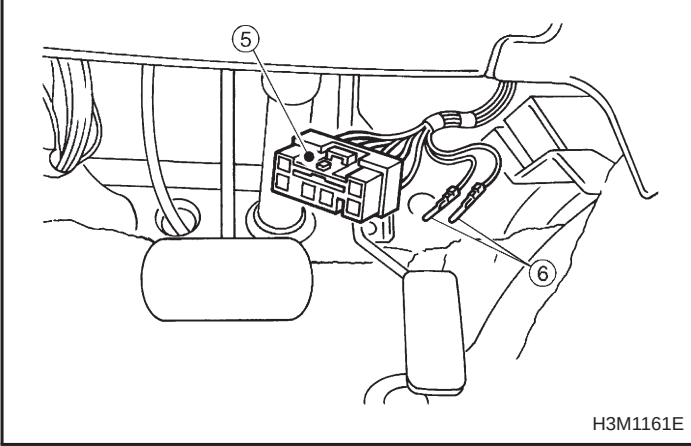
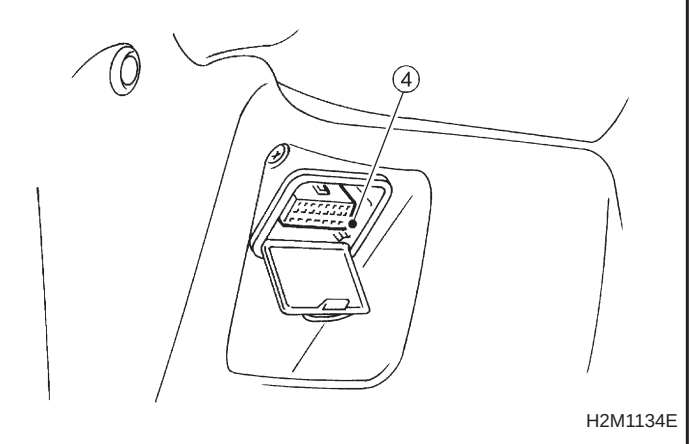
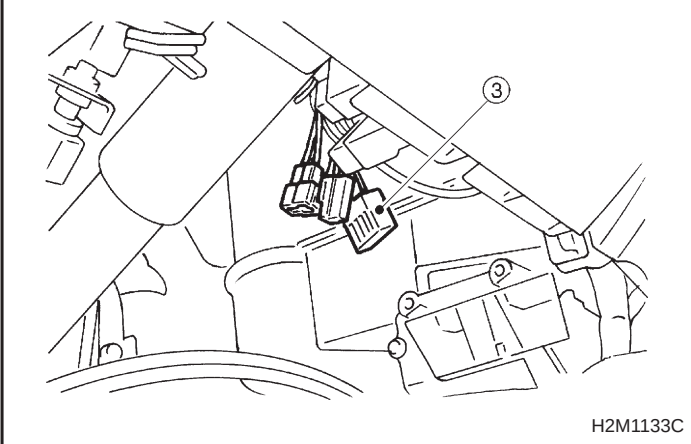
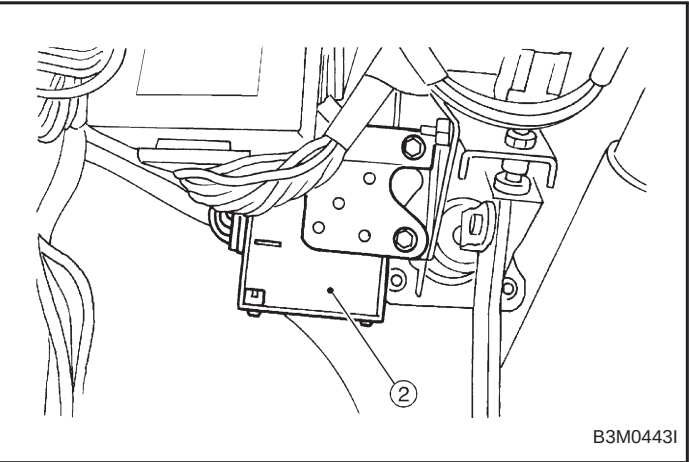
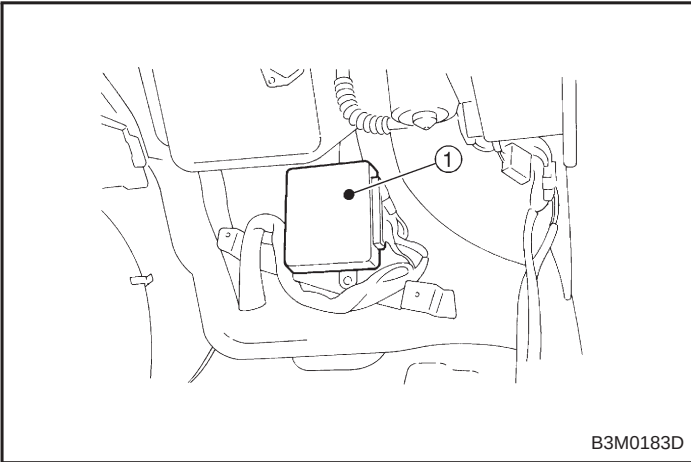
- 1) Check that selector lever does not move from "N" to "R" without pushing the button.
- 2) Check that selector lever does not move from "R" to "P" without pushing the button.
- 3) Check that selector lever does not move from "P" to "R" without pushing the button.
- 4) Check that selector lever does not move from "3" to "2" without pushing the button.

3. Electrical Components Location

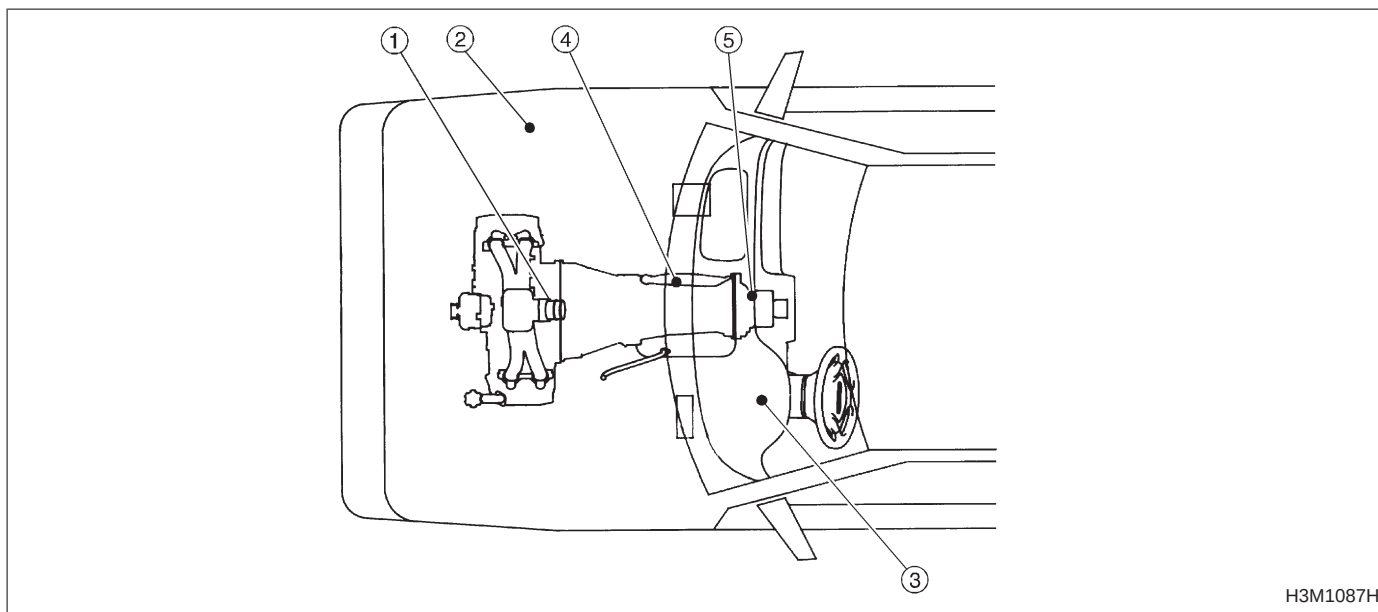
1. MODULE



① ECM	⑤ Diagnosis connector
② TCM	⑥ Diagnosis terminal
③ Data link connector (for Subaru select monitor only)	⑦ AT OIL TEMP indicator light (AT diagnostic indicator light)
④ Data link connector (for Subaru select monitor and OBD-II general scan tool)	

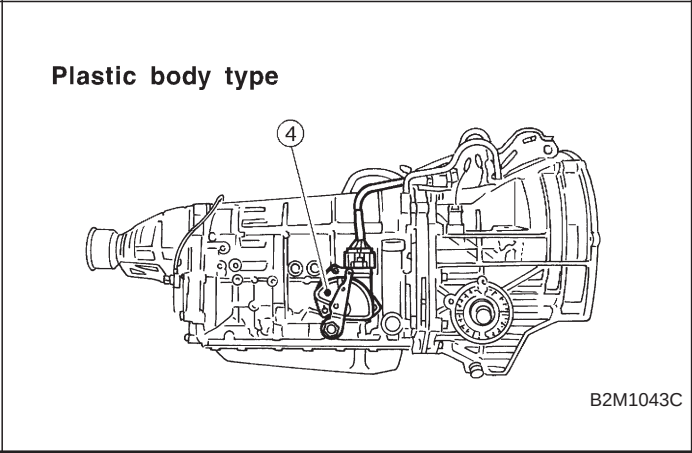
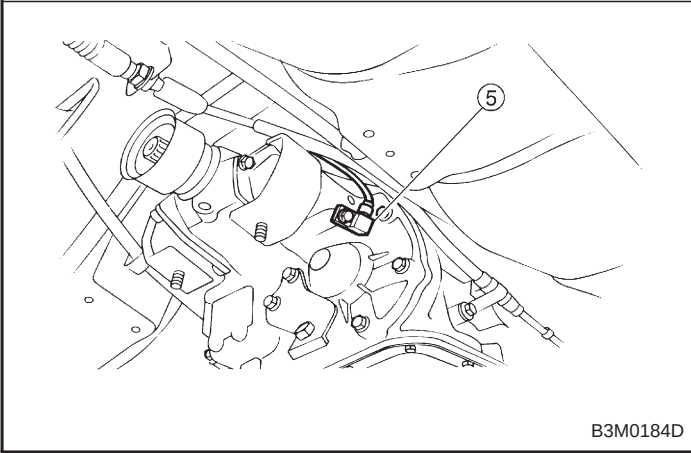
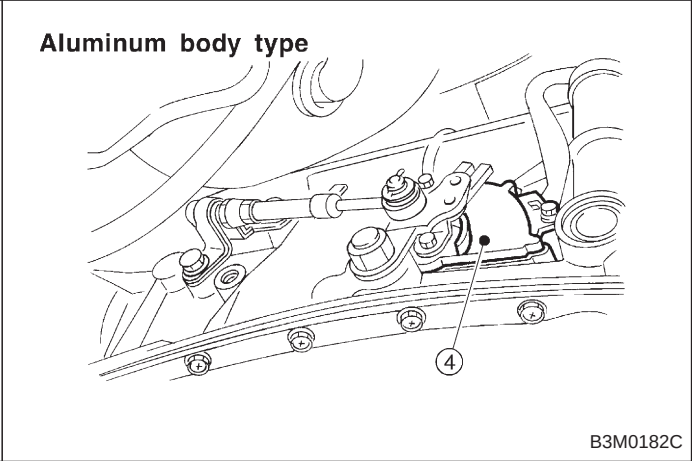
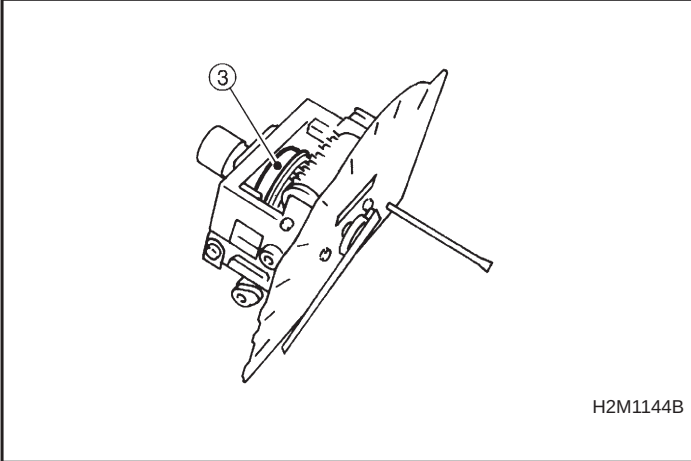
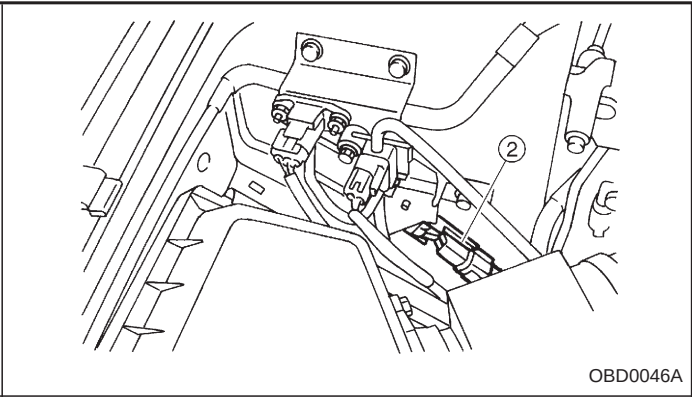
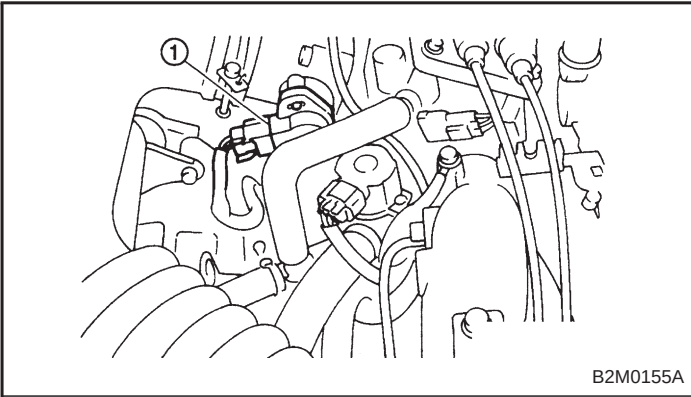


2. SENSOR

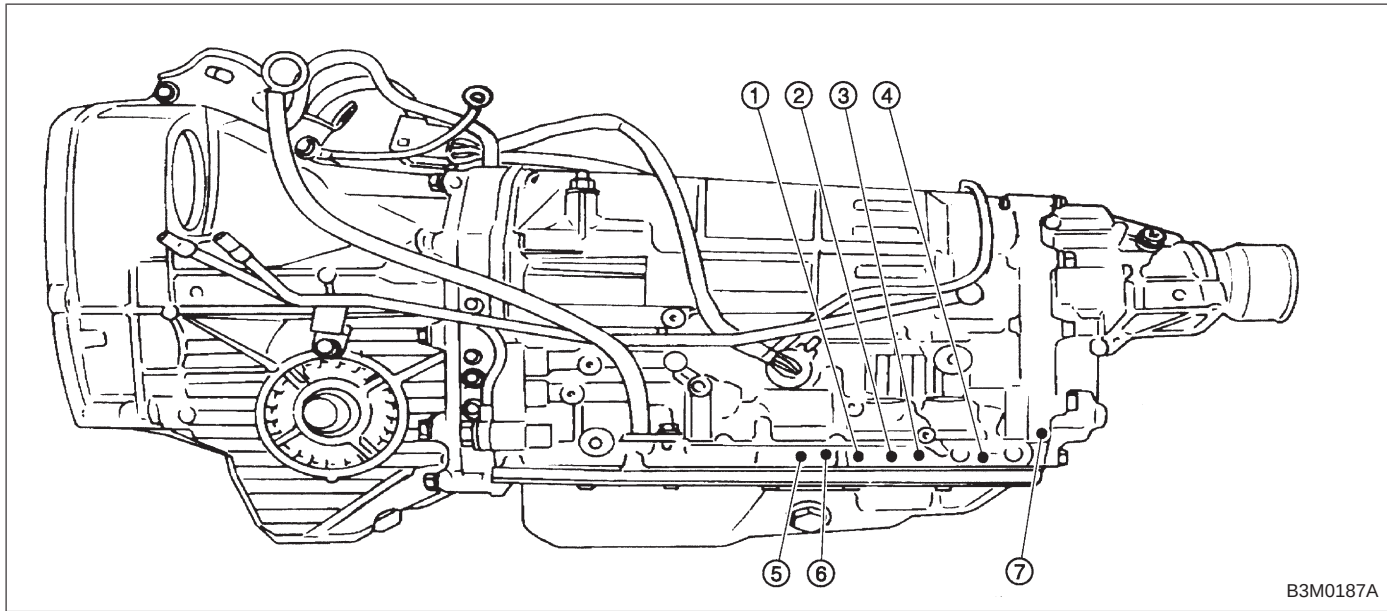


- ① Throttle position sensor
- ② Dropping resistor
- ③ Vehicle speed sensor 2

- ④ Inhibitor switch
- ⑤ Vehicle speed sensor 1

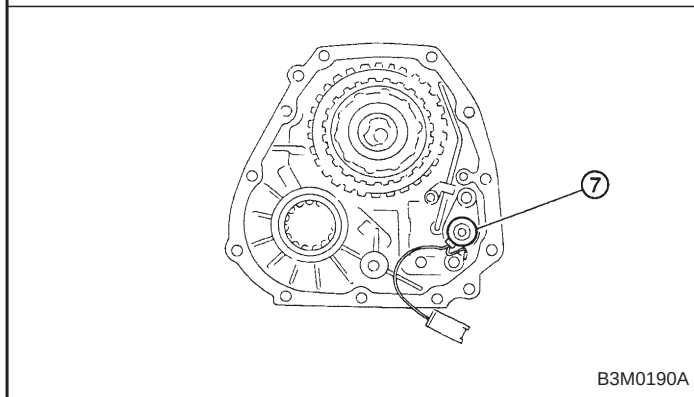
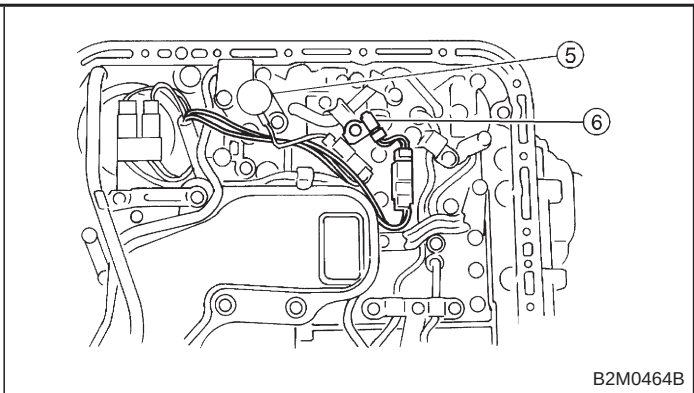
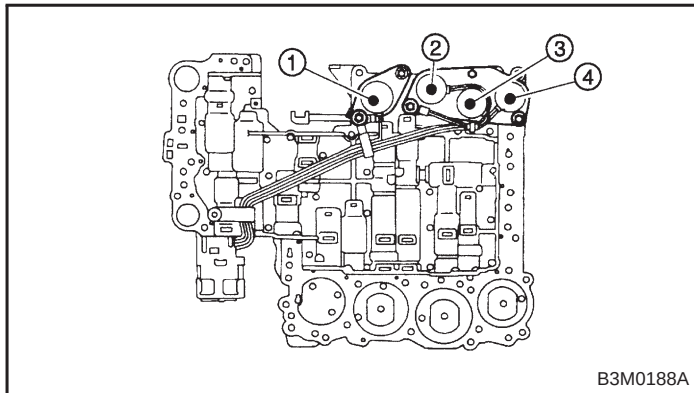


3. SOLENOID



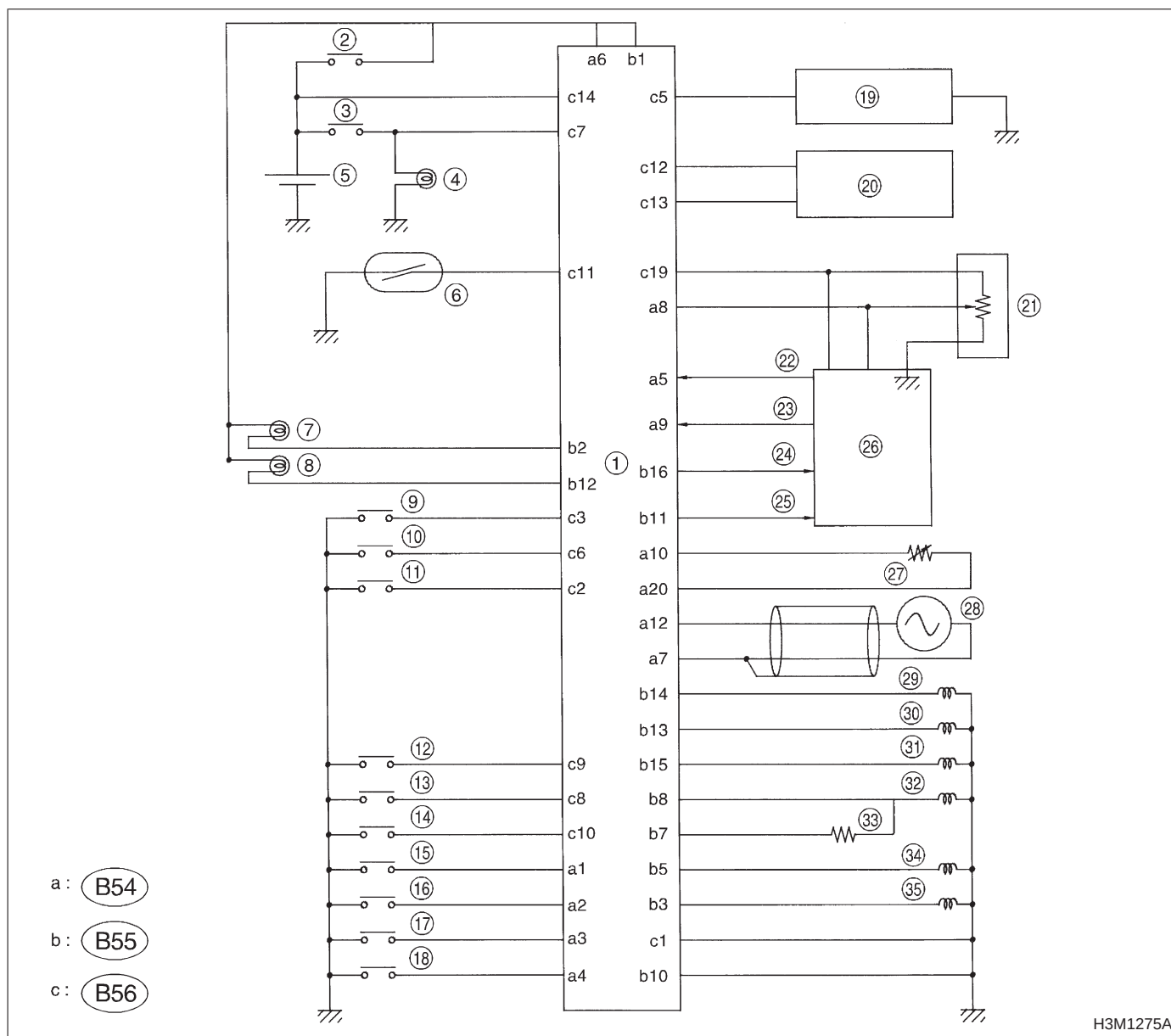
- ① Duty solenoid A
- ② Solenoid 2
- ③ Solenoid 1
- ④ Solenoid 3

- ⑤ Duty solenoid B
- ⑥ ATF temperature sensor
- ⑦ Duty solenoid C (AWD)



SUBARU.

4. Schematic

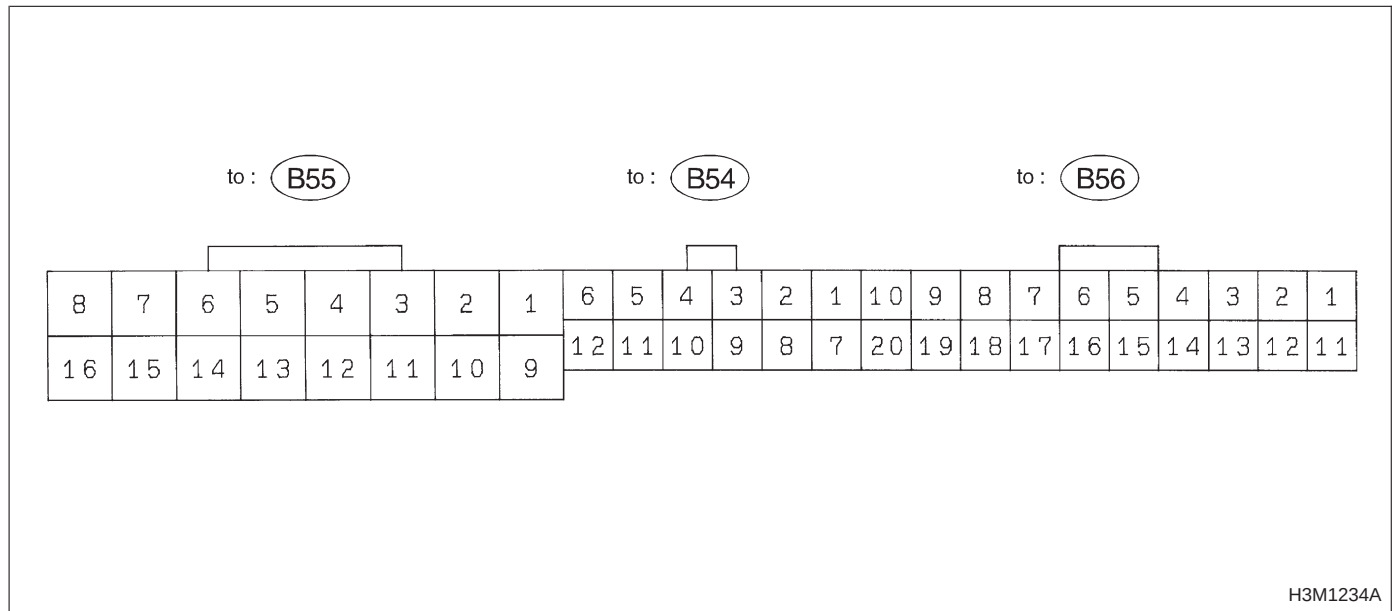


- ① Transmission control module
- ② Ignition switch
- ③ Brake switch
- ④ Brake light
- ⑤ Battery
- ⑥ Vehicle speed sensor 2
- ⑦ FWD indicator light
- ⑧ AT OIL TEMP indicator light
- ⑨ Cruise set switch
- ⑩ Diagnosis switch
- ⑪ FWD switch
- ⑫ "P" range switch

- ⑬ "R" range switch
- ⑭ "N" range switch
- ⑮ "D" range switch
- ⑯ "3" range switch
- ⑰ "2" range switch
- ⑱ "1" range switch
- ⑲ ABS control module
- ⑳ Data link connector
- ㉑ Throttle position sensor
- ㉒ Engine speed signal
- ㉓ Mass air flow signal
- ㉔ Torque control signal

- ㉕ AT diagnostics signal
- ㉖ Engine control module
- ㉗ ATF temperature sensor
- ㉘ Vehicle speed sensor 1
- ㉙ Shift solenoid 1
- ㉚ Shift solenoid 2
- ㉛ Shift solenoid 3
- ㉜ Duty solenoid A
- ㉝ Dropping resistor
- ㉞ Duty solenoid B
- ㉟ Duty solenoid C

5. Transmission Control Module (TCM) I/O Signal



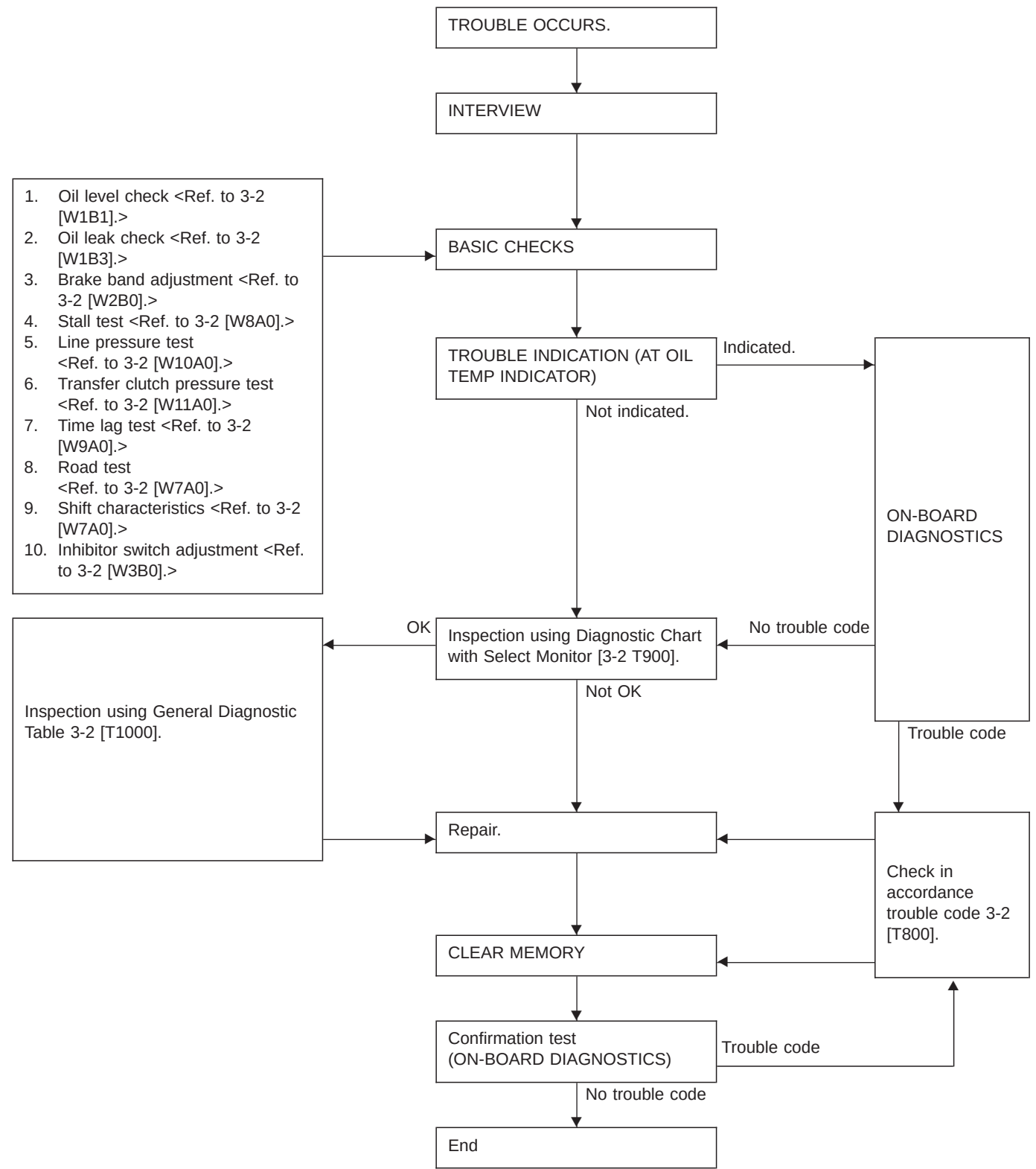
Check with ignition switch ON.

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	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
Diagnosis switch		B56	6	Diagnosis connector connected	Less than 1
				Diagnosis connector disconnected	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
AT diagnostic signal		B55	11	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.	0.5±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 4	—
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
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 blinks immediately after the engine starts.

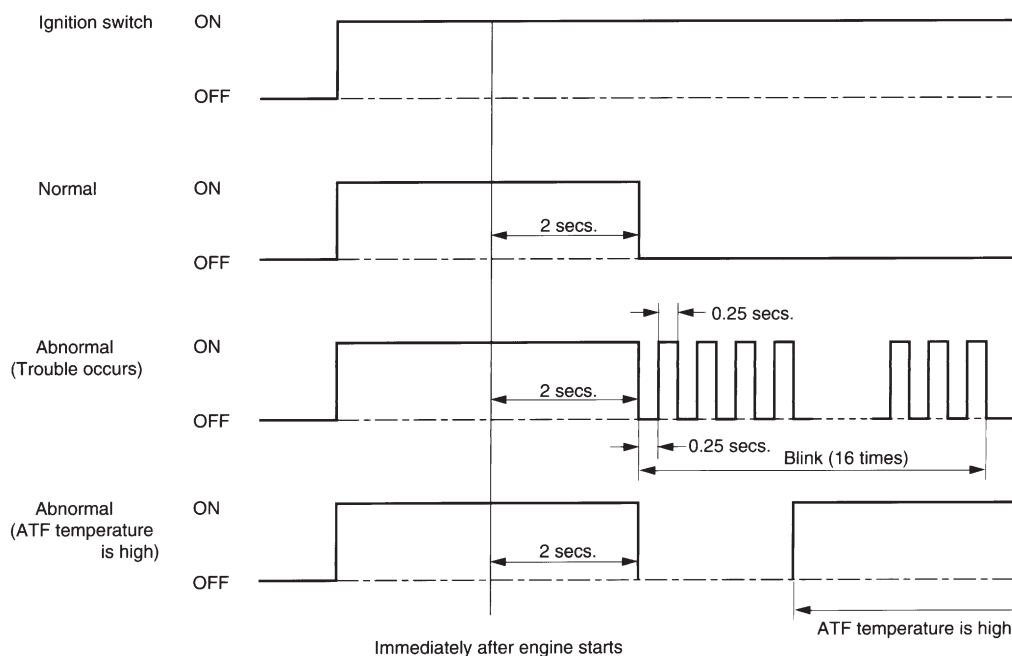
The malfunctioning part or unit can be determined by a trouble code during on-board diagnostics operation. Problems which occurred previously can also be identified through the memory function.

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.

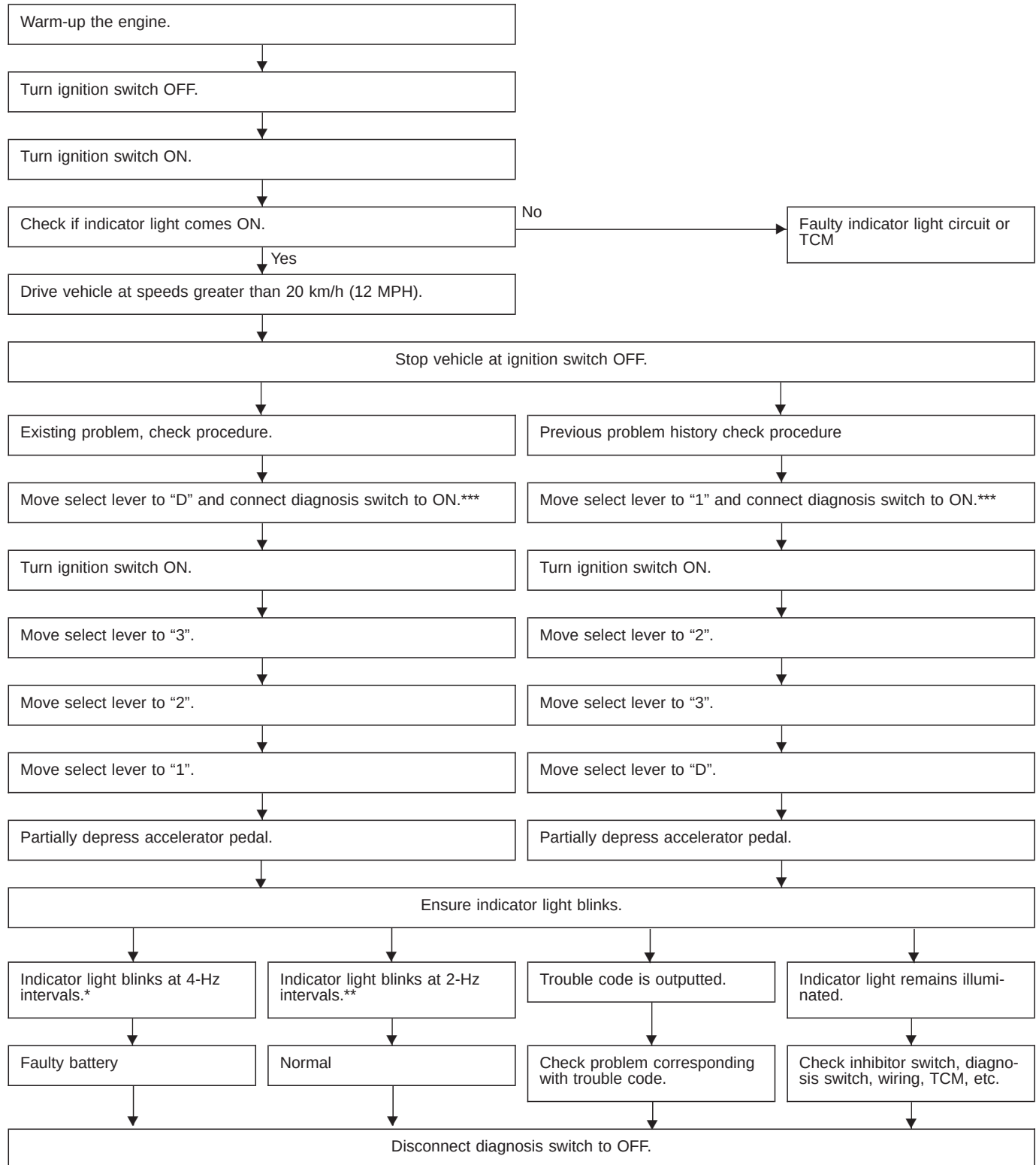
WARNING:

Warning can be noticed only when the engine is initially started.



H3H1066

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).

***: Plug in diagnosis terminal to diagnosis connector No. 5 located below instrument lower cover.

7. Diagnostics for On-board Diagnostics Failed

A: AT OIL TEMP INDICATOR LIGHT

DIAGNOSIS:

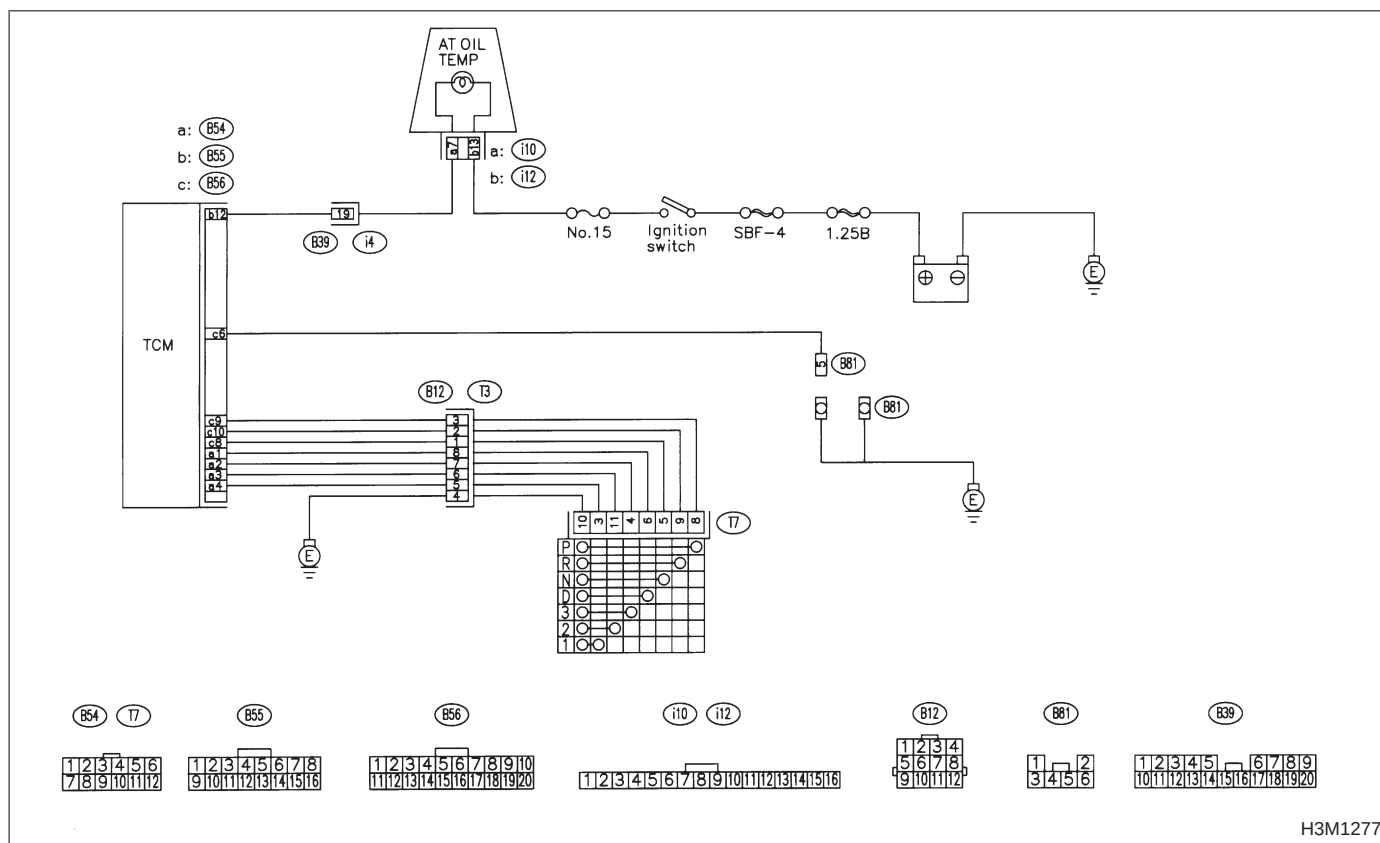
- The AT OIL TEMP indicator light circuit is open or shorted.

TROUBLE SYMPTOM:

- When ignition switch is turned to ON (engine OFF), AT OIL TEMP indicator light does not illuminate.

..... TROUBLE 1

- When on board diagnostics is performed, AT OIL TEMP indicator light remains illuminated. TROUBLE 2



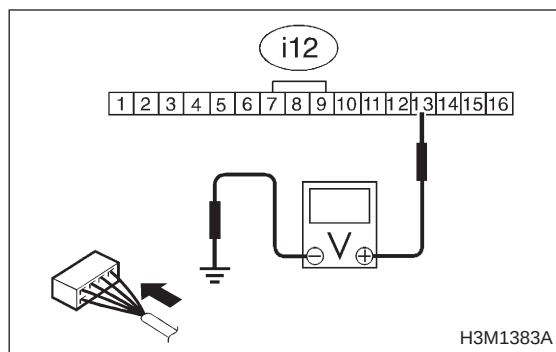
H3M1277

7A1

CLASSIFY THE MALFUNCTION. IS IT TROUBLE 1 OR TROUBLE 2?

If the malfunction shows TROUBLE 1, go to **7A2**.

If the malfunction shows TROUBLE 2, go to **7A5**.

**7A2****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.

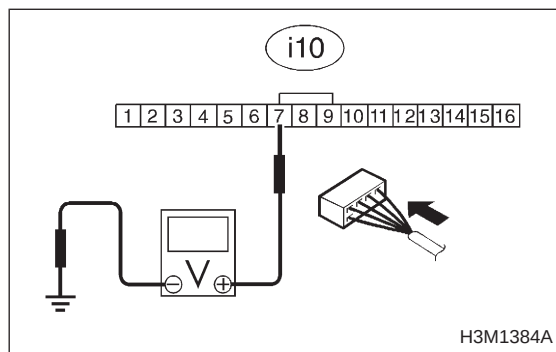
Connector & terminal**(i12) No. 13 (+) — Chassis ground (-):****CHECK** : Is voltage more than 10 V?**YES** : Go to next **CHECK** .**NO** : Check the following and repair if necessary.

- Check that fuse (No. 15) is not blown out.

NOTE:

If replaced fuse (No. 15) blows out easily, check the harness for short circuit between fuse (No. 15) and combination meter.

- Check that harness from fuse to combination meter is not open.

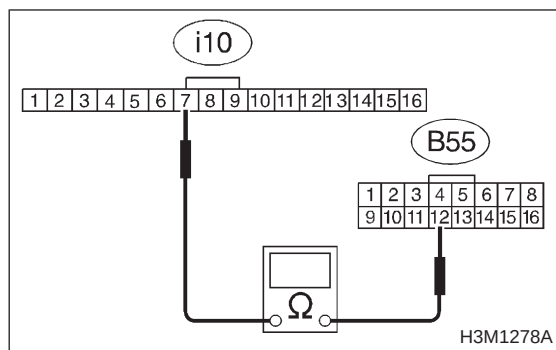
Connector & terminal**(i10) No. 7 (+) — Chassis ground (-):****CHECK** : Is voltage less than 1 V?**YES** : Go to step 7A3.**NO** : Replace bulb or combination meter.**7A3****CHECK OPEN CIRCUIT OF HARNESS.**

- 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. 7:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to step 7A4.**NO** : Repair harness connector.**NOTE:**

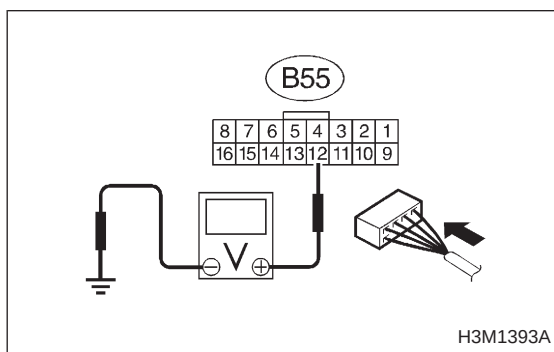
In this case, repair the following:



- Open circuit in harness between TCM and combination meter.
- Poor contact in coupling connector (B39).

7A4	CHECK INPUT SIGNAL 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 (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.

7A5	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 on Subaru Select Monitor.
- 6) Designate mode using function key.

Function mode FA1

- FA1: Check the range switch ON ↔ OFF signal.

CHECK : **When each range is selected, does LED of Subaru Select Monitor light up?**

YES : Go to step 7A6.

NO : Check inhibitor switch circuit.

NOTE:

For the diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

7A6**CHECK DIAGNOSIS SWITCH.**

1) Designate mode using function key.

Function mode FA1

● FA1: Check diagnosis switch (SS) ON ↔ OFF signal.

2) Diagnosis switch to ON.

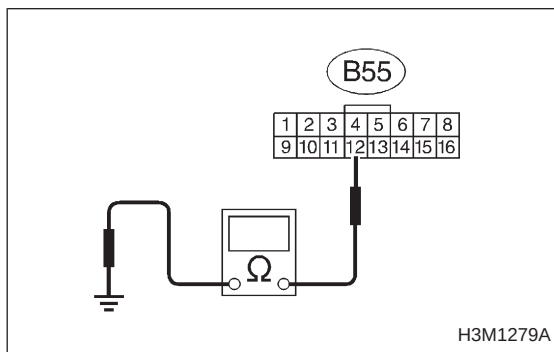
CHECK : **Does LED of diagnosis switch on Subaru Select Monitor light up?**

YES : Go to step **7A7**.

NO : Check diagnosis switch circuit.

NOTE:

For the diagnosis procedure on diagnosis switch circuit, refer to 3-2 [T9R0].

**7A7****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.

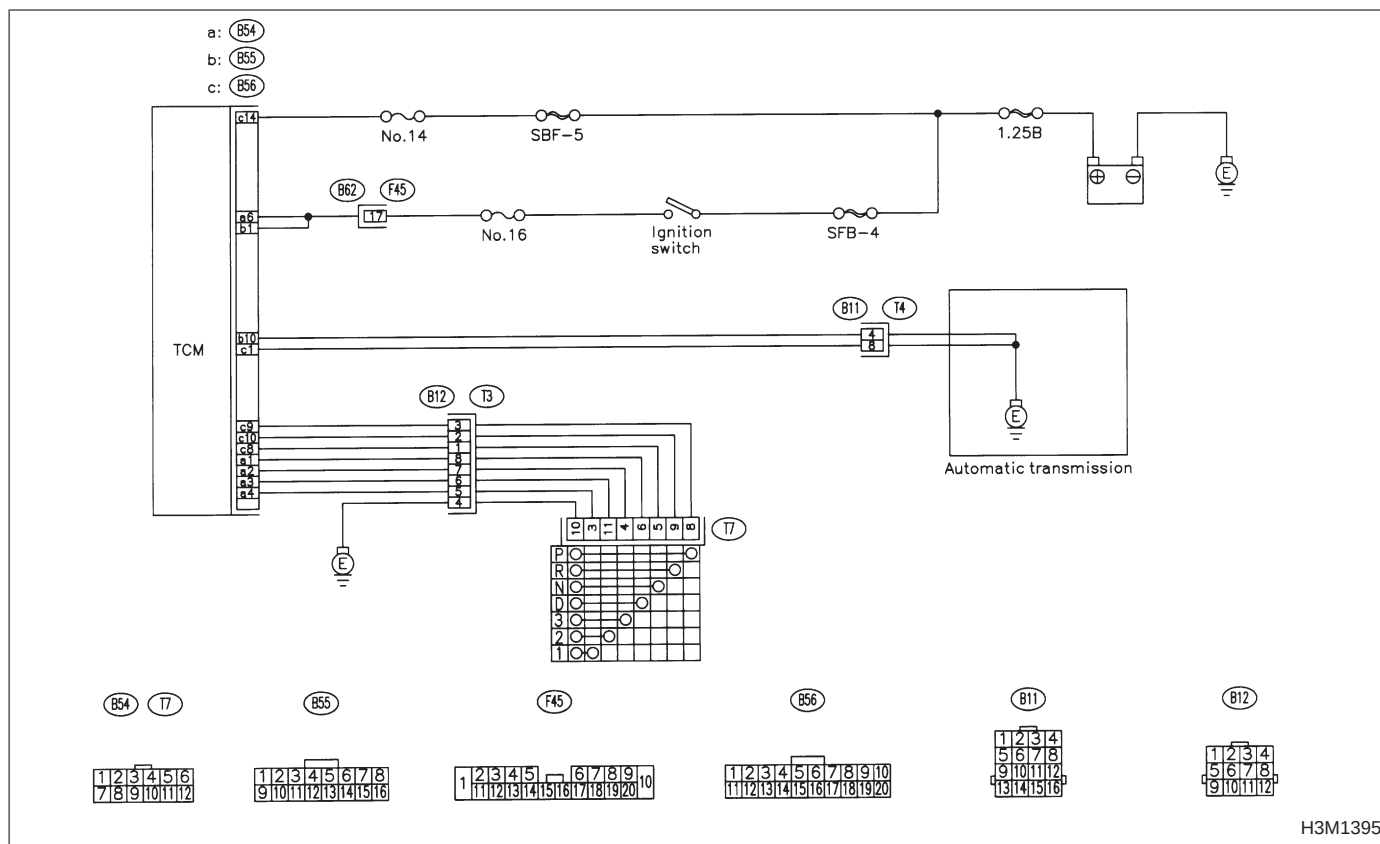
Connector & terminal/specified resistance (B55) No. 12 — Chassis ground:

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

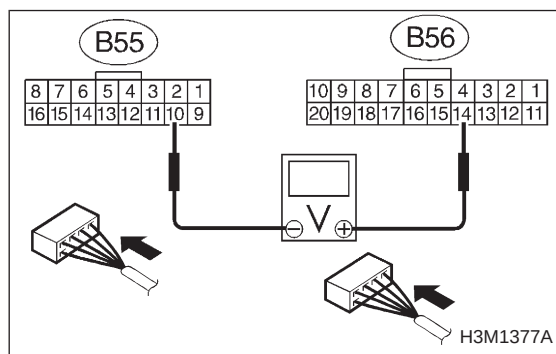
YES : Replace TCM.

NO : Repair short circuit in harness between combination meter connector and TCM connector.

B: CONTROL MODULE POWER SUPPLY AND GROUND LINE



H3M1395



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 (-):

CHECK : Is the voltage more than 10 V?

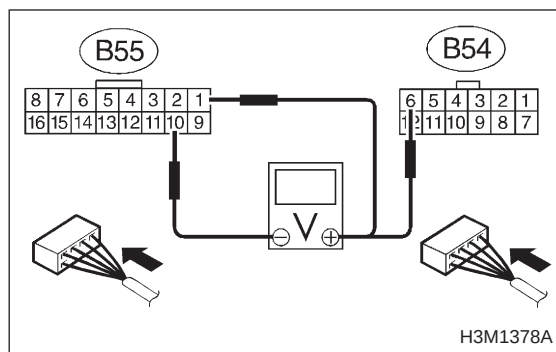
YES : Go to next **CHECK** .

NO : Repair harness of back-up power supply circuit.

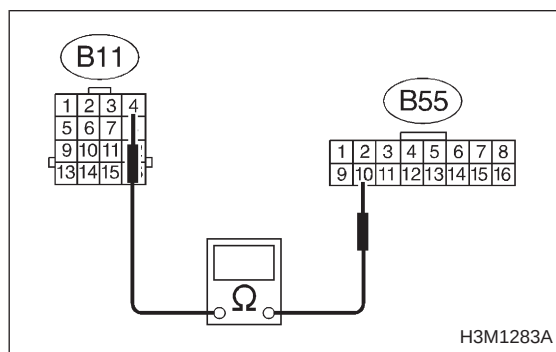
CHECK : Is there poor contact of TCM connector?

YES : Repair poor contact in TCM connector.

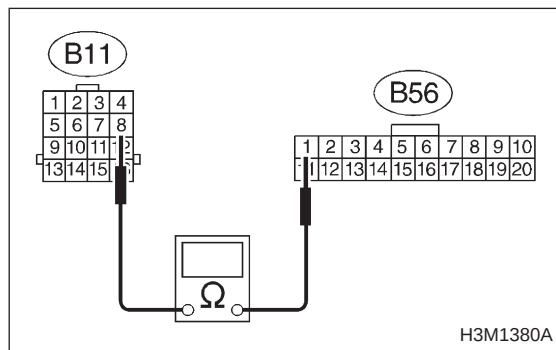
NO : Go to step 7B2.

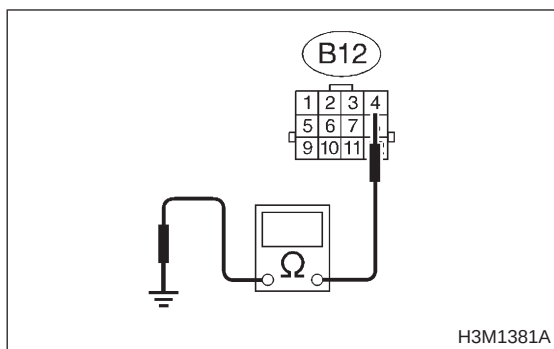
**7B2****CHECK IGNITION POWER SUPPLY CIRCUIT.**

- 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 (-):****(B55) No. 1 (+) — No. 10 (-):****CHECK : Is the voltage more than 10 V?****YES** : Go to next **CHECK** .**NO** : Repair harness of ignition power supply circuit.**CHECK : Is there poor contact of TCM connector?****YES** : Repair poor contact in TCM connector.**NO** : Go to step **7B3**.**7B3****CHECK HARNESS CONNECTOR BETWEEN TCM, INHIBITOR SWITCH AND TRANSMISSION.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM, transmission and inhibitor switch.
- 3) Measure resistance between TCM connector.

Connector & terminal**(B55) No. 10 — (B11) No. 4:****CHECK : Is the resistance less than 1 Ω?****YES** : Go to next **CHECK** .**NO** : Repair open circuit in harness between TCM and transmission.**Connector & terminal****(B56) No. 1 — (B11) No. 8:****CHECK : Is the resistance less than 1 Ω?****YES** : Go to next **CHECK** .**NO** : Repair open circuit in harness between TCM and transmission.



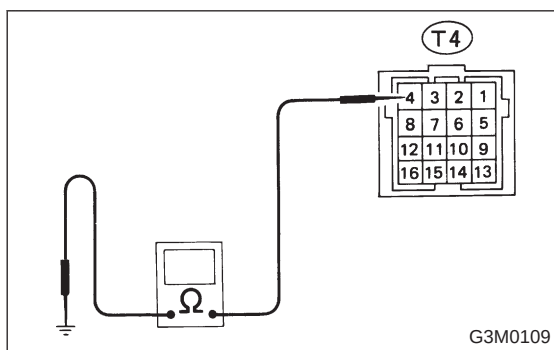
Connector & terminal

(B12) No. 4 — Chassis ground:

CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 7B4.

NO : Repair open circuit in harness between TCM and transmission.



7B4

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.

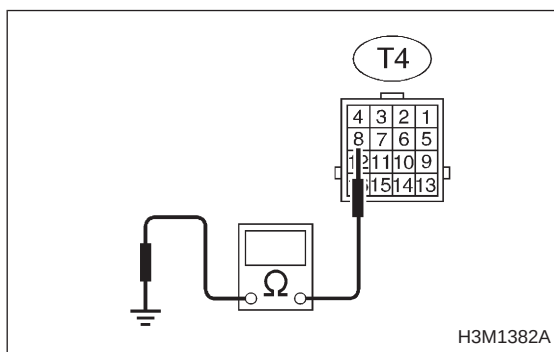
Connector & terminal

(T4) No. 4 — Transmission ground:

CHECK : Is the resistance less than 1 Ω ?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between transmission and transmission ground.



Connector & terminal

(T4) No. 8 — Transmission ground:

CHECK : Is the resistance less than 1 Ω ?

YES : Repair transmission ground terminal.

NO : Repair open circuit in harness between transmission and transmission ground.

8. Diagnostic Chart with Trouble Code

A: LIST OF TROUBLE CODE

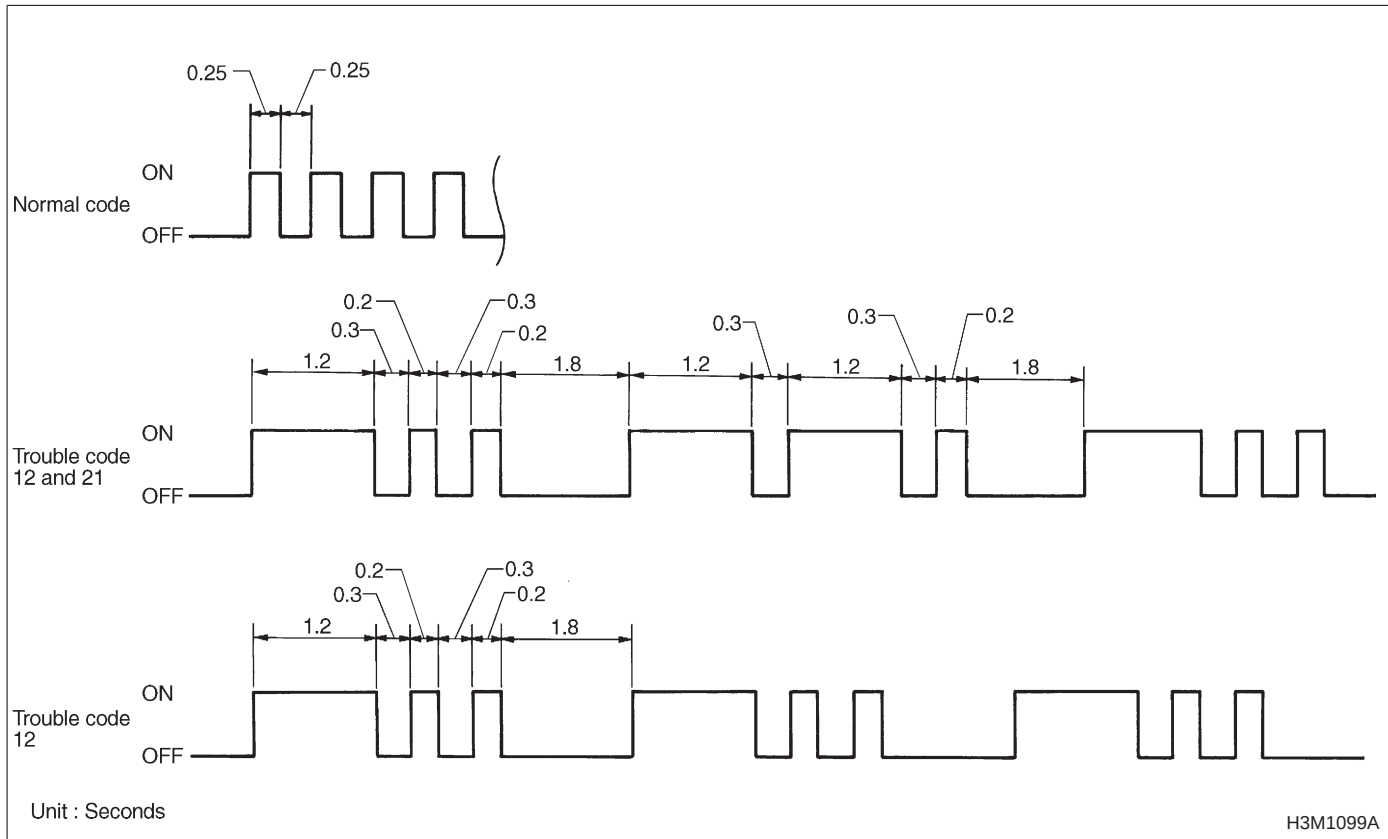
1. TROUBLE CODE

Trouble code	Item	Content of diagnosis	Abbr. (Select monitor)	Page
11	Duty solenoid A	Detects open or shorted drive circuit, as well as valve seizure.	PL	24
12	Duty solenoid B	Detects open or shorted drive circuit, as well as valve seizure.	L/U	33
13	Shift solenoid 3	Detects open or shorted drive circuit, as well as valve seizure.	OVR	41
14	Shift solenoid 2	Detects open or shorted drive circuit, as well as valve seizure.	SFT2	47
15	Shift solenoid 1	Detects open or shorted drive circuit, as well as valve seizure.	SFT1	52
21	ATF temperature sensor	Detects open or shorted input signal circuit.	ATFT	57
22	Mass air flow signal	Detects open or shorted input signal circuit.	AFM	64
23	Engine speed signal	Detects open or shorted input signal circuit.	EREV	67
24	Duty solenoid C	Detects open or shorted drive circuit, as well as valve seizure.	4WD	70
25	Torque control signal	Detects open or shorted input signal circuit.	TQ.CT	76
31	Throttle position sensor	Detects open or shorted input signal circuit.	THV	78
32	Vehicle speed sensor 1	Detects open or shorted input signal circuit.	VSP1	85
33	Vehicle speed sensor 2	Detects open or shorted input signal circuit.	VSP2	91

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 (located under the right lower portion of the instrument panel).

CLEAR MEMORY:

Removal of No. 14 fuse (for at least one minute)

- The No. 14 fuse is located in the line to the memory back-up power supply of the TCM and ECM (MFI). Removal of this fuse clears the previous trouble codes stored in the TCM and ECM (MFI) memory.
- Be sure to remove the No. 14 fuse for at least the specified length of time. Otherwise, trouble codes may not be cleared.

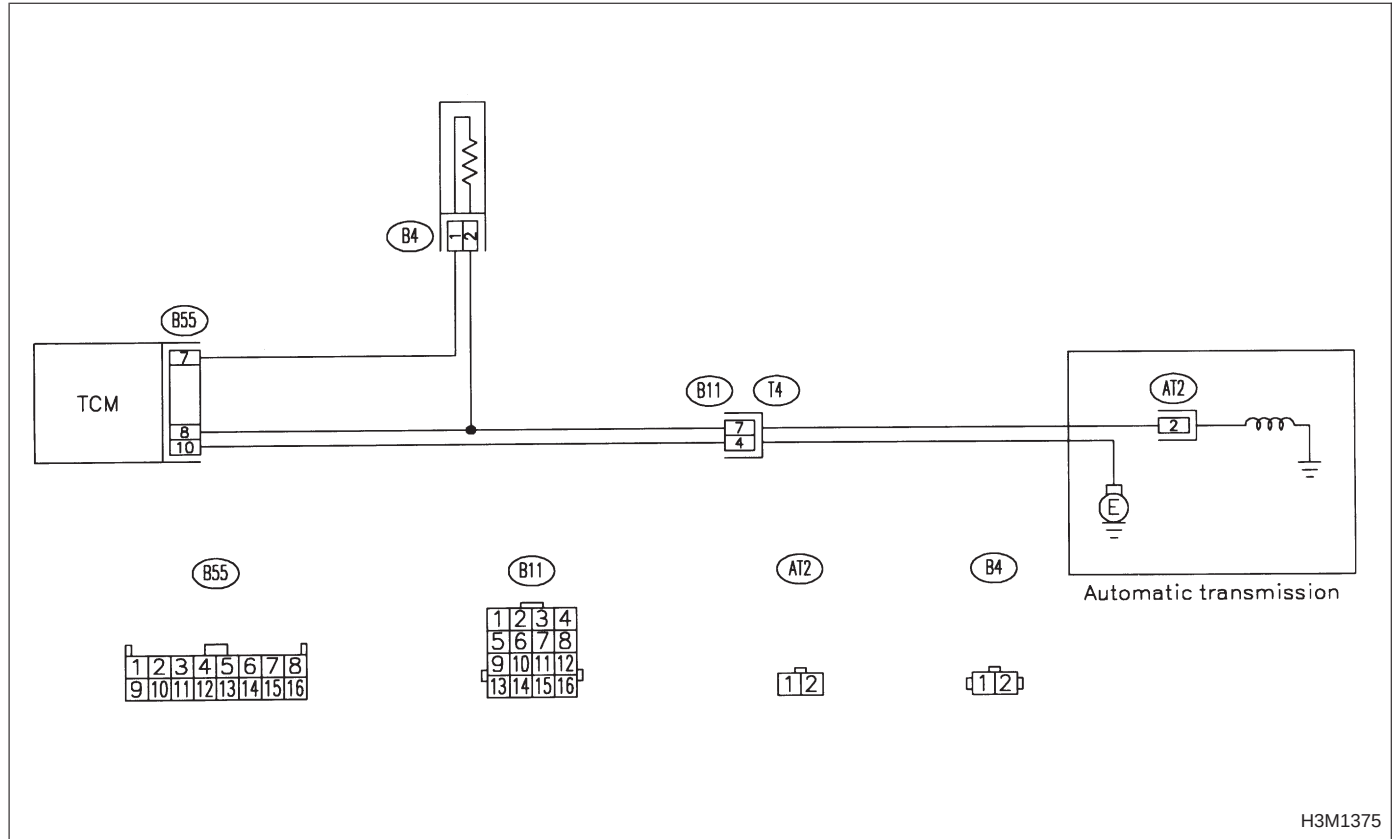
C: TROUBLE CODE 11
— DUTY SOLENOID A —

DIAGNOSIS:

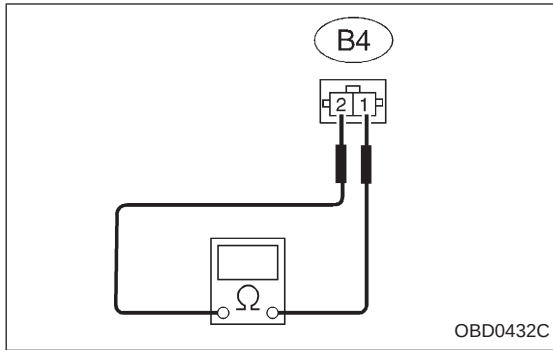
Output signal circuit of duty solenoid A or resistor is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



H3M1375



8C1 CHECK RESISTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from dropping resistor.
- 3) Measure resistance between dropping resistor terminal.

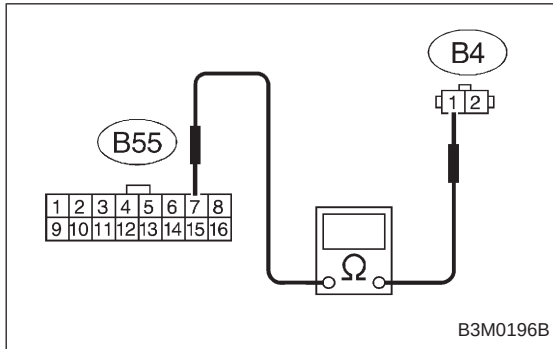
Terminals

(B4) No. 1 — No. 2:

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) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM.
- 3) Measure resistance of harness between TCM connector and dropping resistor connector.

Connector & terminal

(B55) No. 7 — (B4) No. 1:

CHECK : Is the resistance less than 1 Ω?

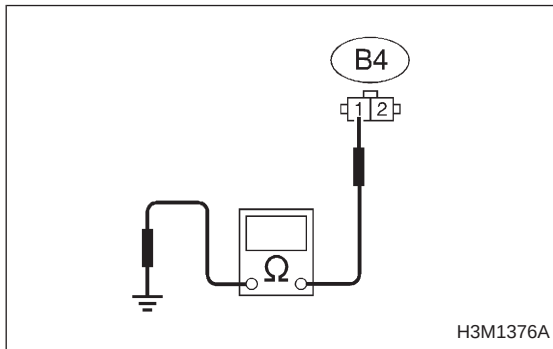
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and dropping resistor connector.
- Poor contact in TCM connector.
- Poor contact in dropping resistor connector.



- 4) Measure resistance of harness between dropping resistor connector and chassis ground.

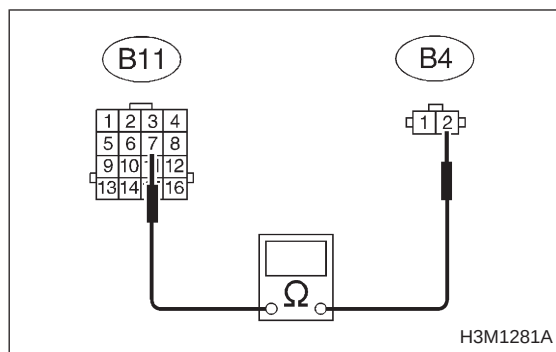
Connector & terminal

(B4) No. 1 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8C3.

NO : Repair short circuit in harness between TCM and dropping resistor connector.

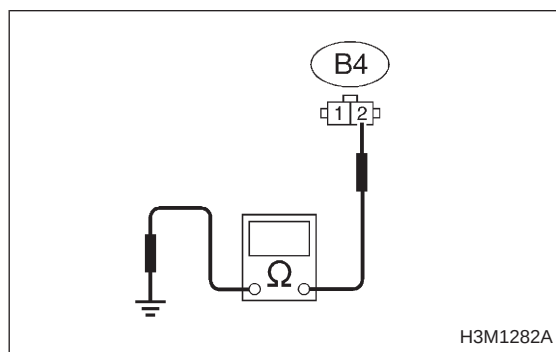
**8C3****CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.**

- 1) Disconnect connector from transmission.
- 2) Measure resistance of harness between transmission and dropping resistor connector.

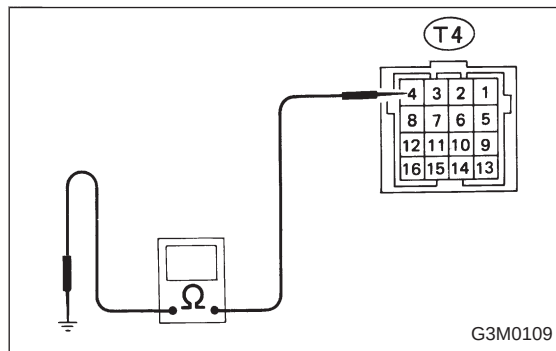
Connector & terminal**(B4) No. 2 — (B11) No. 7:****(CHECK) : Is the resistance less than 1 Ω ?****(YES) : Go to next step 3).****(NO) : Repair harness and connector.****NOTE:**

In this case, repair the following:

- Open circuit in harness between dropping resistor and transmission connector.
- Poor contact in transmission connector.
- Poor contact in dropping resistor connector.

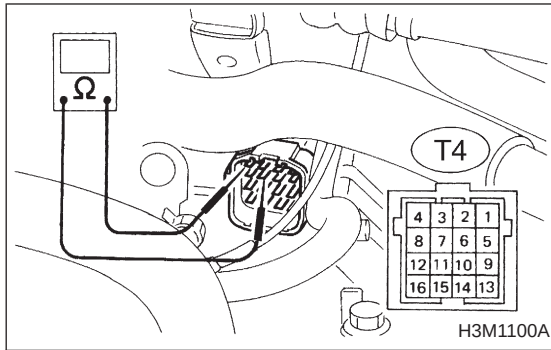


- 3) Measure resistance of harness between dropping resistor connector and chassis ground.

Connector & terminal**(B4) No. 2 — Chassis ground:****(CHECK) : Is the resistance more than 1 M Ω ?****(YES) : Go to step 8C4.****(NO) : Repair short circuit in harness between dropping resistor and transmission connector.****8C4****CHECK DUTY SOLENOID A GROUND LINE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) 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 8C5.****(NO) : Repair open circuit in transmission harness connector.**



8C5

CHECK DUTY SOLENOID A.

Measure resistance between transmission connector receptacle's terminals.

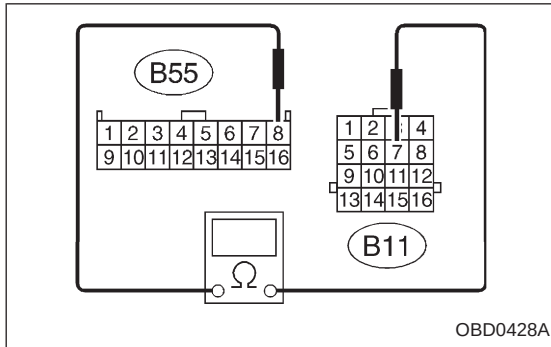
Connector & terminal

(T4) No. 7 — No. 4:

CHECK : Is the resistance between 1.5 and 4.5 Ω ?

YES : Go to step 8C6.

NO : Go to step 8C8.



8C6

CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from transmission and TCM.
- 3) 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 ?

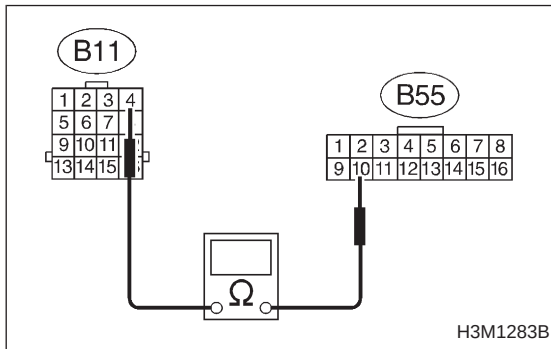
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



Connector & terminal

(B55) No. 10 — (B11) No. 4:

CHECK : Is the resistance less than 1 Ω ?

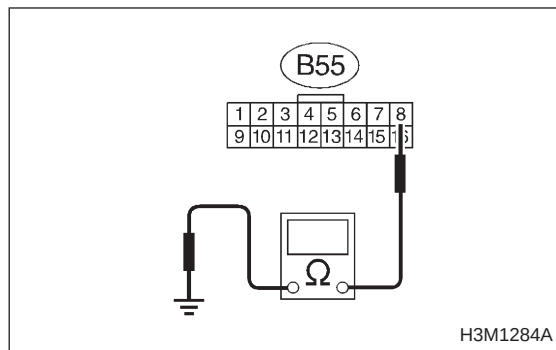
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



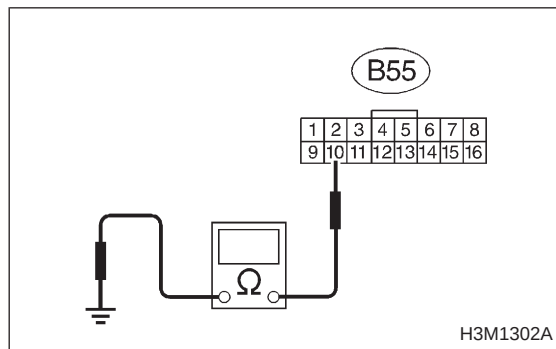
Connector & terminal

(B55) No. 8 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and transmission connector.



Connector & terminal

(B55) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8C7.

NO : Repair short circuit harness between TCM and transmission connector.

8C7

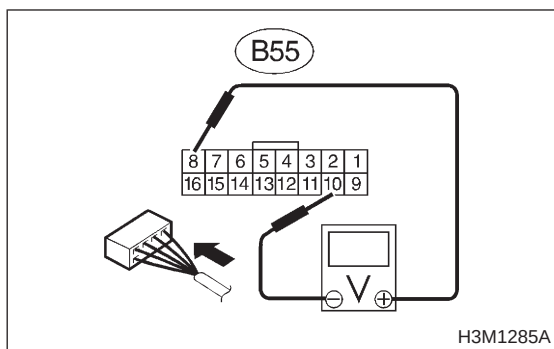
CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM, transmission and dropping resistor.
- 3) 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.

- 4) Turn ignition switch to ON (engine OFF).
- 5) Move selector lever to "N".



6) 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?

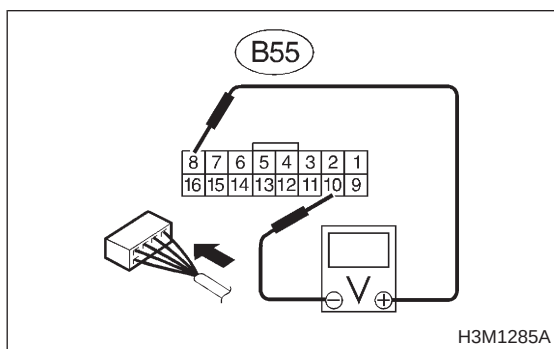
YES : Go to next step **CHECK1** .

NO : Go to next **CHECK** .

CHECK : Is the voltage between 1.5 and 4.0 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal

(B55) No. 8 (+) — No. 10 (-):

CHECK1 : Is the voltage less than 1 V with throttle fully open?

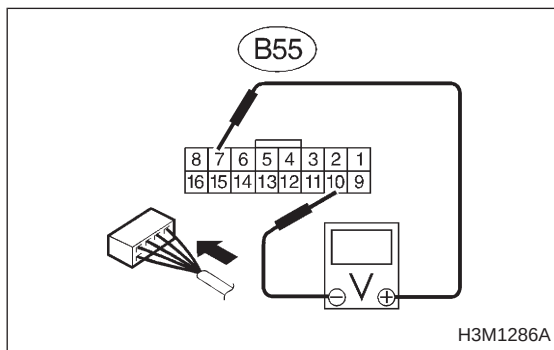
YES : Go to next step **CHECK1** .

NO : Go to next **CHECK** .

CHECK : Is the voltage less than 1 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal

(B55) No. 7 (+) — No. 10 (-):

CHECK1 : Is the voltage between 5 and 14 V with throttle fully closed?

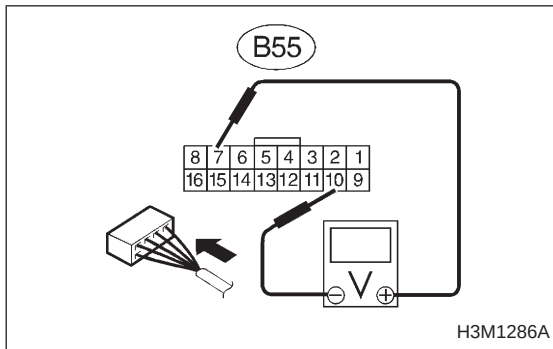
YES : Go to next step **CHECK1** .

NO : Go to next **CHECK** .

CHECK : Is the voltage between 5 and 14 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal

(B55) No. 7 (+) — No. 10 (-):

CHECK1 : Is the voltage less than 1 V with throttle fully open?

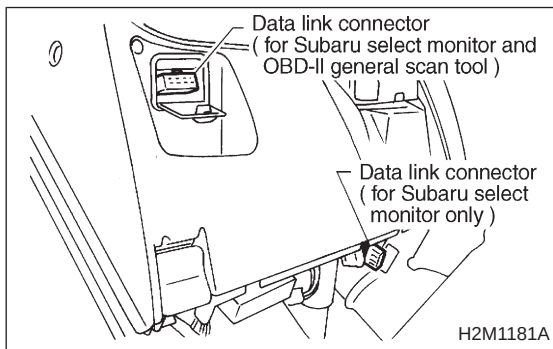
YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to next **CHECK** .

CHECK : Is the voltage between 5 and 14 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace 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) Stop the engine and turn ignition switch to ON (engine OFF).

- 7) Move selector lever to "N".

- 8) Read data on Subaru Select Monitor.

- 9) Designate mode using function key.

Function mode F11

- F11: Line pressure duty is indicated in "%".

PLDTY
(F11)

100%

OBD0427

10) Throttle is fully closed.

CHECK : *Is the value 100% in function mode F11?*

YES : Go to next step 11).

NO : Go to next **CHECK** .

CHECK : *Is the value 100% by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?*

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

PLDTY
(F 1 1)

15%

H3M1287

11) Throttle is fully open.

CHECK : *Is the value 15% in function mode F11?*

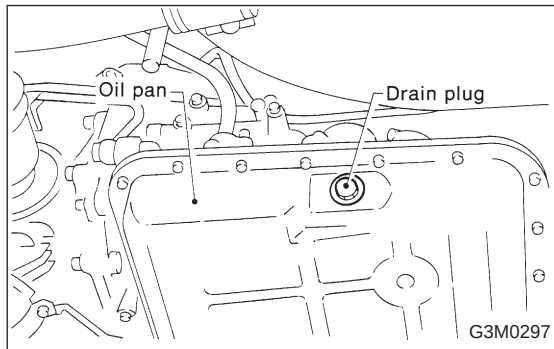
YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to next **CHECK** .

CHECK : *Is the value 15% by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?*

YES : Repair poor contact in TCM connector.

NO : Replace TCM.



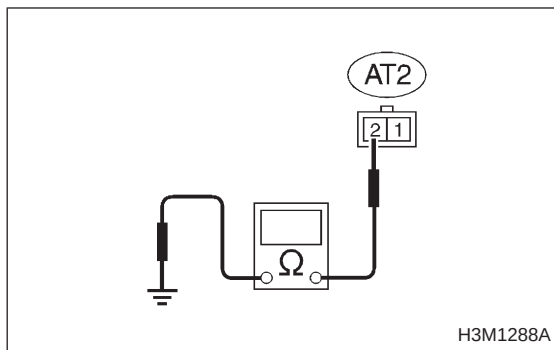
8C8 CHECK DUTY SOLENOID A (IN TRANSMISSION).

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Drain automatic transmission fluid.

CAUTION:

Do not drain the automatic transmission fluid until it cools down.

- 5) Remove oil pan, and disconnect connector from duty solenoid A.



6) Measure resistance between duty solenoid A connector and transmission ground.

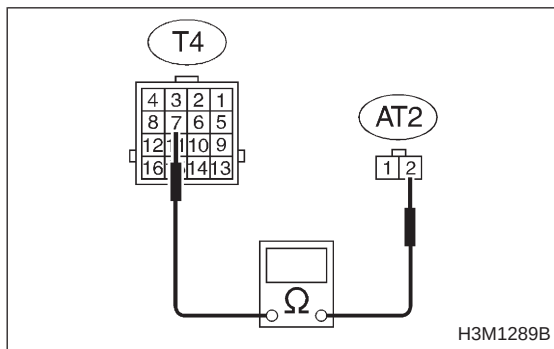
Terminal

(AT2) No. 2 — Transmission ground:

CHECK : Is the resistance 1.5 and 4.5 Ω ?

YES : Go to step 8C9.

NO : Replace duty solenoid A.



8C9

CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DUTY SOLENOID A.

1) Disconnect connector from transmission.

2) 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 ?

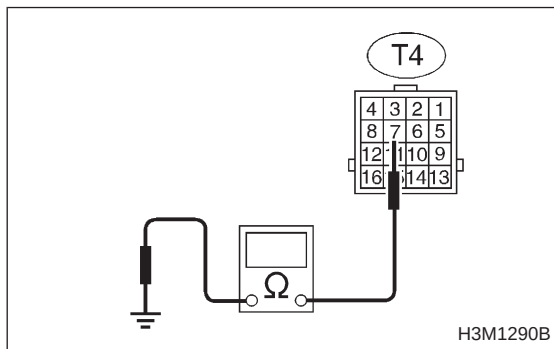
YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between duty solenoid A and transmission connector.
- Poor contact in duty solenoid A connector.
- Poor contact in transmission connector.



3) 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 Ω ?

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.

D: TROUBLE CODE 12

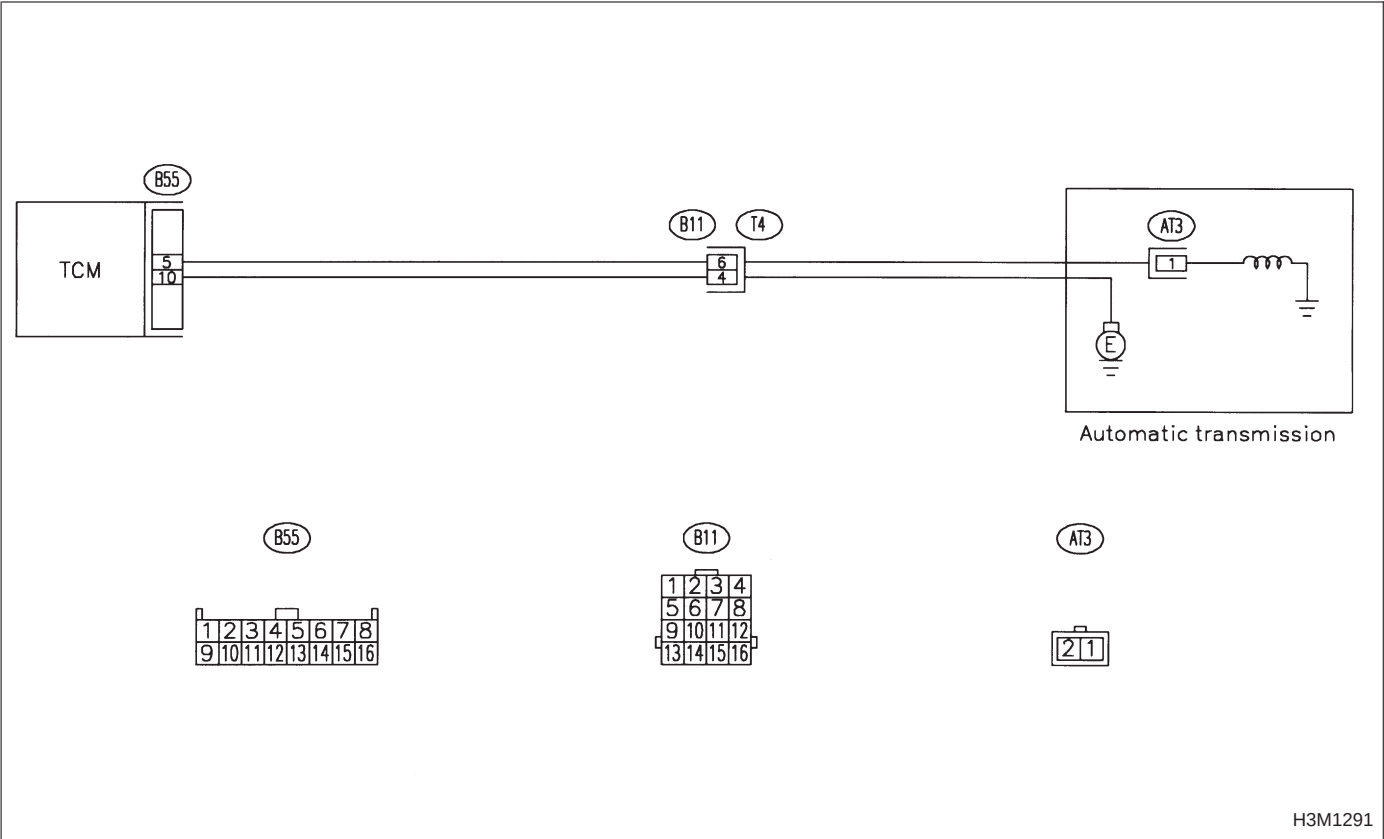
— DUTY SOLENOID B —

DIAGNOSIS:

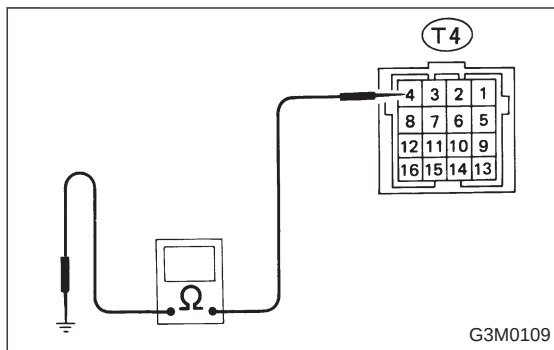
Output signal circuit of duty solenoid B is open or shorted.

TROUBLE SYMPTOM:

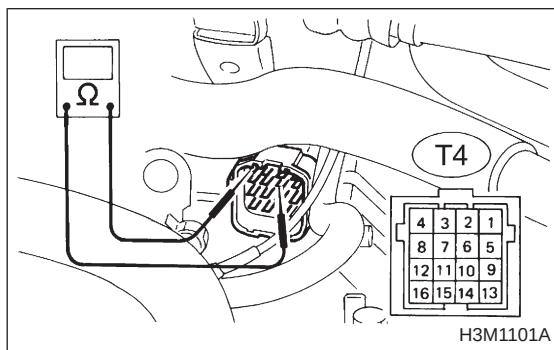
No “lock-up” (after engine warm-up).



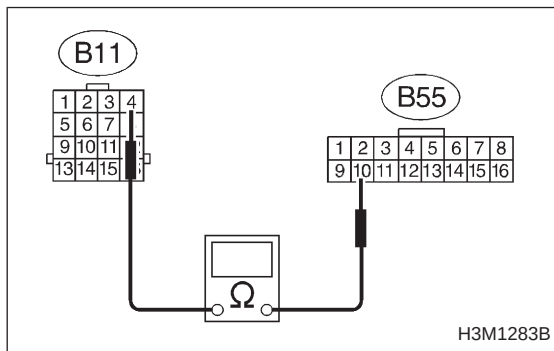
8D1	CHECK TROUBLE CODE.
CHECK	: Do multiple trouble codes appear in the on-board diagnostics test mode?
YES	: Go to another trouble code.
NO	: Go to step 8D2.

**8D2****CHECK DUTY SOLENOID B GROUND LINE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) 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 connector.**8D3****CHECK DUTY SOLENOID B.**

Measure resistance between transmission connector receptacle's terminals.

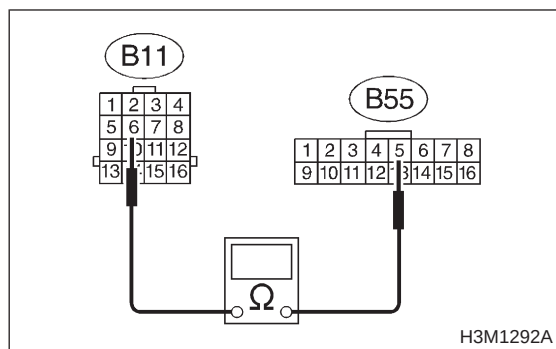
Connector & terminal**(T4) No. 6 — No. 4:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to step 8D4.**NO** : Go to step 8D7.**8D4****CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from transmission and TCM.
- 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 next **CHECK** .**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



Connector & terminal (B55) No. 5 — (B11) No. 6:

CHECK : Is the resistance less than 1 Ω ?

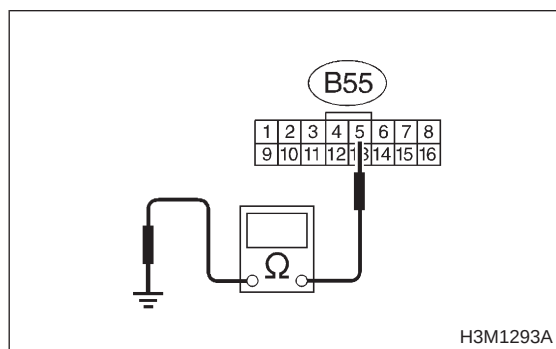
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.

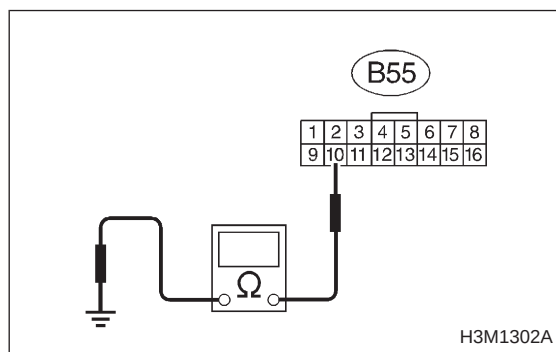


Connector & terminal (B55) No. 5 — Chassis ground:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and transmission connector.



Connector & terminal (B55) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to step 8D5.

NO : Repair short circuit in harness between TCM and transmission connector.

8D5	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 3) Lift-up the vehicle and place safety stand.

CAUTION:

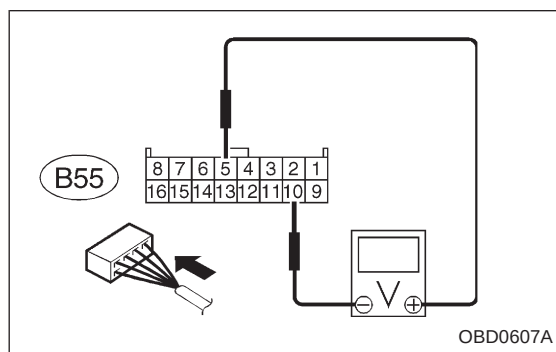
On AWD models, make sure that all wheels are raised off floor.

- 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.



- 6) Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 5 (+) — No. 10 (-):

CHECK : Is the voltage more than 8.5 V?

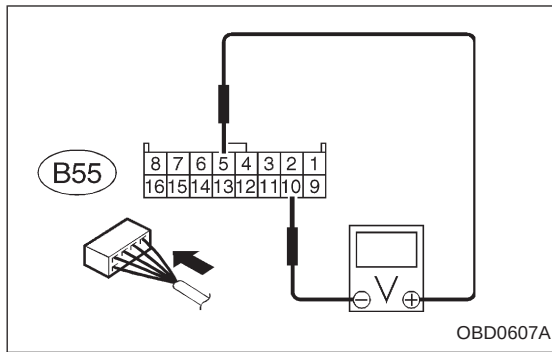
YES : Go to next step 7).

NO : Go to next **CHECK** .

CHECK : Is the voltage more than 8.5 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



7) Return the engine to idling speed and move selector lever to "N".

8) 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 next **CHECK** .

CHECK : **Is the voltage less than 0.5 V while shaking harness and connector of TCM?**

YES : Repair poor contact in TCM.

NO : Replace TCM.

NOTE:

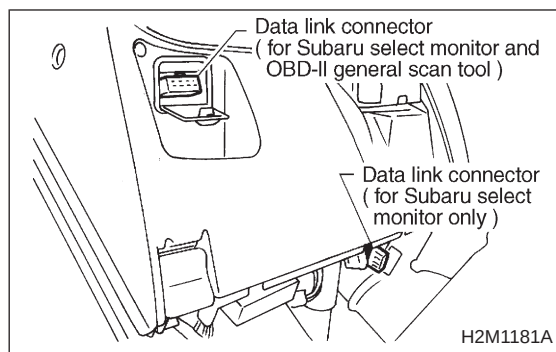
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

● **Using Subaru Select Monitor**

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 3) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, 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:

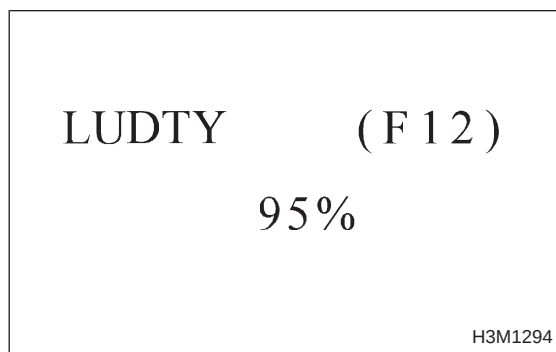
If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 7) Read data on Subaru Select Monitor.

- 8) Designate mode using function key.

Function mode F12

- F12: Lock-up duty is indicated in "%".



- 9) Move selector lever to "D" and slowly increase vehicle speed to 75 km/h (47 m/h). Wheels will lock-up.

CHECK : Is the value 95% in function mode F12?

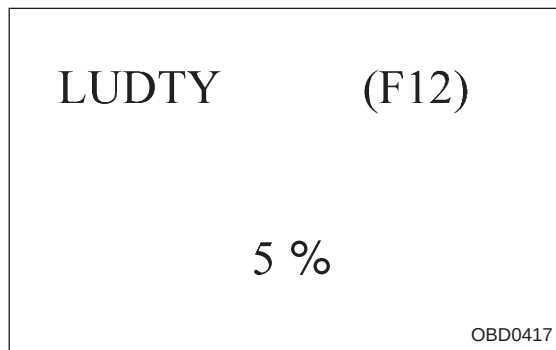
YES : Go to next step 10).

NO : Go to next **CHECK** .

CHECK : Is the value 95% by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?

YES : Repair poor contact in TCM connector.

NO : Replace TCM.



- 10) Return the engine to idling speed and move selector lever to "N".

CHECK : Is the value 5% in function mode F12?

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 next **CHECK** .

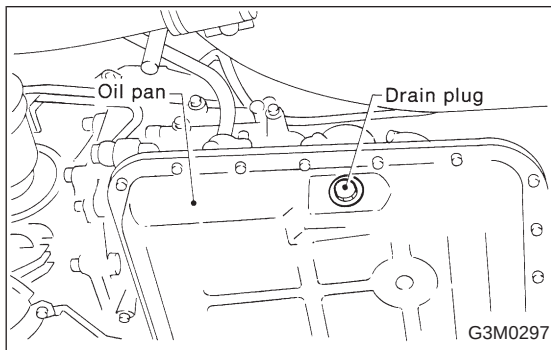
CHECK : Is the value 5% by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

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] or [T9J0].>



8D6

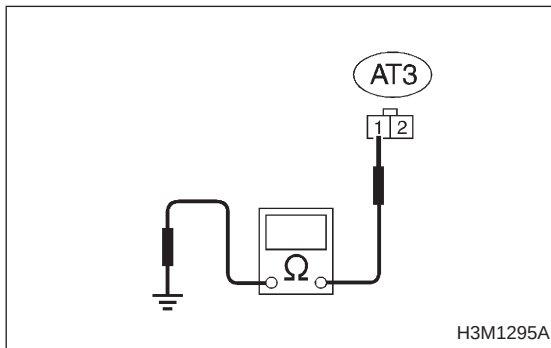
**CHECK DUTY SOLENOID B
(IN TRANSMISSION).**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Drain automatic transmission fluid.

CAUTION:

Do not drain the automatic transmission fluid until it cools down.

- 5) Remove oil pan, and disconnect connector from duty solenoid B.



- 6) Measure resistance between duty solenoid B connector and transmission ground.

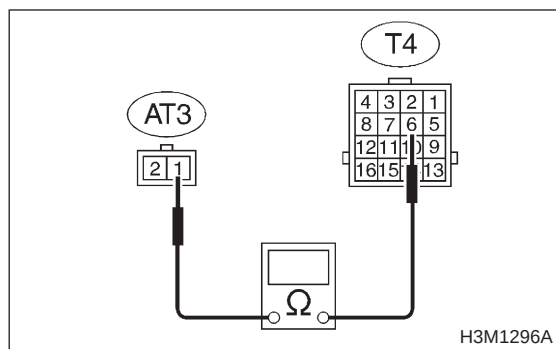
Connector & terminal

(AT3) No. 1 — Transmission ground:

CHECK : Is the resistance between 9 and 17 Ω ?

YES : Go to step 8D7.

NO : Replace duty solenoid B.

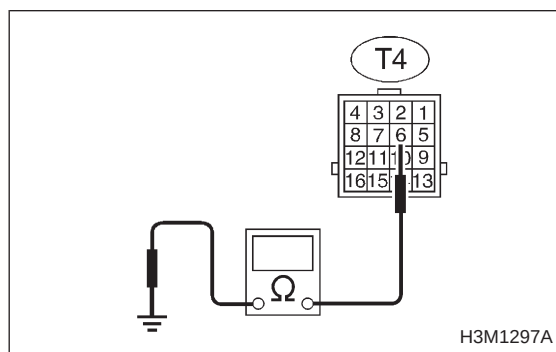
**8D7**
**CHECK HARNESS CONNECTOR
BETWEEN DUTY SOLENOID B AND
TRANSMISSION.**

- 1) Disconnect connector from transmission.
- 2) 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 next step 3).
NO : Repair harness and connector.
NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



- 3) Measure resistance of harness between transmission connector and transmission ground.

Connector & terminal
(T4) No. 6 — Transmission ground:
CHECK : Is the resistance more than 1 M Ω ?
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 connector.
NO : Repair short circuit in harness between TCM and transmission connector.

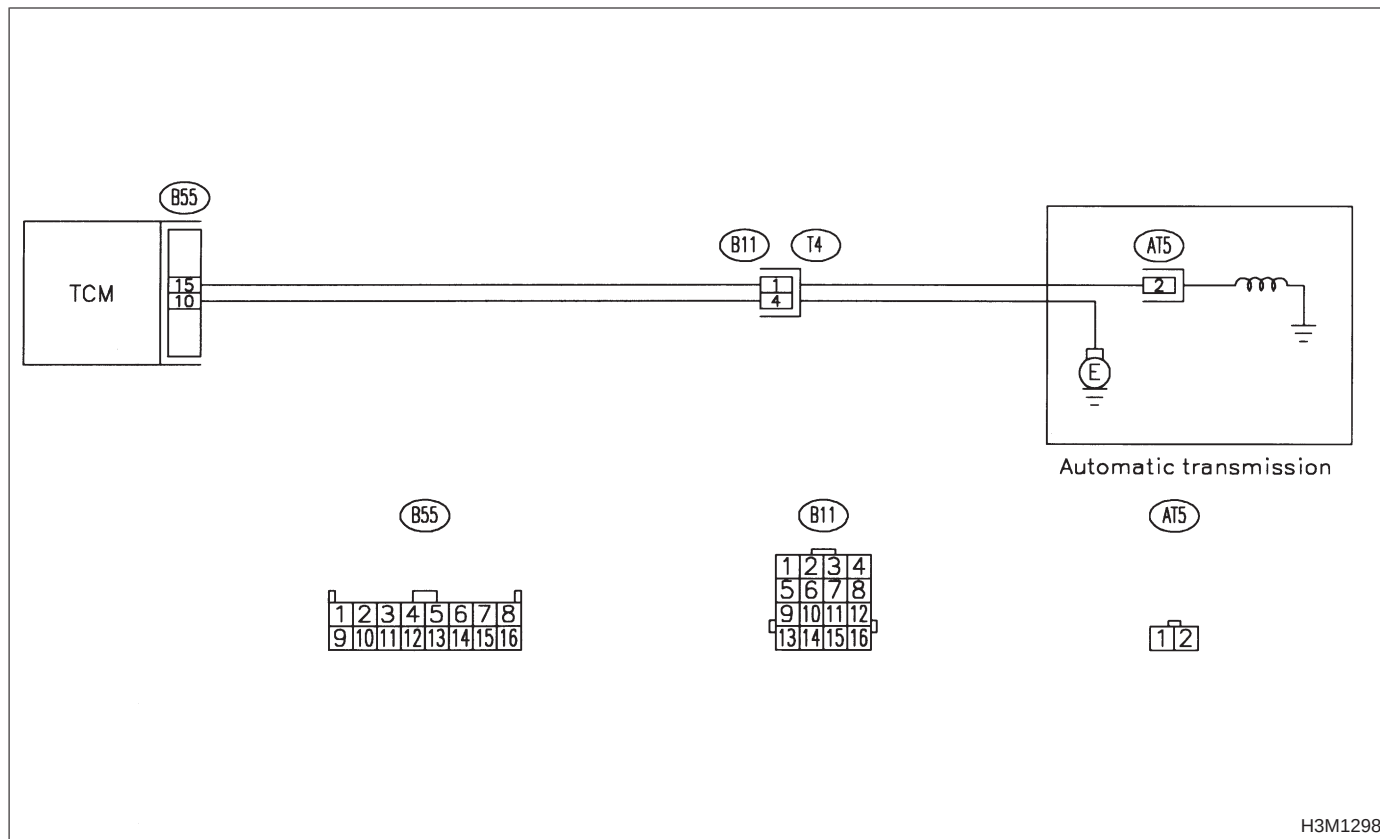
E: TROUBLE CODE 13 **— SHIFT SOLENOID 3 —**

DIAGNOSIS:

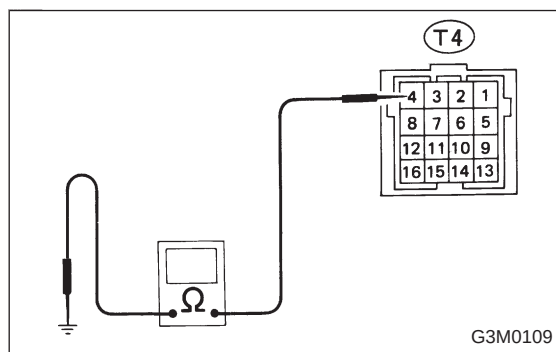
Output signal circuit of shift solenoid 3 is open or shorted.

TROUBLE SYMPTOM:

Ineffective engine brake with shift lever in "3".



H3M1298



G3M0109

8E1

CHECK SHIFT SOLENOID 3 GROUND LINE.

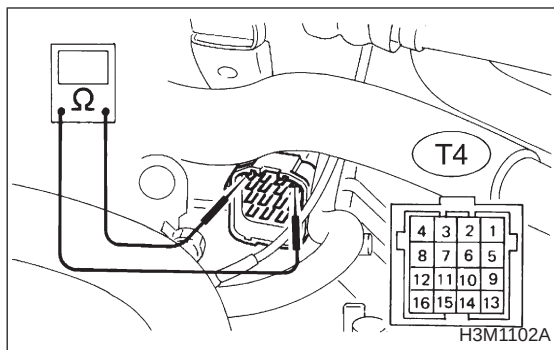
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Measure resistance between transmission connector and transmission ground.

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 connector.

**8E2****CHECK SHIFT SOLENOID 3.**

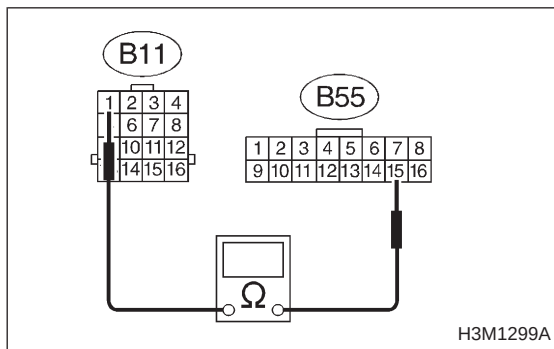
Measure resistance between transmission connector terminals.

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 8E5.

**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 ?

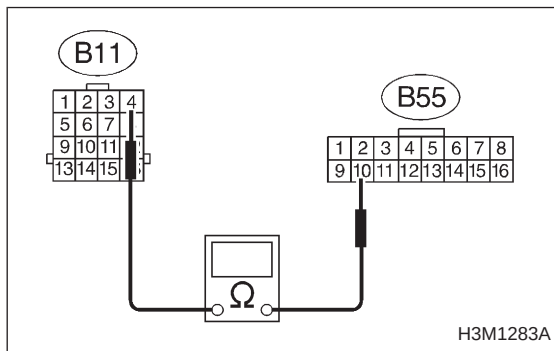
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.

**Connector & terminal****(B55) No. 10 — (B11) No. 4:**

CHECK : Is the resistance less than 1 Ω ?

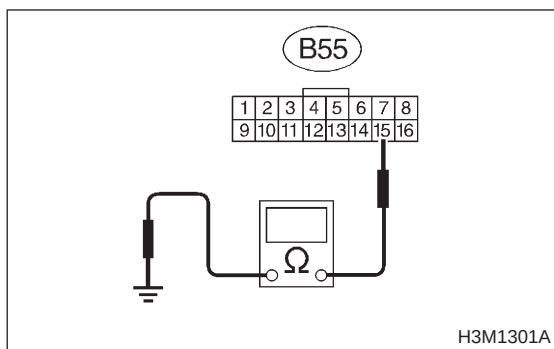
YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



3) Measure resistance of harness between TCM connector and transmission ground.

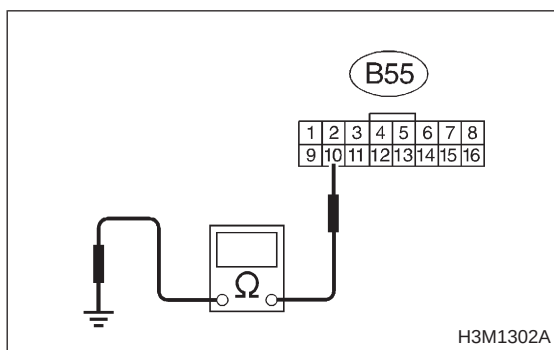
Connector & terminal

(B55) No. 15 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and transmission connector.



Connector & terminal

(B55) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8E4.

NO : Repair short circuit in harness between TCM and transmission connector.

8E4	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

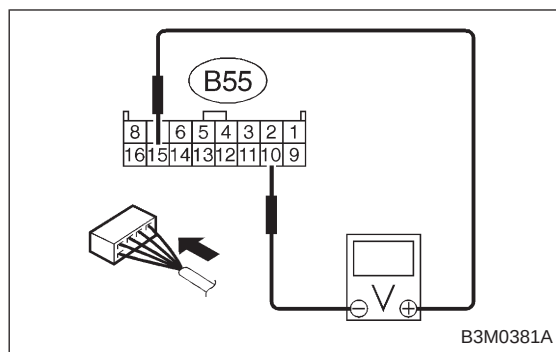
On AWD models, raise all wheels off ground.

3) 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.

4) Move selector lever to "2", and slowly increase vehicle speed to 35 km/h (22 m/h).



5) Measure voltage between TCM connector terminals.

Connector & terminal

(B55) No. 15 (+) — No. 10 (-):

CHECK : Is the voltage less than 1 V?

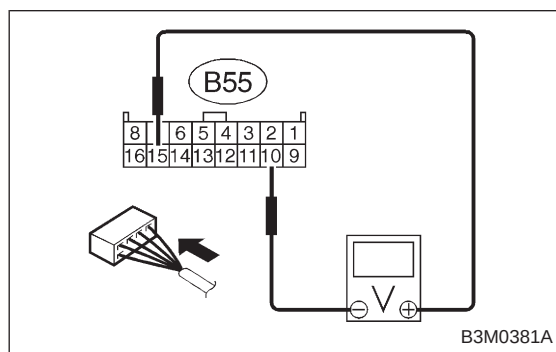
YES : Go to next step 6).

NO : Go to next **CHECK** .

CHECK : Is the voltage less than 1 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



6) Move selector lever to "D", and slowly increase vehicle speed to 65 km/h (41 m/h).

7) 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 next **CHECK** .

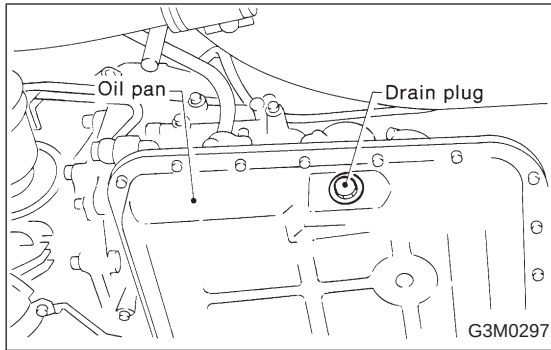
CHECK : Is the voltage more than 10 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.

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] or [T9J0].>



8E5

CHECK SHIFT SOLENOID 3 (IN TRANSMISSION).

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

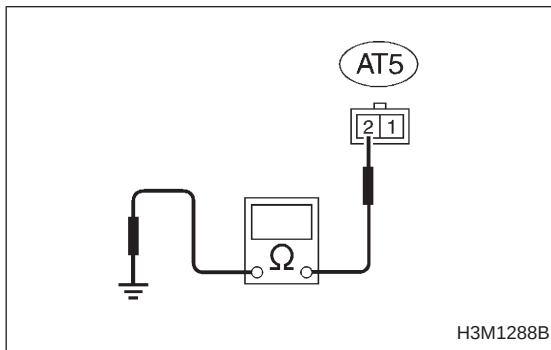
On AWD models, raise all wheels off ground.

- 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 shift solenoid 3.



- 7) Measure resistance between shift solenoid 3 connector and transmission ground.

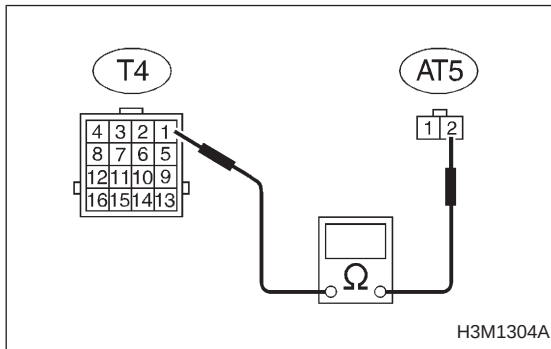
Terminal

(AT5) No. 2 — Transmission ground:

CHECK : Is the resistance between 20 and 32 Ω ?

YES : Go to step 8E6.

NO : Replace shift solenoid assembly.



8E6

CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 3 AND TRANSMISSION.

- 1) 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 ?

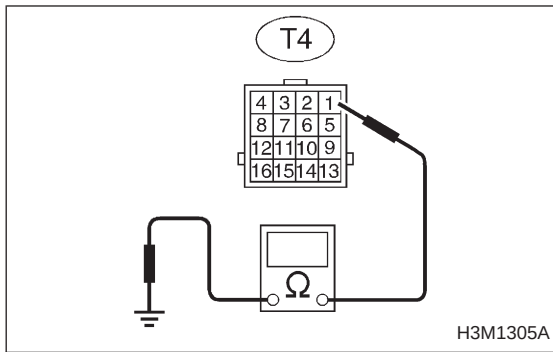
YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between shift solenoid 3 and transmission connector.
- Poor contact in shift solenoid 3 connector.
- Poor contact in transmission connector.



2) 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 contact in the TCM.

- Poor contact in shift solenoid 3 connector.
- Poor contact in transmission connector.

NO : Repair short circuit harness between TCM and transmission connector.

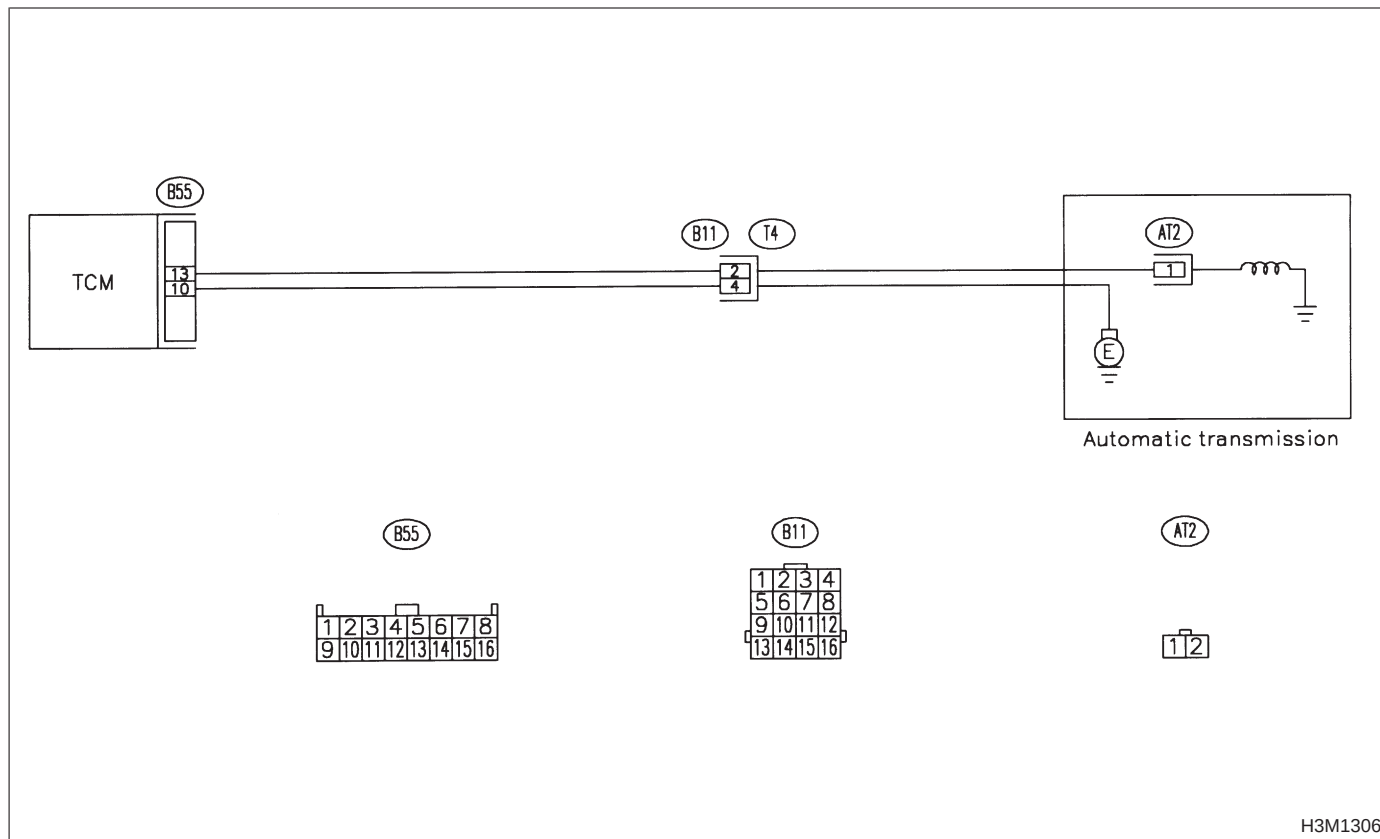
F: TROUBLE CODE 14
— SHIFT SOLENOID 2 —

DIAGNOSIS:

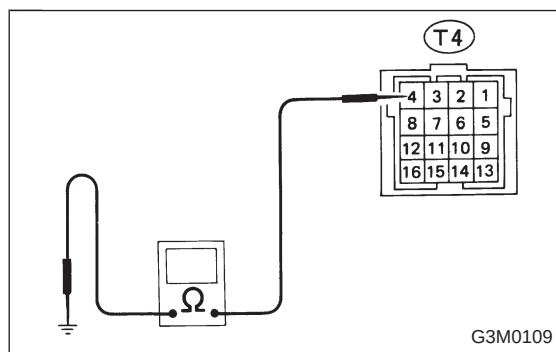
Output signal circuit of shift solenoid 2 is open or shorted.

TROUBLE SYMPTOM:

Does not shift.



H3M1306



G3M0109

8F1

CHECK SHIFT SOLENOID 2 GROUND LINE.

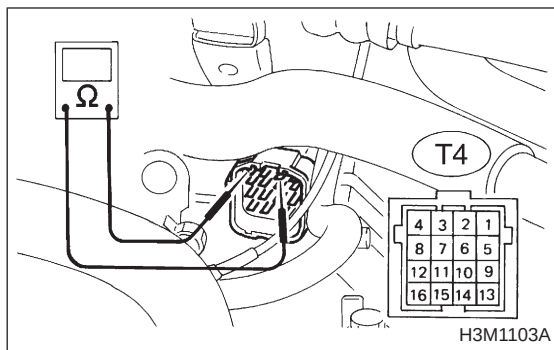
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Measure resistance between transmission connector and transmission ground.

Connector & terminal
(T4) No. 4 — Chassis ground:

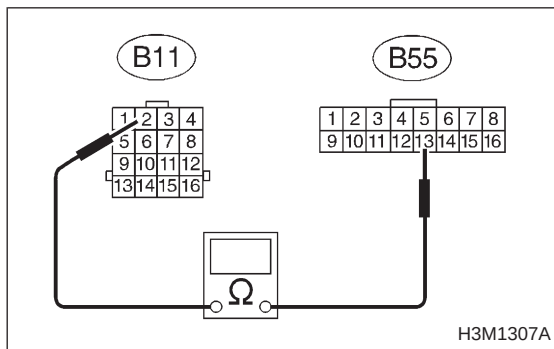
CHECK : Is the resistance less than 1 Ω?

YES : Go to step 8F2.

NO : Repair open circuit in transmission harness connector.

**8F2****CHECK SHIFT SOLENOID 2.**

Measure resistance between transmission connector terminals.

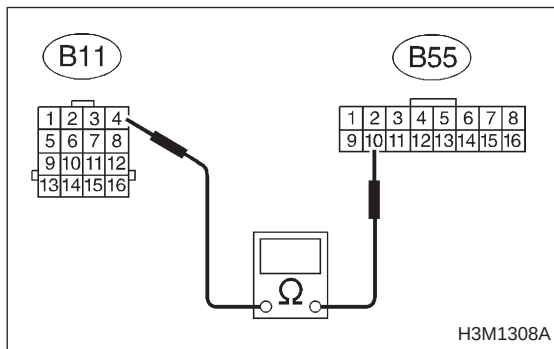
Connector & terminal**(T4) No. 2 — No. 4:****CHECK** : Is the resistance between 20 and 32 Ω ?**YES** : Go to step 8F3.**NO** : Go to step 8F5.**8F3****CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.**

- 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 next **CHECK** .**NO** : Repair harness and connector.**NOTE:**

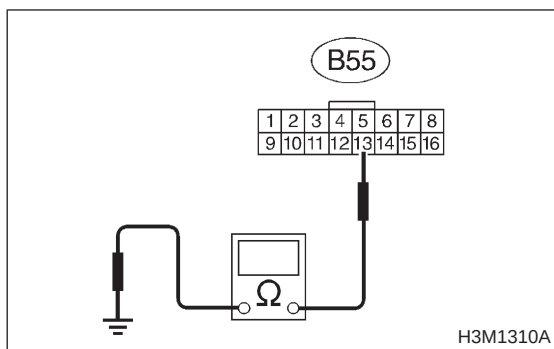
In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.

**Connector & terminal****(B55) No. 10 — (B11) No. 4:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to next step 3).**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



3) Measure resistance of harness between TCM connector and transmission ground.

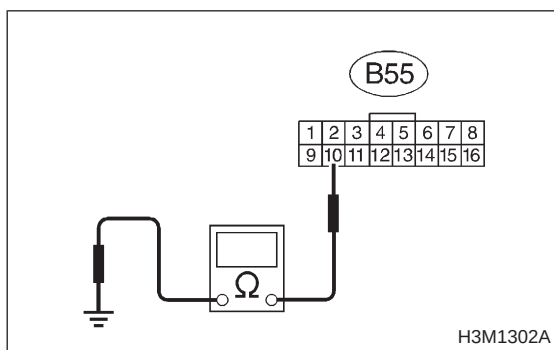
Connector & terminal

(B55) No. 13 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and transmission connector.



Connector & terminal

(B55) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8F4.

NO : Repair short circuit in harness between TCM and transmission connector.

8F4	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

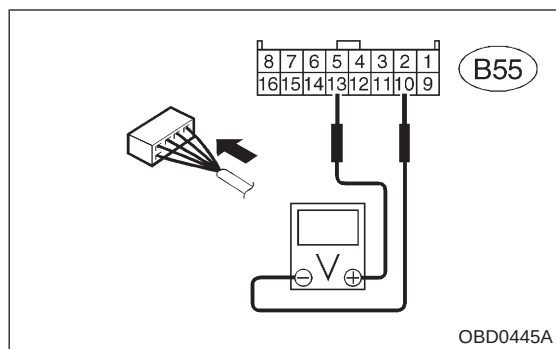
On AWD models, raise all wheels off ground.

3) 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.

4) Move selector lever to "D", and slowly increase vehicle speed to 50 km/h (31 m/h).



5) 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 next step 6).

6) Move selector lever to “D”, and slowly increase vehicle speed to 50 km/h (31 m/h).

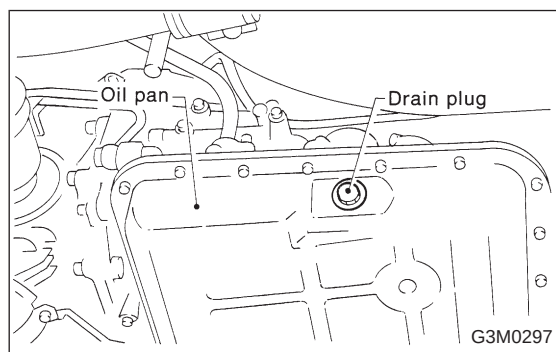
CHECK : **Is the voltage changing 9 V → 1 V while shaking harness and connector of TCM?**

YES : Repair poor contact in TCM.

NO : Replace TCM.

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] or [T9J0].>



8F5

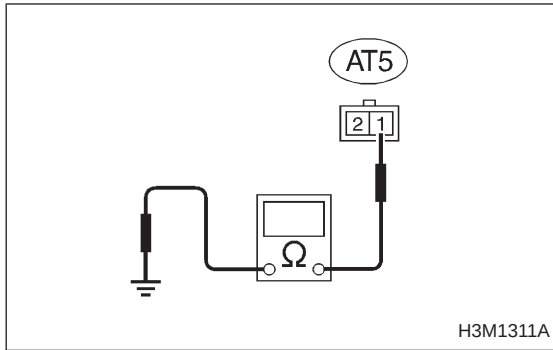
CHECK SHIFT SOLENOID 2 (IN TRANSMISSION).

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Drain automatic transmission fluid.

CAUTION:

Do not drain the automatic transmission fluid until it cools down.

- 5) Remove oil pan, and disconnect connector from shift solenoid 2.



6) Measure resistance between shift solenoid 2 connector and transmission ground.

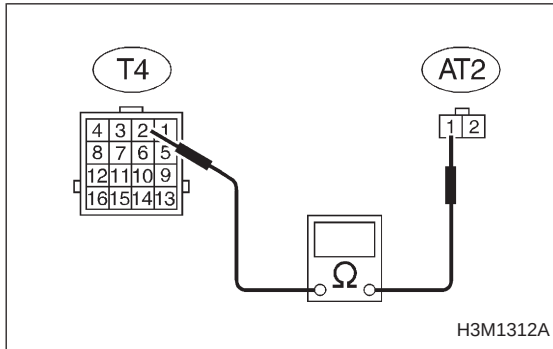
Terminal

(AT2) No. 1 — Transmission ground:

CHECK : Is the resistance between 20 and 32 Ω ?

YES : Go to step 8F6.

NO : Replace shift solenoid assembly.



8F6

CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.

1) 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 ?

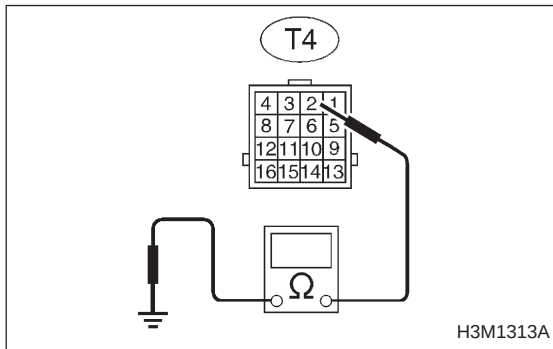
YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between shift solenoid 2 and transmission connector.
- Poor contact in shift solenoid 2 connector.
- Poor contact in transmission connector.



2) 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 Ω ?

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.

- Poor contact in shift solenoid 2 connector.
- Poor contact in transmission connector.

NO : Repair short circuit harness between TCM and transmission connector.

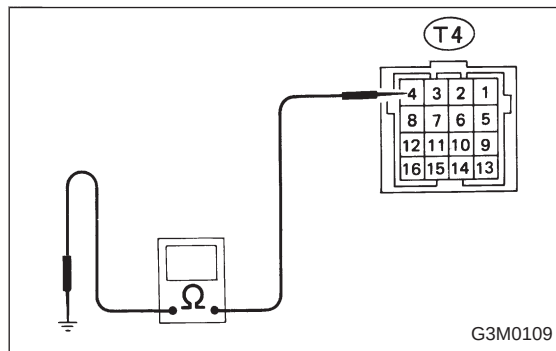
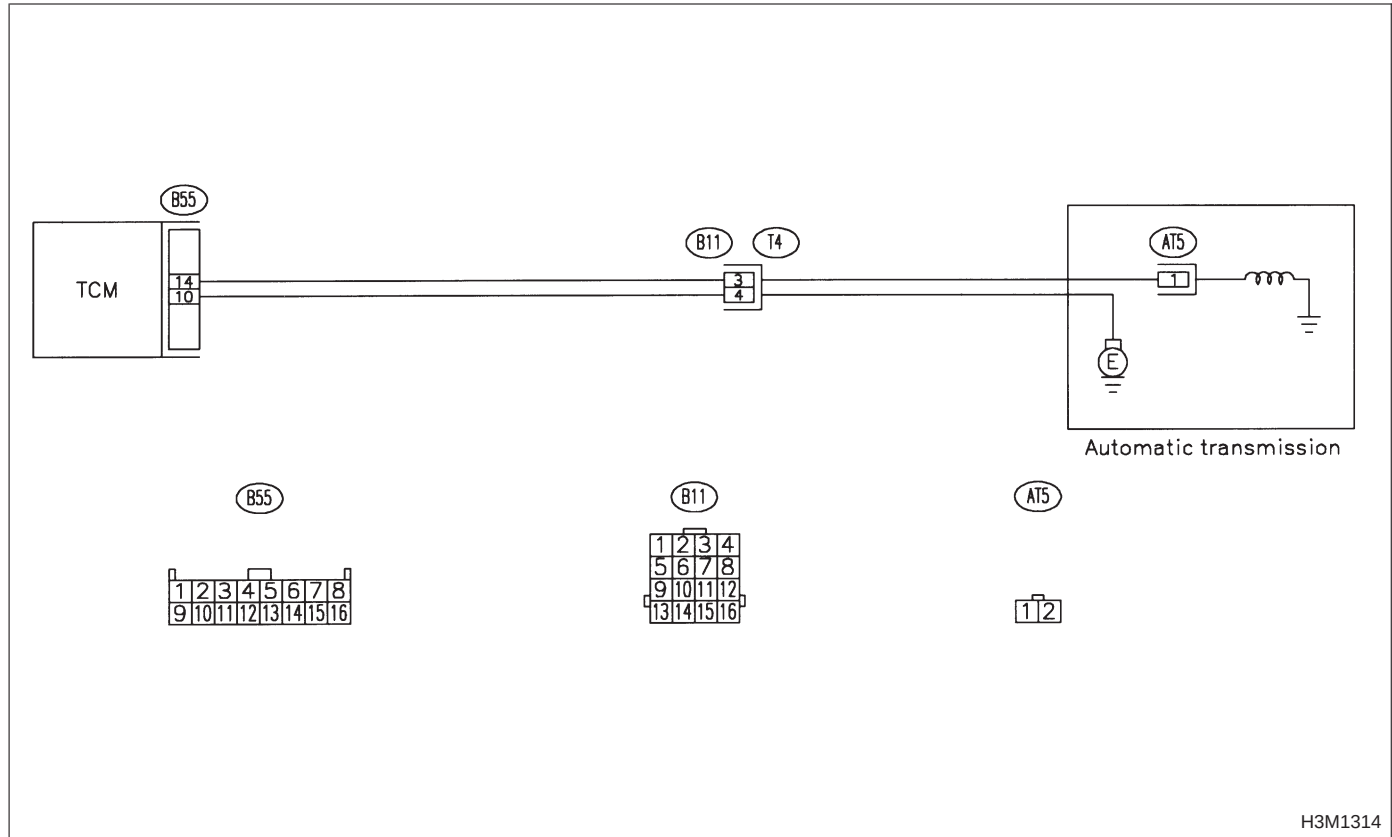
G: TROUBLE CODE 15 — SHIFT SOLENOID 1 —

DIAGNOSIS:

Output signal circuit of shift solenoid 3 is open or shorted.

TROUBLE SYMPTOM:

Does not shift.



8G1

CHECK SHIFT SOLENOID 1 GROUND LINE.

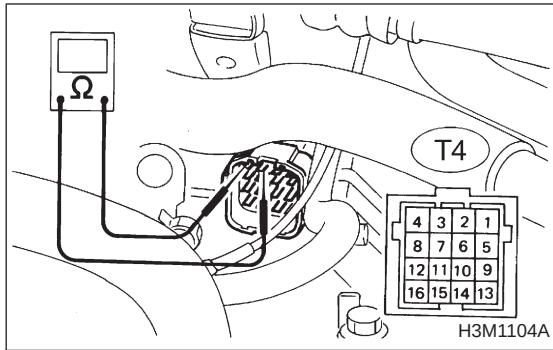
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Measure resistance between transmission connector and transmission ground.

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 connector.



8G2

CHECK SHIFT SOLENOID 1.

Measure resistance between transmission connector terminals.

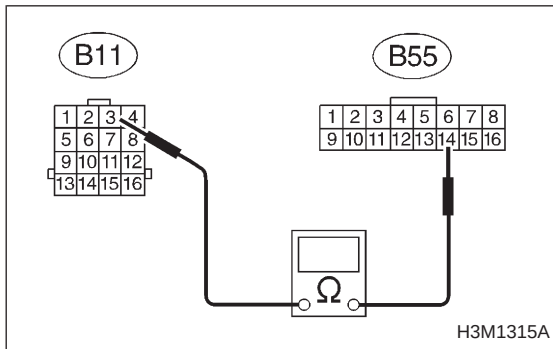
Connector & terminal

(T4) No. 3 — No. 4:

CHECK : Is the resistance between 20 and 32 Ω ?

YES : Go to step 8G3.

NO : Go to step 8G5.



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 ?

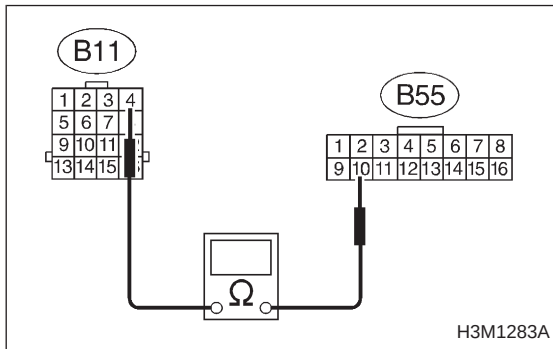
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



Connector & terminal

(B55) No. 10 — (B11) No. 4:

CHECK : Is the resistance less than 1 Ω ?

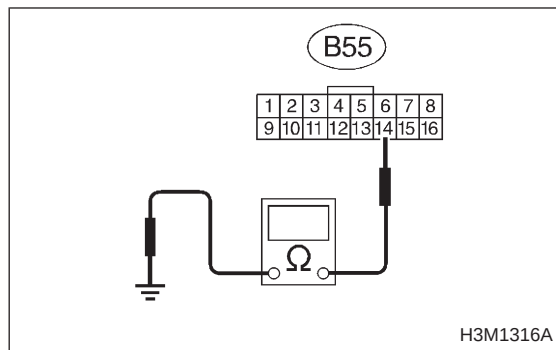
YES : Go to next step 3).

NO : Repair harness connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



3) Measure resistance of harness between TCM connector and transmission ground.

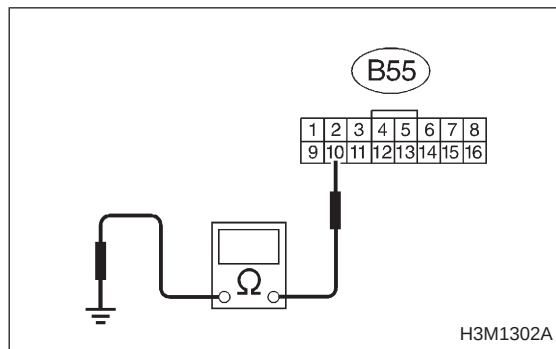
Connector & terminal

(B55) No. 14 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and transmission connector.



Connector & terminal

(B55) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8G4.

NO : Repair short circuit in harness between TCM and transmission connector.

8G4	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Connect connectors to TCM and transmission.
- 2) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

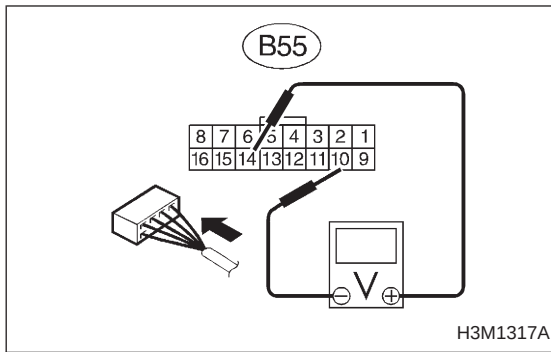
On AWD models, raise all wheels off ground.

3) 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.

4) Move selector lever to "D", and slowly increase vehicle speed to 50 km/h (31 m/h).



5) 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 next step 7).

6) Move selector lever to “D”, and slowly increase vehicle speed to 50 km/h (31 m/h).

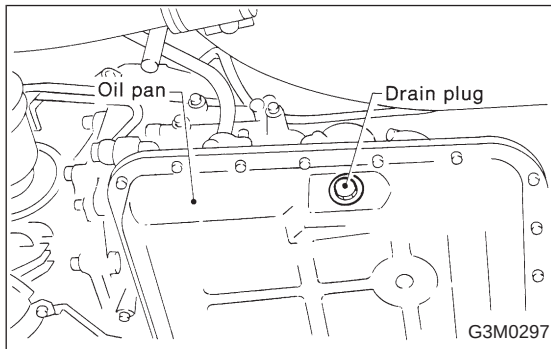
CHECK : Is the voltage changing 1 V → 9 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.

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] or [T9J0].>



8G5

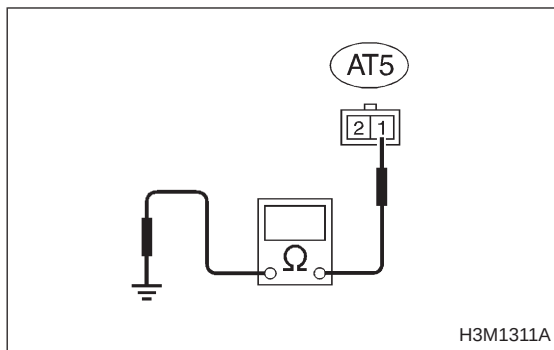
CHECK SHIFT SOLENOID 1 (IN TRANSMISSION).

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Lift-up or raise the vehicle and support with safety stand.

CAUTION:

On AWD models, raise all wheels off ground.

- 5) Drain automatic transmission fluid.
- 6) Remove oil pan, and disconnect connector from shift solenoid 1.



7) Measure resistance between shift solenoid 1 connector and transmission ground.

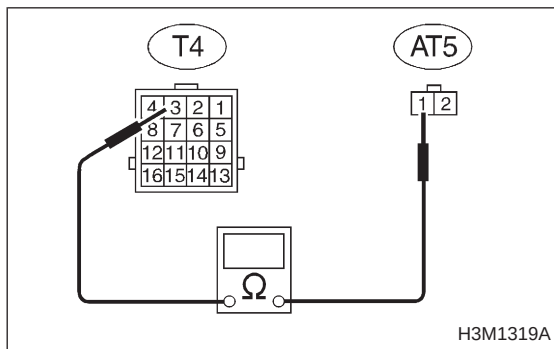
Terminal

(AT5) No. 1 — Transmission ground:

CHECK : Is the resistance between 20 and 32 Ω ?

YES : Go to step 8G6.

NO : Replace shift solenoid assembly.



8G6

CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.

1) 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 ?

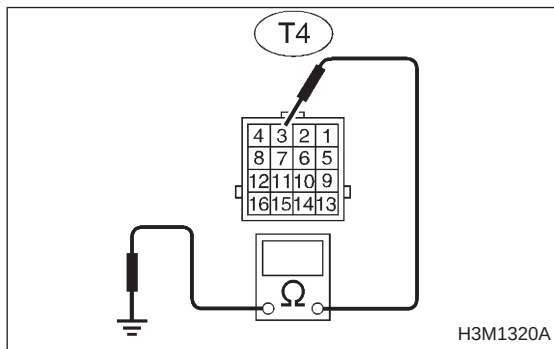
YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in shift solenoid 1 connector.
- Poor contact in transmission connector.



2) 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 M Ω ?

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.

NOTE:

In this case, repair the following:

- Poor contact in shift solenoid 1 connector.
 - Poor contact in transmission connector.
- NO** : Repair short circuit harness between TCM and transmission connector.

H: TROUBLE CODE 21

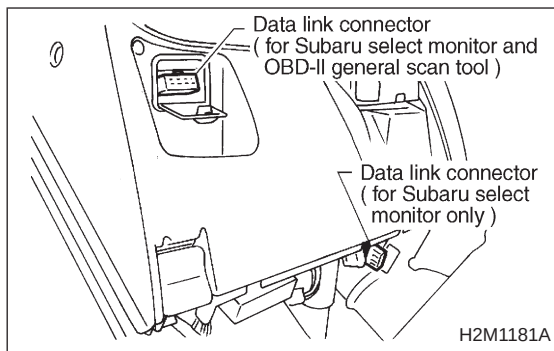
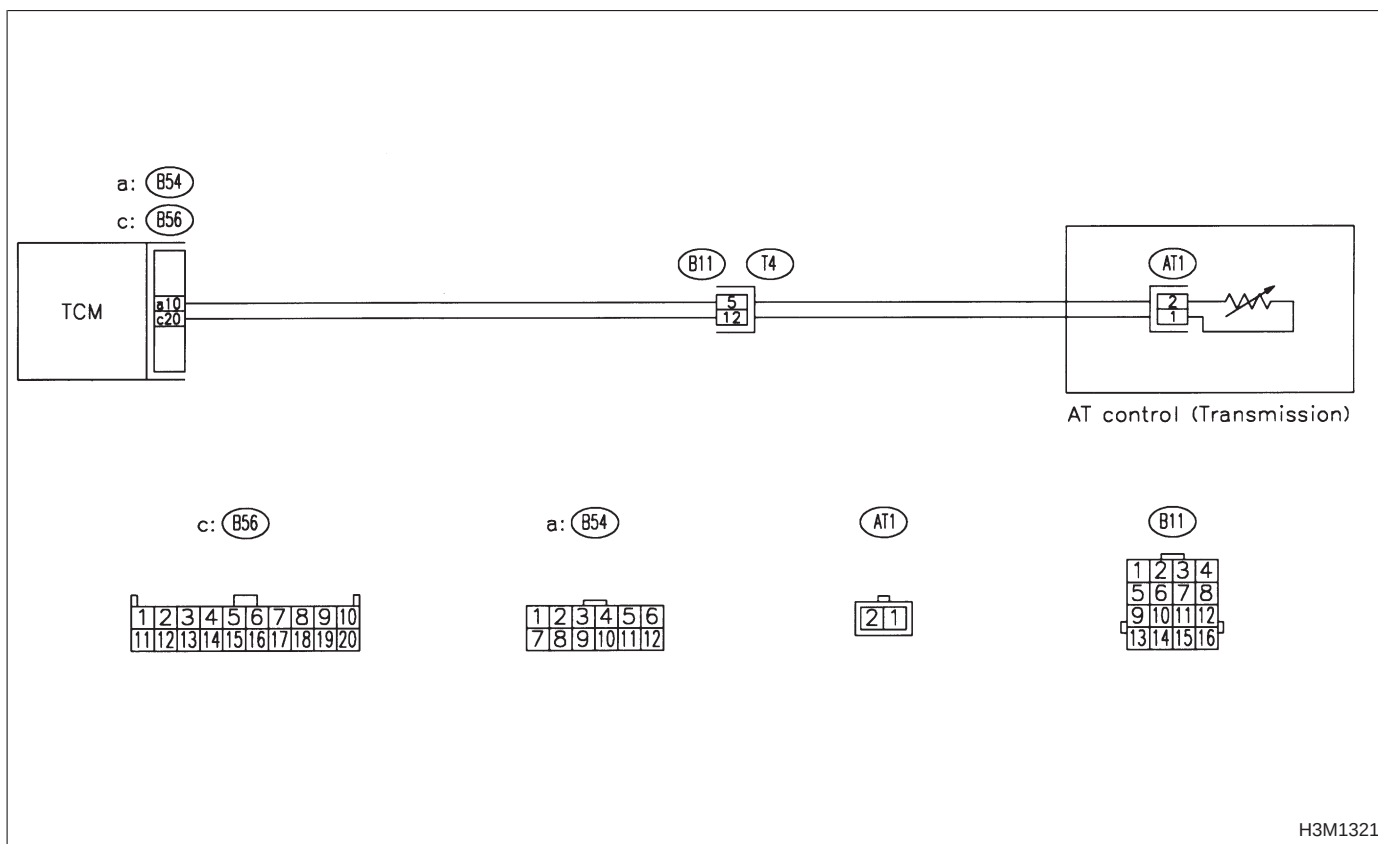
— ATF TEMPERATURE SENSOR —

DIAGNOSIS:

Input signal circuit of TCM to ATF temperature sensor is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

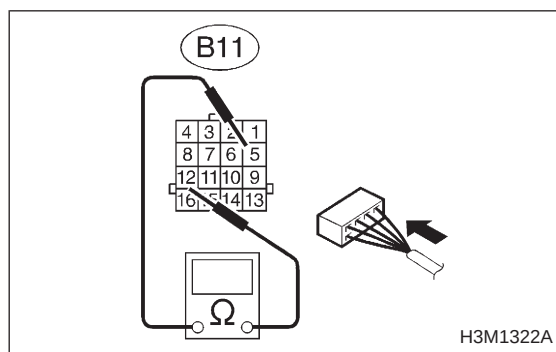


8H1

CHECK ATF TEMPERATURE SENSOR.

- 1) Turn ignition switch to OFF.
 - 2) Connect Subaru Select Monitor to data link connector.
 - 3) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
 - 4) Start engine.
 - 5) Read data on Subaru Select Monitor.
 - 6) Designate mode function key.
- Function mode F07 or F08
- F07: ATF temperature is indicated in "°F".

- F08: ATF temperature is indicated in “°C”.



7) Measure resistance between transmission connector receptacle's terminals shown in the following table.

Connector & terminal

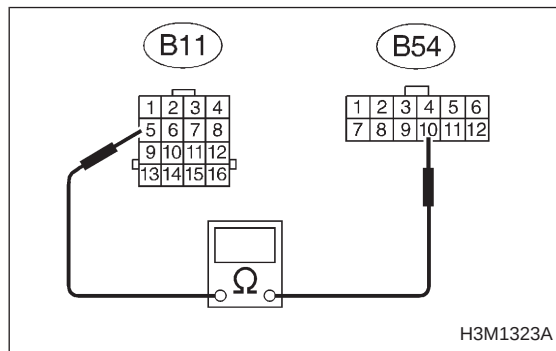
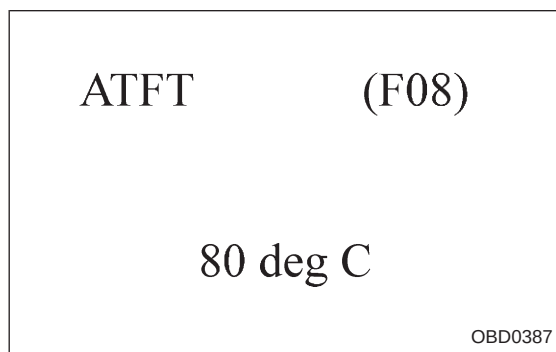
(B11) No. 12 — No. 5:

Function mode F07 (°F)	Function mode F08 (°C)	Resistance (kΩ)
68	20	2.1 — 2.9
104	40	0.96 — 1.36
140	60	0.49 — 0.69
176	80	0.272 — 0.374

CHECK : Is the resistance in range?

YES : Go to step 8H2.

NO : Go to step 8H4.



8H2

CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.

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

Connector & terminal

(B54) No. 10 — (B11) No. 5:

CHECK : Is the resistance less than 1 Ω?

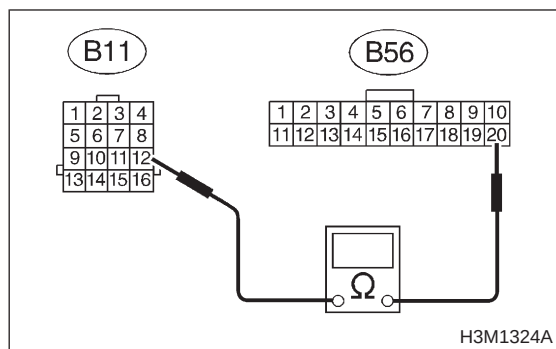
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



Connector & terminal

(B56) No. 20 — (B11) No. 12:

CHECK : Is the resistance less than 1 Ω ?

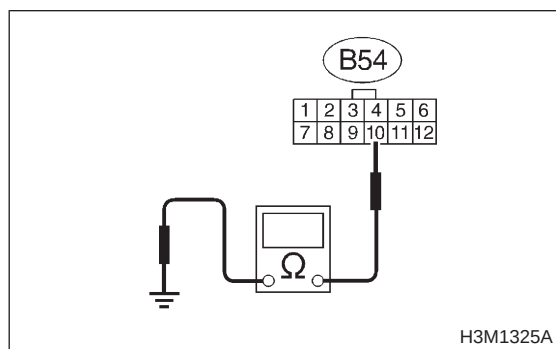
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



4) Measure resistance of harness between TCM connector and transmission ground.

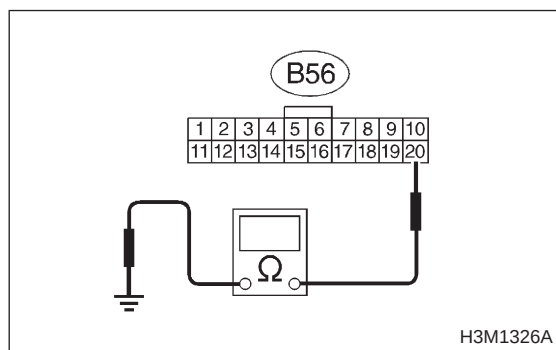
Connector & terminal

(B54) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and transmission connector.



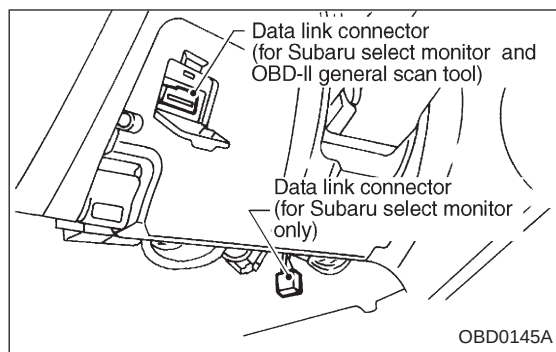
Connector & terminal

(B56) No. 20 — Chassis ground:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to step 8H3.

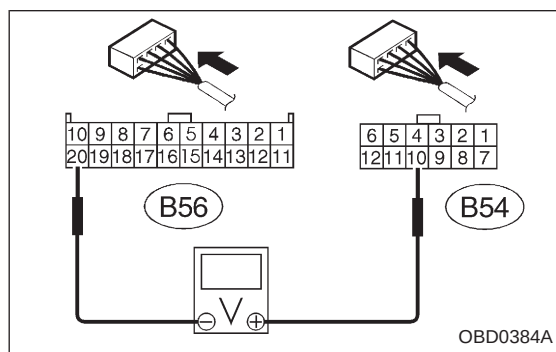
NO : Repair short circuit in harness between TCM and transmission connector.

**8H3****CHECK INPUT SIGNAL FOR TCM.**

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 3) Connect Subaru Select Monitor to data link connector.
- 4) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
- 5) Start engine.
- 6) Read data on Subaru Select Monitor.
- 7) Designate mode function key.

Function mode F07 or F08

- F07: ATF temperature is indicated in "°F".
 - F08: ATF temperature is indicated in "°C".
- 8) ATF temperature is above 20°C (68°F) in function mode F08 (F07).



- 9) 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?

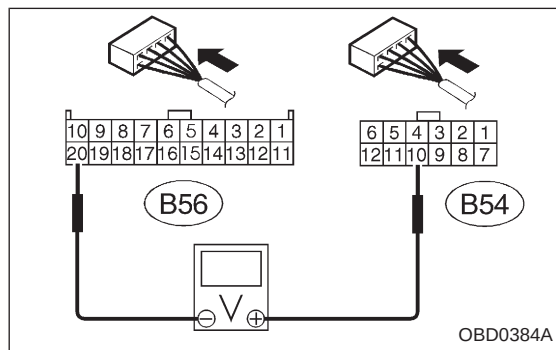
YES : Go to next step 10).

NO : Go to next **CHECK** .

CHECK : Is the voltage between 2.9 and 4.0 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



- 10) Warm-up the transmission until ATF temperature is about 80°C (176°F) in function mode F08 (F07).

NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 11) 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?*

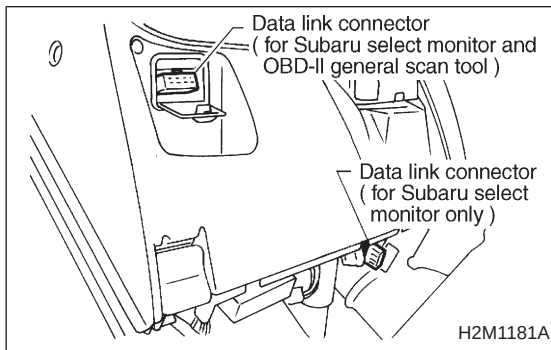
YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.

NO : Go to next **CHECK** .

CHECK : *Is the voltage between 1.0 and 1.4 V while shaking harness and connector of TCM?*

YES : Repair poor contact in TCM.

NO : Replace 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 on Subaru Select Monitor.

7) Designate mode function key.

Function mode F07 or F08

● F07: ATF temperature is indicated in "°F".

● F08: ATF temperature is indicated in "°C".

ATFT (F07)

176 deg F

OBD0386

CHECK : *Is the ATF temperature between 70 and 110°C (158 and 230°F).*

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.

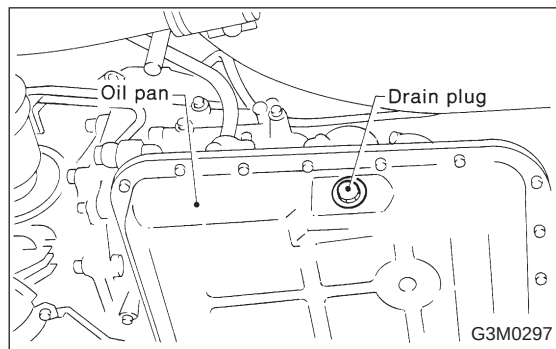
NO : Go to next **CHECK** .

ATFT (F08)

80 deg C

OBD0387

- CHECK** : Is the ATF temperature between 70 and 110°C (158 and 230°F) by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?
- YES** : Repair poor contact in TCM.
- NO** : Replace TCM.



8H4 CHECK ATF TEMPERATURE SENSOR (IN TRANSMISSION).

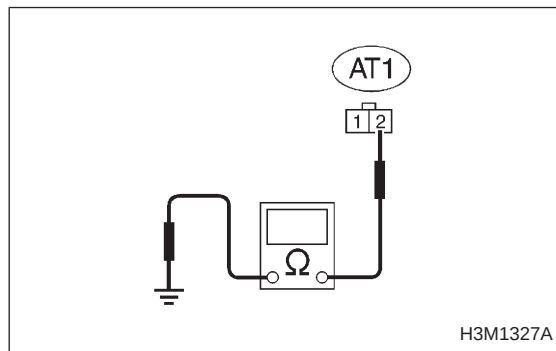
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Remove transmission connector from bracket.
- 4) Lift-up the vehicle and place safety stand.

CAUTION:
On AWD models, 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.

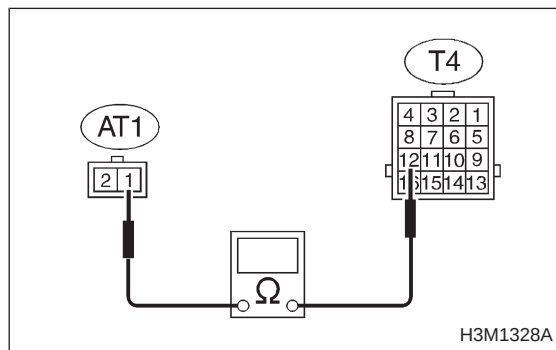
- 6) Remove oil pan, and disconnect connector from ATF temperature sensor connector.



- 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 8H5.
- NO** : Replace ATF temperature sensor.



8H5 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 ?

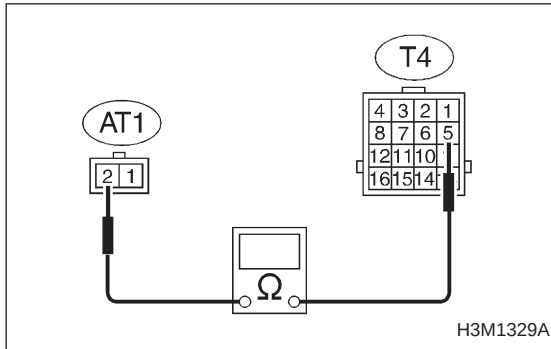
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ATF temperature sensor and transmission connector.
- Poor contact in ATF temperature sensor connector.
- Poor contact in transmission connector.



Connector & terminal

(T4) No. 5 — (AT1) No. 2:

CHECK : Is the resistance less than 1 Ω ?

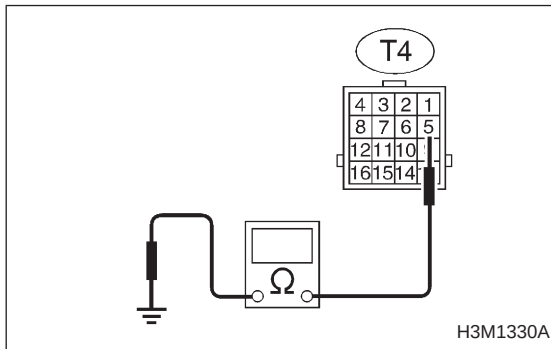
YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ATF temperature sensor and transmission connector.
- Poor contact in ATF temperature sensor connector.
- Poor contact in transmission connector.



3) Measure resistance of harness between transmission connector and transmission ground.

Connector & terminal

(T4) No. 5 — Transmission ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between ATF temperature sensor and transmission connector.

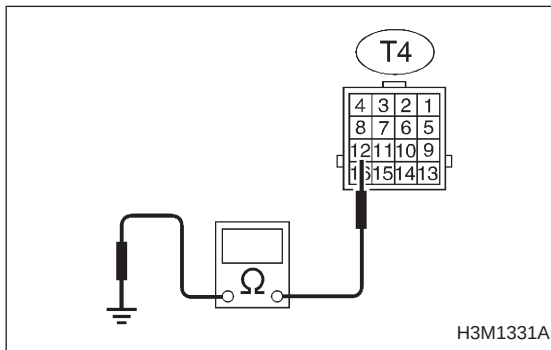
Connector & terminal

(T4) No. 12 — Transmission ground:

CHECK : Is the resistance more than 1 M Ω ?

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.



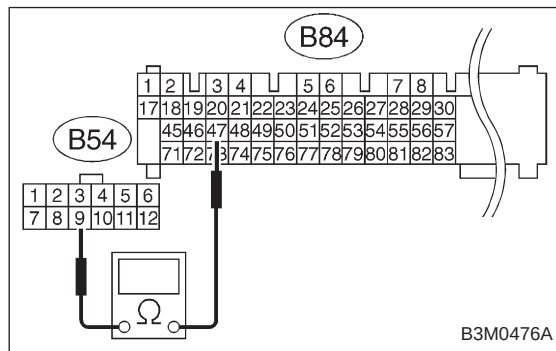
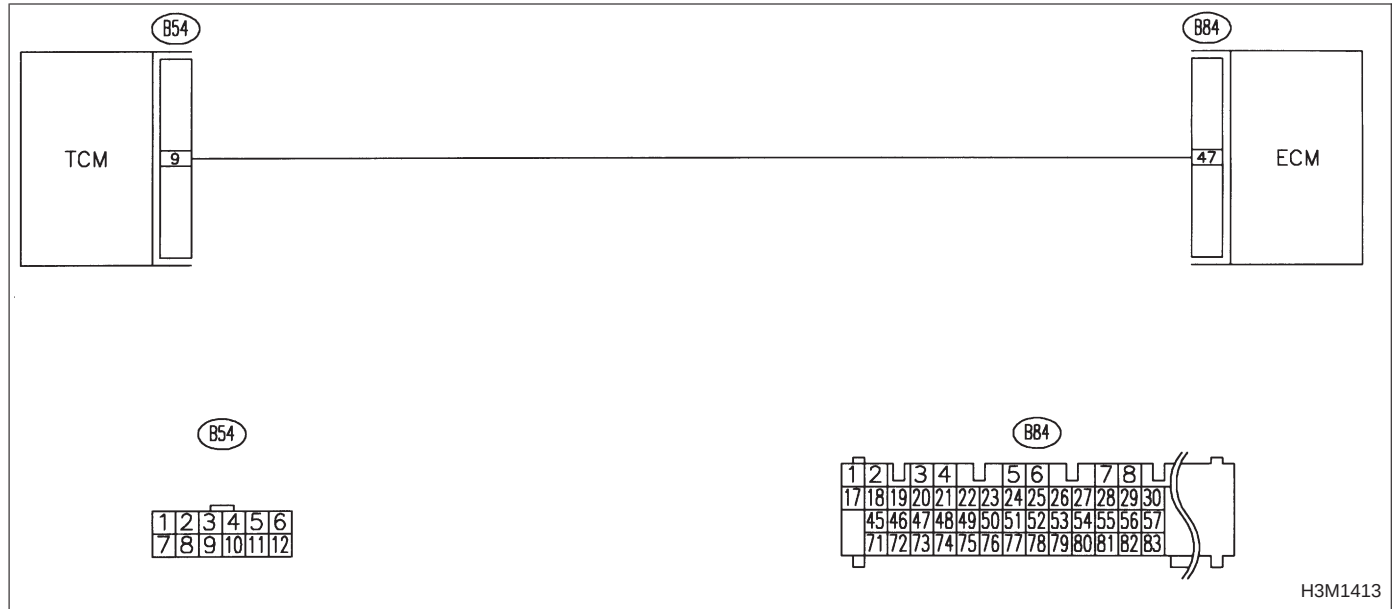
I: TROUBLE CODE 22
— MASS AIR FLOW SIGNAL —

DIAGNOSIS:

Input signal circuit of TCM from ECM is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



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?

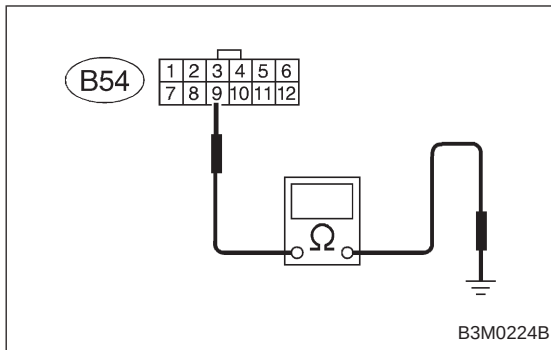
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and ECM connector.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



4) Measure resistance of harness between TCM connector and chassis ground.

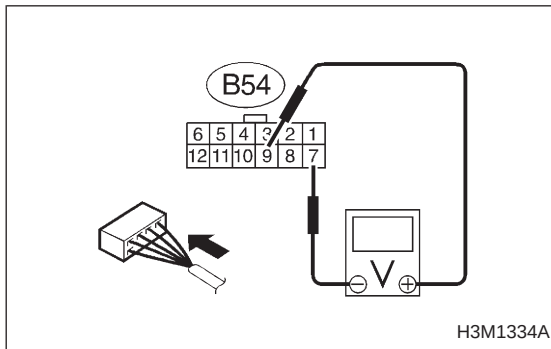
Connector & terminal

(B54) No. 9 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8I2.

NO : Repair short circuit in harness between TCM and ECM connector.



8I2

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?

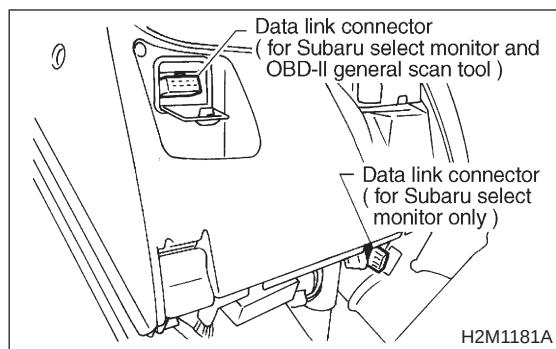
YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.

NO : Go to next **CHECK** .

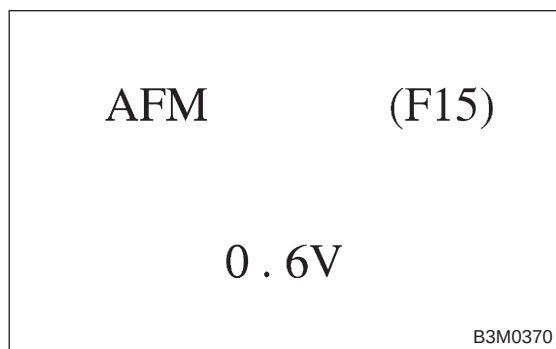
CHECK : Is the voltage between 0.5 V and 1.2 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace 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 on Subaru Select Monitor.
 - 8) Designate mode using function key.
- Function mode: F15
- F15: Display shows mass air flow signal value sent from ECM.



- CHECK** : *Is the value between 0.5 and 1.2 V in function mode F15?*
- 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 next **CHECK** .
- CHECK** : *Is the voltage between 0.5 V and 1.2 V by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?*
- YES** : Repair poor contact in TCM connector.
- NO** : Replace TCM.

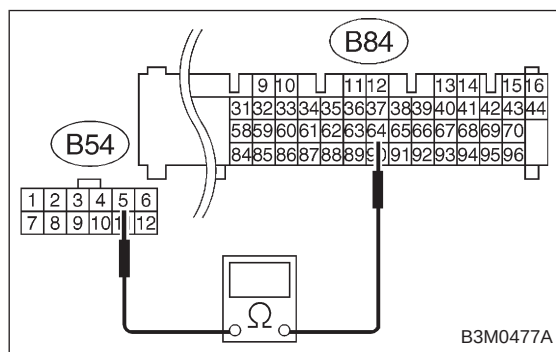
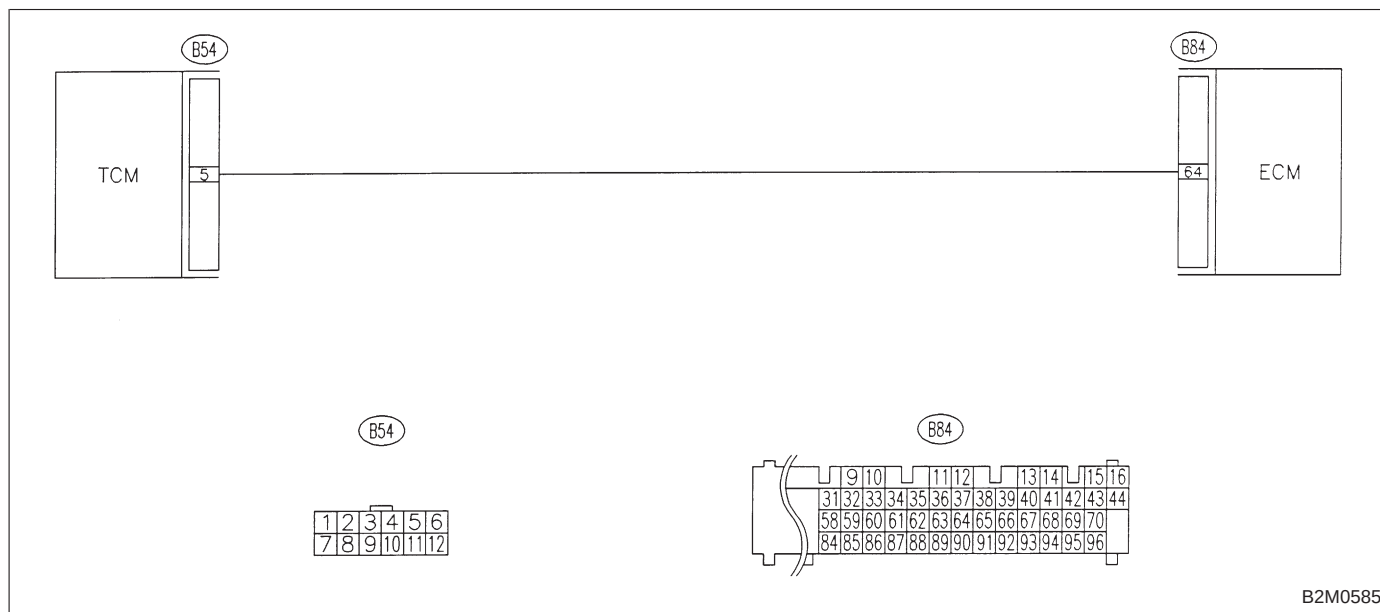
J: TROUBLE CODE 23 **— ENGINE SPEED SIGNAL —**

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".



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?

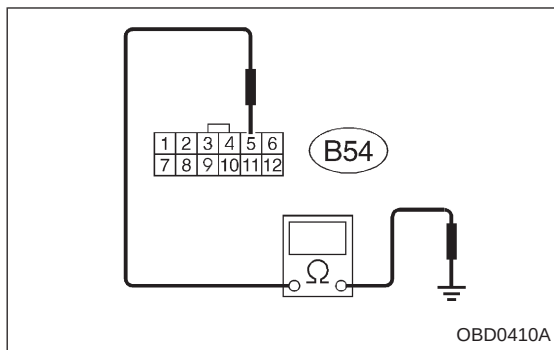
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and ECM connector.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



4) Measure resistance of harness between TCM connector and chassis ground.

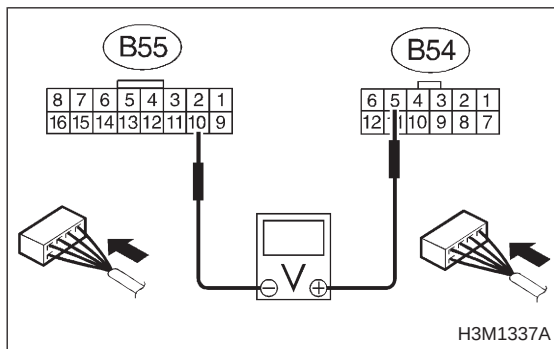
Connector & terminal

(B54) No. 5 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8J2.

NO : Repair short circuit in harness between TCM and ECM connector.



8J2

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.

NO : Go to next **CHECK** .

CHECK : Is the voltage more than 10.5 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Go to next **CHECK** .

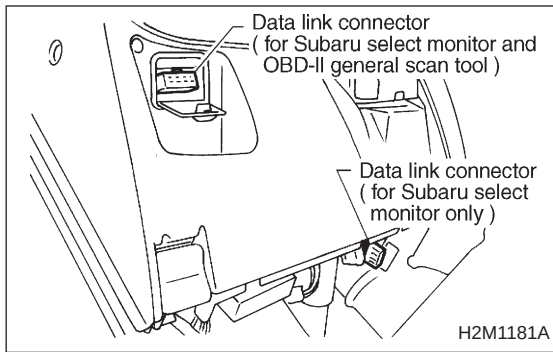
CHECK : **Replace ECM with a new one. Does the trouble code appear again, after the memory has been cleared?**

YES : Replace TCM.

NOTE:

Install the old ECM.

NO : Replace ECM.



- 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 on Subaru Select Monitor.
 - 8) Designate mode using function key.
- Function mode: F06
- F06: 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.

NO : Go to next **CHECK** .

CHECK : *Does the value shown on Subaru Select Monitor become equal to the tachometer reading when shaking TCM connector and harness?*

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

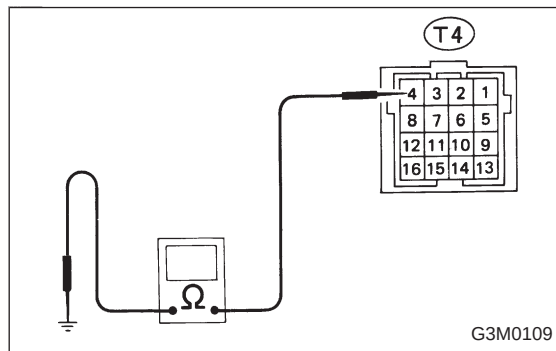
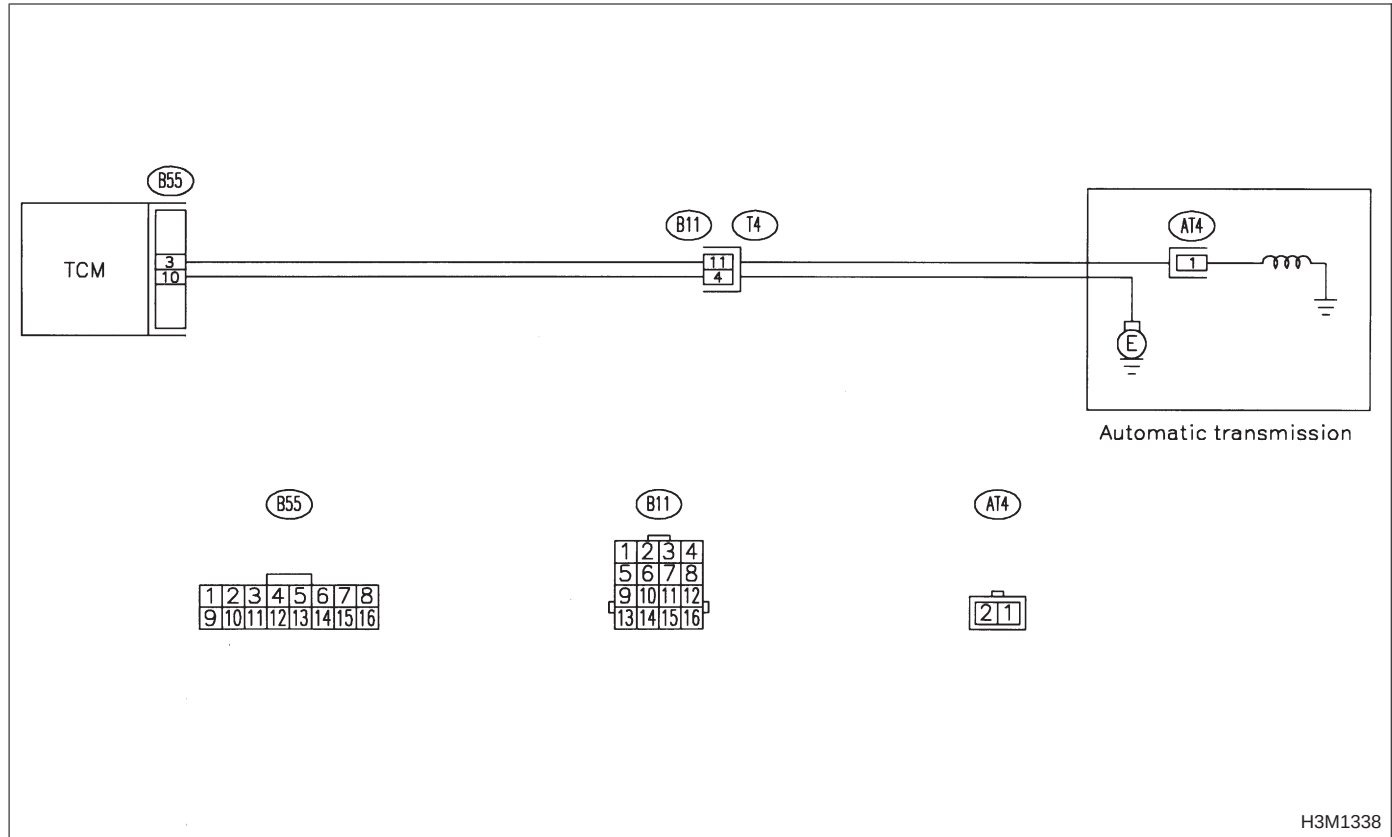
K: TROUBLE CODE 24 — DUTY SOLENOID C —

DIAGNOSIS:

Output signal circuit of duty solenoid C is open or shorted.

TROUBLE SYMPTOM:

Excessive "braking" in tight corners.


8K1

CHECK DUTY SOLENOID C GROUND LINE.

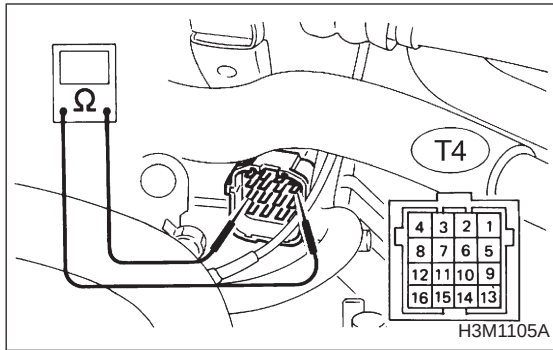
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Measure resistance between transmission connector and transmission ground.

Connector & terminal
(T4) No. 4 — Chassis ground:

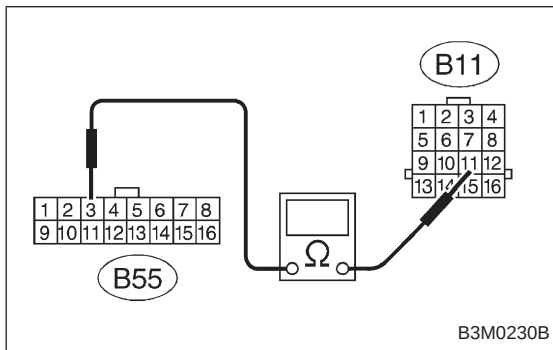
CHECK : Is the resistance less than 1 Ω?

YES : Go to step 8K2.

NO : Repair open circuit in transmission harness connector.

**8K2****CHECK DUTY SOLENOID C.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Measure resistance between transmission connector and transmission terminals.

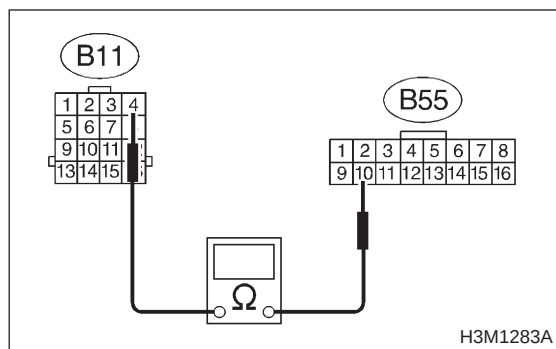
Connector & terminal**(T4) No. 11 — No. 4:****CHECK** : Is the resistance between 9 and 17 Ω ?**YES** : Go to step 8K3.**NO** : Go to step 8K5.**8K3****CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission and TCM.
- 3) 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 next **CHECK** .**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



Connector & terminal

(B55) No. 10 — (B11) No. 4:

CHECK : Is the resistance less than 1 Ω ?

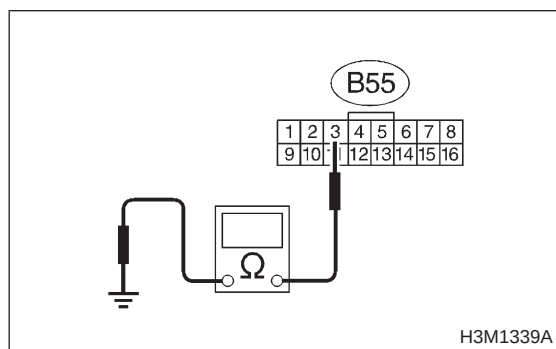
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



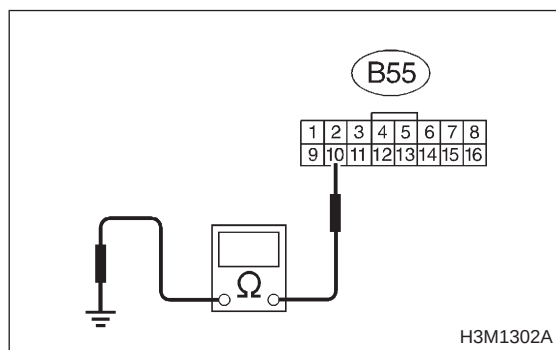
Connector & terminal

(B55) No. 3 — Chassis ground:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to step 8K4.

NO : Repair short circuit in harness between TCM and transmission connector.



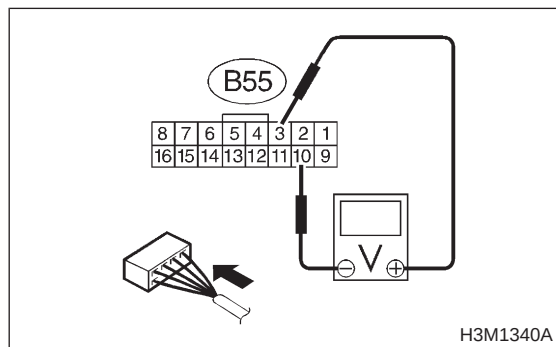
Connector & terminal

(B55) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to step 8K4.

NO : Repair short circuit in harness between TCM and transmission connector.



8K4	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 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” position?

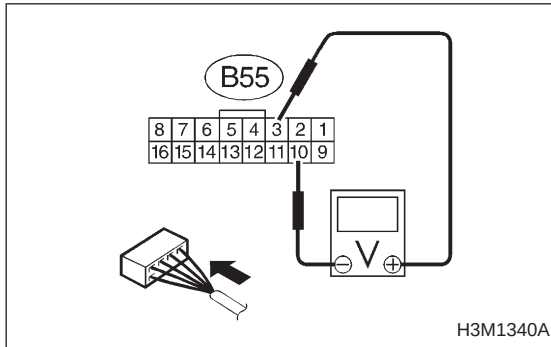
YES : Go to next step **CHECK1** .

NO : Go to next **CHECK** .

CHECK : Is the voltage less than 1 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal

(B55) No. 3 (+) — No. 10 (-):

CHECK1 : Is the voltage between 5 V and 7 V in “D” position?

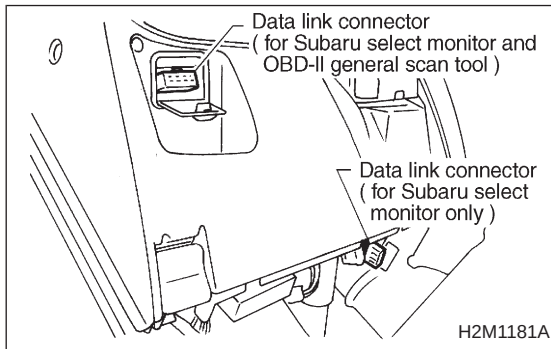
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the ATF temperature sensor and transmission connector.

NO : Go to next **CHECK** .

CHECK : Is the voltage between 5 V and 7 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace 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) 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 on Subaru Select Monitor.
- 7) Designate mode using function key.

Function mode F13

- F13: AWD duty is indicated in “%”.

4WDTY (F13)

25%

H3M1341

- CHECK** : Is the value 25% in function mode F13?
- YES** : Go to next step 8).
- NO** : Go to next **CHECK** .
- CHECK** : Is the value 25% by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?
- YES** : Repair poor contact in TCM.
- NO** : Replace TCM.

4WDTY (F13)

95%

G3M0733

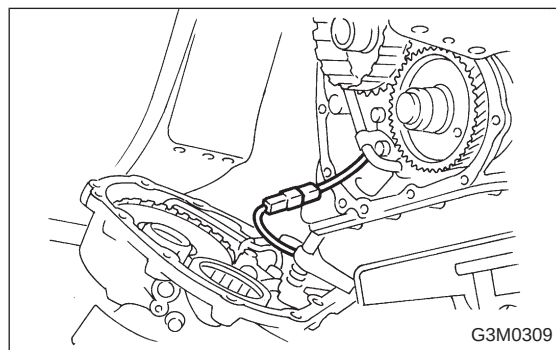
- 8) Set FWD mode.
- 9) Throttle fully closed.
- CHECK** : Is the value 95% in function mode F13?
- YES** : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the ATF temperature sensor and transmission connector.
- NO** : Go to next **CHECK** .
- CHECK** : Is the value 95% by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?
- YES** : Repair poor contact in TCM.
- NO** : Replace TCM.

8K5	CHECK DUTY SOLENOID C (IN TRANSMISSION).

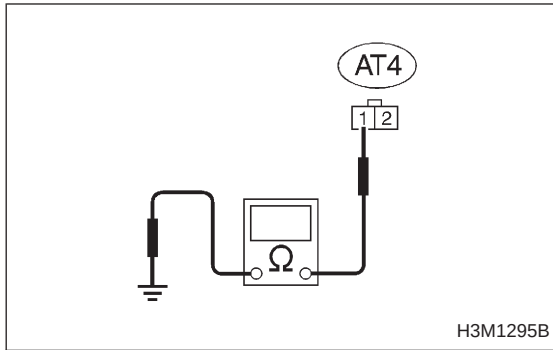
- 1) Turn ignition switch to OFF.
- 2) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 3) Drain automatic transmission fluid.
- CAUTION:**
Do not drain the automatic transmission fluid until it cools down.
- 4) Remove extension case, and disconnect connector from duty solenoid C.
<Ref. to 3-2 [W6A0].>

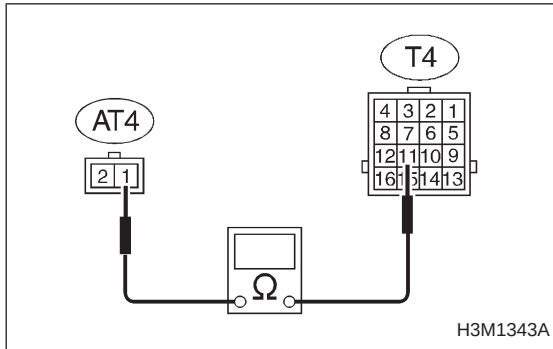


5) Measure resistance between duty solenoid C connector and transmission ground.

CHECK : **Terminal**
(AT4) No. 1 — Transmission ground:
Is the resistance between 9 and 17 Ω?

YES : Go to step 8K6.

NO : Replace duty solenoid C.



8K6

**CHECK HARNESS CONNECTOR
 BETWEEN DUTY SOLENOID C AND
 TRANSMISSION.**

- 1) Disconnect connector from transmission.
- 2) Remove transmission bracket.
- 3) 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?**

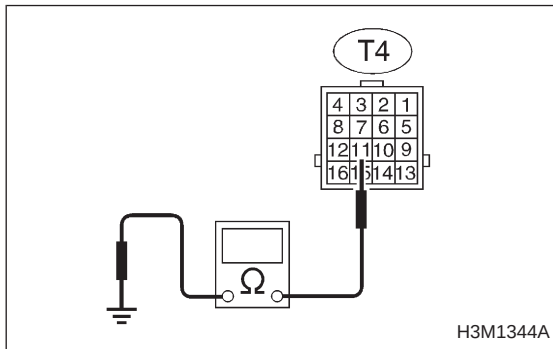
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between duty solenoid C and transmission connector.
- Poor contact in duty solenoid C connector.
- Poor contact in transmission connector.



4) Measure resistance of harness between transmission 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

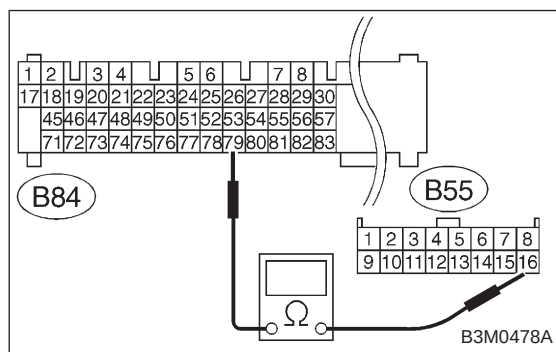
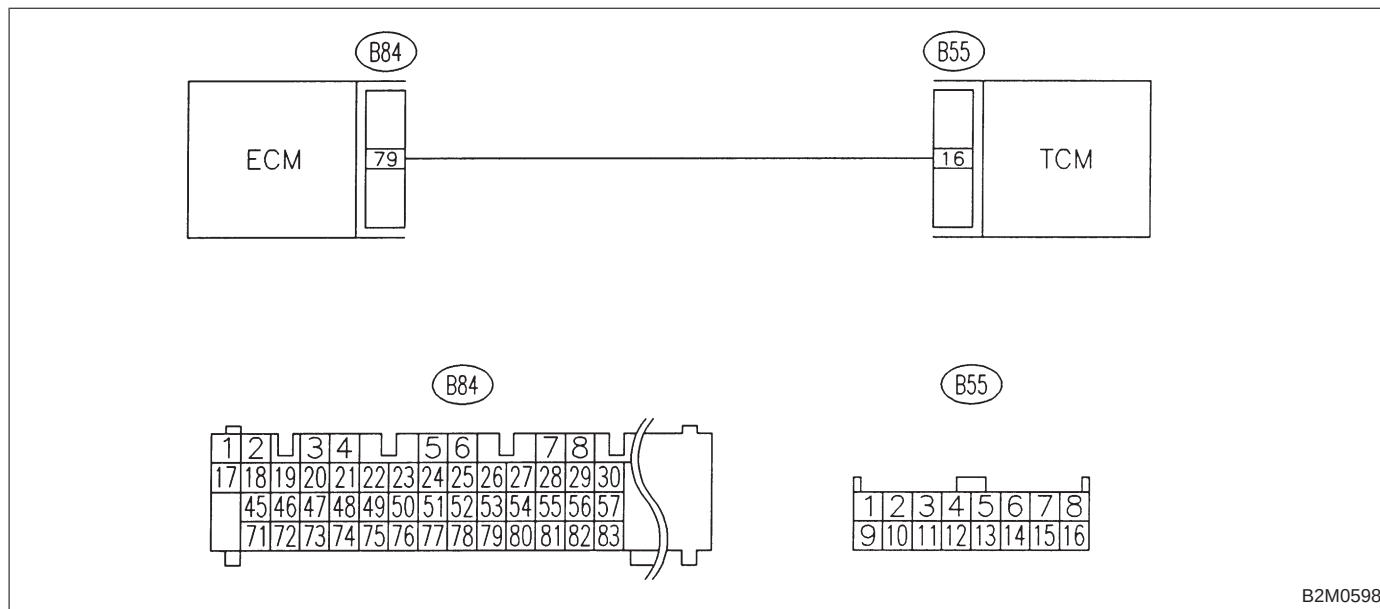
— TORQUE CONTROL SIGNAL —

DIAGNOSIS:

- Torque control signal is not emitted from TCM.
- The signal circuit is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



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?

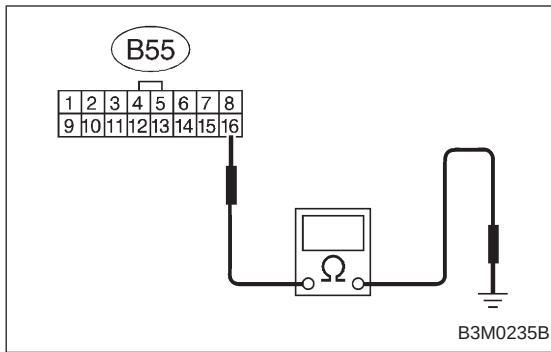
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and ECM connector.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



4) Measure resistance of harness between TCM connector and chassis ground.

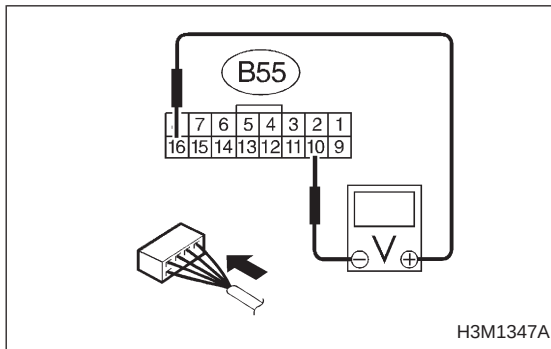
Connector & terminal

(B55) No. 16 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8L2.

NO : Repair short circuit in harness between TCM and ECM connector.



8L2

CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Turn ignition switch to OFF.

2) Connect connectors to TCM and ECM.

3) Turn ignition switch to ON (engine OFF).

4) 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.

NO : Go to next **CHECK** .

CHECK : Is the voltage between 4 V and 6 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Go to next **CHECK** .

CHECK : Replace ECM with a new one. Does the trouble code appear again, after the memory has been cleared?

YES : Replace TCM.

NOTE:

Install the old ECM.

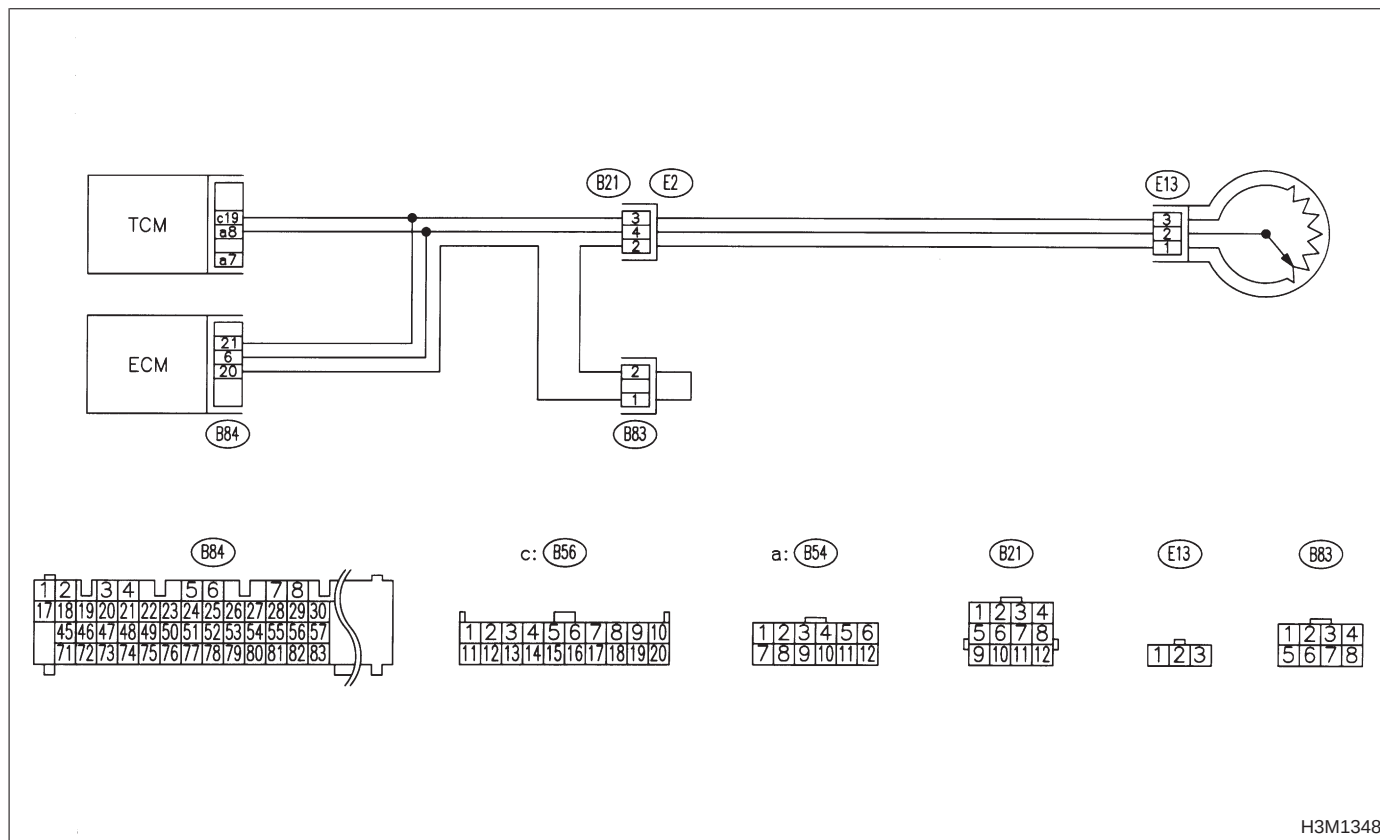
NO : Replace ECM.

M: TROUBLE CODE 31**— THROTTLE POSITION SENSOR —****DIAGNOSIS:**

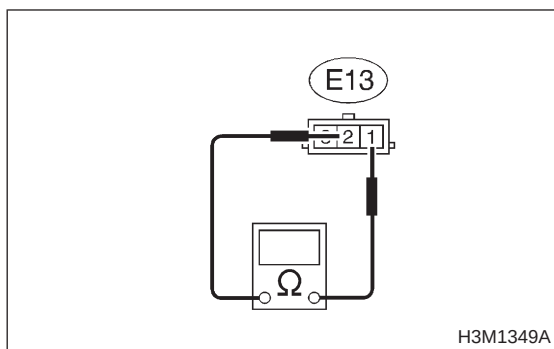
Input signal circuit of throttle position sensor is open or shorted.

TROUBLE SYMPTOM:

Shift point too high or too low; engine brake not effected in "3" range; excessive shift shock; excessive tight corner "braking".



H3M1348



8M1

CHECK THROTTLE POSITION SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from throttle position sensor.
- 3) Measure resistance between throttle position sensor connector receptacle's terminals.

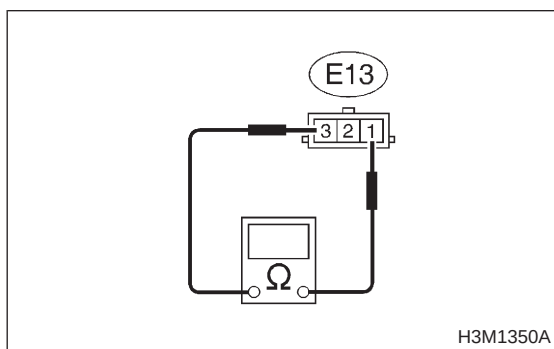
Terminals

(E13) No. 1 — No. 2:

CHECK : Is the resistance between 0.3 and 0.7 kΩ?

YES : Go to next **CHECK** .

NO : Replace throttle position sensor.



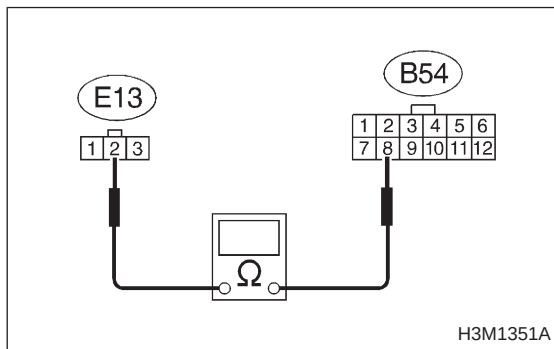
Terminals

(E13) No. 1 — No. 3:

CHECK : Is the resistance between 3.5 and 6.5 kΩ?

YES : Go to step 8M2.

NO : Replace throttle position sensor.



8M2

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?

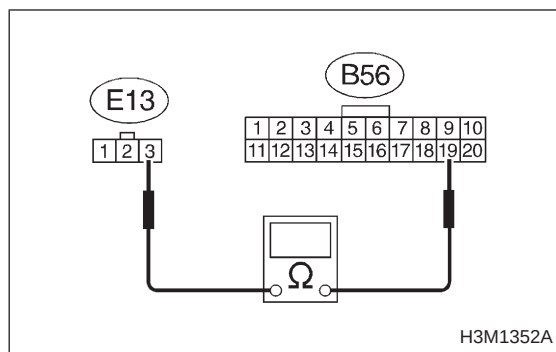
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

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



Connector & terminal

(B56) No. 19 — (E13) No. 3:

CHECK : Is the resistance less than 1 Ω ?

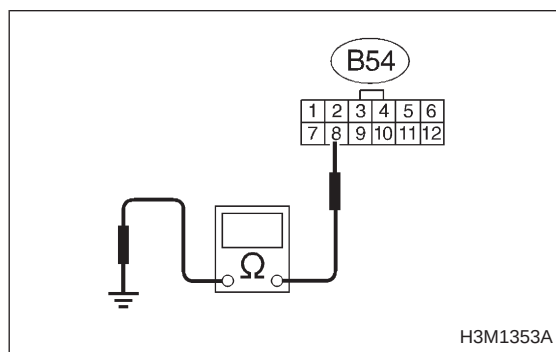
YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

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



3) Measure resistance of harness between TCM connector and chassis ground.

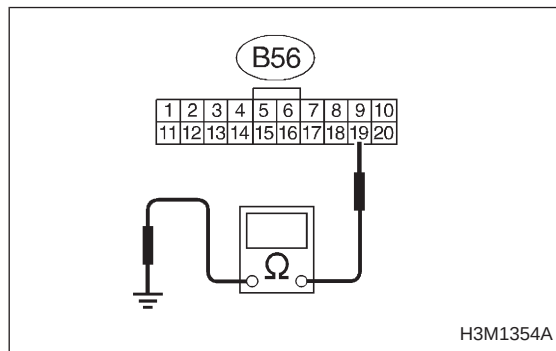
Connector & terminal

(B54) No. 8 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to next **CHECK** .

NO : Repair short circuit in harness between TCM and throttle position sensor.



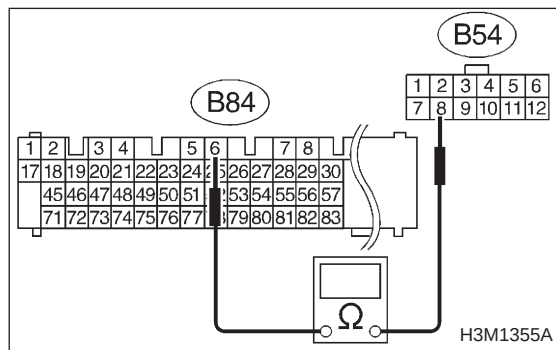
Connector & terminal

(B56) No. 19 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 8M3.

NO : Repair short circuit in harness between TCM and throttle position sensor.



8M3	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 ?

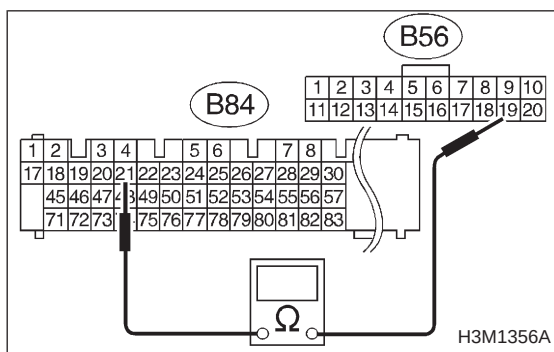
YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and ECM.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



Connector & terminal

(B56) No. 19 — (B84) No. 21:

CHECK : Is the resistance less than 1 Ω ?

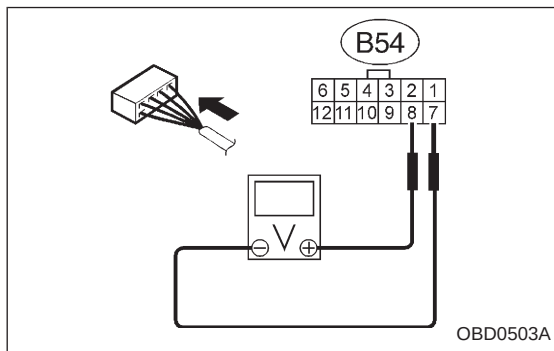
YES : Go to step 8M4.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between TCM and ECM.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



8M4

CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to TCM, throttle position sensor and ECM.

2) Turn ignition switch to ON (engine OFF).

3) 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?

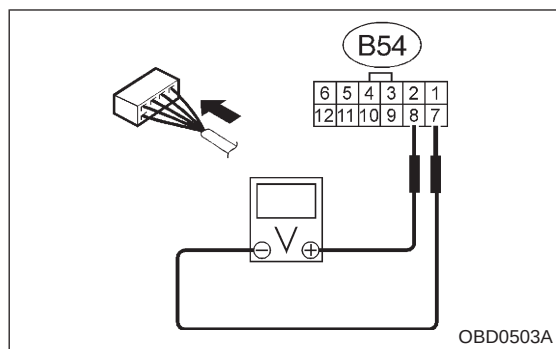
YES : Go to next step **CHECK** .

NO : Go to next **CHECK1** .

CHECK1 : Is the voltage between 0.3 and 0.7 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.

**Connector & terminal****(B54) No. 8 (+) — No. 7 (-):**

CHECK : Is the voltage between 4.3 and 4.9 V with throttle fully open?

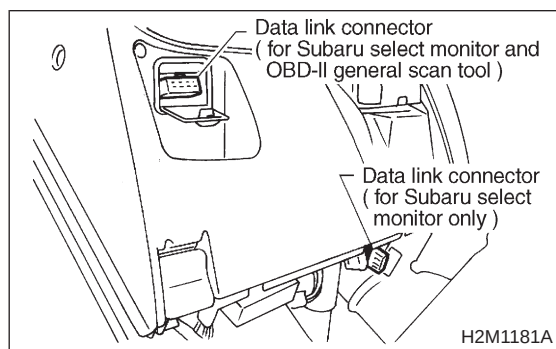
YES : Go to step 8M5.

NO : Go to next **CHECK** .

CHECK : Is the voltage between 4.3 and 4.9 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



- Using Subaru Select Monitor

1) Connect connectors to TCM, throttle position sensor and ECM.

2) Connect Subaru Select Monitor to data link connector.

3) Turn ignition switch to ON (engine OFF).

4) Turn Subaru Select Monitor switch to ON.

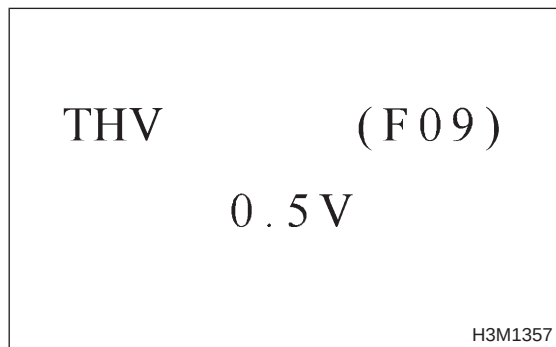
5) Throttle fully closed.

6) Read data on Subaru Select Monitor.

7) Designate mode using function key.

Function mode F09

- F09: Throttle position sensor input signal is indicated.



CHECK : Is the value voltage between 0.3 and 0.7 V in function mode F09?

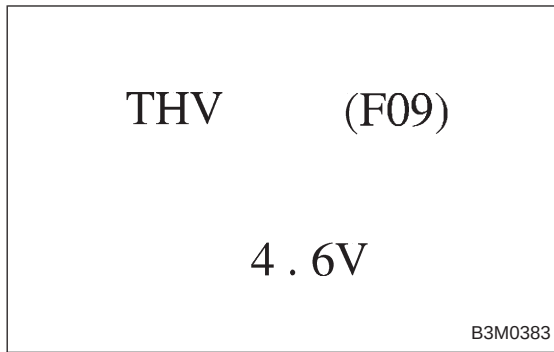
YES : Go to next step 8).

NO : Go to next **CHECK** .

CHECK : Is the voltage between 0.3 and 0.7 V by shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



8) Throttle fully open.

CHECK : Is the value voltage between 4.3 and 4.9 V in function model F09?

NOTE:

Must be changed correspondingly with accelerator pedal operation (from "released" to "depressed" position).

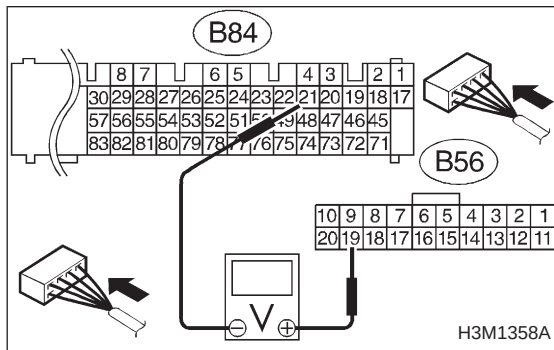
YES : Go to step 8M5.

NO : Go to next **CHECK** .

CHECK : Is the voltage between 4.3 and 4.9 V by shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



8M5	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?

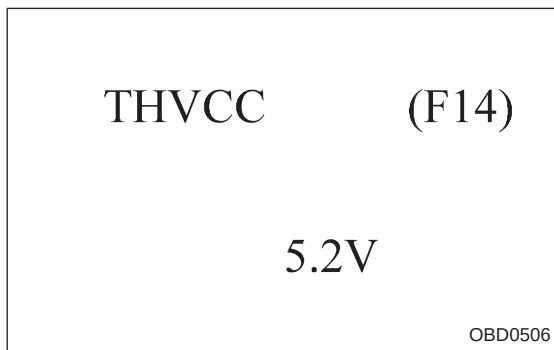
YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to next **CHECK** .

CHECK : Is the voltage between 5.02 and 5.22 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



● Using Subaru Select Monitor

1) Read data on Subaru Select Monitor.

2) Designate mode using function key.

Function mode F14

● F14: Throttle position sensor power supply voltage is indicated.

CHECK : *Is the value voltage between 5.02 and 5.22 V in function mode F14?*

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.

CHECK : *Is the voltage between 5.02 and 5.22 V by shaking harness and connector of TCM?*

YES : Repair poor contact in TCM.

NO : Replace TCM.

N: TROUBLE CODE 32

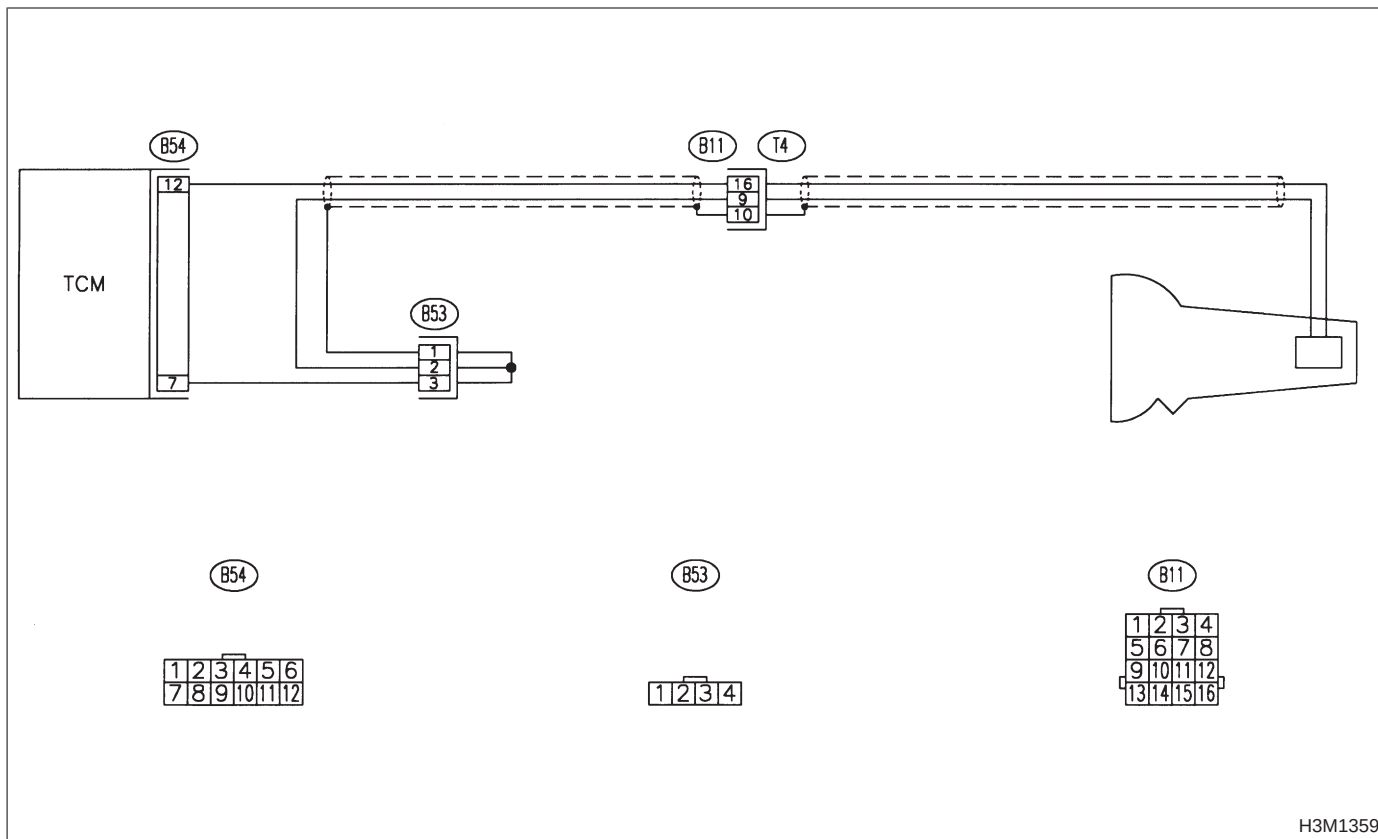
— VEHICLE SPEED SENSOR 1 —

DIAGNOSIS:

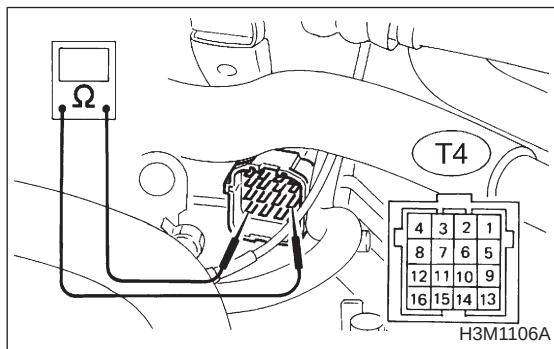
Input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

No lock-up or excessive tight corner “braking”.



H3M1359



H3M1106A

8N1

CHECK VEHICLE SPEED SENSOR 1.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission.
- 3) Measure resistance between transmission connector receptacle's terminals.

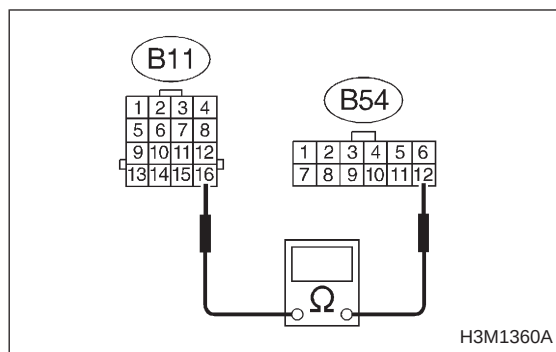
Connector & terminal

(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 connector.



8N2

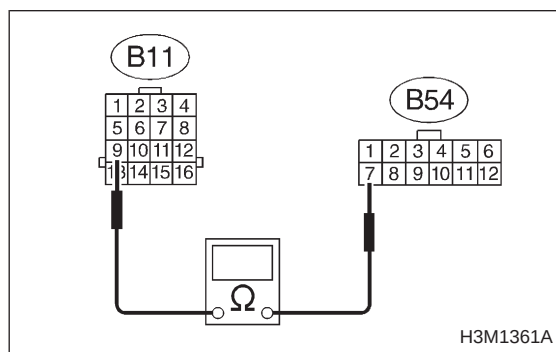
CHECK HARNESS BETWEEN TCM AND TRANSMISSION CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from transmission and TCM.
- 3) 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 next **CHECK** .**NO** : Repair harness and connector.**NOTE:**

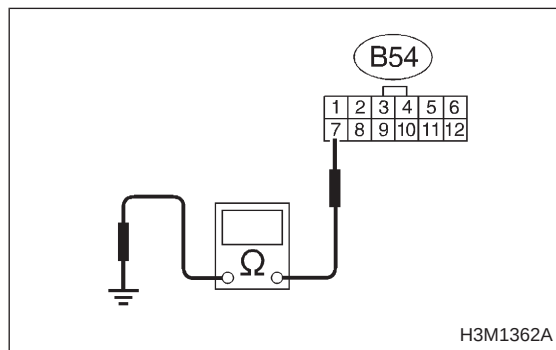
In this case, repair the following:

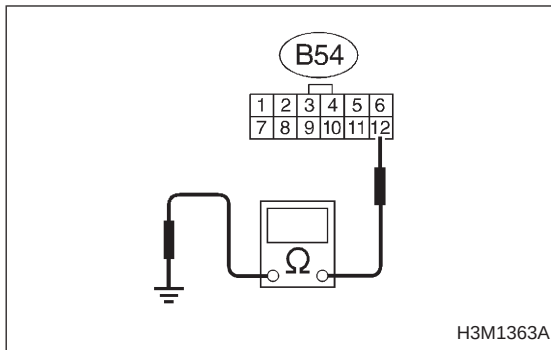
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission.

**Connector & terminal****(B54) No. 7 — (B11) No. 9:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to next **CHECK** .**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission.
- Poor contact in shield joint connector (B53).

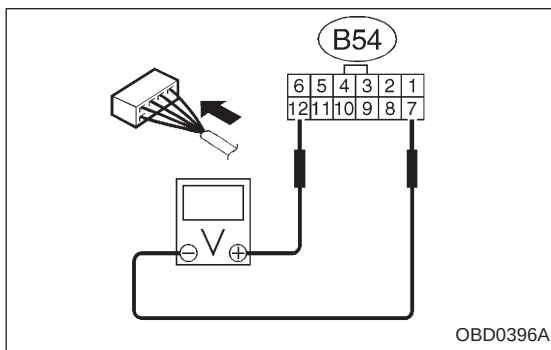
**Connector & terminal****(B54) No. 7 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair short circuit in harness between TCM and transmission connector.

**Connector & terminal****(B54) No. 12 — Chassis ground:****(CHECK)** : Is the resistance more than 1 MΩ?**(YES)** : Go to step 8N3.**(NO)** : Repair short circuit in harness between TCM and transmission connector.**8N3****CHECK INPUT SIGNAL FOR TCM.**

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 3) Lift-up or raise the vehicle and place safety stands.

CAUTION:**On AWD models, raise all wheels off floor.**

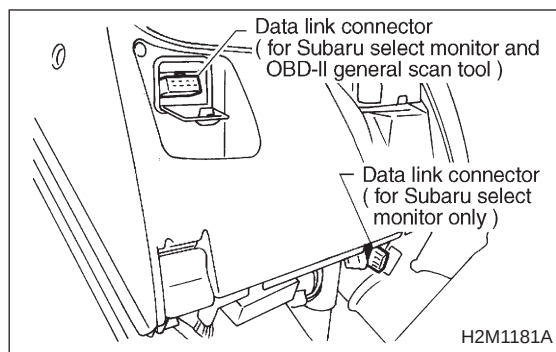
- 4) Start the engine and set vehicle in 20 km/h (12 m/h) condition.



- 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.**(NO)** : Go to next **(CHECK)** .**(CHECK)** : Is the voltage more than AC 1 V while shaking harness and connector of TCM?**(YES)** : Repair poor contact in TCM.**(NO)** : Replace TCM.**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] or [T9J0].>



- 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) Lift-up or raise the vehicle and place safety stands.

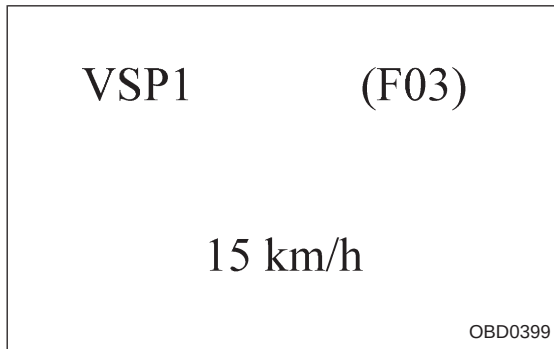
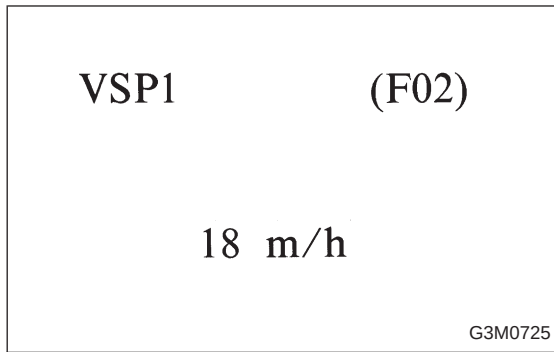
CAUTION:

On AWD models, 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 on Subaru Select Monitor.
- 8) Designate mode using function key.

Function mode F02 or F03

- F02: Compare speedometer with Subaru Select Monitor indications.
- F02: Vehicle speed is indicated in "m/h".
- F03: Compare speedometer with Subaru Select Monitor indications.
- F03: Vehicle speed is indicated in "km/h".



CHECK : Are Select Monitor indications noted anywhere between vehicle speeds listed under the F02 and/or F03 function modes, and speedometer indications? Refer to the table below.

Speedometer (in combination meter)	Function mode F02	Function mode F03
20 (m/h or km/h)	19 — 22 (m/h)	18 — 23 (km/h)
40 (m/h or km/h)	39 — 42 (m/h)	38 — 43 (km/h)
60 (m/h or km/h)	58 — 62 (m/h)	58 — 63 (km/h)

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 next **CHECK** .

CHECK : Is the vehicle speed within the range of table by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?

YES : Repair poor contact in TCM.

NO : Replace TCM.

NOTE:

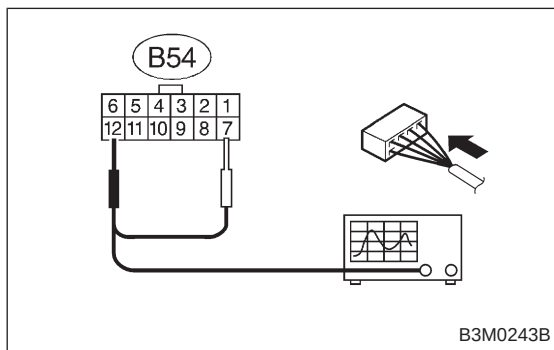
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

● Using Oscilloscope

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and transmission.
- 3) Lift-up or raise the vehicle and place safety stands.

CAUTION:

On AWD models, raise all wheels off floor.



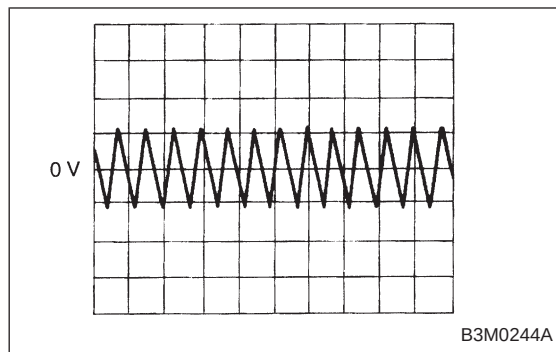
4) Set oscilloscope to TCM connector terminals.

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.

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.

NO : Go to next **CHECK** .

CHECK : *Is the voltage more than AC 1 V by shaking harness and connector of TCM while monitoring the value with oscilloscope?*

YES : Repair poor contact in TCM.

NO : Replace TCM.

NOTE:

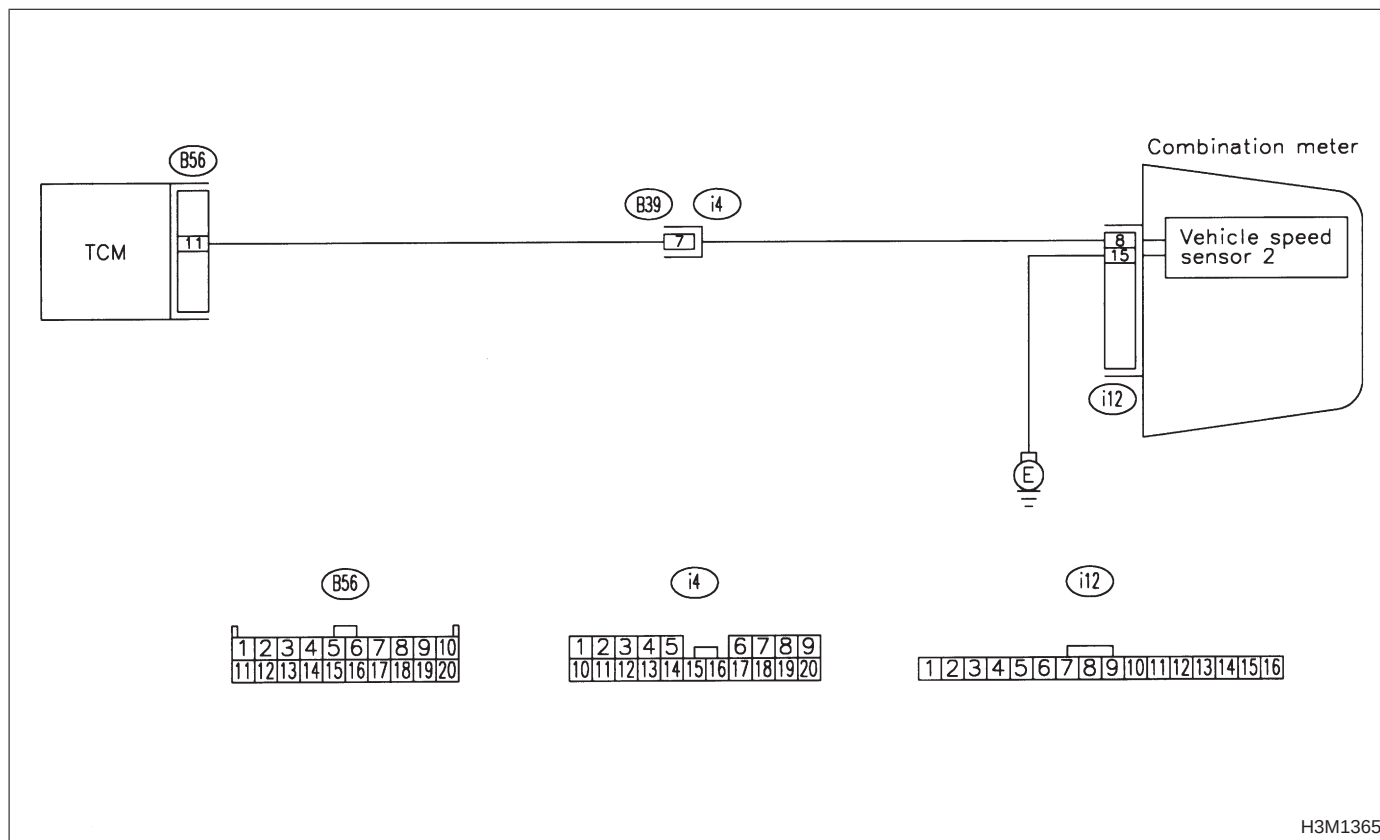
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

O: TROUBLE CODE 33**— VEHICLE SPEED SENSOR 2 —****DIAGNOSIS:**

- The vehicle speed signal is abnormal.
- The circuit in combination meter is faulty.
- The harness connector between TCM and vehicle speed sensor is in short or open.

TROUBLE SYMPTOM:

- Erroneous idling.
- Engine stalls.
- Poor driving performance.

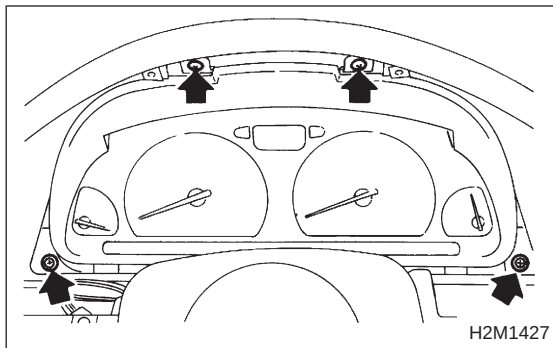


801	CHECK OPERATION OF SPEEDOMETER.

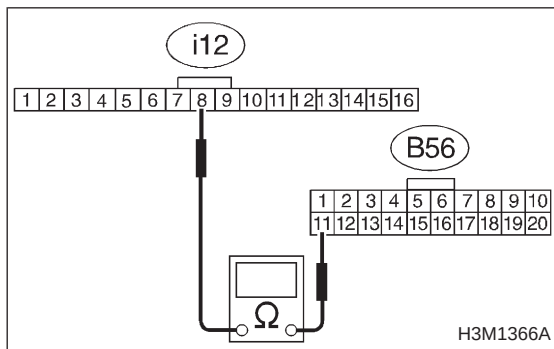
CHECK : Does speedometer operate normally?

YES : Go to step 802.

NO : Check speedometer. <Ref. to 6-2 [K2A0].>

**802**
**CHECK HARNESS CONNECTOR
BETWEEN TCM AND COMBINATION
METER.**

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter.

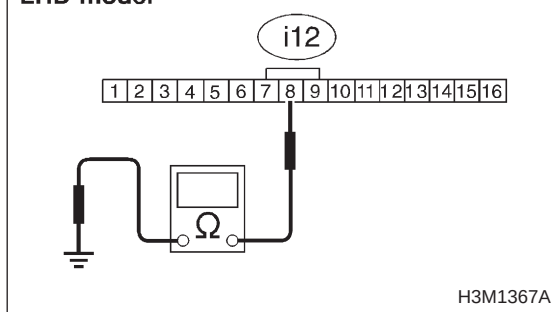


- 3) Disconnect connectors from TCM and combination meter.
- 4) Measure resistance of harness between TCM and combination meter connector.

Connector & terminal
(B56) No. 11 — (i12) No. 8:
(CHECK) : Is the resistance less than 1 Ω?
(YES) : Go to next (CHECK) .
(NO) : Repair harness and connector.
NOTE:

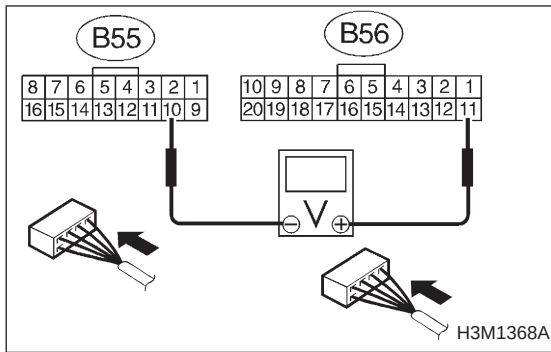
In this case, repair the following:

- Open circuit in harness between TCM and combination meter connector.
- Poor contact in TCM connector.
- Poor contact in combination meter connector.
- Poor contact in coupling connector (B39).

LHD model

Connector & terminal
(i12) No. 8 — Chassis ground:
(CHECK) : Is the resistance more than 1 MΩ?
(YES) : Go to step 803.
(NO) : Repair short circuit in harness between TCM and combination meter connector.
803
CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and combination meter.
- 3) Install combination meter.
- 4) Lift-up the vehicle and place safety stand.

CAUTION:
On AWD models, make sure that all wheels are raised off floor.



- 5) Start the engine, and set vehicle in 10 km/h (6 m/h).
- 6) Measure voltage between TCM connector terminals.

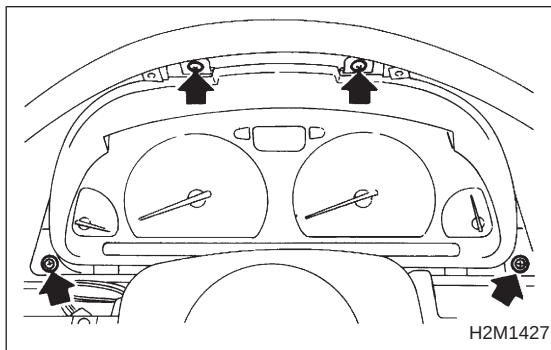
Connector & terminal

(B56) No. 11 (+) — (B55) No. 10 (-):

- CHECK** : Is the voltage less than 1 V ↔ more than 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 connector in the TCM.
- NO** : Is the voltage changing less than 1 V ↔ more than 4 V while shaking harness and connector of TCM?

NOTE:

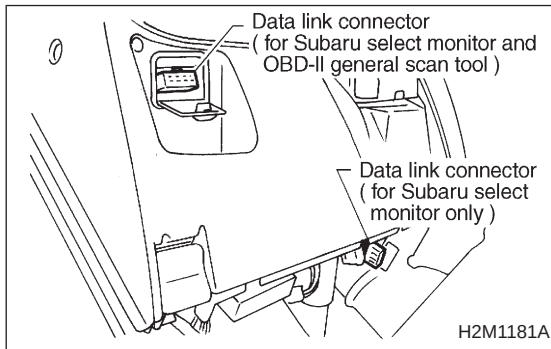
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>



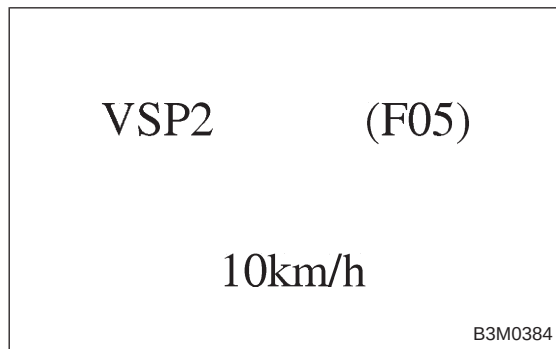
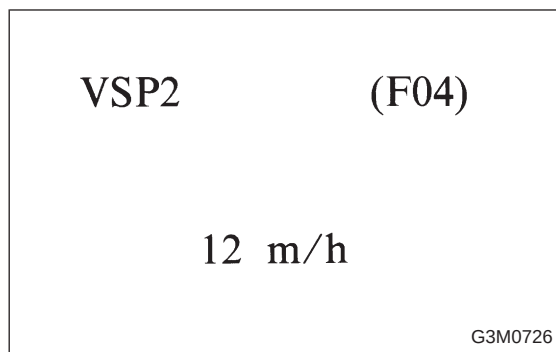
- Using Subaru Select Monitor
- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and combination meter.
- 3) Install combination meter.
- 4) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 5) Connect Subaru Select Monitor to data link connector.
 - 6) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
 - 7) Start the engine, and drive all wheels.
 - 8) Read data on Subaru Select Monitor.
 - 9) Designate mode using function key.
- Function mode F04 or F05
- F04: Compare speedometer with Subaru Select Monitor indications.
 - F04: Vehicle speed is indicated in “m/h”.
 - F05: Compare speedometer with Subaru Select Monitor indications.
 - F05: Vehicle speed is indicated in “km/h”.



CHECK : Are Select Monitor indications noted anywhere between vehicle speeds listed under the F04 and/or F05 function modes, and speedometer indications? Refer to the table below.

Speedometer (in combination meter)	Function mode F04	Function mode F05
20 (m/h or km/h)	19 — 22 (m/h)	18 — 23 (km/h)
40 (m/h or km/h)	39 — 42 (m/h)	38 — 43 (km/h)
60 (m/h or km/h)	58 — 62 (m/h)	58 — 63 (km/h)

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 next **CHECK** .

CHECK : Is the vehicle speed within the range of table by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?

YES : Repair poor contact in TCM.

NO : Replace TCM.

NOTE:

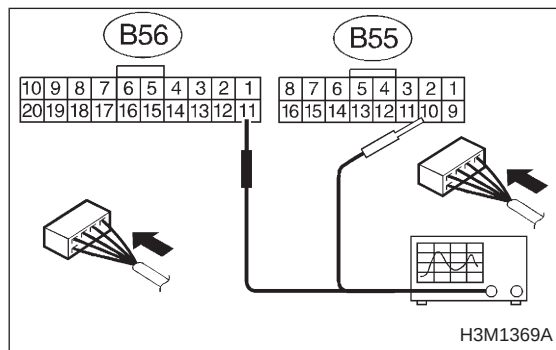
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

● Using Oscilloscope

- 1) Turn ignition switch to OFF.
- 2) Connect connectors to TCM and combination meter.
- 3) Install combination meter.
- 4) Lift-up or raise the vehicle and place safety stands.

CAUTION:

On AWD models, raise all wheels off floor.



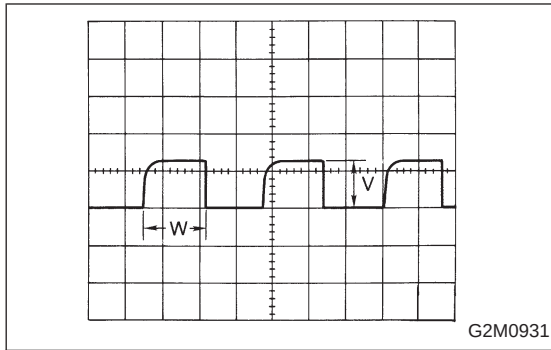
5) Set oscilloscope to TCM connector terminals.

Positive probe; (B56) No. 11

Earth lead; (B55) No. 10

6) Start the engine.

7) Shift on the gear position, and keep the vehicle speed at constant.



8) Measure signal voltage indicated on oscilloscope.

CHECK : *Is the voltage more than AC 2 V?*

NOTE:

If vehicle speed increases, the width of amplitude (W) decreases.

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 next **CHECK** .

CHECK : *Is the voltage more than AC 2 V by shaking harness and connector of TCM while monitoring the value with oscilloscope?*

NOTE:

If vehicle speed increases, the width of amplitude (W) decreases.

YES : Repair poor contact in TCM.

NO : Replace TCM.

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] or [T9J0].>

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 "F" mode (select monitor function), 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 in select mode function.
- 4) Compare measured values with basic data.
- 5) Determine item which is outside basic data specifications.
- 6) Check sensor and actuator affected.

B: LIST OF OUTPUT MODES

1. FUNCTION MODE

Mode	Contents	Abbr.	Unit	Contents of display	Page
F00	Mode display	—	—	AT or EGI mode (when monitor is connected.)	98
F01	Battery voltage	VB	V	Battery voltage applied to control unit.	98
F02	Vehicle speed sensor 1	VSP1	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 1.	99
F03	Vehicle speed sensor 1	VSP1	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 1.	99
F04	Vehicle speed sensor 2	VSP2	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 2.	101
F05	Vehicle speed sensor 2	VSP2	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 2.	101
F06	Engine speed signal	EREV	rpm	Engine speed sent from ECM.	102
F07	ATF temperature sensor	ATFT	°F	ATF temperature (°F) sent from ATF temperature sensor.	103
F08	ATF temperature sensor	ATFT	°C	ATF temperature (°C) sent from ATF temperature sensor.	103
F09	Throttle position sensor	THV	V	Voltage sent from throttle position sensor.	105
F10	Gear position	GEAR	—	Transmission gear position	106
F11	Line pressure duty	PLDTY	%	Duty ratio flowing through duty solenoid A.	107
F12	Lock-up duty	LUPTY	%	Duty ratio flowing through duty solenoid B.	110
F13	AWD duty	4WDTY	%	Duty ratio flowing through duty solenoid C.	113
F14	Throttle position sensor power supply	THVCC	V	Power supply voltage to throttle position sensor	117
F15	Mass air flow signal	AFM	V	Output voltage from air flow sensor	118

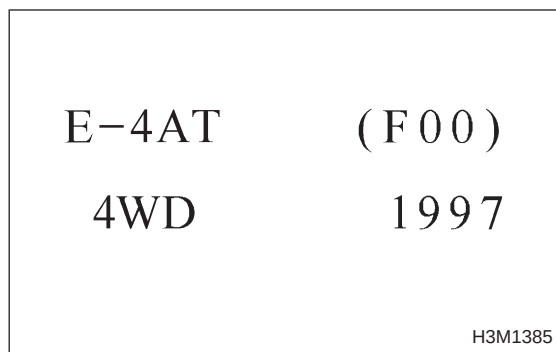
2. ON ↔ OFF SIGNAL LIST

Mode	LED No.	Signal name	Display	LED "ON" requirements	Page
FA0	1	FWD switch	FF	When fuse is installed in FWD switch.	121
	2*	Kick-down switch	KD	—	—
	3	—	—	—	—
	4	—	—	—	—
	5	Brake switch	BR	When brake switch is turned ON.	—
	6	ABS switch	AB	When ABS signal is entered.	—
	7	Cruise control set	CR	When cruise control is set.	—
	8*	Power switch	PW	—	—
	9	—	—	—	—
	10	—	—	—	—
FA1	1	P/N range switch	NP	When P or N range is selected.	—
	2	R range switch	RR	When R range is selected.	—
	3	D range switch	RD	When D range is selected.	—
	4	3 range switch	R3	When 3 range is selected.	—
	5	2 range switch	R2	When 2 range is selected.	—
	6	1 range switch	R1	When 1 range is selected.	—
	7	Diagnosis switch	SS	When diagnosis switch is turned ON.	127
	8	—	—	—	—
	9	—	—	—	—
	10	—	—	—	—

*: LED Nos. 2 and 8 cannot be turned on.

3. DIAGNOSIS MODE

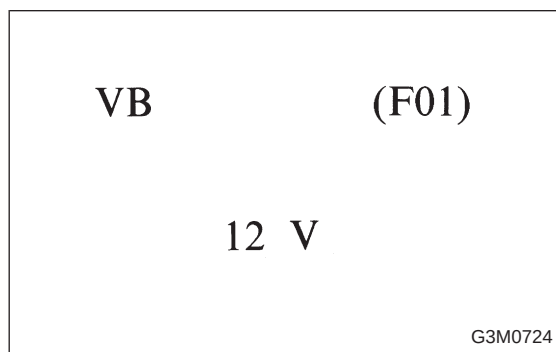
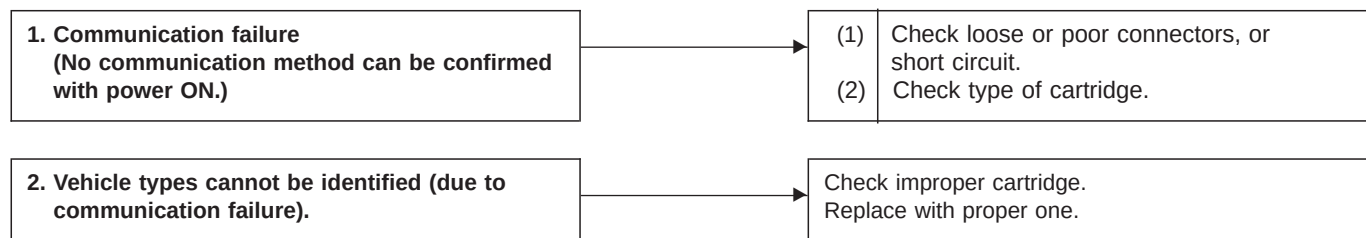
Mode	Contents	Abbr.	Contents of display
FB0	On-board diagnostics	DIAG.U	Current trouble code determined by on-board diagnostics.
FB1	On-board diagnostics	DIAG.M	Previous trouble code stored in memory by on-board diagnostics.
FC0	Back-up clear	—	Function of clearing trouble code stored in memory.



C: MODE F00 — MODE DISPLAY — SPECIFIED DATA:

Data at the left should be indicated.

Probable cause (if outside "specified data")

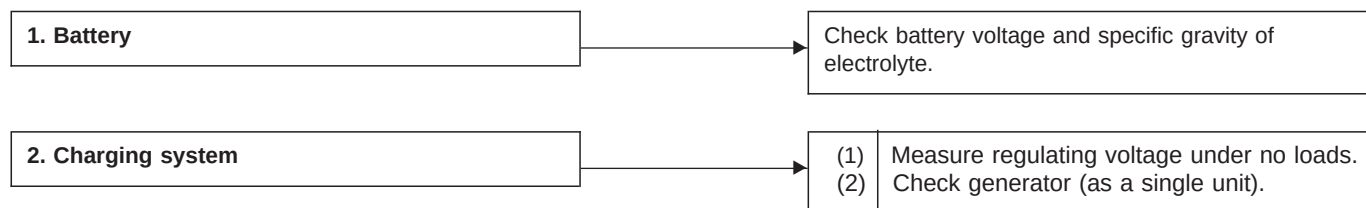


D: MODE F01 — BATTERY VOLTAGE (VB) — CONDITION:

- Ignition switch ON
- Engine idling after warm-up

SPECIFIED DATA:

VB: 10 — 16 V

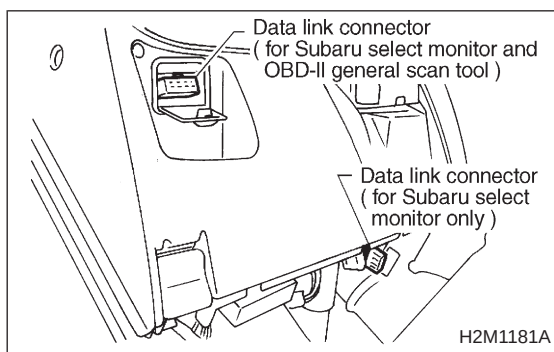


E: MODE F02 OR F03**— CHECK VEHICLE SPEED SENSOR 1 —**

- 1) Turn ignition switch to OFF.
- 2) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 3) Connect Subaru Select Monitor to data link connector.
- 4) Start the engine, and turn Subaru Select Monitor switch to ON.

5) Read data on Subaru Select Monitor.

6) Designate mode using function key.

Function mode: F02 or F03

- F02: Compare speedometer with Subaru Select Monitor indications.
- F02: Vehicle speed is indicated in "m/h".
- F03: Compare speedometer with Subaru Select Monitor indications.
- F03: Vehicle speed is indicated in "km/h".

VSP1 (F02)

18 m/h

G3M0725

VSP1 (F03)

15 km/h

OBD0399

CHECK

: Are Select Monitor indications noted anywhere between vehicle speeds listed under the F02 and/or F03 function modes, and speedometer indications? Refer to the table below.

Speedometer (in combination meter)	Function mode F02	Function mode F03
20 (m/h or km/h)	19 — 22 (m/h)	18 — 23 (km/h)
40 (m/h or km/h)	39 — 42 (m/h)	38 — 43 (km/h)
60 (m/h or km/h)	58 — 62 (m/h)	58 — 63 (km/h)

YES

: Go to step MODE F04 or F05.

NO

: Check vehicle speed sensor 1 circuit.

NOTE:

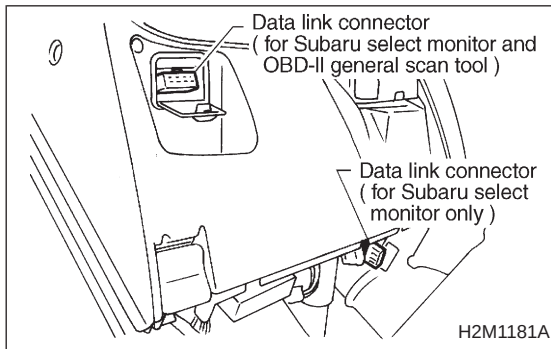
- For the diagnostics procedure on vehicle speed sensor 1 circuit, refer to 3-2 [T8N0].
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

F: MODE F04 OR F05**— CHECK VEHICLE SPEED SENSOR 2 —**

- 1) Turn ignition switch to OFF.
- 2) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 3) Connect Subaru Select Monitor to data link connector.
- 4) Start the engine, and turn Subaru Select Monitor switch to ON.

5) Read data on Subaru Select Monitor.

6) Designate mode using function key.

Function mode: F04 or F05

- F04: Compare speedometer with Subaru Select Monitor indications.
- F04: Vehicle speed is indicated in "m/h".
- F05: Compare speedometer with Subaru Select Monitor indications.
- F05: Vehicle speed is indicated in "km/h".

VSP2 (F04)

12 m/h

G3M0726

CHECK : Are Select Monitor indications noted anywhere between vehicle speeds listed under the F04 and/or F05 function modes, and speedometer indications? Refer to the table below.

Speedometer (in combination meter)	Function mode F04	Function mode F05
20 (m/h or km/h)	19 — 22 (m/h)	18 — 23 (km/h)
40 (m/h or km/h)	39 — 42 (m/h)	38 — 43 (km/h)
60 (m/h or km/h)	58 — 62 (m/h)	58 — 63 (km/h)

YES : Go to step MODE F06.

NO : Check vehicle speed sensor 2 circuit.

NOTE:

- For the diagnostics procedure on vehicle speed sensor 2 circuit, refer to 3-2 [T800].
- 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] or [T9J0].>

VSP2 (F05)

10km/h

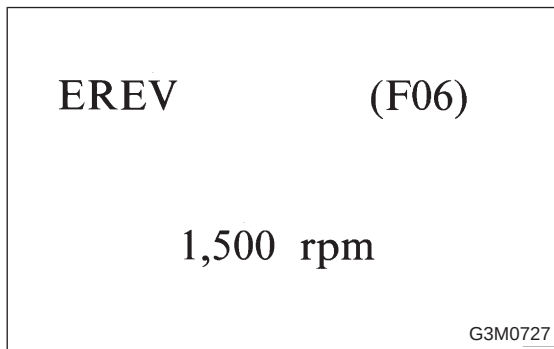
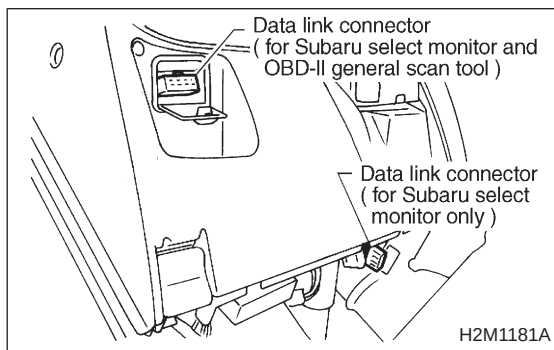
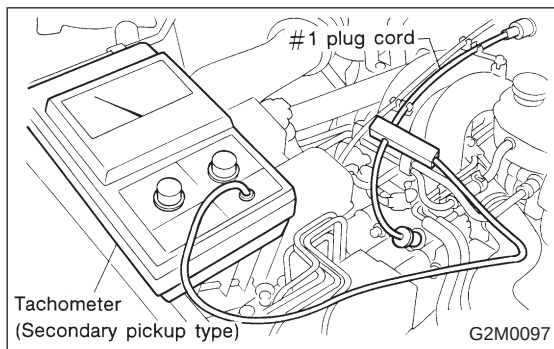
B3M0384

G: MODE F06**— CHECK ENGINE SPEED SIGNAL —**

- 1) Turn ignition switch to OFF.
- 2) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 3) Attach the pickup sensor on tachometer (secondary pickup type) to #1 cylinder spark plug cord (without tachometer models).
- 4) Turn A/C switch to OFF (with A/C models).

- 5) Connect Subaru Select Monitor to data link connector.
- 6) Start the engine, and turn Subaru Select Monitor switch to ON.
- 7) 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.

- 8) Read data on Subaru Select Monitor.
- 9) Designate mode using function key.

Function mode: F06

- F06: Engine revolution is indicated in "rpm".

CHECK : *Is the revolution in function mode F06 and tachometer within the specifications shown in the following table?*

Tachometer (in combination meter)	Function mode F06
Idling	600 — 800 rpm
1,000 rpm	925 — 1,075 rpm
2,000 rpm	1,890 — 2,145 rpm

YES : Go to step MODE F07.

NO : Check engine speed signal circuit.

NOTE:

- For the diagnostics procedure on engine speed signal circuit, refer to 3-2 [T8J0].
- 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] or [T9J0].>

H: MODE F07 OR F08**— CHECK ATF TEMPERATURE SENSOR —**

- 1) Turn ignition switch to OFF.
- 2) Start engine.

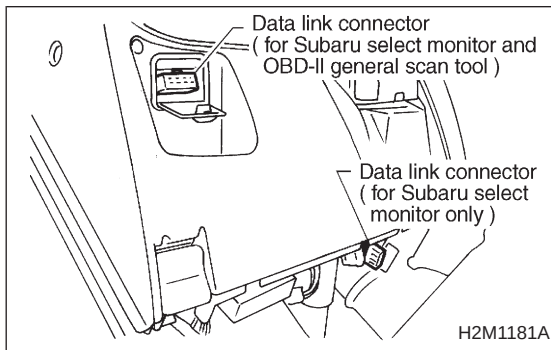
CHECK : *Does the AT OIL TEMP warning light remain on 2 seconds after the engine has been started?*

YES : Go to next step 3).

NO : Check ATF temperature sensor and combination meter circuit.

NOTE:

For the diagnostics procedure on ATF temperature sensor and combination meter circuit, refer to 3-2 [T8H0].



- 3) Turn ignition switch to OFF.
 - 4) Connect Subaru Select Monitor to data link connector.
 - 5) Turn ignition switch to ON (engine OFF).
 - 6) Turn Subaru Select Monitor switch to ON.
 - 7) Start engine.
 - 8) Read data on Subaru Select Monitor.
 - 9) Designate mode using function key.
- Function mode: F07 or F08

● F07: ATF temperature is indicated in "°F".

● F08: ATF temperature is indicated in "°C".

- 10) 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.

ATFT (F07)

176 deg F

OBD0386

- 11) Turn ignition switch to OFF.

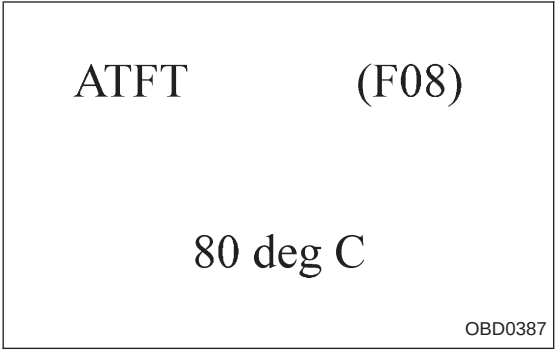
CHECK : *Does the ATF temperature change from 176°F (80°C)?*

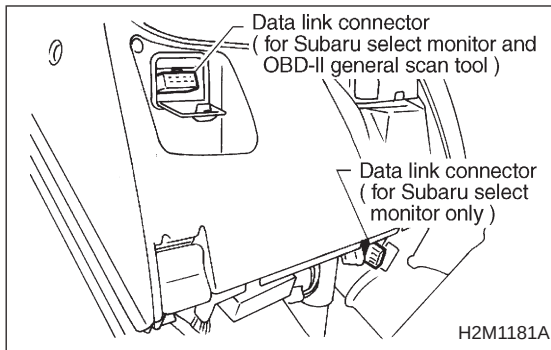
YES : Go to step MODE F09.

NO : Check ATF temperature sensor circuit.

NOTE:

For the diagnostics procedure on ATF temperature sensor circuit, refer to 3-2 [T8H0].



**I: MODE F09****— CHECK THROTTLE POSITION SENSOR —**

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to data link connector.
- 3) Turn ignition switch to ON.
- 4) Turn Subaru Select Monitor switch to ON.
- 5) Read data on Subaru Select Monitor.
- 6) Designate mode using function key.

Function mode: F09

- F09: Throttle position sensor input signal is indicated.

(CHECK) : *Is voltage between 0.3 and 0.7 V in the function mode F09 when the accelerator pedal is completely released?*

(YES) : Go to next **(CHECK)** .

(NO) : Check throttle position sensor circuit.

NOTE:

For the diagnostics procedure on throttle position sensor circuit, refer to 3-2 [T8M0].

THV (F09)

0.5 V

H3M1357

(CHECK) : *Is voltage between 4.4 and 4.8 V in the function mode F09 when the accelerator pedal is completely depressed?*

(YES) : Go to next **(CHECK)** .

(NO) : Check throttle position sensor circuit.

NOTE:

For the diagnostics procedure on throttle position sensor circuit, refer to 3-2 [T8M0].

THV (F09)

4.6 V

B3M0383

(CHECK) : *Does voltage in the function mode F09 decrease smoothly when the accelerator pedal is fully depressed and then fully released?*

(YES) : Go to step MODE F10.

(NO) : Check throttle position sensor circuit.

NOTE:

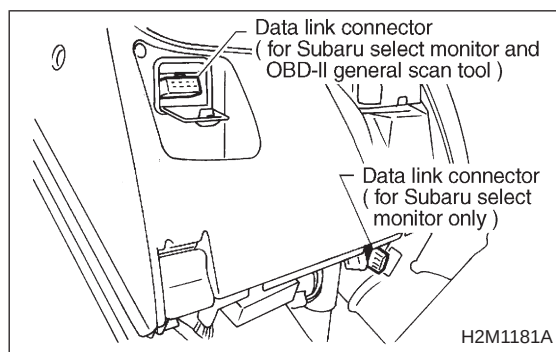
For the diagnostics procedure on throttle position sensor circuit, refer to 3-2 [T8M0].

J: MODE F10**— CHECK GEAR POSITION —**

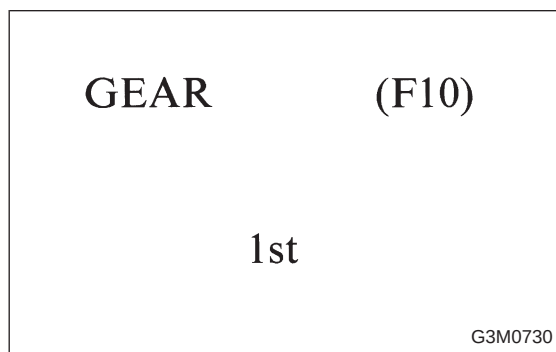
- 1) Turn ignition switch to OFF.
- 2) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 3) Connect Subaru Select Monitor to data link connector.
 - 4) Start the engine, and turn Subaru Select Monitor switch to ON.
 - 5) Select D range, and drive vehicle.
 - 6) Read data on Subaru Select Monitor.
 - 7) Designate mode using function key.
- Function mode: F10
- F10: Gear position is indicated.



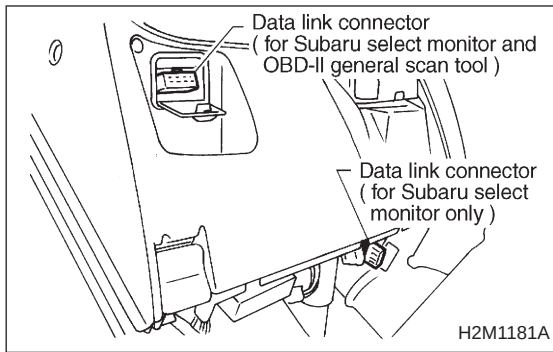
CHECK : *Does the transmission gear correspond to the gear which is shown on display in the F10 mode?*

YES : Go to step MODE F11.

NO : Check shift solenoid 1 and shift solenoid 2 signal circuit.

NOTE:

- For the diagnostics procedure on shift solenoid 1 and shift solenoid 2 signal circuit, refer to 3-2 [T8F0] and [T8G0].
- 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] or [T9J0].>



K: MODE F11

— CHECK LINE PRESSURE DUTY —

- 1) Turn ignition switch to OFF.
- 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).

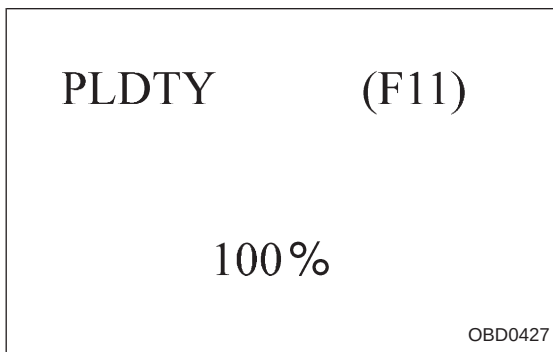
NOTE:

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 on Subaru Select Monitor.
- 8) Designate mode using function key.

Function mode: F11

- F11: Line pressure duty is indicated in "%".



CHECK : Does the function mode F11 indicate 100% when the accelerator pedal is completely released?

YES : Go to next **CHECK** .

NO : Go to step 9K1.



CHECK : Does the function mode F11 indicate 15% or less when the accelerator pedal is completely depressed?

YES : Go to next **CHECK** .

NO : Go to step 9K1.

CHECK : Does the function mode F11 change smoothly when the accelerator pedal is fully depressed and then fully released?

YES : Go to step MODE F12.

NO : Go to step 9K1.

THV (F09)
4 . 6V
B3M0383

9K1**CHECK THROTTLE POSITION SENSOR CIRCUIT (FUNCTION MODE F09).**

CHECK : *Is there any trouble in throttle position sensor circuit?*

NOTE:

For the diagnostics procedure on throttle position sensor circuit (mode F09), refer to 3-2 [T9I0].

YES : Repair or replace throttle position sensor circuit, refer to 3-2 [T8M0].

NO : Go to step **9K2**.

EREV (F06)
1,500 rpm
G3M0727

9K2**CHECK ENGINE SPEED SIGNAL CIRCUIT (FUNCTION MODE F06).**

CHECK : *Is there any trouble in engine speed signal circuit?*

NOTE:

For the diagnostics procedure on engine speed signal circuit (mode F06), refer to 3-2 [T9G0].

YES : Repair or replace engine speed signal circuit, refer to 3-2 [T8J0].

NO : Go to step **9K3**.

ATFT (F07)

176 deg F

OBD0386

9K3**CHECK ATF TEMPERATURE SENSOR CIRCUIT (FUNCTION MODE F07 OR F08).****CHECK** : *Is there any trouble in ATF temperature sensor circuit?*

NOTE:

For the diagnostics procedure on ATF temperature sensor circuit (mode F07 or F08), refer to 3-2 [T9H0].

YES : Repair or replace ATF temperature sensor circuit, refer to 3-2 [T8H0].**NO** : Go to step **9K4**.**9K4****CHECK INHIBITOR SWITCH.**

- 1) Turn ignition switch and Subaru Select Monitor to ON.
- 2) Read data on Subaru Select Monitor.
- 3) Designate mode using function key.

Function mode: FA1

- FA1: Check the inhibitor switch ON ↔ OFF signal.

CHECK : *When each range is selected, does LED of the range switch on Subaru Select Monitor light up?***YES** : Go to step MODE FA12.**NO** : Check inhibitor switch circuit.

NOTE:

For the diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

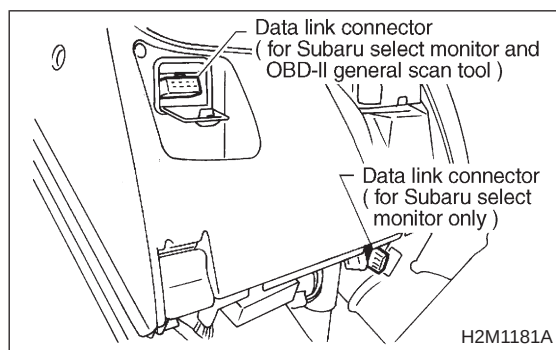
L: MODE F12

— CHECK LOCK-UP DUTY —

- 1) Turn ignition switch to OFF.
- 2) Lift-up the vehicle and place safety stand.

CAUTION:

On AWD models, make sure that all wheels are raised off floor.



- 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).

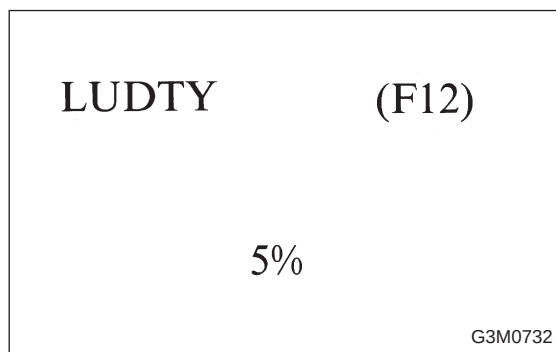
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 6) Read data on Subaru Select Monitor.
- 7) Designate mode using function key.

Function mode: F12

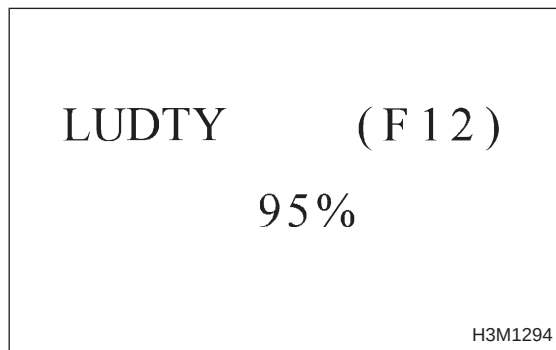
- F12: Lock-up duty is indicated in “%”.



CHECK : Does the function mode F12 indicate 5%?

YES : Go to next step 8).

NO : Go to step 9L1.



- 8) Move selector lever to “D” and slowly increase vehicle speed to 75 km/h (47 m/h).

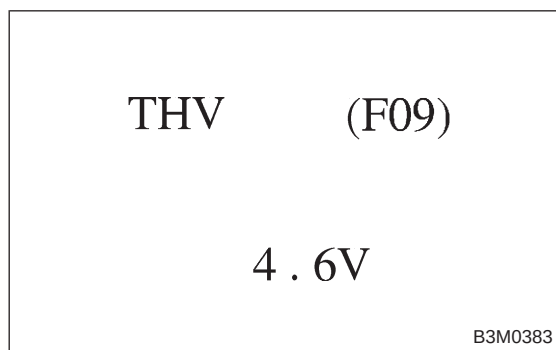
CHECK : Does the function mode F12 indicate 95%?

YES : Go to step MODE F13.

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] or [T9J0].>

(NO) : Go to step **9L1**.

**9L1****CHECK THROTTLE POSITION SENSOR CIRCUIT (FUNCTION MODE F09).**

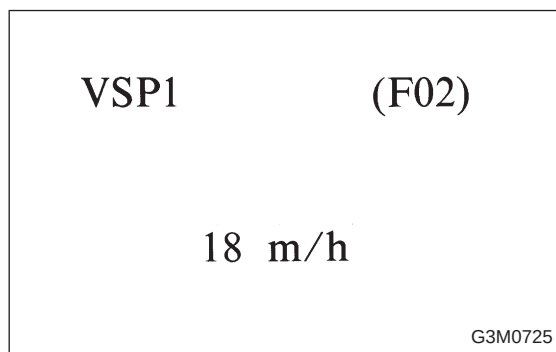
(CHECK) : *Is there any trouble in throttle position sensor circuit?*

NOTE:

For the diagnostics procedure on throttle position sensor circuit (mode F09), refer to 3-2 [T9I0].

(YES) : Repair or replace throttle position sensor circuit, refer to 3-2 [T8M0].

(NO) : Go to step **9L2**.

**9L2****CHECK VEHICLE SPEED SENSOR 1 CIRCUIT (FUNCTION MODE F02 OR F03).**

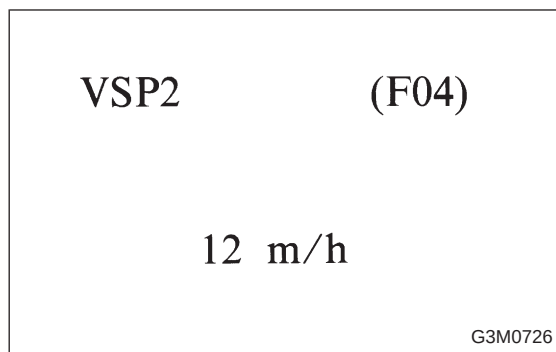
(CHECK) : *Is there any trouble in vehicle speed sensor 1 circuit?*

NOTE:

For the diagnostics procedure on vehicle speed sensor 1 circuit (mode F02 or F03), refer to 3-2 [T9E0].

(YES) : Repair or replace vehicle speed sensor 1 circuit, refer to 3-2 [T8N0].

(NO) : Go to step **9L3**.

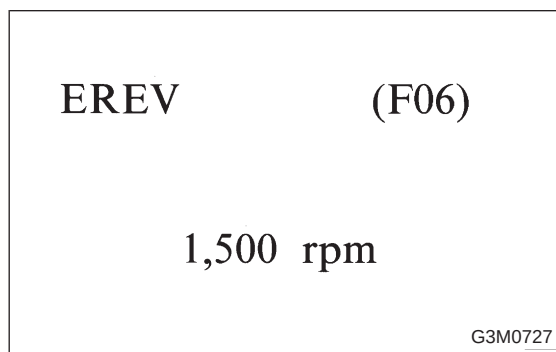
**9L3****CHECK VEHICLE SPEED SENSOR 2 CIRCUIT (FUNCTION MODE F04 OR F05).****CHECK****: Is there any trouble in vehicle speed sensor 2 circuit?**

NOTE:

For the diagnostics procedure on vehicle speed sensor 2 circuit (mode F04 or F05), refer to 3-2 [T9F0].

YES

: Repair or replace vehicle speed sensor 2 circuit, refer to 3-2 [T8O0].

NO: Go to step **9L4**.**9L4****CHECK ENGINE SPEED SIGNAL CIRCUIT (FUNCTION MODE F06).****CHECK****: Is there any trouble in engine speed signal circuit?**

NOTE:

For the diagnostics procedure on engine speed signal circuit (mode F06), refer to 3-2 [T9G0].

YES

: Repair or replace engine speed signal circuit, refer to 3-2 [T8J0].

NO: Go to step **9L5**.**9L5****CHECK INHIBITOR SWITCH.**

1) Turn ignition switch and Subaru Select Monitor to ON.

2) Read data on Subaru Select Monitor.

3) Designate mode using function key.

Function mode: FA1

● FA1: Check the inhibitor switch ON ↔ OFF signal.

CHECK**: When each range is selected, does LED of the range switch on Subaru Select Monitor light up?****YES**

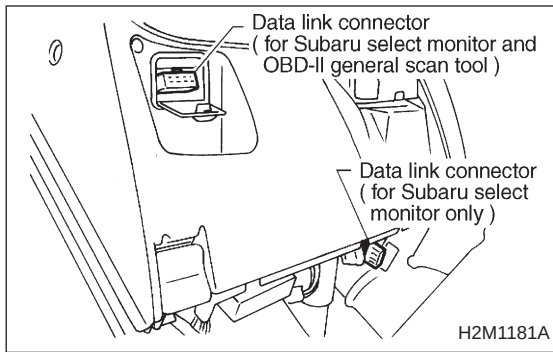
: Go to MODE F13.

NO

: Check inhibitor switch circuit.

NOTE:

For the diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].



M: MODE F13

— CHECK AWD DUTY —

- 1) Turn ignition switch to OFF.
- 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) Turn ignition switch to ON (engine OFF).
- 6) Move selector lever to "D".
- 7) Read data on Subaru Select Monitor.
- 8) Designate mode using function key.

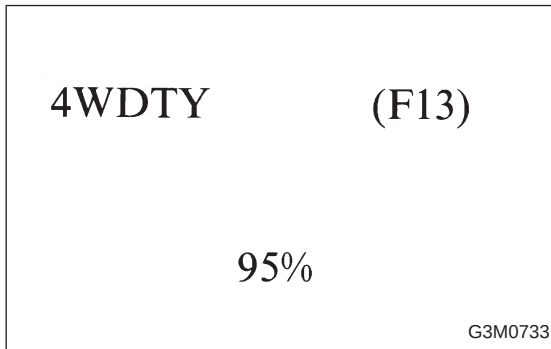
Function mode: F13

- F13: AWD duty is indicated in "%".

CHECK : *Does the duty ratio change in response to the depress-release motion of the accelerator pedal in the function mode F13?*

YES : Go to next step 9).

NO : Go to step **9M1**.



- 9) Turn ignition switch to OFF.

- 10) Set FWD mode.

- 11) Turn ignition switch to ON (engine OFF).

CHECK : *Does the function mode F13 indicate 95%?*

YES : Go to step MODE F14.

NO : Go to step **9M1**.

THV

(F09)

4 . 6V

B3M0383

9M1

CHECK THROTTLE POSITION SENSOR (FUNCTION MODE F09).

CHECK

: Is there any trouble in throttle position sensor circuit?

NOTE:

For the diagnostics procedure on throttle position sensor circuit (mode F09), refer to 3-2 [T9I0].

YES

: Repair or replace throttle position sensor circuit, refer to 3-2 [T8M0].

NO

: Go to step 9M2.

VSP1

(F02)

18 m/h

G3M0725

9M2

CHECK VEHICLE SPEED SENSOR 1 (FUNCTION MODE F02 OR F03).

CHECK

: Is there any trouble in vehicle speed sensor 1 circuit?

NOTE:

For the diagnostics procedure on vehicle speed sensor 1 circuit (mode F02 or F03), refer to 3-2 [T9E0].

YES

: Repair or replace vehicle speed sensor 1 circuit, refer to 3-2 [T8N0].

NO

: Go to step 9M3.

VSP2 (F04)

12 m/h

G3M0726

9M3

**CHECK VEHICLE SPEED SENSOR 2
(FUNCTION MODE F04 OR F05).****CHECK** : *Is there any trouble in vehicle speed sensor 2 circuit?*

NOTE:

For the diagnostics procedure on vehicle speed sensor 2 circuit (mode F04 or F05), refer to 3-2 [T9F0].

YES : Repair or replace vehicle speed sensor 2 circuit, refer to 3-2 [T8O0].**NO** : Go to step **9M4**.

ATFT (F07)

176 deg F

OBD0386

9M4

**CHECK ATF TEMPERATURE SENSOR
CIRCUIT (FUNCTION MODE F07 OR F08).****CHECK** : *Is there any trouble in ATF temperature sensor circuit?*

NOTE:

For the diagnostics procedure on ATF temperature sensor circuit (mode F07 or F08), refer to 3-2 [T9H0].

YES : Repair or replace ATF temperature sensor circuit, refer to 3-2 [T8H0].**NO** : Go to step **9M5**.

9M5**CHECK INHIBITOR SWITCH CIRCUIT.**

- 1) Turn ignition switch and Subaru Select Monitor to ON.
- 2) Read data on Subaru Select Monitor.
- 3) Designate mode using function key.

Function mode: FA1

- FA1: Check the inhibitor switch ON ↔ OFF signal.

CHECK : *When each range is selected, does LED of range switch on Subaru Select Monitor light up?*

YES : Go to step 9M6.

NO : Check inhibitor switch circuit.

NOTE:

For the diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9M6**CHECK ABS SIGNAL.**

- 1) Start the engine, and turn Subaru Select Monitor switch to ON.
- 2) Read data on Subaru Select Monitor.

Designate mode using function key.

Function mode: FA0

- FA0: Check the ABS switch (AB) ON ↔ OFF signal.

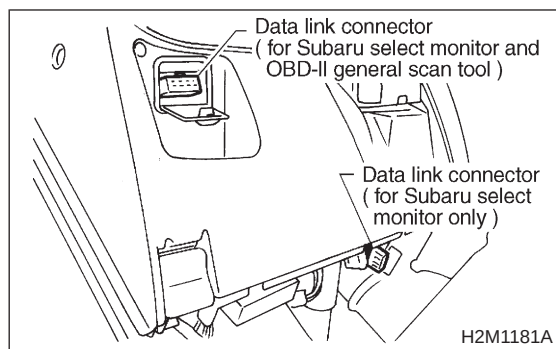
CHECK : *Does the ABS switch (AB) flash while the vehicle is being driven at speeds of 6 km/h (4 MPH) or more, and less than 10 km/h (6 MPH)?*

YES : Go to step MODE F14.

NO : Check ABS signal circuit.

NOTE:

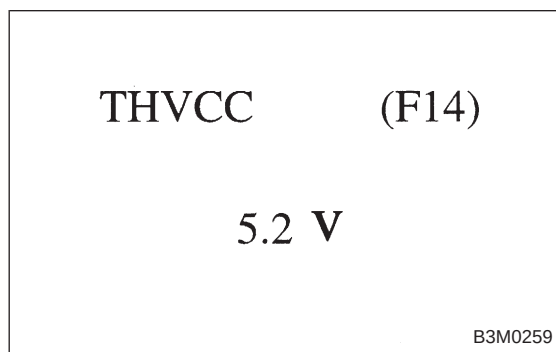
For the diagnostics procedure on ABS signal circuit, refer to 4-4 [T8I0].

**N: MODE F14****— CHECK THROTTLE POSITION SENSOR POWER SUPPLY —**

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to data link connector.
- 3) Turn ignition switch to ON (engine OFF) and Subaru Select Monitor switch to ON.
- 4) Read data on Subaru Select Monitor.
- 5) Designate mode using function key.

Function mode: F14

- Throttle position sensor power supply voltage is indicated.



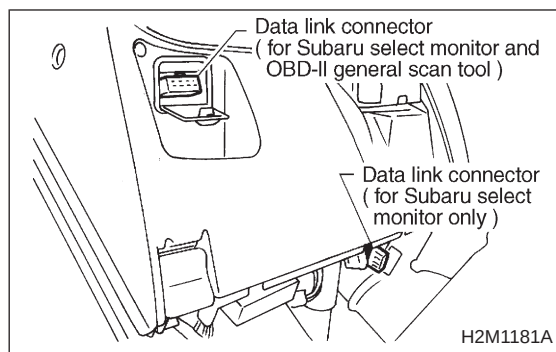
CHECK : *Is the value fixed between 5.02 and 5.22 V in function mode F14?*

YES : Go to step MODE F15.

NO : Check throttle position sensor power supply circuit.

NOTE:

For the diagnostics procedure on throttle position sensor power supply circuit, refer to 3-2 [T8M0].

**O: MODE F15****— CHECK MASS AIR FLOW SIGNAL —**

- 1) Turn ignition switch to OFF.
- 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).

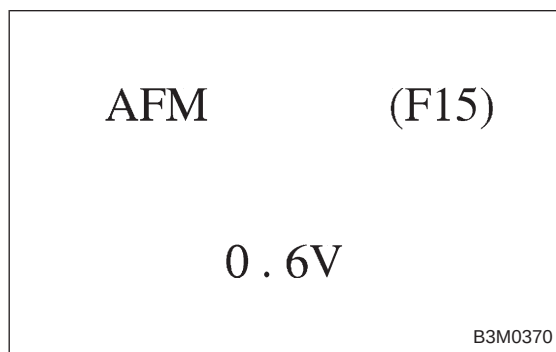
NOTE:

If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature.

- 5) Engine idling after warm-up.
- 6) Move selector lever to "N".
- 7) Read data on Subaru Select Monitor.
- 8) Designate mode using function key.

Function mode: F15

- F15: 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 in the function mode F15?*

YES : Go to next **CHECK** .

NO : Check mass air flow signal circuit.

NOTE:

For the diagnostics procedure on mass air flow signal circuit, refer to 3-2 [T810].

CHECK : *Has trouble been eliminated after ECM replacement?*

YES : Replace ECM.

NO : Go to next **CHECK** .

NOTE:

Install the old ECM.

CHECK : *Has trouble been eliminated after TCM replacement?*

YES : Replace TCM.

NO : Go to MODE FA0.

DISPLAY

LED No.	Signal name	Symbol
1	FWD switch	FF
2	Kick-down switch	KD
3	—	—
4	—	—
5	Brake	BR
6	ABS switch	AB
7	Cruise control set	CR
8	Power switch	PW
9	—	—
10	—	—

FF	KD	—	—	BR
AB	CR	PW	—	—

1	2	3	4	5
6	7	8	9	10

H3M1373A

P: MODE FA0

— SWITCH 1 (SW1) —

Reference values

- Lights up when the fuse is installed in FWD switch (No. 1).
- Light up when the brake pedal is depressed (No. 5)
- Light up when the ABS signal is entered (No. 6).
- Lights up when the cruise control is set (No. 7).

NOTE:

Kick-down switch and power switch are not installed. Therefore, LEDs of kick-down switch (KD) and power switch (PW) do not light up.

9P1

CHECK FWD SWITCH (FF).

CHECK

: *When fuse is inserted in FWD switch, does LED (FF) light up?*

YES

: Go to step 9P2.

NO

: Check FWD switch circuit.

NOTE:

For diagnostics procedure on FWD switch circuit , refer to 3-2 [T9Q0].

9P2

CHECK BRAKE (BR).

CHECK

: *When the brake pedal is depressed, does LED (BR) light up?*

YES

: Go to 9P3.

NO

: Check brake switch circuit.

NOTE:

For diagnostics procedure on brake switch circuit, refer to 2-7 [T10BH0].

9P3	CHECK ABS SWITCH (AB).

Engine start.

CHECK : *Does the LED (AB) flash while the vehicle is being driven at speed of 6 km/h (4 MPH) or more, and less than 10 km/h (6 MPH)?*

YES : Go to **9P4**.

NO : Check ABS switch circuit.

NOTE:

For diagnostics procedure or ABS switch circuit, refer to 4-4 [T8I0].

9P4	CHECK CRUISE CONTROL SET (CR).

CHECK : *When cruise control is set, does LED (CR) light up?*

YES : Go to MODE FA1.

NO : Check cruise control set circuit.

NOTE:

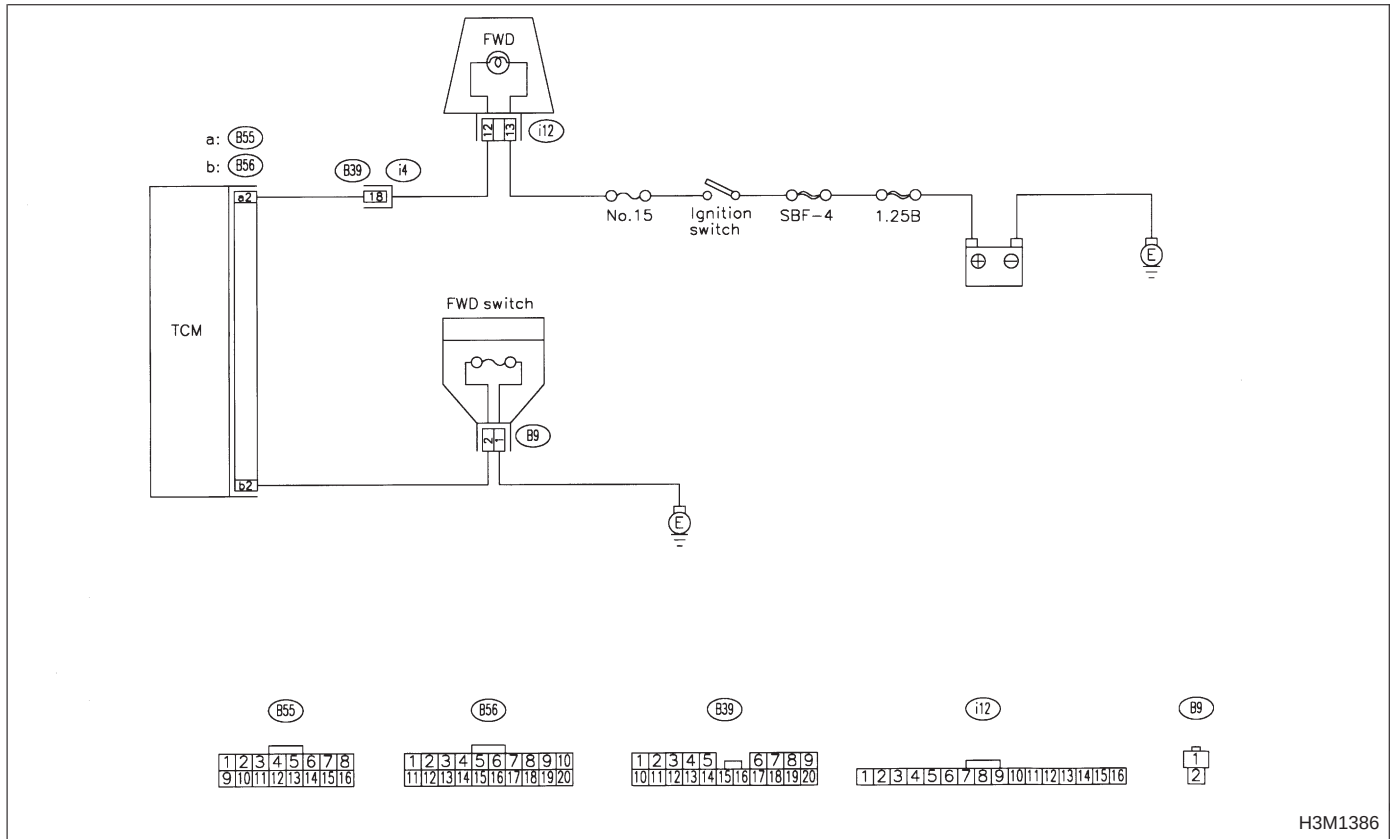
For diagnostics procedure on cruise control circuit, refer to 2-7 [T10CX0].

Q: MODE FA0

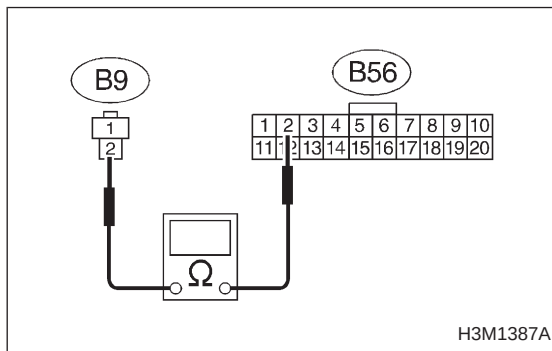
— LED NO. 1, FWD SWITCH —

DIAGNOSIS:

- LED does not come on even if FWD switch is ON.
- Diagnosis switch circuit is open or short.



H3M1386



H3M1387A

9Q1

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 — (B9) No. 2:

CHECK : Is the resistance less than 1 Ω?

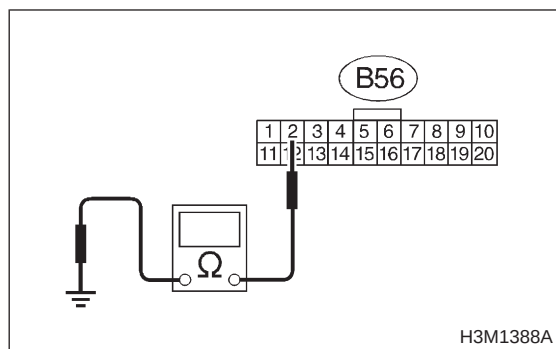
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Poor contact in TCM connector.
- Poor contact in FWD switch.
- Open circuit in harness between TCM and FWD switch connector.



4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

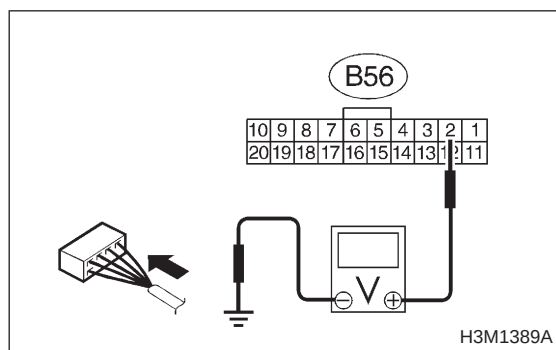
Connector & terminal

(B56) No. 2 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 9Q2.

NO : Repair short circuit in harness connector between TCM and chassis ground.



9Q2

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 and removing 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?

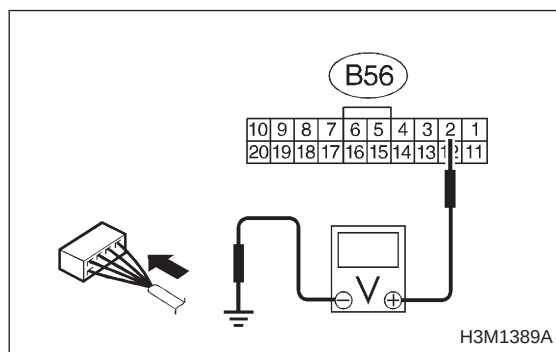
YES : Go to next step **CHECK** .

NO : Go to next **CHECK1** .

CHECK1 : Is the voltage less than 1 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.



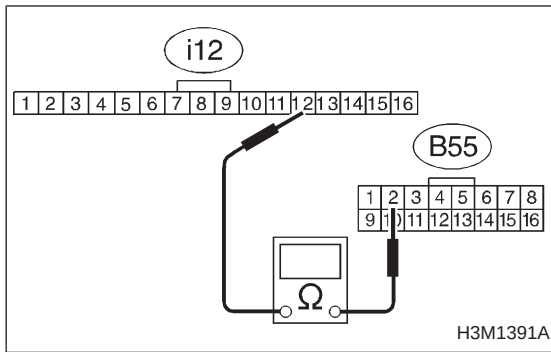
Connector & terminal

(B56) No. 2 (+) — Chassis ground (-):

CHECK : Is the voltage more than 10 V in FWD switch while removing?

YES : Go to step 9Q3.

NO : Replace TCM.

**9Q3**
**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 — (i12) No. 12:
CHECK : Is the resistance less than 1 Ω ?

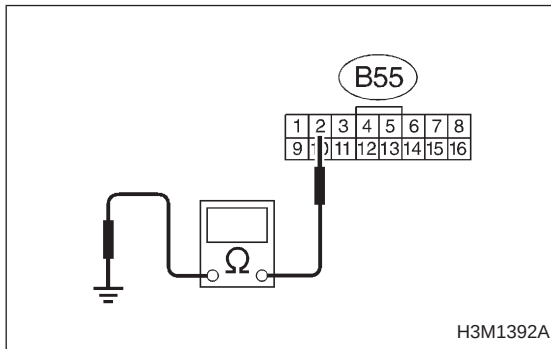
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Poor contact in TCM connector.
- Poor contact in combination meter.
- Open circuit in harness between TCM and combination meter.
- Poor contact in coupling connector (B39).

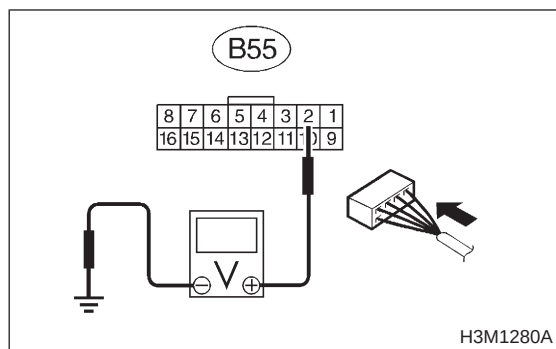


- 4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal
(B55) No. 2 — Chassis ground:
CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 9Q4.

NO : Repair short circuit in harness connector between TCM and combination meter.



9Q4

CHECK OUTPUT 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.
- 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?

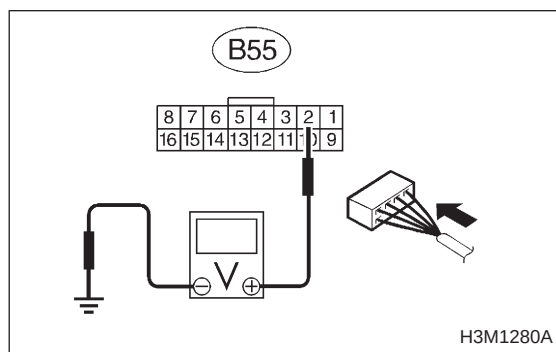
YES : Go to next step **CHECK** .

NO : Go to next **CHECK1** .

CHECK1 : Is the voltage less than 1 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.

**Connector & terminal****(B55) No. 2 — Chassis ground:**

CHECK : Is the voltage more than 10 V in FWD switch while removing?

YES : Go to next **CHECK** .

NO : Replace TCM.

CHECK : Is the voltage more than 10 V while shaking harness and connector of TCM?

YES : Repair poor contact in TCM.

NO : Replace TCM.

DISPLAY

LED No.	Signal name	Symbol
1	N/P range switch	NP
2	R range switch	RR
3	D range switch	RD
4	3 range switch	R3
5	2 range switch	R2
6	1 range switch	R1
7	Diagnosis switch	SS
8	—	—
9	—	—
10	—	—

NP	RR	RD	R3	R2
R1	SS	—	—	—

1	2	3	4	5
6	7	8	9	10

H3M1374A

R: MODE FA1

— SWITCH 2 (SW2) —

Reference values

- Lights up when the N or P range is selected (No. 1).
- Lights up when the R range is selected (No. 2).
- Lights up when the D range is selected (No. 3).
- Lights up when the 3 range is selected (No. 4).
- Lights up when the 2 range is selected (No. 5).
- Lights up when the 1 range is selected (No. 6).
- Lights up when the diagnosis switch is connected (No. 7).

9R1 CHECK N/P RANGE SWITCH (NP).

CHECK : When N and P ranges are selected, does LED (NP) light up?

YES : Go to step 9R2.

NO : Check inhibitor switch circuit.

NOTE:

For diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9R2 CHECK R RANGE SWITCH (RR).

CHECK : When the R range is selected, does LED (RR) light up?

YES : Go to step 9R3.

NO : Check inhibitor switch circuit.

NOTE:

For diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9R3 CHECK D RANGE SWITCH (RD).

CHECK : When the D range is selected, does LED (RD) light up?

YES : Go to step 9R4.

NO : Check inhibitor switch circuit.

NOTE:

For diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9R4	CHECK 3 RANGE SWITCH (R3).

CHECK : *When the 3 range is selected, does LED (R3) light up?*

YES : Go to step 9R5.

NO : Check inhibitor switch circuit.

NOTE:

For diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9R5	CHECK 2 RANGE SWITCH (R2).

CHECK : *When the 2 range is selected, does LED (R2) light up?*

YES : Go to step 9R6.

NO : Check inhibitor switch circuit.

NOTE:

For diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9R6	CHECK 1 RANGE SWITCH (R1).

CHECK : *When the 1 range is selected, does LED (R1) light up?*

YES : Go to step 9R7.

NO : Check inhibitor switch circuit.

NOTE:

For diagnostics procedure on inhibitor switch circuit, refer to 2-7 [T10BI0].

9R7	CHECK DIAGNOSIS SWITCH (SS).

CHECK : *When the diagnosis switch is turned on, does LED (SS) light up?*

YES : Go to general diagnostics table.

NOTE:

Inspect using general diagnostics table, refer to 3-2 [T1000].

NO : Check diagnosis switch circuit.

NOTE:

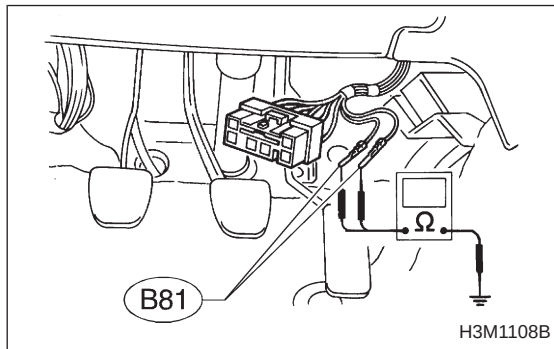
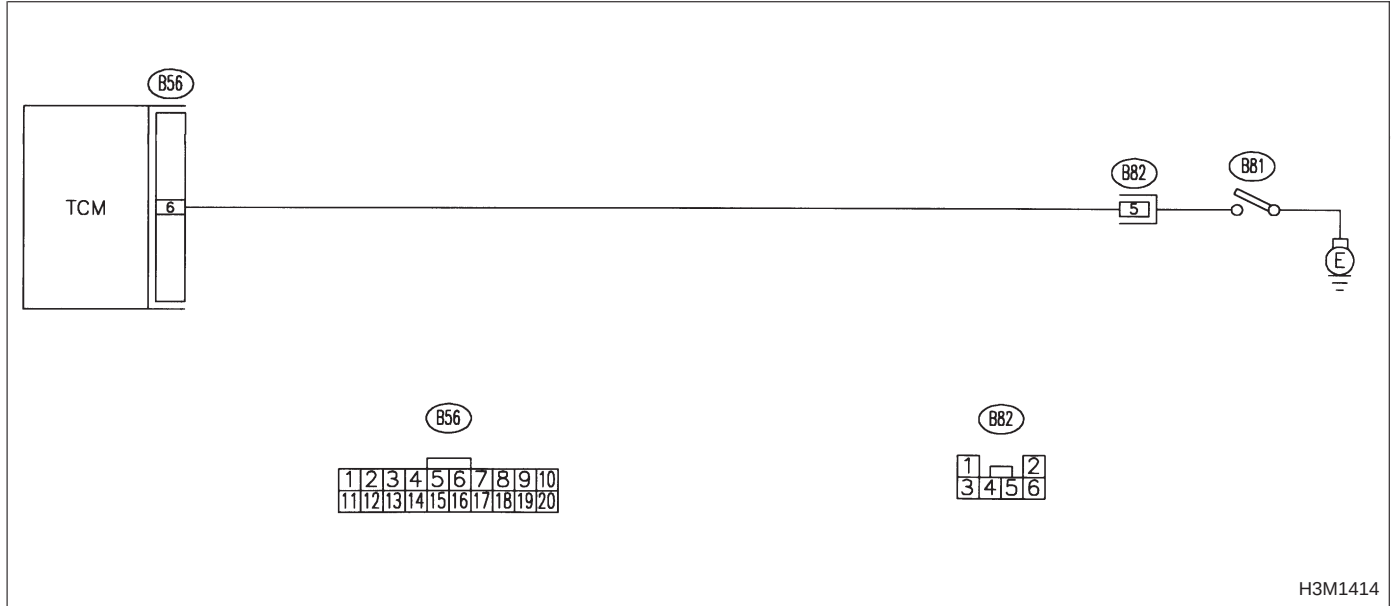
For diagnostics procedure on inhibitor switch circuit, refer to 3-2 [T9R0].

S: MODE FA1

— LED NO. 7, DIAGNOSIS SWITCH —

DIAGNOSIS:

- LED does not come on even if diagnosis switch is ON.
- Diagnosis switch circuit is open or short.



9S1

CHECK DIAGNOSIS SWITCH GROUND LINE.

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

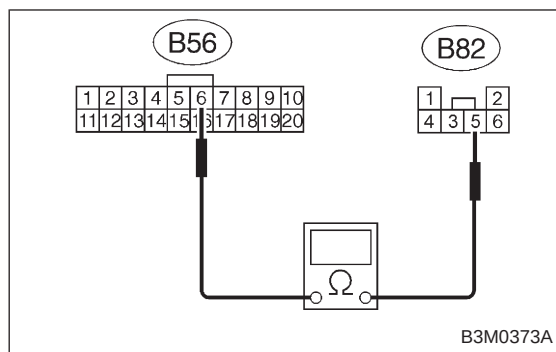
Terminal

(B81) — Chassis ground:

CHECK : Is the resistance less than 1 Ω ?

YES : Go to step 9S2.

NO : Repair open circuit in diagnosis ground terminals.

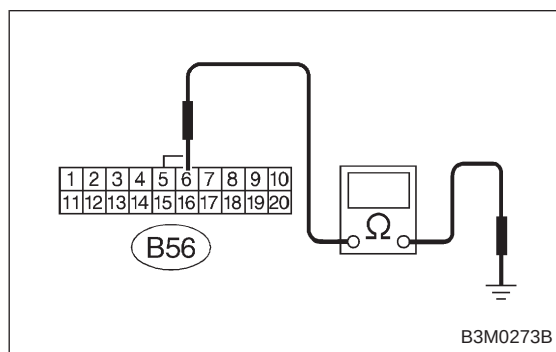
**9S2**
CHECK HARNESS CONNECTOR BETWEEN TCM AND DIAGNOSIS SWITCH.

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

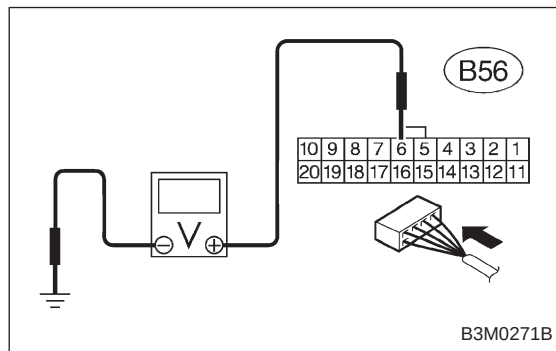
Connector & terminal
(B56) No. 6 — (B82) No. 5:
(CHECK) : Is the resistance less than 1 Ω ?
(YES) : Go to next step 4).
(NO) : Repair harness and connector.
NOTE:

In this case, repair the following:

- Poor contact in TCM connector.
- Poor contact in diagnosis switch.
- Open circuit in harness between TCM and diagnosis connector.

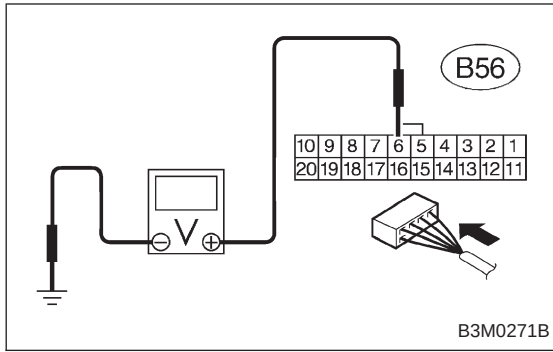


- 4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal
(B56) No. 6 — Chassis ground:
(CHECK) : Is the resistance more than 1 M Ω ?
(YES) : Go to step 3.
(NO) : Repair short circuit in harness connector between TCM and chassis ground.
**9S3**
CHECK INPUT SIGNAL FOR TCM.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM.
- 3) Turn ignition switch to ON.
- 4) Measure signal voltage for TCM while connecting and disconnecting the diagnosis terminal to diagnosis connector.

Connector & terminal
(B56) No. 6 — Chassis ground:
(CHECK) : Is the voltage less than 1 V in diagnosis connector connected?
(YES) : Go to next step (CHECK) .
(NO) : Go to next (CHECK1) .
(CHECK1) : Is the voltage less than 1 V while shaking harness and connector of TCM?
(YES) : Repair poor contact in TCM.
(NO) : Replace TCM.



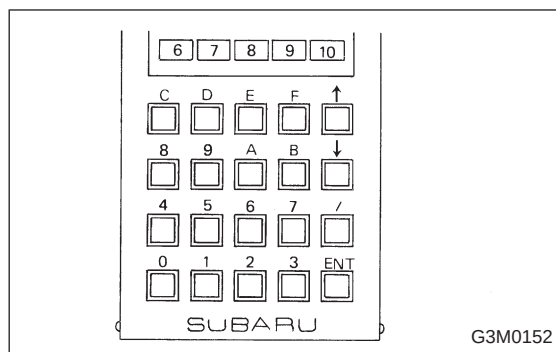
Connector & terminal

(B56) No. 6 — Chassis ground:

CHECK : Is the voltage more than 6 V in diagnosis connector disconnected?

YES : Repair poor contact in TCM.

NO : Replace TCM.



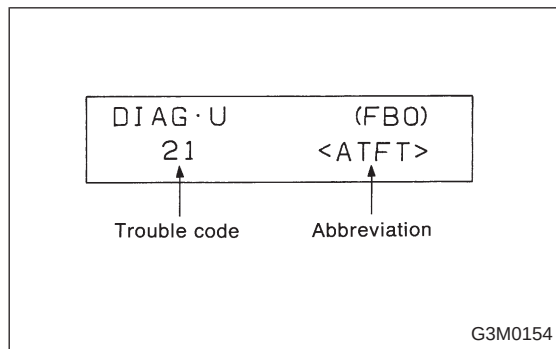
T: MODE FB0

— ON-BOARD DIAGNOSTICS (DIAG. U) —

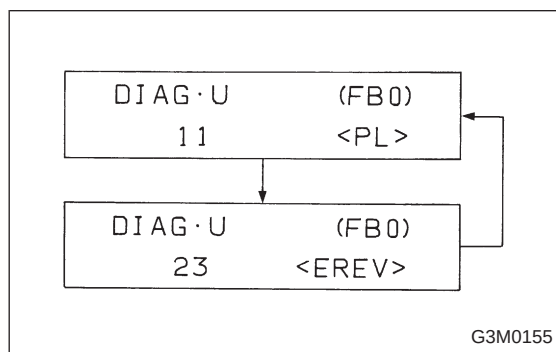
DISPLAY:

Current trouble code determined by on-board diagnostics.

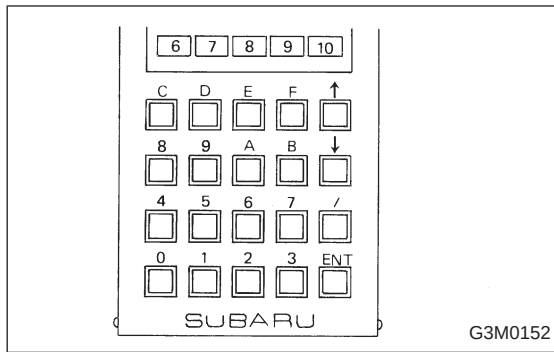
- 1) Connect select monitor.
- 2) Designate mode using function key.
Press [F] [B] [0] [ENT] in that order.



- 3) Ensure displayed trouble code(s).
- When there is only one trouble code



- When there are multiple trouble codes



G3M0152

U: MODE FB1

— ON-BOARD DIAGNOSTICS (DIAG. M) —

DISPLAY:

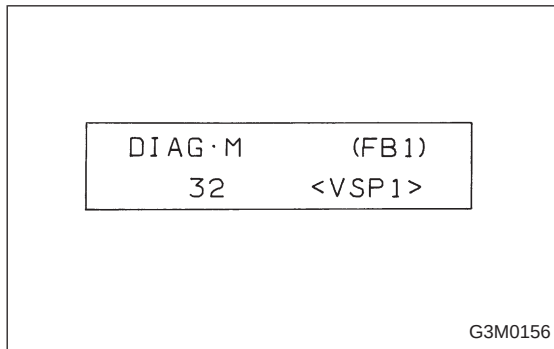
Previous trouble code stored in by on-board diagnostics.

- 1) Connect select monitor.
- 2) Designate mode using function key.

Press [F] [B] [1] [ENT] in that order.

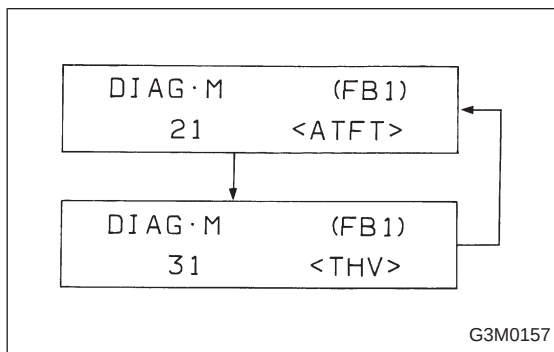
- 3) Ensure displayed trouble code(s).

- When there is only one trouble code



G3M0156

- When there are multiple trouble codes



G3M0157

V: MODE FC0 — BACK-UP CLEAR —**DISPLAY:**

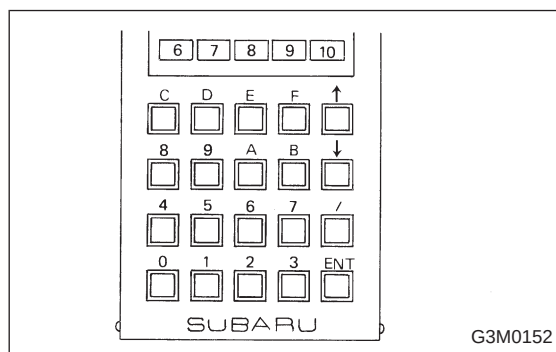
Function of clearing trouble code stored in memory.

The current trouble history code is deleted from the monitor when the ignition switch is turned OFF after performing on-board diagnostics. However, past trouble history code are stored in TCM. They remain in memory even when the ignition switch is turned OFF, because there is a memory back-up battery. The current trouble history code can be displayed again when on-board diagnostics is performed after driving, provided that no inspection or repair has been made.

To delete past trouble history codes, first perform on-board diagnostics after inspection and repair using the current trouble history code, then confirm that no trouble code is displayed. Next, select and execute a particular mode on the select monitor.

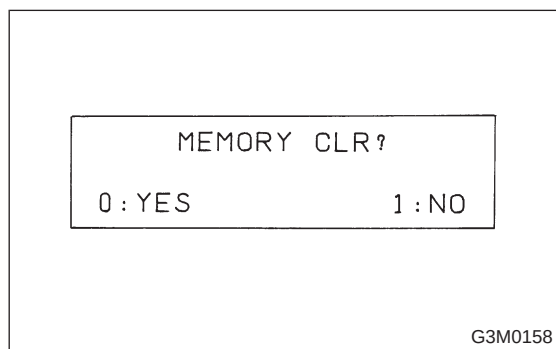
NOTE:

- Since the past trouble history is deleted, it is necessary when erasing the trouble code to inspect and make repairs according to the trouble code, and ensure that no trouble code is indicated in on-board diagnostics.
- The past trouble history will not be lost, provided inspection and repairs are performed according to the current trouble history code, and that no trouble remains.



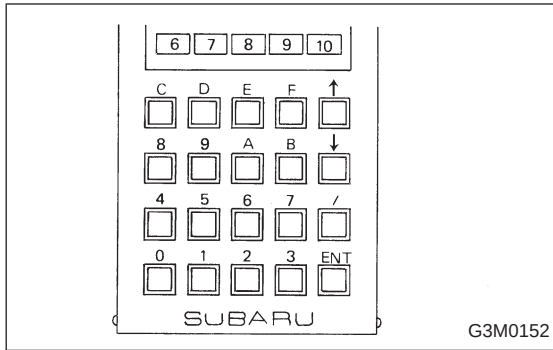
G3M0152

- 1) Connect select monitor.
- 2) Designate mode using function key.
Press [F] [C] [0] [ENT] in that order.

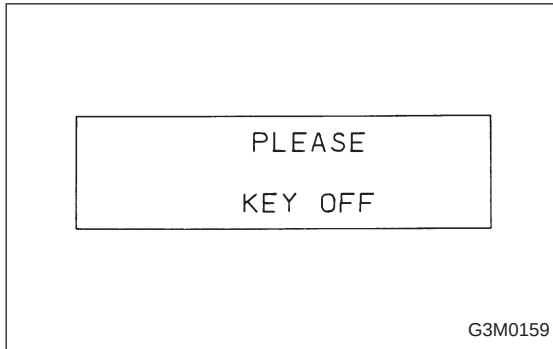


G3M0158

- 3) Ensure displayed message.



- 4) Press [ENT] key.
 - When executing, (YES)
Press [0] [ENT] in that order.
 - When not executing, (NO)
Press [1] [ENT] in that order.



- 5) When executed, the indication as shown here appears for approximately four seconds, and the past trouble history is deleted.

- 6) After the display is gone, turn ignition switch to OFF.

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 unit 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

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 2) Select lever 3) Parking mechanism
Shift lever cannot be moved or is hard to move from "P" range.	
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

BRAKES 4-4

	Page
T DIAGNOSTICS AIRBAG	2
1. Supplemental Restraint System "Airbag"	2
2. Pre-inspection	2
3. Electrical Components Location	4
4. Schematic	6
5. Control Module I/O Signal	7
6. Diagnostics Chart for On-board Diagnosis System.....	10
7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure	16
8. Diagnostics Chart with Trouble Code by ABS Warning Light	26
9. Select Monitor Function Mode	108
10. Diagnostics Chart with Select Monitor.....	120
11. General Diagnostics Table	263

1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the ABS control module, ABS sensor 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 control module, ABS sensor 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

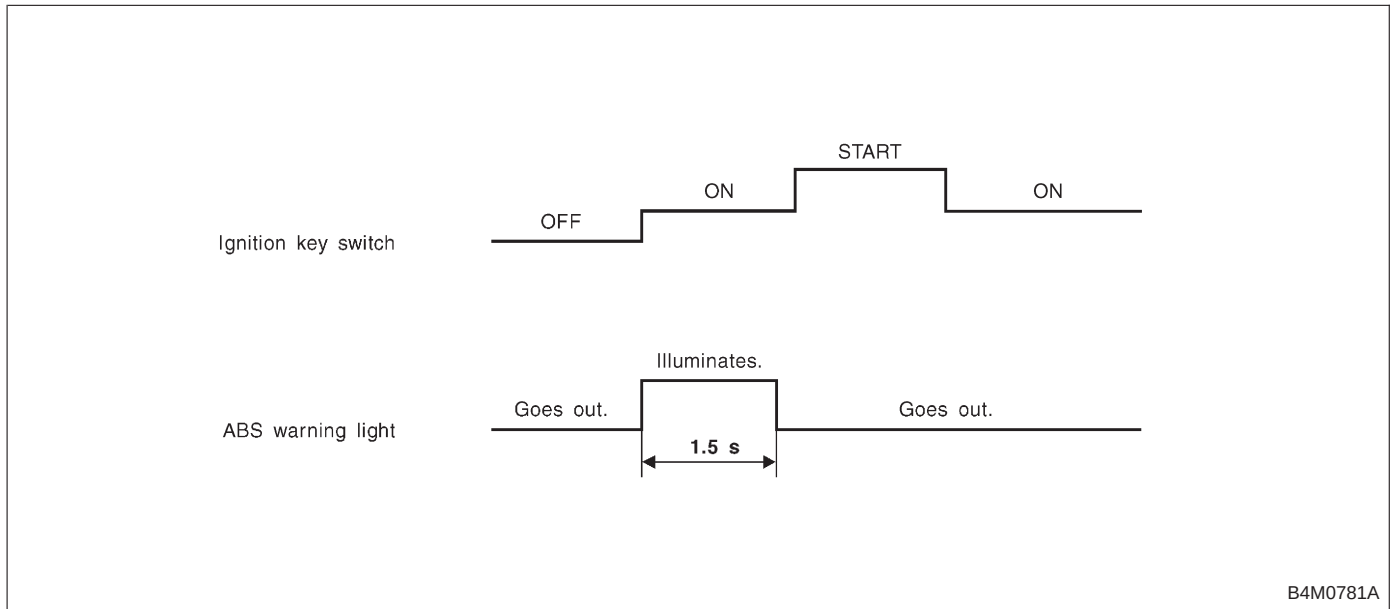
Check brake drag. <Ref. to 4-4 [K100].>

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 [S1A0], [S1B0].>

B: ELECTRICAL INSPECTION**1. WARNING LIGHT ILLUMINATION PATTERN**

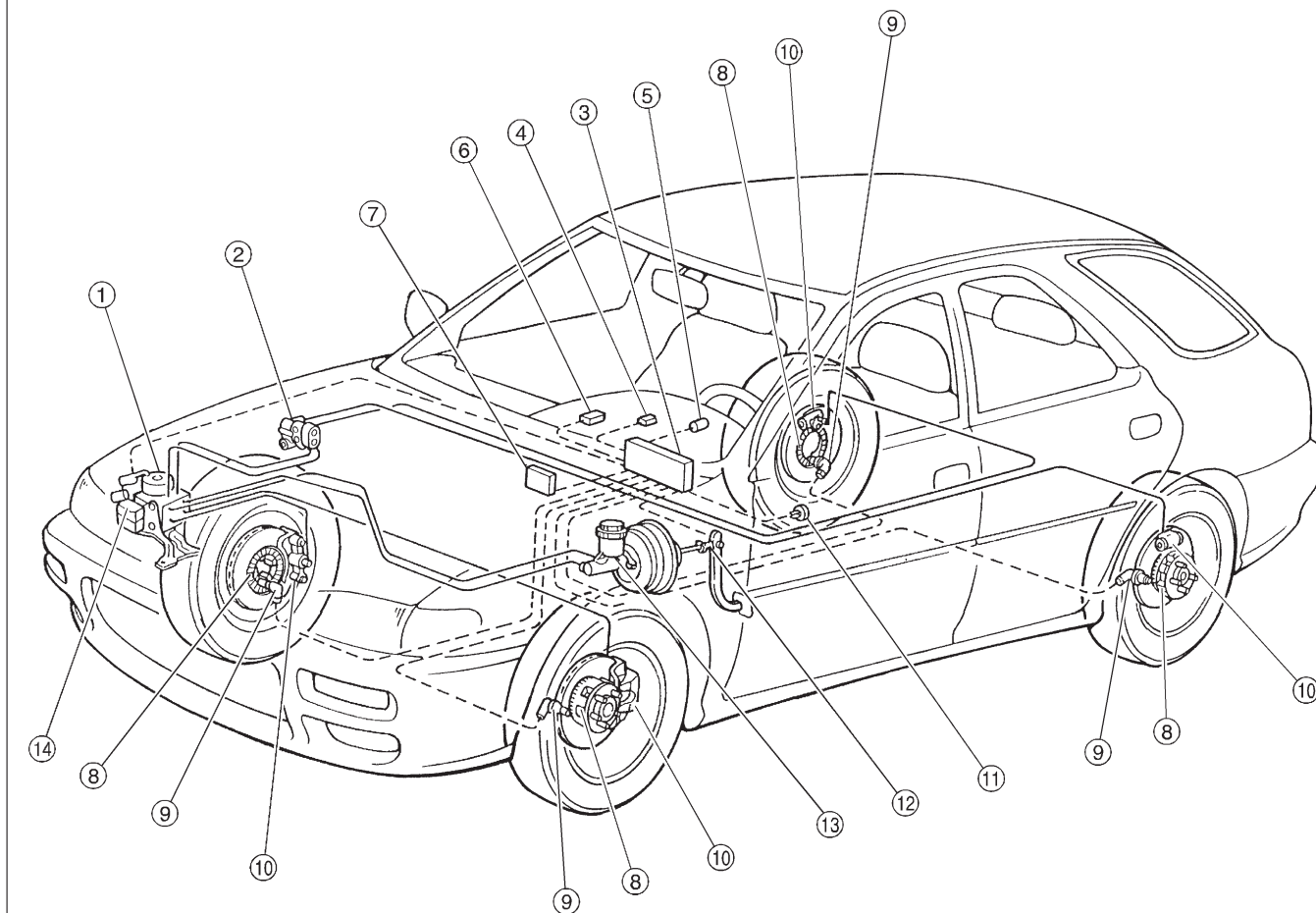
1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.

2) When the ABS warning light remains constantly OFF, repair the ABS warning light circuit or diagnosis circuit. <Ref. to 4-4 [T7A0].>

NOTE:

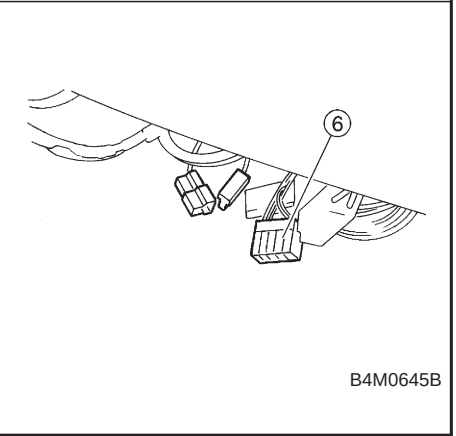
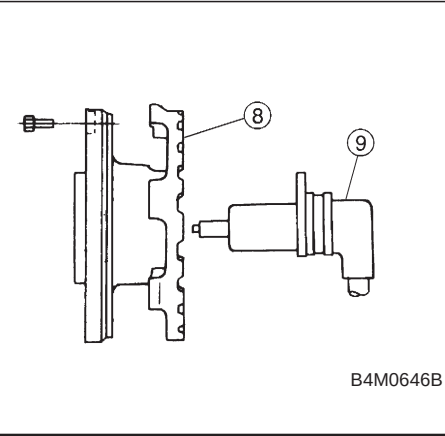
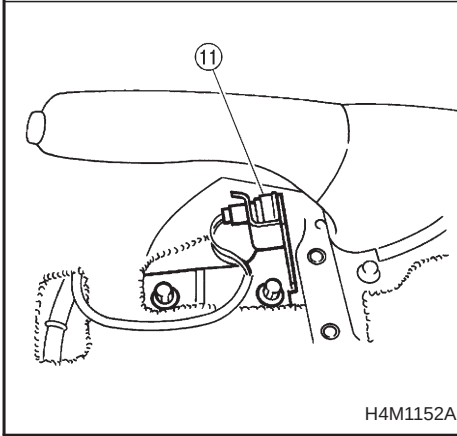
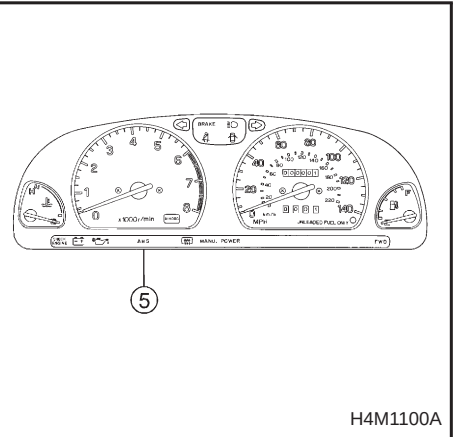
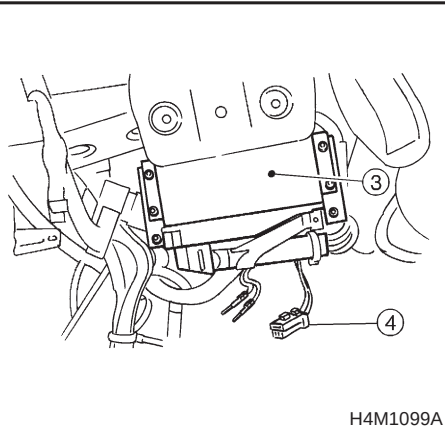
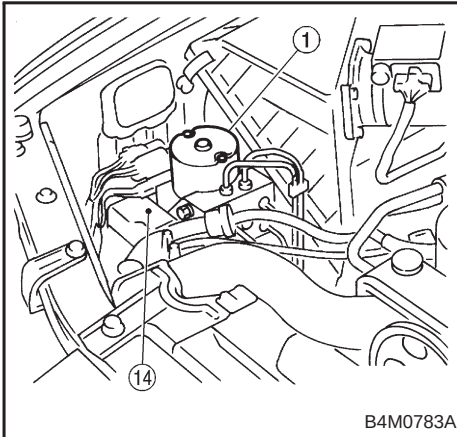
Even though the ABS warning light does not go out 1.5 seconds after it illuminates, the ABS system operates normally when the warning light goes out while driving at approximately 12 km/h (7 MPH). However, the Anti-lock brakes do not work while the ABS warning light is illuminated.

3. Electrical Components Location

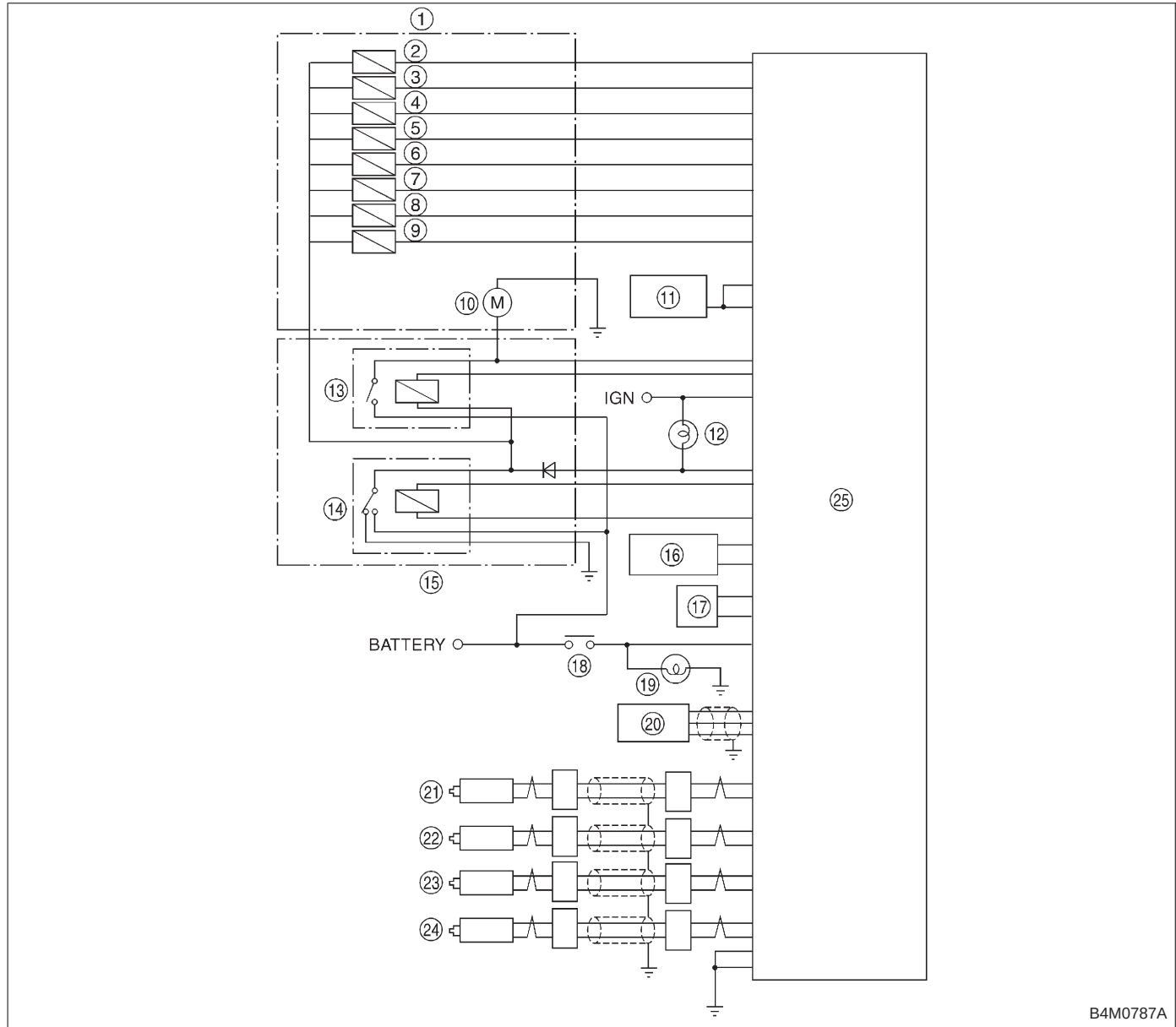


H4M1098A

① Hydraulic control unit (H/U)	⑧ Tone wheel
② Proportioning valve	⑨ ABS sensor
③ ABS control module (ABSCM)	⑩ Wheel cylinder
④ ABS diagnosis connector	⑪ G sensor (only AWD vehicle)
⑤ ABS warning light	⑫ Brake switch
⑥ Data link connector (for Subaru select monitor)	⑬ Master cylinder
⑦ Transmission control module (only AT vehicle)	⑭ Relay box



4. Schematic

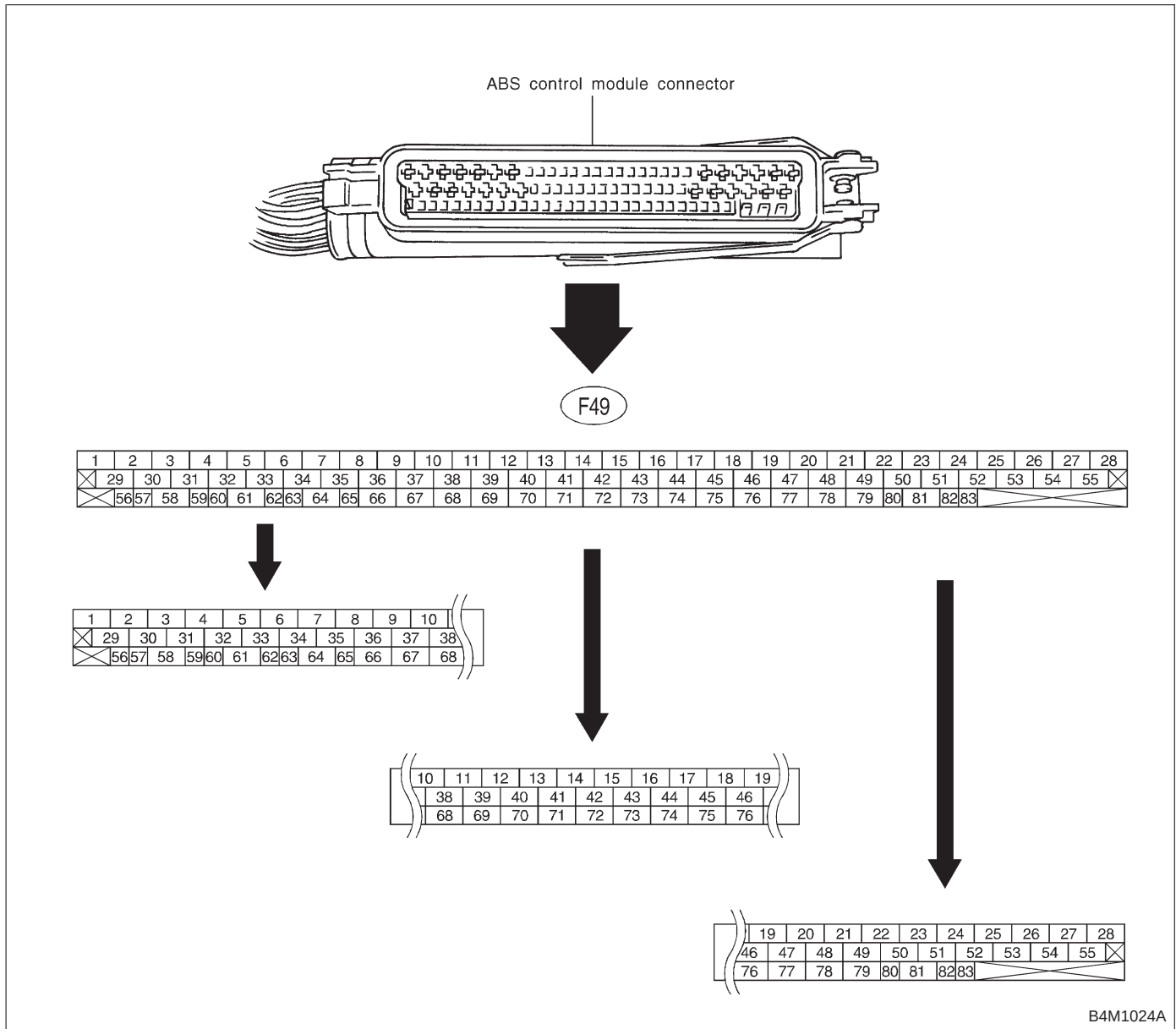


B4M0787A

① Hydraulic control unit (H/U)	⑭ Valve relay
② Front left inlet solenoid valve	⑮ Relay box
③ Front left outlet solenoid valve	⑯ Data link connector
④ Front right inlet solenoid valve	⑰ ABS diagnosis connector
⑤ Front right outlet solenoid valve	⑱ Stop light switch
⑥ Rear left inlet solenoid valve	⑲ Stop light
⑦ Rear left outlet solenoid valve	⑳ G sensor (only AWD model)
⑧ Rear right inlet solenoid valve	㉑ Front left ABS sensor
⑨ Rear right outlet solenoid valve	㉒ Front right ABS sensor
⑩ Motor	㉓ Rear left ABS sensor
⑪ Transmission control module (only AT model)	㉔ Rear right ABS sensor
⑫ ABS warning light	㉕ ABS control module (ABSCM)
⑬ Motor relay	

5. Control Module I/O Signal

1. I/O SIGNAL VOLTAGE

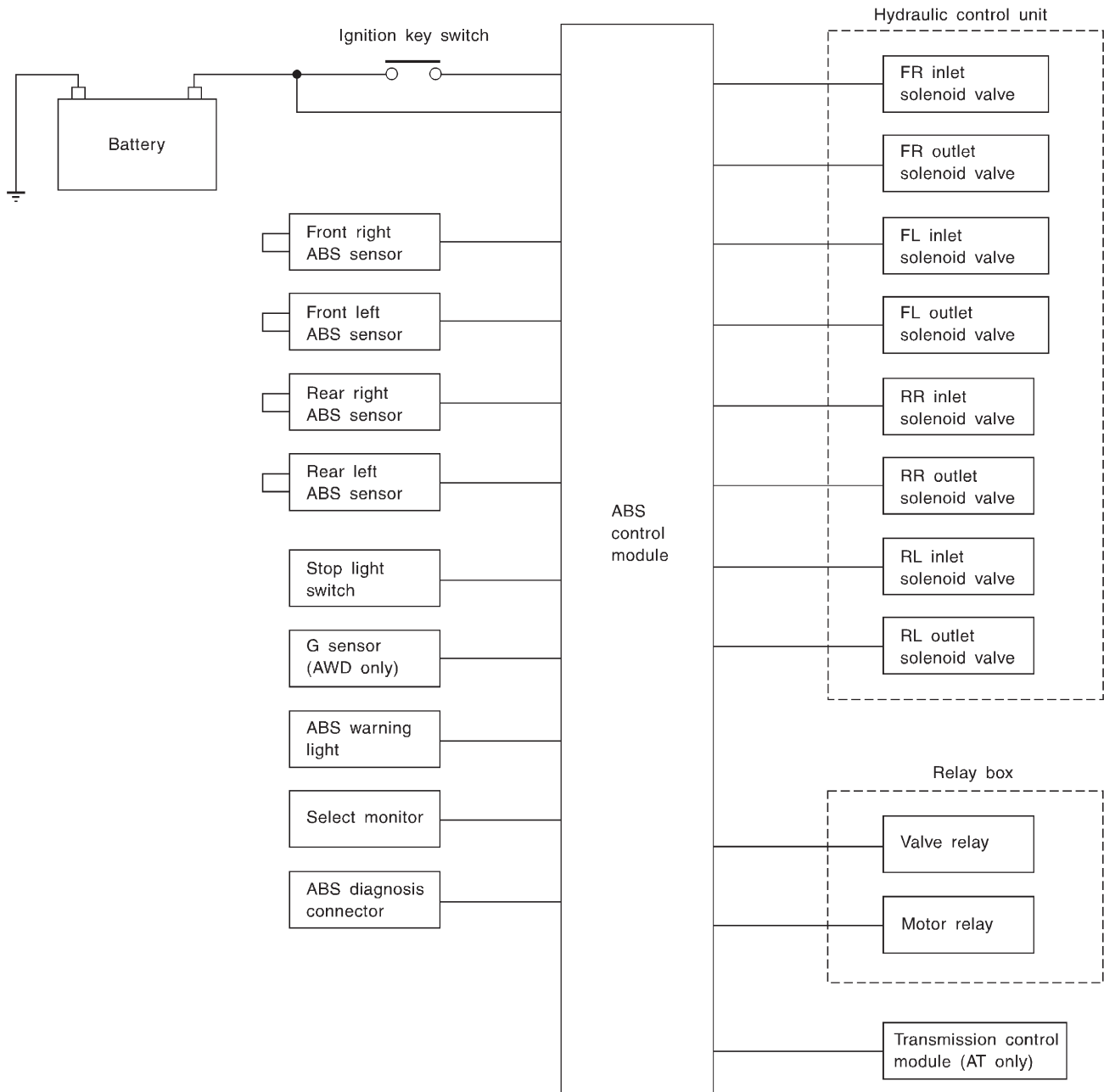


NOTE:

The terminal numbers in the ABS control module connector are as shown in the figure.

Contents			Terminal No.	Input/Output signal
				Measured value and measuring conditions
ABS sensor (Wheel speed sensor)	Front left wheel		49—19	0.12 — 1 V (When it is 20 Hz.)
	Front right wheel		14—15	
	Rear left wheel		16—17	
	Rear right wheel		18—46	
Hydraulic control unit	Solenoid valve	Front left outlet	51—1	10 — 13 V when the valve is OFF and less than 1.5 V when the valve is ON.
		Front right outlet	3—1	
		Rear left outlet	4—1	
		Rear right outlet	50—1	
		Front left inlet	24—1	
		Front right inlet	30—1	
		Rear left inlet	31—1	
		Rear right inlet	23—1	
Relay box	Valve relay power supply		27—1	10 — 13 V when ignition switch is ON.
	Valve relay coil		47—1	Less than 1.5 V when ignition switch is ON.
	Motor relay coil		22—1	More than 10 V when the ABS control does not operate still and less than 1.5 V when ABS operates.
	Motor monitoring		10—1	Less than 1.5 V when the ABS control does not operate still and more than 10 V when ABS operates.
G sensor (AWD model only)	power supply		8—45	4.75 — 5.25 V
	ground		45	—
	output		7—45	2.3±0.2 V when vehicle is in horizontal position.
Stop light switch			36—1	Less than 1.5 V when the stop light is OFF and more than 4.5 V when the stop light is ON.
ABS warning light			54—1	Less than 1.5 V during 1.5 seconds when ignition switch is ON, and 10 — 14 V after 1.5 seconds.
AT ABS signal (AT model only)			12—1	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			39—1	Less than 1.5 V when the ABS control does not operate still and more than 5.5 V when ABS operates.
Select monitor	Data is received.		11—1	Less than 1.5 V when no data is received.
	Data is sent.		38—1	4.75 — 5.25 V when no data is sent.
ABS diagnosis connector	Terminal No. 1		5—1	10 — 14 V when ignition switch is ON.
	Terminal No. 2		13—1	10 — 14 V when ignition switch is ON.
Power supply			28—1	10 — 14 V when ignition switch is ON.
Grounding line			1	—
Grounding line			55	—

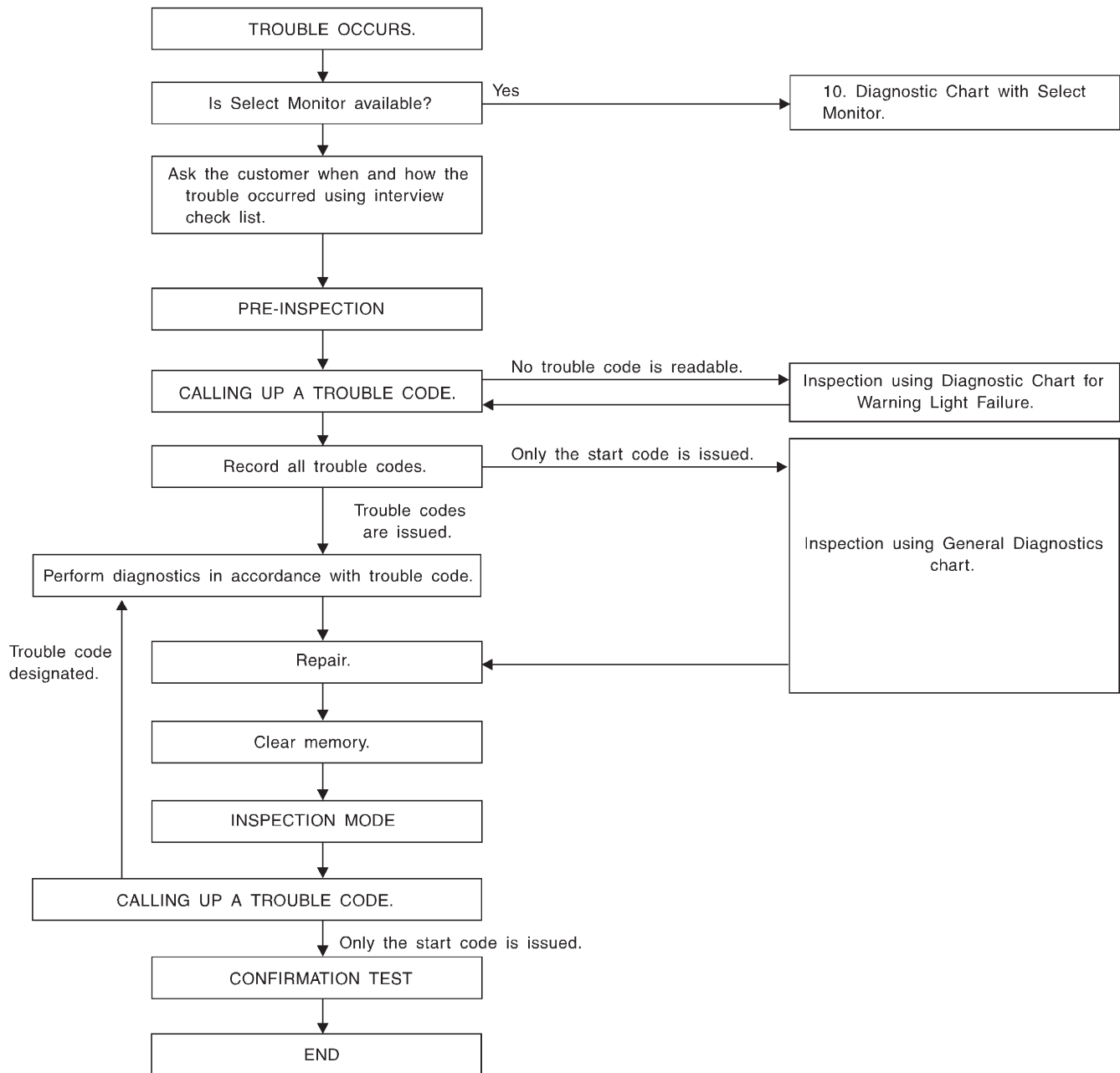
2. I/O SIGNAL DIAGRAM



B4M0788B

6. Diagnostics Chart for On-board Diagnosis System

A: BASIC DIAGNOSTICS PROCEDURE



B4M1051A

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 :		

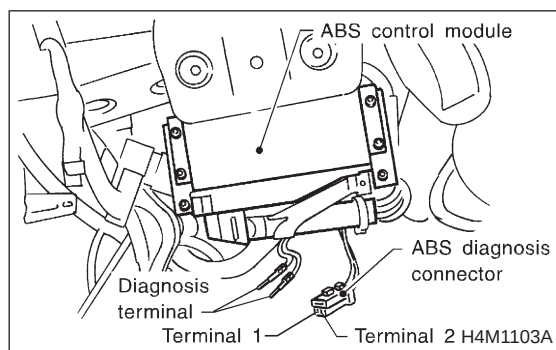
Behavior of vehicle	a) Directional stability cannot be obtained or steering arm refuses to work when applying brakes : ☐ Yes / ☐ No	
	● When :	☐ Vehicle turns to right ☐ Vehicle turns to left ☐ Spins ☐ Others :
	b) Directional stability cannot be obtained or steering arm refuses to work when accelerating : ☐ 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 EEP ROM 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.)

1. CALLING UP A TROUBLE CODE

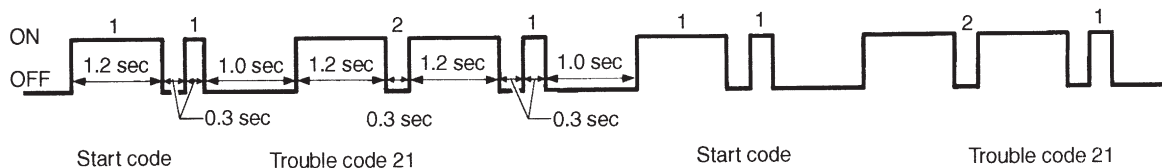
- 1) Take out ABS diagnosis connector from side of driver's seat heater unit.
- 2) Turn ignition switch OFF.
- 3) Connect ABS diagnosis connector terminal 2 to diagnosis terminal.
- 4) Turn ignition switch ON.
- 5) ABS warning light is set in the diagnostic mode and blinks to identify trouble code.
- 6) After the start code (11) is shown, the trouble codes will be shown in order of the last information first. These repeat for a maximum of 5 minutes.

NOTE:

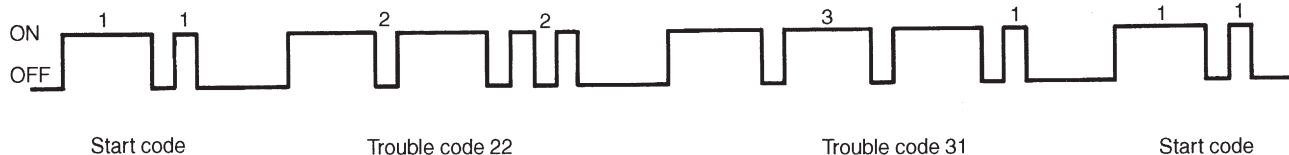
When there are no trouble codes in memory, only the start code (11) is shown.

Example of code indication

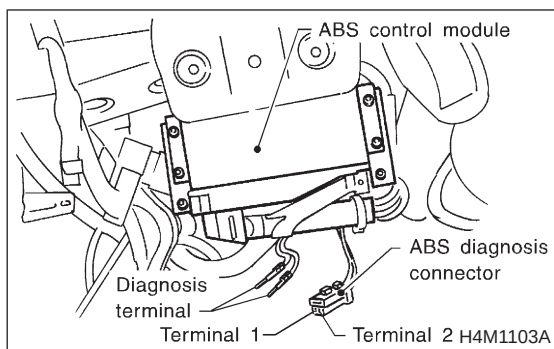
Trouble code: 21



Trouble code: 22, 31

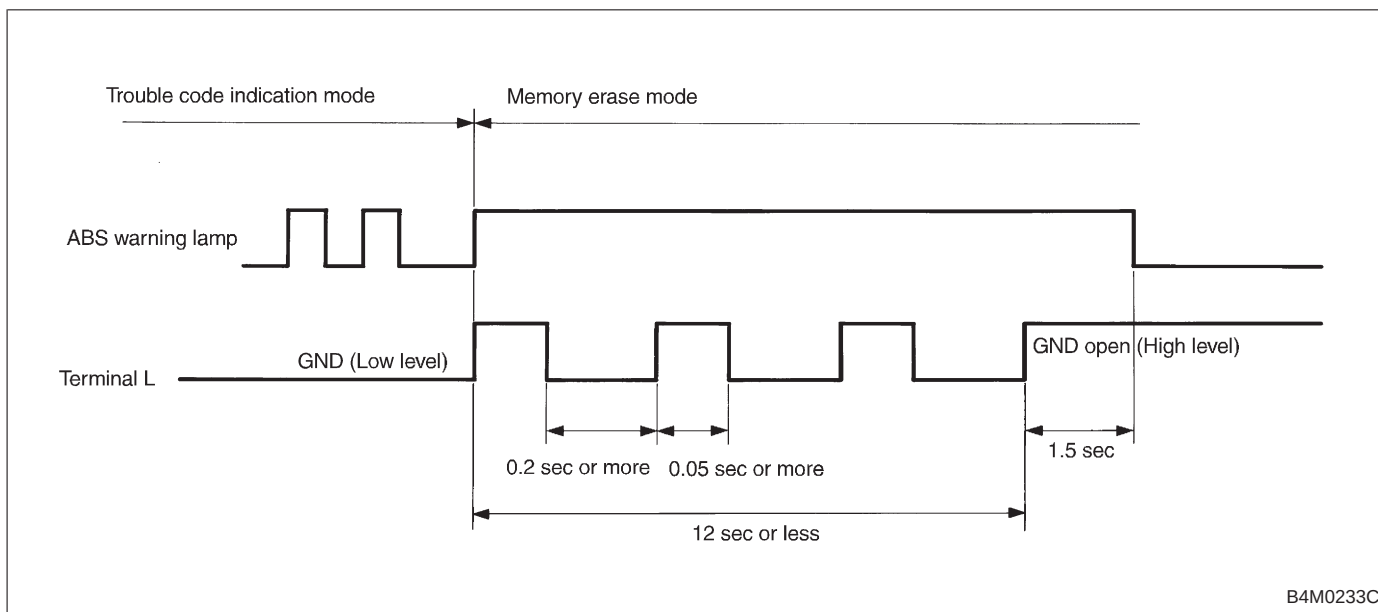


B4M0232A



2. CLEARING MEMORY

- 1) After calling up a trouble code, disconnect ABS diagnosis connector terminal 2 from diagnosis terminal.
- 2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 2 and diagnosis terminal for at least 0.05 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.

7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure

A: ABS WARNING LIGHT DOES NOT COME ON.

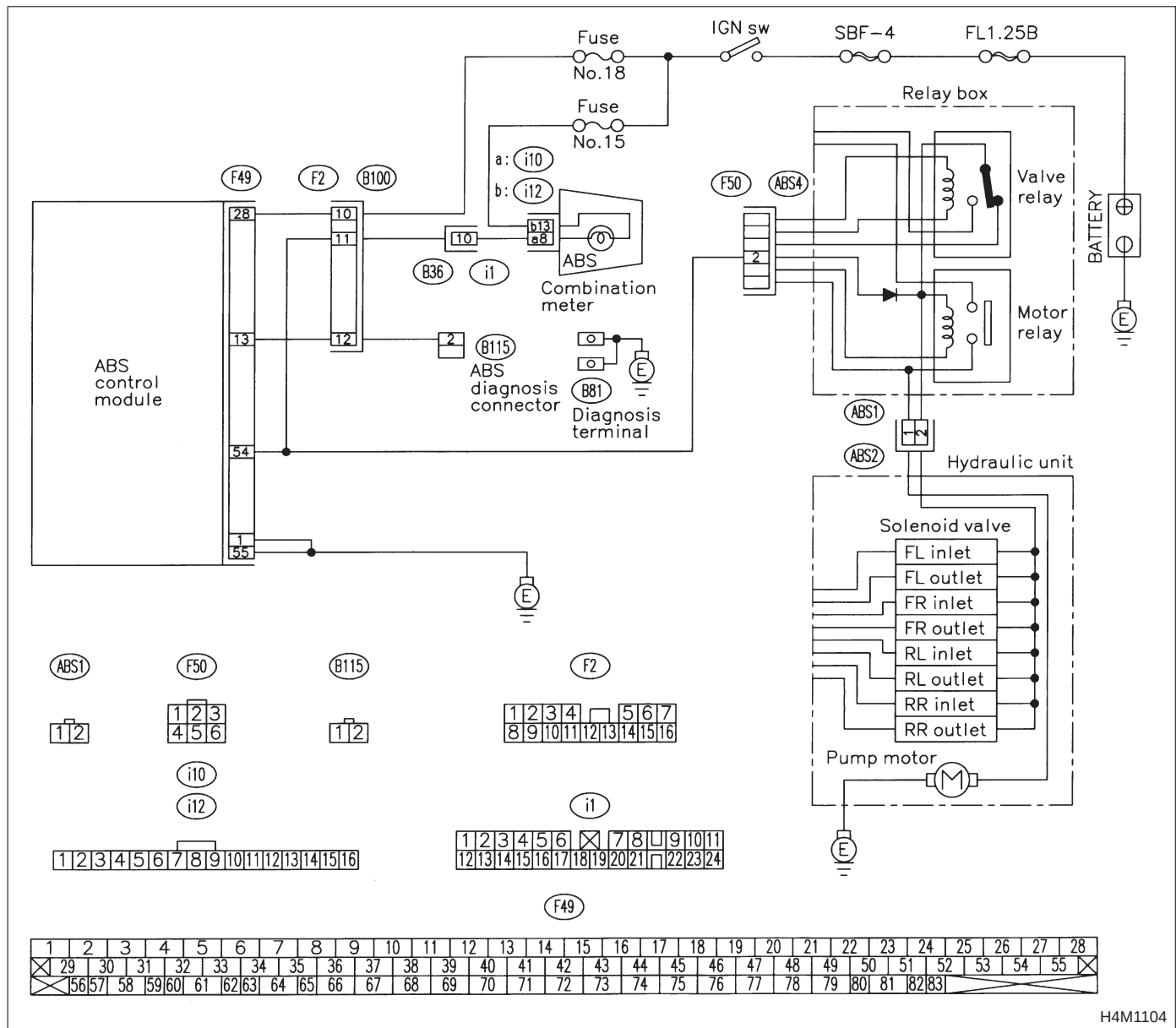
DIAGNOSIS:

- 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:



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.

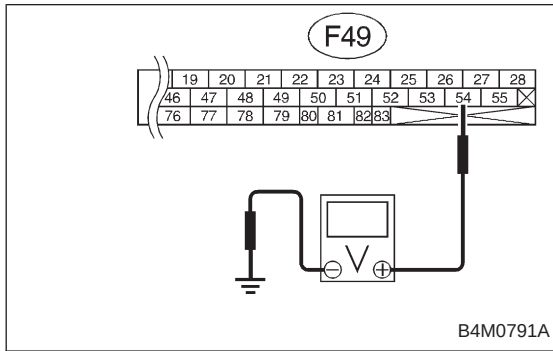
2) Remove combination meter.

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 WIRING HARNESS.

1) Disconnect connector from ABSCM.

2) Disconnect connector (F50) from relay box.

3) Turn ignition switch to ON.

4) Measure voltage between connector (F49) and chassis ground.

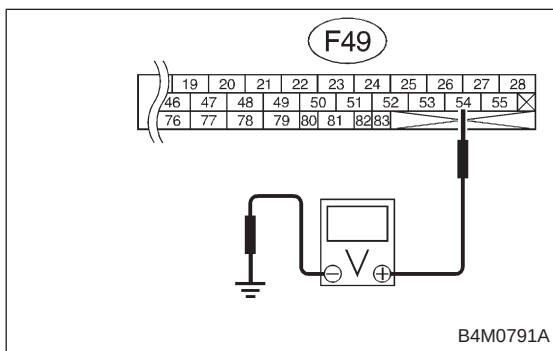
Connector & terminal

(F49) No. 54 (+) — Chassis ground (-):

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

YES : Go to step 7A4.

NO : Repair broken wire in harness or connector.



7A4

CHECK WIRING HARNESS.

1) Turn ignition switch to OFF.

2) Measure voltage between ABSCM connector (F49) and chassis ground.

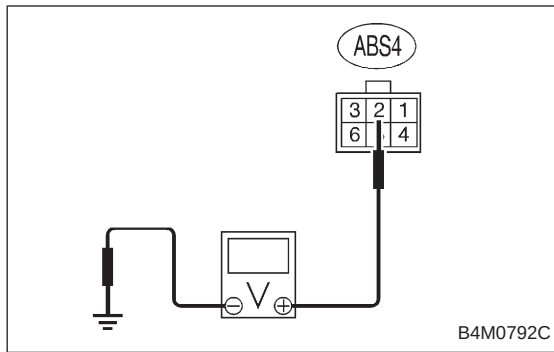
Connector & terminal

(F49) No. 54 (+) — Chassis ground (-):

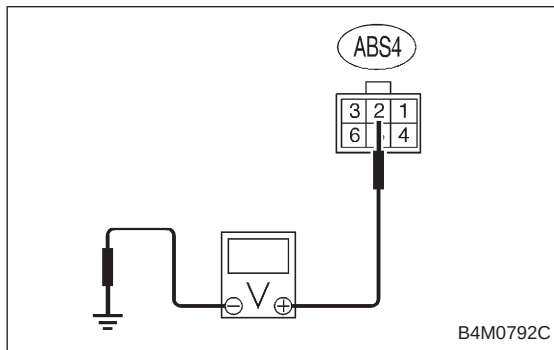
CHECK : **Is voltage less than 3 V?**

YES : Go to step 7A5.

NO : Repair battery short of harness.

**7A5****CHECK BATTERY SHORT OF RELAY BOX.**

- 1) Disconnect connector from relay box.
- 2) Measure voltage between relay box and chassis ground.

Connector & terminal**(ABS4) No. 2 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 7A6.**NO** : Replace relay box.**7A6****CHECK BATTERY SHORT OF RELAY BOX.**

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

Connector & terminal**(ABS4) No. 2 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 7A7.**NO** : Replace relay box.**7A7****CHECK POOR CONTACT IN CONNECTORS.**

Turn ignition switch to OFF.

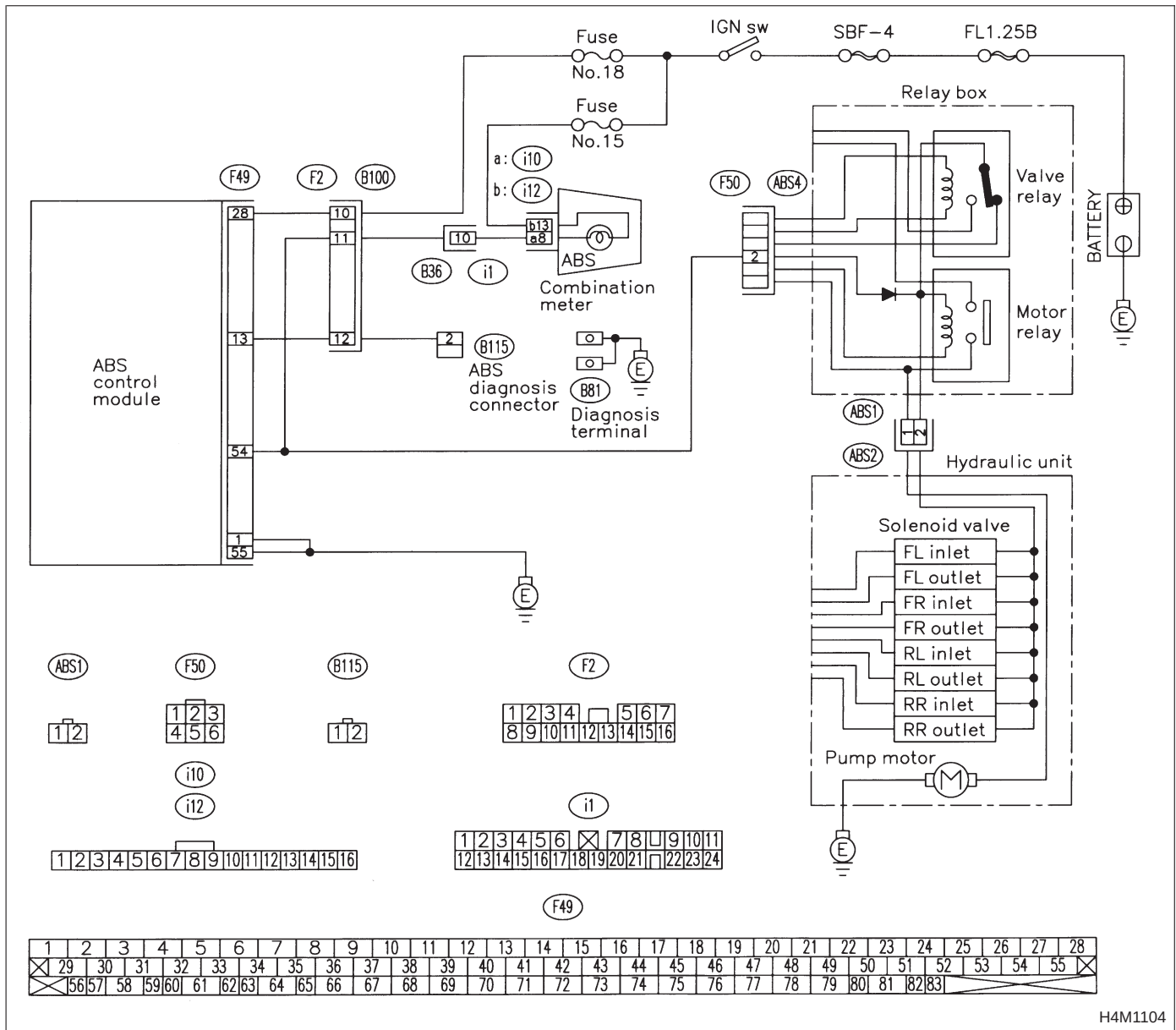
CHECK : Is there poor contact in connectors between combination meter and ABSCM? <Ref. to FOREWORD [T3C1].>**YES** : Repair connector.**NO** : Replace ABSCM.

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:

H4M1104

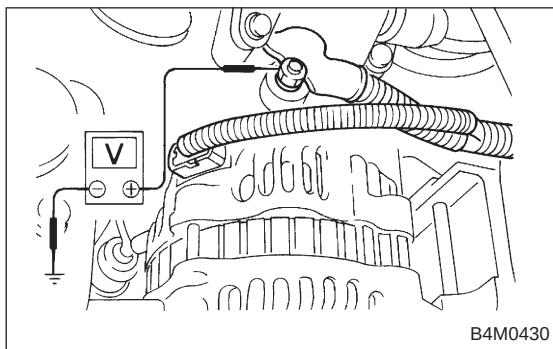
7B1**CHECK INSTALLATION OF ABSCM CONNECTOR.**

Turn ignition switch to OFF.

CHECK : *Is ABSCM connector inserted into ABSCM until the clamp locks onto it?*

YES : Go to step 7B2.

NO : Insert ABSCM connector into ABSCM until the clamp locks onto it.

**7B2****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 7B3.

NO : Repair generator.

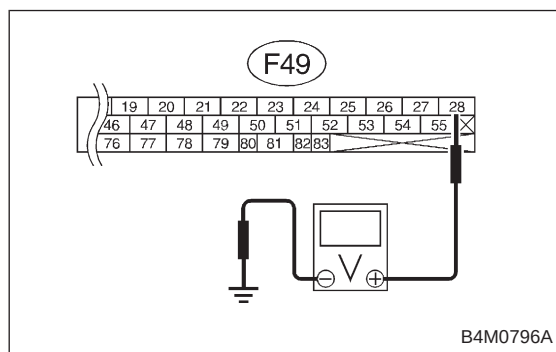
7B3**CHECK BATTERY TERMINAL.**

Turn ignition switch to OFF.

CHECK : *Is there poor contact at battery terminal?*

YES : Repair battery terminal.

NO : Go to step 7B4.

**7B4****CHECK POWER SUPPLY OF ABSCM.**

- 1) Disconnect connector from ABSCM.
- 2) Start engine.
- 3) Idle the engine.
- 4) Measure voltage between ABSCM connector and chassis ground.

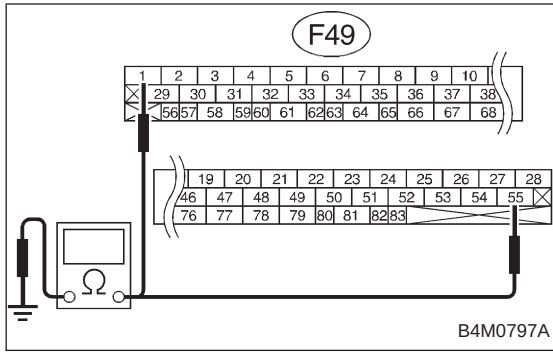
Connector & terminal

(F49) No. 28 (+) — Chassis ground (-):

CHECK : *Is the voltage between 10 and 15 V?*

YES : Go to step 7B5.

NO : Repair ABSCM power supply circuit.



7B5 CHECK GROUND CIRCUIT OF ABSCm.

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

Connector & terminal

(F49) No. 1 — Chassis ground:

(F49) No. 55 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 7B6.

NO : Repair ABSCM ground harness.

7B6 CHECK WIRING HARNESS.

- 1) Disconnect connector (F50) from relay box.
- 2) Turn ignition switch to ON.

CHECK : Does the ABS warning light remain off?

YES : Go to step 7B7.

NO : Repair front wiring harness.

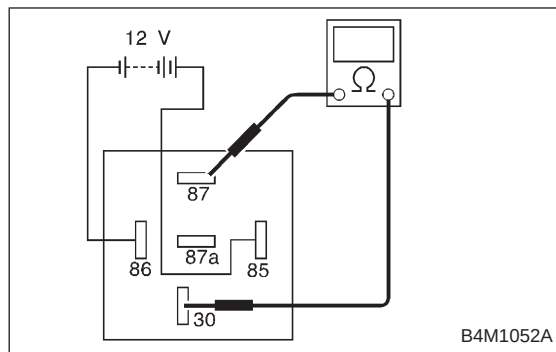
7B7 CHECK RELAY BOX.

- 1) Turn ignition switch to OFF.
- 2) Connect connector (F50) to relay box.
- 3) Remove valve relay from relay box.
- 4) Disconnect connector (ABS1) from hydraulic control unit.
- 5) Turn ignition switch to ON.

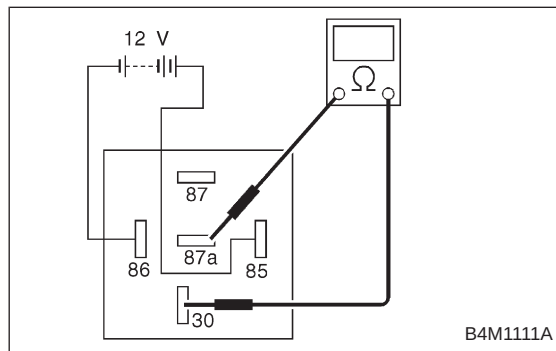
CHECK : Does the ABS warning light remain off?

YES : Go to step 7B8.

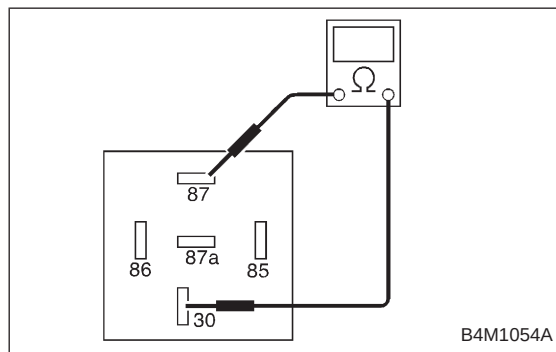
NO : Repair relay box and check fuse.

**7B8****CHECK CONTACT POINT OF VALVE RELAY.**

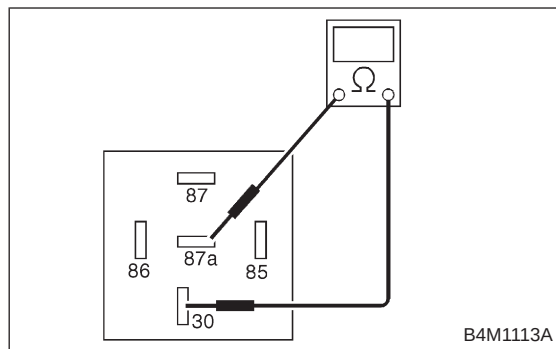
- 1) Connect battery to valve relay terminals No. 85 and No. 86.
- 2) Measure resistance between valve relay terminals.

Terminals**No. 30 — No. 87:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 7B9.**NO** : Replace valve relay.**7B9****CHECK CONTACT POINT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

Terminals**No. 30 — No. 87a:****Is the resistance more than 1 MΩ?****YES** : Go to step 7B10.**NO** : Replace valve relay.**7B10****CHECK CONTACT POINT OF VALVE RELAY.**

- 1) Disconnect battery from valve relay terminals.
- 2) Measure resistance between valve relay terminals.

Terminals**No. 30 — No. 87:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 7B11.**NO** : Replace valve relay.**7B11****CHECK CONTACT POINT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

Terminals**No. 30 — No. 87a:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 7B12.**NO** : Replace valve relay.

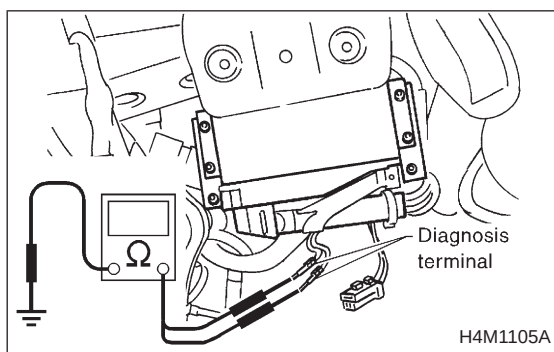
7B12 CHECK HYDRAULIC CONTROL UNIT.

- 1) Turn ignition switch to OFF.
- 2) Connect connector (ABS1) to hydraulic control unit.
- 3) Turn ignition switch to ON.

CHECK : *Is the ABS warning light off?*

YES : Go to step **7B13**.

NO : Replace hydraulic control unit and check fuse No. 19.

**7B13 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 1 Ω?*

YES : Go to step **7B14**.

NO : Repair diagnosis terminal harness.

7B14 CHECK DIAGNOSIS LINE.

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal to ABS diagnosis connector (B115) No. 2.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

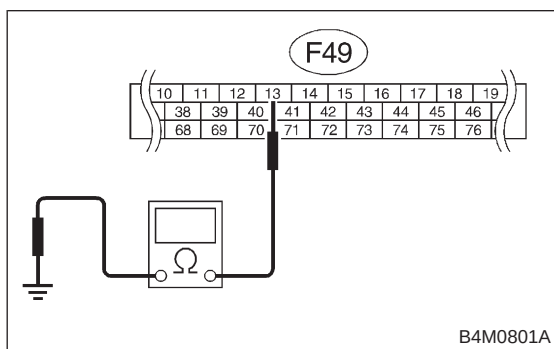
Connector & terminal

(F49) No. 13 — Chassis ground:

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

YES : Go to step **7B15**.

NO : Repair harness connector between ABSCM and ABS diagnosis connector.

**7B15 CHECK POOR CONTACT IN ABSCM CONNECTOR.**

CHECK : *Is there poor contact in ABSCM connector?*
 <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

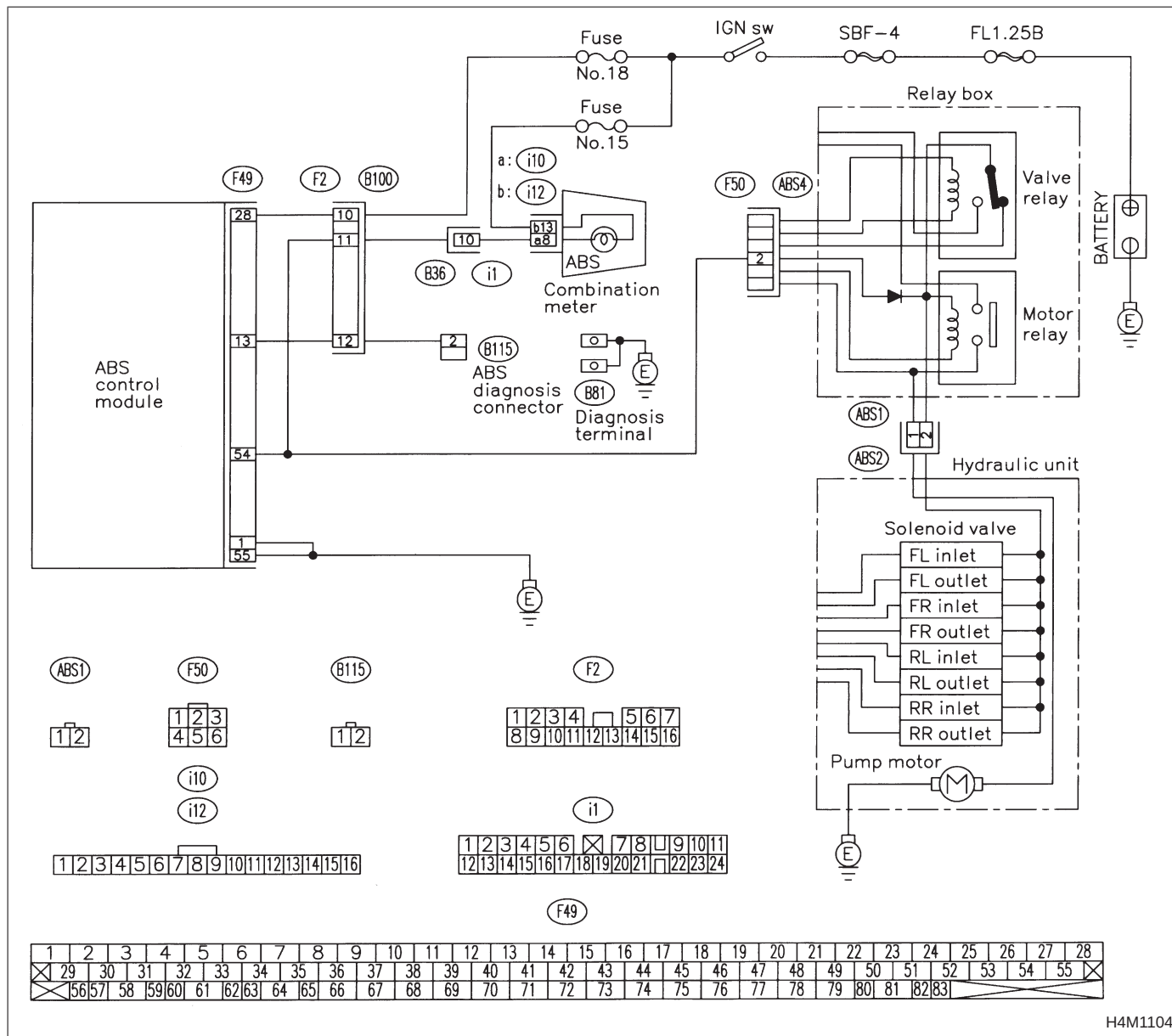
NO : Replace ABSCM.

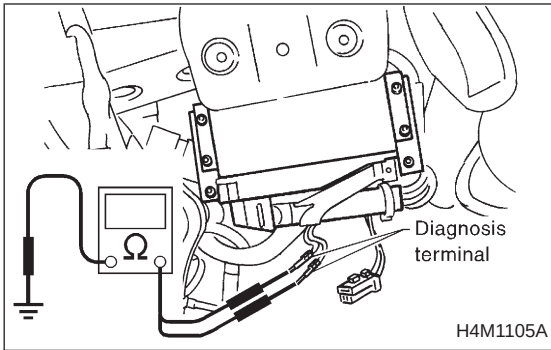
C: TROUBLE CODE DOES NOT APPEAR.**DIAGNOSIS:**

- 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:



7C1 CHECK DIAGNOSIS TERMINAL.

Measure resistance between diagnosis terminals (B81) and chassis ground.

Terminals

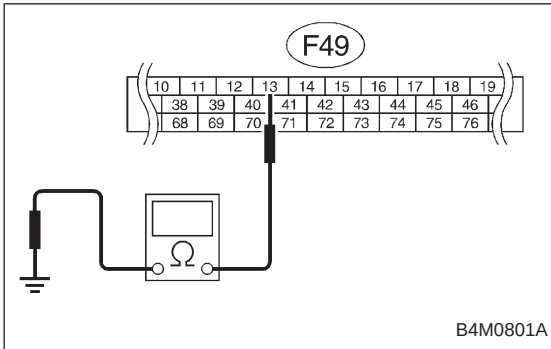
Diagnosis terminal (A) — Chassis ground:

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 to ABS diagnosis connector (B115) No. 2.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 13 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 7C3.

NO : Repair harness connector between ABSCM and ABS diagnosis connector.

7C3 CHECK POOR CONTACT IN ABSCM CONNECTOR.

CHECK : Is there poor contact in ABSCM connector?
<Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Replace ABSCM.

8. Diagnostics Chart with Trouble Code by ABS Warning Light

A: LIST OF TROUBLE CODE

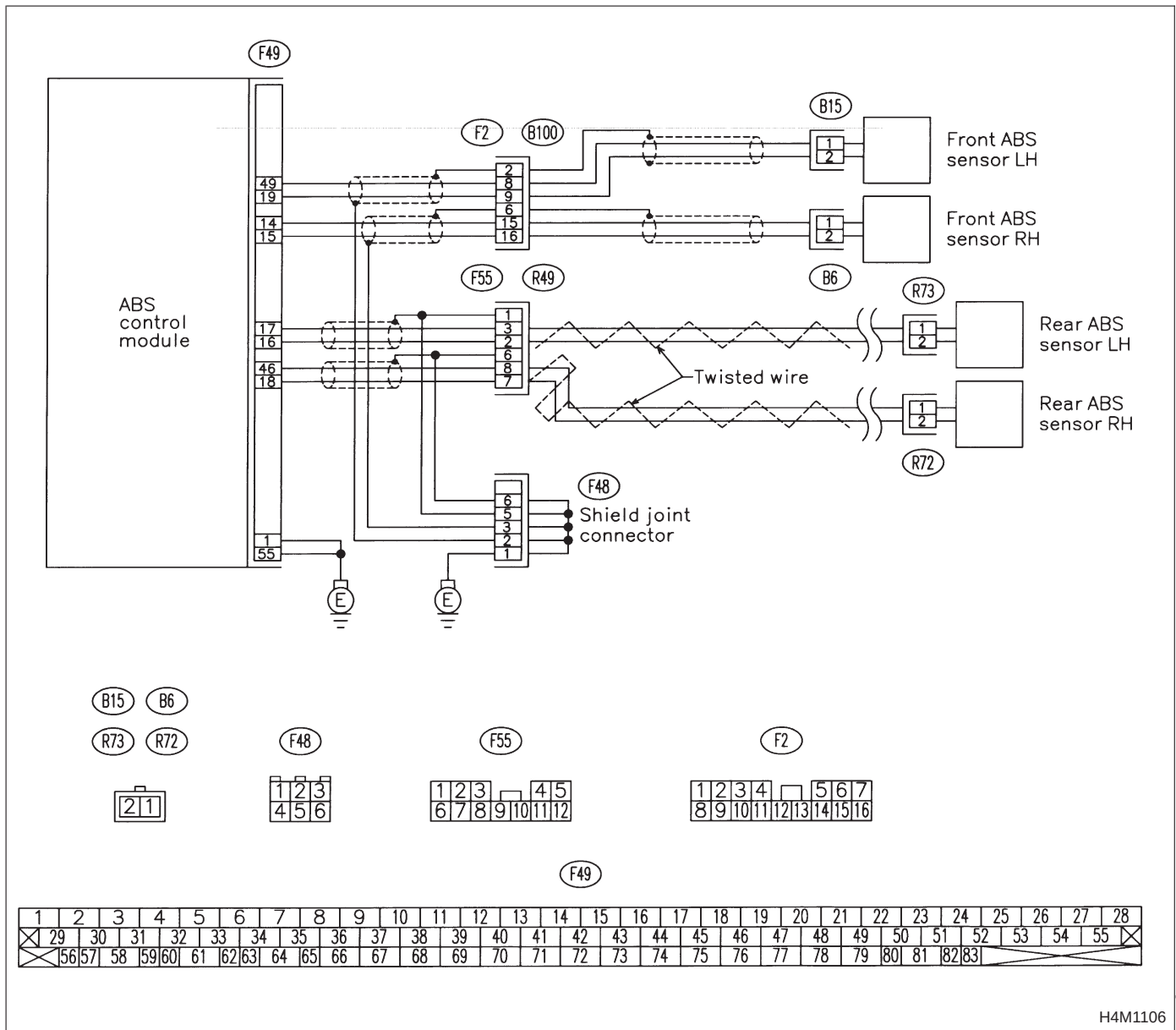
Trouble code	Contents of diagnosis		Ref. to 4-4
11	Start code ● Trouble code is shown after start code. ● Only start code is shown in normal condition.		—
21	Abnormal ABS sensor (Open circuit or input voltage too high)	Front right ABS sensor	[T8B0]
23		Front left ABS sensor	[T8C0]
25		Rear right ABS sensor	[T8D0]
27		Rear left ABS sensor	[T8E0]
22	Abnormal ABS sensor (Abnormal ABS sensor signal)	Front right ABS sensor	[T8F0]
24		Front left ABS sensor	[T8G0]
26		Rear right ABS sensor	[T8H0]
28		Rear left ABS sensor	[T8I0]
29		Any one of four	[T8J0]
31	Abnormal solenoid valve circuit(s) in hydraulic unit	Front right inlet valve	[T8K0]
32		Front right outlet valve	[T8O0]
33		Front left inlet valve	[T8L0]
34		Front left outlet valve	[T8P0]
35		Rear right inlet valve	[T8M0]
36		Rear right outlet valve	[T8Q0]
37		Rear left inlet valve	[T8N0]
38		Rear left outlet valve	[T8R0]
41	Abnormal ABS control module		[T8S0]
42	Source voltage is low.		[T8T0]
44	A combination of AT control abnormal		[T8U0]
46	Abnormal G sensor power supply voltage		[T8V0]
51	Abnormal valve relay		[T8W0]
52	Abnormal motor and/or motor relay		[T8X0]
54	Abnormal stop light switch		[T8Y0]
56	Abnormal G sensor output voltage		[T8Z0]

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:**

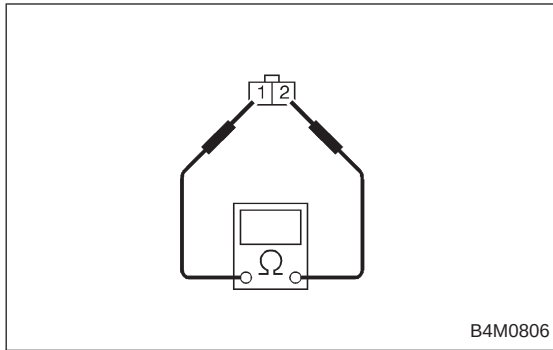
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

TROUBLE SYMPTOM:

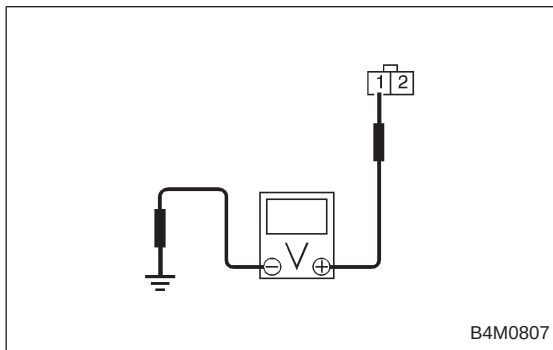
- ABS does not operate.

WIRING DIAGRAM:

H4M1106

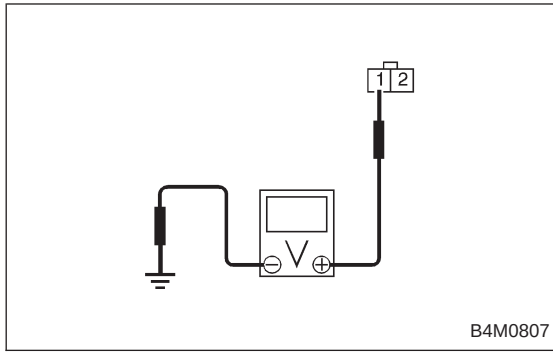
**8E1****CHECK ABS SENSOR.**

- 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.
- 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 (-):

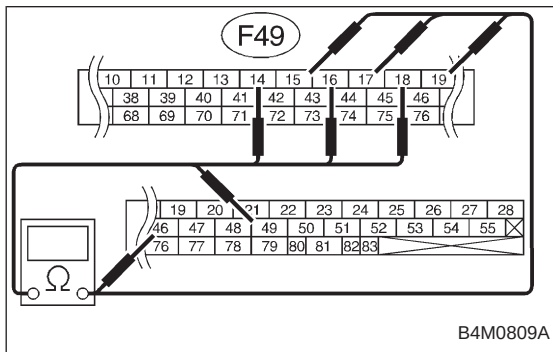
Rear RH No. 1 (+) — Chassis ground (-):

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 AND ABS SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Connect connector to ABS sensor.
- 3) Measure resistance between ABSCM connector terminals.

Connector & terminal

Trouble code 21 / (F49) No. 14 — No. 15:

Trouble code 23 / (F49) No. 49 — No. 19:

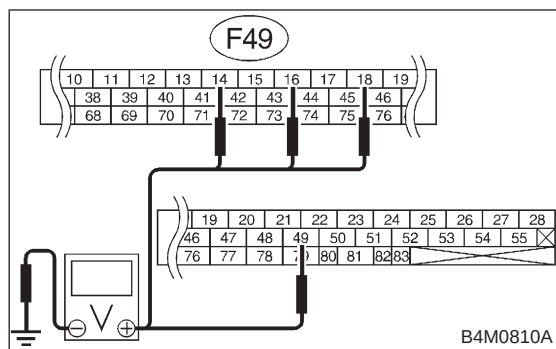
Trouble code 25 / (F49) No. 18 — No. 46:

Trouble code 27 / (F49) No. 16 — No. 17:

CHECK : Is the resistance between 0.8 and 1.2 kΩ?

YES : Go to step 8E5.

NO : Repair harness/connector between ABSCM and ABS sensor.

**8E5****CHECK BATTERY SHORT OF HARNESS.**

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 21 / (F49) No. 14 (+) — Chassis ground (-):

Trouble code 23 / (F49) No. 49 (+) — Chassis ground (-):

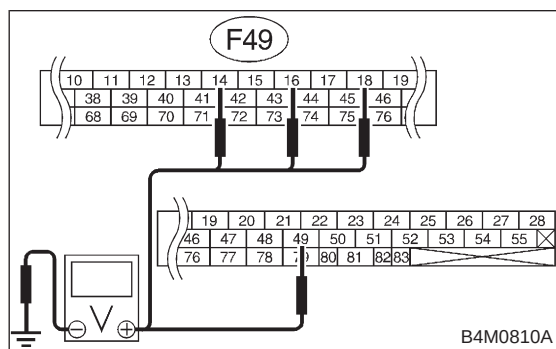
Trouble code 25 / (F49) No. 18 (+) — Chassis ground (-):

Trouble code 27 / (F49) No. 16 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8E6.

NO : Repair harness between ABSCM and ABS sensor.

**8E6****CHECK BATTERY SHORT OF HARNESS.**

1) Turn ignition switch to ON.

2) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 21 / (F49) No. 14 (+) — Chassis ground (-):

Trouble code 23 / (F49) No. 49 (+) — Chassis ground (-):

Trouble code 25 / (F49) No. 18 (+) — Chassis ground (-):

Trouble code 27 / (F49) No. 16 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8E7.

NO : Repair harness between ABSCM and ABS sensor.

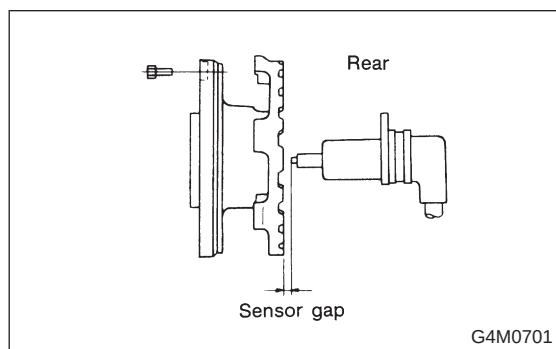
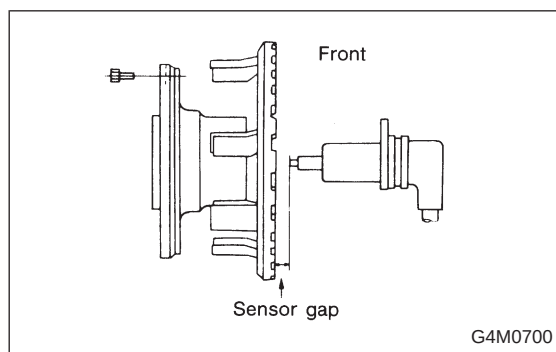
8E7**CHECK INSTALLATION OF ABS SENSOR.****Tightening torque:**

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:** **$13 \pm 3 \text{ N}\cdot\text{m}$ ($1.3 \pm 0.3 \text{ kg}\cdot\text{m}$, $9 \pm 2.2 \text{ ft}\cdot\text{lb}$)****(CHECK)** : **Are the tone wheel installation bolts tightened securely?****(YES)** : Go to step **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.

(CHECK) : **Is the gap within the specifications shown in the following table?**

	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)

(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 POOR CONTACT IN CONNECTORS.****(CHECK)** : **Is there poor contact in connectors between ABSCM and ABS sensor? <Ref. to FOREWORD [T3C1].>****(YES)** : Repair connector.**(NO)** : Go to step **8E12**.

8E12**CHECK ABSCM.**

- 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.

NO: Go to step **8E13**.**8E13****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 and ABS sensor.

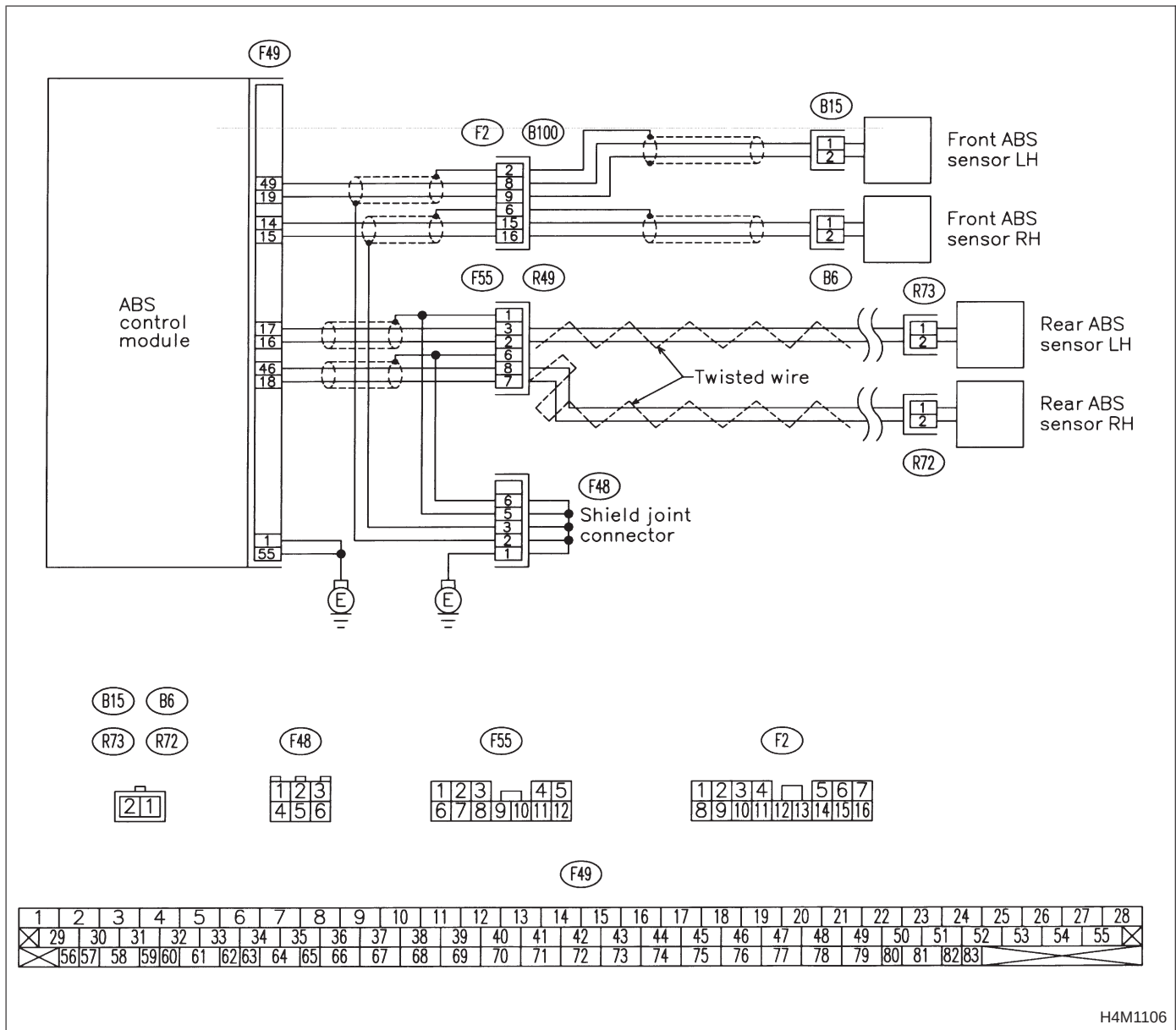
F: TROUBLE CODE 22 (FRONT RH)
G: TROUBLE CODE 24 (FRONT LH)
H: TROUBLE CODE 26 (REAR RH)
I: TROUBLE CODE 28 (REAR LH)
— ABNORMAL ABS SENSOR (ABNORMAL ABS SENSOR SIGNAL) —

DIAGNOSIS:

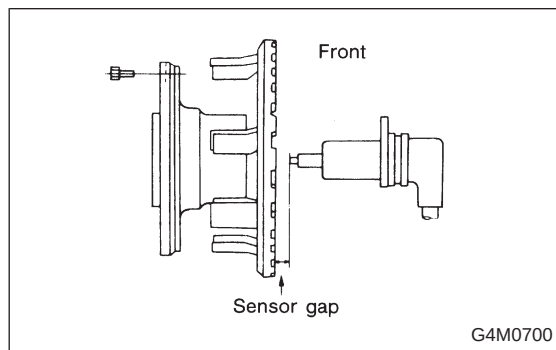
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:

H4M1106

8I1**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 8I2.**NO** : Tighten ABS sensor installation bolts securely.**8I2****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 8I3.**NO** : Tighten tone wheel installation bolts securely.**8I3****CHECK ABS SENSOR GAP.**

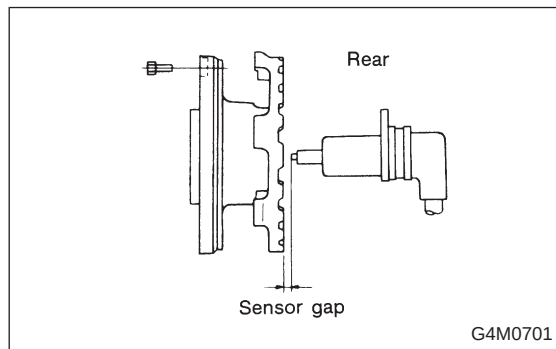
Measure tone wheel to pole piece gap over entire perimeter of the wheel.

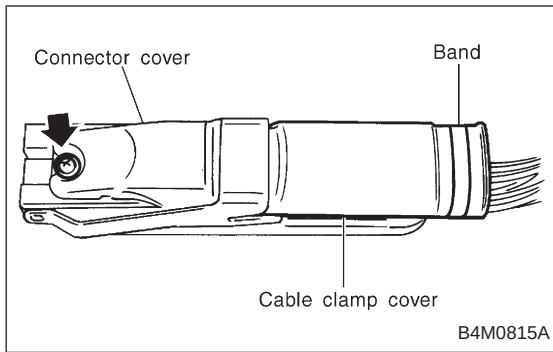
CHECK : Is the gap within the specifications shown in the following table?

	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)

YES : Go to step 8I4.**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.

**8I4****CHECK OSCILLOSCOPE.****CHECK** : Is an oscilloscope available?**YES** : Go to step 8I5.**NO** : Go to step 8I6.



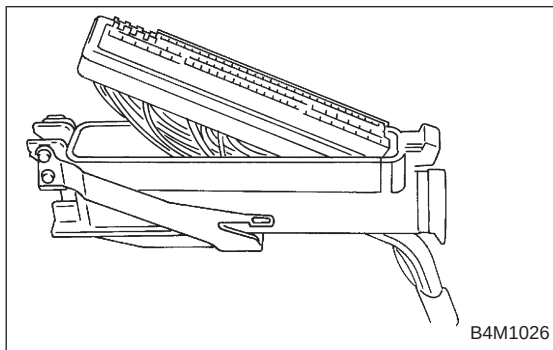
815

CHECK ABS SENSOR SIGNAL.

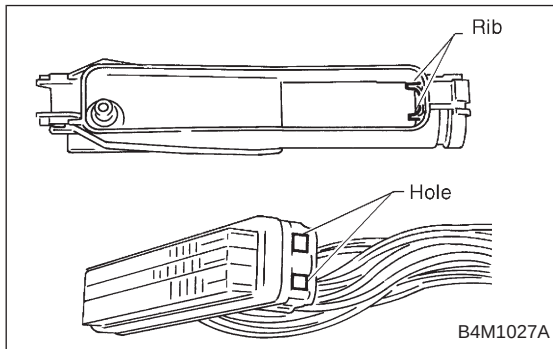
- 1) Raise all four wheels of ground.
- 2) Turn ignition switch OFF.
- 3) Disconnect connector from ABS control module.
- 4) Remove band.
- 5) Remove cable clamp cover.
- 6) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.



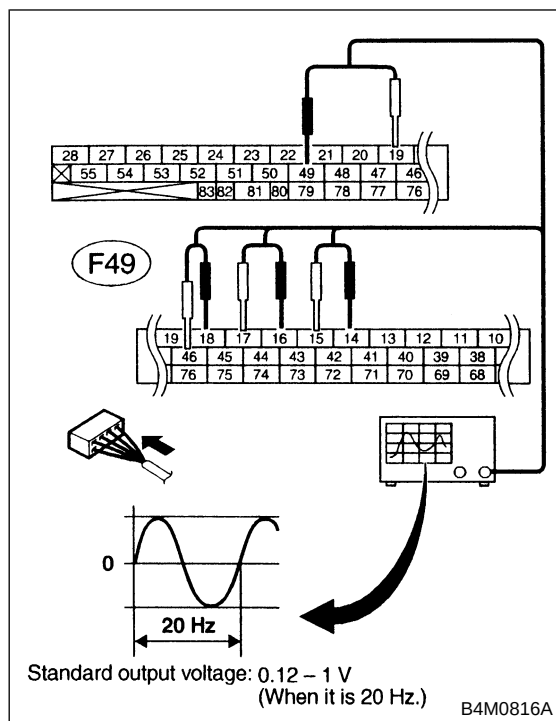
- 7) Remove connector cover.



NOTE:

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

- 8) Connect connector to ABS control module.
- 9) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
- 10) Turn ignition switch ON.



11) 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 / (F49) No. 14 (+) — No. 15 (–):

Trouble code 24 / (F49) No. 49 (+) — No. 19 (–):

Trouble code 26 / (F49) No. 18 (+) — No. 46 (–):

Trouble code 28 / (F49) No. 16 (+) — No. 17 (–):

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

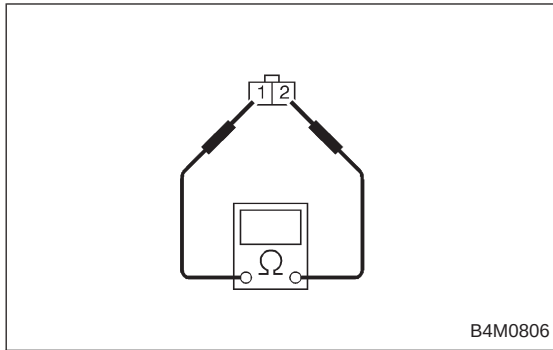
CHECK HUB RUNOUT.

Measure hub runout.

CHECK : Is the runout less than 0.05 mm (0.0020 in)?

YES : Go to step 819.

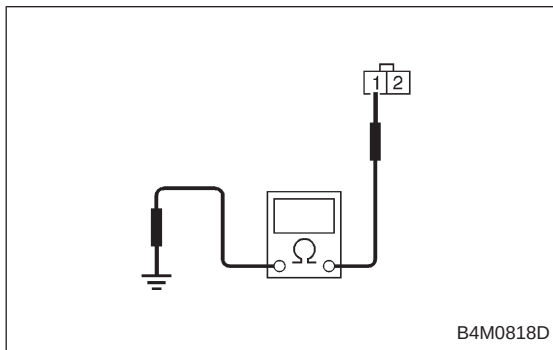
NO : Repair hub.


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.

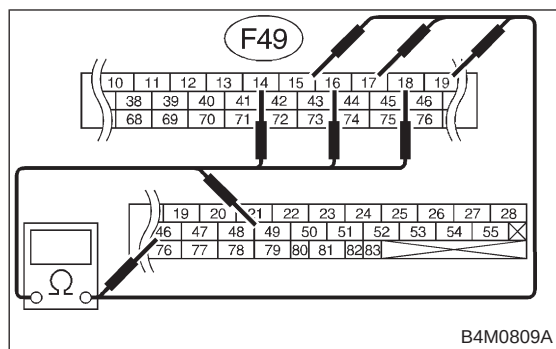
NO : Replace ABS sensor.

8I10
CHECK GROUND SHORT OF ABS SENSOR.

Measure resistance between ABS sensor and chassis ground.

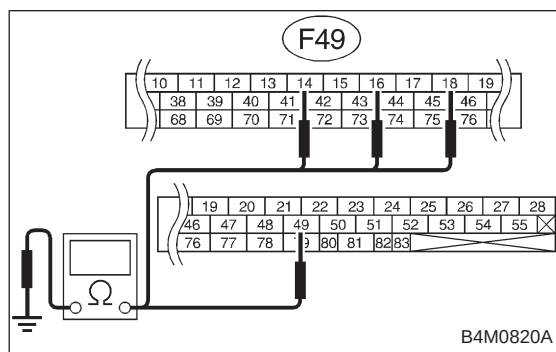
Terminal
Front RH No. 1 — Chassis ground:
Front LH No. 1 — Chassis ground:
Rear RH No. 1 — Chassis ground:
Rear LH No. 1 — Chassis ground:
CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8I11.

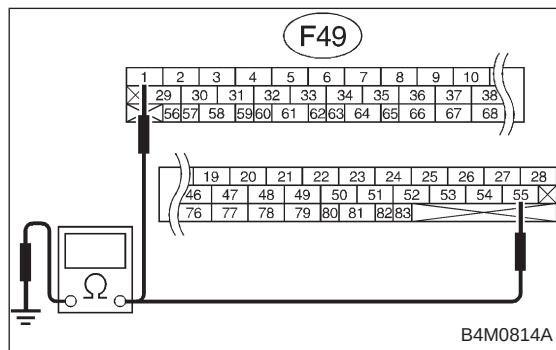
NO : Replace ABS sensor.

**8I11****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

- 1) Connect connector to ABS sensor.
- 2) Disconnect connector from ABS control module.
- 3) Measure resistance at ABSCM connector terminals.

Connector & terminal**Trouble code 22 / (F49) No. 14 — No. 15:****Trouble code 24 / (F49) No. 49 — No. 19:****Trouble code 26 / (F49) No. 18 — No. 46:****Trouble code 28 / (F49) No. 16 — No. 17:****CHECK** : Is the resistance between 0.8 and 1.2 kΩ?**YES** : Go to step 8I12.**NO** : Repair harness/connector between ABSCM and ABS sensor.**8I12****CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

Connector & terminal**Trouble code 22 / (F49) No. 14 — Chassis ground:****Trouble code 24 / (F49) No. 49 — Chassis ground:****Trouble code 26 / (F49) No. 18 — Chassis ground:****Trouble code 28 / (F49) No. 16 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 8I13.**NO** : Repair harness/connector between ABSCM and ABS sensor.**8I13****CHECK GROUND CIRCUIT OF ABSCM.**

Measure resistance between ABSCM and chassis ground.

Connector & terminal**(F49) No. 1 — GND:****(F49) No. 55 — GND:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 8I14.**NO** : Repair ABSCM ground harness.

8I14**CHECK POOR CONTACT IN CONNECTORS.****CHECK**: *Is there poor contact in connectors between ABSCM and ABS sensor? <Ref. to FOREWORD [T3C1].>***YES**

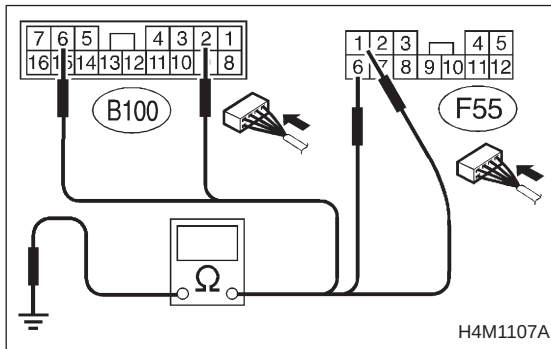
: Repair connector.

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. 6 — Chassis ground:****Trouble code 24 / (B100) No. 2 — Chassis ground:****Trouble code 26 / (F55) No. 6 — Chassis ground:****Trouble code 28 / (F55) No. 1 — Chassis ground:****CHECK**: *Is the resistance less than 0.5 Ω?***YES**: Go to step **8I18**.**NO**

: Repair shield harness.

8I18**CHECK ABSCM.**

- 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.

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) —

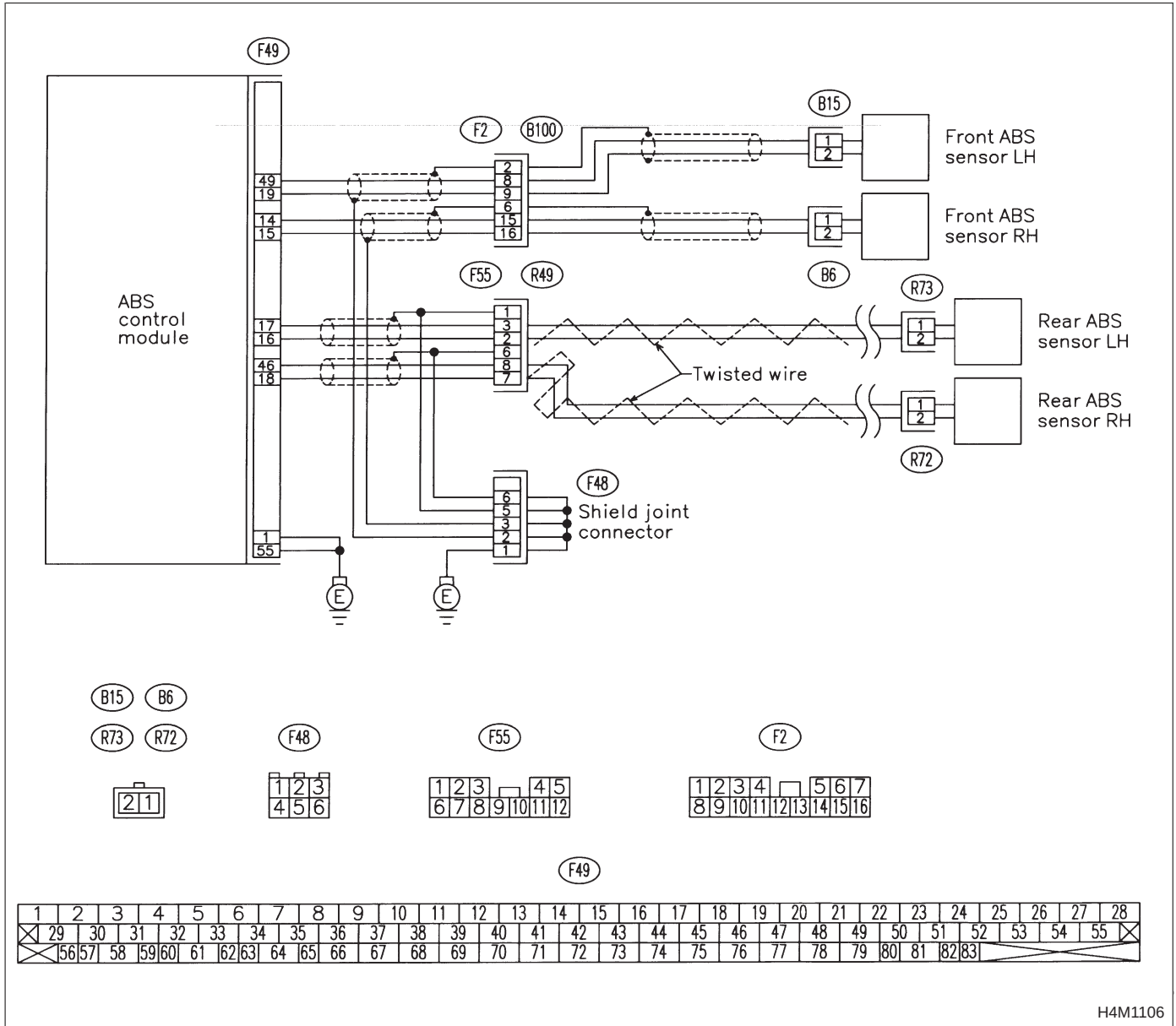
DIAGNOSIS:

- 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:



H4M1106

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.

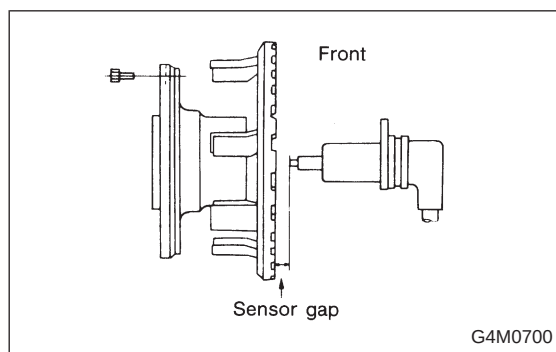
Tightening torque:

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:** **$13 \pm 3 \text{ N}\cdot\text{m}$ ($1.3 \pm 0.3 \text{ kg}\cdot\text{m}$, $9 \pm 2.2 \text{ ft}\cdot\text{lb}$)****(CHECK)** : **Are the tone wheel installation bolts tightened securely?****(YES)** : Go to step **8J7**.**(NO)** : Tighten tone wheel installation bolts securely.**8J7****CHECK ABS SENSOR GAP.**

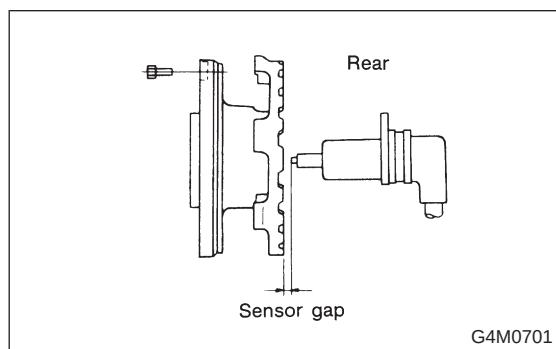
Measure tone wheel to pole piece gap over entire perimeter of the wheel.

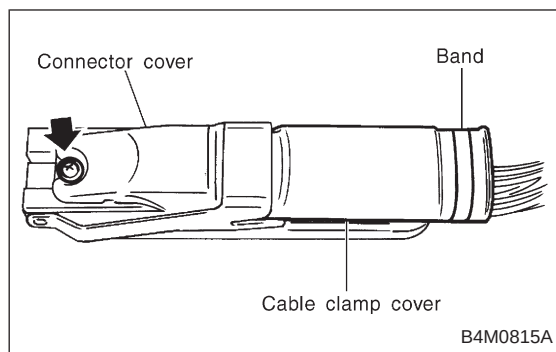
(CHECK) : **Is the gap within the specifications shown in the following table?**

	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)

(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.

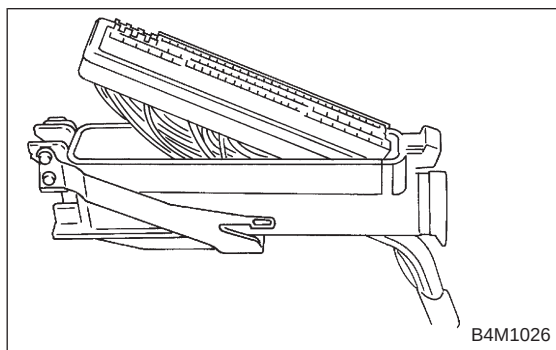
**8J8****CHECK OSCILLOSCOPE.****(CHECK)** : **Is an oscilloscope available?****(YES)** : Go to step **8J9**.**(NO)** : Go to step **8J10**.

**8J9****CHECK ABS SENSOR SIGNAL.**

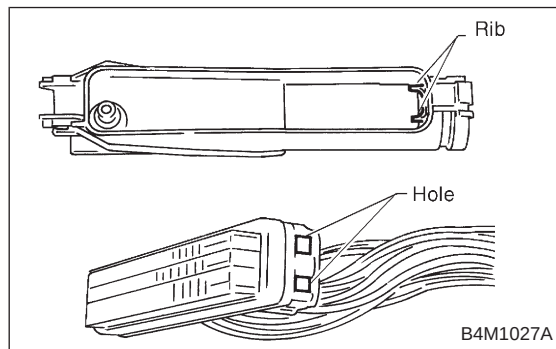
- 1) Raise all four wheels of ground.
- 2) Turn ignition switch OFF.
- 3) Disconnect connector from ABS control module.
- 4) Remove band.
- 5) Remove cable clamp cover.
- 6) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.

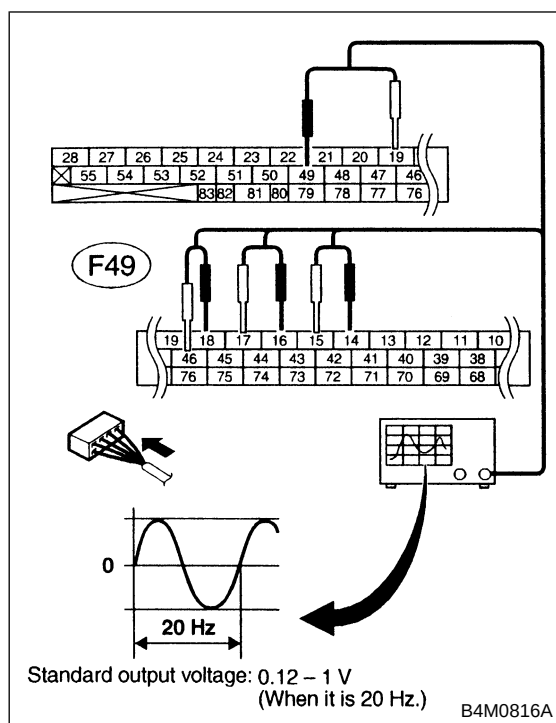


- 7) Remove connector cover.

**NOTE:**

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

- 8) Connect connector to ABS control module.
- 9) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
- 10) Turn ignition switch ON.



11) 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

(F49) No. 14 (+) — No. 15 (–) (Front RH):

(F49) No. 49 (+) — No. 19 (–) (Front LH):

(F49) No. 18 (+) — No. 46 (–) (Rear RH):

(F49) No. 16 (+) — No. 17 (–) (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.

- 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.

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.

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 HYDRAULIC UNIT —

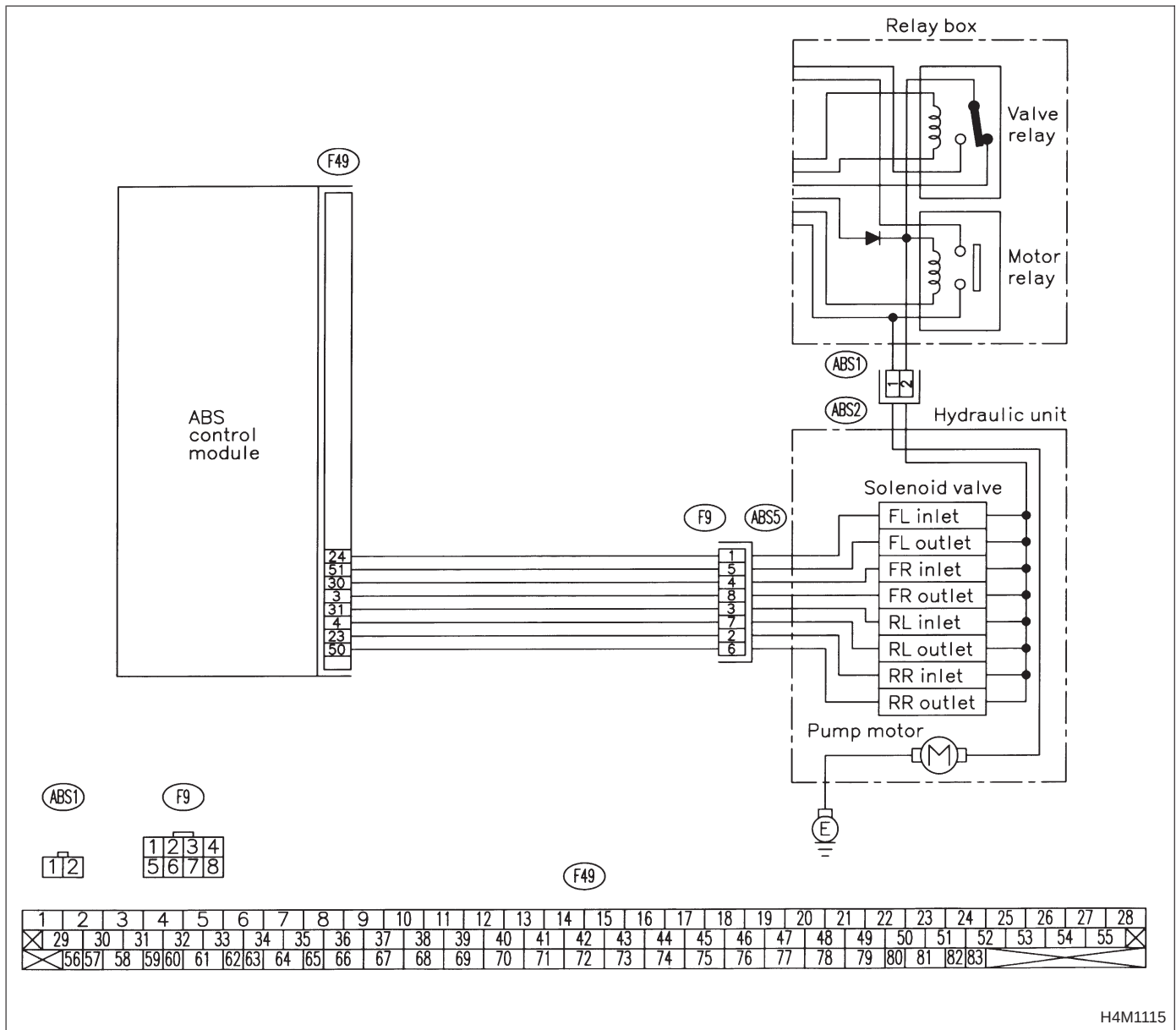
DIAGNOSIS:

- Faulty harness/connector
- Faulty inlet solenoid valve in hydraulic unit

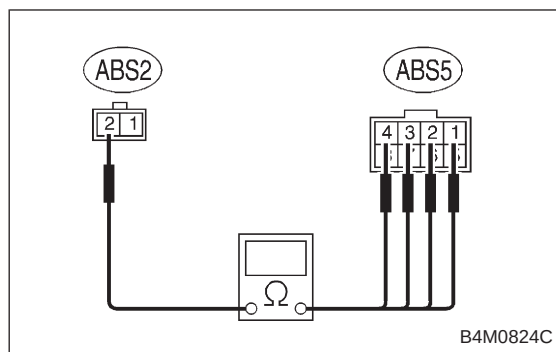
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1115

**8N1****CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 — (ABS2) No. 2:

Trouble code 33 / (ABS5) No. 1 — (ABS2) No. 2:

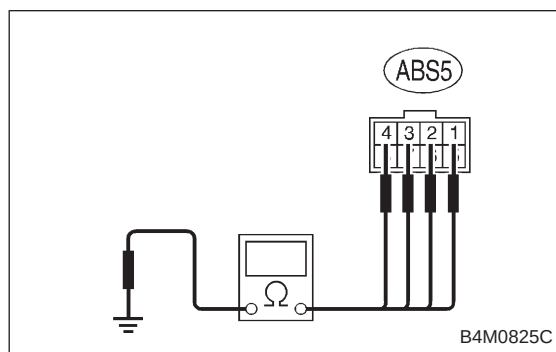
Trouble code 35 / (ABS5) No. 2 — (ABS2) No. 2:

Trouble code 37 / (ABS5) No. 3 — (ABS2) No. 2:

CHECK : Is the resistance between 7.8 and 9.2 Ω ?

YES : Go to step 8N2.

NO : Replace hydraulic unit.

**8N2****CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 — Chassis ground:

Trouble code 33 / (ABS5) No. 1 — Chassis ground:

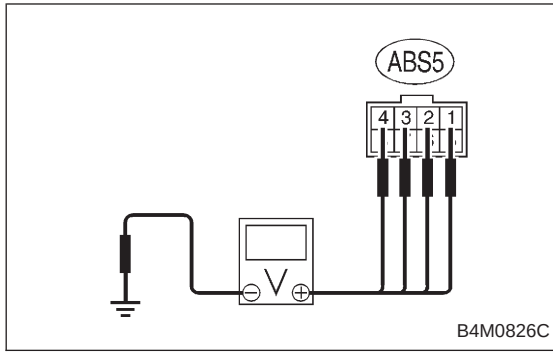
Trouble code 35 / (ABS5) No. 2 — Chassis ground:

Trouble code 37 / (ABS5) No. 3 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 8N3.

NO : Replace hydraulic unit.



8N3

CHECK BATTERY SHORT OF SOLENOID VALVE.

- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 (+) — Chassis ground (-):

Trouble code 33 / (ABS5) No. 1 (+) — Chassis ground (-):

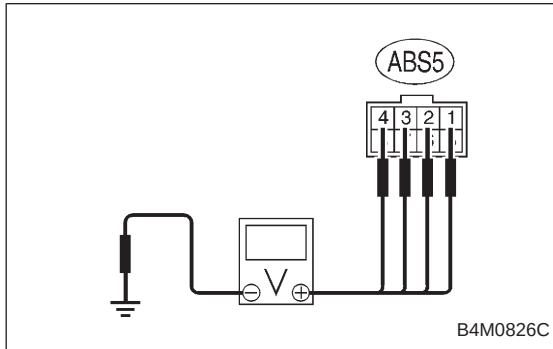
Trouble code 35 / (ABS5) No. 2 (+) — Chassis ground (-):

Trouble code 37 / (ABS5) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8N4.

NO : Replace hydraulic unit.



8N4

CHECK BATTERY SHORT OF SOLENOID VALVE.

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

Connector & terminal

Trouble code 31 / (ABS5) No. 4 (+) — Chassis ground (-):

Trouble code 33 / (ABS5) No. 1 (+) — Chassis ground (-):

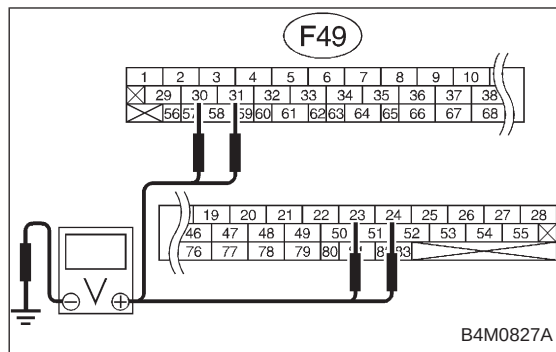
Trouble code 35 / (ABS5) No. 2 (+) — Chassis ground (-):

Trouble code 37 / (ABS5) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8N5.

NO : Replace hydraulic unit.

**8N5****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 31 / (F49) No. 30 (+) — Chassis ground (-):

Trouble code 33 / (F49) No. 24 (+) — Chassis ground (-):

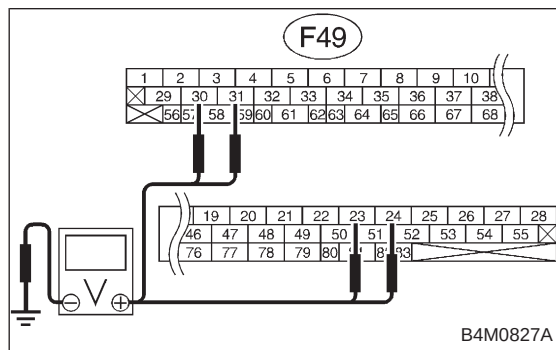
Trouble code 35 / (F49) No. 23 (+) — Chassis ground (-):

Trouble code 37 / (F49) No. 31 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8N6.

NO : Repair harness between ABSCM and hydraulic unit.

**8N6****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 31 / (F49) No. 30 (+) — Chassis ground (-):

Trouble code 33 / (F49) No. 24 (+) — Chassis ground (-):

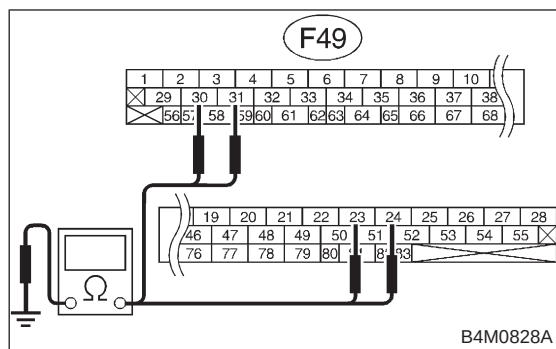
Trouble code 35 / (F49) No. 23 (+) — Chassis ground (-):

Trouble code 37 / (F49) No. 31 (+) — Chassis ground (-):

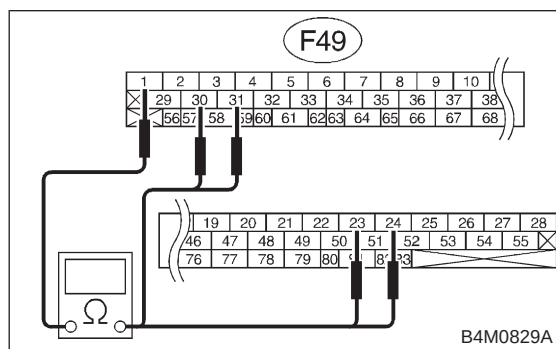
CHECK : Is the voltage less than 1 V?

YES : Go to step 8N7.

NO : Repair harness between ABSCM and hydraulic unit.

**8N7****CHECK GROUND SHORT OF HARNESS.**

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

Connector & terminal**Trouble code 31 / (F49) No. 30 — Chassis ground:****Trouble code 33 / (F49) No. 24 — Chassis ground:****Trouble code 35 / (F49) No. 23 — Chassis ground:****Trouble code 37 / (F49) No. 31 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 8N8.**NO** : Repair harness between ABSCM and hydraulic unit.**8N8****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**Trouble code 31 / (F49) No. 30 — No. 1:****Trouble code 33 / (F49) No. 24 — No. 1:****Trouble code 35 / (F49) No. 23 — No. 1:****Trouble code 37 / (F49) No. 31 — No. 1:****CHECK** : Is the resistance between 8.3 and 9.7 Ω?**YES** : Go to step 8N9.**NO** : Repair harness/connector between ABSCM and hydraulic unit.**8N9****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>**YES** : Repair connector.**NO** : Go to step 8N10.

8N10	CHECK ABSCM.

- 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.

NO : Go to step **8N11**.

8N11	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 HYDRAULIC UNIT —

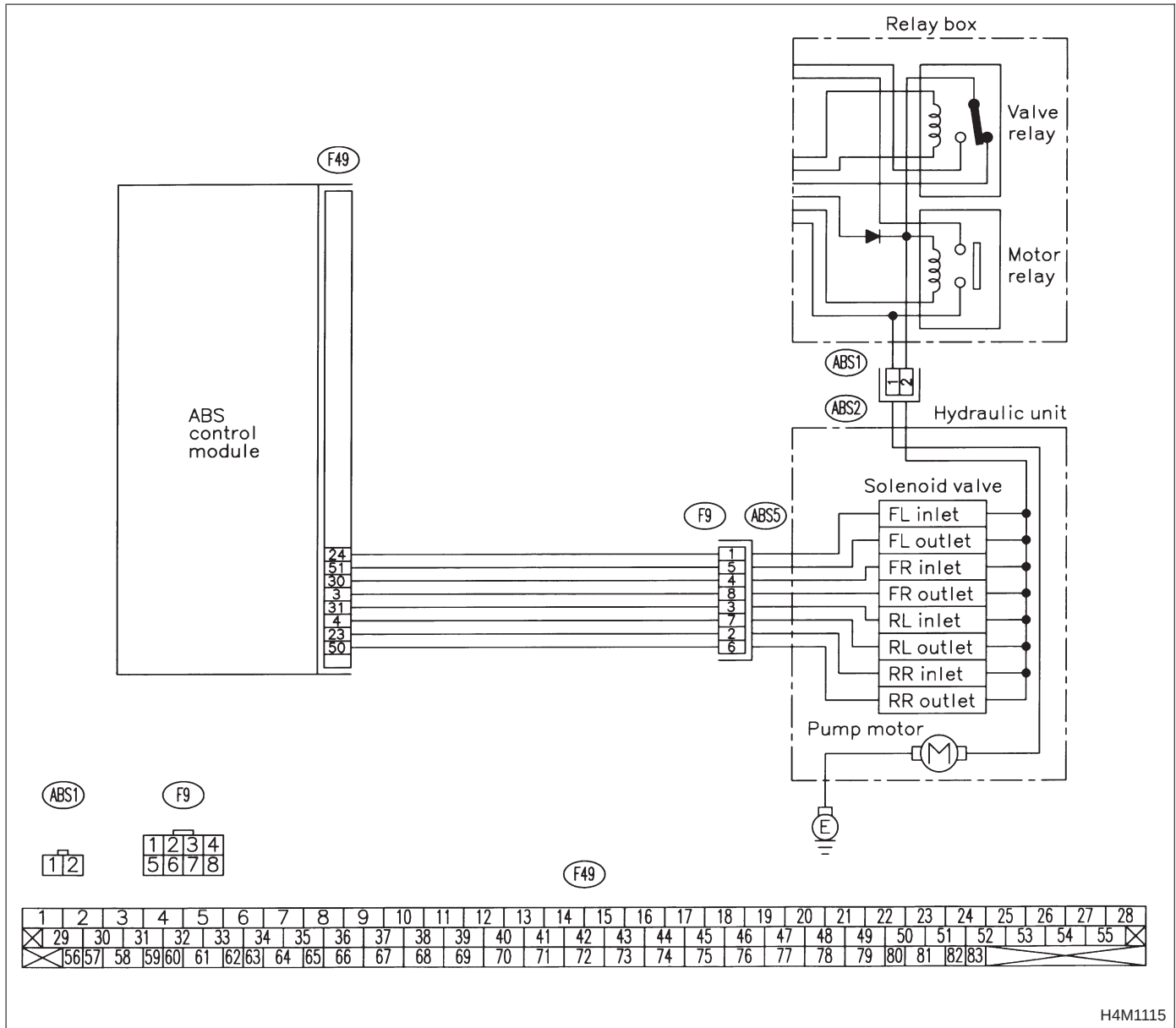
DIAGNOSIS:

- Faulty harness/connector
- Faulty outlet solenoid valve in hydraulic unit

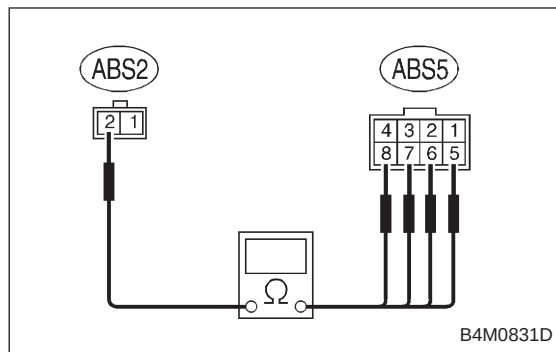
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1115

**8R1****CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 — (ABS2) No. 2:

Trouble code 34 / (ABS5) No. 5 — (ABS2) No. 2:

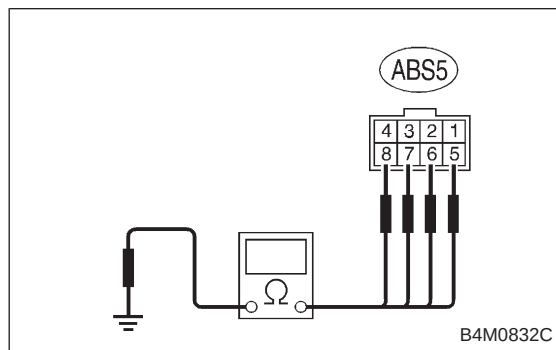
Trouble code 36 / (ABS5) No. 6 — (ABS2) No. 2:

Trouble code 38 / (ABS5) No. 7 — (ABS2) No. 2:

CHECK : Is the resistance between 3.8 and 4.8 Ω ?

YES : Go to step 8R2.

NO : Replace hydraulic unit.

**8R2****CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 — Chassis ground:

Trouble code 34 / (ABS5) No. 5 — Chassis ground:

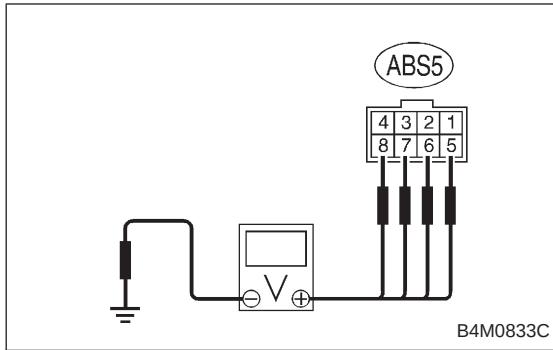
Trouble code 36 / (ABS5) No. 6 — Chassis ground:

Trouble code 38 / (ABS5) No. 7 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 8R3.

NO : Replace hydraulic unit.



8R3

CHECK BATTERY SHORT OF SOLENOID VALVE.

- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 (+) — Chassis ground (-):

Trouble code 34 / (ABS5) No. 5 (+) — Chassis ground (-):

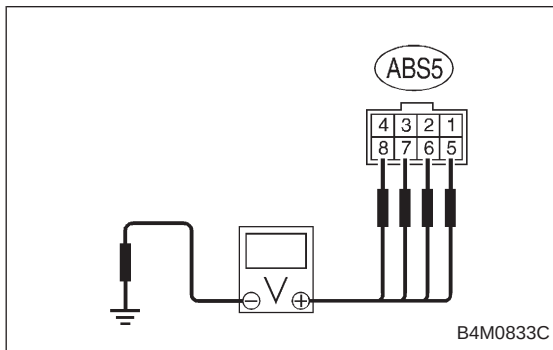
Trouble code 36 / (ABS5) No. 6 (+) — Chassis ground (-):

Trouble code 38 / (ABS5) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8R4.

NO : Replace hydraulic unit.



8R4

CHECK BATTERY SHORT OF SOLENOID VALVE.

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

Connector & terminal

Trouble code 32 / (ABS5) No. 8 (+) — Chassis ground (-):

Trouble code 34 / (ABS5) No. 5 (+) — Chassis ground (-):

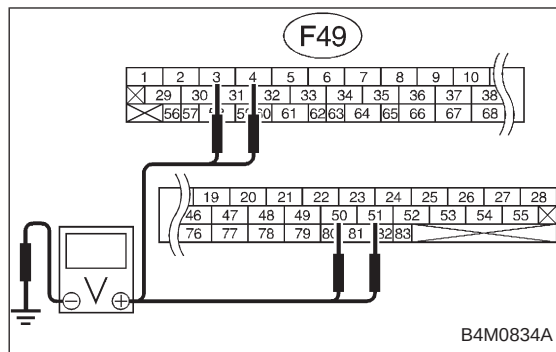
Trouble code 36 / (ABS5) No. 6 (+) — Chassis ground (-):

Trouble code 38 / (ABS5) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8R5.

NO : Replace hydraulic unit.

**8R5****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 (+) — Chassis ground (-):

Trouble code 34 / (F49) No. 51 (+) — Chassis ground (-):

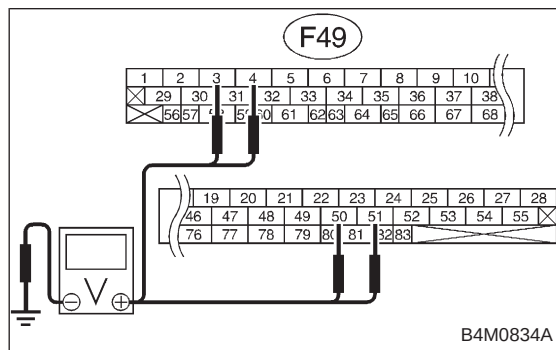
Trouble code 36 / (F49) No. 50 (+) — Chassis ground (-):

Trouble code 38 / (F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8R6.

NO : Repair harness between ABSCM and hydraulic unit.

**8R6****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 (+) — Chassis ground (-):

Trouble code 34 / (F49) No. 51 (+) — Chassis ground (-):

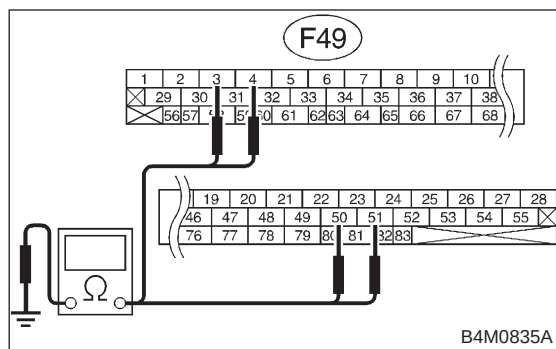
Trouble code 36 / (F49) No. 50 (+) — Chassis ground (-):

Trouble code 38 / (F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8R7.

NO : Repair harness between ABSCM and hydraulic unit.


8R7
CHECK GROUND SHORT OF HARNESS.

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

Connector & terminal

Trouble code 32 / (F49) No. 3 — Chassis ground:

Trouble code 34 / (F49) No. 51 — Chassis ground:

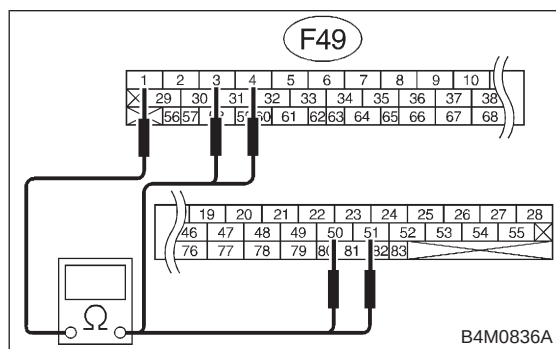
Trouble code 36 / (F49) No. 50 — Chassis ground:

Trouble code 38 / (F49) No. 4 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8R8.

NO : Repair harness between ABSCM and hydraulic unit.


8R8
CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal

Trouble code 32 / (F49) No. 3 — No. 1:

Trouble code 34 / (F49) No. 51 — No. 1:

Trouble code 36 / (F49) No. 50 — No. 1:

Trouble code 38 / (F49) No. 4 — No. 1:

CHECK : Is the resistance between 4.3 and 5.3 Ω?

YES : Go to step 8R9.

NO : Repair harness/connector between ABSCM and hydraulic unit.

8R9
CHECK POOR CONTACT IN CONNECTORS.

CHECK : Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 8R10.

8R10**CHECK ABSCM.**

- 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.

NO: Go to step **8R11**.**8R11****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 —

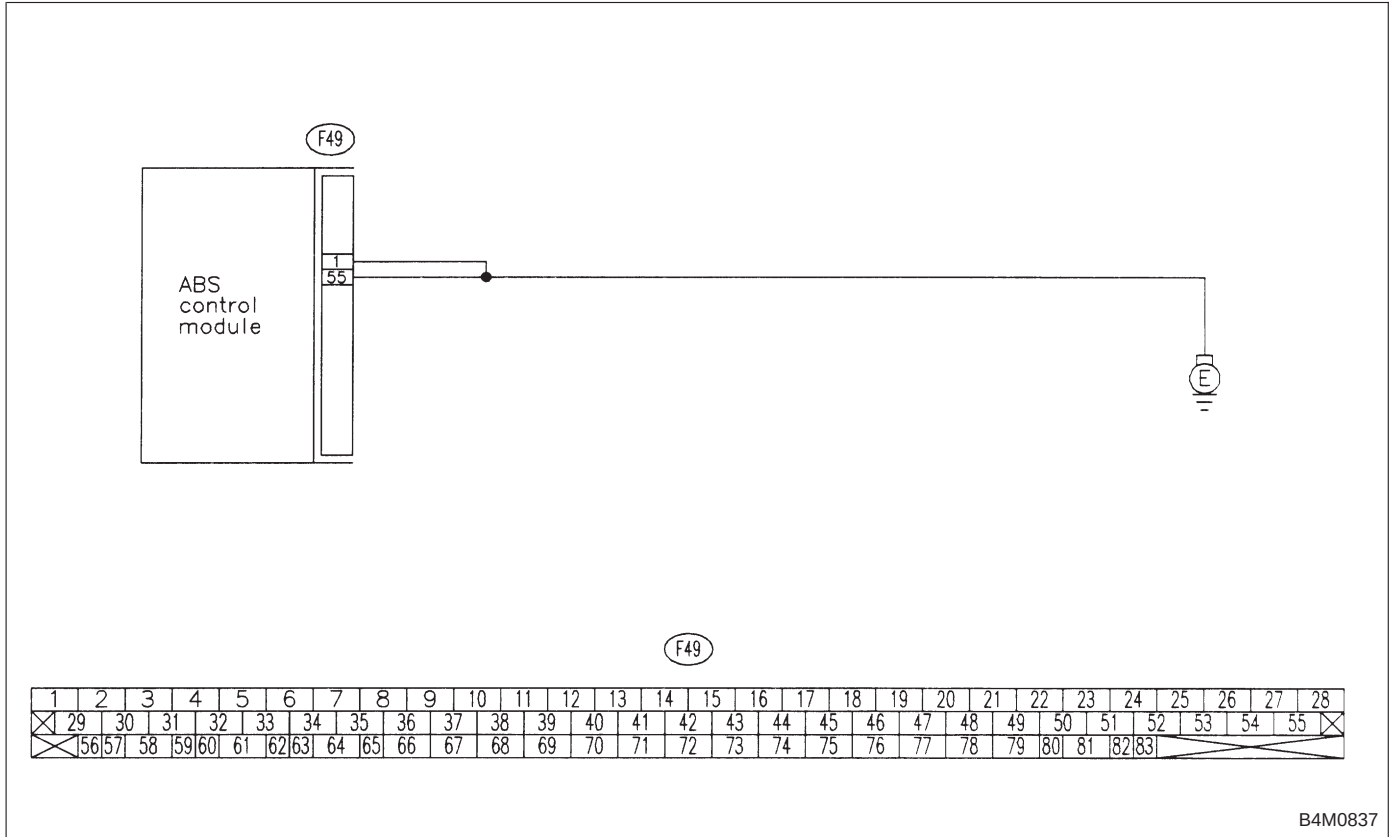
DIAGNOSIS:

- Faulty ABSCM

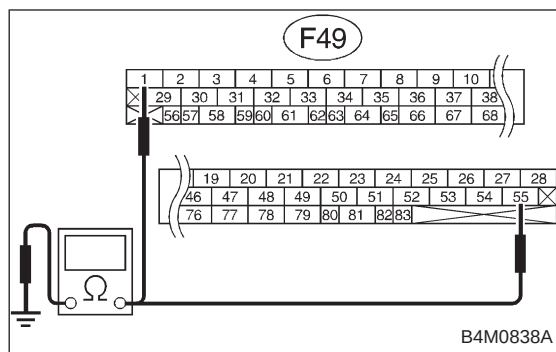
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



B4M0837

**8S1****CHECK GROUND CIRCUIT OF ABSCm.**

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

Connector & terminal**(F49) No. 1 — Chassis ground:****(F49) No. 55 — Chassis ground:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 8S2.**NO** : Repair ABSCm ground harness.**8S2****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : Is there poor contact in connectors between battery, ignition switch and ABSCm? <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.**

- 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.**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.**

T: TROUBLE CODE 42

— SOURCE VOLTAGE IS LOW. —

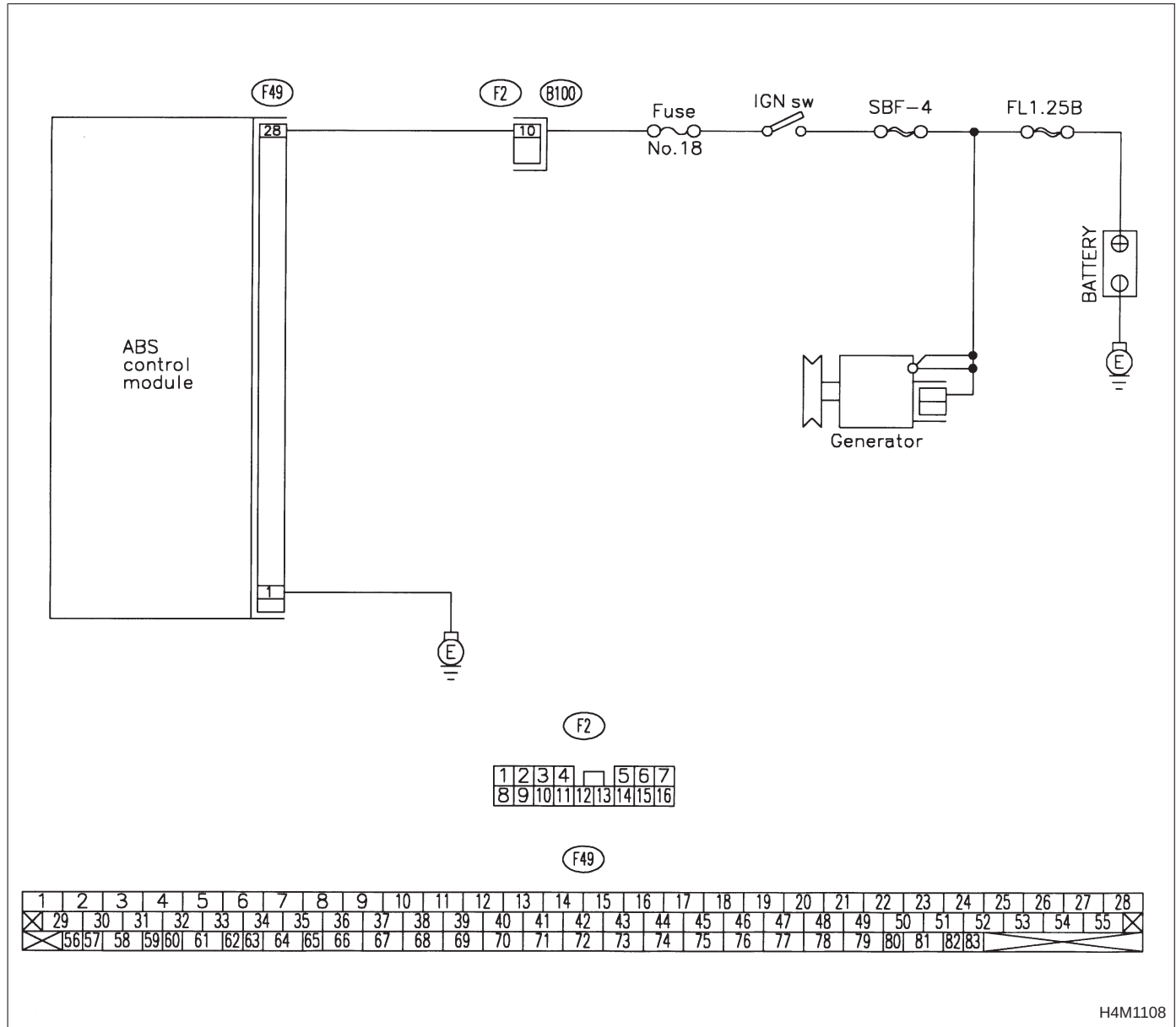
DIAGNOSIS:

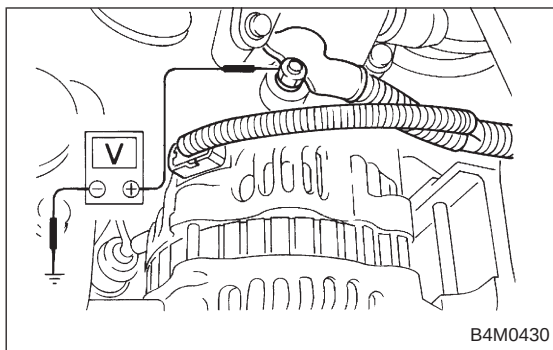
- Power source voltage of the ABSCM is low.

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 15 V?

YES : Go to step 8T2.

NO : Repair generator.

8T2

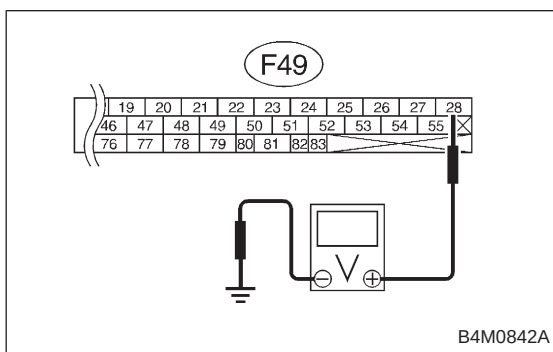
CHECK BATTERY TERMINAL.

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.

- 1) Disconnect connector from ABSCM.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCM connector and chassis ground.

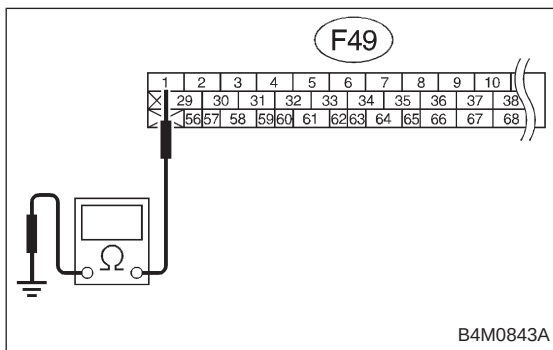
Connector & terminal

(F49) No. 28 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 15 V?

YES : Go to step 8T4.

NO : Repair harness connector between battery, ignition switch and ABSCM.



8T4

CHECK GROUND CIRCUIT OF ABSCM.

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

Connector & terminal

(F49) No. 1 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 8T5.

NO : Repair ABSCM ground harness.

8T5	CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between generator, battery and ABSCM? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **8T6**.

8T6	CHECK ABSCM.

- 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.

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.

**U: TROUBLE CODE 44
— A COMBINATION OF AT CONTROL
ABNORMAL —**

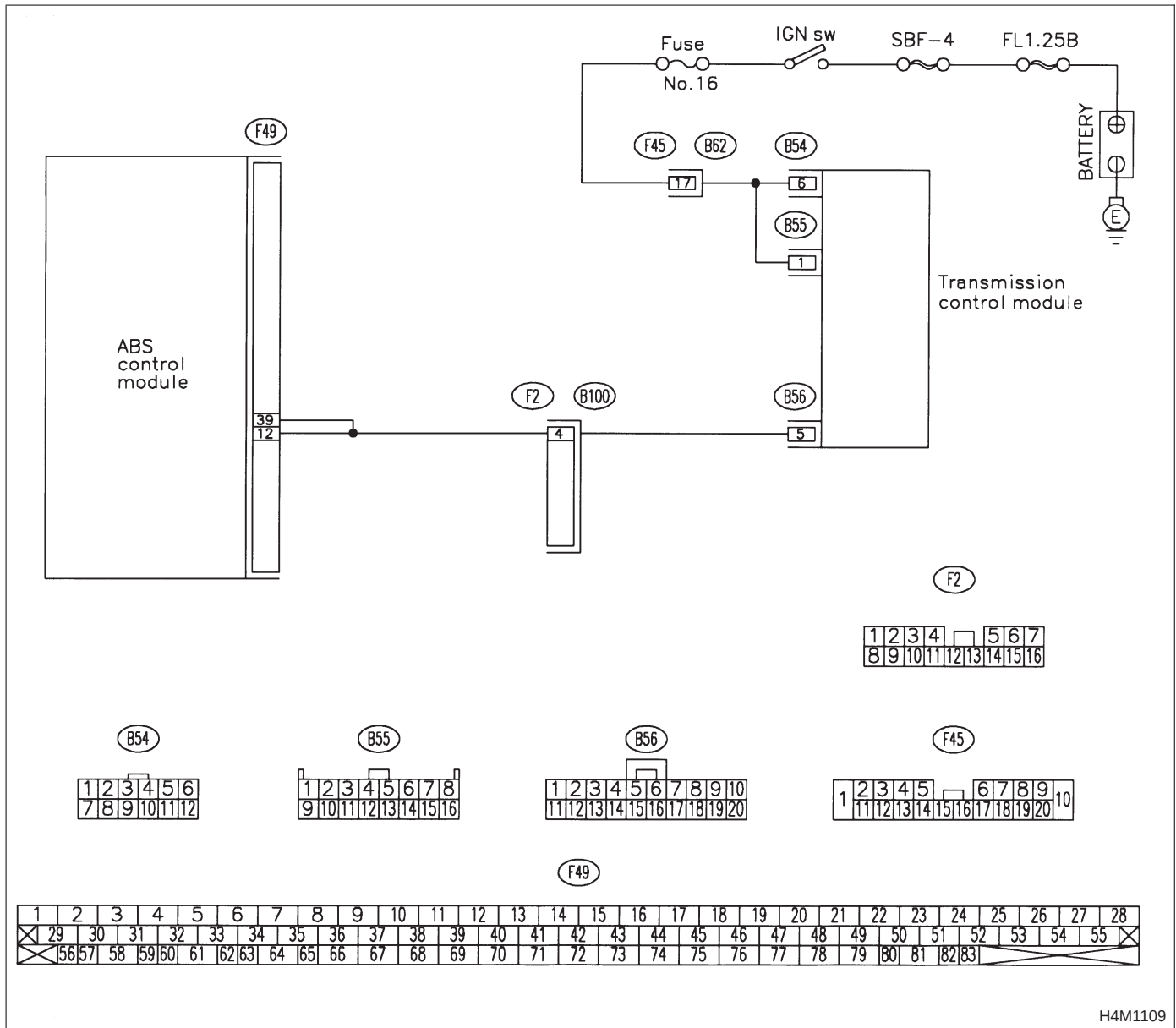
DIAGNOSIS:

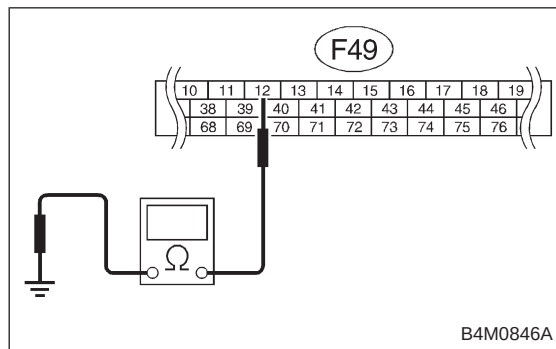
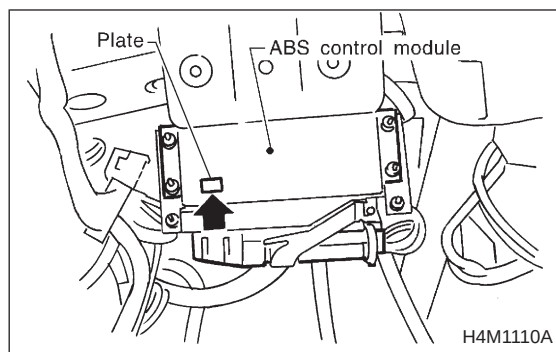
- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



**8U1****CHECK SPECIFICATIONS OF THE ABSCM.**

Check specifications of the plate attached to the ABSCM.

CHECK : *Is an ABSCM for AT model installed on a MT model?*

YES : Replace ABSCM.

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.
- 4) Measure resistance between ABSCM connector and chassis ground.

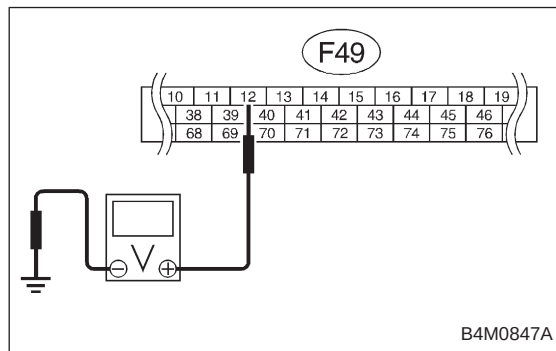
Connector & terminal

(F49) No. 12 — Chassis ground:

CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **8U3**.

NO : Repair harness between TCM and ABSCM.

**8U3****CHECK BATTERY SHORT OF HARNESS.**

Measure voltage between ABSCM connector and chassis ground.

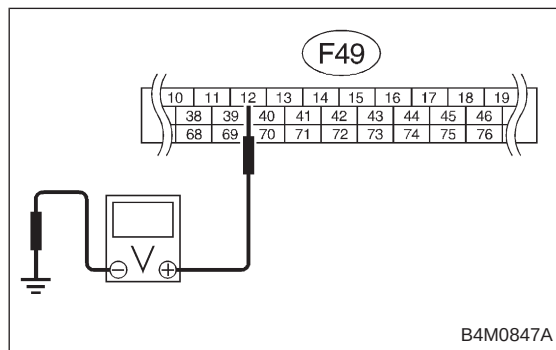
Connector & terminal

(F49) No. 12 (+) — Chassis ground (-):

CHECK : *Is the voltage less than 1 V?*

YES : Go to step **8U4**.

NO : Repair harness between TCM and ABSCM.

**8U4****CHECK BATTERY SHORT OF HARNESS.**

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

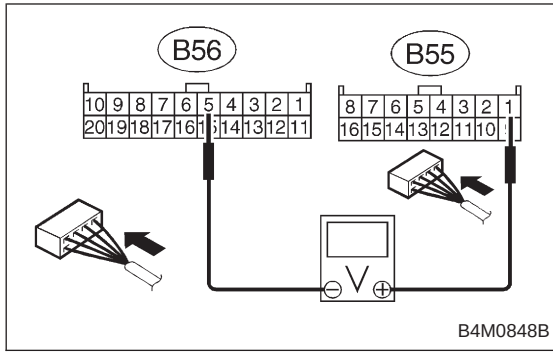
Connector & terminal

(F49) No. 12 (+) — Chassis ground (-):

CHECK : *Is the voltage less than 1 V?*

YES : Go to step **8U5**.

NO : Repair harness between TCM and ABSCM.



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 terminals.

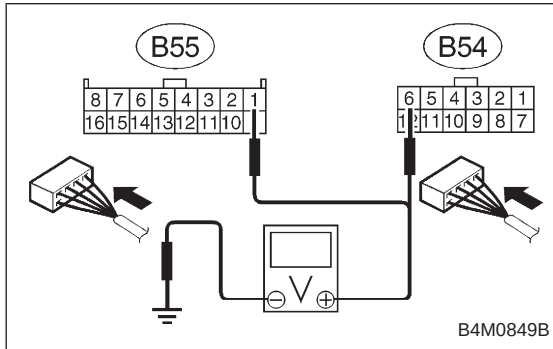
Connector & terminal

(B55) No. 1 (+) — (B56) No. 5 (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Go to step 8U7.

NO : Go to step 8U6.



8U6 CHECK TCM.

Measure voltage between TCM connector and chassis ground.

Connector & terminal

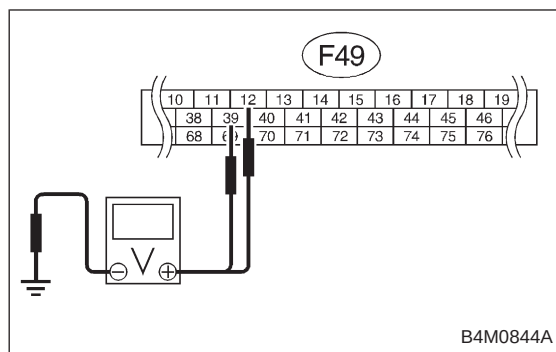
(B54) No. 6 (+) — Chassis ground (-):

(B55) No. 1 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Replace TCM.

NO : Repair harness/connector between battery, ignition switch and TCM.

**8U7****CHECK OPEN CIRCUIT OF HARNESS.**

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 12 (+) — Chassis ground (–):

(F49) No. 39 (+) — Chassis ground (–):

CHECK : **Is the voltage between 10 V and 13 V?**

YES : Go to step **8U8**.

NO : Repair harness/connector between TCM and ABSCM.

8U8**CHECK POOR CONTACT IN CONNECTORS.**

CHECK : **Is there poor contact in connectors between TCM and ABSCM? <Ref. to FOREWORD [T3C1].>**

YES : Repair connector.

NO : Go to step **8U9**.

8U9**CHECK ABSCM.**

- 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.

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 46

— ABNORMAL G SENSOR POWER SUPPLY VOLTAGE —

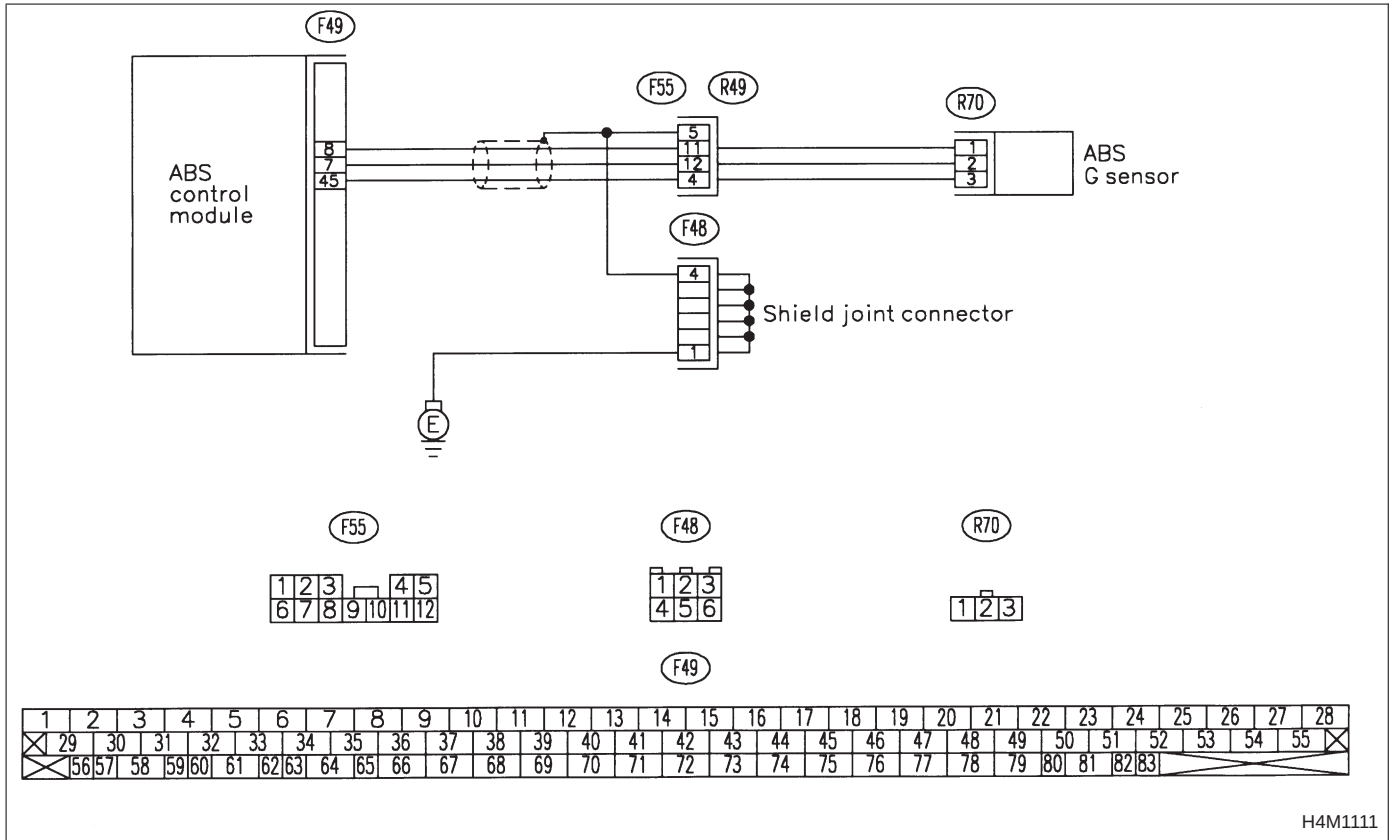
DIAGNOSIS:

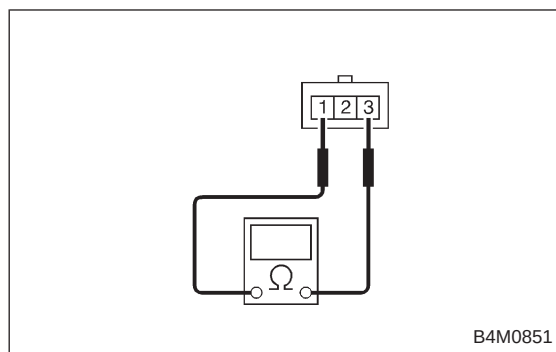
- Faulty G sensor power supply voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





8V1

CHECK G SENSOR.

- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Disconnect connector from G sensor.
- 4) Measure resistance of G sensor.

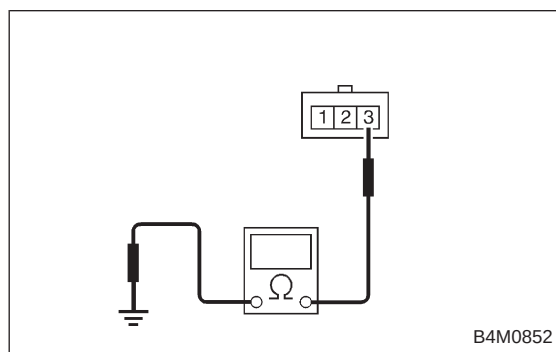
Terminal

No. 1 — No. 3:

CHECK : Is the resistance between 42 and 58 kΩ?

YES : Go to step 8V2.

NO : Replace G sensor.



8V2

CHECK GROUND SHORT OF G SENSOR.

Measure resistance between G sensor and bracket.

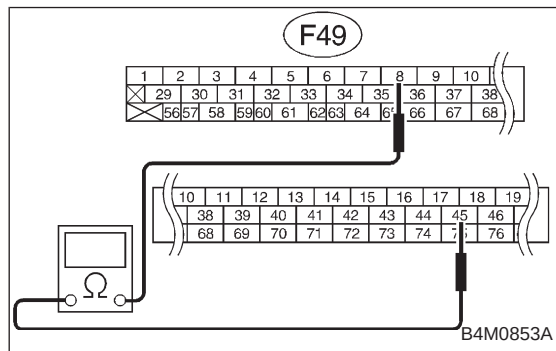
Terminal

No. 3 — Bracket:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8V3.

NO : Replace G sensor.



8V3

CHECK SHORT CIRCUIT IN HARNESS BETWEEN ABSCM AND G SENSOR.

- 1) Disconnect connector from ABSCM.
- 2) Measure resistance between ABSCM connector terminals.

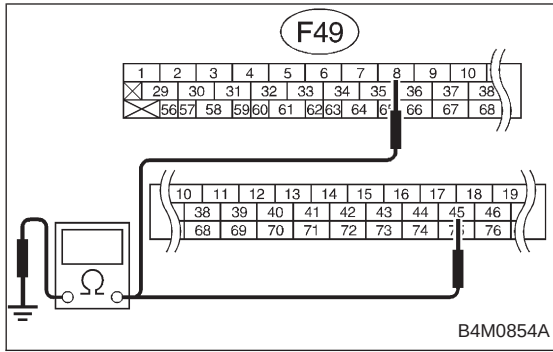
Connector & terminal

(F49) No. 45 — No. 8:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8V4.

NO : Repair harness between ABSCM and G sensor.


8V4
CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

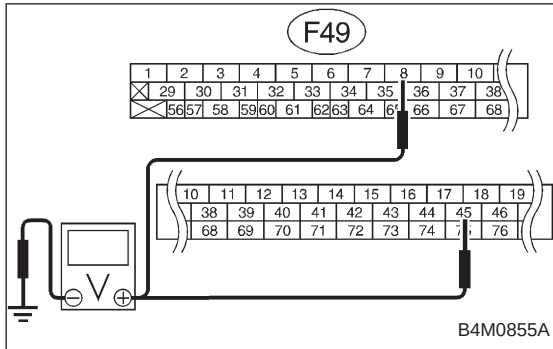
(F49) No. 8 — Chassis ground:

(F49) No. 45 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8V5.

NO : Repair harness between ABSCM and G sensor.


8V5
CHECK BATTERY SHORT OF HARNESS.

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

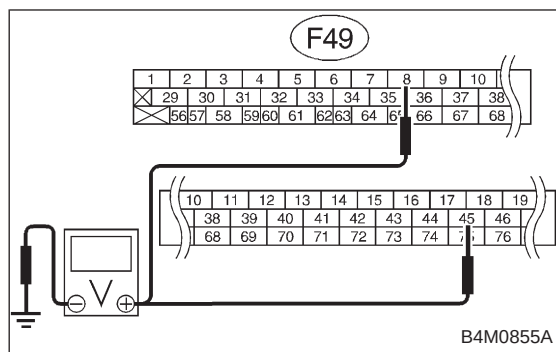
(F49) No. 8 (+) — Chassis ground (-):

(F49) No. 45 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8V6.

NO : Repair harness between ABSCM and G sensor.

**8V6****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal**(F49) No. 8 (+) — Chassis ground (-):****(F49) No. 45 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 8V7.**NO** : Repair harness between ABSCM and chassis ground.**8V7****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : Is there poor contact in connectors between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>**YES** : Repair connector.**NO** : Go to step 8V8.**8V8****CHECK ABSCM.**

- 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.**NO** : Go to step 8V9.**8V9****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 51 **— ABNORMAL VALVE RELAY —**

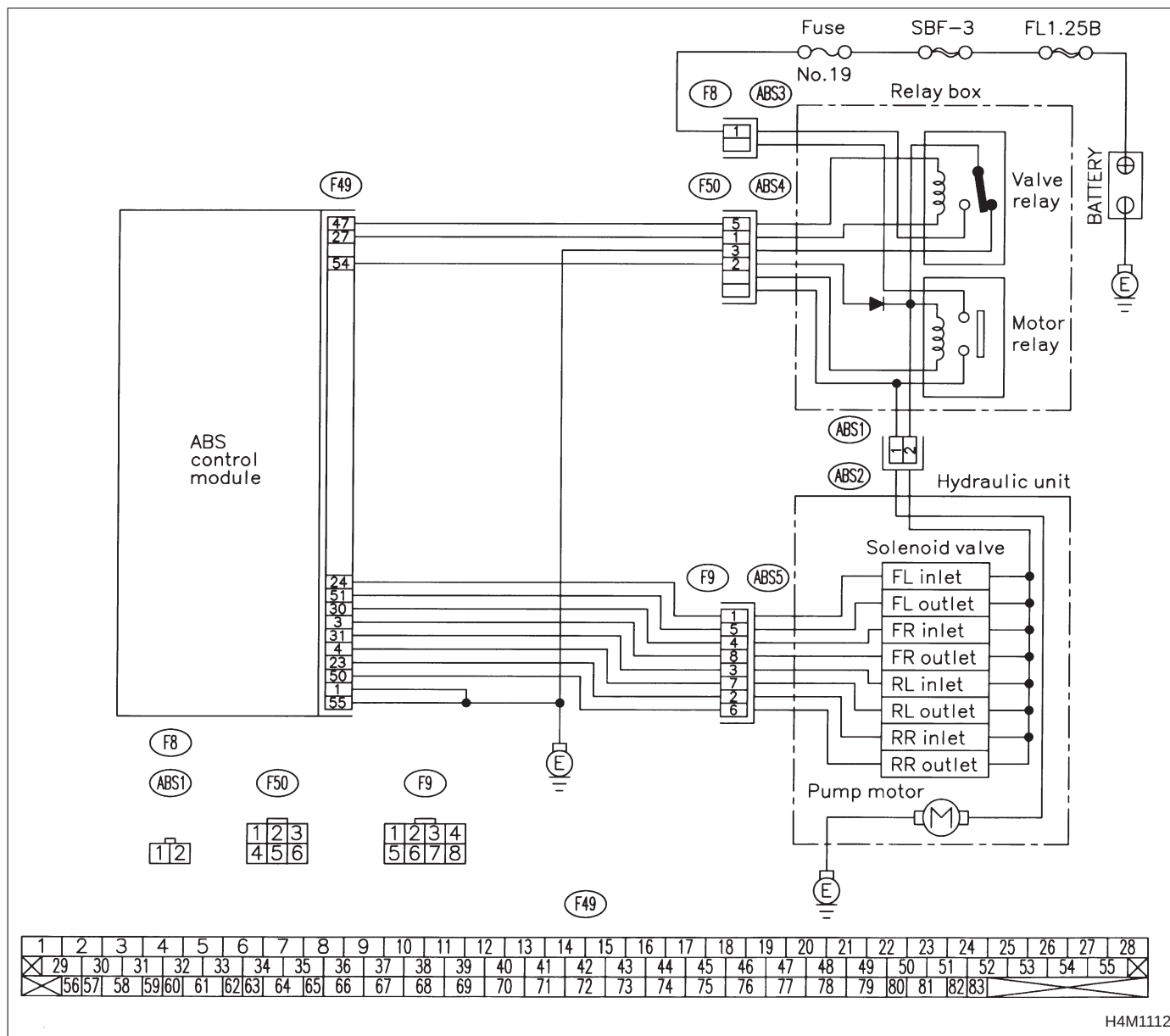
DIAGNOSIS:

- Faulty valve relay

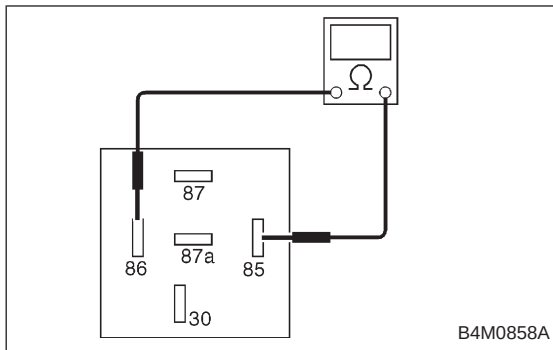
TROUBLE SYMPTOM:

- ABS does not operate.

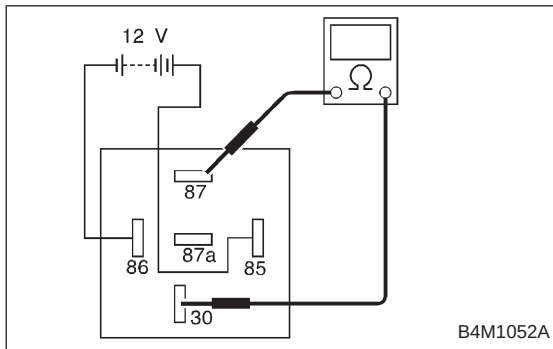
WIRING DIAGRAM:



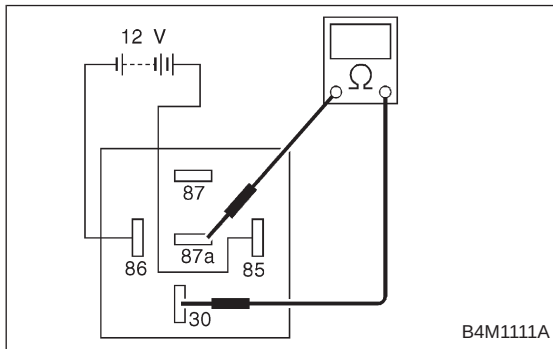
H4M1112

**8W1****CHECK RESISTANCE OF VALVE RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove valve relay from relay box.
- 3) Measure resistance between valve relay terminals.

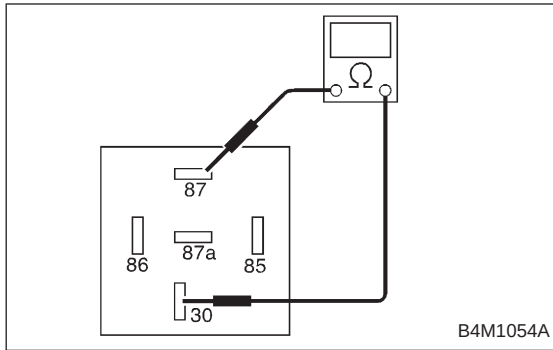
Terminals**No. 85 — No. 86:****CHECK** : Is the resistance between 93 and 113 Ω ?**YES** : Go to step **8W2**.**NO** : Replace valve relay.**8W2****CHECK CONTACT POINT OF VALVE RELAY.**

- 1) Connect battery to valve relay terminals No. 85 and No. 86.
- 2) Measure resistance between valve relay terminals.

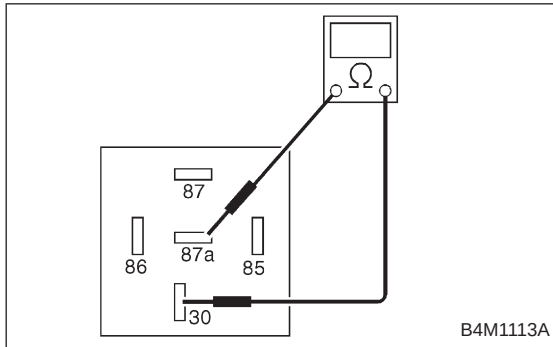
Terminals**No. 30 — No. 87:****CHECK** : Is the resistance less than 0.5 Ω ?**YES** : Go to step **8W3**.**NO** : Replace valve relay.**8W3****CHECK CONTACT POINT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

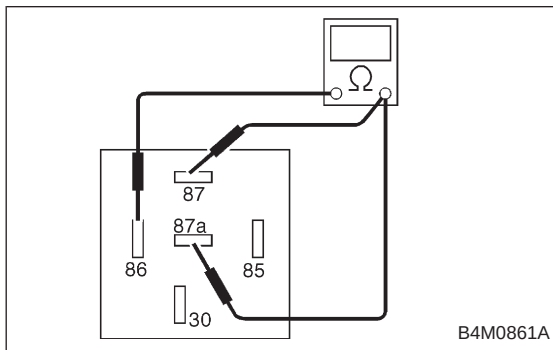
Terminals**No. 30 — No. 87a:****Is the resistance more than 1 M Ω ?****YES** : Go to step **8W4**.**NO** : Replace valve relay.

**8W4****CHECK CONTACT POINT OF VALVE RELAY.**

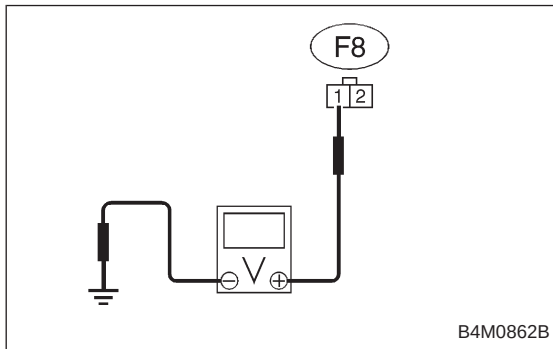
- 1) Disconnect battery from valve relay terminals.
- 2) Measure resistance between valve relay terminals.

Terminals**No. 30 — No. 87:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 8W5.**NO** : Replace valve relay.**8W5****CHECK CONTACT POINT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

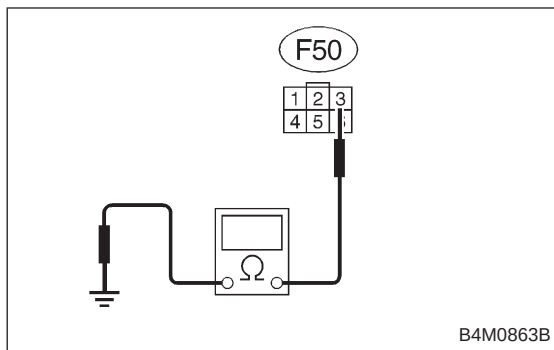
Terminals**No. 30 — No. 87a:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 8W6.**NO** : Replace valve relay.**8W6****CHECK SHORT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

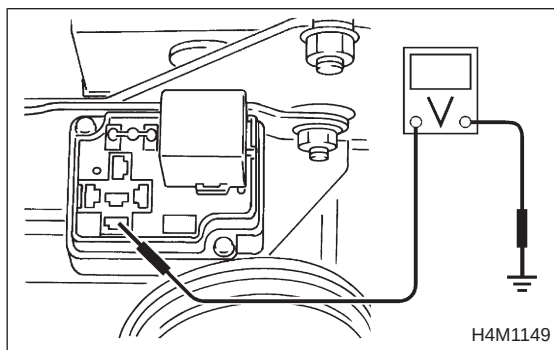
Terminals**No. 86 — No. 87:****No. 86 — No. 87a:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 8W7.**NO** : Replace valve relay.**8W7****CHECK POWER SUPPLY FOR VALVE RELAY.**

- 1) Disconnect connector (F8) from relay box.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between relay box connector and chassis ground.

Connector & terminal**(F8) No. 1 (+) — Chassis ground (-):****CHECK** : Is the voltage between 10 V and 13 V?**YES** : Go to step 8W8.**NO** : Repair harness between battery and relay box connector. Check fuse No. 19.

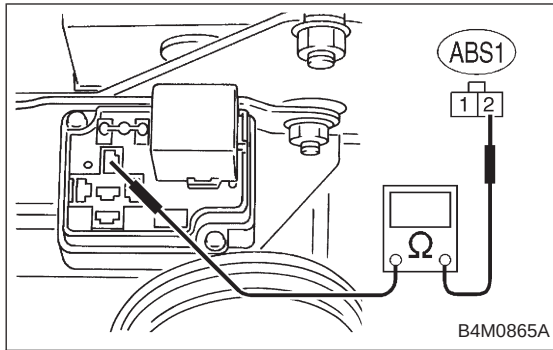
**8W8****CHECK GROUND CIRCUIT OF RELAY BOX.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (F50) from relay box.
- 3) Measure resistance between relay box connector and chassis ground.

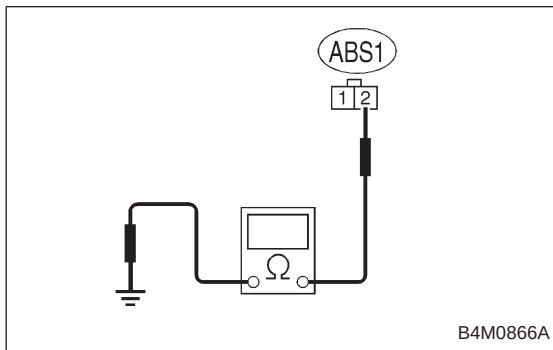
Connector & terminal**(F50) No. 3 — Chassis ground:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 8W9.**NO** : Repair relay box ground harness.**8W9****CHECK OPEN CIRCUIT AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (ABS1) from hydraulic unit.
- 2) Connect connector (F8) to relay box.
- 3) Turn ignition switch to ON.
- 4) Measure voltage of relay box.

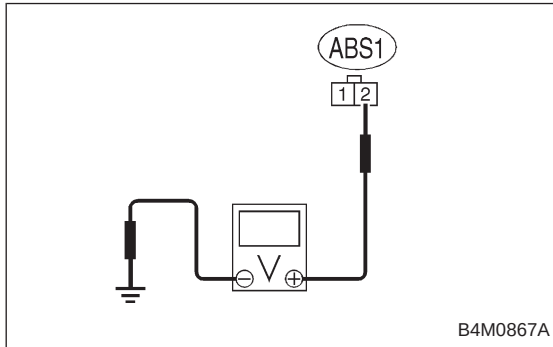
Connector & terminal**Valve relay installing point No. 87 — Chassis ground:****CHECK** : Is the voltage between 10 V and 13 V?**YES** : Go to step 8W10.**NO** : Replace relay box and check fuse No. 19.

**8W10****CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between hydraulic unit connector and valve relay installing point.

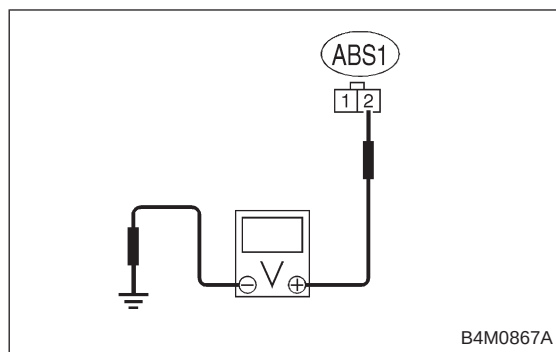
Connector & terminal**(ABS1) No. 2 — Valve relay installing point No. 30:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 8W11.**NO** : Replace relay box.**8W11****CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between hydraulic unit connector and chassis ground.

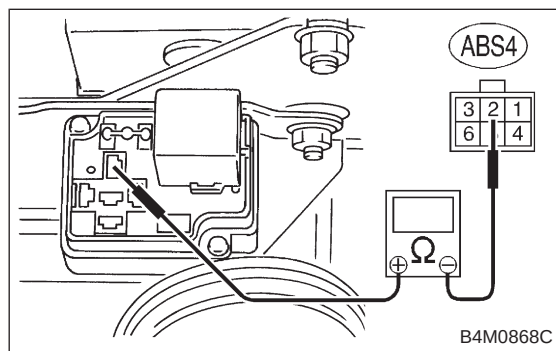
Connector & terminal**(ABS1) No. 2 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 8W12.**NO** : Replace relay box and check fuse SBF6.**8W12****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between hydraulic unit connector and chassis ground.

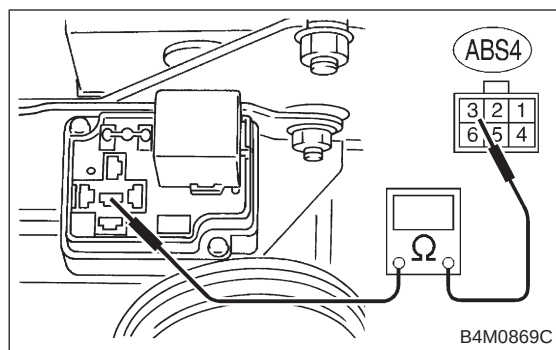
Connector & terminal**(ABS1) No. 2 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 8W13.**NO** : Replace relay box. Check fuse No. 19 and SBF6.

**8W13****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

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

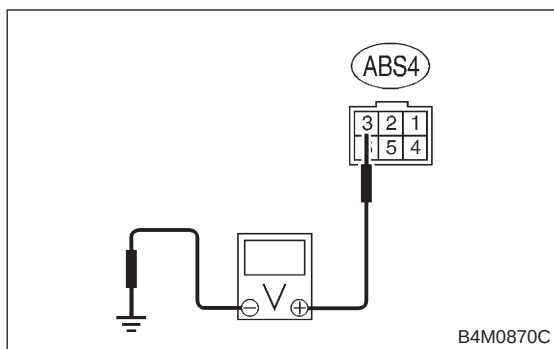
Connector & terminal**(ABS1) No. 2 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step **8W14**.**NO** : Replace relay box. Check fuse No. 19 and SBF6.**8W14****CHECK DIODE OF RELAY BOX.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between relay box connector and valve relay installing point.

Connector & terminal**Valve relay installing point No. 30 (+) — (ABS4) No. 2 (-):****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step **8W15**.**NO** : Replace relay box.**8W15****CHECK OPEN CIRCUIT IN GROUND CIRCUIT OF RELAY BOX.**

Measure resistance between relay box connector and valve relay installing point.

Connector & terminal**(ABS4) No. 3 — Valve relay installing point No. 87a:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step **8W16**.**NO** : Replace relay box.


8W16

CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.

Measure voltage between relay box connector and chassis ground.

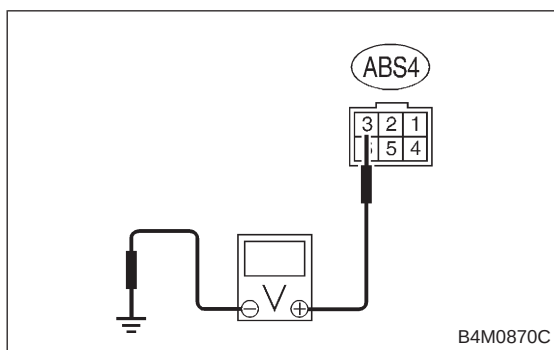
Connector & terminal

(ABS4) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8W17.

NO : Replace relay box and check all fuses.


8W17

CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.

1) Turn ignition switch to ON.

2) Measure voltage between relay box connector and chassis ground.

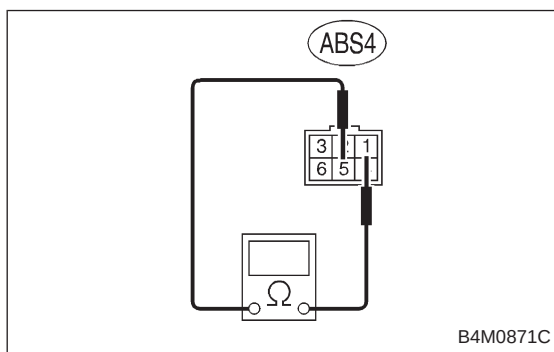
Connector & terminal

(ABS4) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8W18.

NO : Replace relay box and check all fuses.


8W18

CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX.

1) Turn ignition switch to OFF.

2) Install valve relay to relay box.

3) Measure resistance between relay box connector terminals.

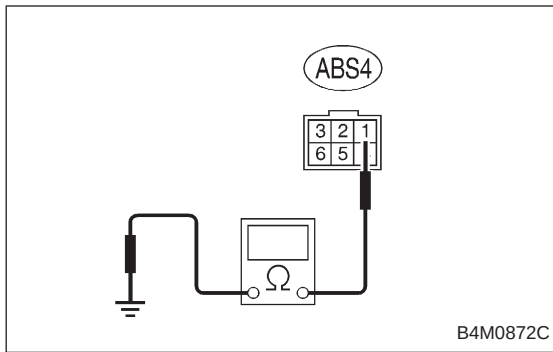
Connector & terminal

(ABS4) No. 1 — No. 5:

CHECK : Is the resistance between 93 and 113 Ω ?

YES : Go to step 8W19.

NO : Replace relay box.

**8W19****CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

Measure resistance between relay box connector and chassis ground.

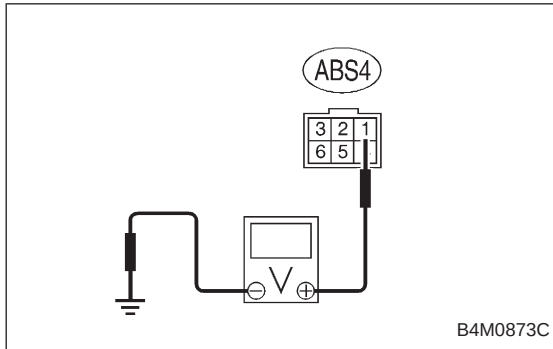
Connector & terminal

(ABS4) No. 1 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8W20.

NO : Replace relay box and check all fuses.

**8W20****CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

Measure voltage between relay box connector and chassis ground.

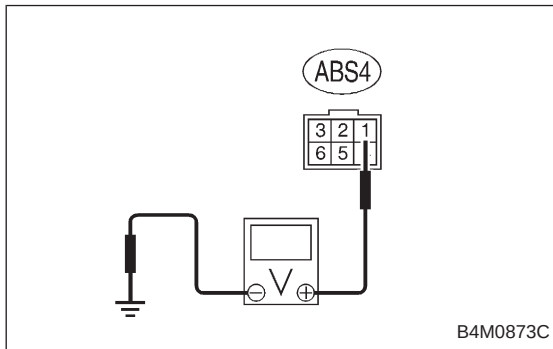
Connector & terminal

(ABS4) No. 1 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8W21.

NO : Replace relay box. Check fuse No. 19 and SBF45A.

**8W21****CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

1) Turn ignition switch to ON.

2) Measure voltage between relay box connector and chassis ground.

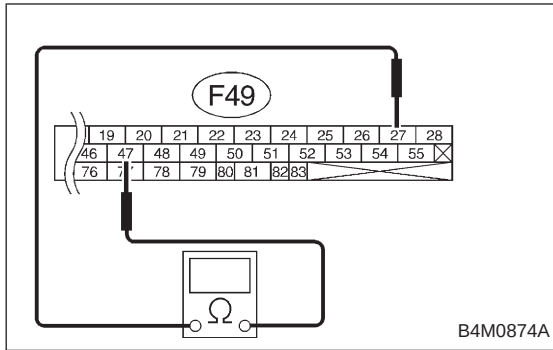
Connector & terminal

(ABS4) No. 1 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8W22.

NO : Replace relay box. Check fuse No. 19 and SBF45A.



8W22

CHECK OPEN CIRCUIT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

- 1) Turn ignition switch to OFF.
- 2) Connect connector (F50) to relay box.
- 3) Measure resistance between ABSCM connector terminals.

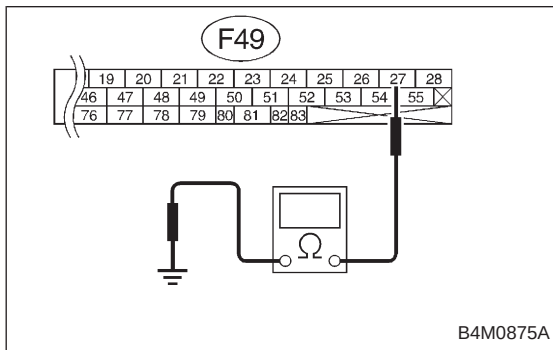
Connector & terminal

(F49) No. 27 — No. 47:

CHECK : Is the resistance between 93 and 113 Ω?

YES : Go to step 8W23.

NO : Repair harness between ABSCM and relay box.
Check fuse No. 18.



8W23

CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.

Measure resistance between ABSCM connector and chassis ground.

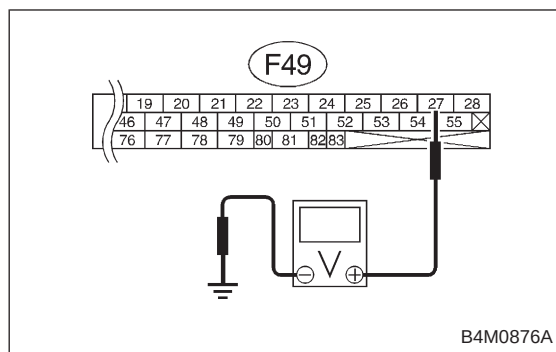
Connector & terminal

(F49) No. 27 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8W24.

NO : Repair harness between ABSCM and relay box.
Check fuse No. 18.

**8W24****CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

Measure voltage between ABSCM connector and chassis ground.

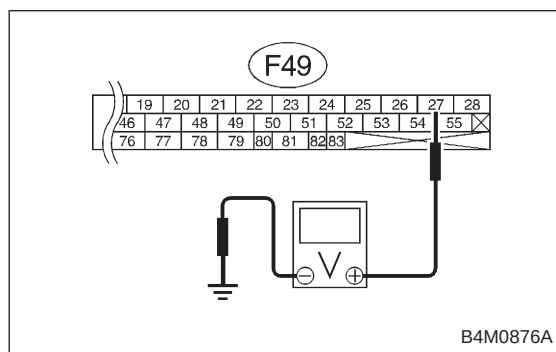
Connector & terminal

(F49) No. 27 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **8W25**.

NO : Repair harness between ABSCM and relay box and check all fuses.

**8W25****CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

1) Turn ignition switch to ON.

2) Measure voltage between ABSCM connector and chassis ground.

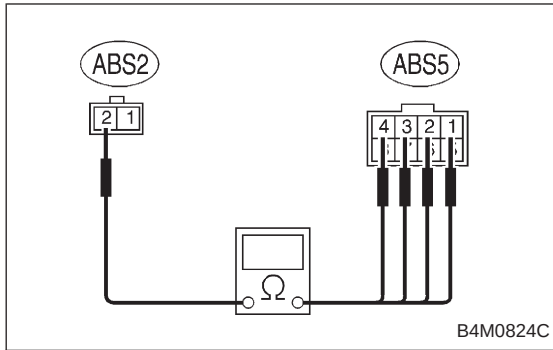
Connector & terminal

(F49) No. 27 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **8W26**.

NO : Repair harness between ABSCM and relay box and check all fuses.



8W26

CHECK RESISTANCE OF INLET SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal

(ABS5) No. 4 — (ABS2) No. 2:

(ABS5) No. 1 — (ABS2) No. 2:

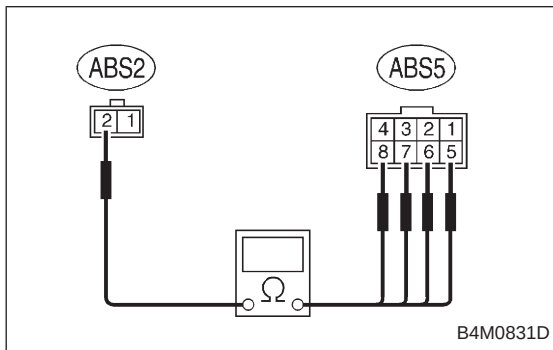
(ABS5) No. 2 — (ABS2) No. 2:

(ABS5) No. 3 — (ABS2) No. 2:

CHECK : Is the resistance between 7.8 and 9.2 Ω?

YES : Go to step 8W27.

NO : Replace hydraulic unit.



8W27

CHECK RESISTANCE OF OUTLET SOLENOID VALVE.

Measure resistance between hydraulic unit connector terminals.

Connector & terminal

(ABS5) No. 8 — (ABS2) No. 2:

(ABS5) No. 5 — (ABS2) No. 2:

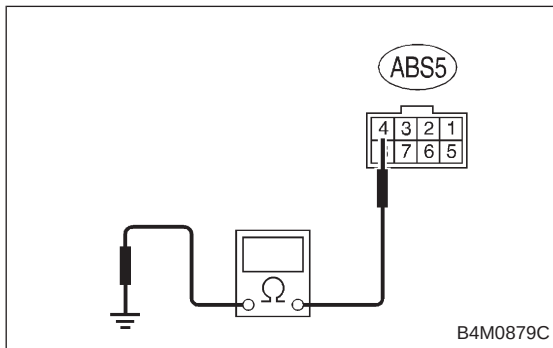
(ABS5) No. 6 — (ABS2) No. 2:

(ABS5) No. 7 — (ABS2) No. 2:

CHECK : Is the resistance between 3.8 and 4.8 Ω?

YES : Go to step 8W28.

NO : Replace hydraulic unit.



8W28

CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

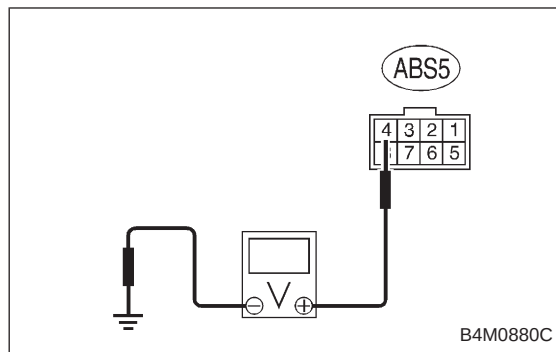
Connector & terminal

(ABS5) No. 4 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8W29.

NO : Replace hydraulic unit and check all fuses.

**8W29****CHECK BATTERY SHORT OF SOLENOID VALVE.**

Measure voltage between hydraulic unit connector and chassis ground.

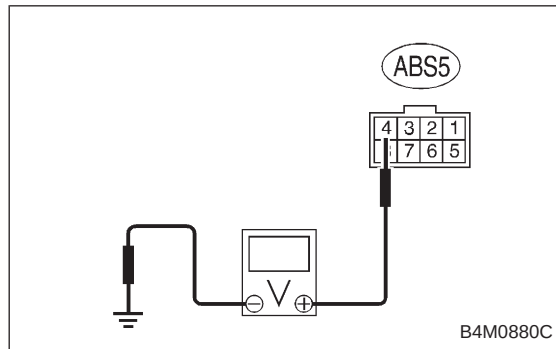
Connector & terminal

(ABS5) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **8W30**.

NO : Replace hydraulic unit and check all fuses.

**8W30****CHECK BATTERY SHORT OF SOLENOID VALVE.**

1) Turn ignition switch to ON.

2) Measure voltage between hydraulic unit connector and chassis ground.

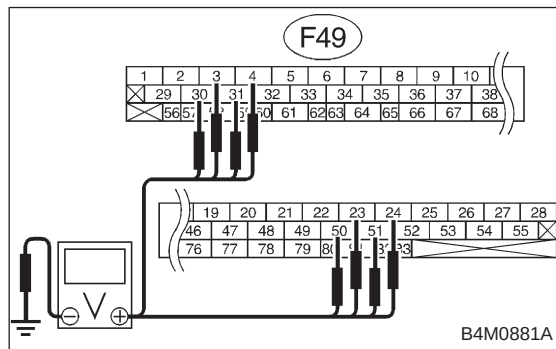
Connector & terminal

(ABS5) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **8W31**.

NO : Replace hydraulic unit and check all fuses.

**8W31****CHECK BATTERY SHORT OF HARNESS.**

1) Turn ignition switch to OFF.

2) Disconnect connector from hydraulic unit.

3) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 30 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):

(F49) No. 23 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 51 (+) — Chassis ground (-):

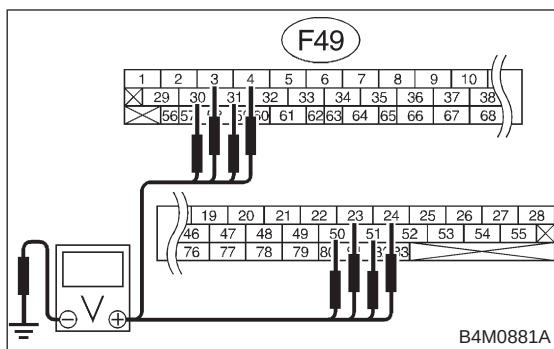
(F49) No. 50 (+) — Chassis ground (-):

(F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **8W32**.

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.



8W32

CHECK BATTERY SHORT OF HARNESS.

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

Connector & terminal

(F49) No. 30 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):

(F49) No. 23 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 51 (+) — Chassis ground (-):

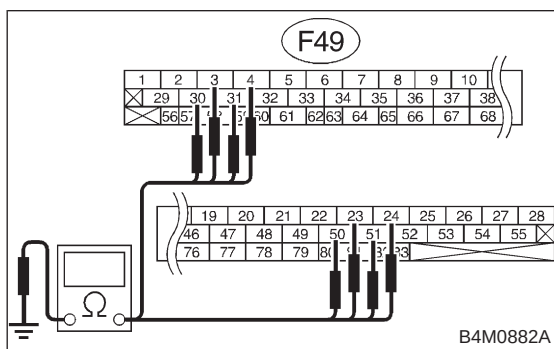
(F49) No. 50 (+) — Chassis ground (-):

(F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8W33.

NO : Repair harness between hydraulic unit and ABSCM and check all fuses.



8W33

CHECK GROUND SHORT OF HARNESS.

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

Connector & terminal

(F49) No. 30 — Chassis ground:

(F49) No. 24 — Chassis ground:

(F49) No. 23 — Chassis ground:

(F49) No. 31 — Chassis ground:

(F49) No. 3 — Chassis ground:

(F49) No. 51 — Chassis ground:

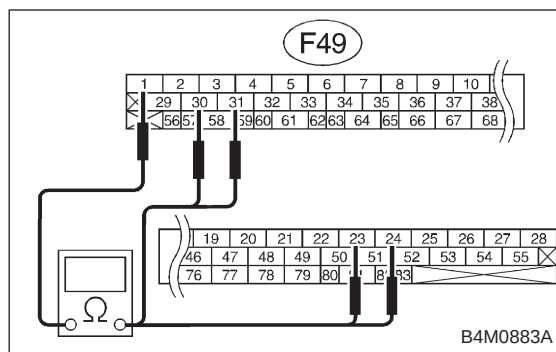
(F49) No. 50 — Chassis ground:

(F49) No. 4 — Chassis ground:

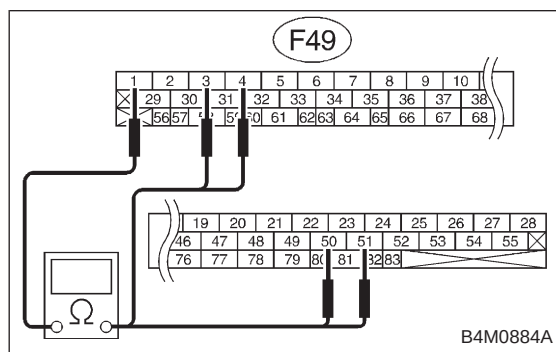
CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8W34.

NO : Repair harness between hydraulic unit and ABSCM.

**8W34****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 30 — No. 1:****(F49) No. 24 — No. 1:****(F49) No. 23 — No. 1:****(F49) No. 31 — No. 1:****CHECK** : Is the resistance between 8.3 and 9.7 Ω?**YES** : Go to step **8W35**.**NO** : Repair harness/connector between hydraulic unit and ABSCM.**8W35****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 3 — No. 1:****(F49) No. 51 — No. 1:****(F49) No. 50 — No. 1:****(F49) No. 4 — No. 1:****CHECK** : Is the resistance between 4.3 and 5.3 Ω?**YES** : Go to step **8W36**.**NO** : Repair harness/connector between hydraulic unit and ABSCM.**8W36****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : Is there poor contact in connector between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>**YES** : Repair connector.**NO** : Go to step **8W37**.

8W37	CHECK ABSCM.

- 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.

NO : Go to step **8W38**.

8W38	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.

X: TROUBLE CODE 52 — ABNORMAL MOTOR AND/OR MOTOR RELAY —

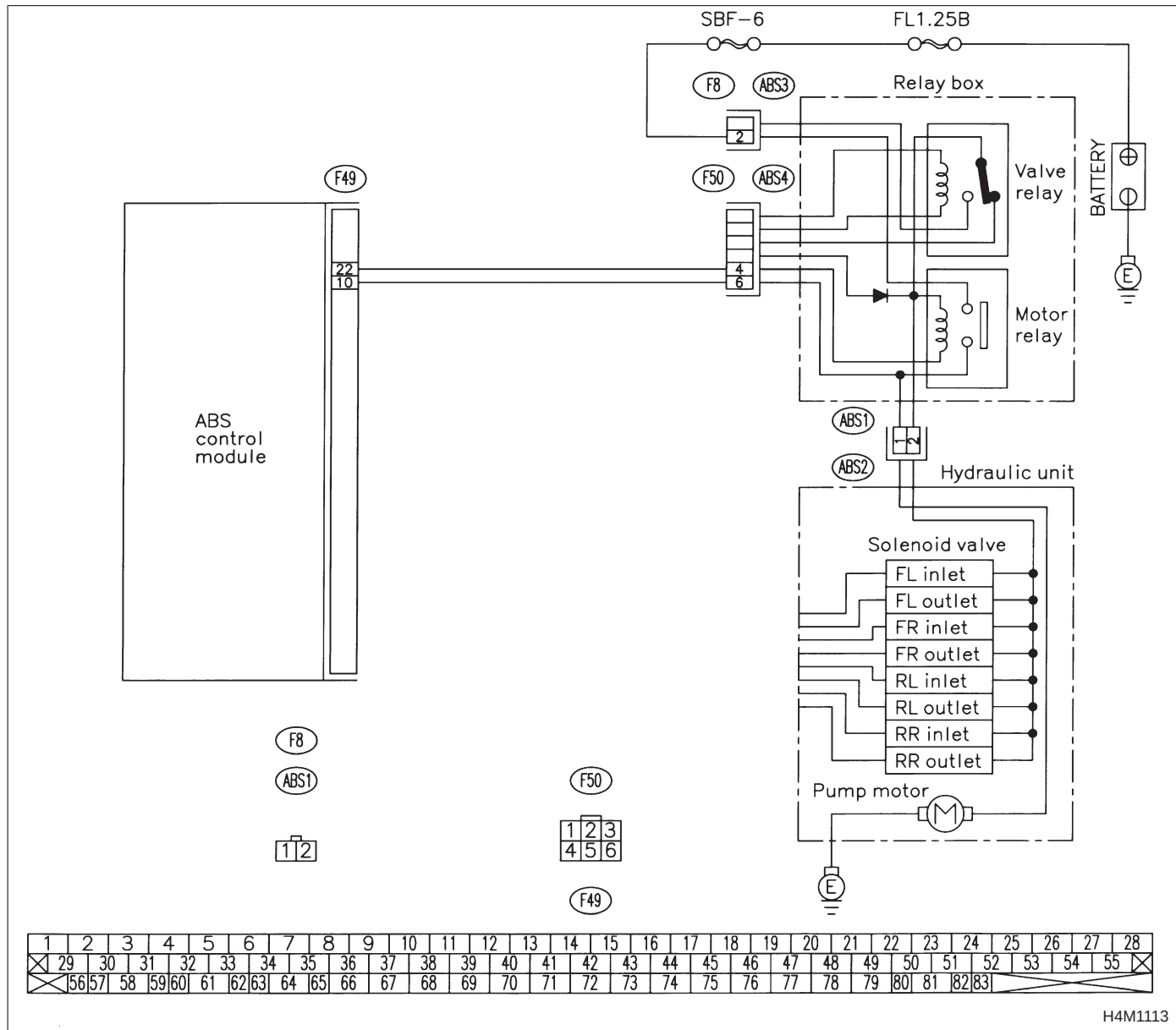
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

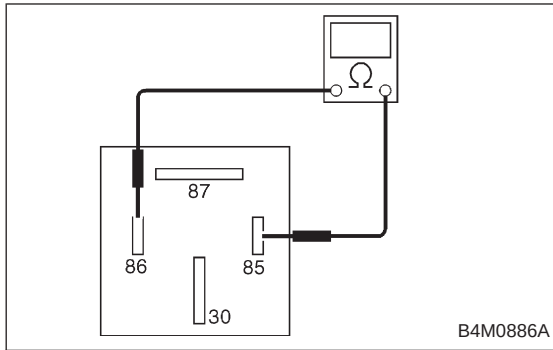
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1113



8X1

CHECK RESISTANCE OF MOTOR RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Measure resistance between motor relay terminals.

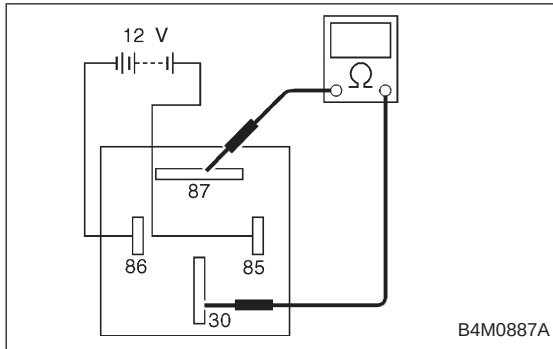
Terminals

No. 85 — No. 86:

CHECK : Is the resistance between 70 and 90 Ω ?

YES : Go to step 8X2.

NO : Replace motor relay.



8X2

CHECK CONTACT POINT OF MOTOR RELAY.

- 1) Connect battery to motor relay terminals No. 85 and No. 86.
- 2) Measure resistance between motor relay terminals.

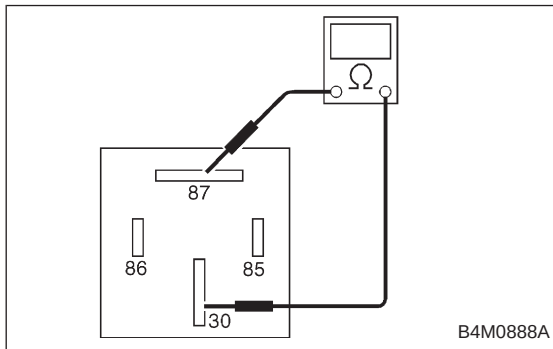
Terminals

No. 30 — No. 87:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 8X3.

NO : Replace motor relay.



8X3

CHECK CONTACT POINT OF MOTOR RELAY.

- 1) Disconnect battery from motor relay terminals.
- 2) Measure resistance between motor relay terminals.

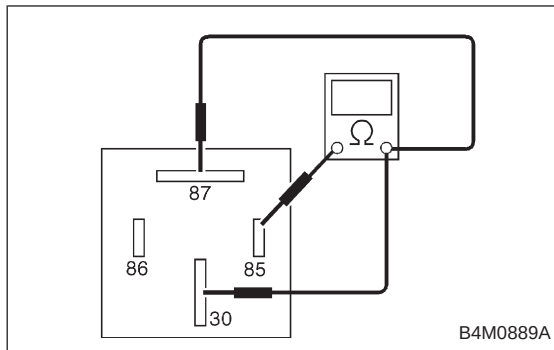
Terminals

No. 30 — No. 87:

CHECK : Is the resistance more than 1 $M\Omega$?

YES : Go to step 8X4.

NO : Replace motor relay.

**8X4****CHECK SHORT OF MOTOR RELAY.**

Measure resistance between motor relay terminals.

Terminals

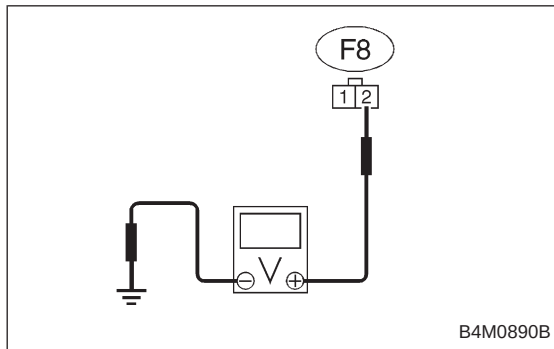
No. 85 — No. 30:

No. 85 — No. 87:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8X5.

NO : Replace motor relay.

**8X5****CHECK INPUT VOLTAGE OF RELAY BOX.**

- 1) Disconnect connector (F8) from relay box.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between relay box connector and chassis ground.

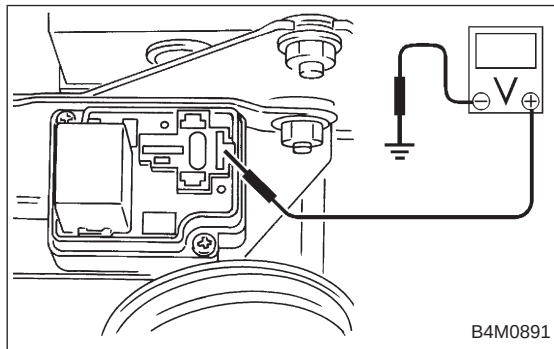
Connector & terminal

(F8) No. 2 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Go to step 8X6.

NO : Repair harness/connector between battery and relay box, and check fuse SBF6.

**8X6****CHECK INPUT VOLTAGE OF MOTOR RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Connect connector (F8) to relay box.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between relay box and chassis ground.

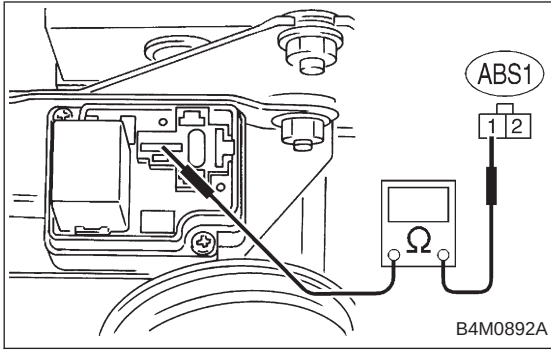
Connector & terminal

Relay installing point No. 87 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Go to step 8X7.

NO : Replace relay box, and check fuse SBF6.



8X7

CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (ABS1) from hydraulic unit.
- 3) Measure resistance between hydraulic unit and motor relay installing portion.

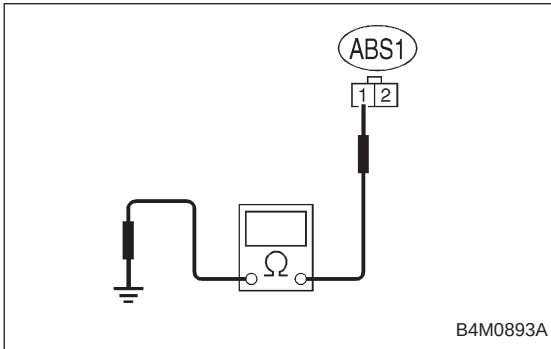
Connector & terminal

(ABS1) No. 1 — Motor relay installing portion No. 30:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 8X8.

NO : Replace relay box.



8X8

CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit and chassis ground.

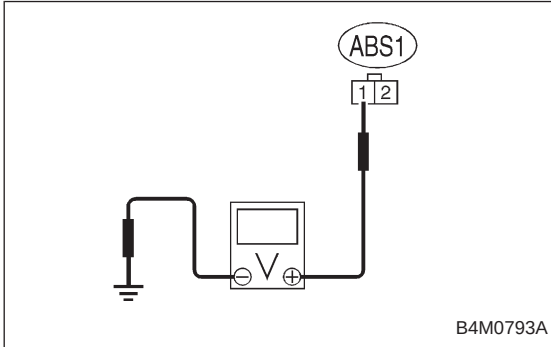
Connector & terminal

(ABS1) No. 1 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 8X9.

NO : Replace relay box. Check fuse No. 19.



8X9

CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between ABSCM connector and chassis ground.

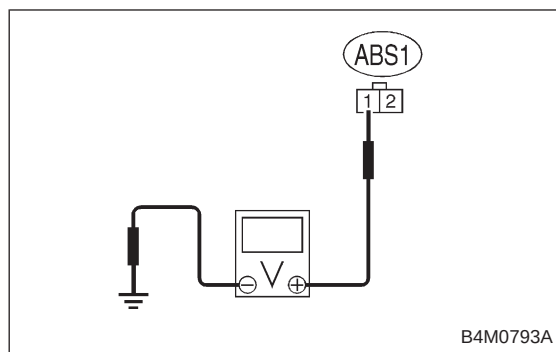
Connector & terminal

(ABS1) No. 1 (+) — Chassis ground (-):

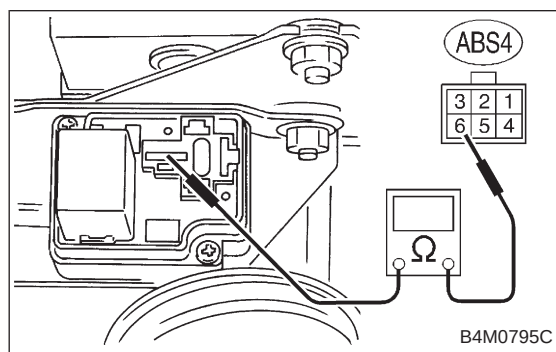
CHECK : Is the voltage less than 1 V?

YES : Go to step 8X10.

NO : Replace relay box.

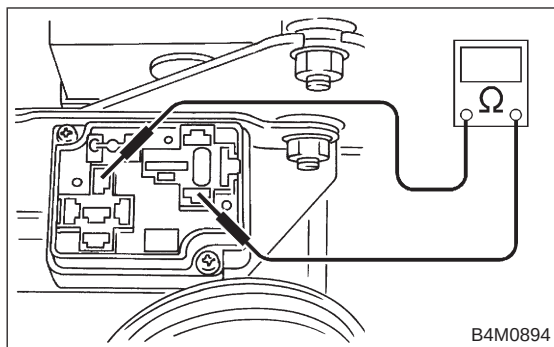
**8X10****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

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

Connector & terminal**(ABS1) No. 1 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 8X11.**NO** : Replace relay box.**8X11****CHECK OPEN CIRCUIT IN MONITOR SYSTEM CIRCUIT OF RELAY BOX.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (F50) from relay box.
- 3) Measure resistance between relay box connector and motor relay installing point.

Connector & terminal**(ABS4) No. 6 — Motor relay installing point No. 30:****CHECK** : Is the resistance less than 0.5 Ω ?**YES** : Go to step 8X12.**NO** : Replace relay box.



8X12

CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX.

- 1) Remove valve relay from relay box.
- 2) Measure resistance between motor relay installing point and valve relay installing point.

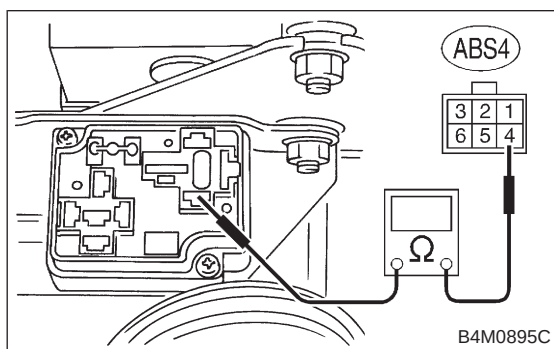
Connector & terminal

Motor relay installing point No. 86 — Valve relay installing point No. 30:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 8X13.

NO : Replace relay box.



8X13

CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between motor relay installing point and relay box connector.

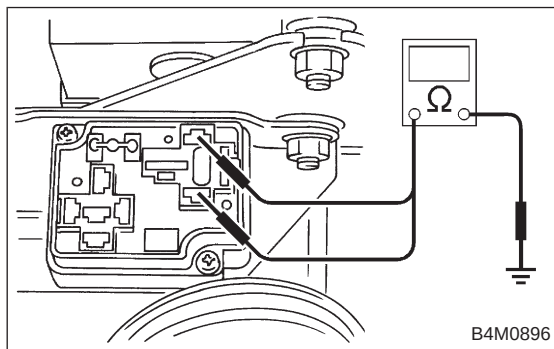
Connector & terminal

Motor relay installing point No. 86 — (ABS4) No. 4:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 8X14.

NO : Replace relay box.



8X14

CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box and chassis ground.

Connector & terminal

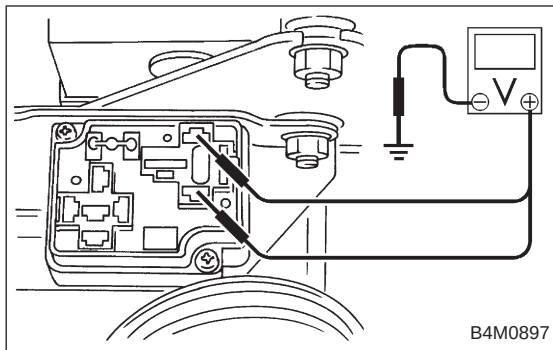
Motor relay installing point No. 86 — Chassis ground:

Motor relay installing point No. 85 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 8X15.

NO : Replace relay box. Check fuse No. 19.

**8X15****CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

Measure voltage between motor relay installing point and chassis ground.

Connector & terminal

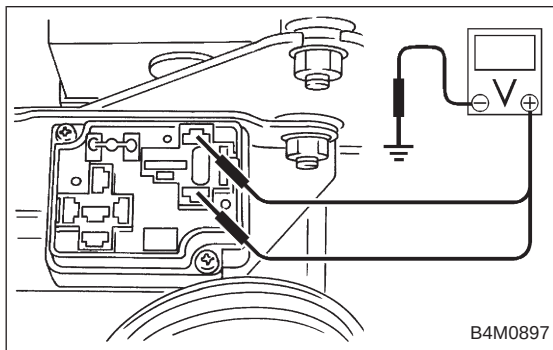
Motor relay installing point (+) No. 86 — Chassis ground (-):

Motor relay installing point (+) No. 85 — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8X16.

NO : Replace relay box and check all fuses.

**8X16****CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

1) Turn ignition switch to ON.

2) Measure voltage between motor relay installing point and chassis ground.

Connector & terminal

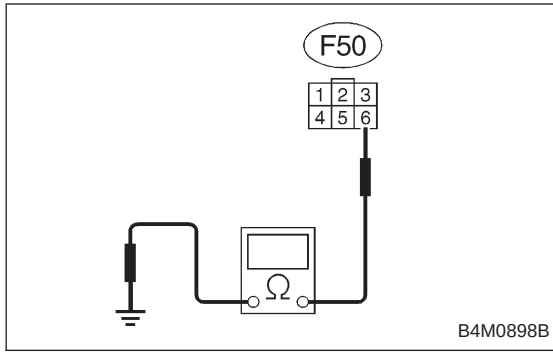
Motor relay installing point (+) No. 86 — Chassis ground:

Motor relay installing point (+) No. 85 — Chassis ground:

CHECK : Is the voltage less than 1 V?

YES : Go to step 8X17.

NO : Replace relay box and check all fuses.



8X17

CHECK OPEN CIRCUIT IN MONITOR SYSTEM HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Connect between terminals No. 10 and No. 1 of ABSCM connector (F49) with a lead wire.
- 3) Measure resistance between relay box connector and chassis ground.

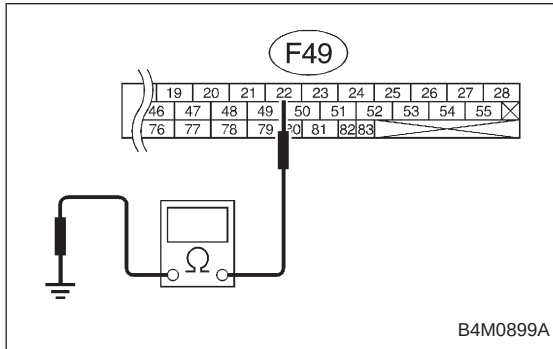
Connector & terminal

(F50) No. 6 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 8X18.

NO : Repair harness/connector between ABSCM and relay box.



8X18

CHECK OPEN CIRCUIT IN RELAY CONTROL SYSTEM HARNESS.

- 1) Connect valve relay and motor relay to relay box.
- 2) Connect connector (F50) to relay box.
- 3) Connect connector to hydraulic unit.
- 4) Measure resistance between ABSCM connector and chassis ground.

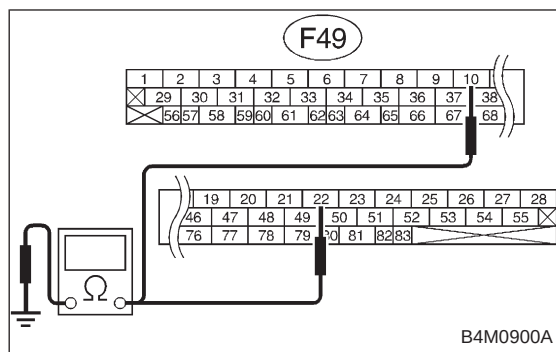
Connector & terminal

(F49) No. 22 — Chassis ground:

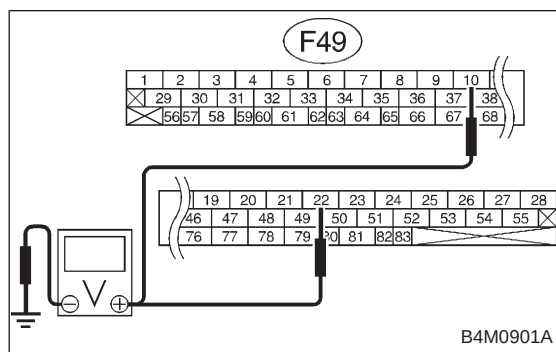
CHECK : Is the resistance between 70 and 90 Ω?

YES : Go to step 8X19.

NO : Repair harness/connector between ABSCM and relay box.

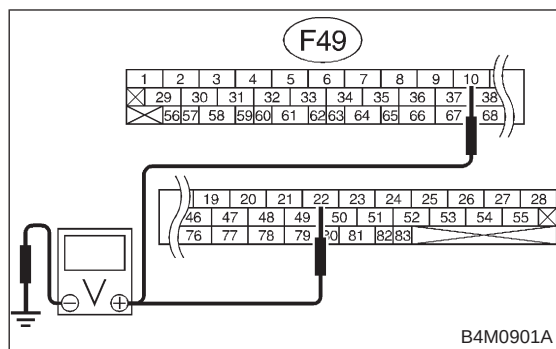
**8X19****CHECK GROUND SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 22 — Chassis ground:****(F49) No. 10 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 8X20.**NO** : Repair harness between ABSCM and relay box. Check fuse No. 19 and SBF6.**8X20****CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.**

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 22 (+) — Chassis ground (-):****(F49) No. 10 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 8X21.**NO** : Repair harness between relay box and ABSCM. Check fuse SBF6.



8X21

CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.

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

Connector & terminal

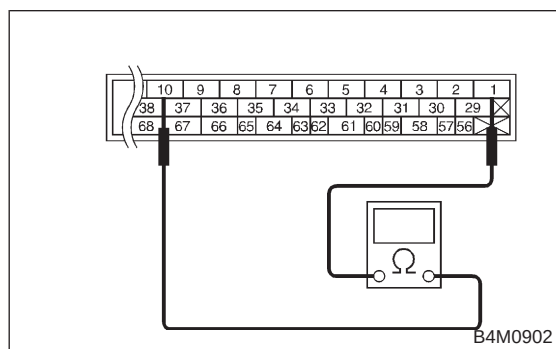
(F49) No. 22 (+) — Chassis ground (-):

(F49) No. 10 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8X22.

NO : Repair harness between relay box and ABSCM. Check fuse SBF6.



8X22

CHECK GROUND SHORT AT ABSCM MONITOR TERMINAL.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM terminals.

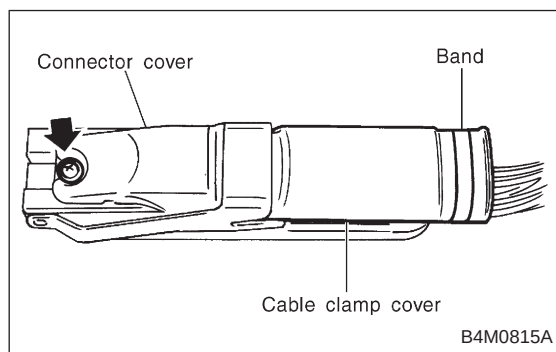
Terminal

No. 10 — No. 1:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 8X23.

NO : Replace ABSCM.



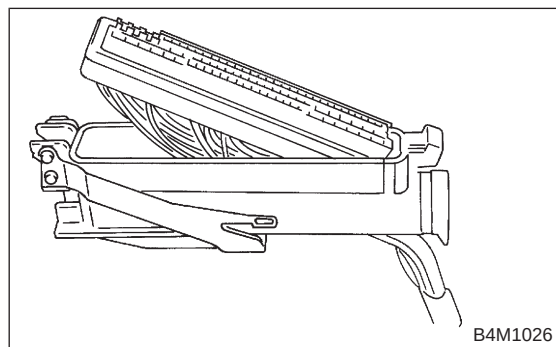
8X23

CHECK BATTERY SHORT IN ABSCM CONNECTOR TERMINAL.

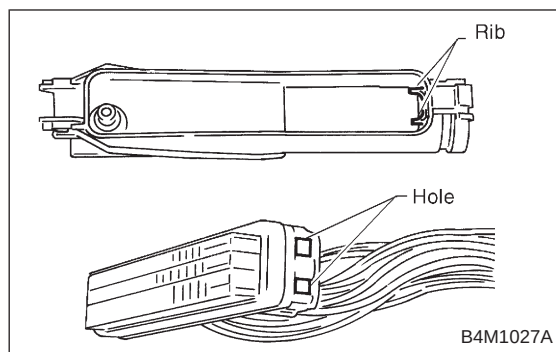
- 1) Remove band.
- 2) Remove cable clamp cover.
- 3) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.



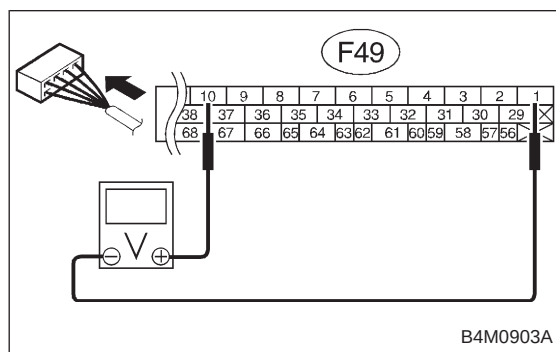
- 4) Remove connector cover.



NOTE:

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

5) Connect all connectors.



6) Measure voltage between ABSCM connector terminals.

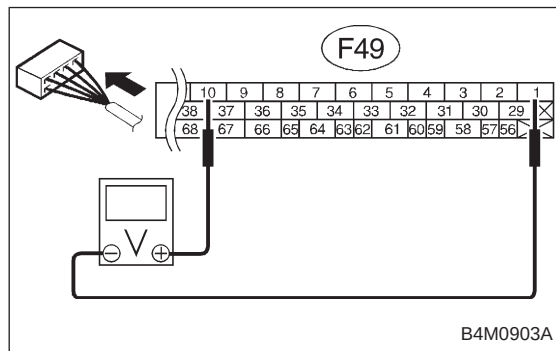
Connector & terminal

(F49) No. 10 (+) — No. 1 (-):

CHECK : Is the voltage less than 2 V?

YES : Go to step 8X24.

NO : Replace ABSCM.

**8X24****CHECK BATTERY SHORT IN ABSCM CONNECTOR TERMINAL.**

1) Turn ignition switch to ON.

2) Measure voltage between ABSCM connector terminals.

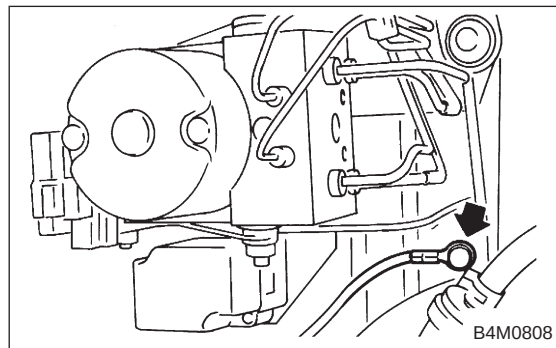
Connector & terminal

(F49) No. 10 (+) — No. 1 (-):

CHECK : Is the voltage less than 2 V?

YES : Go to step 8X25.

NO : Replace ABSCM.

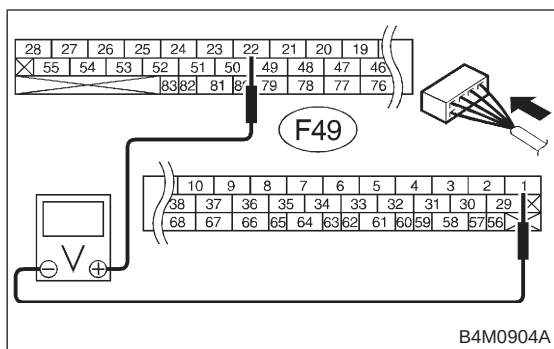
**8X25****CHECK CONDITION OF MOTOR GROUND.****Tightening torque:**

32±10 N·m (3.3±1.0 kg·m, 24±7 ft·lb):

CHECK : Is the motor ground terminal tightly clamped?

YES : Go to step 8X26.

NO : Tighten the clamp of motor ground terminal.

**8X26****CHECK ABSCM MOTOR DRIVE TERMINAL.**

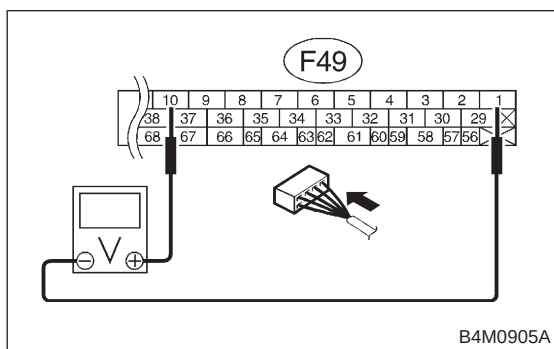
- 1) Operate the check sequence. <Ref. to 4-4 [W12D0].>
- 2) Measure voltage between ABSCM connector terminals.

Connector & terminal**(F49) No. 22 (+) — No. 1 (-):**

CHECK : Does the voltage drop from between 10 V and 13 V to less than 1.5 V, and rise to between 10 V and 13 V again when carrying out the check sequence?

YES : Go to step 8X27.

NO : Replace ABSCM.

**8X27****CHECK MOTOR OPERATION.**

- 1) Operate the check sequence. <Ref. to 4-4 [W12D0].>
- 2) Measure voltage between ABSCM connector terminals.

Connector & terminal**(F49) No. 10 (+) — No. 1 (-):**

CHECK : Does the voltage raise from less than 1.5 V to between 10 V and 13 V, and return to less than 1.5 V again when carrying out the check sequence?

YES : Go to step 8X28.

NO : Replace hydraulic unit.

8X28**CHECK MOTOR OPERATION.**

Operate the check sequence. <Ref. to 4-4 [W12D0].>

CHECK : Can motor revolution noise (buzz) be heard when carrying out the check sequence?

YES : Go to step 8X29.

NO : Replace hydraulic unit.

8X29**CHECK POOR CONTACT IN CONNECTORS.**

Turn ignition switch to OFF.

CHECK : Is there poor contact in connector between hydraulic unit, relay box and ABSCM? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 8X30.

8X30**CHECK ABSCM.**

- 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.****NO****: Go to step 8X31.****8X31****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.**

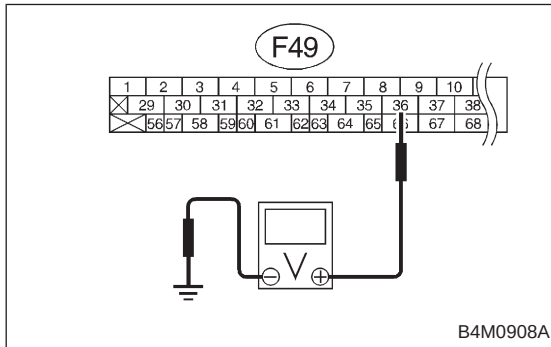
8Y1	CHECK STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK : *Do stop lights come on?*

YES : Go to step **8Y2**.

NO : Repair stop lights circuit.



8Y2	CHECK OPEN CIRCUIT IN HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Depress brake pedal.
- 4) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal
(F49) No. 36 — Chassis ground:

CHECK : *Is the voltage between 10 V and 13 V?*

YES : Go to step **8Y3**.

NO : Repair harness between stop light switch and ABSCM.

8Y3	CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connector between stop light switch and ABSCM? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **8Y4**.

8Y4	CHECK ABSCM.

- 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.

NO : Go to step **8Y5**.

8Y5	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.

Z: TROUBLE CODE 56
— ABNORMAL G SENSOR OUTPUT
VOLTAGE —

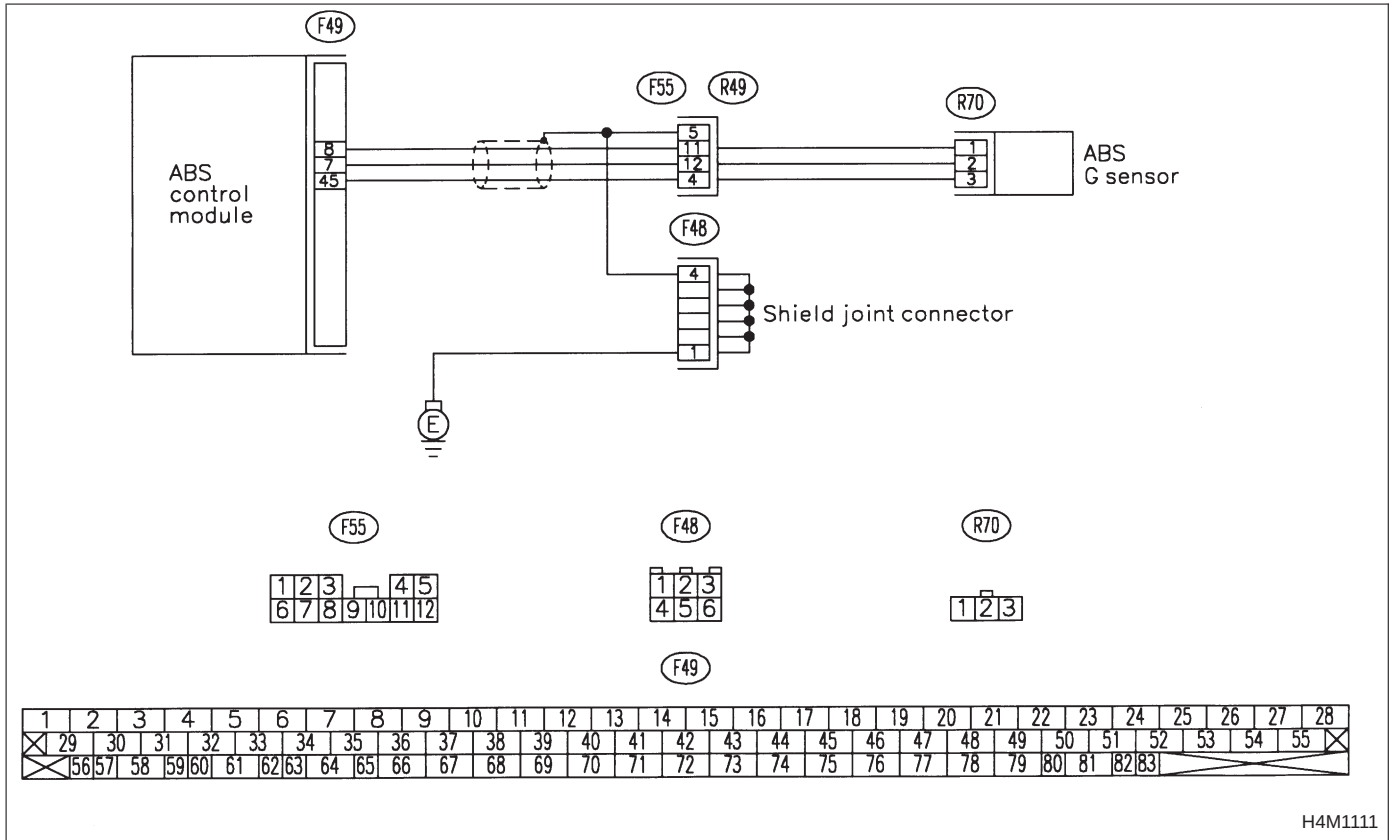
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

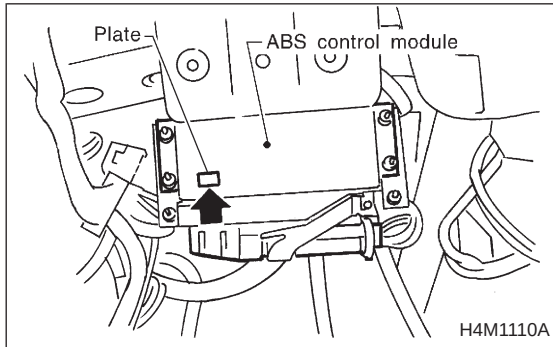
- ABS does not operate.

WIRING DIAGRAM:



8Z1**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**

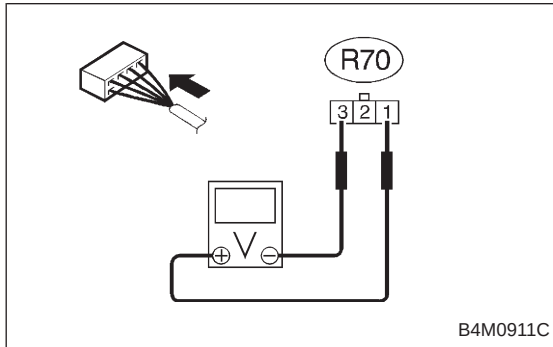
: The ABS is normal. Erase the trouble code.

NO: Go to step **8Z2**.**8Z2****CHECK SPECIFICATIONS OF ABSCM.**

Check specifications of the plate attached to the ABSCM.

CHECK: *Is an ABSCM for 4WD model installed on a FWD model?***CAUTION:****Be sure to turn ignition switch to OFF when removing ABSCM.****YES**

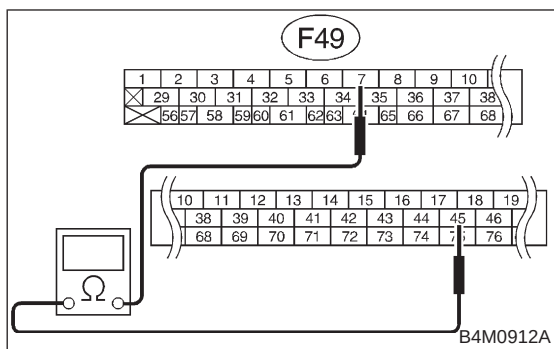
: Replace ABSCM.

NO: Go to step **8Z3**.**8Z3****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 **8Z4**.**NO**

: Repair harness/connector between G sensor and ABSCM.



8Z4

CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM connector terminals.

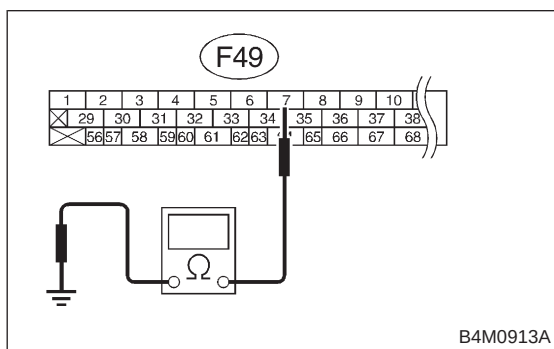
Connector & terminal

(F49) No. 7 — No. 45:

CHECK : Is the resistance between 4.3 and 4.9 kΩ?

YES : Go to step 8Z5.

NO : Repair harness/connector between G sensor and ABSCM.



8Z5

CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

- 1) Disconnect connector from G sensor.
- 2) Measure resistance between ABSCM connector and chassis ground.

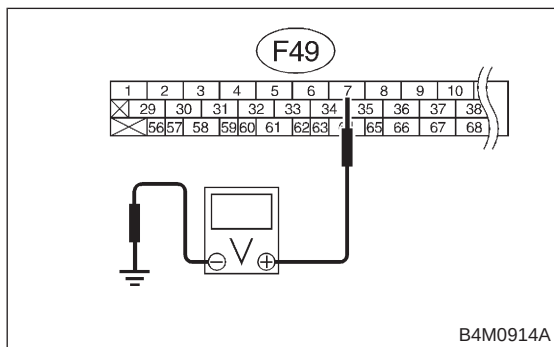
Connector & terminal

(F49) No. 7 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 8Z6.

NO : Repair harness between G sensor and ABSCM.



8Z6

CHECK BATTERY SHORT OF HARNESS.

Measure voltage between ABSCM connector and chassis ground.

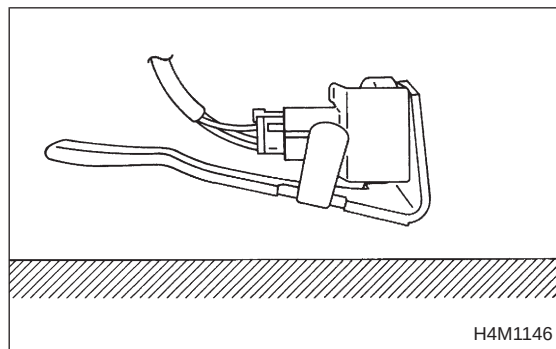
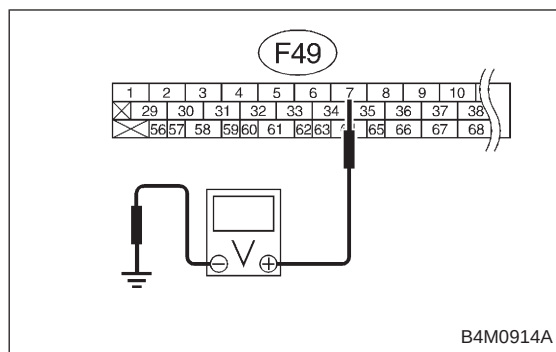
Connector & terminal

(F49) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 8Z7.

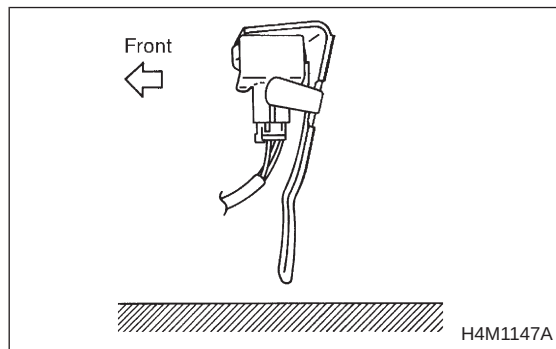
NO : Repair harness between G sensor and ABSCM.

**8Z7****CHECK BATTERY SHORT OF HARNESS.**

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

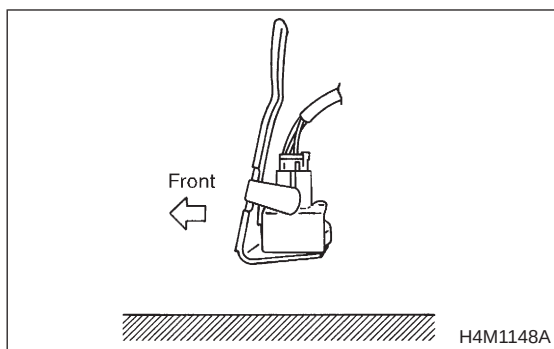
Connector & terminal**(F49) No. 7 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 8Z8.**NO** : Repair harness between G sensor and ABSCM.**8Z8****CHECK G SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove G sensor from vehicle.
- 3) Connect connector to G sensor.
- 4) Connect connector to ABSCM.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) No. 2 (+) — No. 1 (-):****CHECK** : Is the voltage between 2.1 and 2.4 V when G sensor is horizontal?**YES** : Go to step 8Z9.**NO** : Replace G sensor.**8Z9****CHECK G SENSOR.**

Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) 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 8Z10.**NO** : Replace G sensor.



8Z10	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal
(R70) 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 **8Z11**.

NO : Replace G sensor.

8Z11	CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connector between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **8Z12**.

8Z12	CHECK ABSCM.

- 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.

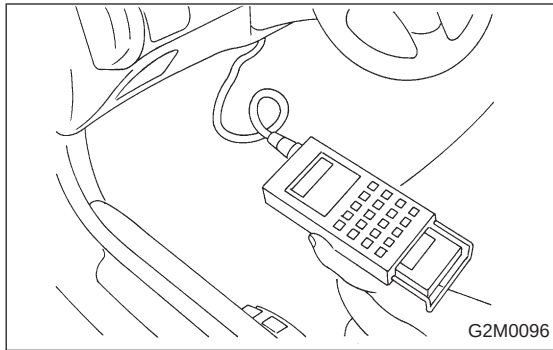
NO : Go to step **8Z13**.

8Z13	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. 498346200

A: LIST OF FUNCTION MODE

1. F MODE (ROM ID, ANALOG DATA ARE DISPLAYED.)

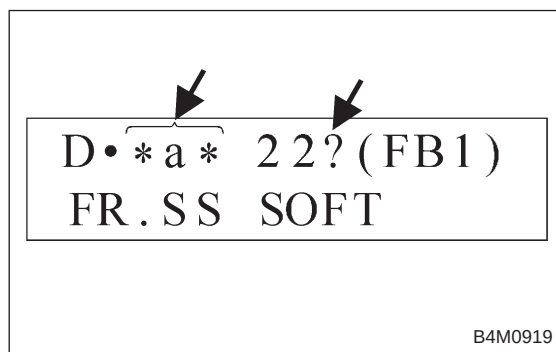
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4
Code	Abbreviation				
F00	ROM ID	ECM identification	ROM ID number of ECM is read and enabled communication state is displayed.	Possible	[T9B0]
F01	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	[T9C0]
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	[T9D0]
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	[T9E0]
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	[T9F0]
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	[T9C0]
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	[T9D0]
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	[T9E0]
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	[T9F0]
F09	BLS	Stop light switch monitor	Stop light switch monitor voltage is displayed.	Possible	[T9G0]
F10	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.	Possible	[T9H0]

2. FA MODE (ON/OFF DATA ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4
Code	Abbreviation				
FA0	B1	Stop light switch	LED 1 comes on with the switch on (with the brake pedal down).	Possible	[T9I0]
	VR	Valve relay signal	LED 2 comes on with the valve relay off.		
	MR	Motor relay signal	LED 3 comes on with the motor on.		
	AT	AT ABS signal	LED 4 comes on when ABS control is on.		
	AW	ABS warning light	LED 6 comes on when the warning light is on.		
	VM	Valve relay monitor	LED 1 comes on with the valve relay off.		
	MM	Motor relay monitor	LED 8 comes on when the motor relay is on.		
	CM	CCM signal	LED 9 comes on when ABS control is on.		

3. FB MODE (TROUBLE CODES ARE DISPLAYED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4
Code	Abbreviation				
FB1	D-ALL	History of trouble codes is displayed.	A maximum of 3 trouble codes are displayed in order of occurrence.	Possible	[T10B0]
	D-NEW		The most recent trouble code appears on the select monitor display.		
	D-MID		The second most recent trouble code appears on the select monitor display.		
	D-OLD		The third most recent trouble code appears on the select monitor display.		

**NOTE:**

- If a particular trouble code is not properly stored in memory (due to a drop in ABSCM 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 (NEW, MID and OLD).

4. FC MODE (TROUBLE CODES ARE ERASED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4
Code	Abbreviation				
FC0	D-CLR	History of trouble codes is erased.	Function of clearing trouble code.	Possible	[T9J0]

5. FD MODE (ABS SEQUENCE CHECK MODE)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4
Code	Abbreviation				
FD1	A-CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	[W12D0]

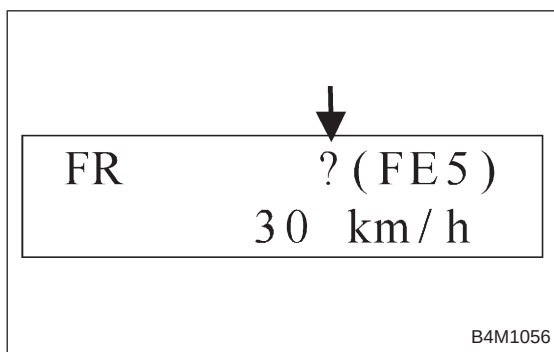
6. FE MODE (FREEZE FRAME DATA)**NOTE:**

- 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.

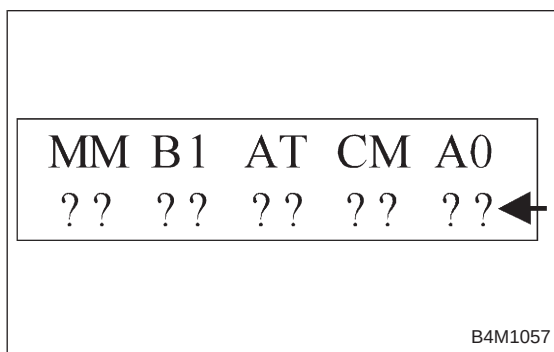
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4
Code	Abbreviation				
FE1	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	[T9K0]
FE2	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	[T9L0]
FE3	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	[T9M0]
FE4	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	[T9N0]
FE5	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	[T9K0]
FE6	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	[T9L0]
FE7	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	[T9M0]
FE8	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	[T9N0]
FE13	POWER	ABSCM power supply voltage (V)	Power (in volts) supplied to ABSCM appears on the select monitor display.	Possible	[T9O0]
FE14	G-SENS	G sensor output voltage (V)	Refers to vehicle acceleration detected by the analog G sensor. It appears on the select monitor display in volts.	Possible	[T9P0]
FE15	MM	Motor relay monitor	LED 1 comes on when motor relay is on.	Possible	[T9Q0]
	B1	Stop light switch	LED 2 comes on with the stop light switch on (with the brake pedal depressed).		
	AT	AT ABS signal	LED 3 comes on when ABS control is on.		
	CM	CCM signal	LED 4 comes on when ABS control is on.		
	A0	ABS control	LED 5 comes on when ABS control is on.		
FE16	CODE	Trouble code	The most recent trouble code appears on select monitor display.	Possible	[T9R0]

1) When a trouble code is not stored in memory, activating the FE mode causes the initial value to appear on the select monitor display.

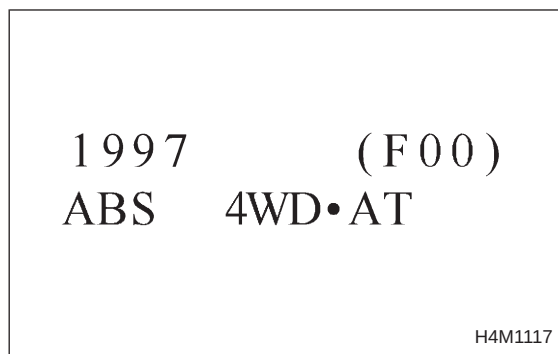
- FE1 — 4: 159 mile/h
- FE5 — 8: 255 km/h
- FE13: 16.84 V
- FE14: 5.00 V
- FE15: The MM, B1 and A0 LEDs are on.
The AT and CM LEDs are out.
- FE16: NO HISTORY OF OCCURED



2) 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.



3) When a trouble code is detected in the FE mode, a question mark "?" appears continuously on the select monitor display until the freeze frame data is stored in memory.



B: MODE F00
— ROM ID NUMBER (ROM) —

CONDITION:

Ignition switch ON

SPECIFIED DATA:

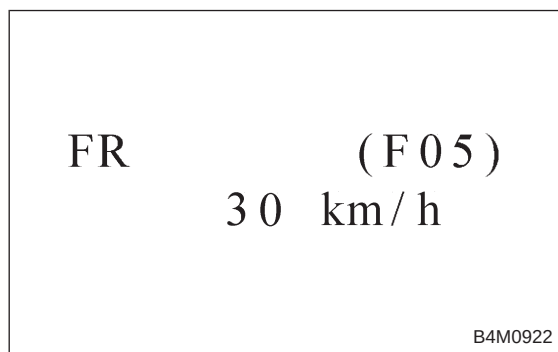
Presentation display

9B1	CHECK MESSAGE OF DISPLAY.

- CHECK** : *Does display indicate message "Error 1"?*
- YES** : Repair loose or disconnect connector, or discontinued circuit in data link circuit.
- NO** : Go to step **9B2**.

9B2	CHECK MESSAGE OF DISPLAY.

- CHECK** : *Does display indicate message "Error 2"?*
- YES** : Repair poor contact of select monitor cartridge, or installation of different type select monitor cartridge.
- NO** : Data link system is normal.

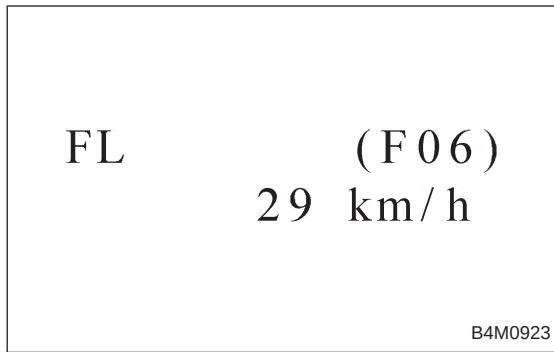


C: MODE F01 AND F05
— FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- Compare speedometer with monitor indications.
- F01: FR wheel speed is indicated in mile per hour (mile/h).
- F05: FR wheel speed is indicated in kilometer per hour (km/h).

NOTE:

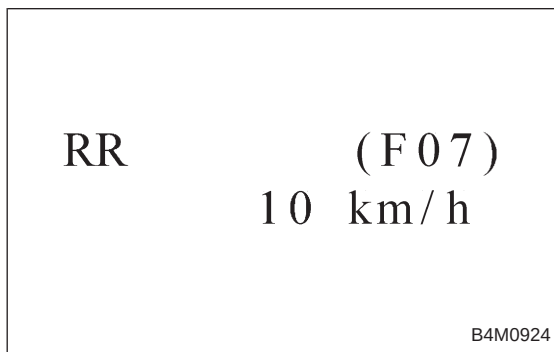
The monitor as shown, indicates that FR wheel speed is 30 km/h.

**D: MODE F02 AND F06****— FRONT LEFT WHEEL SPEED SIGNAL****(FL) —**

- Compare speedometer with monitor indications.
- F02: FL wheel speed is indicated in mile per hour (mile/h).
- F06: FL wheel speed is indicated in kilometer per hour (km/h).

NOTE:

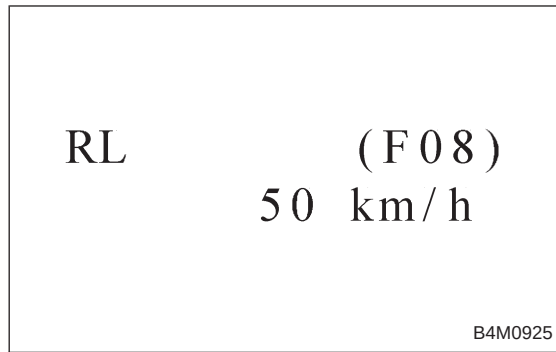
The monitor as shown, indicates that FL wheel speed is 29 km/h.

**E: MODE F03 AND F07****— REAR RIGHT WHEEL SPEED SIGNAL****(RR) —**

- Compare speedometer with monitor indications.
- F03: RR wheel speed is indicated in mile per hour (mile/h).
- F07: RR wheel speed is indicated in kilometer per hour (km/h).

NOTE:

The monitor as shown, indicates that RR wheel speed is 10 km/h.

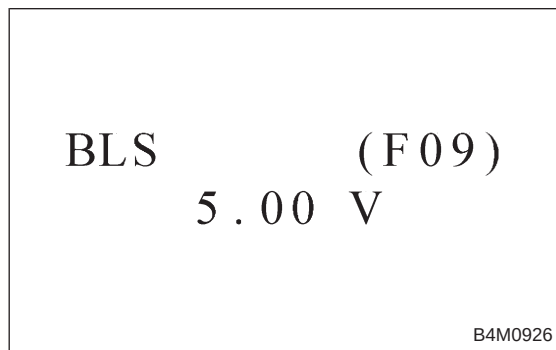
**F: MODE F04 AND F08****— REAR LEFT WHEEL SPEED SIGNAL (RL) —**

—

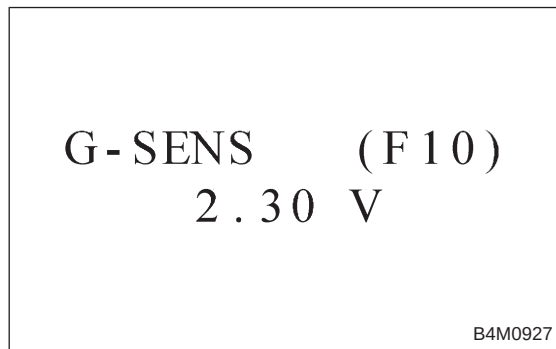
- Compare speedometer with monitor indications.
- F04: RL wheel speed is indicated in mile per hour (mile/h).
- F08: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:

The monitor as shown, indicates that RL wheel speed is 50 km/h.

**G: MODE F09****— STOP LIGHT SWITCH MONITOR (BLS) —**

- Stop light switch monitor voltage is displayed.

**H: MODE F10****— G SENSOR OUTPUT VOLTAGE (G-SENS) —**

—

- Refers to vehicle acceleration detecting by the analog G sensor. It appears on the select monitor display in volts.

NOTE:

Only AWD model

LED No.	Signal name	Display
1	Stop light switch	B1
2	Valve relay signal	VR
3	Motor relay signal	MR
4	AT ABS signal	AT
5	—	—
6	ABS warning light	AW
7	Valve relay monitor	VM
8	Motor relay monitor	MM
9	CCM signal	CM
10	—	—

B1	VR	MR	AT	—
AW	VM	MM	CM	—

1	2	3	4	5
6	7	8	9	10

I: MODE FA0**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”

LED No. 1 Stop light switch is turned ON. (With brake pedal depressed.)

LED No. 2 Valve relay is turned OFF.

LED No. 3 Motor relay is turned ON.

LED No. 4 ABS control operates.

LED No. 6 ABS warning light is ON.

LED No. 7 Valve relay is turned OFF.

LED No. 8 Motor relay is turned ON.

LED No. 9 ABS control operates.

MEMORY CLR ?
0 : YES 1 : NO

B4M0930

**J: MODE FC0
— HISTORY OF TROUBLE CODES IS
ERASED (D·CLR) —**

- Deletes the recorded trouble codes in ABS control module.

[F] [C] [O] [ENT]

B4M0931

1) Press the function key [F] [C] [O] [ENT] in that order.

MEMORY CLR ?
0 : YES 1 : NO

B4M0930

2) System indicates as shown.

MEMORY CLR ?
* 0 : YES 1 : NO

B4M0933

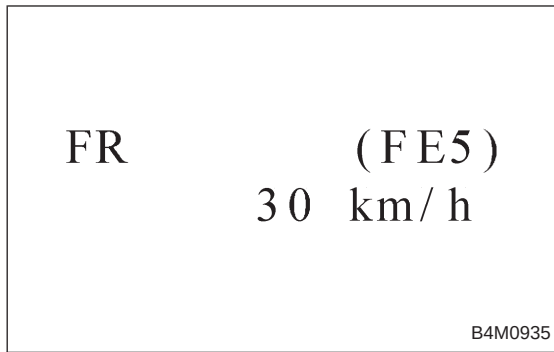
3) Press the function key [0], to clear memories. The indication of * is added to screen.

PLEASE
KEY OFF

B4M0934

4) Press the function key [ENT]. System indicates as shown.

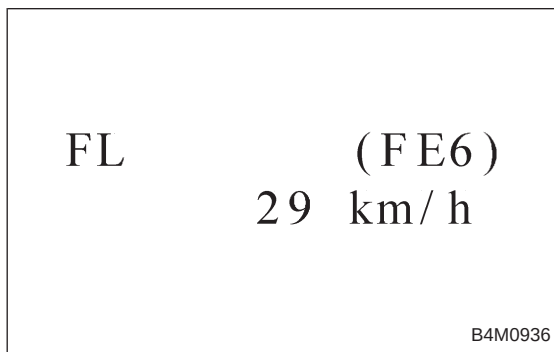
5) Turn ignition switch to OFF.

**K: MODE FE1 AND FE5****— FRONT RIGHT WHEEL SPEED SIGNAL****(FR) —**

- The wheel speed is indicated at the time of malfunction.
- FE1: FR wheel speed is indicated in mile per hour (mile/h).
- FE5: FR wheel speed is indicated in kilometer per hour (km/h).

NOTE:

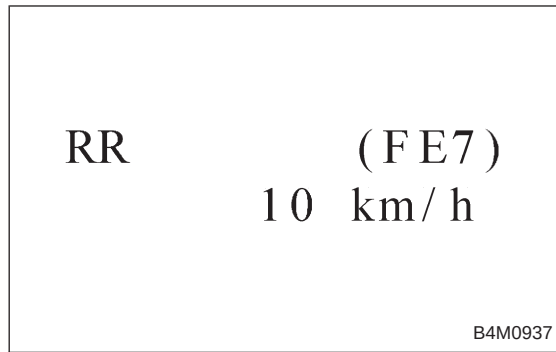
The monitor as shown, indicates that FR wheel speed is 30 km/h.

**L: MODE FE2 AND FE6****— FRONT LEFT WHEEL SPEED SIGNAL****(FL) —**

- The wheel speed is indicated at the time of malfunction.
- FE2: FL wheel speed is indicated in mile per hour (mile/h).
- FE6: FL wheel speed is indicated in kilometer per hour (km/h).

NOTE:

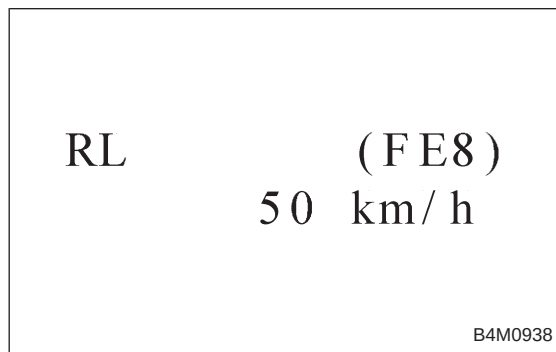
The monitor as shown, indicates that FL wheel speed is 29 km/h.

**M: MODE FE3 AND FE7****— REAR RIGHT WHEEL SPEED SIGNAL (RR) —**

- The wheel speed is indicated at the time of malfunction.
- FE3: RR wheel speed is indicated in mile per hour (mile/h).
- FE7: RR wheel speed is indicated in kilometer per hour (km/h).

NOTE:

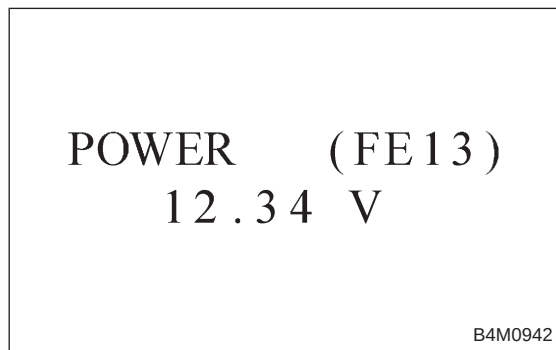
The monitor as shown, indicates that RR wheel speed is 10 km/h.

**N: MODE FE4 AND FE8****— REAR LEFT WHEEL SPEED SIGNAL (RL) —**

- The wheel speed is indicated at the time of malfunction.
- FE4: RL wheel speed is indicated in mile per hour (mile/h).
- FE8: RL wheel speed is indicated in kilometer per hour (km/h).

NOTE:

The monitor as shown, indicates that RL wheel speed is 50 km/h.

**O: MODE FE13****— ABSCM POWER SUPPLY VOLTAGE (POWER) —**

- ABSCM power supply voltage is indicated at the time of malfunction.

G - SENS (FE14)
2.27 V

B4M0939

LED No.	Signal name	Display
1	Motor relay monitor	MM
2	Stop light switch	B1
3	AT ABS signal	AT
4	CCM signal	CM
5	ABS signal	AO
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

MM	B1	AT	CM	AO
—	—	—	—	—
1	2	3	4	5
6	7	8	9	10

CODE 21 (FE16)
FR. SS HARD

H4M1151

P: MODE FE14**— G SENSOR OUTPUT VOLTAGE (G-SENS) —**

- Refers to vehicle acceleration detected by the analog G sensor at the time of malfunction. It appears on the select monitor display in volts.

NOTE:

Only AWD model

Q: MODE FE15**— ON ↔ OFF SIGNAL —**

- ON or OFF is indicated at the time of malfunction.
- Requirement for LED “ON”

LED No. 1 Motor relay is turned ON.

LED No. 2 Stop light switch is turned ON. (With brake pedal depressed.)

LED No. 3 ABS control operates.

LED No. 4 ABS control operates.

LED No. 5 ABS control operates.

R: MODE FE16**— TROUBLE CODE (CODE) —**

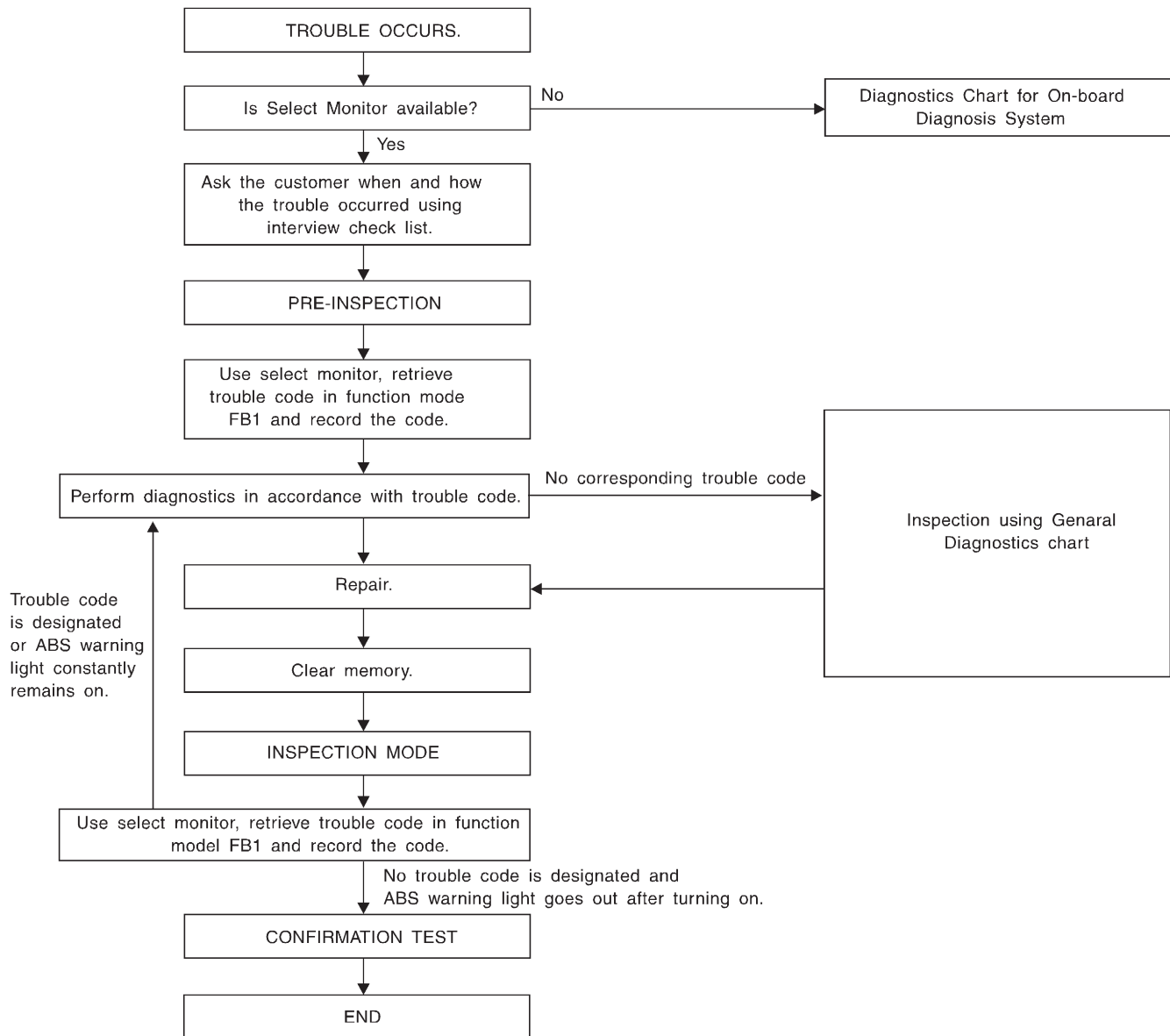
- When freeze frame data is stored in memory, trouble code appears on monitor.

NOTE:

The monitor as shown, indicates trouble code 21.

10. Diagnostics Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART



B4M1076A

NOTE:

To check harness for broken wires or short circuits, shake it while holding it or the connector.

B: LIST OF TROUBLE CODE

Code	Display screen (FB1)	Contents of diagnosis	Ref. to 4-4
—	ERROR 3 (1)	Select monitor communication failure	[T10C0]
11	NO TROUBLE	Although no trouble appears on the select monitor display, the ABS warning light remains on	[T10D0]
21	FR. SS HARD	Open circuit or input voltage too high of FR sensor	[T10E0]
22	FR. SS SOFT	Abnormal ABS sensor signal of FR sensor	[T10I0]
23	FL. SS HARD	Open circuit or input voltage too high of FL sensor	[T10F0]
24	FL. SS SOFT	Abnormal ABS sensor signal of FL sensor	[T10J0]
25	RR. SS HARD	Open circuit or input voltage too high of RR sensor	[T10G0]
26	RR. SS SOFT	Abnormal ABS sensor signal of RR sensor	[T10K0]
27	RL. SS HARD	Open circuit or input voltage too high of RL sensor	[T10H0]
28	RL. SS SOFT	Abnormal ABS sensor signal of RL sensor	[T10L0]
29	EITHER. SS SOFT	Abnormal ABS sensor signal (any one of four)	[T10M0]
31	FR. EV VALVE	Abnormal FR inlet valve	[T10N0]
32	FR. AV VALVE	Abnormal FR outlet valve	[T10R0]
33	FL. EV VALVE	Abnormal FL inlet valve	[T10O0]
34	FL. AV VALVE	Abnormal FL outlet valve	[T10S0]
35	RR. EV VALVE	Abnormal RR inlet valve	[T10P0]
36	RR. AV VALVE	Abnormal RR outlet valve	[T10T0]
37	RL. EV VALVE	Abnormal RL inlet valve	[T10Q0]
38	RL. AV VALVE	Abnormal RL outlet valve	[T10U0]
41	ECU	Abnormal ABSCM	[T10V0]
42	LOW VOLTAGE	Source voltage is low	[T10W0]
44	CCM LINE	A combination of AT control abnormalities (ABS not in control)	[T10X0]
	CCM OPEN	A combination of AT control abnormalities (ABS in control)	[T10Y0]
46	GS POWER OVER	G sensor line voltage too high	[T10Z0]
	GS POWER LOW	G sensor line voltage too low	[T10AA0]
51	V. RELAY	Abnormal valve relay	[T10AB0]
	V. RELAY ON	Valve relay ON failure	[T10AC0]
52	M. RELAY OPEN	Open circuit of motor relay	[T10AD0]
	M. RELAY ON	Motor relay ON failure	[T10AE0]
	MOTOR	Abnormal motor	[T10AF0]
54	BLS	Abnormal stop light switch	[T10AG0]
56	G SENSOR LINE	Open or short circuit of G sensor	[T10AH0]
	G SENSOR +B	Battery short of G sensor	[T10AI0]
	G SENSOR H μ	Abnormal G sensor high μ output	[T10AJ0]
	G SENSOR STICK	G sensor output is stuck	[T10AK0]

NOTE:

High μ means high friction coefficient against road surface.

ERROR 3

B4M0943

C: ERROR 3 (1) — SELECT MONITOR COMMUNICATION FAILURE —

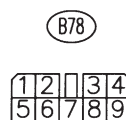
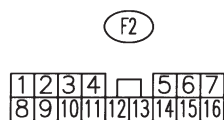
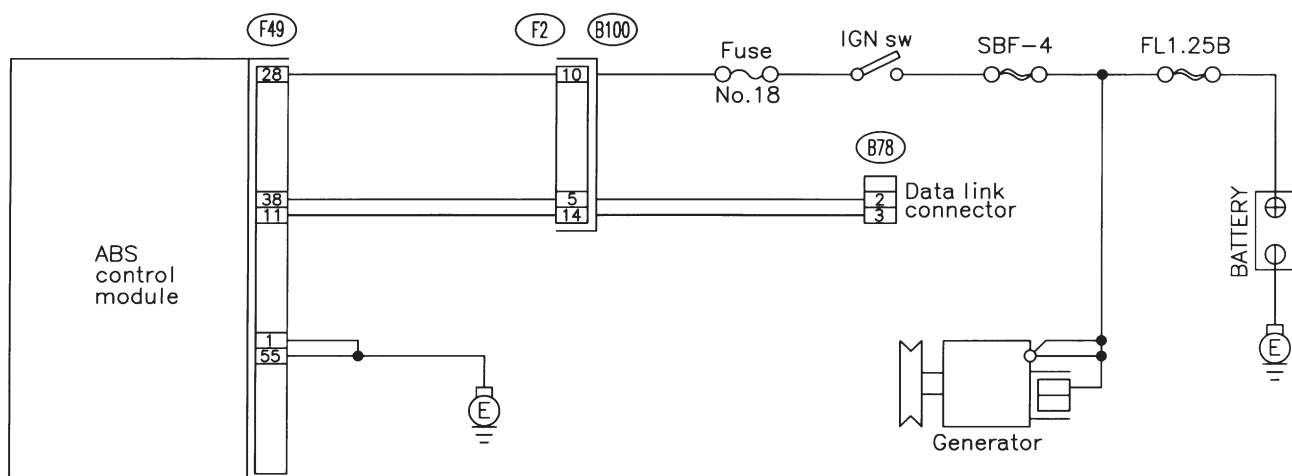
DIAGNOSIS:

- Faulty harness connector

TROUBLE SYMPTOM:

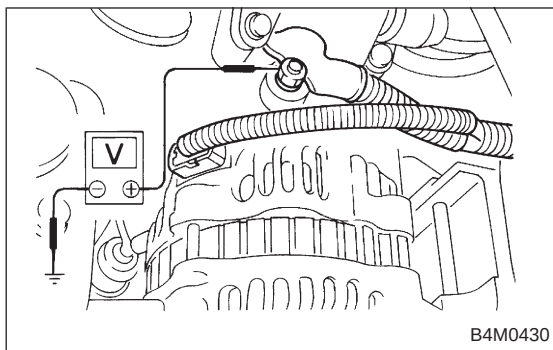
- ABS warning light remains on.
- ERROR 3 or 1 appears on the select monitor display.

WIRING DIAGRAM:



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

H4M1116



10C1	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 10C2.**NO** : Repair generator.

10C2	CHECK BATTERY TERMINAL.

Turn ignition switch to OFF.

CHECK : Is there poor contact at battery terminal?**YES** : Repair battery terminal.**NO** : Go to step 10C3.

10C3	CHECK COMMUNICATION OF SELECT MONITOR.

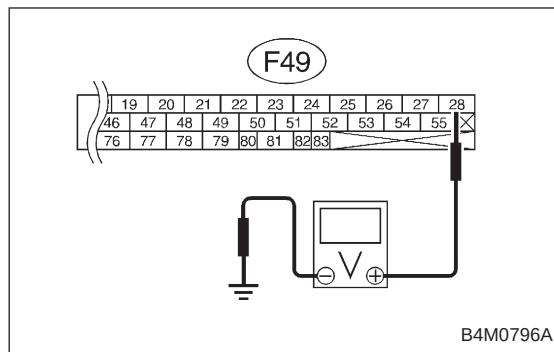
Using the select monitor, check whether communication to other system (such as engine, AT, etc.) can be executed normally.

CHECK : Are the name and year of the system displayed on the select monitor?**YES** : Go to step 10C4.**NO** : Repair select monitor communication cable and connector.

10C4	CHECK INSTALLATION OF ABSCM CONNECTOR.

Turn ignition switch to OFF.

CHECK : Is ABSCM connector inserted into ABSCM until the clamp locks onto it?**YES** : Go to step 10C5.**NO** : Insert ABSCM connector into ABSCM until the clamp locks onto it.

**10C5****CHECK POWER SUPPLY OF ABSCM.**

- 1) Disconnect connector from ABSCM.
- 2) Start engine.
- 3) Idle the engine.
- 4) Measure voltage between ABSCM connector and chassis ground.

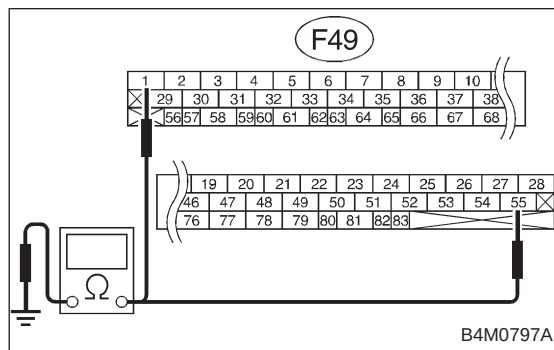
Connector & terminal

(F49) No. 28 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 and 15 V?

YES : Go to step 10C6.

NO : Repair ABSCM power supply circuit.

**10C6****CHECK GROUND CIRCUIT OF ABSCM.**

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

Connector & terminal

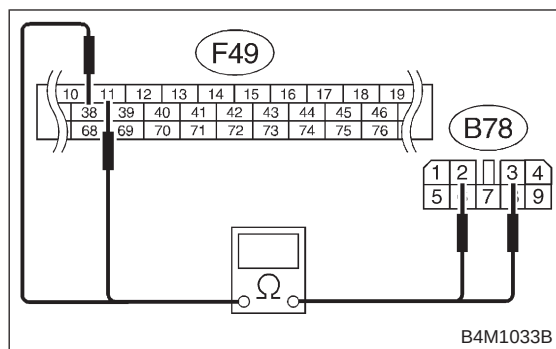
(F49) No. 1 — Chassis ground:

(F49) No. 55 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Repair harness/connector between ABSCM and select monitor.

NO : Go to step 10C7.

**10C7****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND DATA LINK.**

- 1) Turn ignition switch OFF.
- 2) Measure resistance between ABSCM connector and data link connector.

Connector & terminal**(F49) No. 11 — (B78) No. 3:****(F49) No. 38 — (B78) No. 2:****CHECK** : *Is the resistance less than 0.5 Ω?***YES** : Repair harness and connector between ABSCM and data link connector.**NO** : Go to step **10C8**.**10C8****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : *Is there poor contact in connectors between ABSCM and data link? <Ref. to FOREWORD [T3C1].>***YES** : Repair connector.**NO** : Replace ABSCM.

D•ALL 11 (FB1)
NO TROUBLE

B4M0944

D: NO TROUBLE

— ALTHOUGH NO TROUBLE APPEARS ON THE SELECT MONITOR DISPLAY, THE ABS WARNING LIGHT REMAINS ON —

DIAGNOSIS:

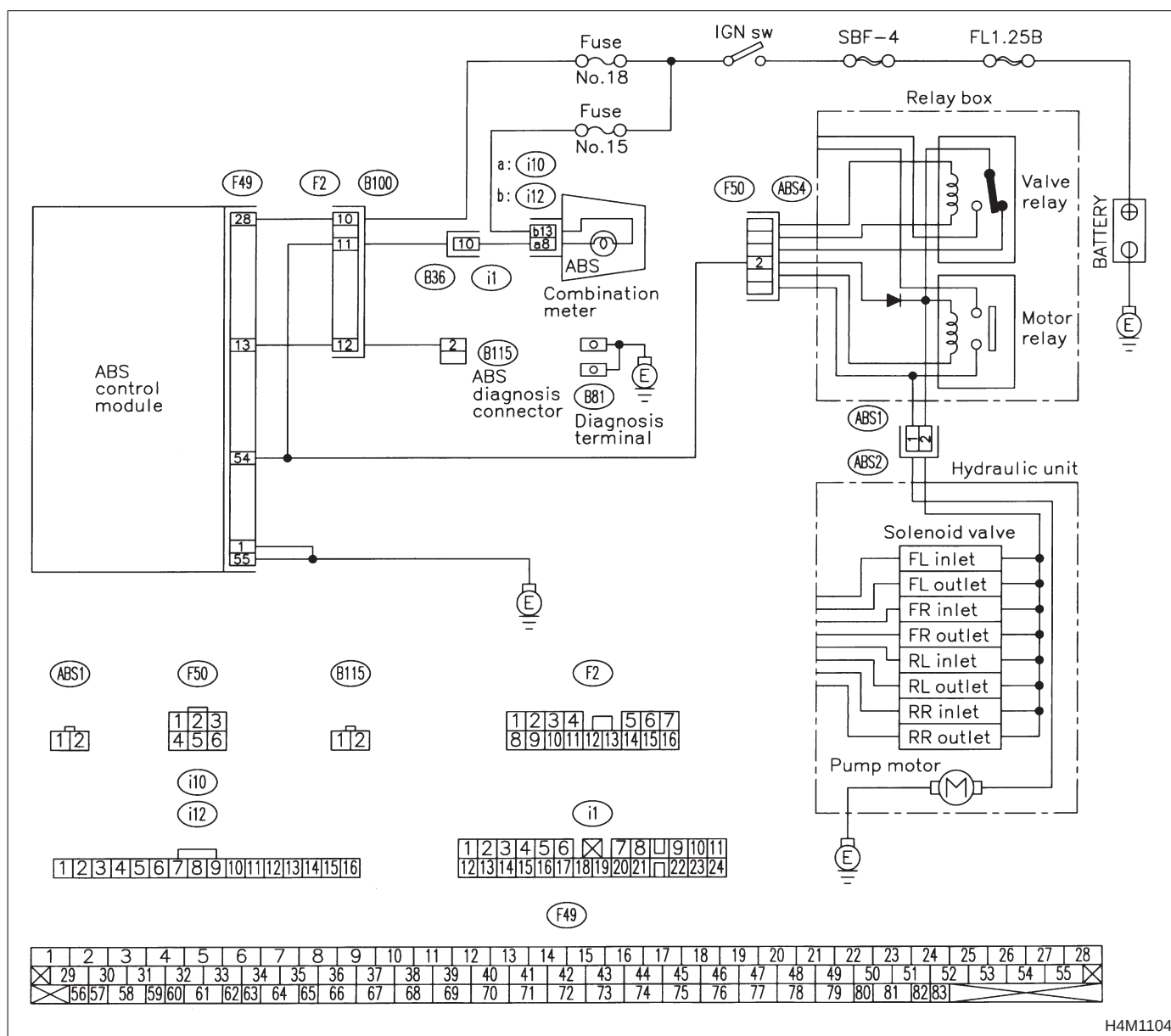
- ABS warning light circuit is shorted.

TROUBLE SYMPTOM:

- ABS warning light remains on.
- NO TROUBLE displayed on the select monitor.

NOTE:

When the ABS warning light is OFF and "NO TROUBLE" is displayed on the select monitor, the system is in normal condition.

WIRING DIAGRAM:

H4M1104

10D1	CHECK GROUND SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Disconnect connector (F50) from relay box.
- 4) Turn ignition switch to ON.

CHECK : ***Does the ABS warning light remain OFF?***

YES : Go to step **10D2**.

NO : Repair harness between ABSCM, relay box ABS warning light.

10D2	CHECK GROUND SHORT OF RELAY BOX.

- 1) Turn ignition switch to OFF.
- 2) Connect connector (F50) to relay box.
- 3) Disconnect connector (ABS1) from hydraulic unit.
- 4) Remove valve relay from relay box.
- 5) Turn ignition switch to ON.

CHECK : ***Does the ABS warning light remain OFF?***

YES : Replace ABSCM.

NO : Replace relay box.

D•NEW 21 (F B1)
FR. SS HARD

B4M0945

**E: TROUBLE CODE 21 FR. SS HARD
— ABNORMAL FRONT RH ABS SENSOR
(OPEN CIRCUIT OR INPUT VOLTAGE TOO
HIGH) —**

D•NEW 23 (F B1)
FL. SS HARD

B4M0946

**F: TROUBLE CODE 23 FL. SS HARD
— ABNORMAL FRONT LH ABS SENSOR
(OPEN CIRCUIT OR INPUT VOLTAGE TOO
HIGH) —**

D•NEW 25 (F B1)
RR. SS HARD

B4M0947

**G: TROUBLE CODE 25 RR. SS HARD
— ABNORMAL REAR RH ABS SENSOR
(OPEN CIRCUIT OR INPUT VOLTAGE TOO
HIGH) —**

D•NEW 27 (F B1)
RL. SS HARD

B4M0948

**H: TROUBLE CODE 27 RL. SS HARD
— ABNORMAL REAR LH ABS SENSOR
(OPEN CIRCUIT OR INPUT VOLTAGE TOO
HIGH) —**

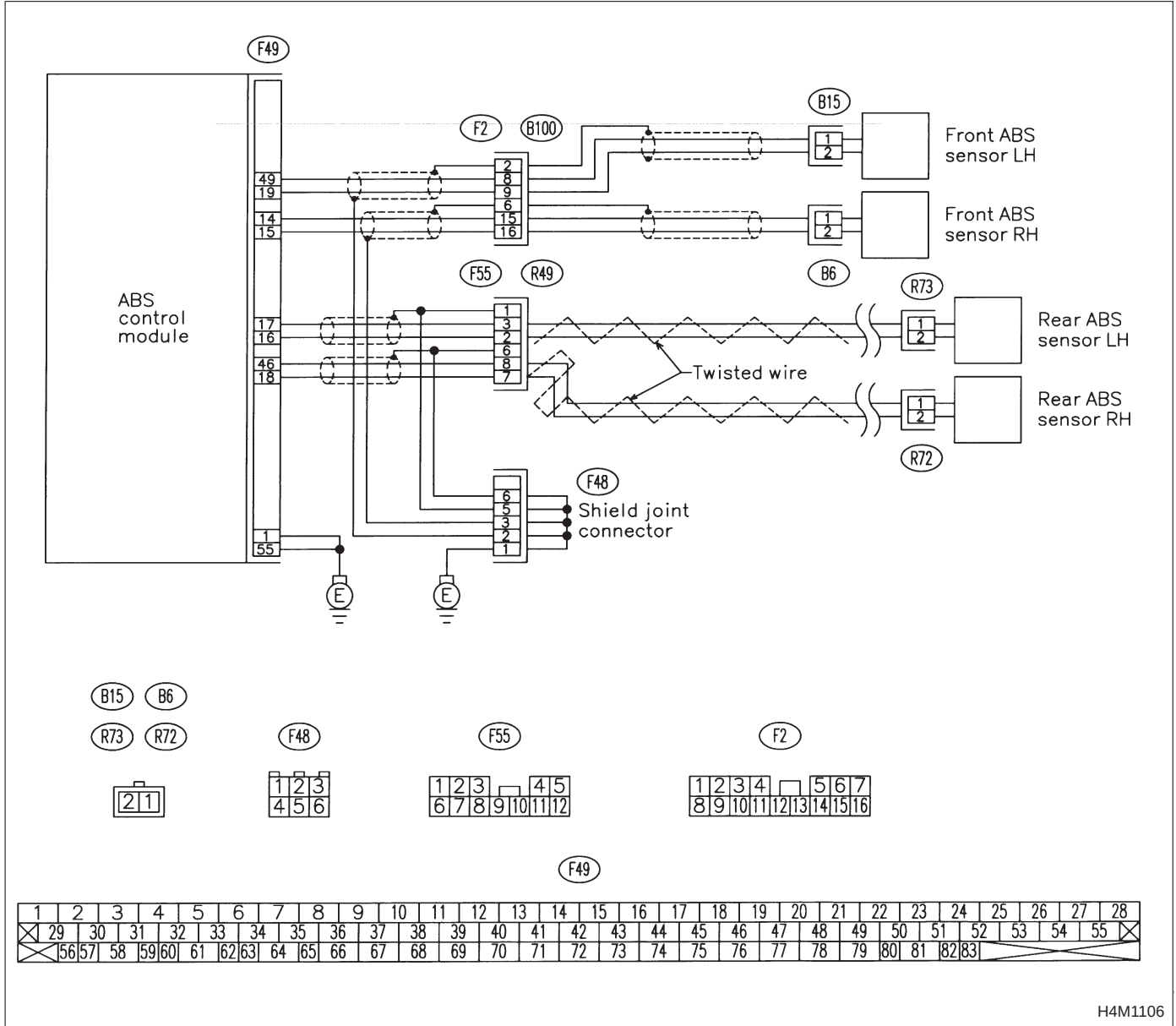
DIAGNOSIS:

- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

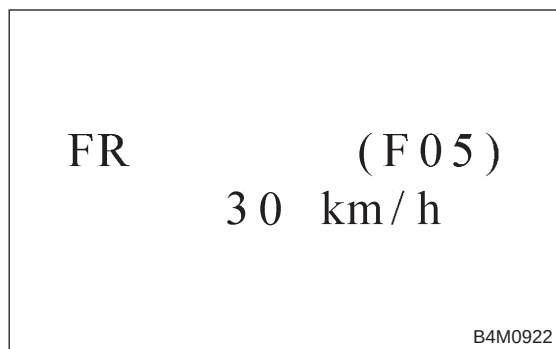
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1106

**10H1****CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.**

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:

The select monitor display shows that the front right wheel is rotating at 30 km/h.



: 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?



: Go to step **10H2**.



: 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)



: Are the ABS sensor installation bolts tightened securely?



: Go to step **10H3**.



: 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)



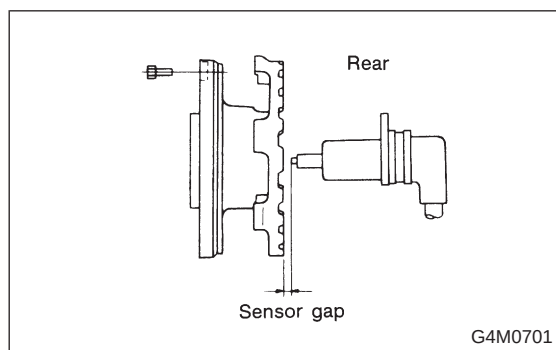
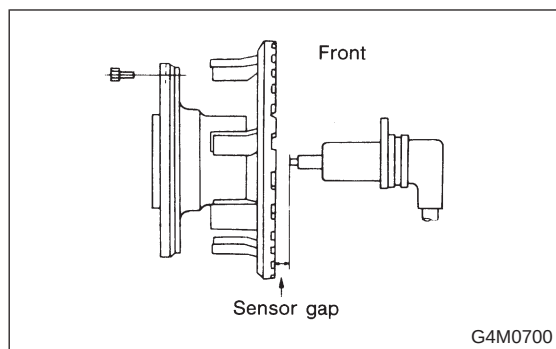
: Are the tone wheel installation bolts tightened securely?



: Go to step **10H4**.



: Tighten tone wheel installation bolts securely.



10H4 CHECK ABS SENSOR GAP.

Measure tone wheel-to-pole piece gap over entire perimeter of the wheel.

CHECK : *Is the gap within the specifications shown in the following table?*

	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)

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 and ABS sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step 10H7.

10H7 CHECK ABSCM.

- 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.

NO : Go to step 10H8.

10H8**CHECK ANY OTHER TROUBLE CODES APPEARANCE.****CHECK**: **Are other trouble codes being output?****YES**

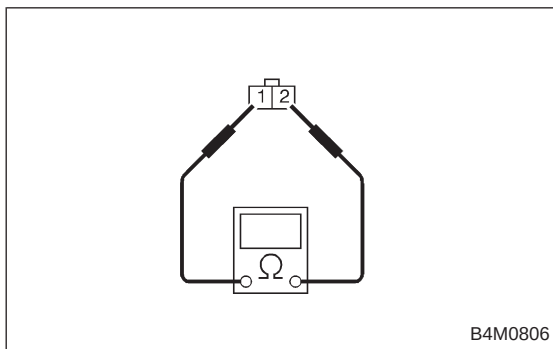
: Proceed with the diagnosis corresponding to the trouble code.

NO

: A temporary poor contact.

NOTE:

Check harness and connectors between ABSCM and ABS sensor.



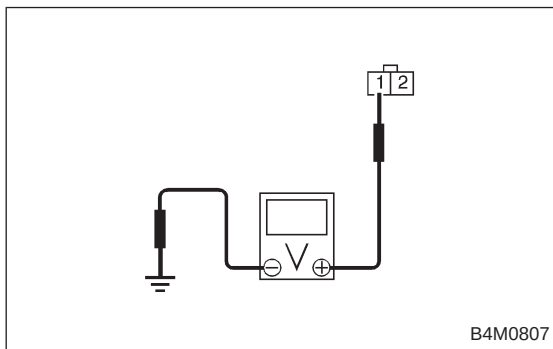
B4M0806

10H9**CHECK RESISTANCE OF 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 k Ω ?****YES**: Go to step **10H10**.**NO**

: Replace ABS sensor.



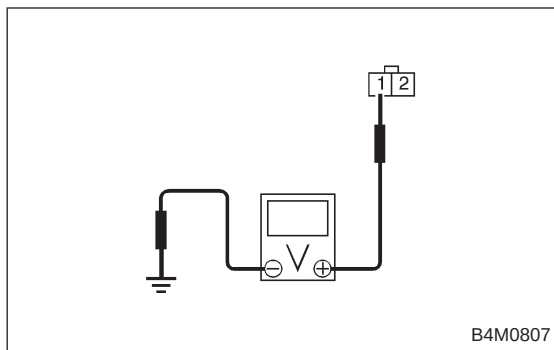
B4M0807

10H10**CHECK BATTERY SHORT OF ABS SENSOR.**

- 1) Disconnect connector from ABSCM.
- 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 (-):

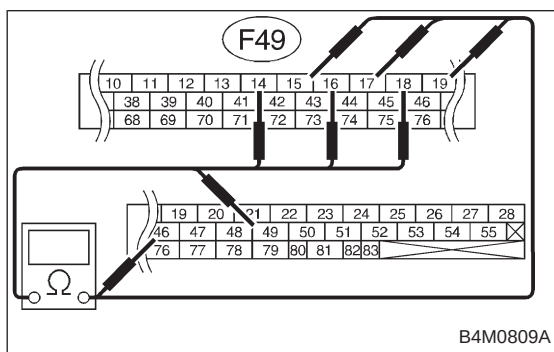
Rear RH No. 1 (+) — Chassis ground (-):

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 AND ABS SENSOR.

- 1) Connect connector to ABS sensor.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal

Trouble code 21 / (F49) No. 14 — No. 15:

Trouble code 23 / (F49) No. 49 — No. 19:

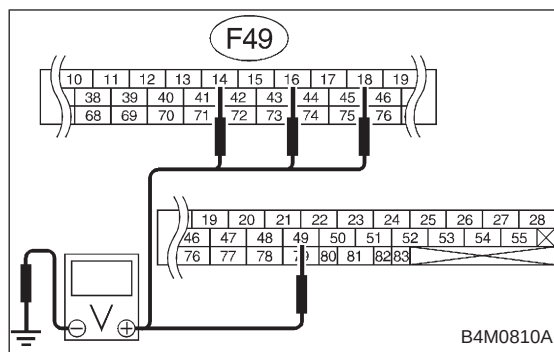
Trouble code 25 / (F49) No. 18 — No. 46:

Trouble code 27 / (F49) No. 16 — No. 17:

CHECK : Is the resistance between 0.8 and 1.2 kΩ?

YES : Go to step 10H13.

NO : Repair harness/connector between ABSCM and ABS sensor.

**10H13 CHECK BATTERY SHORT OF HARNESS.**

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 21 / (F49) No. 14 — Chassis ground:

Trouble code 23 / (F49) No. 49 — Chassis ground:

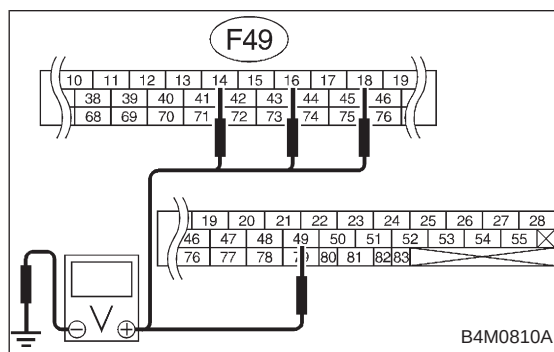
Trouble code 25 / (F49) No. 18 — Chassis ground:

Trouble code 27 / (F49) No. 16 — Chassis ground:

CHECK : Is the voltage less than 1 V?

YES : Go to step 10H14.

NO : Repair harness between ABSCM and ABS sensor.

**10H14 CHECK BATTERY SHORT OF HARNESS.**

1) Turn ignition switch to ON.

2) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 21 / (F49) No. 14 — Chassis ground:

Trouble code 23 / (F49) No. 49 — Chassis ground:

Trouble code 25 / (F49) No. 18 — Chassis ground:

Trouble code 27 / (F49) No. 16 — Chassis ground:

CHECK : Is the voltage less than 1 V?

YES : Go to step 10H15.

NO : Repair harness between ABSCM and ABS sensor.

10H15 CHECK INSTALLATION OF ABS SENSOR.

CHECK : **Tightening torque:**

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

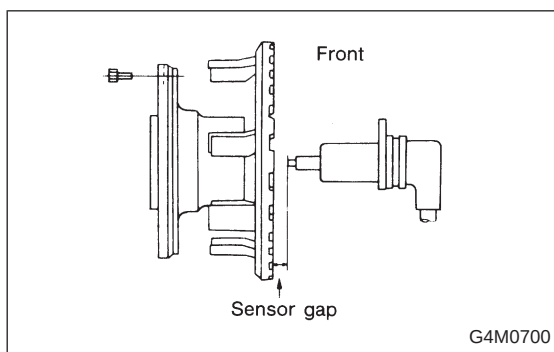
Are the ABS sensor installation bolts tightened securely?

YES : Go to step 10H16.

NO : Tighten ABS sensor installation bolts securely.

10H16**CHECK INSTALLATION OF TONE WHEEL.****CHECK**: **Tightening torque:** **$13 \pm 3 \text{ N}\cdot\text{m}$ ($1.3 \pm 0.3 \text{ kg}\cdot\text{m}$, $9 \pm 2.2 \text{ ft}\cdot\text{lb}$)****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.

CHECK: **Is the gap within the specifications shown in the following table?**

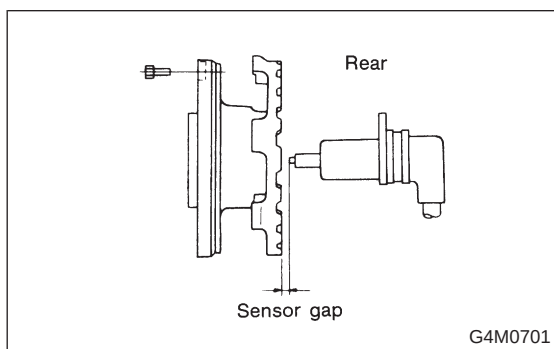
	Front wheel	Rear wheel
Specifications	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

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 POOR CONTACT IN CONNECTORS.**

Turn ignition switch to OFF.

CHECK: **Is there poor contact in connectors between ABSCM and ABS sensor? <Ref. to FOREWORD [T3C1].>****YES**

: Repair connector.

NO: Go to step **10H20**.

10H20	CHECK ABSCM.

- 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.

NO : Go to step **10H21**.

10H21	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 and ABS sensor.

D•NEW 22 (F B1)
FR. SS SOFT

B4M0812

**I: TROUBLE CODE 22 FR. SS SOFT
— ABNORMAL FRONT RH ABS SENSOR
(ABNORMAL ABS SENSOR SIGNAL) —**

D•NEW 24 (F B1)
FL. SS SOFT

B4M0949

**J: TROUBLE CODE 24 FL. SS SOFT
— ABNORMAL FRONT LH ABS SENSOR
(ABNORMAL ABS SENSOR SIGNAL) —**

D•NEW 26 (F B1)
RR. SS SOFT

B4M0950

**K: TROUBLE CODE 26 RR. SS SOFT
— ABNORMAL REAR RH ABS SENSOR
(ABNORMAL ABS SENSOR SIGNAL) —**

D•NEW 28 (F B1)
RL. SS SOFT

B4M0951

**L: TROUBLE CODE 28 RL. SS SOFT
— ABNORMAL REAR LH ABS SENSOR
(ABNORMAL ABS SENSOR SIGNAL) —**

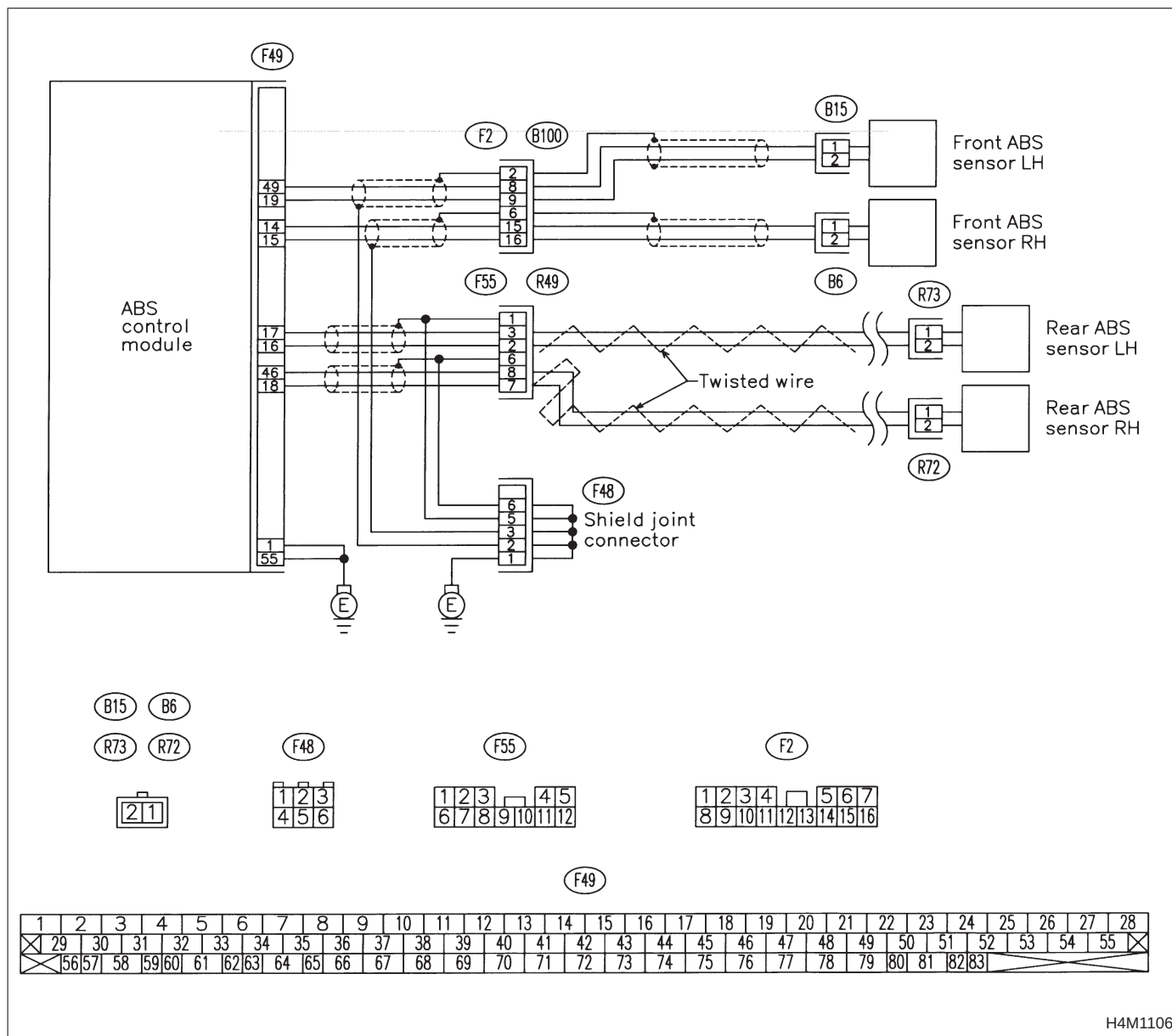
DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1106

FR (F05)
30 km/h

B4M0922

10L1**CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.**

Read the ABS sensor output corresponding to the faulty system in the select monitor function mode.

NOTE:

The select monitor display shows that the front right wheel is rotating at 30 km/h.

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 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**

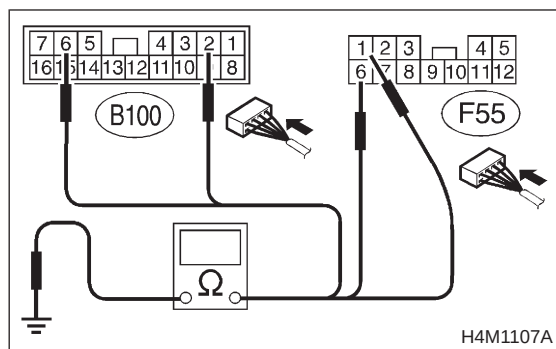
: Are noise sources (such as an antenna) installed near the sensor harness?

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. 6 — Chassis ground:

Trouble code 24 / (B100) No. 2 — Chassis ground:

Trouble code 26 / (F55) No. 6 — Chassis ground:

Trouble code 28 / (F55) No. 1 — Chassis ground:

(CHECK) : Is the resistance less than 0.5 Ω?

(YES) : Go to step 10L6.

(NO) : Repair shield harness.

10L6**CHECK ABSCM.**

- 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.

(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.

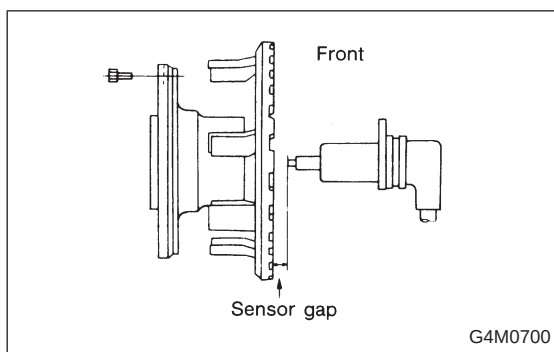
10L8**CHECK INSTALLATION OF ABS SENSOR.****Tightening torque:**

32±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 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.**

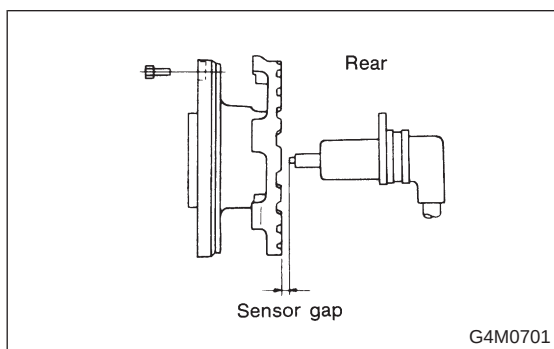
Measure tone wheel to pole piece gap over entire perimeter of the wheel.

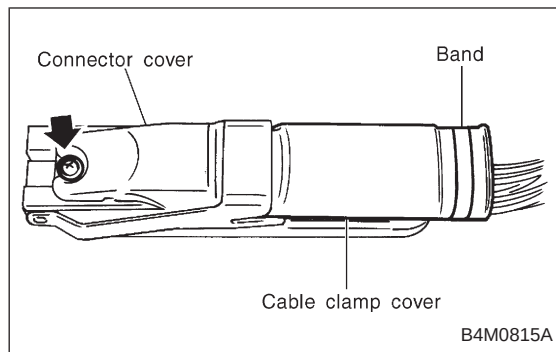
(CHECK) : **Is the gap within the specifications shown in the following table?**

	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)

(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.

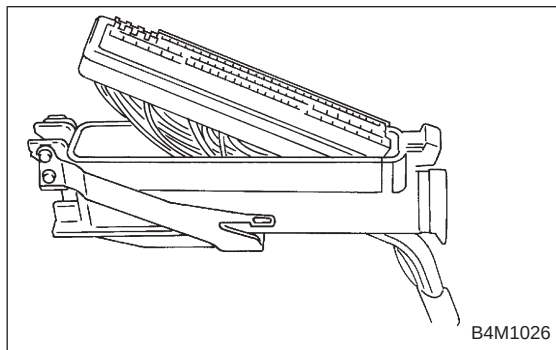
**10L11****CHECK OSCILLOSCOPE.****(CHECK)** : **Is an oscilloscope available?****(YES)** : Go to step **10L12**.**(NO)** : Go to step **10L13**.

**10L12****CHECK ABS SENSOR SIGNAL.**

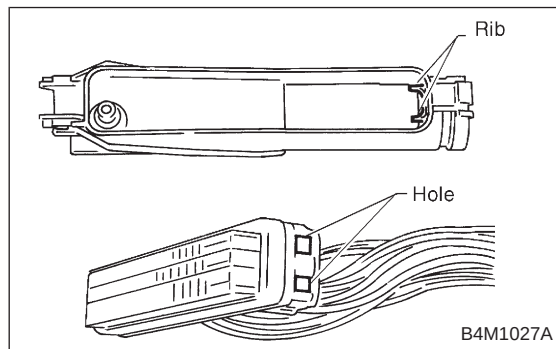
- 1) Turn ignition switch OFF.
- 2) Raise all four wheels of ground.
- 3) Disconnect connector from ABS control module.
- 4) Remove band.
- 5) Remove cable clamp cover.
- 6) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.

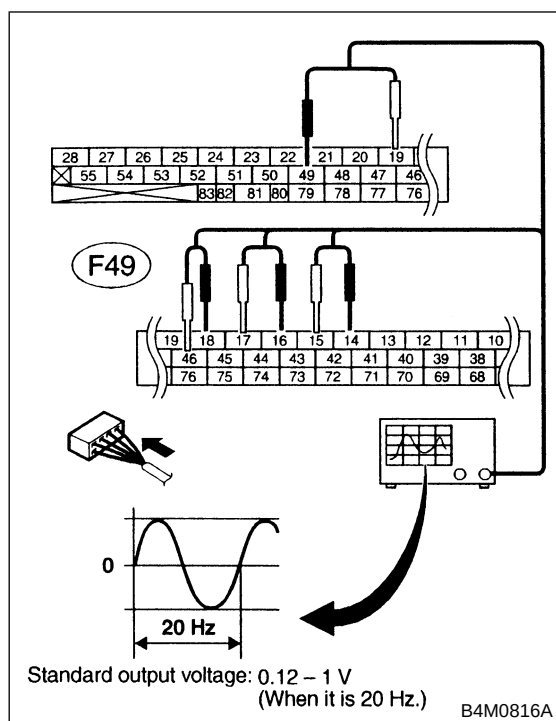


- 7) Remove connector cover.

**NOTE:**

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

- 8) Connect connector to ABS control module.
- 9) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
- 10) Turn ignition switch ON.



11) 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 / (F49) No. 14 (+) — No. 15 (-):

Trouble code 24 / (F49) No. 49 (+) — No. 19 (-):

Trouble code 26 / (F49) No. 18 (+) — No. 46 (-):

Trouble code 28 / (F49) No. 16 (+) — No. 17 (-):

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 teeth in the ABS sensor pole piece or the tone wheel?

YES : Replace ABS sensor or tone wheel.

NO : Go to step 10L15.

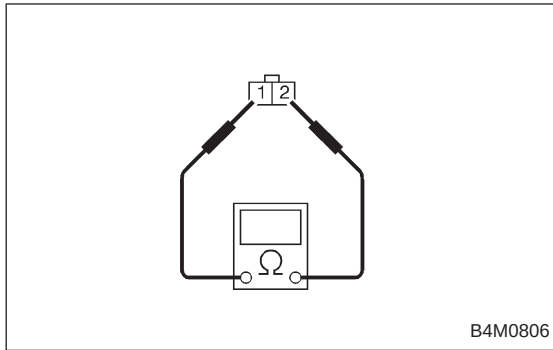
10L15 CHECK HUB RUNOUT.

Measure hub runout.

CHECK : Is the runout less than 0.05 mm (0.0020 in)?

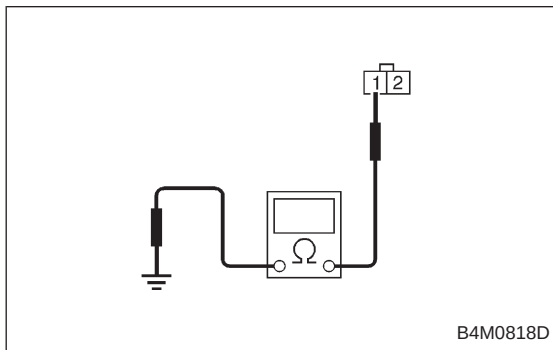
YES : Go to step 10L16.

NO : Repair hub.



10L16	CHECK RESISTANCE OF ABS SENSOR.

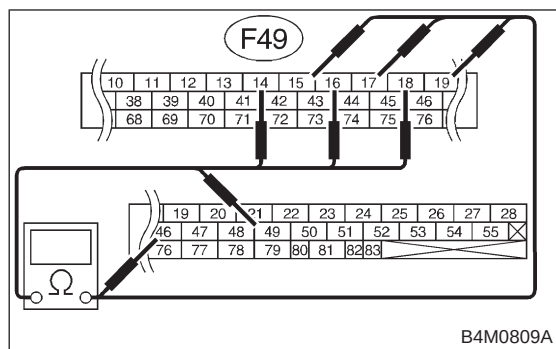
- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminals.

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 AND ABS SENSOR.

- 1) Connect connector to ABS sensor.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance at ABSCM connector terminals.

Connector & terminal

Trouble code 22 / (F49) No. 14 — No. 15:

Trouble code 24 / (F49) No. 49 — No. 69:

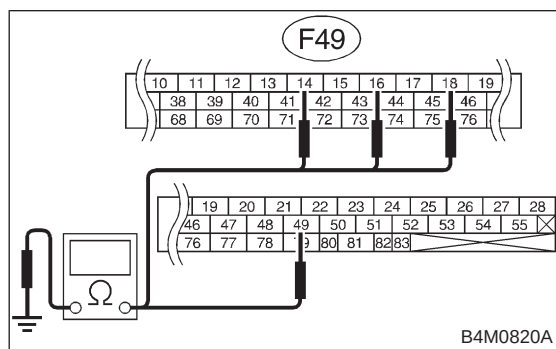
Trouble code 26 / (F49) No. 18 — No. 46:

Trouble code 28 / (F49) No. 16 — No. 17:

CHECK : Is the resistance between 0.8 and 1.2 k Ω ?

YES : Go to step 10L19.

NO : Repair harness/connector between ABSCM and ABS sensor.



10L19

CHECK GROUND SHORT OF HARNESS.

Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 22 / (F49) No. 14 — Chassis ground:

Trouble code 24 / (F49) No. 49 — Chassis ground:

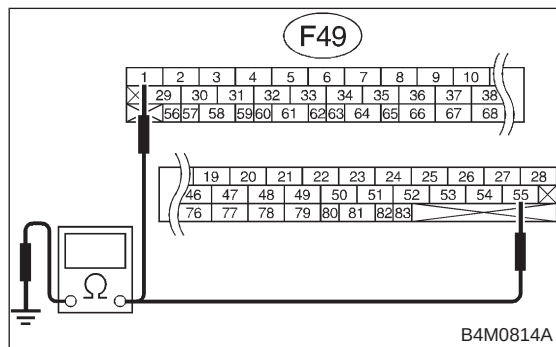
Trouble code 26 / (F49) No. 18 — Chassis ground:

Trouble code 28 / (F49) No. 16 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10L20.

NO : Repair harness between ABSCM and ABS sensor.



10L20

CHECK GROUND CIRCUIT OF ABSCM.

Measure resistance between ABSCM and chassis ground.

Connector & terminal

(F49) No. 1 — Chassis ground:

(F49) No. 55 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 10L21.

NO : Repair ABSCM ground harness.

10L21**CHECK POOR CONTACT IN CONNECTORS.****CHECK**: *Is there poor contact in connectors between ABSCM and ABS sensor? <Ref. to FOREWORD [T3C1].>***YES**

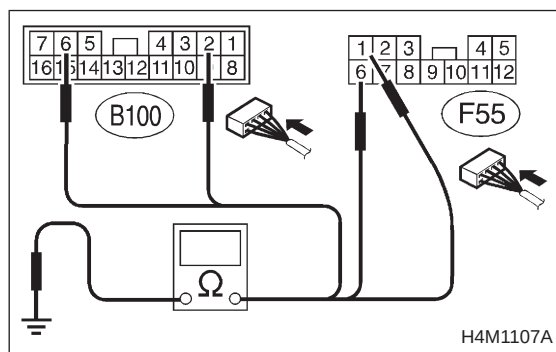
: Repair connector.

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. 6 — Chassis ground:****Trouble code 24 / (B100) No. 2 — Chassis ground:****Trouble code 26 / (F55) No. 6 — Chassis ground:****Trouble code 28 / (F55) No. 1 — Chassis ground:****CHECK**: *Is the resistance less than 0.5 Ω ?***YES**: Go to step **10L25**.**NO**

: Repair shield harness.

10L25	CHECK ABSCM.

- 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.

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.

D•NEW 29 (FB1)
EITHER. SS SOFT

B4M0952

**M: TROUBLE CODE 29 EITHER. SS SOFT
— ABNORMAL ABS SENSOR SIGNAL (ANY
ONE OF FOUR) —**

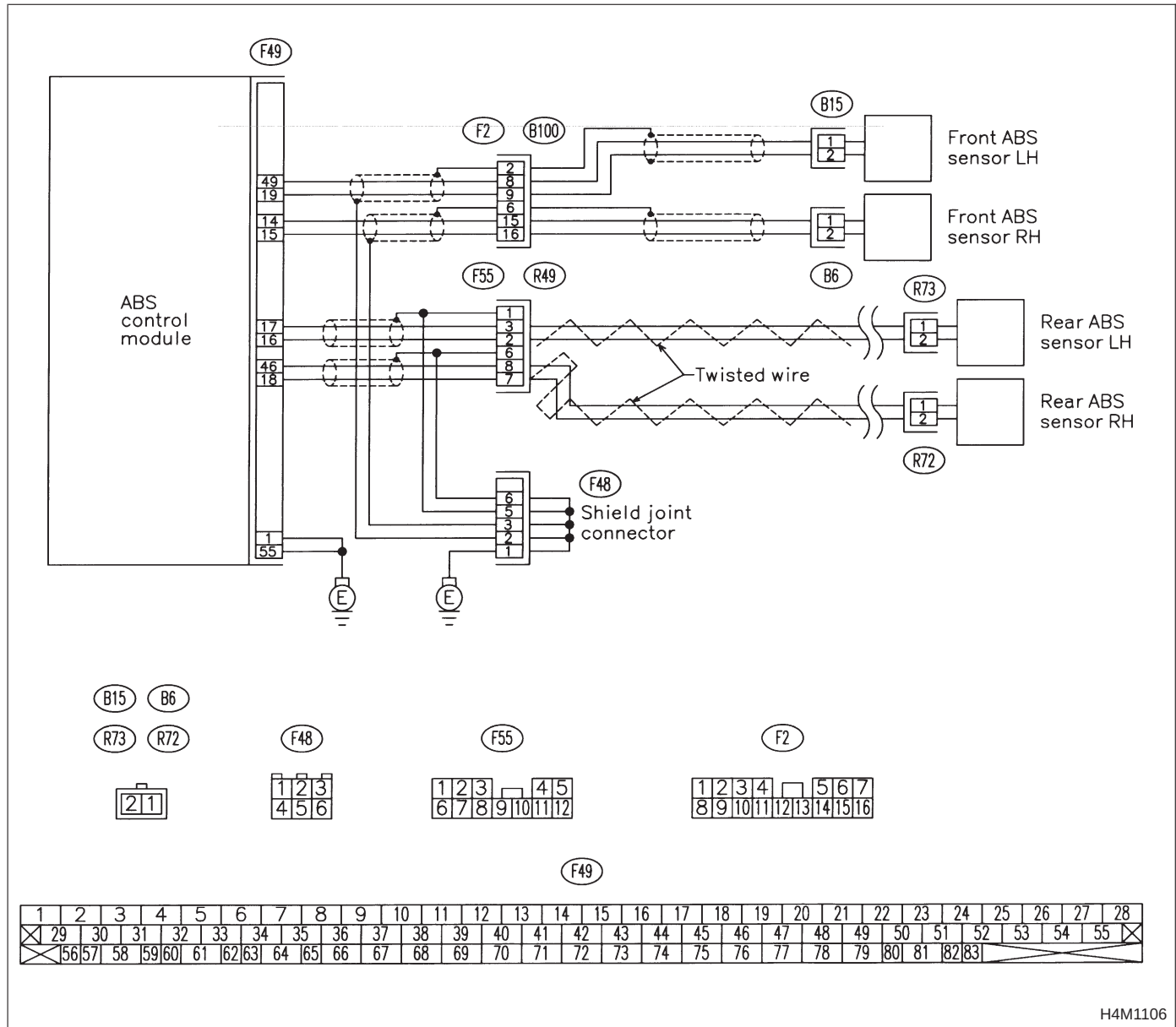
DIAGNOSIS:

- 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:



H4M1106

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.

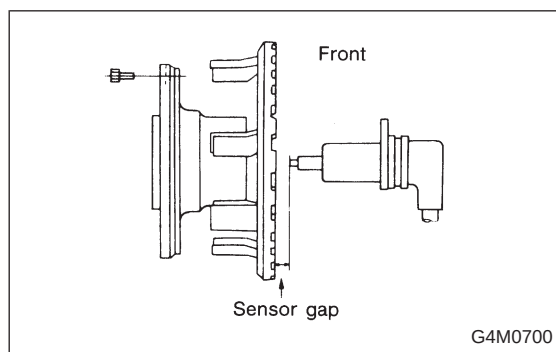
Tightening torque:

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:** **$13 \pm 3 \text{ N}\cdot\text{m}$ ($1.3 \pm 0.3 \text{ kg}\cdot\text{m}$, $9 \pm 2.2 \text{ ft}\cdot\text{lb}$)****(CHECK)** : **Are the tone wheel installation bolts tightened securely?****(YES)** : Go to step **10M7**.**(NO)** : Tighten tone wheel installation bolts securely.**10M7****CHECK ABS SENSOR GAP.**

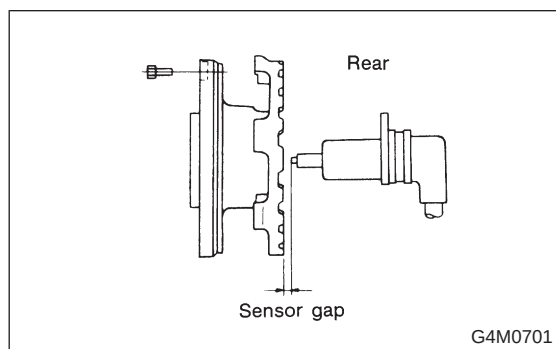
Measure tone wheel to pole piece gap over entire perimeter of the wheel.

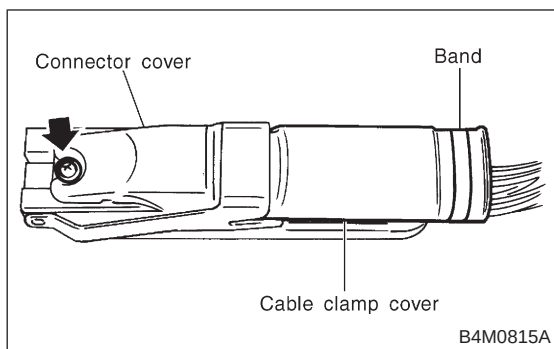
(CHECK) : **Is the gap within the specifications shown in the following table?**

	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)

(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.

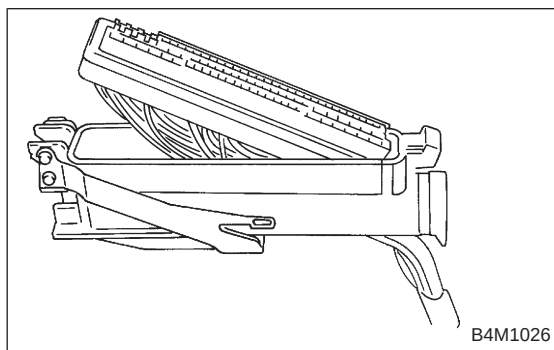
**10M8****CHECK OSCILLOSCOPE.****(CHECK)** : **Is an oscilloscope available?****(YES)** : Go to step **10M9**.**(NO)** : Go to step **10M10**.

**10M9****CHECK ABS SENSOR SIGNAL.**

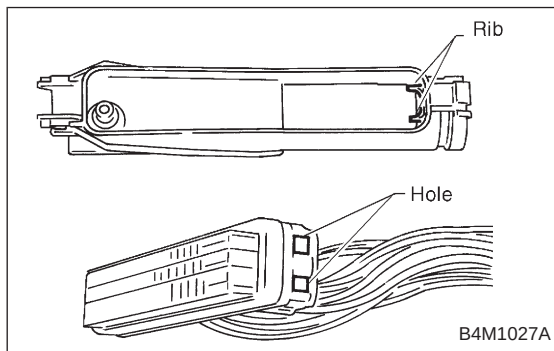
- 1) Turn ignition switch OFF.
- 2) Raise all four wheels of ground.
- 3) Disconnect connector from ABS control module.
- 4) Remove band.
- 5) Remove cable clamp cover.
- 6) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.

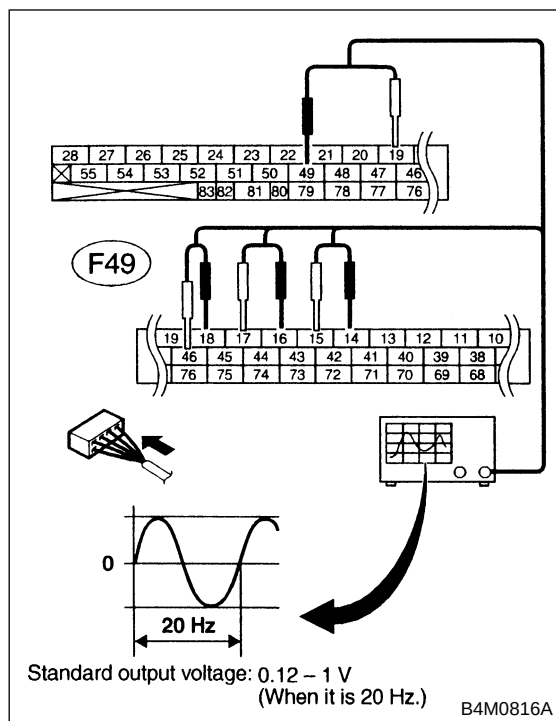


- 7) Remove connector cover.

**NOTE:**

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

- 8) Connect connector to ABS control module.
- 9) Connect the oscilloscope to the ABS control module connector.
- 10) Turn ignition switch ON.



11) 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

(F49) No. 14 (+) — No. 15 (–) (Front RH):

(F49) No. 49 (+) — No. 19 (–) (Front LH):

(F49) No. 18 (+) — No. 46 (–) (Rear RH):

(F49) No. 16 (+) — No. 17 (–) (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.

- 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.

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.

D•NEW 31 (F B1)
FR. EV VALVE

B4M0953

**N: TROUBLE CODE 31 FR. EV VALVE
— ABNORMAL FRONT RH INLET SOLENOID
VALVE —**

D•NEW 33 (F B1)
FL. EV VALVE

B4M0954

**O: TROUBLE CODE 33 FL. EV VALVE
— ABNORMAL FRONT LH INLET SOLENOID
VALVE —**

D•NEW 35 (F B1)
RR. EV VALVE

B4M0955

**P: TROUBLE CODE 35 RR. EV VALVE
— ABNORMAL REAR RH INLET SOLENOID
VALVE —**

D•NEW 37 (F B1)
RL. EV VALVE

B4M0956

**Q: TROUBLE CODE 37 RL. EV VALVE
— ABNORMAL REAR LH INLET SOLENOID
VALVE —**

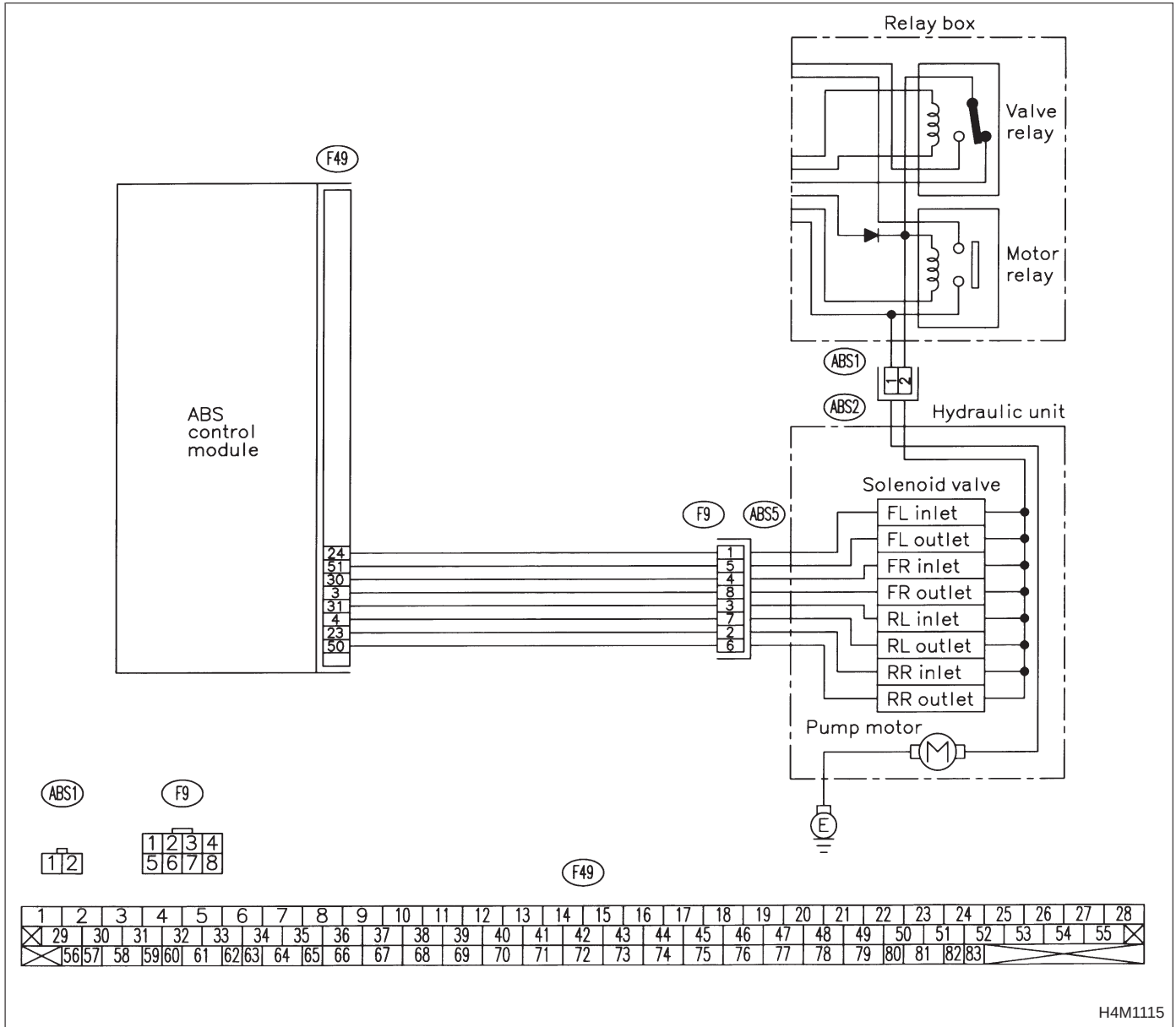
DIAGNOSIS:

- Faulty harness/connector
- Faulty inlet solenoid valve in hydraulic unit

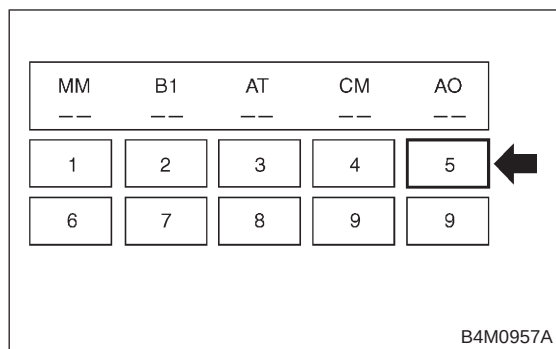
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1115

**10Q1 CHECK FREEZE FRAME DATA.**

Press [F], [E], [1] and [5] on the select monitor.

CHECK : *Is the select monitor LED 5 off? Was the ABS inactive when the problem occurred?*

YES : Go to step **10Q2**.

NO : Go to step **10Q15**.

10Q2 CHECK THE CONDITION WHEN THE TROUBLE OCCURRED.

Ask the vehicle owner about driving conditions when the trouble occurred. Attempt to duplicate the conditions.

CHECK : *Is the trouble immediately apparent?*

YES : Go to step **10Q3**.

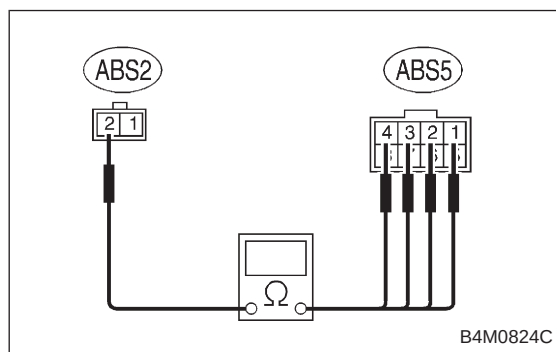
NO : Go to step **10Q15**.

10Q3 CHECK THE CONDITION WHEN THE TROUBLE OCCURRED.

CHECK : *Did the trouble occur immediately after engine starting or during standing starts?*

YES : Go to step **10Q11**.

NO : Go to step **10Q4**.

**10Q4 CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 — (ABS2) No. 2:

Trouble code 33 / (ABS5) No. 1 — (ABS2) No. 2:

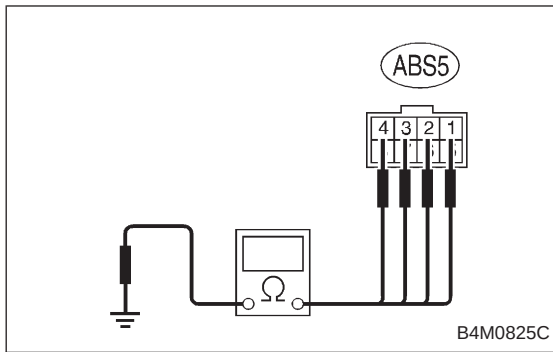
Trouble code 35 / (ABS5) No. 2 — (ABS2) No. 2:

Trouble code 37 / (ABS5) No. 3 — (ABS2) No. 2:

CHECK : *Is the resistance between 7.8 and 9.2 Ω?*

YES : Go to step **10Q5**.

NO : Replace hydraulic unit.

**10Q5****CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 — Chassis ground:

Trouble code 33 / (ABS5) No. 1 — Chassis ground:

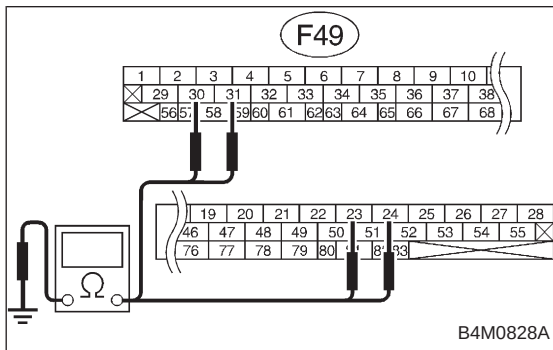
Trouble code 35 / (ABS5) No. 2 — Chassis ground:

Trouble code 37 / (ABS5) No. 3 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10Q6.

NO : Replace hydraulic unit.

**10Q6****CHECK GROUND SHORT OF HARNESS.**

1) Disconnect connector from ABSCM.

2) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 31 / (F49) No. 30 — Chassis ground:

Trouble code 33 / (F49) No. 24 — Chassis ground:

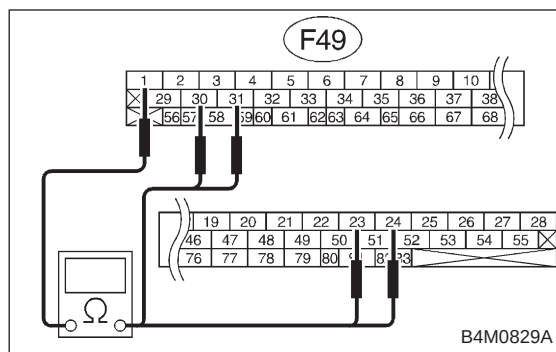
Trouble code 35 / (F49) No. 23 — Chassis ground:

Trouble code 37 / (F49) No. 31 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10Q7.

NO : Repair harness between ABSCM and hydraulic unit.

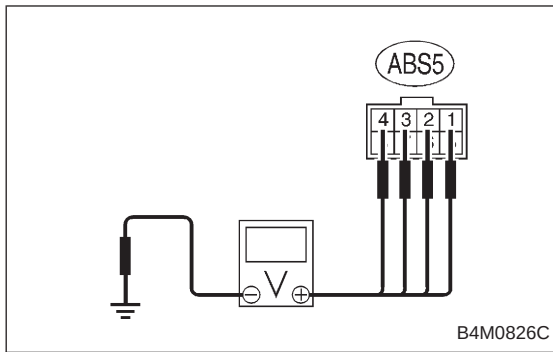
**10Q7****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**Trouble code 31 / (F49) No. 30 — No. 1:****Trouble code 33 / (F49) No. 24 — No. 1:****Trouble code 35 / (F49) No. 23 — No. 1:****Trouble code 37 / (F49) No. 31 — No. 1:****CHECK** : *Is the resistance between 8.3 and 9.7 Ω?***YES** : Go to step **10Q8**.**NO** : Repair harness/connector between ABSCM and hydraulic unit.**10Q8****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>***YES** : Repair connector.**NO** : Go to step **10Q9**.**10Q9****CHECK ABSCM.**

- 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.**NO** : Go to step **10Q10**.**10Q10****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.

**10Q11****CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Disconnect connector from ABSCM.
- 4) Measure voltage between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 (+) — Chassis ground (-):

Trouble code 33 / (ABS5) No. 1 (+) — Chassis ground (-):

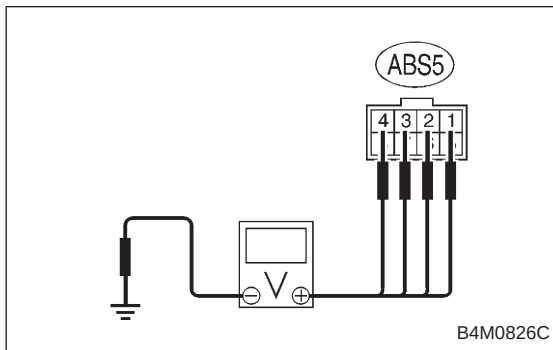
Trouble code 35 / (ABS5) No. 2 (+) — Chassis ground (-):

Trouble code 37 / (ABS5) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10Q12.

NO : Replace hydraulic unit.

**10Q12****CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

Connector & terminal

Trouble code 31 / (ABS5) No. 4 (+) — Chassis ground (-):

Trouble code 33 / (ABS5) No. 1 (+) — Chassis ground (-):

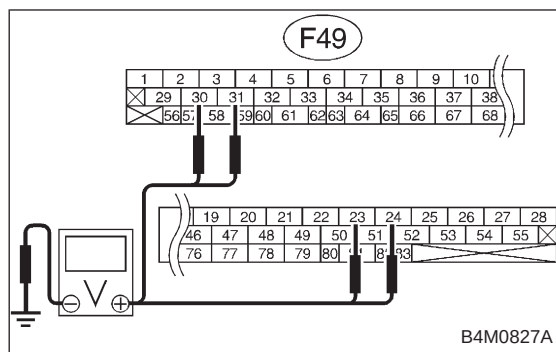
Trouble code 35 / (ABS5) No. 2 (+) — Chassis ground (-):

Trouble code 37 / (ABS5) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10Q13.

NO : Replace hydraulic unit.

**10Q13****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 31 / (F49) No. 30 (+) — Chassis ground (-):

Trouble code 33 / (F49) No. 24 (+) — Chassis ground (-):

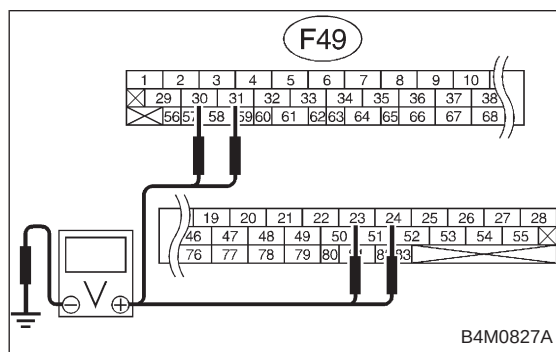
Trouble code 35 / (F49) No. 23 (+) — Chassis ground (-):

Trouble code 37 / (F49) No. 31 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10Q14.

NO : Repair harness between ABSCM and hydraulic unit.

**10Q14****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 31 / (F49) No. 30 (+) — Chassis ground (-):

Trouble code 33 / (F49) No. 24 (+) — Chassis ground (-):

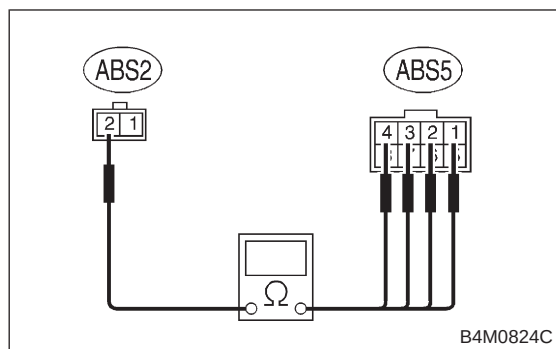
Trouble code 35 / (F49) No. 23 (+) — Chassis ground (-):

Trouble code 37 / (F49) No. 31 (+) — Chassis ground (-):

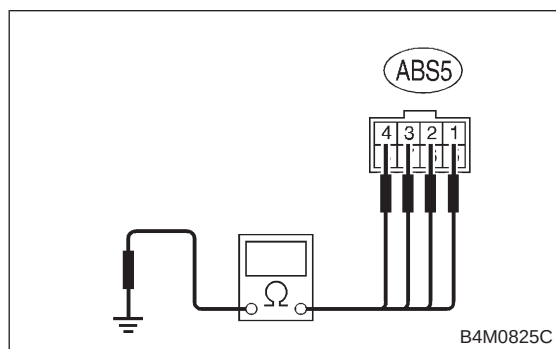
CHECK : Is the voltage less than 1 V?

YES : Replace ABSCM.

NO : Repair harness between ABSCM and hydraulic unit.

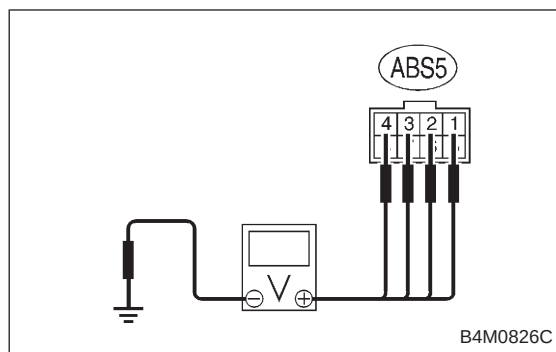
**10Q15****CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal**Trouble code 31 / (ABS5) No. 4 — (ABS2) No. 2:****Trouble code 33 / (ABS5) No. 1 — (ABS2) No. 2:****Trouble code 35 / (ABS5) No. 2 — (ABS2) No. 2:****Trouble code 37 / (ABS5) No. 3 — (ABS2) No. 2:****CHECK** : Is the resistance between 7.8 and 9.2 Ω?**YES** : Go to step 10Q16.**NO** : Replace hydraulic unit.**10Q16****CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

Connector & terminal**Trouble code 31 / (ABS5) No. 4 — Chassis ground:****Trouble code 33 / (ABS5) No. 1 — Chassis ground:****Trouble code 35 / (ABS5) No. 2 — Chassis ground:****Trouble code 37 / (ABS5) No. 3 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10Q17.**NO** : Replace hydraulic unit.

**10Q17****CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 31 / (ABS5) No. 4 (+) — Chassis ground (-):

Trouble code 33 / (ABS5) No. 1 (+) — Chassis ground (-):

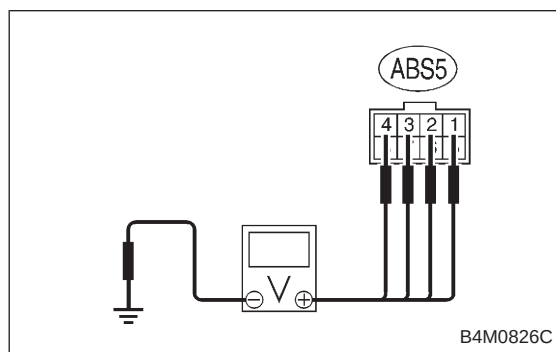
Trouble code 35 / (ABS5) No. 2 (+) — Chassis ground (-):

Trouble code 37 / (ABS5) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10Q18.

NO : Replace hydraulic unit.

**10Q18****CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

Connector & terminal

Trouble code 31 / (ABS5) No. 4 (+) — Chassis ground (-):

Trouble code 33 / (ABS5) No. 1 (+) — Chassis ground (-):

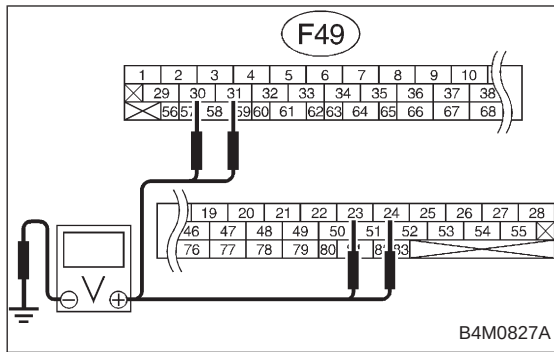
Trouble code 35 / (ABS5) No. 2 (+) — Chassis ground (-):

Trouble code 37 / (ABS5) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10Q19.

NO : Replace hydraulic unit.



10Q19	CHECK BATTERY SHORT OF HARNESS.

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

Connector & terminal

Trouble code 31 / (F49) No. 30 (+) — Chassis ground (-):

Trouble code 33 / (F49) No. 24 (+) — Chassis ground (-):

Trouble code 35 / (F49) No. 23 (+) — Chassis ground (-):

Trouble code 37 / (F49) No. 31 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10Q20.

NO : Repair harness between ABSCM and hydraulic unit.

10Q20	CHECK BATTERY SHORT OF HARNESS.

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

Connector & terminal

Trouble code 31 / (F49) No. 30 (+) — Chassis ground (-):

Trouble code 33 / (F49) No. 24 (+) — Chassis ground (-):

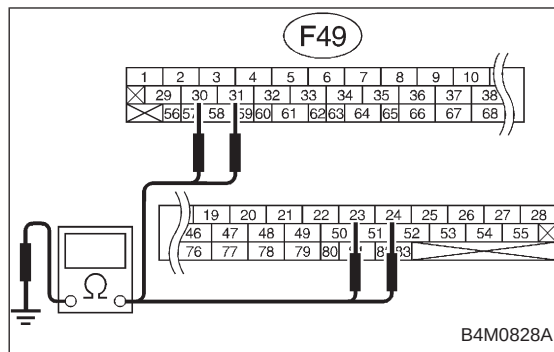
Trouble code 35 / (F49) No. 23 (+) — Chassis ground (-):

Trouble code 37 / (F49) No. 31 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

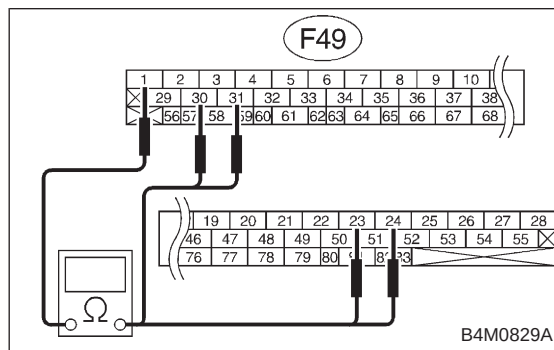
YES : Go to step 10Q21.

NO : Repair harness between ABSCM and hydraulic unit.



10Q21	CHECK GROUND SHORT OF HARNESS.

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

Connector & terminal**Trouble code 31 / (F49) No. 30 — Chassis ground:****Trouble code 33 / (F49) No. 24 — Chassis ground:****Trouble code 35 / (F49) No. 23 — Chassis ground:****Trouble code 37 / (F49) No. 31 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10Q22.**NO** : Repair harness between ABSCM and hydraulic unit.

10Q22	CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**Trouble code 31 / (F49) No. 30 — No. 1:****Trouble code 33 / (F49) No. 24 — No. 1:****Trouble code 35 / (F49) No. 23 — No. 1:****Trouble code 37 / (F49) No. 31 — No. 1:****CHECK** : Is the resistance between 8.3 and 9.7 Ω?**YES** : Go to step 10Q23.**NO** : Repair harness/connector between ABSCM and hydraulic unit.

10Q23	CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10Q24**.

10Q24	CHECK ABSCM.

- 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.

NO : Go to step **10Q25**.

10Q25	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.

D•NEW 32 (F B1)
FR. AV VALVE

B4M0958

**R: TROUBLE CODE 32 FR. AV VALVE
— ABNORMAL FRONT RH OUTLET
SOLENOID VALVE —**

D•NEW 34 (F B1)
FL. AV VALVE

B4M0959

**S: TROUBLE CODE 34 FL. AV VALVE
— ABNORMAL FRONT LH OUTLET
SOLENOID VALVE —**

D•NEW 36 (F B1)
RR. AV VALVE

B4M0960

**T: TROUBLE CODE 36 RR. AV VALVE
— ABNORMAL REAR RH OUTLET SOLENOID
VALVE —**

D•NEW 38 (F B1)
RL. AV VALVE

B4M0961

**U: TROUBLE CODE 38 RL. AV VALVE
— ABNORMAL REAR LH OUTLET SOLENOID
VALVE —**

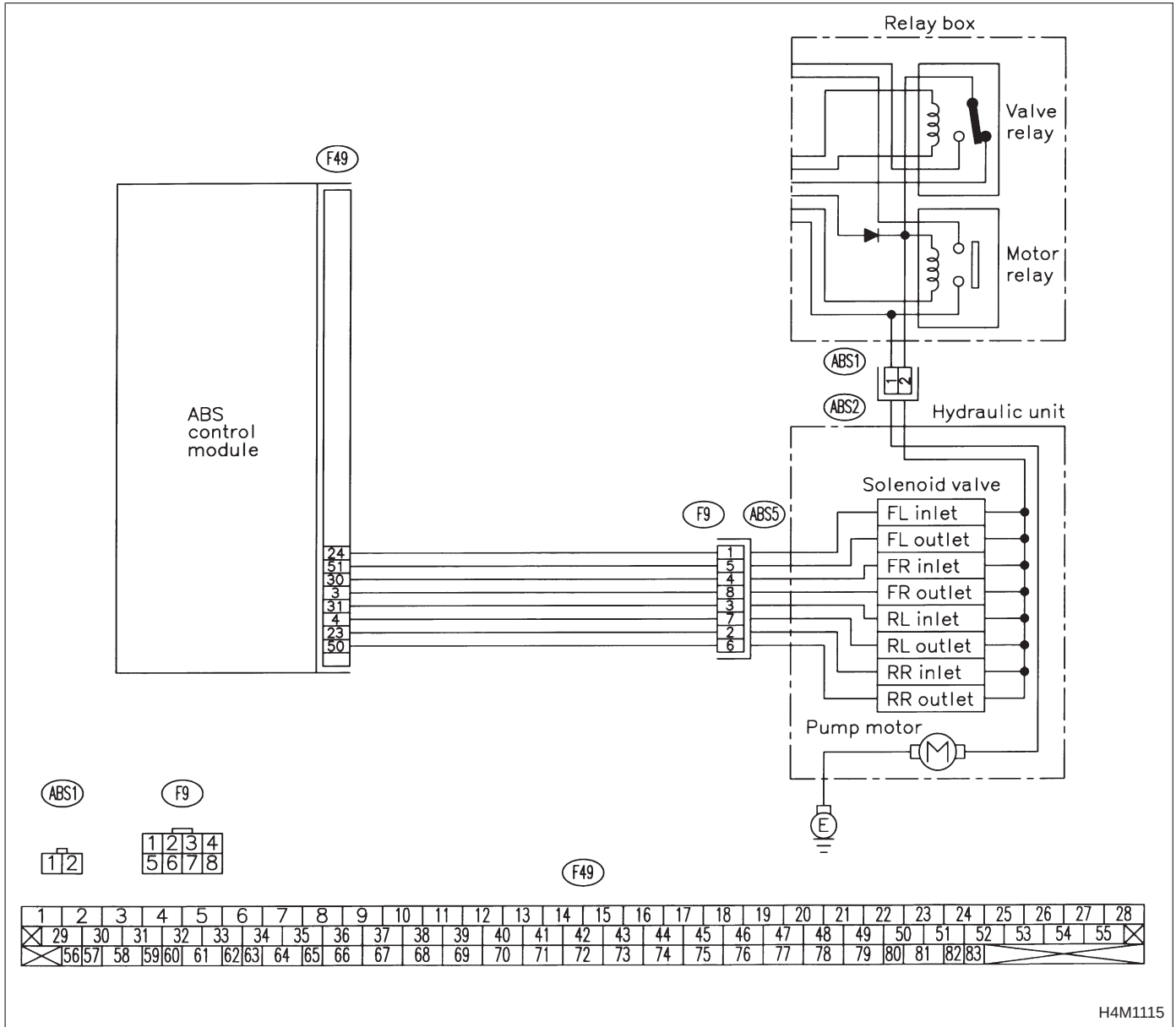
DIAGNOSIS:

- Faulty harness/connector
- Faulty outlet solenoid valve in hydraulic unit

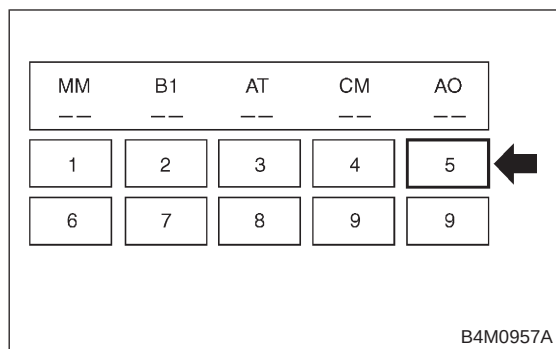
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1115

**10U1 CHECK FREEZE FRAME DATA.**

Press [F], [E], [1] and [5] on the select monitor.

CHECK : *Is the select monitor LED 5 off? Was the ABS inactive when the problem occurred?*

YES : Go to step 10U2.

NO : Go to step 10U15.

10U2 CHECK THE CONDITION WHEN THE TROUBLE OCCURRED.

Ask the vehicle owner about driving conditions when the trouble occurred. Attempt to duplicate the conditions.

CHECK : *Is the trouble immediately apparent?*

YES : Go to step 10U3.

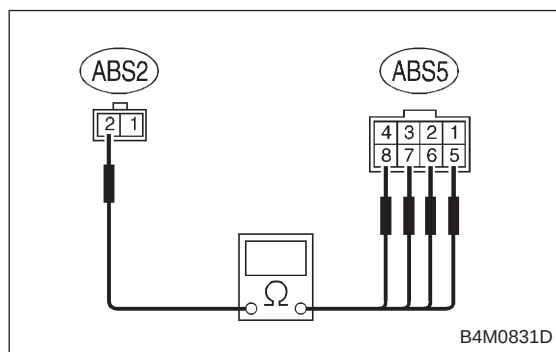
NO : Go to step 10U15.

10U3 CHECK THE CONDITION WHEN THE TROUBLE OCCURRED.

CHECK : *Did the trouble occur immediately after engine starting or during standing starts?*

YES : Go to step 10U11.

NO : Go to step 10U4.

**10U4 CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 — (ABS2) No. 2:

Trouble code 34 / (ABS5) No. 5 — (ABS2) No. 2:

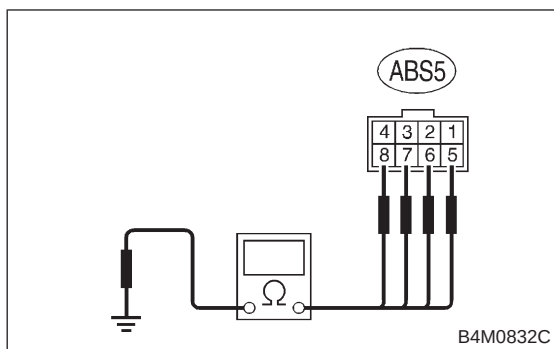
Trouble code 36 / (ABS5) No. 6 — (ABS2) No. 2:

Trouble code 38 / (ABS5) No. 7 — (ABS2) No. 2:

CHECK : *Is the resistance between 3.8 and 4.8 Ω?*

YES : Go to step 10U5.

NO : Replace hydraulic unit.



10U5

CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 — Chassis ground:

Trouble code 34 / (ABS5) No. 5 — Chassis ground:

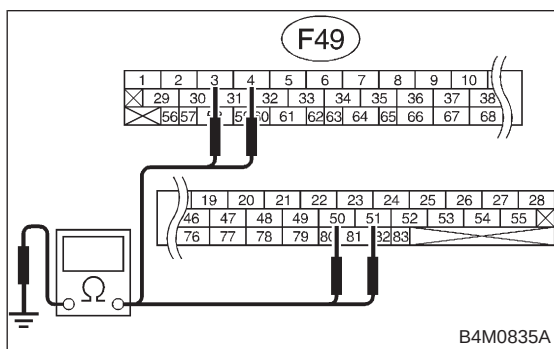
Trouble code 36 / (ABS5) No. 6 — Chassis ground:

Trouble code 38 / (ABS5) No. 7 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10U6.

NO : Replace hydraulic unit.



10U6

CHECK GROUND SHORT OF HARNESS.

1) Disconnect connector from ABSCM.

2) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

Trouble code 32 / (F49) No. 3 — Chassis ground:

Trouble code 34 / (F49) No. 51 — Chassis ground:

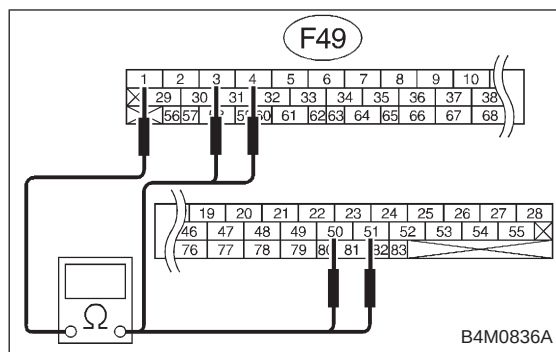
Trouble code 36 / (F49) No. 50 — Chassis ground:

Trouble code 38 / (F49) No. 4 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10U7.

NO : Repair harness between ABSCM and hydraulic unit.

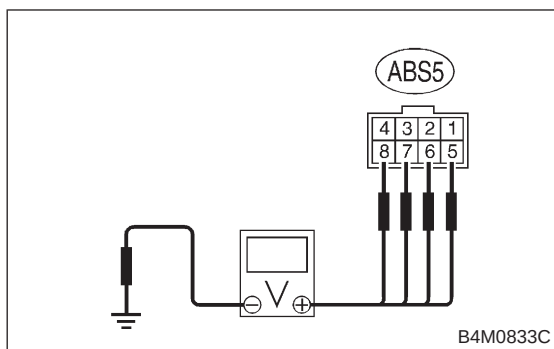
**10U7****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**Trouble code 32 / (F49) No. 3 — No. 1:****Trouble code 34 / (F49) No. 51 — No. 1:****Trouble code 36 / (F49) No. 50 — No. 1:****Trouble code 38 / (F49) No. 4 — No. 1:****CHECK** : Is the resistance between 4.3 and 5.3 Ω ?**YES** : Go to step 10U8.**NO** : Repair harness/connector between ABSCM and hydraulic unit.**10U8****CHECK POOR CONTACT IN CONNECTORS.****CHECK** : Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>**YES** : Repair connector.**NO** : Go to step 10U9.**10U9****CHECK ABSCM.**

- 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.**NO** : Go to step 10U10.**10U10****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.

**10U11****CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Disconnect connector from ABSCM.
- 4) Measure voltage between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 (+) — Chassis ground (-):

Trouble code 34 / (ABS5) No. 5 (+) — Chassis ground (-):

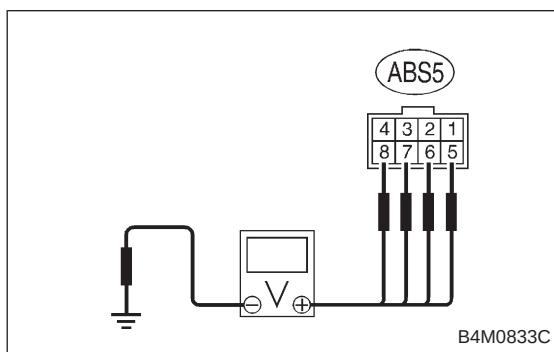
Trouble code 36 / (ABS5) No. 6 (+) — Chassis ground (-):

Trouble code 38 / (ABS5) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U12.

NO : Replace hydraulic unit.

**10U12****CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

Connector & terminal

Trouble code 32 / (ABS5) No. 8 (+) — Chassis ground (-):

Trouble code 34 / (ABS5) No. 5 (+) — Chassis ground (-):

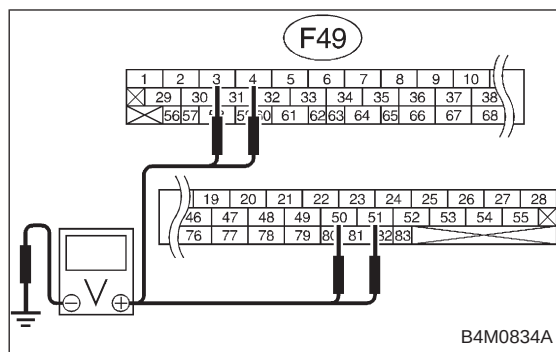
Trouble code 36 / (ABS5) No. 6 (+) — Chassis ground (-):

Trouble code 38 / (ABS5) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U13.

NO : Replace hydraulic unit.

**10U13****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 (+) — Chassis ground (-):

Trouble code 34 / (F49) No. 51 (+) — Chassis ground (-):

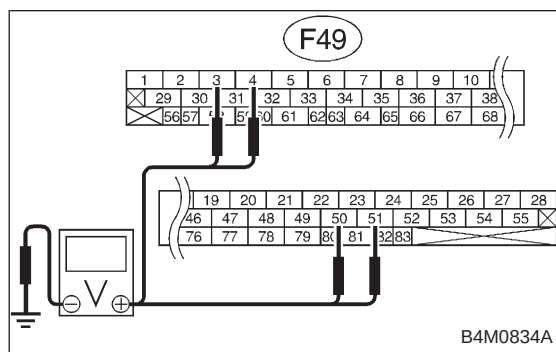
Trouble code 36 / (F49) No. 50 (+) — Chassis ground (-):

Trouble code 38 / (F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U14.

NO : Repair harness between ABSCM and hydraulic unit.

**10U14****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 (+) — Chassis ground (-):

Trouble code 34 / (F49) No. 51 (+) — Chassis ground (-):

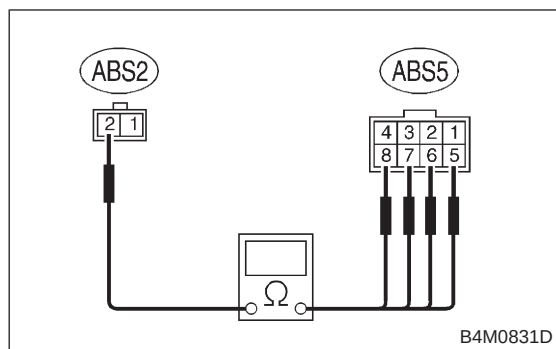
Trouble code 36 / (F49) No. 50 (+) — Chassis ground (-):

Trouble code 38 / (F49) No. 4 (+) — Chassis ground (-):

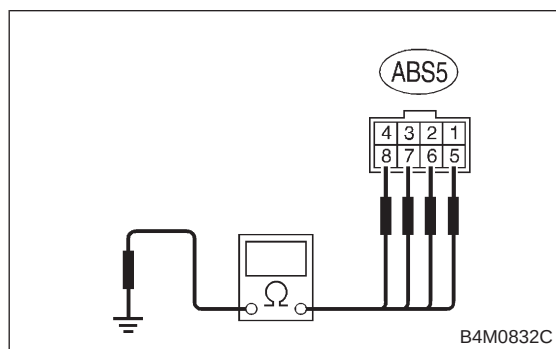
CHECK : Is the voltage less than 1 V?

YES : Replace ABSCM.

NO : Repair harness between ABSCM and hydraulic unit.

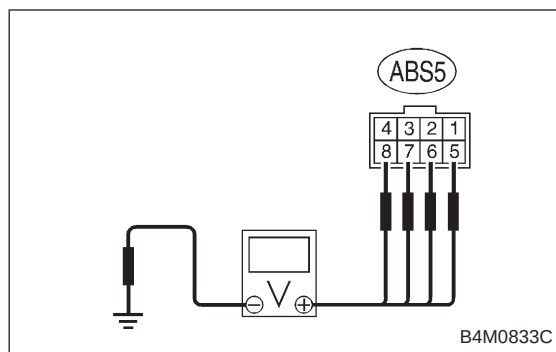
**10U15****CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors (ABS1, F9) from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal**Trouble code 32 / (ABS5) No. 8 — (ABS2) No. 2:****Trouble code 34 / (ABS5) No. 5 — (ABS2) No. 2:****Trouble code 36 / (ABS5) No. 6 — (ABS2) No. 2:****Trouble code 38 / (ABS5) No. 7 — (ABS2) No. 2:****CHECK** : Is the resistance between 3.8 and 4.8 Ω?**YES** : Go to step 10U16.**NO** : Replace hydraulic unit.**10U16****CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

Connector & terminal**Trouble code 32 / (ABS5) No. 8 — Chassis ground:****Trouble code 34 / (ABS5) No. 5 — Chassis ground:****Trouble code 36 / (ABS5) No. 6 — Chassis ground:****Trouble code 38 / (ABS5) No. 7 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10U17.**NO** : Replace hydraulic unit.

**10U17****CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between hydraulic unit connector and chassis ground.

Connector & terminal

Trouble code 32 / (ABS5) No. 8 (+) — Chassis ground (-):

Trouble code 34 / (ABS5) No. 5 (+) — Chassis ground (-):

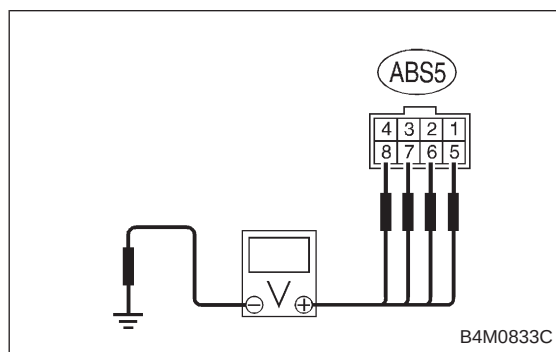
Trouble code 36 / (ABS5) No. 6 (+) — Chassis ground (-):

Trouble code 38 / (ABS5) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U18.

NO : Replace hydraulic unit.

**10U18****CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

Connector & terminal

Trouble code 32 / (ABS5) No. 8 (+) — Chassis ground (-):

Trouble code 34 / (ABS5) No. 5 (+) — Chassis ground (-):

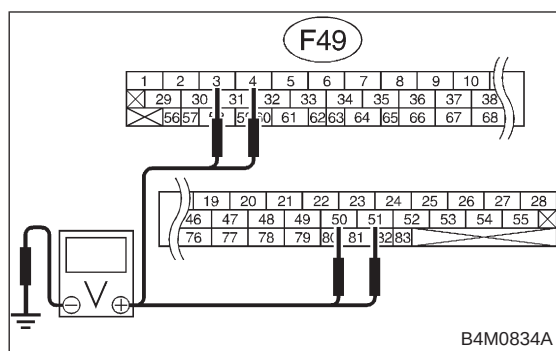
Trouble code 36 / (ABS5) No. 6 (+) — Chassis ground (-):

Trouble code 38 / (ABS5) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U19.

NO : Replace hydraulic unit.

**10U19 CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 (+) — Chassis ground (-):

Trouble code 34 / (F49) No. 51 (+) — Chassis ground (-):

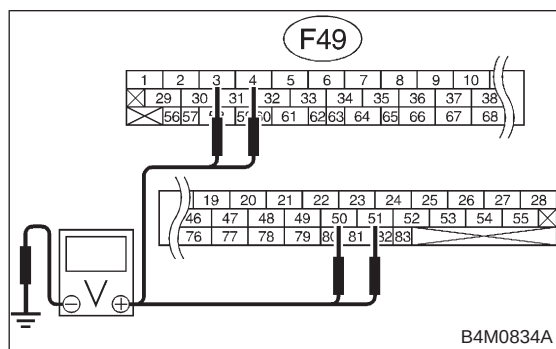
Trouble code 36 / (F49) No. 50 (+) — Chassis ground (-):

Trouble code 38 / (F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U20.

NO : Repair harness between ABSCM and hydraulic unit.

**10U20 CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 (+) — Chassis ground (-):

Trouble code 34 / (F49) No. 51 (+) — Chassis ground (-):

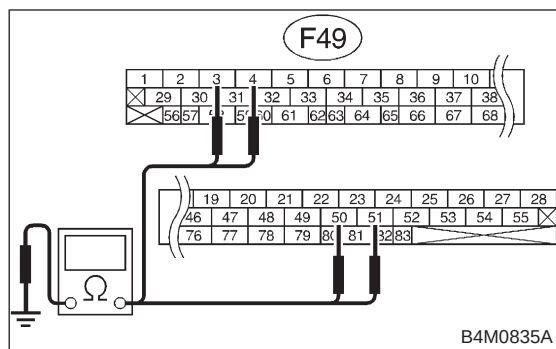
Trouble code 36 / (F49) No. 50 (+) — Chassis ground (-):

Trouble code 38 / (F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10U21.

NO : Repair harness between ABSCM and hydraulic unit.

**10U21 CHECK GROUND SHORT OF HARNESS.**

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

Connector & terminal

Trouble code 32 / (F49) No. 3 — Chassis ground:

Trouble code 34 / (F49) No. 51 — Chassis ground:

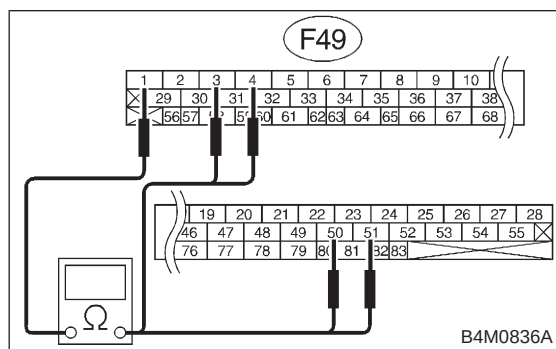
Trouble code 36 / (F49) No. 50 — Chassis ground:

Trouble code 38 / (F49) No. 4 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10U22.

NO : Repair harness between ABSCM and hydraulic unit.

**10U22 CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal

Trouble code 32 / (F49) No. 3 — No. 1:

Trouble code 34 / (F49) No. 51 — No. 1:

Trouble code 36 / (F49) No. 50 — No. 1:

Trouble code 38 / (F49) No. 4 — No. 1:

CHECK : Is the resistance between 4.3 and 5.3 Ω?

YES : Go to step 10U23.

NO : Repair harness/connector between ABSCM and hydraulic unit.

10U23	CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10U24**.

10U24	CHECK ABSCM.

- 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.

NO : Go to step **10U25**.

10U25	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

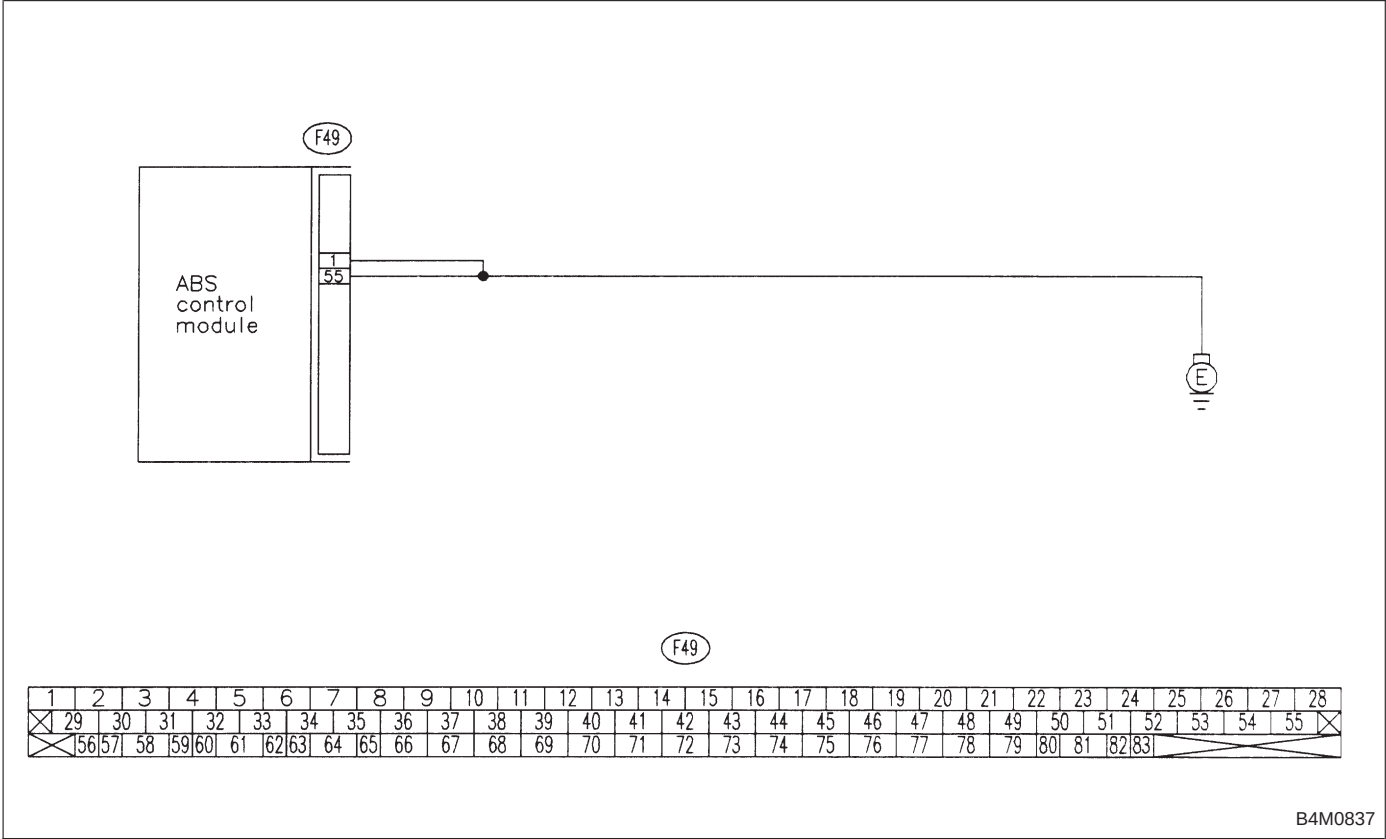
NO : A temporary poor contact.

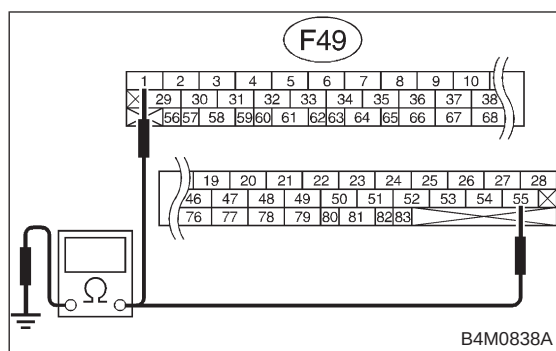
D•NEW 41 (FB1)
ECU

B4M0962

V: TROUBLE CODE 41 ECU
— ABNORMAL ABS CONTROL MODULE —
DIAGNOSIS:
● Faulty ABSCM
TROUBLE SYMPTOM:
● ABS does not operate.

WIRING DIAGRAM:





10V1	CHECK GROUND CIRCUIT OF ABSCm.

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

Connector & terminal**(F49) No. 1 — Chassis ground:****(F49) No. 55 — Chassis ground:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 10V2.**NO** : Repair ABSCm ground harness.

10V2	CHECK POOR CONTACT IN CONNECTORS.

CHECK : Is there poor contact in connectors between battery, ignition switch and ABSCm? <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.

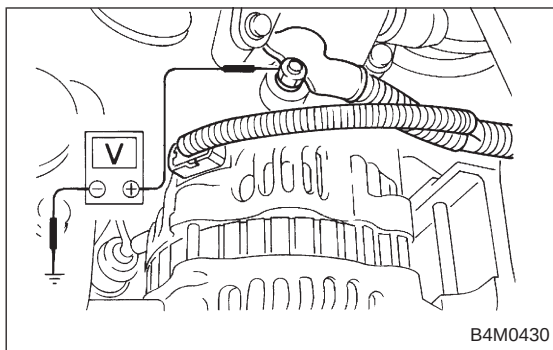
10V5	CHECK ABSCm.

- 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.**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.

**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.

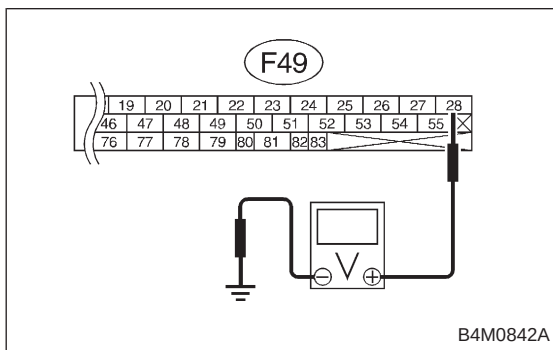
10W2 CHECK BATTERY TERMINAL.

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.**

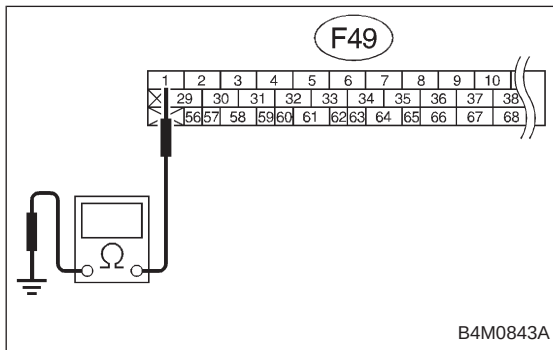
- 1) Disconnect connector from ABSCm.
- 2) Run the engine at idle.
- 3) Measure voltage between ABSCm connector and chassis ground.

Connector & terminal**(F49) No. 28 (+) — 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.

**10W4 CHECK GROUND CIRCUIT OF ABSCm.**

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

Connector & terminal**(F49) No. 1 — Chassis ground:**

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 10W5.

NO : Repair ABSCm ground harness.

10W5	CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connectors between generator, battery and ABSCM? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10W6**.

10W6	CHECK ABSCM.

- 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.

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.

D•NEW 44 (FB1) CCM LINE

B4M0964

X: TROUBLE CODE 44 CCM LINE — A COMBINATION OF AT CONTROL ABNORMALS —

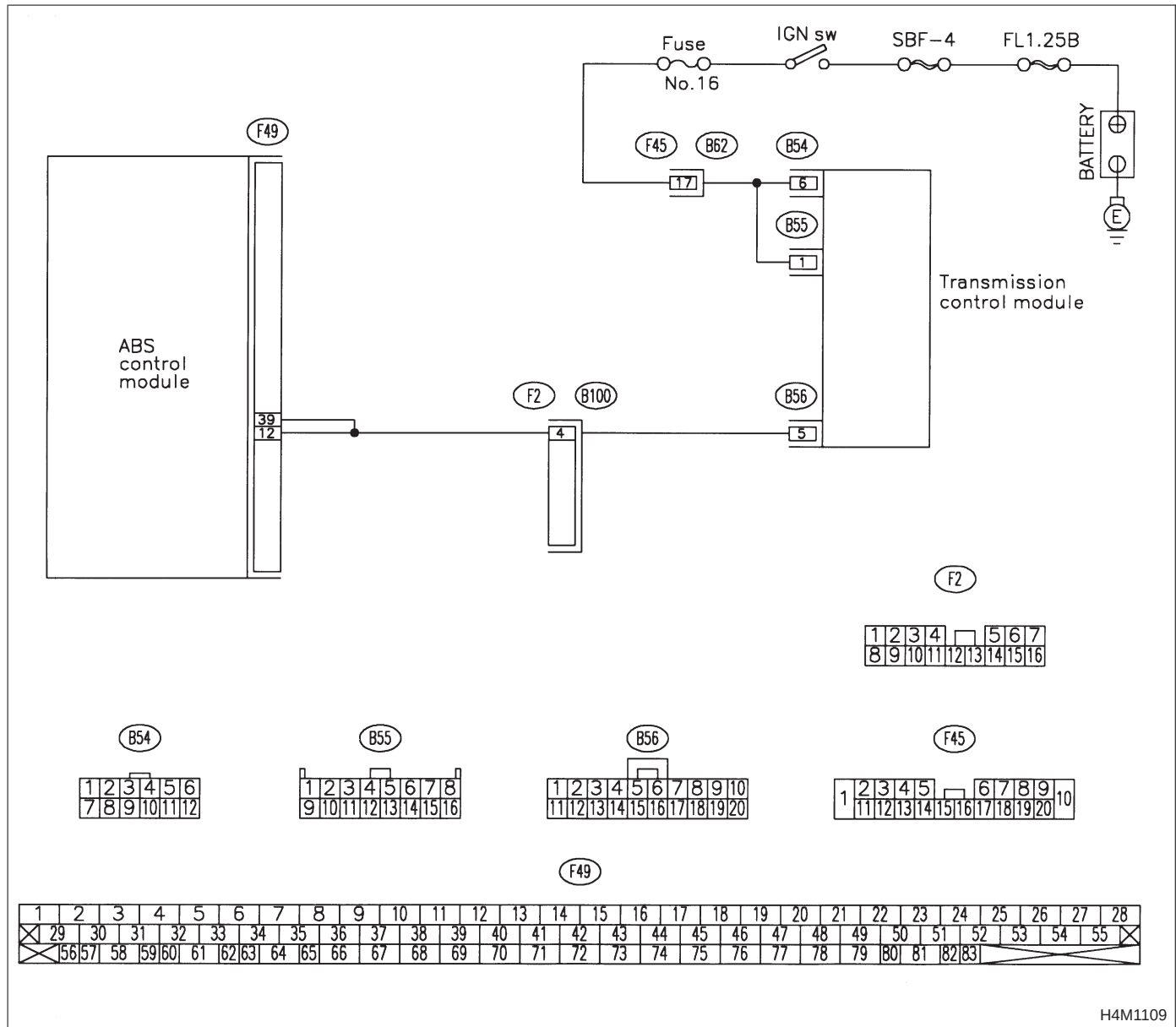
DIAGNOSIS:

- Combination of AT control faults

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1109

1997 (F00)
ABS 4WD•AT

H4M1117

10X1

CHECK SPECIFICATIONS OF ABSCM USING SELECT MONITOR.

- 1) Press [F], [0] and [0] on the select monitor.
- 2) Read the select monitor display.

CHECK : *Is an ABSCM for AT model installed on a MT model?*

YES : Replace ABSCM.

NO : Go to step **10X2**.

10X2

CHECK GROUND SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from TCM.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

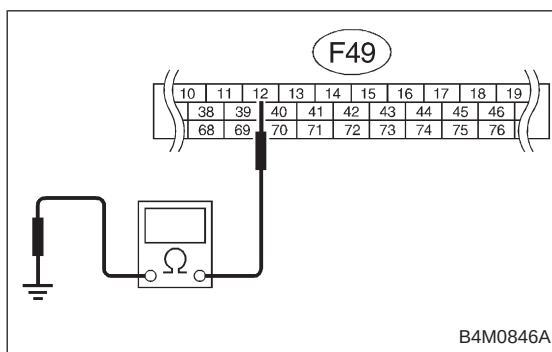
Connector & terminal

(F49) No. 12 — Chassis ground:

CHECK : *Is the resistance more than 1 MΩ?*

YES : Go to step **10X3**.

NO : Repair harness between TCM and ABSCM.



B4M0846A

10X3

CHECK TCM.

- 1) Connect all connectors to TCM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between TCM connector terminals.

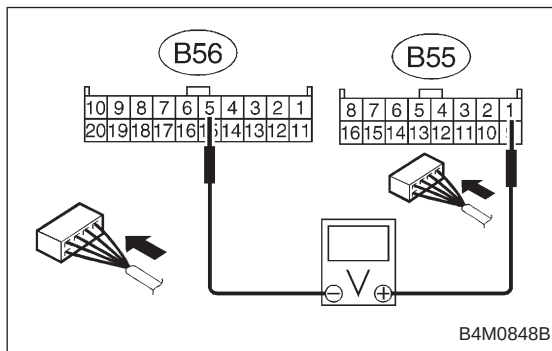
Connector & terminal

(B55) No. 1 (+) — (B56) No. 5 (-):

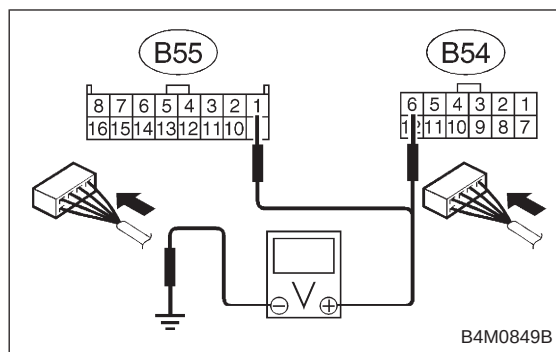
CHECK : *Is the voltage between 10 V and 13 V?*

YES : Go to step **10X5**.

NO : Go to step **10X4**.



B4M0848B

**10X4****CHECK POWER SUPPLY FOR TCM.**

Measure voltage between TCM connector and chassis ground.

Connector & terminal

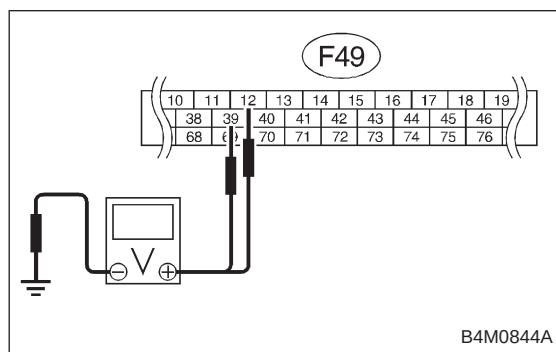
(B54) No. 6 (+) — Chassis ground (–):

(B55) No. 1 (+) — Chassis ground (–):

CHECK : Is the voltage between 10 V and 13 V?

YES : Replace TCM.

NO : Repair harness/connector between battery, ignition switch and TCM.

**10X5****CHECK OPEN CIRCUIT OF HARNESS.**

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 12 (+) — Chassis ground (–):

(F49) No. 39 (+) — Chassis ground (–):

CHECK : Is the voltage more than 10 V?

YES : Go to step 10X6.

NO : Repair harness/connector between AT control module and ABSCM.

10X6**CHECK POOR CONTACT IN CONNECTORS.**

CHECK : Is there poor contact in connectors between AT control module and ABSCM? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 10X7.

10X7	CHECK ABSCM.

- 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.

NO : Go to step **10X8**.

10X8	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.

D•NEW 44 (FB1) CCM OPEN

B4M0965

Y: TROUBLE CODE 44 CCM OPEN — A COMBINATION OF AT CONTROL ABNORMALS —

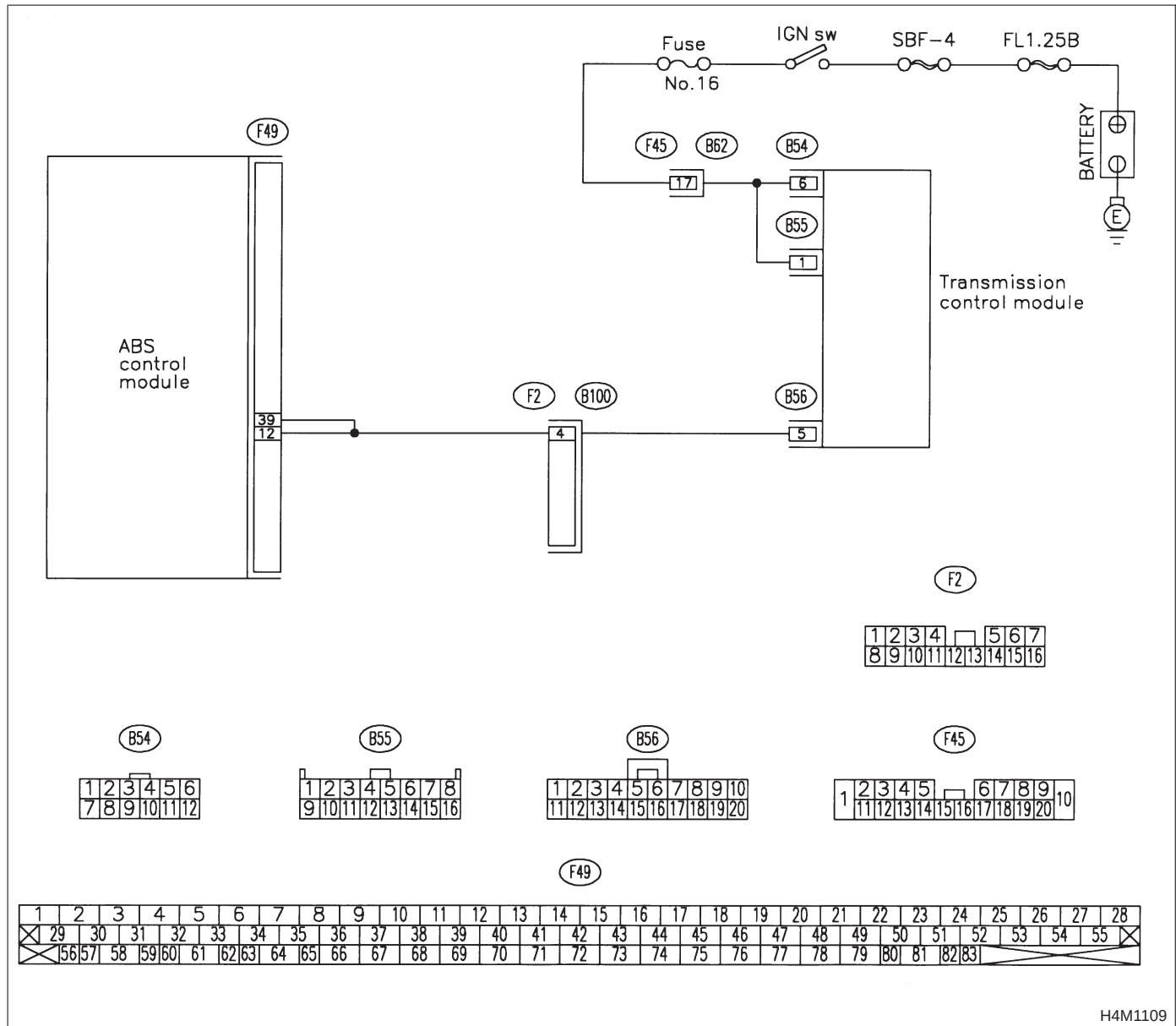
DIAGNOSIS:

- Combination of AT control faults

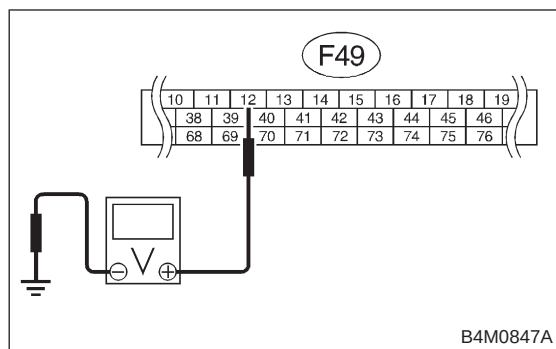
TROUBLE SYMPTOM:

- ABS does not operate.

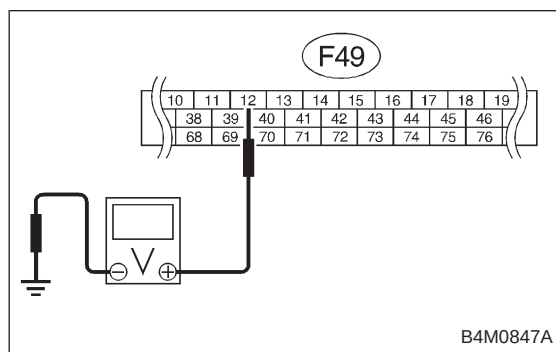
WIRING DIAGRAM:



H4M1109

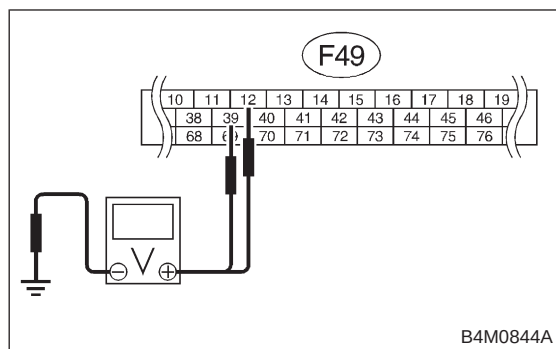
**10Y1****CHECK BATTERY SHORT OF HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from AT control module.
- 3) Disconnect connector from ABSCM.
- 4) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 12 (+) — Chassis ground (-):****CHECK : Is the voltage less than 1 V?****YES : Go to step 10Y2.****NO : Repair harness between AT control module and ABSCM.****10Y2****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal**(F49) No. 12 (+) — Chassis ground (-):****CHECK : Is the voltage less than 1 V?****YES : Go to step 10Y3.****NO : Repair harness between AT control module and ABSCM.**

**10Y3****CHECK OPEN CIRCUIT OF HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Connect all connectors to TCM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 12 (+) — Chassis ground (-):****(F49) No. 39 (+) — Chassis ground (-):****CHECK** : **Is the voltage between 10 V and 13 V?****YES** : Go to step **10Y4**.**NO** : Repair harness/connector between TCM and ABSCM.**10Y4****CHECK POOR CONTACT IN CONNECTORS.**

Turn ignition switch to OFF.

CHECK : **Is there poor contact in connectors between AT control module and ABSCM? <Ref. to FOREWORD [T3C1].>****YES** : Repair connector.**NO** : Go to step **10Y5**.**10Y5****CHECK ABSCM.**

- 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.**NO** : Go to step **10Y6**.**10Y6****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.

D•NEW 46 (FB1) GS POWER OVER

B4M0966

Z: TROUBLE CODE 46 GS POWER OVER — G SENSOR LINE VOLTAGE TOO HIGH —

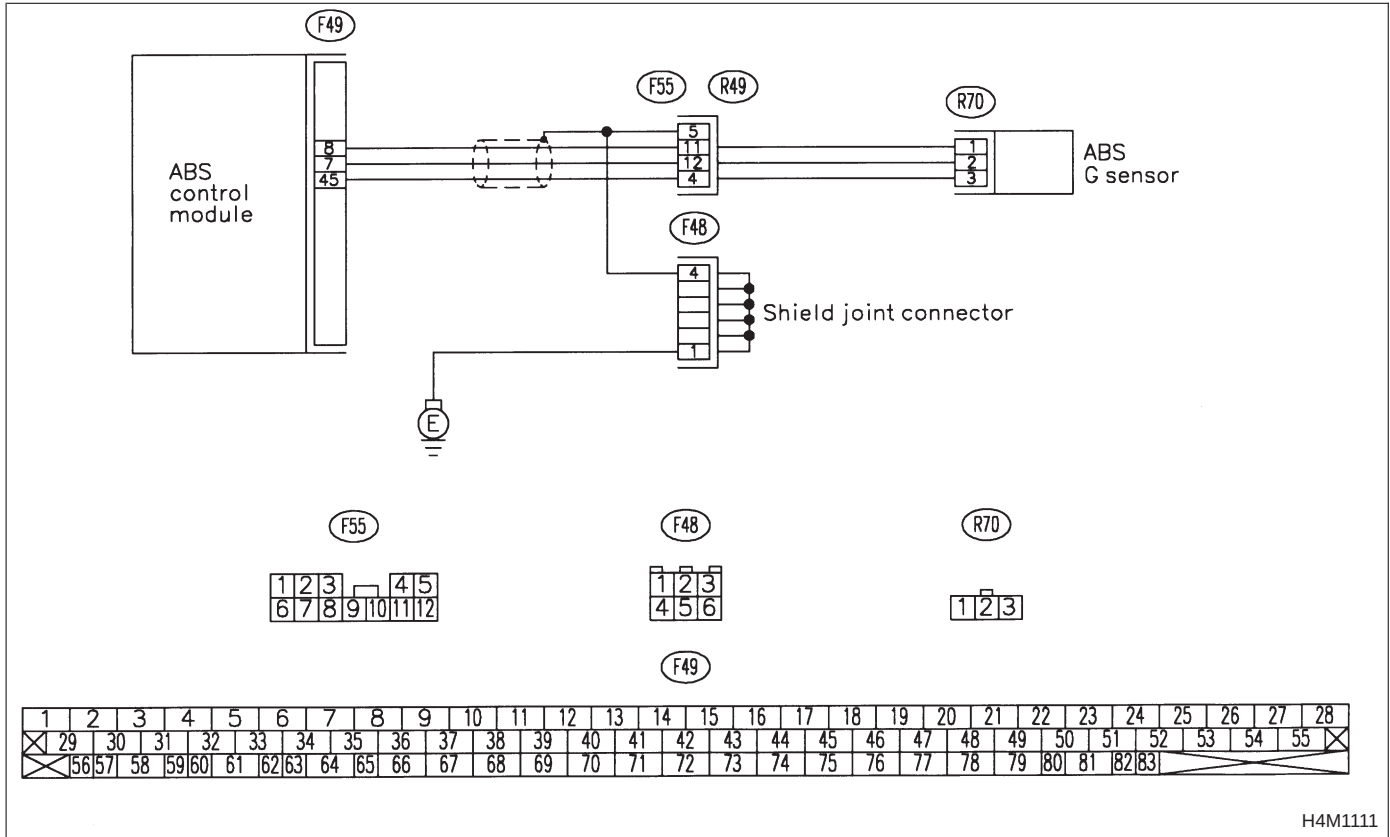
DIAGNOSIS:

- Faulty G sensor power supply voltage

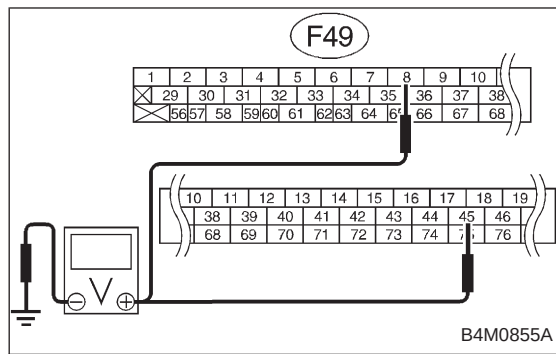
TROUBLE SYMPTOM:

- ABS does not operate.

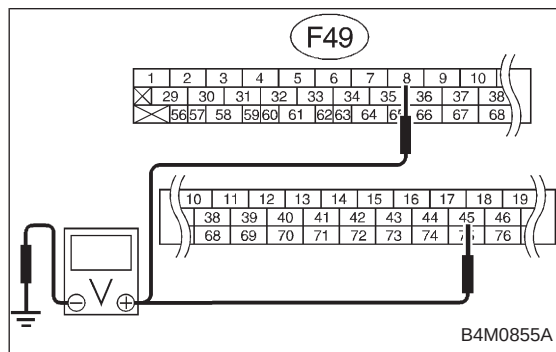
WIRING DIAGRAM:



H4M1111

**10Z1****CHECK BATTERY SHORT OF HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Remove console cover from console box.
- 3) Disconnect connector from G sensor.
- 4) Disconnect connector from ABSCM.
- 5) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 8 (+) — Chassis ground (-):****(F49) No. 45 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step **10Z2**.**NO** : Repair harness between ABSCM and G sensor.**10Z2****CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal**(F49) No. 8 (+) — Chassis ground (-):****(F49) No. 45 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Replace ABSCM.**NO** : Repair harness between ABSCM and chassis ground.

D•NEW 46 (FB1) GS POWER LOW

B4M0967

AA: TROUBLE CODE 46 GS POWER LOW — G SENSOR LINE VOLTAGE TOO LOW —

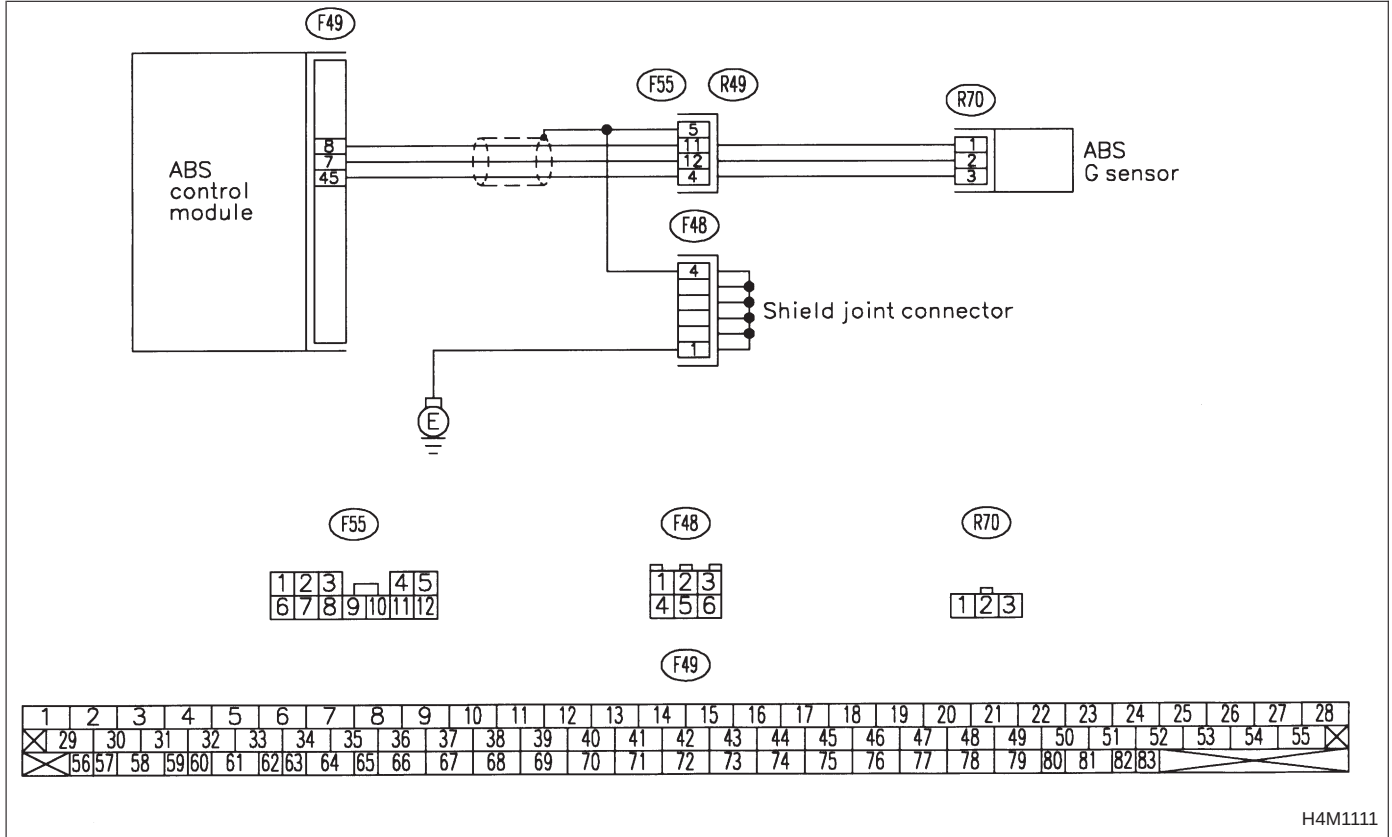
DIAGNOSIS:

- Faulty G sensor power supply voltage

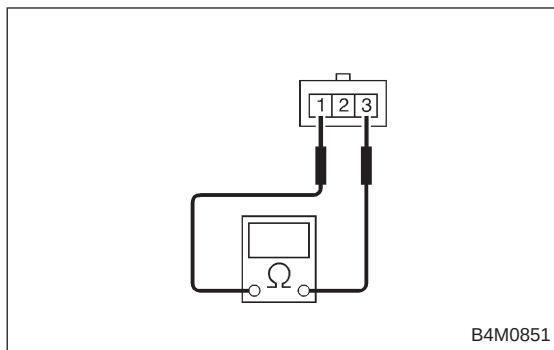
TROUBLE SYMPTOM:

- ABS does not operate.

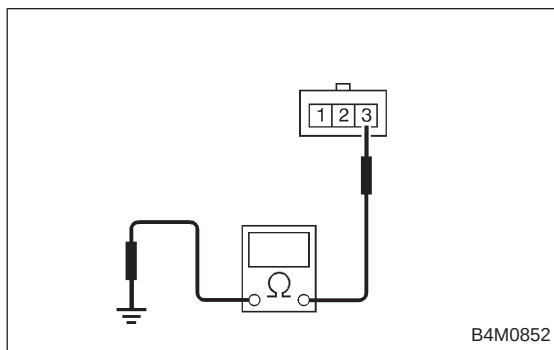
WIRING DIAGRAM:



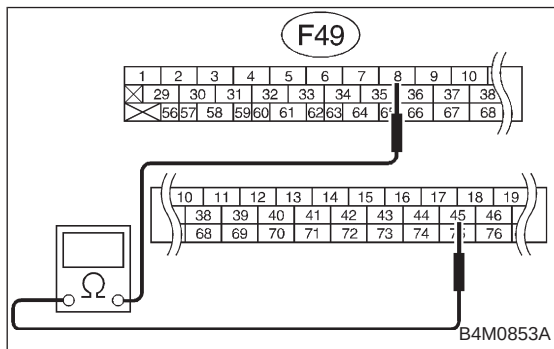
H4M1111

**10AA1 CHECK G SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove console cover from console box.
- 3) Disconnect connector from G sensor.
- 4) Measure resistance of G sensor.

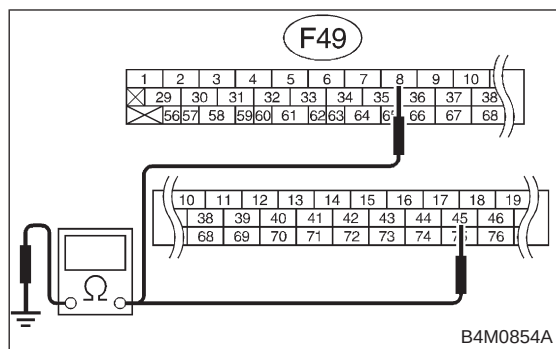
Terminal**No. 1 — No. 3:****CHECK** : Is the resistance between 42 and 58 kΩ?**YES** : Go to step 10AA2.**NO** : Replace G sensor.**10AA2 CHECK GROUND SHORT OF G SENSOR.**

Measure resistance between G sensor and bracket.

Terminal**No. 3 — Bracket:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10AA3.**NO** : Replace G sensor.**10AA3 CHECK SHORT OF HARNESS BETWEEN ABSCM AND G SENSOR.**

- 1) Disconnect connector from ABSCM.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 45 — No. 8****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10AA4.**NO** : Repair harness between ABSCM and G sensor.

**10AA4 CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 8 — Chassis ground:

(F49) No. 45 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AA5.

NO : Repair harness between ABSCM and G sensor.

10AA5 CHECK POOR CONTACT IN CONNECTORS.

CHECK : Is there poor contact in connectors between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 10AA6.

10AA6 CHECK ABSCM.

- 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.

NO : Go to step 10AA7.

10AA7 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.

D•NEW 51 (FB1) V.RELAY

B4M0968

AB: TROUBLE CODE 51 V. RELAY — ABNORMAL VALVE RELAY —

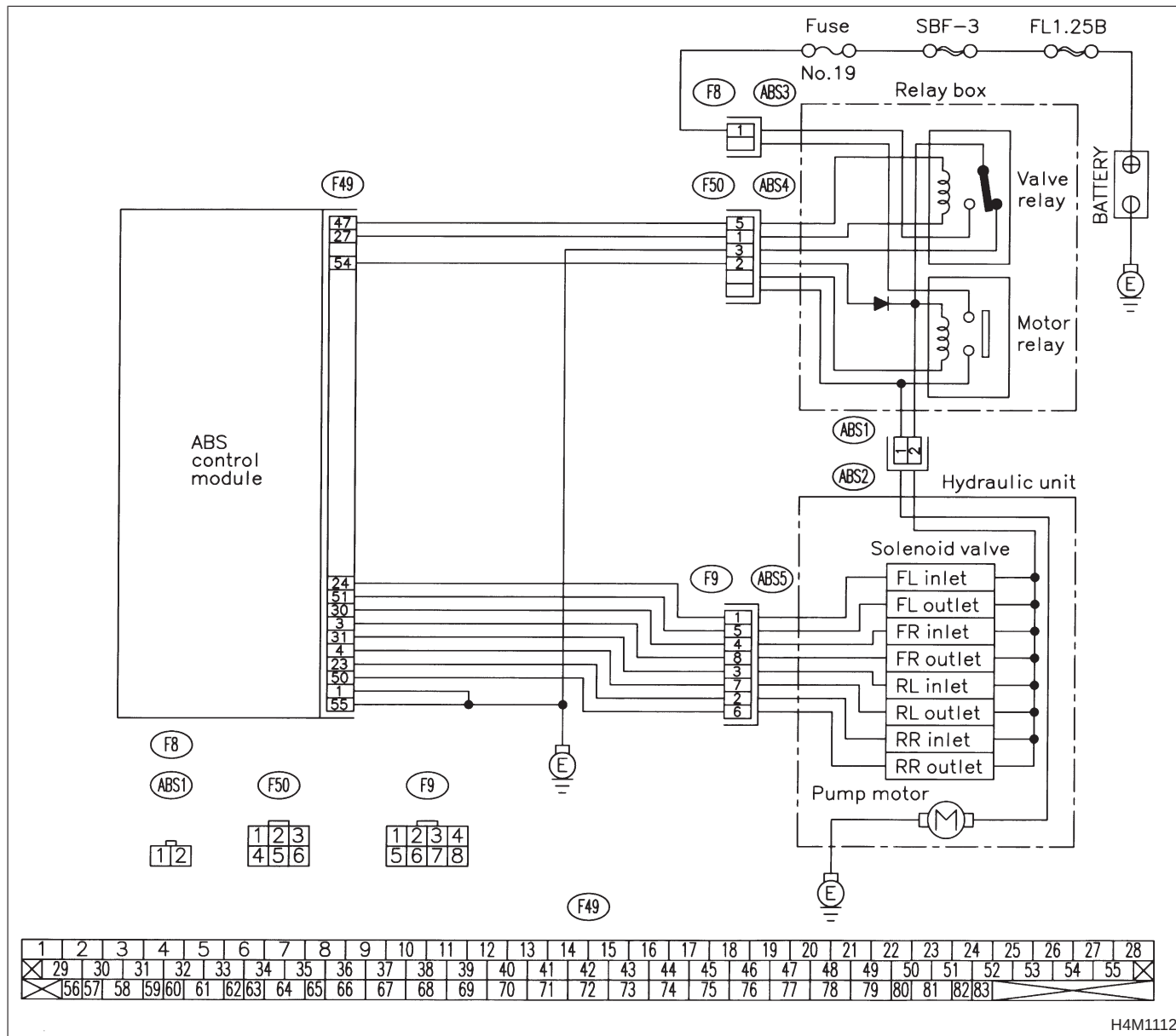
DIAGNOSIS:

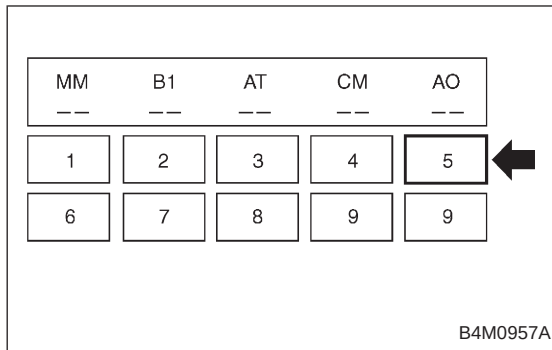
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





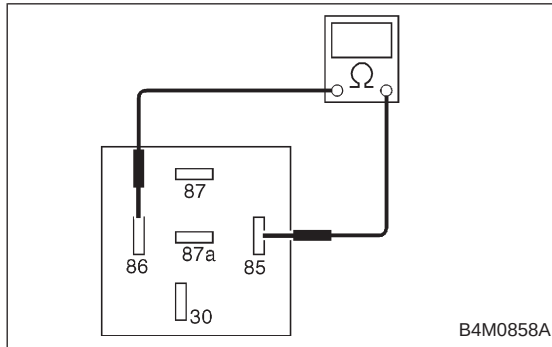
10AB1 CHECK FREEZE FRAME DATA.

Press [F], [E], [1] and [5] on the select monitor.

CHECK : *Is the select monitor LED 5 off? Was the ABS inactive when the problem occurred?*

YES : Go to step 10AB2.

NO : Go to step 10AB32.



10AB2 CHECK RESISTANCE OF VALVE RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove valve relay from relay box.
- 3) Measure resistance between valve relay terminals.

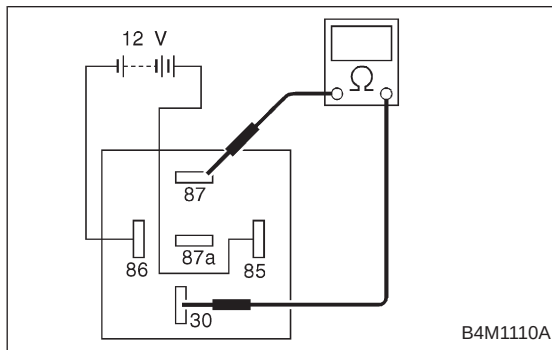
Terminals

No. 85 — No. 86:

CHECK : *Is the resistance between 93 and 113 Ω ?*

YES : Go to step 10AB3.

NO : Replace valve relay.



10AB3 CHECK CONTACT POINT OF VALVE RELAY.

- 1) Connect battery to valve relay terminals No. 85 and No. 86.
- 2) Measure resistance between valve relay terminals.

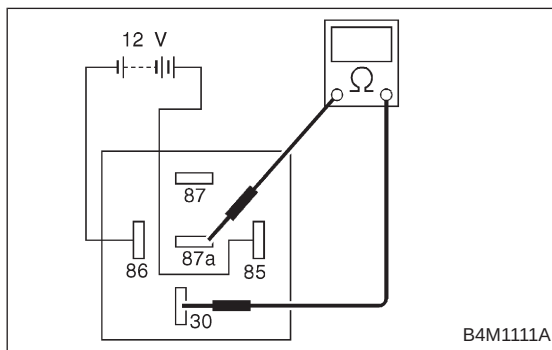
Terminals

No. 30 — No. 87:

CHECK : *Is the resistance less than 0.5 Ω ?*

YES : Go to step 10AB4.

NO : Replace valve relay.



10AB4 CHECK CONTACT POINT OF VALVE RELAY.

Measure resistance between valve relay terminals.

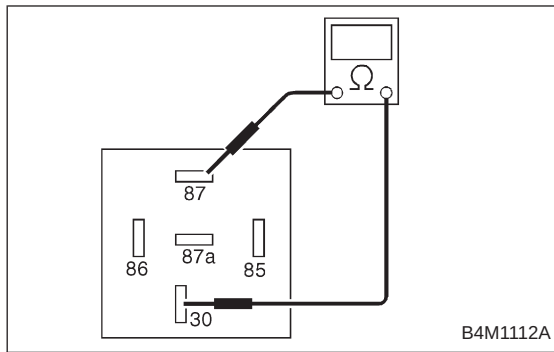
Terminals

No. 30 — No. 87a:

CHECK : *Is the resistance more than 1 M Ω ?*

YES : Go to step 10AB5.

NO : Replace valve relay.



10AB5 CHECK CONTACT POINT OF VALVE RELAY.

- 1) Disconnect battery from valve relay terminals.
- 2) Measure resistance between valve relay terminals.

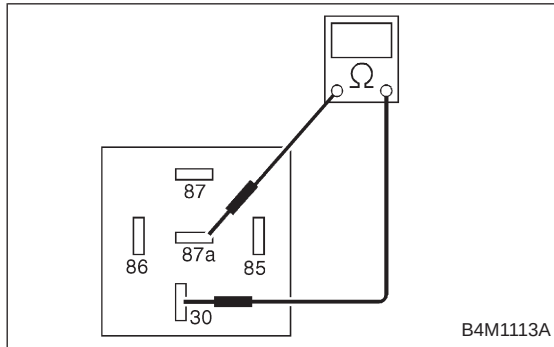
Terminals

No. 30 — No. 87:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AB6.

NO : Replace valve relay.



10AB6 CHECK CONTACT POINT OF VALVE RELAY.

Measure resistance between valve relay terminals.

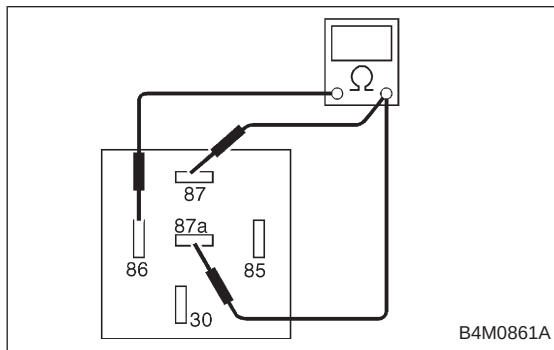
Terminals

No. 30 — No. 87a:

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 10AB7.

NO : Replace valve relay.



10AB7 CHECK SHORT OF VALVE RELAY.

Measure resistance between valve relay terminals.

Terminals

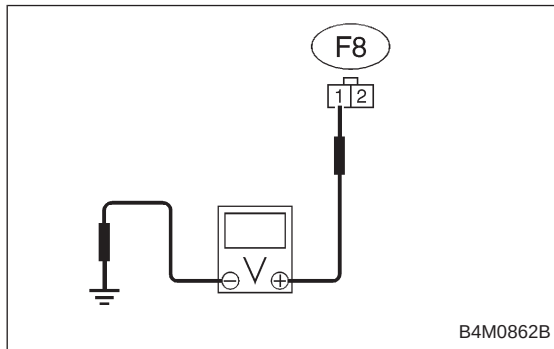
No. 86 — No. 87:

No. 86 — No. 87a:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AB8.

NO : Replace valve relay.



10AB8 CHECK POWER SUPPLY VOLTAGE AT VALVE RELAY CONTACT POINT.

- 1) Disconnect connector (F8) from relay box.
- 2) Measure voltage between relay box connector and chassis ground.

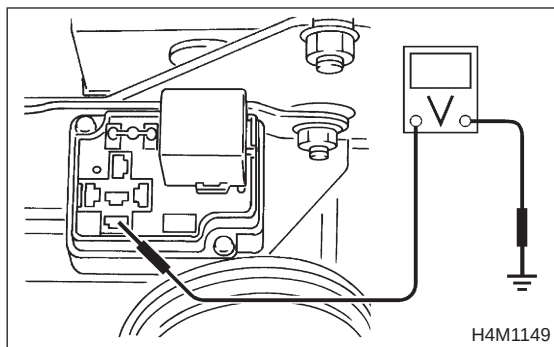
Connector & terminal

(F8) No. 1 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Go to step 10AB9.

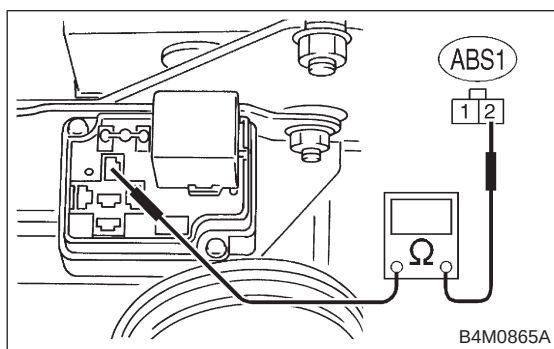
NO : Repair harness connector between battery and relay box, and check fuse No. 19.

**10AB9**
CHECK OPEN AND GROUND SHORT CIRCUIT IN POWER SUPPLY CIRCUIT OF RELAY BOX.

- 1) Disconnect connector (ABS1) from hydraulic unit.
- 2) Connect connector (F8) to relay box.
- 3) Disconnect connector (F50) from relay box.
- 4) Measure voltage of relay box.

Connector & terminal
Valve relay installing point No. 87 — Chassis ground:
CHECK : Is the voltage between 10 V and 13 V?

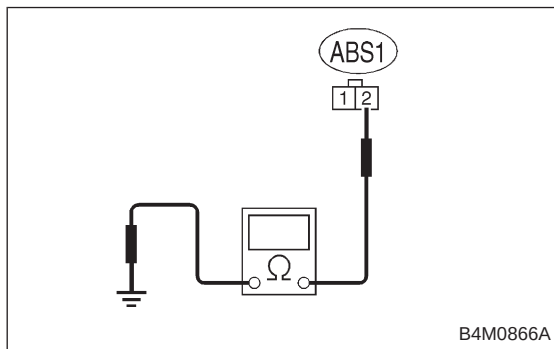
YES : Go to step **10AB10**.

NO : Replace relay box, and check fuse No. 19.
**10AB10**
CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit connector and valve relay installing point.

Connector & terminal
(ABS1) No. 2 — Valve relay installing point No. 30:
CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step **10AB11**.

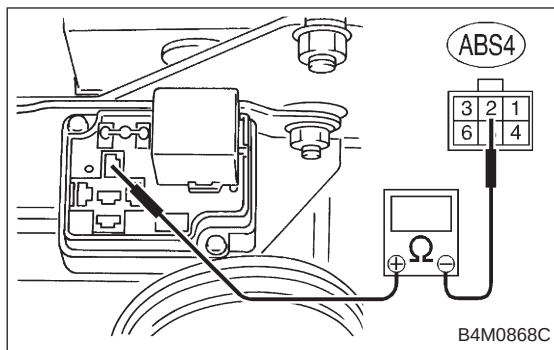
NO : Replace relay box.
**10AB11**
CHECK GROUND SHORT CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and chassis ground.

Connector & terminal
(ABS1) No. 2 — Chassis ground:
CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step **10AB12**.

NO : Replace relay box, and check fuse SBF6.

**10AB12 CHECK DIODE OF RELAY BOX.**

Measure resistance between relay box connector and valve relay installing point.

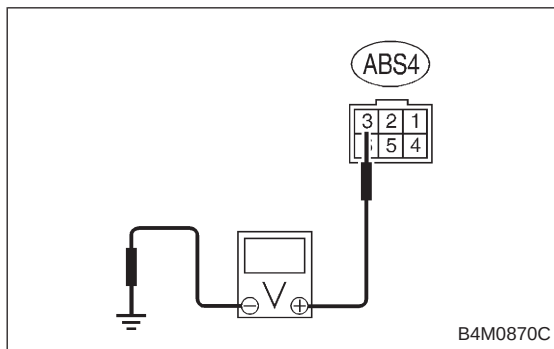
Connector & terminal

Valve relay installing point No. 30 (+) — (ABS4) No. 2 (-):

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AB13.

NO : Replace relay box.

**10AB13 CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.**

1) Disconnect connector from ABSCM.

2) Measure voltage between relay box connector and chassis ground.

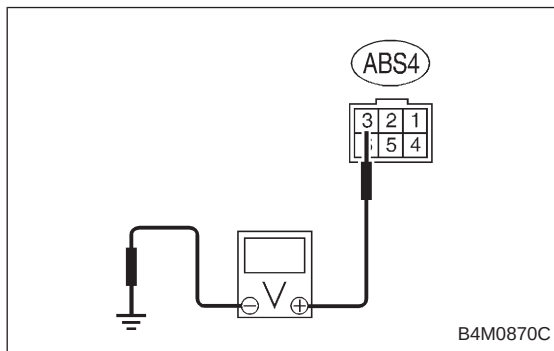
Connector & terminal

(ABS4) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10AB14.

NO : Replace relay box, and check all fuses.

**10AB14 CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.**

1) Turn ignition switch to ON.

2) Measure voltage between relay box connector and chassis ground.

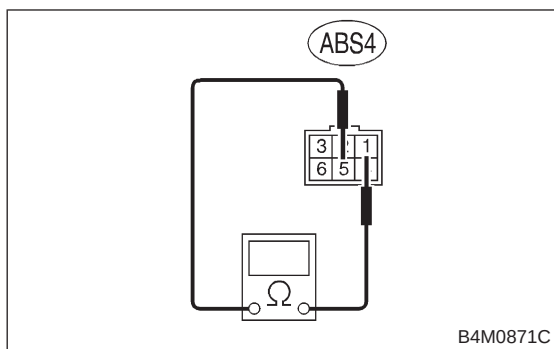
Connector & terminal

(ABS4) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10AB15.

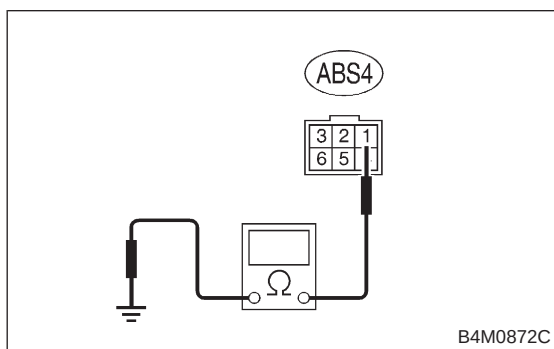
NO : Replace relay box, and check all fuses.


10AB15 CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX.

- 1) Turn ignition switch to OFF.
- 2) Install valve relay to relay box.
- 3) Measure resistance between relay box connector terminals.

Connector & terminal
(ABS4) No. 1 — No. 5:
CHECK : Is the resistance between 93 and 113 Ω?

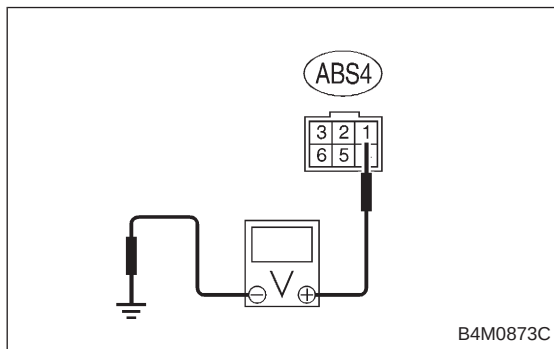
YES : Go to step **10AB16**.

NO : Replace relay box.

10AB16 CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box connector and chassis ground.

Connector & terminal
(ABS4) No. 1 — Chassis ground:
CHECK : Is the resistance more than 1 MΩ?

YES : Go to step **10AB17**.

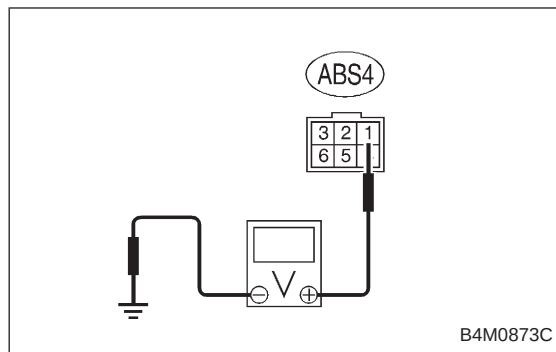
NO : Replace relay box, and check all fuses.

10AB17 CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure voltage between relay box connector and chassis ground.

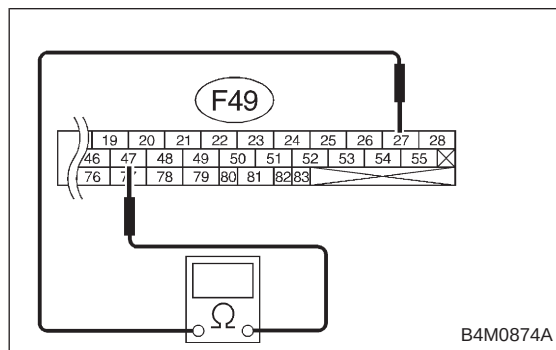
Connector & terminal
(ABS4) No. 1 (+) — Chassis ground (-):
CHECK : Is the voltage less than 1 V?

YES : Go to step **10AB18**.

NO : Replace relay box, and check fuse No. 19 and SBF6.

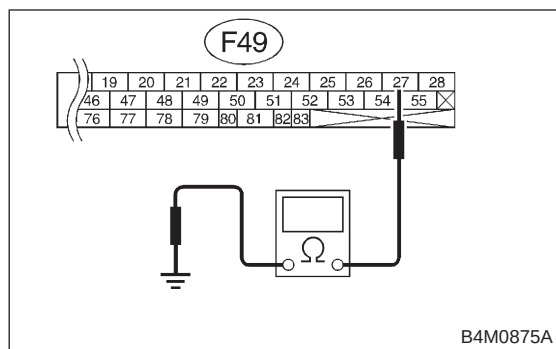
**10AB18****CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

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

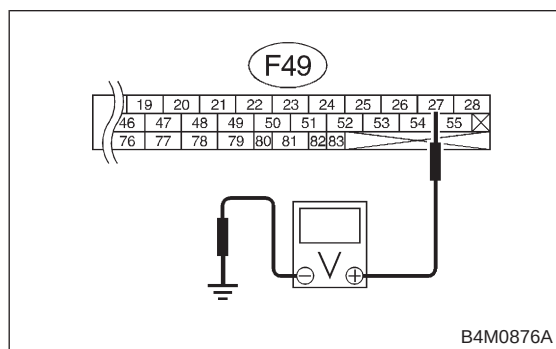
Connector & terminal**(ABS4) No. 1 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step **10AB19**.**NO** : Replace relay box, and check fuse No. 19 and SBF6.**10AB19****CHECK OPEN CIRCUIT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Connect connector (F50) to relay box.
- 3) Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 27 — No. 47:****CHECK** : Is the resistance between 93 and 113 Ω ?**YES** : Go to step **10AB20**.**NO** : Repair harness between ABSCM and relay box, and check fuse No. 18.

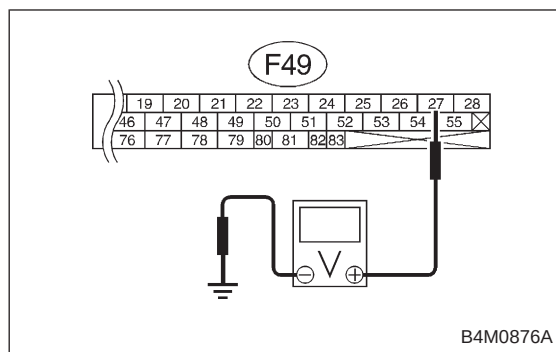
**10AB20****CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between ABSCM connector and chassis ground.

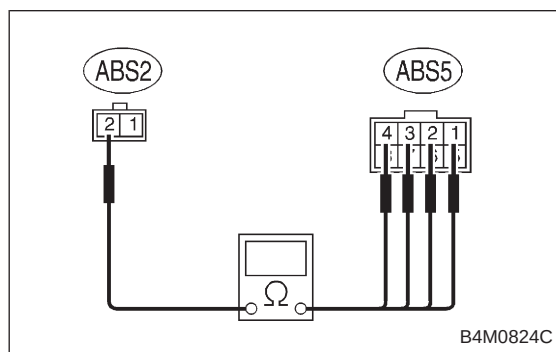
Connector & terminal**(F49) No. 27 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10AB21.**NO** : Repair harness between ABSCM and relay box, and check fuse No. 18.**10AB21****CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

- 1) Connect connector (F50) to relay box.
- 2) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 27 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 10AB22.**NO** : Repair harness between ABSCM and relay box, and check all fuses.

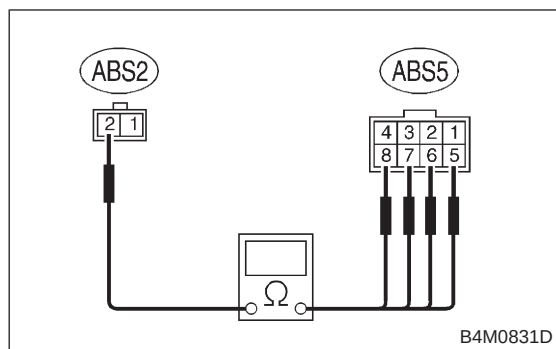
**10AB22****CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

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

Connector & terminal**(F49) No. 27 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step **10AB23**.**NO** : Repair harness between ABSCM and relay box, and check all fuses.**10AB23****CHECK RESISTANCE OF INLET SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure resistance between hydraulic unit connector terminals.

Connector & terminal**(ABS5) No. 4 — (ABS2) No. 2:****(ABS5) No. 1 — (ABS2) No. 2:****(ABS5) No. 2 — (ABS2) No. 2:****(ABS5) No. 3 — (ABS2) No. 2:****CHECK** : Is the resistance between 7.8 and 9.2 Ω ?**YES** : Go to step **10AB24**.**NO** : Replace hydraulic unit.



10AB24 CHECK RESISTANCE OF OUTLET SOLENOID VALVE.

Measure resistance between hydraulic unit connector terminals.

Connector & terminal

(ABS5) No. 8 — (ABS2) No. 2:

(ABS5) No. 5 — (ABS2) No. 2:

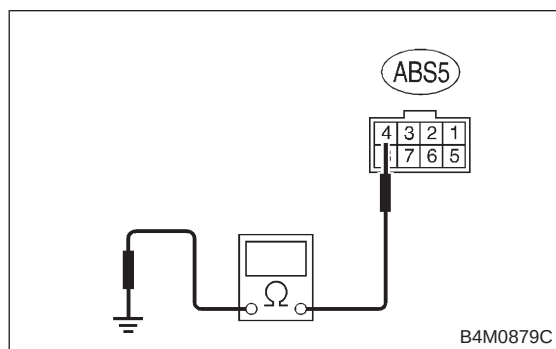
(ABS5) No. 6 — (ABS2) No. 2:

(ABS5) No. 7 — (ABS2) No. 2:

CHECK : Is the resistance between 3.8 and 4.8 Ω ?

YES : Go to step 10AB25.

NO : Replace hydraulic unit.



10AB25 CHECK GROUND SHORT OF SOLENOID VALVE.

Measure resistance between hydraulic unit connector and chassis ground.

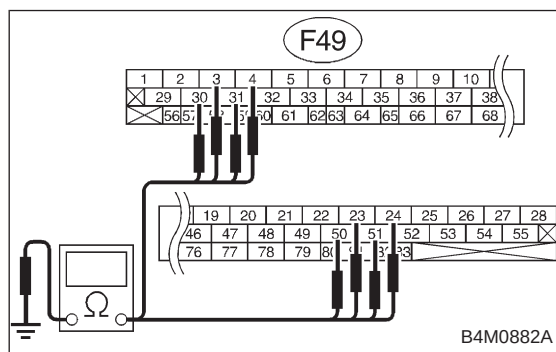
Connector & terminal

(ABS5) No. 4 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10AB26.

NO : Replace hydraulic unit, and check all fuses.



10AB26 CHECK GROUND SHORT OF HARNESS.

- 1) Disconnect connector from hydraulic unit.
- 2) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 30 — Chassis ground:

(F49) No. 24 — Chassis ground:

(F49) No. 23 — Chassis ground:

(F49) No. 31 — Chassis ground:

(F49) No. 3 — Chassis ground:

(F49) No. 51 — Chassis ground:

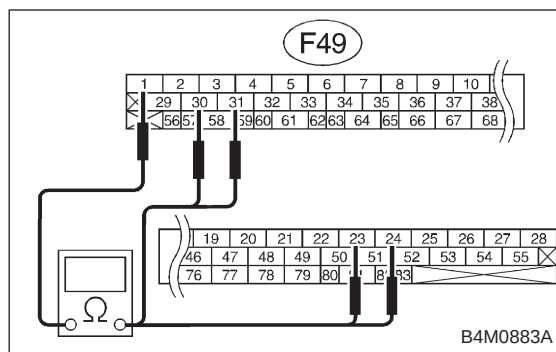
(F49) No. 50 — Chassis ground:

(F49) No. 4 — Chassis ground:

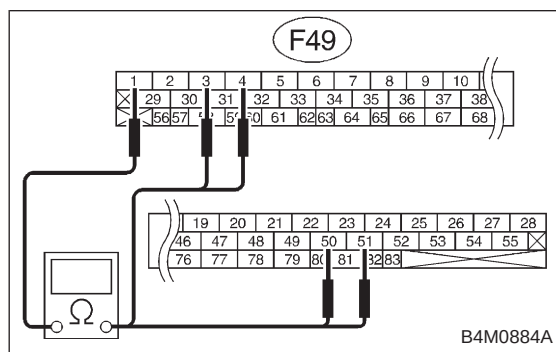
CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10AB27.

NO : Repair harness between hydraulic unit and ABSCM.

**10AB27****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

- 1) Connect connector to hydraulic unit.
- 2) Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 30 — No. 1:****(F49) No. 24 — No. 1:****(F49) No. 23 — No. 1:****(F49) No. 31 — No. 1:****(CHECK)** : Is the resistance between 8.3 and 9.7 Ω?**(YES)** : Go to step **10AB28**.**(NO)** : Repair harness/connector between hydraulic unit and ABSCM.**10AB28****CHECK HARNESS/CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 3 — No. 1:****(F49) No. 51 — No. 1:****(F49) No. 50 — No. 1:****(F49) No. 4 — No. 1:****(CHECK)** : Is the resistance between 4.3 and 5.3 Ω?**(YES)** : Go to step **10AB29**.**(NO)** : Repair harness/connector between hydraulic unit and ABSCM.**10AB29****CHECK POOR CONTACT IN CONNECTORS.****(CHECK)** : Is there poor contact in connector between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>**(YES)** : Repair connector.**(NO)** : Go to step **10AB30**.

10AB30 CHECK ABSCM.

- 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.

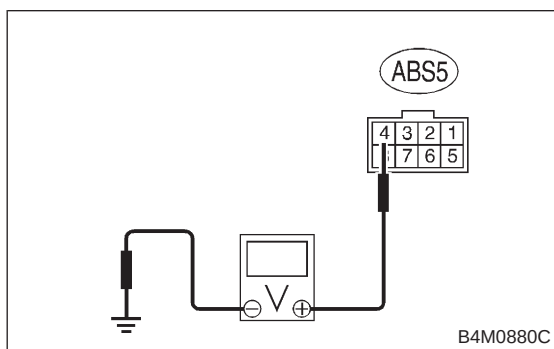
NO : Go to step **10AB31**.

10AB31 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.

**10AB32 CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors (ABS1, F9) from hydraulic unit.
- 3) Disconnect connector from ABSCM.
- 4) Measure voltage between hydraulic unit connector and chassis ground.

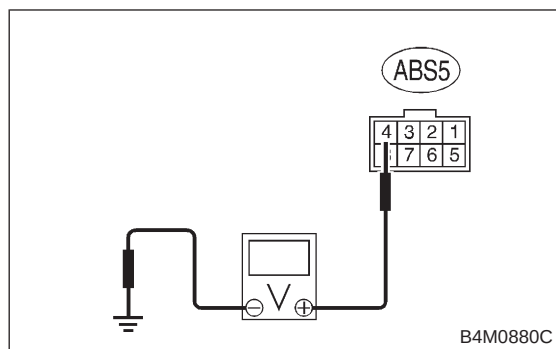
Connector & terminal

(ABS5) No. 4 (+) — Chassis ground (-):

CHECK : *Is the voltage less than 1 V?*

YES : Go to step **10AB33**.

NO : Replace hydraulic unit, and check all fuses.


10AB33 CHECK BATTERY SHORT OF SOLENOID VALVE.

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

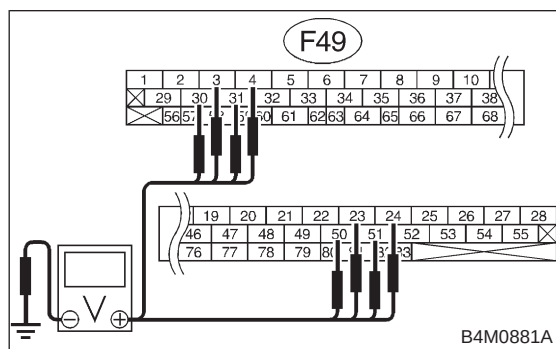
Connector & terminal

(ABS5) No. 4 (+) — Chassis ground (-):

(CHECK) : Is the voltage less than 1 V?

(YES) : Go to step 10AB34.

(NO) : Replace hydraulic unit, and check all fuses.


10AB34 CHECK BATTERY SHORT OF HARNESS.

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

Connector & terminal

(F49) No. 30 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):

(F49) No. 23 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 51 (+) — Chassis ground (-):

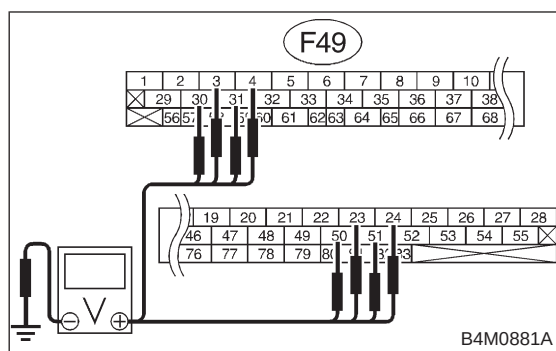
(F49) No. 50 (+) — Chassis ground (-):

(F49) No. 4 (+) — Chassis ground (-):

(CHECK) : Is the voltage less than 1 V?

(YES) : Go to step 10AB35.

(NO) : Repair harness between hydraulic unit and ABSCM, and check all fuses.

**10AB35 CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

(F49) No. 30 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):

(F49) No. 23 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 51 (+) — Chassis ground (-):

(F49) No. 50 (+) — Chassis ground (-):

(F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10AB36.

NO : Repair harness between hydraulic unit and ABSCM, and check all fuses.

10AB36 CHECK ABSCM.

- 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.

NO : Go to step 10AB37.

10AB37 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.

D•NEW 51 (FB1)
V.RELAY ON

B4M0802

AC: TROUBLE CODE 51 V. RELAY ON — VALVE RELAY ON FAILURE —

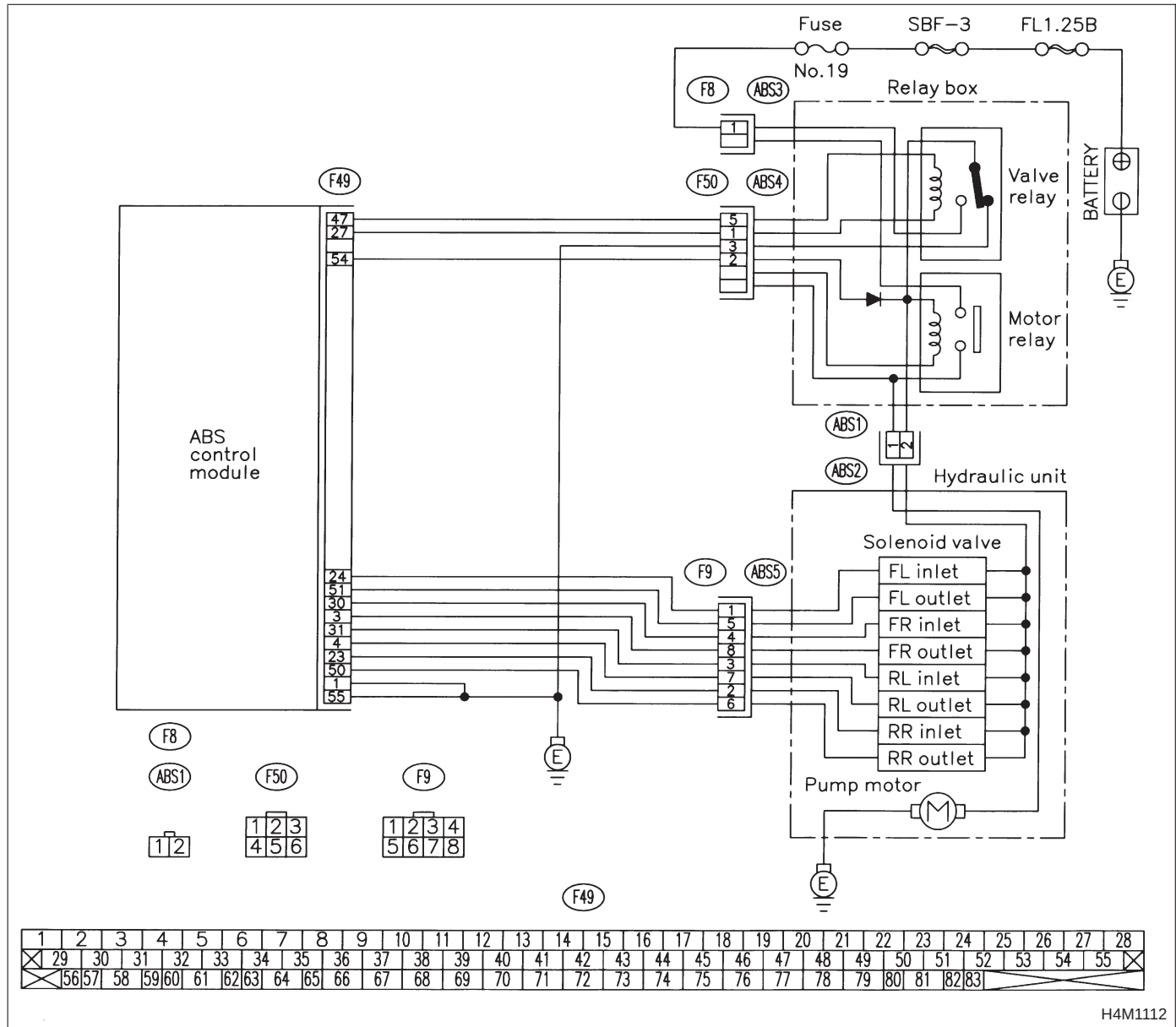
DIAGNOSIS:

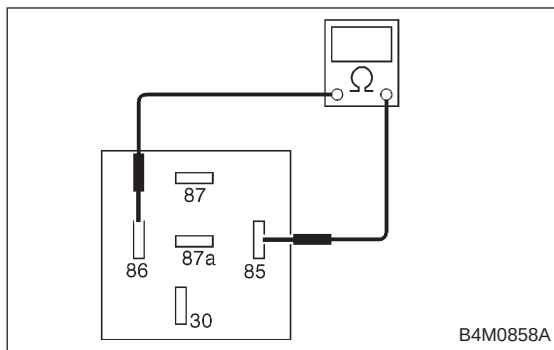
- Faulty valve relay

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:





10AC1 CHECK RESISTANCE OF VALVE RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove valve relay from relay box.
- 3) Measure resistance between valve relay terminals.

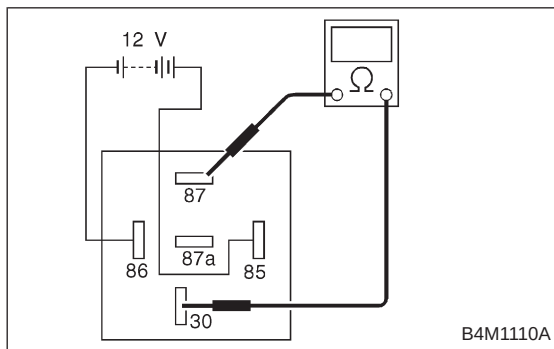
Terminals

No. 85 — No. 86:

CHECK : Is the resistance between 93 and 113 Ω ?

YES : Go to step 10AC2.

NO : Replace valve relay.



10AC2 CHECK CONTACT POINT OF VALVE RELAY.

- 1) Connect battery to valve relay terminals No. 85 and No. 86.
- 2) Measure resistance between valve relay terminals.

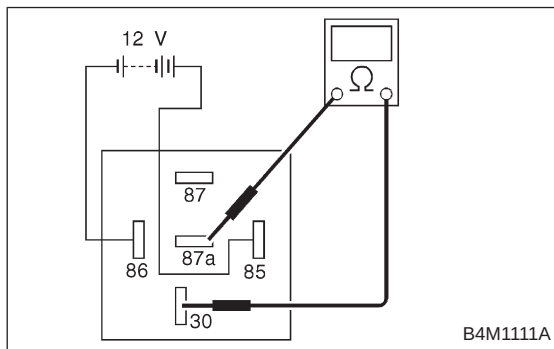
Terminals

No. 30 — No. 87:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 10AC3.

NO : Replace valve relay.



10AC3 CHECK CONTACT POINT OF VALVE RELAY.

Measure resistance between valve relay terminals.

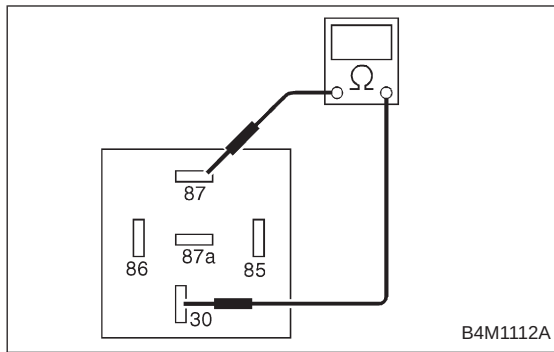
Terminals

No. 30 — No. 87a:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10AC4.

NO : Replace valve relay.



10AC4 CHECK CONTACT POINT OF VALVE RELAY.

- 1) Disconnect battery from valve relay terminals.
- 2) Measure resistance between valve relay terminals.

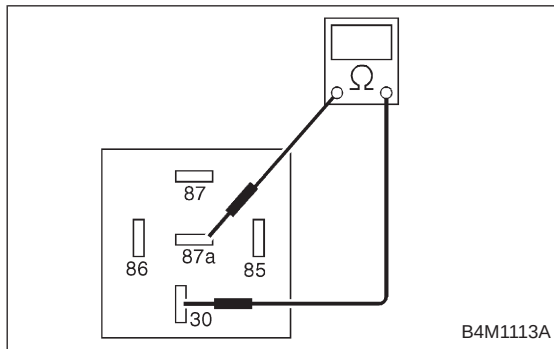
Terminals

No. 30 — No. 87:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AC5.

NO : Replace valve relay.



10AC5 CHECK CONTACT POINT OF VALVE RELAY.

Measure resistance between valve relay terminals.

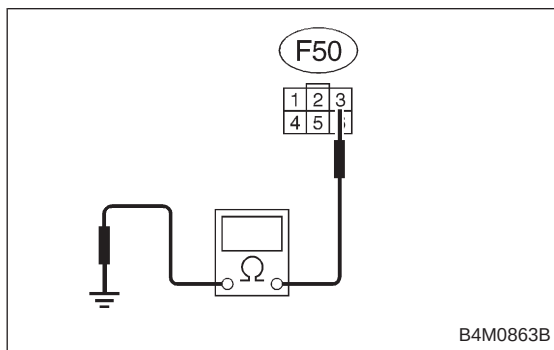
Terminals

No. 30 — No. 87a:

CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 10AC6.

NO : Replace valve relay.



10AC6 CHECK GROUND CIRCUIT OF RELAY BOX.

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box connector and chassis ground.

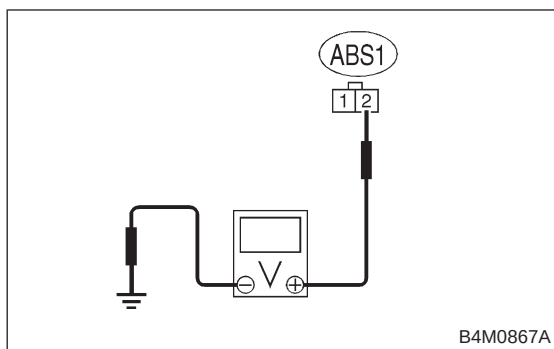
Connector & terminal

(F50) No. 3 — Chassis ground:

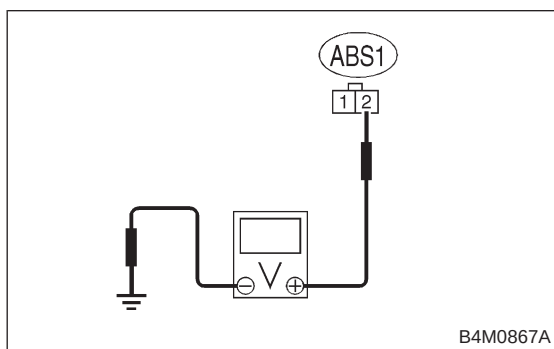
CHECK : Is the resistance less than 0.5 Ω?

YES : Go to step 10AC7.

NO : Repair relay box ground harness.

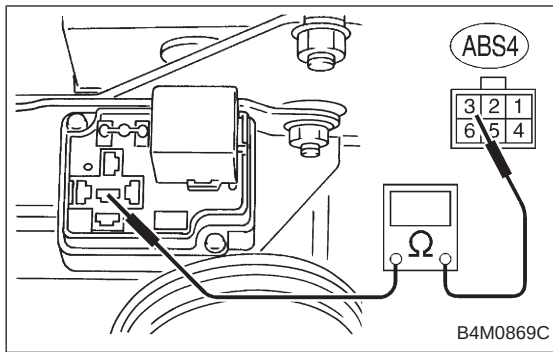
**10AC7****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector from ABSCM.
- 2) Disconnect connector (ABS1) from hydraulic unit.
- 3) Measure voltage between hydraulic unit connector and chassis ground.

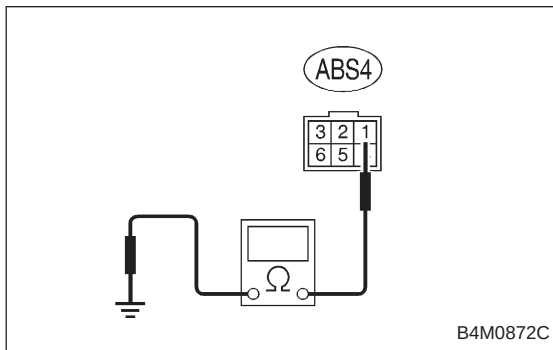
Connector & terminal**(ABS1) No. 2 (+) — Chassis ground (-):****CHECK** : *Is the voltage less than 1 V?***YES** : Go to step **10AC8**.**NO** : Replace relay box, and check fuse No. 19 and SBF6.**10AC8****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

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

Connector & terminal**(ABS1) No. 2 (+) — Chassis ground (-):****CHECK** : *Is the voltage less than 1 V?***YES** : Go to step **10AC9**.**NO** : Replace relay box, and check fuse No. 9 and SBF6.

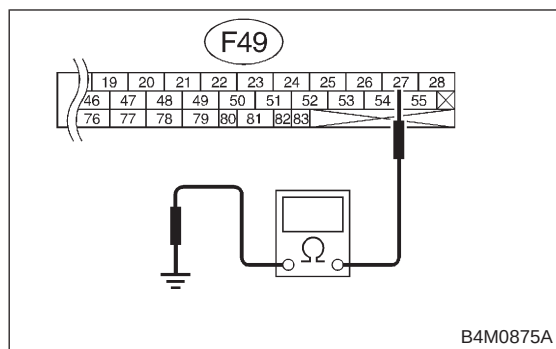
**10AC9****CHECK OPEN CIRCUIT IN GROUND CIRCUIT OF RELAY BOX.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between relay box connector and valve relay installing point.

Connector & terminal**(ABS4) No. 3 — Valve relay installing point No. 87a:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step **10AC10**.**NO** : Replace relay box.**10AC10****CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

- 1) Install valve relay to relay box.
- 2) Measure resistance between relay box connector and chassis ground.

Connector & terminal**(ABS4) No. 1 — Chassis ground:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step **10AC11**.**NO** : Replace relay box, and check all fuses.

**10AC11****CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

Measure resistance between ABSCM connector and chassis ground.

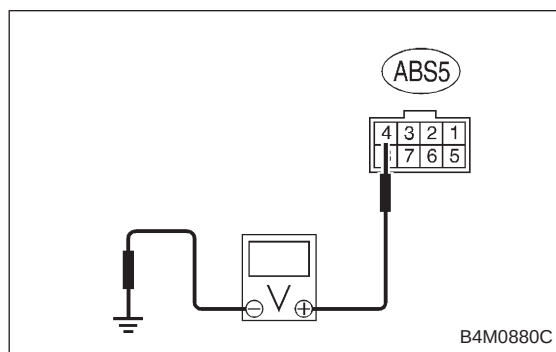
Connector & terminal

(F49) No. 27 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AC12.

NO : Repair harness between ABSCM and relay box, and check fuse No. 18.

**10AC12****CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Disconnect connector (ABS1, F9) from hydraulic unit.
- 2) Measure voltage between hydraulic unit connector and chassis ground.

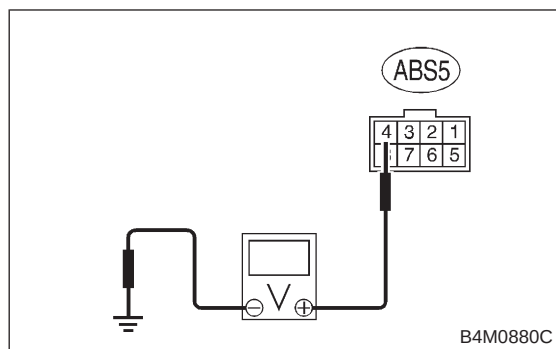
Connector & terminal

(ABS5) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10AC13.

NO : Replace hydraulic unit, and check all fuses.



10AC13 CHECK BATTERY SHORT OF SOLENOID VALVE.

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

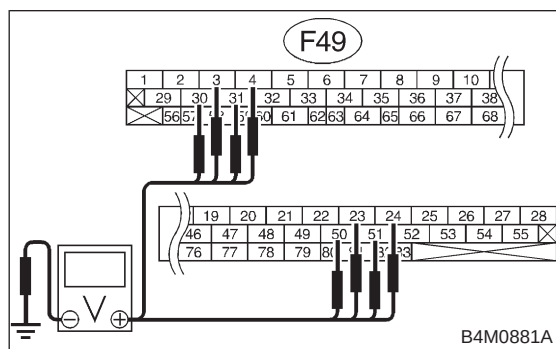
Connector & terminal

(ABS5) No. 4 (+) — Chassis ground (-):

(CHECK) : Is the voltage less than 1 V?

(YES) : Go to step **10AC14**.

(NO) : Replace hydraulic unit, and check all fuses.



10AC14 CHECK BATTERY SHORT OF HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

(F49) No. 30 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):

(F49) No. 23 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 51 (+) — Chassis ground (-):

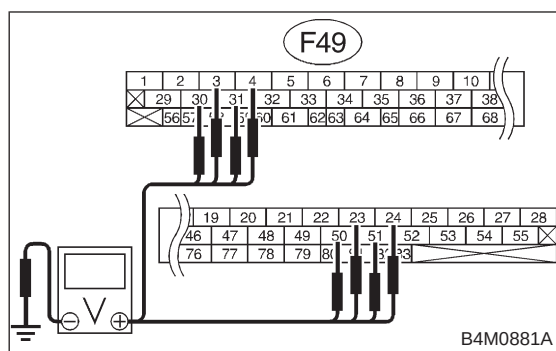
(F49) No. 50 (+) — Chassis ground (-):

(F49) No. 4 (+) — Chassis ground (-):

(CHECK) : Is the voltage less than 1 V?

(YES) : Go to step **10AC15**.

(NO) : Repair harness between hydraulic unit and ABSCM, and check all fuses.

**10AC15 CHECK BATTERY SHORT OF HARNESS.**

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

Connector & terminal

(F49) No. 30 (+) — Chassis ground (-):

(F49) No. 24 (+) — Chassis ground (-):

(F49) No. 23 (+) — Chassis ground (-):

(F49) No. 31 (+) — Chassis ground (-):

(F49) No. 3 (+) — Chassis ground (-):

(F49) No. 51 (+) — Chassis ground (-):

(F49) No. 50 (+) — Chassis ground (-):

(F49) No. 4 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10AC16.

NO : Repair harness between hydraulic unit and ABSCM, and check all fuses.

10AC16 CHECK POOR CONTACT IN CONNECTORS.

CHECK : Is there poor contact in connectors between ABSCM and hydraulic unit? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 10AC17.

10AC17 CHECK ABSCM.

- 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.

NO : Go to step 10AC18.

10AC18 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.

D•NEW 52 (FB1) M. RELAY OPEN

B4M0969

AD: TROUBLE CODE 52 M. RELAY OPEN — OPEN CIRCUIT OF MOTOR RELAY —

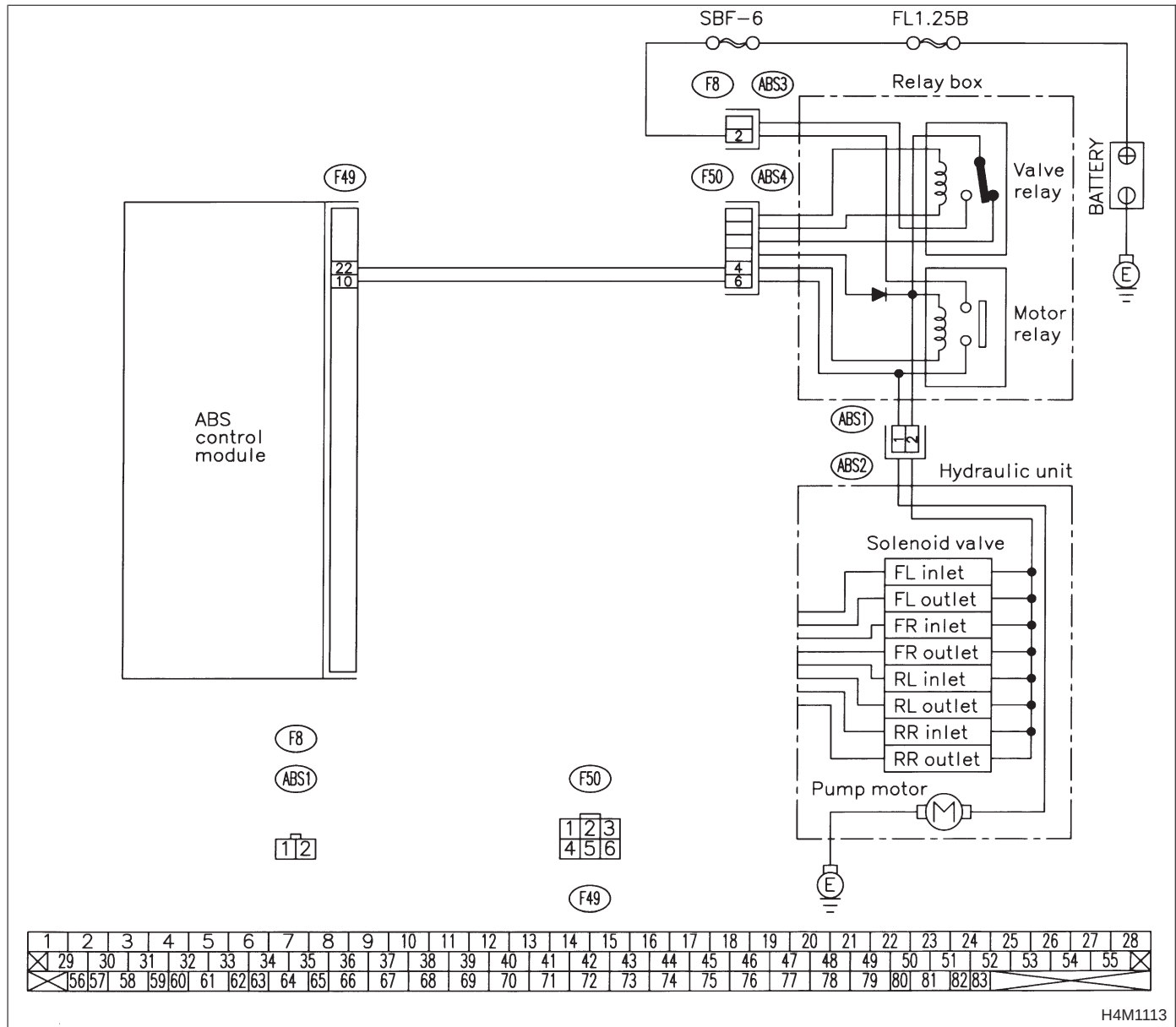
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

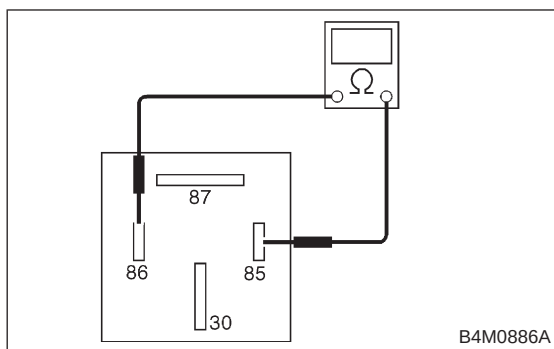
TROUBLE SYMPTOM:

- ABS does not operate.

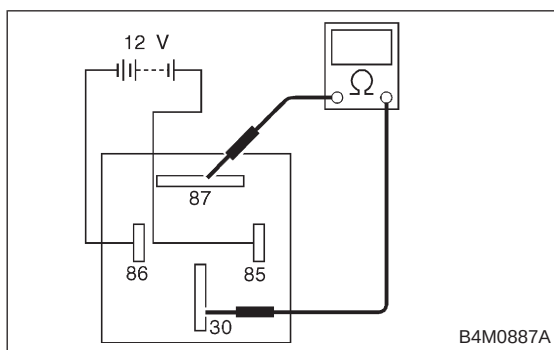
WIRING DIAGRAM:



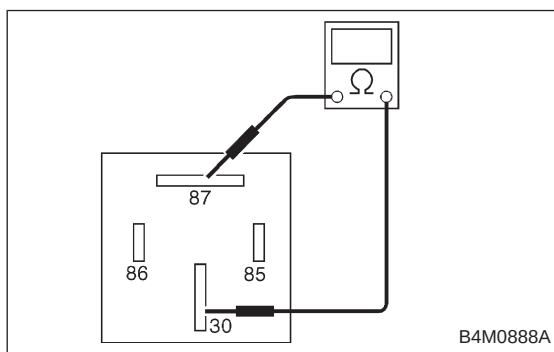
H4M1113

**10AD1 CHECK RESISTANCE OF MOTOR RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Measure resistance between motor relay terminals.

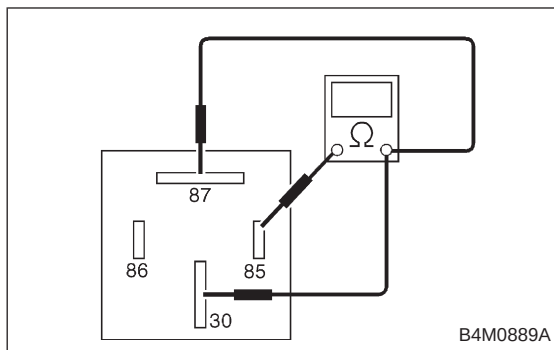
Terminals**No. 85 — No. 86:****CHECK** : Is the resistance between 70 and 90 Ω ?**YES** : Go to step 10AD2.**NO** : Replace motor relay.**10AD2 CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Connect battery to motor relay terminals No. 85 and No. 86.
- 2) Measure resistance between motor relay terminals.

Terminals**No. 30 — No. 87:****CHECK** : Is the resistance less than 0.5 Ω ?**YES** : Go to step 10AD3.**NO** : Replace motor relay.**10AD3 CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Disconnect battery from motor relay terminals.
- 2) Measure resistance between motor relay terminals.

Terminals**No. 30 — No. 87:****CHECK** : Is the resistance more than 1 $M\Omega$?**YES** : Go to step 10AD4.**NO** : Replace motor relay.

**10AD4 CHECK SHORT OF MOTOR RELAY.**

Measure resistance between motor relay terminals.

Terminals

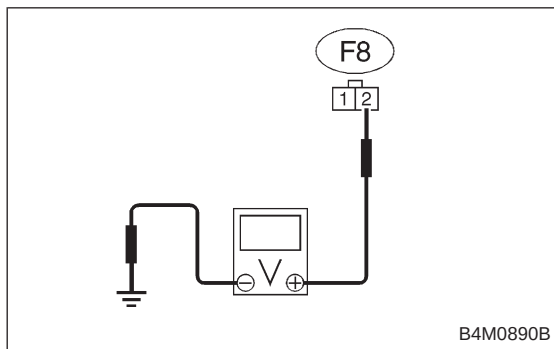
No. 85 — No. 30:

No. 85 — No. 87:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AD5.

NO : Replace motor relay.

**10AD5 CHECK INPUT VOLTAGE OF RELAY BOX.**

1) Disconnect connector (F8) from relay box.

2) Measure voltage between relay box connector and chassis ground.

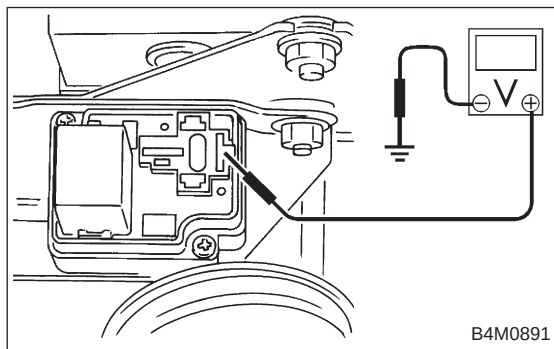
Connector & terminal

(F8) No. 2 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Go to step 10AD6.

NO : Repair harness/connector between battery and relay box, and check fuse SBF6.

**10AD6 CHECK INPUT VOLTAGE OF MOTOR RELAY.**

1) Connect connector (F8) to relay box.

2) Measure voltage between relay box and chassis ground.

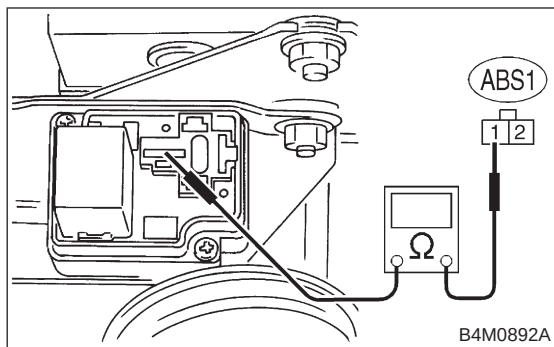
Connector & terminal

Relay installing point No. 87 (+) — Chassis ground (-):

CHECK : Is the voltage between 10 V and 13 V?

YES : Go to step 10AD7.

NO : Replace relay box, and fuse SBF6.



10AD7 CHECK OPEN CIRCUIT IN CONTACT POINT CIRCUIT OF RELAY BOX.

- 1) Disconnect connector (ABS1) from hydraulic unit.
- 2) Measure resistance between hydraulic unit and motor relay installing portion.

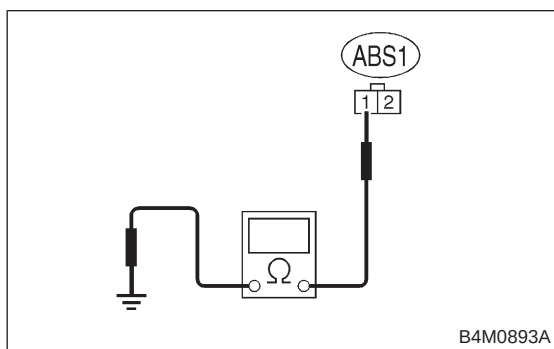
Connector & terminal

(ABS1) No. 1 — Motor relay installing portion No. 30:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 10AD8.

NO : Replace relay box.



10AD8 CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

Measure resistance between hydraulic unit and chassis ground.

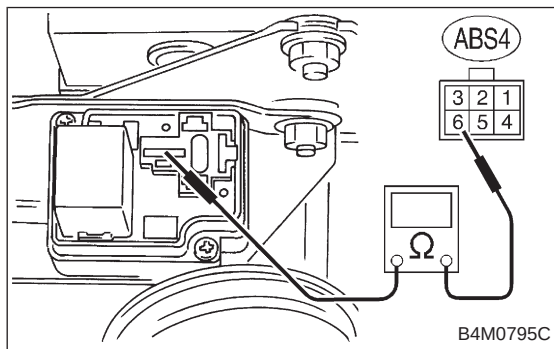
Connector & terminal

(ABS1) No. 1 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10AD9.

NO : Replace relay box, and check fuse No. 19.



10AD9 CHECK OPEN CIRCUIT IN MONITOR SYSTEM CIRCUIT OF RELAY BOX.

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box connector and motor relay installing point.

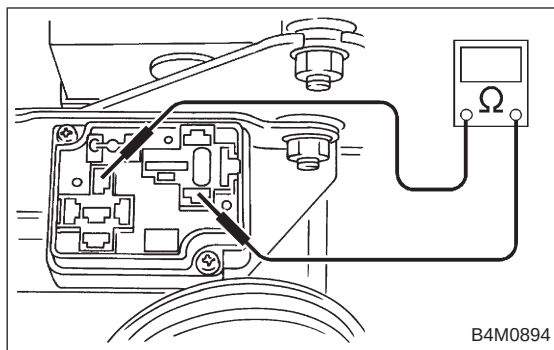
Connector & terminal

(ABS4) No. 6 — Motor relay installing point No. 30:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 10AD10.

NO : Replace relay box.


10AD10 CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX.

- 1) Remove valve relay from relay box.
- 2) Measure resistance between motor relay installing point and valve relay installing point.

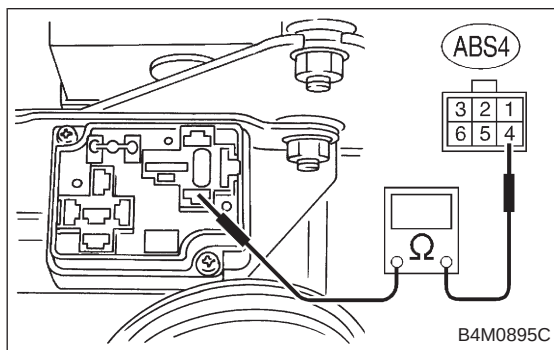
Connector & terminal

Motor relay installing point No. 86 — Valve relay installing point No. 30:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 10AD11.

NO : Replace relay box.


10AD11 CHECK OPEN CIRCUIT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between motor relay installing point and relay box connector.

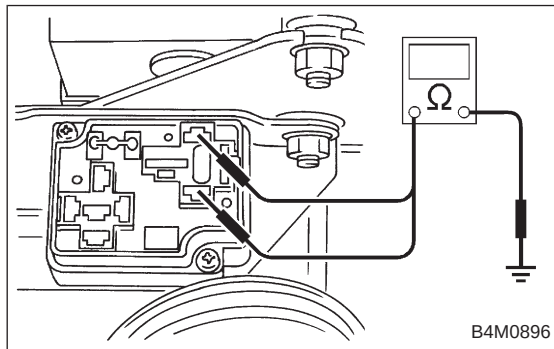
Connector & terminal

Motor relay installing point No. 86 — (ABS4) No. 4:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step 10AD12.

NO : Replace relay box.


10AD12 CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

Measure resistance between relay box and chassis ground.

Connector & terminal

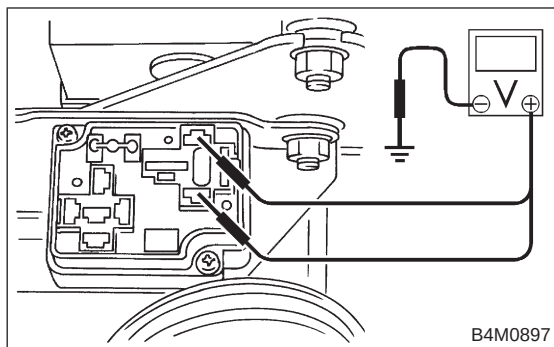
Motor relay installing point No. 86 — Chassis ground:

Motor relay installing point No. 85 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10AD13.

NO : Replace relay box, and check fuse No. 19.


10AD13 CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

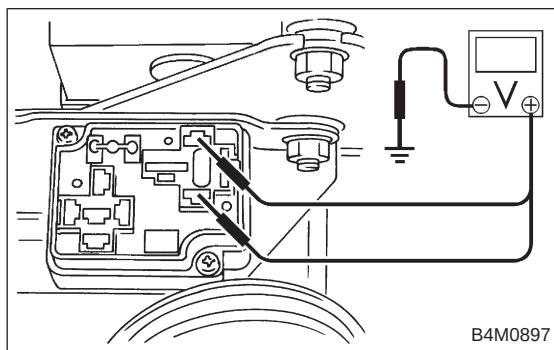
- 1) Disconnect connector from ABSCM.
- 2) Measure voltage between motor relay installing point and chassis ground.

Connector & terminal

Motor relay installing point No. 85 (+) — Chassis ground (-):

Motor relay installing point No. 86 (+) — Chassis ground (-):

- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step **10AD14**.
- NO** : Replace relay box, and check all fuses.


10AD14 CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.

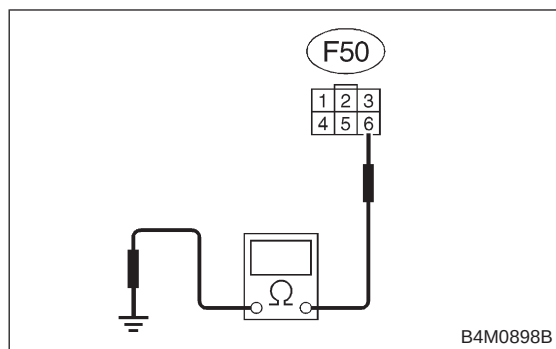
- 1) Turn ignition switch to ON.
- 2) Measure voltage between motor relay installing point and chassis ground.

Connector & terminal

Motor relay installing point No. 85 (+) — Chassis ground (-):

Motor relay installing point No. 86 (+) — Chassis ground (-):

- CHECK** : Is the voltage less than 1 V?
- YES** : Go to step **10AD15**.
- NO** : Replace relay box, and check all fuses.


10AD15 CHECK OPEN CIRCUIT IN MONITOR SYSTEM HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Connect between terminals No. 10 and No. 1 of ABSCM connector (F49) with a lead wire.
- 3) Measure resistance between relay box connector and chassis ground.

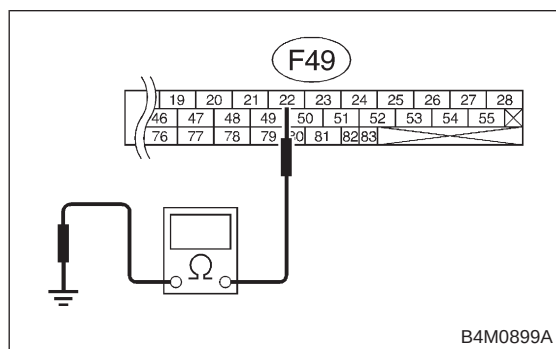
Connector & terminal

(F50) No. 6 — Chassis ground:

CHECK : Is the resistance less than 0.5 Ω ?

YES : Go to step **10AD16**.

NO : Repair harness/connector between ABSCM and relay box.


10AD16 CHECK OPEN CIRCUIT IN RELAY CONTROL SYSTEM HARNESS.

- 1) Connect valve relay and motor relay to relay box.
- 2) Connect connector (F50) to relay box.
- 3) Connect connector to hydraulic unit.
- 4) Measure resistance between ABSCM connector and chassis ground.

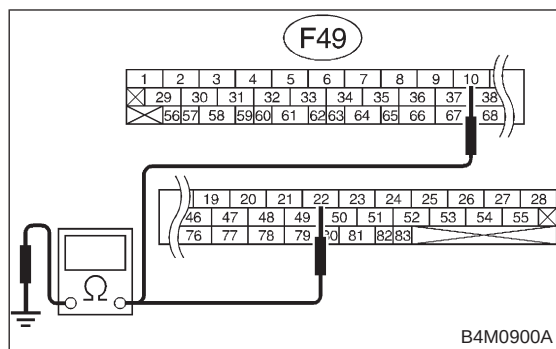
Connector & terminal

(F49) No. 22 — Chassis ground:

CHECK : Is the resistance between 70 and 90 Ω ?

YES : Go to step **10AD17**.

NO : Repair harness/connector between ABSCM and relay box.


10AD17 CHECK GROUND SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

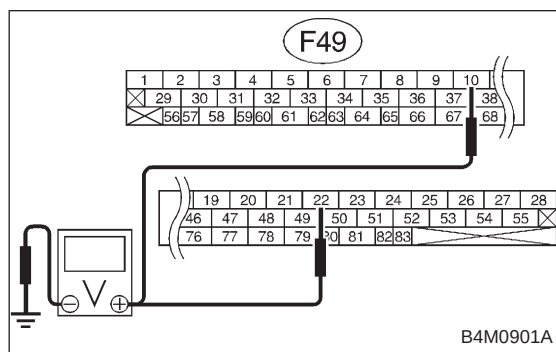
(F49) No. 22 — Chassis ground:

(F49) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step **10AD18**.

NO : Repair harness between ABSCM and relay box, and check fuse No. 19 and SBF6.


10AD18 CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.

Measure voltage between ABSCM and chassis ground.

Connector & terminal

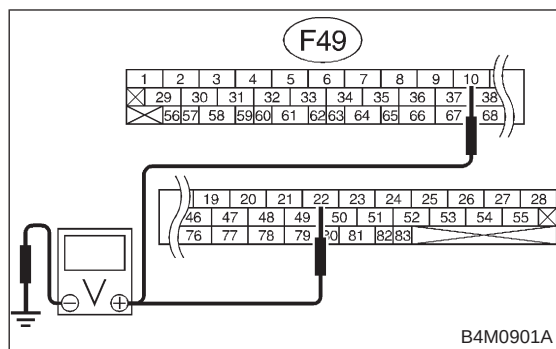
(F49) No. 22 (+) — Chassis ground (-):

(F49) No. 10 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **10AD19**.

NO : Repair harness between relay box and ABSCM, and check fuse SBF6.



10AD19 CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.

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

Connector & terminal

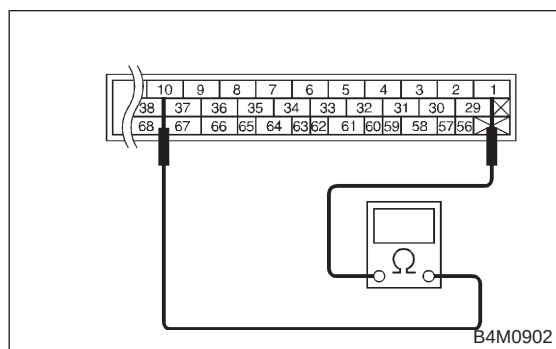
(F49) No. 22 (+) — Chassis ground (-):

(F49) No. 10 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step 10AD20.

NO : Repair harness between relay box and ABSCM, and check fuse SBF6.



10AD20 CHECK GROUND SHORT AT ABSCM MONITOR TERMINAL.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between ABSCM terminals.

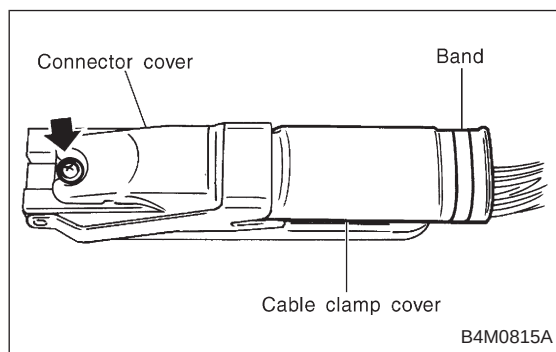
Terminal

No. 10 — No. 1:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AD21.

NO : Replace ABSCM.

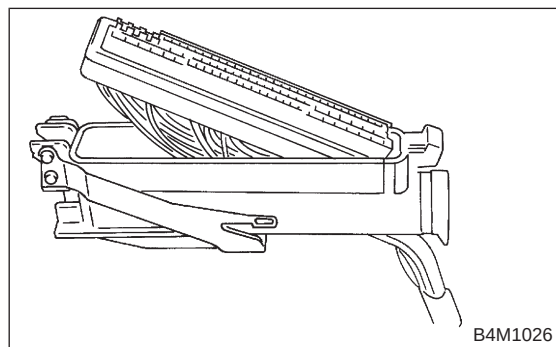


10AD21 CHECK ABSCM MOTOR DRIVE TERMINAL.

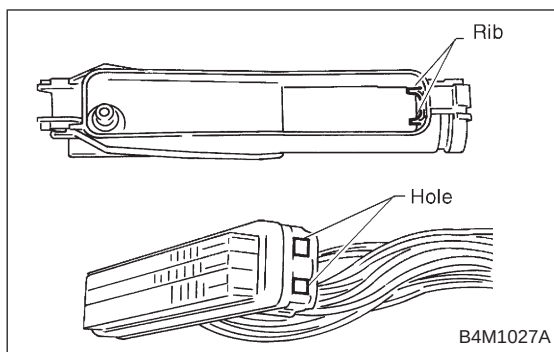
- 1) Disconnect connector cover from ABSCM connector.
- 2) Remove band.
- 3) Remove cable clamp cover.
- 4) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.



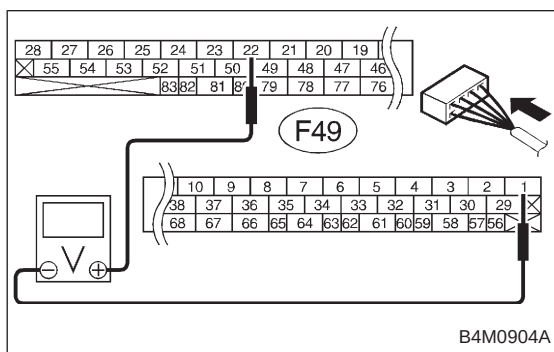
- 5) Remove connector cover.



NOTE:

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

6) Connect all connectors.



7) Measure voltage between ABSCM connector terminals.

8) Operate the check sequence. <Ref. to 4-4 [W12D0].>

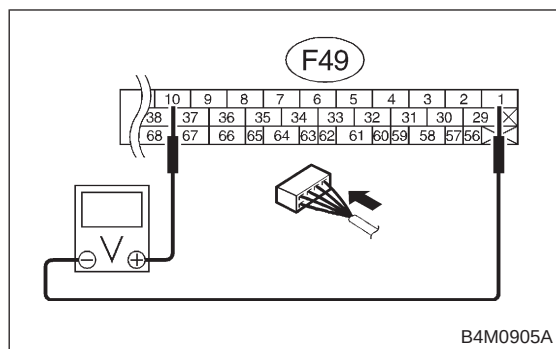
Connector & terminals

(F49) No. 22 (+) — No. 1 (-):

CHECK : Does the voltage drop from between 10 V and 13 V to less than 1.5 V, and rise to between 10 V and 13 V again when carrying out the check sequence?

YES : Go to step 10AD22.

NO : Replace ABSCM.

**10AD22 CHECK MOTOR OPERATION.**

- 1) Measure voltage between ABSCM connector terminal.
- 2) Operate the check sequence. <Ref. to 4-4 [W12D0].>

Connector & terminals**(F49) No. 10 (+) — No. 1 (-):**

CHECK : *Does the voltage raise from less than 1.5 V to between 10 V and 13 V and return to less than 1.5 V again when carrying out the check sequence?*

YES : Go to step **10AD23**.

NO : Replace hydraulic unit.

10AD23 CHECK MOTOR OPERATION.

Operate the check sequence. <Ref. to 4-4 [W12D0].>

CHECK : *Can motor revolution noise (buzz) be heard when carrying out the check sequence?*

YES : Go to step **10AD24**.

NO : Replace hydraulic unit.

10AD24 CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connectors between hydraulic unit, relay box and ABSCM? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10AD25**.

10AD25 CHECK ABSCM.

- 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.

NO : Go to step **10AD26**.

10AD26 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.

D•NEW 52 (FB1) M. RELAY ON

B4M0970

AE: TROUBLE CODE 52 M. RELAY ON — MOTOR RELAY ON FAILURE —

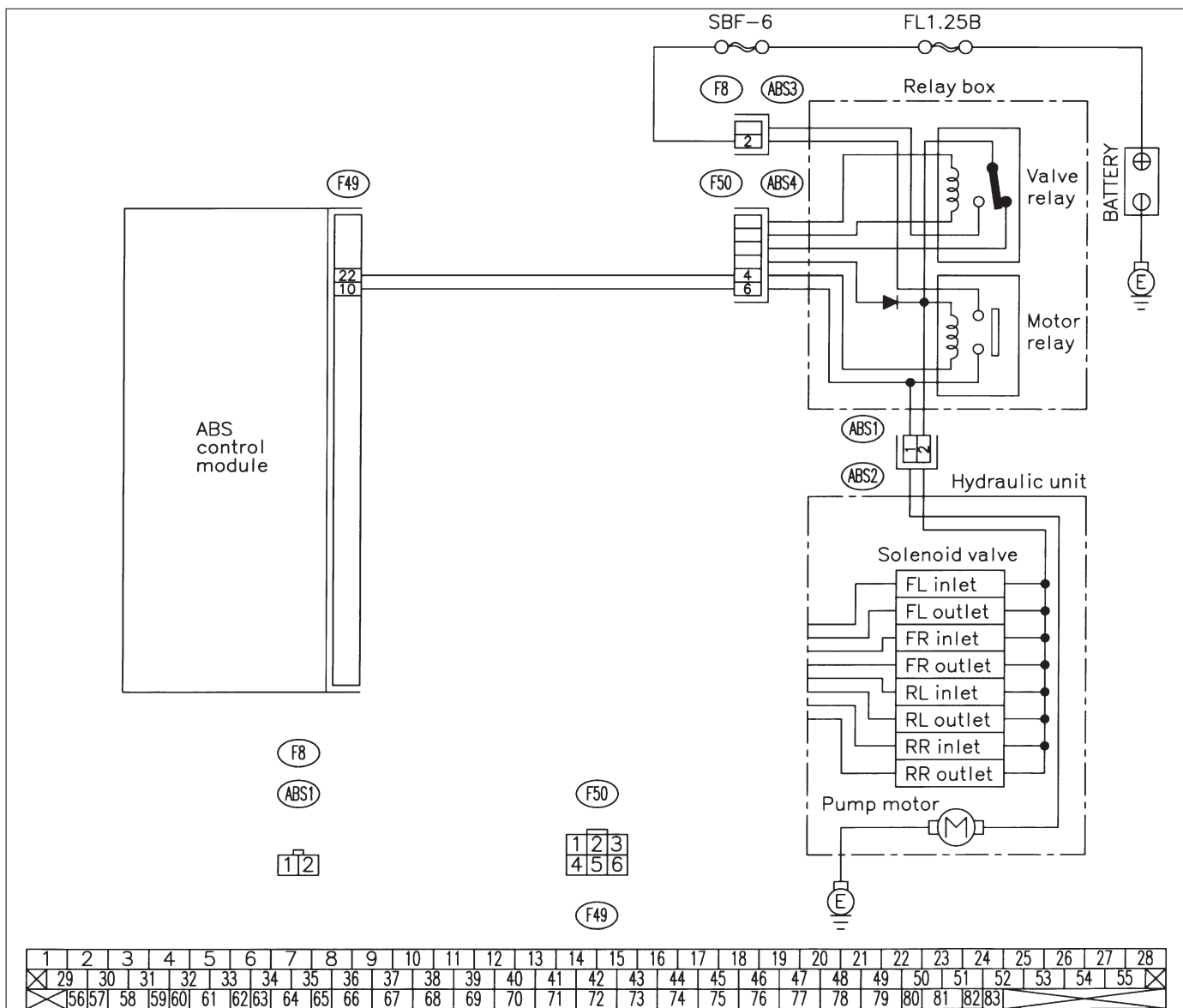
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

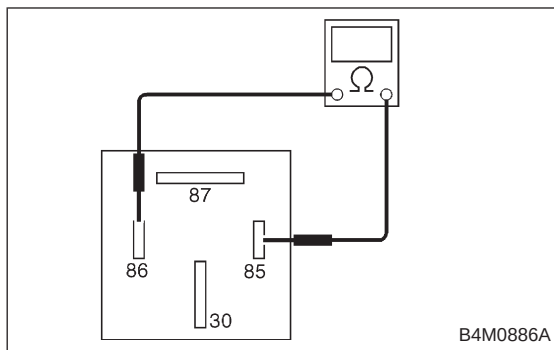
TROUBLE SYMPTOM:

- ABS does not operate.

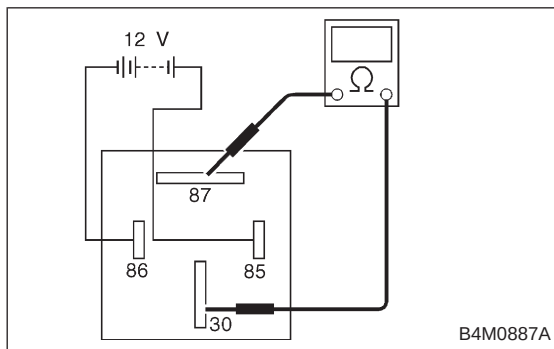
WIRING DIAGRAM:



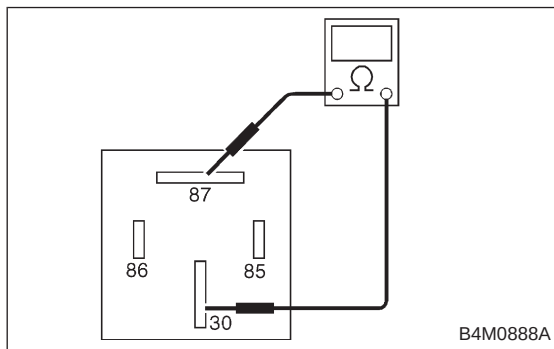
H4M1113

**10AE1 CHECK RESISTANCE OF MOTOR RELAY.**

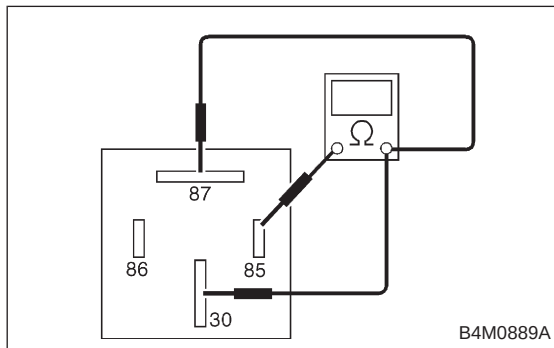
- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Measure resistance between motor relay terminals.

Terminals**No. 85 — No. 86:****CHECK** : Is the resistance between 70 and 90 Ω ?**YES** : Go to step 10AE2.**NO** : Replace motor relay.**10AE2 CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Connect battery to motor relay terminals No. 85 and No. 86.
- 2) Measure resistance between motor relay terminals.

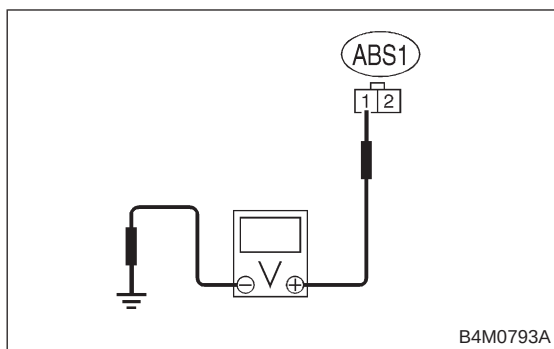
Terminals**No. 30 — No. 87:****CHECK** : Is the resistance less than 0.5 Ω ?**YES** : Go to step 10AE3.**NO** : Replace motor relay.**10AE3 CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Disconnect battery from motor relay terminals.
- 2) Measure resistance between motor relay terminals.

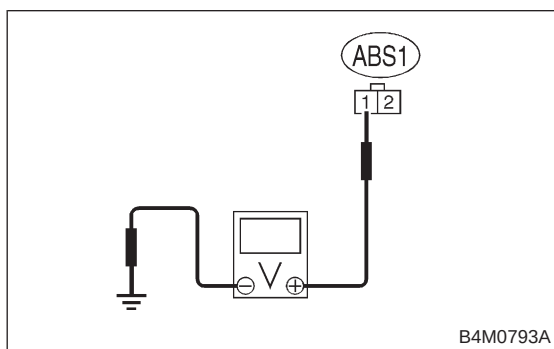
Terminals**No. 30 — No. 87:****CHECK** : Is the resistance more than 1 $M\Omega$?**YES** : Go to step 10AE4.**NO** : Replace motor relay.**10AE4 CHECK SHORT OF MOTOR RELAY.**

Measure resistance between motor relay terminals.

Terminals**No. 85 — No. 30:****No. 85 — No. 87:****CHECK** : Is the resistance more than 1 $M\Omega$?**YES** : Go to step 10AE5.**NO** : Replace motor relay.

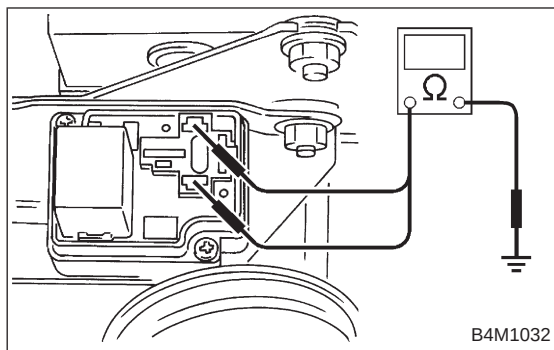
**10AE5****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector from ABSCM.
- 2) Disconnect connector (ABS1) from hydraulic unit.
- 3) Measure voltage between relay box connector and chassis ground.

Connector & terminal**(ABS1) No. 1 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 10AE6.**NO** : Replace relay box.**10AE6****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

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

Connector & terminal**(ABS1) No. 1 (+) — Chassis ground (-):****CHECK** : Is the voltage less than 1 V?**YES** : Go to step 10AE7.**NO** : Replace relay box.

**10AE7****CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (F50) from relay box.
- 3) Measure resistance between relay box and chassis ground.

Connector & terminal

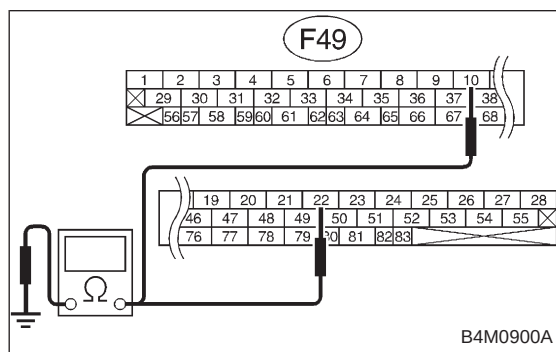
Motor relay installing point No. 85 — Chassis ground:

Motor relay installing point No. 86 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AE8.

NO : Replace relay box, and check fuse No. 19.

**10AE8****CHECK GROUND SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.**

- 1) Disconnect connector (F49) from ABSCM.
- 2) Measure resistance between ABSCM connector and chassis ground.

Connector & terminal

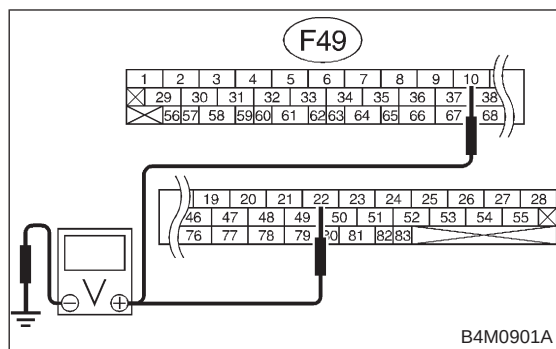
(F49) No. 22 — Chassis ground:

(F49) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AE9.

NO : Repair harness between ABSCM and relay box, and check fuse No. 19 and SBF6.

**10AE9****CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.**

Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

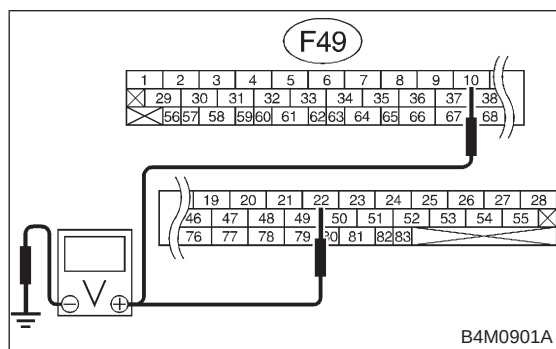
(F49) No. 22 (+) — Chassis ground (-):

(F49) No. 10 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **10AE10**.

NO : Repair harness between relay box and ABSCM connector, and check fuse SBF6.

**10AE10****CHECK BATTERY SHORT IN HARNESS BETWEEN RELAY BOX AND ABSCM.**

1) Turn ignition switch to ON.

2) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal

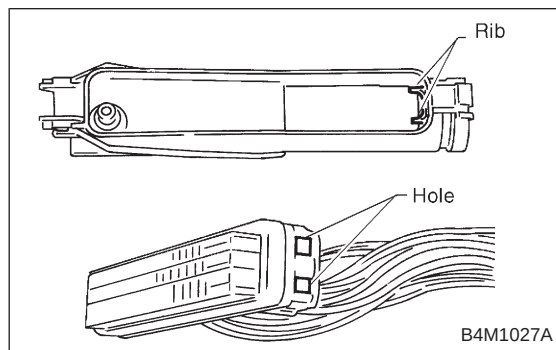
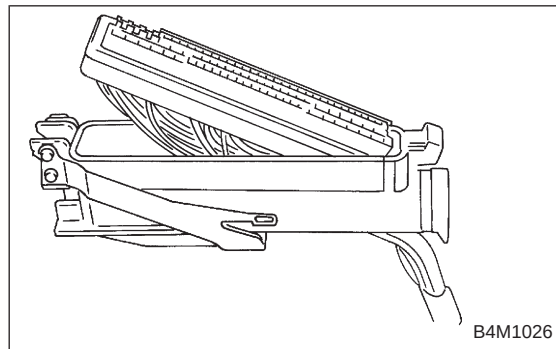
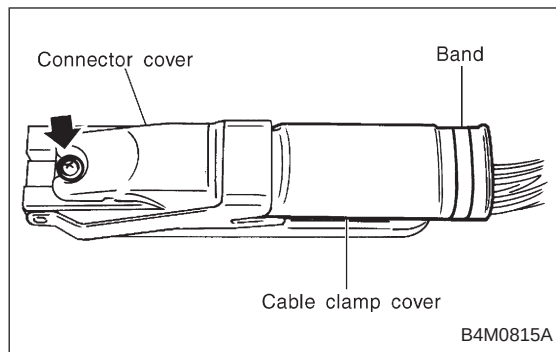
(F49) No. 22 (+) — Chassis ground (-):

(F49) No. 10 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **10AE11**.

NO : Repair harness between relay box and ABSCM, and check fuse SBF6.

**10AE11****CHECK BATTERY SHORT AT ABSCM MONITOR TERMINAL.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABS control module.
- 3) Remove band.
- 4) Remove cable clamp cover.
- 5) Remove screws securing connector cover.

CAUTION:

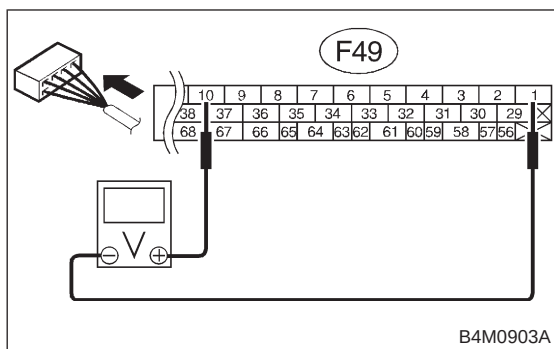
Do not allow harness to catch on adjacent parts during installation.

- 6) Remove connector cover.

NOTE:

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

- 7) Connect all connectors.



8) Measure voltage between ABS connector terminals.

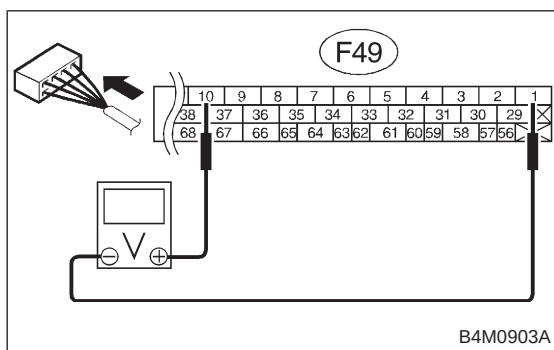
Connector & terminal

(F49) No. 10 (+) — No. 1 (-):

CHECK : Is the voltage less than 2 V?

YES : Go to step 10AE12.

NO : Replace ABS.



10AE12 CHECK BATTERY SHORT AT ABS MONITOR TERMINAL.

1) Turn ignition switch to ON.

2) Measure voltage between ABS connector terminals.

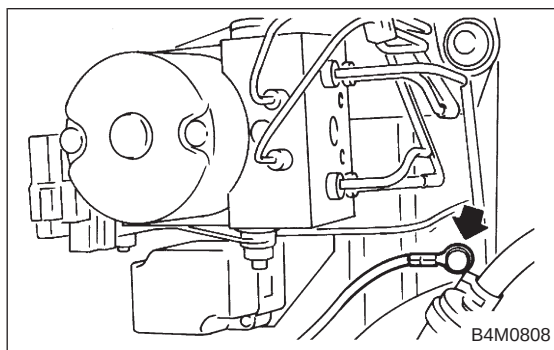
Connector & terminal

(F49) No. 10 (+) — No. 1 (-):

CHECK : Is the voltage less than 2 V?

YES : Go to step 10AE13.

NO : Replace ABS.



10AE13 CHECK MOTOR GROUND.

Turn ignition switch to OFF.

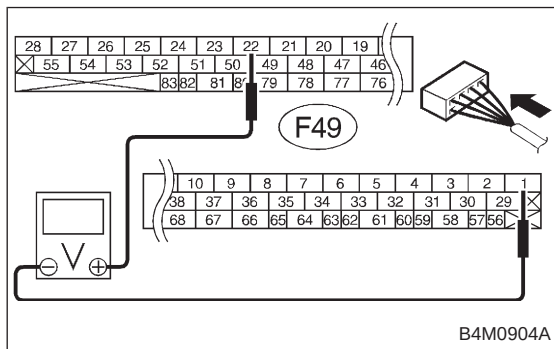
CHECK : Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

Is the motor ground terminal tightly clamped?

YES : Go to step 10AE14.

NO : Tighten the clamp of motor ground terminal.



10AE14 CHECK ABS MOTOR DRIVE TERMINAL.

1) Measure voltage between ABS connector terminals.

2) Operate the check sequence. <Ref. to 4-4 [W12D0].>

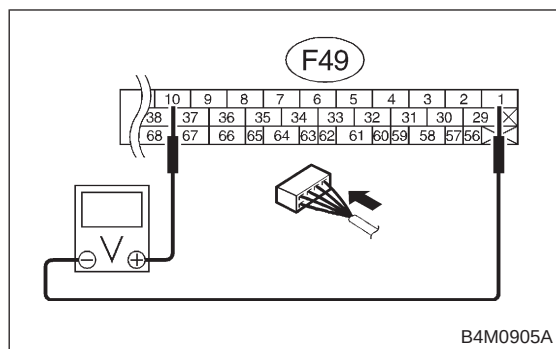
Connector & terminals

(F49) No. 22 (+) — No. 1 (-):

CHECK : Does the voltage drop from between 10 V and 13 V to less than 1.5 V, and rise to between 10 V and 13 V again when carrying out the check sequence?

YES : Go to step 10AE15.

NO : Replace ABS.

**10AE15 CHECK MOTOR OPERATION.**

- 1) Measure voltage between ABSCM connector terminal.
- 2) Operate the check sequence. <Ref. to 4-4 [W12D0].>

Connector & terminals**(F49) No. 10 (+) — No. 1 (-):**

CHECK : **Does the voltage raise from less than 1.5 V to between 10 V and 13 V, and return to less than 1.5 V again when carrying out the check sequence?**

YES : Go to step **10AE16**.

NO : Replace hydraulic unit.

10AE16 CHECK MOTOR OPERATION.

Operate the check sequence. <Ref. to 4-4 [W12D0].>

CHECK : **Can motor revolution noise (buzz) be heard when carrying out the check sequence?**

YES : Go to step **10AE17**.

NO : Replace hydraulic unit.

10AE17 CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : **Is there poor contact in connector between hydraulic unit, relay box and ABSCM? <Ref. to FOREWORD [T3C1].>**

YES : Repair connector.

NO : Go to step **10AE18**.

10AE18 CHECK ABSCM.

- 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.

NO : Go to step **10AE19**.

10AE19 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.

D•NEW 52 (FB1) MOTOR

B4M0971

AF: TROUBLE CODE 52 MOTOR — ABNORMAL MOTOR —

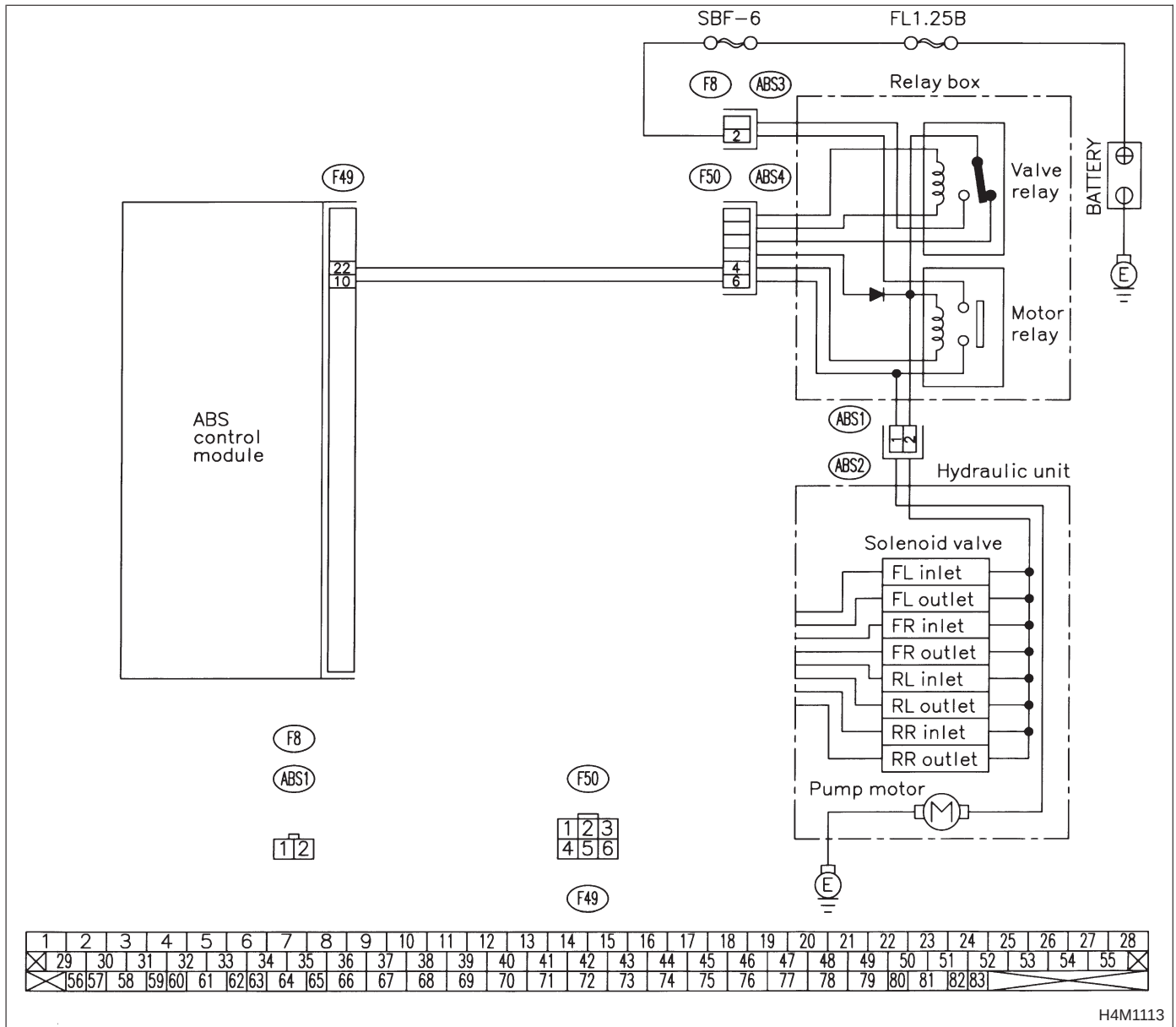
DIAGNOSIS:

- Faulty motor
- Faulty motor relay
- Faulty harness connector

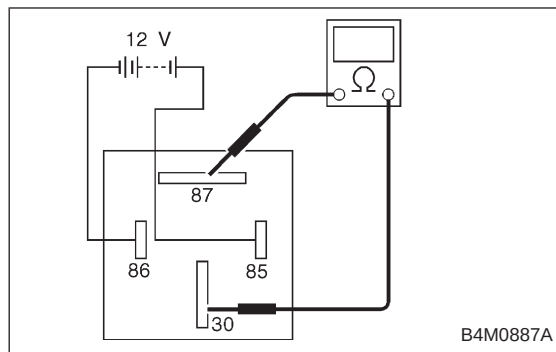
TROUBLE SYMPTOM:

- ABS does not operate.

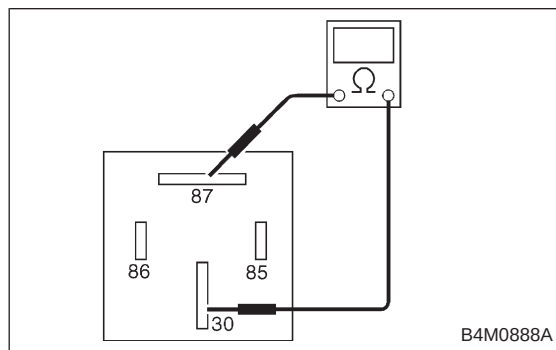
WIRING DIAGRAM:



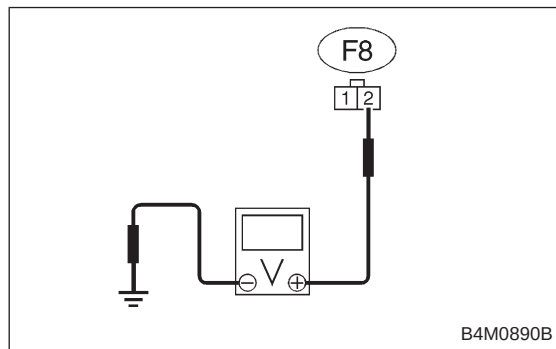
H4M1113

**10AF1****CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Connect battery to motor relay terminals No. 85 and No. 86.
- 4) Measure resistance between motor relay terminals.

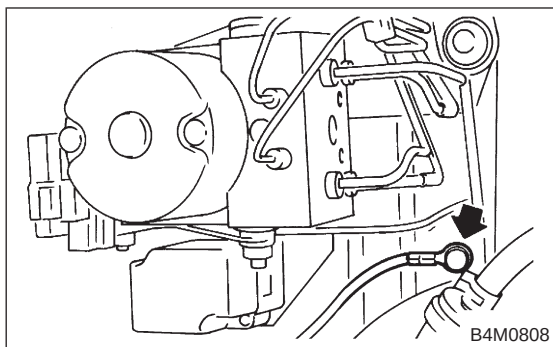
Terminals**No. 30 — No. 87:****CHECK** : Is the resistance less than 0.5 Ω?**YES** : Go to step 10AF2.**NO** : Replace motor relay.**10AF2****CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Disconnect battery from motor relay terminals.
- 2) Measure resistance between motor relay terminals.

Terminals**No. 30 — No. 87:****CHECK** : Is the resistance more than 1 MΩ?**YES** : Go to step 10AF3.**NO** : Replace motor relay.**10AF3****CHECK INPUT VOLTAGE OF RELAY BOX.**

- 1) Disconnect connector (F8) from relay box.
- 2) Measure voltage between relay box connector and chassis ground.

Connector & terminal**(F8) No. 2 (+) — Chassis ground (-):****CHECK** : Is the voltage between 10 V and 13 V?**YES** : Go to step 10AF4.**NO** : Repair harness/connector between battery and relay box, and check fuse SBF6.



10AF4	CHECK MOTOR GROUND.

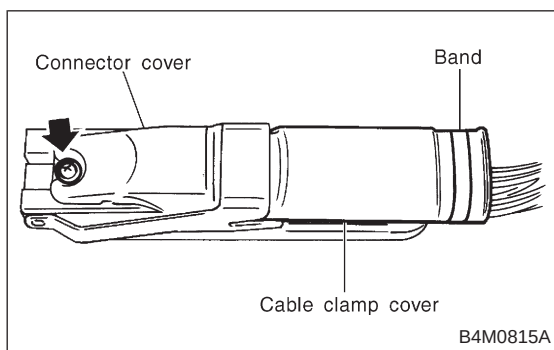
Tightening torque:

32±10 N·m (3.3±1.0 kg-m, 24±7 ft-lb)

CHECK : Is the motor ground terminal tightly clamped?

YES : Go to step **10AF5**.

NO : Tighten the clamp of motor ground terminal.

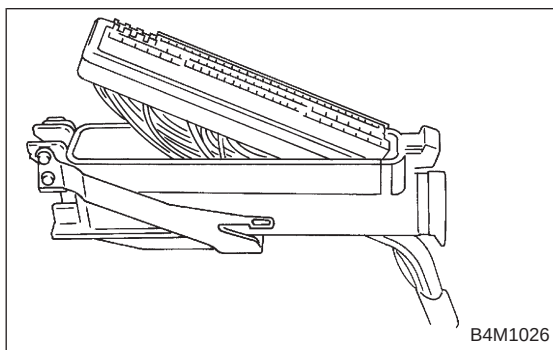


10AF5	CHECK MOTOR OPERATION.

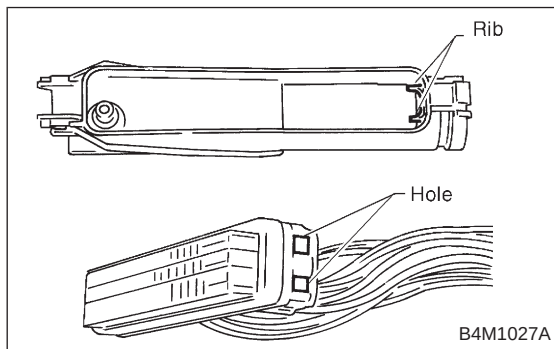
- 1) Disconnect connector from ABS control module.
- 2) Remove band.
- 3) Remove cable clamp cover.
- 4) Remove screws securing connector cover.

CAUTION:

Do not allow harness to catch on adjacent parts during installation.



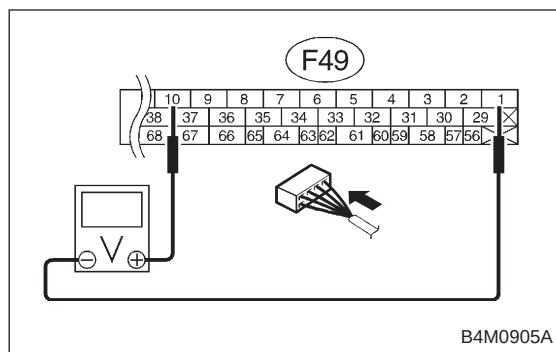
- 5) Remove connector cover.



NOTE:

- To install, reverse above removal procedures.
- Align connector cover rib with connector hole before installation.

- 6) Connect connector to ABSCM.
- 7) Connect motor relay to relay box.
- 8) Connect all connectors.



- 9) Measure voltage between ABSCM connector terminal.
 10) Operate the check sequence. <Ref. to 4-4 [W12D0].>

Connector & terminals

(F49) No. 10 (+) — No. 1 (-):

CHECK : Does the voltage raise from less than 1.5 V to between 10 V and 13 V, and return to less than 1.5 V again when carrying out the check sequence?

YES : Go to step 10AF6.

NO : Replace hydraulic unit.

10AF6	CHECK MOTOR OPERATION.

Operate the check sequence. <Ref. to 4-4 [W12D0].>

CHECK : Can motor revolution noise (buzz) be heard when carrying out the check sequence?

YES : Go to step 10AF7.

NO : Replace hydraulic unit.

10AF7	CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : Is there poor contact in connector between hydraulic unit, relay box and ABSCM? <Ref. to FOREWORD [T3C1].>

YES : Repair connector.

NO : Go to step 10AF8.

10AF8	CHECK ABSCM.

- 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.

NO : Go to step 10AF9.

10AF9	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.

D•NEW 54 (FB1) BLS

B4M0972

AG: TROUBLE CODE 54 BLS — ABNORMAL STOP LIGHT SWITCH —

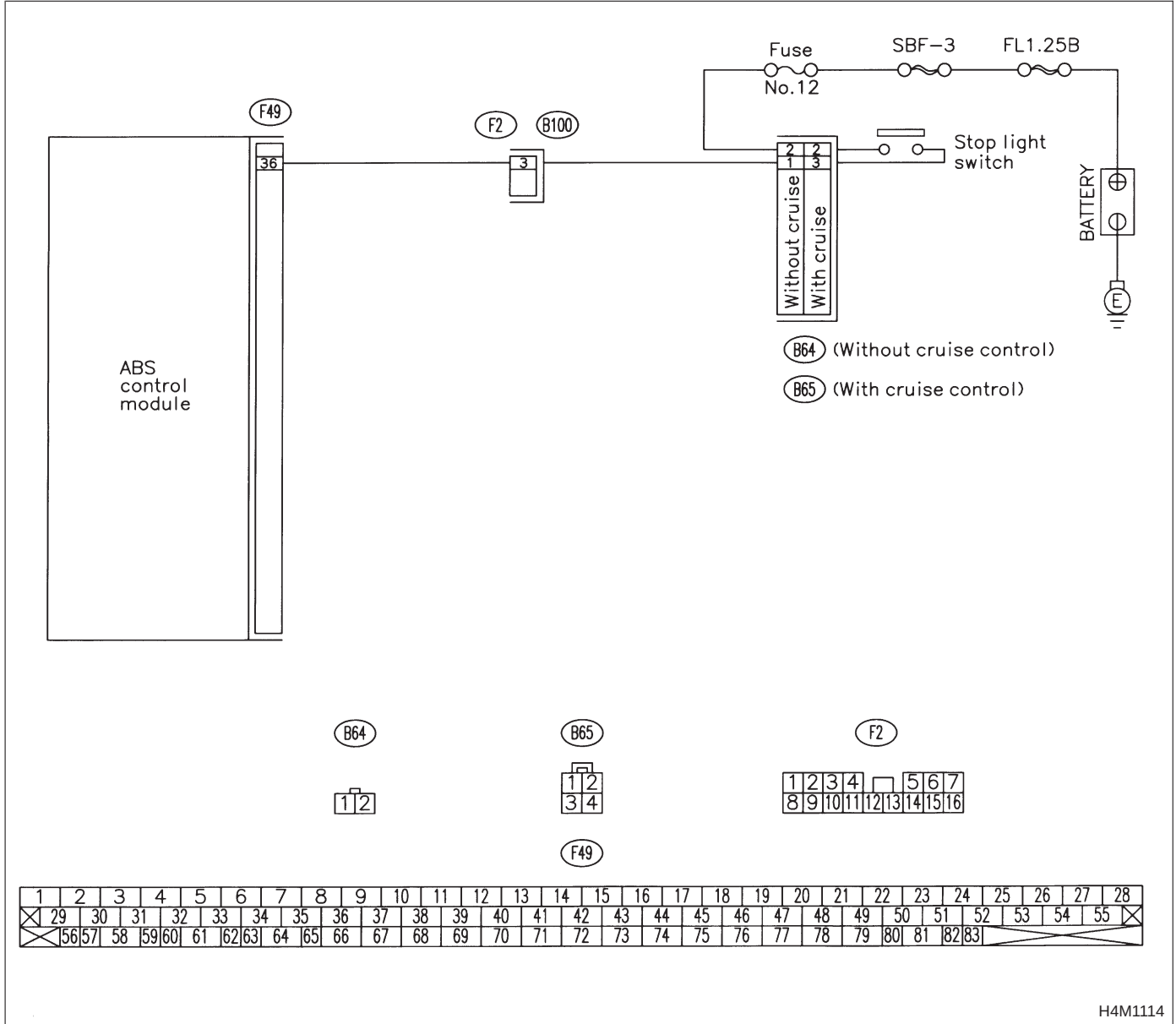
DIAGNOSIS:

- Faulty stop light switch

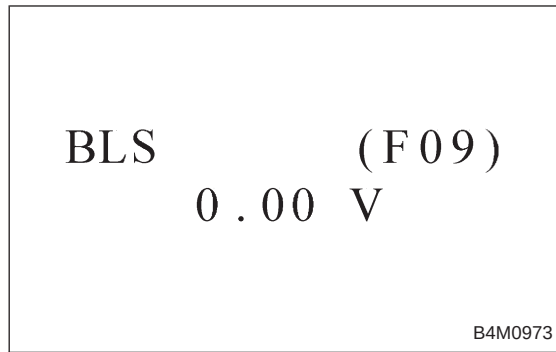
TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1114



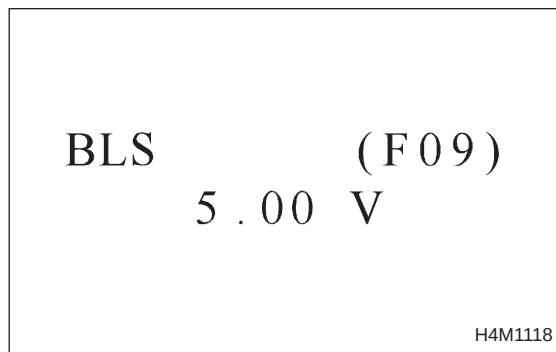
10AG1	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

- 1) Press [F], [0] and [9] on the select monitor.
- 2) Depress the brake pedal.
- 3) Read the stop light switch output on the select monitor display.

CHECK : *Is the reading indicated on monitor display less than 1.5 V?*

YES : Go to step **10AG2**.

NO : Go to step **10AG3**.



10AG2	CHECK OUTPUT OF STOP LIGHT SWITCH USING SELECT MONITOR.

- 1) Release the brake pedal.
- 2) Read the stop light switch output on the select monitor display.

CHECK : *Is the reading indicated on monitor display greater than 4.5 V?*

YES : Go to step **10AG5**.

NO : Go to step **10AG3**.

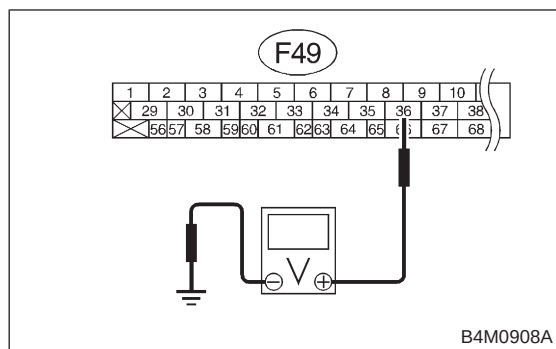
10AG3	CHECK IF STOP LIGHTS COME ON.

Depress the brake pedal.

CHECK : *Do stop lights turn on?*

YES : Go to step **10AG4**.

NO : Repair stop lights circuit.

**10AG4 CHECK OPEN CIRCUIT IN HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Depress brake pedal.
- 4) Measure voltage between ABSCM connector and chassis ground.

Connector & terminal**(F49) No. 36 — Chassis ground:****CHECK** : *Is the voltage between 10 V and 13 V?***YES** : Go to step **10AG5**.**NO** : Repair harness between stop light switch and ABSCM connector.**10AG5 CHECK POOR CONTACT IN CONNECTORS.****CHECK** : *Is there poor contact in connector between stop light switch and ABSCM? <Ref. to FOREWORD [T3C1].>***YES** : Repair connector.**NO** : Go to step **10AG6**.**10AG6 CHECK ABSCM.**

- 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.**NO** : Go to step **10AG7**.**10AG7 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.

D•NEW 56 (FB1) G SENSOR LINE

B4M0974

AH: TROUBLE CODE 56 G SENSOR LINE — OPEN OR SHORT CIRCUIT OF G SENSOR —

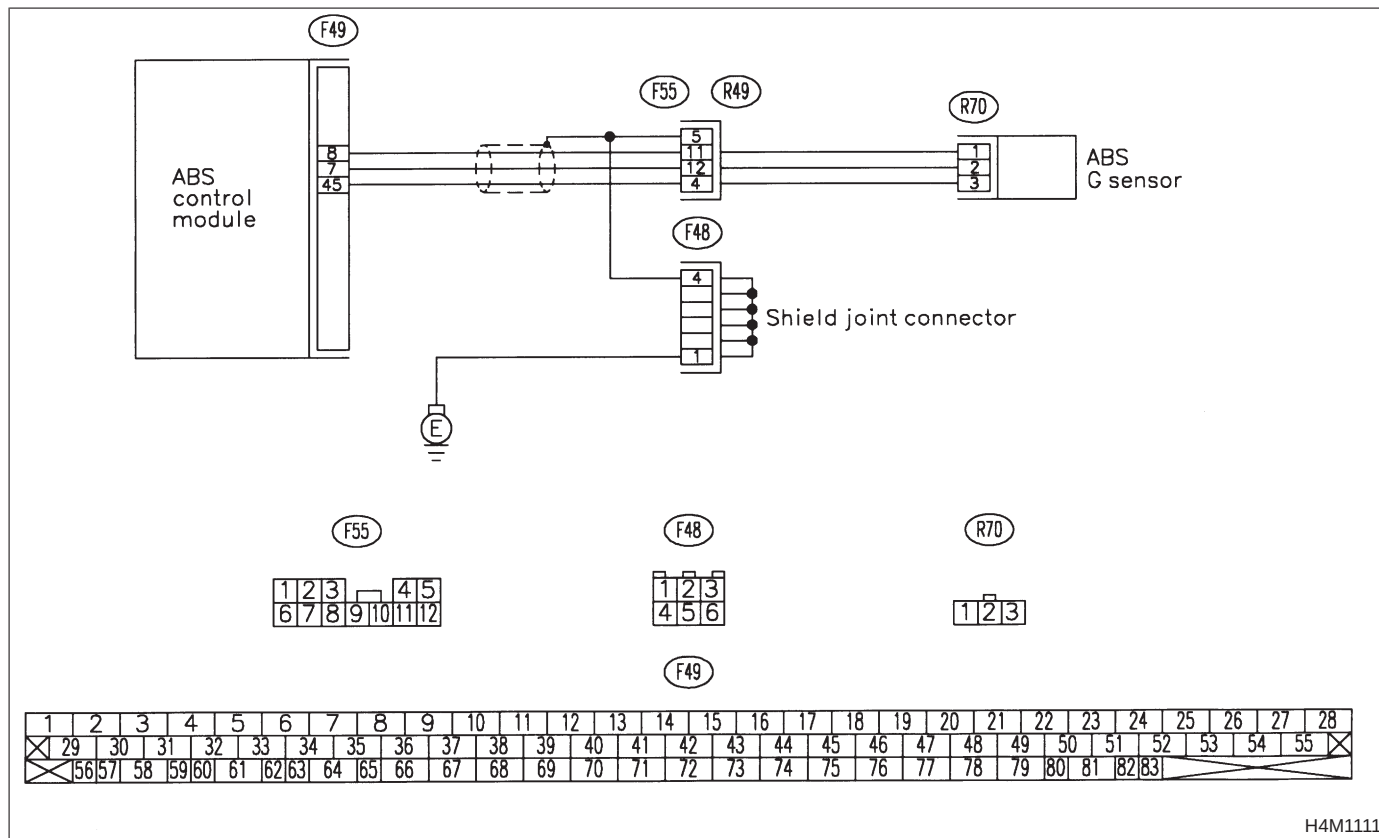
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



1997 (F00)
ABS 4WD•AT

H4M1117

10AH1 CHECK SPECIFICATIONS OF ABSCM USING SELECT MONITOR.

- 1) Press [F], [0] and [0] on the select monitor.
- 2) Read the select monitor display.

CHECK : *Is an ABSCM for 4WD model installed on a FWD model?*

YES : Replace ABSCM.

NO : Go to step 10AH2.

10AH2 CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- 1) Press [F], [1] and [0] on the select monitor.
- 2) Read the select monitor display.

CHECK : *Is the indicated reading between 2.1 and 2.5 V when the G sensor is in horizontal position?*

YES : Go to step 10AH3.

NO : Go to step 10AH6.

G-SENS (F10)
2.30 V

B4M0927

10AH3 CHECK POOR CONTACT IN CONNECTORS.

CHECK : *Is there poor contact in connector between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step 10AH4.

10AH4 CHECK ABSCM.

- 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.

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.

FR (FE5)
0 km/h

B4M0977

10AH6 CHECK FREEZE FRAME DATA.

- 1) Press [F], [E] and [5] on the select monitor.
- 2) Read the select monitor display.

CHECK : *Is the reading indicated on monitor display 0 km?*

YES : Go to step 10AH7.

NO : Go to step 10AH15.

FL (FE6)
0 km/h

B4M0978

10AH7 CHECK FREEZE FRAME DATA.

- 1) Press the scroll key so that FE6 appears on the monitor display.
- 2) Read the select monitor display.

CHECK : *Is the reading indicated on monitor display 0 km?*

YES : Go to step 10AH8.

NO : Go to step 10AH15.

RR (FE7)
0 km/h

B4M0979

10AH8 CHECK FREEZE FRAME DATA.

- 1) Press the scroll key so that FE7 appears on the monitor display.
- 2) Read the select monitor display.

CHECK : *Is the reading indicated on monitor display 0 km?*

YES : Go to step 10AH9.

NO : Go to step 10AH15.

RL (FE8)
0 km/h

B4M0980

10AH9 CHECK FREEZE FRAME DATA.

- 1) Press the scroll key so that FE8 appears on the monitor display.
- 2) Read the select monitor display.

CHECK : *Is the reading indicated on monitor display 0 km?*

YES : Go to step 10AH10.

NO : Go to step 10AH15.

G-SENS (FE14)
3.70 V

B4M0981

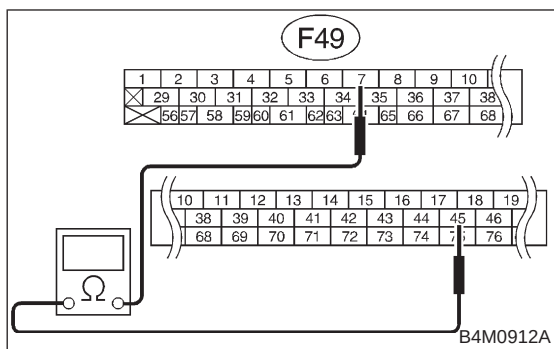
10AH10 CHECK FREEZE FRAME DATA.

- 1) Press the scroll key so that FE14 appears on the monitor display.
- 2) Read the select monitor display.

CHECK : *Is the reading indicated on monitor display more than 3.65 V?*

YES : Go to step 10AH11.

NO : Go to step 10AH15.


10AH11
CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM connector terminals.

Connector & terminal
(F49) No. 7 — No. 45:

- CHECK** : Is the resistance between 4.3 and 4.9 kΩ?
- YES** : Go to step **10AH12**.
- NO** : Repair harness/connector between G sensor and ABSCM.

10AH12
CHECK POOR CONTACT IN CONNECTORS.

- CHECK** : Is there poor contact in connector between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>
- YES** : Repair connector.
- NO** : Go to step **10AH13**.

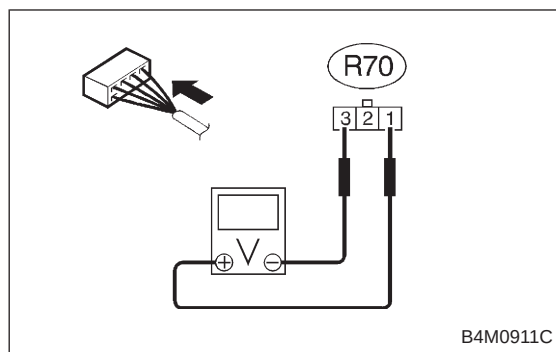
10AH13
CHECK ABSCM.

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

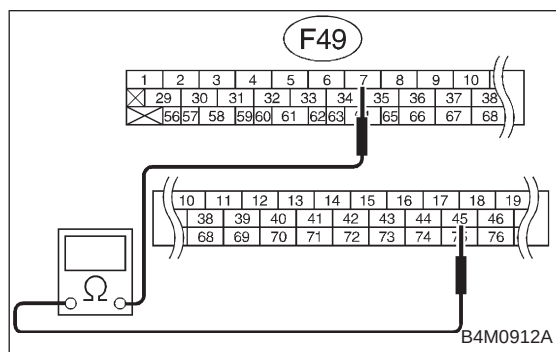
- CHECK** : Is the same trouble code as in the current diagnosis still being output?
- YES** : Replace ABSCM.
- NO** : Go to step **10AH14**.

10AH14
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.

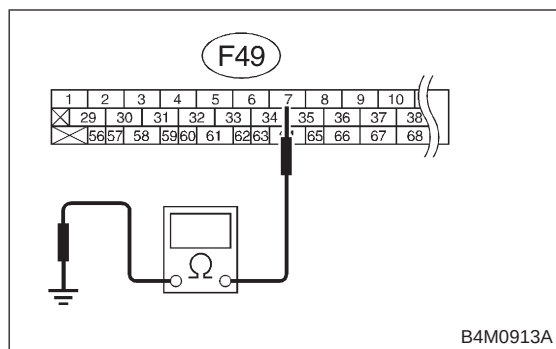
**10AH15 CHECK INPUT VOLTAGE OF G SENSOR.**

- 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 **10AH16**.**(NO)** : Repair harness/connector between G sensor and ABSCM.**10AH16 CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 7 — No. 45:****(CHECK)** : Is the resistance between 4.3 and 4.9 kΩ?**(YES)** : Go to step **10AH17**.**(NO)** : Repair harness/connector between G sensor and ABSCM.



10AH17 CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.

- 1) Disconnect connector from G sensor.
- 2) Measure resistance between ABSCM connector and chassis ground.

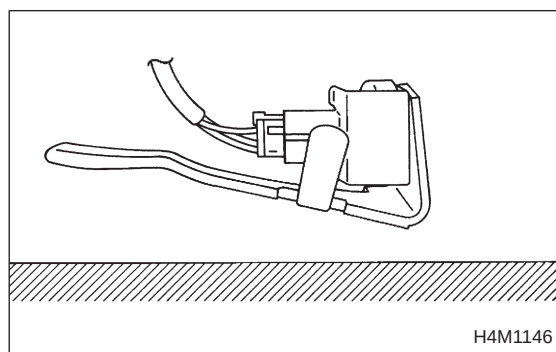
Connector & terminal

(F49) No. 7 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10AH18.

NO : Repair harness between G sensor and ABSCM.



10AH18 CHECK G SENSOR.

- 1) Connect connector to G sensor.
- 2) Connect connector to ABSCM.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between G sensor connector terminals.

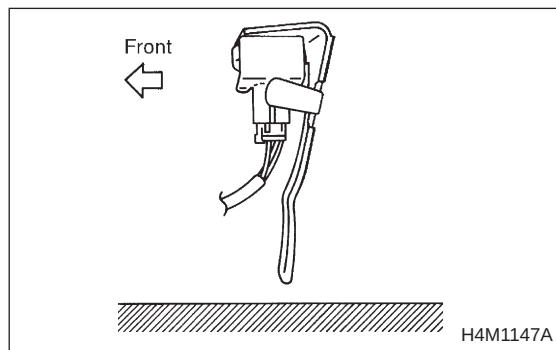
Connector & terminal

(R70) No. 2 (+) — No. 1 (-):

CHECK : Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?

YES : Go to step 10AH19.

NO : Replace G sensor.



10AH19 CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

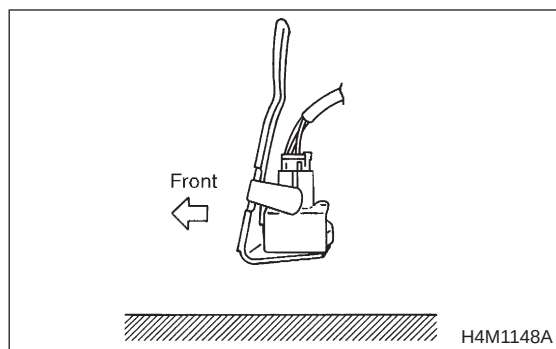
Connector & terminal

(R70) 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 10AH20.

NO : Replace G sensor.

**10AH20 CHECK G SENSOR.**

Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) 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 **10AH21**.

NO : Replace G sensor.

10AH21 CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10AH22**.

10AH22 CHECK ABSCM.

- 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.

NO : Go to step **10AH23**.

10AH23 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.

D•NEW 56 (FB1) G SENSOR +B

B4M0982

AI: TROUBLE CODE 56 G SENSOR +B — BATTERY SHORT OF G SENSOR —

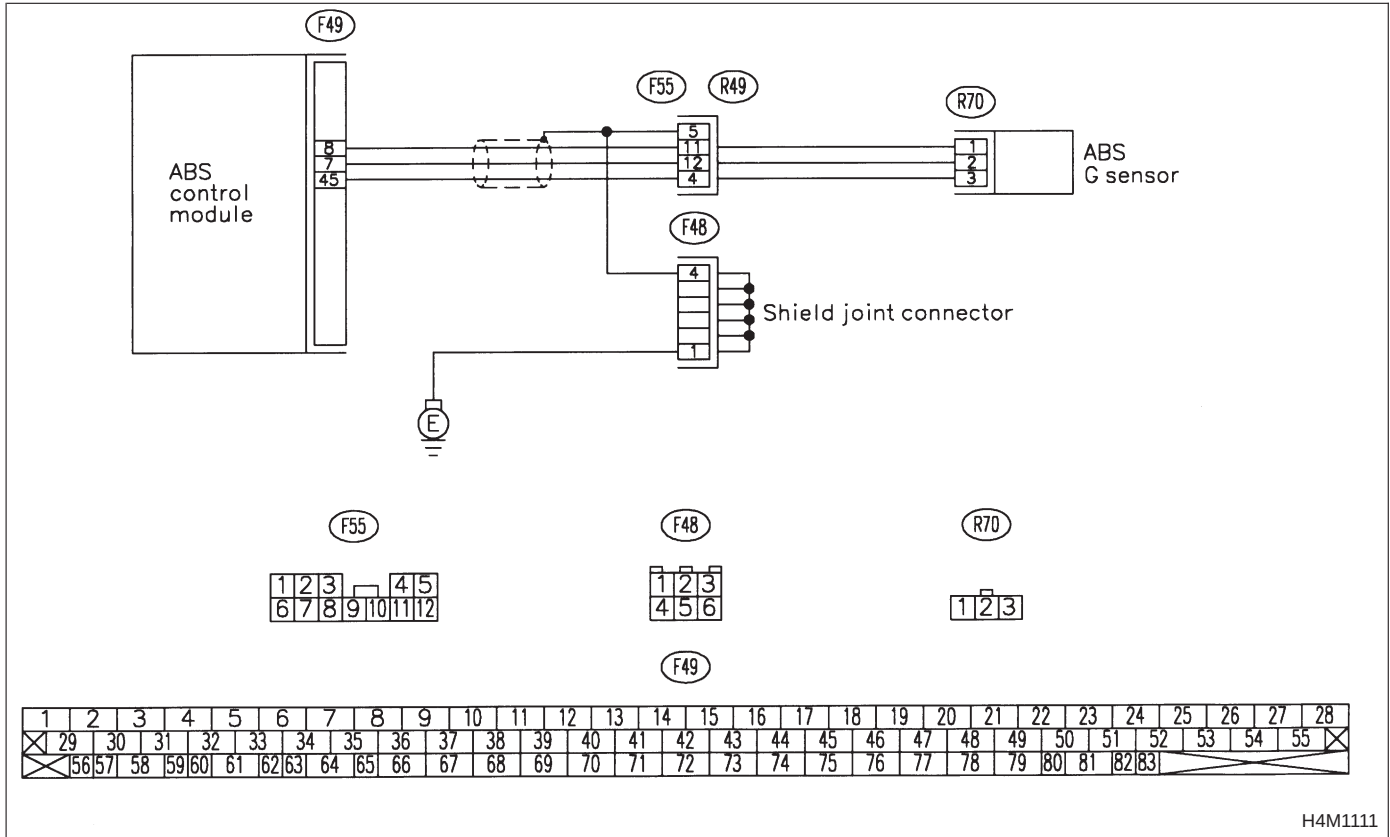
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



H4M1111

G - SENS (F10)
2.30 V

B4M0927

10AI1**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.**

- 1) Press [F], [1] and [0] on the select monitor.
- 2) Read the select monitor display.

CHECK : Is the indicated reading between 2.1 and 2.5 V when the G sensor is in horizontal position?

YES : Replace ABSCM.

NO : Go to step **10AI2**.

10AI2**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.
- 5) Measure voltage between ABSCM connector and chassis ground.

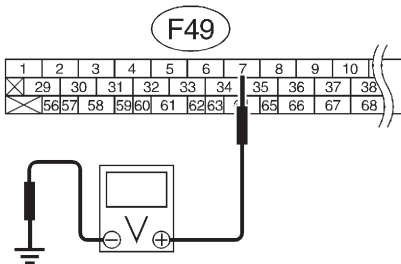
Connector & terminal

(F49) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **10AI3**.

NO : Repair harness between G sensor and ABSCM.



B4M0914A

10AI3**CHECK BATTERY SHORT OF HARNESS.**

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

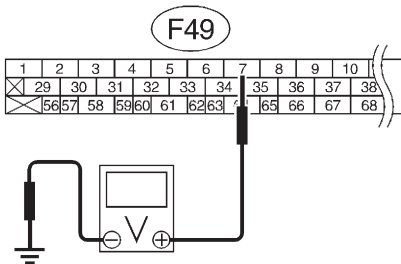
Connector & terminal

(F49) No. 7 (+) — Chassis ground (-):

CHECK : Is the voltage less than 1 V?

YES : Go to step **10AI4**.

NO : Repair harness between G sensor and ABSCM.



B4M0914A

10AI4	CHECK ABSCM.

- 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.

NO : Go to step **10AI5**.

10AI5	CHECK ANY OTHER TROUBLE CODES APPEARANCE.

CHECK : *Are other trouble codes being output?*

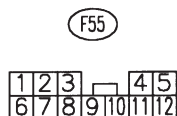
YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

B4M0984

- ABS does not operate.

Wiring diagram for the ABS control module. The diagram shows the ABS control module connected to the ABS G sensor via a shielded cable. The cable has a shield joint connector. The wiring includes terminals F49, F55, R49, F48, and R70. The ABS control module has terminals 8, 7, and 45. The ABS G sensor has terminals 1, 2, and 3. The shield joint connector has terminals 4, 1, and 2. The ground symbol is labeled E.



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	

H4M1111

G - SENS (F10)
2.30 V

B4M0927

10AJ1 CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.

- 1) Press [F], [1] and [0] on the select monitor.
- 2) Read the select monitor display.

CHECK : *Is the indicated reading 2.3 ± 0.2 V when the G sensor is in horizontal position?*

YES : Go to step 10AJ2.

NO : Go to step 10AJ6.

10AJ2 CHECK POOR CONTACT IN CONNECTORS.

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step 10AJ3.

10AJ3 CHECK ABSCM.

- 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.

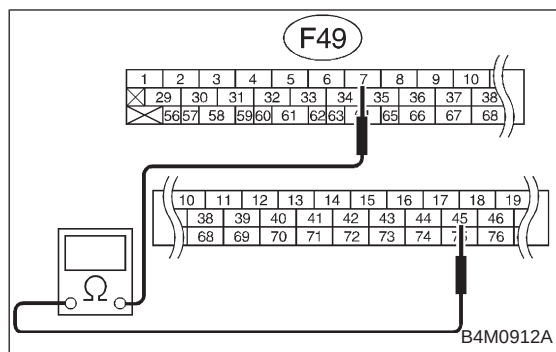
NO : Go to step 10AJ4.

10AJ4 CHECK ANY OTHER TROUBLE CODES APPEARANCE.

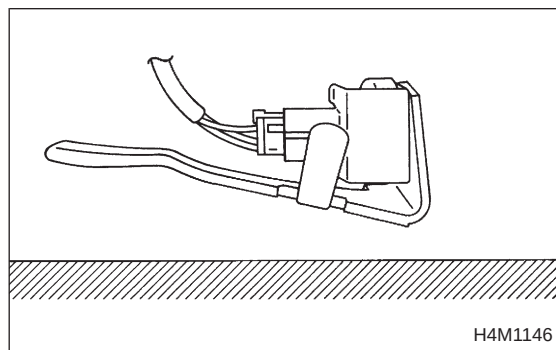
CHECK : *Are other trouble codes being output?*

YES : Proceed with the diagnosis corresponding to the trouble code.

NO : A temporary poor contact.

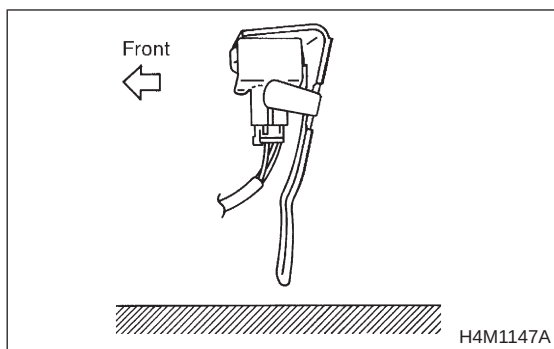
**10AJ5****CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM connector terminals.

Connector & terminal**(F49) No. 7 — No. 45:****CHECK** : Is the resistance between 4.3 and 4.9 kΩ?**YES** : Go to step 10AJ6.**NO** : Repair harness/connector between G sensor and ABSCM.**10AJ6****CHECK G SENSOR.**

- 1) Remove console box.
- 2) Remove G sensor from vehicle.
- 3) Connect connector to G sensor.
- 4) Connect connector to ABSCM.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) No. 2 (+) — No. 1 (-):****CHECK** : Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?**YES** : Go to step 10AJ7.**NO** : Replace G sensor.

**10AJ7 CHECK G SENSOR.**

Measure voltage between G sensor connector terminals.

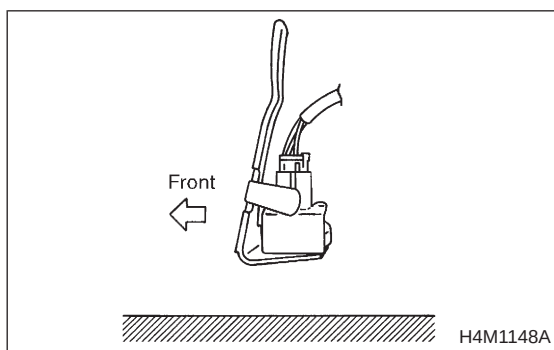
Connector & terminal

(R70) 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 **10AJ8**.

NO : Replace G sensor.

**10AJ8 CHECK G SENSOR.**

Measure voltage between G sensor connector terminals.

Connector & terminal

(R70) 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 **10AJ9**.

NO : Replace G sensor.

10AJ9 CHECK ABSCM.

- 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.

NO : Go to step **10AJ10**.

10AJ10 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.

D•NEW 56 (FB1)
G SENSOR STICK

B4M0813

AK: TROUBLE CODE 56 G SENSOR STICK
— G SENSOR OUTPUT IS STUCK —

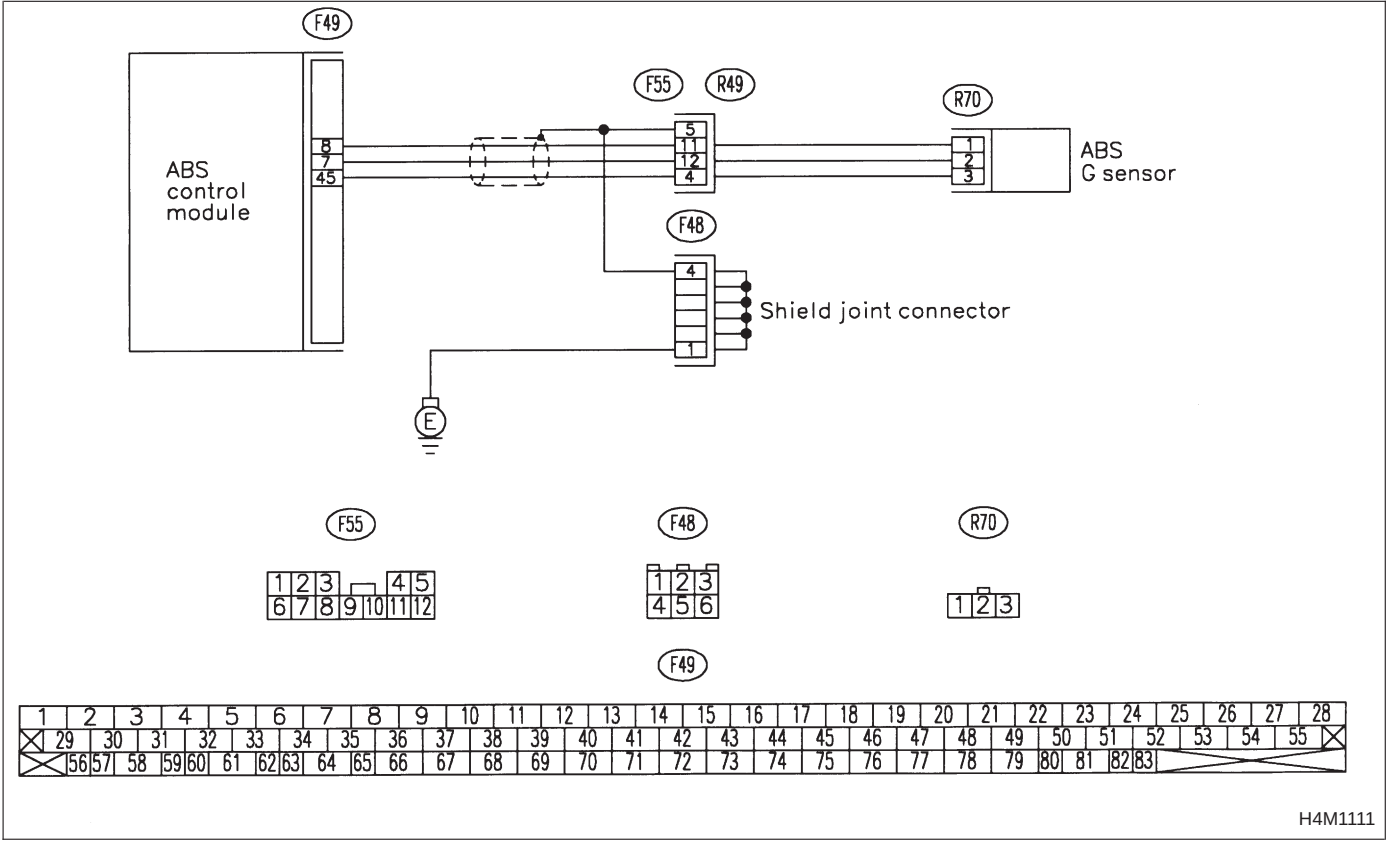
DIAGNOSIS:

- Faulty G sensor output voltage

TROUBLE SYMPTOM:

- ABS does not operate.

WIRING DIAGRAM:



10AK1**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 **10AK2**.

G - SENS (F10)
2.30 V

B4M0927

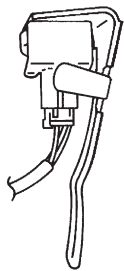
10AK2**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.**

1) Press [F], [1] and [0] on the select monitor.

2) Read the select monitor display.

CHECK*Is the indicated reading between 2.1 and 2.5 V when the vehicle is in horizontal position?***YES**: Go to step **10AK3**.**NO**: Go to step **10AK8**.

Front
←



H4M1147A

10AK3**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.

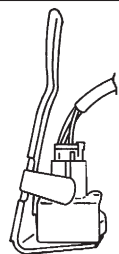
5) Press [F], [1] and [0] on the select monitor.

6) Read the select monitor display.

CHECK*Is the indicated reading between 3.7 and 4.1 V when G sensor is inclined forwards to 90°?***YES**: Go to step **10AK4**.**NO**

: Replace G sensor.

Front
←



H4M1148A

10AK4**CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.**

Read the select monitor display.

CHECK*Is the indicated reading between 0.5 and 0.9 V when G sensor is inclined backwards to 90°?***YES**: Go to step **10AK5**.**NO**

: Replace G sensor.

10AK5**CHECK POOR CONTACT IN CONNECTORS.**

Turn ignition switch to OFF.

CHECK : *Is there poor contact in connector between ABSCM and G sensor? <Ref. to FOREWORD [T3C1].>*

YES : Repair connector.

NO : Go to step **10AK6**.

10AK6**CHECK ABSCM.**

- 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.

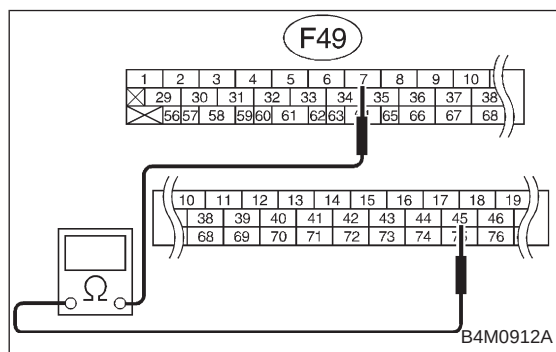
NO : Go to step **10AK7**.

10AK7**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.

**10AK8****CHECK OPEN CIRCUIT IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

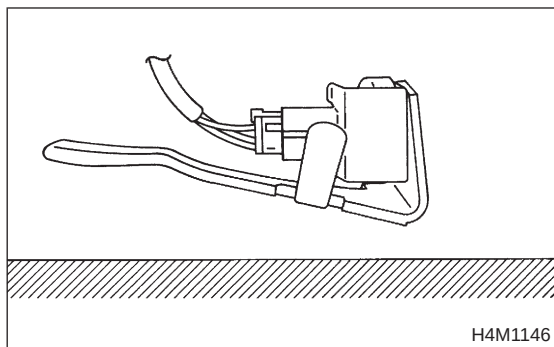
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM connector terminals.

Connector & terminal
(F49) No. 7 — No. 45:

CHECK : *Is the resistance between 4.3 and 4.9 kΩ?*

YES : Go to step **10AK9**.

NO : Repair harness/connector between G sensor and ABSCM.



10AK9	CHECK G SENSOR.

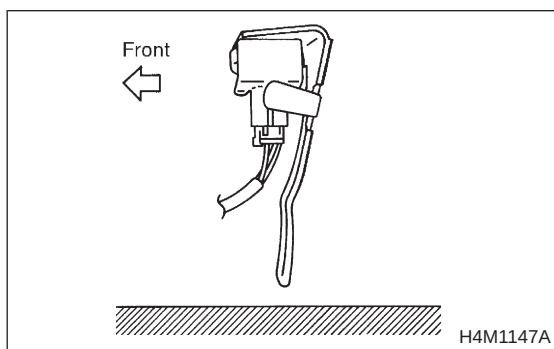
- 1) Remove console box.
- 2) Remove G sensor from vehicle.
- 3) Connect connector to G sensor.
- 4) Connect connector to ABSCM.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) No. 2 (+) — No. 1 (-):**

CHECK : Is the voltage between 2.1 and 2.5 V when G sensor is horizontal?

YES : Go to step **10AK10**.

NO : Replace G sensor.



10AK10	CHECK G SENSOR.

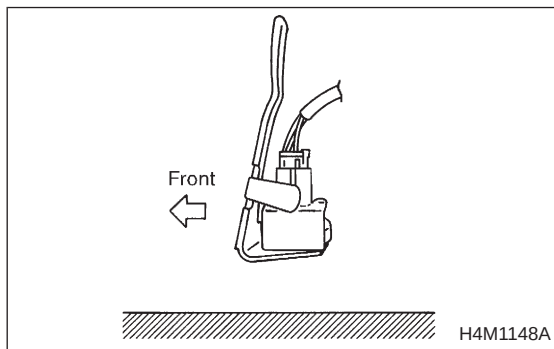
Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) 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 **10AK11**.

NO : Replace G sensor.



10AK11	CHECK G SENSOR.

Measure voltage between G sensor connector terminals.

Connector & terminal**(R70) 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 **10AK12**.

NO : Replace G sensor.

10AK12	CHECK ABSCM.

- 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.

NO : Go to step **10AK13**.

10AK13	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.	● Hydraulic unit (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.	● Hydraulic unit (solenoid valve) ● ABS sensor ● Brake (pads) ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
Poor braking	Long braking/stopping distance	● Hydraulic unit (solenoid valve) ● Brake (pads) ● Air in brake line ● Tire specifications, tire wear and air pressures ● Incorrect wiring or piping connections
	Wheel locks.	● Hydraulic unit (solenoid valve, motor) ● ABS sensor ● Incorrect wiring or piping connections
	Brake dragging	● Hydraulic unit (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	● Hydraulic unit (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 hydraulic unit	● Hydraulic unit (mount bushing) ● ABS sensor ● Brake piping
	Noise from front of vehicle	● Hydraulic unit (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 [W12C2].>
- NO** : CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE <Ref. to 4-4 [W12C1].>

ENGINE COOLING SYSTEM **2-5**

	Page
T DIAGNOSTICS	2
1. Radiator Main Fan	2
2. Radiator Sub Fan (With A/C model only)	10

1. Radiator Main Fan

A: OPERATION (WITHOUT A/C MODEL)

DETECTING CONDITION:

- Engine coolant temperature is above 95°C (203°F).

TROUBLE SYMPTOM:

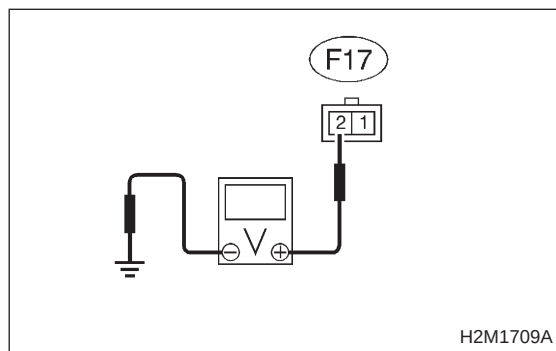
- Radiator main fan does not operate under the above condition.

1A1	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) Warm-up the engine 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 (-):

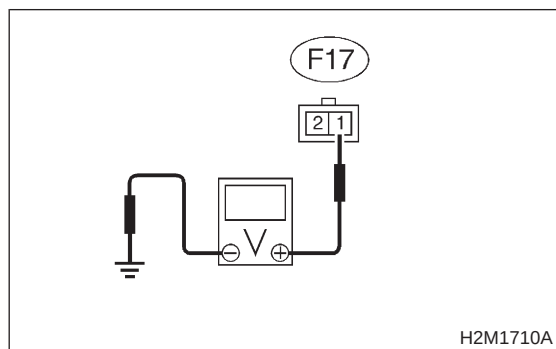
CHECK : Is the voltage more than 10 V?

YES : Go to step 1A2.

NO : Go to step 1A5.

1A2	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 1A3.

NO : Repair open circuit in harness between main fan motor connector and chassis ground.

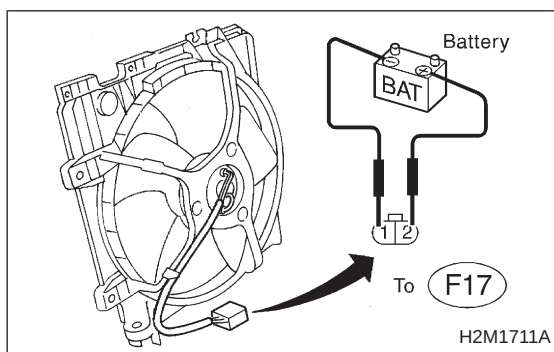
1A3**CHECK POOR CONTACT.**

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 **1A4**.

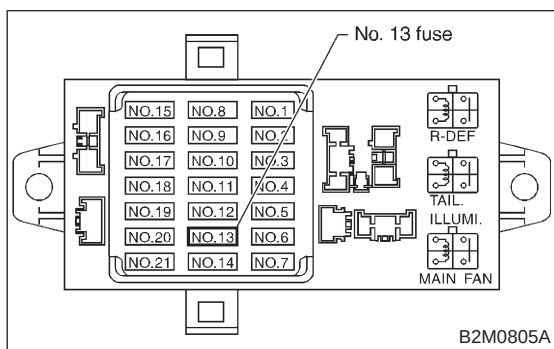
**1A4****CHECK MAIN FAN MOTOR.**

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.

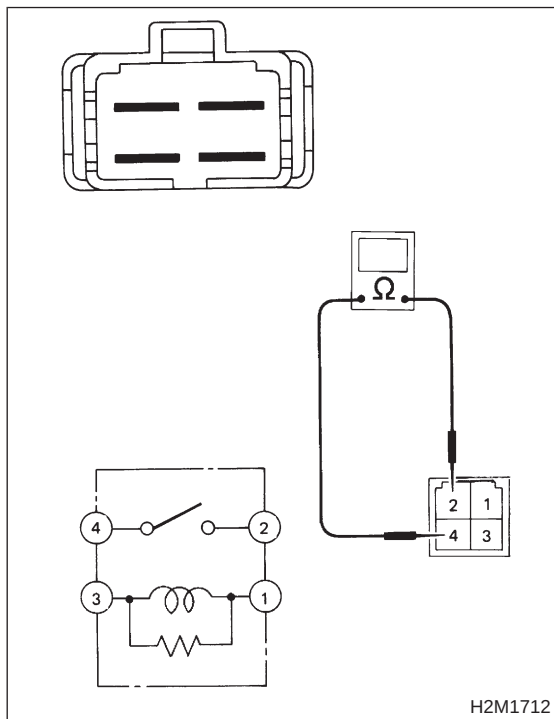
**1A5****CHECK FUSE.**

- 1) Turn ignition switch to OFF.
- 2) Remove fuse No. 13 from fuse and relay box.
- 3) Check condition of fuse.

CHECK : *Is the fuse blown-out?*

YES : Replace fuse.

NO : Go to step **1A6**.

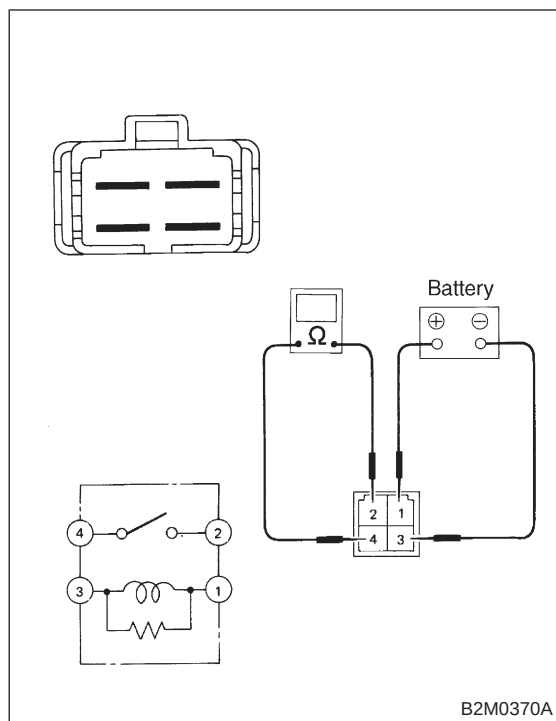
**1A6****CHECK MAIN FAN RELAY.**

- 1) Remove main fan relay from fuse and relay box.
- 2) Check continuity between main fan relay terminals.

CHECK : *Does no continuity exist between terminals No. 2 and No. 4?*

YES : Go to step **1A7**.

NO : Replace main fan relay.

**1A7****CHECK MAIN FAN RELAY.**

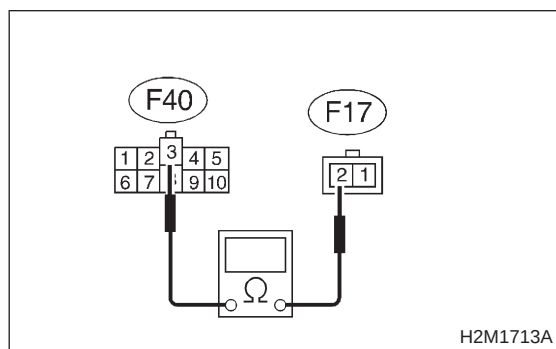
1) Connect battery positive (+) terminal to terminal No. 1 of main fan relay, and negative (-) terminal to terminal No. 3.

2) Check continuity between main fan relay terminals.

CHECK : **Does continuity exist between terminals No. 2 and No. 4?**

YES : Go to step 1A8.

NO : Replace main fan relay.

**1A8****CHECK HARNESS CONNECTOR BETWEEN FUSE AND RELAY BOX AND MAIN FAN MOTOR.**

1) Disconnect connector from fuse and relay box.

2) Measure resistance of harness connector between fuse and relay box and main fan motor.

Connector & terminal
(F40) No. 3 — (F17) No. 2:

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

YES : Go to step 1A9.

NO : Repair open circuit in harness between fuse and relay box and main fan motor connector.

1A9**CHECK POOR CONTACT.**

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

CHECK : **Is there poor contact in fuse and relay box connector?**

YES : Repair poor contact in fuse and relay box connector.

NO : Go to step 1A10.

1A10**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

: Contact with SOA service.

NOTE:

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

B: OPERATION (WITH A/C MODEL)**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 95°C (203°F).
- A/C switch is turned OFF.
- Vehicle speed is below 19 km/h (12 MPH).

TROUBLE SYMPTOM:

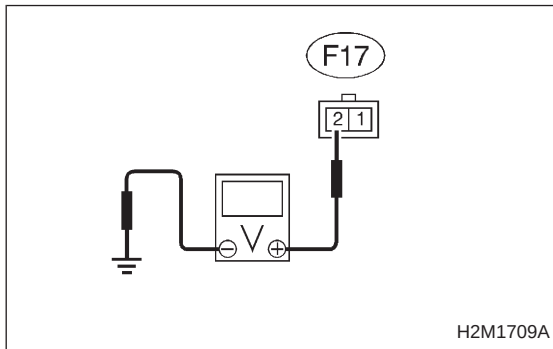
- Radiator main fan does not rotate under conditions (1) and (2) above.

1B1	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) Warm-up the engine 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.

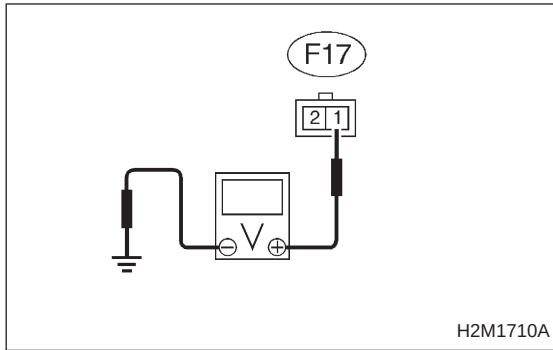
Connector & terminal

(F17) No. 2 (+) — Chassis ground (—):

CHECK : Is the voltage more than 10 V?

YES : Go to step 1B2.

NO : Go to step 1B5.



1B2

CHECK GROUND CIRCUIT OF MAIN FAN MOTOR.

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

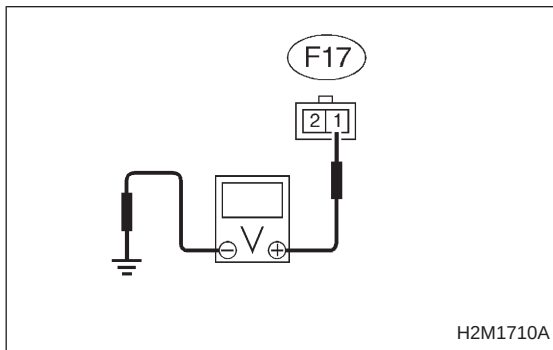
Connector & terminal

(F17) No. 1 — Chassis ground:

CHECK : Is the resistance less than 5 Ω?

YES : Go to step 1B3.

NO : Repair open circuit in harness between main fan motor connector and chassis ground.



1B3

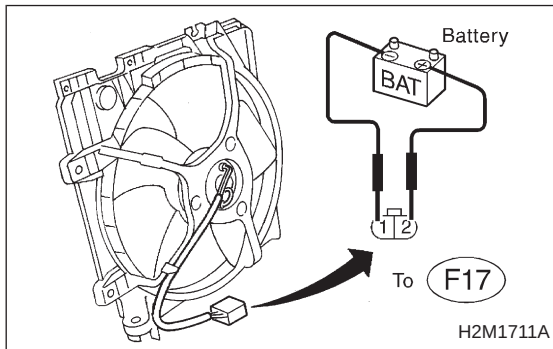
CHECK POOR CONTACT.

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 1B4.



1B4

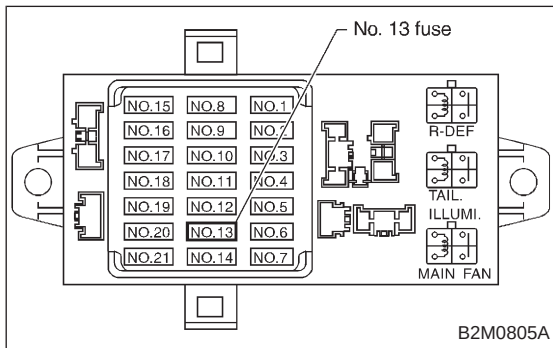
CHECK MAIN FAN MOTOR.

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.



1B5

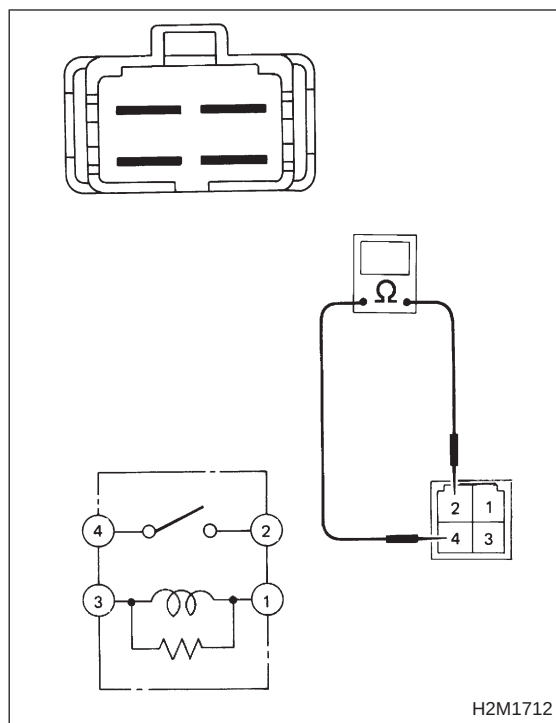
CHECK FUSE.

- 1) Turn ignition switch to OFF.
- 2) Remove fuse No. 13 from fuse and relay box.
- 3) Check condition of fuse.

CHECK : Is the fuse blown-out?

YES : Replace fuse.

NO : Go to step 1B6.

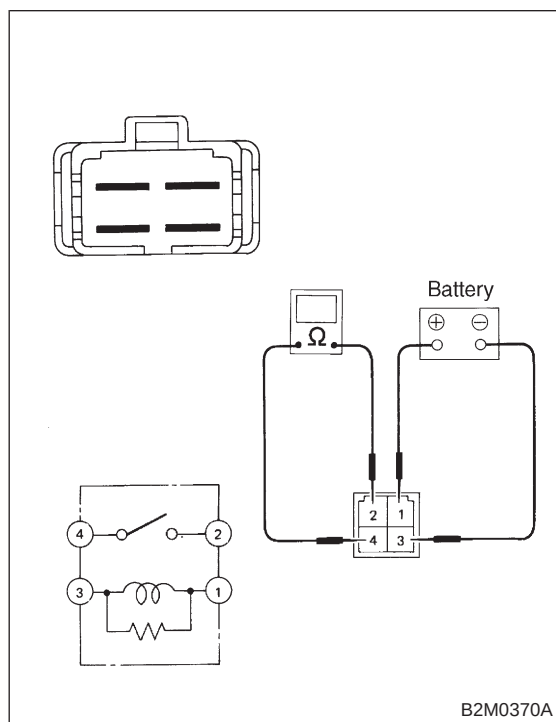
**1B6****CHECK MAIN FAN RELAY.**

- 1) Remove main fan relay from fuse and relay box.
- 2) Check continuity between main fan relay terminals.

CHECK : ***Does no continuity exist between terminals No. 2 and No. 4?***

YES : Go to step **1B7**.

NO : Replace main fan relay.

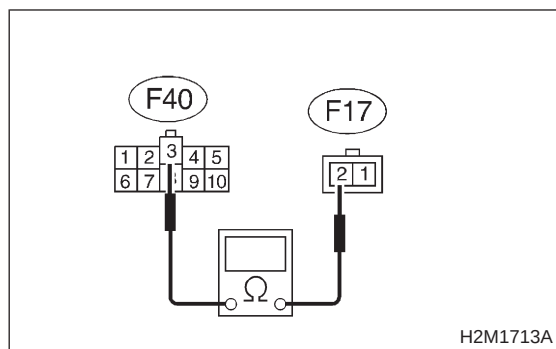
**1B7****CHECK MAIN FAN RELAY.**

- 1) Connect battery to terminals No. 1 and No. 3 of main fan relay.
- 2) Check continuity between main fan relay terminals.

CHECK : ***Does continuity exist between terminals No. 2 and No. 4?***

YES : Go to step **1B8**.

NO : Replace main fan relay.

**1B8****CHECK HARNESS CONNECTOR BETWEEN FUSE AND RELAY BOX AND MAIN FAN MOTOR.**

- 1) Disconnect connector from fuse and relay box.
- 2) Measure resistance of harness connector between fuse and relay box and main fan motor.

Connector & terminal
(F40) No. 3 — (F17) No. 2:

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

YES : Go to step **1B9**.

NO : Repair open circuit in harness between fuse and relay box and main fan motor connector.

1B9**CHECK POOR CONTACT.**

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

CHECK : **Is there poor contact fuse and relay box connector?**

YES : Repair poor contact in fuse and relay box connector.

NO : Go to step **1B10**.

1B10**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 : Contact with SOA service.

NOTE:

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

2. 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.

2A1	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) Warm-up the engine 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.

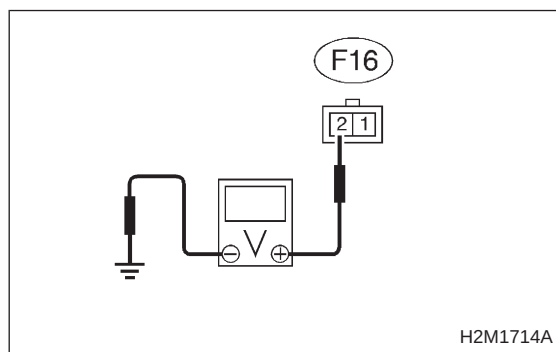
Connector & terminal

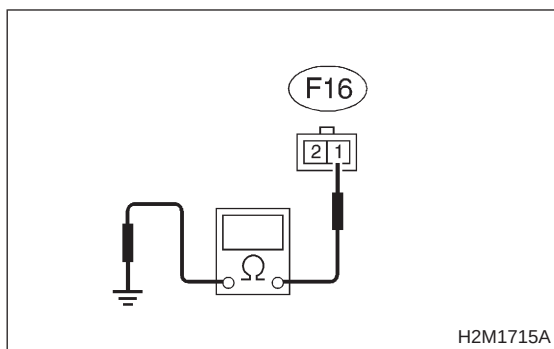
(F16) No. 2 (+) — Chassis ground (-):

CHECK : Is the voltage more than 10 V?

YES : Go to step 2A2.

NO : Go to step 2A5.

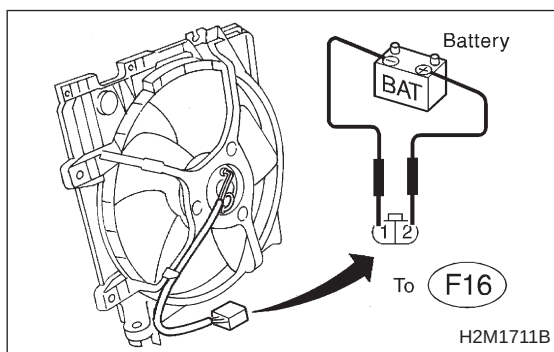


**2A2****CHECK GROUND CIRCUIT OF SUB FAN MOTOR.**

- 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 **2A3**.**NO** : Repair open circuit in harness between sub fan motor connector and chassis ground.**2A3****CHECK POOR CONTACT.**

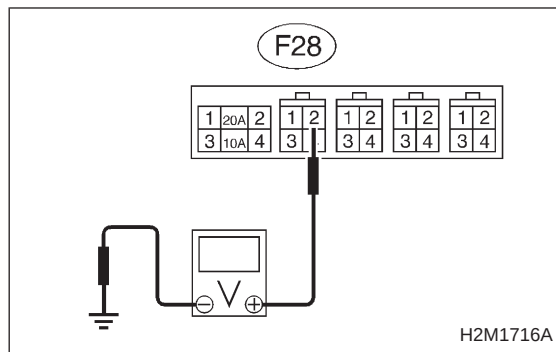
Check poor contact in sub fan motor connector. <Ref. to FOREWORD [T3C1].>

CHECK : *Is there poor contact in sub fan motor connector?***YES** : Repair poor contact in sub fan motor connector.**NO** : Go to step **2A4**.**2A4****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.**2A5****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.

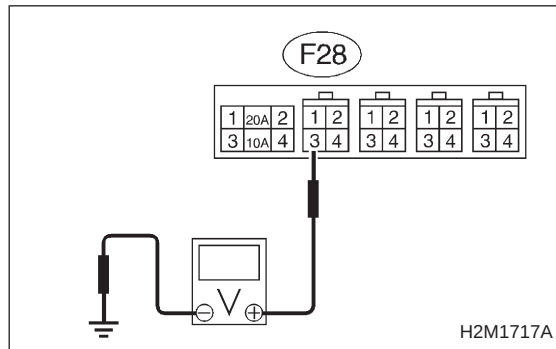
Connector & terminal

(F28) No. 2 (+) — 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 SUB FAN RELAY.

1) Turn ignition switch to ON.

2) Measure voltage between sub fan relay terminal and chassis ground.

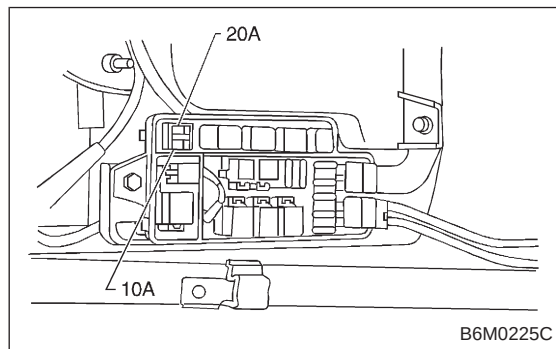
Connector & terminal

(F28) No. 3 (+) — Chassis ground (-):

CHECK : Is the voltage more than 10 V?

YES : Go to step 2A17.

NO : Go to step 2A12.



2A7

CHECK 20 A FUSE.

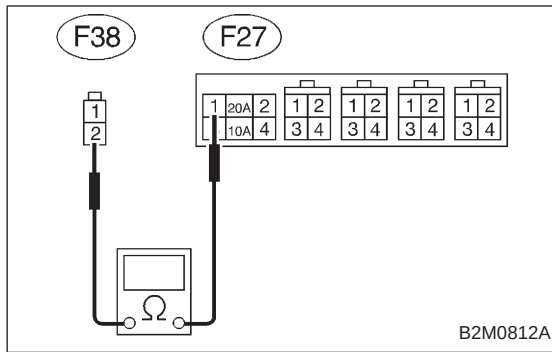
1) Remove 20 A fuse from A/C relay holder.

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**(F38) 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.**

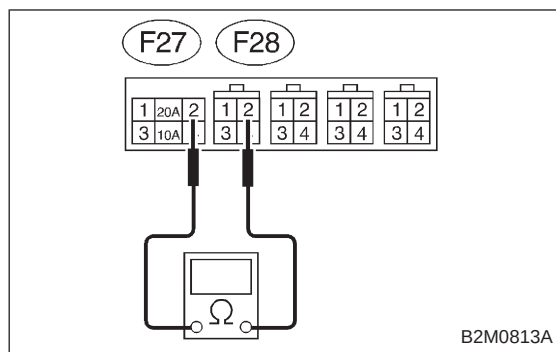
Check poor contact in main fuse box connector. <Ref. to FOREWORD [T3C1].>

- 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 connector.
- NO** : Go to step 2A11.

**2A11****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.

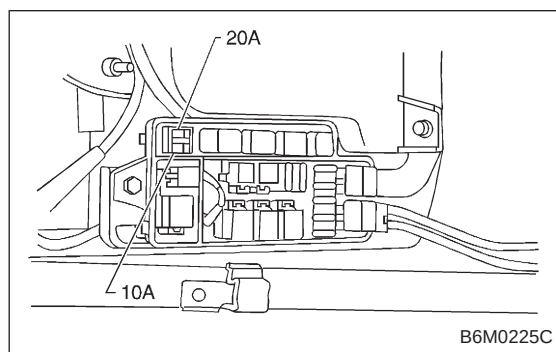
Connector & terminal

(F27) No. 2 — (F28) No. 2:

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.

**2A12****CHECK 10 A FUSE.**

- 1) Turn ignition switch to OFF.
- 2) Remove 10 A fuse from A/C relay holder.
- 3) Check condition of fuse.

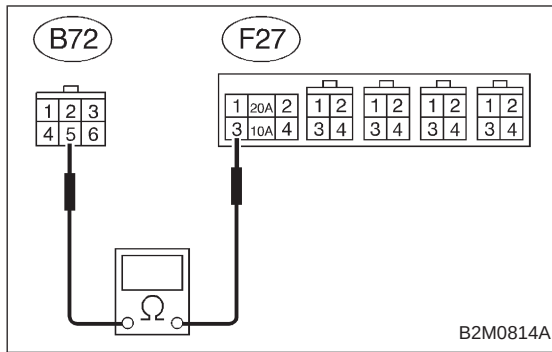
CHECK : **Is the fuse blown-out?**

YES : Replace fuse.

NO : Go to step **2A13**.

2A13**CHECK HARNESS CONNECTOR BETWEEN IGNITION SWITCH AND A/C RELAY HOLDER 10 A FUSE.**

- 1) Disconnect connector from ignition switch.
- 2) Disconnect connectors (F42) and (B52) from fuse and relay box, and (F39) from main fuse box.



3) Measure resistance of harness between ignition switch connector and A/C relay holder 10 A fuse terminal.

Connector & terminal

(B72) No. 5 — (F27) No. 3:

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 10 A fuse terminal.
- 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.

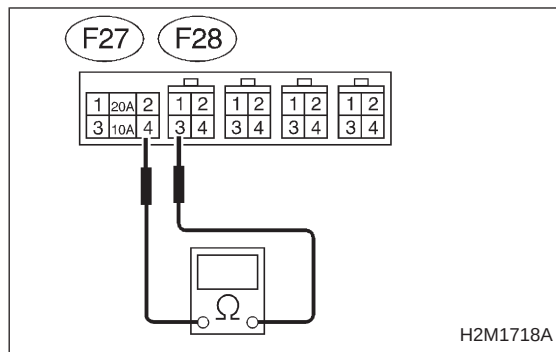
2A15	CHECK POOR CONTACT.

Check poor contact in A/C relay holder 10 A fuse connector. <Ref. to FOREWORD [T3C1].>

CHECK : Is there poor contact in A/C relay holder 10 A fuse connector?

YES : Repair poor contact in 10 A fuse connector.

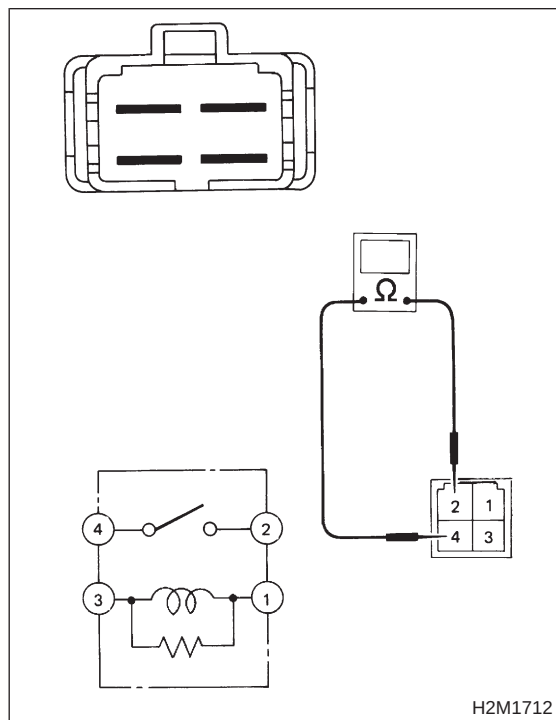
NO : Go to step 2A16.

**2A16****CHECK HARNESS CONNECTOR BETWEEN 10 A FUSE AND SUB FAN RELAY IN A/C RELAY HOLDER.**

Measure resistance of harness between 10 A fuse and sub fan relay terminal.

Connector & terminal
(F27) No. 4 — (F28) No. 3:

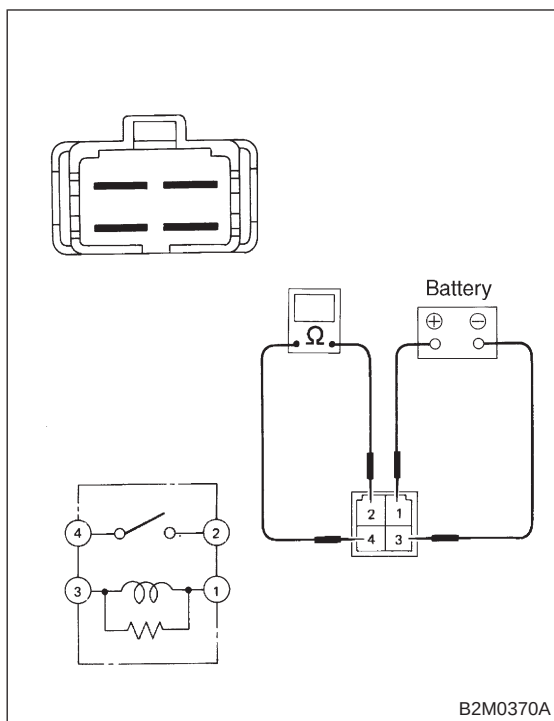
- CHECK** : **Is the resistance less than 1 Ω ?**
- YES** : Repair poor contact in sub fan relay connector.
- NO** : Repair open circuit in harness between 10 A fuse and sub fan relay connector.

**2A17****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. 2 and No. 4?**

- YES** : Go to step **2A18**.
- NO** : Replace sub fan relay.

**2A18****CHECK SUB FAN RELAY.**

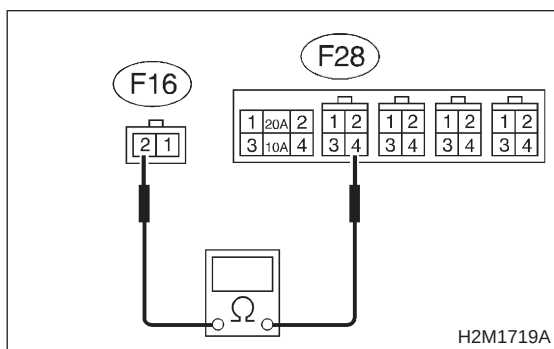
1) Connect battery to terminals No. 1 and No. 3 of sub fan relay.

2) Check continuity between sub fan relay terminals.

CHECK : **Does continuity exist between terminals No. 2 and No. 4?**

YES : Go to step **2A19**.

NO : Replace sub fan relay.

**2A19****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. 4:

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

YES : Go to step **2A20**.

NO : Repair open circuit in harness between sub fan motor and sub fan relay connector.

2A20**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 **2A21**.

2A21	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.

ON-BOARD DIAGNOSTICS II SYSTEM

2-7

	Page
T DIAGNOSTICS AIRBAG	2
1. General	2
2. Electrical Components Location	10
3. Diagnosis System	34
4. Cautions	76
5. Specified Data.....	79
6. Basic Diagnostic Procedure.....	85
7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL)	89
8. Diagnostics for Engine Starting Failure	98
9. General Diagnostic Table.....	122
10. Diagnostic Chart with Trouble Code.....	130

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.

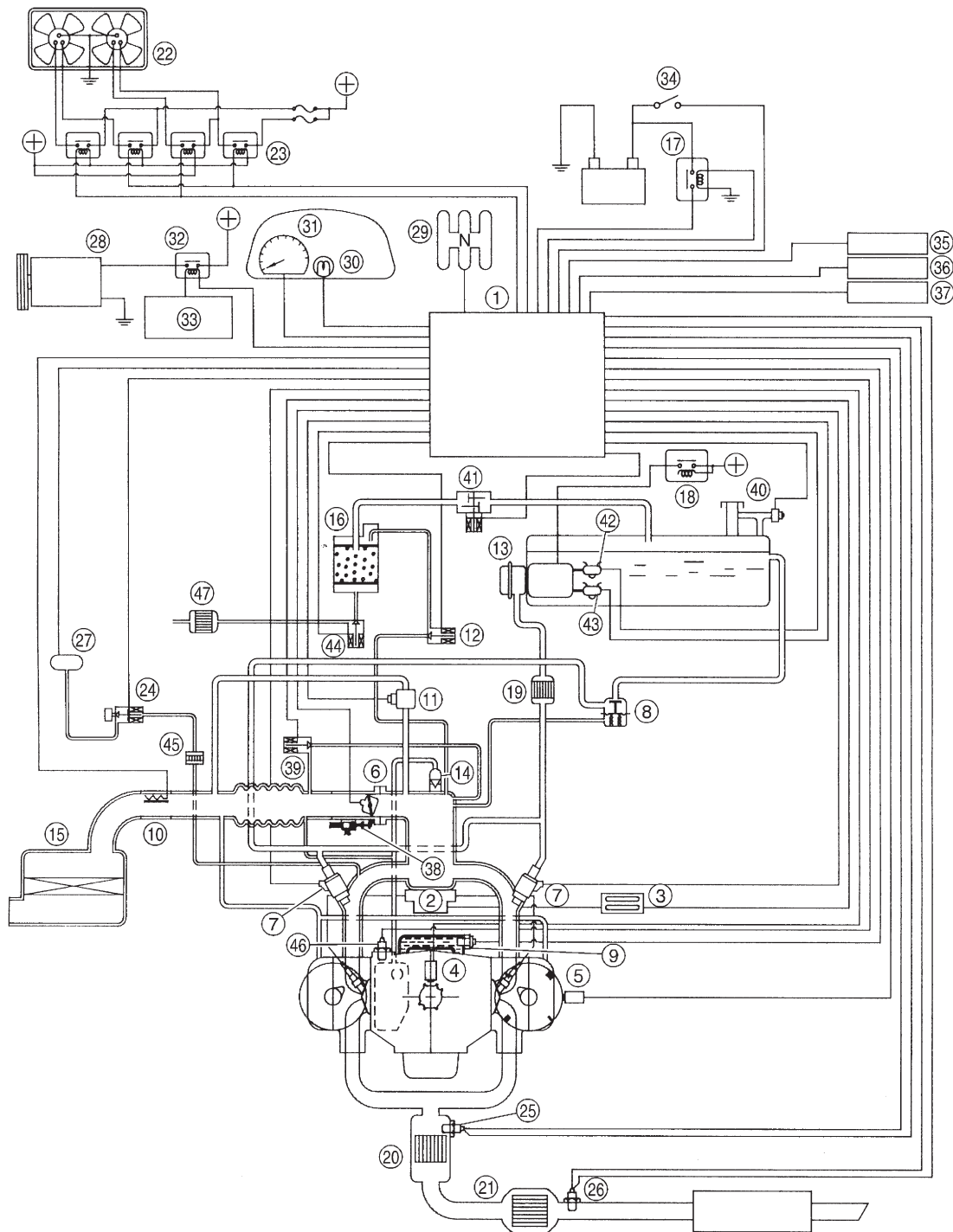
With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system where the electro-magnetic injection valve (fuel injector) opens only for a short period of time, depending on the quantity of air required for one cycle of operation. In actual operation, the injection quan-

tity 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:

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

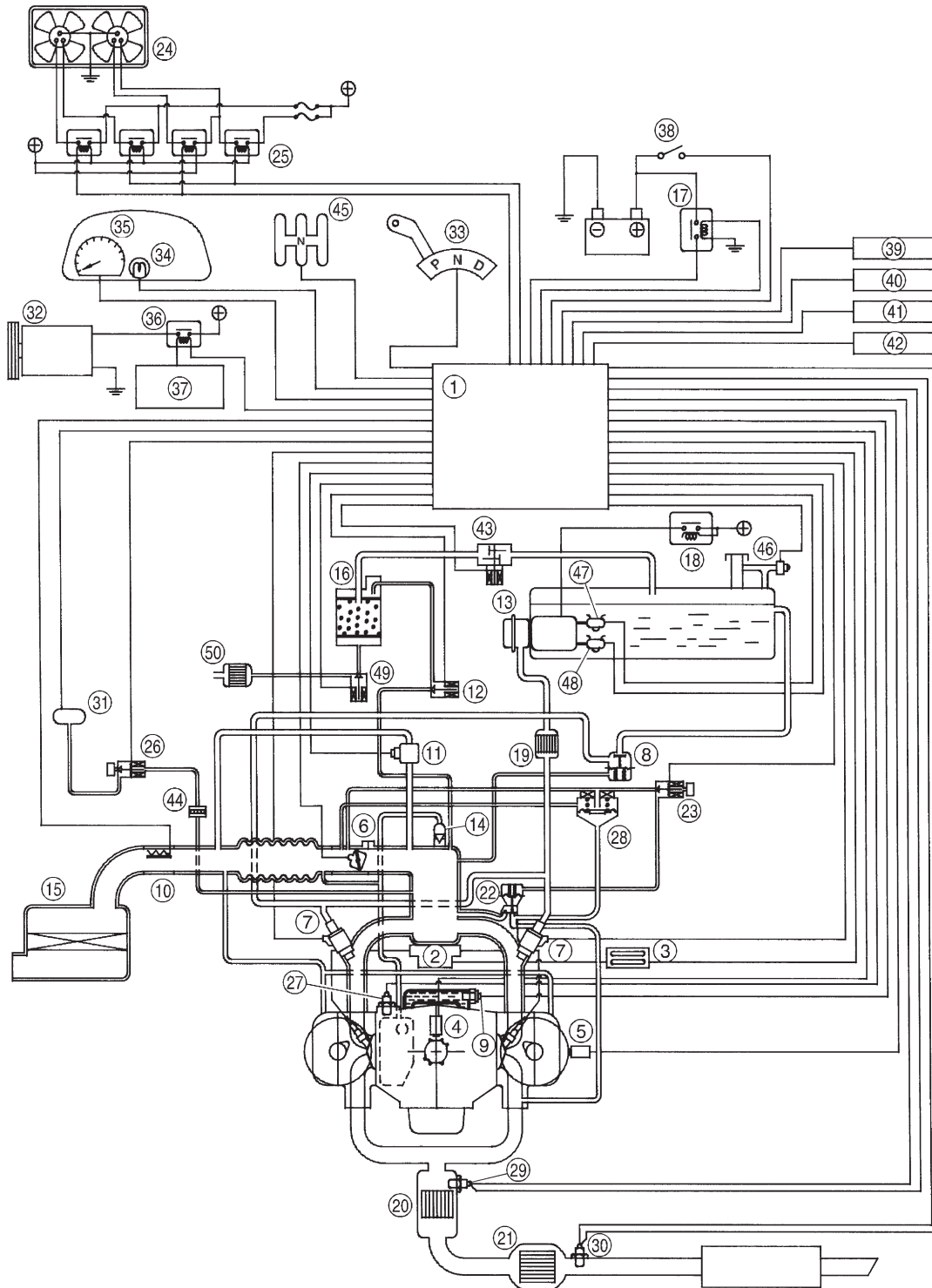
2. SCHEMATIC (1800 cc MODEL)



H2M1595A

-
① Engine control module (ECM)	②⑤ Front oxygen sensor
② Ignition coil	②⑥ Rear oxygen sensor
③ Ignitor	②⑦ Pressure sensor
④ Crankshaft position sensor	②⑧ A/C compressor (With A/C models)
⑤ Camshaft position sensor	②⑨ Neutral position switch
⑥ Throttle position sensor	③⑩ CHECK ENGINE malfunction indicator lamp (MIL)
⑦ Fuel injectors	③⑪ Tachometer
⑧ Pressure regulator	③⑫ A/C relay (With A/C models)
⑨ Engine coolant temperature sensor	③⑬ A/C control module (With A/C models)
⑩ Mass air flow sensor	③⑭ Ignition switch
⑪ Idle air control solenoid valve	③⑮ Vehicle speed sensor
⑫ Purge control solenoid valve	③⑯ Data link connector (For Subaru select monitor)
⑬ Fuel pump	③⑰ Data link connector (For Subaru select monitor and OBD-II general scan tool)
⑭ PCV valve	③⑱ Throttle opener
⑮ Air cleaner	③⑲ FICD solenoid valve (With A/C models)
⑯ Canister	④⑰ Fuel tank pressure sensor
⑰ Main relay	④⑱ Pressure control solenoid valve
⑱ Fuel pump relay	④⑲ Fuel temperature sensor
⑲ Fuel filter	④⑲ Fuel level sensor
⑲ Front catalytic converter	④⑲ Vent control solenoid valve
⑲ Rear catalytic converter	④⑲ Filter
⑲ Radiator fan	④⑲ Knock sensor
⑲ Radiator fan relay	④⑲ Air filter
⑲ Pressure sources switching solenoid valve	

3. SCHEMATIC (2200 cc MODEL)



H2M2340A

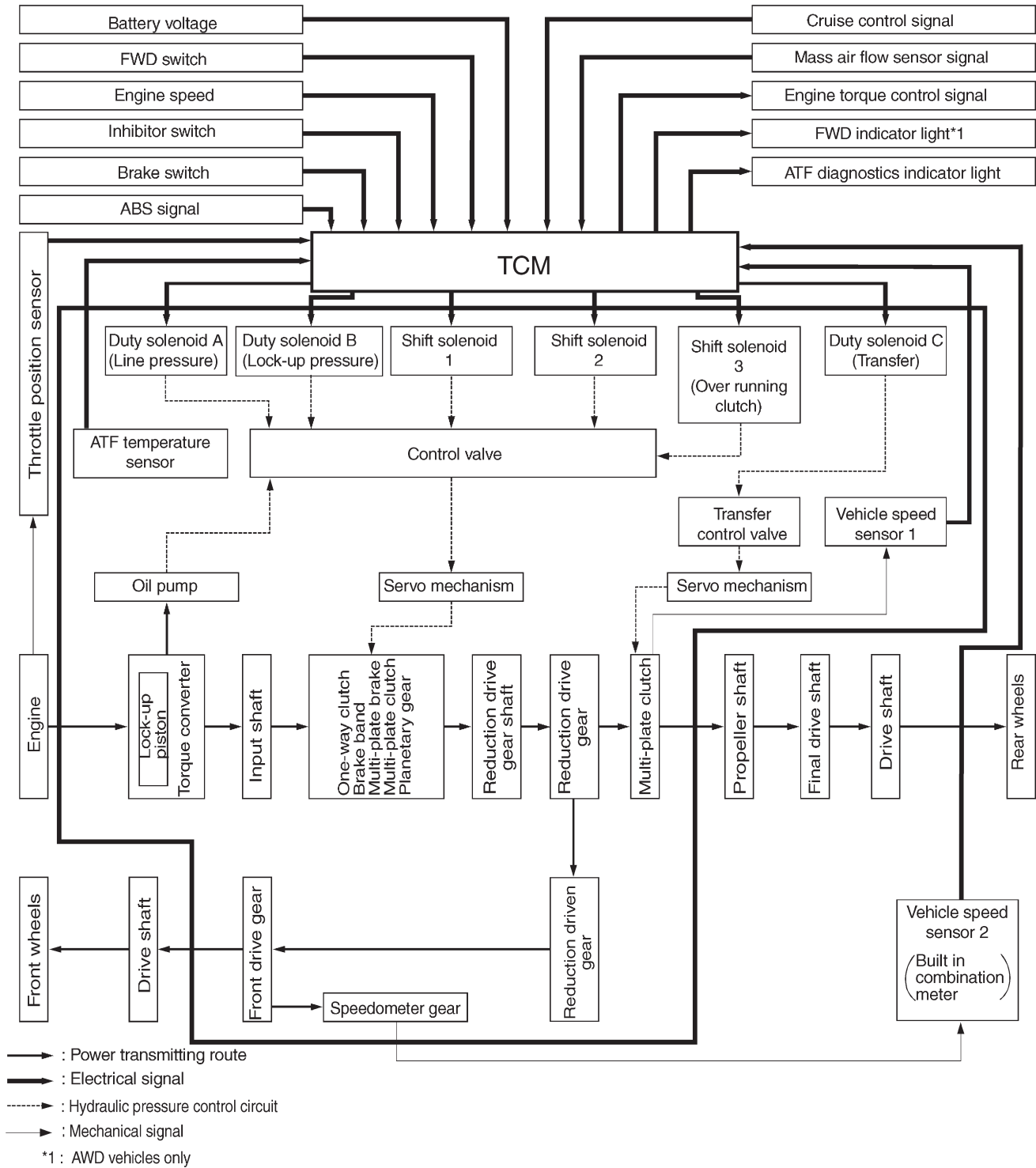
① Engine control module (ECM)	②⑥ Pressure sources switching solenoid valve
② Ignition coil	②⑦ Knock sensor
③ Ignitor	②⑧ Back-pressure transducer
④ Crankshaft position sensor	②⑧ Front oxygen sensor
⑤ Camshaft position sensor	③⑩ Rear oxygen sensor
⑥ Throttle position sensor	③① Pressure sensor
⑦ Fuel injectors	③② A/C compressor
⑧ Pressure regulator	③③ Inhibitor switch (AT vehicles)
⑨ Engine coolant temperature sensor	③④ CHECK ENGINE malfunction indicator lamp (MIL)
⑩ Mass air flow sensor	③⑤ Tachometer
⑪ Idle air control solenoid valve	③⑥ A/C relay
⑫ Purge control solenoid valve	③⑦ A/C control module
⑬ Fuel pump	③⑧ Ignition switch
⑭ PCV valve	③⑨ Transmission control module (TCM)
⑮ Air cleaner	④⑩ Vehicle speed sensor
⑯ Canister	④① Data link connector (Subaru select monitor)
⑰ Main relay	④② Data link connector (OBD-II general scan tool)
⑱ Fuel pump relay	④③ Pressure control solenoid valve
⑲ Fuel filter	④④ Filter
⑳ Front catalytic converter	④⑤ Neutral position switch (MT vehicles)
㉑ Rear catalytic converter	④⑥ Fuel tank pressure sensor
㉒ EGR valve (AT vehicles only)	④⑦ Fuel temperature sensor
㉓ EGR control solenoid valve (AT vehicles only)	④⑧ Fuel level sensor
㉔ Radiator fan	④⑧ Vent control solenoid valve
㉕ Radiator fan relay	⑤① Air filter

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. SCHEMATIC

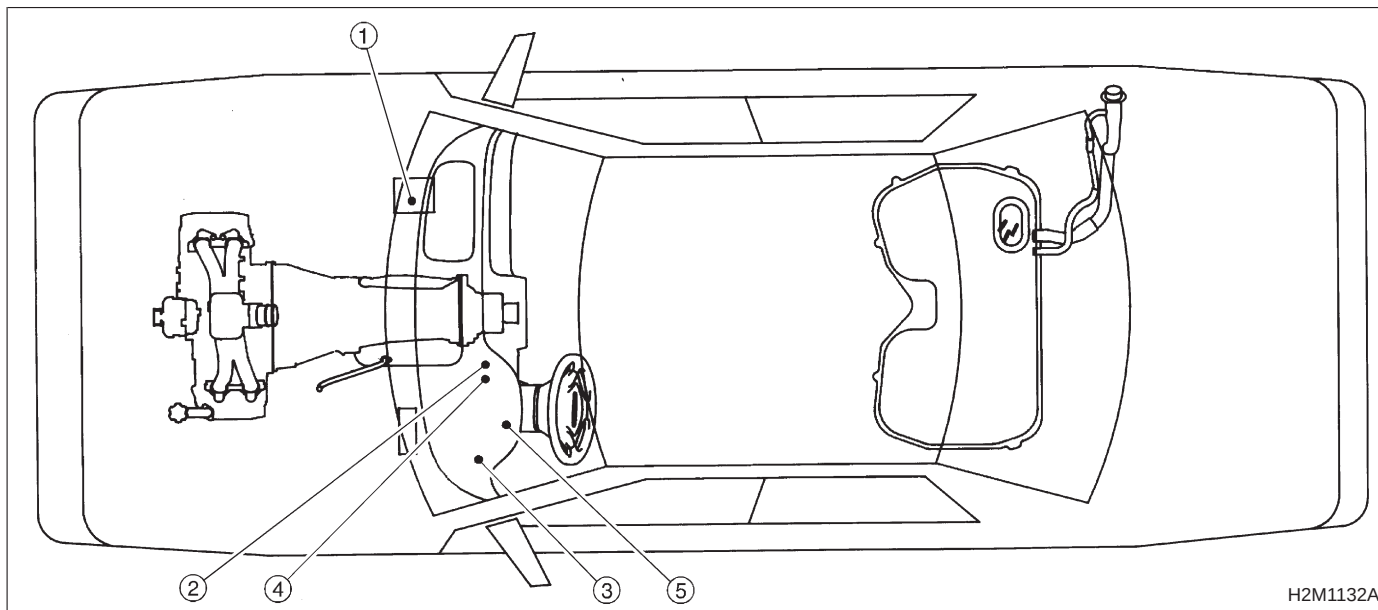


H2M1486A

2. Electrical Components Location

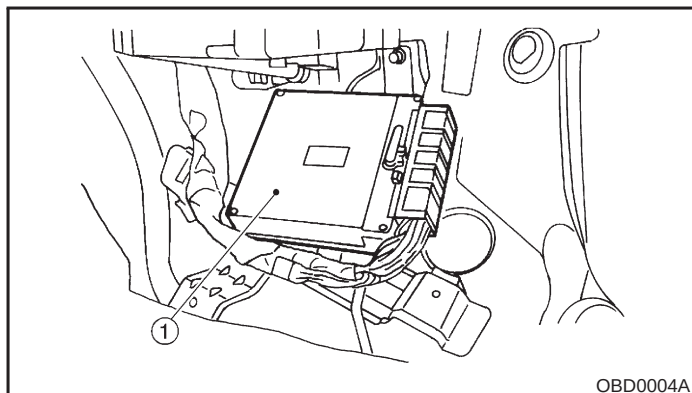
A: ENGINE (1800 cc MODEL)

1. MODULE

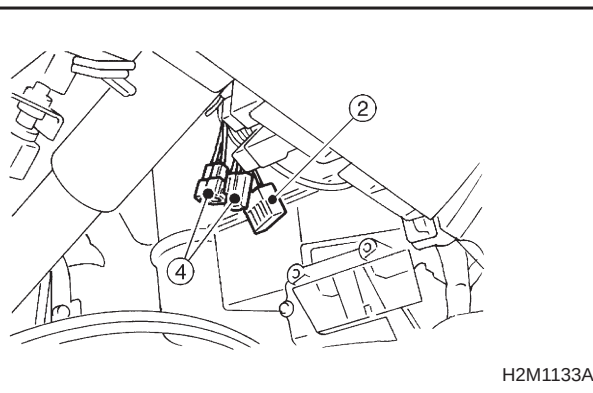


H2M1132A

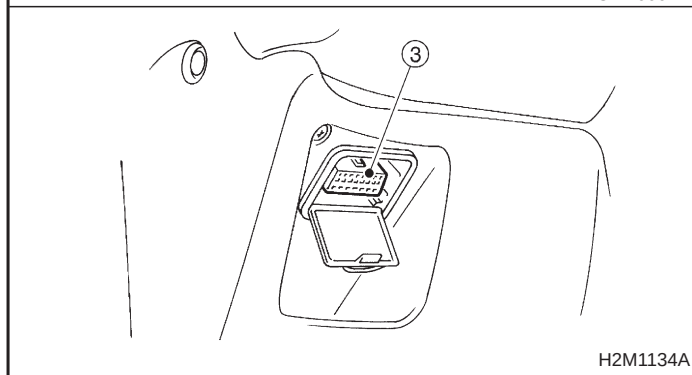
- ① Engine control module (ECM)
- ② Data link connector (for Subaru select monitor only)
- ③ Data link connector (for Subaru select monitor and OBD-II general scan tool)
- ④ Test mode connector
- ⑤ CHECK ENGINE malfunction indicator lamp (MIL)



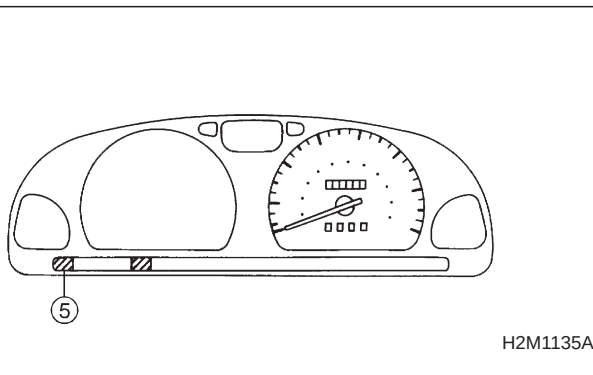
OBD0004A



H2M1133A

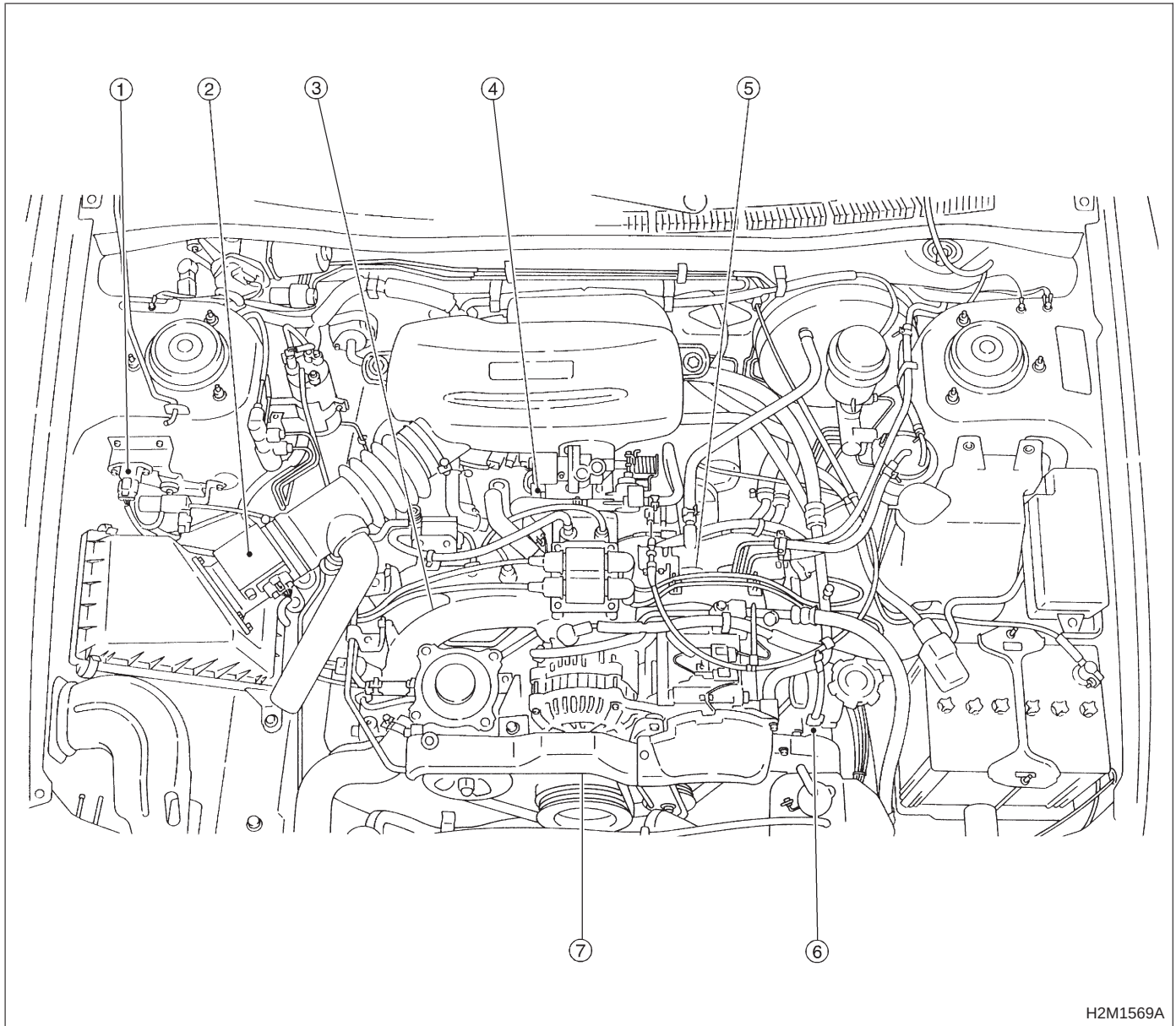


H2M1134A



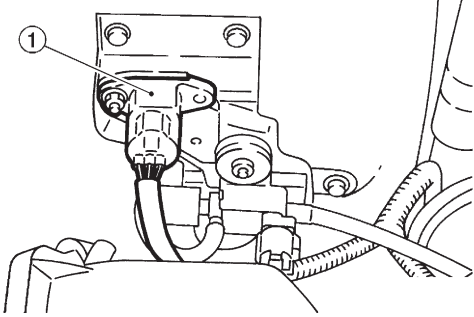
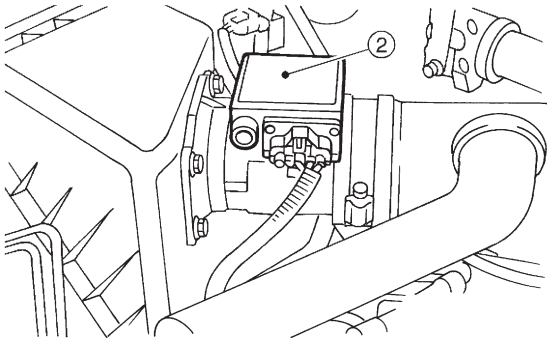
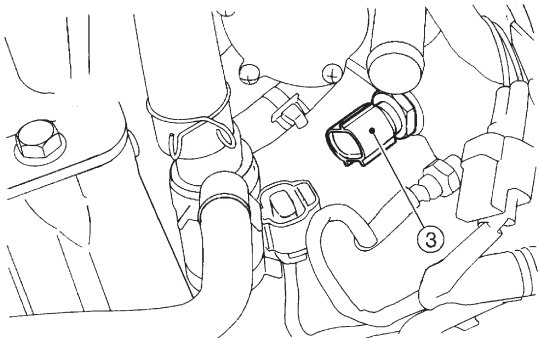
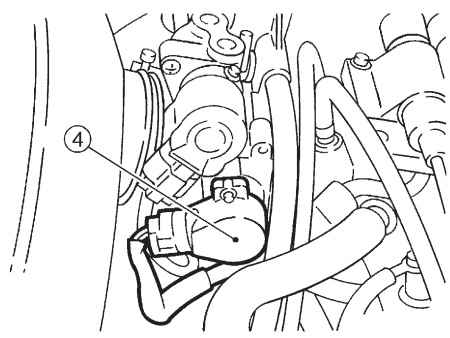
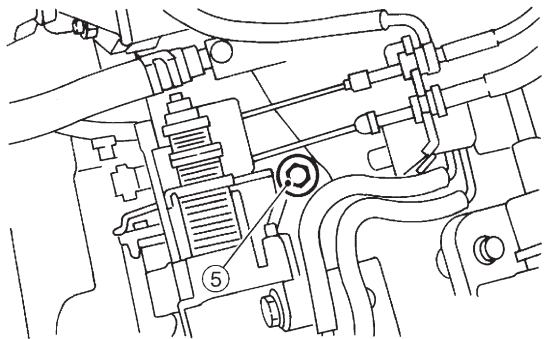
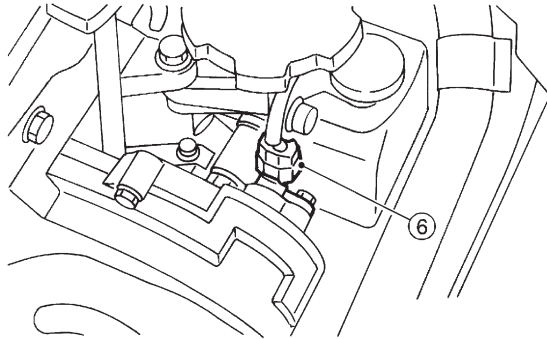
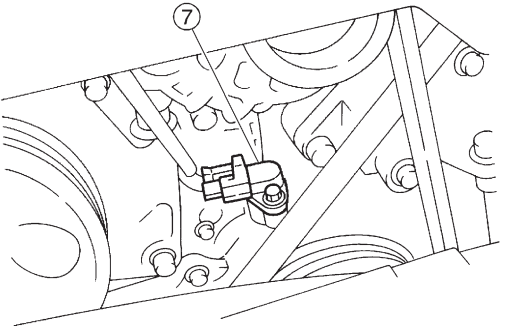
H2M1135A

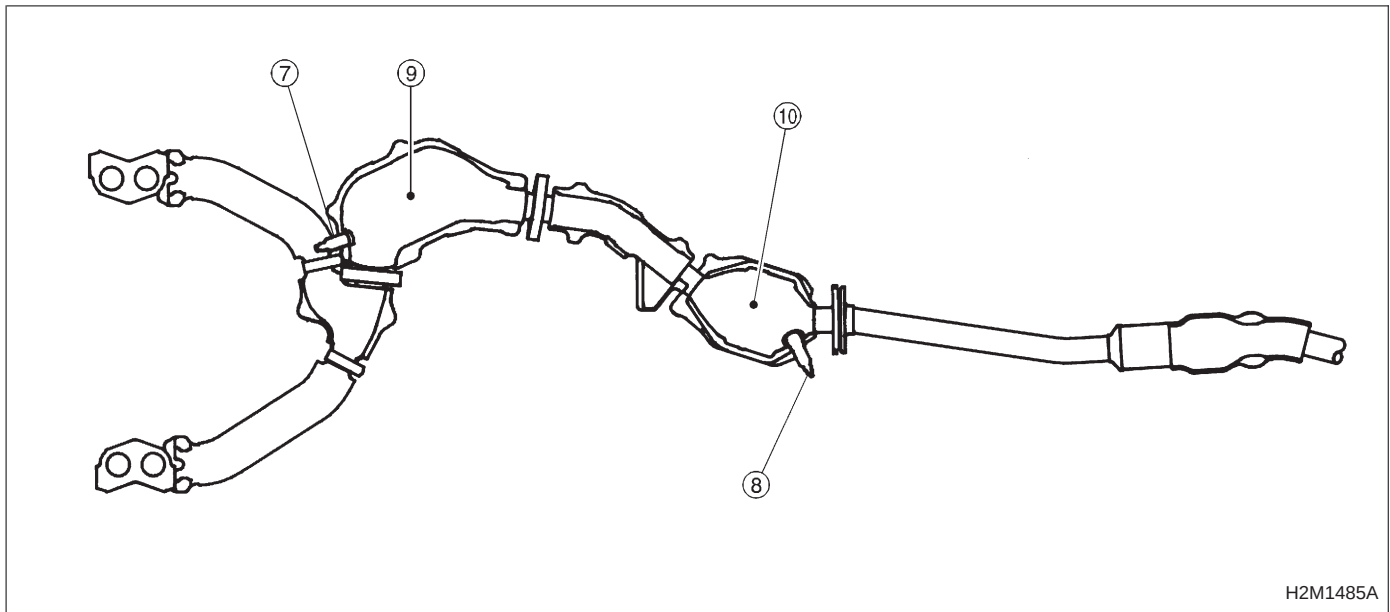
2. SENSOR



- ① Pressure sensor
- ② Mass air flow sensor
- ③ Engine coolant temperature sensor
- ④ Throttle position sensor

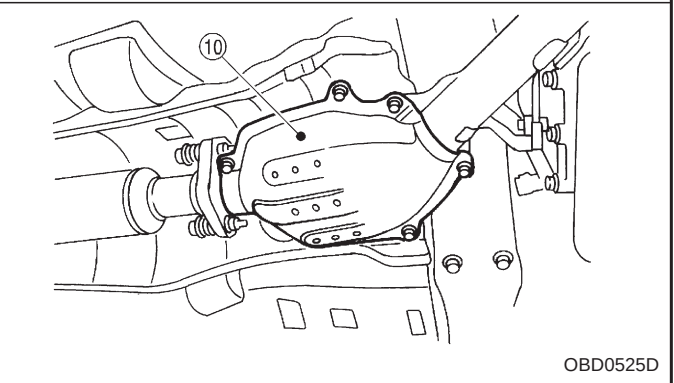
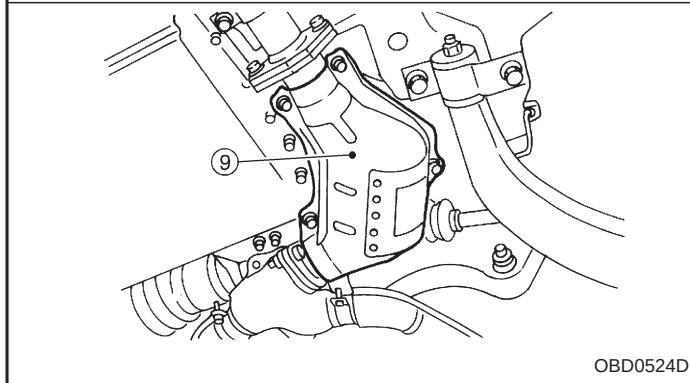
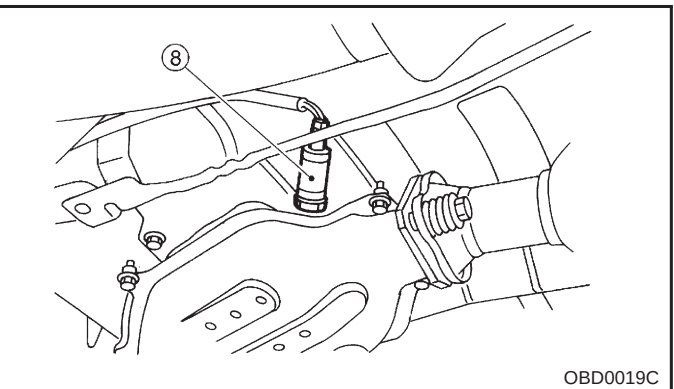
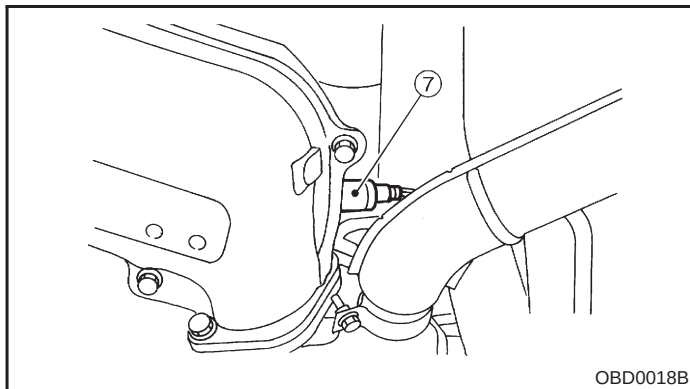
- ⑤ Knock sensor
- ⑥ Camshaft position sensor
- ⑦ Crankshaft position sensor

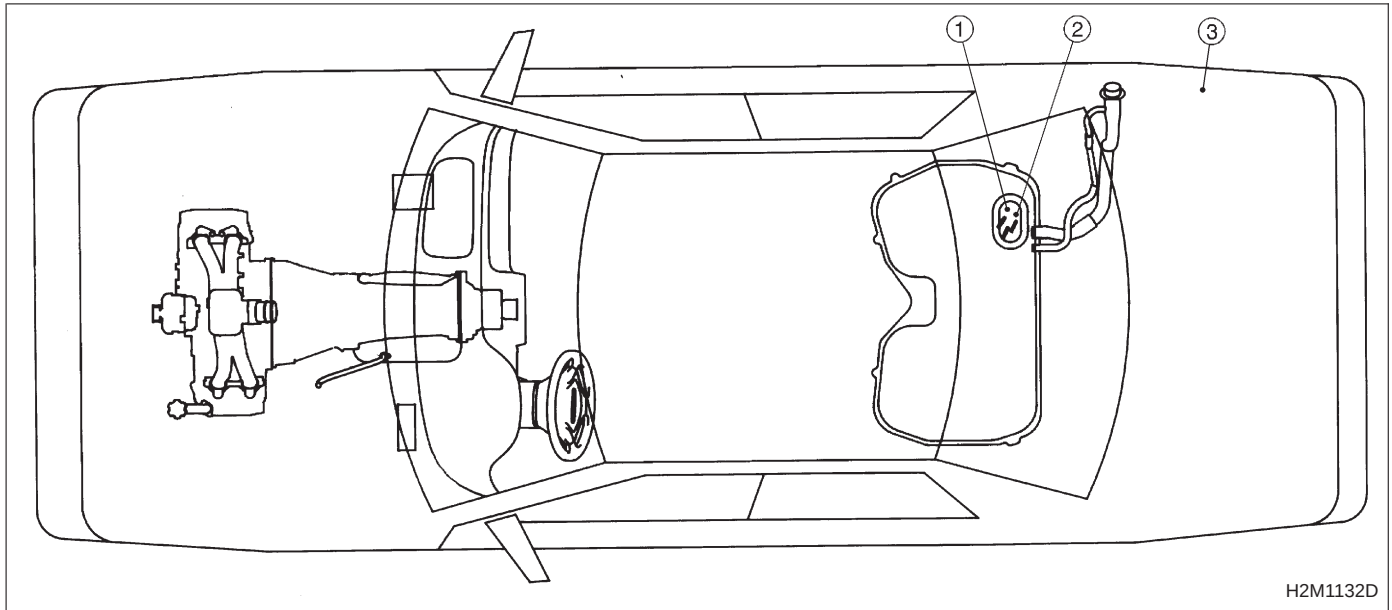
 Diagram showing the location of electrical component 1, a sensor or actuator, mounted on a bracket near the engine.	 Diagram showing the location of electrical component 2, a control unit or relay, mounted on a bracket near the engine.
 Diagram showing the location of electrical component 3, a sensor or actuator, mounted on a bracket near the engine.	 Diagram showing the location of electrical component 4, a sensor or actuator, mounted on a bracket near the engine.
 Diagram showing the location of electrical component 5, a sensor or actuator, mounted on a bracket near the engine.	 Diagram showing the location of electrical component 6, a sensor or actuator, mounted on a bracket near the engine.
 Diagram showing the location of electrical component 7, a sensor or actuator, mounted on a bracket near the engine.	SUBARU.



- ⑦ Front oxygen sensor
- ⑧ Rear oxygen sensor

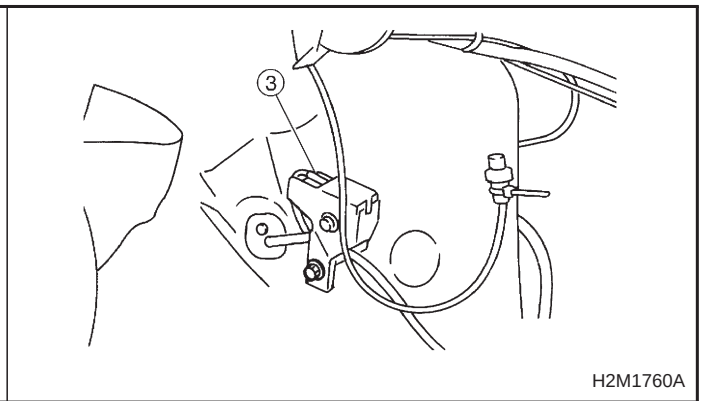
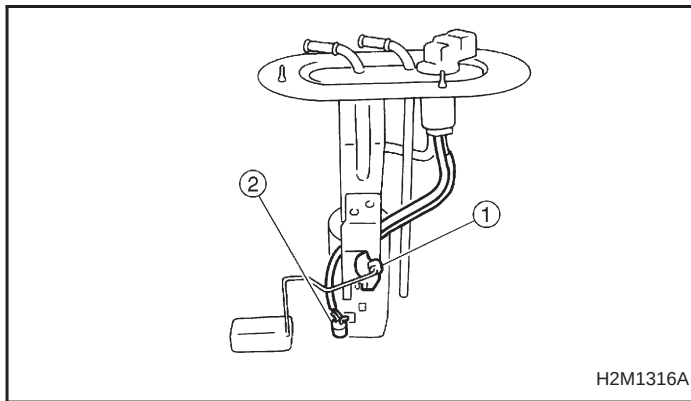
- ⑨ Front catalytic converter
- ⑩ Rear catalytic converter

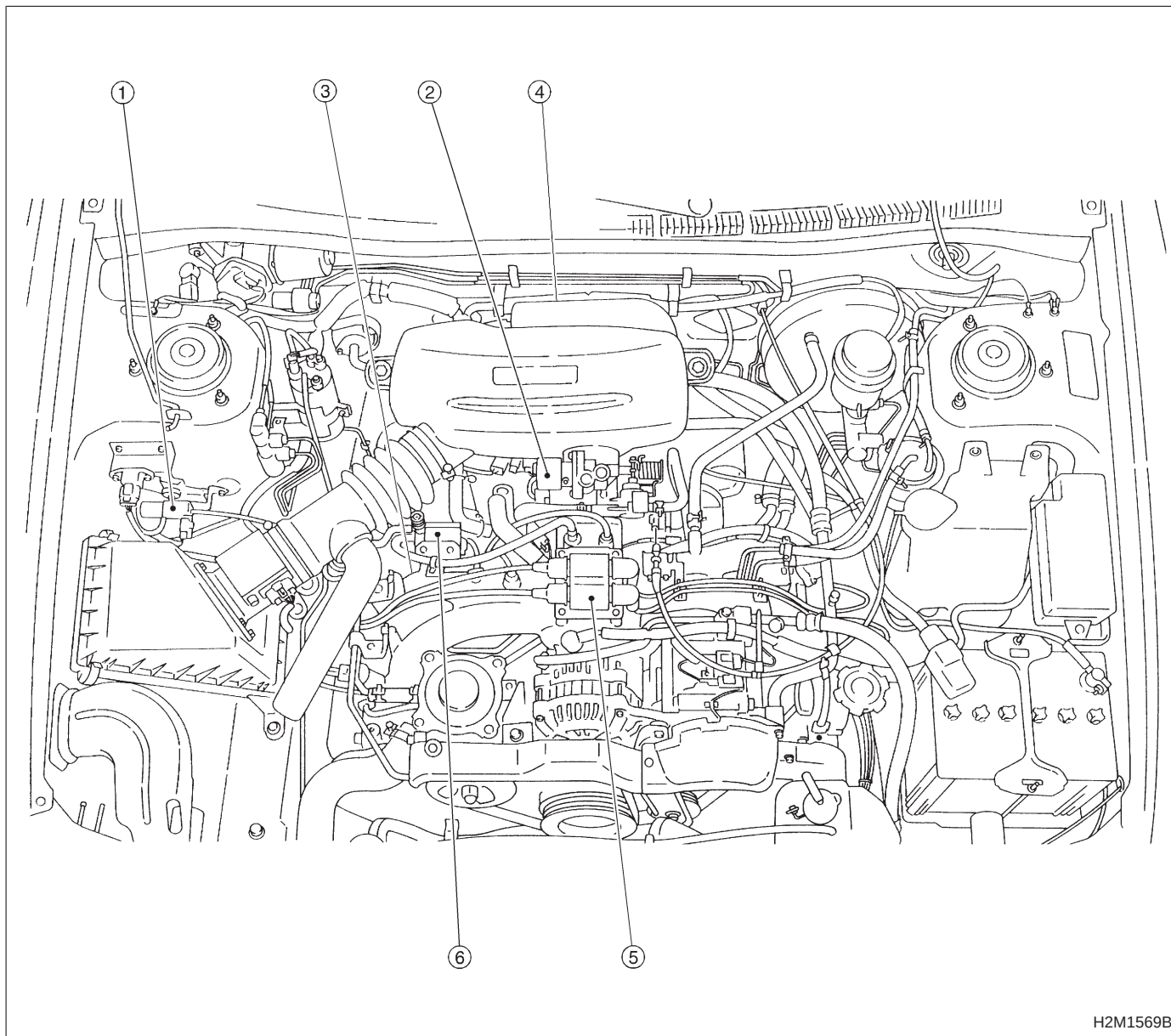




- ① Fuel level sensor
- ② Fuel temperature sensor

- ③ Fuel tank pressure sensor

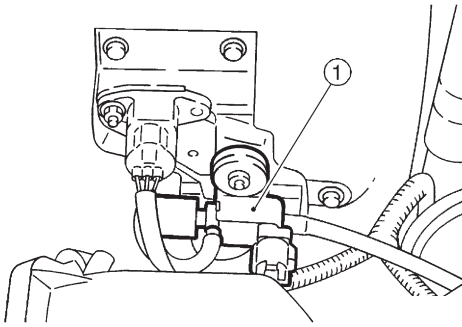


**3. SOLENOID VALVE, EMISSION CONTROL SYSTEM
PARTS AND IGNITION SYSTEM PARTS**

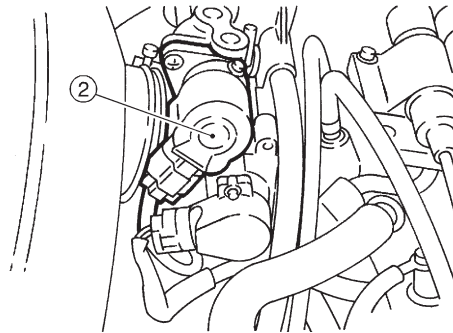
H2M1569B

- ① Pressure sources switching solenoid valve
- ② Idle air control solenoid valve
- ③ Purge control solenoid valve

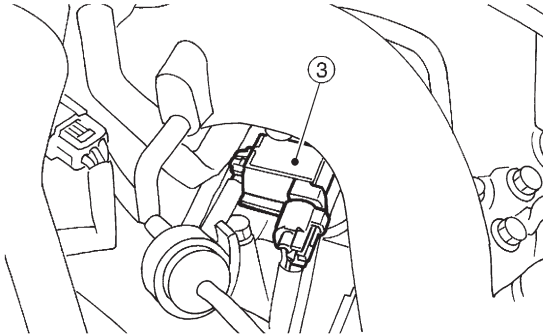
- ④ Ignitor
- ⑤ Ignition coil
- ⑥ FICD solenoid valve (With A/C models)



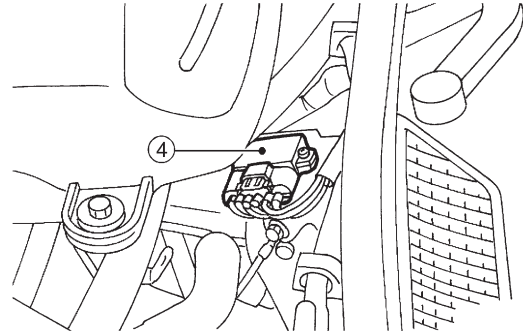
H2M1598A



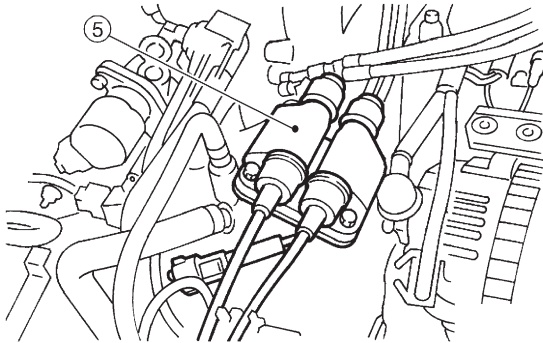
H2M1599A



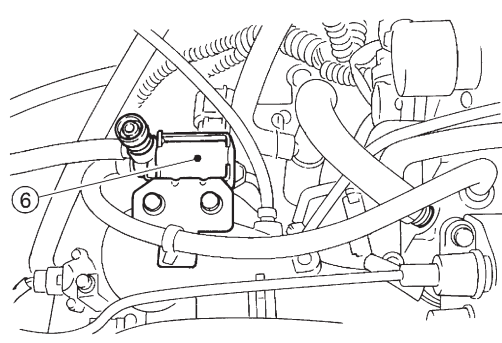
B2M1039C



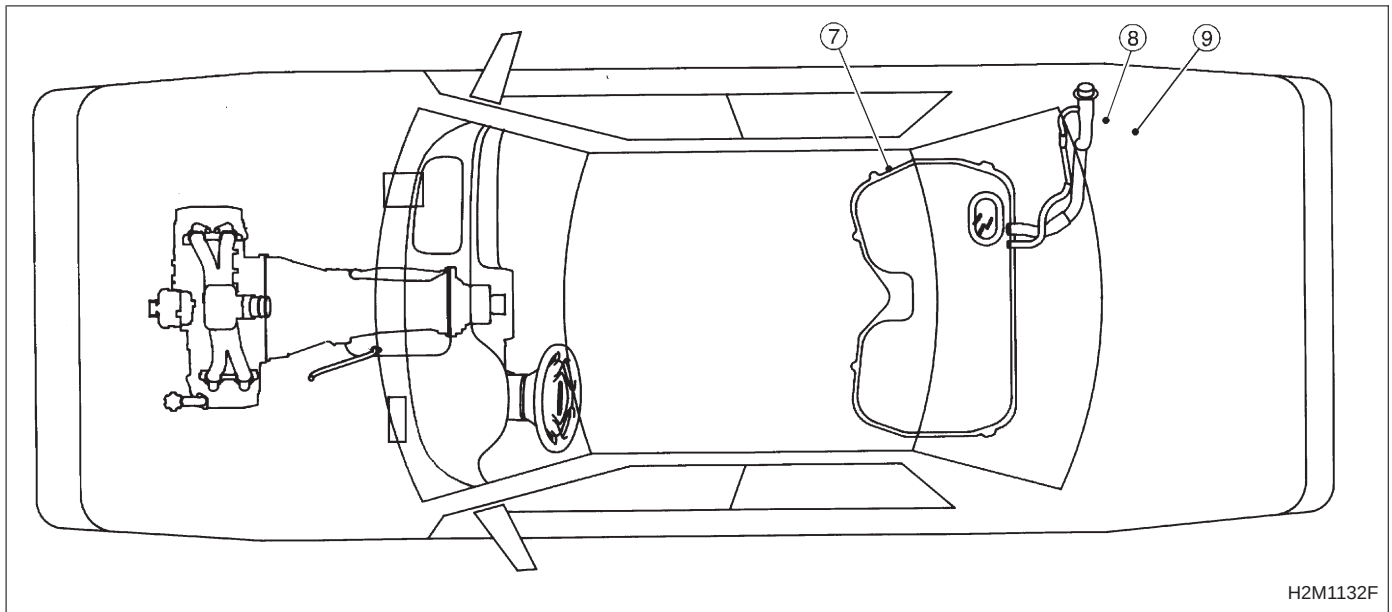
B2M1040B



H6M0403A

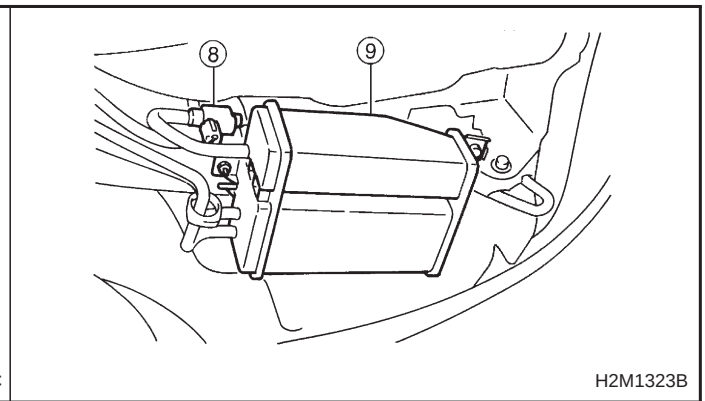
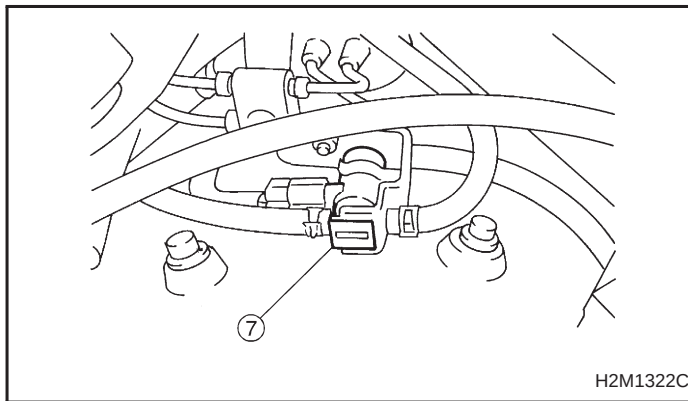


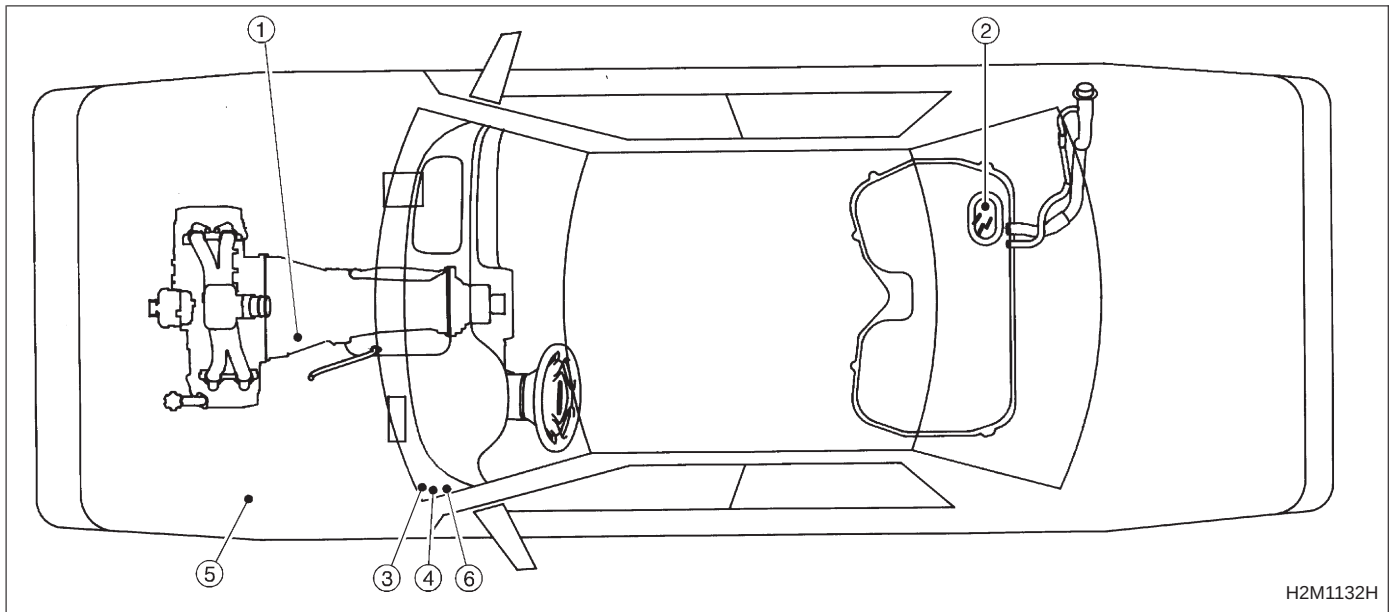
H2M1232C



- ⑦ Pressure control solenoid valve
- ⑧ Vent control solenoid valve

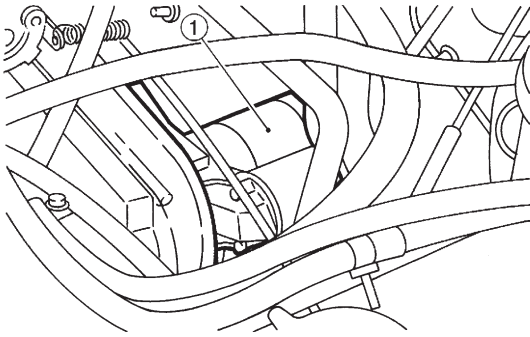
- ⑨ Canister



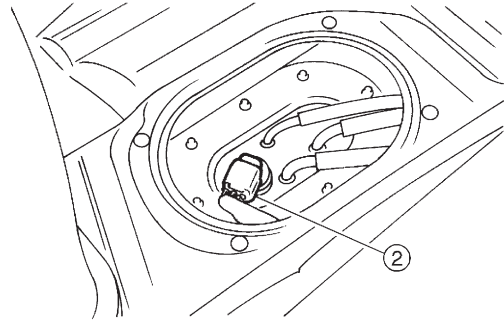


- ① Starter
- ② Fuel pump
- ③ Main relay

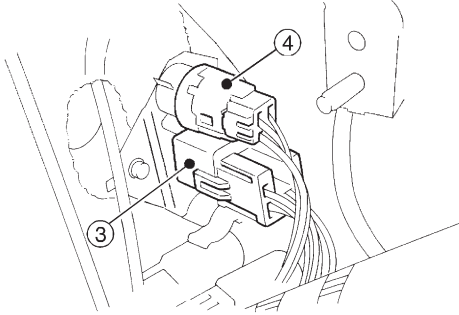
- ④ Fuel pump relay
- ⑤ Radiator sub fan relay (With A/C models only)
- ⑥ Main fan relay



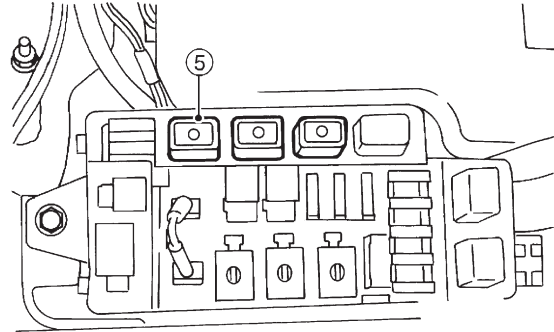
H2M1605A



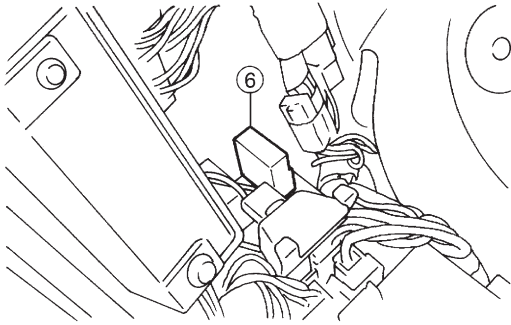
H2M1140A



B2M0218B

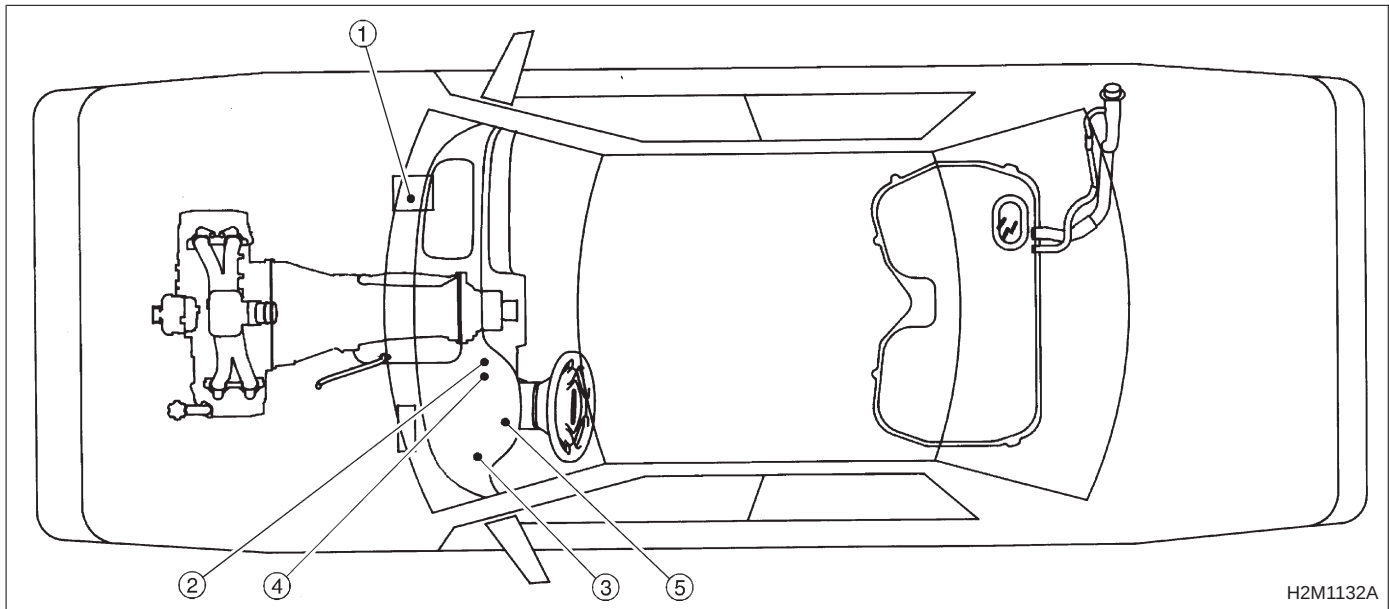


OBD0034B

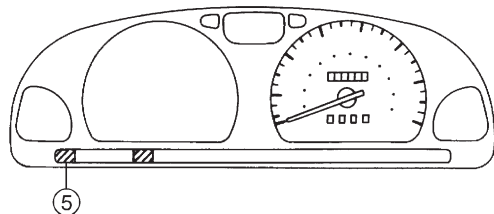
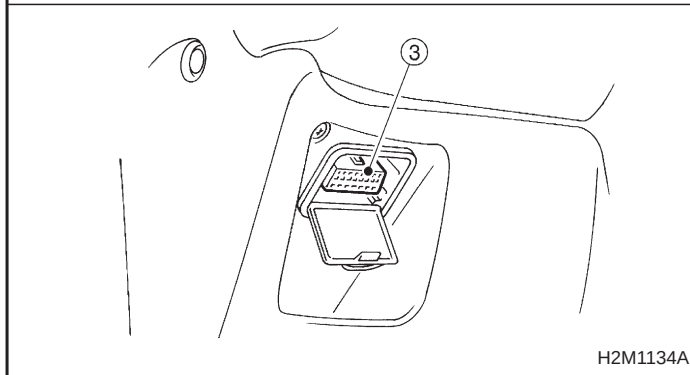
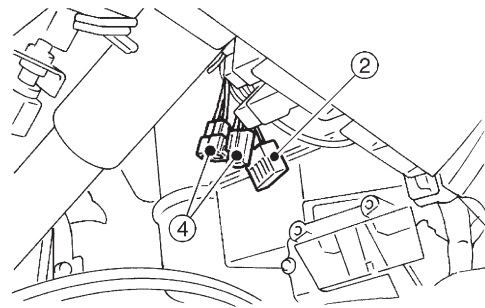
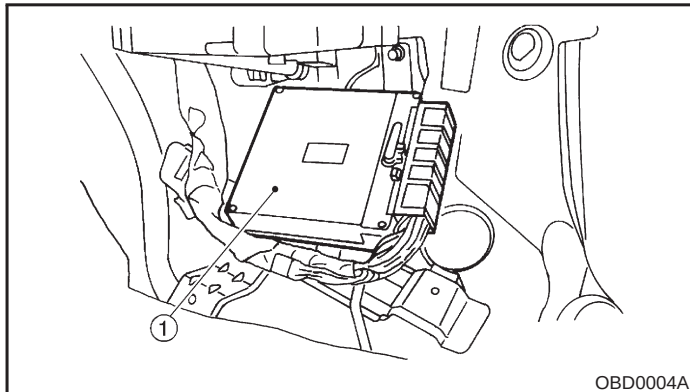


H2M1141B

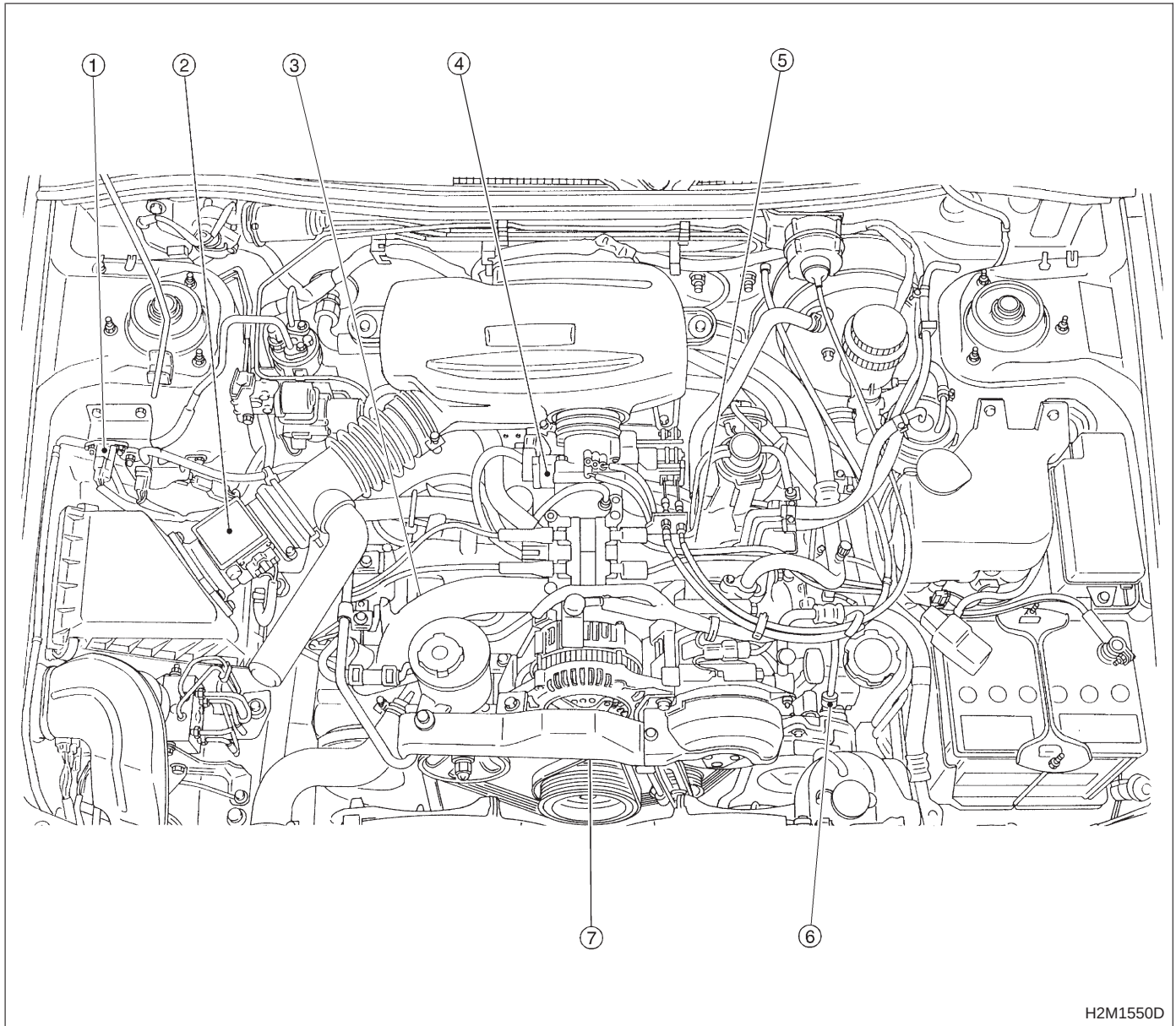
SUBARU.

B: ENGINE (2200 cc MODEL)**1. MODULE**

- ① Engine control module (ECM)
- ② Data link connector (for Subaru select monitor only)
- ③ Data link connector (for Subaru select monitor and OBD-II general scan tool)
- ④ Test mode connector
- ⑤ CHECK ENGINE malfunction indicator lamp (MIL)

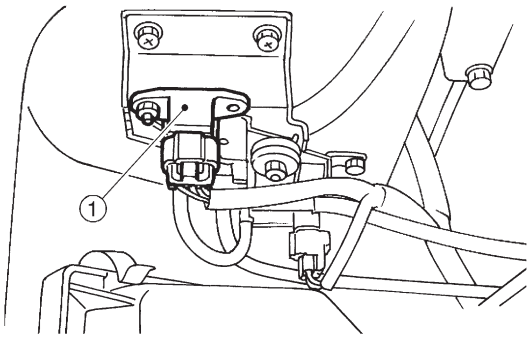
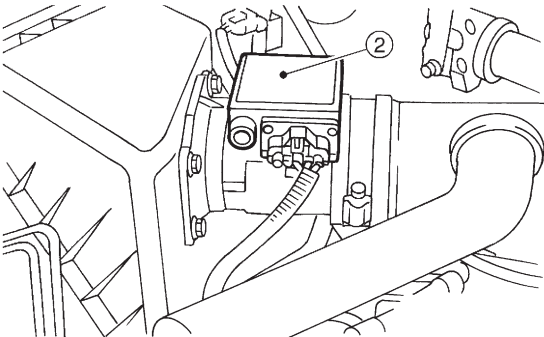
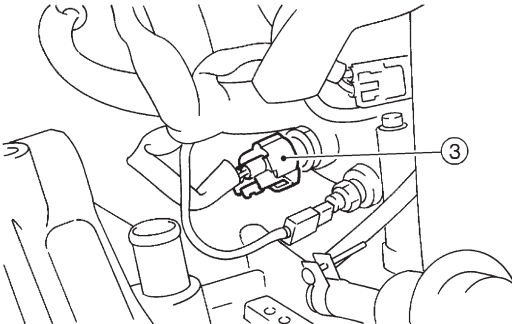
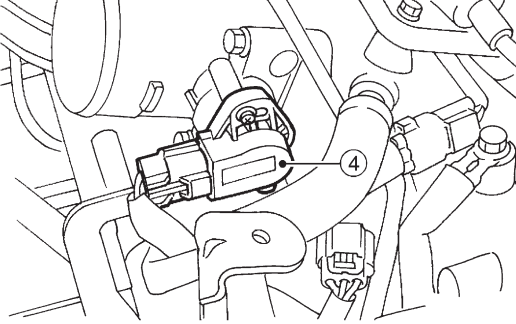
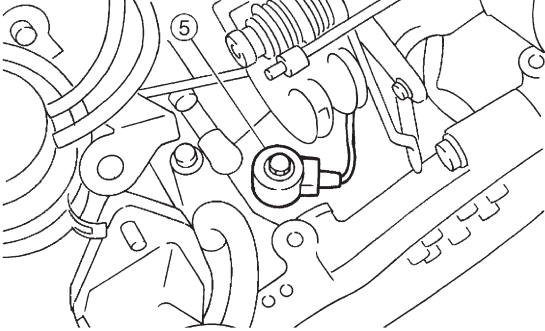
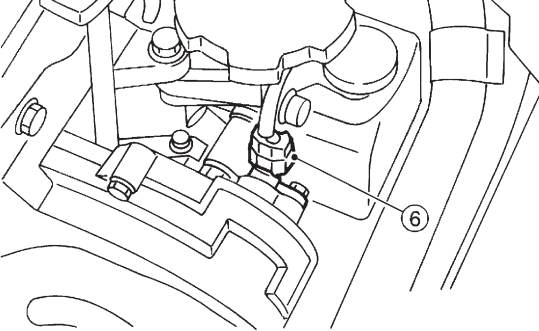
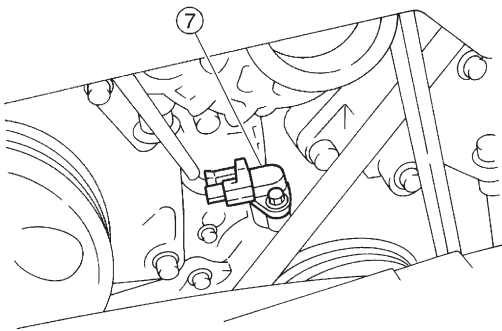


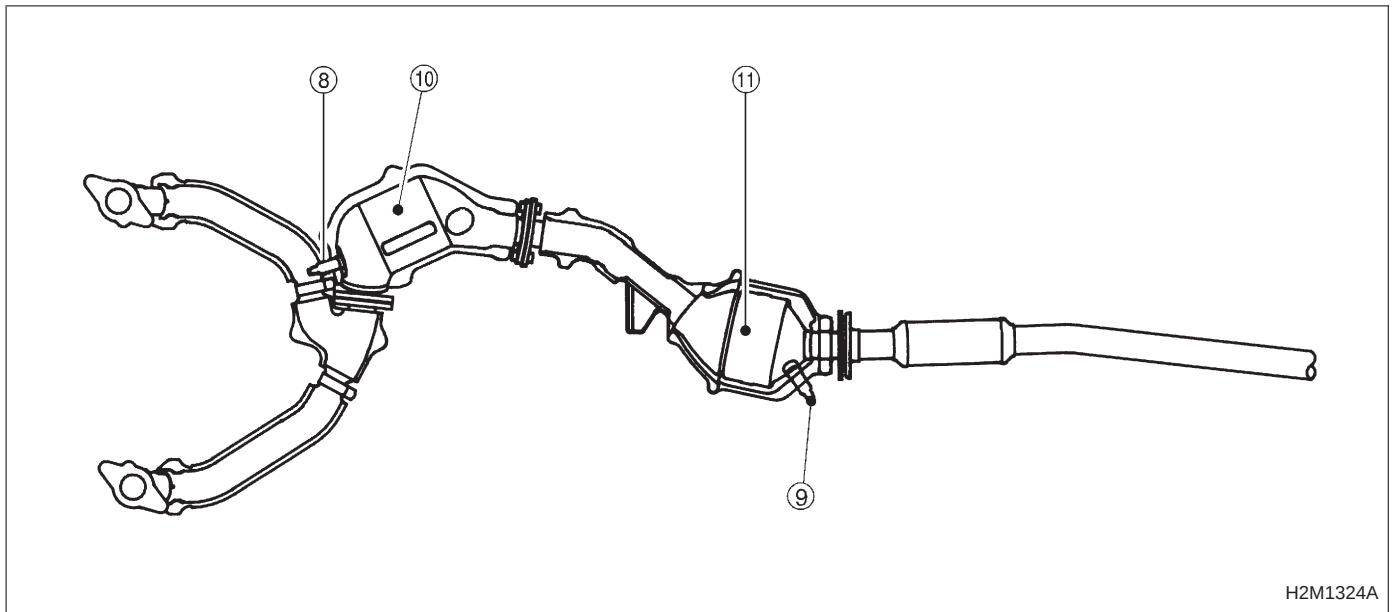
2. SENSOR



- ① Pressure sensor
- ② Mass air flow sensor
- ③ Engine coolant temperature sensor
- ④ Throttle position sensor

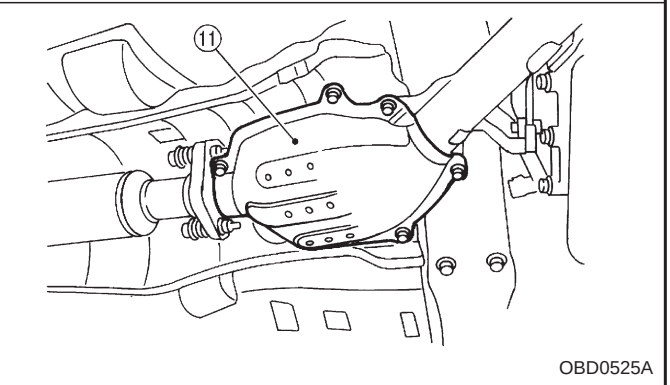
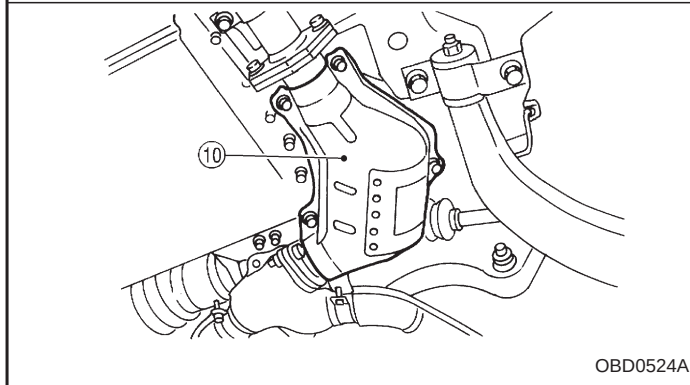
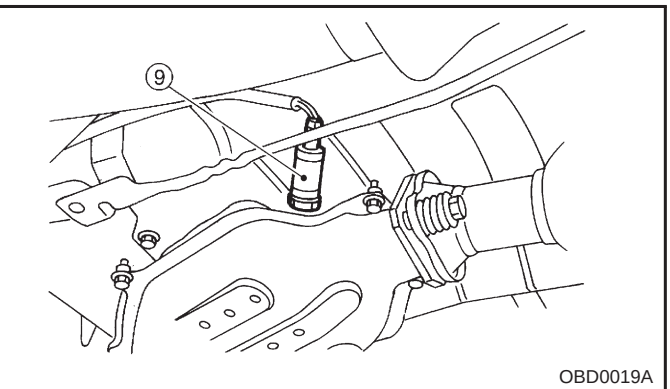
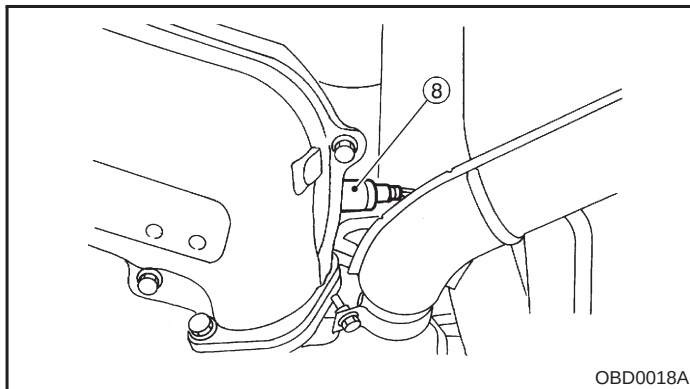
- ⑤ Knock sensor
- ⑥ Camshaft position sensor
- ⑦ Crankshaft position sensor

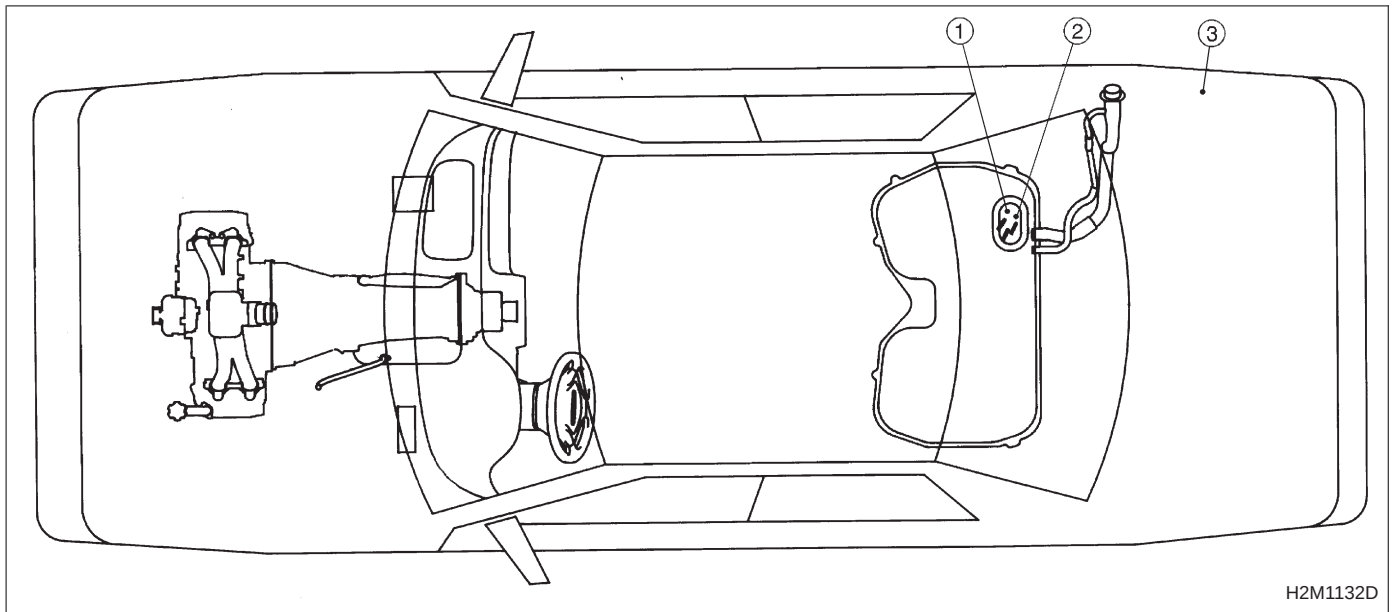
 H2M1483A	 B2M1034A
 B2M1690A	 B2M1035A
 B2M1691A	 OBD0015A
 B2M0213B	SUBARU.



- ⑧ Front oxygen sensor
- ⑨ Rear oxygen sensor

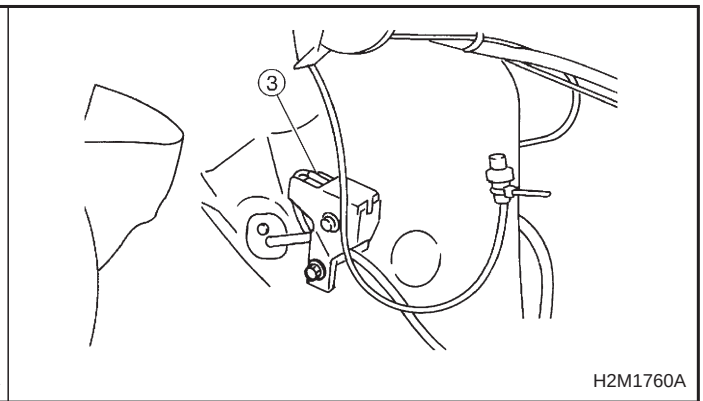
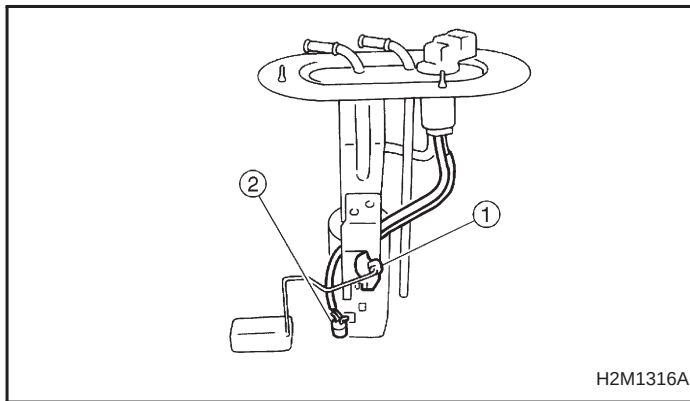
- ⑩ Front catalytic converter
- ⑪ Rear catalytic converter

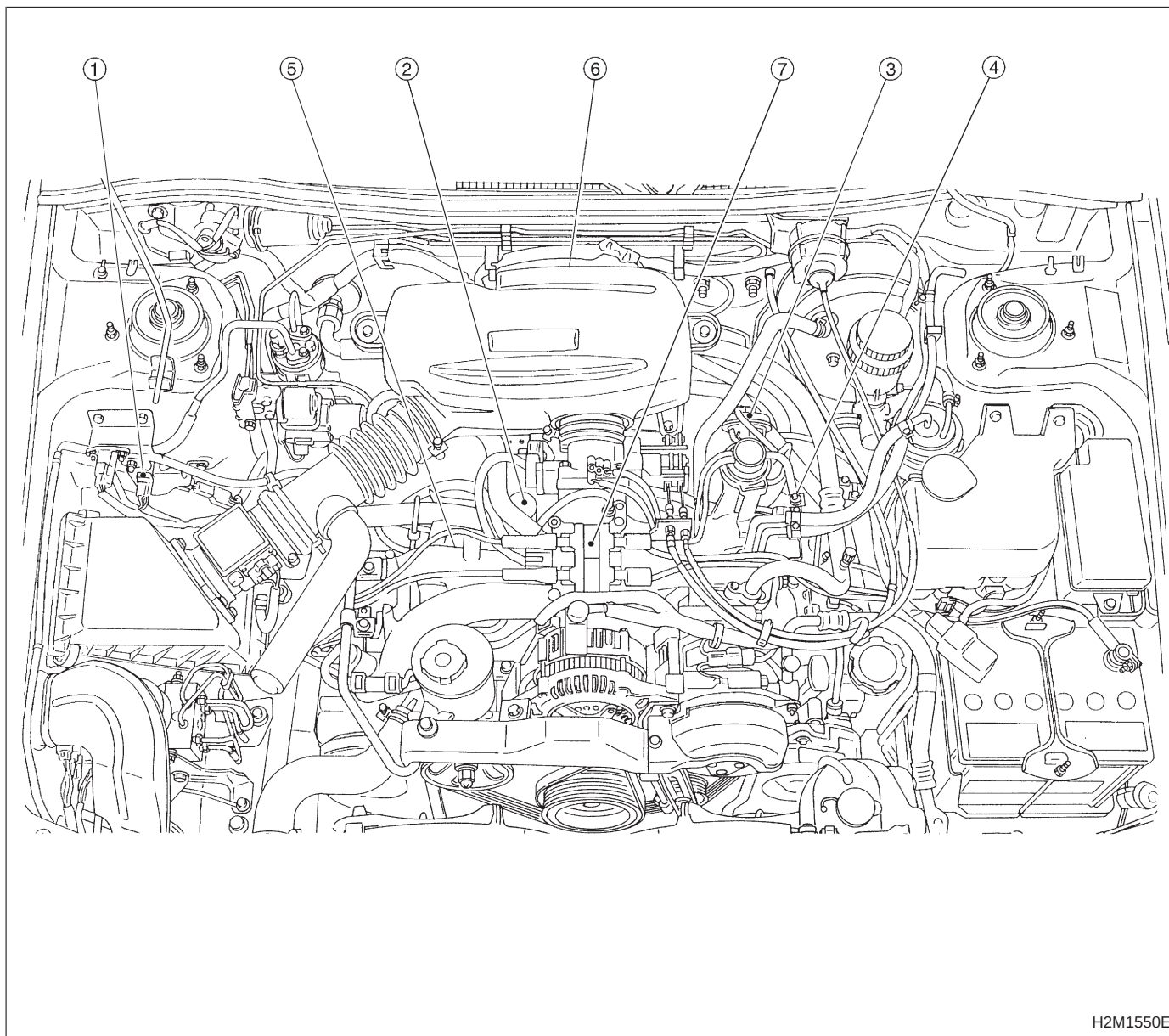




- ① Fuel level sensor
- ② Fuel temperature sensor

- ③ Fuel tank pressure sensor

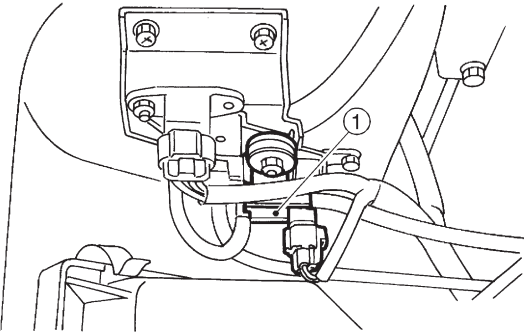
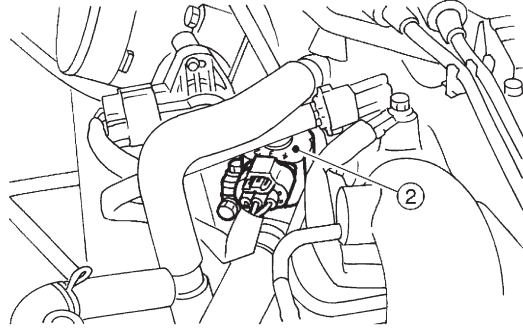
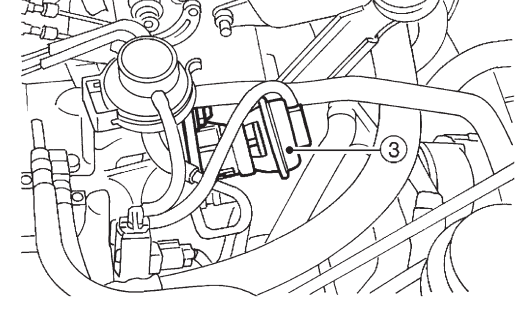
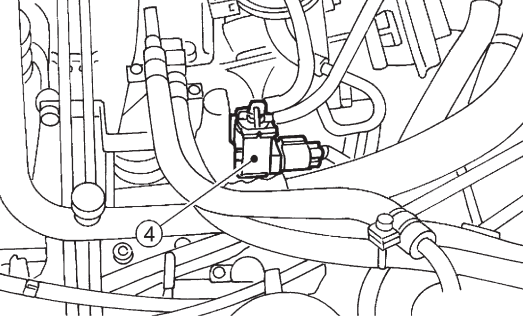
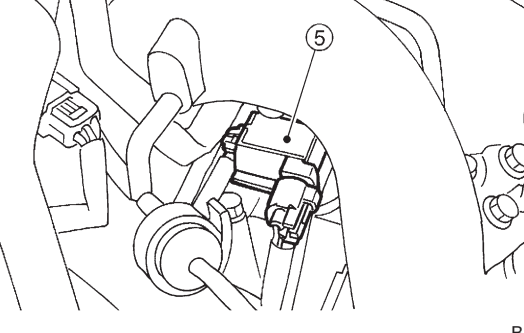
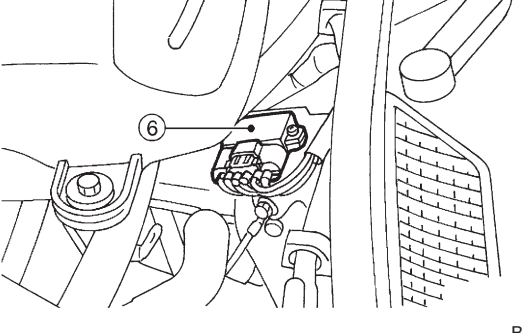
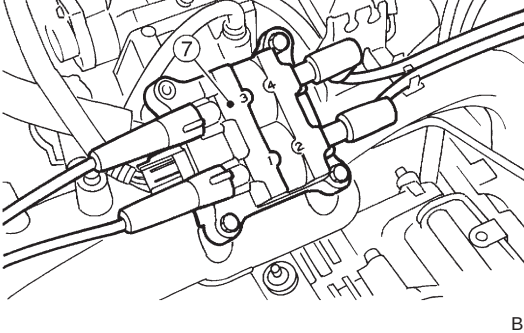


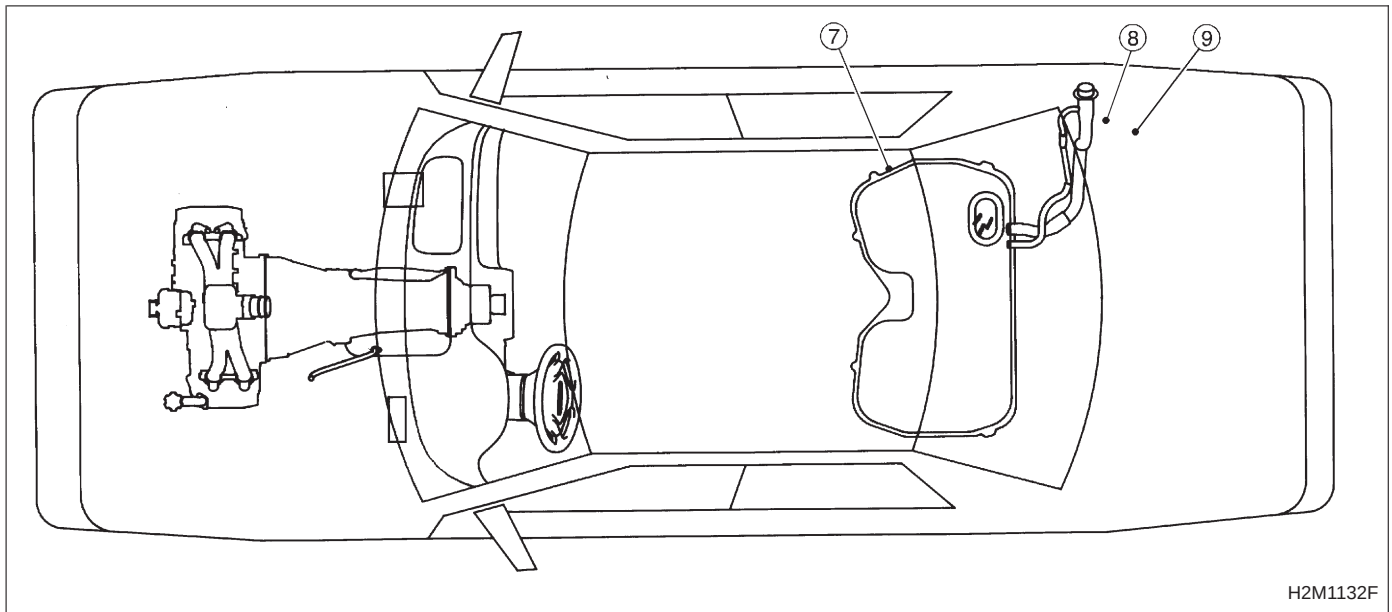
**3. SOLENOID VALVE, EMISSION CONTROL SYSTEM
PARTS AND IGNITION SYSTEM PARTS**

H2M1550E

- ① Pressure sources switching solenoid valve
- ② Idle air control solenoid valve
- ③ EGR valve (AT vehicles)
- ④ EGR control solenoid valve (AT vehicles)

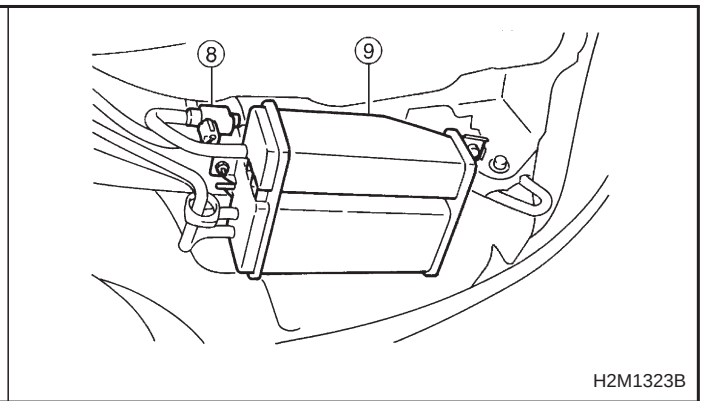
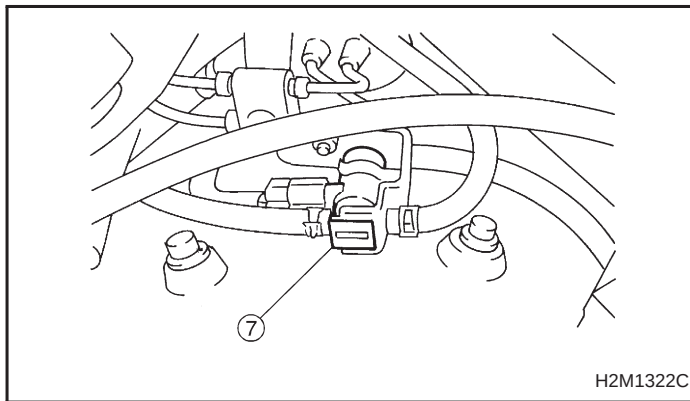
- ⑤ Purge control solenoid valve
- ⑥ Ignitor
- ⑦ Ignition coil

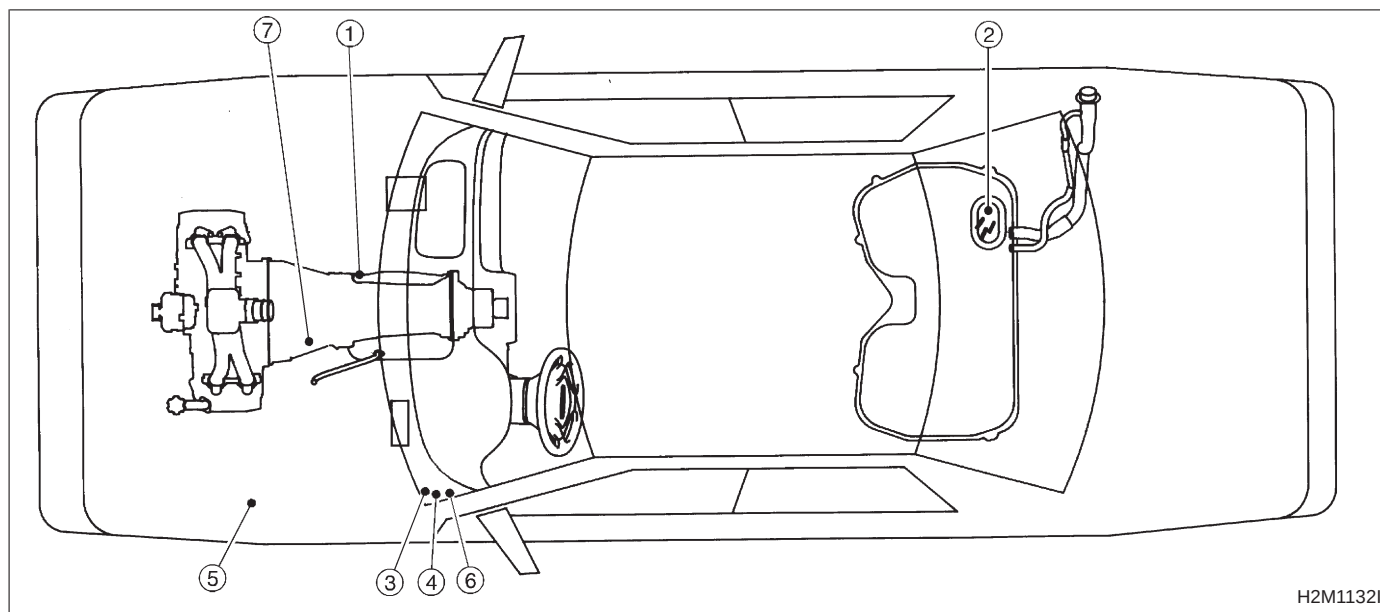
 H2M1484A	 B2M1036A
 B2M1037B	 B2M1038B
 B2M1039A	 B2M1040A
 B2M1041B	SUBARU.



- ⑦ Pressure control solenoid valve
- ⑧ Vent control solenoid valve

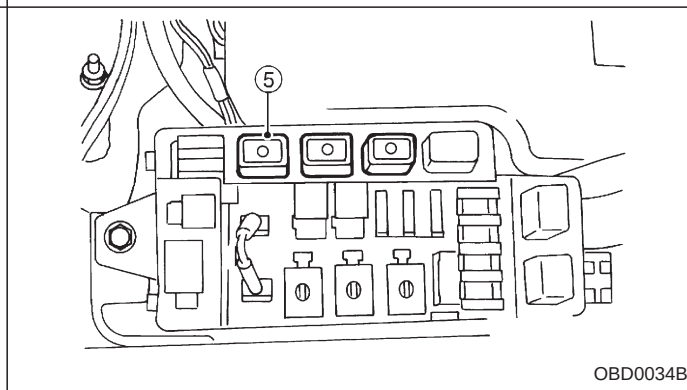
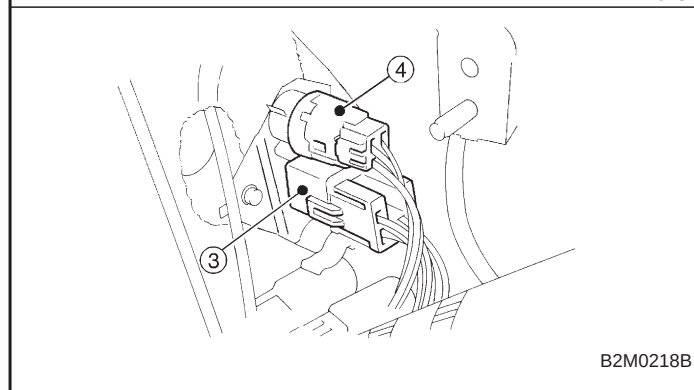
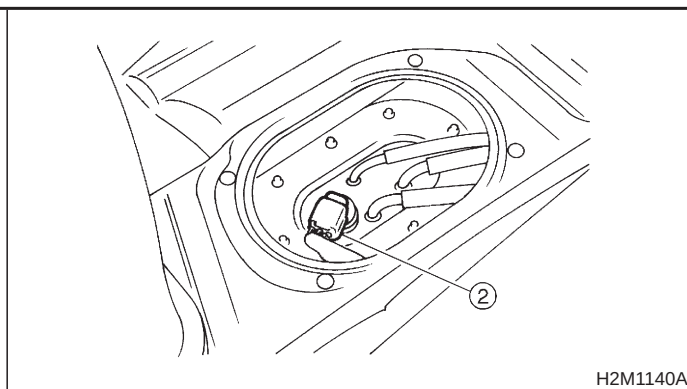
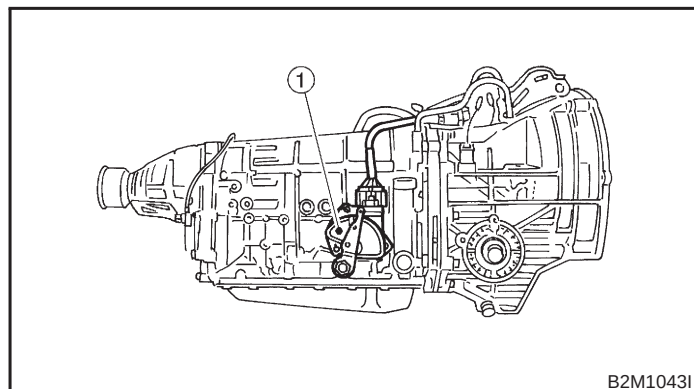
- ⑨ Canister

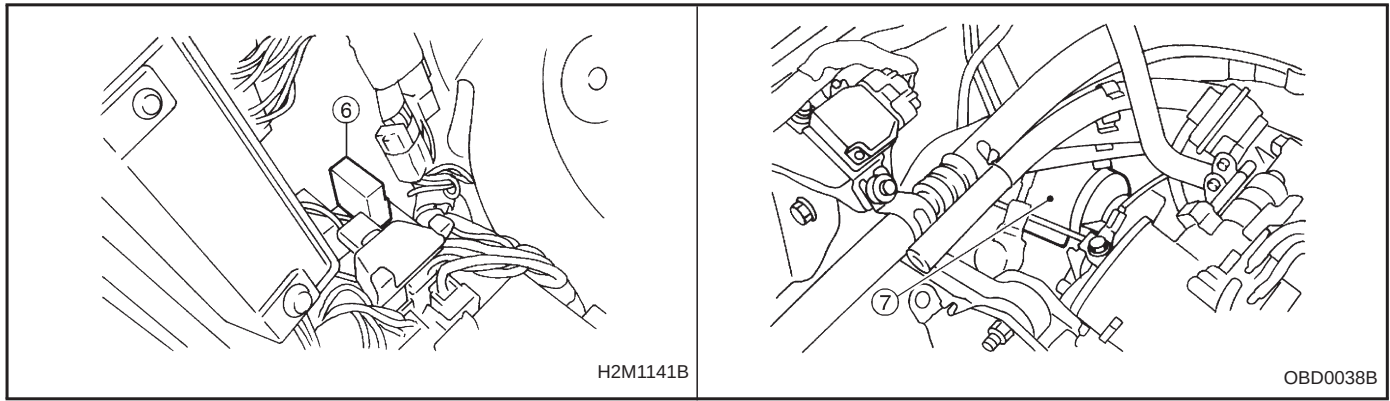


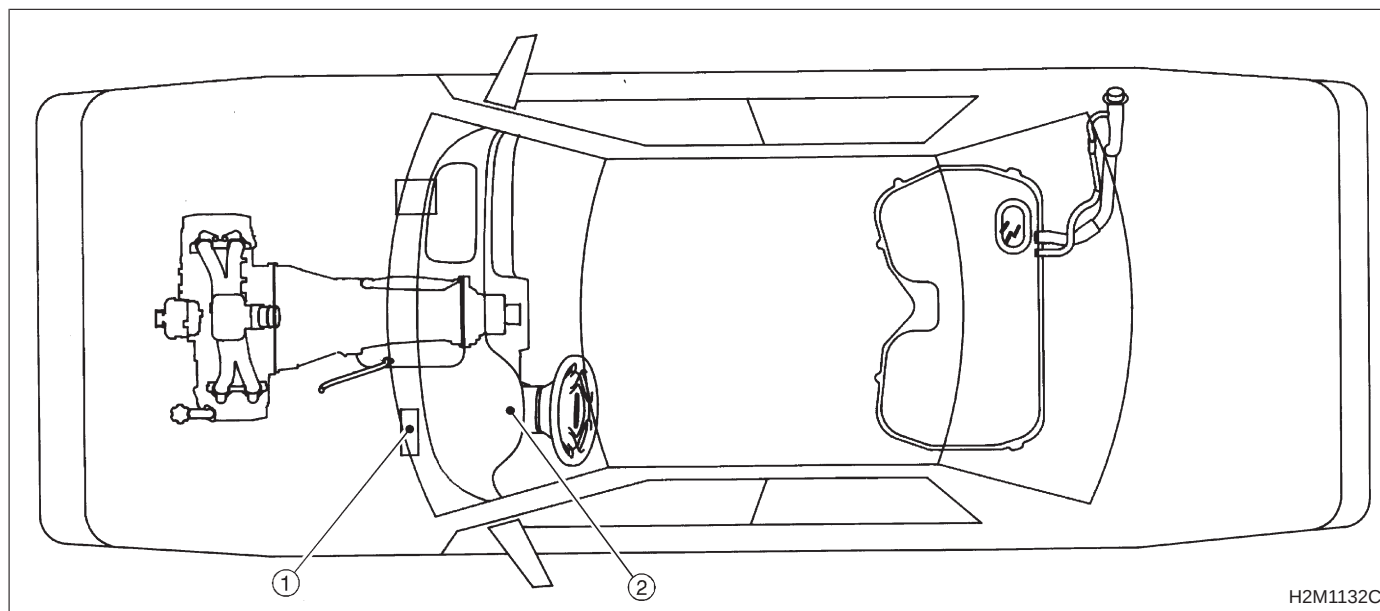


- ① Inhibitor switch
- ② Fuel pump
- ③ Main relay
- ④ Fuel pump relay

- ⑤ Radiator sub fan relay (With A/C models only)
- ⑥ Main fan relay
- ⑦ Starter

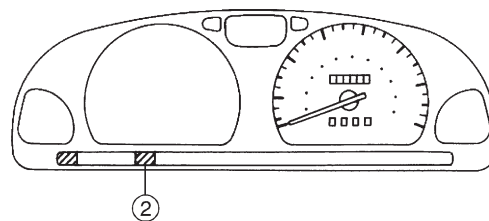
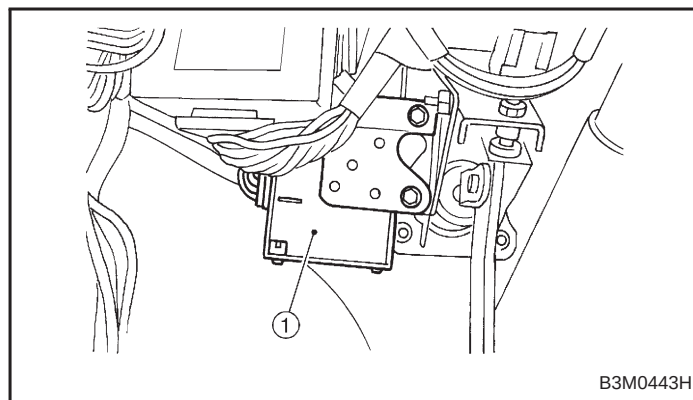
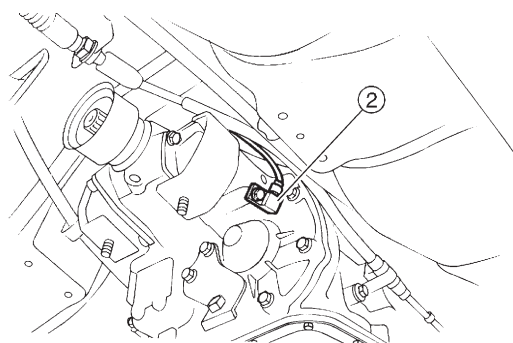
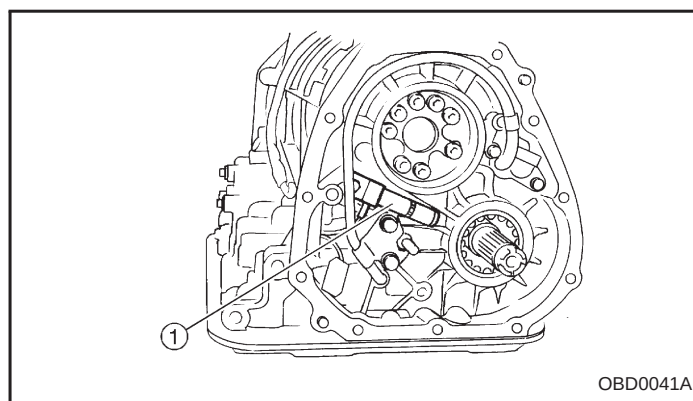




C: TRANSMISSION**1. MODULE**

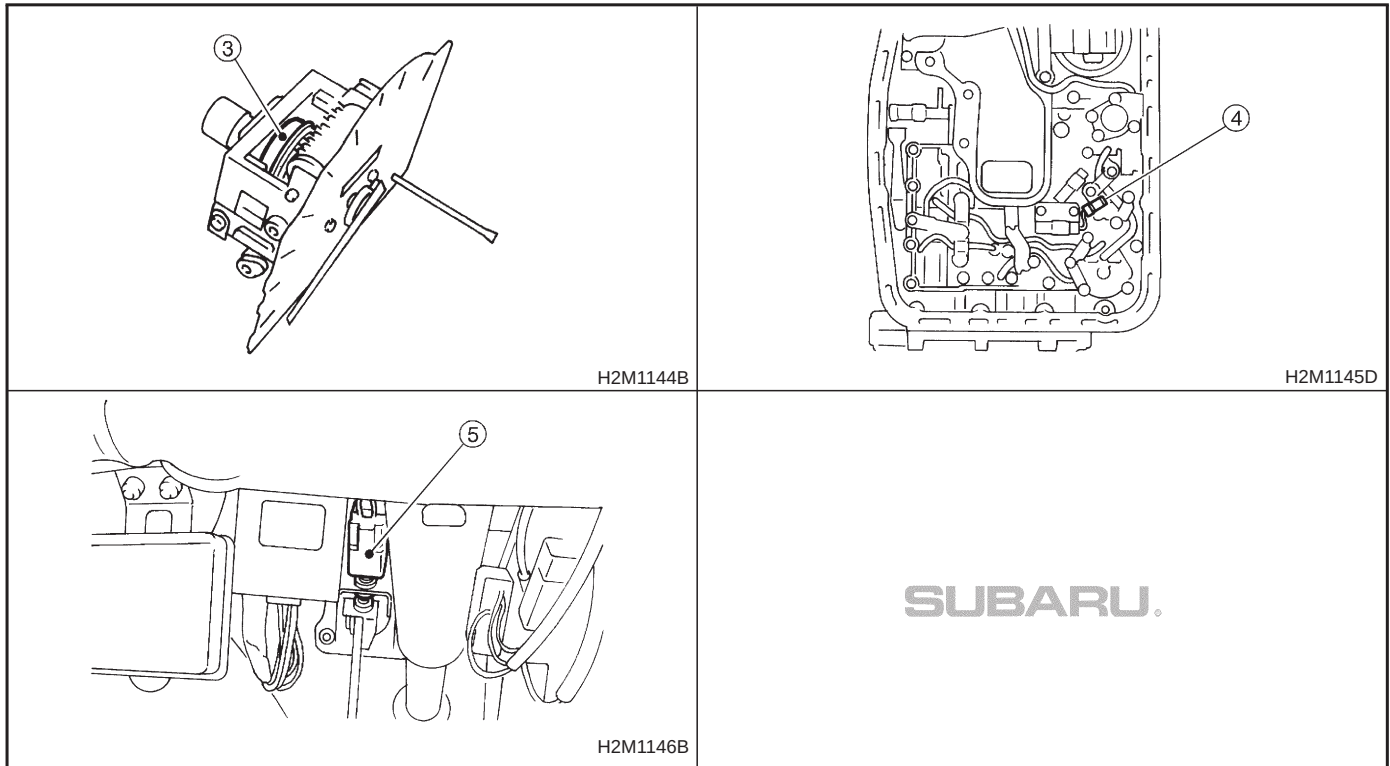
① Transmission Control Module (TCM) (for AT vehicles)

② AT diagnostic indicator light (for AT vehicles)

**2. SENSOR**

① Vehicle speed sensor 1 (for AT FWD vehicles)

② Vehicle speed sensor 1 (for AT AWD vehicles)

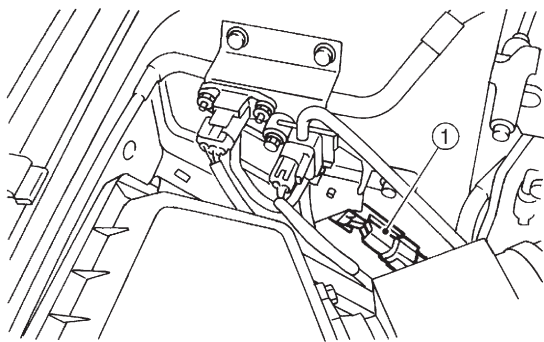


- ③ Vehicle speed sensor 2
- ④ ATF temperature sensor (for AT vehicles)

- ⑤ Brake light switch

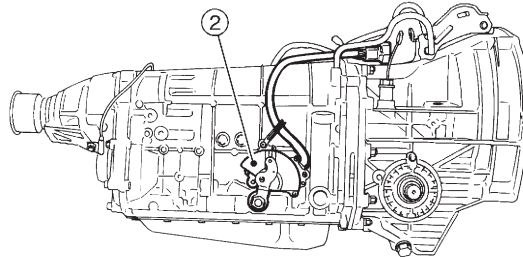
3. SOLENOID VALVE AND RELAY

● For AT vehicles



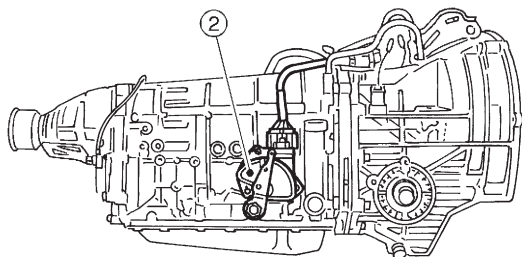
OBD0046B

Aluminum body type

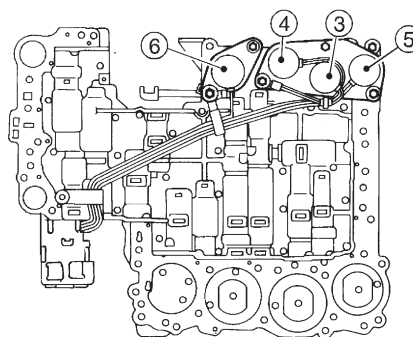


OBD0047D

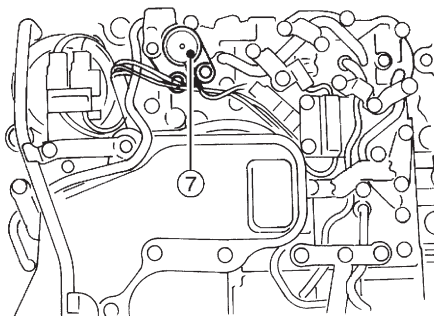
Plastic body type



B2M1043D



OBD0048A



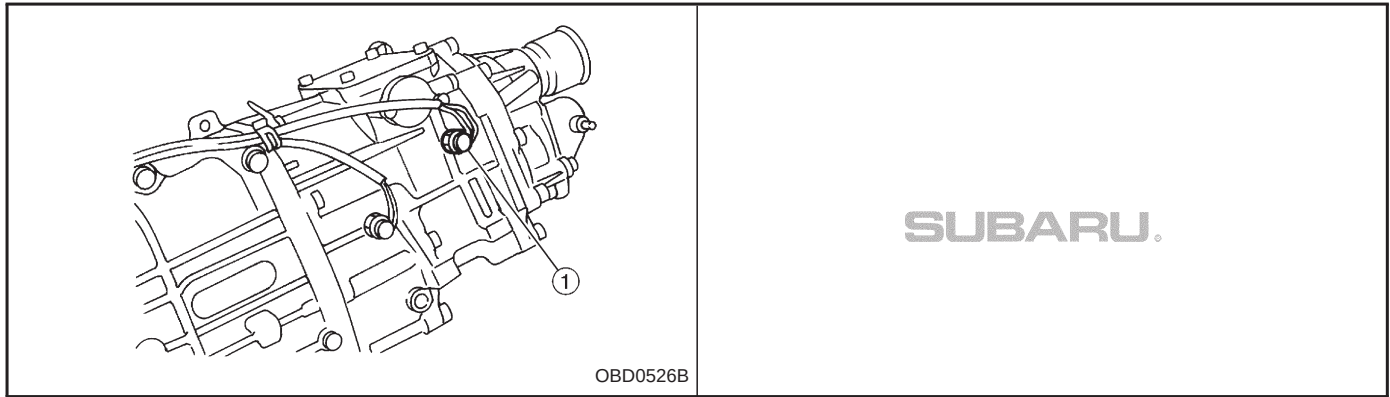
H2M1147A

SUBARU.

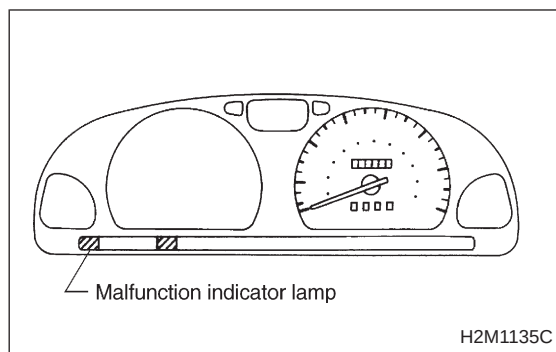
- ① Dropping resistor
- ② Inhibitor switch
- ③ Shift solenoid valve 1
- ④ Shift solenoid valve 2

- 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

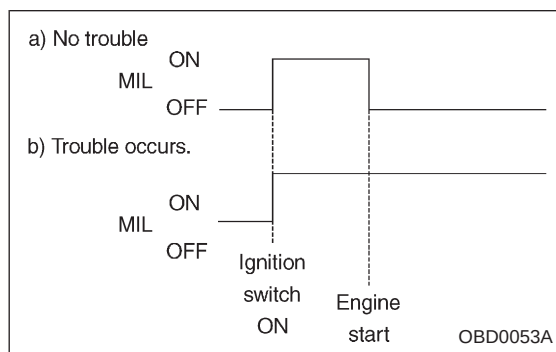
A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

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

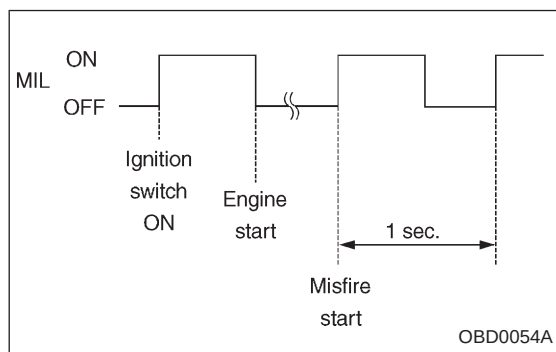
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter illuminates.

NOTE:

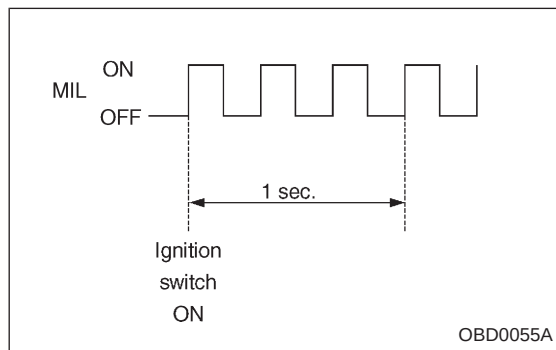
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Ref. to 2-7 [T700].>



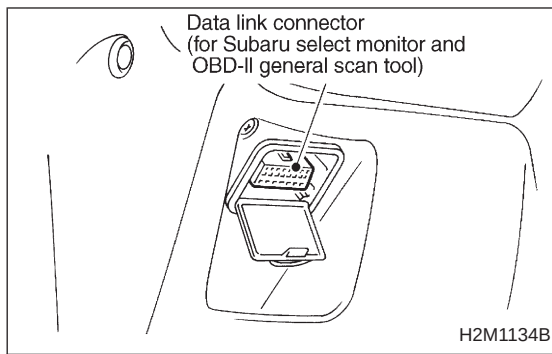
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.



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:

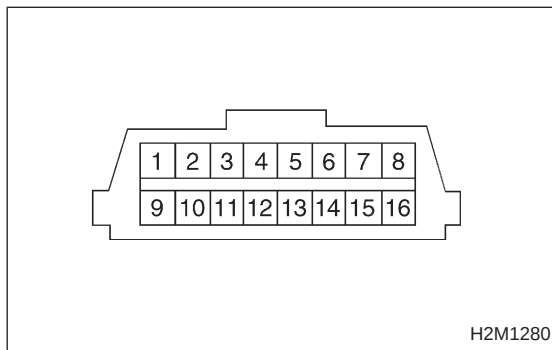
- (1) MODE \$01: Current powertrain diagnostic data
- (2) MODE \$02: Powertrain freeze frame data
- (3) MODE \$03: Emission-related powertrain diagnostic trouble codes
- (4) MODE \$04: Clear/Reset emission-related diagnostic information
- (5) MODE \$05: Oxygen sensor monitoring test results

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 (FOR OBD-II GENERAL SCAN TOOL AND SUBARU SELECT MONITOR)

- 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)

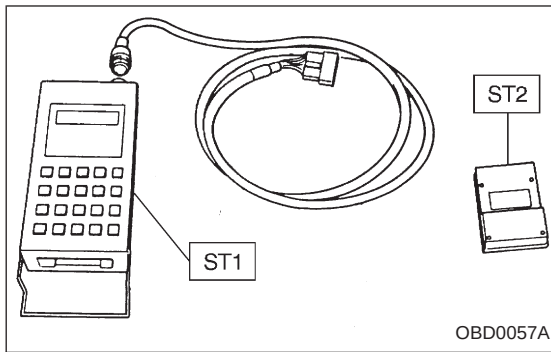
Refers to the mode using oxygen sensor output data while the on-board diagnosis system is performing diagnosis on the oxygen sensor.

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).



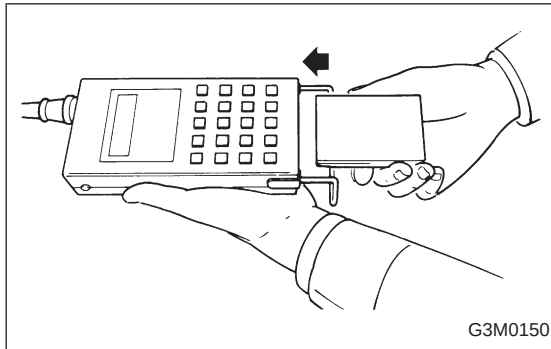
C: SUBARU SELECT MONITOR

1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.

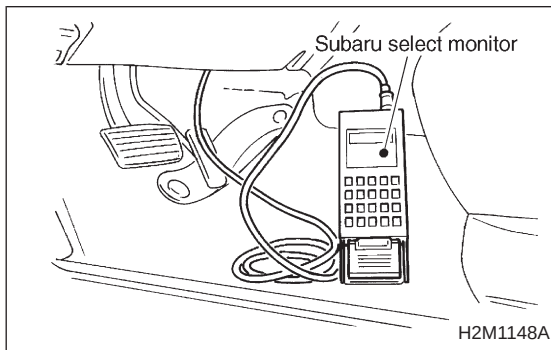
ST1 498307500 SELECT MONITOR KIT

ST2 498346200 CARTRIDGE



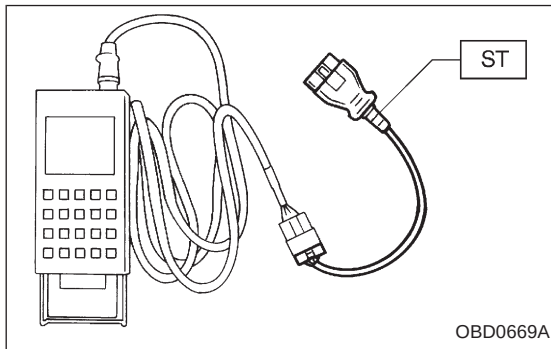
2) Turn ignition switch and Subaru select monitor switch to OFF.

3) Insert cartridge into Subaru select monitor.



4) Connect Subaru select monitor to data link connector.

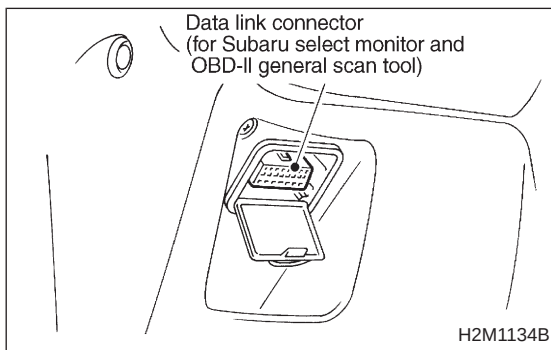
- Using data link connector for Subaru select monitor only, connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



- Using data link connector for Subaru select monitor and OBD-II general scan tool;

(1) Connect ST to Subaru select monitor cable.

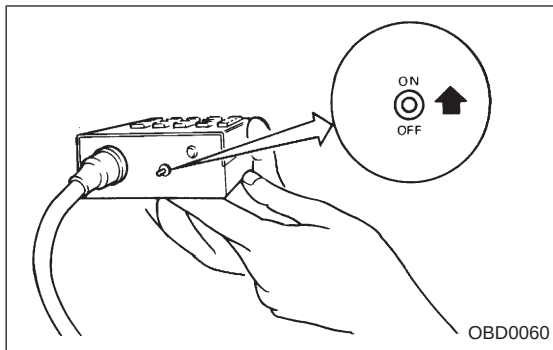
ST 498357200 ADAPTER CABLE



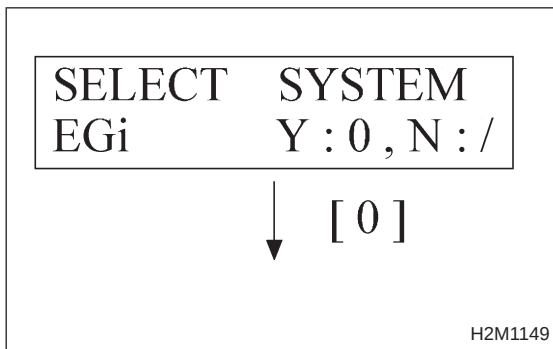
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:

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

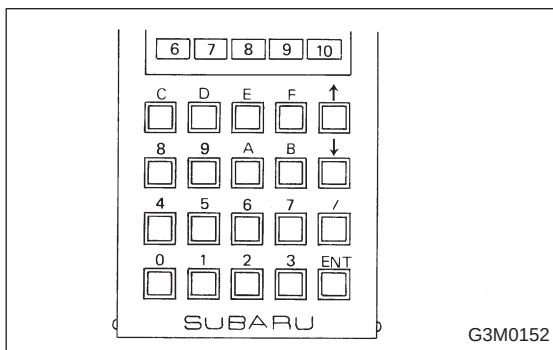


- 5) Turn ignition switch ON (engine OFF) and Subaru select monitor switch ON.
- 6) Using Subaru select monitor, call up diagnostic trouble code(s) and various data, then record them.

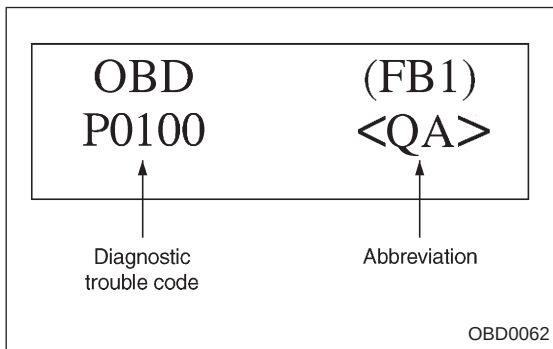


2. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB1)

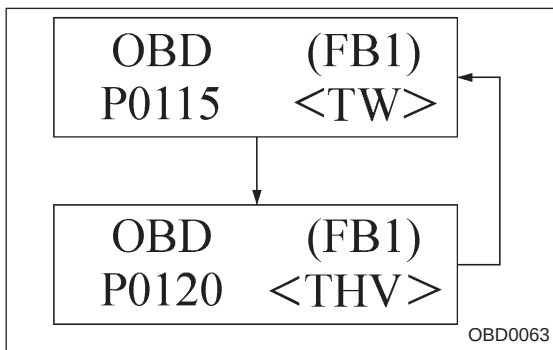
- 1) Select engine mode using function key. Press the function key [0].



- 2) Designate mode using function key. Press [F] [B] [1] [ENT] in that order.



- 3) Ensure diagnostic trouble code(s) is shown.
 - (1) When there is only one diagnostic trouble code.



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

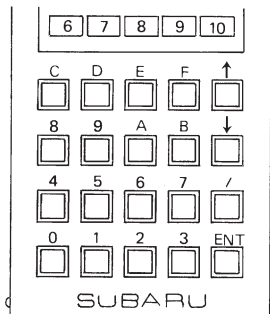
SELECT SYSTEM
EGi Y : 0 , N : /



H2M1149

3. READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE. (FUNCTION MODE)

- 1) Select engine mode using function key.
Press the function key [0].



G3M0152

- 2) Designate mode using function key.

<Ref. to 2-7 [T3C6].>

(Example: Press [F] [0] [1] [ENT] in that order.)

- 3) Ensure data of input or output signal is shown.

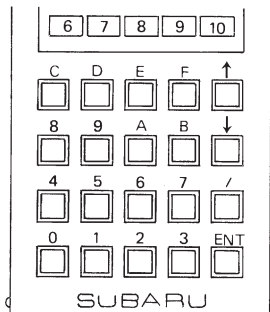
SELECT SYSTEM
EGi Y : 0 , N : /



H2M1149

4. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB2)

- 1) Select engine mode using function key.
Press the function key [0].



G3M0152

- 2) Designate mode using function key.

Press [F] [B] [2] [ENT] in that order.

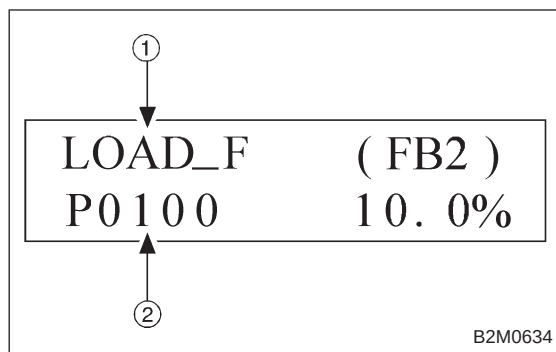
FFCODE (FB2)

NO TROUBLE

B2M0474

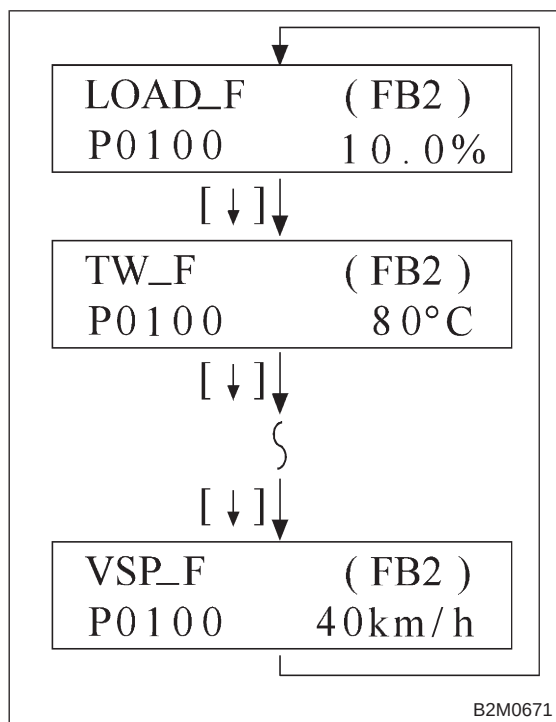
- 3) Ensure freeze frame data(s) is (are) shown.

(1) When no trouble is detected, or after memory is cleared.



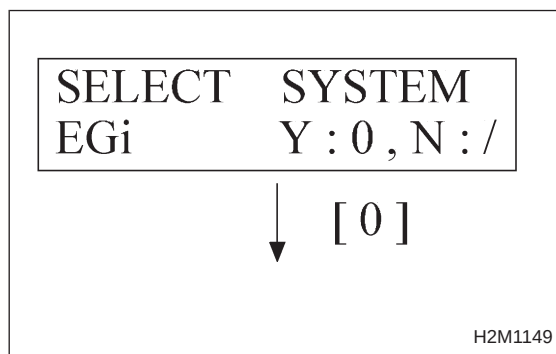
(2) When some trouble is detected.

- ① Abbreviation
- ② Diagnostic trouble code of trouble occurred



NOTE:

Other freeze frame data is shown on display by pushing the function key [↓].



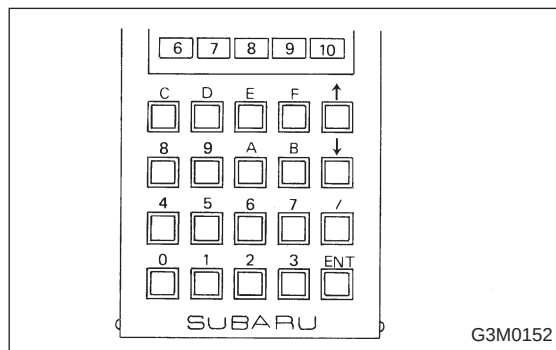
5. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB3)

NOTE:

- For items and contents shown on display, refer to "6. READ DATA FUNCTION KEY LIST FOR ENGINE". <Ref. to 2-7 [T3C6].>
- Freeze frame data will not erase without clearing memory.

1) Select engine mode using function key.
Press the function key [0].

2) Designate mode using function key.
Press [F] [B] [3] [ENT] in that order.



DIAG. I (FB3)

NO TROUBLE

B2M0636

3) Ensure freeze frame data(s) is (are) shown.

(1) When no trouble is detected, or after memory is cleared.

DIAG. I (FB3)

NO TROUBLE

B2M0636

(2) When a trouble occurs but the corresponding item is not displayed.

①

QA_F

(FB3)

P0100

4.55V

②

B2M0638

(3) When only one trouble corresponding to the displayed item has occurred.

① Abbreviation

② Diagnostic trouble code of trouble occurred

QA_F

(FB3)

P0100

4.55V

EGR

(FB3)

P0403

Low

B2M0649

(4) When multiple troubles corresponding to the displayed item are detected.

NOTE:

Freeze frame data is shown on display for 2 seconds at a time.

6. READ DATA FUNCTION KEY LIST FOR ENGINE

Function mode	Contents	Abbreviation	Unit of measure
F00	ROM ID number	YEAR	—
F01	Battery voltage	VB	V
F02	Vehicle speed signal	VSP	km/h, MPH
F03	Engine speed signal	EREV	rpm
F04	Engine coolant temperature signal	TW	°C, °F
F05	Ignition signal	ADVS	deg
F06	Mass air flow signal	QA	g/s, V
F07	Throttle position signal	THV	%, V
F08	Injector pulse width	TIM	mS
F09	Idle air control signal	ISC	%
F10	Load data	LOAD	%
F11	Front oxygen sensor output signal	O2	V
F12	Front oxygen sensor maximum and minimum output signal	O2max - min	V, V
F13	Rear oxygen sensor output signal	RO2	V
F14	Rear oxygen sensor maximum and minimum output signal	RO2max - min	V, V
F17	Short term fuel trim	ALPHA	%
F19	Knock sensor signal	KNOCK	deg
F20	Atmospheric absolute pressure signal	BARO. P	kPa, mmHg
F21	Intake manifold absolute pressure signal	MANI. P	kPa, mmHg
F29	A/F correction (short term trim) by rear oxygen sensor	PHOS	%
F30	Long term fuel trim	KBLRC	%
F31	Long term whole fuel trim	K0	%
F32	Front oxygen sensor heater current	FO2H	A
F33	Rear oxygen sensor heater current	RO2H	A
F35	Purge control solenoid valve duty ratio	CPCD	%
F36	Maximum value of cylinder #1 misfire times during 100 rotations	MF1	%
F37	Maximum value of cylinder #2 misfire times during 100 rotations	MF2	%
F38	Maximum value of cylinder #3 misfire times during 100 rotations	MF3	%
F39	Maximum value of cylinder #4 misfire times during 100 rotations	MF4	%
F42	Maximum and minimum EGR system pressure value (AT vehicles only)	EGR max - min	kPa
F43	Fuel tank pressure signal	TNKP	kPa, mmHg
F44	Fuel temperature signal	TNKT	°C, °F
F45	Fuel level signal	FLEVEL	V
FA0	ON ↔ OFF signal	—	—
FA1	ON ↔ OFF signal	—	—
FA2	ON ↔ OFF signal	—	—
FA3	ON ↔ OFF signal	—	—
FA4	ON ↔ OFF signal	—	—
FA5	ON ↔ OFF signal	—	—
FB0	Diagnostic trouble code (DTC)	INSPECT	—
FB1	Diagnostic trouble code (DTC)	OBD	—

Function mode	Contents	Abbreviation	Unit of measure
FB2	Load data (Freeze frame data)	LOAD-F	%
	Engine coolant temperature signal (Freeze frame data)	TW-F	°C
	Short term fuel trim (Freeze frame data)	ALPH-F	%
	Long term fuel trim (Freeze frame data)	KBLR-F	%
	Intake manifold absolute pressure signal (Freeze frame data)	MANI-F	kPa
	Engine speed signal (Freeze frame data)	EREV-F	rpm
	Vehicle speed signal (Freeze frame data)	VSP-F	km/h
FB3	Mass air flow signal (Freeze frame data)	QA-F (P0100)	V
	Pressure signal (Freeze frame data)	PS-F (P0105)	V
	Pressure signal (Freeze frame data)	PR-F (P0106)	V
	Engine coolant temperature signal (Freeze frame data)	TW-F (P0115)	V
	Throttle position signal (Freeze frame data)	THV-F (P0120)	V
	EGR control solenoid valve signal (Freeze frame data)	EGR (P0403)	—*1
	Purge control solenoid valve signal (Freeze frame data)	CPC (P0443)	—*1
	Start switch signal (Freeze frame data)	STSW (P1100)	—*1
	Pressure sources switching solenoid valve signal (Freeze frame data)	BR1 (P1102)	—*1
	Radiator fan relay 1 signal (Freeze frame data)	FAN1 (P1500)	—*1
FC0	Clear memory	—	—
FD01	Compulsory fuel pump relay operation check	FUEL PUMP	—
FD02	Compulsory purge control solenoid valve operation check	CPC SOL	—
FD03	Compulsory radiator fan relay operation check	RAD FAN	—
FD04	Compulsory A/C relay operation check	A/C RELAY	—
FD05	Compulsory EGR control solenoid valve operation check	EGR SOL	—
FD07	Compulsory pressure control solenoid valve operation check	PCV SOL	—
FD08	Compulsory vent control solenoid valve operation check	VENT SOL	—
FD09	Compulsory FICD solenoid valve operation check	FICD SOL	—
FD10	Compulsory pressure sources switching solenoid valve operation check	BR SOL	—

NOTE:

● Subaru select monitor is also available for monitoring information other than that used for check and repair of the vehicle.

● F42 (Maximum and minimum EGR system pressure value) will not read accurately until the EGR flow diagnosis terminates.

EGR flow diagnosis terminates when LED No. 2 illuminates at function mode FA4.

● *1: "Hi" or "Low" is shown instead of measured value.

● Because ASV solenoid valve and air injection system diagnosis solenoid valve are not installed, FD06 and FD11 will be displayed but non-functional.

1 9 9 7

(F 0 0)

2 . 2

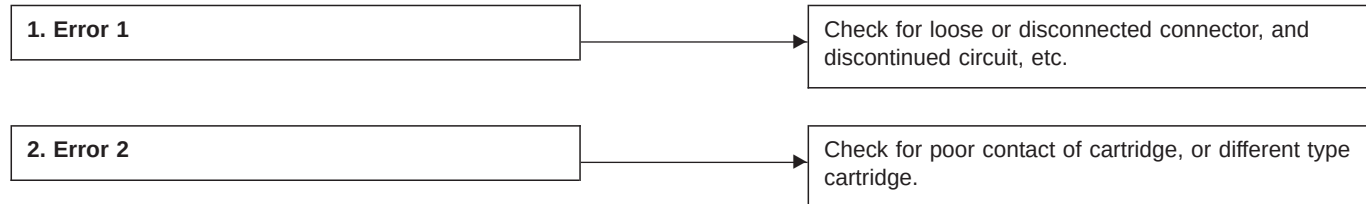
SOHC

B2M1045

7. FUNCTION MODE: F00
— ROM ID NUMBER (YEAR) —
CONDITION:
Ignition switch “ON”

SPECIFIED DATA:
Presentation display

- Probable cause (Item outside “specified data”)



VB

(F01)

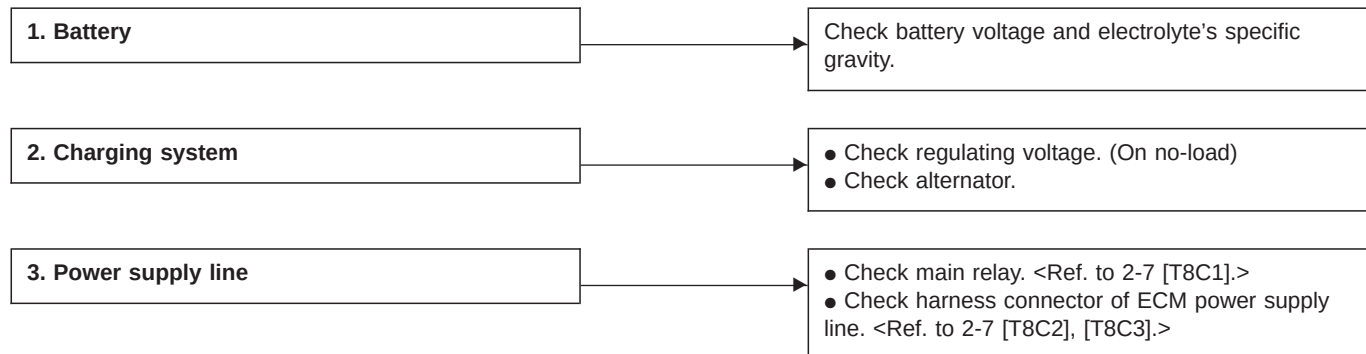
12.4 V

B2M0270

8. FUNCTION MODE: F01
— BATTERY VOLTAGE (VB) —
CONDITION:
(1) Ignition switch “ON”
(2) Idling after warm-up

SPECIFIED DATA:
(1) 11±1 V
(2) 13±1 V

- Probable cause (Item outside “specified data”)



VSP (F02)

24km/h 15MPH

B2M0754

9. FUNCTION MODE: F02**— VEHICLE SPEED SIGNAL (VSP) —**

- Vehicle speed is indicated in kilometer per hour (km/h) and mile per hour (MPH) at the same time.

EREV (F03)

1500 rpm

B2M0478

10. FUNCTION MODE: F03**— ENGINE SPEED SIGNAL (EREV) —**

TW (F04)

80 ° C 176 ° F

B2M0479

11. FUNCTION MODE: F04**— ENGINE COOLANT TEMPERATURE SIGNAL (TW)****—**

- Engine coolant temperature is indicated in “°C” and “°F” at the same time.

ADVS (F05)

15 deg

B2M0480

12. FUNCTION MODE: F05**— IGNITION SIGNAL (ADVS) —****NOTE:**

The ignition timing value displayed in mode F05 is a value computed by ECM and will not always correspond with the value measured with a timing light.

QA (F06)

1 . 67g / s 2 . 02V

B2M0481

13. FUNCTION MODE: F06**— MASS AIR FLOW SIGNAL (QA) —**

- Mass air flow and voltage input from mass air flow sensor are shown on display at the same time.

THV (F07)

0% 0.21V

B2M0482

14. FUNCTION MODE: F07**— THROTTLE POSITION SIGNAL (THV) —**

- Throttle position is indicated in percentage (%) and voltage (V) at the same time.

NOTE:

Be sure that the displayed value changes smoothly when changing throttle valve from fully closed to fully opened.

TIM (F08)

2.82 mS

B2M0483

15. FUNCTION MODE: F08**— INJECTOR PULSE WIDTH (TIM) —**

ISC (F09)

35.7 %

B2M0484

16. FUNCTION MODE: F09**— IDLE AIR CONTROL SIGNAL (ISC) —**

LOAD (F10)

10.0 %

B2M0485

17. FUNCTION MODE: F10**— LOAD DATA (LOAD) —**

O2 (F11)

0.60 V

B2M0486

18. FUNCTION MODE: F11**— FRONT OXYGEN SENSOR OUTPUT SIGNAL (O2)****—**

O2max - min (F12)

0 . 80V 0 . 10V

B2M0487

19. FUNCTION MODE: F12

— FRONT OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (FO2MAX - MIN) —

- Front oxygen sensor maximum and minimum output signals are indicated at the same time.

RO2 (F13)

0 . 60 V

B2M0488

20. FUNCTION MODE: F13

— REAR OXYGEN SENSOR OUTPUT SIGNAL (RO2)

—

RO2max - min (F14)

0 . 80V 0 . 10V

B2M0489

21. FUNCTION MODE: F14

— REAR OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (RO2MAX - MIN) —

- Rear oxygen sensor maximum and minimum output signals are indicated at the same time.

ALPHA (F17)

— 0 . 8 %

B2M0490

22. FUNCTION MODE: F17

— SHORT TERM FUEL TRIM [A/F CORRECTION COEFFICIENT] (ALPHA) —

KNOCK (F19)

3 . 0 deg

B2M0491

23. FUNCTION MODE: F19

— KNOCK SENSOR SIGNAL [IGNITION TIMING CORRECTION COEFFICIENT] (KNOCK) —

BARO. P (F 2 0)

1 0 0 kPa 752 mmHg

B2M0755

24. FUNCTION MODE: F20

— ATMOSPHERIC ABSOLUTE PRESSURE SIGNAL (BARO. P) —

- Atmospheric absolute pressure is indicated in “kPa” and “mmHg” at the same time.

MANI. P (F 2 1)

2 9 kPa 218 mmHg

B2M0756

25. FUNCTION MODE: F21

— INTAKE MANIFOLD ABSOLUTE PRESSURE SIGNAL (MANI. P) —

- Intake manifold absolute pressure is indicated in “kPa” and “mmHg” at the same time.

PHOS (F29)

0 . 7 8 %

B2M0494

26. FUNCTION MODE: F29

— A/F CORRECTION COEFFICIENT [SHORT TERM TRIM] BY REAR OXYGEN SENSOR (PHOS) —

KBLRC (F30)

5 . 5 %

B2M0495

27. FUNCTION MODE: F30

— LONG TERM FUEL TRIM [A/F LEARNING CORRECTION COEFFICIENT] (KBLRC) —

K0 (F31)

0 . 0 %

B2M0496

28. FUNCTION MODE: F31

— LONG TERM FUEL TRIM WHOLE [A/F LEARNING CONTROL COEFFICIENT] (K0) —

FO2H (F32)

1 . 00 A

B2M0497

29. FUNCTION MODE: F32
— FRONT OXYGEN SENSOR HEATER CURRENT
(FO2H) —

RO2H (F33)

1 . 00 A

B2M0498

30. FUNCTION MODE: F33
— REAR OXYGEN SENSOR HEATER CURRENT
(RO2H) —

CPCD (F35)

0%

H2M1325

31. FUNCTION MODE: F35
— PURGE CONTROL SOLENOID VALVE DUTY RATIO
(CPCD) —

MF1 (F36)

0 %

B2M0499

32. FUNCTION MODE: F36
— MAXIMUM VALUE OF CYLINDER #1 MISFIRE RATE
DURING 100 ROTATIONS (MF1) —

MF2 (F37)

0 %

B2M0500

33. FUNCTION MODE: F37
— MAXIMUM VALUE OF CYLINDER #2 MISFIRE RATE
DURING 100 ROTATIONS (MF2) —

MF3 (F38)

0 %

B2M0501

34. FUNCTION MODE: F38
— MAXIMUM VALUE OF CYLINDER #3 MISFIRE RATE DURING 100 ROTATIONS (MF3) —

MF4 (F39)

0 %

B2M0502

35. FUNCTION MODE: F39
— MAXIMUM VALUE OF CYLINDER #4 MISFIRE RATE DURING 100 ROTATIONS (MF4) —

EGRmax-min (F4 2)

1 0 0 kPa 4 kPa

B2M0759

36. FUNCTION MODE: F42
— MAXIMUM AND MINIMUM EGR SYSTEM PRESSURE VALUE [AT VEHICLES] (EGRMAX-MIN) —
● Maximum and minimum EGR system pressure value are indicated at the same time.

TNKP (F43)

0 . 1 0 kPa 1 mmHg

H2M1326

37. FUNCTION MODE: F43
— FUEL TANK PRESSURE SIGNAL (TNKP) —

TNKT (F44)

2 0 ° C 6 8 ° F

H2M1308

38. FUNCTION MODE: F44
— FUEL TEMPERATURE SIGNAL (TNKT) —

FLEVEL (F45)

2.50V

H2M1327

39. FUNCTION MODE: F45
— FUEL LEVEL SIGNAL (FLEVEL) —

40. FA MODE FOR ENGINE

Function mode	LED No.	Contents	Display	LED "ON" requirements
FA0	3	Neutral switch	NT	When neutral position signal is entered.
	7	Test mode connector	UD	When test mode connector is connected.
	8	AT/MT identification signal	AT	When AT identification signal is entered.
	9	Ignition switch	IG	When ignition switch is turned ON.
FA1	1	Radiator fan relay 2	R2	When radiator fan relay 2 is in function.
	2	Knock signal	KS	When knock signal is entered.
	3	Purge control solenoid valve	CN	When purge control solenoid valve is in function.
	4	Fuel pump relay	FP	When fuel pump relay is in function.
	6	Radiator fan relay 1	R1	When radiator fan relay 1 is in function.
	7	Air conditioner relay	AR	When air conditioner relay is in function.
	8	Air conditioner switch	AC	When air conditioner switch is turned ON.
FA2	1	FICD solenoid valve	AF	When FICD solenoid valve is in function.
	2	AEC signal	EC	When AEC signal is entered.
	3	EAM signal	AM	When EAM signal is gone out.
	4	AEB signal	EB	When AEB signal is entered.
	6	AET signal	ET	When AET signal is entered.
	7	Engine torque control signal	TR	When engine torque control signal is entered.
FA3	7	Pressure sources switching solenoid valve	BR	When pressure sources switching solenoid valve is in function.
FA4	1	Catalyst	CA	When diagnosis of catalyzer is finished.
	2	EGR system	E1	When diagnosis of EGR system is finished.
	3	Federal spec. vehicle identification signal	FC	When Federal spec. vehicle identification signal is entered.
	8	Rear oxygen sensor signal	OR	When rear oxygen sensor mixture ratio is rich.
	9	Front oxygen sensor signal	O2	When front oxygen sensor mixture ratio is rich.
FA5	6	Vent control solenoid valve	AL	When vent control solenoid valve is in function.
	7	EGR solenoid valve	ER	When EGR solenoid valve is in function.
	8	Pressure control solenoid valve	PC	When pressure control solenoid valve is in function.

LED No.	Signal name	Display
1	—	—
2	—	—
3	Neutral switch	NT
4	—	—
5	—	—
6	—	—
7	Test mode connector	UD
8	Identification of AT model	AT
9	Ignition switch	IG
0	—	—

—	—	NT	—	—
—	UD	AT	IG	—

1	2	3	4	5
6	7	8	9	0

LED No.	Signal name	Display
1	Radiator fan relay 2	R2
2	Knock signal	KS
3	Purge control solenoid valve	CN
4	Fuel pump relay	FP
5	—	—
6	Radiator fan relay 1	R1
7	A/C relay	AR
8	A/C switch	AC
9	—	—
0	—	—

R2	KS	CN	FP	—
R1	AR	AC	—	—

1	2	3	4	5
6	7	8	9	0

41. FUNCTION MODE: FA0**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 3 ● On MT model, gear position is in neutral.
 ● On AT model, shift position is in “P” or “N”.

LED No. 7 Test mode connector is connected.

LED No. 8 Vehicle is AT model.

LED No. 9 Ignition switch is turned ON.

42. FUNCTION MODE: FA1**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 1 Radiator fan relay 2 is turned ON.

LED No. 2 Engine is knocking.

LED No. 3 Purge control solenoid valve is in function.

LED No. 4 Fuel pump relay is turned ON.

LED No. 6 Radiator fan relay 1 is turned ON.

LED No. 7 A/C relay is turned ON.

LED No. 8 A/C switch is turned ON.

NOTE:

● When LED No. 1, 3, 4, 6 and 7 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

● When LED No. 4 illuminates for only 2 seconds after the ignition switch is turned to ON, (and then goes out), the corresponding part is functioning properly.

● LED No. 3 is applicable only to the models not equipped with enhanced evaporative emission control system.

LED No.	Signal name	Display
1	FICD solenoid valve	AF
2	AEC signal	EC
3	EAM signal	AM
4	AEB signal	EB
5	—	—
6	AET signal	ET
7	Engine torque control signal	TR
8	—	—
9	—	—
0	—	—

AF	EC	AM	EB	—
ET	TR	—	—	—

1	2	3	4	5
6	7	8	9	0

LED No.	Signal name	Display
1	—	—
2	—	—
3	—	—
4	—	—
5	—	—
6	—	—
7	Pressure sources switching solenoid valve	BR
8	—	—
9	—	—
0	—	—

—	—	—	—	—
—	BR	—	—	—

1	2	3	4	5
6	7	8	9	0

43. FUNCTION MODE: FA2

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.

LED No. 1 FICD solenoid valve is in function.

LED No. 2 ECM entered the AEC signal emitted from TCS C/M.

LED No. 3 EAM signal goes out.

LED No. 4 ECM entered the AEB signal emitted from TCS C/M.

LED No. 6 ECM entered the AET signal emitted from TCS C/M.

LED No. 7 ECM entered the torque control signal emitted from TCM.

NOTE:

When LED No. 1 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

44. FUNCTION MODE: FA3

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.

LED No. 7 Pressure sources switching solenoid valve is in function.

NOTE:

When LED No. 7 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

LED No.	Signal name	Display
1	Catalyst	CA
2	EGR system	E1
3	Federal spec. vehicle identification signal	FC
4	—	—
5	—	—
6	—	—
7	—	—
8	Rear oxygen sensor signal	OR
9	Front oxygen sensor signal	O2
0	—	—

CA	E1	FC	—	—
—	—	OR	O2	—

1	2	3	4	5
6	7	8	9	0

LED No.	Signal name	Display
1	—	—
2	—	—
3	—	—
4	—	—
5	—	—
6	Vent control solenoid valve	AL
7	EGR solenoid valve	ER
8	Pressure control solenoid valve	PC
9	—	—
0	—	—

—	—	—	—	—
AL	ER	PC	—	—

1	2	3	4	5
6	7	8	9	0

45. FUNCTION MODE: FA4**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 1 Diagnosis of catalyzer is finished.

LED No. 2 Diagnosis of EGR system is finished.

LED No. 3 Vehicle is Federal spec. vehicles.

LED No. 8 Rear oxygen sensor mixture ratio is rich.

LED No. 9 Front oxygen sensor mixture ratio is rich.

46. FUNCTION MODE: FA5**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 6 Vent control solenoid valve is in function.

LED No. 7 EGR solenoid valve is in function.

LED No. 8 Pressure control solenoid valve is in function.

NOTE:

When LED No. 6, 7 and 8 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

47. FB MODE FOR ENGINE

Function mode	Abbreviation	Contents	Contents of display	Page
FB0	INSPECT	On-board diagnostics (Inspection)	Current trouble code indicated by on-board diagnostics after clear memory.	67 <Ref. to 2-7 [T3E0].>
FB1	OBD	On-board diagnostics (Read data)	Current trouble code indicated by on-board diagnostics.	40 <Ref. to 2-7 [T3C2].>
FB2	LOAD-F	Load data	● Freeze frame data ● Data stored at the time of trouble occurrence, is shown on display.	41 <Ref. to 2-7 [T3C4].>
	TW-F	Engine coolant temperature signal		
	ALPH-F	Throttle position signal		
	KBLR-F	Long term fuel trim		
	MANI-F	Intake manifold absolute pressure signal		
	EREV-F	Engine speed signal		
	VSP-F	Vehicle speed signal		
FB3	QA-F (P0100)	Mass air flow signal	● Freeze frame data ● Data stored at the time of trouble occurrence, is shown on display.	42 <Ref. to 2-7 [T3C5].>
	PS-F (P0105)	Pressure signal		
	PR-F (P0106)	Pressure signal		
	TW-F (P0115)	Engine coolant temperature signal		
	THV-F (P0120)	Throttle position signal		
	EGR (P0403)	EGR control solenoid valve signal		
	CPC (P0443)	Purge control solenoid valve signal		
	STSW (P1100)	Start switch signal		
	BR1 (P1102)	Pressure sources switching solenoid valve signal		
	FAN1 (P1500)	Radiator fan relay 1 signal		

48. FC MODE FOR ENGINE

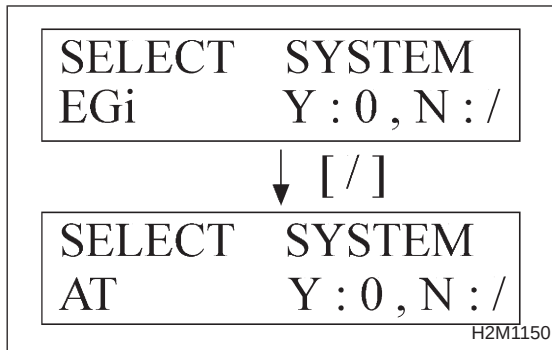
Function mode	Abbreviation	Contents	Contents of display	Page
FC0	MEMORY CLR	Back-up memory clear	Function of clearing trouble code stored in memory.	66 <Ref. to 2-7 [T3D0].>

49. FD MODE FOR ENGINE

Function mode	Abbreviation	Contents	Contents of display	Page
FD01	FUEL PUMP	Compulsory valve operation check	Function of checking operation of fuel pump relay, purge control solenoid valve, radiator fan relay, A/C relay, EGR control solenoid valve, pressure control solenoid valve, vent control solenoid valve and pressure sources switching solenoid valve.	72 <Ref. to 2-7 [T3F0].>
FD02	CPC SOL			
FD03	RAD FAN			
FD04	A/C RELAY			
FD05	EGR SOL			
FD07	PCV SOL			
FD08	VENT SOL			
FD09	FICD SOL			
FD10	BR SOL			

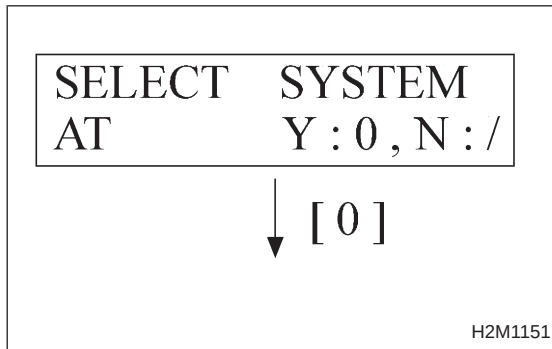
NOTE:

Because ASV solenoid valve and air injection system diagnosis solenoid valve are not installed, FD06 and FD11 will be displayed but non-functional.

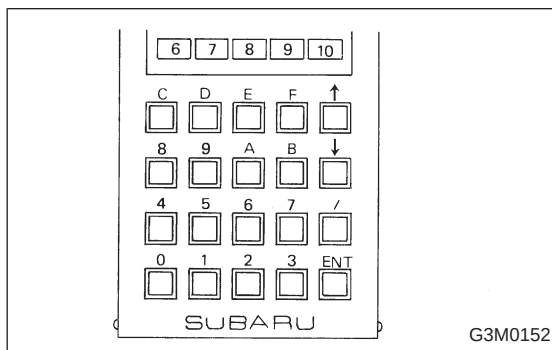


50. READ CURRENT DATA SHOWN ON DISPLAY FOR AT. (FUNCTION MODE)

1) Select AT mode using function key.
Press the function key [/], and change to AT mode.



2) Press the function key [0].



3) Designate mode using function key.

<Ref. to 2-7 [T3C51].>

(Example: Press [F] [0] [2] [ENT] in that order.)

4) Ensure data of input or output signal is shown.

51. READ DATA FUNCTION KEY LIST FOR AT

Function mode	Contents	Abbr.	Unit
F00	Mode display	E-4AT	—
F01	Battery voltage	VB	V
F02	Vehicle speed sensor 1 signal	VSP1	m/h
F03	Vehicle speed sensor 1 signal	VSP1	km/h
F04	Vehicle speed sensor 2 signal	VSP2	m/h
F05	Vehicle speed sensor 2 signal	VSP2	km/h
F06	Engine speed	EREV	rpm
F07	ATF temperature sensor signal	ATFT	deg F
F08	ATF temperature sensor signal	ATFT	deg C
F09	Throttle position sensor signal	THV	V
F10	Gear position	GEAR	—
F11	Line pressure duty ratio	PLDTY	%
F12	Lock-up duty ratio	LUPTY	%
F13	AWD duty ratio	4WDTY	%
F14	Throttle position sensor power supply voltage	THVCC	V
F15	Mass air flow sensor signal	AFM	V

E - 4AT (F 00)
4WD 1997

B2M1046

52. FUNCTION MODE: F00**— MODE DISPLAY —****SPECIFIED DATA:**

Data at the left should be indicated.

Probable cause (if outside "specified data")

1. Communication failure
(No communication method can be confirmed with power ON.)

(1)	Check loose or poor connectors, or shortcircuit.
(2)	Check type of cartridge.

2. Vehicle types cannot be identified (due to communication failure).

Check improper cartridge.
Replace with proper one.

VB (F01)

12.7 V

OBD0673

53. FUNCTION MODE: F01**— BATTERY VOLTAGE (VB) —****CONDITION:**

- (1) Ignition switch ON
(2) Engine idling after warm-up

SPECIFIED DATA:

- (1) 12±1 V
(2) 13±1 V

1. Battery

Check battery voltage and specific gravity of electrolyte.

2. Charging system

(1)	Measure regulating voltage under no loads.
(2)	Check generator (as a single unit).

VSP1(F02)

18 m/h

G3M0725

54. FUNCTION MODE: F02
— VEHICLE SPEED SENSOR 1 SIGNAL (VSP1) —
- F02: Vehicle speed is indicated in mile per hour (m/h).
 - F03: Vehicle speed is indicated in kilometer per hour (km/h).

VSP2(F04)

12 m/h

G3M0726

55. FUNCTION MODE: F04
— VEHICLE SPEED SENSOR 2 SIGNAL (VSP2) —
- F04: Vehicle speed is indicated in mile per hour (m/h).
 - F05: Vehicle speed is indicated in kilometer per hour (km/h).

EREV(F06)

1,500 rpm

G3M0727

56. FUNCTION MODE: F06
— ENGINE SPEED (EREV) —

ATFT(F07)

176 deg F

OBD0386

57. FUNCTION MODE: F07
— ATF TEMPERATURE SENSOR SIGNAL (ATFT) —
- F07: ATF temperature is indicated in “deg F”.
 - F08: ATF temperature is indicated in “deg C”.

THV(F09)

4.0 V

G3M0935

58. FUNCTION MODE: F09
— THROTTLE POSITION SENSOR SIGNAL (THV) —

GEAR (F10)

1st

G3M0730

59. FUNCTION MODE: F10
— GEAR POSITION (GEAR) —

PLDTY (F11)

50%

G3M0731

60. FUNCTION MODE: F11
— LINE PRESSURE DUTY RATIO (PLDTY) —

LUPTY (F12)

5%

G3M0732

61. FUNCTION MODE: F12
— LOCK-UP DUTY RATIO (LUPTY) —

4WDTY (F13)

95%

G3M0733

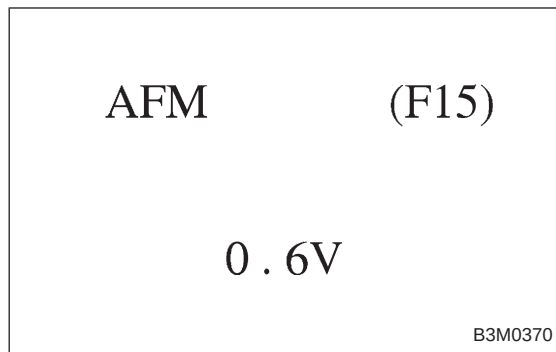
62. FUNCTION MODE: F13
— AWD DUTY RATIO (4WDTY) —

THVCC (F14)

5.2 V

B3M0259

63. FUNCTION MODE: F14
— THROTTLE POSITION SENSOR POWER SUPPLY VOLTAGE (THVCC) —



64. FUNCTION MODE: F15
— MASS AIR FLOW SENSOR SIGNAL (AFM) —

LED No.	Signal name	Display
1	FWD switch	FF
2	Kick-down switch	KD
3	—	—
4	—	—
5	Brake switch	BR
6	ABS switch	AB
7	Cruise control set	CR
8	Power switch	PW
9	—	—
10	—	—

FF	KD	—	—	BR
AB	CR	PW	—	—

1	2	3	4	5
6	7	8	9	10

65. FUNCTION MODE: FA0**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 1 Fuse is installed in FWD switch.

LED No. 2 Kick-down switch is turned ON. (Europe and General models only)

LED No. 5 Brake pedal is depressed.

LED No. 6 ABS signal is entered.

LED No. 7 Cruise control is set.

LED No. 8 Power switch is turned ON. (Europe and General models only)

LED No.	Signal name	Display
1	N/P range switch	NP
2	R range switch	RR
3	D range switch	RD
4	3 range switch	R3
5	2 range switch	R2
6	1 range switch	R1
7	Diagnosis switch	SS
8	—	—
9	—	—
10	—	—

NP	RR	RD	R3	R2
R1	SS	—	—	—

1	2	3	4	5
6	7	8	9	10

66. FUNCTION MODE: FA1**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 1 “N” or “P” range is selected.

LED No. 2 “R” range is selected.

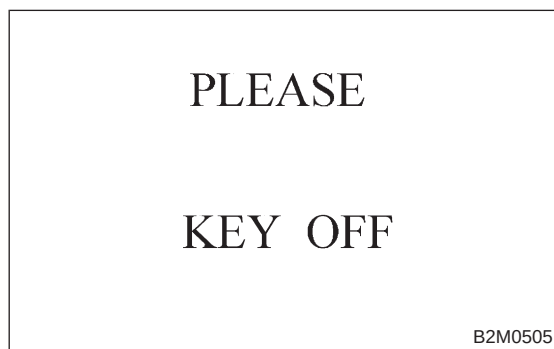
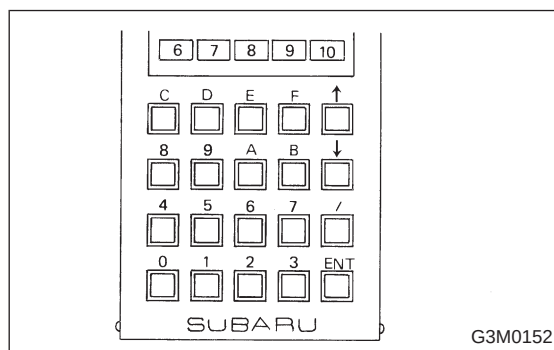
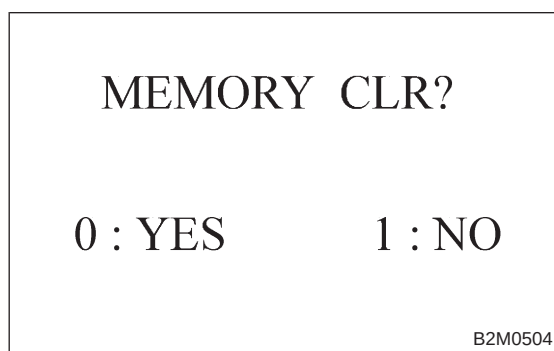
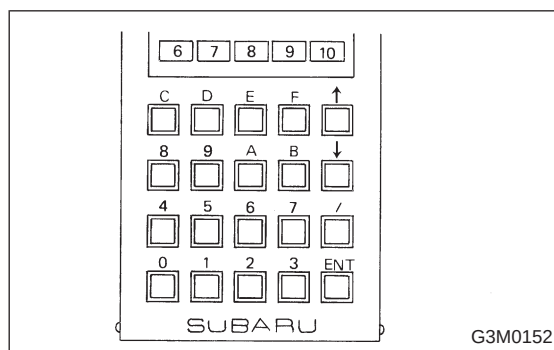
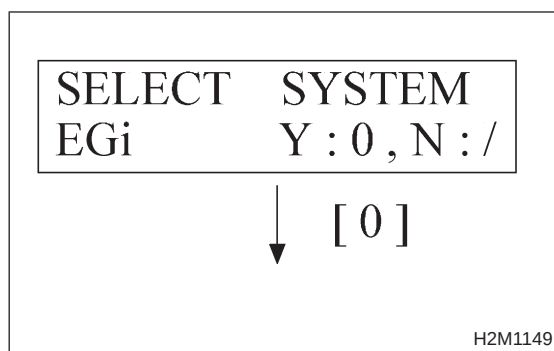
LED No. 3 “D” range is selected.

LED No. 4 “3” range is selected.

LED No. 5 “2” range is selected.

LED No. 6 “1” range is selected.

LED No. 7 Diagnosis connector is connected.



D: CLEAR MEMORY MODE

1. SUBARU SELECT MONITOR

1) Select engine mode or AT mode using function key.

- Engine mode:

Press the function key [0].

- AT mode:

Press the function key [/] [0] in that order.

2) Designate mode using function key.

Press [F] [C] [0] [ENT] in that order.

3) Ensure displayed message.

4) Press function key.

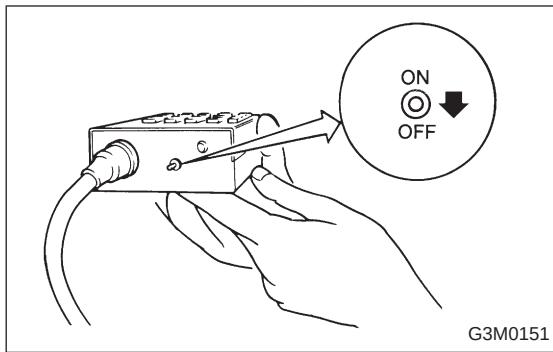
- When executing, (YES)

Press [0] [ENT] in that order.

- When not executing, (NO)

Press [1] [ENT] in that order.

5) When executed, the indication as shown here appears for approximately four seconds, and the past trouble history is deleted.



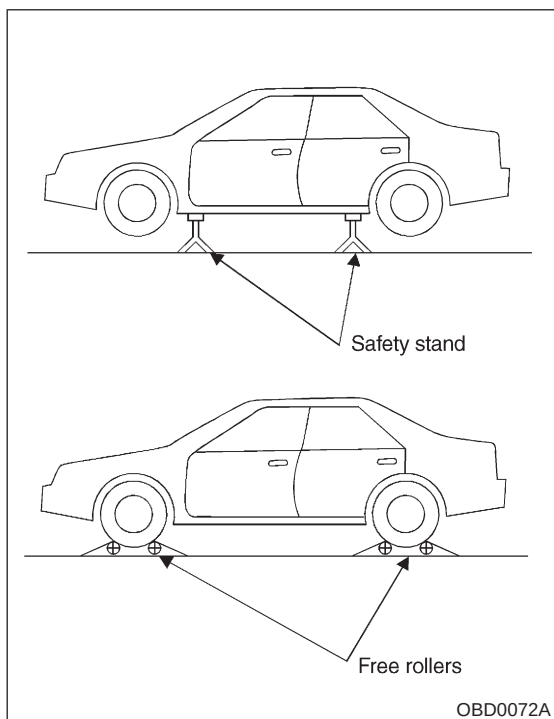
6) After the display is gone, turn Subaru select monitor switch and ignition switch to OFF.

NOTE:

When the ECM, battery terminals, etc. are disconnected after memory is cleared, idling speed may increase. This is not considered a problem because the ISC valve duty controlled learning value has been cleared. To return the engine to idling speed, idle for approximately 2 minutes with air conditioner off.

2. 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

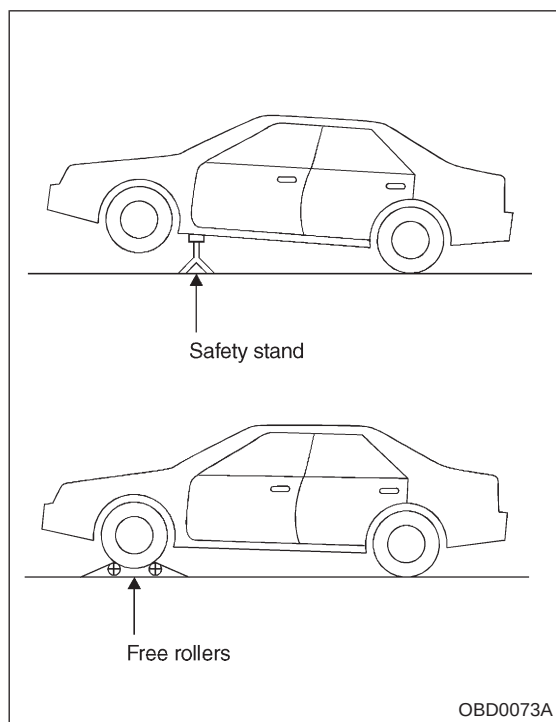
Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

● FULL-TIME AWD MODELS

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 runout 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.

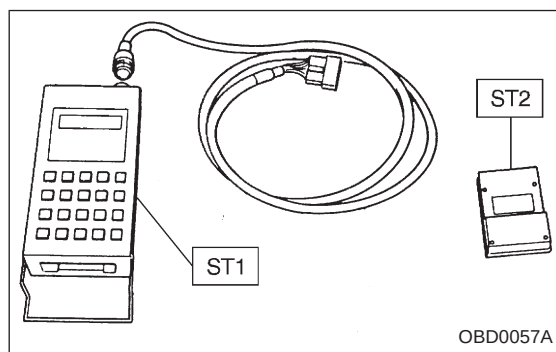
- Since the rear wheels will also rotate, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.



● FWD MODELS

WARNING:

- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a safety stand.
- If only the front wheels are raised or placed on a free roller, apply parking brakes and lock the rear wheels.
- Secure a rope or wire to the front and rear towing or tie-down hooks to prevent the lateral runout 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.

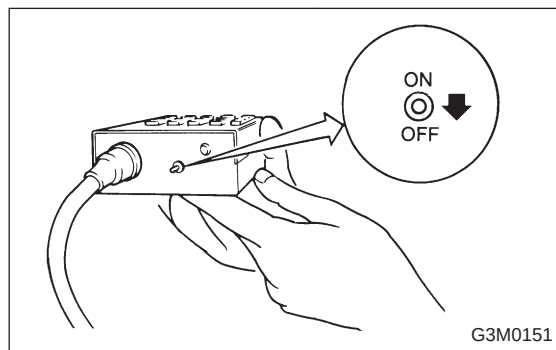


2. SUBARU SELECT MONITOR

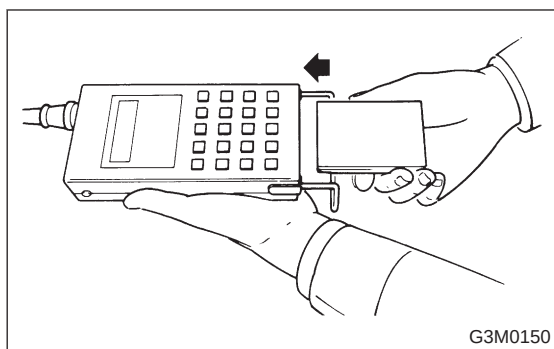
After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data.

1) Prepare Subaru select monitor and cartridge.

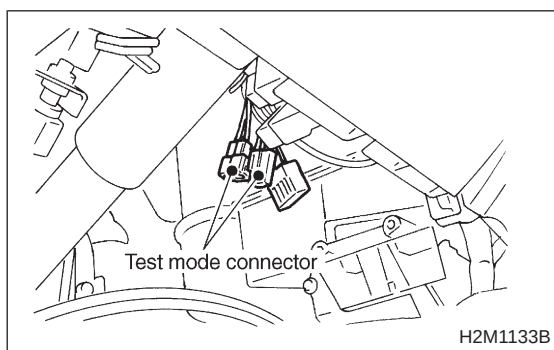
ST1 498307500 SELECT MONITOR KIT
ST2 498346200 CARTRIDGE



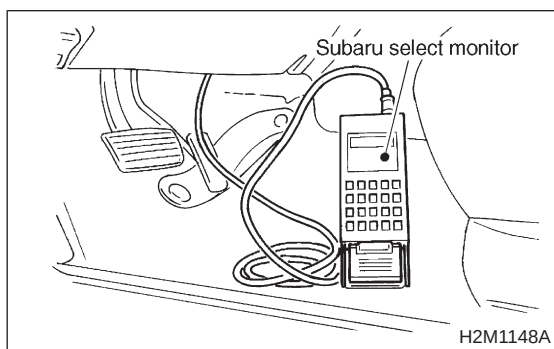
2) Turn ignition switch and Subaru select monitor switch to OFF.



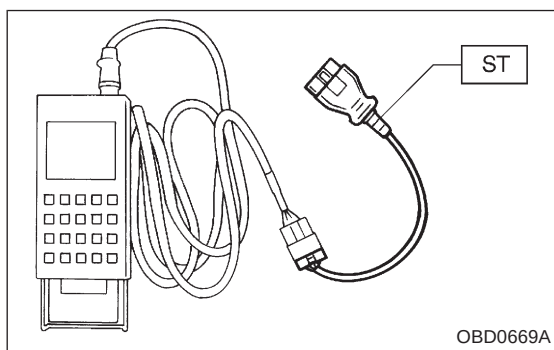
3) Insert cartridge into Subaru select monitor.



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.



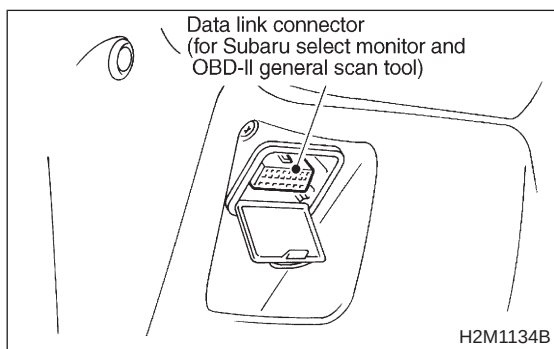
5) Connect Subaru select monitor to data link connector.
 ● Using data link connector for Subaru select monitor only:
 Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



● Using data link connector for Subaru select monitor and OBD-II general scan tool:

(1) Connect ST to Subaru select monitor cable.

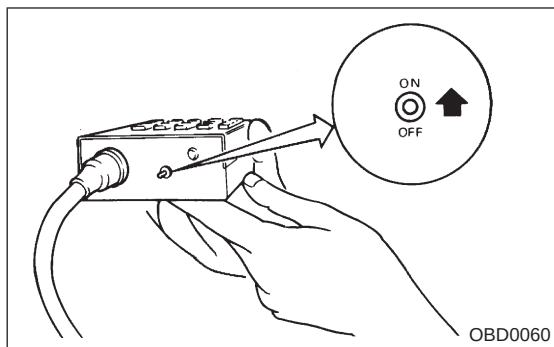
ST 498357200 ADAPTER CABLE



(2) 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.

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) 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)

8) Using the selector lever or shift lever, turn the "P" position switch and the "N" position switch to ON.

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

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

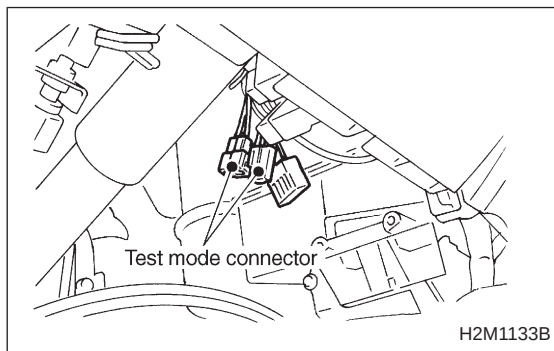
NOTE:

On models without tachometer, use the Subaru select monitor or tachometer (Secondary pickup type).

11) 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:

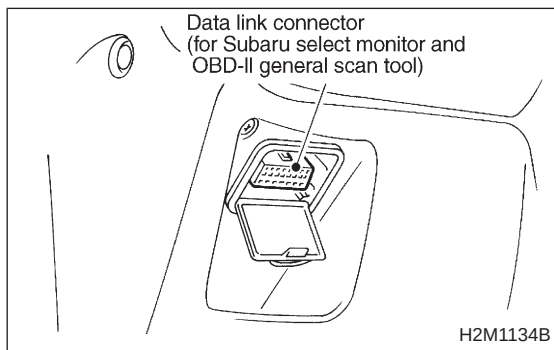
- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to 4-4 [T6D2].> or <Ref. to 4-4 [T9J0].>



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 Subaru select monitor or 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. <Ref. to 4-4 [T6D2].> or <Ref. to 4-4 [T9J0].>

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].>

SELECT SYSTEM
EGi Y : 0 , N : /

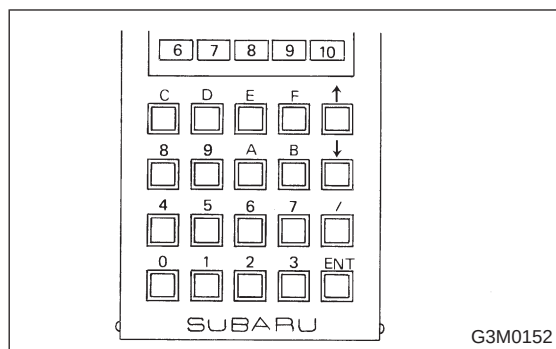
↓ [0]

H2M1149

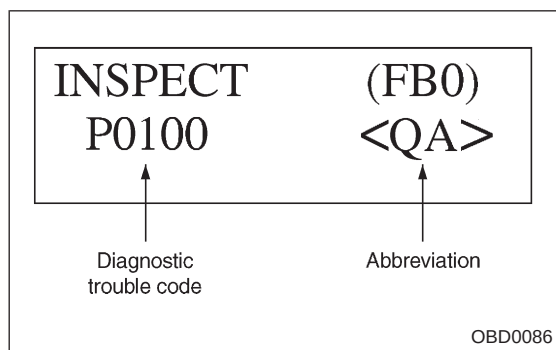
4. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB0 <INSPECTION MODE>)

Using Subaru select monitor, check for diagnostic trouble code(s) and record the result(s).

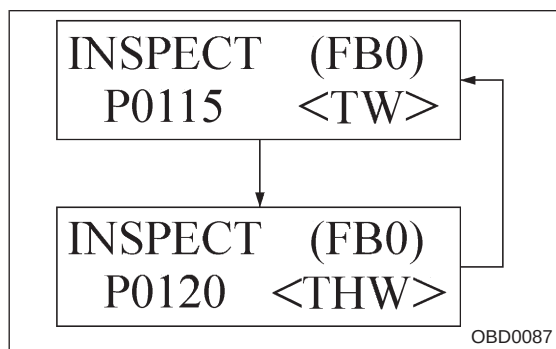
1) Select engine mode using function key.
Press the function key [0].



2) Designate mode using function key.
Press [F] [B] [0] [ENT] in that order.



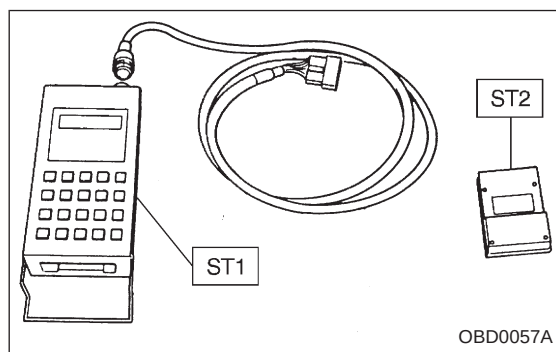
3) Ensure diagnostic trouble code(s) is shown.
(1) When there is only one diagnostic trouble code.



(2) When there are multiple diagnostic trouble codes.

NOTE:

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

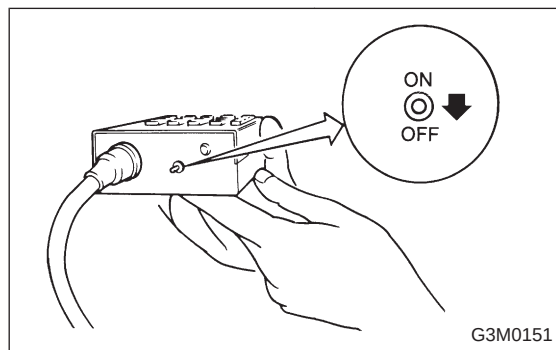


**F: COMPULSORY VALVE OPERATION
CHECK MODE (FD MODE)**

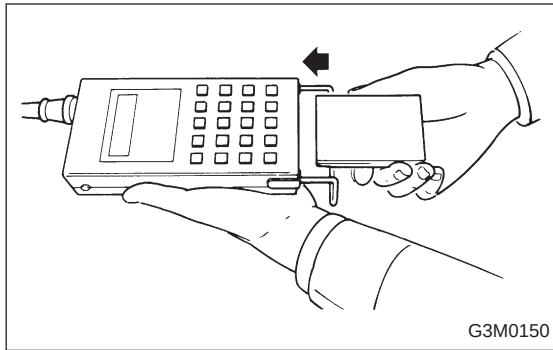
1. SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.

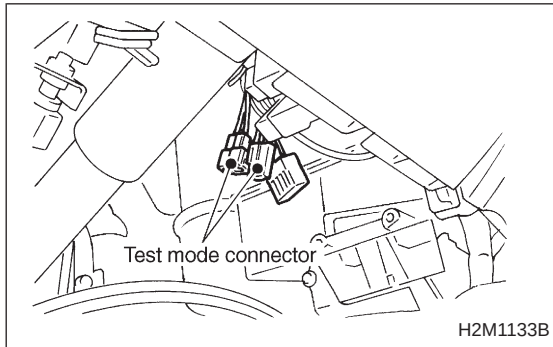
ST1 498307500 SELECT MONITOR KIT
ST2 498346200 CARTRIDGE



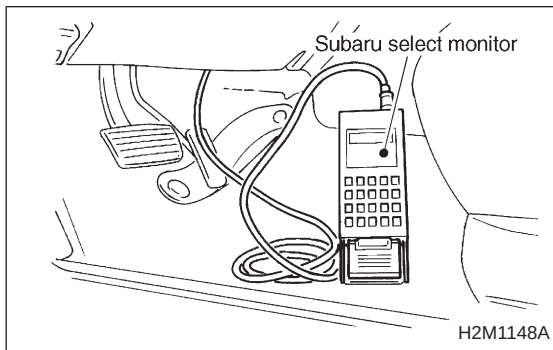
2) Turn ignition switch and Subaru select monitor switch to OFF.



3) Insert cartridge into Subaru select monitor.

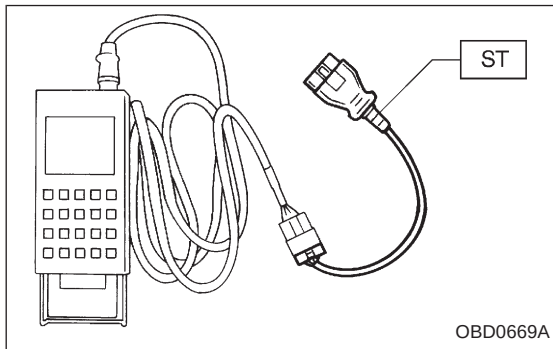


4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



5) Connect Subaru select monitor to data link connector.

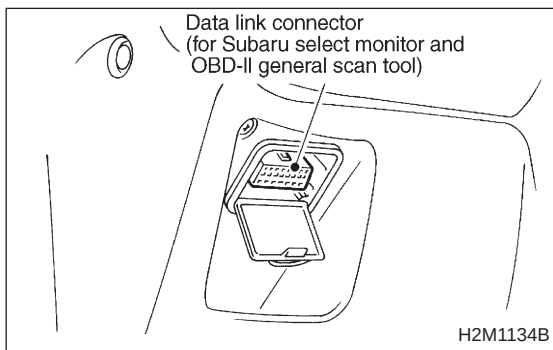
- Using data link connector for Subaru select monitor only:
Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



- Using data link connector for Subaru select monitor and OBD-II general scan tool:

(1) Connect ST to Subaru select monitor cable.

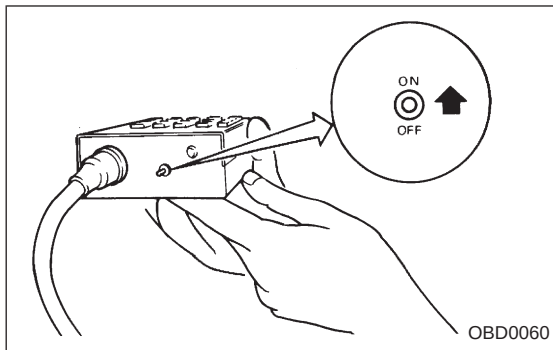
ST1 498357200 ADAPTER CABLE



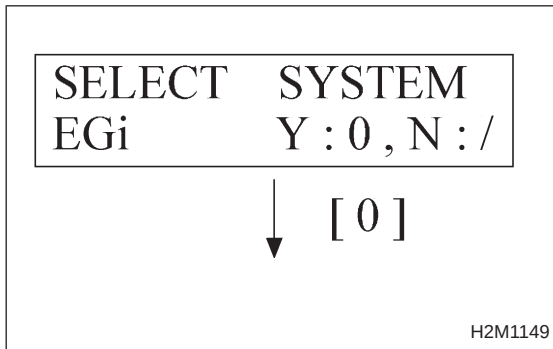
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:

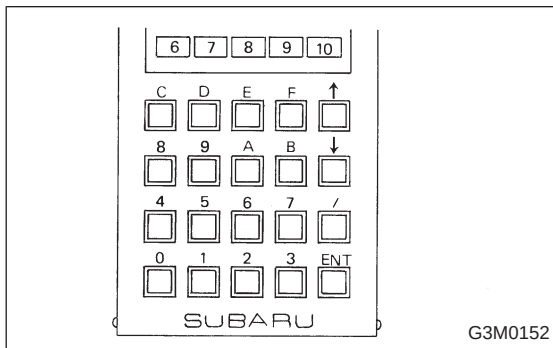
Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.



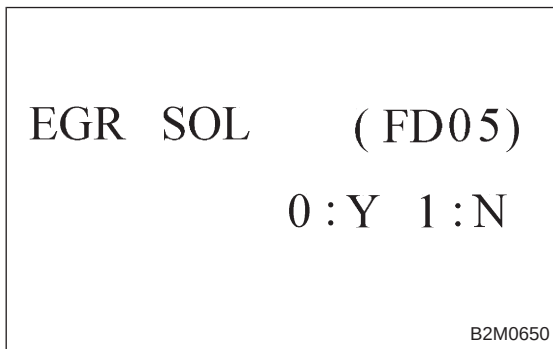
6) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.



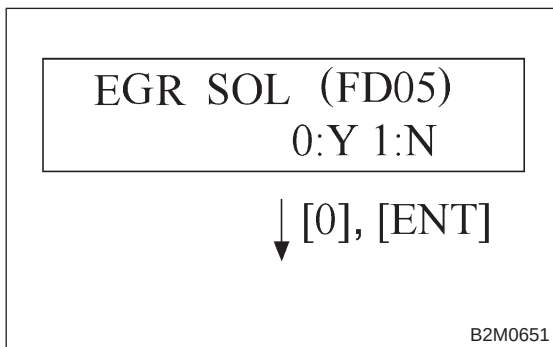
7) Select engine mode using function key.
Press the function key [0].



8) Designate mode using function key.
<Ref. to 2-7 [T3C6].>
(Example: Press [F] [D] [0] [5] [ENT] in that order.)



9) Ensure displayed message.



10) Press the function key.
(1) When executing, press the function key [0].

EGR SOL (FD05)

CHK 0:Y 1:N

B2M0652

NOTE:

When in compulsory valve operation check mode the monitor indicates the execution of valve check on display.

EGR SOL (FD05)

0:Y 1:N

↓ [1], [ENT]

B2M0653

EGR SOL (FD05)
END OF CHECK



1996 (F00)
2.2 SOHC

B2M0643

11) When compulsory valve operation check mode is exited or check completed, the monitor indicates the completion of compulsory valve operation check on the display, and automatically returns to the initial mode (FUNCTION MODE: F00).

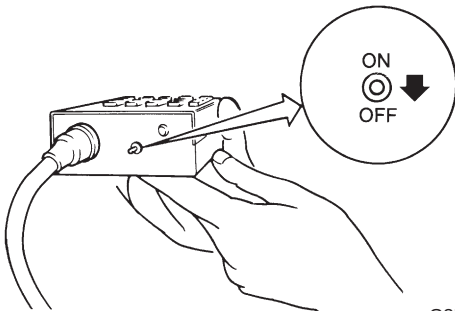
G: FINISHING DIAGNOSIS OPERATION

1. SUBARU SELECT MONITOR

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

2) Turn Subaru select monitor switch and ignition switch to OFF.

3) Disconnect Subaru select monitor from its data link connector.



G3M0151

4. Cautions

A: SUPPLEMENTAL RESTRAINT SYSTEM “AIRBAG”

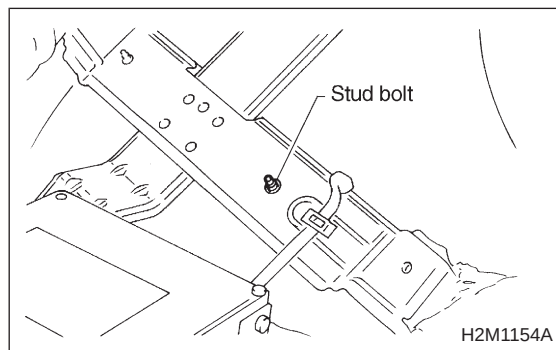
Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

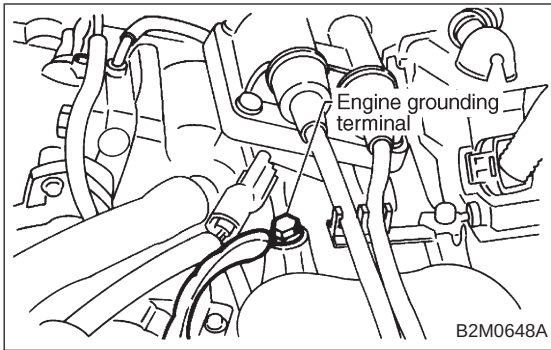
CAUTION:

- 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. <Ref. to 4-4 [T6D2].> or <Ref. to 4-4 [T9J0].>

C: PRE-INSPECTION

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

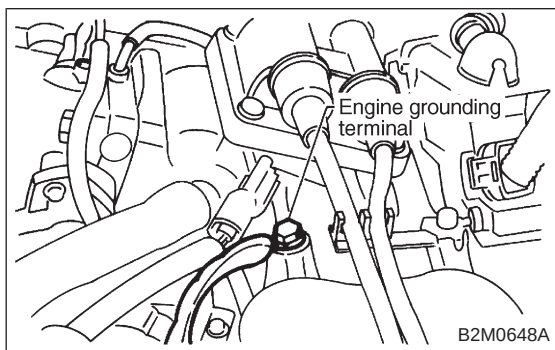
1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V

Specific gravity: Above 1.260

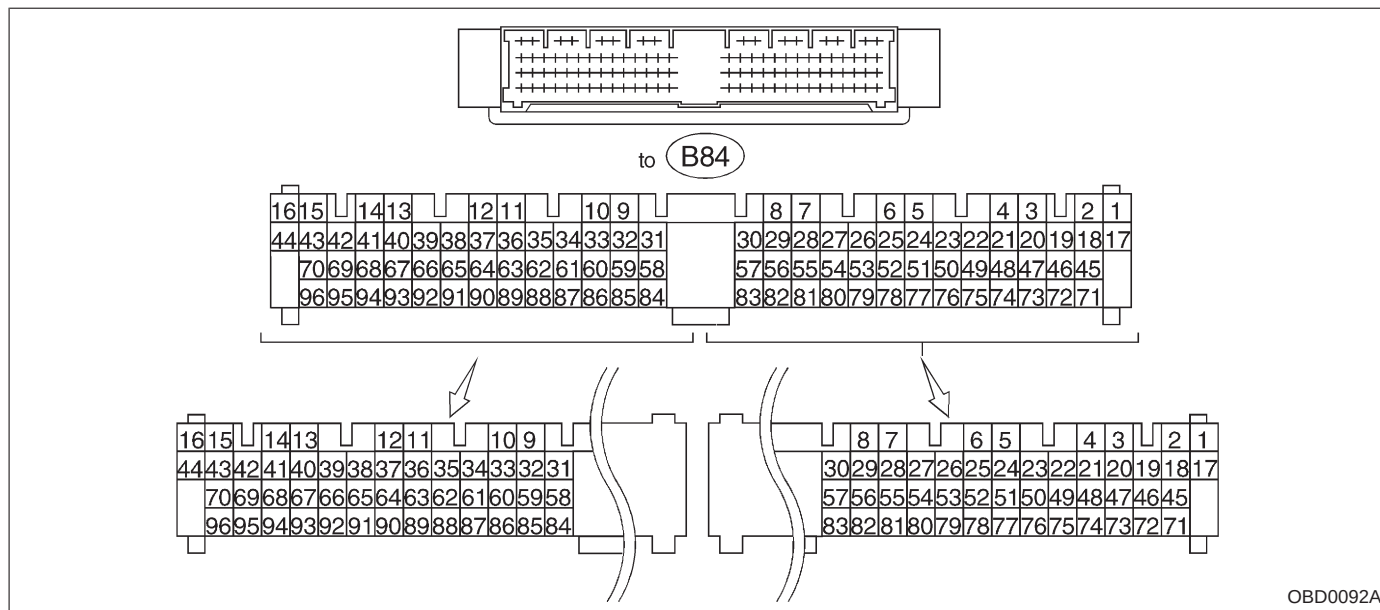
2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

**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

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	20	0	0	1800 cc model
		B84	54	0	0	2200 cc model
Camshaft position sensor	Signal (+)	B84	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B84	28	0	0	—
	Shield	B84	20	0	0	1800 cc model
		B84	54	0	0	2200 cc model
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

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
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	2200 cc model only
	Shield	B84	56	0	0	
AT/MT identification		B84	81	(AT) 5 (MT) 0	(AT) 5 (MT) 0	When measuring voltage between ECM and body.
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 control		B84	74	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control		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	2200 cc model only
Mass air flow signal for AT		B84	47	0 — 0.3	0.8 — 1.2	2200 cc model only
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	2200 cc AT vehicles only
Front oxygen sensor heater signal		B84	38	0 — 1.0	0 — 1.0	—

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
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	—
FICD control solenoid valve		B84	9	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	● 1800 cc model only ● A/C equipped model
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	—

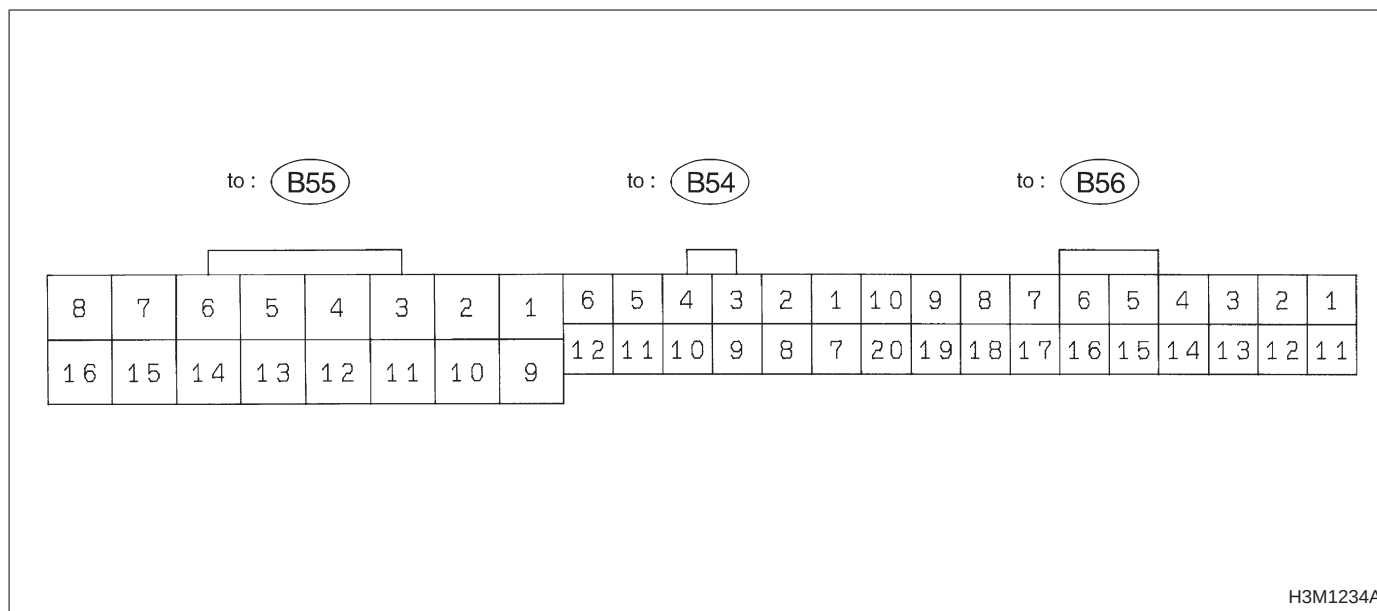
B: ENGINE CONDITION DATA

Content	Model	Specified data
Mass air flow	1800 cc	1.6 — 2.8 (g/sec): Idling
		6.1 — 10.3 (g/sec): 2,500 rpm racing
	2200 cc	1.7 — 3.3 (g/sec): Idling
		7.1 — 14.2 (g/sec): 2,500 rpm racing
Engine load	1800 cc	1.7 — 3.0 (%): Idling
		6.6 — 11.2 (%): 2,500 rpm racing
	2200 cc	1.6 — 2.9 (%): Idling
		6.4 — 12.8 (%): 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



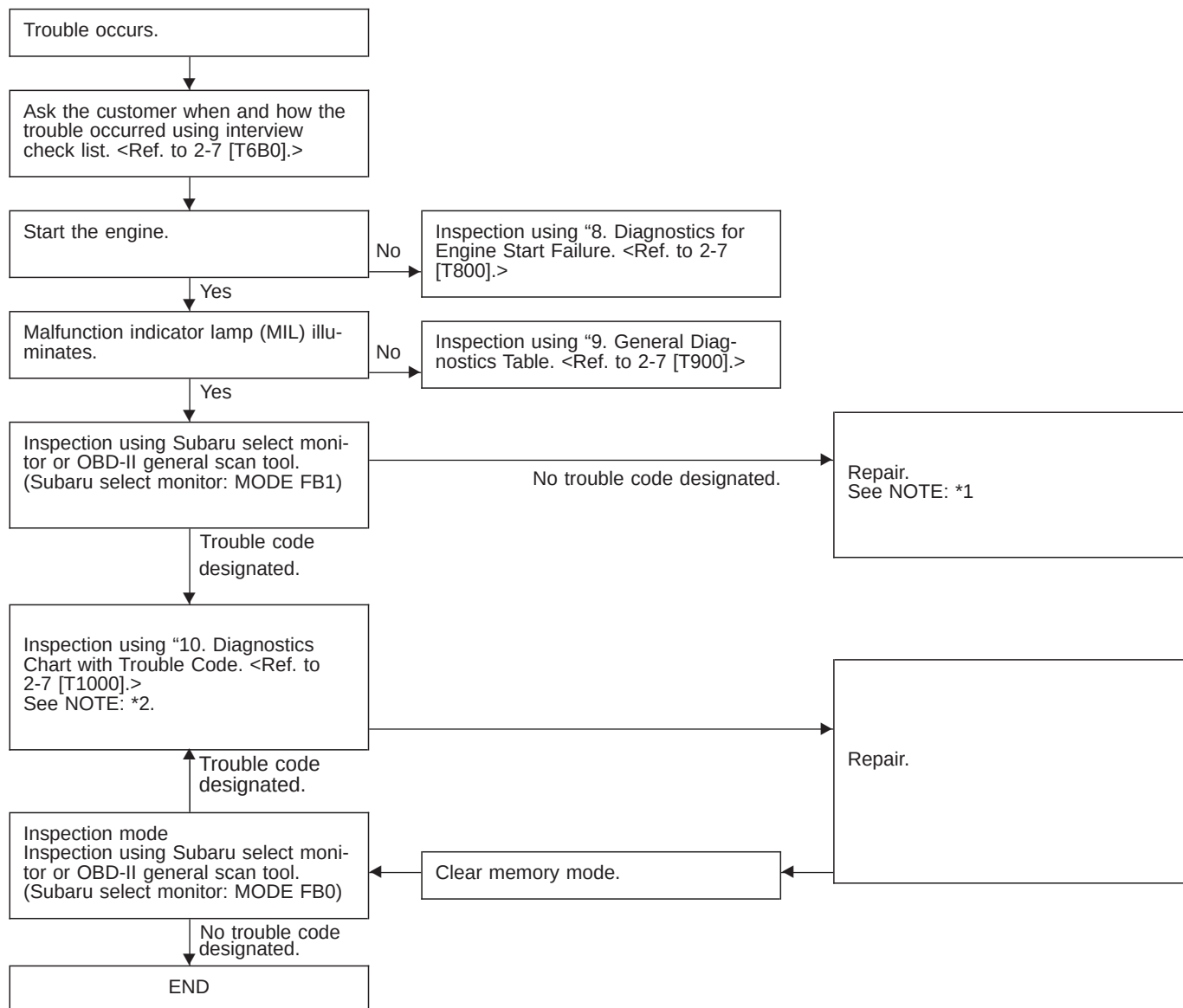
Check with ignition switch ON.

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
AT diagnostics signal		B55	12	Ignition switch ON (with engine OFF)	Less than 1
				Ignition switch ON (with engine ON)	More than 10
Diagnosis switch		B56	6	Diagnosis connector connected.	Less than 1
				Diagnosis connector disconnected.	More than 6

5. Specified Data

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
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 (AWD model only)	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal (Subaru select monitor)	B56	12	—	—	—
		13	—	—	
AT diagnosis signal	B56	11	Ignition switch ON	Less than 1 ↔ More than 4	—

6. Basic Diagnostic Procedure



NOTE:

- *1: If trouble code is not shown on display although the MIL illuminates, perform diagnostics of the MIL (CHECK ENGINE LIGHT) circuit or combination meter. <Ref. to 2-7 [T700].>
- *2: Carry out the basic check, only when trouble code about automatic transmission is shown on display. <Ref. to 2-7 [T6A0].>

A: 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].>

B: 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.

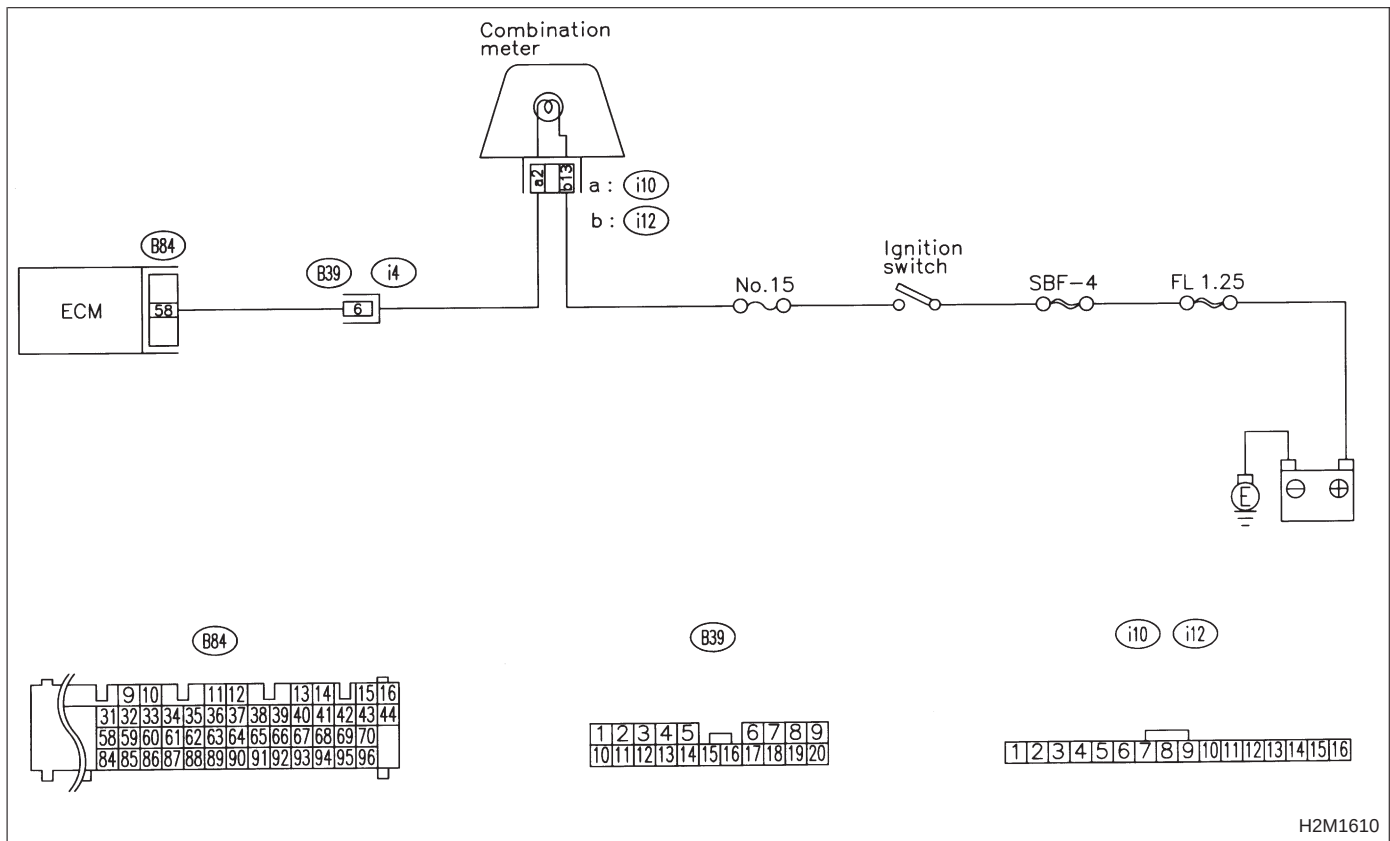
DIAGNOSIS:

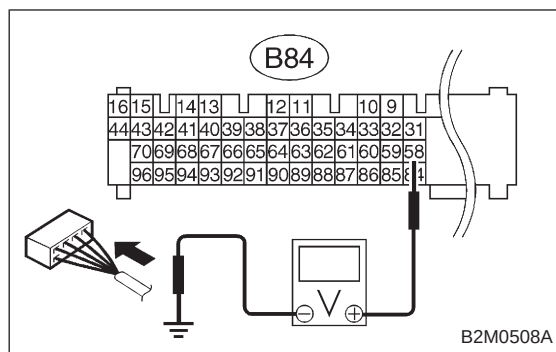
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.

TROUBLE SYMPTOM:

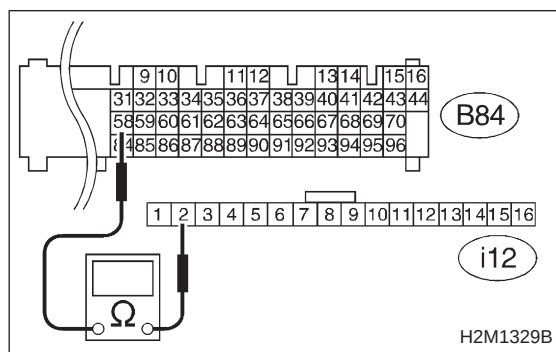
- When ignition switch is turned ON (engine OFF), MIL does not come on.

WIRING DIAGRAM:



**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 7A2.****(NO) : Go to next (CHECK) .****(CHECK) : Does the MIL come on when shaking or pulling ECM connector and harness?****(YES) : Repair poor contact in ECM connector.****(NO) : Go to next (CHECK) .****(CHECK) : Is ECM connector correctly connected?****(YES) : Replace ECM.****(NO) : Repair connection of ECM connector.****7A2****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 — (i12) No. 2:****(CHECK) : Is resistance less than 1 Ω?****(YES) : Go to step 7A3.****(NO) : Repair harness and connector.****NOTE:**

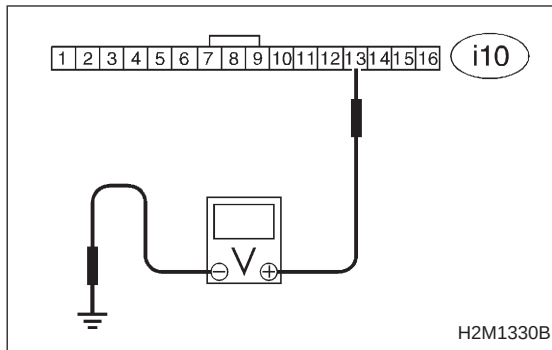
In this case, repair the following:

- Open circuit in harness between ECM and combination meter connector
- Poor contact in coupling connector (B39)

7A3**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 7A4.**

**7A4****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. 13 (+) — Chassis ground (-):****CHECK : Is voltage more than 10 V?****YES** : Go to step 7A5.**NO** : Check the following and repair if necessary.

- Blown out fuse (No. 15).

NOTE:

If replaced fuse (No. 15) blows easily, check the harness for short circuit of harness between fuse (No. 15) and combination meter connector.

- Open or short circuit in harness between fuse (No. 15) and combination meter connector
- Open or short circuit in harness between fuse (No. 15) and ignition switch connector
- Poor contact in ignition switch connector

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** : Replace bulb or combination meter.

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

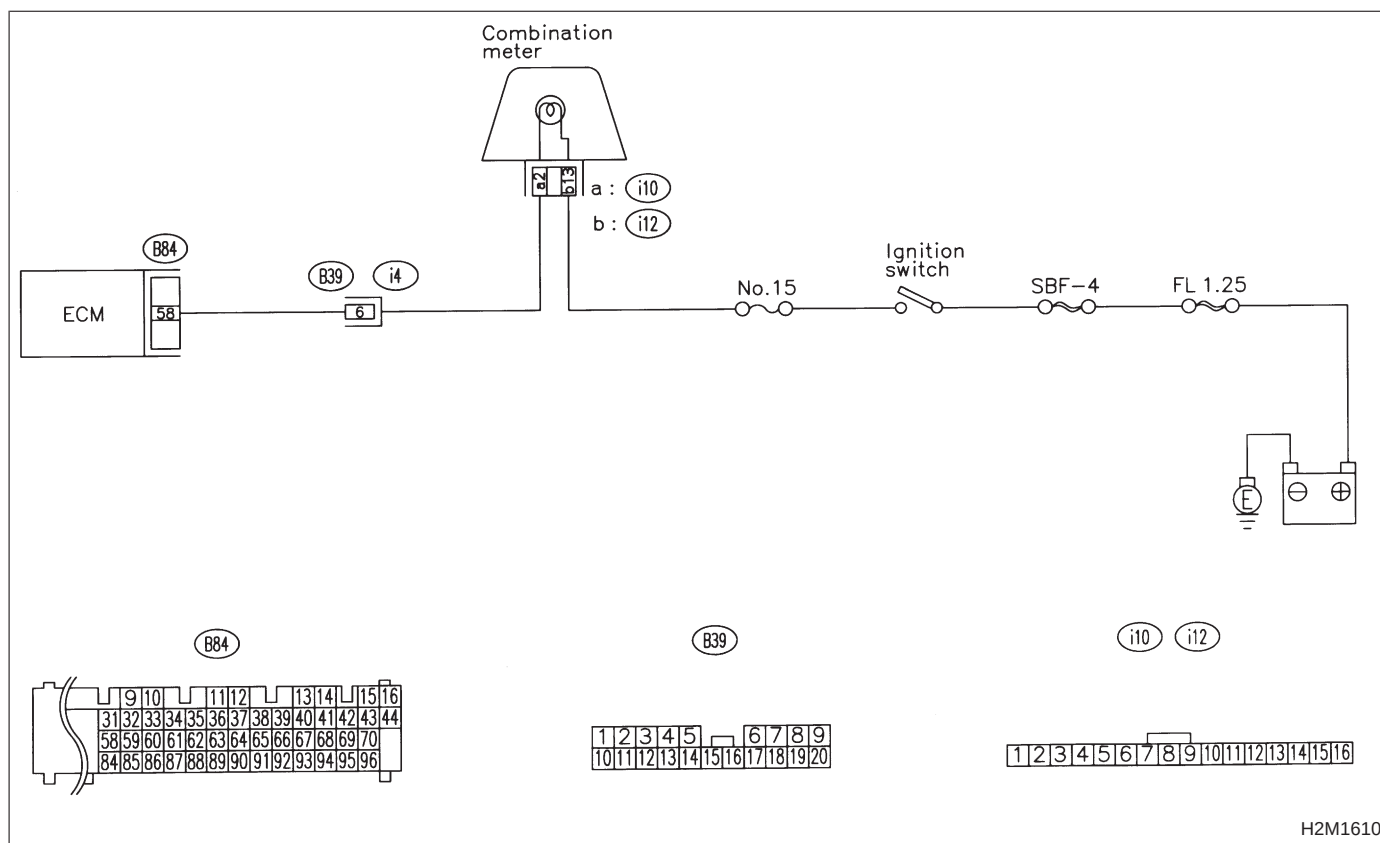
DIAGNOSIS:

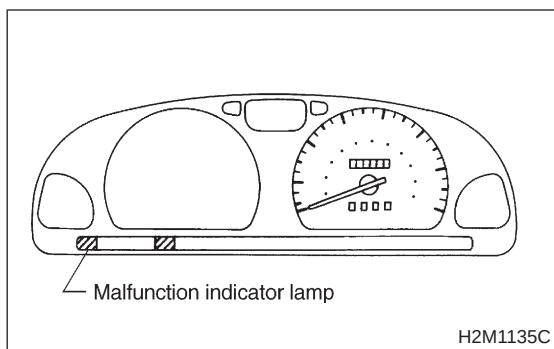
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.

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:



**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.

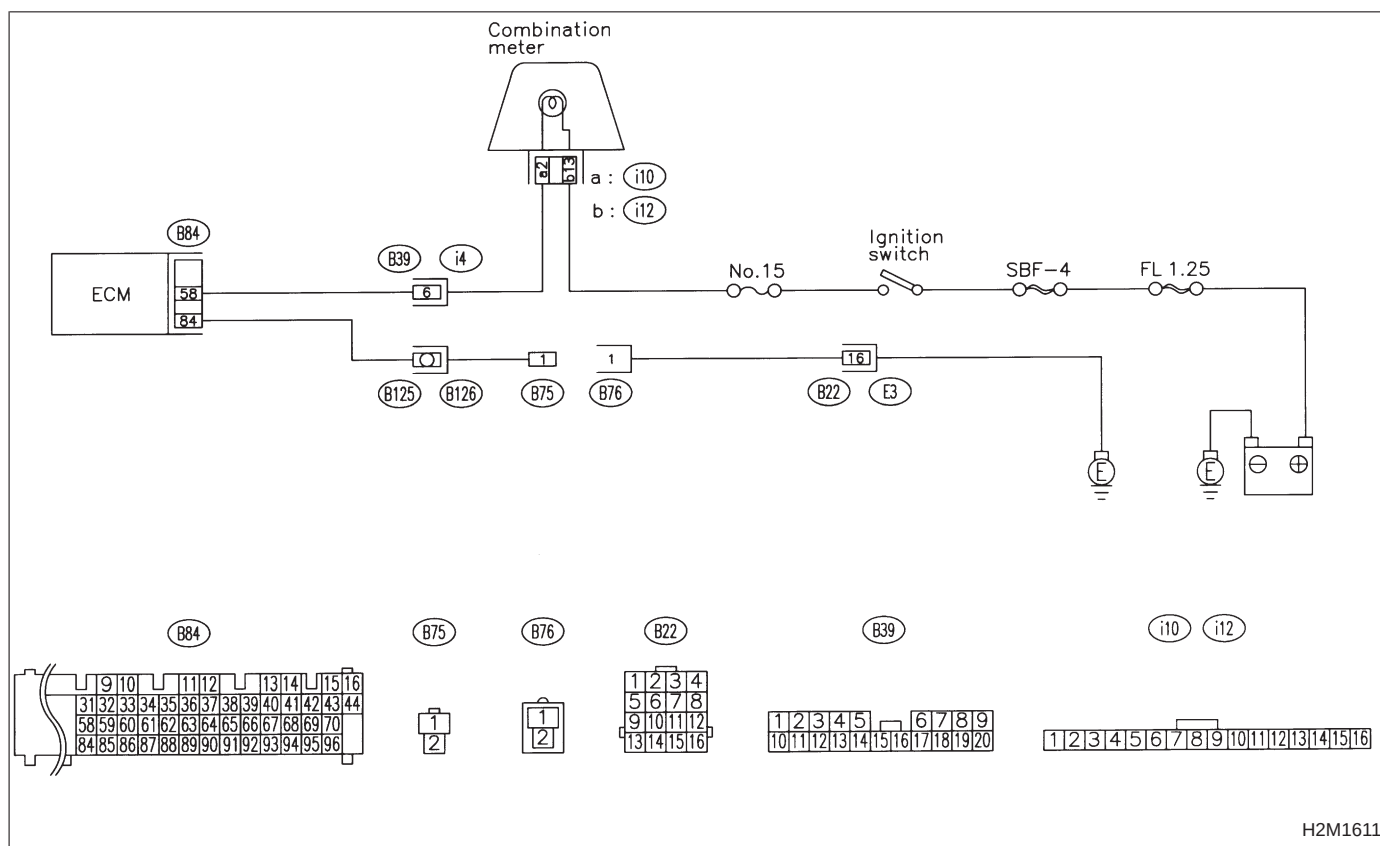
DIAGNOSIS:

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

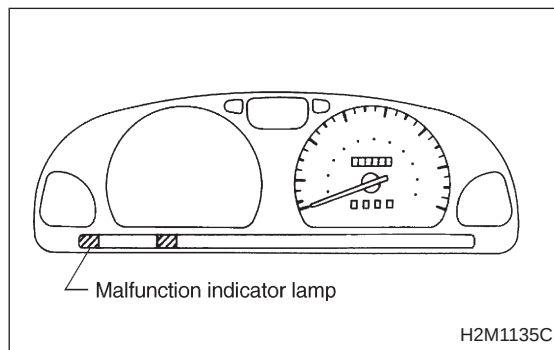
TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



H2M1611



H2M1135C

7C1

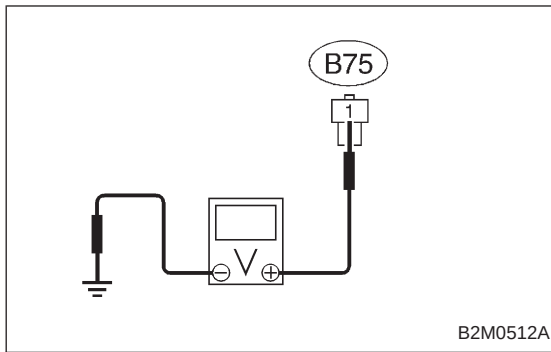
CHECK OPERATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).

- 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 [T700].>



7C2	CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between test mode connector and chassis ground.

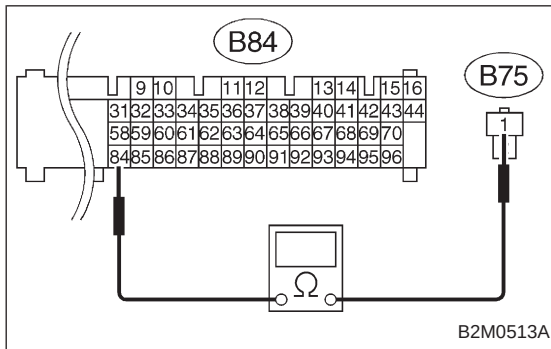
Connector & terminal

(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)

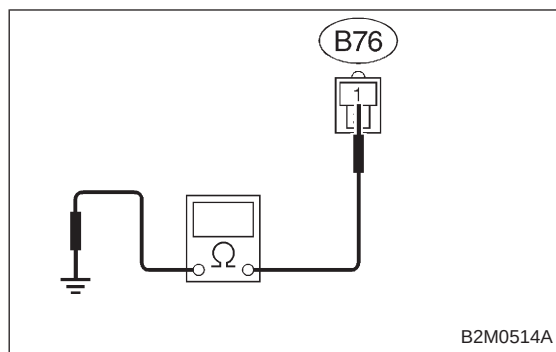
7C4	CHECK POOR CONTACT.

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.

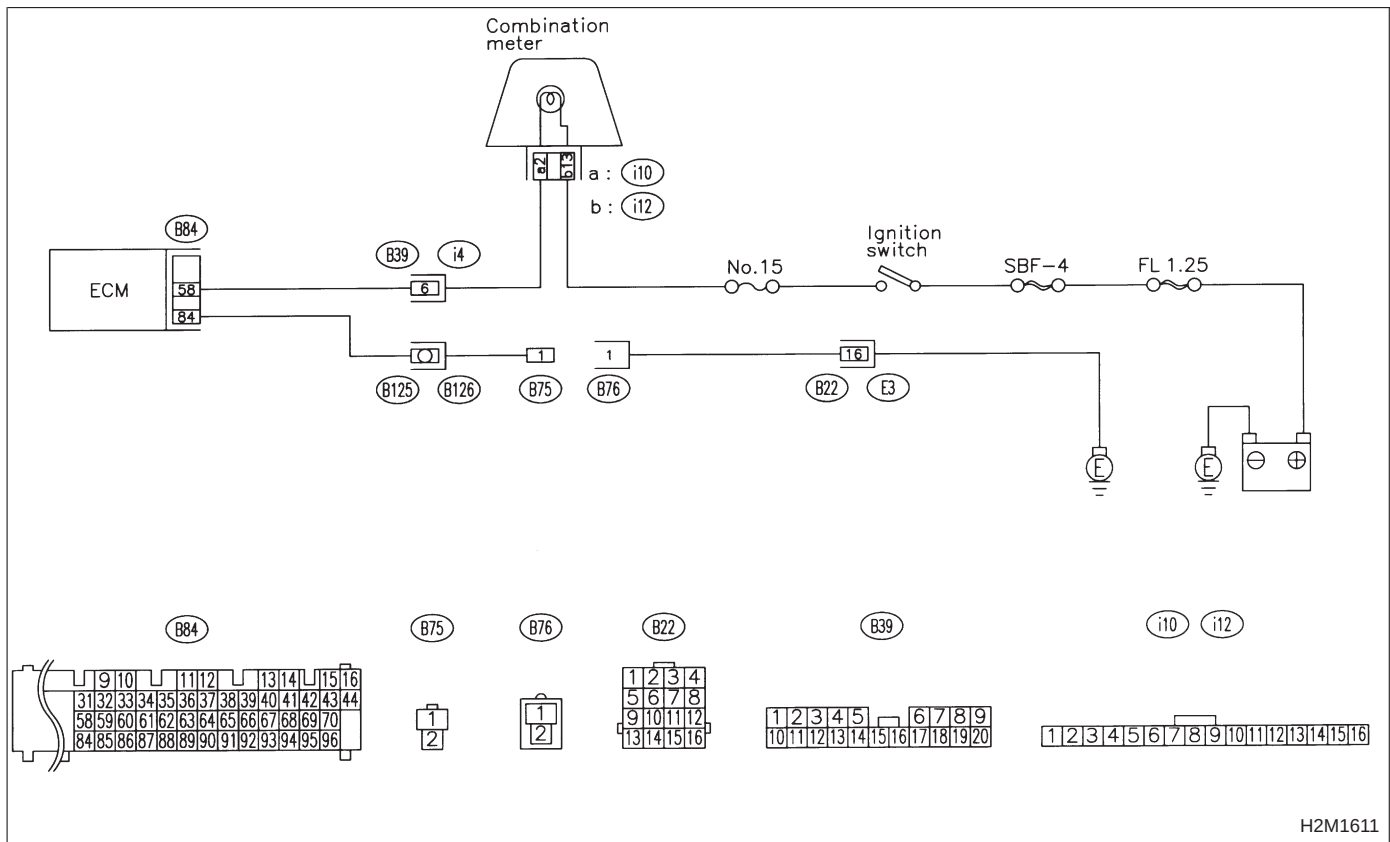
DIAGNOSIS:

- Test mode connector circuit is shorted.

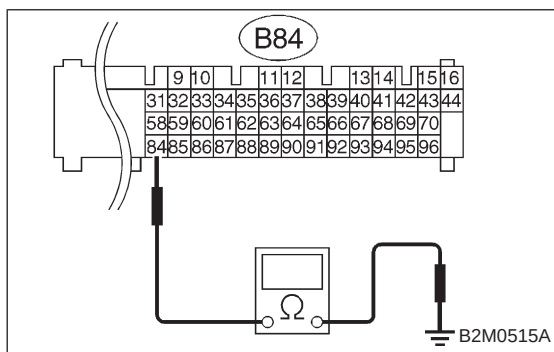
TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



H2M1611



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:

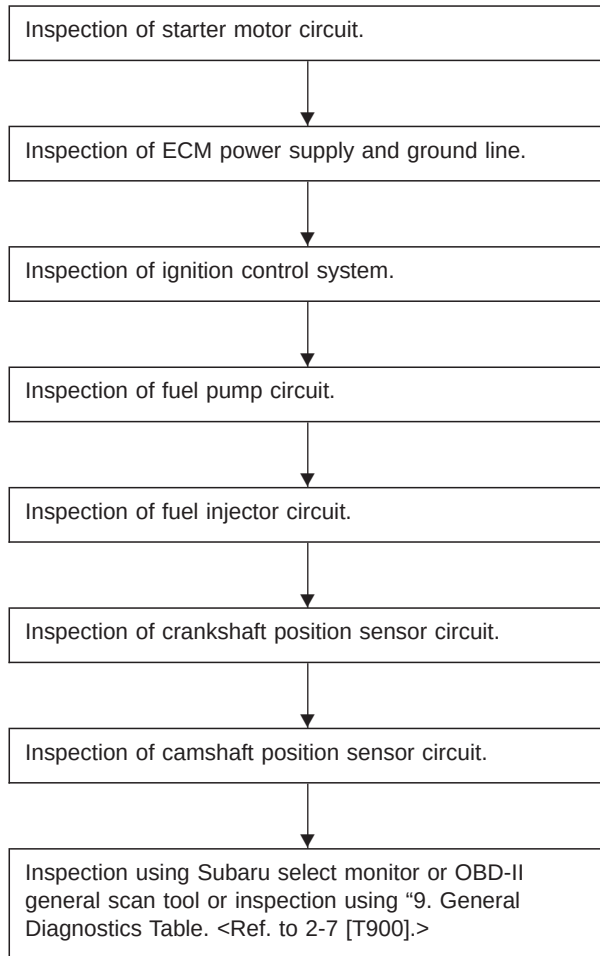
CHECK : Is resistance less than 5 Ω?

YES : Repair short circuit in harness between ECM and test mode connector.

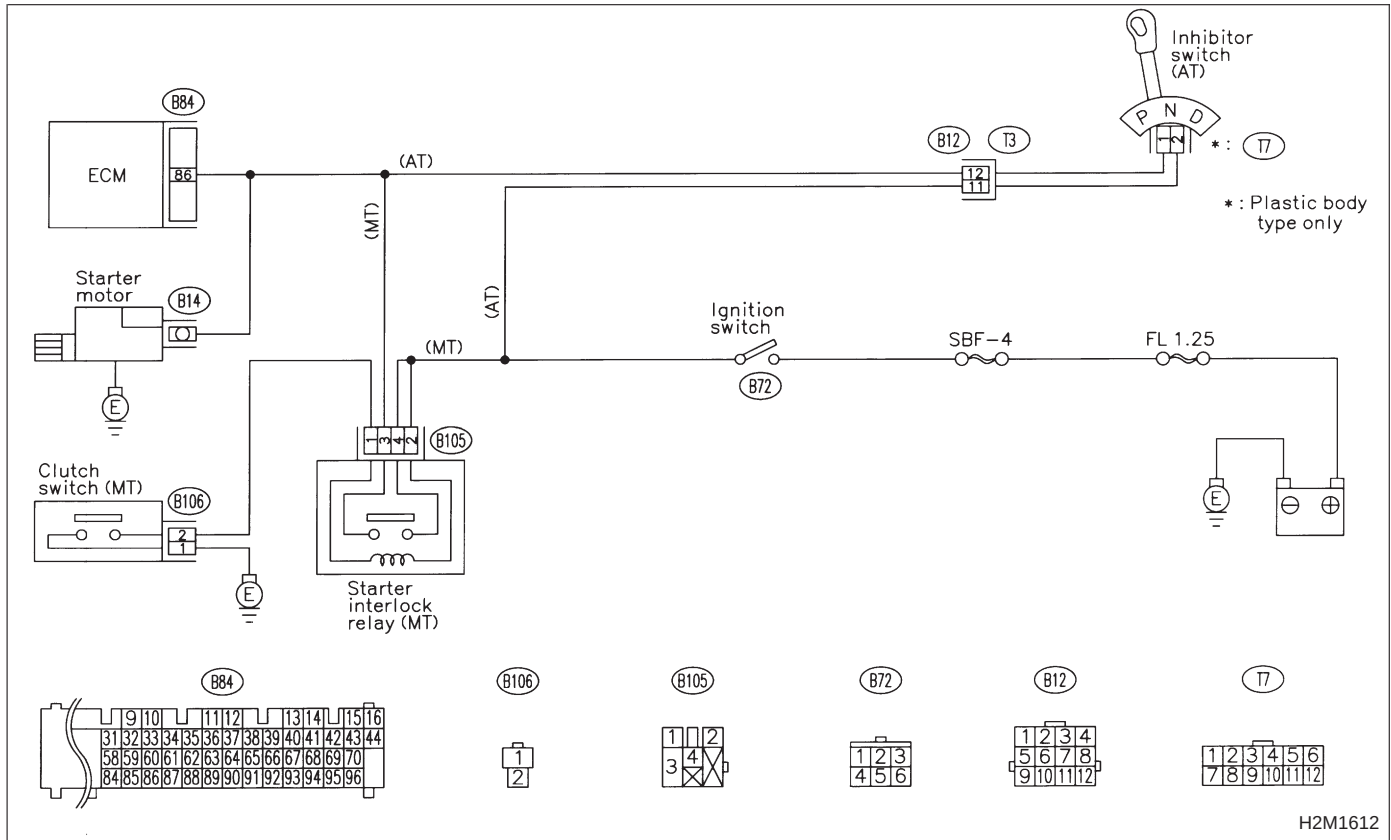
NO : Replace ECM.

8. Diagnostics for Engine Starting Failure

A: BASIC DIAGNOSTICS CHART

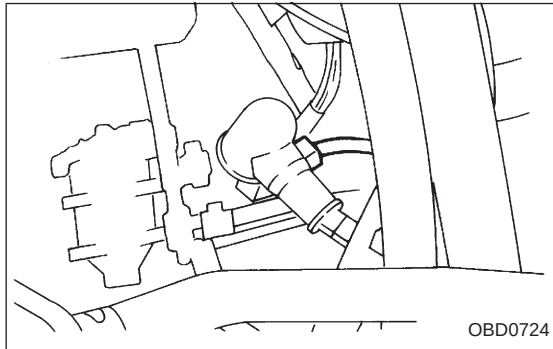


B: STARTER MOTOR CIRCUIT WIRING DIAGRAM:



CAUTION:

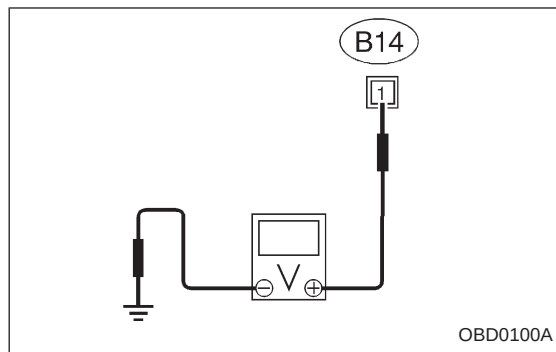
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>



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 (-):

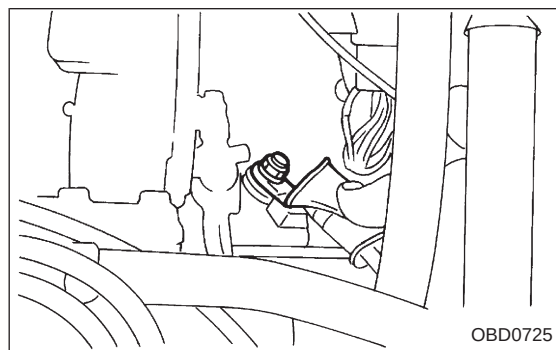
CHECK : Is the voltage more than 10 V?

NOTE:

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

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 [K1A0].>

NO : Repair open circuit of ground cable.

8B3

CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove SBF No. 4 from main fuse box.
- 3) Measure resistance of fuse.

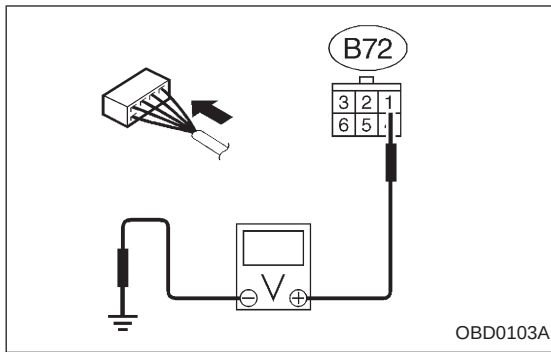
CHECK : Is resistance less than 1 Ω ?

NO : Replace SBF No. 4.

YES : Go to next step 4).

4) Install SBF No. 4 to main fuse box.

5) Turn ignition switch to ON.



6) 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 8B4.

NO : Repair open circuit in harness between ignition switch and SBF No. 4 connector.

8B4

CHECK TRANSMISSION TYPE.

CHECK : *Is transmission type AT?*

YES : Go to step 8B5.

NO : Go to step 8B10.

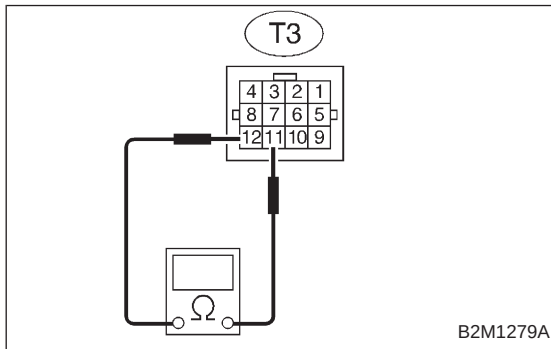
8B5

CHECK INHIBITOR SWITCH TYPE.

CHECK : *Is inhibitor switch type plastic body?*

YES : Go to step 8B6.

NO : Go to step 8B9.



8B6

CHECK INHIBITOR SWITCH.

1) Turn ignition switch to OFF.

2) Place the selector lever in the "P" or "N" position.

3) Measure resistance between transmission harness connector receptacle's terminals.

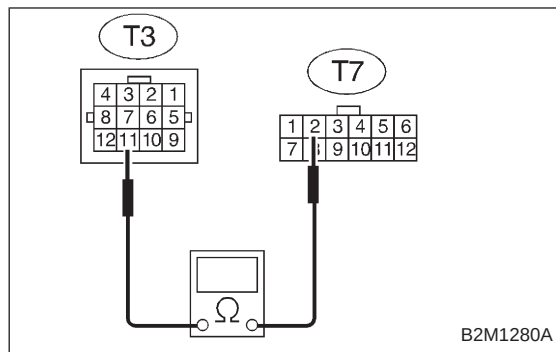
Connector & terminal

(T3) No. 11 — No. 12:

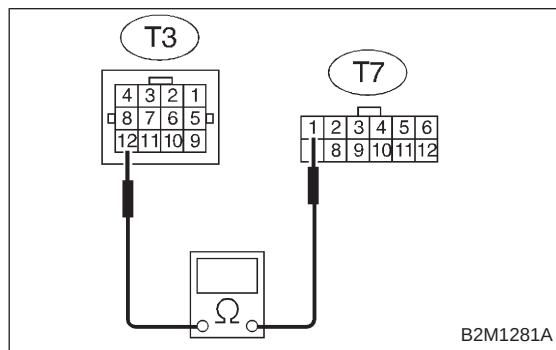
CHECK : *Is the resistance less than 1 Ω?*

YES : Repair open circuit in harness between starter motor and ignition switch connector.

NO : Go to step 8B7.

**8B7****CHECK TRANSMISSION HARNESS.**

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

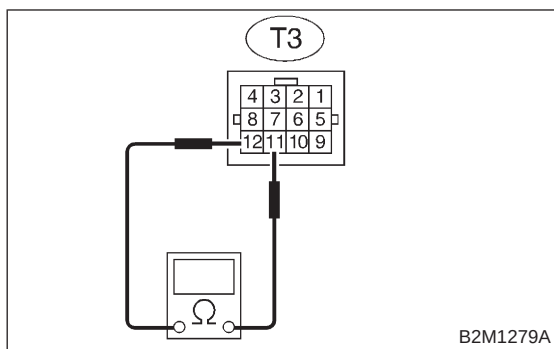
Connector & terminal**(T3) No. 11 — (T7) No. 2:****CHECK** : *Is the resistance less than 1 Ω?***YES** : Go to next step 3).**NO** : Repair open circuit in harness between transmission harness and inhibitor switch connector.

- 3) Measure resistance of harness between transmission harness and inhibitor switch connector.

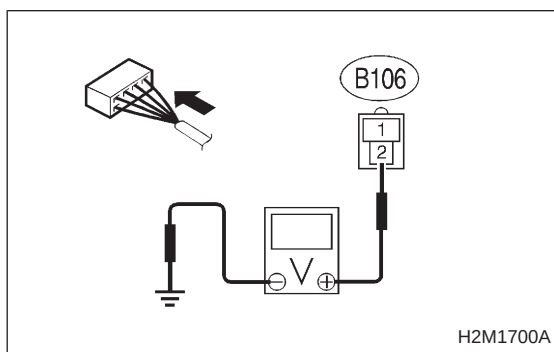
Connector & terminal**(T3) No. 12 — (T7) No. 1:****CHECK** : *Is the resistance less than 1 Ω?***YES** : Go to step 8B8.**NO** : Repair open circuit in harness between transmission harness and inhibitor switch connector.**8B8****CHECK POOR CONTACT.**

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.

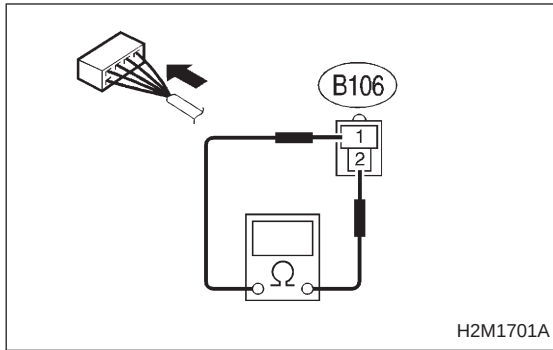
**8B9****CHECK INHIBITOR SWITCH.**

- 1) Turn ignition switch to OFF.
- 2) Place the selector lever in the "P" or "N" position.
- 3) Disconnect connector from 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** : Replace inhibitor switch.**8B10****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?**NO** : Replace starter interlock relay.**YES** : Go to next step 3).



3) Turn ignition switch to OFF.

4) Measure resistance between clutch switch connector terminals while depressing the clutch pedal.

Connector & terminal

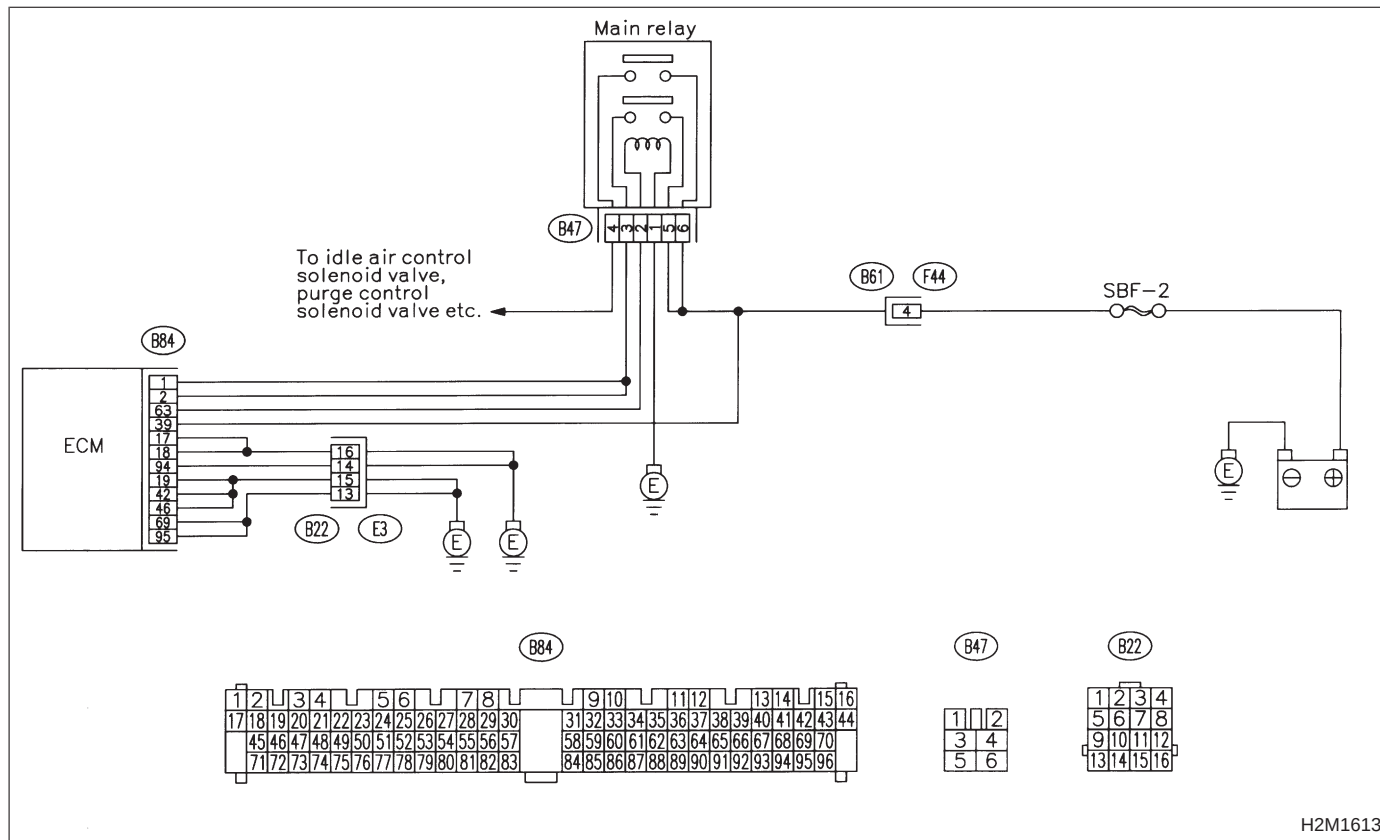
(B106) No. 1 — No. 2:

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

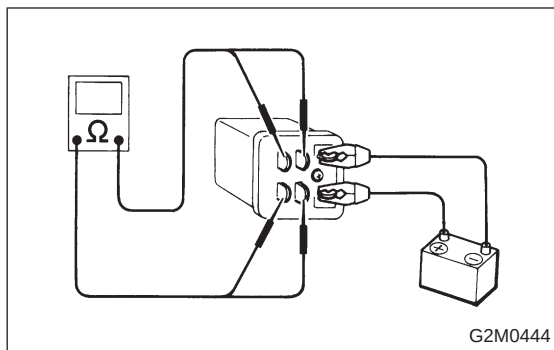
YES : Repair open circuit in harness between starter motor and ignition switch connector.

NO : Replace clutch switch.

WIRING DIAGRAM:



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

**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 next step 5).

YES : Replace main relay.

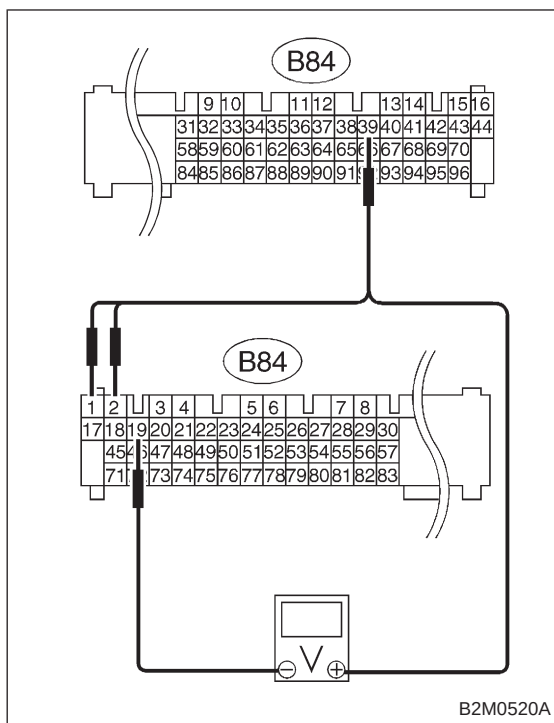
- 5) Measure resistance between main relay terminals.

Terminals**No. 4 — No. 6:**

CHECK : Is the resistance less than 10 Ω?

YES : Go to step 8C2.

NO : Replace main relay.

**8C2****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 next step 5).

NO : Repair open or ground short circuit in harness of power supply circuit.

- 5) 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 next step 6).

NO : Repair open or ground short circuit in harness of power supply circuit.

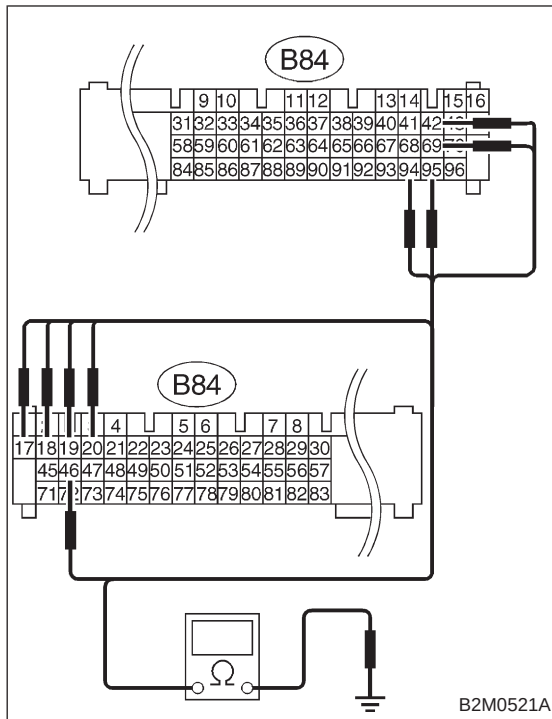
- 6) Measure power supply voltage between ECM connector terminals.

Connector & terminal**(B84) No. 39 (+) — No. 19 (-):**

CHECK : Is the voltage more than 10 V?

YES : Go to step 8C3.

NO : Repair open or ground short circuit in harness of power supply circuit.

**8C3****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 next step 3).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

- 3) 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 next step 4).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

- 4) Measure resistance of harness between ECM and chassis ground.

Connector & terminal**(B84) No. 19 — Chassis ground:**

CHECK : Is the resistance less than 5 Ω ?

YES : Go to next step 5).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

- 5) 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 next step 6).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

- 6) 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 next step 7).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

7) 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 next step 8).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

8) 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 next step 9).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

9) 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 next step 10).

NO : Repair open circuit in harness between ECM connector and engine grounding terminal.

10) Measure resistance of harness between ECM and chassis ground.

Connector & terminal

(B84) No. 95 — Chassis ground:

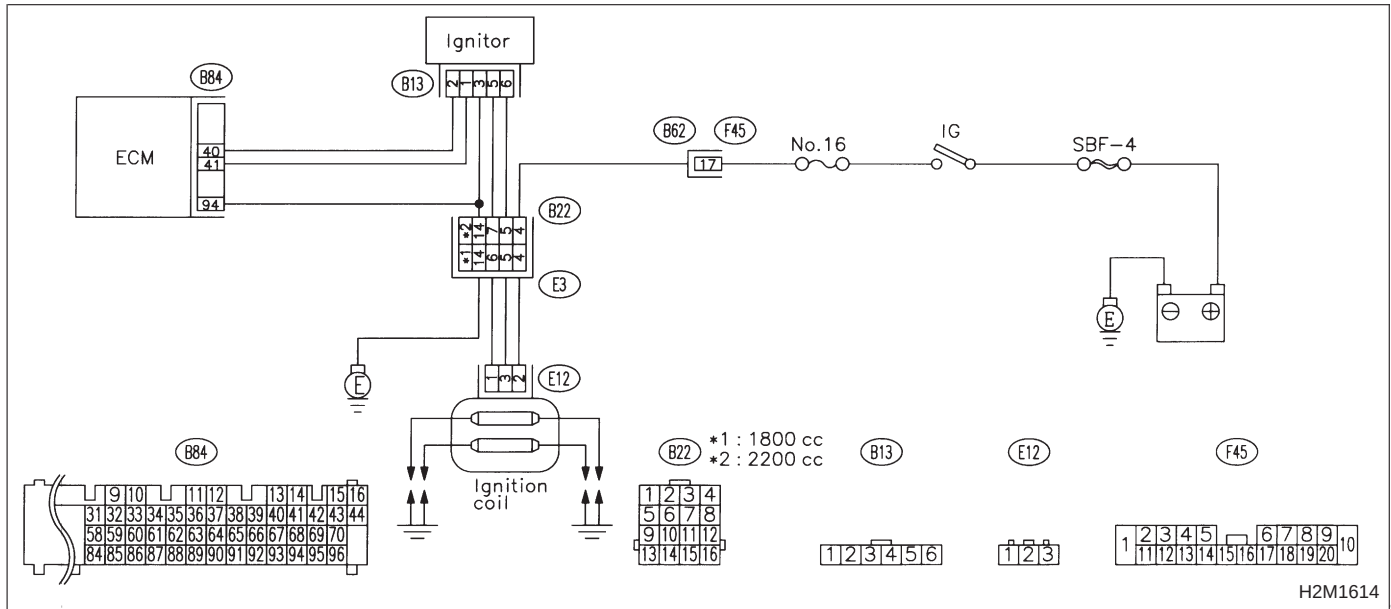
CHECK : Is the resistance less than 5 Ω ?

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

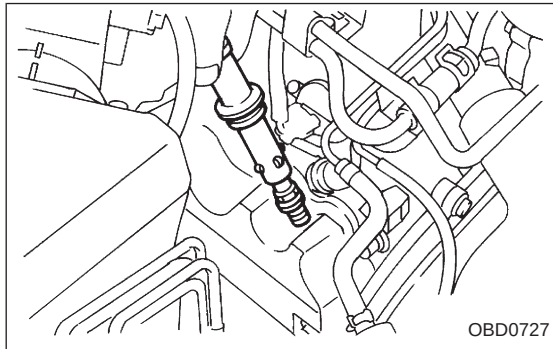
WIRING DIAGRAM:



CAUTION:

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

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



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:

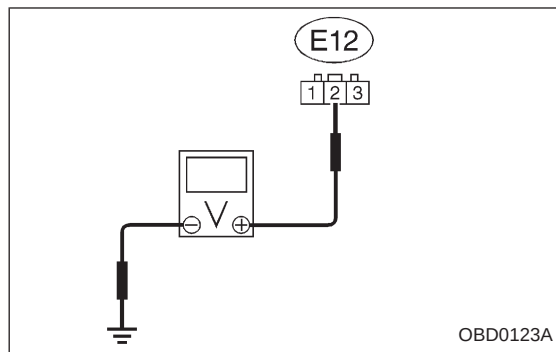
Do not remove spark plug from engine.

- 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.

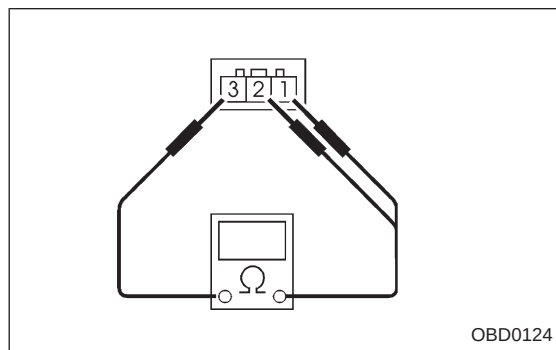
**8D2****CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL.**

- 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 connectors (B22 and F45)

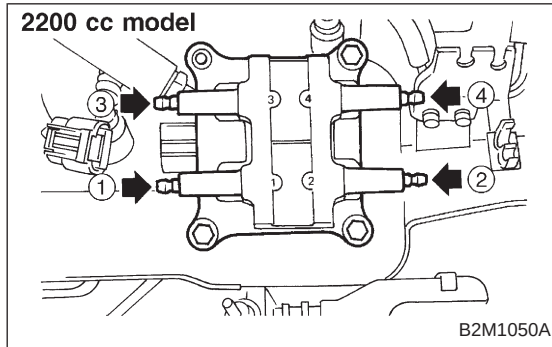
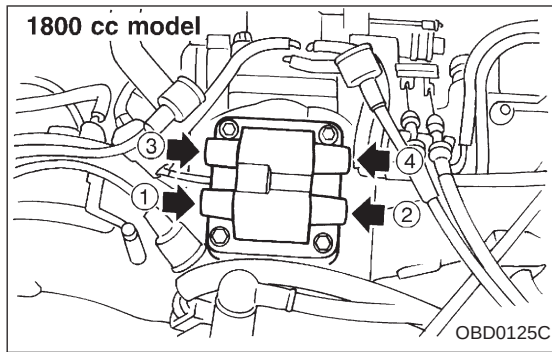
**8D3****CHECK IGNITION COIL.**

- 1) 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 next step 2).**NO** : Replace ignition coil.

- 2) 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?**NO** : Replace ignition coil.**YES** : Go to next step 3).



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

Terminals

#1 — #2:

- CHECK** : • **1800 cc model**
Is the resistance between 18 and 24 Ω ?
• **2200 cc model**
Is the resistance between 10 and 15 k Ω ?

YES : Go to next step 4).

NO : Replace ignition coil.

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

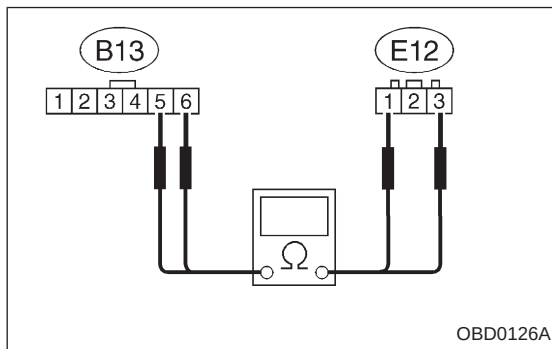
Terminals

#3 — #4:

- CHECK** : • **1800 cc model**
Is the resistance between 18 and 24 Ω ?
• **2200 cc model**
Is the resistance between 10 and 15 k Ω ?

YES : Go to step 8D4.

NO : Replace ignition coil.



8D4

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 ignition coil and ignitor connector.

Connector & terminal

(B13) No. 5 — (E12) No. 1:

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

YES : Go to next step 4).

YES : Go to step 8D5.

4) 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 8D6.

NO : Go to step 8D5.

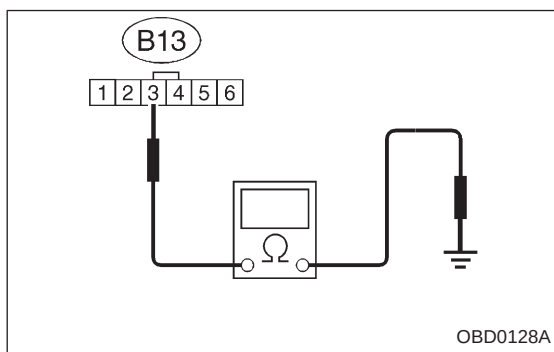
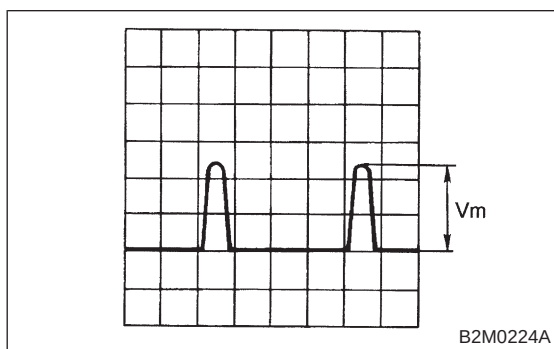
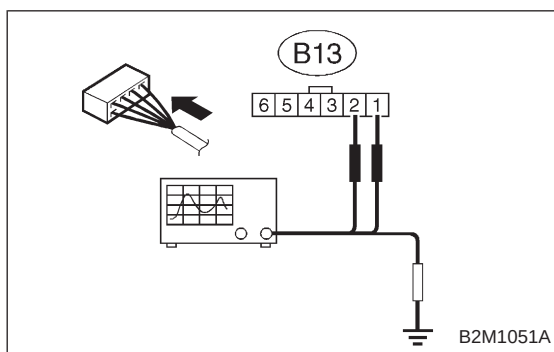
8D5**CHECK POOR CONTACT.**

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.

**8D6****CHECK INPUT SIGNAL FOR IGNITOR.**

1) 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 next step 2).

NO : Replace ignitor.

2) 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 8D7.

NO : Replace ignitor.

8D7**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?*

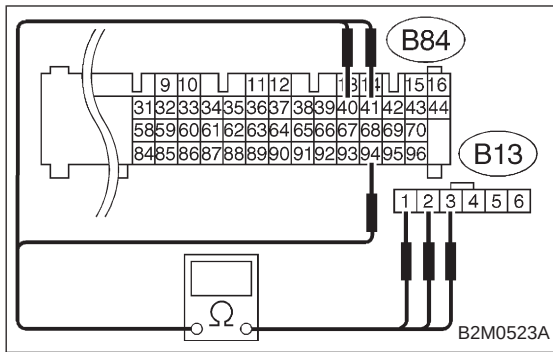
YES : Go to step 8D8.

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)

**8D8****CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.**

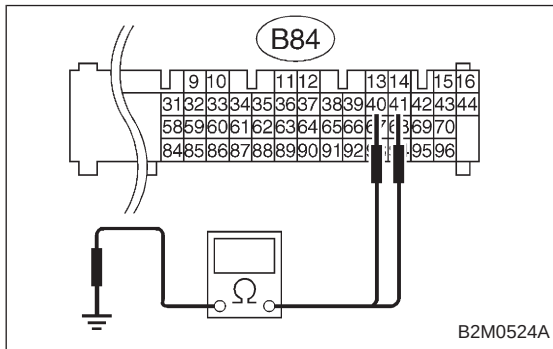
- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness between ECM and ignitor connector.

Connector & terminal**(B84) No. 41 — (B13) No. 1:****CHECK** : Is the resistance less than 1 Ω?**YES** : Go to next step 3).**NO** : Repair open circuit in harness between ECM and ignitor connector.

- 3) 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 next step 4).**NO** : Repair open circuit in harness between ECM and ignitor connector.

- 4) 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?**NO** : Repair open circuit in harness between ECM and ignitor connector.**YES** : Go to next step 5).

- 5) 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 next step 6).**NO** : Repair ground short circuit in harness between ECM and ignitor connector.

- 6) 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 8D9.**NO** : Repair ground short circuit in harness between ECM and ignitor connector.

8D9	CHECK POOR CONTACT.

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

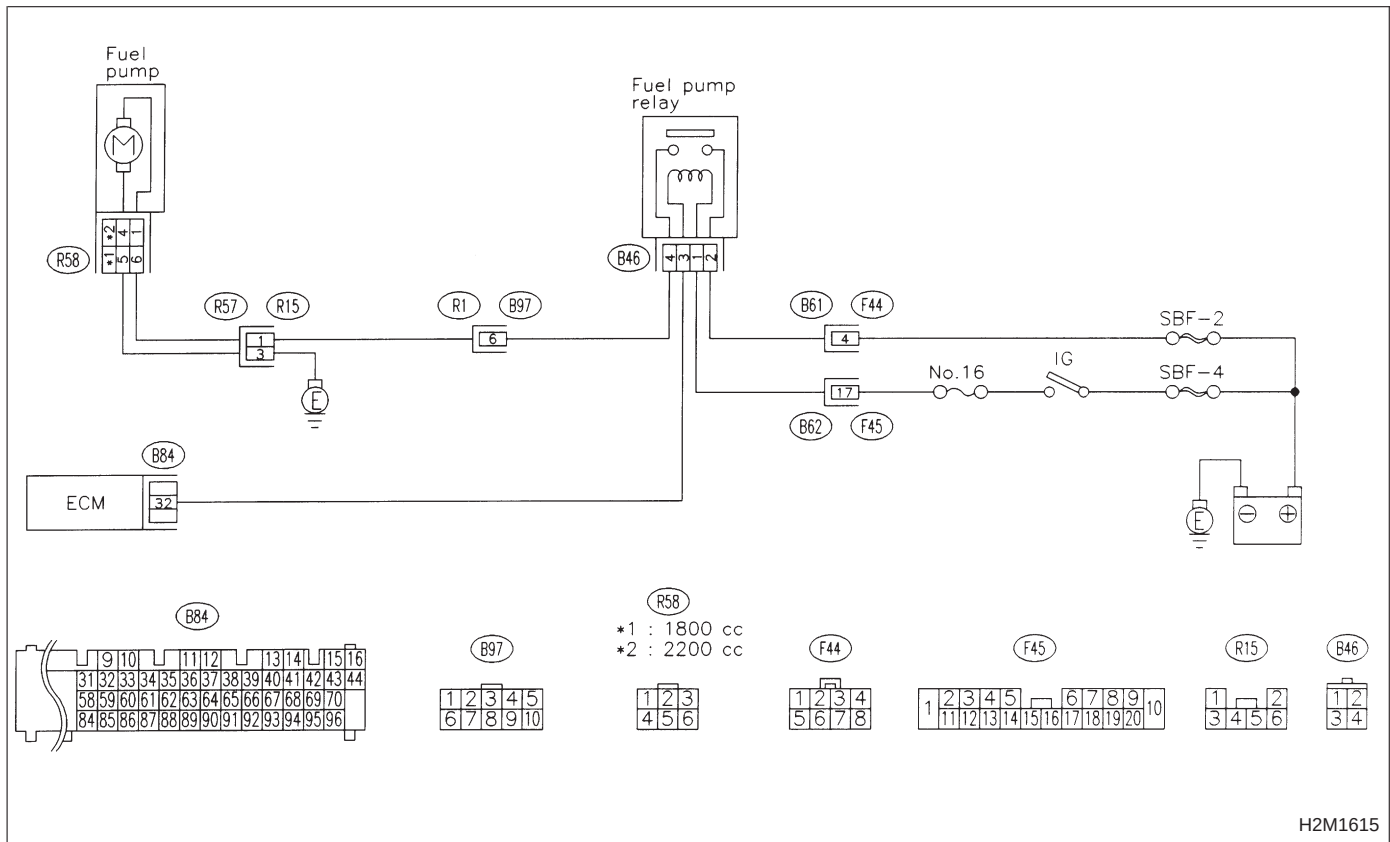
CHECK : *Is there poor contact in ECM connector?*

YES : Repair poor contact in ECM connector.

NO : Check fuel pump circuit. <Ref. to 2-7 [T8E0].>

E: FUEL PUMP CIRCUIT

WIRING DIAGRAM:



CAUTION:

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

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

8E1	CHECK OPERATING SOUND OF FUEL PUMP.

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

(CHECK) : Does fuel pump produce operating sound?

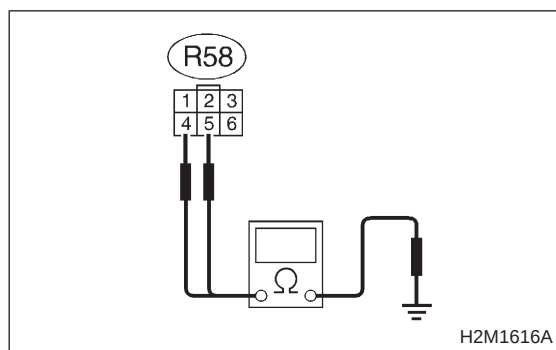
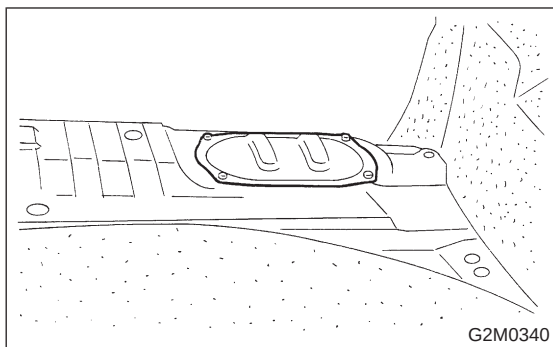
NOTE:

Fuel pump operation check can also be executed using Subaru Select Monitor (Function mode: FD01).

For the procedure, refer to “COMPULSORY VALVE OPERATION CHECK MODE”. <Ref. to 2-7 [T3F0].>

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 right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

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

Connector & terminal

- 1800 cc model

(R58) No. 5 — Chassis ground:

- 2200 cc model

(R58) No. 4 — Chassis ground:

CHECK : Is the resistance less than 5 Ω?

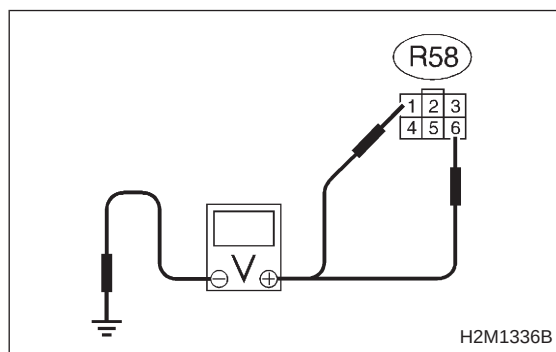
YES : Go to step 8E3.

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

- 1800 cc model

(R58) No. 6 (+) — Chassis ground (-):

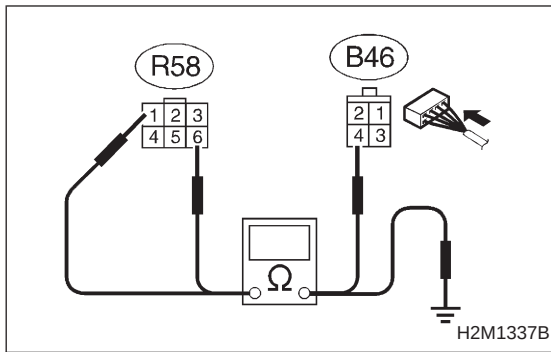
- 2200 cc model

(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.**

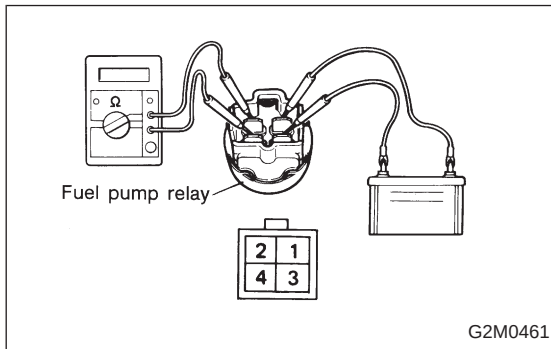
- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between fuel pump and fuel pump relay connector.

Connector & terminal● **1800 cc model****(R58) No. 6 — (B46) No. 4:**● **2200 cc model****(R58) No. 1 — (B46) No. 4:****(CHECK)** : **Is the resistance less than 1 Ω?****(YES)** : Go to next step 3).**(NO)** : Repair harness and connector.**NOTE:**

In this case, repair the following:

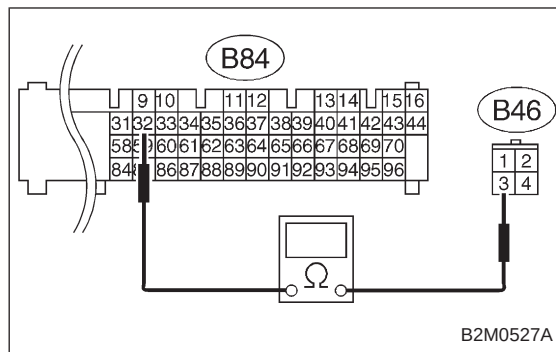
- Open circuit in harness between fuel pump and fuel pump relay connector
- Poor contact in coupling connectors (R15 and B97)

- 3) Measure resistance of harness between fuel pump and fuel pump relay connector.

Connector & terminal● **1800 cc model****(R58) No. 6 — Chassis ground:**● **2200 cc model****(R58) No. 1 — Chassis ground:****(CHECK)** : **Is the resistance more than 1 MΩ?****(YES)** : Go to step 8E5.**(NO)** : Repair short circuit in harness between fuel pump and fuel pump relay connector.**8E5****CHECK FUEL PUMP RELAY.**

- 1) Disconnect connectors from fuel pump relay and main relay.
- 2) Remove fuel pump relay and main relay with 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 8E6.**(NO)** : Replace fuel pump relay.

**8E6****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.

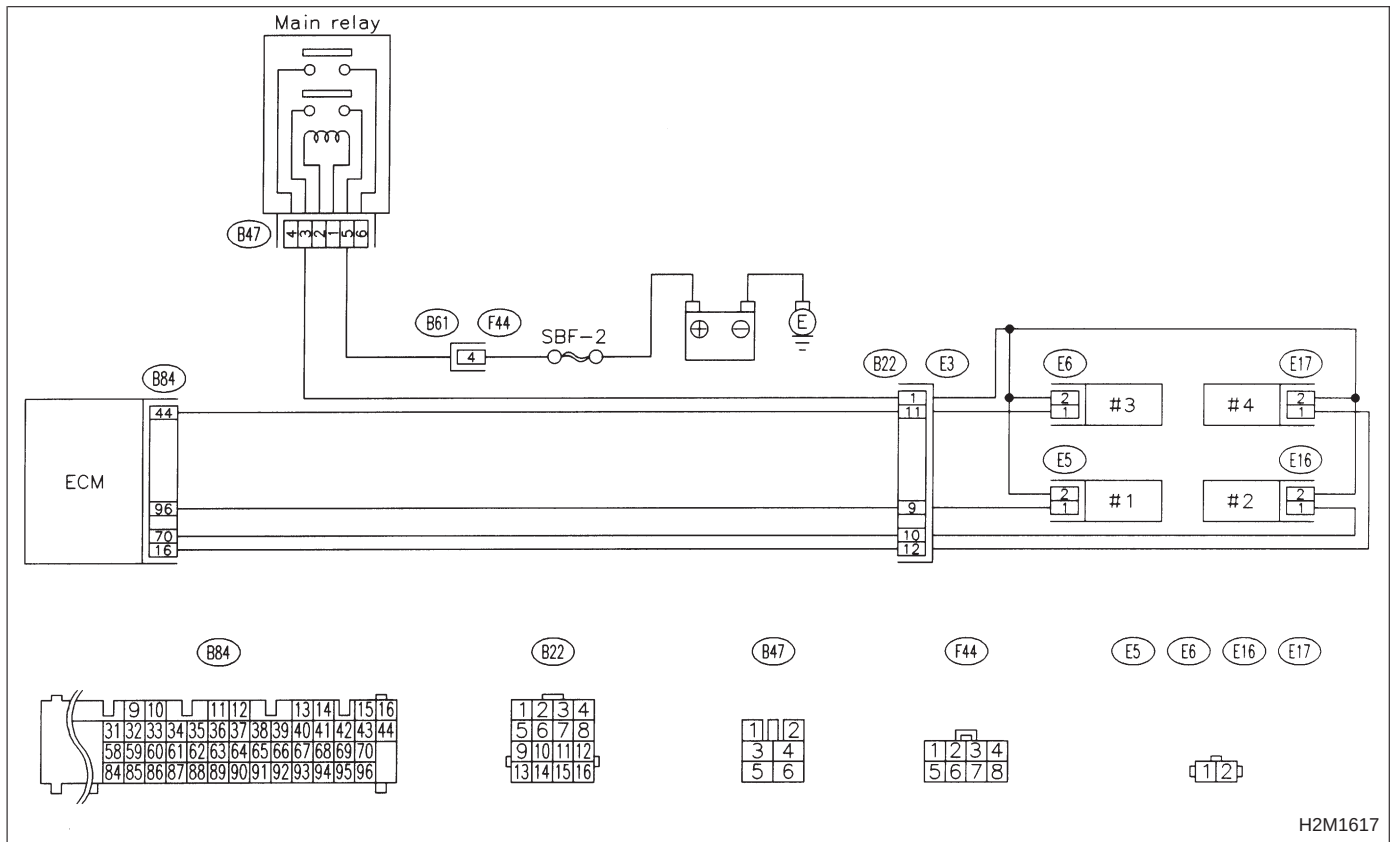
Connector & terminal**(B84) No. 32 — (B46) No. 3:****CHECK : Is the resistance less than 1 Ω ?****YES : Go to step 8E7.****NO : Repair open circuit in harness between ECM and fuel pump relay connector.****8E7****CHECK POOR CONTACT.**

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

WIRING DIAGRAM:



CAUTION:

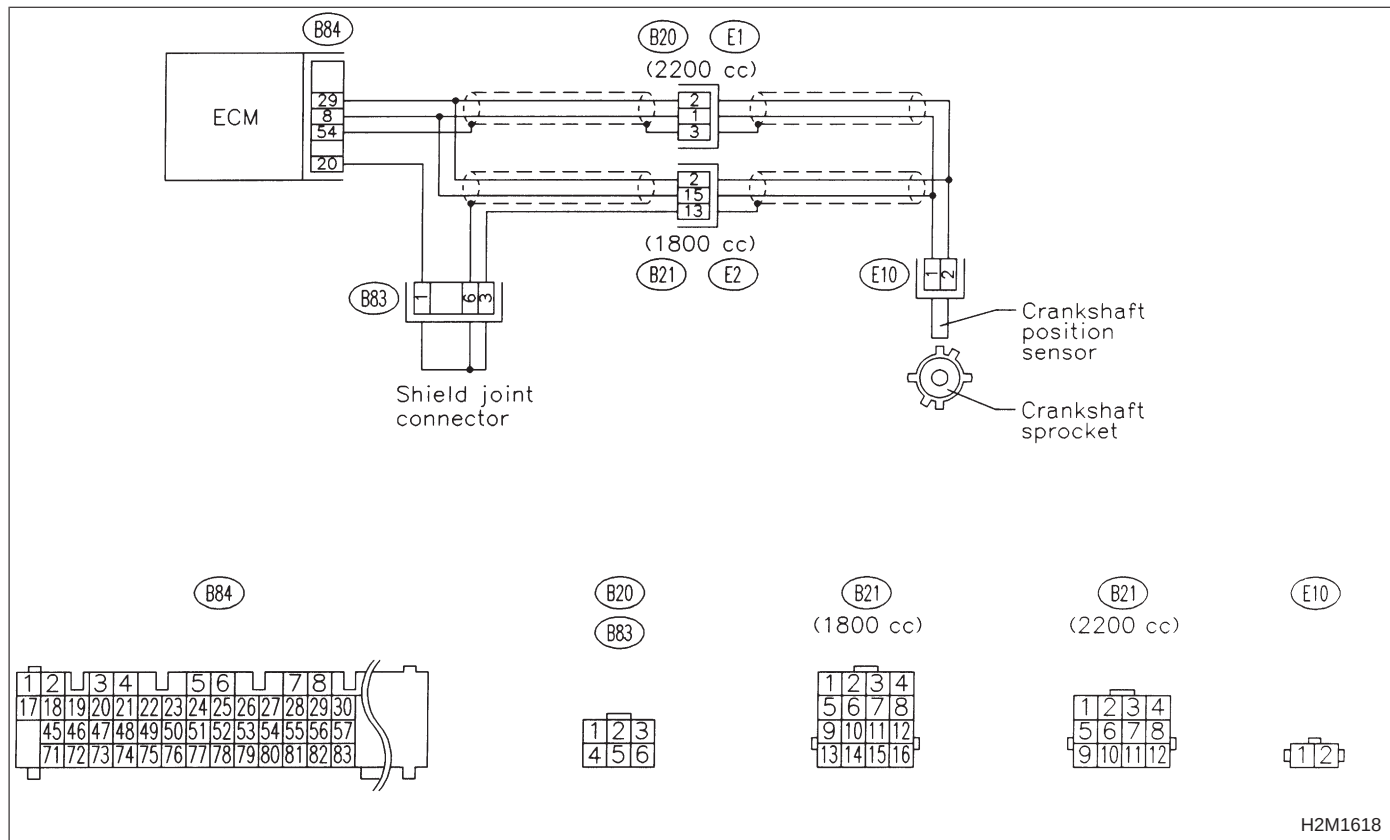
- Check or repair only faulty parts.
 - After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
- <Ref. to 2-7 [T3D0] and [T3E0].>

NOTE:

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

G: CRANKSHAFT POSITION SENSOR CIRCUIT

WIRING DIAGRAM:



CAUTION:

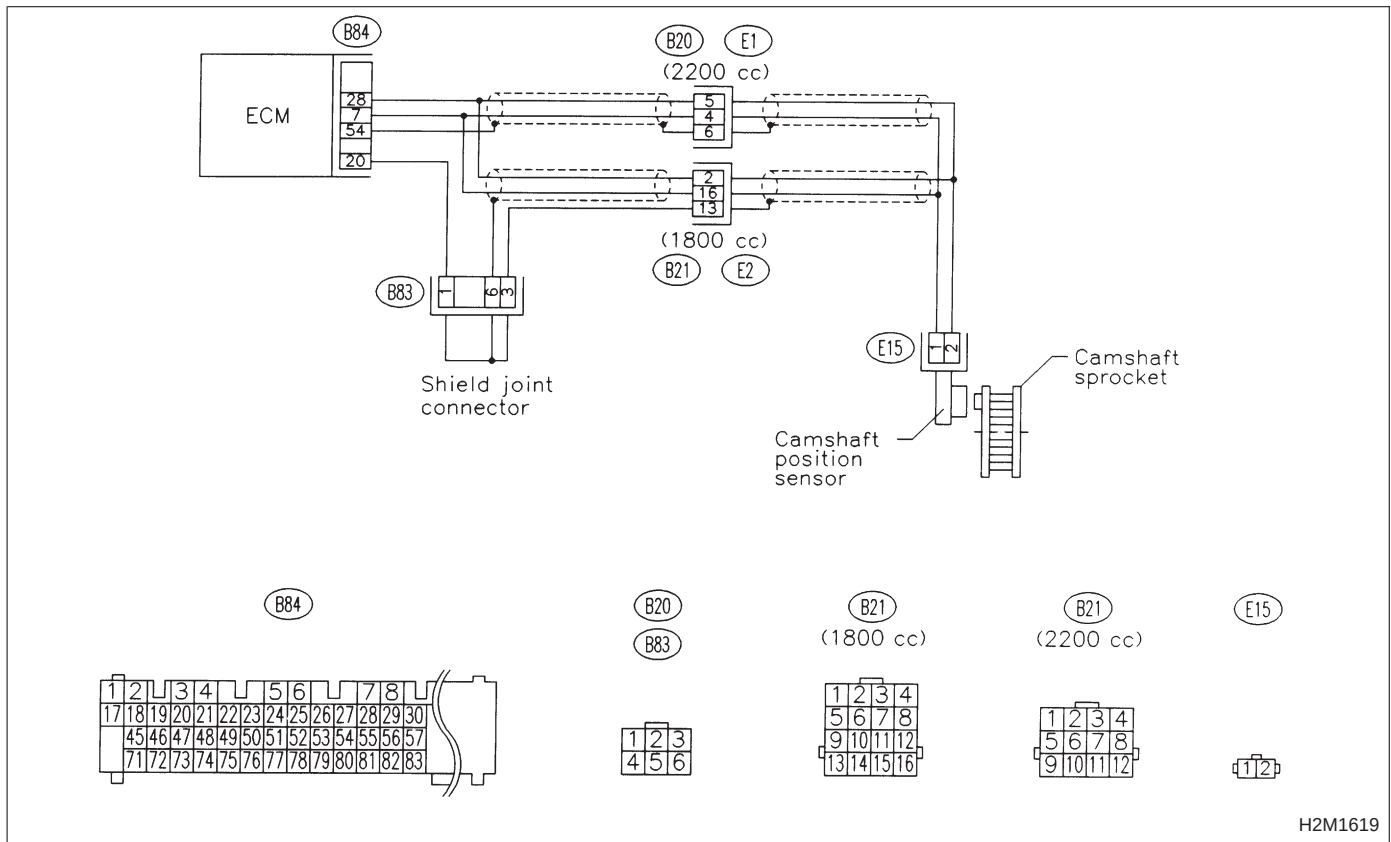
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

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

NOTE:

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

H: CAMSHAFT POSITION SENSOR CIRCUIT WIRING DIAGRAM:



9. General Diagnostic Table

A: GENERAL DIAGNOSTICS TABLE WITH NONCONFORMITY 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 NONCONFORMITY SYMPTOM FOR AUTOMATIC TRANSMISSION

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 unit 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

Symptom	Problem parts
Vehicle does not start in any shift range (engine stalls).	1) Parking brake mechanism 2) Planetary gear
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

Symptom	Problem parts
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
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 2) Select lever 3) Parking mechanism
Shift lever cannot be moved or is hard to move from "P" range.	
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

Symptom	Problem parts
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
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

Symptom	Problem parts
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
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

Symptom	Problem parts
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

10. Diagnostic Chart with Trouble Code

A: DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P0101	QA—RLOW	Mass air flow sensor circuit range/performance problem (low input)	133
P0102	QA—LOW	Mass air flow sensor circuit low input	135
P0103	QA—HI	Mass air flow sensor circuit high input	140
P0106	PS—R2	Pressure sensor circuit range/performance problem	143
P0107	P—SLOW	Pressure sensor circuit low input	147
P0108	P—SHI	Pressure sensor circuit high input	151
P0116	TW—LOW	Engine coolant temperature sensor circuit low input	156
P0117	TW—HI	Engine coolant temperature sensor circuit high input	159
P0121	TH—RHI	Throttle position sensor circuit range/performance problem (high input)	163
P0122	THV—LOW	Throttle position sensor circuit low input	165
P0123	THV—HI	Throttle position sensor circuit high input	170
P0125	TW—CL	Insufficient coolant temperature for closed loop fuel control	173
P0130	FO2—V	Front oxygen sensor circuit malfunction	175
P0133	FO2—R	Front oxygen sensor circuit slow response	178
P0135	FO2H	Front oxygen sensor heater circuit malfunction	180
P0136	RO2—V	Rear oxygen sensor circuit malfunction	184
P0139	RO2—R	Rear oxygen sensor circuit slow response	187
P0141	RO2H	Rear oxygen sensor heater circuit malfunction	189
P0170	FUEL	Fuel trim malfunction	193
P0181	TNKT—F	Fuel temperature sensor A circuit range/performance problem	198
P0182	TNKT—LOW	Fuel temperature sensor A circuit low input	200
P0183	TNKT—HI	Fuel temperature sensor A circuit high input	203
P0261	INJ1	Fuel injector circuit low input - #1	209
P0262	INJ1—HI	Fuel injector circuit high input - #1	214
P0264	INJ2	Fuel injector circuit low input - #2	209
P0265	INJ2—HI	Fuel injector circuit high input - #2	214
P0267	INJ3	Fuel injector circuit low input - #3	209
P0268	INJ3—HI	Fuel injector circuit high input - #3	214
P0270	INJ4	Fuel injector circuit low input - #4	209
P0271	INJ4—HI	Fuel injector circuit high input - #4	214
P0301	MIS—1	Cylinder 1 misfire detected	218
P0302	MIS—2	Cylinder 2 misfire detected	218
P0303	MIS—3	Cylinder 3 misfire detected	218
P0304	MIS—4	Cylinder 4 misfire detected	218
P0325	KNOCK	Knock sensor circuit malfunction	227
P0335	CRANK	Crankshaft position sensor circuit malfunction	230
P0336	CRANK—R	Crankshaft position sensor circuit range/performance problem	233
P0340	CAM	Camshaft position sensor circuit malfunction	235
P0341	CAM—R	Camshaft position sensor circuit range/performance problem	238

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P0400	EGR	Exhaust gas recirculation flow malfunction	240
P0403	EGRSOL	Exhaust gas recirculation circuit low input	245
P0420	CAT	Catalyst system efficiency below threshold	249
P0440	EVAP	Evaporative emission control system malfunction	251
P0441	CPC—F	Evaporative emission control system incorrect purge flow	255
P0443	CPC	Evaporative emission control system purge control valve circuit low input	257
P0446	VCMSOL—LO	Evaporative emission control system vent control low input	261
P0451	TNKP—F	Evaporative emission control system pressure sensor range/performance problem	265
P0452	TNKP—LOW	Evaporative emission control system pressure sensor low input	267
P0453	TNKP—HI	Evaporative emission control system pressure sensor high input	272
P0461	FLVL—R	Fuel level sensor circuit range/performance problem	278
P0462	FLVL—LOW	Fuel level sensor circuit low input	280
P0463	FLVL—HI	Fuel level sensor circuit high input	290
P0500	VSP	Vehicle speed sensor malfunction	298
P0505	ISC	Idle control system malfunction	300
P0506	ISC—RLOW	Idle control system RPM lower than expected	307
P0507	ISC—RHI	Idle control system RPM higher than expected	309
P0600	—	Serial communication link malfunction	311
P0601	RAM	Internal control module memory check sum error	313
P0703	ATBRK	Brake switch input malfunction	314
P0705	ATRNG	Transmission range sensor circuit malfunction	317
P0710	ATF	Transmission fluid temperature sensor circuit malfunction	336
P0720	ATVSP	Output speed sensor (vehicle speed sensor 1) circuit malfunction	337
P0725	ATNE	Engine speed input circuit malfunction	338
P0731	ATGR1	Gear 1 incorrect ratio	339
P0732	ATGR2	Gear 2 incorrect ratio	339
P0733	ATGR3	Gear 3 incorrect ratio	339
P0734	ATGR4	Gear 4 incorrect ratio	339
P0740	ATLU—F	Torque converter clutch system malfunction	343
P0743	ATLU	Torque converter clutch system electrical	347
P0748	ATPL	Pressure control solenoid electrical	348
P0753	ATSFT1	Shift solenoid A electrical	349
P0758	ATSFT2	Shift solenoid B electrical	350
P0760	ATOVR—F	Shift solenoid C malfunction	351
P0763	ATOVR	Shift solenoid C electrical	355
P1100	ST—SWOFF	Starter switch circuit low input	356
P1101	N—SW	Neutral position switch circuit malfunction [MT vehicles]	358
P1101	N—SWOFF	Neutral position switch circuit high input [AT vehicles]	362
P1102	BR	Pressure sources switching solenoid valve circuit low input	367
P1103	TRQ	Engine torque control signal circuit malfunction	371
P1120	ST—SWON	Starter switch circuit high input	374

DTC No.	Abbreviation (Subaru Select Monitor)	Item	Page
P1121	N—SWON	Neutral position switch circuit low input [AT vehicles]	376
P1122	BR—HI	Pressure sources switching solenoid valve circuit high input	380
P1141	QA—RHI	Mass air flow sensor circuit range/performance problem (high input)	382
P1142	TH—RLOW	Throttle position sensor circuit range/performance problem (low input)	384
P1143	PS—RLOW	Pressure sensor circuit range/performance problem (low input)	386
P1144	PS—RHI	Pressure sensor circuit range/performance problem (high input)	390
P1400	PCVSOL—LO	Fuel tank pressure control solenoid valve circuit low input	392
P1420	PCVSOL—HI	Fuel tank pressure control solenoid valve circuit high input	396
P1421	EGRSOL—HI	Exhaust gas recirculation circuit high input	399
P1422	CPC—HI	Evaporative emission control system purge control valve circuit high input	402
P1423	VCMSOL—HI	Evaporative emission control system vent control high input	405
P1440	PCV—FLOW	Fuel tank pressure control system function problem (low input)	408
P1441	PCV—FHI	Fuel tank pressure control system function problem (high input)	412
P1442	FLVL—R2	Fuel level sensor circuit range/performance problem 2	415
P1500	FAN—1	Radiator fan relay 1 circuit low input	417
P1502	FAN—F	Radiator fan function problem	421
P1507	ISC—SHI	Idle control system malfunction (fail-safe)	423
P1520	FAN—1HI	Radiator fan relay 1 circuit high input	425
P1540	VSP—S	Vehicle speed sensor malfunction 2	428
P1700	ATTH	Throttle position sensor circuit malfunction for automatic transmission	430
P1701	ATCRS	Cruise control set signal circuit malfunction for automatic transmission	432
P1702	ATDIAG—LO	Automatic transmission diagnosis input signal circuit low input	434
P1722	ATDIAG—HI	Automatic transmission diagnosis input signal circuit high input	437
P1742	ATDIAG—2	Automatic transmission diagnosis input signal circuit malfunction	440

OBD (FB1)

P0101 <QA_RLOW>

B2M1056

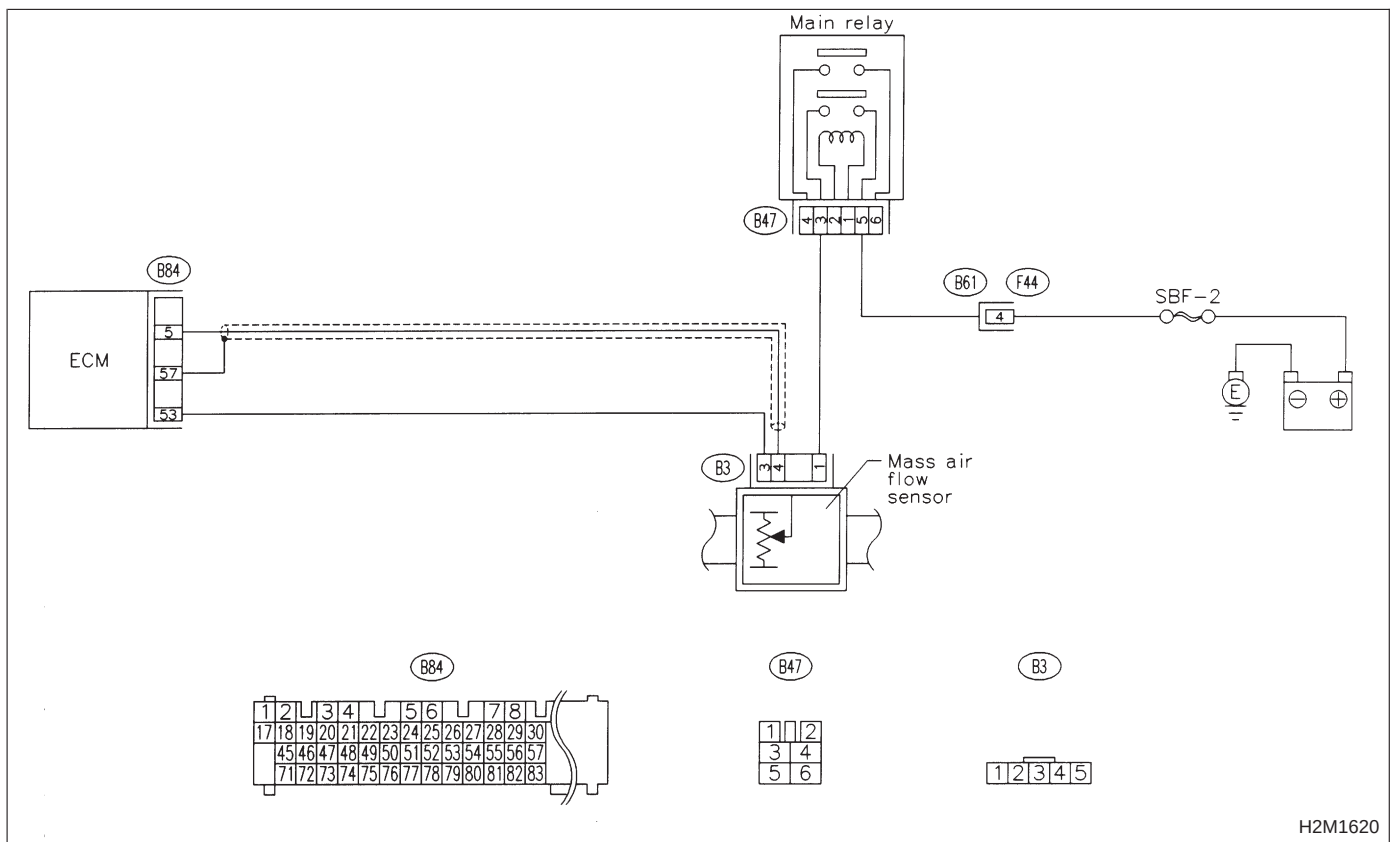
B: DTC P0101
— MASS AIR FLOW SENSOR CIRCUIT
RANGE/PERFORMANCE PROBLEM
(LOW INPUT) —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:

H2M1620

CAUTION:

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

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

10B1	CHECK DTC P0102 OR P0103 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.

OBD (FB1)

P0102 <QA_LOW>

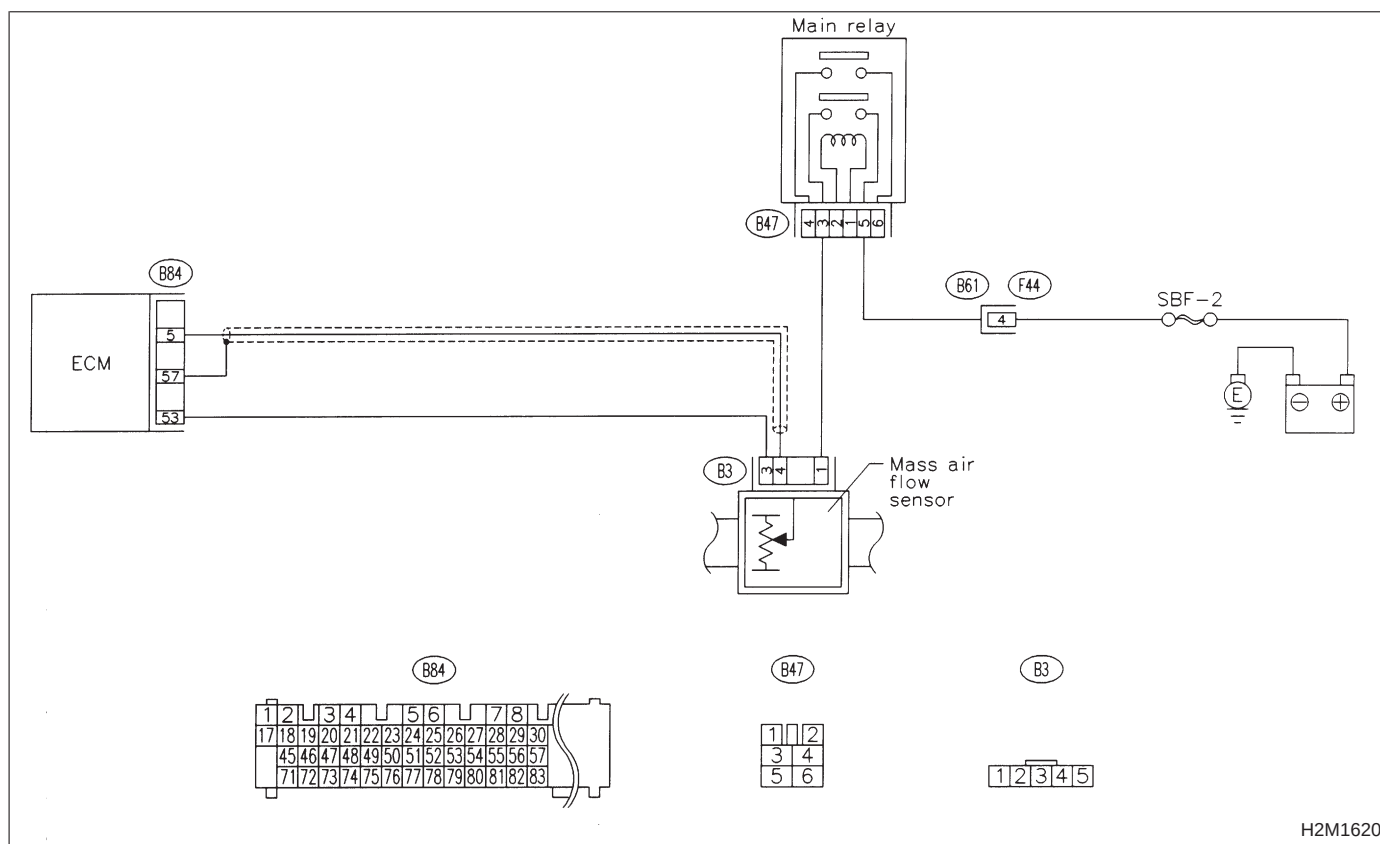
B2M1058

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

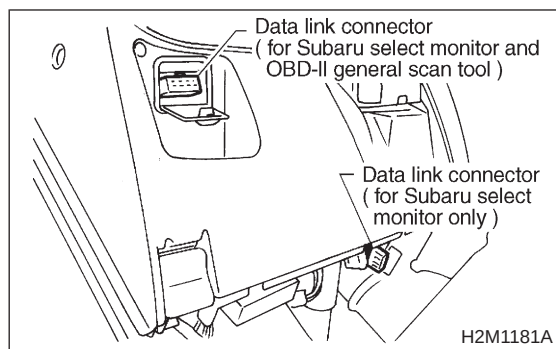
WIRING DIAGRAM:

H2M1620

CAUTION:

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

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



QA (F06)

1 . 67g / s 2 . 02V

B2M0481

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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F06

- F06: Mass air flow and voltage input from mass air flow sensor are shown on display at the same time.

CHECK : *Is the value equal to or more than 1.3 g/sec or 0.3 V and equal to or less than 250 g/sec or 5.0 V in function mode F06?*

Probable cause: Poor connect of connectors, circuit and grounding line.

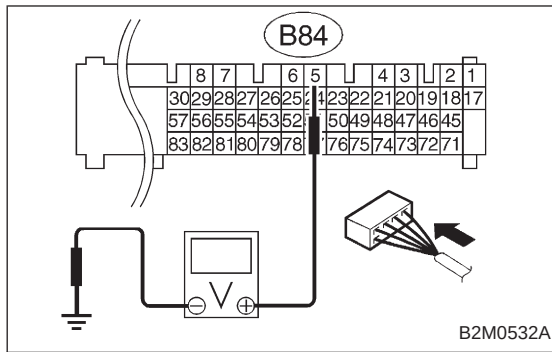
YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor.

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.
(USING VOLTAGE METER AND SUBARU
SELECT MONITOR.)**

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

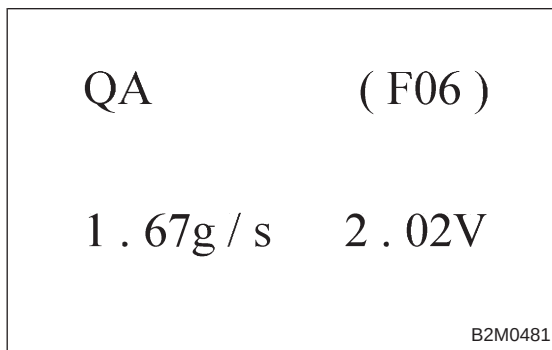
Connector & terminal

(B84) No. 5 (+) — Chassis ground (-):

CHECK : Is the voltage less than 0.3 V?

YES : Go to step 10C3.

NO : Go to next step 2).



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

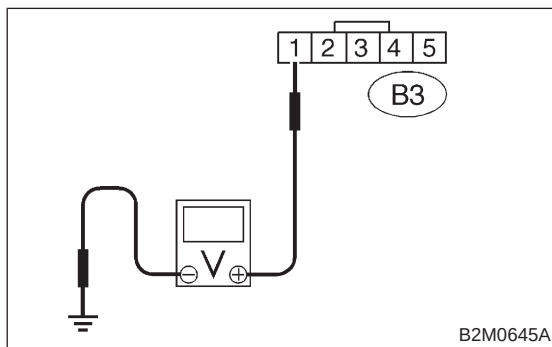
CHECK : Does the voltage change more than 0.3 V by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?

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.

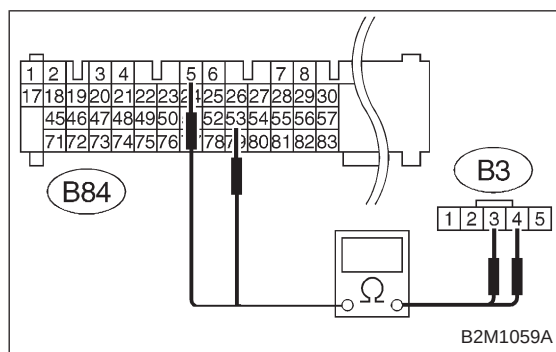
**10C3**
**CHECK POWER SUPPLY TO MASS AIR
FLOW SENSOR.**

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 10C4.**NO** : Repair open circuit in harness between main relay and mass air flow sensor connector.**10C4****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 next step 4).**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

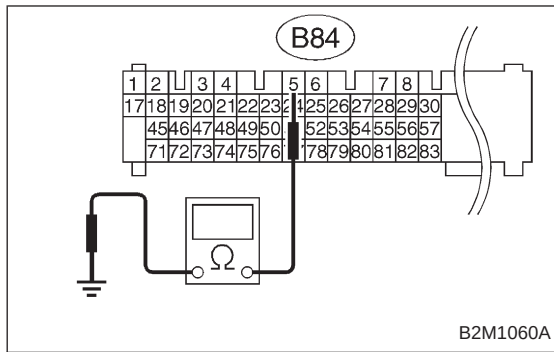
- Open circuit in harness between ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector

- 4) 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 10C5.**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

**10C5****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.

OBD

(FB1)

P0103

<QA_HI>

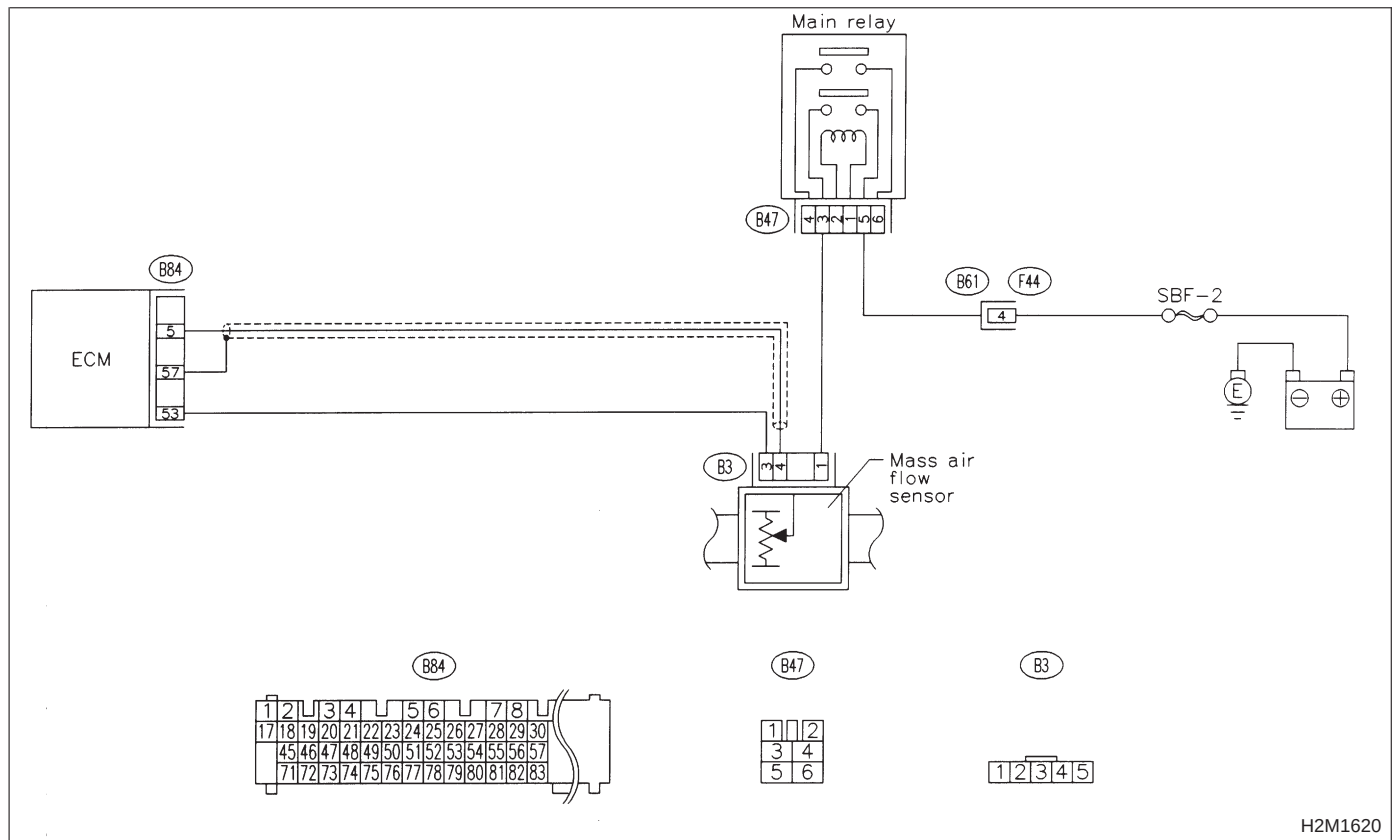
B2M1061

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

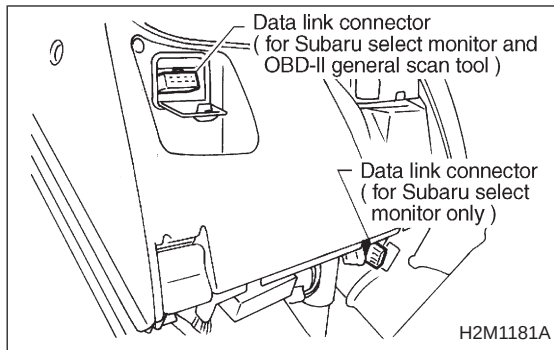
WIRING DIAGRAM:

H2M1620

CAUTION:

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

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

**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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F06

- F06: Mass air flow and voltage input from mass air flow sensor are shown on display at the same time.

CHECK : *Is the value equal to or more than 1.3 g/sec or 0.3 V and equal to or less than 250 g/sec or 5.0 V in function mode F06?*

Probable cause: Poor connect of connectors, circuit and grounding line.

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

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

QA (F06)

1 . 67g / s 2 . 02V

B2M0481

QA	(F06)
1 . 67g / s	2 . 02V
B2M0481	

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 on Subaru select monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F06

CHECK : *Is the value more than 250 g/sec 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.

- OBD-II general scan tool

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

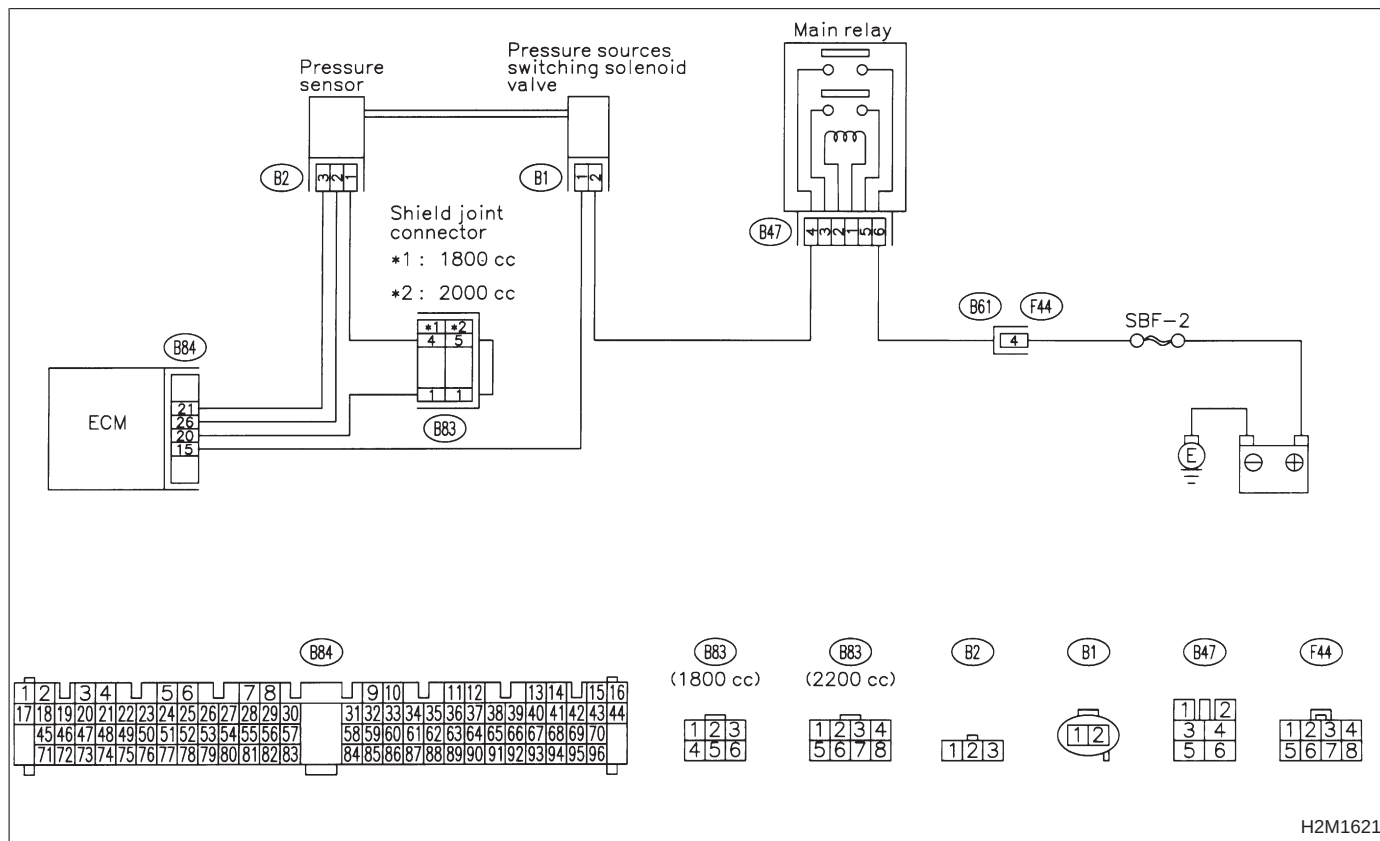
OBD (FB1)

P0106 <PS_R2>

B2M1062

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

- Two consecutive driving cycles with fault

WIRING DIAGRAM:**CAUTION:**

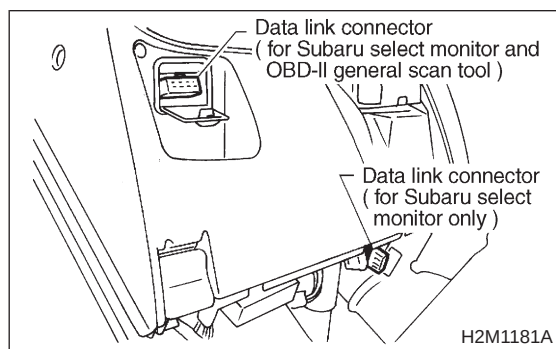
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and INSPECTION MODES.

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

10E1**CHECK DTC P0107, P0108, P1102 OR P1122 ON DISPLAY.****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].>

NOTE:

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

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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F21 and F20

- F21: Display shows pressure signal value sent from the pressure sensor.
- F20: Display shows pressure signal value sent from the pressure sensor.

CHECK: ***Is the value more than 85 kPa in function mode F21?*****YES**: Go to step **10E3**.**NO**

: Go to next step 6).

MANI.P (F 2 1)**29kPa218mmHg**

B2M0756

BARO. P (F 2 0)

1 0 0 kPa 752 mmHg

B2M0755

6) Read data on Subaru Select Monitor or OBD-II general scan tool.

CHECK : *Is the value less than 32 kPa in function mode F20?*

YES : Go to step 10E4.

NO : Go to step 7).

BARO. P (F 2 0)

1 0 0 kPa 752 mmHg

B2M0755

7) Read data on Subaru Select Monitor or OBD-II general scan tool.

CHECK : *Is the value more than 133 kPa in function mode F20?*

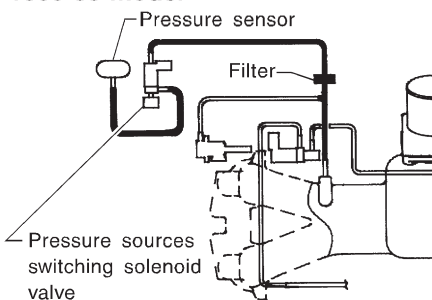
YES : Replace pressure sensor.

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

● OBD-II general scan tool

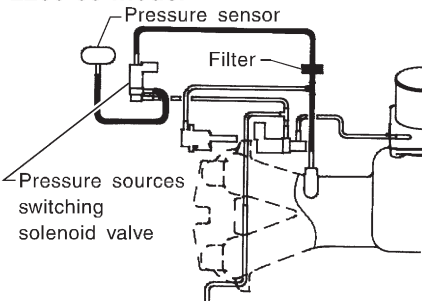
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

1800 cc model



B2M1063B

2200 cc model



B2M1269B

10E3

CHECK VACUUM HOSE.

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

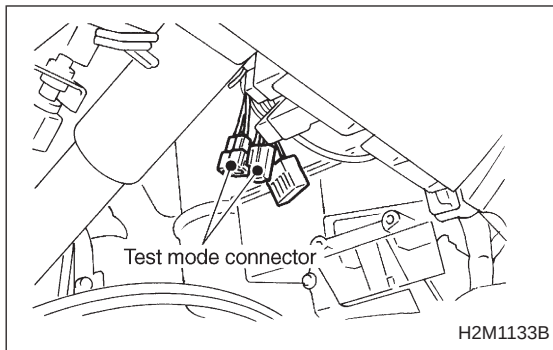
NOTE:

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

YES : Repair or replace hoses or filter.

NO : Go to step 10E4.

**10E4****CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.**

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

CHECK : ***Does pressure sources switching solenoid valve produce operating sound? (ON ↔ OFF each 1.5 sec.)***

NOTE:

Pressure sources switching solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD10). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Replace pressure sensor.

NO : Replace pressure sources switching solenoid valve.

OBD (FB1)
P0107 <P_SLOW>

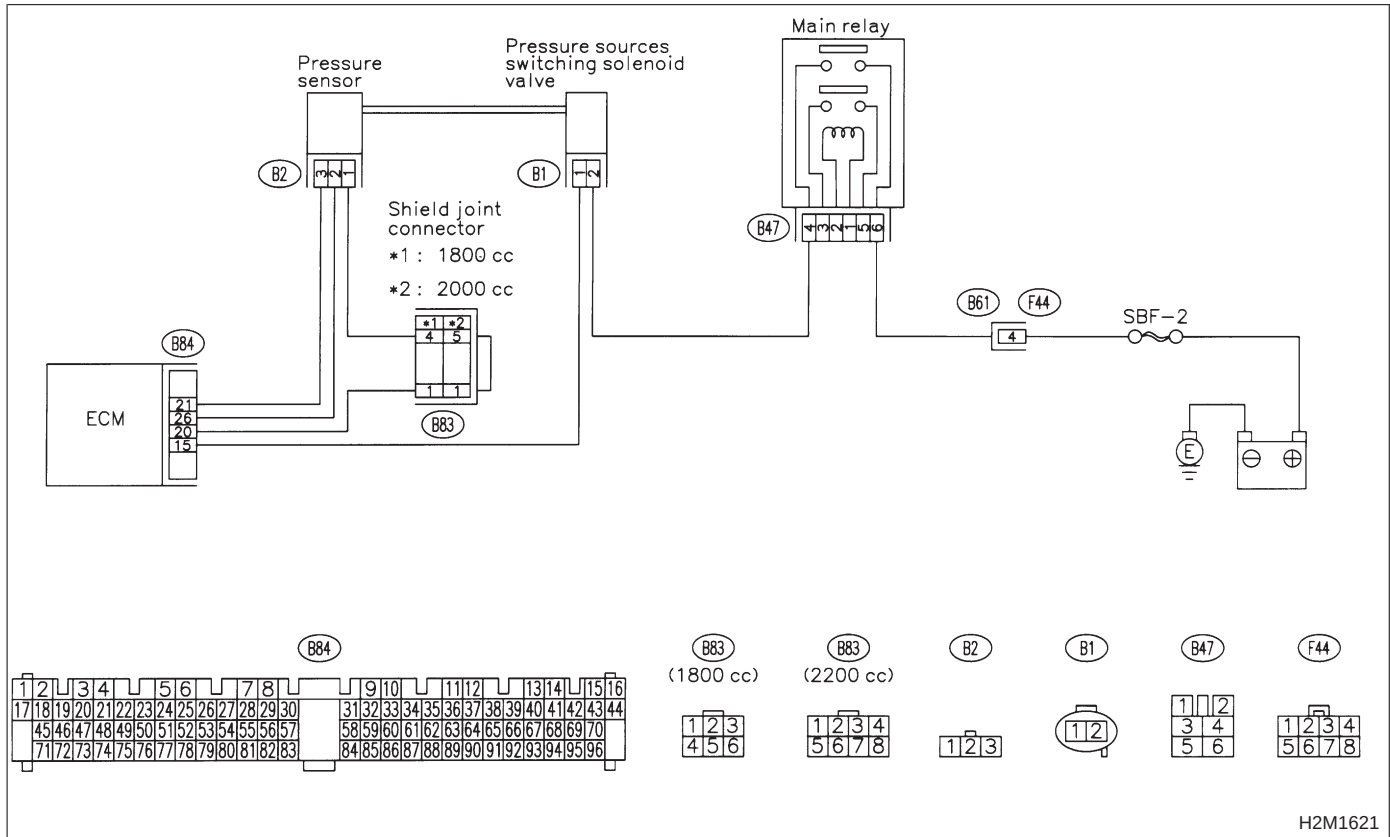
B2M1064

F: DTC P0107 — PRESSURE SENSOR CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

- Immediately at fault recognition

WIRING DIAGRAM:

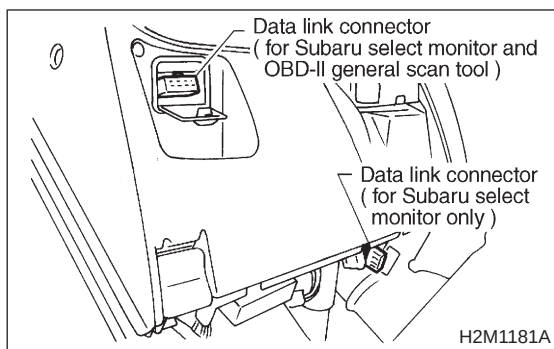


H2M1621

CAUTION:

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

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



MANI.P (F 2 1)

29kPa218mmHg

B2M0756

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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F21

- F21: Display shows pressure signal value sent from pressure sensor.

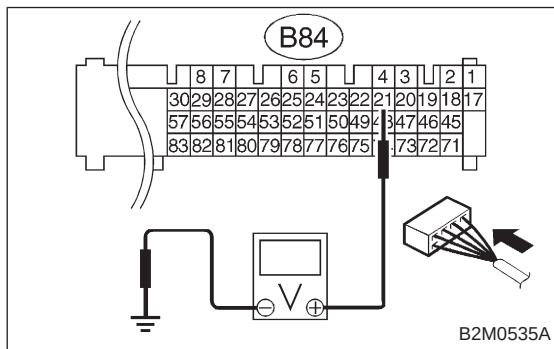
CHECK : Is the value less than 0 kPa in function mode F21?

YES : Go to step 10F2.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

- OBD-II general scan tool

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



10F2

CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

- 1) Measure voltage between ECM connector and chassis ground.

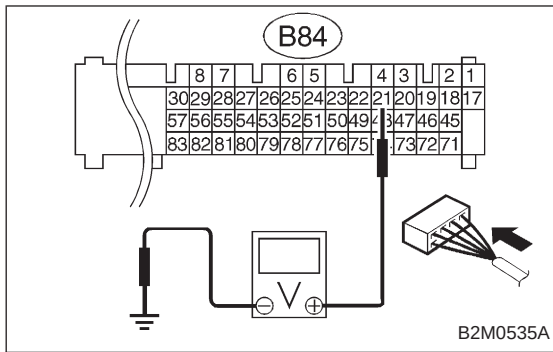
Connector & terminal

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

CHECK : Is the voltage more than 4.5 V?

YES : Go to next step 2).

NO : Go to next **CHECK** .



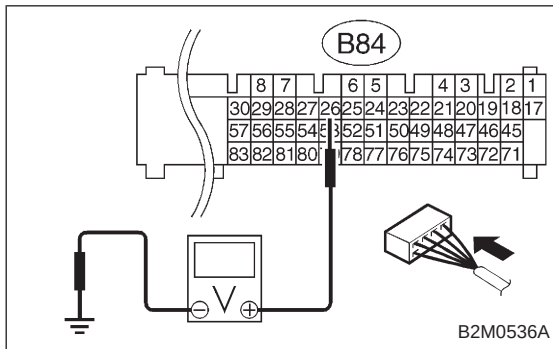
CHECK : Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?

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.



2) Measure voltage between ECM and chassis ground.

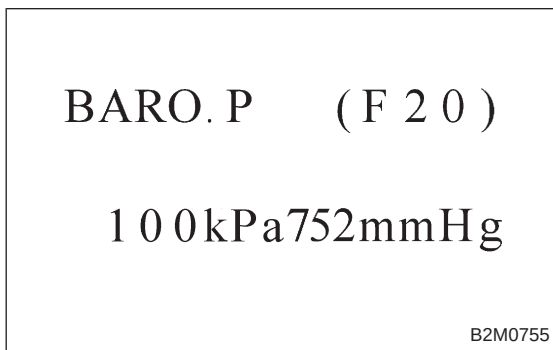
Connector & terminal

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

CHECK : Is the voltage less than 0.2 V?

YES : Go to step 10F3.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

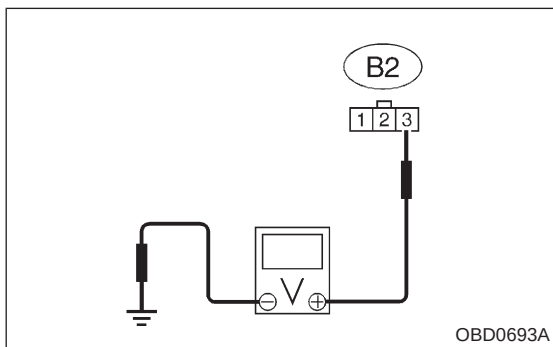
Function mode: F20

● F20: Display shows pressure signal value sent from pressure sensor.

CHECK : Does the value change more than 0 kPa 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 10F3.



10F3

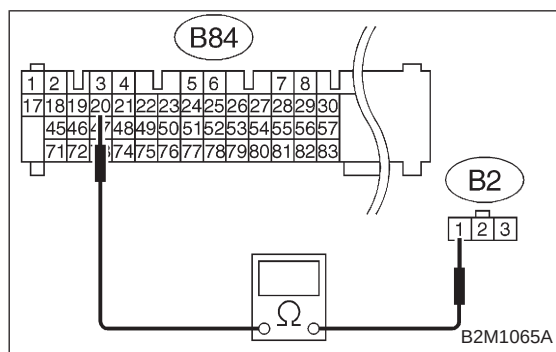
CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.

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 next step 5).**NO** : Repair open circuit in harness between ECM and pressure sensor connector.

5) Turn ignition switch to OFF.

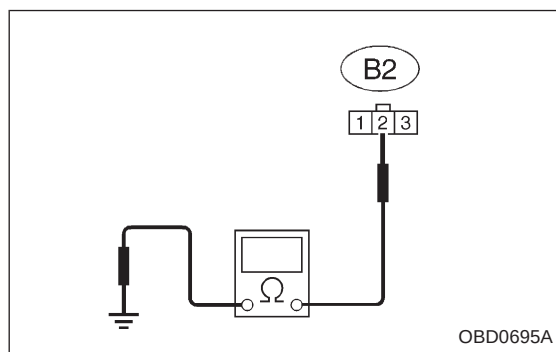
6) Disconnect connector from ECM.

7) 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 next step 8).**NO** : Repair harness and connector.**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and pressure sensor connector
- Poor contact in shield joint connector (B83)



8) 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 kΩ?***YES** : Go to step 10F4.**NO** : Repair ground short circuit in harness between ECM and pressure sensor connector.**10F4****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.

OBD (FB1)
P0108 <P_SHI>

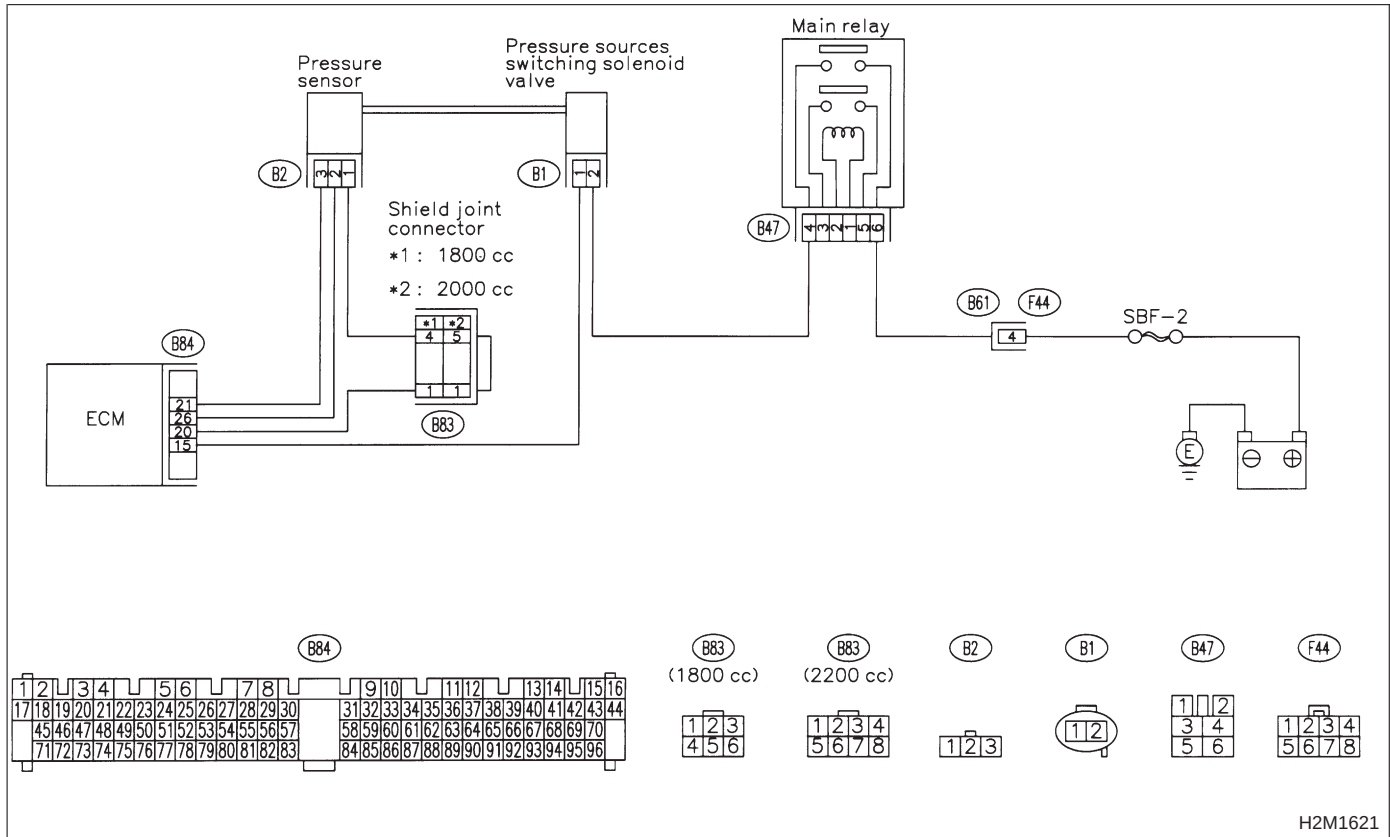
B2M1066

G: DTC P0108 — PRESSURE SENSOR CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

- Immediately at fault recognition

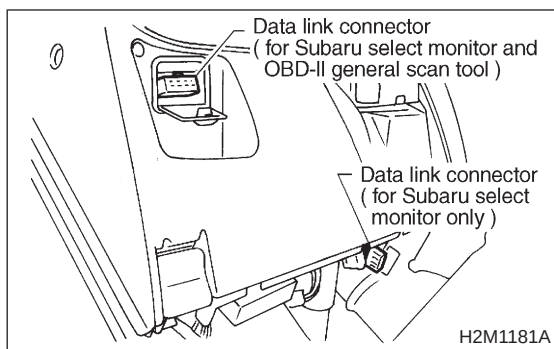
WIRING DIAGRAM:



CAUTION:

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

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



MANI.P (F 2 1)

29kPa218mmHg

B2M0756

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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F21

- F21: Display shows pressure signal value sent from pressure sensor.

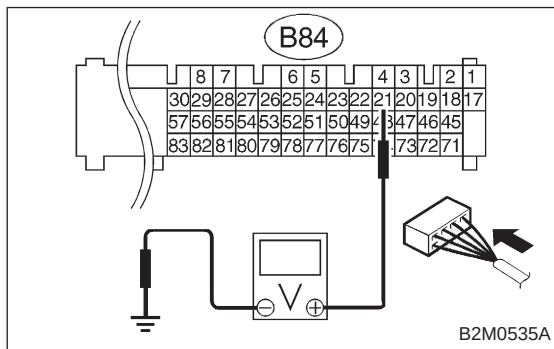
CHECK : Is the value more than 140 kPa in function mode F21?

YES : Go to step 10G5.

NO : Go to step 10G2.

- OBD-II general scan tool

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

**10G2****CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)**

- 1) Measure voltage between ECM connector and chassis ground.

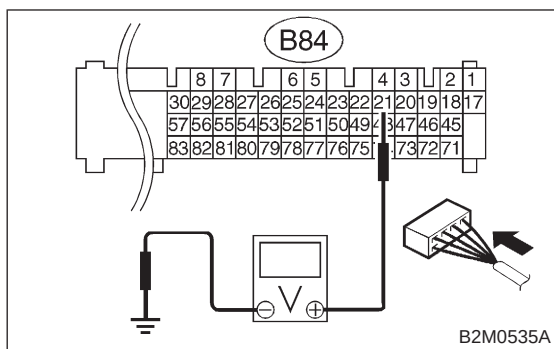
Connector & terminal

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

CHECK : Is the voltage more than 4.5 V?

YES : Go to next step 2).

NO : Go to next **CHECK** .



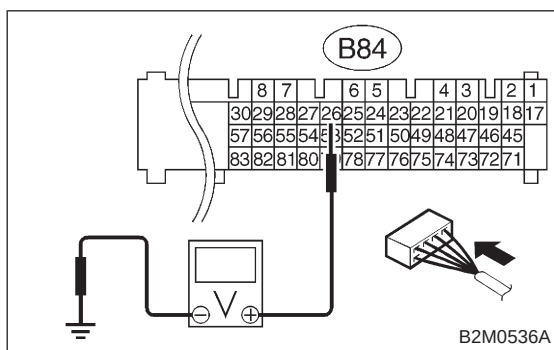
CHECK : Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?

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.



2) Measure voltage between ECM connector and chassis ground.

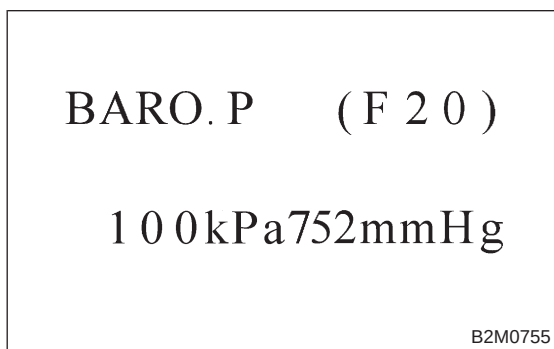
Connector & terminal

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

CHECK : Is the voltage less than 0.2 V?

YES : Go to step 10G3.

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

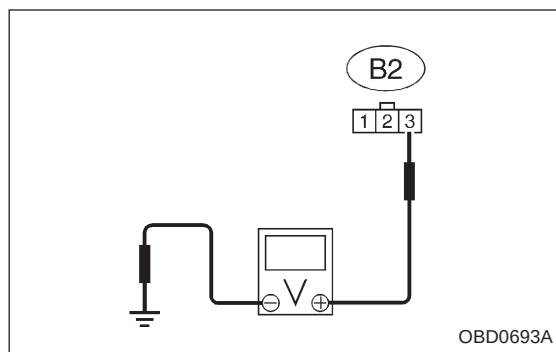
Function mode: F20

● F20: Display shows pressure signal value sent from pressure sensor.

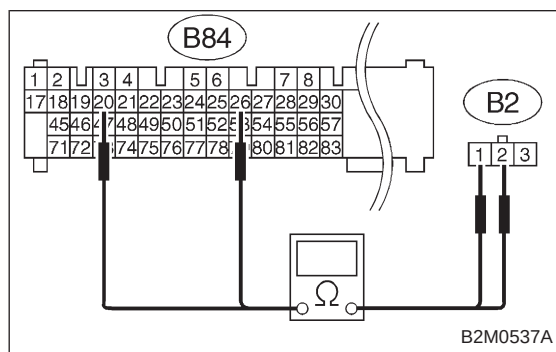
CHECK : Does the value change more than 0 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?

YES : Repair poor contact in ECM connector.

NO : Go to step 10G3.

**10G3****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 next step 5).**NO** : Repair open circuit in harness between ECM and pressure sensor connector.

- 5) Turn ignition switch to OFF.
- 6) Disconnect connector from ECM.
- 7) 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 next step 8).**NO** : Repair open circuit in harness between ECM and pressure sensor connector.

- 8) 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 10G4.**NO** : Repair harness and connector**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and pressure sensor connector
- Poor contact in shield joint connector (B83)

10G4**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.

MANI.P (F 2 1)

29kPa218mmHg

B2M0756

10G5**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 on Subaru select monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F21

CHECK : *Is the value more than 140 kPa in function mode F21?*

YES : Repair battery short circuit in harness between ECM and pressure sensor connector.

NO : Replace pressure sensor.

● OBD-II general scan tool

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

OBD (FB1)

P0116 <TW_LOW>

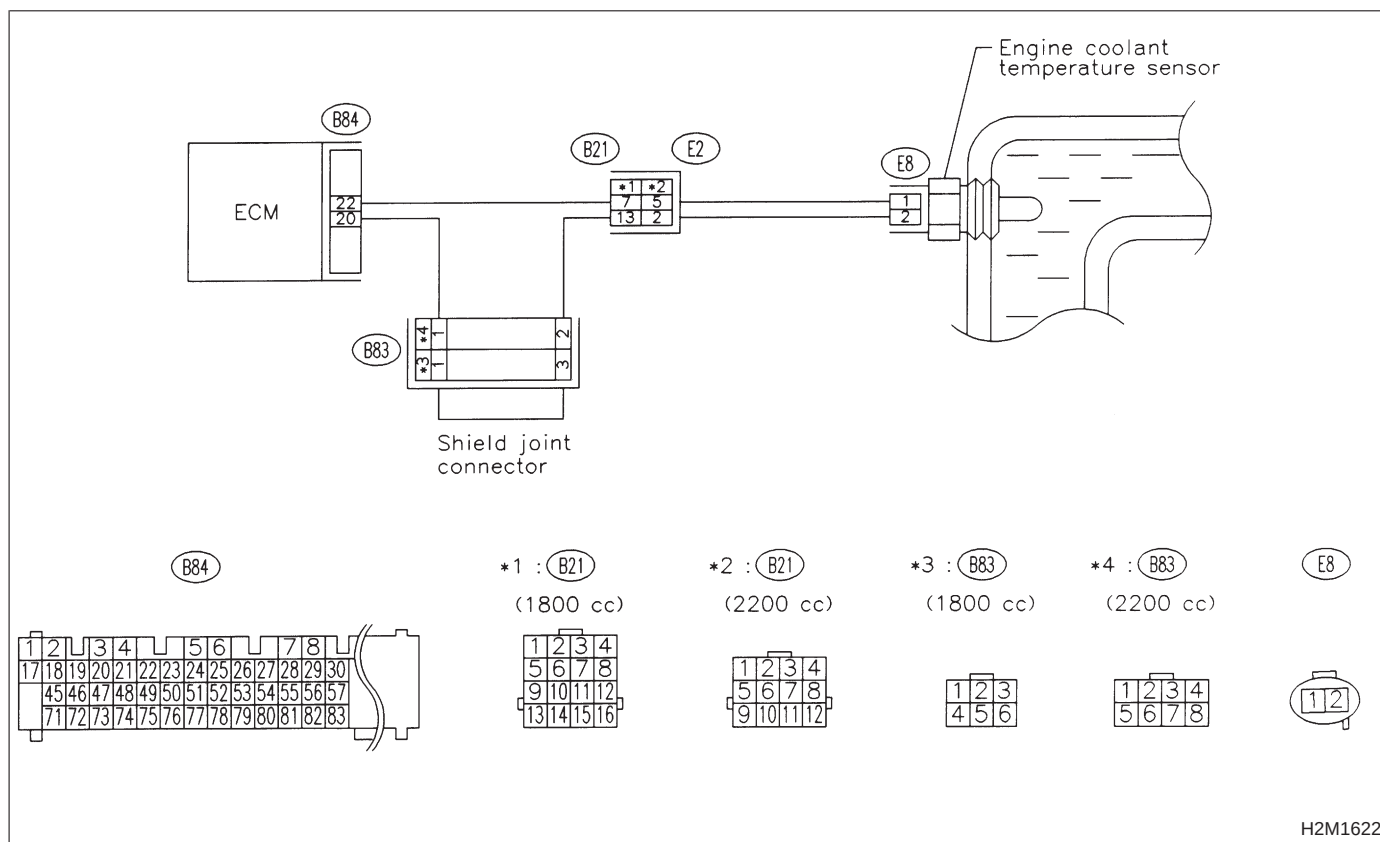
B2M1067

**H: DTC P0116
— ENGINE COOLANT TEMPERATURE
SENSOR CIRCUIT LOW INPUT —****DTC DETECTING CONDITION:**

- Immediately at fault recognition

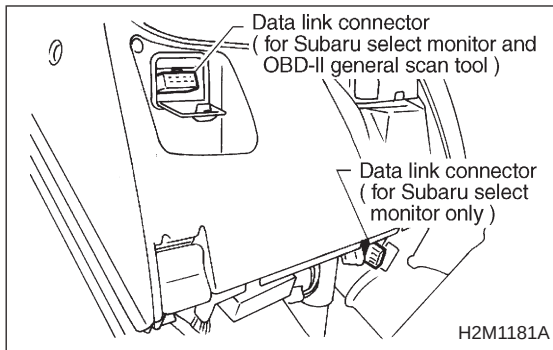
TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

WIRING DIAGRAM:**CAUTION:**

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

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

**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.

TW (F04)

80 ° C 176 ° F

B2M0479

- 5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in "°C" and "°F".

CHECK : Is the value greater than 150°C or 300°F in function mode F04?

YES : Go to step 10H2.

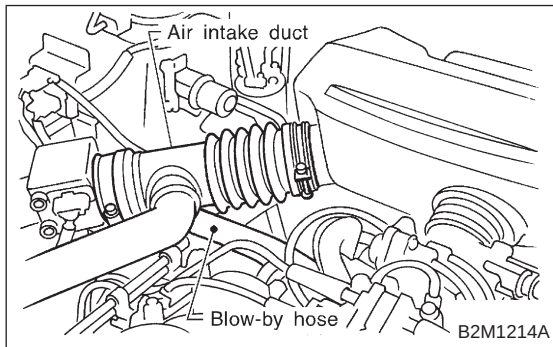
NO : Repair poor contact.

NOTE:

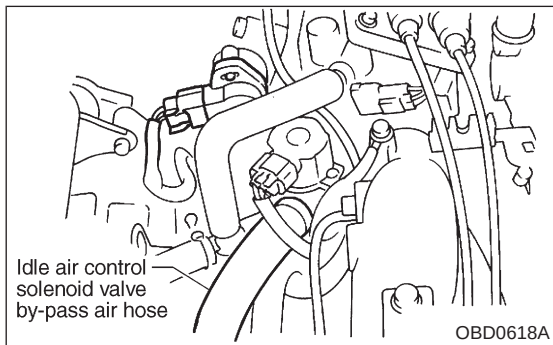
In this case, repair the following:

- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B21)
- OBD-II general scan tool

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

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

- 1) Turn ignition switch to OFF.
- 2) Remove air intake duct. <Ref. to 2-7 [W1A0].>



- 3) Remove idle air control solenoid valve by-pass air hose (2200 cc model).

- 4) Disconnect connector from engine coolant temperature sensor.

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

TW (F04)

80 ° C 176 ° F

B2M0479

6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in “°C” and “°F”.

CHECK : *Is the value less than -40°C or -40°F in function mode F04?*

YES : Replace engine coolant temperature sensor.

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

- OBD-II general scan tool

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

OBD

(FB1)

P0117

<TW_HI>

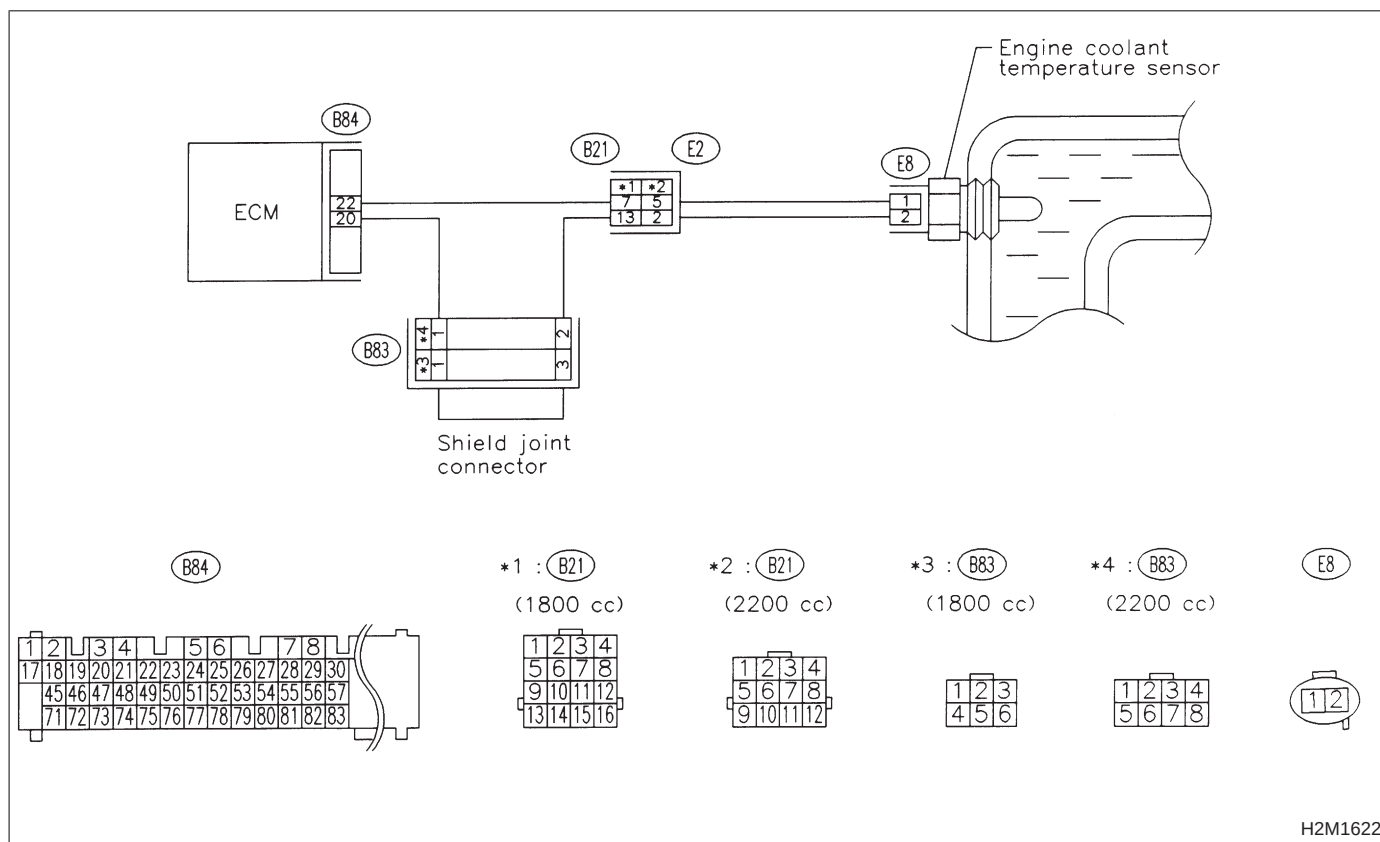
B2M1068

I: DTC P0117**— ENGINE COOLANT TEMPERATURE
SENSOR CIRCUIT HIGH INPUT —****DTC DETECTING CONDITION:**

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

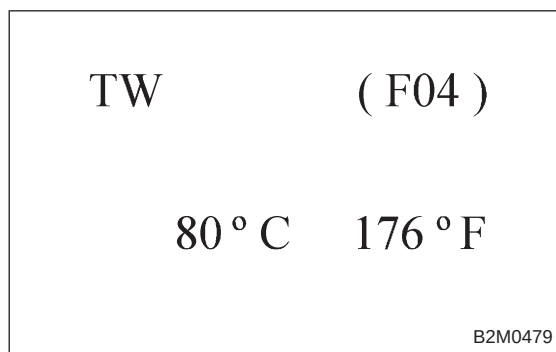
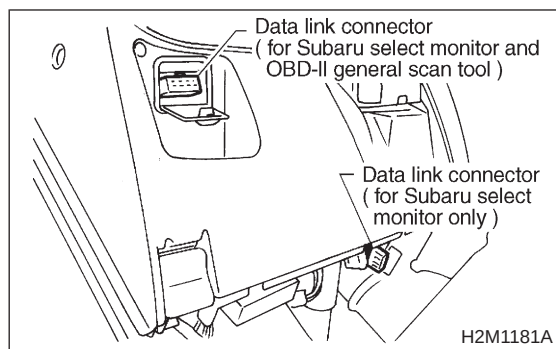
WIRING DIAGRAM:

H2M1622

CAUTION:

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

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

**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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in "°C" and "°F".

CHECK : Is the value less than -40°C or -40°F in function mode F04?

YES : Go to step 10I2.

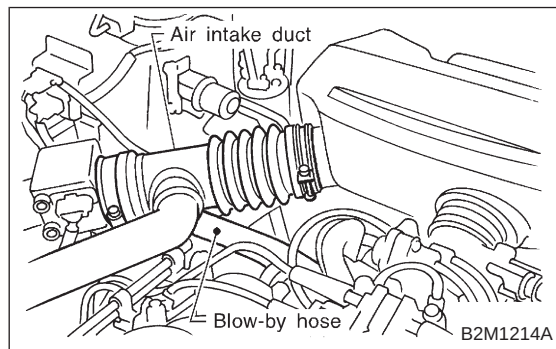
NO : Repair poor contact.

NOTE:

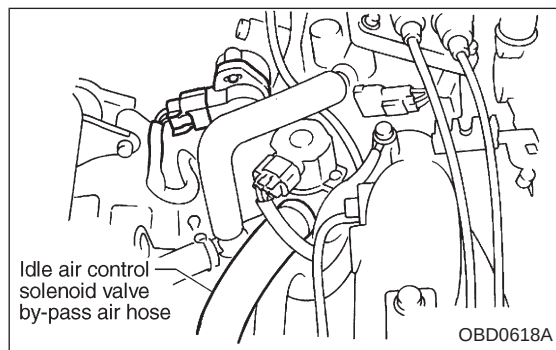
In this case, repair the following:

- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B21)
- OBD-II general scan tool

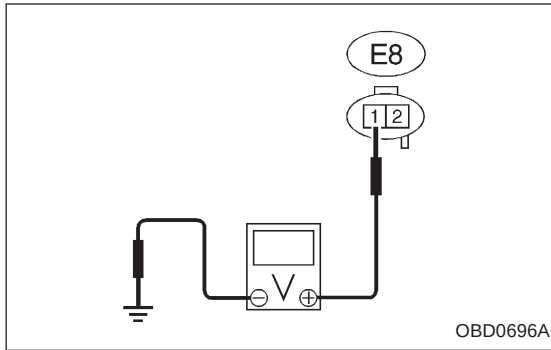
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

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

- 1) Turn ignition switch to OFF.
- 2) Remove air intake duct. <Ref. to 2-7 [W1A0].>



- 3) Remove idle air control solenoid valve by-pass air hose. (2200 cc model)
- 4) Disconnect connector from engine coolant temperature sensor.



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

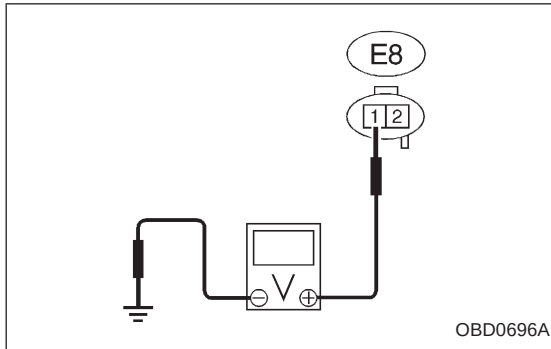
Connector & terminal

(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 next step 6).



6) Turn ignition switch to ON.

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

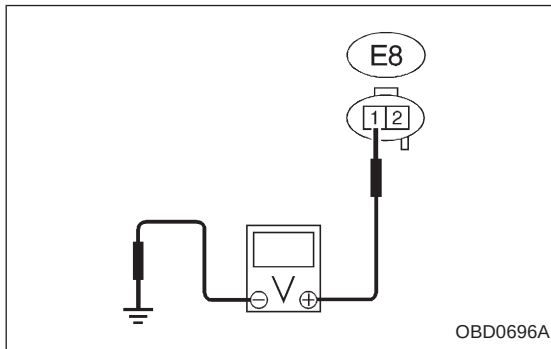
Connector & terminal

(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) 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?

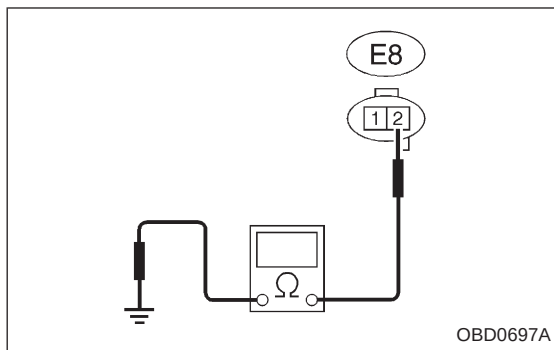
YES : Go to next step 2).

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)



2) Turn ignition switch to OFF.

3) 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)
- Poor contact in shield joint connector (B83)

OBD (FB1)

P0121 <TH_RHI>

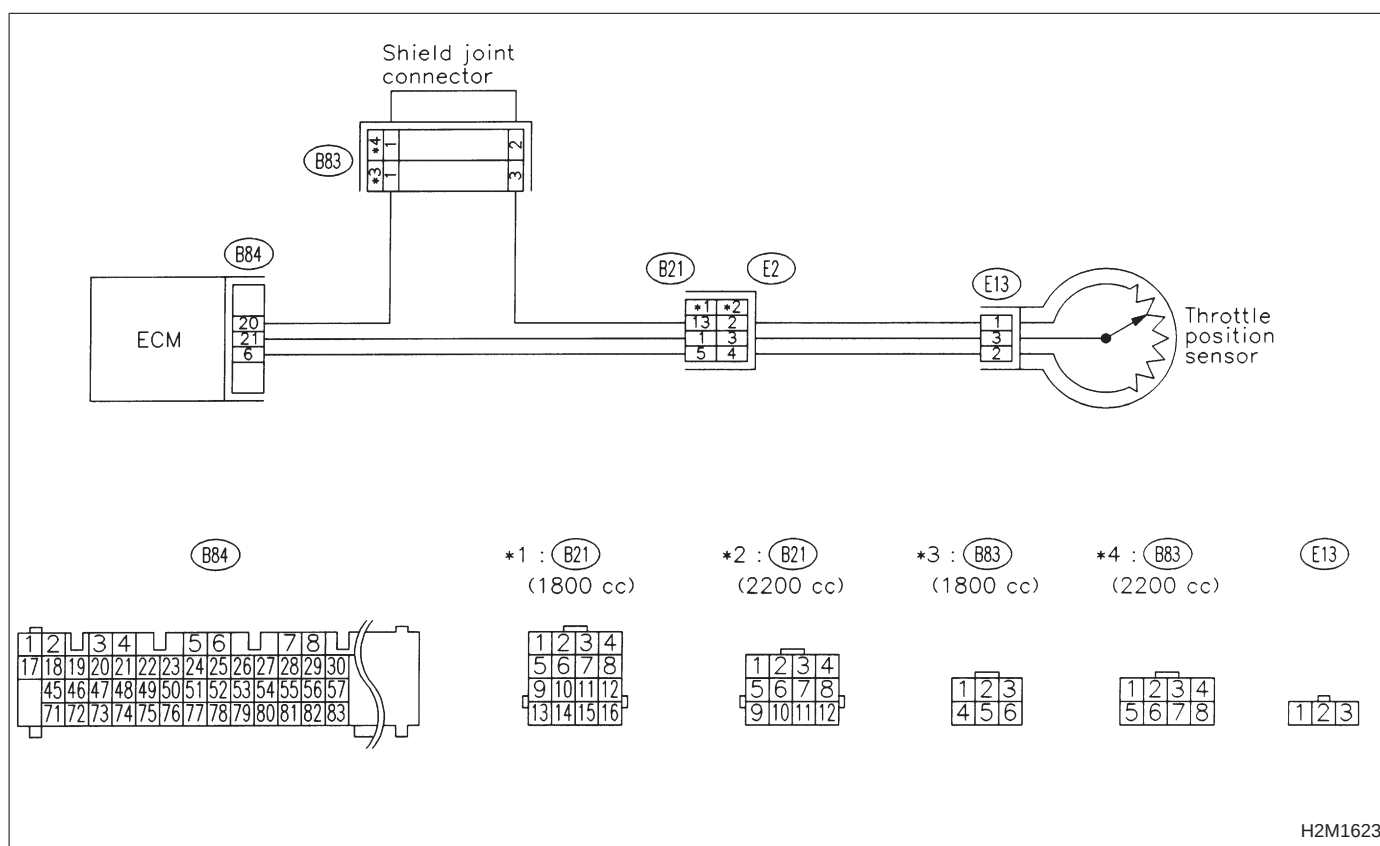
B2M1069

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

WIRING DIAGRAM:**CAUTION:**

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

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

10J1	CHECK DTC P0122 OR P0123 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.

OBD (FB1)

P0122 <THV_LOW>

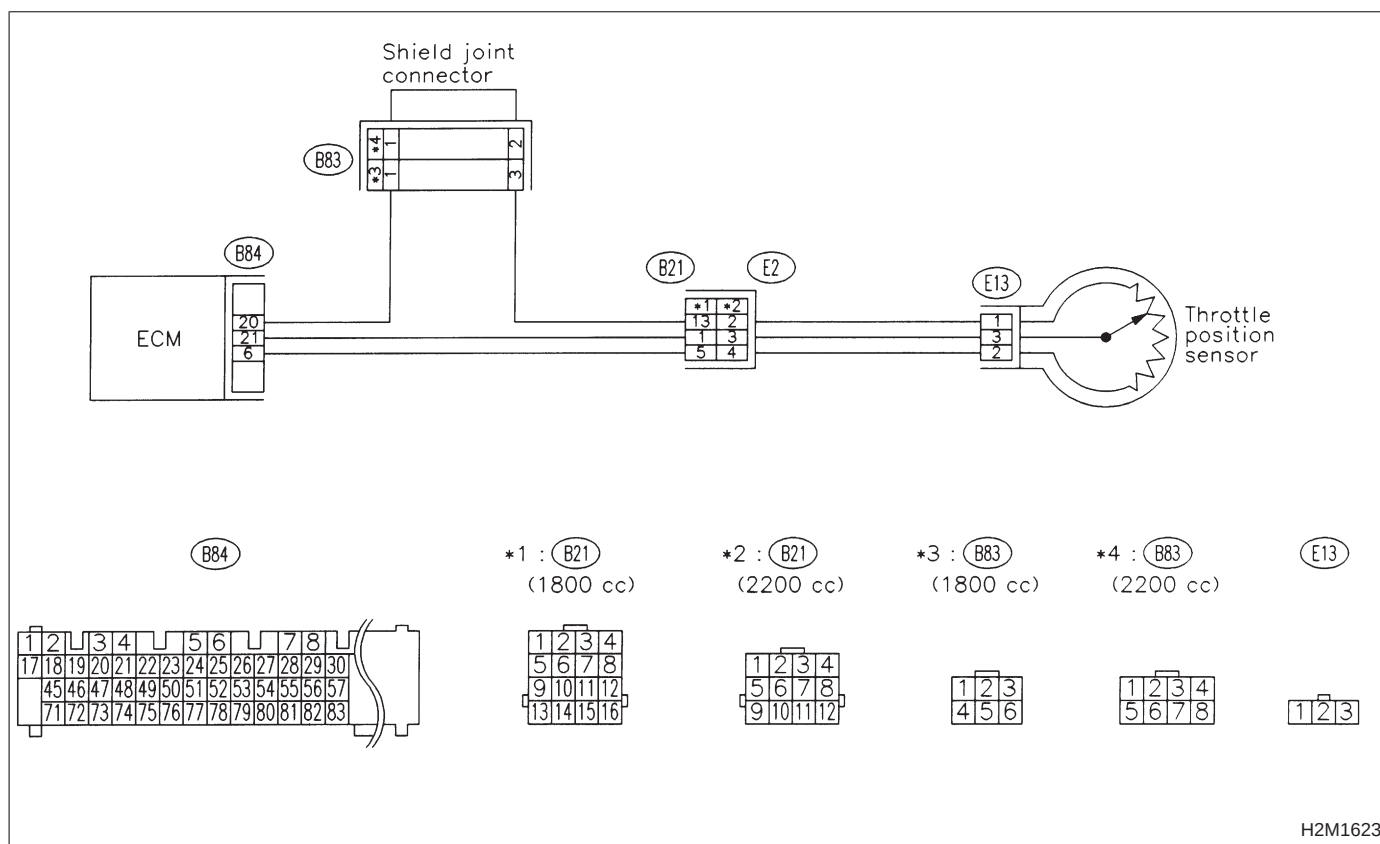
B2M1070

K: DTC P0122**— THROTTLE POSITION SENSOR CIRCUIT
LOW INPUT —****DTC DETECTING CONDITION:**

- Immediately at fault recognition

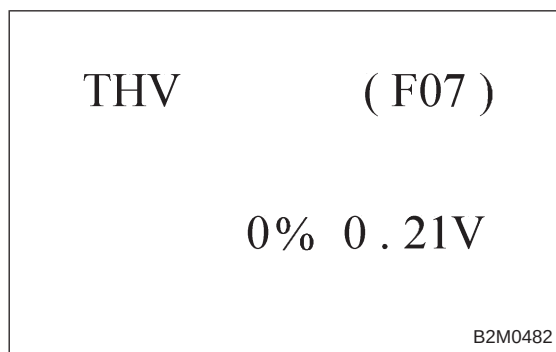
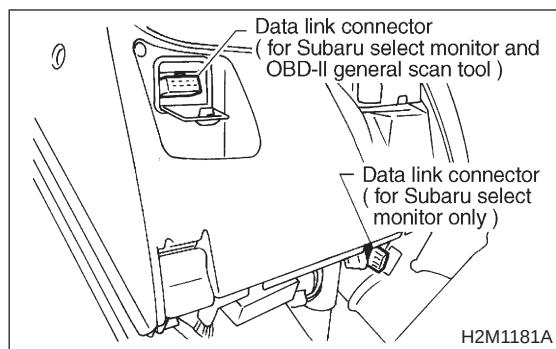
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

WIRING DIAGRAM:**CAUTION:**

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

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

**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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F07

- F07: Throttle position sensor output signal is indicated.

CHECK : **Is the value less than 0.1 V in function mode F07?**

YES : Go to step **10G2**.

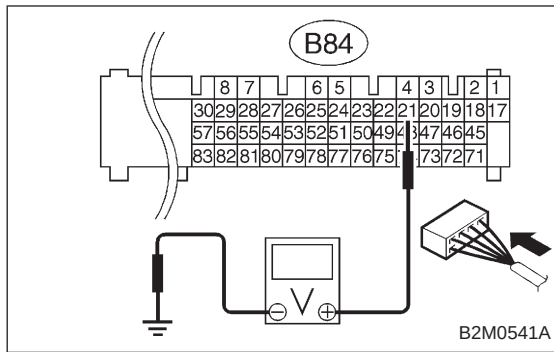
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

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)
- OBD-II general scan tool

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

**10K2**

**CHECK INPUT SIGNAL FOR ECM.
(USING VOLTAGE METER AND SUBARU
SELECT MONITOR.)**

1) 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 next step 2).

NO : Go to next **CHECK** .

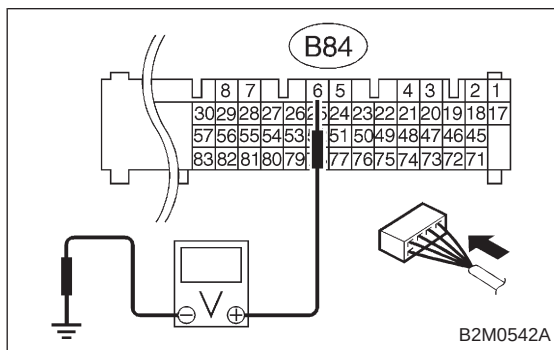
CHECK : Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?

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.



2) 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 10K3.

NO : Go to next step 3).

THV (F07)

0% 0.21V

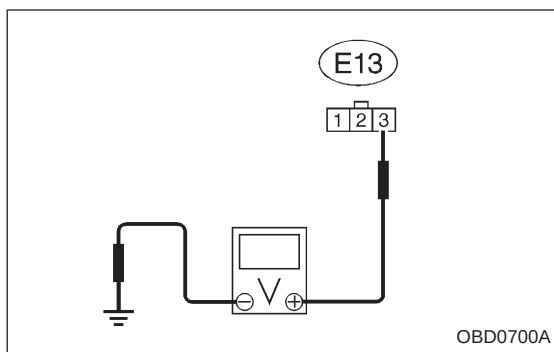
B2M0482

3) 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 10K3.



10K3

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?

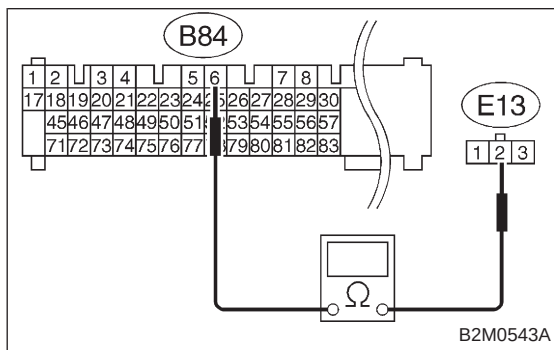
YES : Go to next step 5).

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)



- 5) Turn ignition switch to OFF.

- 6) 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?

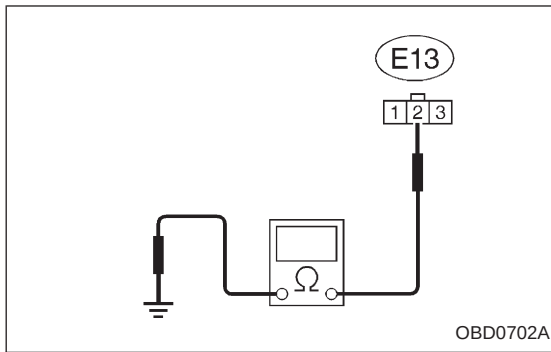
YES : Go to next step 7).

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)



7) 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 **10K4**.

10K4

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.

OBD

(FB1)

P0123

<THV_HI>

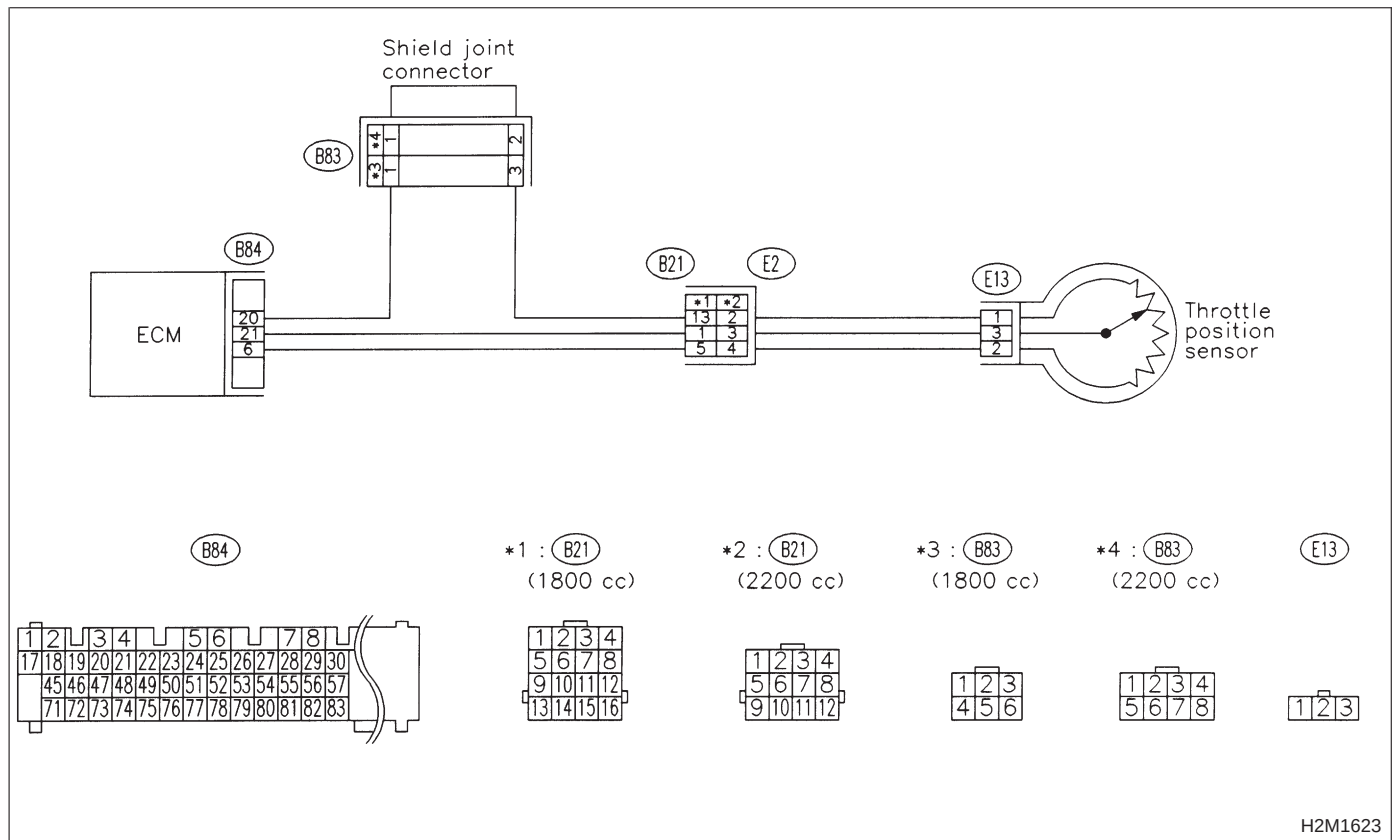
B2M1071

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

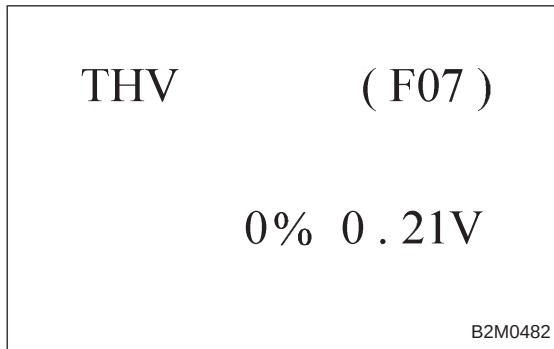
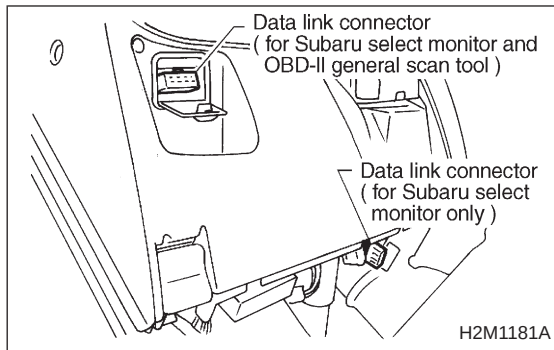
WIRING DIAGRAM:

H2M1623

CAUTION:

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

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

**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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F07

- F07: Throttle position sensor output signal is indicated.

CHECK : *Is the value more than 4.9 V in function mode F07?*

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

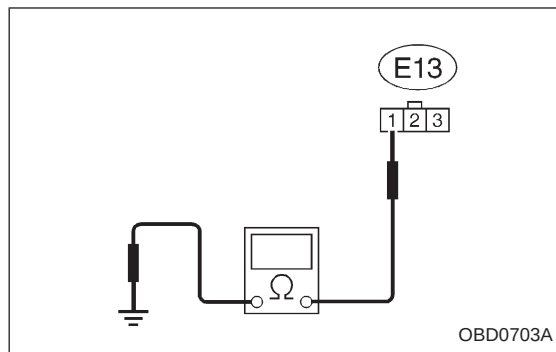
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

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)
- OBD-II general scan tool

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

**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?

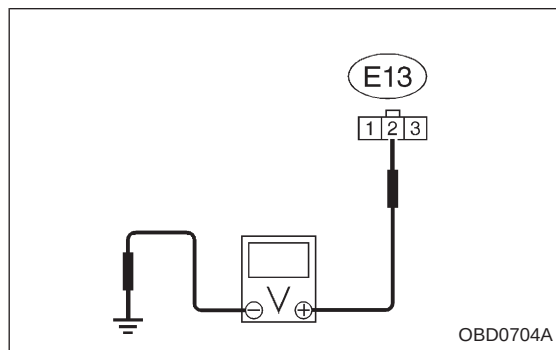
YES : Go to next step 4).

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 shield joint connector (B83)



- 4) Turn ignition switch to ON.

- 5) 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.

OBD

(FB1)

P0125

<TW_CL>

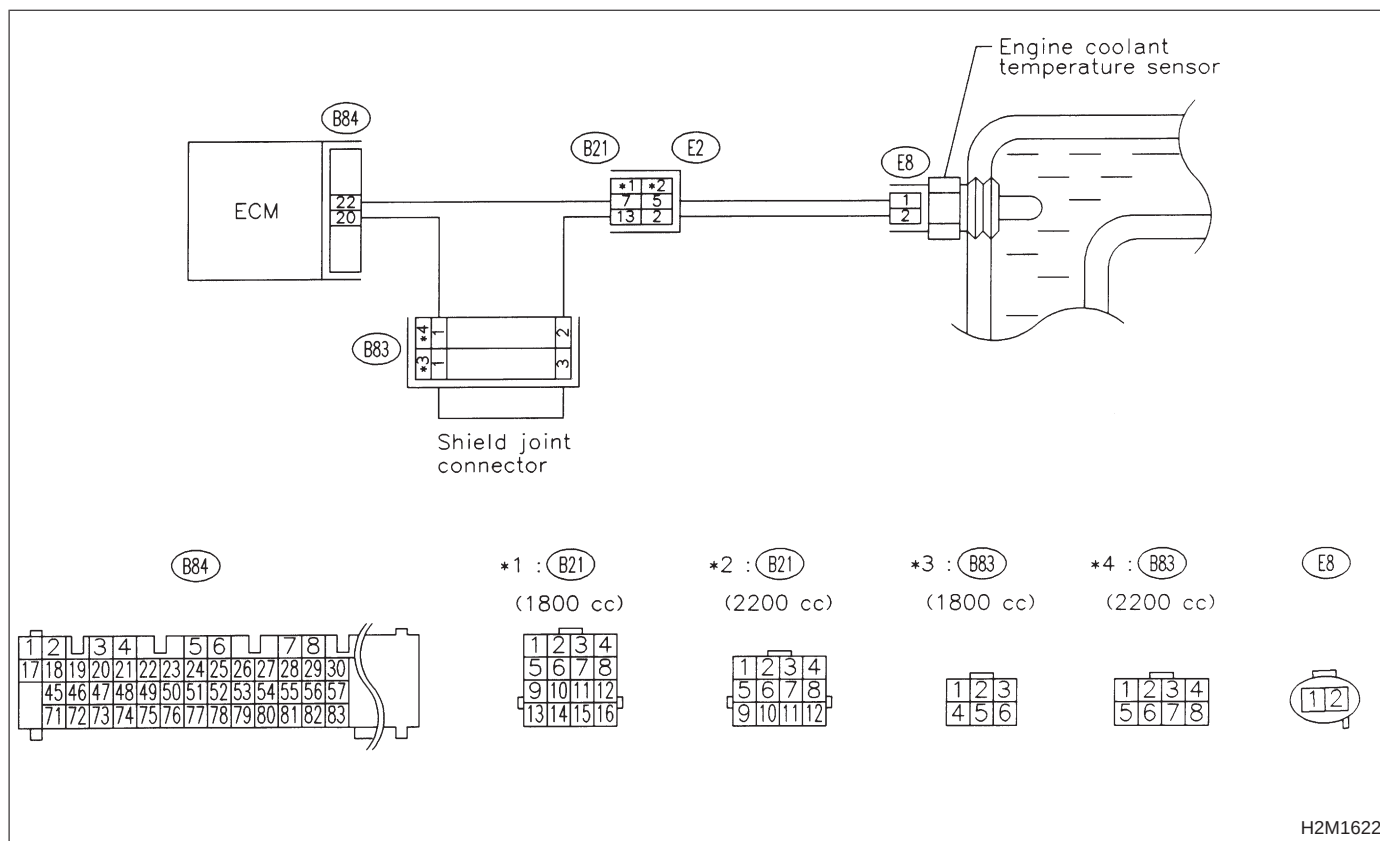
OBD0191

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.

WIRING DIAGRAM:**CAUTION:**

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

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

10M1	CHECK DTC P0116 OR P0117 ON DISPLAY.

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0116 or P0117?*

YES : Inspect DTC P0116 or P0117 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.

OBD

(FB1)

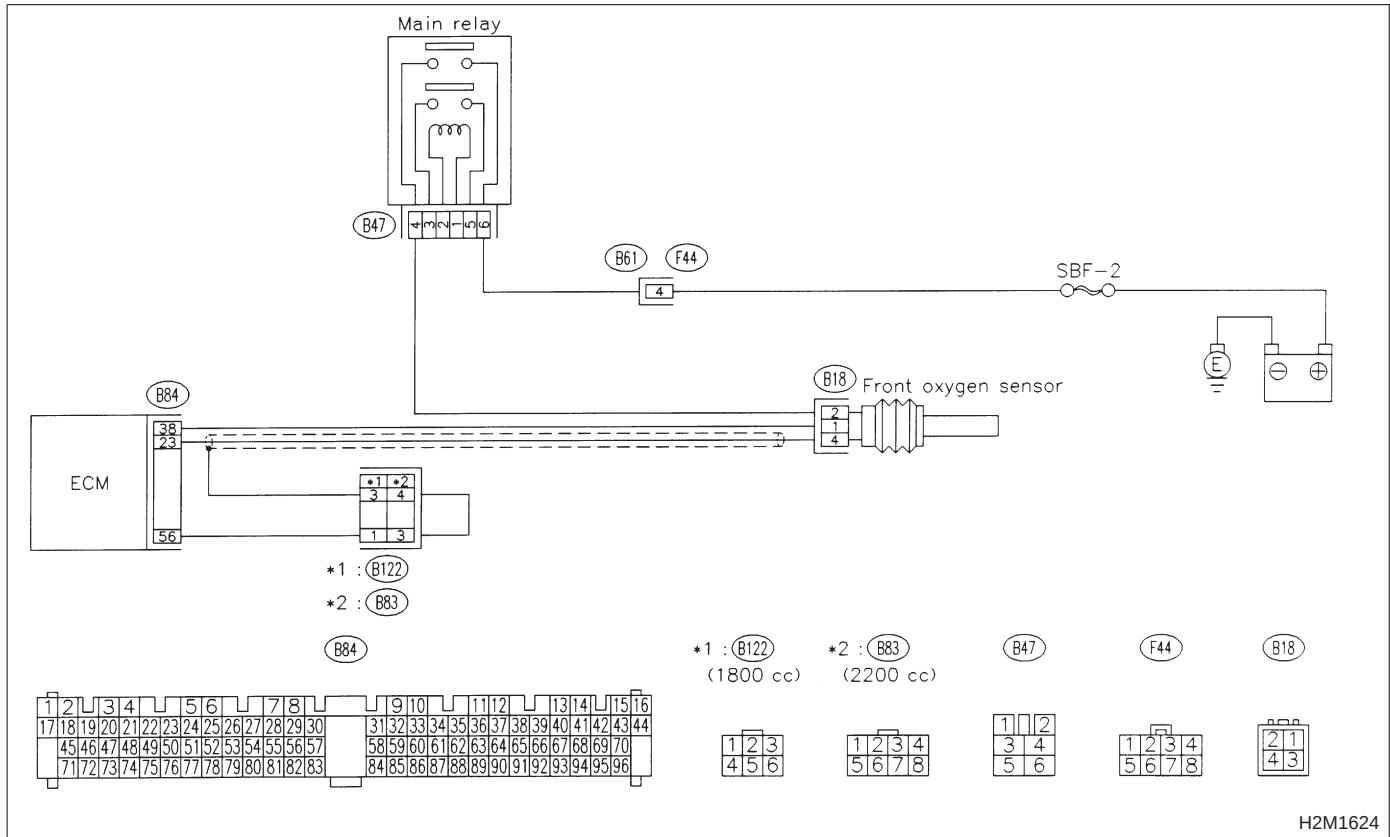
P0130

<FO2_V>

OBD0199

N: DTC P0130**— FRONT OXYGEN SENSOR CIRCUIT
MALFUNCTION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

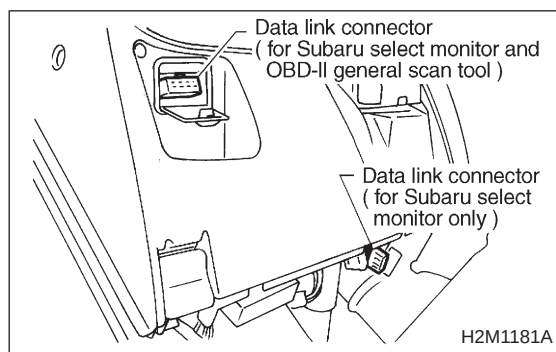
WIRING DIAGRAM:

H2M1624

CAUTION:

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

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



O2max - min (F12)

0 . 80V 0 . 10V

B2M0487

10N1

CHECK FOR OTHER CAUSES AFFECTING EXHAUST GAS.

CHECK : *Is CO % more than 2 % after engine warm-up?*

YES : Check fuel system.

NOTE:

- Check for use of improper fuel.
- Check if engine oil or coolant level is extremely low.

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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F12

- F12: Front oxygen sensor max. and min. output signals are indicated at the same time.

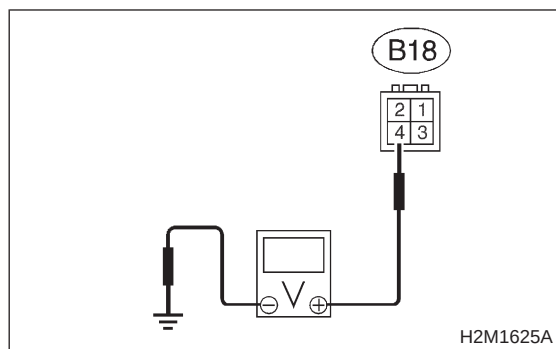
CHECK : *Is the difference of voltage less than 0.1 V between the value of max. output and min. output with function mode F12?*

YES : Go to step **10N3**.

NO : Replace front oxygen sensor.

- OBD-II general scan tool

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

**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. 4 (+) — Engine ground (–):****CHECK** : *Is the voltage more than 0.2 V?***YES** : Go to step **10N4**.**NO** : Repair harness and connector.**NOTE:**

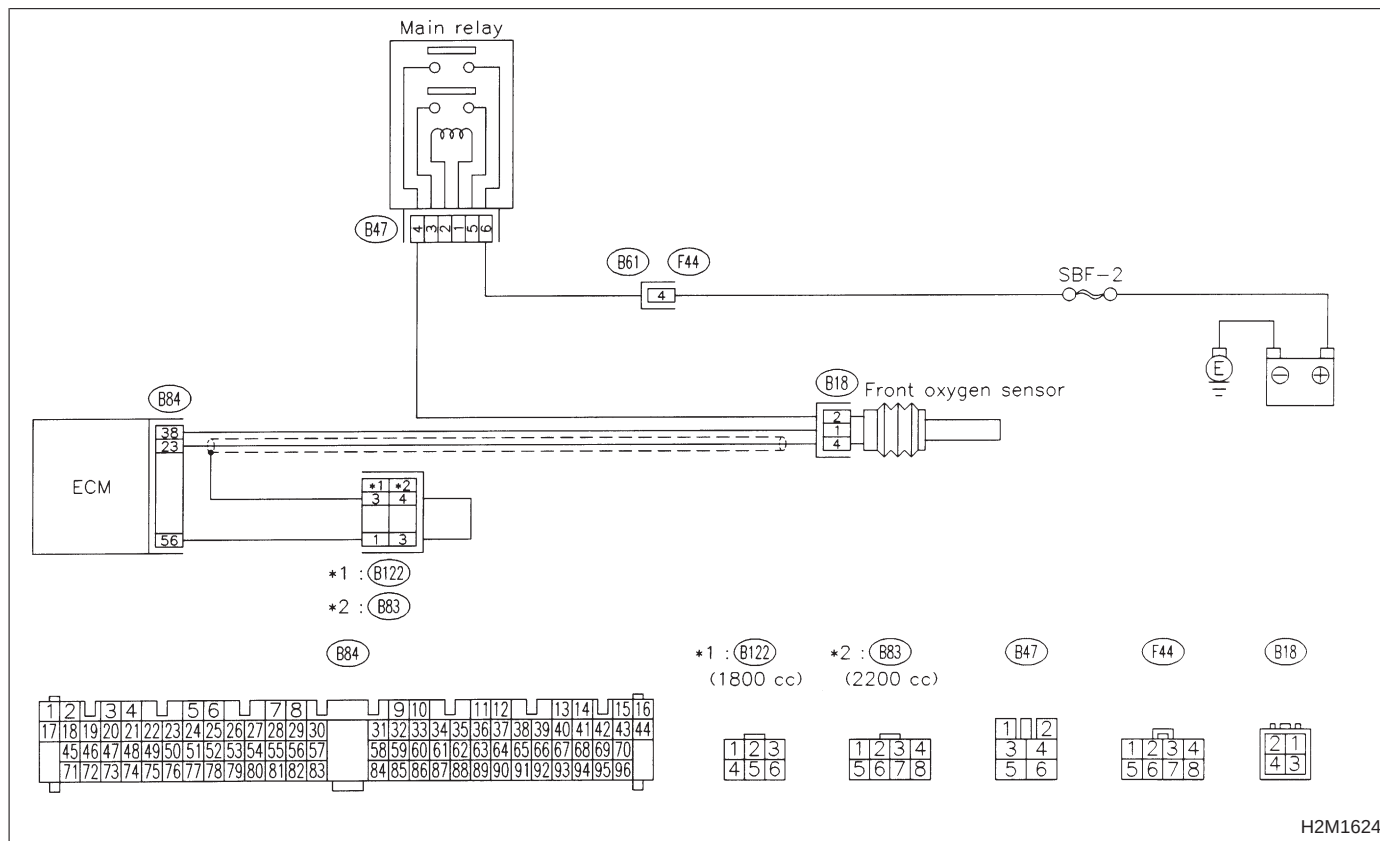
In this case, repair the following:

- 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

WIRING DIAGRAM:**CAUTION:**

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

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

1001	CHECK DTC P0130 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?*

NOTE:

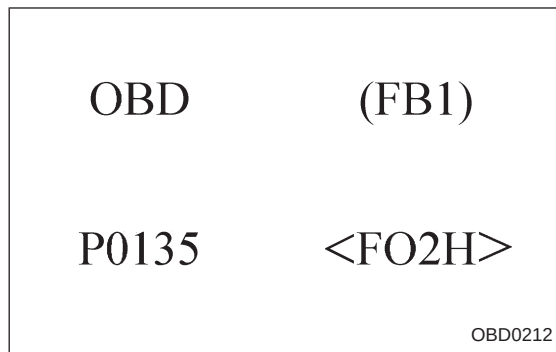
Check the following items.

- 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

YES : Repair exhaust system.

NO : Replace front oxygen sensor.

10. Diagnostic Chart with Trouble Code

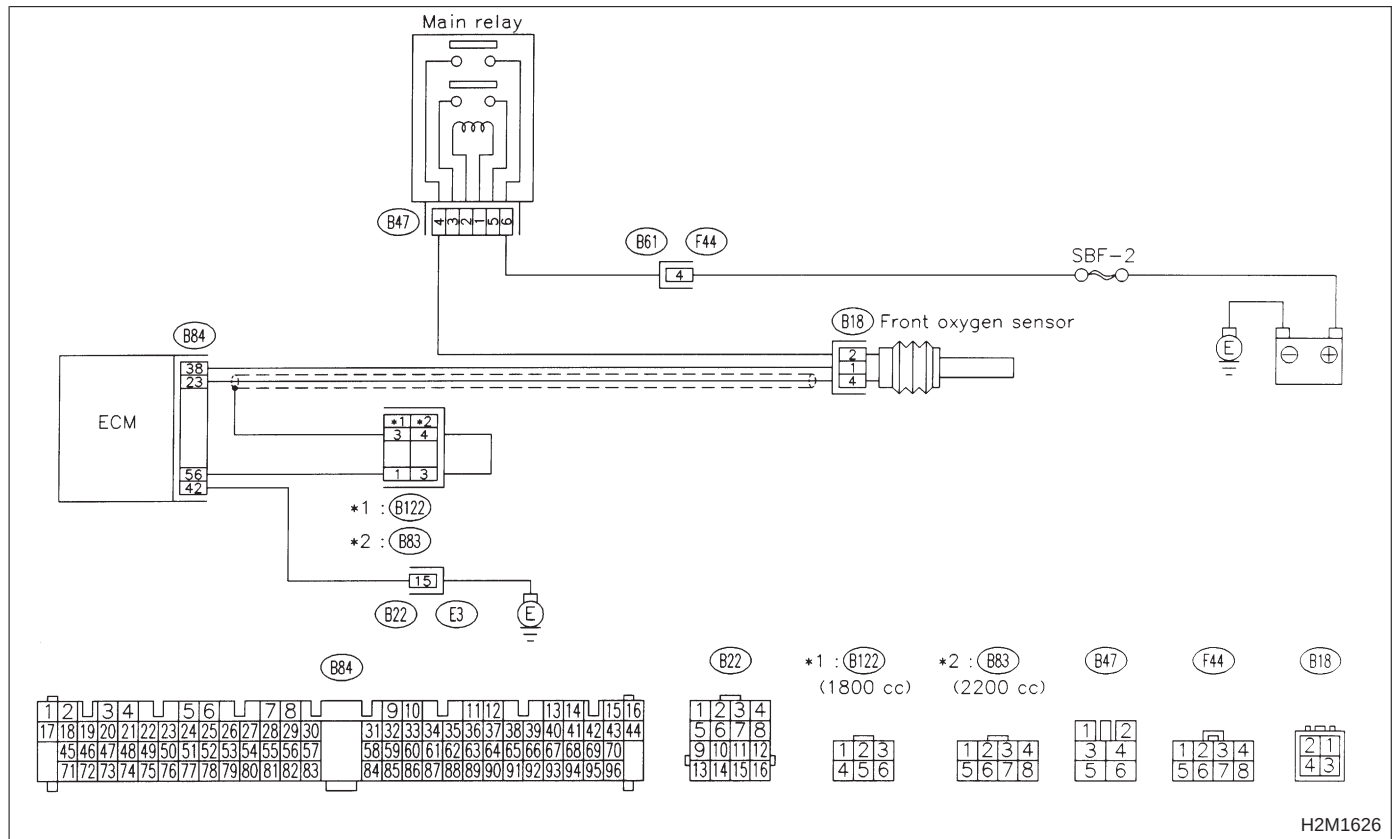


**P: DTC P0135
— FRONT OXYGEN SENSOR HEATER
CIRCUIT MALFUNCTION —**

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:

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

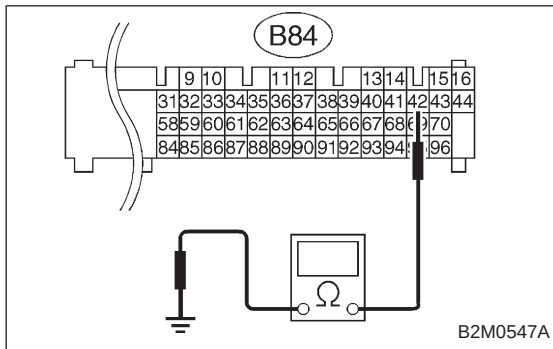
<Ref. to 2-7 [T3D0] and [T3E0].>

10P1	CHECK DTC P0141 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 next step 1).

NO : Go to step **10P2**.



- 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 ?

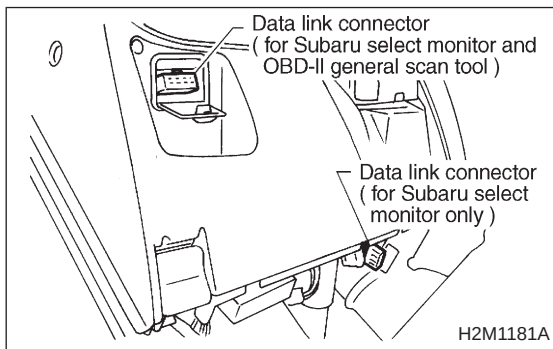
YES : Repair poor contact in ECM connector.

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)



10P2	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.

FO2H (F32)

1.00 A

B2M0497

5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F32

- F32: Front oxygen sensor heater current is indicated.

CHECK : Is the value more than 0.2 A in function mode F32?

YES : Repair connector.

NOTE:

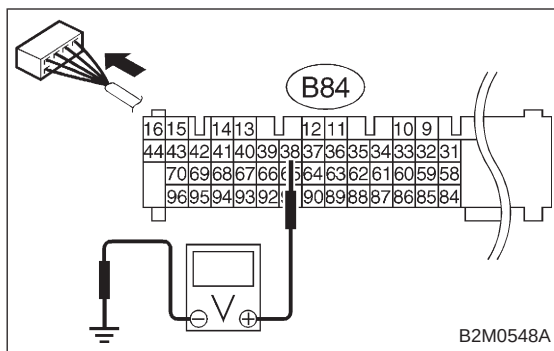
In this case, repair the following:

- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

NO : Go to step 10P3.

- OBD-II scan tool

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

**10P3****CHECK OUTPUT SIGNAL FROM ECM.
(USING VOLTAGE METER.)**

- 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 10P4.

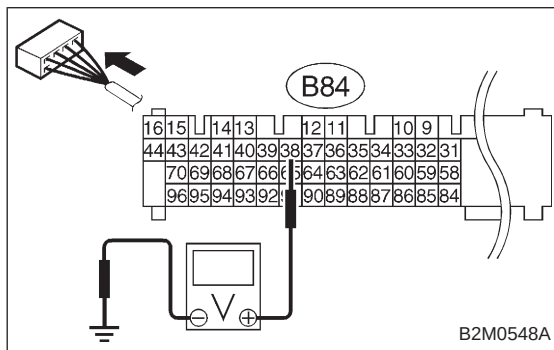
NO : Go to next step 3).

- 3) Measure voltage between ECM connector and 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 next step 4).



- 4) Disconnect connector from front oxygen sensor.

- 5) Measure voltage between ECM connector and chassis ground.

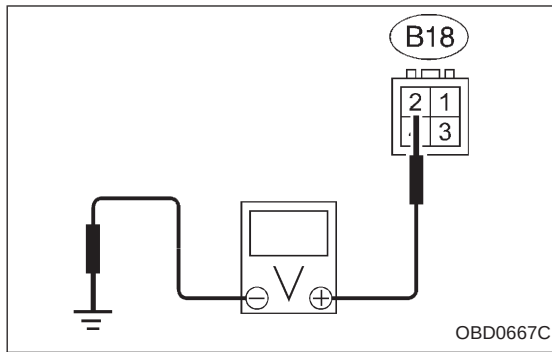
Connector & terminal

(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.

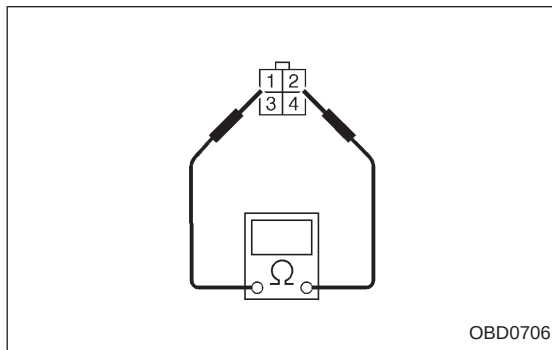
**10P4****CHECK POWER SUPPLY TO FRONT OXYGEN SENSOR.**

- 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 **10P5**.**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

**10P5****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.

OBD

(FB1)

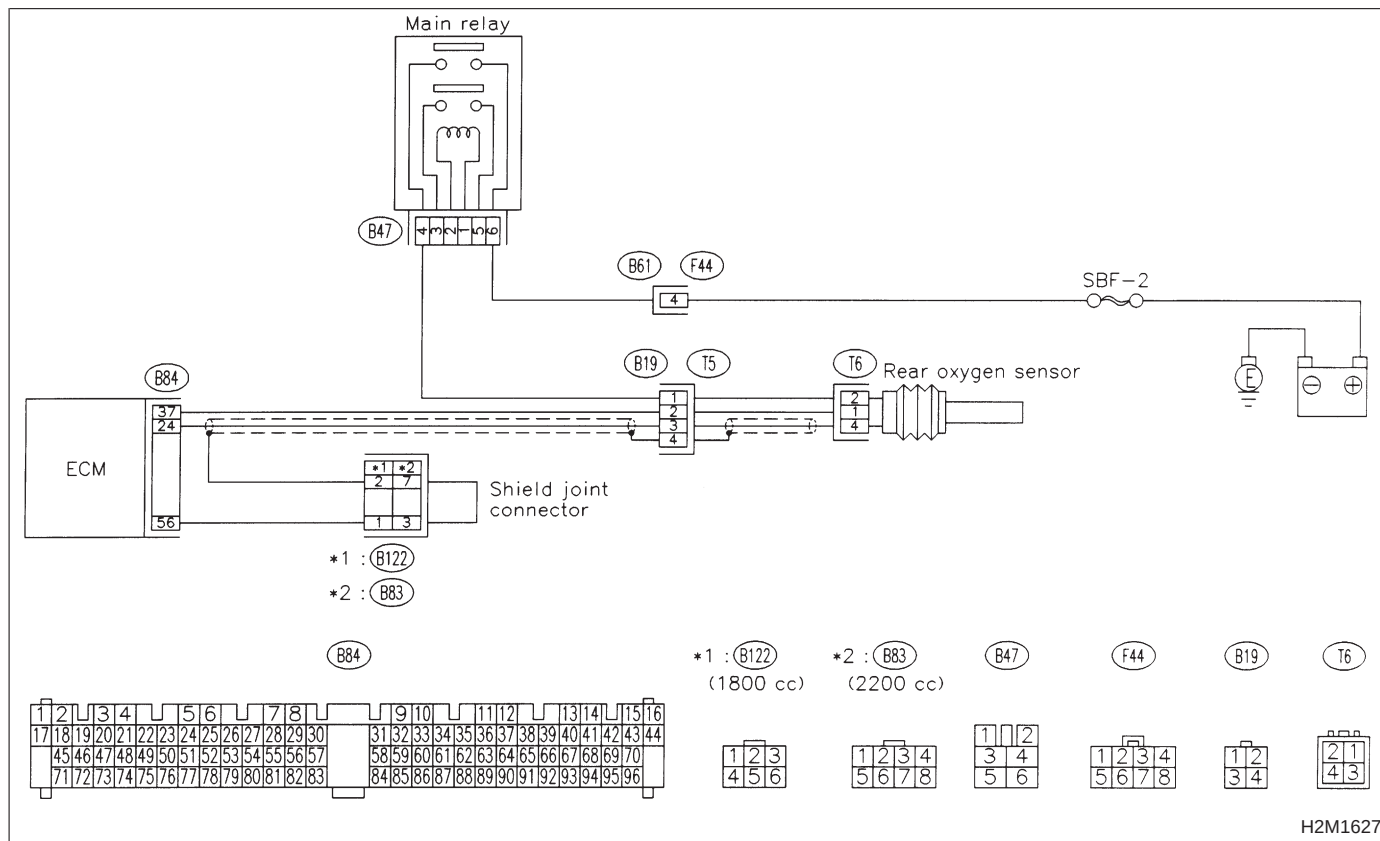
P0136

<RO2_V>

OBD0220

Q: DTC P0136**— REAR OXYGEN SENSOR CIRCUIT MALFUNCTION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

H2M1627

CAUTION:

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

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

10Q1	CHECK DTC P0130 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].>

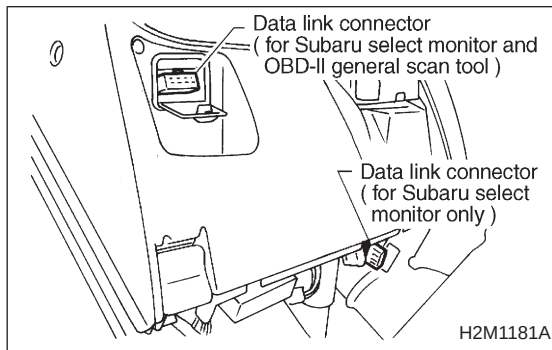
CHECK : Is the failure cause of P0130 in the fuel system?

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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F13

- F13: Rear oxygen sensor output signal is indicated.

CHECK : Does the value fluctuate in function mode F13?

YES : Go to step 10Q5.

NO : Go to next step 6).

RO2 (F13)

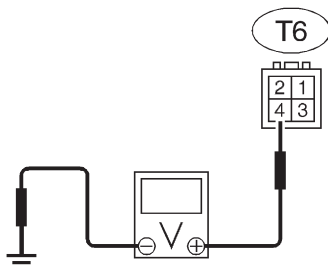
0 . 60 V

B2M0488

RO2 (F13)

0 . 60 V

B2M0488



OBD0707A

6) Read data on Subaru Select Monitor or OBD-II General Scan Tool.

CHECK : *Is the value fixed between 0.2 and 0.4 V in function mode F13?*

YES : Go to step 10Q4.

NO : Replace rear oxygen sensor.

● OBD-II general scan tool

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

10Q4**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

10Q5**CHECK EXHAUST SYSTEM.**

CHECK : *Is there a fault in 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

YES : Repair or replace faulty parts.

NO : Replace rear oxygen sensor.

OBD

(FB1)

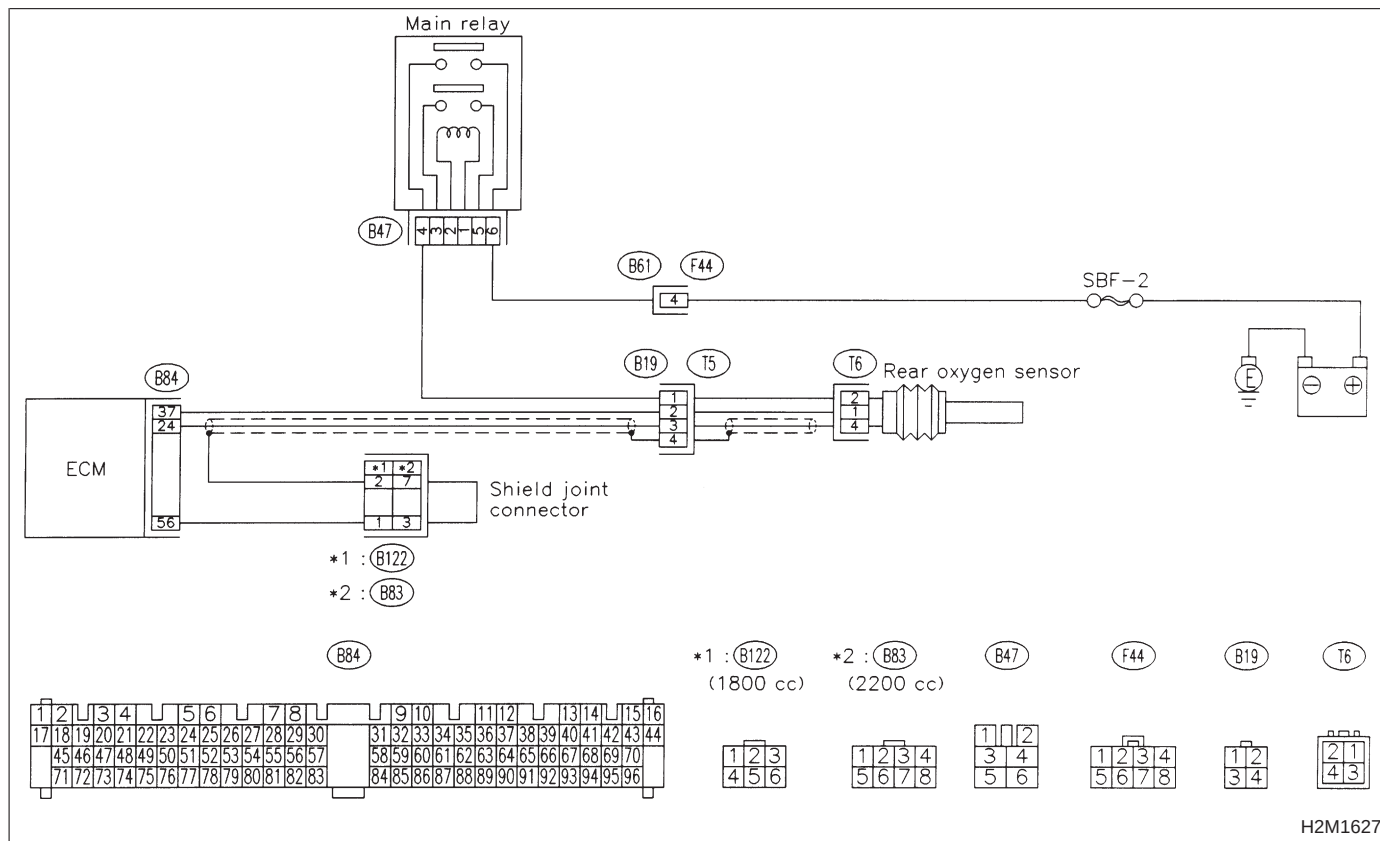
P0139

<RO2_R>

OBD0229

R: DTC P0139**— REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:**CAUTION:**

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

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

10R1**CHECK DTC P0136 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". <Ref. to 2-7 [T10A0].>****NOTE:****In this case, it is not necessary to inspect DTC P0139.****NO****: Replace rear oxygen sensor.**

OBD

(FB1)

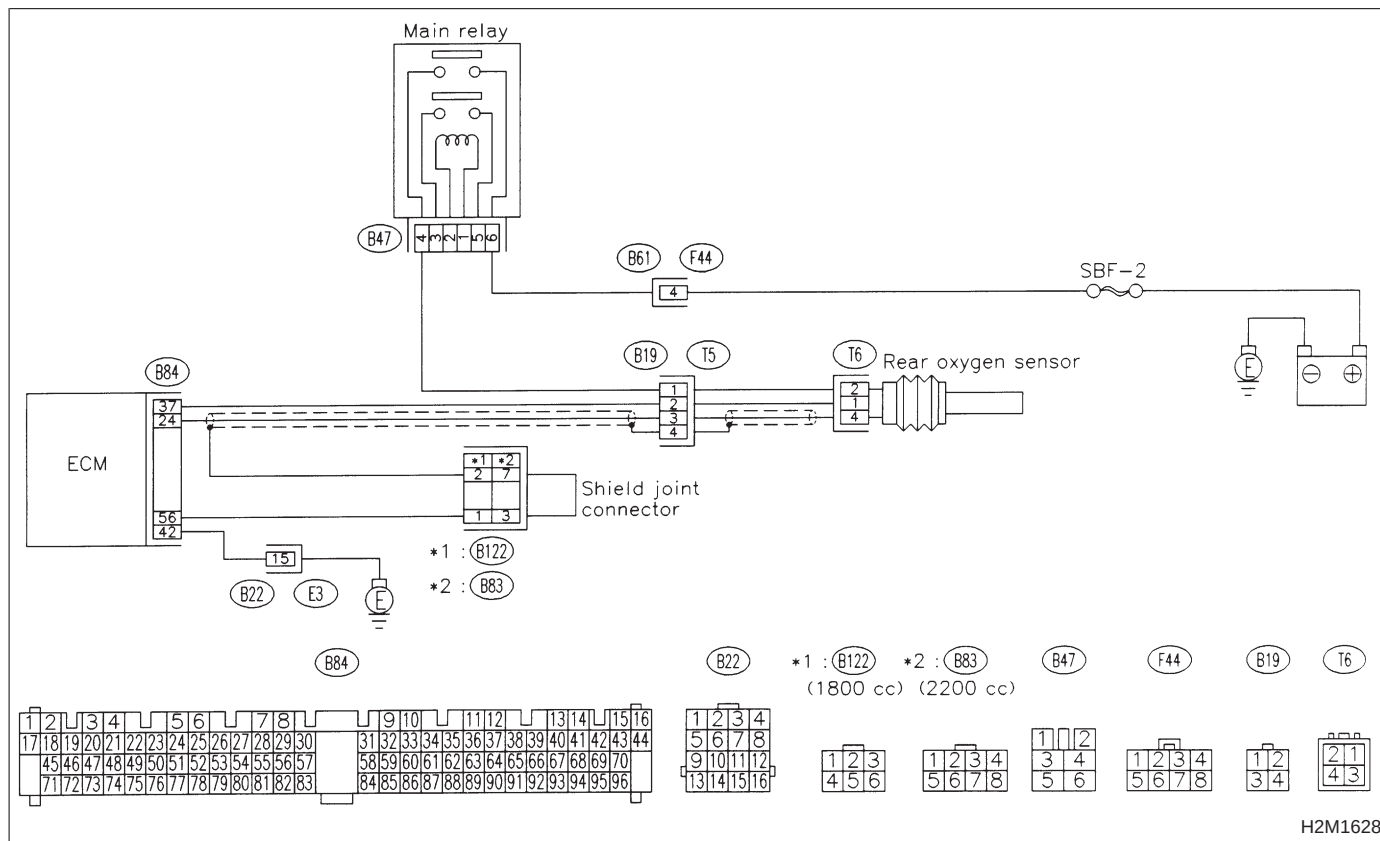
P0141

<RO2H>

OBD0232

S: DTC P0141**— REAR OXYGEN SENSOR HEATER
CIRCUIT MALFUNCTION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

H2M1628

CAUTION:

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

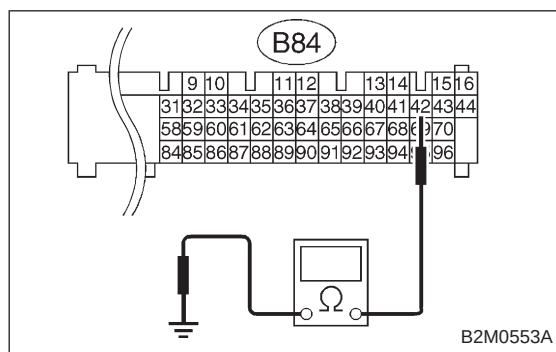
<Ref. to 2-7 [T3D0] and [T3E0].>

10S1	CHECK DTC P0135 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 next step 1).

NO : Go to step **10S2**.



- 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 ?

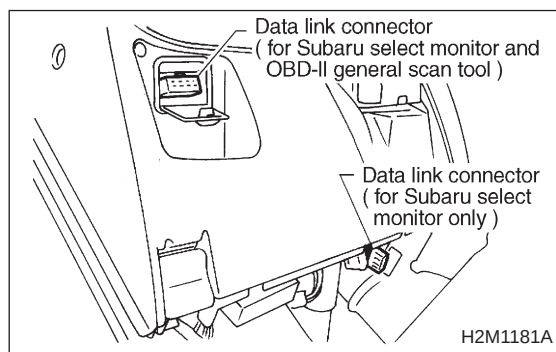
YES : Repair poor contact in ECM connector.

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 engine grounding terminal
- Poor contact in coupling connector (B22)



10S2	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.

RO2H (F33)

1.00 A

B2M0498

5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F33

- F33: Rear oxygen sensor heater current is indicated.

CHECK : *Is the value more than 0.2 A in function mode F33?*

YES : Repair connector.

NOTE:

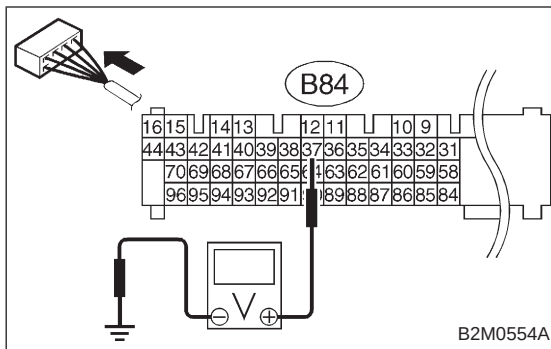
In this case, repair the following:

- 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 **10S3**.

- OBD-II scan tool

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

**10S3****CHECK OUTPUT SIGNAL FROM ECM.
(USING VOLTAGE METER.)**

- 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 **10S4**.

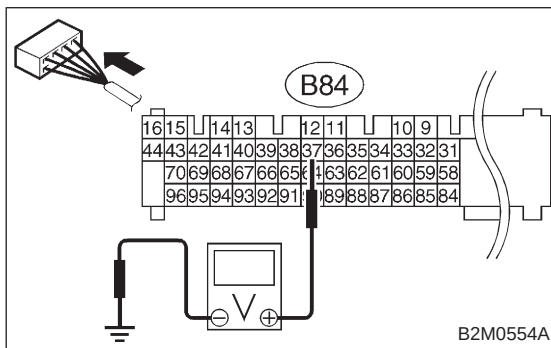
NO : Go to next step 3).

- 3) Measure voltage between ECM connector and 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 next step 4).



- 4) Disconnect connector from rear oxygen sensor.

- 5) Measure voltage between ECM connector and chassis ground.

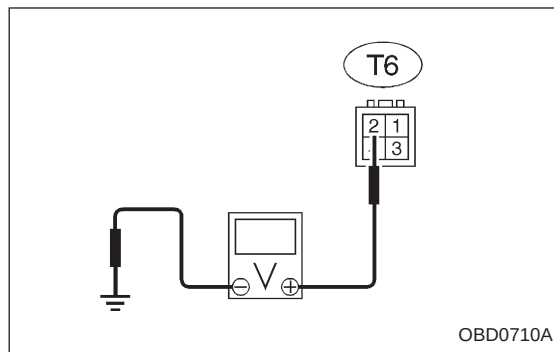
Connector & terminal

(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.

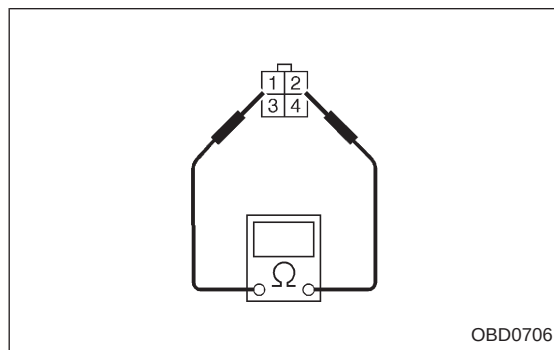
**10S4****CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.**

- 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 10S5.****(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

**10S5****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.

OBD	(FB1)
P0170	<FUEL>
OBD0240	

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**

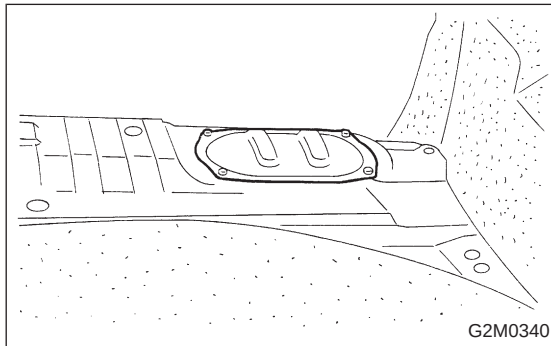
: *Are there holes, loose bolts or disconnection of hose on air intake system?*

YES

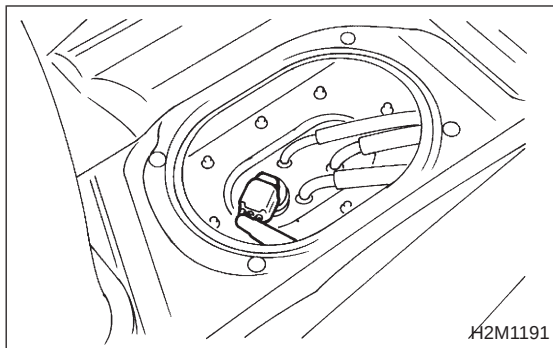
: Repair air intake system.

NO

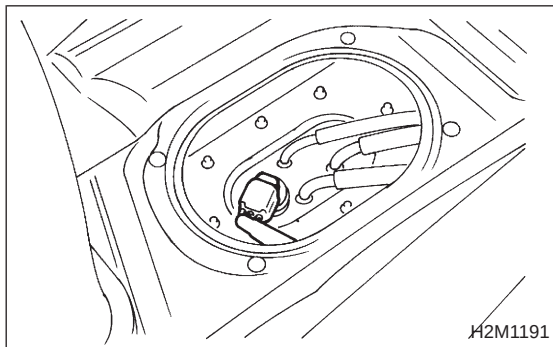
: Go to step **10T3**.

**10T3****CHECK FUEL PRESSURE.****1) Release fuel pressure.**

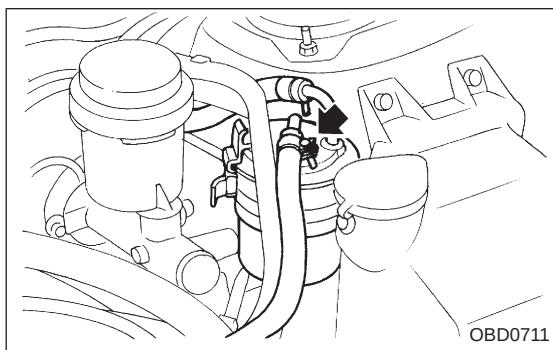
(1) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).



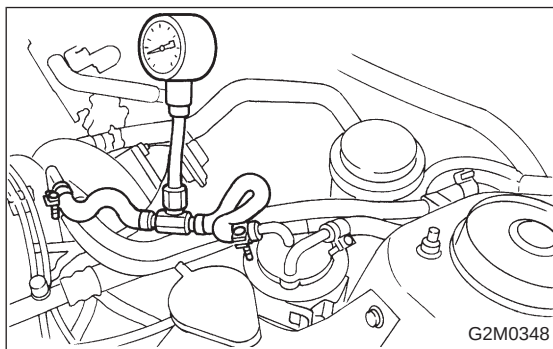
- (2) Disconnect connector from fuel tank.
- (3) Start the engine, and run it until it stalls.
- (4) After stopping the engine, crank the engine for 5 to 7 seconds to reduce fuel pressure.
- (5) Turn ignition switch to OFF.



- 2) Connect connector to fuel tank.



- 3) Disconnect fuel delivery hose from fuel filter, and connect fuel pressure gauge.



- 4) Start the engine and idle while gear position is neutral.
- 5) Measure fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.

CHECK : Is fuel pressure between 226 and 275 kPa (2.3 — 2.8 kg/cm², 33 — 40 psi)?

YES : Go to next step 6).

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

6) After connecting pressure regulator vacuum hose, measure fuel pressure.

CHECK : Is fuel pressure between 157 and 206 kPa (1.6 — 2.1 kg/cm², 23 — 30 psi)?

YES : Go to step 10T4.

NO : Repair the following items.

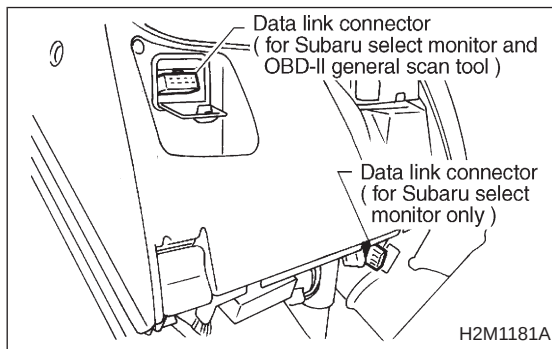
Fuel pressure too high	- Faulty pressure regulator - Clogged fuel return line or bent hose
Fuel pressure too low	- Faulty pressure regulator - Improper fuel pump discharge - Clogged fuel supply line

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.



10T4

CHECK ENGINE COOLANT TEMPERATURE SENSOR.
<REF. TO 2-7 [T10H0] OR [T10I0].>

- Turn ignition switch to OFF.
- Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- Start the engine and warm-up completely.

TW (F04)

80 ° C 176 ° F

B2M0479

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

- Subaru Select Monitor
Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in “°C” and “°F”.

CHECK : ***Is temperature greater than 60°C or 140°F in function mode F04?***

YES : Go to step **10T5**.

NO : Replace engine coolant temperature sensor.

- OBD-II general scan tool

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

10T5

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.

QA (F06)

1 . 67g / s 2 . 02V

B2M0481

5) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F06

- F06: Mass air flow and voltage input from mass air flow sensor are shown on display.

CHECK : *Is the voltage in function mode F06 within the specifications shown in the following table?*

Model	Engine speed	Specified value
1800 cc	Idling	1.6 — 2.8 (g/sec)
	2,500 rpm	6.1 — 10.3 (g/sec)
2200 cc	Idling	1.7 — 3.3 (g/sec)
	2,500 rpm	7.1 — 14.2 (g/sec)

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.

- OBD-II general scan tool

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

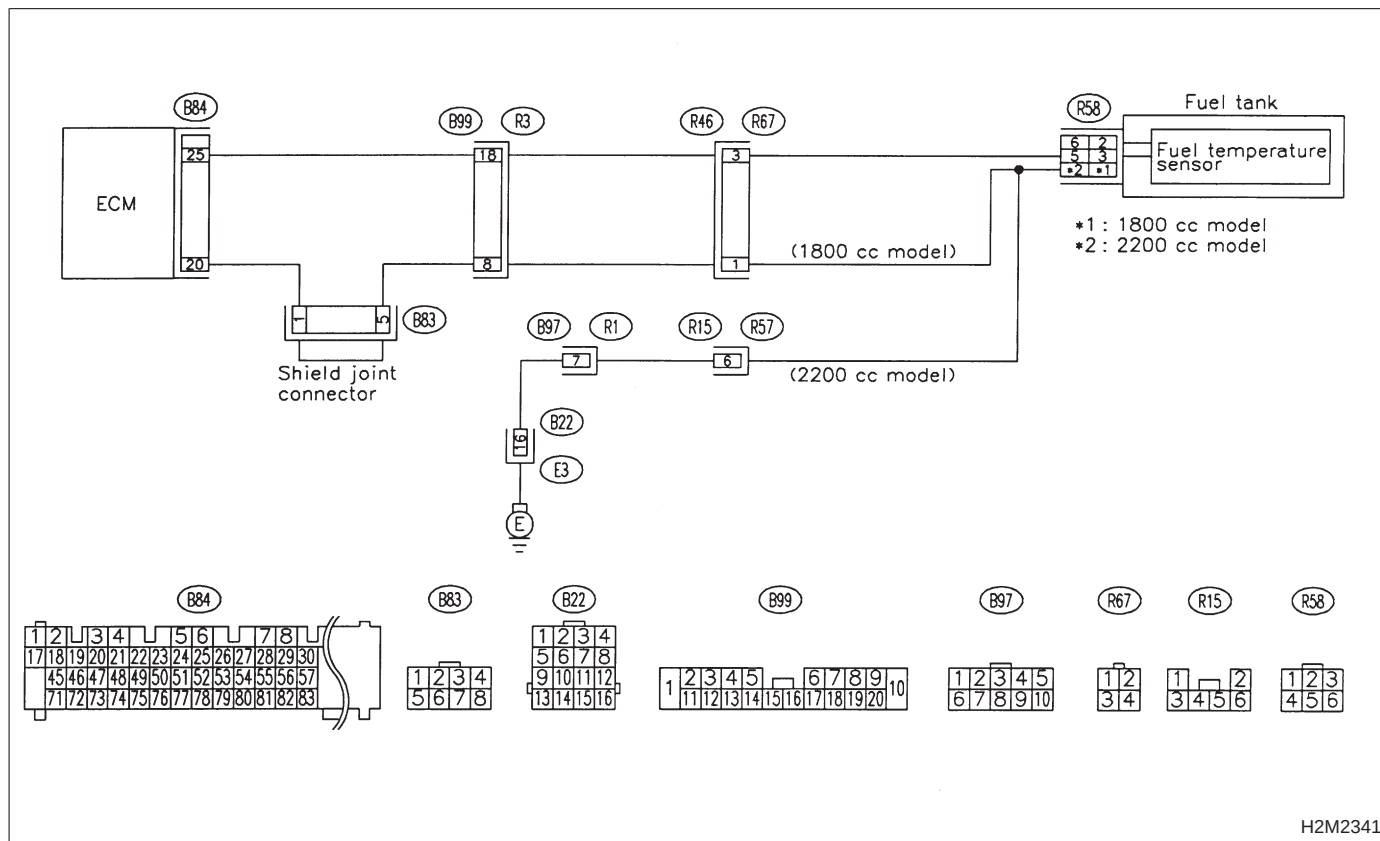
OBD (FB1)

P0181 <TNKT_F>

H2M1350

U: DTC P0181**— FUEL TEMPERATURE SENSOR A CIRCUIT RANGE/PERFORMANCE PROBLEM —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

H2M2341

CAUTION:

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

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

10U1	CHECK DTC P0182 OR P0183 ON DISPLAY.

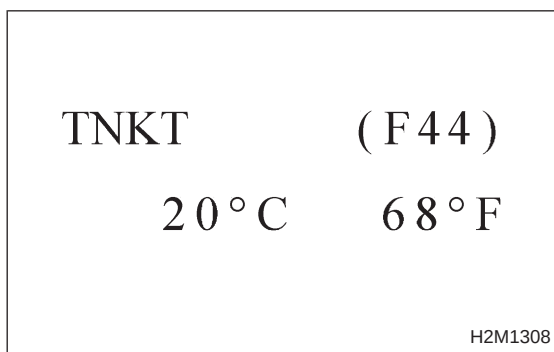
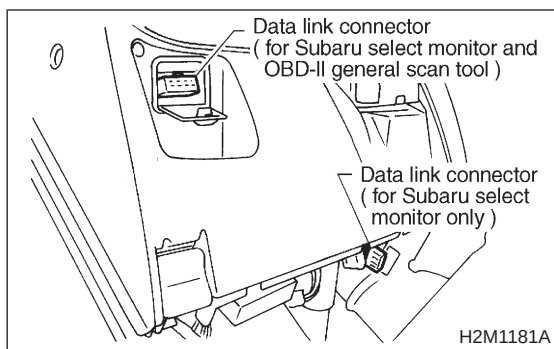
CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0182 or P0183?*

YES : Inspect DTC P0182 or P0183 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NOTE:

In this case, it is not necessary to inspect DTC P0181.

NO : Replace fuel temperature sensor.

**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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F44

- F44: Fuel temperature is indicated in "°C" and "°F".

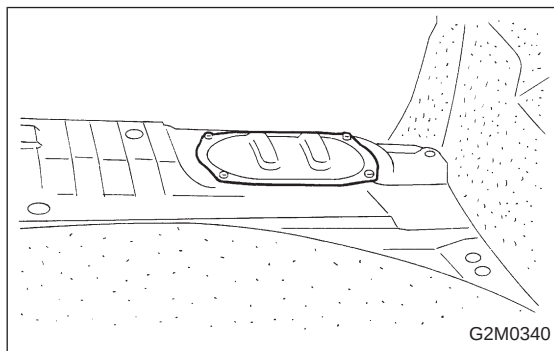
CHECK : Is the value greater than 150°C or 300°F in function mode F44?

YES : Go to step 10V2.

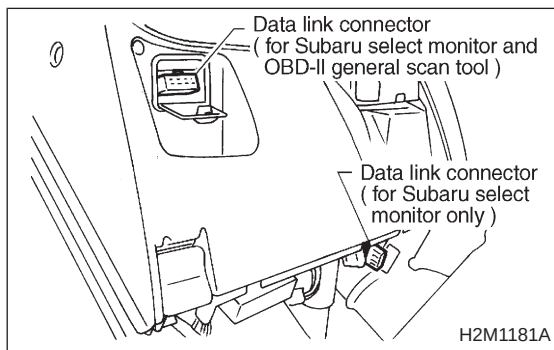
NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

- OBD-II general scan tool

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

**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.

TNKT	(F 44)
20 ° C	68 ° F
H2M1308	

6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F44

- F44: Fuel temperature is indicated in "°C" and "°F".

CHECK : *Is the value less than -40°C or -40°F in function mode F44?*

YES : Replace fuel temperature sensor.

NO : Repair ground short circuit in harness between fuel pump and ECM connector.

- OBD-II general scan tool

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

OBD (FB1)

P0183 <TNKT_HI>

B2M1080

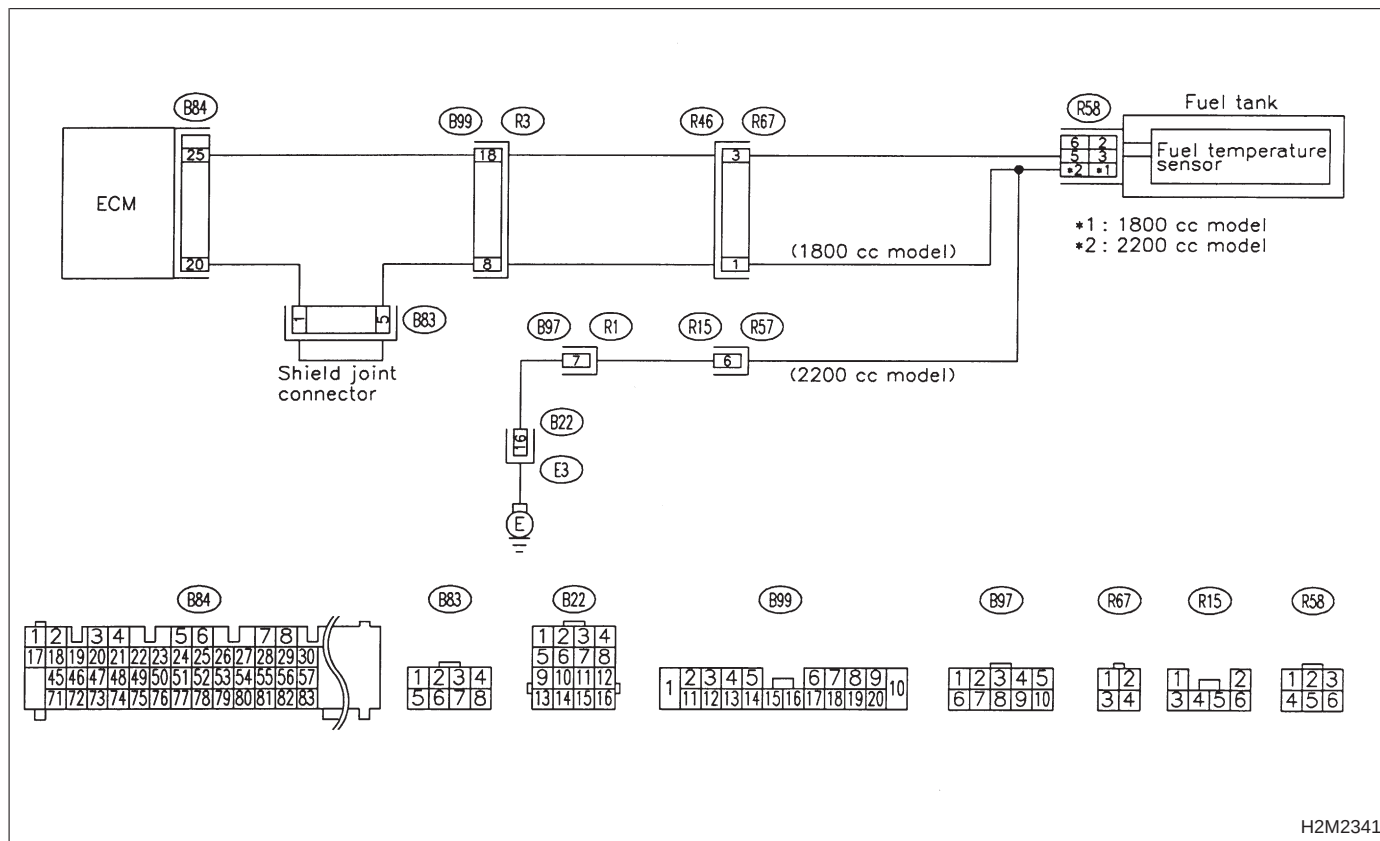
W: DTC P0183

— FUEL TEMPERATURE SENSOR A CIRCUIT
HIGH INPUT —

DTC DETECTING CONDITION:

- Immediately at fault recognition

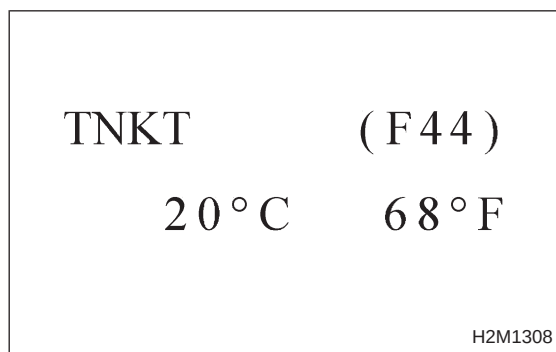
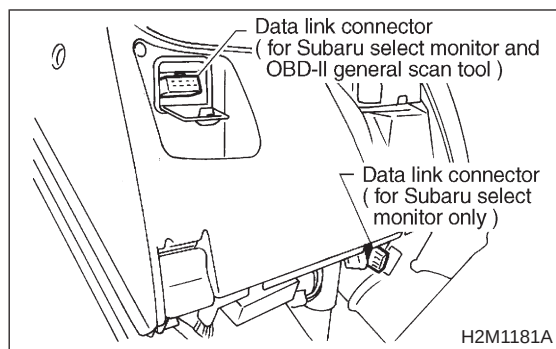
WIRING DIAGRAM:



CAUTION:

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

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

**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 on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F44

- F44: Fuel temperature is indicated in "°C" and "°F".

CHECK : *Is the value less than -40°C or -40°F in function mode F44?*

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 (B83, B99 and R67)
- OBD-II general scan tool

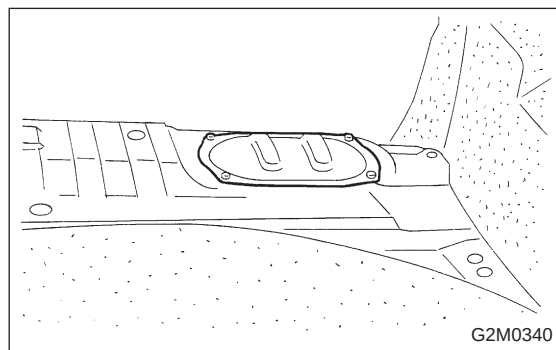
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.

10W2**CHECK ENGINE DISPLACEMENT.**

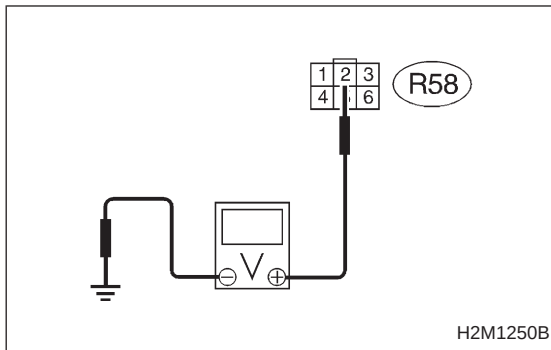
CHECK : *Is the engine 1800 cc model?*

YES : Go to **10W3**.

NO : Go to **10W7**.

**10W3****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.

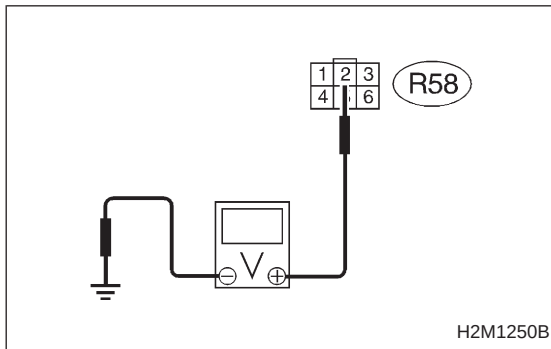
Connector & terminal

(R58) No. 2 (+) — 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.

1) Turn ignition switch to ON.

2) Measure voltage between fuel pump connector and chassis ground.

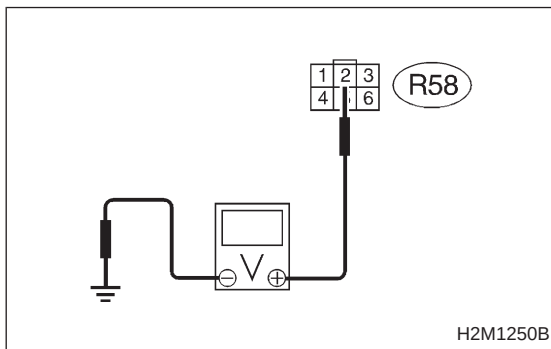
Connector & terminal

(R58) No. 2 (+) — 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 10W5.



10W5

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?

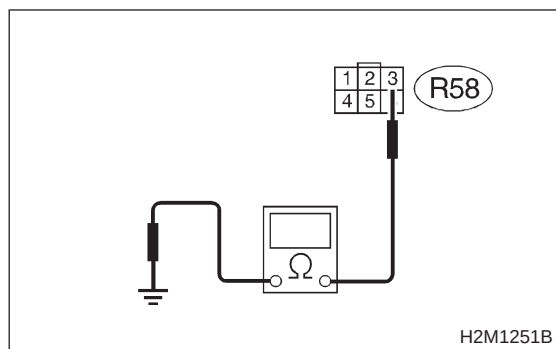
(YES) : Go to step 10W6.

(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 (B99 and R67)

**10W6**
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.

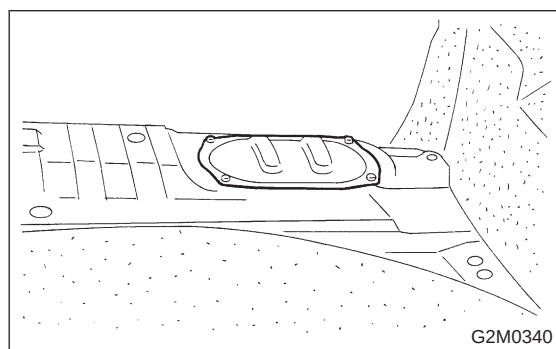
Connector & terminal
(R58) No. 3 — Chassis ground:
(CHECK) : Is the resistance less than 5 Ω?
(YES) : Replace fuel temperature sensor.

(NO) : Repair harness and connector.

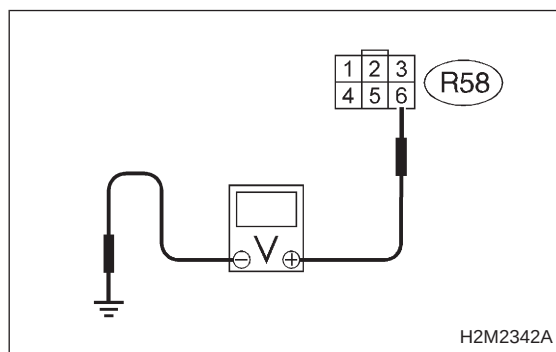
NOTE:

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 (B83, B99 and R67)

**10W7**
CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

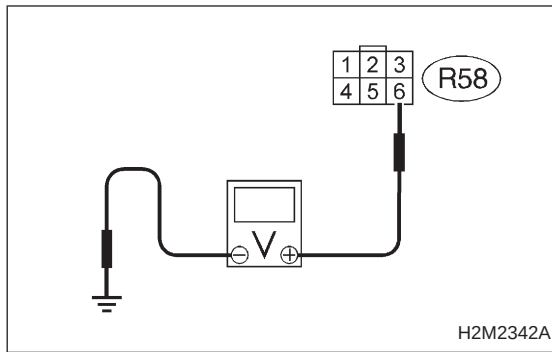
- 1) Turn ignition switch to OFF.
- 2) Remove access hole lid.
- 3) Disconnect connector from fuel pump.



- 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 10W8.

**10W8**

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.

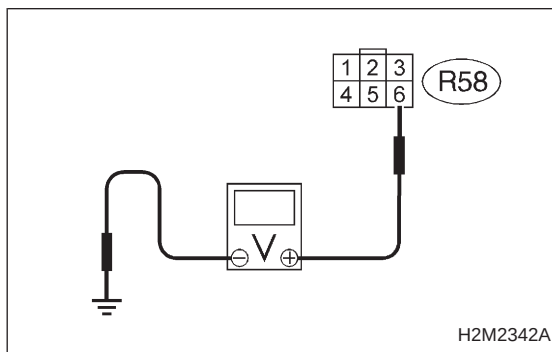
Connector & terminal

(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 **10W9**.

**10W9**

CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.

Measure voltage between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 6 (+) — Chassis ground (-):

CHECK : Is the voltage more than 4 V?

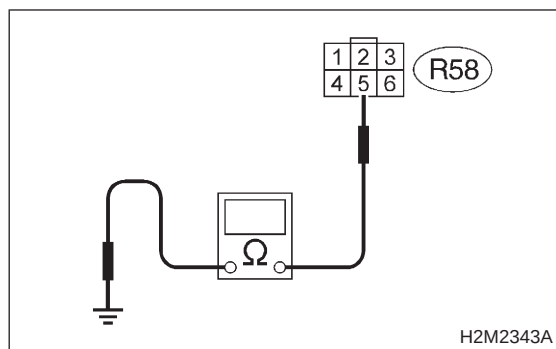
YES : Go to step **10W10**.

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 (B99 and R67)

**10W10**

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 R15)

OBD (FB1)
P0261 <INJ 1>

B2M1081

X: DTC P0261
— FUEL INJECTOR CIRCUIT LOW INPUT -
#1 —

OBD (FB1)
P0264 <INJ 2>

B2M1082

Y: DTC P0264
— FUEL INJECTOR CIRCUIT LOW INPUT -
#2 —

OBD (FB1)
P0267 <INJ 3>

B2M1083

Z: DTC P0267
— FUEL INJECTOR CIRCUIT LOW INPUT -
#3 —

OBD (FB1)
P0270 <INJ 4>

B2M1084

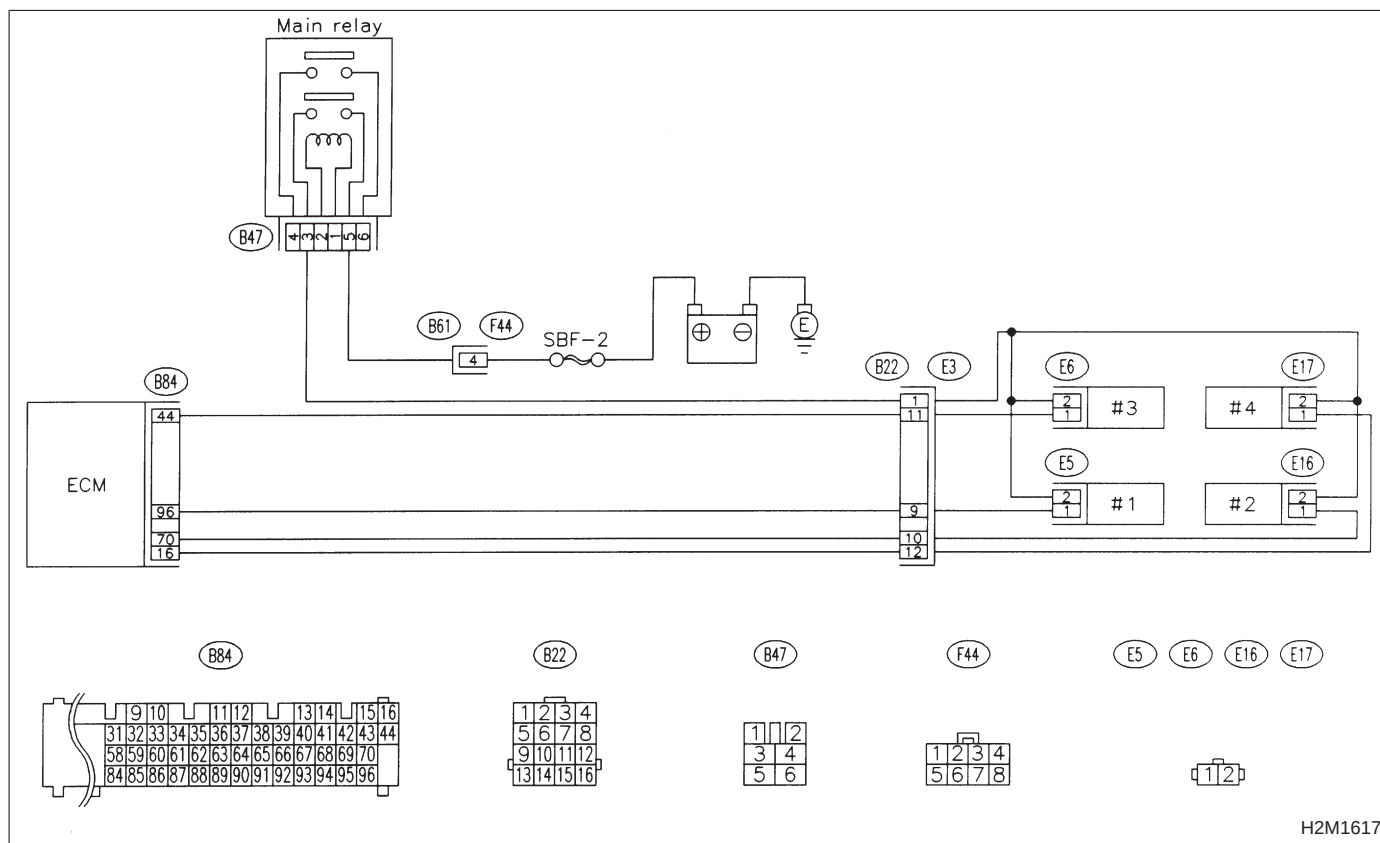
AA: DTC P0270
— FUEL INJECTOR CIRCUIT LOW INPUT -
#4 —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

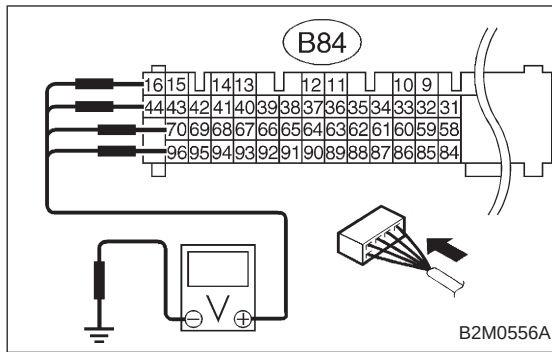
- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving

WIRING DIAGRAM:

H2M1617

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].>



10AA1	CHECK OUTPUT SIGNAL FROM ECM.

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

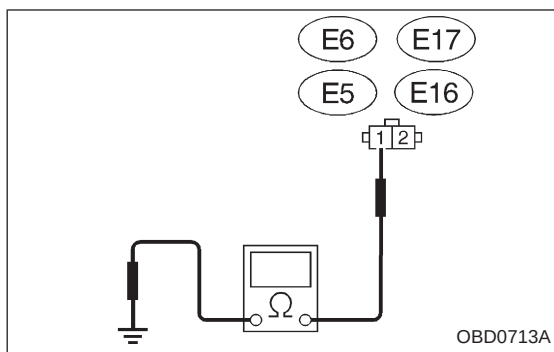
Connector & terminal**#1 (B84) No. 96 (+) — Chassis ground (-):****#2 (B84) No. 70 (+) — Chassis ground (-):****#3 (B84) No. 44 (+) — Chassis ground (-):****#4 (B84) No. 16 (+) — Chassis ground (-):****CHECK** : **Is the voltage more than 10 V?****YES** : Go to step **10AA2**.**NO** : Go to step **10AA3**.

10AA2	CHECK POOR CONTACT.

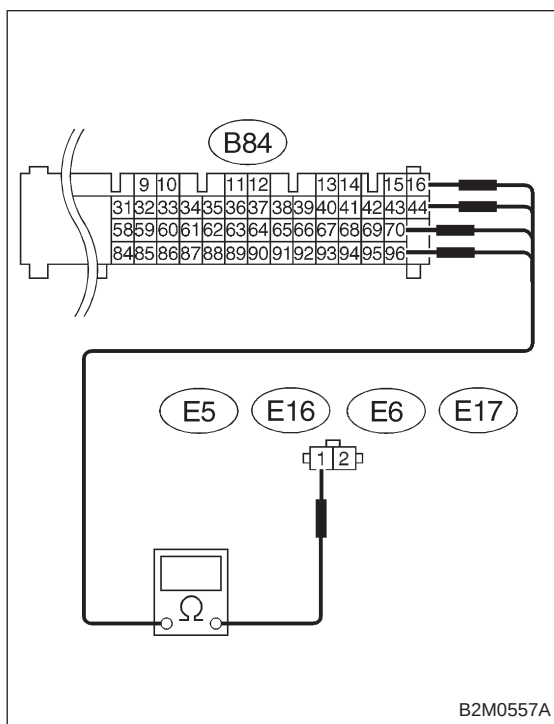
Check poor contact in ECM connector. <Ref. to FOREWORD [T3C1].>

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 resistance between ECM connector and engine ground on faulty cylinders.

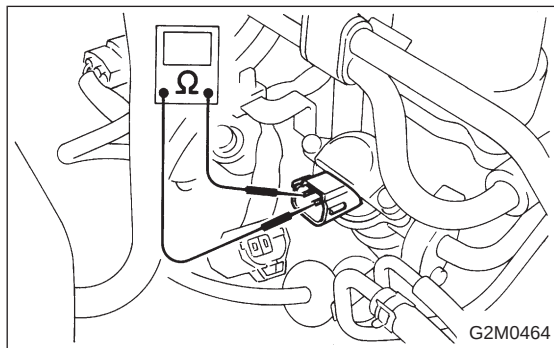
Connector & terminal**#1 (E5) No. 1 — Engine ground:****#2 (E16) No. 1 — Engine ground:****#3 (E6) No. 1 — Engine ground:****#4 (E17) No. 1 — Engine ground:****(CHECK) : Is the resistance less than 10 Ω?****(YES) :** Repair ground short circuit in harness between fuel injector and ECM connector.**(NO) :** Go to next step 4).

- 4) 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:****(CHECK) : Is the resistance less than 1 Ω?****(YES) :** Go to step 10AA4.**(NO) :** Repair harness and connector.**NOTE:**

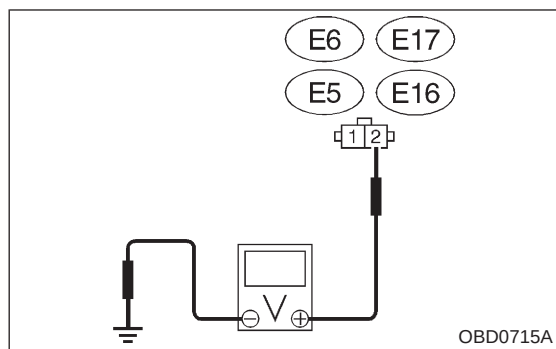
In this case, repair the following:

- Open circuit in harness between ECM and fuel injector connector
- Poor contact in coupling connector (B22)

**10AA4****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?****(NO) :** Replace faulty fuel injector.**(YES) :** Go to step 10AA5.



10AA5	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

OBD (FB1)

P0262 <INJ 1_HI>

B2M1085

AB: DTC P0262

— FUEL INJECTOR CIRCUIT HIGH INPUT -
#1 —

OBD (FB1)

P0265 <INJ 2_HI>

B2M1086

AC: DTC P0265

— FUEL INJECTOR CIRCUIT HIGH INPUT -
#2 —

OBD (FB1)

P0268 <INJ 3_HI>

B2M1087

AD: DTC P0268

— FUEL INJECTOR CIRCUIT HIGH INPUT -
#3 —

OBD (FB1)

P0271 <INJ 4_HI>

B2M1088

AE: DTC P0271

— FUEL INJECTOR CIRCUIT HIGH INPUT -
#4 —

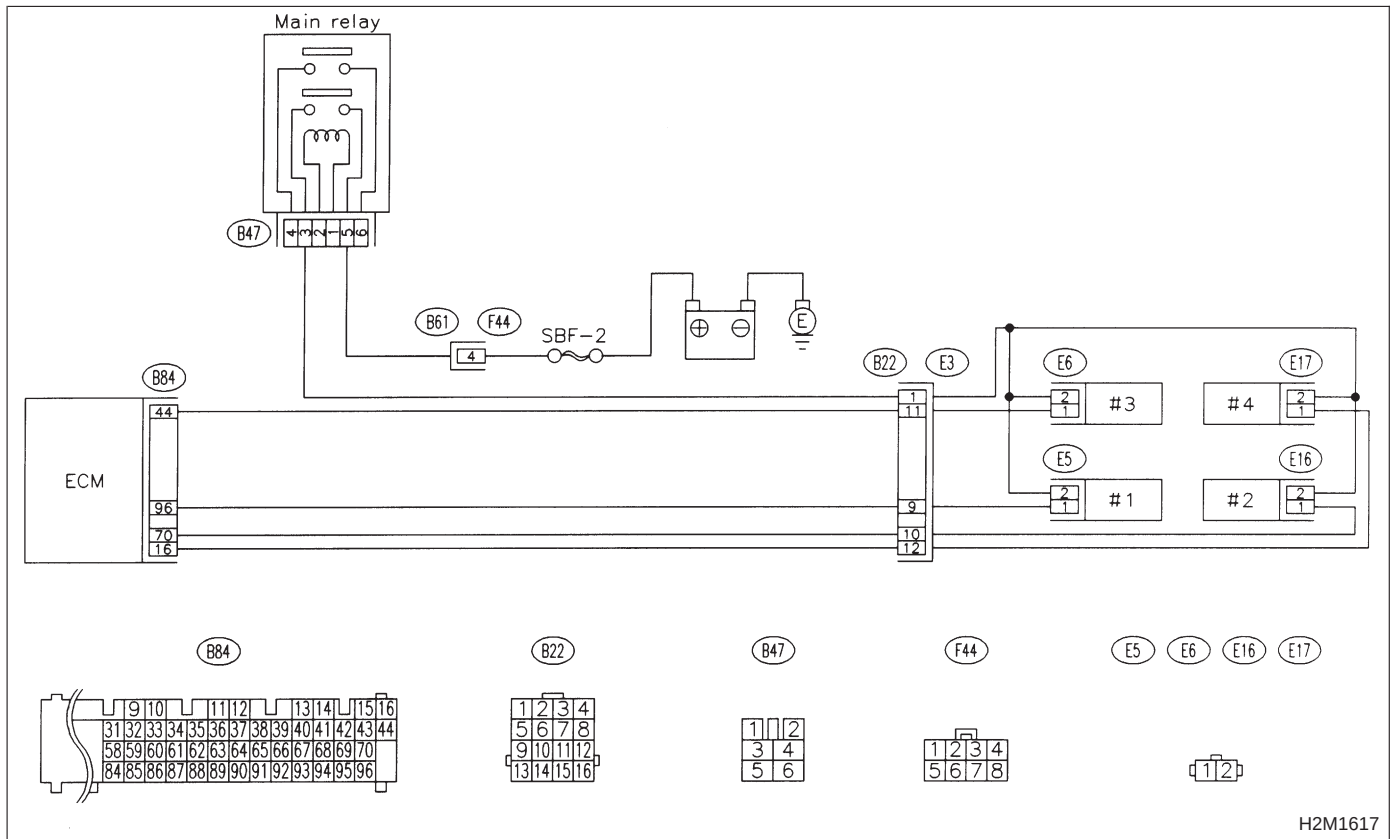
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

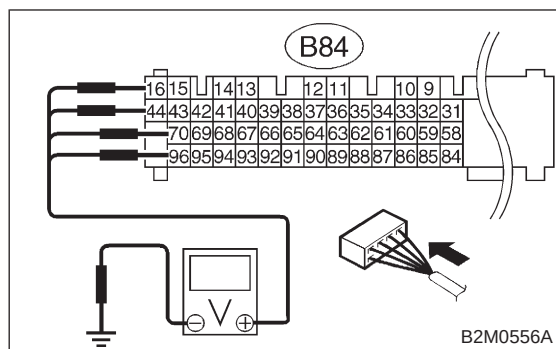
- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving

WIRING DIAGRAM:



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].>


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.

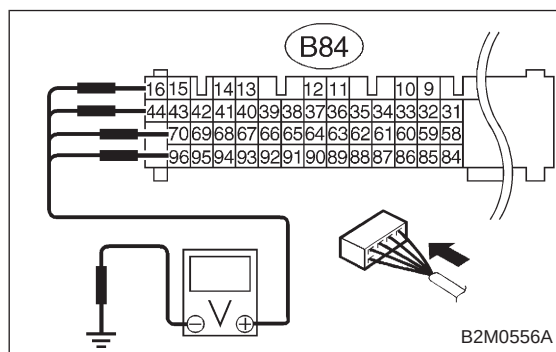
10AE2 CHECK POOR CONTACT.

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 (-):

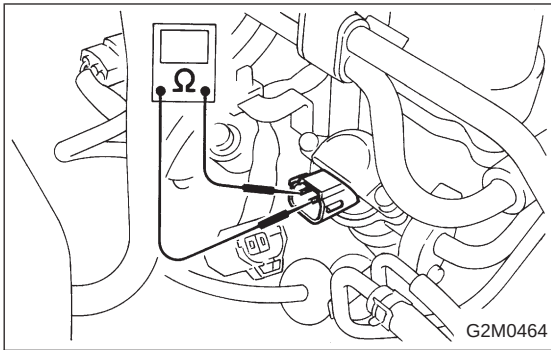
#3 (B84) No. 44 (+) — Chassis ground (-):

#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 next step 5).



- 5) Turn ignition switch to OFF.
6) 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 **10AE4**.

10AE4	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.

OBD (FB1)

P0301 <MIS_1>

OBD0277

AF: DTC P0301**— CYLINDER 1 MISFIRE DETECTED —**

OBD (FB1)

P0302 <MIS_2>

OBD0278

AG: DTC P0302**— CYLINDER 2 MISFIRE DETECTED —**

OBD (FB1)

P0303 <MIS_3>

OBD0279

AH: DTC P0303**— CYLINDER 3 MISFIRE DETECTED —**

OBD (FB1)

P0304 <MIS_4>

OBD0280

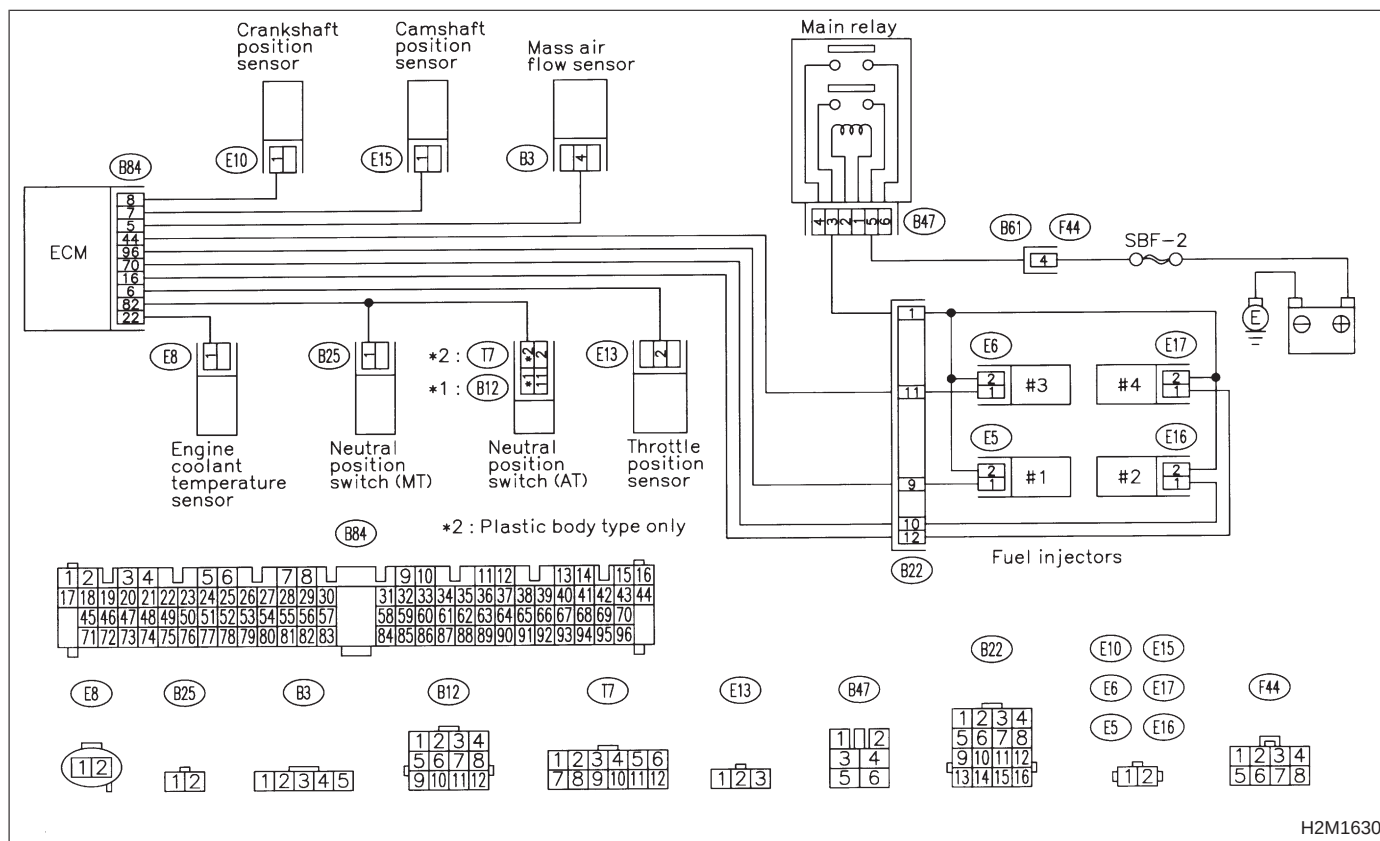
AI: DTC P0304**— CYLINDER 4 MISFIRE DETECTED —**

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

WIRING DIAGRAM:

H2M1630

CAUTION:

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

10AI1	CHECK DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 OR P0271 ON DISPLAY.

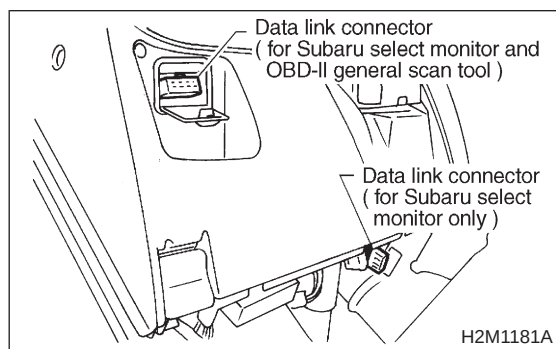
CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0101, P0102, P0103, P0116, P0117, P0125, P0261, P0262, P0264, P0265, P0267, P0268, P0270 or P0271?

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 **10AI2**.



10AI2	CONNECT SUBARU SELECT MONITOR AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to the data link connector.
- 3) Turn ignition switch to ON and turn Subaru Select Monitor switch to ON.

- 4) Read data on Subaru Select Monitor. Designate mode use function key.

Function mode: F42

NOTE:

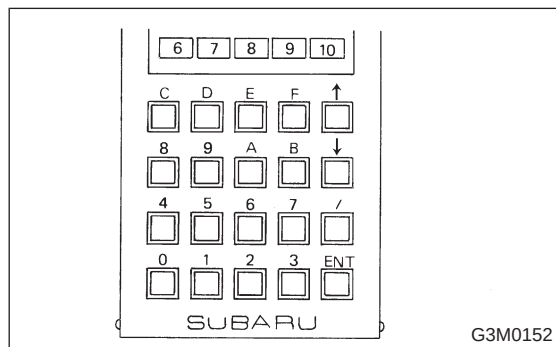
F42: Maximum and minimum EGR system pressure value are indicated at the same time.

- 5) Print out the displayed data on paper.

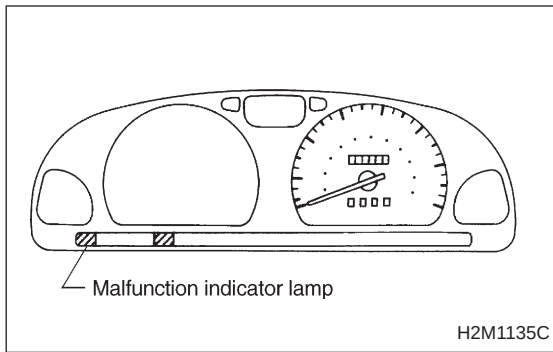
EGRmax-min (F4 2)

1 0 0 kPa 4 kPa

B2M0759



- 6) Clear memory on Subaru Select Monitor. Designate mode use function key. Press [F], [C], [0], [ENT] in that order.



7) Start engine, and drive the vehicle more than 10 minutes.

CHECK : *Is the MIL coming on or blinking?*

YES : Go to step **10A13**.

NO : Go to next **CHECK** .

CHECK : *Has the vehicle been run empty of fuel?*

YES : Finish diagnostics operation, if the engine has no abnormality.

NO : Go to next **CHECK** .

CHECK : *Was the cause of misfire diagnosed when the engine is running?*

NOTE:

Ex. Remove spark plug cord, etc.

YES : Finish diagnostics operation, if the engine has no abnormality.

NO : Repair poor connector.

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)

10A13

CHECK AIR INTAKE SYSTEM.

CHECK : *Is there a fault in air intake system?*

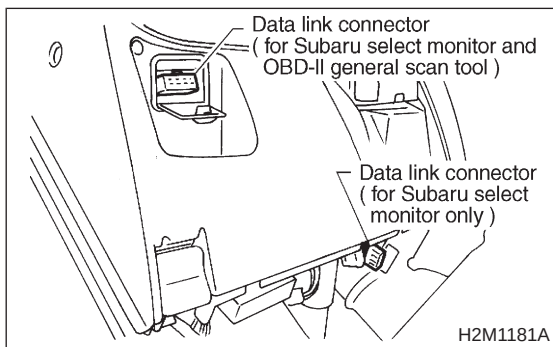
NOTE:

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?

YES : Repair air intake system.

NO : Go to step **10A14**.



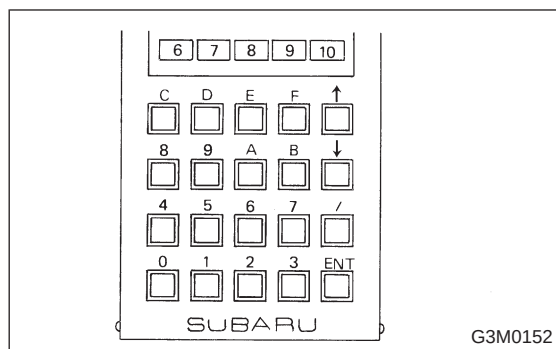
10A14

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

Designate mode use function key.

Function mode: FB1

- 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 10AI5.

NO : Go to next **CHECK** .

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0301 and P0302?

YES : Go to step 10AI6.

NO : Go to next **CHECK** .

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0303 and P0304?

YES : Go to step 10AI7.

NO : Go to next **CHECK** .

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0301 and P0303?

YES : Go to step 10AI8.

NO : Go to next **CHECK** .

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0302 and P0304?

YES : Go to step 10AI9.

NO : Go to step 10AI10.

10AI5	ONLY ONE CYLINDER

CHECK : *Is there a fault in that cylinder?*

NOTE:

Check the following items.

- Spark plug
- Spark plug cord
- Fuel injector
- Compression ratio

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI6	GROUP OF #1 AND #2 CYLINDERS

CHECK : *Are there faults in #1 and #2 cylinders?*

NOTE:

- Check the following items.
 - Spark plugs
 - Fuel injectors
 - Ignition coil
- If no abnormal is discovered, check for "IGNITION CONTROL SYSTEM" of #1 and #2 cylinders side. <Ref. to 2-7 [T8D0].>

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI7**GROUP OF #3 AND #4 CYLINDERS****CHECK****: Are there faults in #3 and #4 cylinders?**

NOTE:

● Check the following items.

- Spark plugs
- Fuel injectors
- Ignition coil

● If no abnormal is discovered, check for "IGNITION CONTROL SYSTEM" of #3 and #4 cylinders side. <Ref. to 2-7 [T8D0].>

YES

: Repair or replace faulty parts.

NO: Go to step **10AI11**.**10AI8****GROUP OF #1 AND #3 CYLINDERS****CHECK****: Are there faults in #1 and #3 cylinders?**

NOTE:

Check the following items.

- Spark plugs
- Fuel injectors
- Skipping timing belt teeth

YES

: Repair or replace faulty parts.

NO: Go to step **10AI11**.

10AI9	GROUP OF #2 AND #4 CYLINDERS

CHECK : *Are there faults in #2 and #4 cylinders?*

NOTE:

Check the following items.

- Spark plugs
- Fuel injectors
- Skipping timing belt teeth

YES : Repair or replace faulty parts.

NO : Go to step **10AI11**.

10AI10	THE CYLINDER AT RANDOM

CHECK : *Is the engine idle rough?*

YES : Go to step **10AI11**.

NO : Go to DTC P0170. <Ref. to 2-7 [T10T3], [T10T4] and [T10T5].>

EGRmax-min (F4 2)

1 0 0kPa 4 kPa

B2M0759

10A11 CHECK EGR SYSTEM.

CHECK : *Is the minimum EGR system pressure value (value of function mode (F42) less than 1 kPa?*

NOTE:

Use the value read in step **10X2** for function mode F42.

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].>

OBD (FB1)

P0325 <KNOCK>

OBD0283

AJ: DTC P0325 — KNOCK SENSOR CIRCUIT MALFUNCTION —

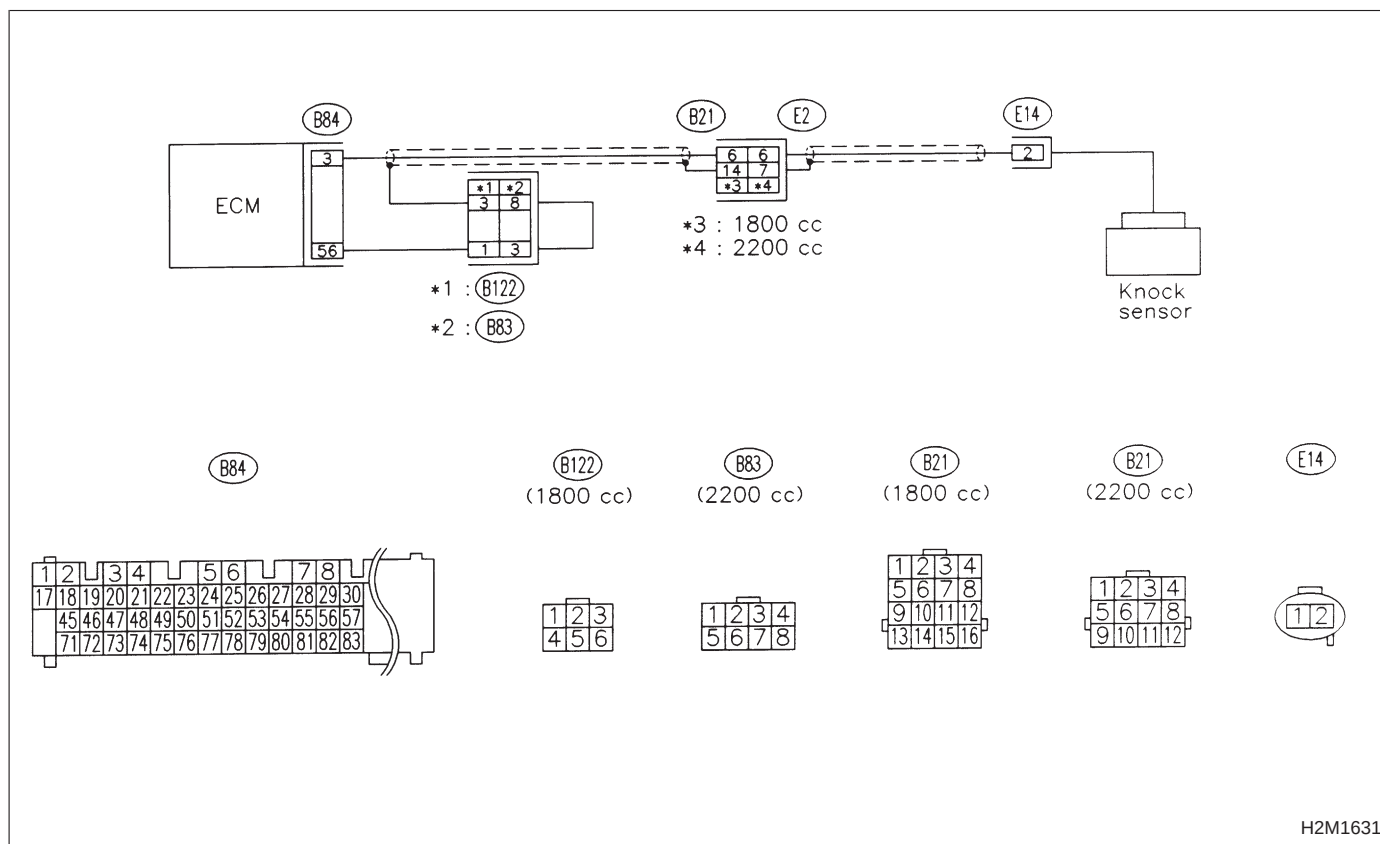
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

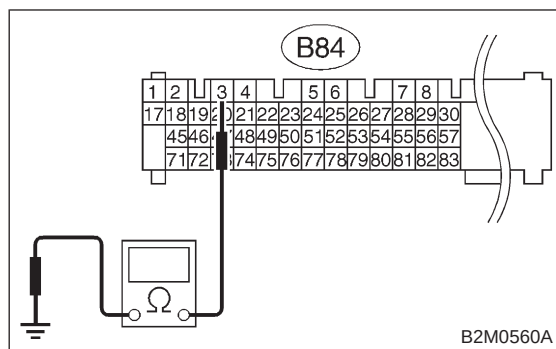
- Poor driving performance
- Knocking occurs.

WIRING DIAGRAM:

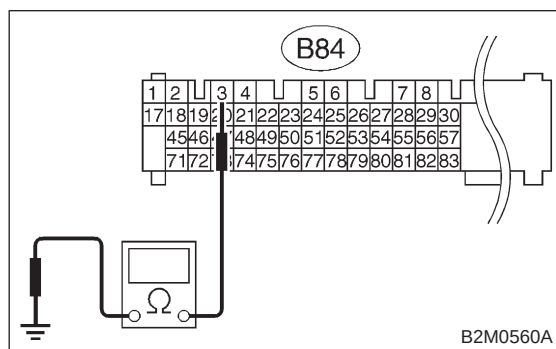


CAUTION:

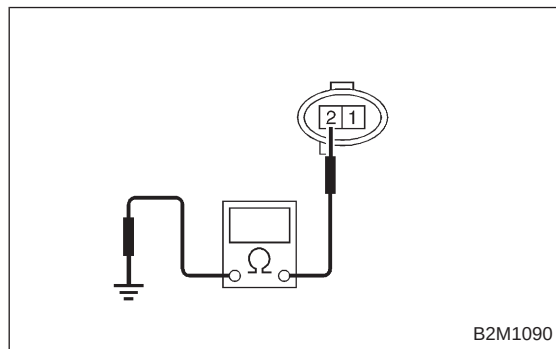
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

**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 kΩ?**YES** : Go to step 10AJ2.**NO** : Go to next step 4).

- 4) Measure resistance of harness between ECM connector and chassis ground.

Connector & terminal**(B84) No. 3 — Chassis ground:****CHECK** : Is the resistance less than 400 kΩ?**YES** : Go to step 10AJ3.**NO** : Go to step 10AJ4.**10AJ2****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 kΩ?**YES** : Go to next **CHECK** .**NO** : Repair harness and connector.**NOTE:**

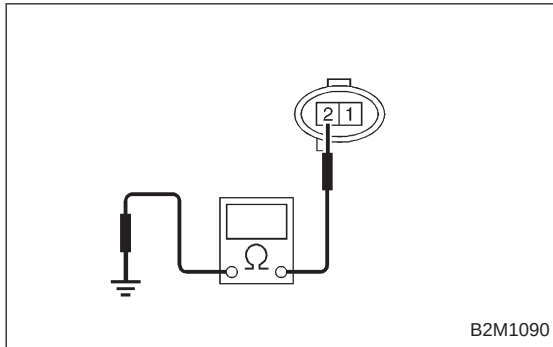
In this case, repair the following:

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

CHECK : *Is the knock sensor installation bolt tightened securely?*

YES : Replace knock sensor.

NO : Tighten knock sensor installation bolt securely.



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:

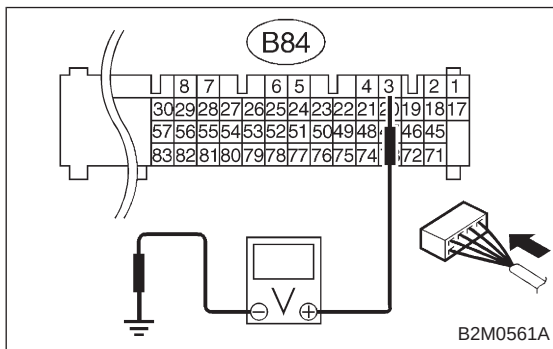
CHECK : *Is the resistance less than 400 kΩ?*

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.



10AJ4 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?*

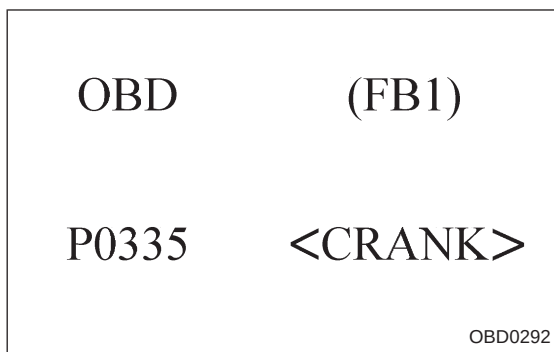
YES : Even if MIL lights up, the circuit has returned to a normal condition at this time. (However, the possibility of poor contact still remains.)

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 —

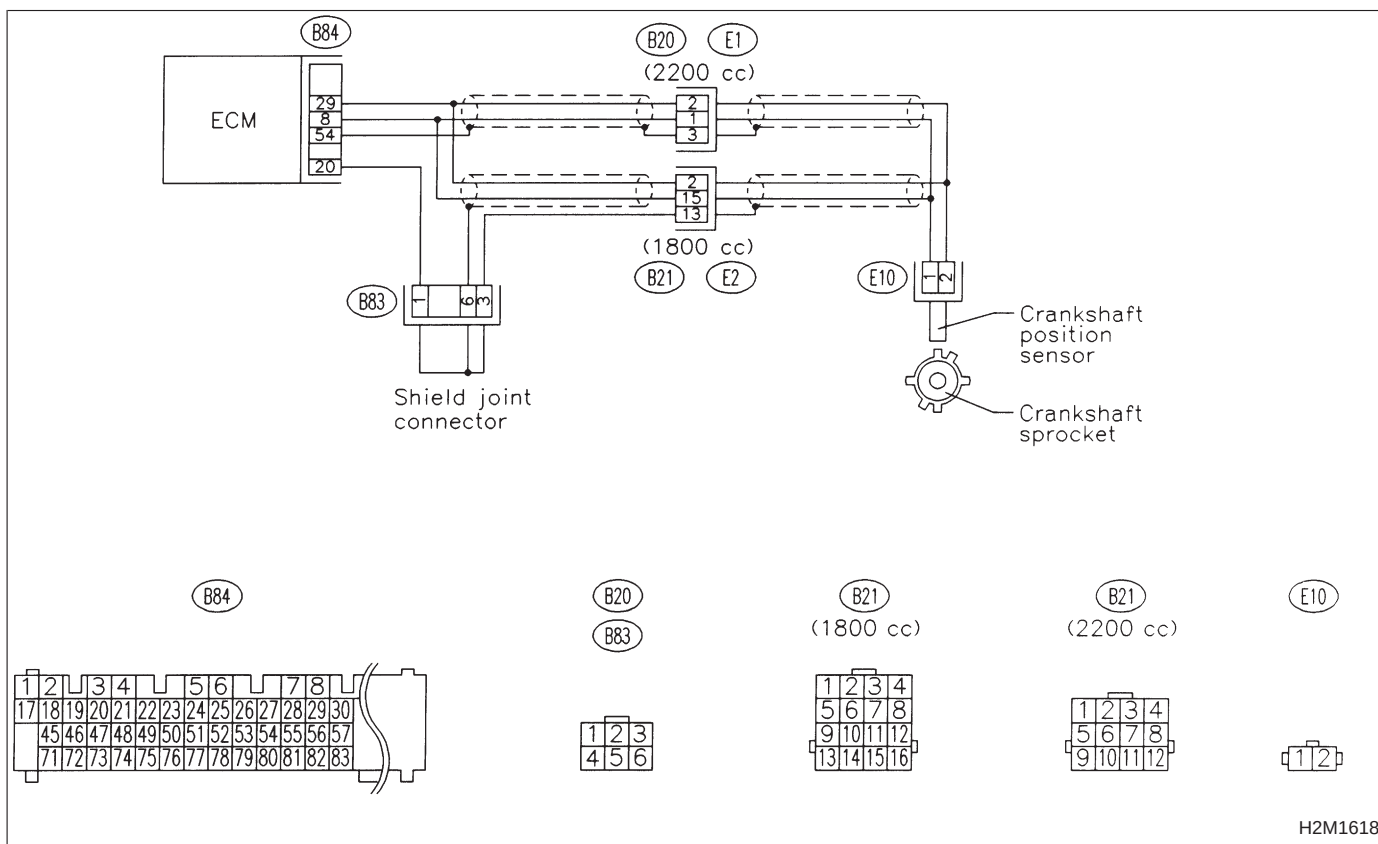
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

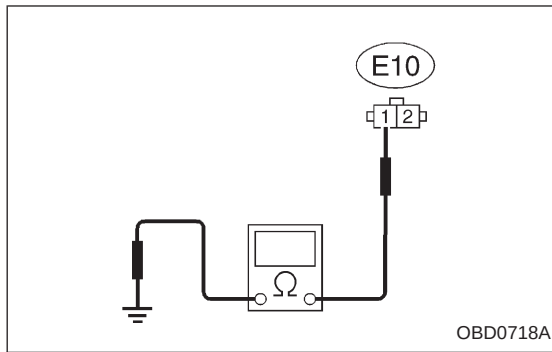
- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:



CAUTION:

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

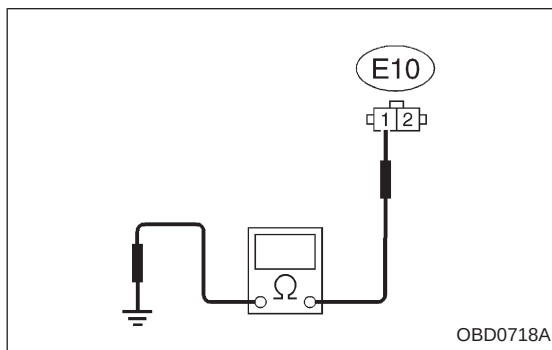
**10AK1****CHECK HARNESS BETWEEN CRANK-SHAFT POSITION SENSOR AND ECM CONNECTOR.**

- 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 (B21) [1800 cc]
- Poor contact in coupling connector (B20) [2200 cc]

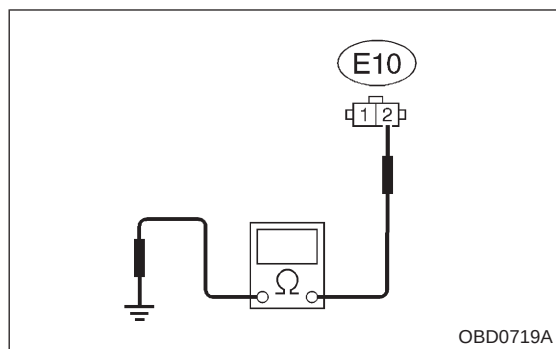
NO : Go to next step 4).

- 4) 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 next step 5).



5) 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 10AK2.

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 (B21) [1800 cc]
- Poor contact in coupling connector (B20) [2200 cc]

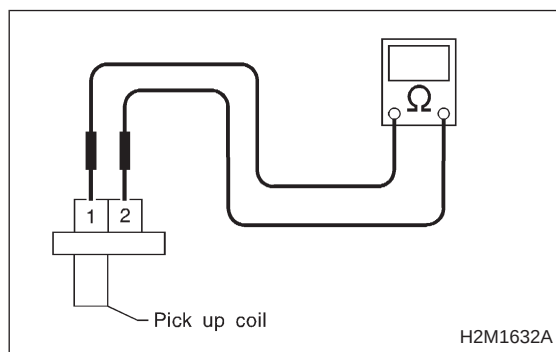
10AK2

CHECK CRANKSHAFT POSITION SENSOR.

CHECK : Is the crankshaft position sensor installation bolt tightened securely?

YES : Go to next step 1).

NO : Tighten crankshaft position sensor installation bolt securely.



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.

OBD (FB1)

P0336 <CRANK_R>

B2M1091

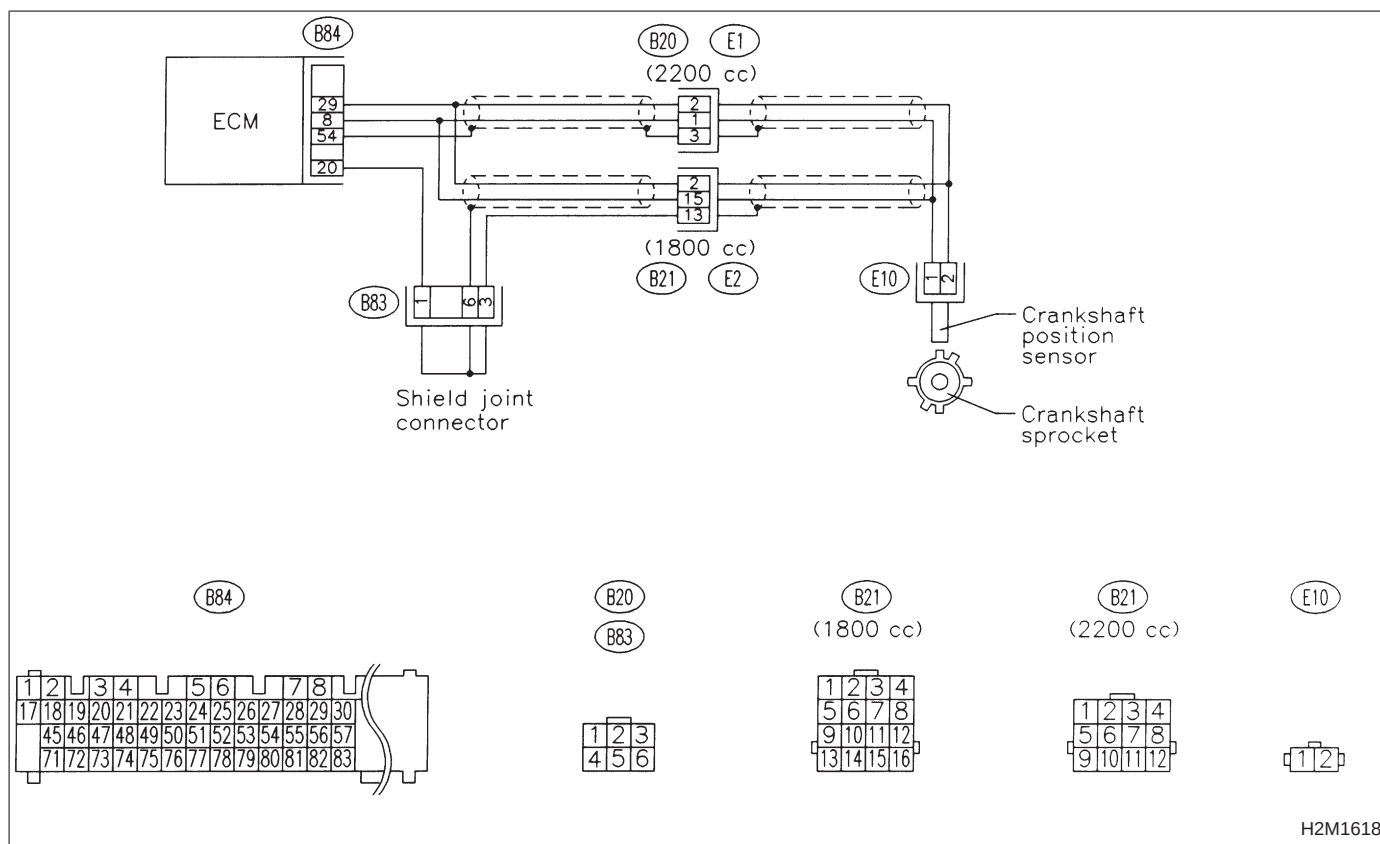
AL: DTC P0336 — CRANKSHAFT POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:

H2M1618

10AL1**CHECK DTC P0335 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.**

OBD

(FB1)

P0340

<CAM>

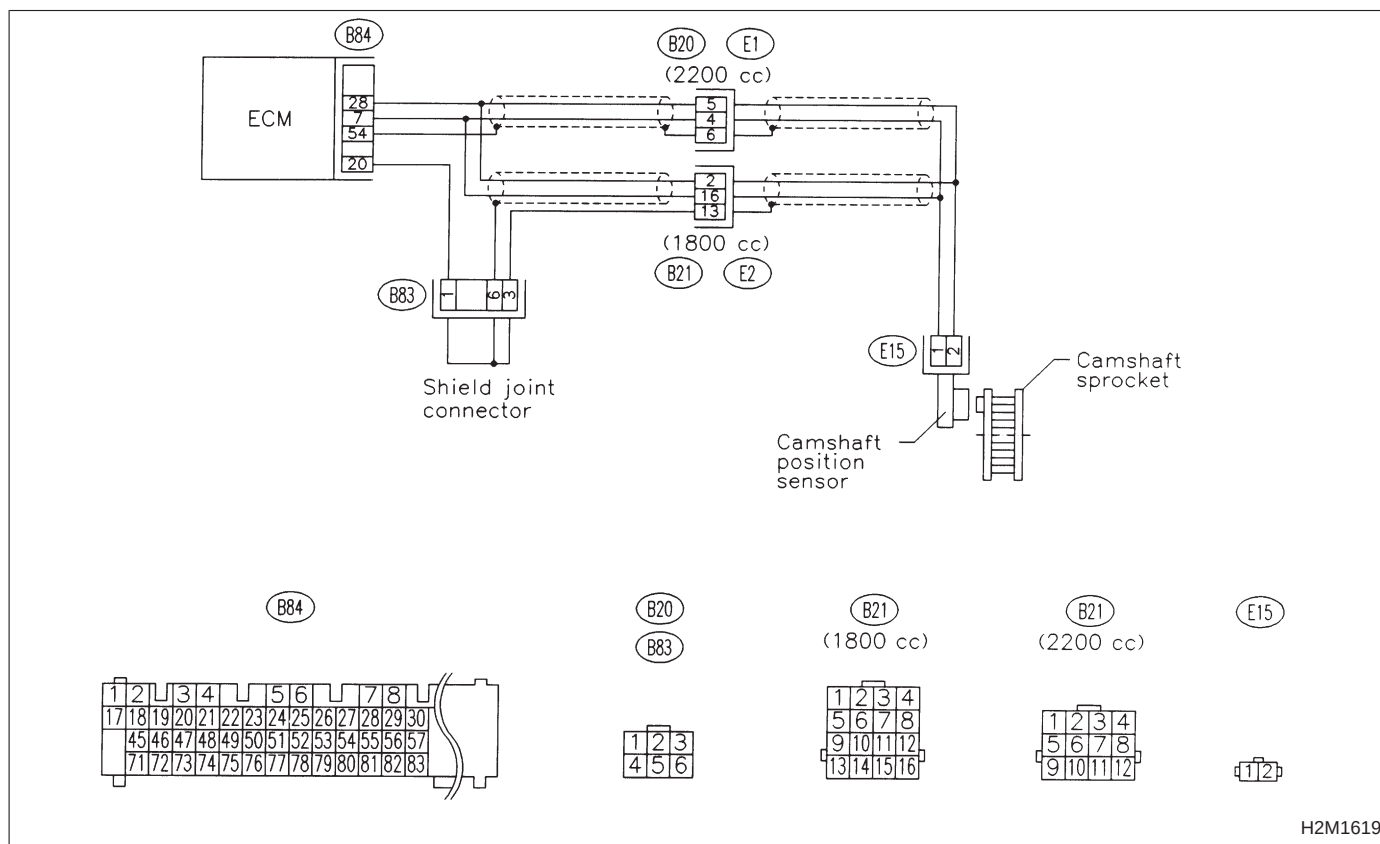
OBD0304

AM: DTC P0340**— CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION —****DTC DETECTING CONDITION:**

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

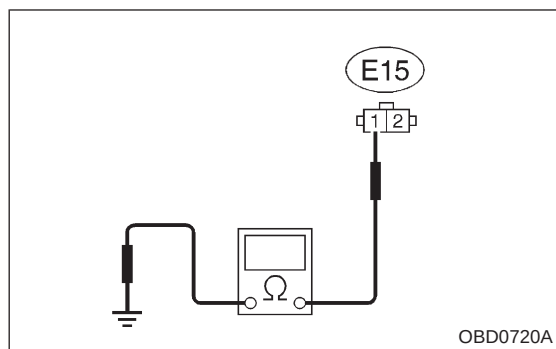
WIRING DIAGRAM:

H2M1619

CAUTION:

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

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

**10AM1**
CHECK HARNESS BETWEEN CAM-SHAFT 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?

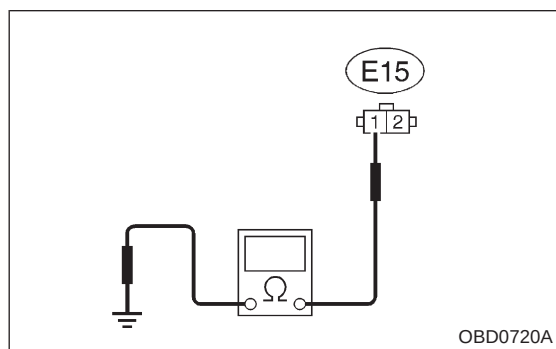
YES : Repair harness and connector.

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 (B21) [1800 cc]
- Poor contact in coupling connector (B20) [2200 cc]

NO : Go to next step 4).



- 4) Measure resistance of harness between camshaft position sensor connector and engine ground.

Connector & terminal
(E15) No. 1 — Engine ground:

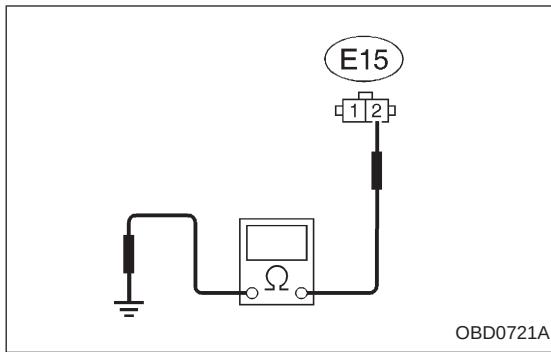
CHECK : Is the resistance less than 10 Ω?

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

NOTE:

The harness between both connectors are shielded. Repair ground short circuit in harness together with shield.

NO : Go to next step 5).



5) 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 10AM2.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

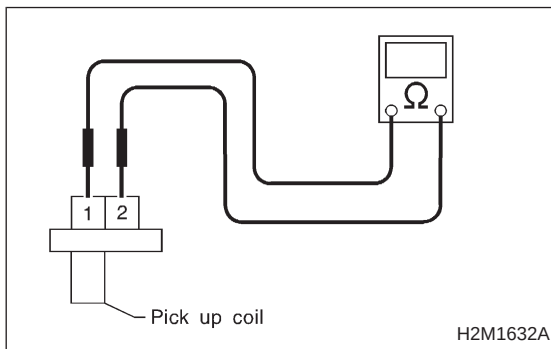
- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B21) [1800 cc]
- Poor contact in coupling connector (B20) [2200 cc]

10AM2	CHECK CAMSHAFT POSITION SENSOR.

CHECK : Is the camshaft position sensor installation bolt tightened securely?

YES : Go to next step 1).

NO : Tighten camshaft position sensor installation bolt securely.



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.

OBD

(FB1)

P0341

<CAM_R>

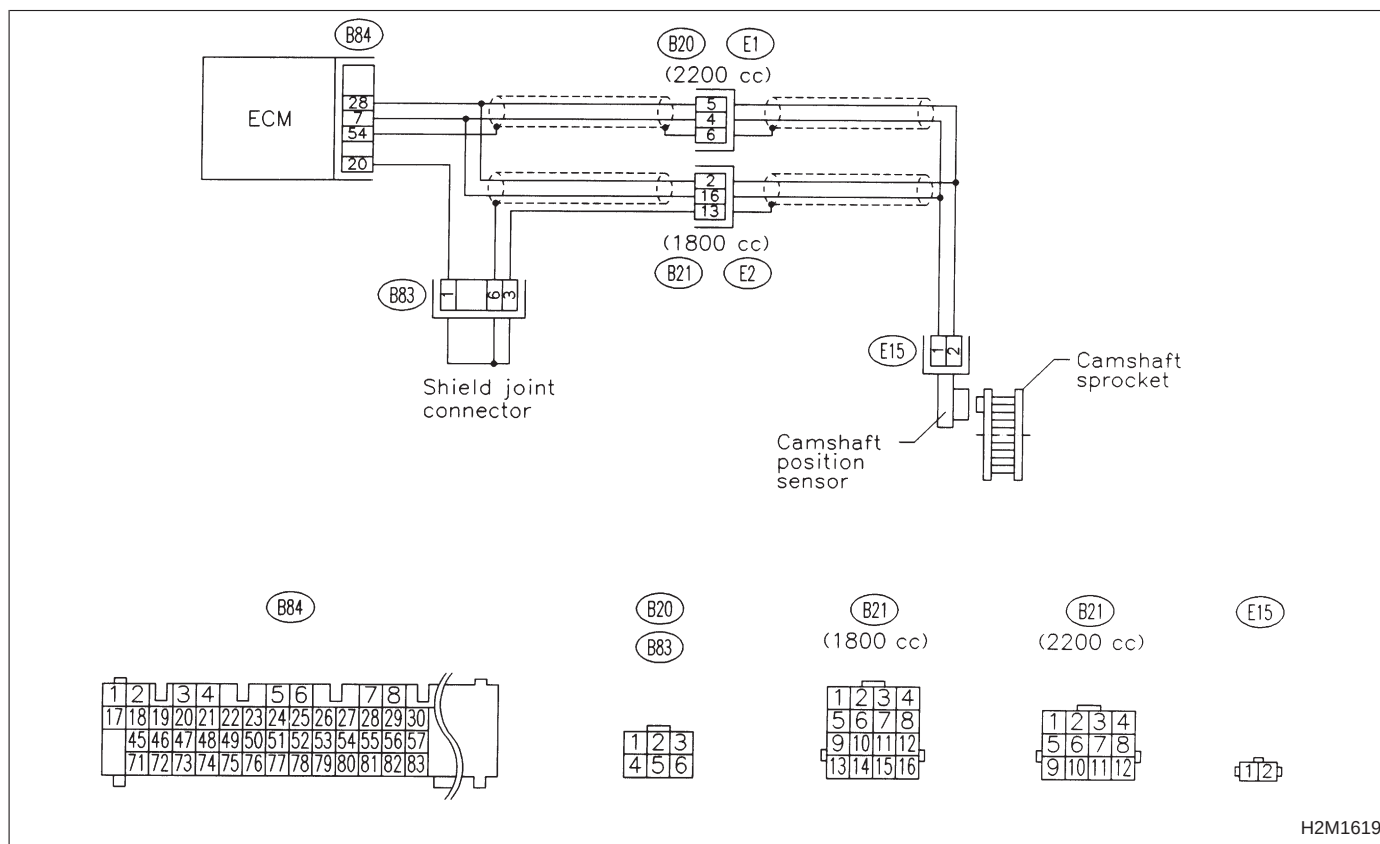
B2M1092

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

WIRING DIAGRAM:

H2M1619

CAUTION:

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

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

10AN1	CHECK DTC P0340 ON DISPLAY.

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0340?*

YES : Inspect DTC P0340 using "10. Diagnostics Chart with Trouble Code". <Ref. to 2-7 [T10A0].>

NO : Replace camshaft position sensor.

OBD (FB1)

P0400 <EGR>

OBD0315

AO: DTC P0400 — EXHAUST GAS RECIRCULATION FLOW MALFUNCTION —

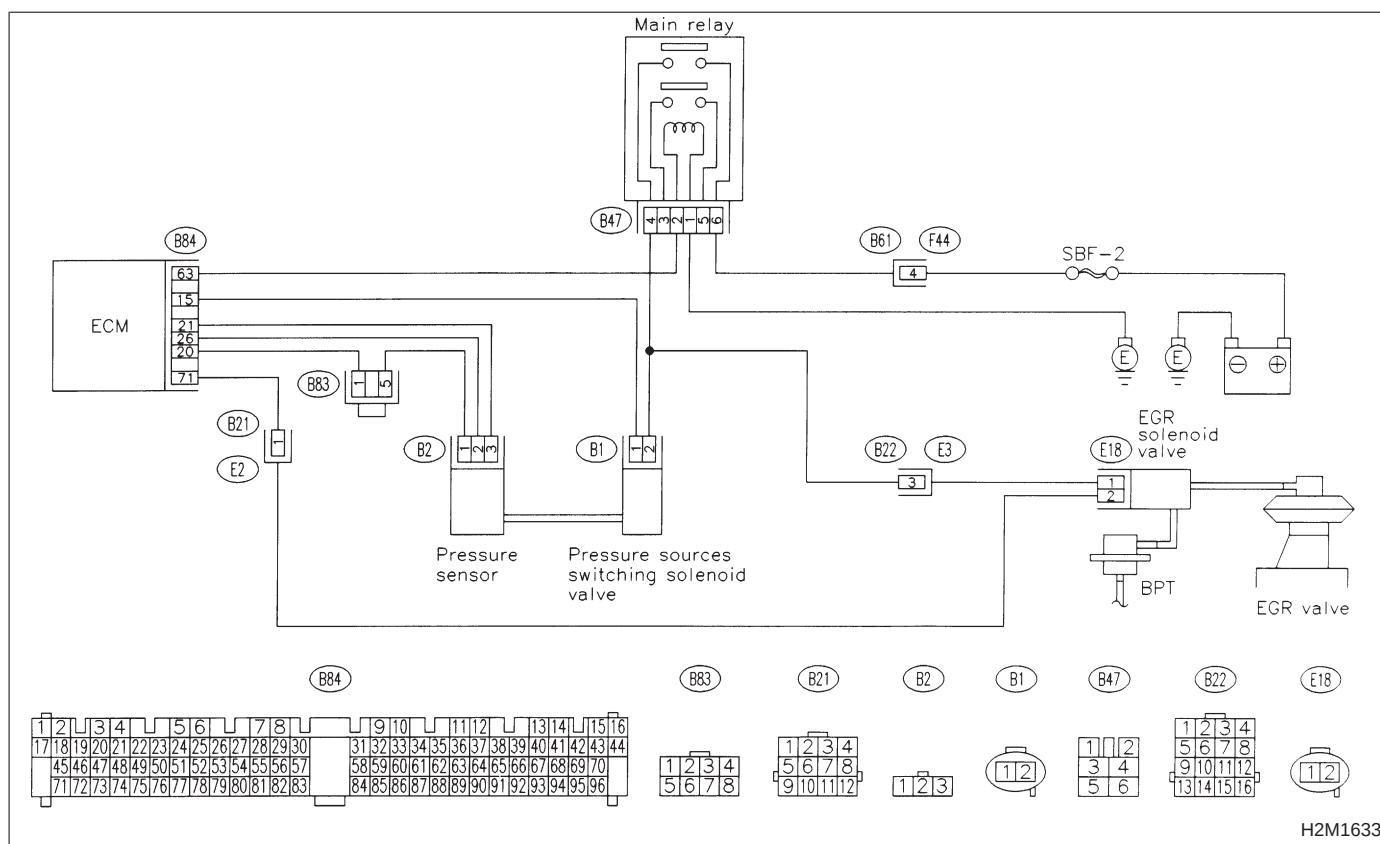
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

WIRING DIAGRAM:



CAUTION:

Before confirmation of actual driving pattern, conduct
CLEAR MEMORY and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AO1	CHECK TRANSMISSION TYPE.

CHECK : *Is transmission type MT?*

YES : Check AT/MT identification circuit. <Ref. to 2-7 [T10DB0].>

NO : Go to step **10AO2**.

10AO2	CHECK DTC P0106, P0107, P0108, P0403, P1102, P1122 OR P1421 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:

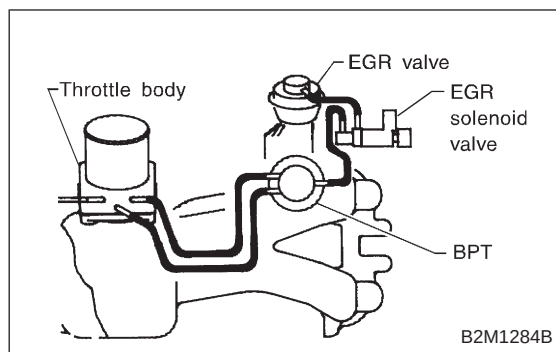
Be careful when checking EGR valve, since it may be extremely hot.

NOTE:

In this case, it is not necessary to inspect DTC P0400.

After checking the above item, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

NO : Go to step **10AO3**.



10A03 CHECK VACUUM LINE.

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

NOTE:

Check the following items.

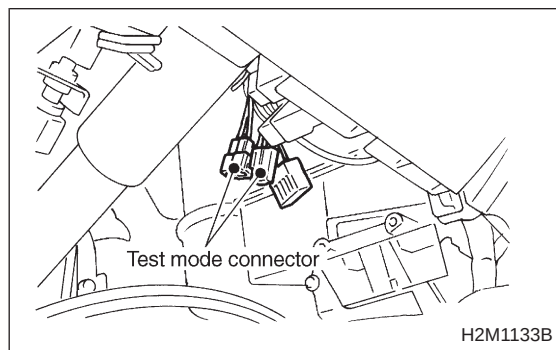
- Disconnection, leakage and clogging of the two vacuum hoses and pipes between throttle body and BPT
- Disconnection, leakage and clogging of the vacuum hose and pipe between EGR solenoid valve and BPT
- Disconnection, leakage and clogging of the vacuum hose between EGR solenoid valve and EGR valve
- Disconnection, leakage and clogging of BPT pressure transmitting hose

YES : Repair or replace hoses and pipes.

And after the checking and repairing, go to

CONFIRMATION OF ACTUAL DRIVING PATTERN.

NO : Go to step 10A04.



10A04 CHECK OPERATION OF EGR SYSTEM.

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

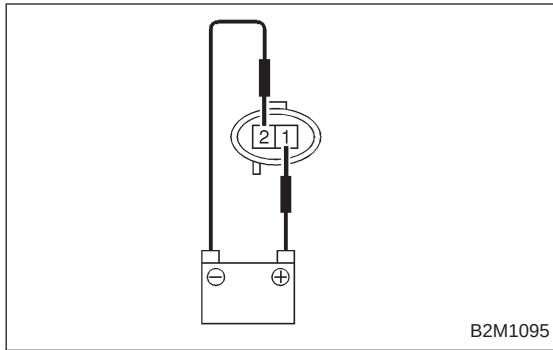
CHECK : *Does EGR solenoid valve produce operating sound?*

NOTE:

EGR control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD05). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to next step 4).

NO : Replace EGR solenoid valve.



- 4) Turn ignition switch to OFF.
- 5) Disconnect connector from EGR solenoid valve.
- 6) Connect 12 V battery's ground $\ominus$ terminal to one terminal of the EGR solenoid valve. Then connect 12 V battery's $\oplus$ 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.

- 7) 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.**

NOTE:

If malfunction is detected again in the confirmation of actual driving pattern, EGR valve is faulty. Go to next step 8).

NO : Go to next step 8).

- 8) 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.**

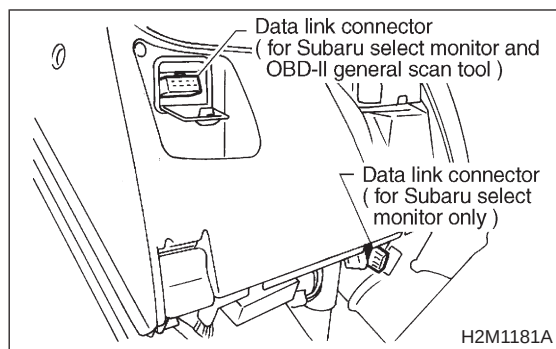
NO : Clean EGR valve. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

CAUTION:

Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.

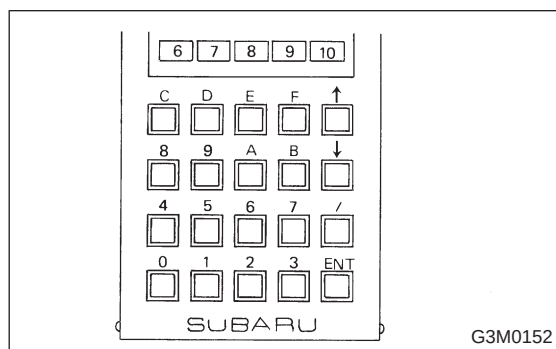
NOTE:

- 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.



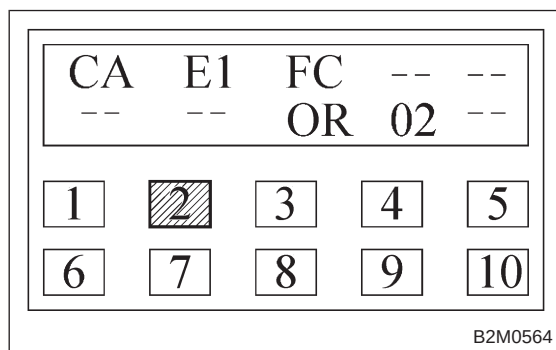
CONFIRMATION OF ACTUAL DRIVING PATTERN.

- 1) Conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>
- 2) Connect Subaru select monitor to its data link connector.
- 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) Designate mode using function key.

Function mode: FA4

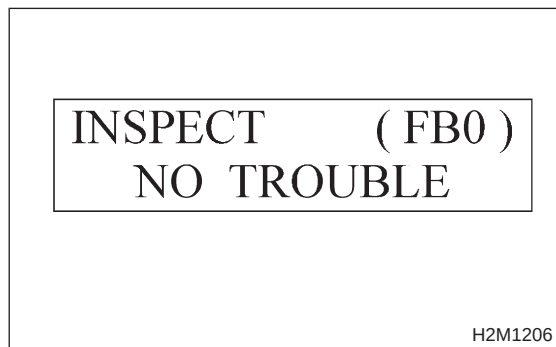


- 6) Drive at 88 ± 5 km/h (55 ± 3 MPH) until the LED No. 2 comes on.

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 "D" range for the diagnosis.



- 7) Designate mode using function key.

Function mode: FB0

- 8) Confirm the "No trouble" indication on Subaru select monitor.

OBD

(FB1)

P0403

<EGRSOL>

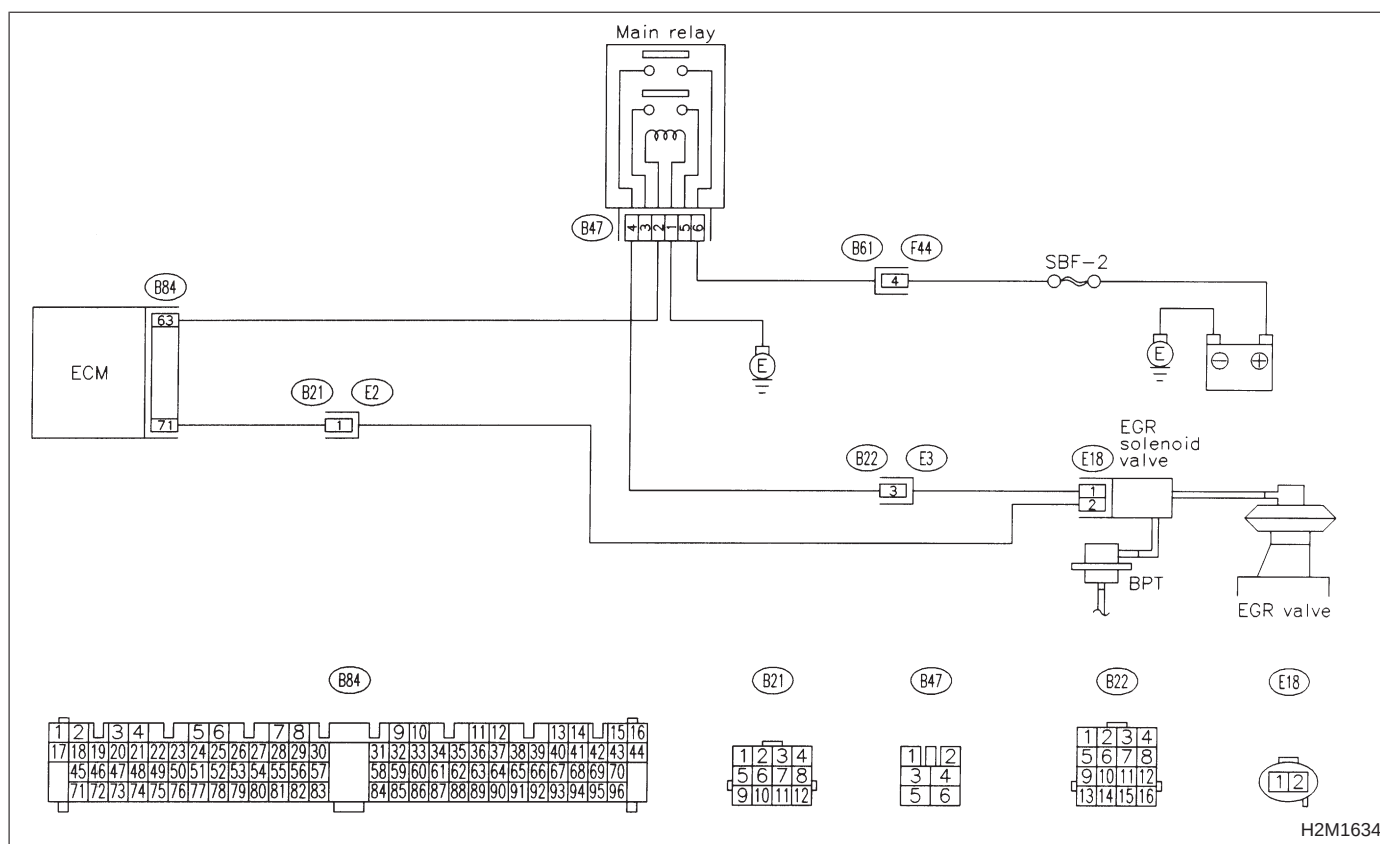
OBD0323

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

WIRING DIAGRAM:**CAUTION:**

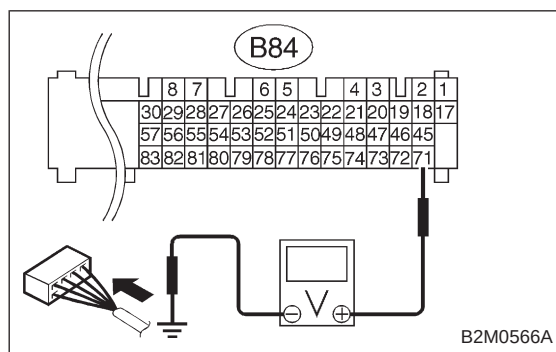
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

10AP1	CHECK TRANSMISSION TYPE.

CHECK : *Is transmission type MT?*

YES : Check AT/MT identification circuit. <Ref. to 2-7 [T10DB0].>

NO : Go to step **10AP2**.



10AP2	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 **10AP3**.

NO : Go to step **10AP4**.

10AP3	CHECK POOR CONTACT.

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

CHECK : *Is there poor contact in ECM connector?*

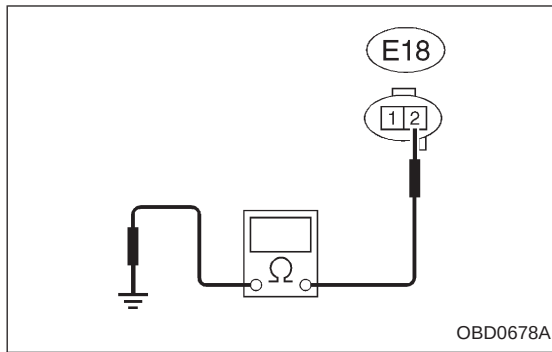
YES : Repair poor contact in ECM connector.

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)

**10AP4**

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.

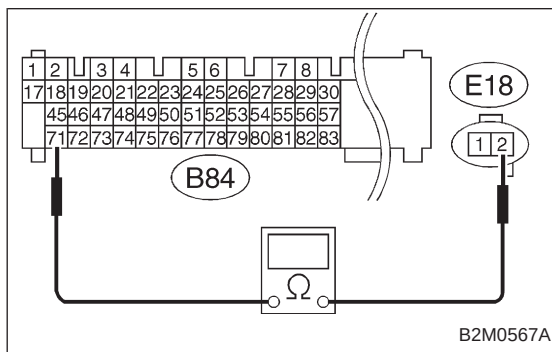
Connector & terminal

(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 next step 4).



- 4) Measure resistance of harness between ECM and EGR solenoid valve connector.

Connector & terminal

(B84) No. 71 — (E18) No. 2:

CHECK : Is the resistance less than 1 Ω ?

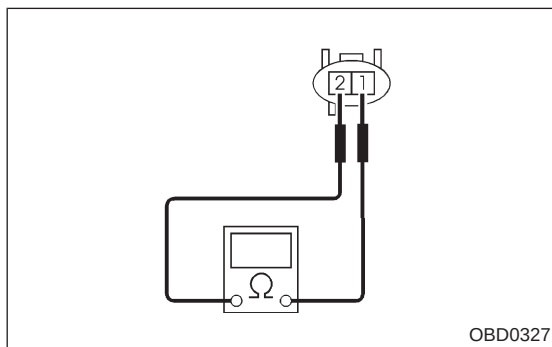
YES : Go to step 10AP5.

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.

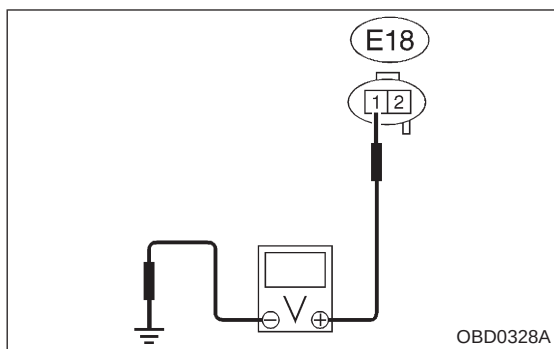
Terminals

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.

OBD

(FB1)

P0420

<CAT>

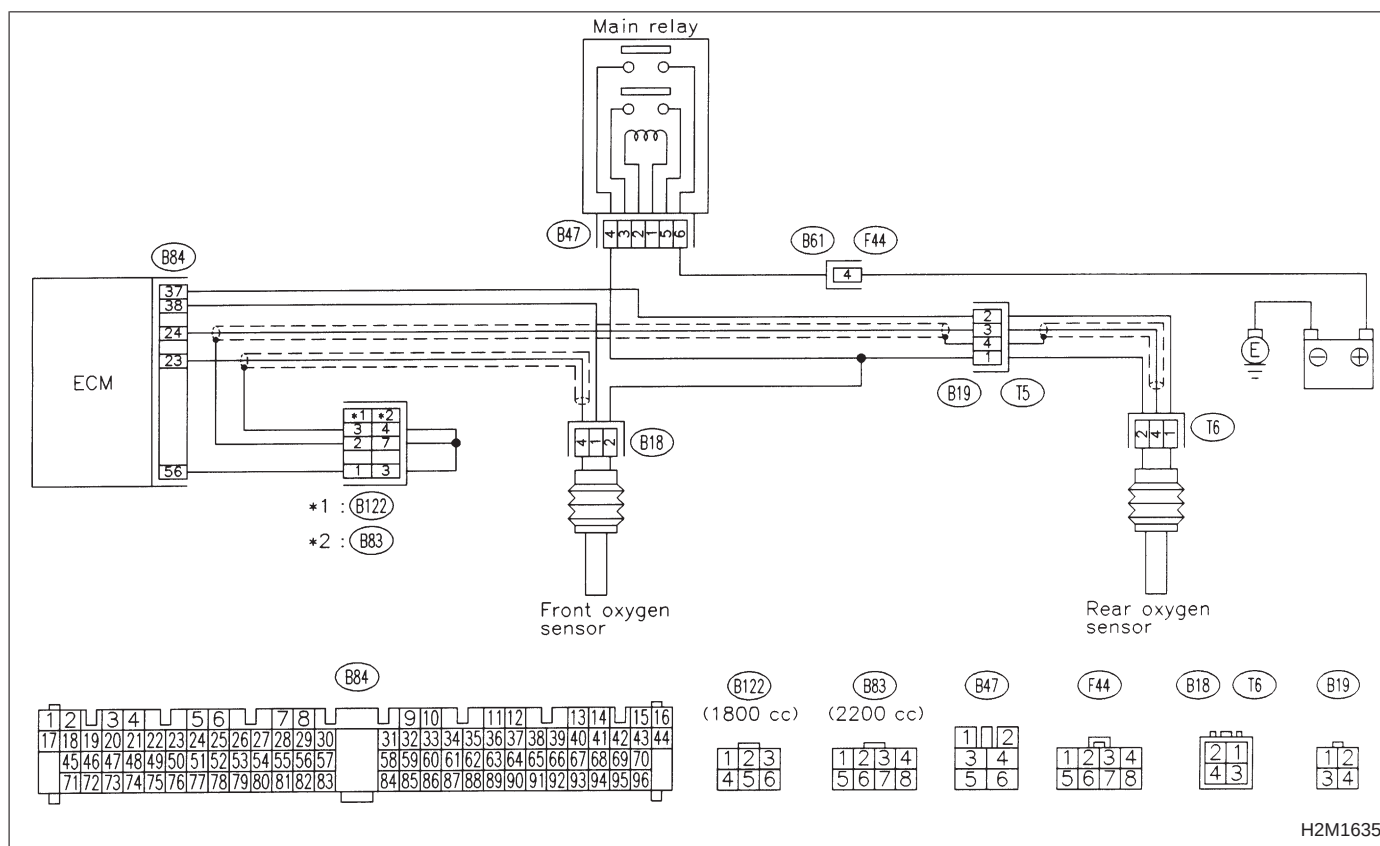
OBD0329

AQ: DTC P0420**— CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD —****DTC DETECTING CONDITION:**

- Immediately at fault recognition (2200 cc Federal spec. vehicles only)
- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine stalls.
- Idle mixture is out of specifications.

WIRING DIAGRAM:

H2M1635

CAUTION:

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

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

10AQ1	CHECK ANY OTHER DTC P0130, P0133, P0135, P0136, P0139 AND P0141 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.

CHECK : *Is there a fault in exhaust system?*

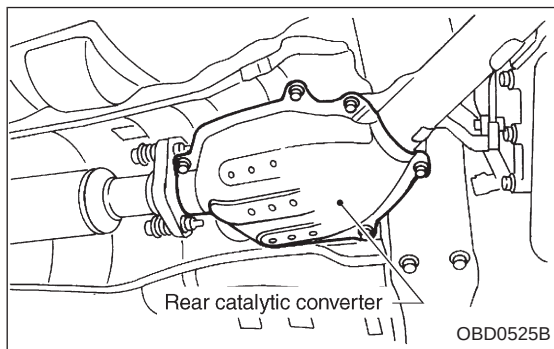
NOTE:

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

YES : Repair or replace exhaust system.

NO : Go to step **10AQ3**.



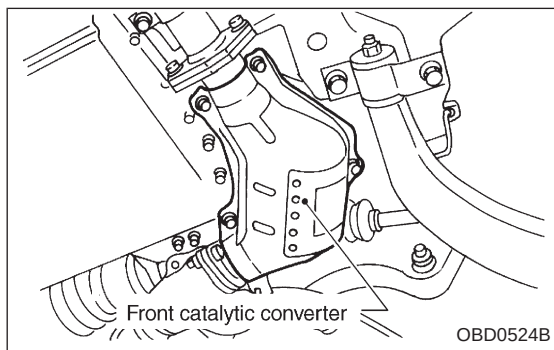
10AQ3	CHECK REAR CATALYTIC CONVERTER.

1) 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 next step 2).



2) 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.

OBD (FB1)
P0440 <EVAP>

H2M1365

AR: DTC P0440 — EVAPORATIVE EMISSION CONTROL SYSTEM MALFUNCTION —

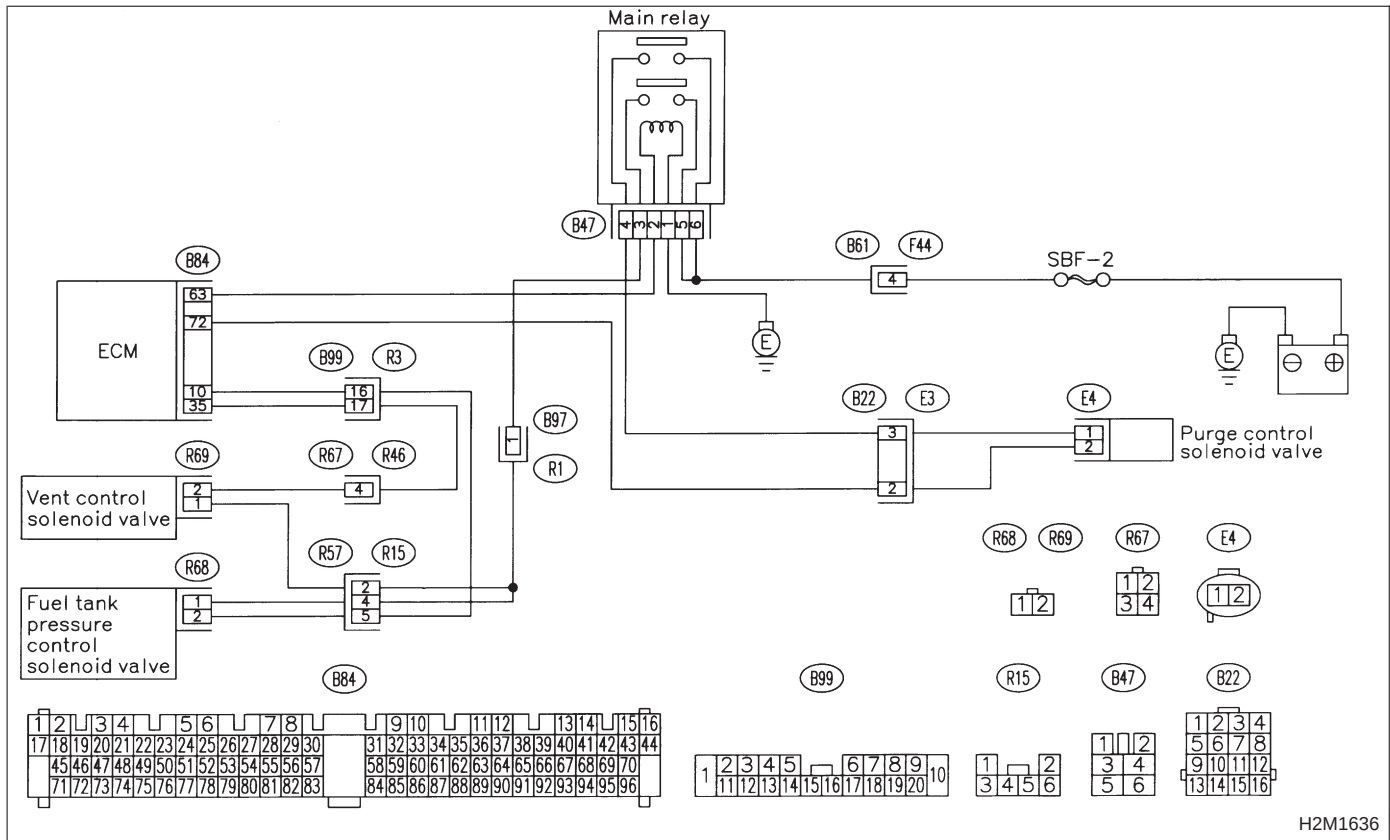
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Gasoline smell

WIRING DIAGRAM:



H2M1636

CAUTION:

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

10AR1**CHECK ANY OTHER DTC (BESIDES DTC P0440) 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 AND FUEL FILLER PIPE.**

1) Turn ignition switch to OFF.

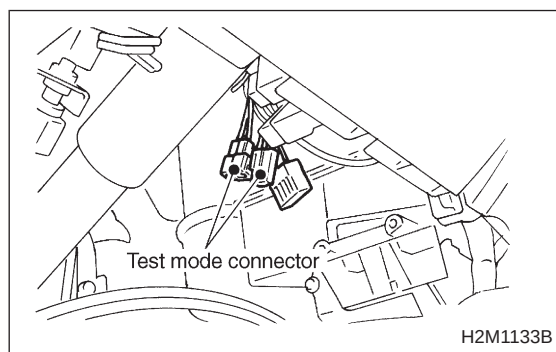
2) Open the fuel flap.

CHECK**: Is the fuel filler cap tightened securely?****YES**

: Tighten fuel filler cap securely.

NO: Go to next **CHECK**.**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 **10AR3**.**10AR3****CHECK VENT CONTROL SOLENOID VALVE.**

1) Connect test mode connector.

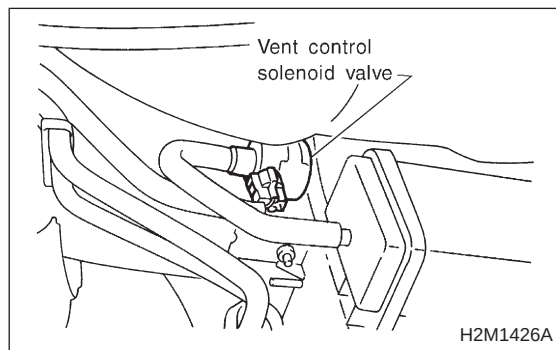
2) Turn ignition switch to ON.

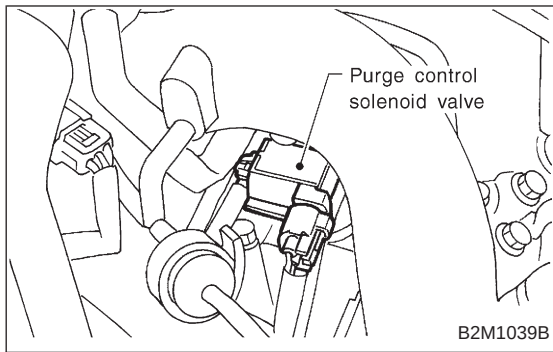
CHECK**: Does vent control solenoid valve produce operating sound?****NOTE:**

Vent control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD08). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES: Go to step **10AR4**.**NO**

: Replace vent control solenoid valve.



**10AR4 CHECK PURGE CONTROL SOLENOID VALVE.**

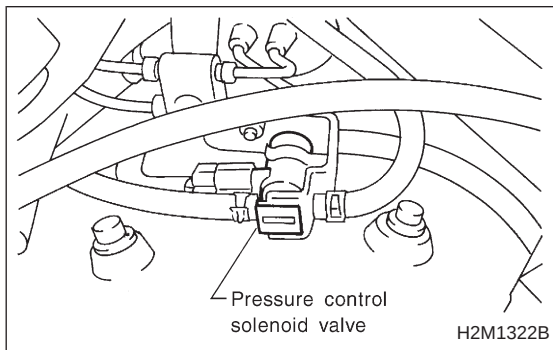
CHECK : *Does purge control solenoid valve produce operating sound?*

NOTE:

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10AR5**.

NO : Replace purge control solenoid valve.

**10AR5 CHECK PRESSURE CONTROL SOLENOID VALVE.**

CHECK : *Does pressure control solenoid valve produce operating sound?*

NOTE:

Pressure control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD07). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10AR6**.

NO : Replace pressure control solenoid valve.

10AR6	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 next **CHECK** .

CHECK : ***Is there any damage at canister?***

YES : Repair or replace canister.

NO : Go to next **CHECK** .

CHECK : ***Is there any damage at fuel tank?***

YES : Repair or replace fuel tank.

NO : Go to next **CHECK** .

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.

OBD

(FB1)

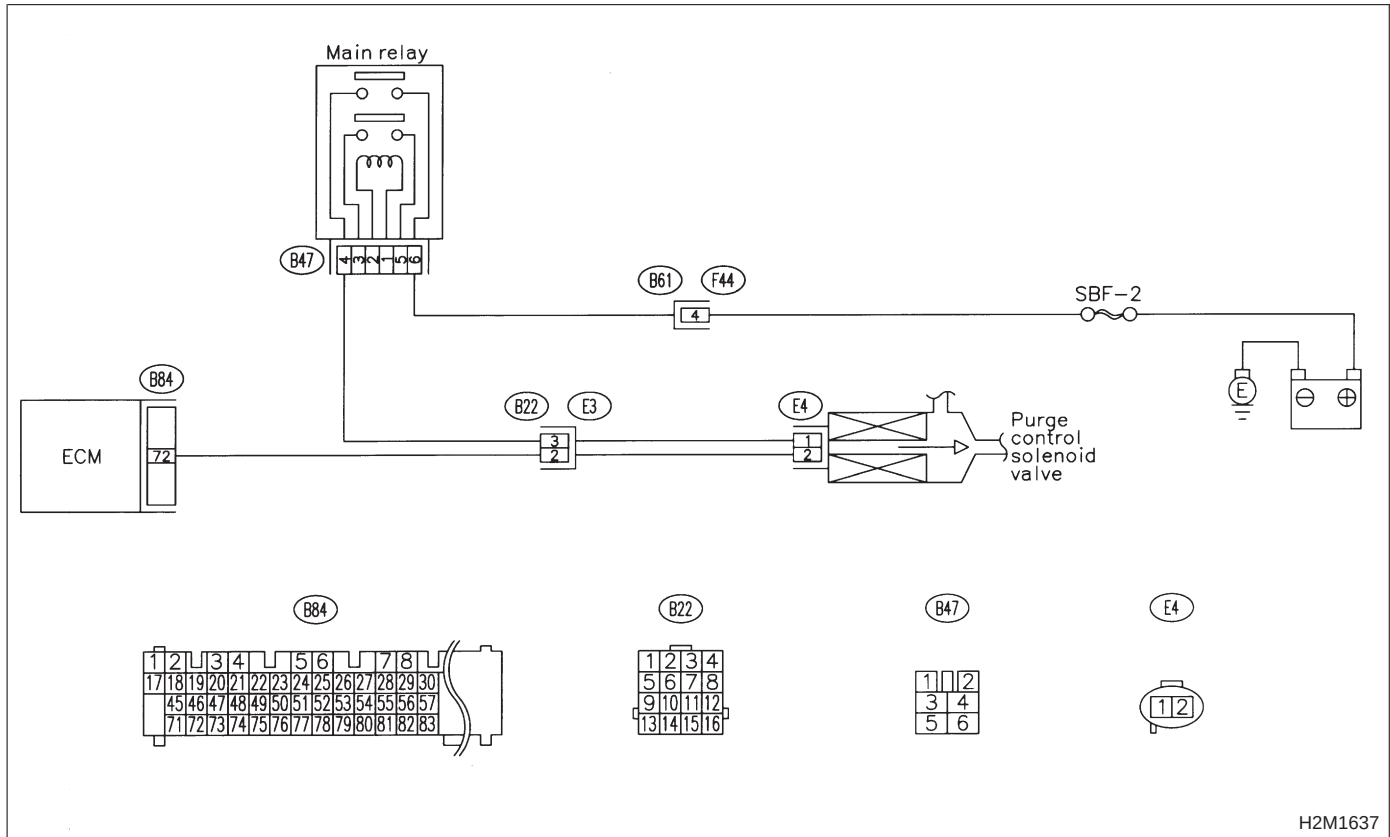
P0441

<CPC_F>

OBD0331

AS: DTC P0441**— EVAPORATIVE EMISSION CONTROL
SYSTEM INCORRECT PURGE FLOW —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

H2M1637

CAUTION:

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

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

10AS1	CHECK DTC P0106, P0107, P0108, P0443, P1102, P1122 OR P1422 ON DISPLAY.

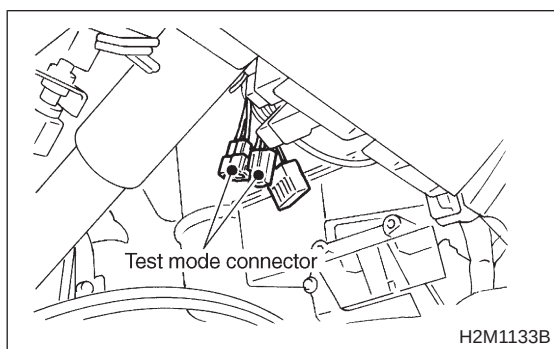
CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0106, P0107, P0108, P0443, P1102, P1122 or P1422?*

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.

CHECK : *Does purge control solenoid valve produce operating sound at about 0.3 Hz?*

NOTE:

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to next step 4).

NO : Replace purge control solenoid valve.

- 4) 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.

OBD

(FB1)

P0443

<CPC>

OBD0335

AT: DTC P0443

— EVAPORATIVE EMISSION CONTROL
SYSTEM PURGE CONTROL VALVE CIRCUIT
LOW INPUT —

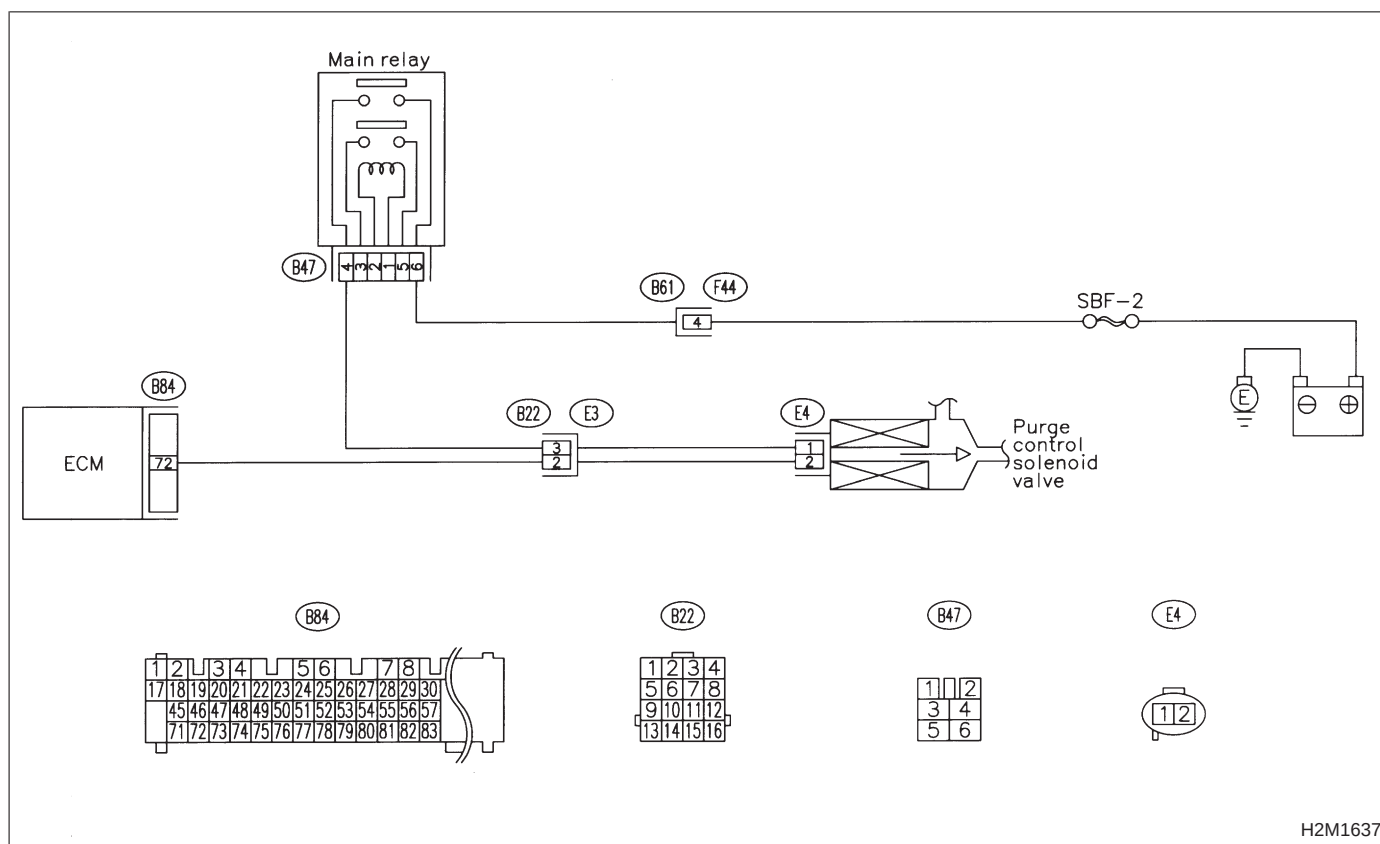
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:

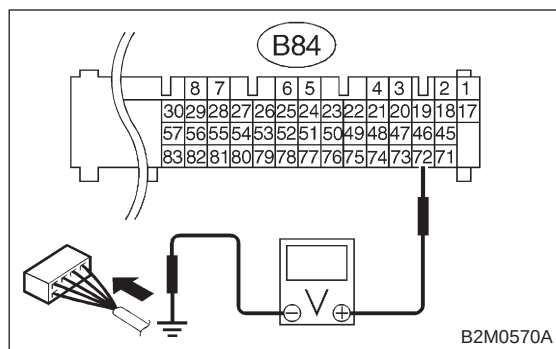


H2M1637

CAUTION:

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

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


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 (-):

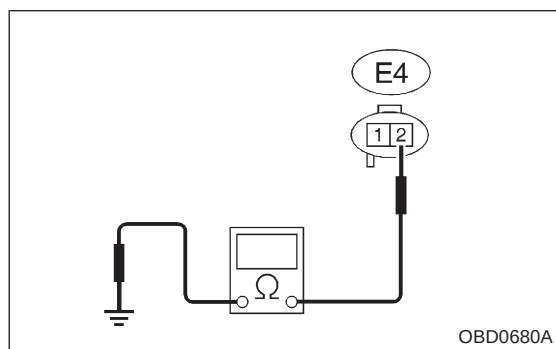
CHECK : Is the voltage more than 10 V?

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.

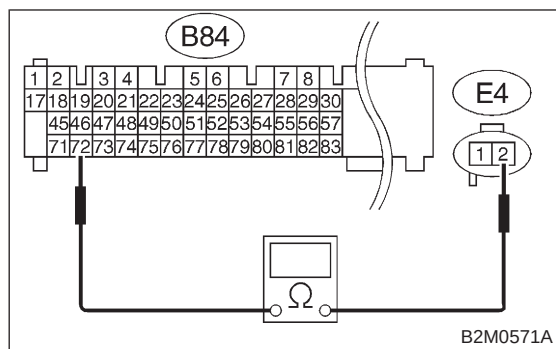
Connector & terminal

(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 next step 4).



4) 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 ?

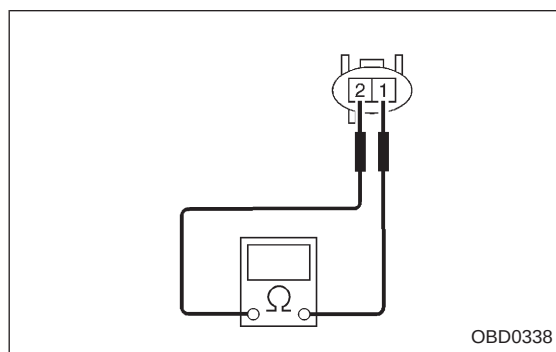
YES : Go to step 10AT3.

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)



10AT3

CHECK PURGE CONTROL SOLENOID VALVE.

1) Remove purge control solenoid valve.

2) Measure resistance between purge control solenoid valve terminals.

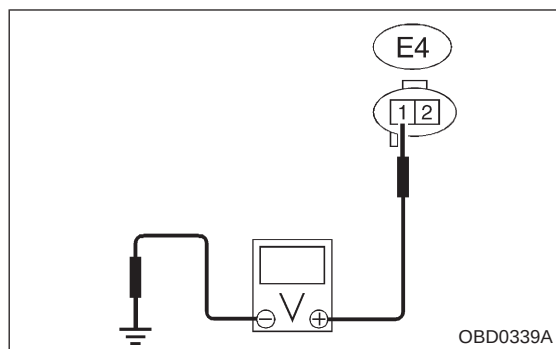
Terminals

No. 1 — No. 2:

CHECK : Is the resistance between 10 and 100 Ω ?

YES : Go to step 10AT4.

NO : Replace purge control solenoid valve.

**10AT4****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 **10AT5**.**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

10AT5**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.

OBD (FB1)

P0446<VCMSOL_LO>

B2M1098

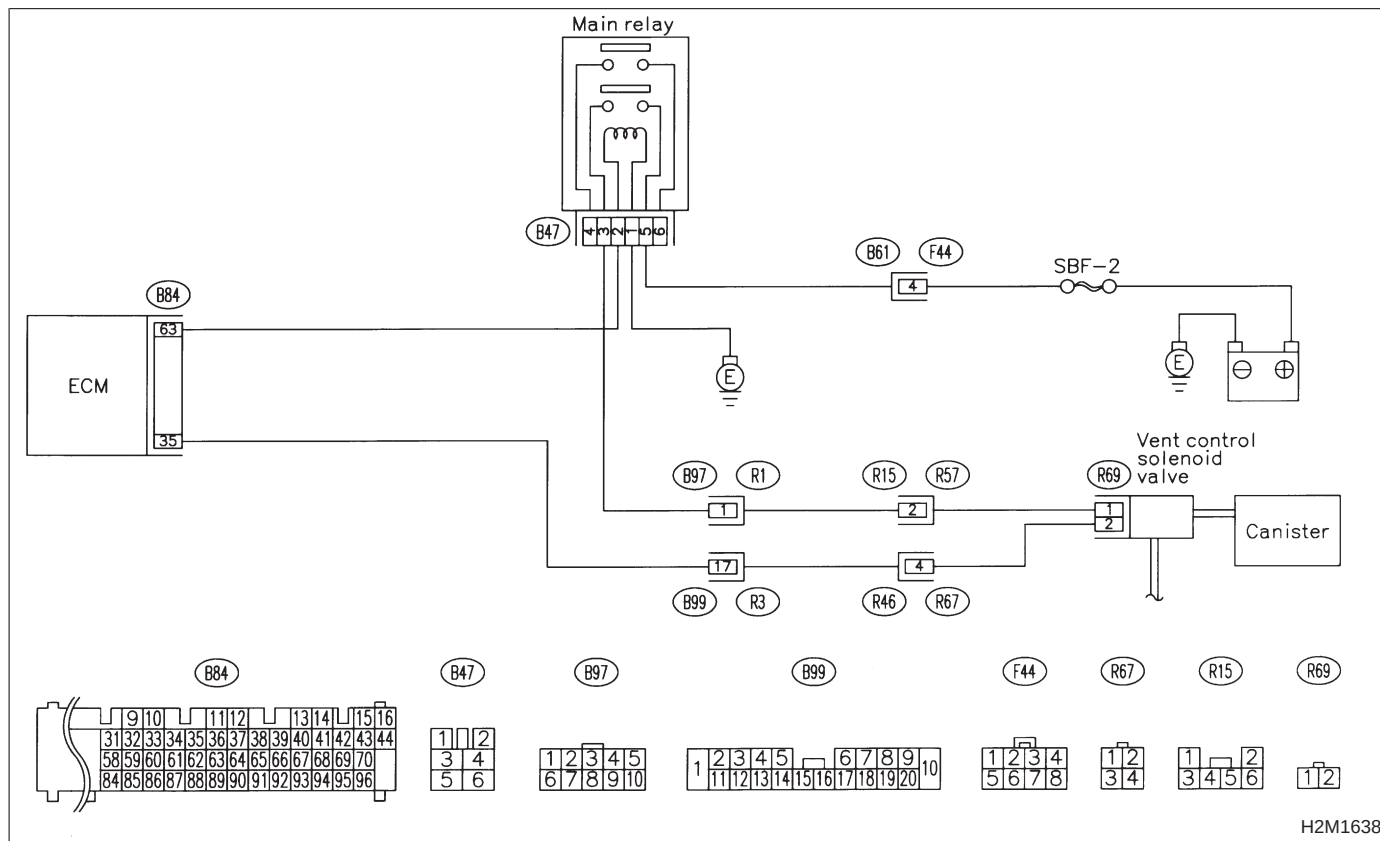
AU: DTC P0446

— EVAPORATIVE EMISSION CONTROL
SYSTEM VENT CONTROL LOW INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

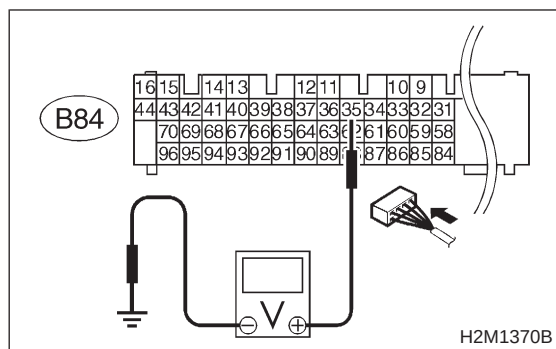
WIRING DIAGRAM:



CAUTION:

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

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


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?

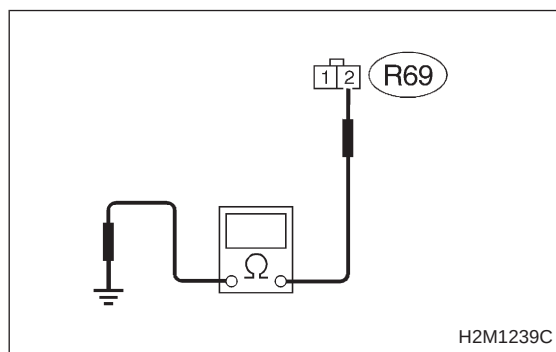
YES : Repair poor contact in ECM connector.

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 vent control solenoid valve connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B97, B99, R15 and R67)


10AU3 CHECK HARNESS BETWEEN VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.

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

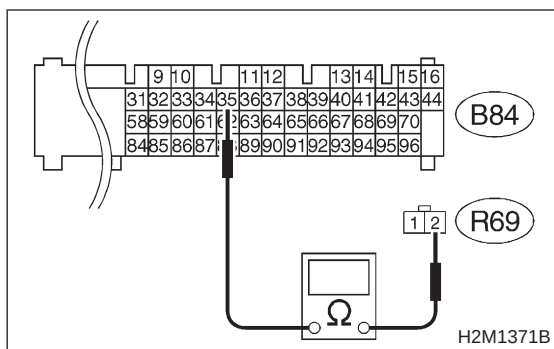
Connector & terminal

(R69) No. 2 — Chassis ground:

CHECK : Is the resistance less than 10 Ω ?

YES : Repair ground short circuit in harness between ECM and vent control solenoid valve connector.

NO : Go to next step 4).



4) Measure resistance of harness between ECM and vent control solenoid valve connector.

Connector & terminal

(B84) No. 35 — (R69) No. 2:

CHECK : Is the resistance less than 1 Ω?

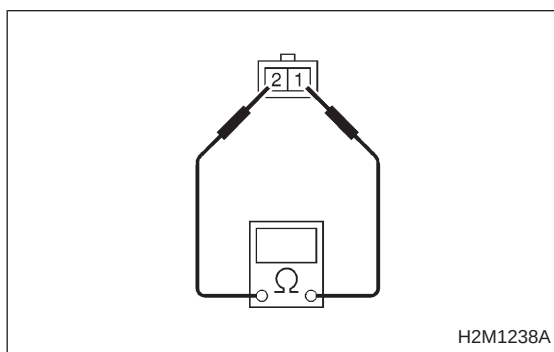
YES : Go to step 10AU4.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and vent control solenoid valve connector
- Poor contact in coupling connectors (B99 and R67)



10AU4

CHECK VENT CONTROL SOLENOID VALVE.

Measure resistance between vent control solenoid valve terminals.

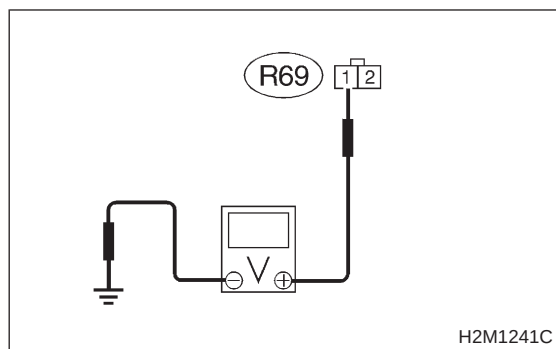
Terminals

No. 1 — No. 2:

CHECK : Is the resistance between 10 and 100 Ω?

YES : Go to step 10AU5.

NO : Replace vent control solenoid valve.

**10AU5****CHECK POWER SUPPLY TO VENT CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between vent control solenoid valve and chassis ground.

Connector & terminal**(R69) No. 1 (+) — Chassis ground (-):****(CHECK) : Is the voltage more than 10 V?****(YES) : Go to step 10AU6.****(NO) : Repair harness and connector.****NOTE:**

In this case, repair the following:

- Open circuit in harness between main relay and vent control solenoid valve
- Poor contact in coupling connectors (B97 and R15)
- Poor contact in main relay connector

10AU6**CHECK POOR CONTACT.**

Check poor contact in vent control solenoid valve connector. <Ref. to FOREWORD [T3C1].>

(CHECK) : Is there poor contact in vent control solenoid valve connector?**(YES) : Repair poor contact in vent control solenoid valve connector.****(NO) : Contact with SOA service.****NOTE:**

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

OBD (FB1)

P0451 <TNKP_F>

H2M1377

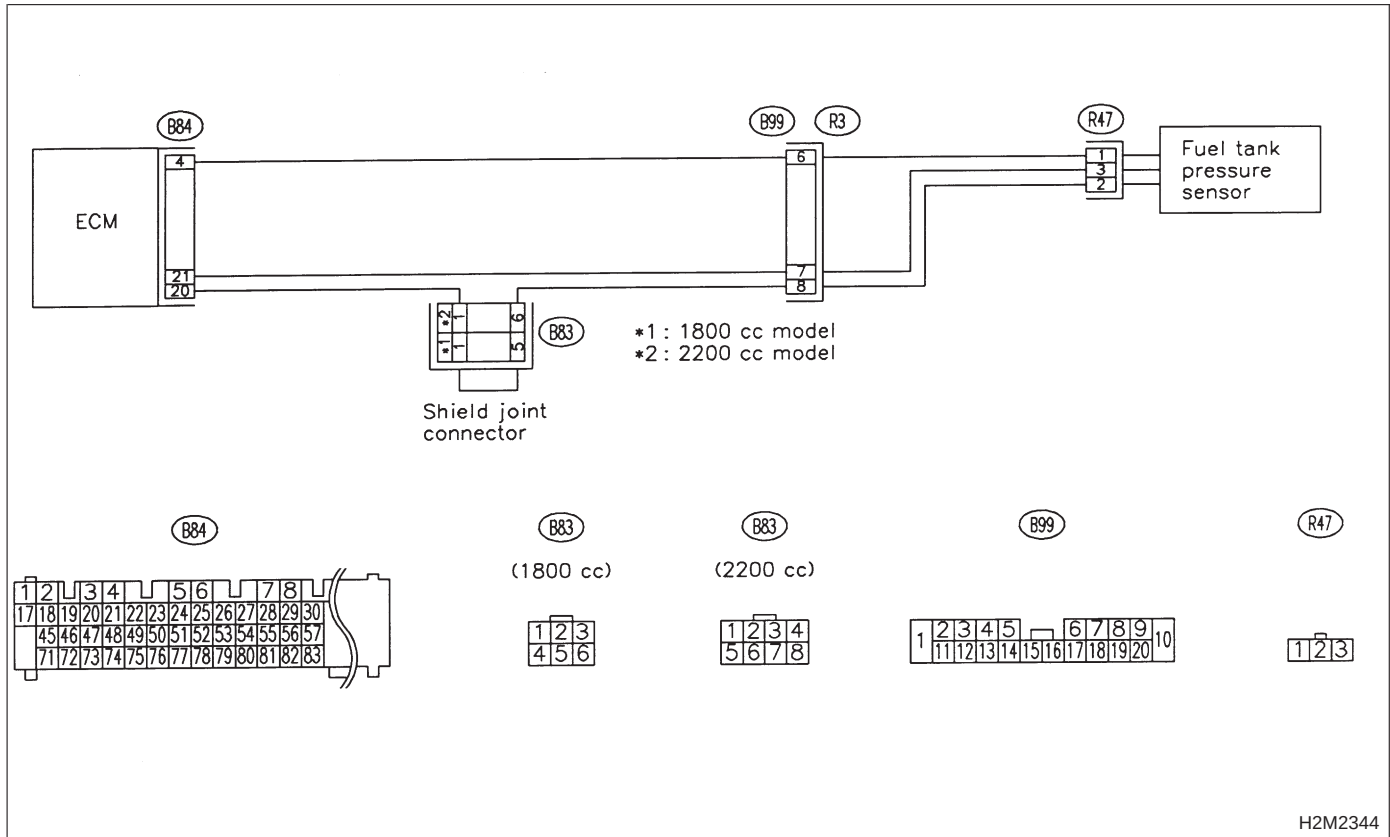
AV: DTC P0451

— EVAPORATIVE EMISSION CONTROL
SYSTEM PRESSURE SENSOR
RANGE/PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:

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

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

10AV1**CHECK PRESSURE/VACUUM LINE.****CHECK****: Is there a fault in 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

YES**: Repair or replace hoses and pipes.****NO****: Replace fuel tank pressure sensor.**

OBD (FB1)

P0452 <TNKP_LOW>

B2M1099

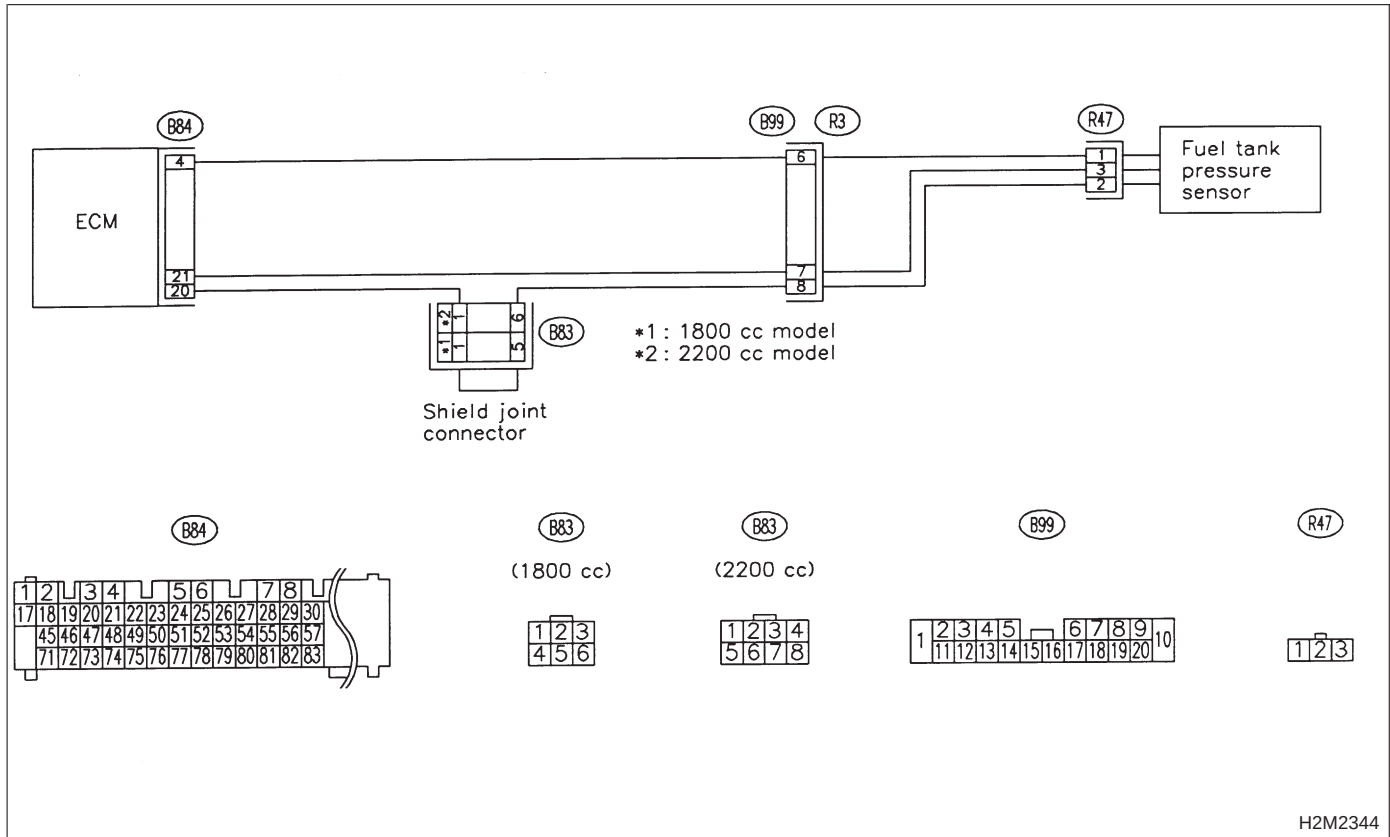
AW: DTC P0452

— EVAPORATIVE EMISSION CONTROL
SYSTEM PRESSURE SENSOR LOW INPUT
—

DTC DETECTING CONDITION:

- Immediately at fault recognition

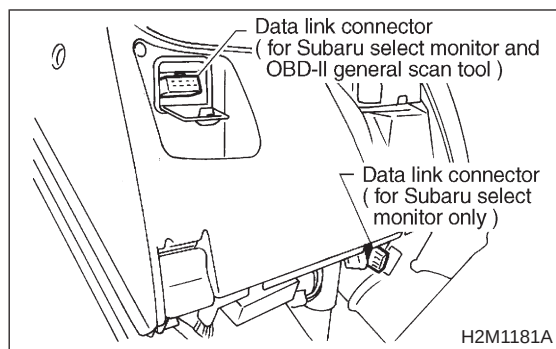
WIRING DIAGRAM:



CAUTION:

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

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



TNKP (F43)
0.10kPa 1mmHg

H2M1326

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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F43

- F43: Display shows pressure signal value sent from fuel tank pressure sensor.

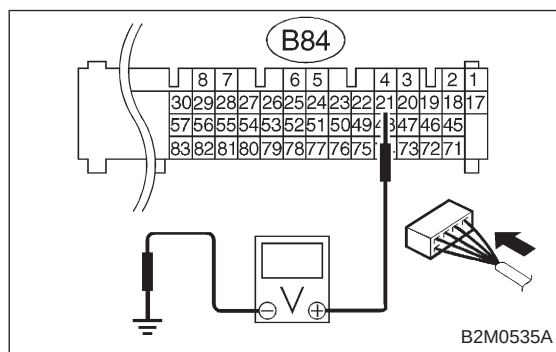
CHECK : Is the value less than -2.8 kPa in function mode F43?

YES : Go to step 10AW2.

NO : Even if MIL lights up, the circuit has returned to a normal condition at this time.

- OBD-II general scan tool

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

**10AW2****CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**

Measure voltage between ECM connector and chassis ground.

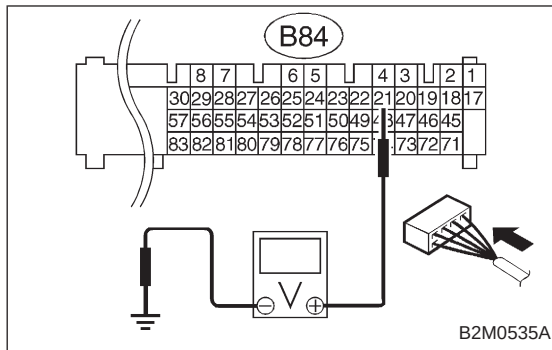
Connector & terminal

(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.

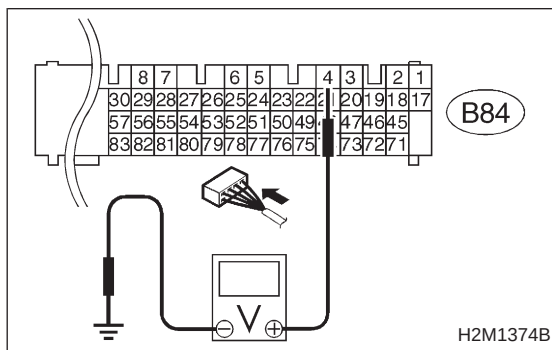
CHECK : *Does the voltage change more than 4.5 V by shaking harness and connector of ECM while monitoring the value with voltage meter?*

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. (USING VOLTAGE METER.)

Measure voltage between ECM and chassis ground.

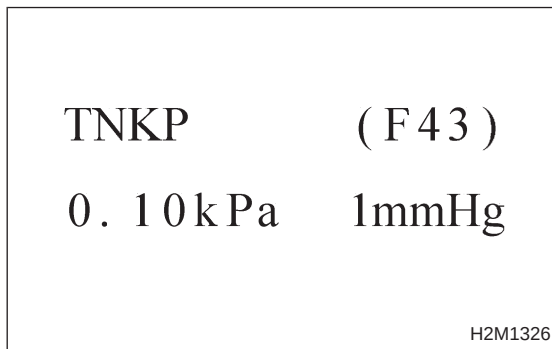
Connector & terminal

(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 on Subaru Select Monitor.

● Subaru Select Monitor

Designate mode using function key.

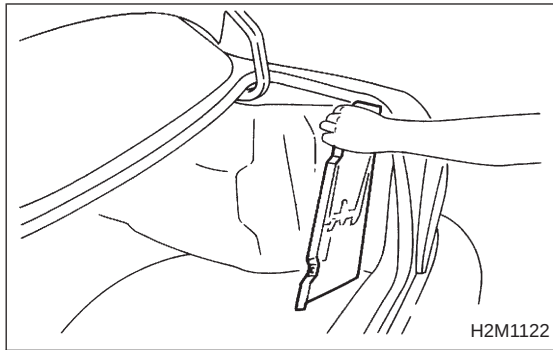
Function mode: F43

● F43: Display shows pressure signal value sent from fuel tank pressure sensor.

CHECK : *Does the value change more than -2.8 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?*

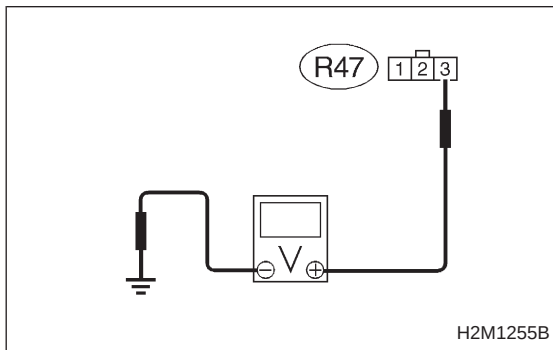
YES : Repair poor contact in ECM connector.

NO : Go to step 10AW6.

**10AW6**

CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Detach right side trunk side trim panel (Sedan) or right side rear quarter trim panel (Wagon).



- 3) Disconnect connector from fuel tank pressure sensor.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between fuel tank pressure sensor connector and chassis ground.

Connector & terminal

(R47) No. 3 (+) — Chassis ground (–):

CHECK : Is the voltage more than 4.5 V?

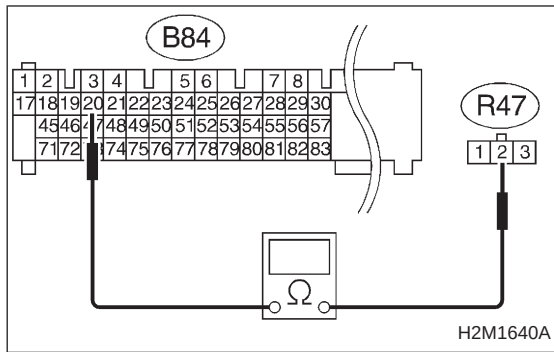
YES : Go to step 10AW7.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B99)

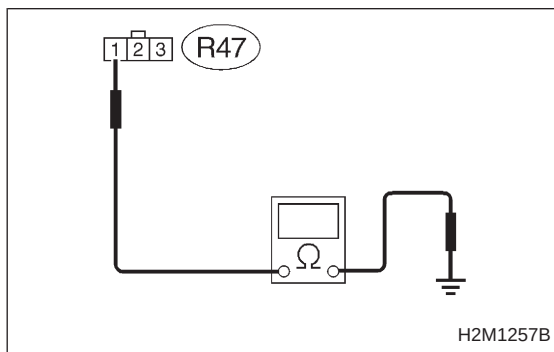
**10AW7****CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

- 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 — (R47) No. 2:****CHECK** : Is the resistance less than 1 Ω?**YES** : Go to step **10AW8**.**NO** : Repair harness and connector.**NOTE:**

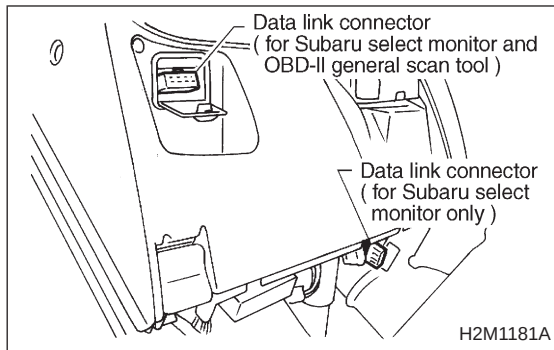
In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connectors (B83 and B99)

**10AW8****CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

Measure resistance of harness between fuel tank pressure sensor connector and chassis ground.

Connector & terminal**(R47) No. 1 — Chassis ground:****CHECK** : Is the resistance more than 500 kΩ?**YES** : Go to step **10AW9**.**NO** : Repair ground short circuit in harness between ECM and fuel tank pressure sensor connector.**10AW9****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.



TNKP (F43)
0. 10 kPa 1mmHg

H2M1326

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 the data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F43

- F43: Display shows pressure signal value sent from fuel tank pressure sensor.

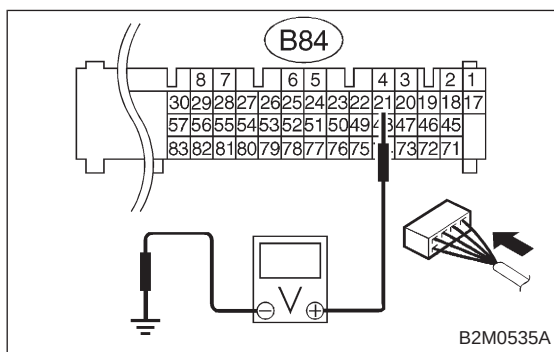
CHECK : Is the value more than 2.8 kPa in function mode F43?

YES : Go to step 10AX10.

NO : Go to step 10AX2.

- OBD-II general scan tool

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

**10AX2****CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**

Measure voltage between ECM connector and chassis ground.

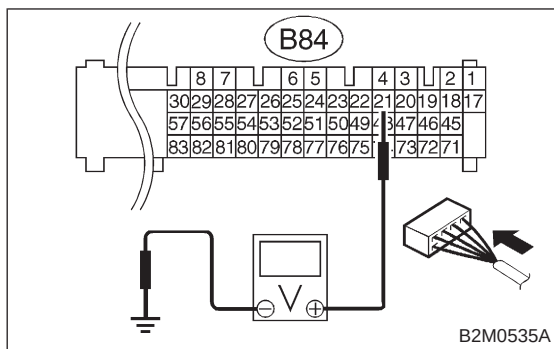
Connector & terminal

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

CHECK : Is the voltage more than 4.5 V?

YES : Go to step 10AX4.

NO : Go to step 10AX3.

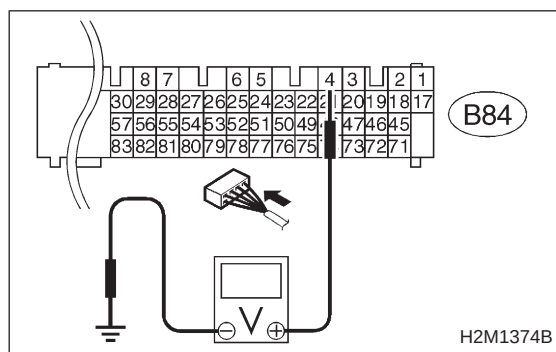
**10AX3****CHECK POWER SUPPLY TO FUEL TANK PRESSURE SENSOR.**

Measure voltage between ECM connector and chassis ground.

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.
(USING VOLTAGE METER.)**

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.

TNKP (F43)
0. 10kPa 1mmHg

H2M1326

**10AX5 CHECK INPUT SIGNAL FOR ECM.
(USING SUBARU SELECT MONITOR.)**

Read data on Subaru Select Monitor.

- Subaru Select Monitor

Designate mode using function key.

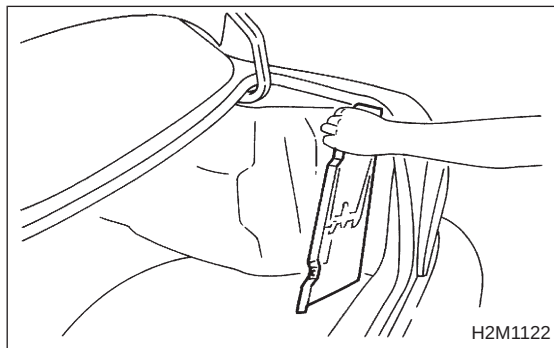
Function mode: F43

- F43: Display shows pressure signal value sent from fuel tank pressure sensor.

(CHECK) : Does the value change more than -2.8 kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?

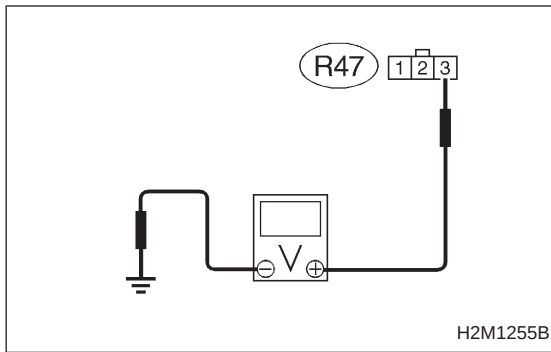
(YES) : Repair poor contact in ECM connector.

(NO) : Go to step 10AX6.



10AX6 CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Detach right side trunk side trim panel (Sedan) or right side rear quarter trim panel (Wagon).

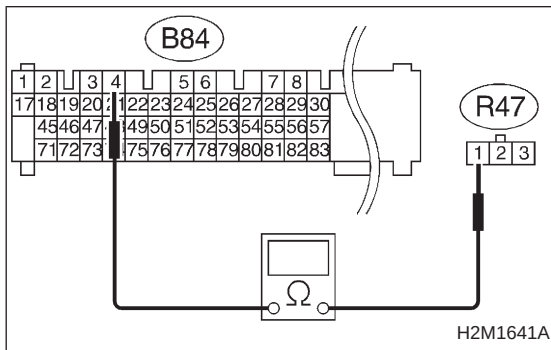


- 3) Disconnect connector from fuel tank pressure sensor.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between fuel tank pressure sensor connector and chassis ground.

Connector & terminal**(R47) No. 3 (+) — 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 fuel tank pressure sensor connector
- Poor contact in coupling connector (B99)

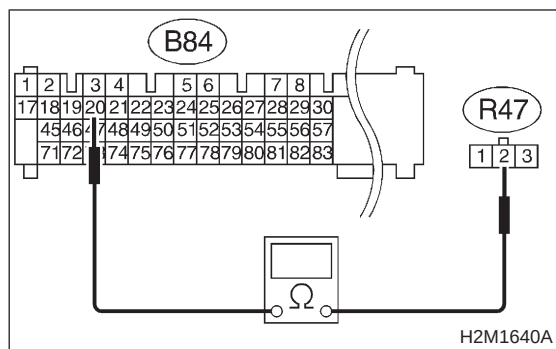
**10AX7****CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

- 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. 4 — (R47) No. 1:****(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 fuel tank pressure sensor connector
- Poor contact in coupling connector (B99)

**10AX8****CHECK HARNESS BETWEEN ECM AND FUEL TANK PRESSURE SENSOR CONNECTOR.**

Measure resistance of harness between ECM and pressure sensor connector.

Connector & terminal
(B84) No. 20 — (R47) No. 2:

CHECK : Is the resistance less than 1 Ω?

YES : Go to step **10AX9**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connectors (B83 and B99)

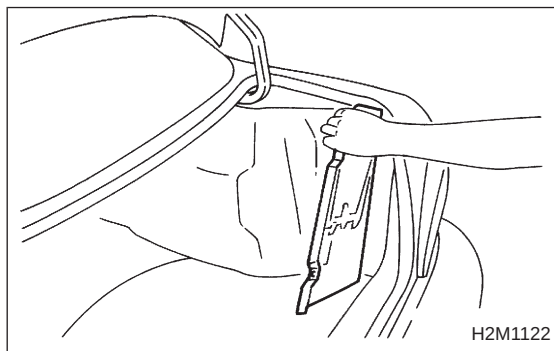
10AX9**CHECK POOR CONTACT.**

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.

**10AX10****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) Detach right side trunk side trim panel (Sedan) or right side rear quarter trim panel (Wagon).

TNKP (F 43)

0 . 1 0 k Pa 1mmHg

H2M1326

- 3) Disconnect connector from fuel tank pressure sensor.
- 4) Remove fuel filler cap.
- 5) Install fuel filler cap.
- 6) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 7) Read data on Subaru select monitor or the OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F43

CHECK : *Is the value more than 2.8 kPa in function mode F43?*

YES : Repair battery short circuit in harness between ECM and fuel tank pressure sensor connector.

NO : Replace fuel tank pressure sensor.

- OBD-II general scan tool

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

OBD (FB1)

P0461 <FLVL_R>

B2M1101

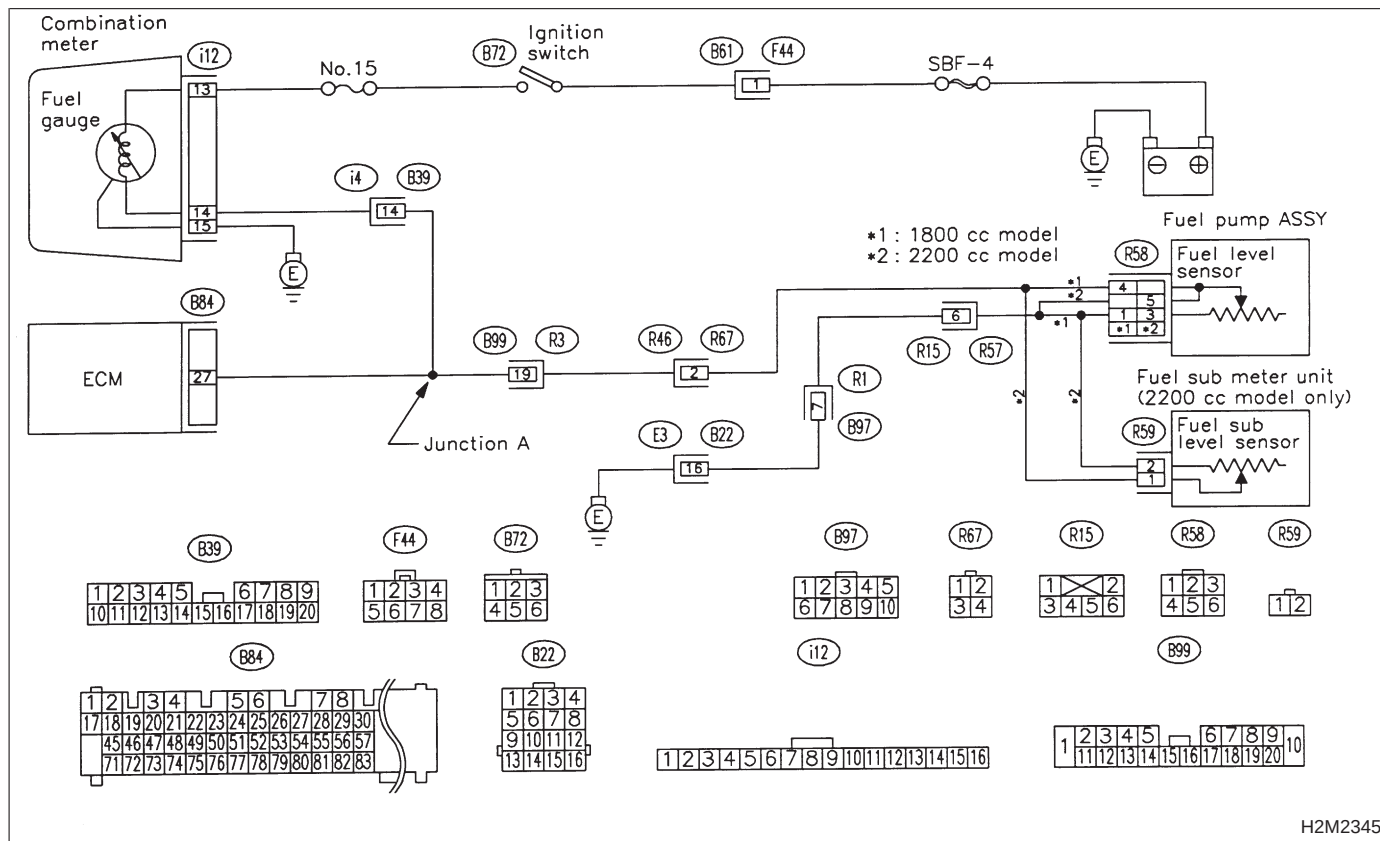
AY: DTC P0461

— FUEL LEVEL SENSOR CIRCUIT RANGE/
PERFORMANCE PROBLEM —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



H2M2345

CAUTION:

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

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

10AY1**CHECK DTC P0462 OR P0463 ON DISPLAY.****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].>****NOTE:****In this case, it is not necessary to inspect this trouble.****NO****: Replace fuel sending unit and fuel sub meter unit.**

OBD (FB1)
P0462 <FLVL_LOW>

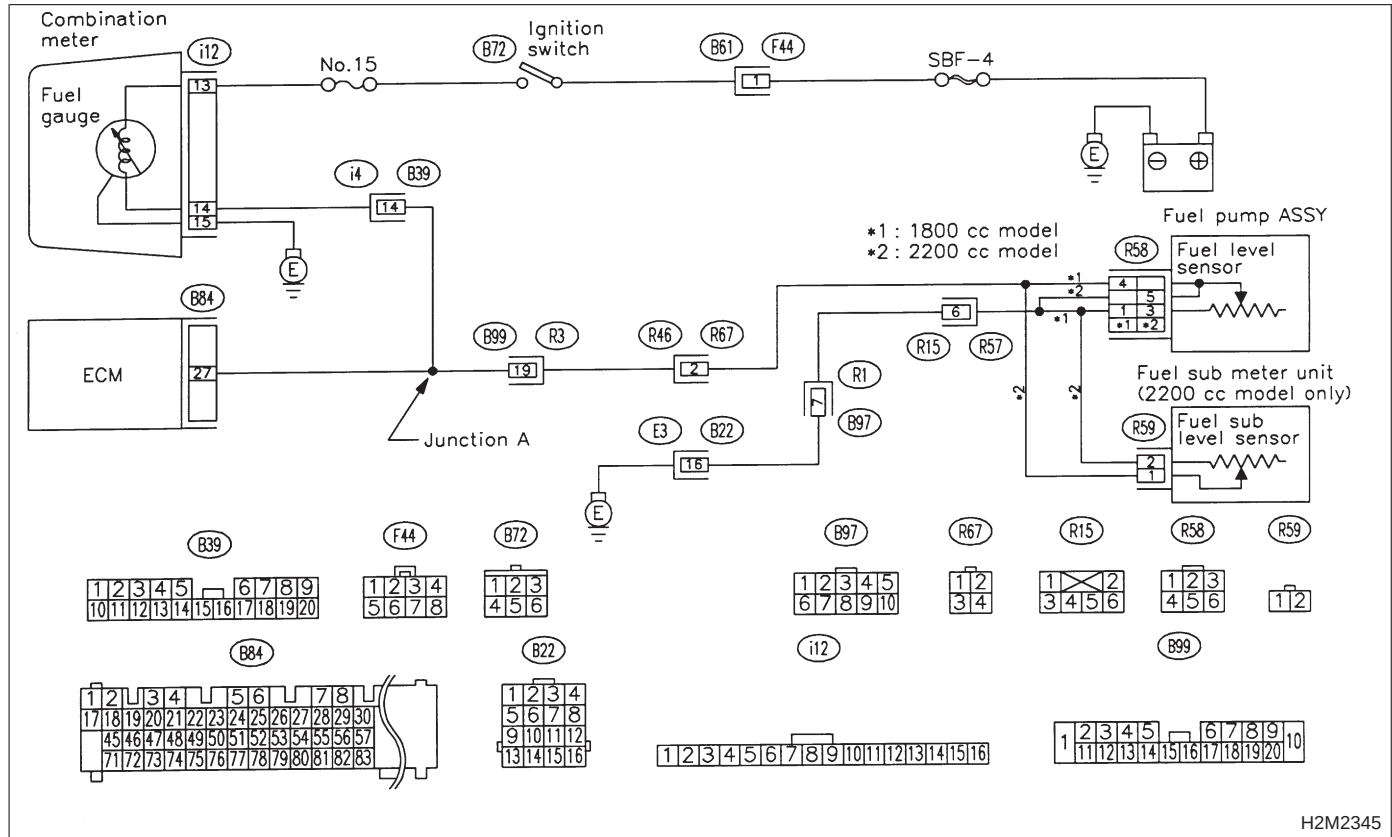
B2M1102

AZ: DTC P0462
— FUEL LEVEL SENSOR CIRCUIT LOW INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



CAUTION:

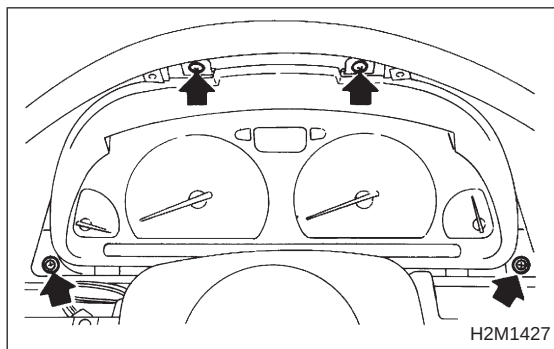
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>

10AZ1	CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.

CHECK : Does speedometer and tachometer operate normally?

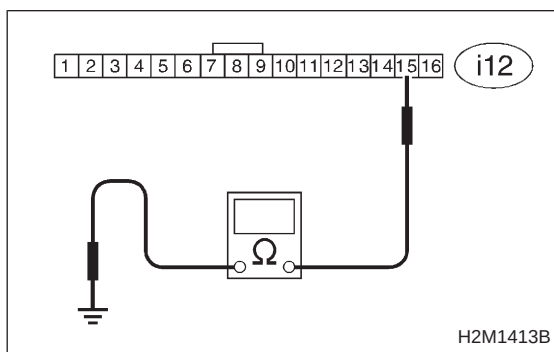
YES : Go to step 10AZ3.

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. 15 — 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:

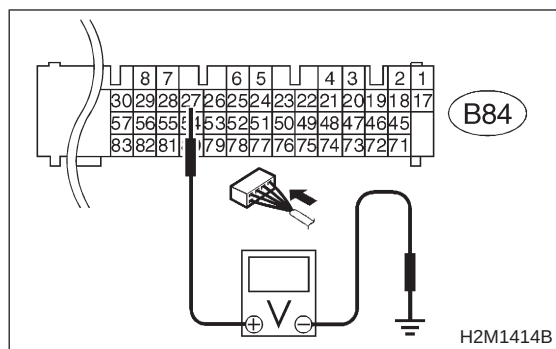
- Open circuit in harness between combination meter connector and grounding terminal
- Poor contact in combination meter connector
- Poor contact in grounding terminal

10AZ3	CHECK ENGINE DISPLACEMENT.

CHECK : Is the engine 1800 cc model?

YES : Go to step 10AZ4.

NO : Go to step 10AZ10.

**10AZ4****CHECK INPUT SIGNAL FOR ECM.
(USING VOLTAGE METER.)**

- 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 10AZ6.****(NO) : Go to step 10AZ5.****FLEVEL (F45)****2.50V**

H2M1327

10AZ5**CHECK INPUT SIGNAL FOR ECM.
(USING SUBARU SELECT MONITOR.)**

Measure voltage between ECM connector and chassis ground.

(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?

- Subaru Select Monitor
- Designate mode using function key.

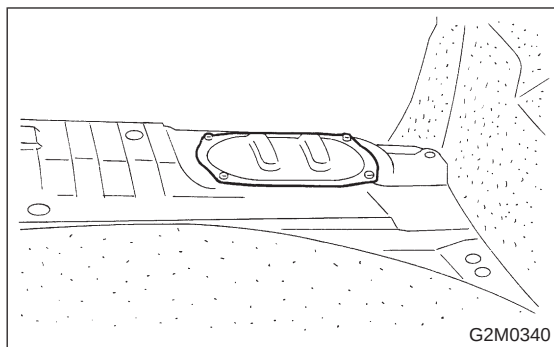
Function mode: F45

- F45: Fuel level sensor output signal is indicated.

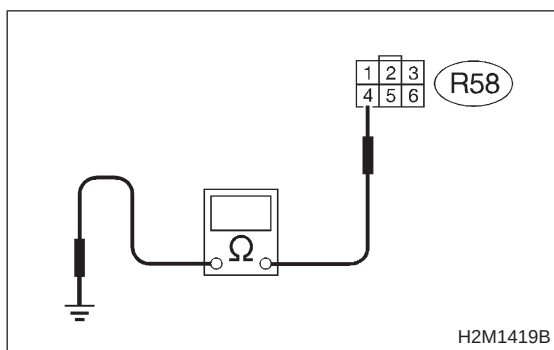
(YES) : Repair poor contact in ECM connector.**(NO) : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.****NOTE:**

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 (B39, B22, B99, B97, R67 and R15)

**10AZ6****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 trunk compartment floor (Sedan) or luggage compartment floor (Wagon).



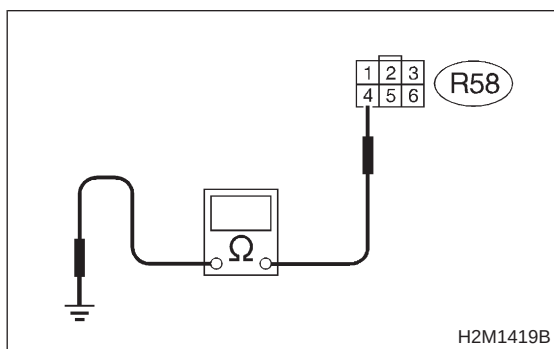
- 3) Disconnect connector from fuel pump.
- 4) Measure resistance of harness between fuel pump connector and chassis ground.

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

CHECK : Is the resistance less than 10 Ω ?

YES : Go to step 10AZ7.

NO : Go to step 10AZ17.

**10AZ7****CHECK FUEL TANK CORD.**

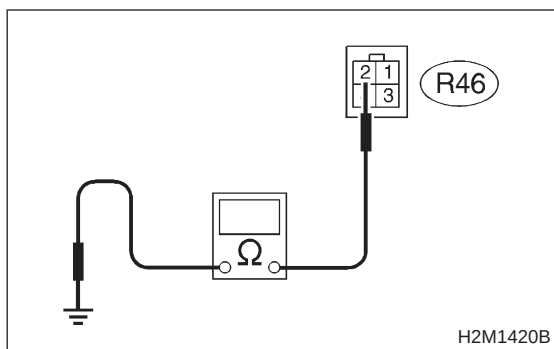
- 1) Separate fuel tank cord connector (R67) and rear wiring harness connector (R46).
- 2) Measure resistance of harness between fuel sub meter unit connector and chassis ground.

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

CHECK : Is the resistance less than 10 Ω ?

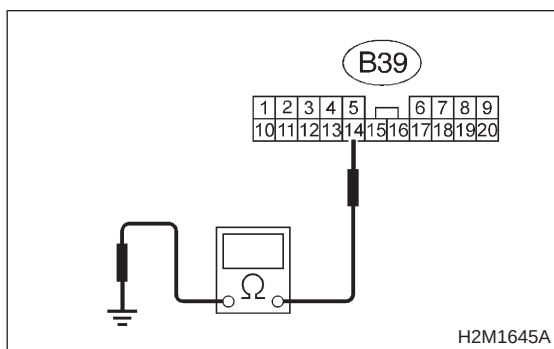
YES : Repair ground short circuit in fuel tank cord.

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.

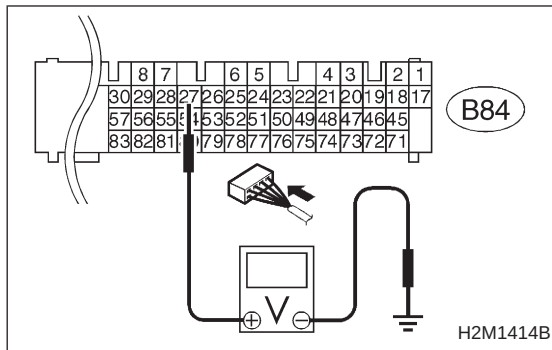
Connector & terminal
(R46) No. 2 — Chassis ground:
CHECK : Is the resistance less than 10 Ω ?
YES : Repair ground short circuit in rear wiring harness.

NO : Go to step 10AZ9.

10AZ9 CHECK BULKHEAD AND INSTRUMENT PANEL WIRING HARNESS.

- 1) Separate bulkhead wiring harness connector (B39) and instrument panel wiring harness connector (i4).
- 2) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

Connector & terminal
(B39) No. 14 — 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 INPUT SIGNAL FOR ECM. (USING VOLTAGE METER.)

- 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 10AZ12.

NO : Go to step 10AZ11.

FLEVEL (F45)

2.50V

H2M1327

10AZ11 CHECK INPUT SIGNAL FOR ECM. (USING SUBARU SELECT MONITOR.)

Measure voltage between ECM connector and chassis ground.

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?

- Subaru Select Monitor
- Designate mode using function key.

Function mode: F45

- F45: Fuel level sensor output signal is indicated.

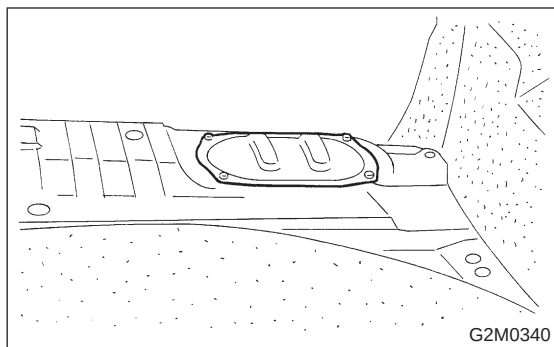
YES : Repair poor contact in ECM connector.

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.

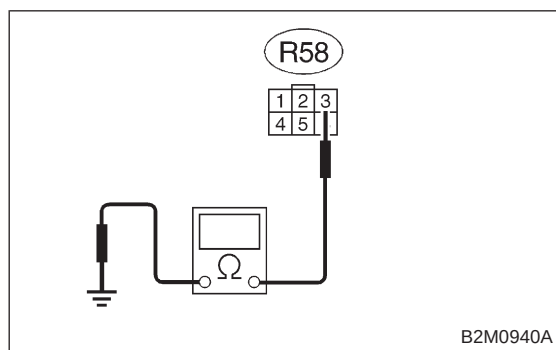
NOTE:

In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in fuel sub meter unit connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B39, B22, B99, B97, R67 and R15)

**10AZ12****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 trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

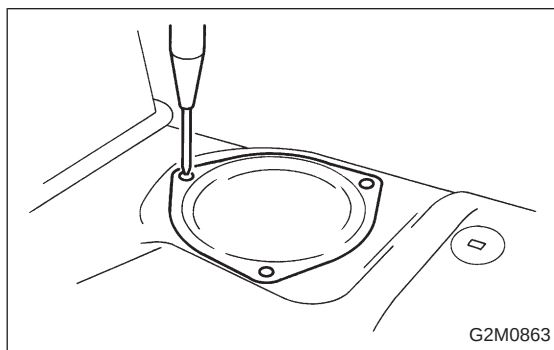


- 3) Disconnect connector from fuel pump.
- 4) Measure resistance of harness between fuel pump connector and chassis ground.

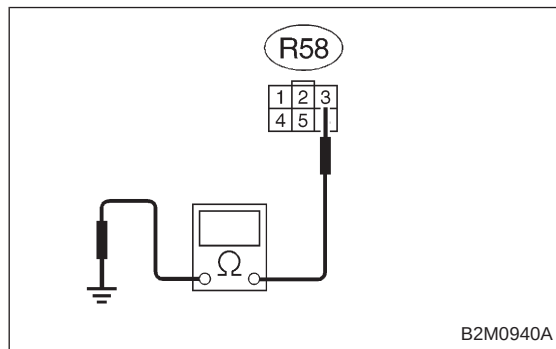
CHECK : **Connector & terminal (R58) No. 3 — Chassis ground:**
Is the resistance less than 10 Ω?

YES : Go to step 10AZ13.

NO : Go to step 10AZ17.

**10AZ13****CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.**

- 1) Remove service hole cover located on the left rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

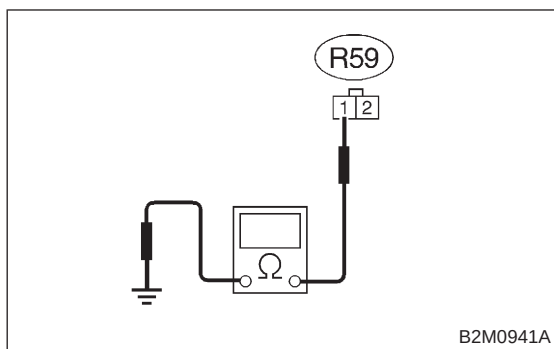


- 2) Disconnect connector from fuel sub meter unit.
- 3) Measure resistance of harness between fuel pump connector and chassis ground.

CHECK : **Connector & terminal (R58) No. 3 — Chassis ground:**
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 10AZ14.

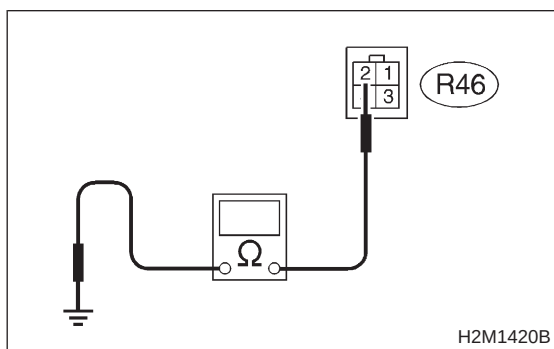
**10AZ14 CHECK FUEL TANK CODE.**

- 1) Separate fuel tank cord connector (R67) and rear wiring harness connector (R46).
- 2) Measure resistance of harness between fuel sub meter unit connector and chassis ground.

CHECK : **Connector & terminal (R59) No. 1 — Chassis ground:**
Is the resistance less than 10 Ω ?

YES : Repair ground short circuit in fuel tank cord.

NO : Go to step **10AZ15**.

**10AZ15 CHECK REAR WIRING HARNESS.**

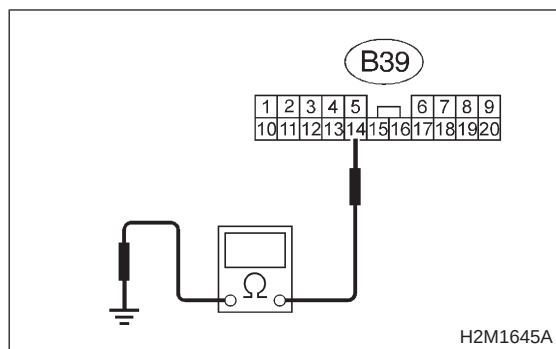
- 1) Separate rear wiring harness connector (R3) and bulk-head wiring harness connector (B99).
- 2) Measure resistance of harness between rear wiring harness connector and chassis ground.

Connector & terminal (R46) No. 2 — Chassis ground:

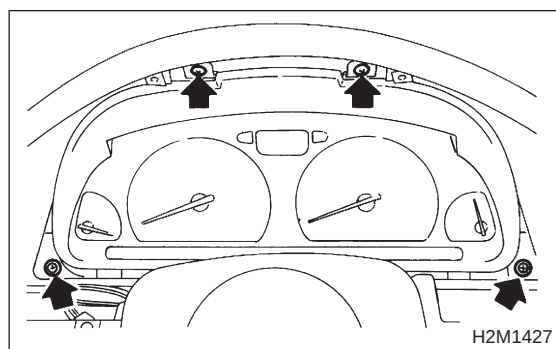
CHECK : **Is the resistance less than 10 Ω ?**

YES : Repair ground short circuit in rear wiring harness.

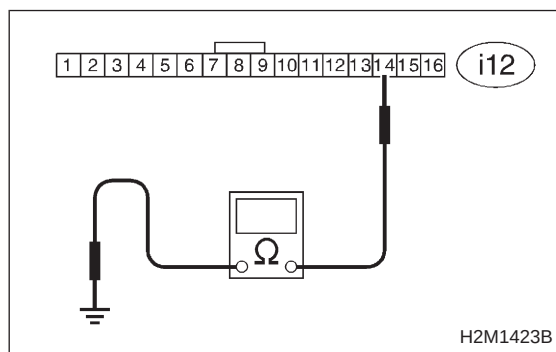
NO : Go to step **10AZ16**.

**10AZ16****CHECK BULKHEAD AND INSTRUMENT PANEL WIRING HARNESS.**

- 1) Separate bulkhead wiring harness connector (B39) and instrument panel wiring harness connector (i4).
- 2) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

Connector & terminal**(B39) No. 14 — 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.**10AZ17****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. 14 — Chassis ground:****Is the resistance less than 200 Ω ?****YES** : Go to step 10AZ18.**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 (B39)

10AZ18	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 **10AZ19**.

NO : Tighten fuel meter installation screw securely.

10AZ19	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.

OBD (FB1)
P0463 <FLVL_HI>

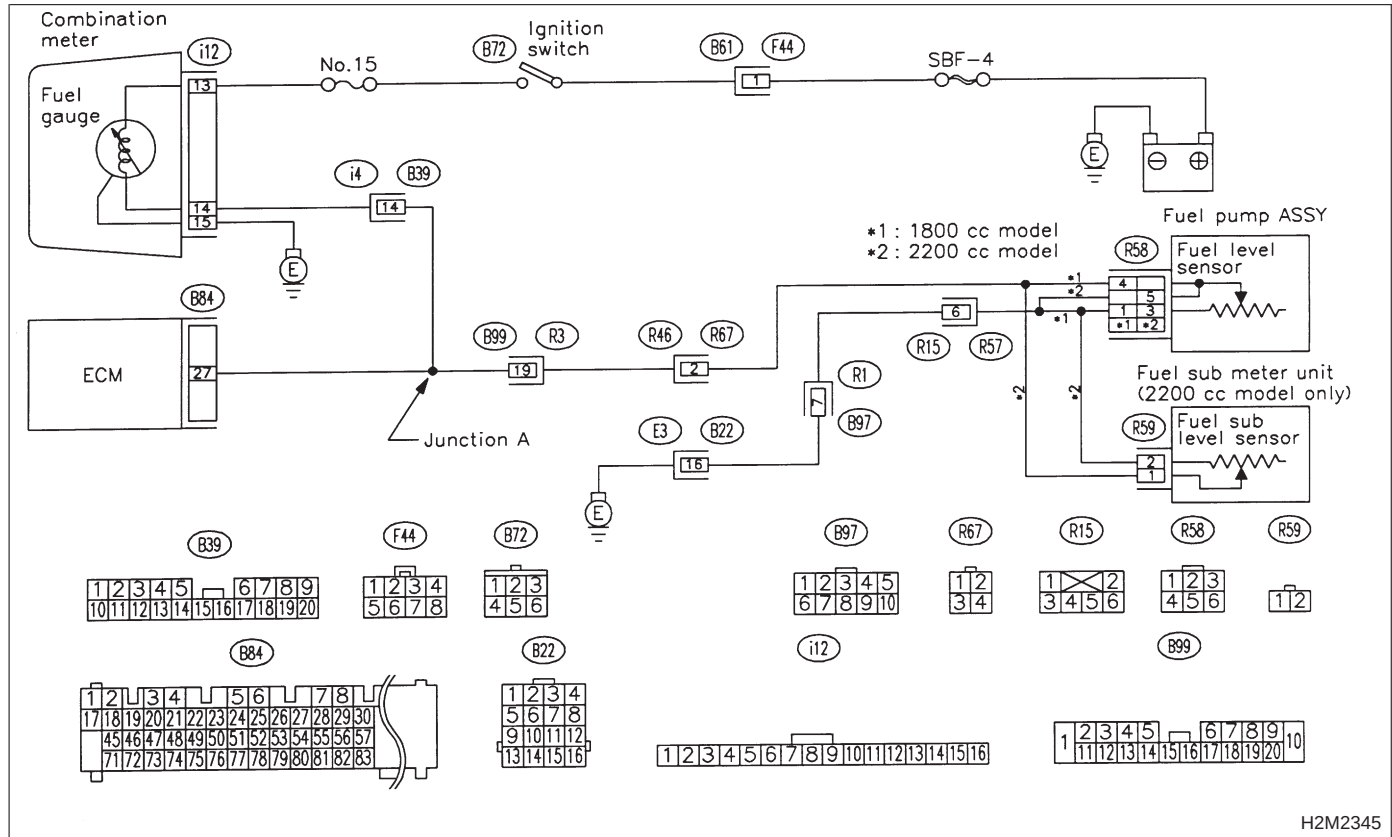
B2M1103

BA: DTC P0463 — FUEL LEVEL SENSOR CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

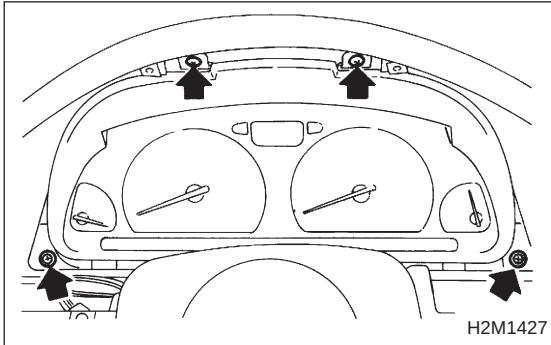
WIRING DIAGRAM:



H2M2345

CAUTION:

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

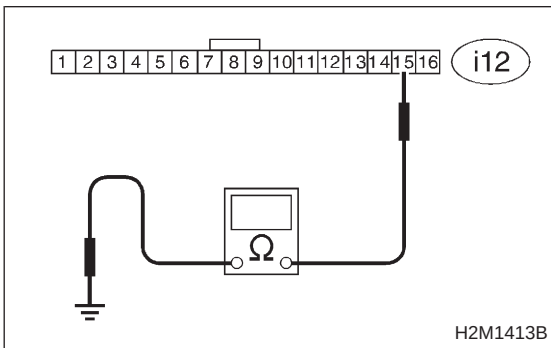
10BA1**CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.****CHECK****: Does speedometer and tachometer operate normally?****YES****: Go to step 10BA3.****NO****: Go to step 10BA2.****10BA2****CHECK GROUND CIRCUIT OF COMBINATION METER.**

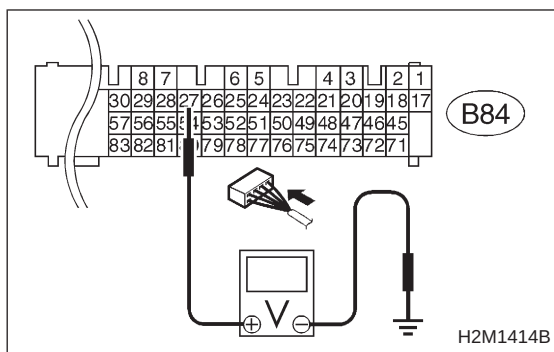
- 1) Turn ignition switch to OFF.
- 2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W8A0].>
- 3) Disconnect connector from combination meter.

- 4) Measure resistance of harness between combination meter connector and chassis ground.

Connector & terminal**(i12) No. 15 — 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 ENGINE DISPLACEMENT.****CHECK****: Is the engine 1800 cc model?****YES****: Go to step 10BA4.****NO****: Go to step 10BA9.**

**10BA4 CHECK INPUT SIGNAL FOR ECM.**

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

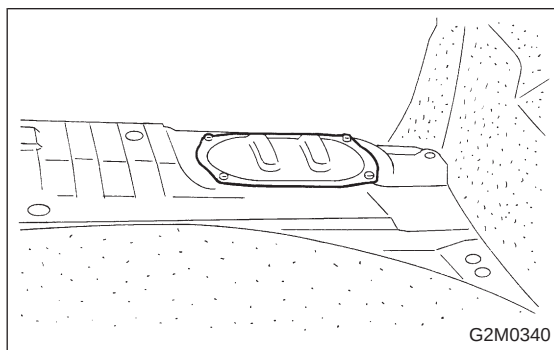
Connector & terminal**(B84) No. 27 (+) — Chassis ground (-):****(CHECK) : Is the voltage more than 4.75 V?****(YES) : Go to step 10BA5.**

(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.

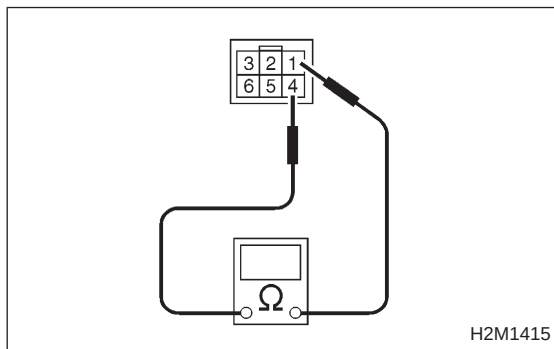
NOTE:

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 (B39, B22, B99, B97, R67 and R15)

**10BA5 CHECK FUEL LEVEL SENSOR.**

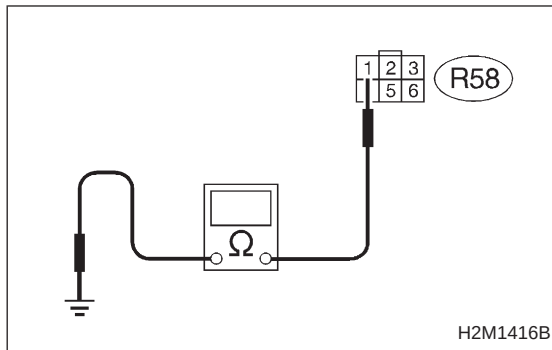
- 1) Turn ignition switch to OFF.
- 2) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).



- 3) Disconnect connector from fuel pump.

- 4) Measure resistance between connector terminals of fuel pump.

Terminals**No. 1 — No. 4:****(CHECK) : Is the resistance less than 100 Ω ?****(YES) : Go to step 10BA6.****(NO) : Replace fuel sending unit.**


10BA6 CHECK GROUND CIRCUIT OF FUEL LEVEL SENSOR.

Measure resistance of harness between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 1 — Chassis ground:

Is the resistance less than 5 Ω?

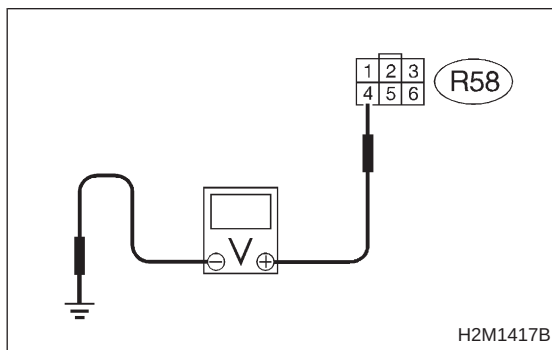
YES : Go to step **10BA7**.

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 (R15, B97 and B22)


10BA7 CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONNECTOR.

1) Turn ignition switch to ON.

2) Measure voltage between fuel pump connector and chassis ground.

Connector & terminal

(R58) No. 4 (+) — Chassis ground (–):

CHECK : **Is the voltage less than 1 V?**

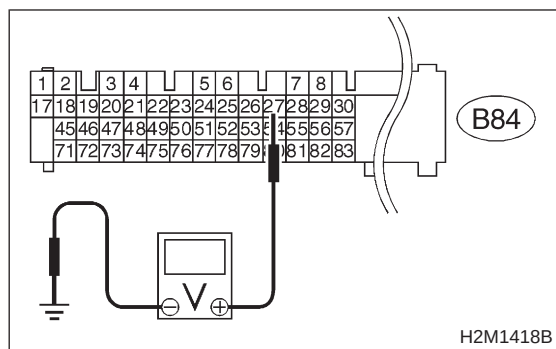
YES : Repair harness and connector.

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 pump connector
- Poor contact in coupling connector (R67)

NO : Go to step **10BA8**.

**10BA8****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:**

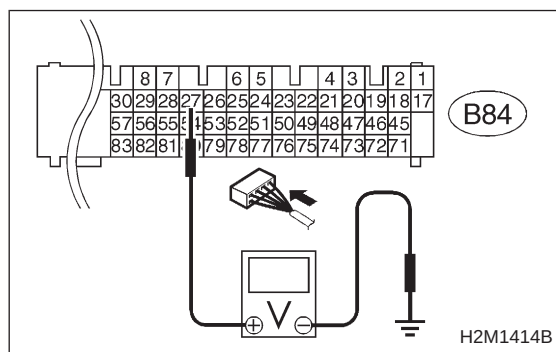
In this case, repair the following:

- 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 ECM connector

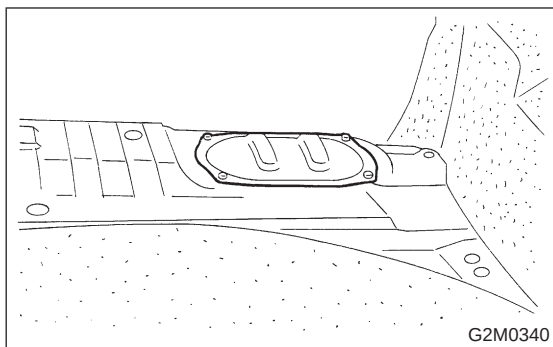
**10BA9****CHECK INPUT SIGNAL FOR ECM.**

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

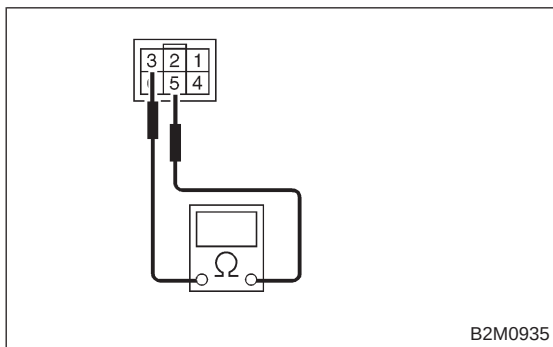
CHECK : **Connector & terminal**
(B84) No. 27 (+) — Chassis ground (-):
Is the voltage more than 4.75 V?**YES** : Go to step **10BA10**.**NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.**NOTE:**

In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in fuel sub meter unit connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connector (i3, B99, B22, B98 and R57)

**10BA10 CHECK FUEL LEVEL SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

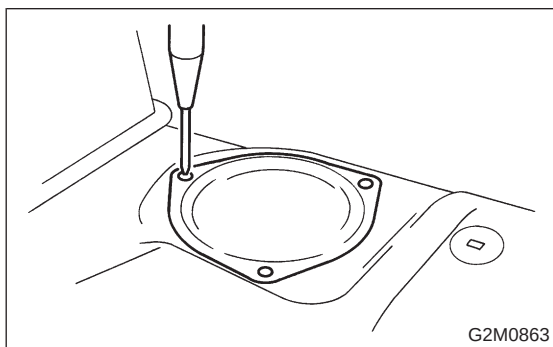


- 3) Disconnect connector from fuel pump.
- 4) Measure resistance between connector terminals of fuel pump.

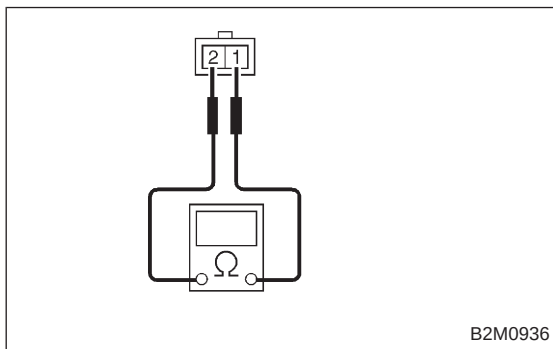
CHECK : **Terminals**
No. 3 — No. 5:
Is the resistance less than 100 Ω ?

YES : Go to step **10BA11**.

NO : Replace fuel sending unit.

**10BA11 CHECK FUEL SUB LEVEL SENSOR.**

- 1) Remove service hole cover located on the left rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

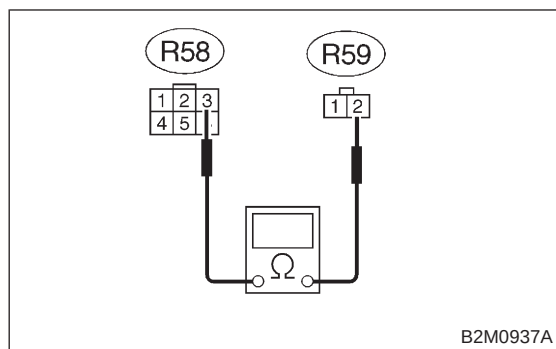


- 2) Disconnect connector from fuel sub meter unit.
- 3) Measure resistance between connector terminals of fuel sub meter unit.

CHECK : **Terminals**
No. 1 — No. 2:
Is the resistance less than 100 Ω ?

YES : Go to step **10BA12**.

NO : Replace fuel sub meter unit.

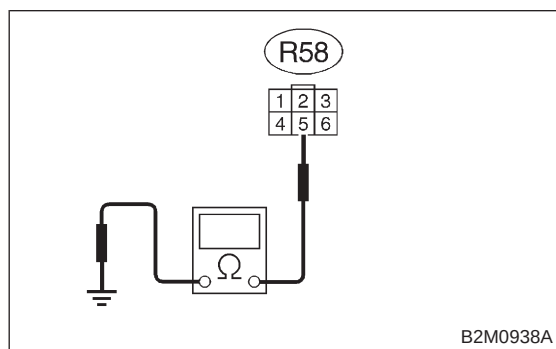
**10BA12**
CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.

Measure resistance of harness between fuel pump and fuel sub meter unit connector.

CHECK : **Connector & terminal**
(R58) No. 3 — (R59) No. 2:
Is the resistance less than 1 Ω?

YES : Go to step **10BA13**.

NO : Repair open circuit in harness between fuel pump and fuel sub meter unit connector.

**10BA13**
CHECK GROUND CIRCUIT OF FUEL LEVEL SENSOR.

Measure resistance of harness between fuel pump connector and chassis ground.

CHECK : **Connector & terminal**
(R58) No. 5 — Chassis ground:
Is the resistance less than 5 Ω?

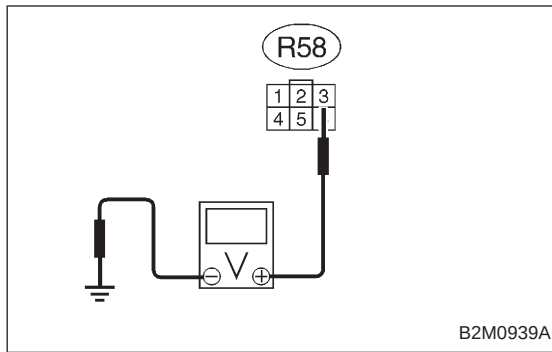
YES : Go to step **10BA14**.

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 (R15, B97 and B22)



10BA14 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.

CHECK : **Connector & terminal (R58) No. 3 (+) — Chassis ground (-): Is the voltage less than 1 V?**

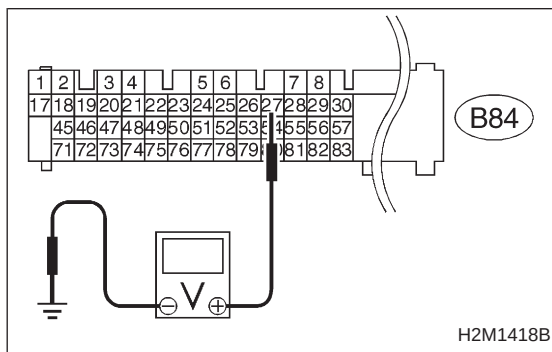
YES : Repair harness and connector.

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 (R67 and B99)

NO : Go to step **10BA15**.



10BA15 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.

CHECK : **Connector & terminal (B84) No. 27 (+) — Chassis ground: Is the voltage less than 1 V?**

YES : Repair harness and connector.

NOTE:

In this case, repair the following:

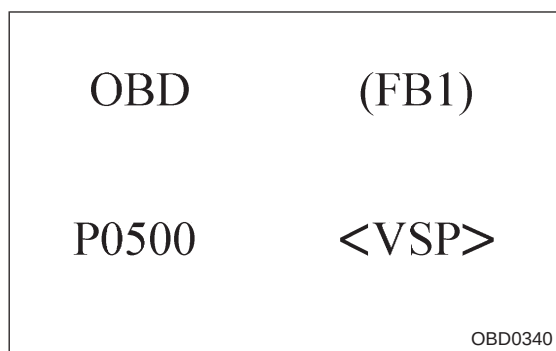
- Open circuit in harness between ECM connector and junction A on rear wiring harness
- Poor contact in coupling connector (B99)

NO : Repair connector.

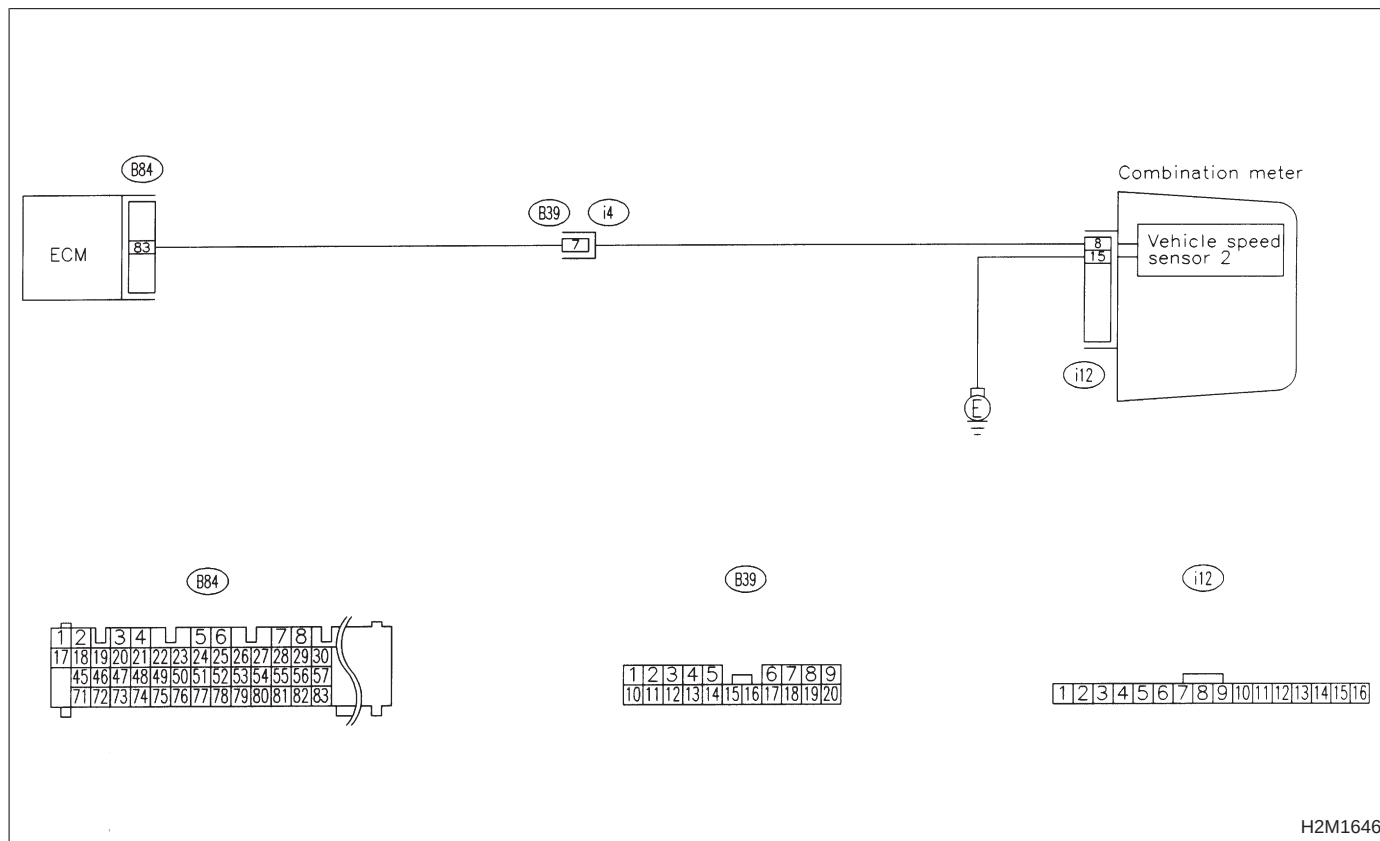
NOTE:

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 P0500****— VEHICLE SPEED SENSOR MALFUNCTION****—****DTC DETECTING CONDITION:**

- Immediately at fault recognition

WIRING DIAGRAM:**CAUTION:**

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

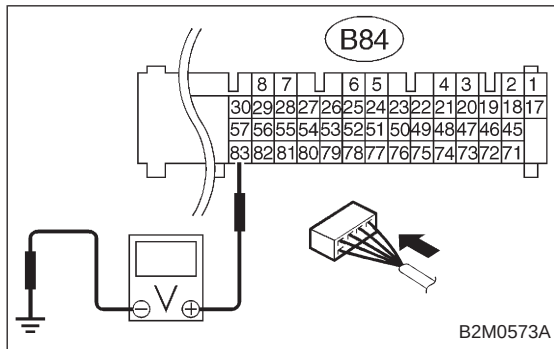
<Ref. to 2-7 [T3D0] and [T3E0].>

10BB1	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.

CHECK : Does speedometer operate normally?

YES : Go to step **10BB2**.

NO : Check speedometer and vehicle speed sensor 2
<Ref. to 6-2 [K2A0].>.



10BB2	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?

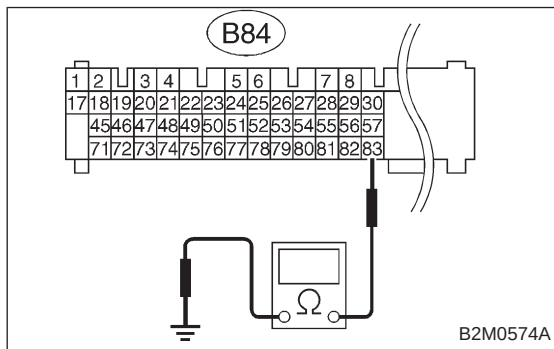
YES : Repair harness and connector.

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 (B39)

NO : Go to step **10BB3**.



10BB3	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.

10BC1	CHECK AIR INTAKE SYSTEM.

- 1) Turn ignition switch to ON.
- 2) Start engine, and idle it.

CHECK : *Is there a fault in air intake system?*

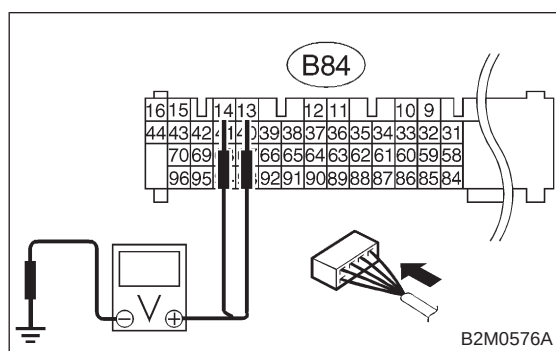
NOTE:

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

YES : Repair or replace air intake system.

NO : Go to step **10BC2**.



10BC2	CHECK OUTPUT SIGNAL FROM ECM.

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

Connector & terminal

(B84) No. 13 (+) — Chassis ground (-):

CHECK : *Is the voltage more than 3 V?*

YES : Go to next step 3).

NO : Go to step **10BC5**.

- 3) Measure voltage between ECM and chassis ground.

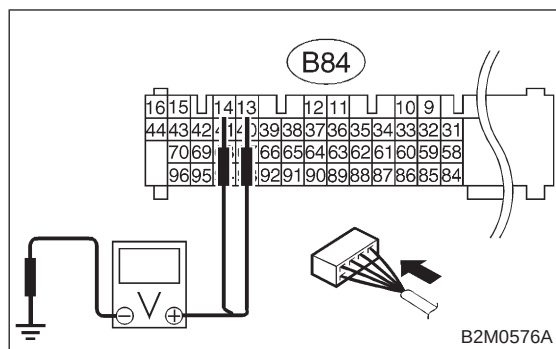
Connector & terminal

(B84) No. 14 (+) — Chassis ground (-):

CHECK : *Is the voltage more than 3 V?*

YES : Go to next step 4).

NO : Go to step **10BC5**.



- 4) Turn ignition switch to OFF.
- 5) Disconnect connector from idle air control solenoid valve.
- 6) Turn ignition switch to ON.
- 7) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 13 (+) — 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 next step 8).

- 8) 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 10BC3.

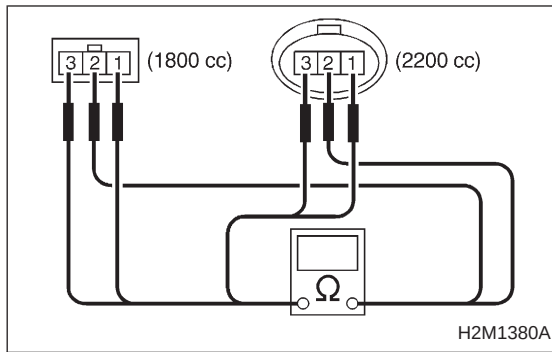
10BC3	CHECK POOR CONTACT.

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 10BC4.

**10BC4****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 next step 3).

- 3) 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 next step 4).

- 4) 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 next step 5).

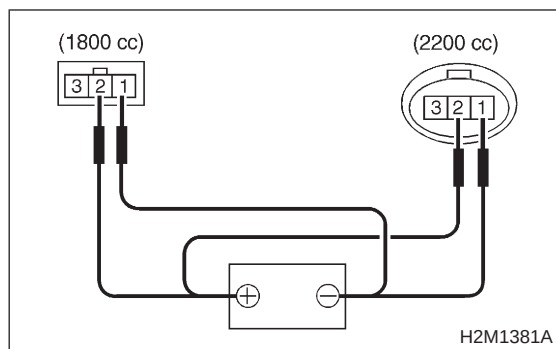
- 5) Measure resistance between idle air control solenoid valve connector terminals.

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 next step 6).



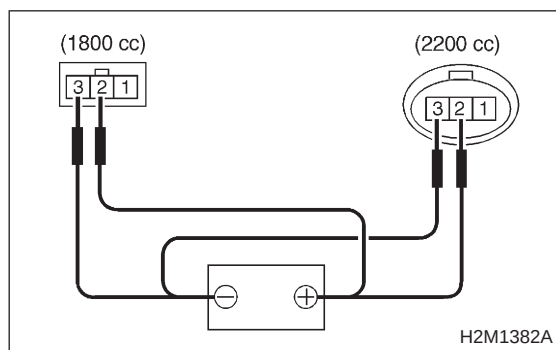
6) Remove idle air control solenoid valve. <Ref. to 2-7 [W12A0].>

7) 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 next step 8).

NO : Clean idle air control solenoid valve. <Ref. to 2-7 [W12B0].>

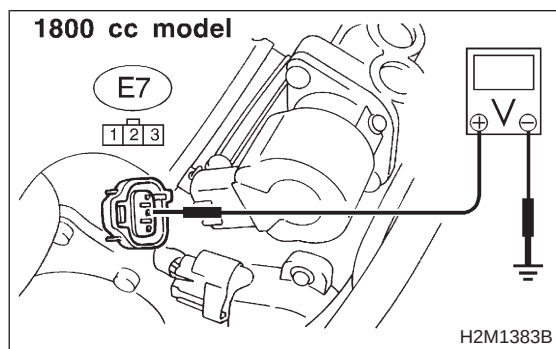


8) Check operation of idle air control solenoid valve.

CHECK : *Is idle air control solenoid valve fully closed when applying the battery to terminals No. 2 (+) and No. 3 (-)?*

YES : Go to step 10BC5.

NO : Clean idle air control solenoid valve. <Ref. to 2-7 [W12B0].>



10BC5	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) Turn ignition switch to ON.

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?*

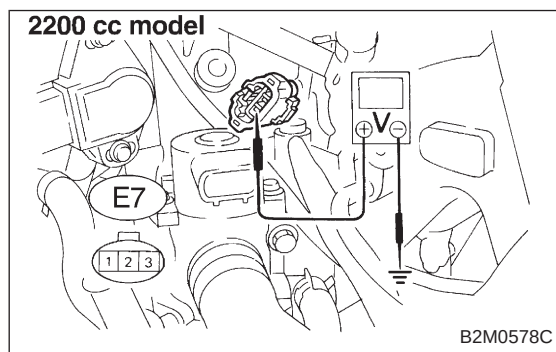
YES : Go to step 10BC6.

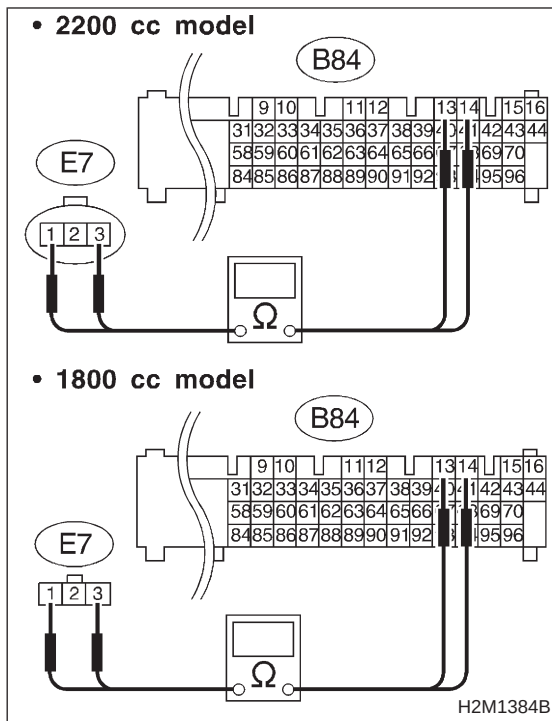
NO : Repair harness and connector.

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)



**10BC6**

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 next step 4).

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 (B21) [1800 cc]

- Poor contact in coupling connector (B22) [2200 cc]

- 4) 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 next step 5).

NO : Repair harness and connector.

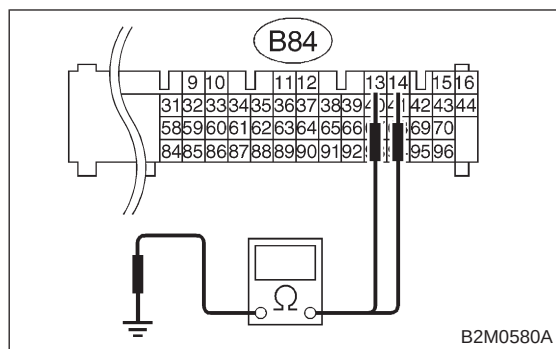
NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and idle air control solenoid valve connector

- Poor contact in coupling connector (B21) [1800 cc]

- Poor contact in coupling connector (B22) [2200 cc]



5) 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 next step 6).

6) 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 10BC7.

10BC7	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.

OBD (FB1)

P0506 <ISC_RLOW>

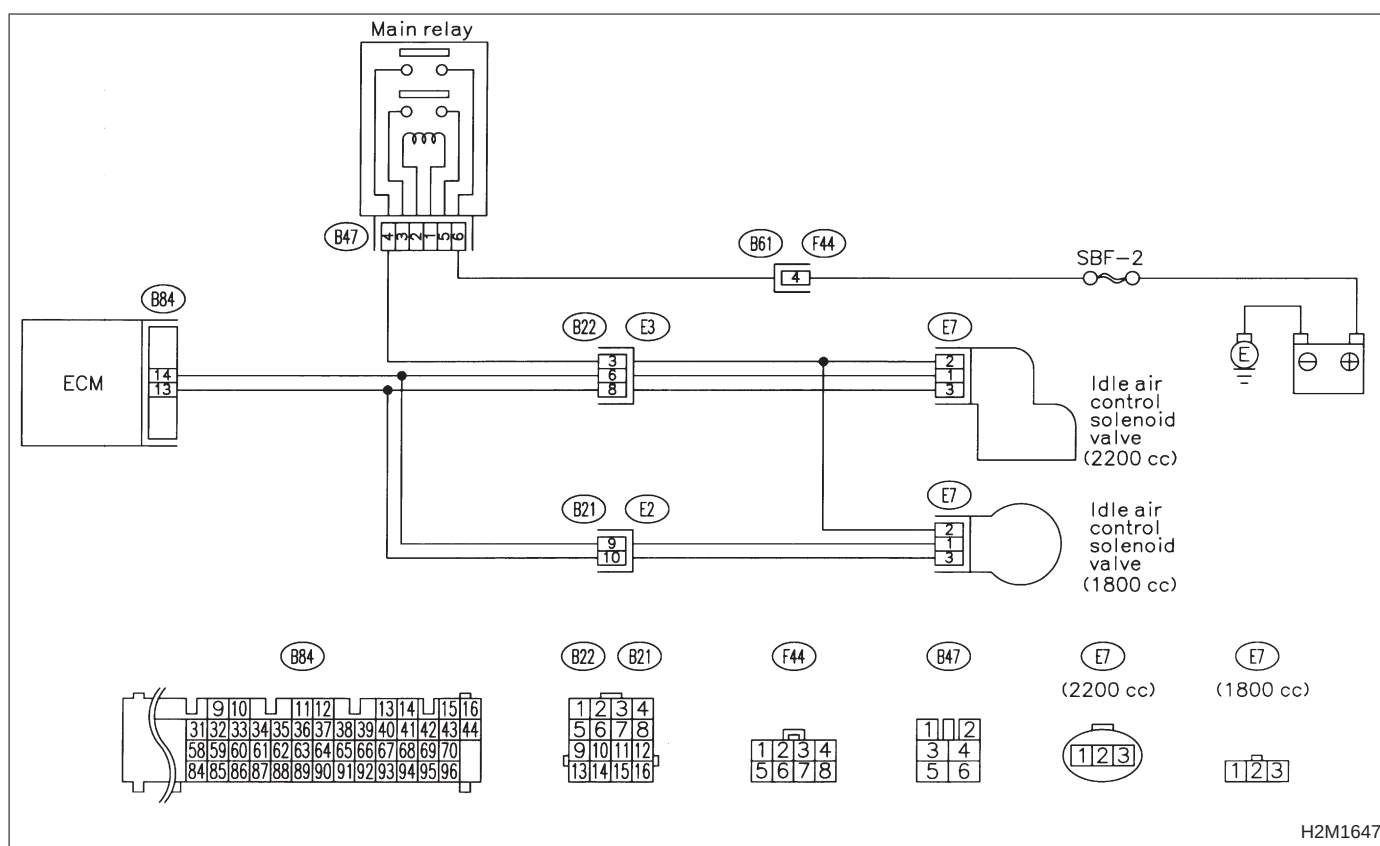
B2M1104

**BD: 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.

WIRING DIAGRAM:**CAUTION:**

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

10BD1	CHECK DTC P0505 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 **10BD2**.

10BD2	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.

OBD (FB1)

P0507 <ISC_RHI>

B2M1105

BE: DTC P0507

— IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED —

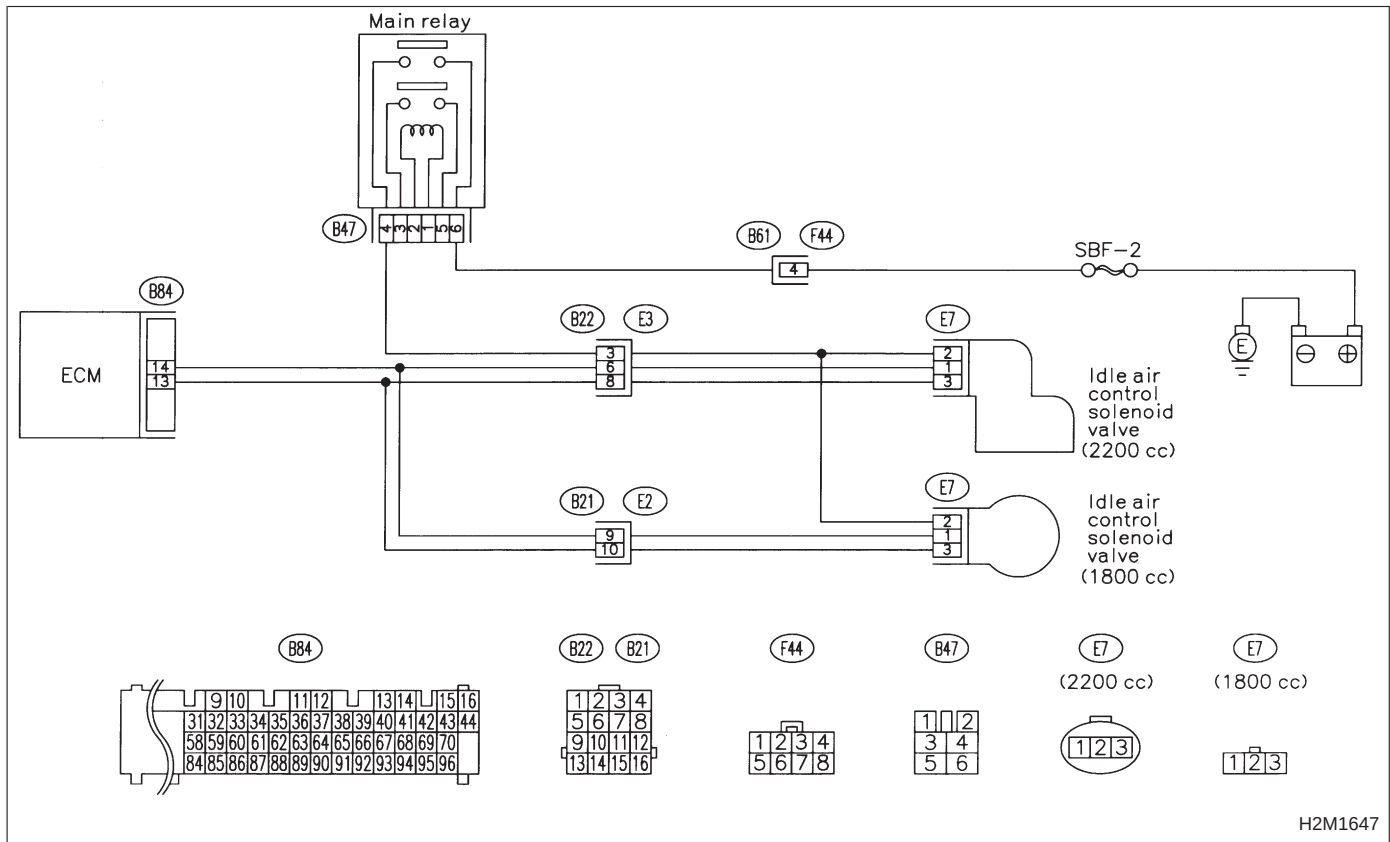
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

WIRING DIAGRAM:



H2M1647

CAUTION:

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

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

10BE1	CHECK DTC P0505 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 **10BE2**.

10BE2	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.

2) Start engine, and idle it.

CHECK : *Is there a fault in air intake system?*

NOTE:

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

YES : Repair air suction and leaks.

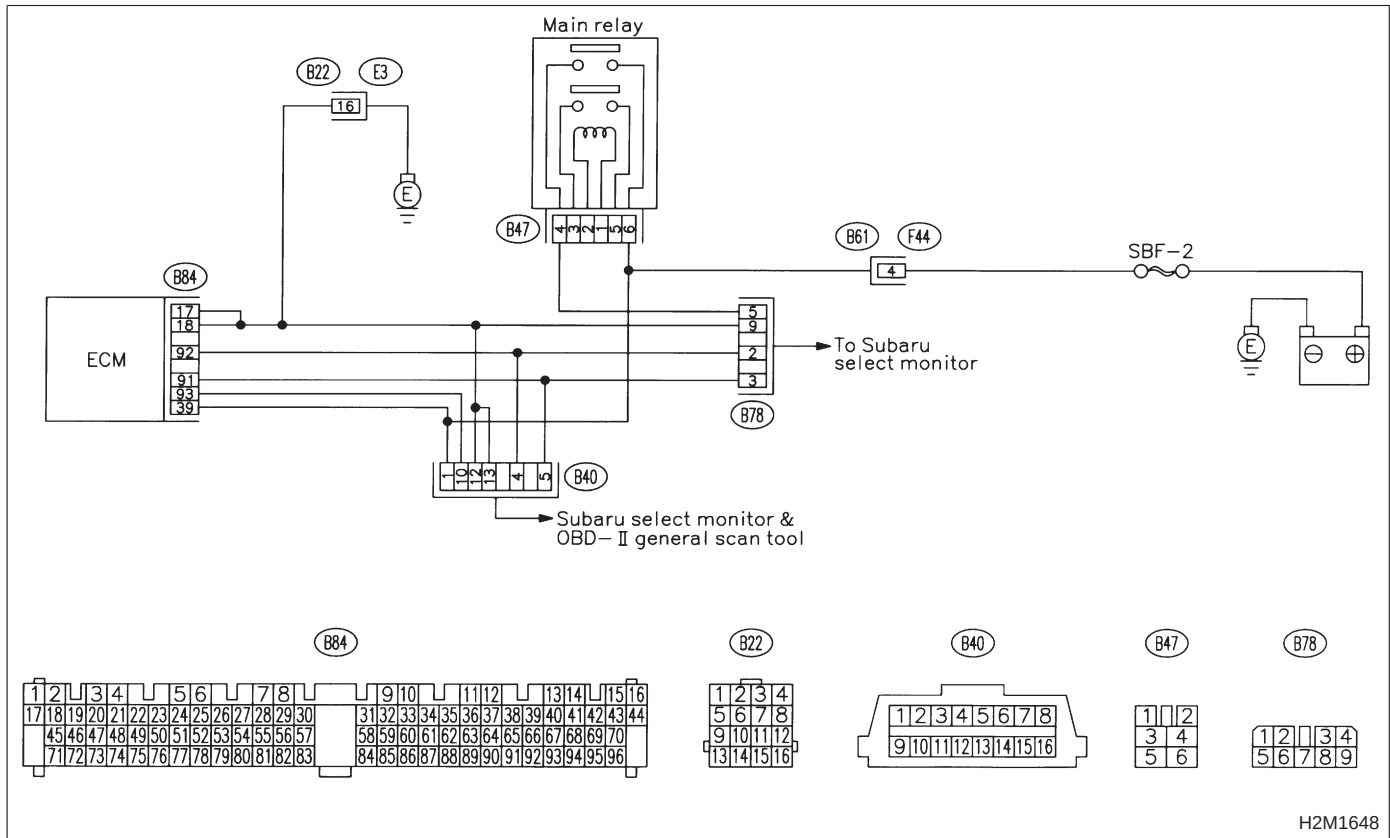
NO : Replace idle air control solenoid valve.

BF: DTC P0600 — SERIAL COMMUNICATION LINK MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

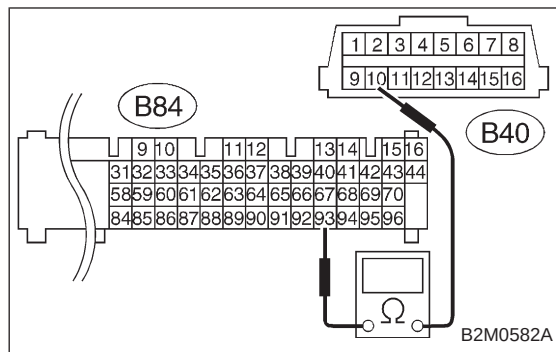


H2M1648

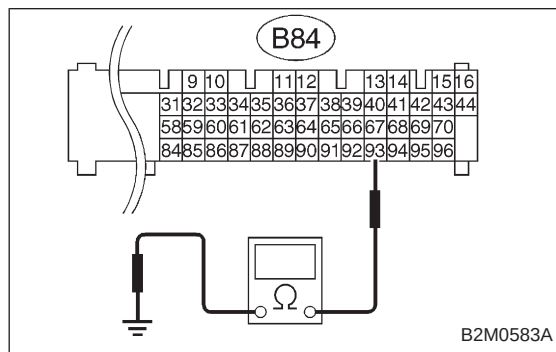
CAUTION:

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

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

**10BF1****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 (for Subaru Select Monitor & OBD-II general scan tool).

Connector & terminal**(B84) No. 93 — (B40) No. 10:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to next step 4).**NO** : Repair open circuit in harness between ECM and data link connector.

- 4) 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.

OBD

(FB1)

P0601

<RAM>

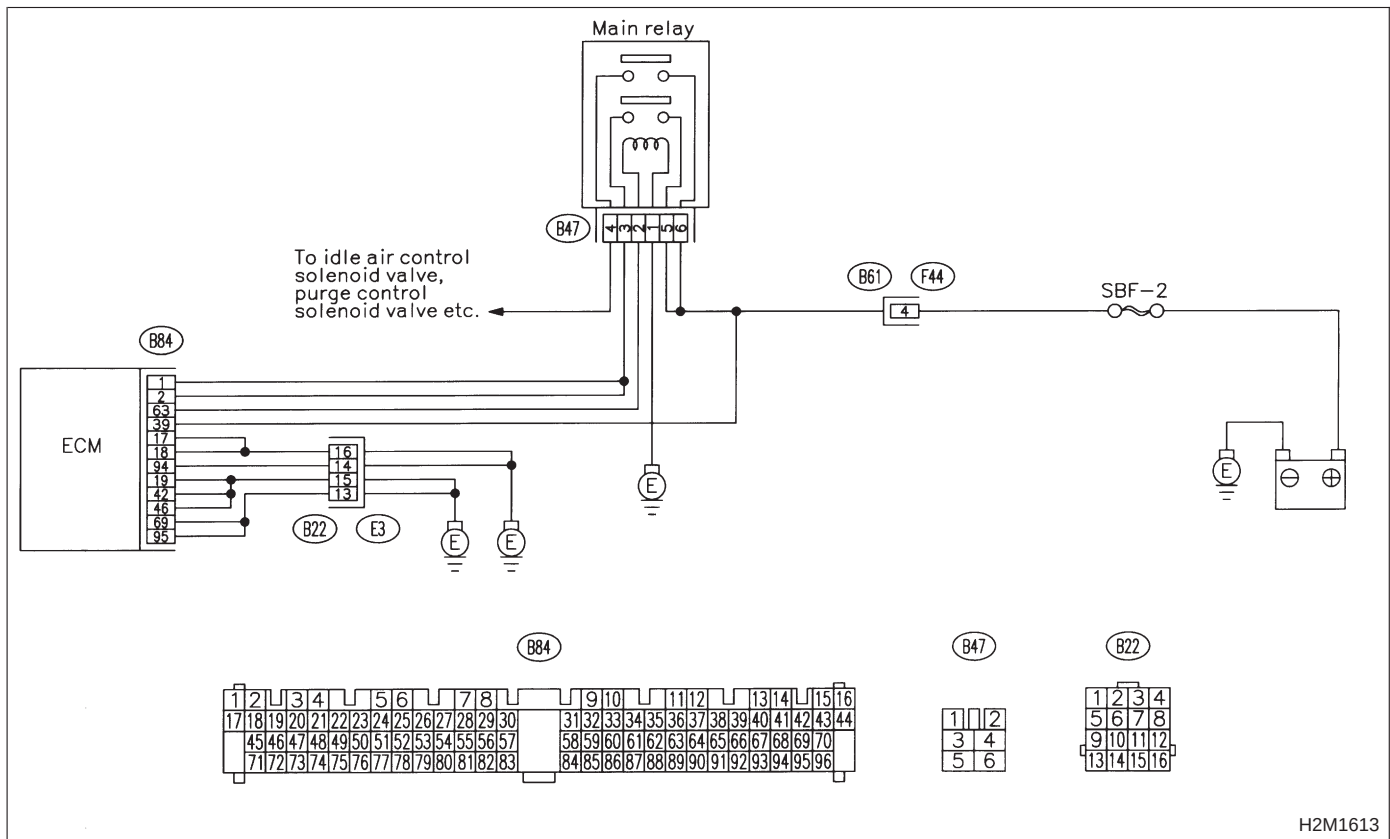
OBD0376

BG: DTC P0601**— INTERNAL CONTROL MODULE MEMORY CHECK SUM ERROR —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Engine does not start.
- Engine stalls.

WIRING DIAGRAM:

H2M1613

CAUTION:

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

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

10BG1 CHECK DTC P0601 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0601?

YES : Replace ECM.

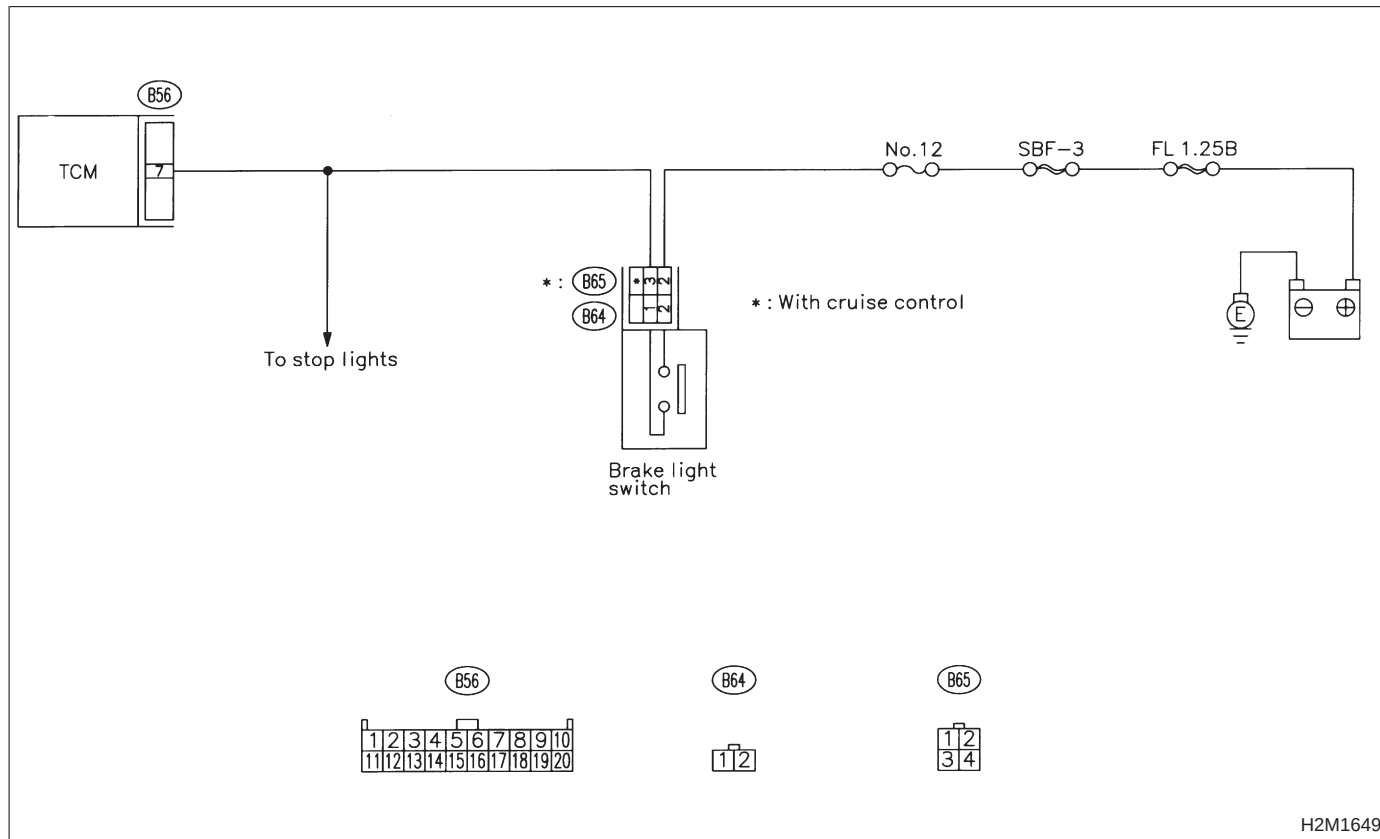
NO : It is not necessary to inspect DTC P0601.

OBD (FB1)
P0703 <ATBRK>

B2M0655

BH: DTC P0703**— BRAKE SWITCH INPUT MALFUNCTION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

H2M1649

CAUTION:

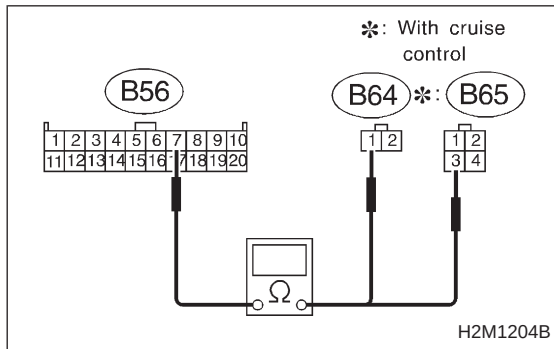
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BH1 CHECK OPERATION OF BRAKE LIGHT.

CHECK : Does brake light come on when depressing the brake pedal?

YES : Go to step 10BH2.

NO : Repair or replace brake light circuit.

**10BH2 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. 1 (Without cruise control):

(B56) No. 7 — (B65) No. 3 (With cruise control):

CHECK : Is the resistance less than 1 Ω ?

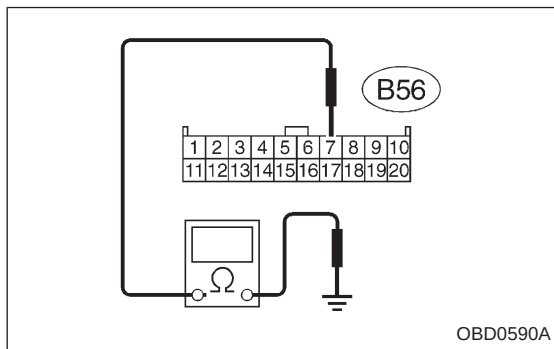
YES : Go to next step 3).

NO : Repair or replace 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



3) Measure resistance of harness between TCM and chassis ground.

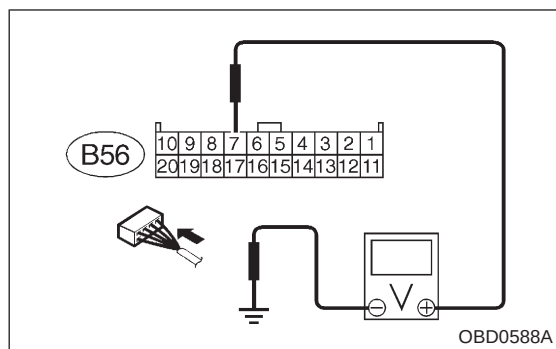
Connector & terminal

(B56) No. 7 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10BH3.

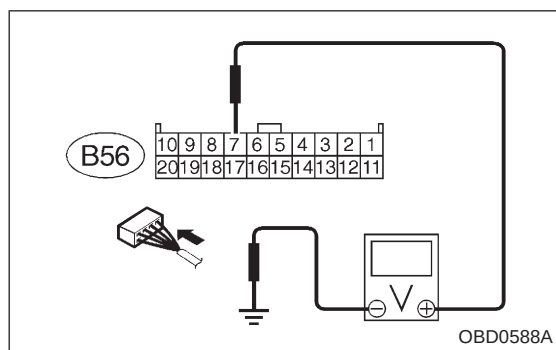
NO : Repair ground short circuit in harness between TCM and brake light switch connector.

**10BH3 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 next step 3).**(NO)** : Adjust or replace brake light switch.

- 3) 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 10BH4.**(NO)** : Adjust or replace brake light switch.**10BH4 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.

OBD (FB1)
P0705 <ATRNG>

B2M0656

BI: DTC P0705 — TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION —

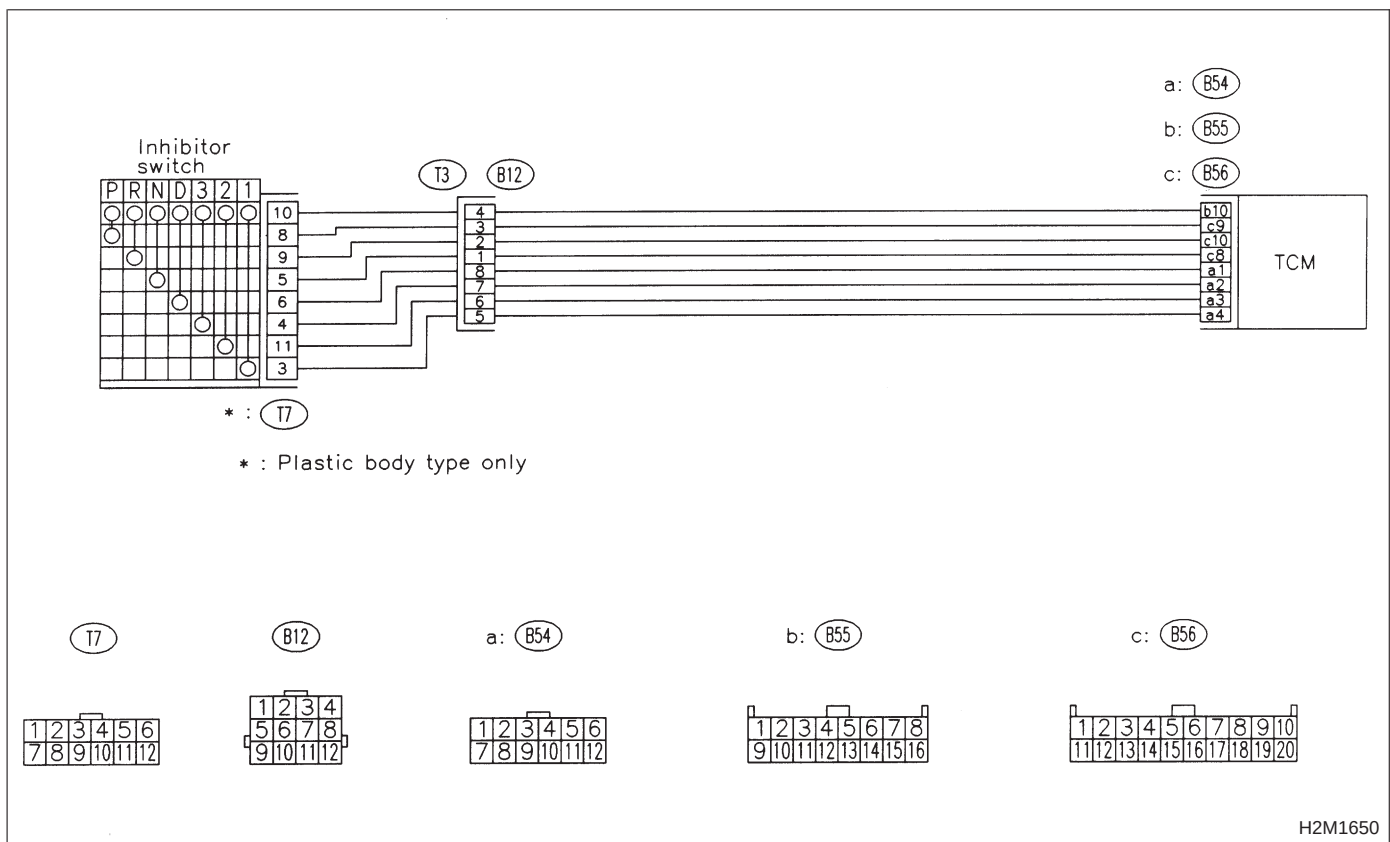
DTC DETECTING CONDITION:

- 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.

WIRING DIAGRAM:



H2M1650

CAUTION:

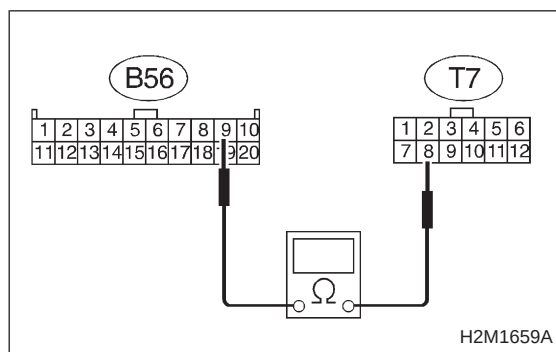
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7 [T3D0] and [T3E0].>

10BI1	CHECK INHIBITOR SWITCH TYPE.

CHECK : Is inhibitor switch type plastic body?

YES : Go to step 10BI2.

NO : Go to step 10BI24.



10BI2	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?

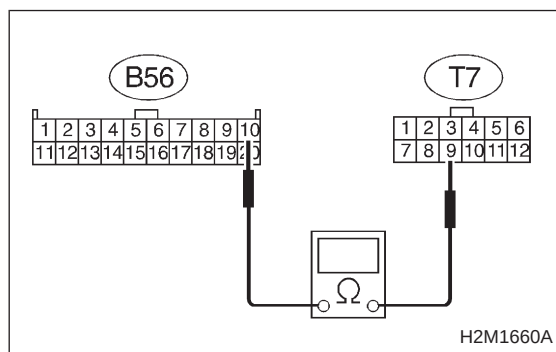
YES : Go to step 10BI3.

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)



10BI3	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?

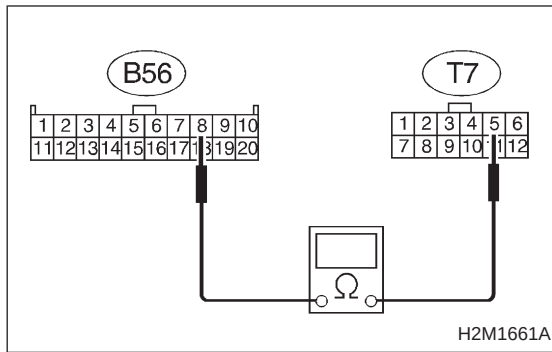
YES : Go to step 10BI4.

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)

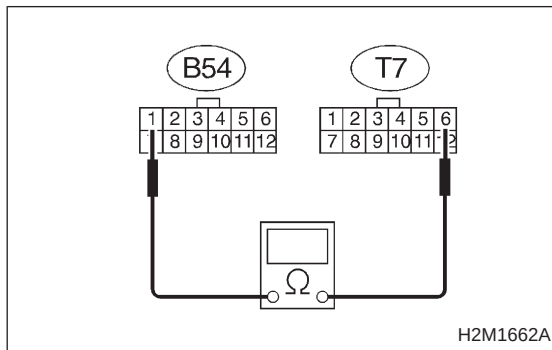
**10BI4****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

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 10BI5.**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)

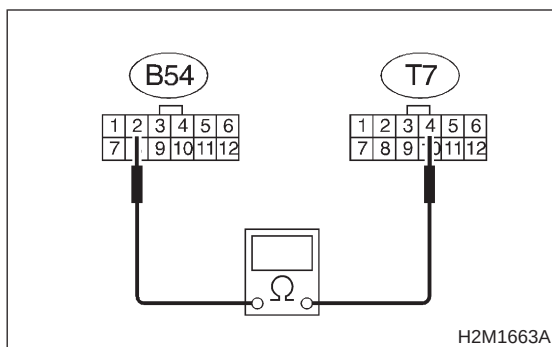
**10BI5****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

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 10BI6.**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)

**10BI6****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

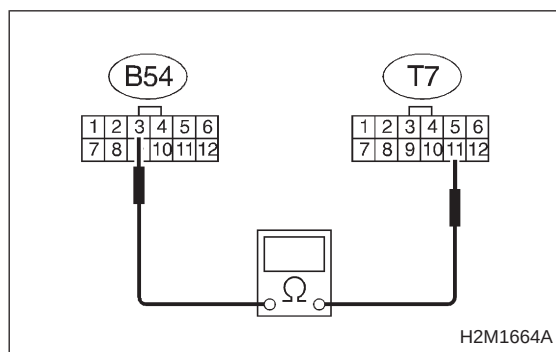
Measure resistance of harness between TCM and transmission harness connector.

Connector & terminal**(B54) No. 2 — (T7) No. 4:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to step 10BI7.**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)

**10BI7****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 ?

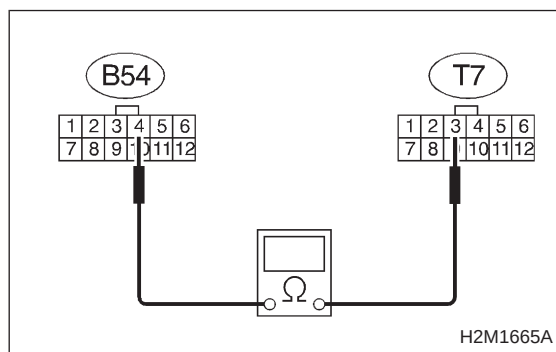
YES : Go to step 10BI8.

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)

**10BI8****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 ?

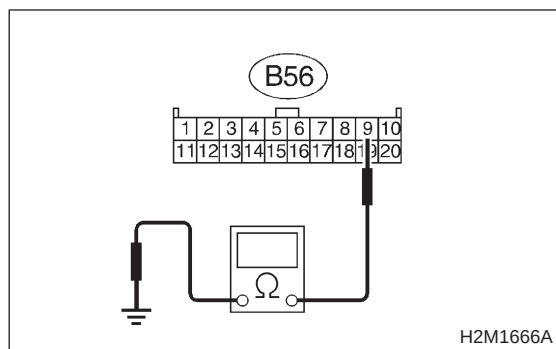
YES : Go to step 10BI9.

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)

**10BI9****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

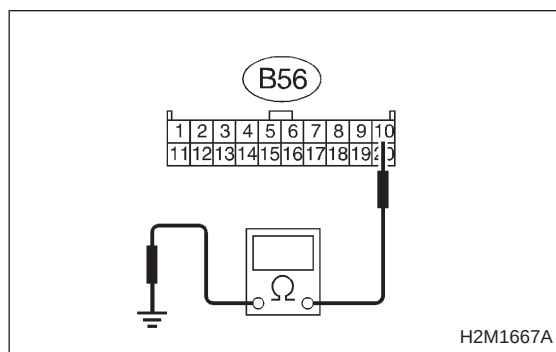
Connector & terminal

(B56) No. 9 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10BI10.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI10****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

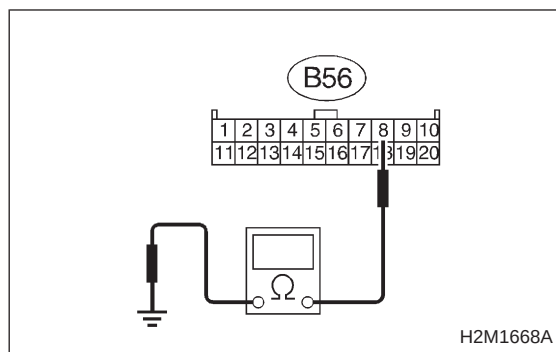
Connector & terminal

(B56) No. 10 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step 10BI11.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI11****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

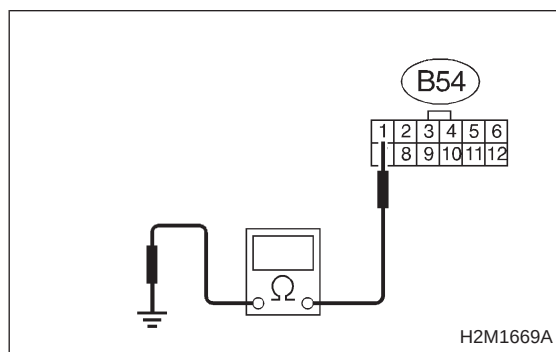
Connector & terminal

(B56) No. 8 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step **10BI12**.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI12****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

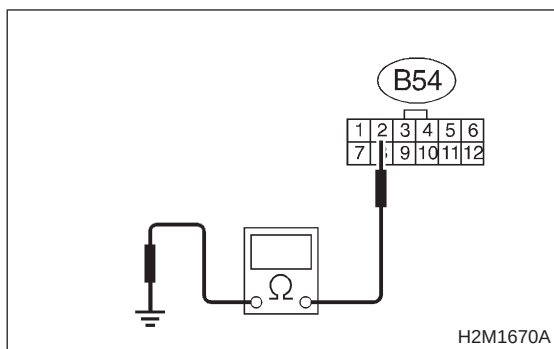
Connector & terminal

(B54) No. 1 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step **10BI13**.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI13****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

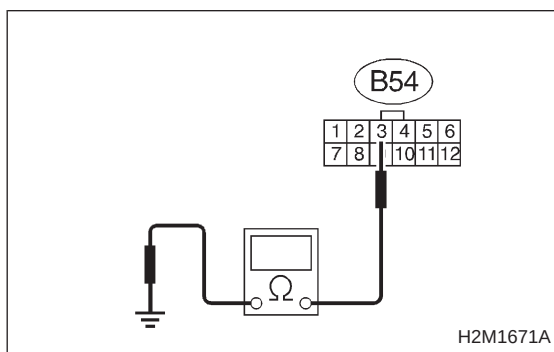
Connector & terminal

(B54) No. 2 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step **10BI14**.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI14****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

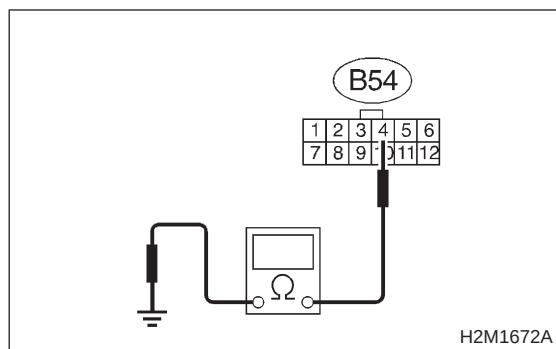
Connector & terminal

(B54) No. 3 — Chassis ground:

CHECK : Is the resistance more than 1 MΩ?

YES : Go to step **10BI15**.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI15****CHECK HARNESS BETWEEN TCM AND INHIBITOR SWITCH CONNECTOR.**

Measure resistance of harness between TCM and chassis ground.

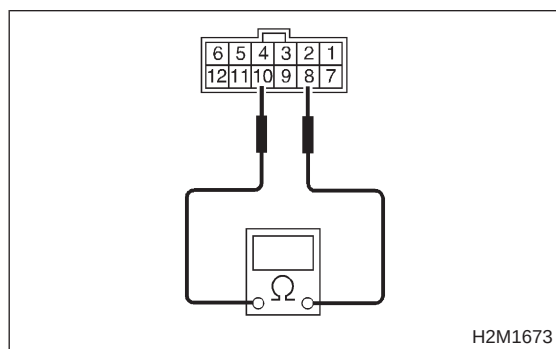
Connector & terminal

(B54) No. 4 — Chassis ground:

CHECK : Is the resistance more than 1 M Ω ?

YES : Go to step 10BI16.

NO : Repair ground short circuit in harness between TCM and transmission harness connector.

**10BI16****CHECK INHIBITOR SWITCH.**

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

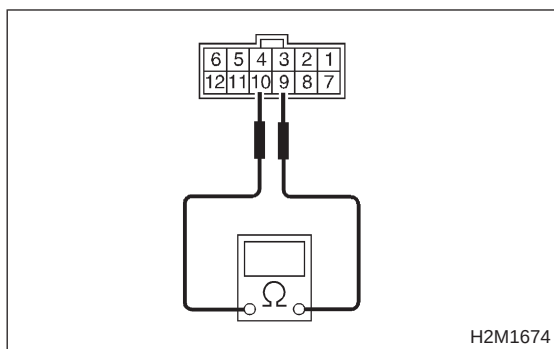
No. 8 — No. 10

CHECK : ● Is the resistance less than 1 Ω in "P" position?

● Is the resistance more than 1 M Ω in other positions?

YES : Go to step 10BI17.

NO : Go to step 10BI23.

**10BI17 CHECK INHIBITOR SWITCH.**

Measure resistance between inhibitor switch connector receptacle's terminals.

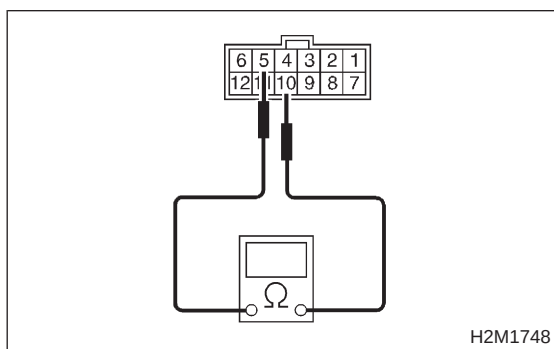
Terminals

No. 9 — No. 10

CHECK : ● *Is the resistance less than 1 Ω in "R" position?*
 ● *Is the resistance more than 1 $M\Omega$ in other positions?*

YES : Go to step **10BI18**.

NO : Go to step **10BI23**.

**10BI18 CHECK INHIBITOR SWITCH.**

Measure resistance between inhibitor switch connector receptacle's terminals.

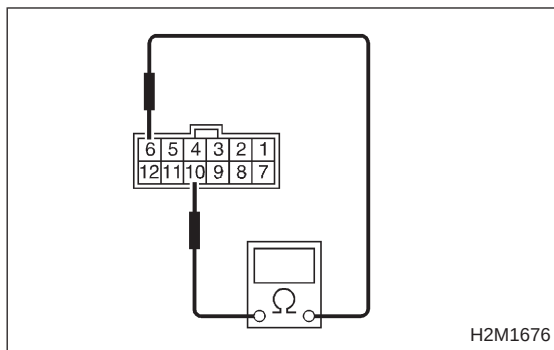
Terminals

No. 5 — No. 10

CHECK : ● *Is the resistance less than 1 Ω in "N" position?*
 ● *Is the resistance more than 1 $M\Omega$ in other positions?*

YES : Go to step **10BI19**.

NO : Go to step **10BI23**.



10BI19	CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

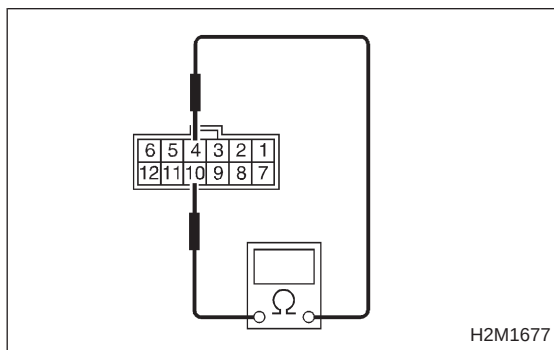
Terminals

No. 6 — No. 10

CHECK : ● *Is the resistance less than 1 Ω in "D" position?*
 ● *Is the resistance more than 1 $M\Omega$ in other positions?*

YES : Go to step **10BI20**.

NO : Go to step **10BI23**.



10BI20	CHECK INHIBITOR SWITCH.

Measure resistance between inhibitor switch connector receptacle's terminals.

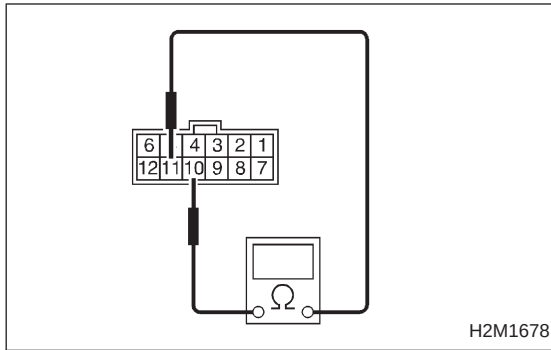
Terminals

No. 4 — No. 10

CHECK : ● *Is the resistance less than 1 Ω in "3" position?*
 ● *Is the resistance more than 1 $M\Omega$ in other positions?*

YES : Go to step **10BI21**.

NO : Go to step **10BI23**.

**10BI21 CHECK INHIBITOR SWITCH.**

Measure resistance between inhibitor switch connector receptacle's terminals.

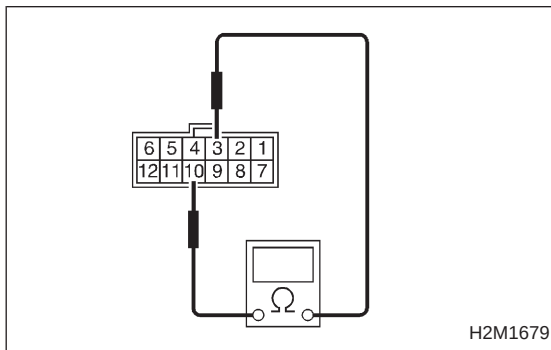
Terminals

No. 11 — No. 10

CHECK : ● *Is the resistance less than 1 Ω in "2" position?*
 ● *Is the resistance more than 1 M Ω in other positions?*

YES : Go to step 10BI22.

NO : Go to step 10BI23.

**10BI22 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?*
 ● *Is the resistance more than 1 M Ω in other positions?*

YES : Go to step 10BI26.

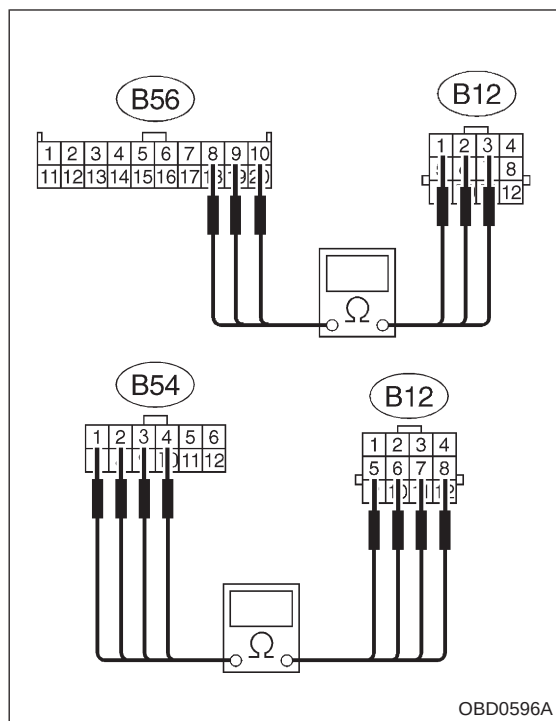
NO : Go to step 10BI23.

10BI23 CHECK SELECTOR CABLE.

CHECK : *Is there faulty connection in the selector cable?*

YES : Repair connection of selector cable.

NO : Replace inhibitor switch.

**10B124****CHECK HARNESS BETWEEN TCM AND TRANSMISSION HARNESS CONNECTOR.**

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

Connector & terminal**(B56) No. 9 — (B12) No. 3:**

CHECK : Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between TCM and transmission harness connector.

Connector & terminal**(B56) No. 10 — (B12) No. 2:**

CHECK : Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between TCM and transmission harness connector.

Connector & terminal**(B56) No. 8 — (B12) No. 1:**

CHECK : Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between TCM and transmission harness connector.

Connector & terminal**(B54) No. 1 — (B12) No. 8:**

CHECK : Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between TCM and transmission harness connector.

Connector & terminal**(B54) No. 2 — (B12) No. 7:**

CHECK : Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

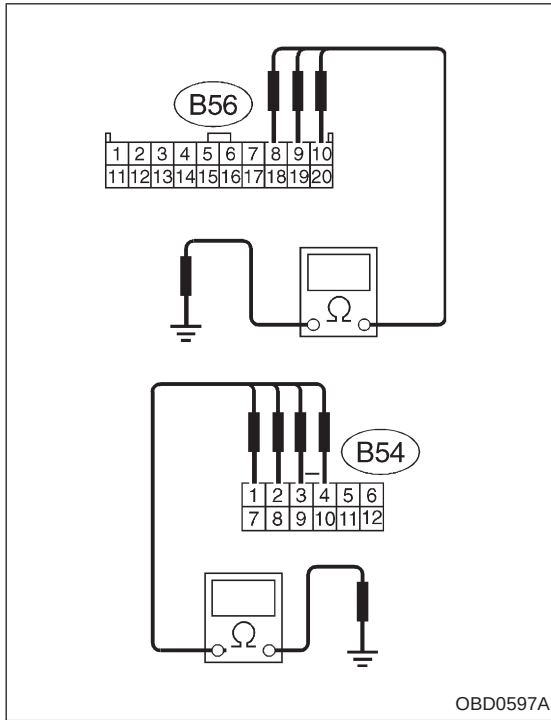
NO : Repair open circuit in harness between TCM and transmission harness connector.

Connector & terminal**(B54) No. 3 — (B12) No. 6:**

CHECK : Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between TCM and transmission harness connector.

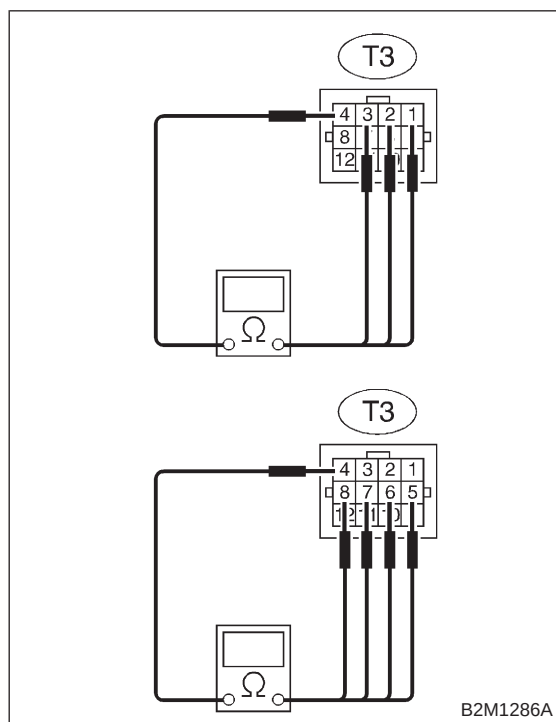
Connector & terminal**(B54) No. 4 — (B12) No. 5:****CHECK** : Is the resistance less than 1 Ω ?**YES** : Go to next step 4).**NO** : Repair open circuit in harness between TCM and transmission harness connector.

4) Measure resistance of harness between TCM and chassis ground.

Connector & terminal**(B56) No. 9 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair ground short circuit in harness between TCM and transmission harness connector.**Connector & terminal****(B56) No. 10 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair ground short circuit in harness between TCM and transmission harness connector.**Connector & terminal****(B56) No. 8 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair ground short circuit in harness between TCM and transmission harness connector.**Connector & terminal****(B54) No. 1 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair ground short circuit in harness between TCM and transmission harness connector.**Connector & terminal****(B54) No. 2 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair ground short circuit in harness between TCM and transmission harness connector.**Connector & terminal****(B54) No. 3 — Chassis ground:****CHECK** : Is the resistance more than 1 M Ω ?**YES** : Go to next **CHECK** .**NO** : Repair ground short circuit in harness between TCM and transmission harness connector.

Connector & terminal
(B54) No. 4 — Chassis ground:

- CHECK** : Is the resistance more than 1 M Ω ?
YES : Go to step 10BI25.
NO : Repair ground short circuit in harness between TCM and transmission harness connector.



10BI25 CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

Connector & terminal
(T3) No. 3 — No. 4

- CHECK** : ● Is the resistance less than 1 Ω in "P" position?
 ● Is the resistance more than 1 M Ω in other positions?
YES : Go to next **CHECK** .
NO : Go to **CHECK1** .

Connector & terminal
(T3) No. 2 — No. 4

- CHECK** : ● Is the resistance less than 1 Ω in "R" position?
 ● Is the resistance more than 1 M Ω in other positions?
YES : Go to next **CHECK** .
NO : Go to **CHECK1** .

Connector & terminal
(T3) No. 1 — No. 4

- CHECK** : ● Is the resistance less than 1 Ω in "N" position?
 ● Is the resistance more than 1 M Ω in other positions?
YES : Go to next **CHECK** .
NO : Go to **CHECK1** .

Connector & terminal
(T3) No. 8 — No. 4

- CHECK** : ● Is the resistance less than 1 Ω in "D" position?
 ● Is the resistance more than 1 M Ω in other positions?
YES : Go to next **CHECK** .
NO : Go to **CHECK1** .

Connector & terminal**(T3) No. 7 — No. 4**

- CHECK** : ● *Is the resistance less than 1 Ω in "3" position?*
● *Is the resistance more than 1 M Ω in other positions?*

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

Connector & terminal**(T3) No. 6 — No. 4**

- CHECK** : ● *Is the resistance less than 1 Ω in "2" position?*
● *Is the resistance more than 1 M Ω in other positions?*

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

Connector & terminal**(T3) No. 5 — No. 4**

- CHECK** : ● *Is the resistance less than 1 Ω in "1" position?*
● *Is the resistance more than 1 M Ω in other positions?*

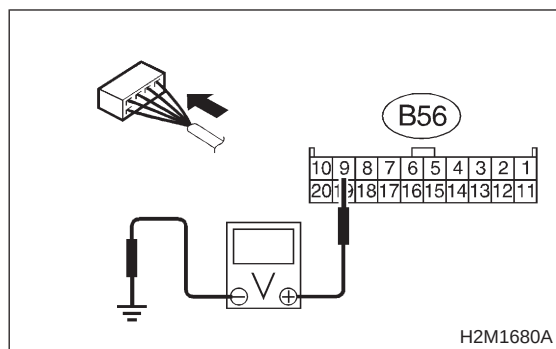
YES : Go to step 10BI26.

NO : Go to **CHECK1** .

CHECK1 : *Is there faulty connection in the selector cable?*

YES : Repair connection of selector cable.

NO : Replace inhibitor switch.



10BI26	CHECK INPUT SIGNAL FOR TCM.

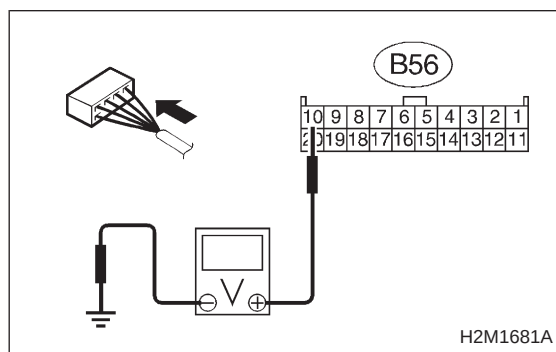
- 1) Turn ignition switch to OFF.
- 2) Connect connector to TCM and transmission.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between TCM and chassis ground.

Connector & terminal**(B56) No. 9 (+) — Chassis ground (-):**

CHECK : ● Is the voltage less than 1 V in “P” and “N” positions?
 ● Is the voltage more than 8 V in other positions?

YES : Go to step 10BI27.

NO : Go to step 10BI33.



10BI27	CHECK INPUT SIGNAL FOR TCM.

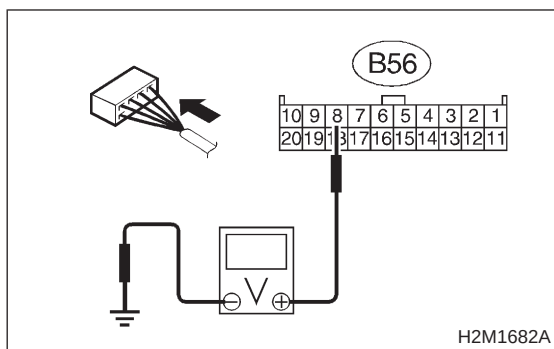
Measure voltage between TCM and chassis ground.

Connector & terminal**(B56) No. 10 (+) — Chassis ground (-):**

CHECK : ● Is the voltage less than 1 V in “R” position?
 ● Is the voltage more than 6 V in other positions?

YES : Go to step 10BI28.

NO : Go to step 10BI33.

**10BI28 CHECK INPUT SIGNAL FOR TCM.**

Measure voltage between TCM and chassis ground.

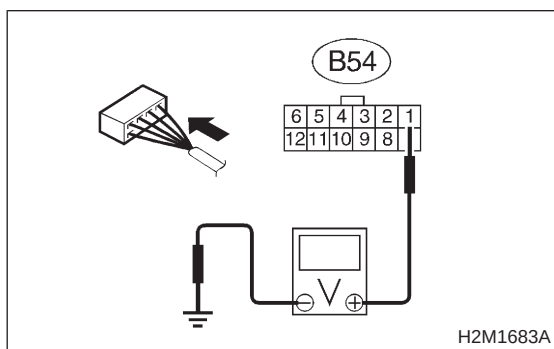
Connector & terminal

(B56) No. 8 (+) — Chassis ground (–):

CHECK : ● Is the voltage less than 1 V in “N” and “P” positions?
● Is the voltage more than 8 V in other positions?

YES : Go to step 10BI29.

NO : Go to step 10BI33.

**10BI29 CHECK INPUT SIGNAL FOR TCM.**

Measure voltage between TCM and chassis ground.

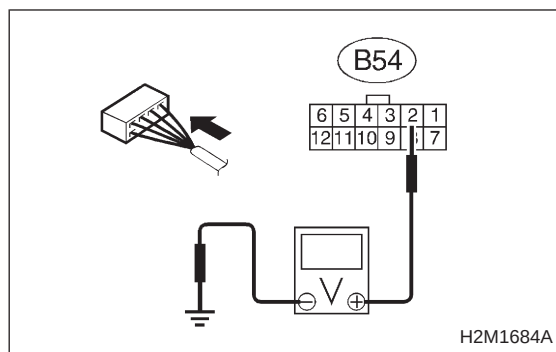
Connector & terminal

(B54) No. 1 (+) — Chassis ground (–):

CHECK : ● Is the voltage less than 1 V in “D” position?
● Is the voltage more than 6 V in other positions?

YES : Go to step 10BI30.

NO : Go to step 10BI33.

**10BI30 CHECK INPUT SIGNAL FOR TCM.**

Measure voltage between TCM and chassis ground.

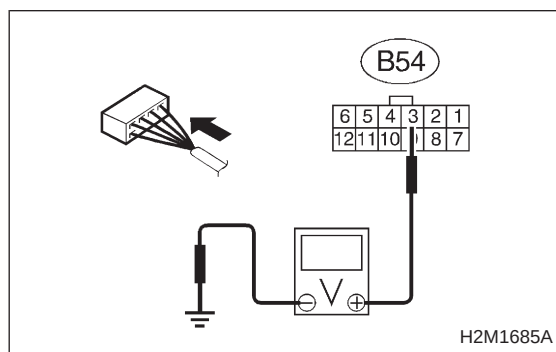
Connector & terminal

(B54) No. 2 (+) — Chassis ground (–):

CHECK : ● Is the voltage less than 1 V in “3” position?
 ● Is the voltage more than 6 V in other positions?

YES : Go to step 10BI31.

NO : Go to step 10BI33.

**10BI31 CHECK INPUT SIGNAL FOR TCM.**

Measure voltage between TCM and chassis ground.

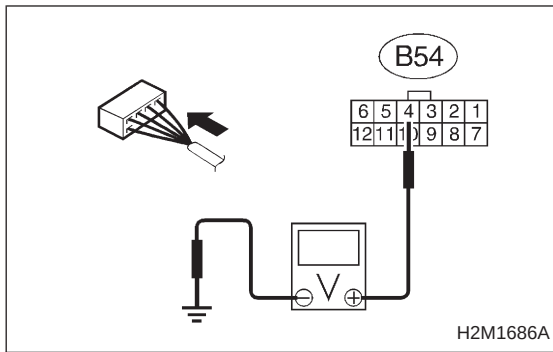
Connector & terminal

(B54) No. 3 (+) — Chassis ground (–):

CHECK : ● Is the voltage less than 1 V in “2” position?
 ● Is the voltage more than 6 V in other positions?

YES : Go to step 10BI32.

NO : Go to step 10BI33.

**10BI32 CHECK INPUT SIGNAL FOR TCM.**

Measure voltage between TCM and chassis ground.

Connector & terminal

(B54) No. 4 (+) — Chassis ground (-):

CHECK : ● *Is the voltage less than 1 V in “1” position?*
● *Is the voltage more than 6 V in other positions?*

YES : Repair poor contact in TCM connector.

NO : Go to step **10BI33**.

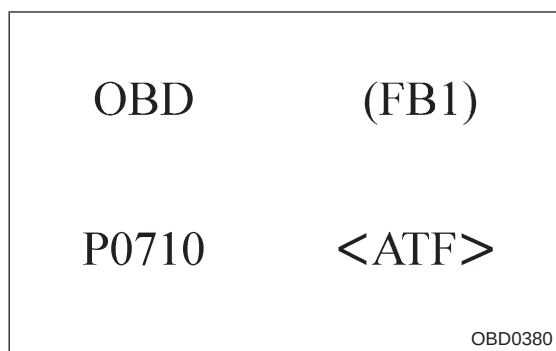
10BI33 CHECK POOR CONTACT.

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.

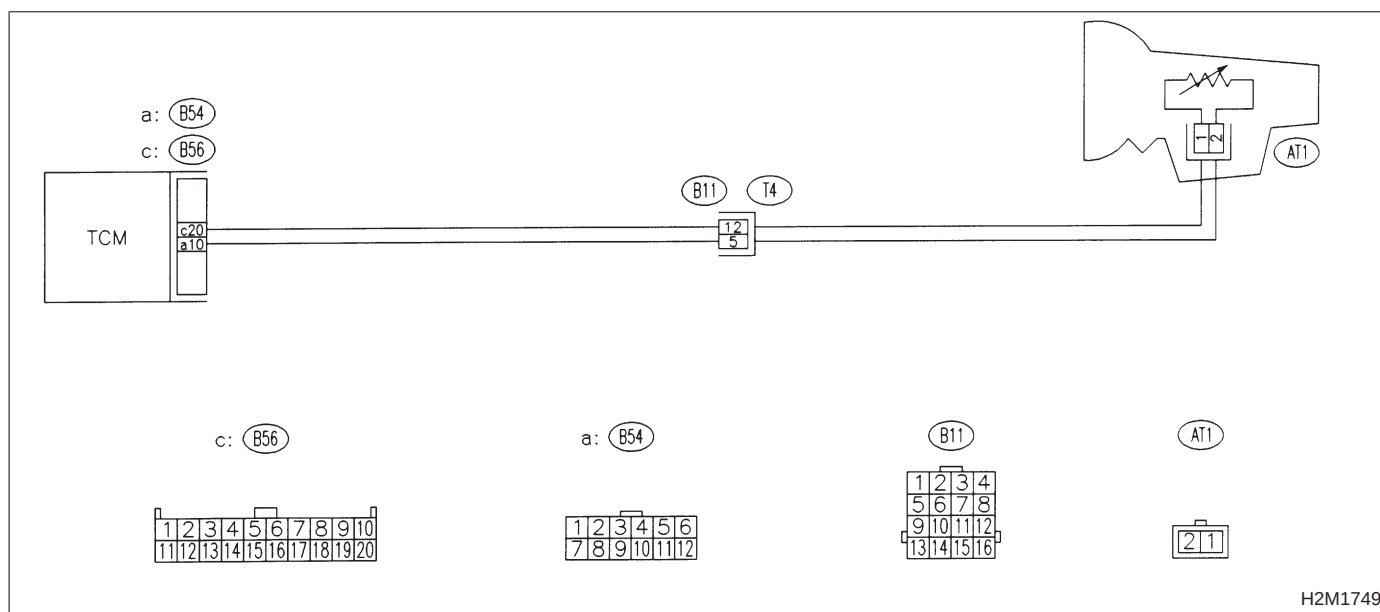
NO : Replace TCM.

**BJ: 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

WIRING DIAGRAM:**CAUTION:**

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

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

10BJ1	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.

OBD (FB1)

P0720 <ATVSP>

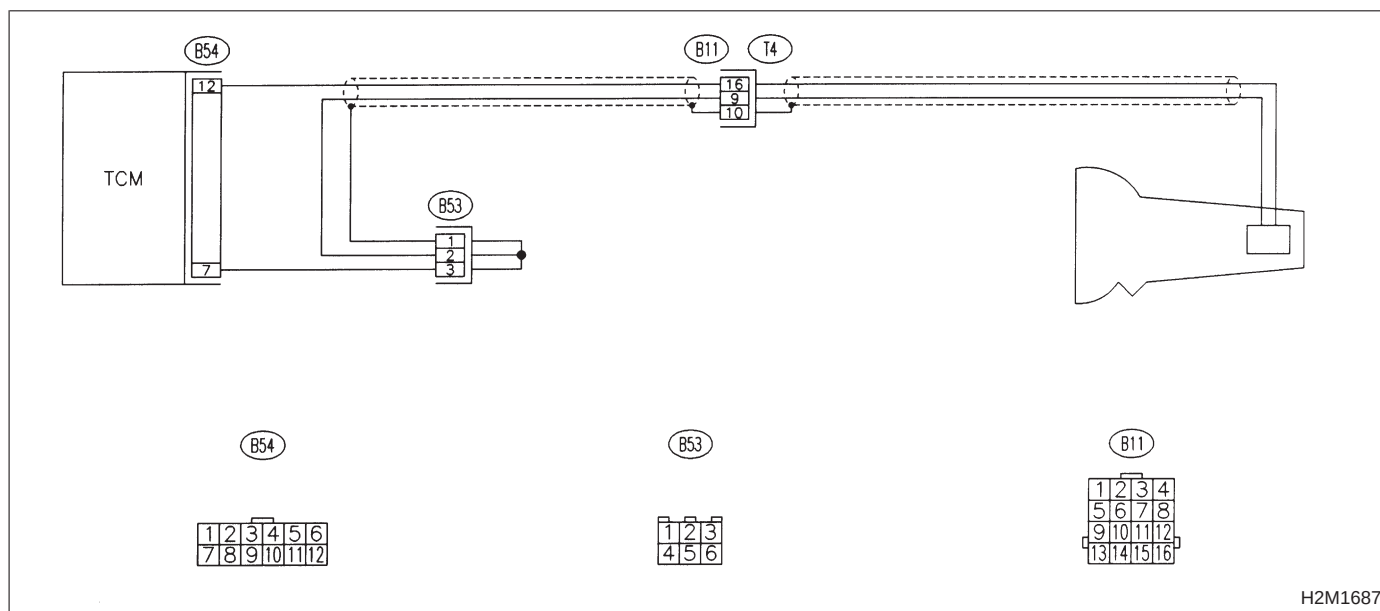
OBD0392

BK: 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”

WIRING DIAGRAM:

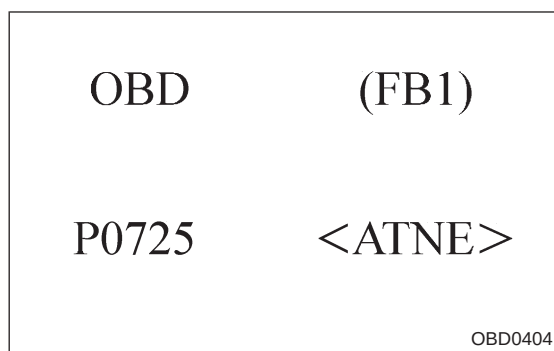
H2M1687

CAUTION:

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

10BK1	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.



BL: DTC P0725 **— ENGINE SPEED INPUT CIRCUIT** **MALFUNCTION —**

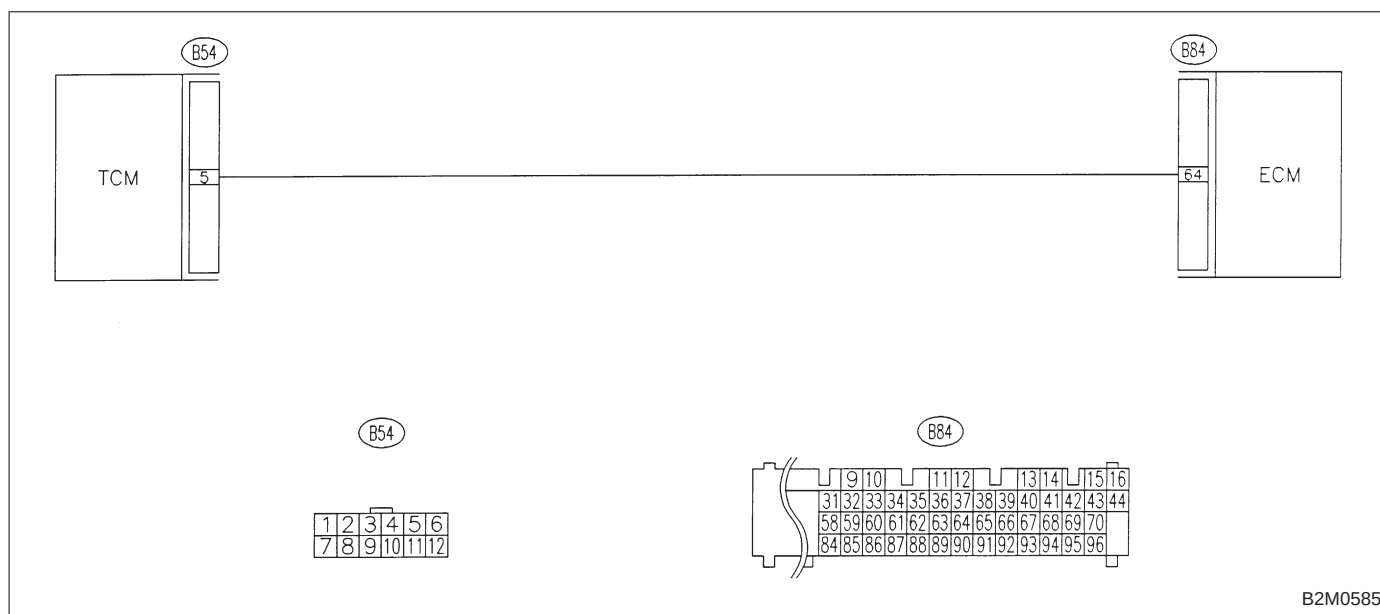
DTC DETECTING CONDITION:

- 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".

WIRING DIAGRAM:



CAUTION:

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

10BL1	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.

OBD (FB1)

P0731 <ATGR1>

B2M0657

BM: DTC P0731

— GEAR 1 INCORRECT RATIO —

OBD (FB1)

P0732 <ATGR2>

B2M0658

BN: DTC P0732

— GEAR 2 INCORRECT RATIO —

OBD (FB1)

P0733 <ATGR3>

B2M0659

BO: DTC P0733

— GEAR 3 INCORRECT RATIO —

OBD (FB1)

P0734 <ATGR4>

B2M0660

BP: DTC P0734

— GEAR 4 INCORRECT RATIO —

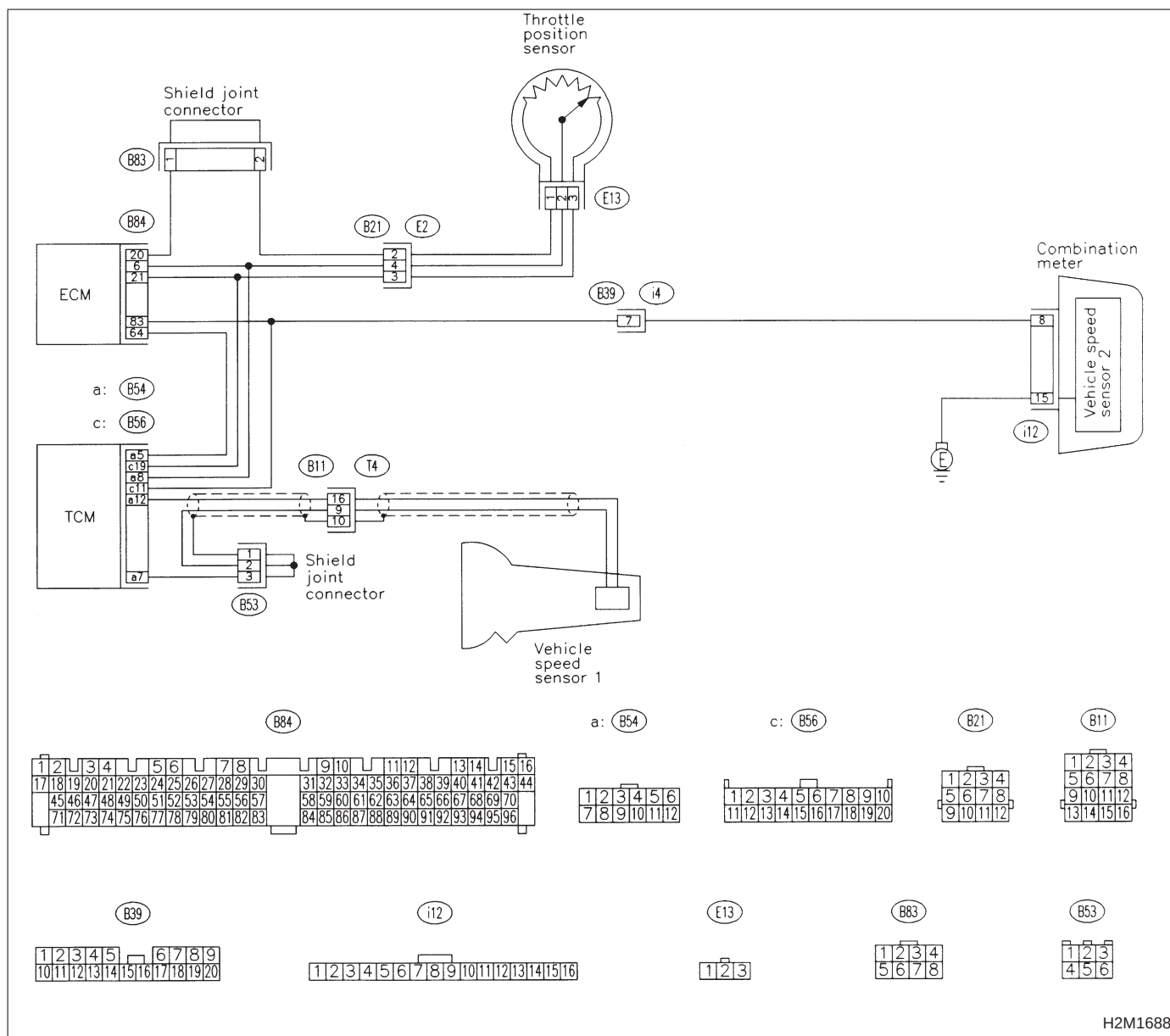
DTC DETECTING CONDITION:

- 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”

WIRING DIAGRAM:



H2M1688

10BP1	CHECK ANY OTHER DTC (BESIDES DTC P0731, P0732, P0733, P0734) 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 10BP2.

10BP2**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 **10BP3**.

10BP3**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 **10BP4**.

10BP4**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 **10BP5**.

10BP5**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 **10BP6**.

10BP6**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 **10BP7**.

10BP7**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.

OBD (FB1)

P0740 <ATLU_F>

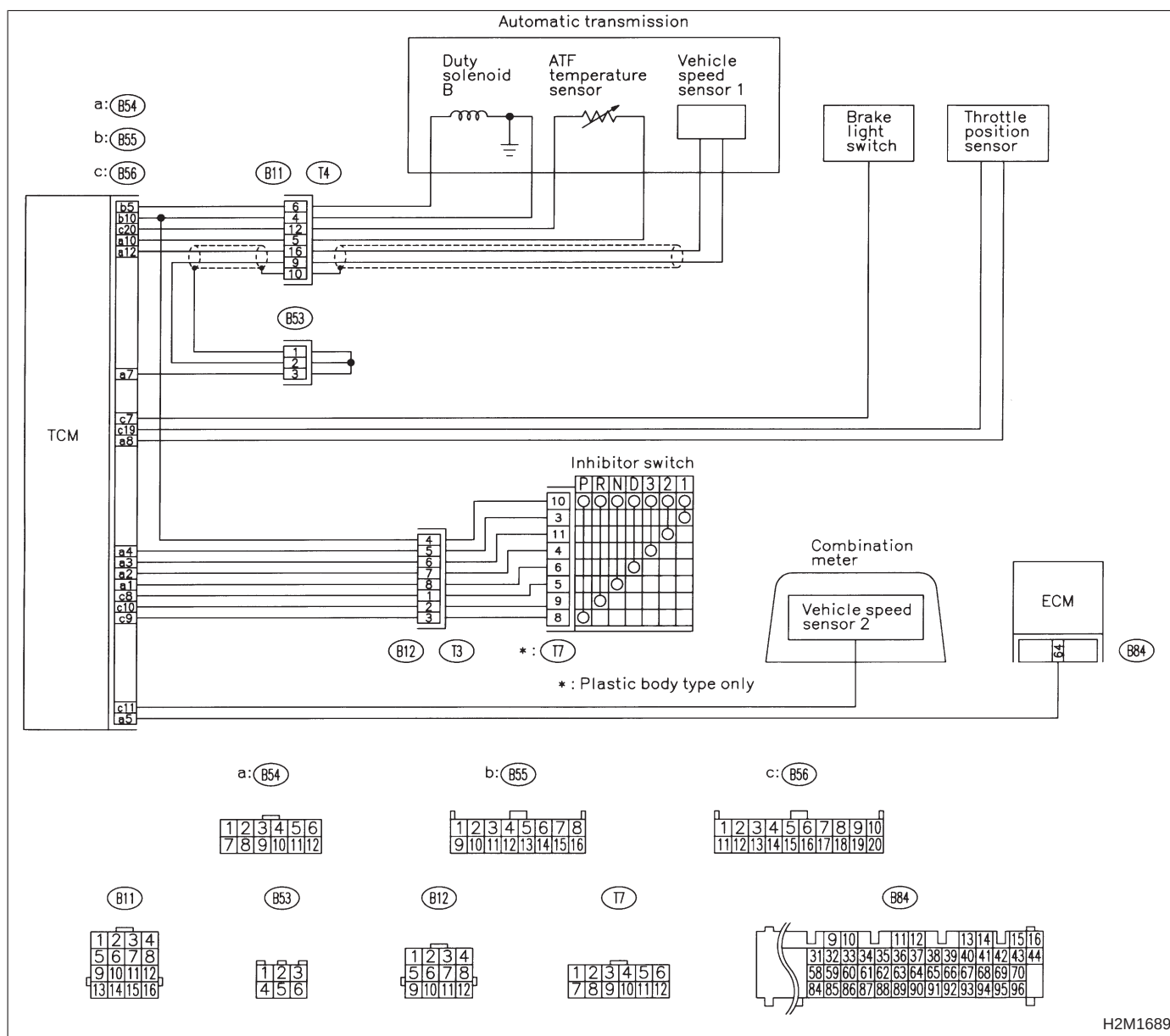
B2M0661

**BQ: DTC P0740
— TORQUE CONVERTER CLUTCH SYSTEM
MALFUNCTION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)
- No shift or excessive tight corner “braking”

WIRING DIAGRAM:

H2M1689

CAUTION:

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

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

10BQ1	CHECK ANY OTHER DTC (BESIDES DTC P0740) 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 **10BQ2**.

10BQ2	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 **10BQ3**.

10BQ3	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 **10BQ4**.

10BQ4	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 **10BQ5**.

10BQ5**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 **10BQ6**.

10BQ6**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 **10BQ7**.

10BQ7**CHECK INHIBITOR SWITCH CIRCUIT.**

Check inhibitor switch circuit. <Ref. to 2-7 [T10BI0].>

CHECK : *Is there any trouble in inhibitor switch circuit?*

YES : Repair or replace inhibitor switch circuit.

NO : Go to step **10BQ8**.

10BQ8**CHECK BRAKE LIGHT SWITCH CIRCUIT.**

Check brake light switch circuit. <Ref. to 2-7 [T10BH0].>

CHECK : *Is there any trouble in brake light switch circuit?*

YES : Repair or replace brake light switch circuit.

NO : Go to step **10BQ9**.

10BQ9**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 **10BQ10**.

10BQ10**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 **10BQ11**.

10BQ11**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.

OBD (FB1)
P0743 <ATLU>

B2M0662

BR: DTC P0743 — TORQUE CONVERTER CLUTCH SYSTEM (DUTY SOLENOID B) ELECTRICAL —

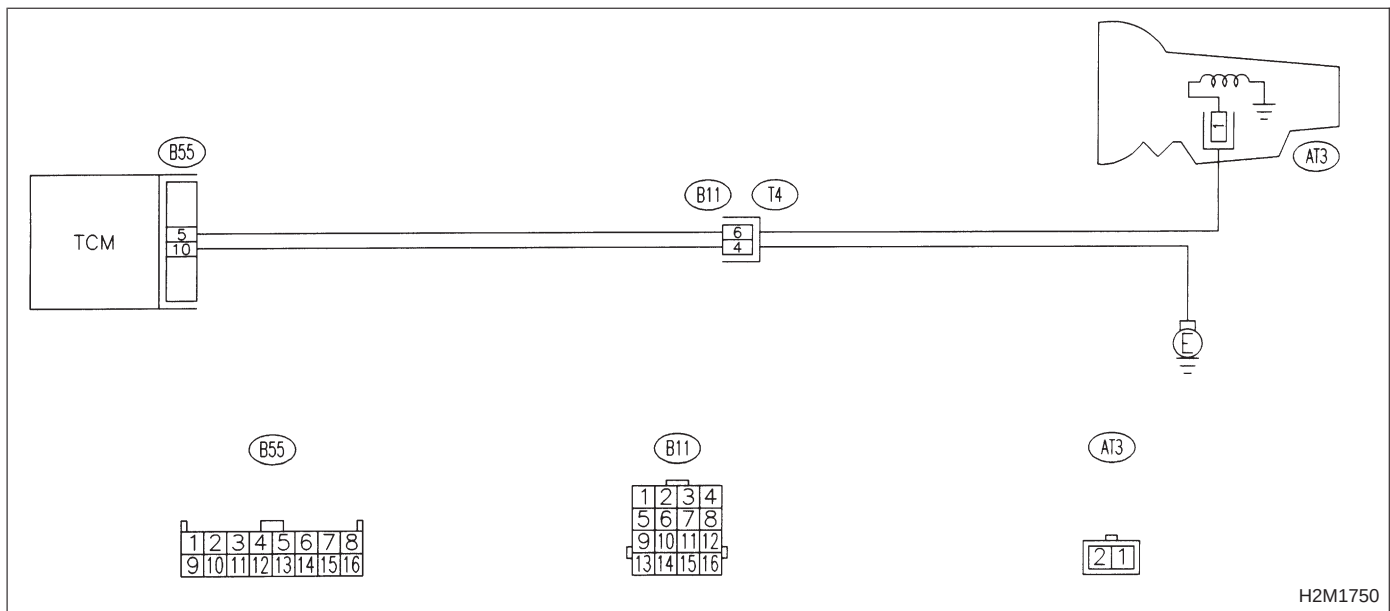
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)

WIRING DIAGRAM:



H2M1750

CAUTION:

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

10BR1 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.

OBD (FB1)
P0748 <ATPL>

B2M0663

BS: DTC P0748
— PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL —

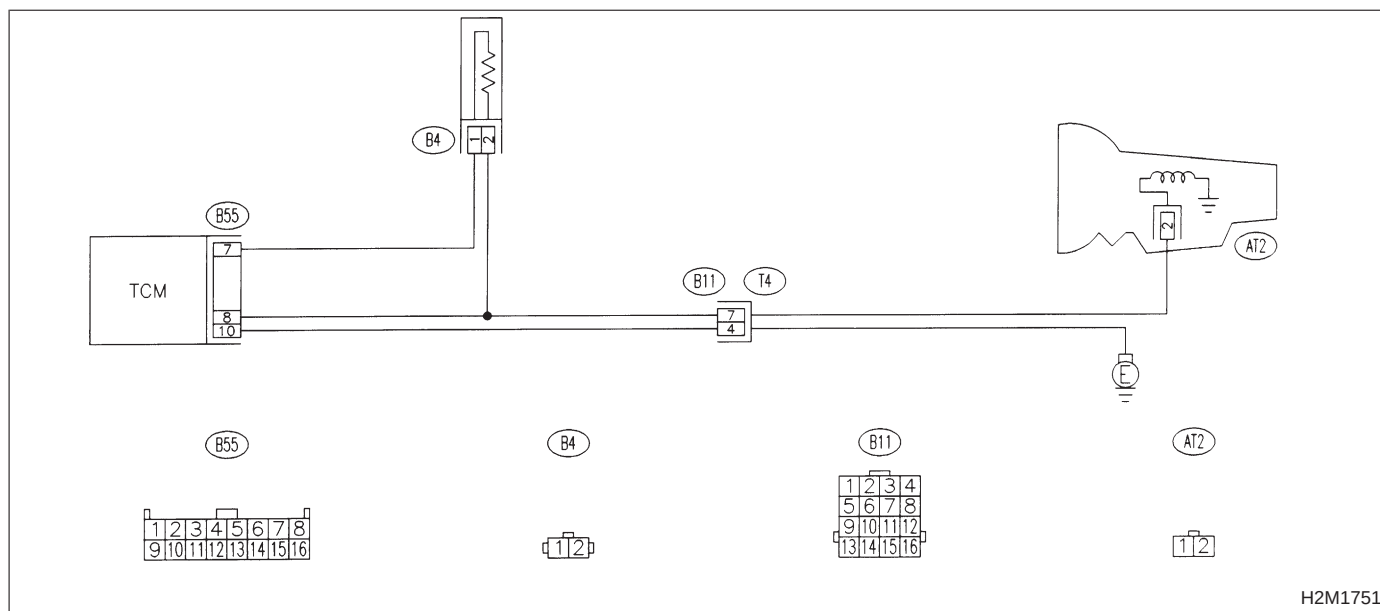
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Excessive shift shock

WIRING DIAGRAM:



H2M1751

CAUTION:

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

10BS1 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.

OBD (FB1)

P0753 <ATSFT1>

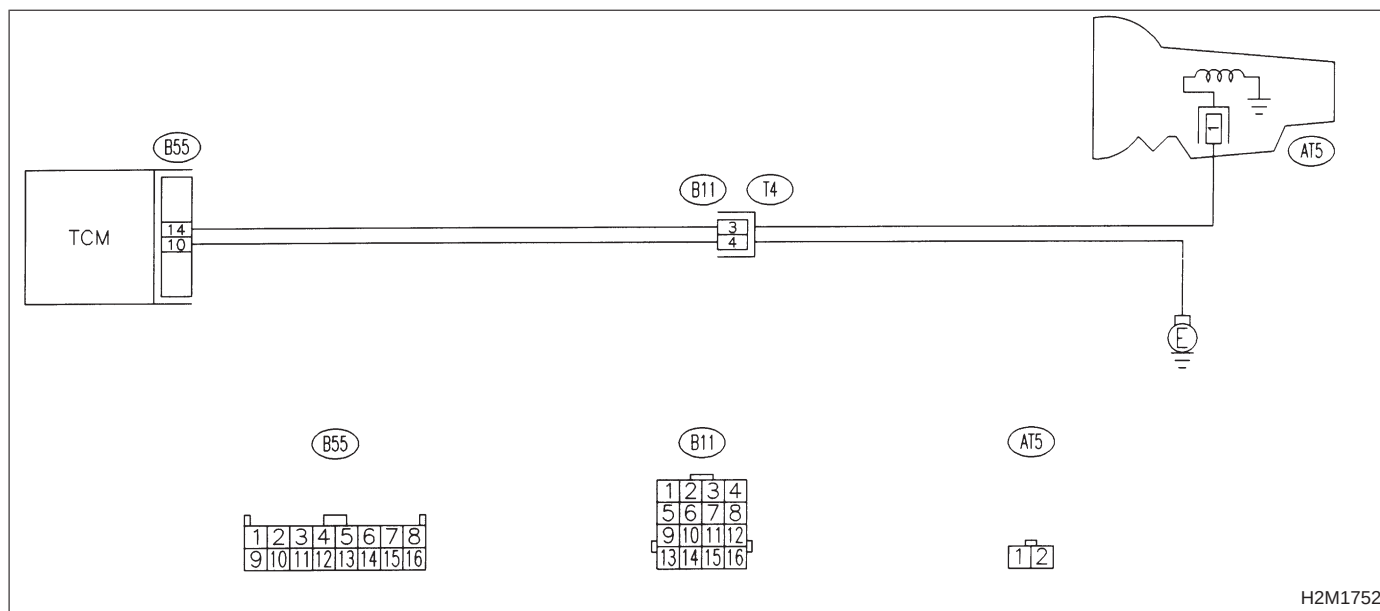
B2M0664

BT: DTC P0753**— SHIFT SOLENOID A (SHIFT SOLENOID 1) ELECTRICAL —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No shift

WIRING DIAGRAM:

H2M1752

CAUTION:

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

10BT1**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.

OBD (FB1)

P0758 <ATSFT2>

B2M0665

BU: DTC P0758 — SHIFT SOLENOID B (SHIFT SOLENOID 2) ELECTRICAL —

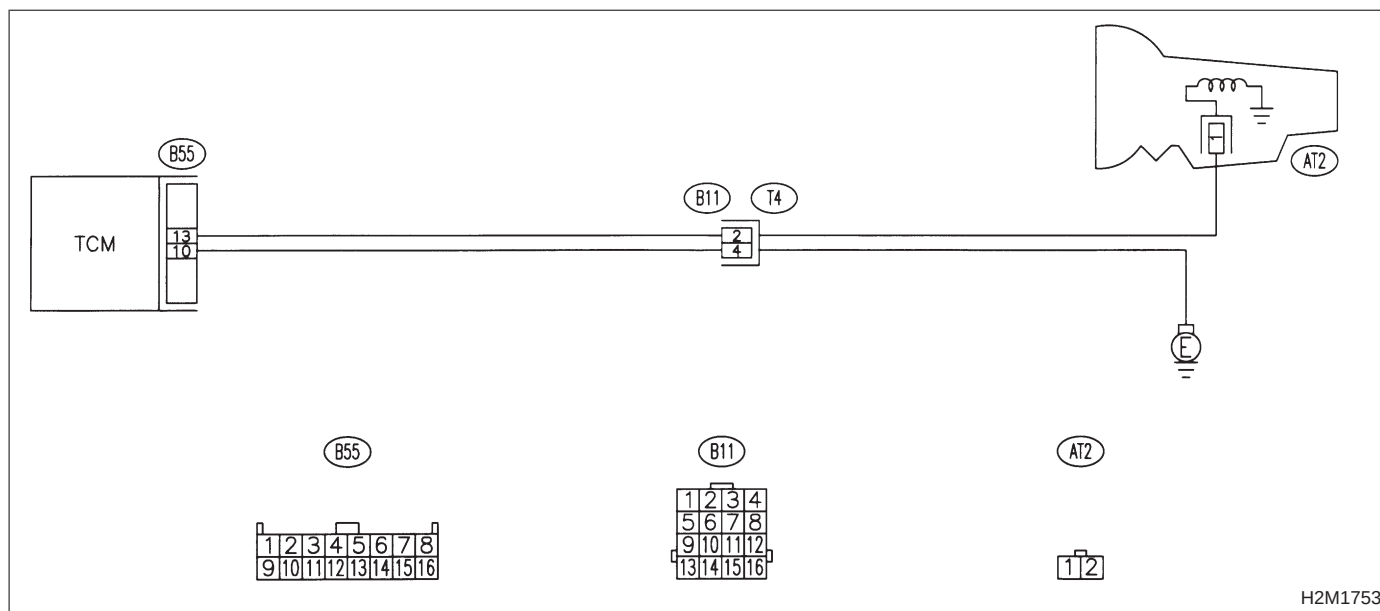
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- No shift

WIRING DIAGRAM:



CAUTION:

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

10BU1	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.

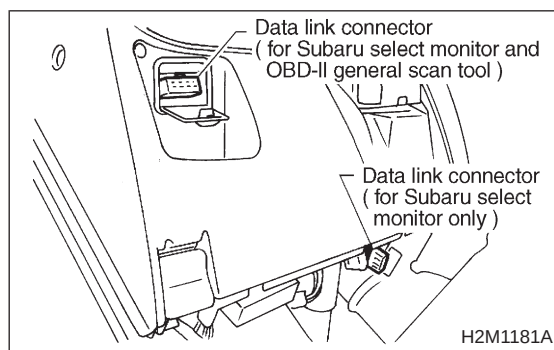
10BV2 CHECK INHIBITOR SWITCH CIRCUIT.

Check inhibitor switch circuit. <Ref. to 2-7 [T10BI0].>

CHECK : *Is there any trouble in inhibitor switch circuit?*

YES : Repair or replace inhibitor switch circuit.

NO : Go to step **10BV3**.

**10BV3 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) Select AT mode using function key.

Press the function key [/], and change to AT mode.

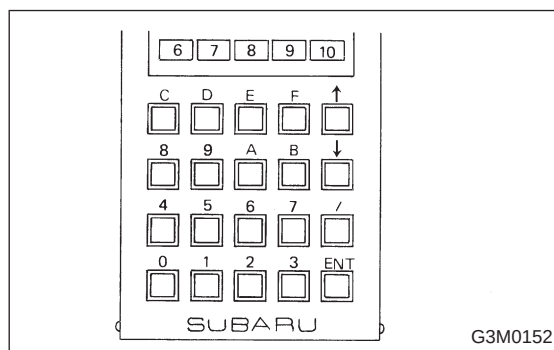
- 7) Press the function key [0].

SELECT SYSTEM
EGi Y : 0 , N : /



SELECT SYSTEM
AT Y : 0 , N : /

H2M1150



- 8) Designate mode using function key.

Function mode for AT: F10

GEAR (F10)

1 st

OBD0615

- 9) Move selector lever to "D" and drive the vehicle.

- 10) Read data on Subaru select monitor.

CHECK : *Does gear position change according to throttle position and vehicle speed?*

YES : Go to step **10BV4**.

NO : Go to step **10BV6**.

10BV4	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 **10BV5**.

10BV5	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.

10BV6	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 **10BV7**.

10BV7	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 **10BV8**.

10BV8	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 **10BV9**.

10BV9	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 **10BV10**.

10BV10	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.

OBD (FB1)
P0763 <ATOVR>

B2M0667

BW: DTC P0763 — SHIFT SOLENOID C (SHIFT SOLENOID 3) ELECTRICAL —

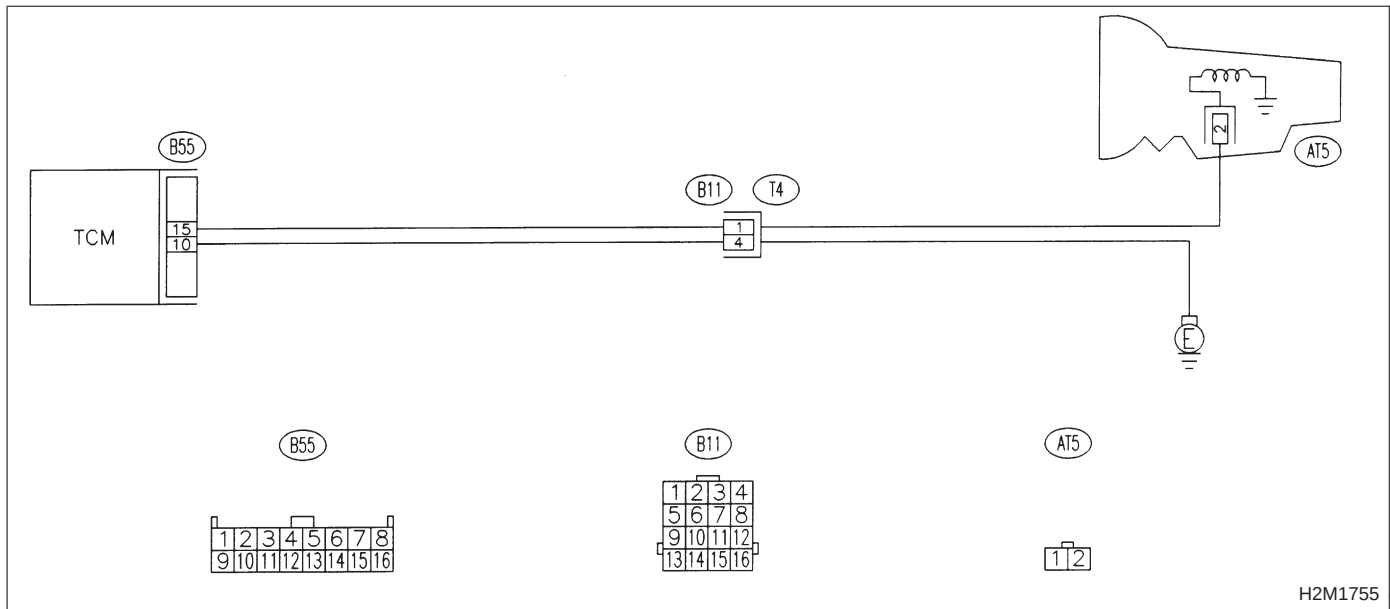
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in "3"

WIRING DIAGRAM:



H2M1755

CAUTION:

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

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

10BW1	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.

OBD (FB1)

P1100 <ST_SWOFF>

B2M1113

BX: DTC P1100**— STARTER SWITCH CIRCUIT LOW INPUT**

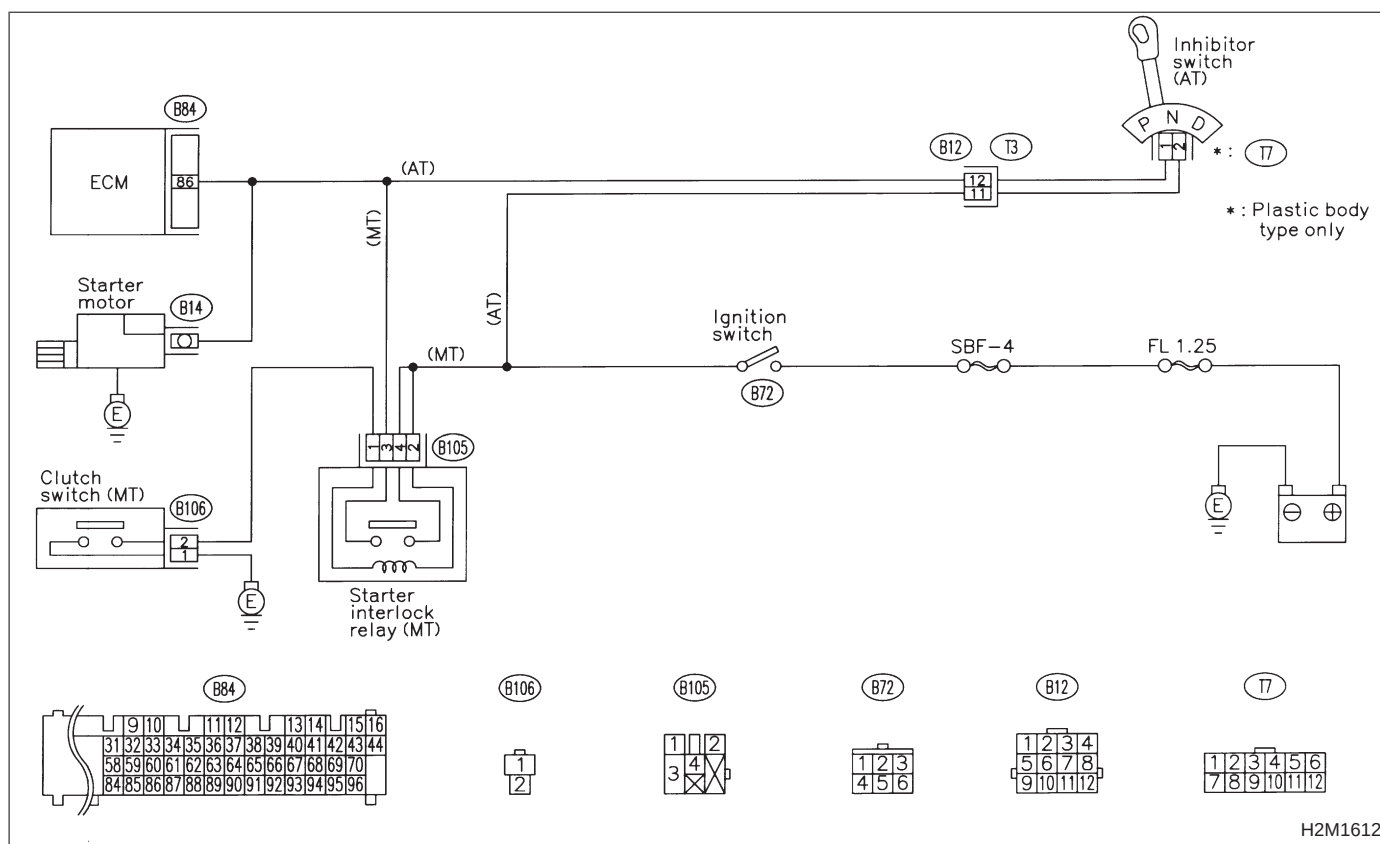
—

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Failure of engine to start

WIRING DIAGRAM:

H2M1612

CAUTION:

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

10BX1**CHECK OPERATION OF STARTER MOTOR.****CHECK****: Does starter motor operate when ignition switch to "ST"?**

NOTE:

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

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].>**

OBD

(FB1)

P1101

<N_SW>

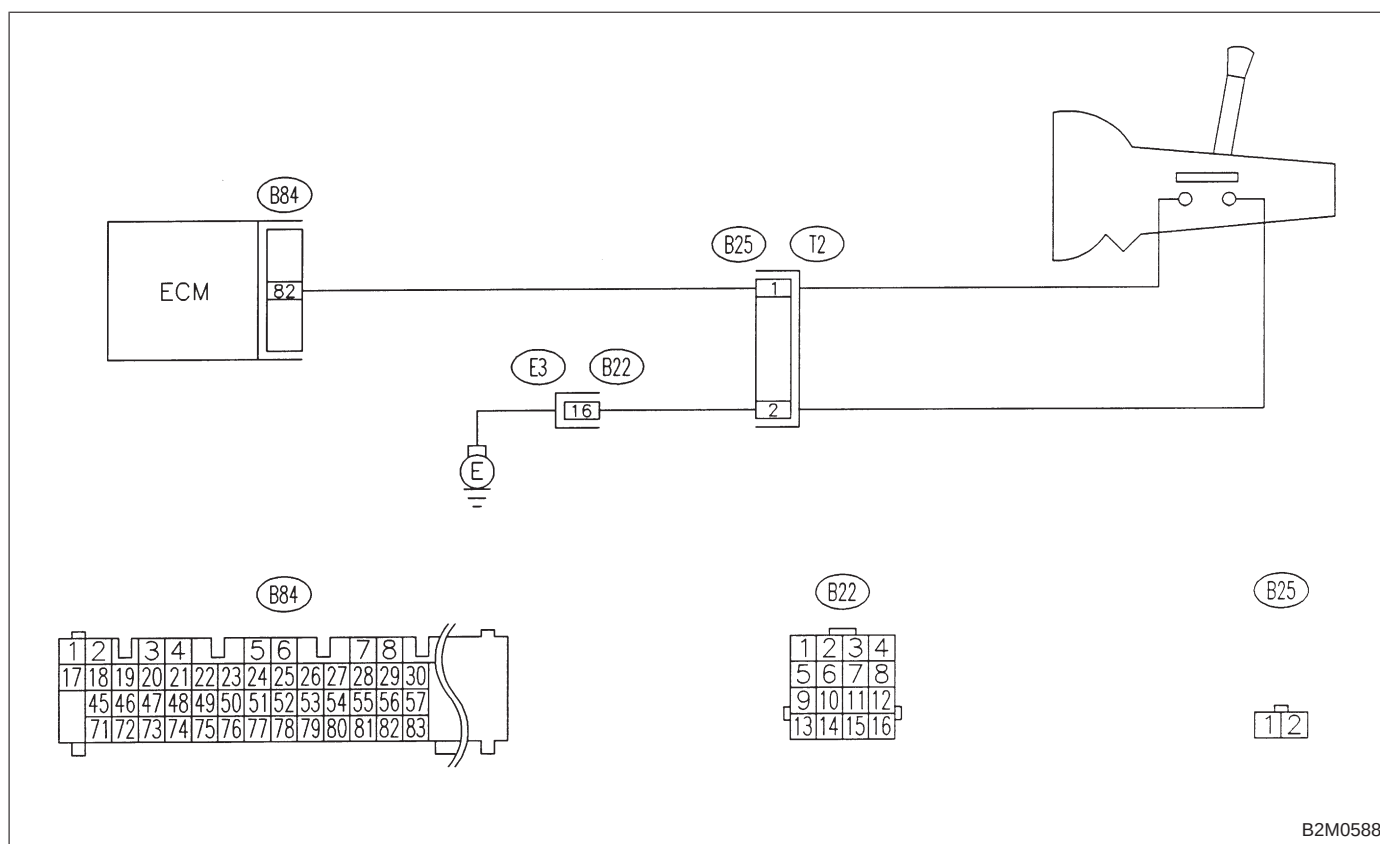
B2M1114

BY: DTC P1101**— NEUTRAL POSITION SWITCH CIRCUIT
MALFUNCTION [MT VEHICLES] —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

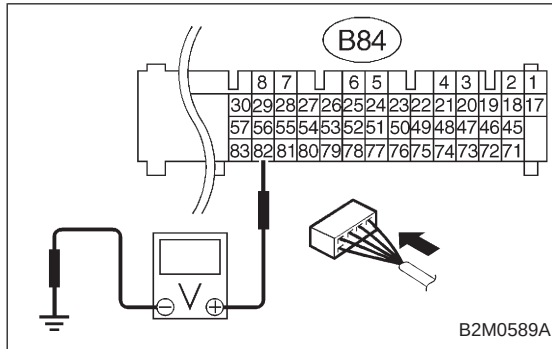
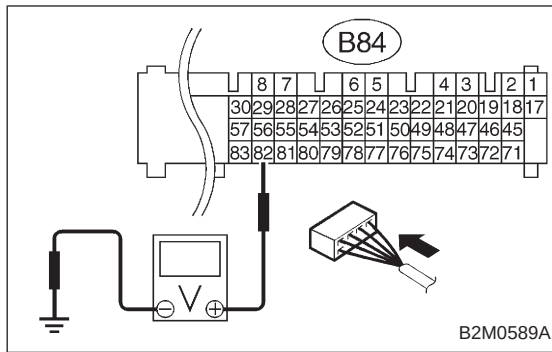
- Erroneous idling

WIRING DIAGRAM:

B2M0588

CAUTION:

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

**10BY1 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 next step 3).****(NO) : Go to step 10BY3.**

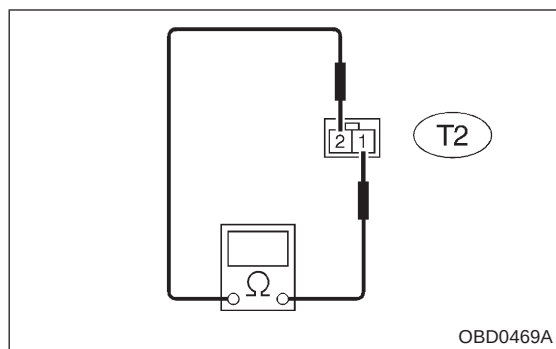
- 3) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 82 (+) — Chassis ground (-):****(CHECK) : Is the voltage less than 1 V in other positions?****(YES) : Go to step 10BY2.****(NO) : Go to step 10BY3.****10BY2 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.

**10BY3 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 M Ω in neutral position?

YES : Go to next step 4).

NO : Repair short circuit in transmission harness or replace neutral position switch.

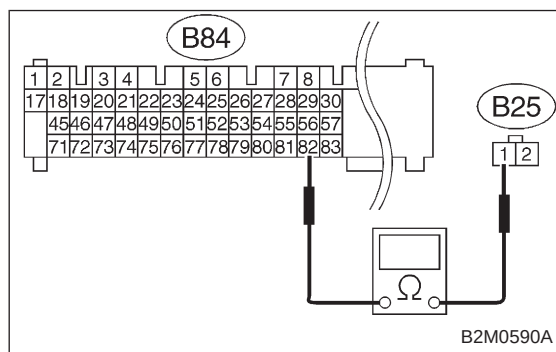
- 4) Measure resistance between transmission harness connector terminals.

Connector & terminal**(T2) No. 1 — No. 2:**

CHECK : Is the resistance less than 1 Ω in other positions?

YES : Go to step 10BY4.

NO : Repair open circuit in transmission harness or replace neutral position switch.

**10BY4 CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH.**

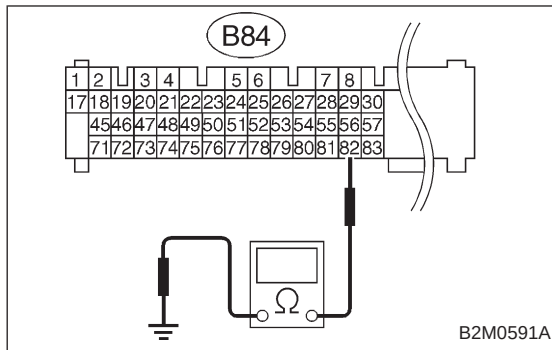
- 1) Disconnect connector from ECM.
- 2) Measure resistance of harness between ECM and transmission harness connector.

Connector & terminal**(B84) No. 82 — (B25) No. 1:**

CHECK : Is the resistance less than 1 Ω ?

YES : Go to next step 3).

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



3) Measure resistance between ECM and chassis ground.

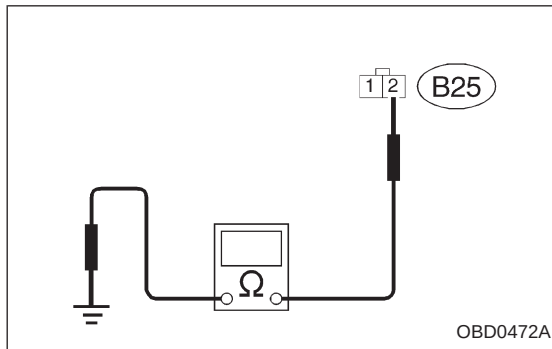
Connector & terminal

(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 next step 4).



4) 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 10BY5.

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)

10BY5	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.

OBD (FB1)

P1101 <N_SWOFF>

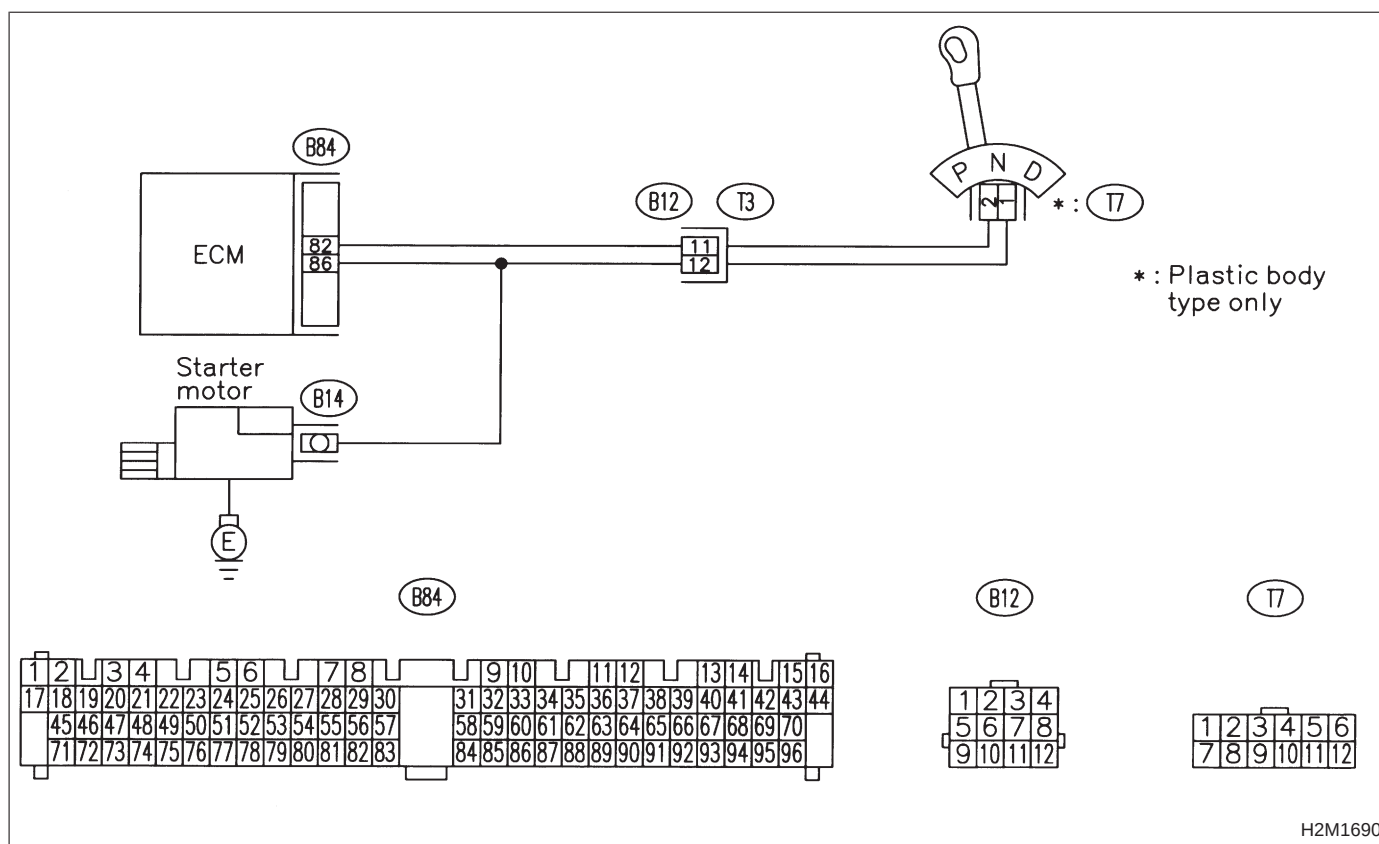
B2M1115

BZ: DTC P1101**— NEUTRAL POSITION SWITCH CIRCUIT
HIGH INPUT [AT VEHICLES] —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:**CAUTION:**

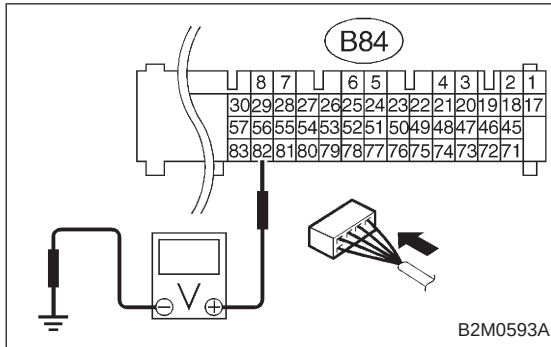
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

10BZ1 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 **10BZ2**.

**10BZ2 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 less than 1 V in "N" and "P" positions?

YES : Go to next step 3).

NO : Go to step **10BZ4**.

3) Measure voltage between ECM and chassis ground.

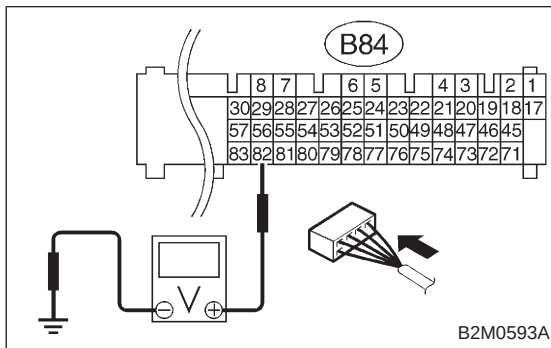
Connector & terminal

(B84) No. 82 (+) — Chassis ground (-):

CHECK : Is the voltage between 4.5 and 5.5 V in other positions?

YES : Go to step **10BZ3**.

NO : Go to step **10BZ4**.

**10BZ3 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.

10BZ4 CHECK INPUT SIGNAL FOR ECM.

Measure voltage between ECM and chassis ground.

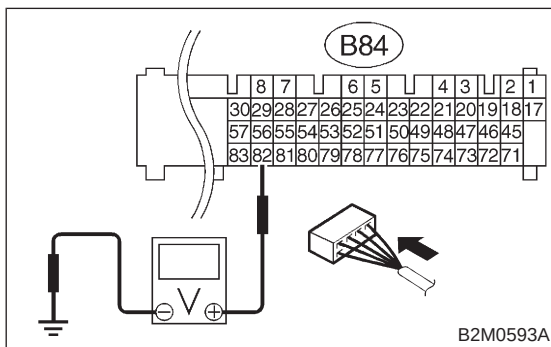
Connector & terminal

(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 **10BZ5**.

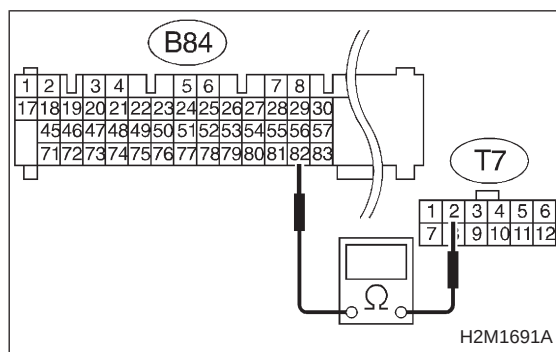


10BZ5	CHECK INHIBITOR SWITCH TYPE.

CHECK : *Is inhibitor switch type plastic body?*

YES : Go to step 10BZ6.

NO : Go to step 10BZ8.



10BZ6	CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH.

- 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?*

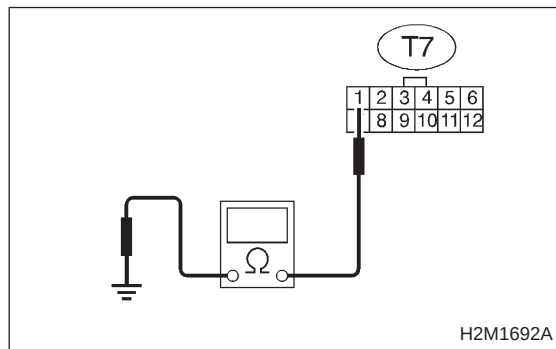
YES : Go to next step 4).

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



- 4) Measure resistance of harness between inhibitor switch connector and engine ground.

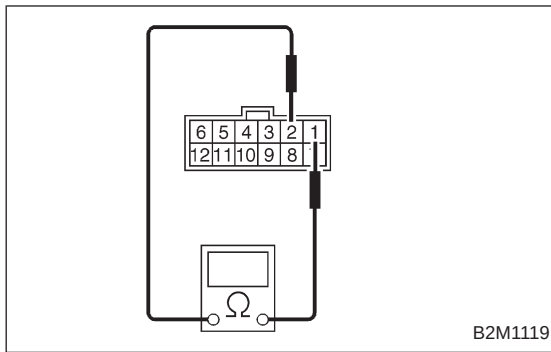
Connector & terminal

(T7) No. 1 — Engine ground:

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

YES : Go to step 10BZ7.

NO : Repair open circuit in inhibitor switch ground line.

**10BZ7 CHECK INHIBITOR SWITCH.**

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals

No. 1 — No. 2:

CHECK : Is the resistance less than 1 Ω in "N" and "P" positions?

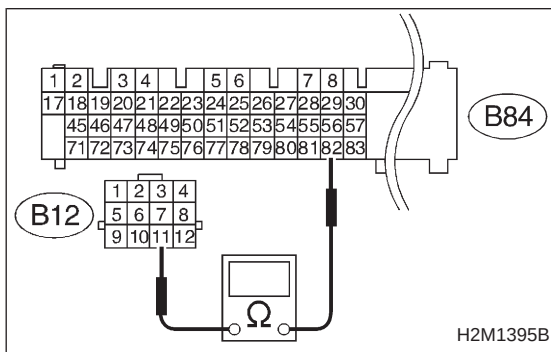
YES : Go to next **CHECK** .

NO : Replace inhibitor switch.

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.

**10BZ8 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 and transmission harness connector.

Connector & terminal

(B84) No. 82 — (B12) No. 11:

CHECK : Is the resistance less than 1 Ω ?

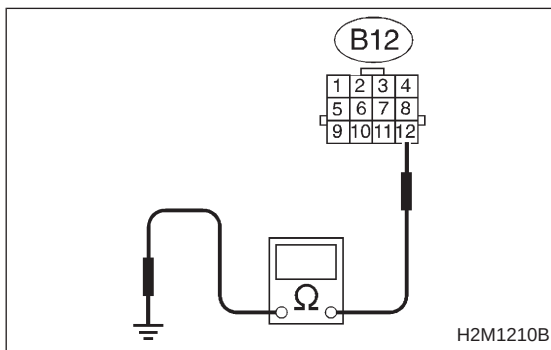
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and transmission harness connector
- Poor contact in transmission harness connector
- Poor contact in ECM connector



- 4) Measure resistance of harness between transmission harness connector and engine ground.

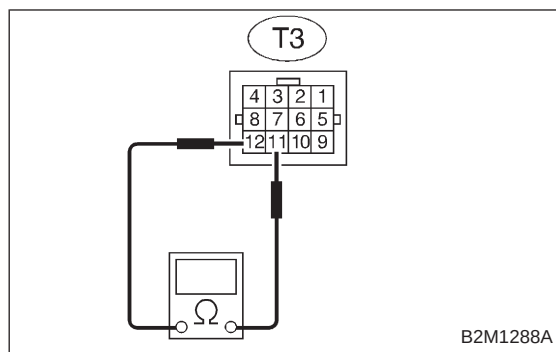
Connector & terminal

(B12) No. 12 — Engine ground:

CHECK : Is the resistance less than 5 Ω ?

YES : Go to step 10BZ9.

NO : Repair open circuit in inhibitor switch ground line.

**10BZ9****CHECK INHIBITOR SWITCH.**

Measure resistance between transmission harness connector receptacle's terminals.

Connector & terminal

(T3) No. 11 — No. 12:

CHECK : *Is the resistance less than 1 Ω in "N" and "P" positions?*

YES : Go to next **CHECK** .

NO : Replace inhibitor switch.

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.

OBD

(FB1)

P1102

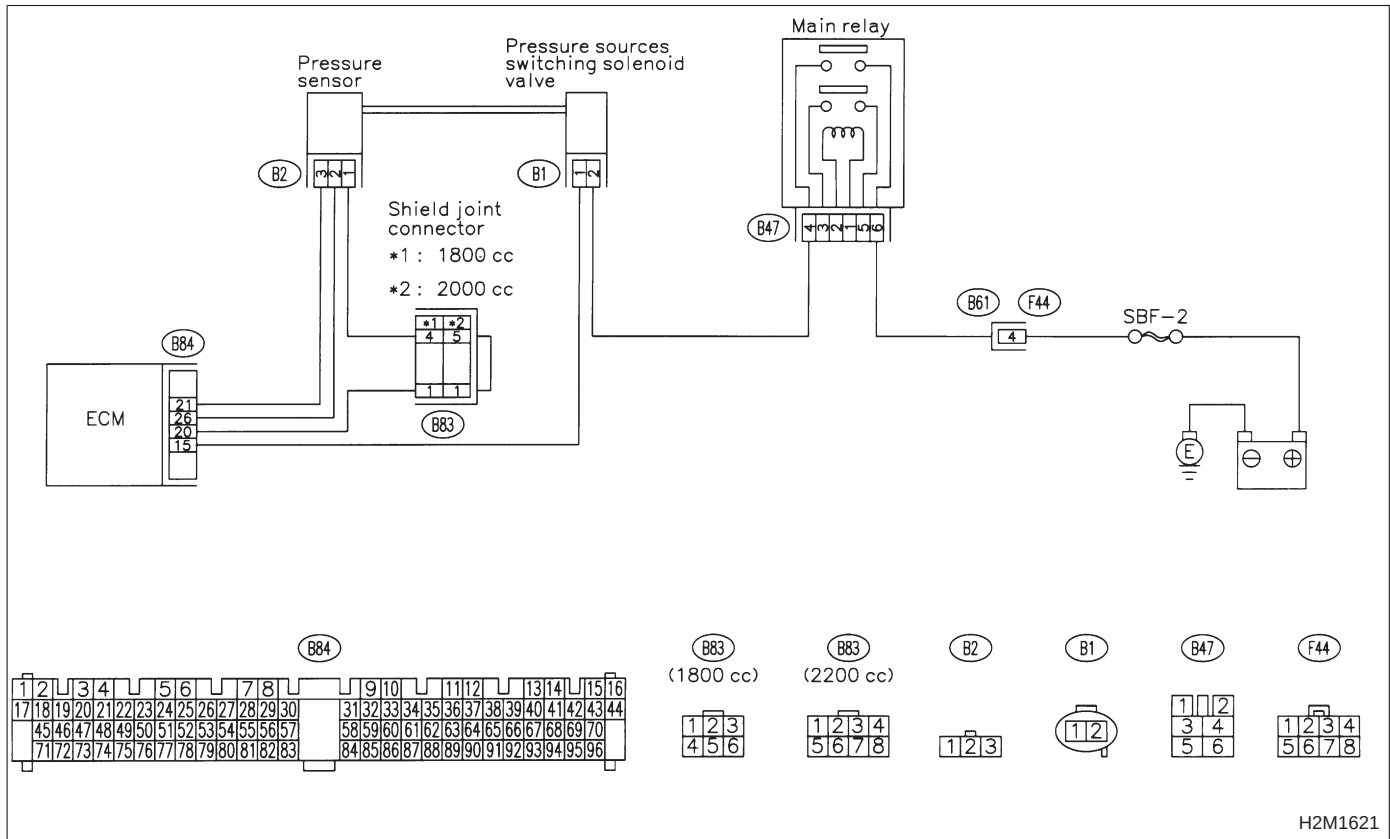
OBD0481

CA: DTC P1102**— PRESSURE SOURCES SWITCHING
SOLENOID VALVE CIRCUIT LOW INPUT —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

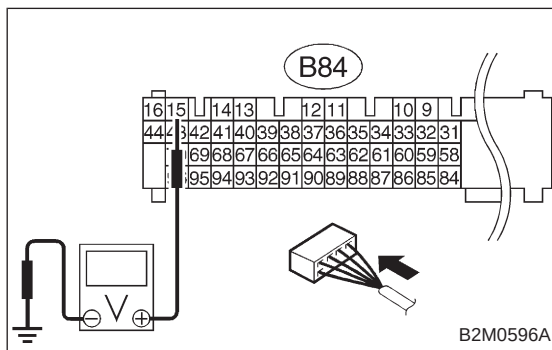
TROUBLE SYMPTOM:

- Erroneous idling
- Failure of engine to start

WIRING DIAGRAM:**CAUTION:**

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

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

**10CA1 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 10CA2.

NO : Go to step 10CA3.

10CA2 CHECK POOR CONTACT.

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

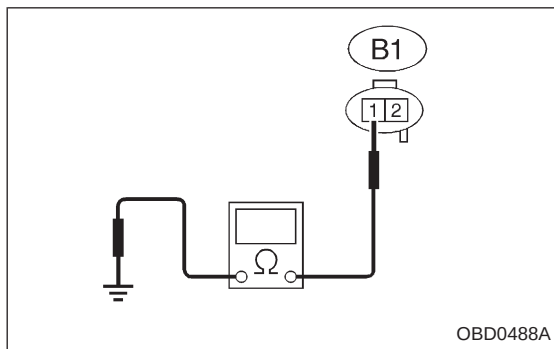
CHECK : *Is there poor contact in ECM connector?*

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.

**10CA3 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.

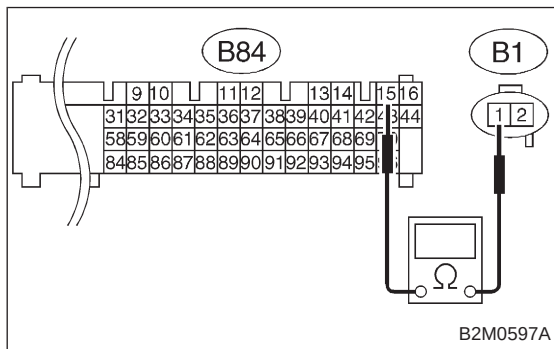
Connector & terminal

(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 next step 4).



4) 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?*

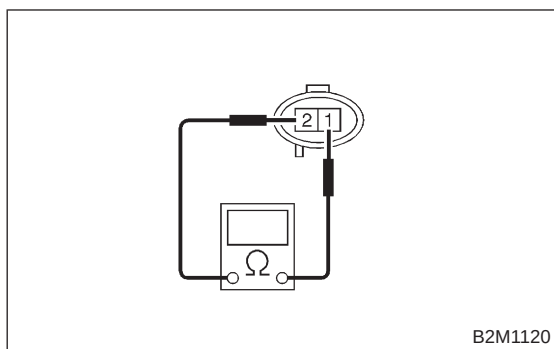
YES : Go to step 10CA4.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and pressure sources switching solenoid valve connector
- Poor contact in shield joint connector (B83)

**10CA4****CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.**

Measure resistance between pressure sources switching solenoid valve connector terminals.

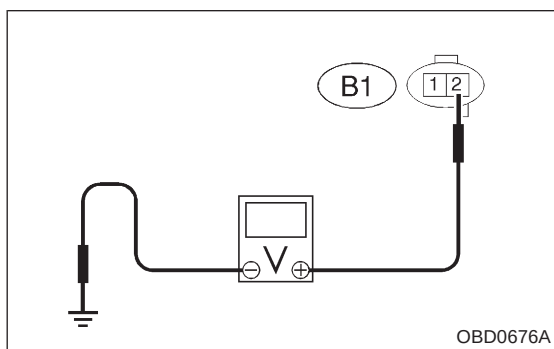
Terminals

No. 1 — No. 2:

CHECK : *Is the resistance between 10 and 100 Ω?*

YES : Go to step **10CA5**.

NO : Replace pressure sources switching solenoid valve.

**10CA5****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 **10CA6**.

NO : Repair open circuit in harness between main relay and pressure sources switching solenoid valve connector.

10CA6**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.

OBD

(FB1)

P1103

<TRQ>

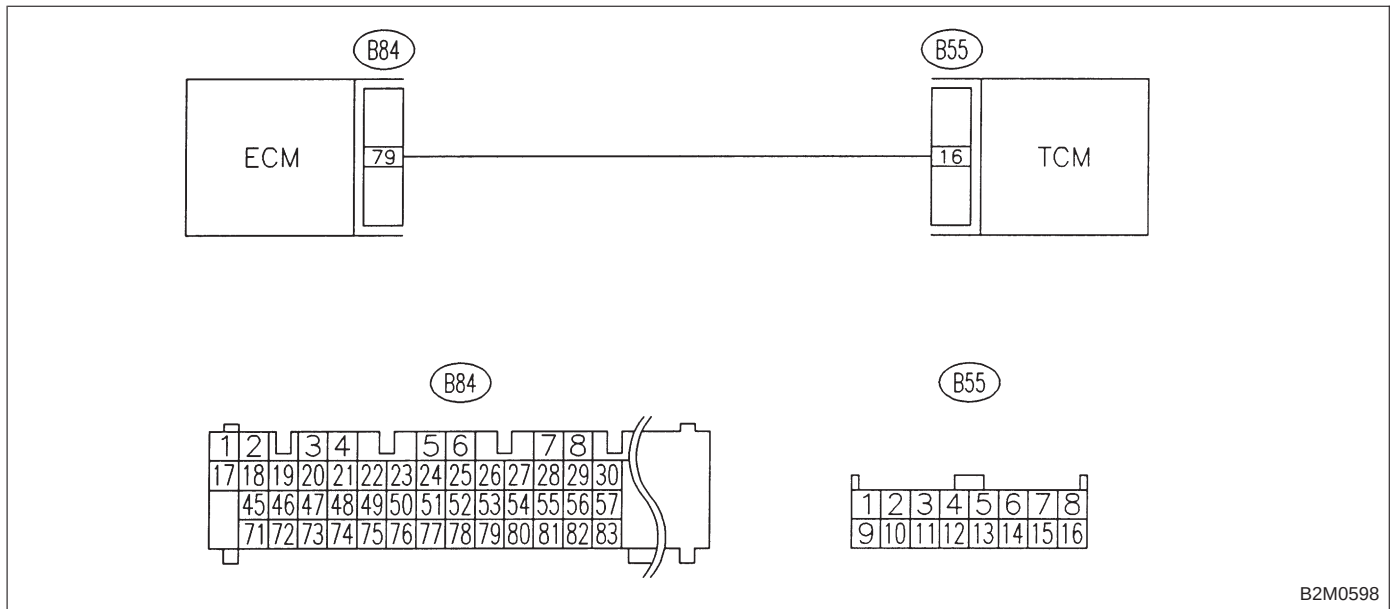
OBD0489

CB: DTC P1103**— ENGINE TORQUE CONTROL SIGNAL
CIRCUIT MALFUNCTION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Excessive shift shock

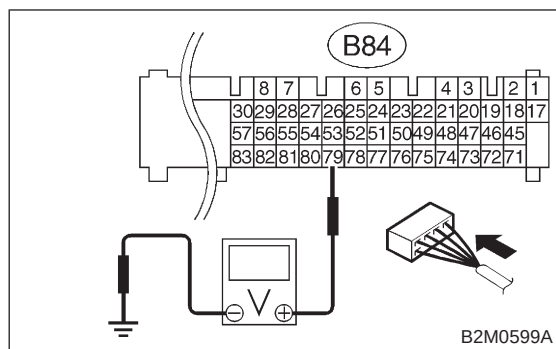
WIRING DIAGRAM:

B2M0598

CAUTION:

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

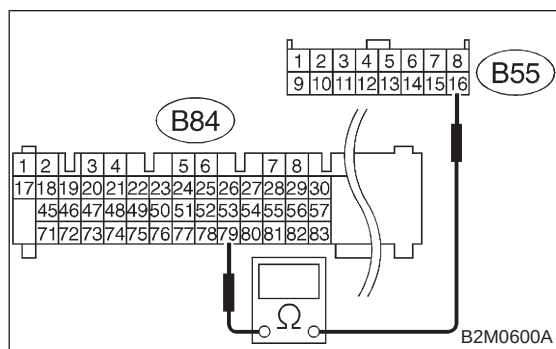
<Ref. to 2-7 [T3D0] and [T3E0].>

**10CB1 CHECK INPUT SIGNAL FOR ECM.**

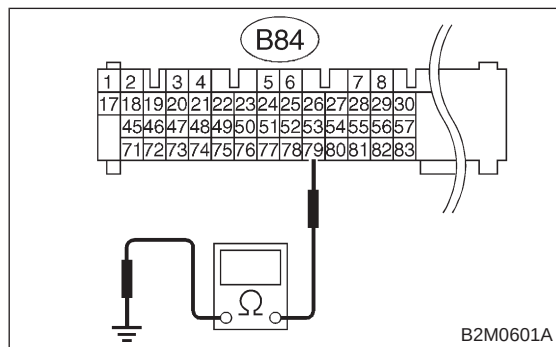
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 79 (+) — Chassis ground (-):****(CHECK) : Is the voltage more than 4.5 V?****(YES) : Go to step 10CB2.****(NO) : Go to step 10CB3.****10CB2 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.****10CB3 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 next step 4).****(NO) : Repair open circuit in harness between ECM and TCM connector.**

- 4) 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 10CB4.**

10CB4**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.

OBD (FB1)

P1120 <ST_SWON>

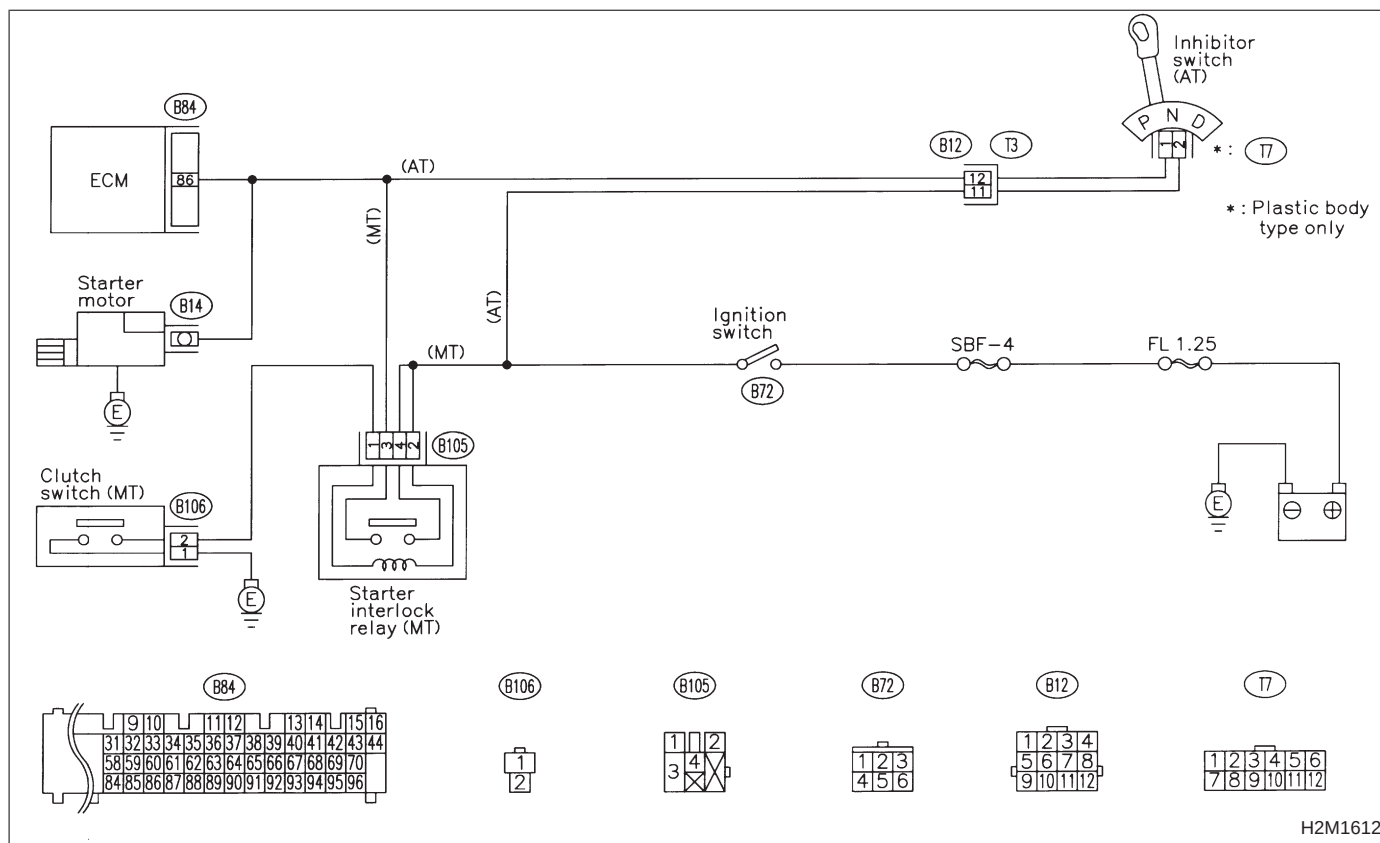
B2M1122

**CC: DTC P1120
— STARTER SWITCH CIRCUIT HIGH
INPUT —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Failure of engine to start

WIRING DIAGRAM:

H2M1612

CAUTION:

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

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

10CC1**CHECK OPERATION OF STARTER MOTOR.****CHECK****: Does starter motor operate when ignition switch to "ON"?**

NOTE:

- On AT vehicles, place the inhibitor switch in each position.
- On MT vehicles, depress or release the clutch pedal.

YES**: Repair battery short circuit in starter motor circuit. After repair, replace ECM.****NO****: Check starter motor circuit. <Ref. to 2-7 [T8B0].>**

OBD (FB1)

P1121 <N_SWON>

B2M1123

CD: DTC P1121

— NEUTRAL POSITION SWITCH CIRCUIT
LOW INPUT [AT VEHICLES] —

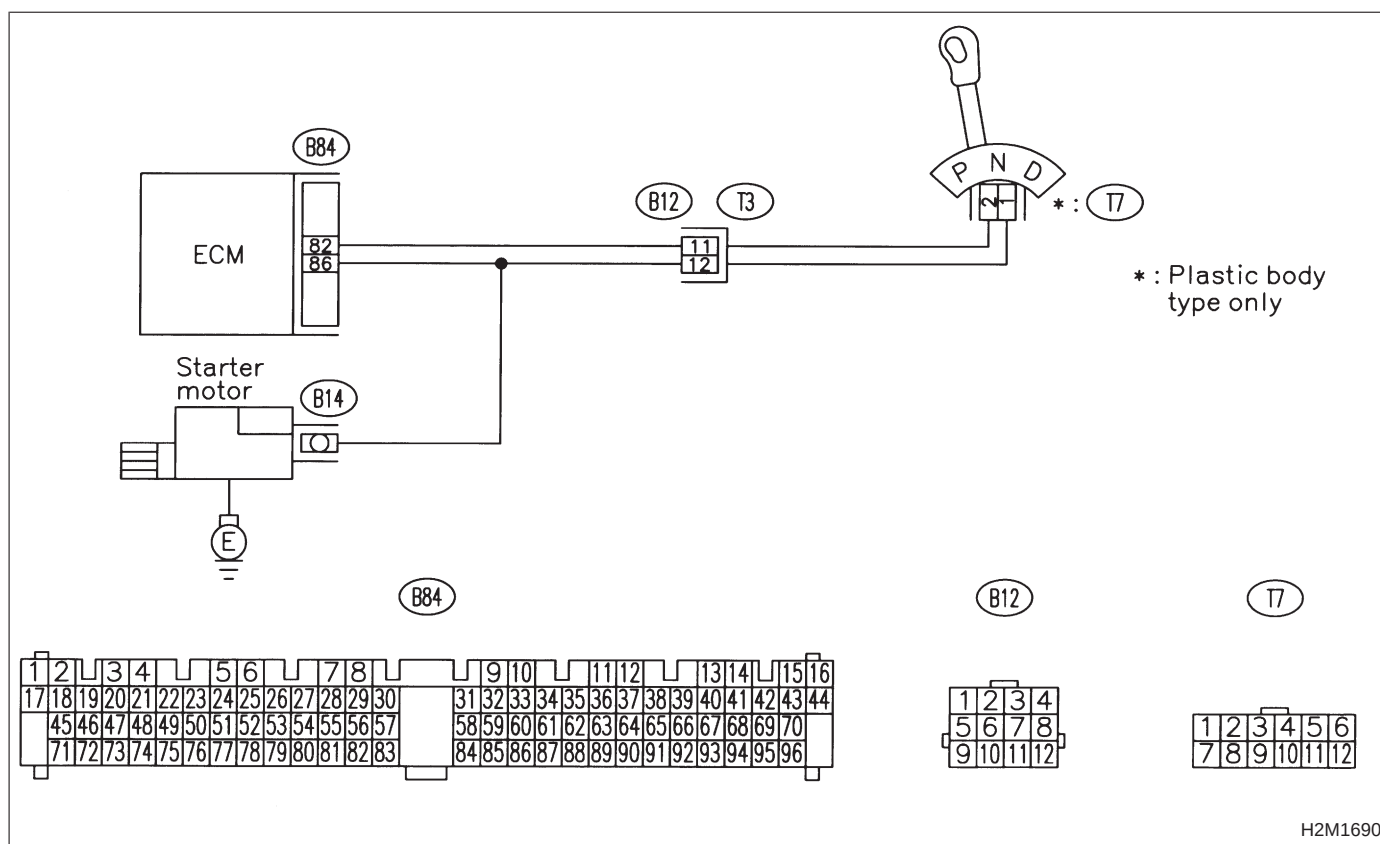
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:

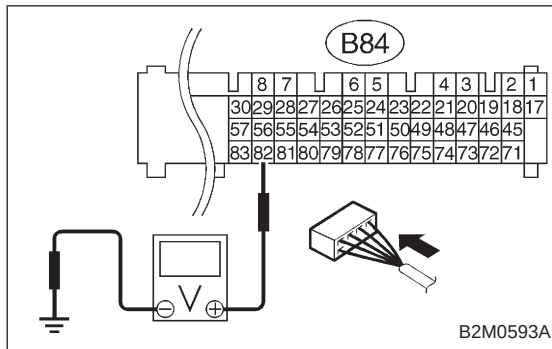


CAUTION:

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

10CD1	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 **10CD2**.

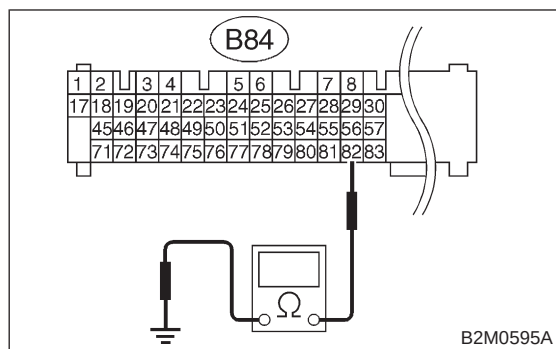


10CD2	CHECK INPUT SIGNAL FOR ECM.

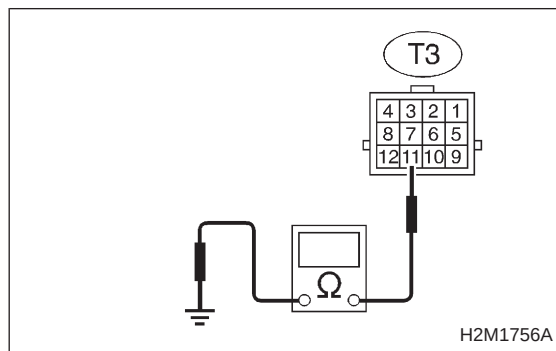
- 1) Turn ignition switch to ON.
 - 2) Measure voltage between ECM and chassis ground.
- Connector & terminal**
(B84) No. 82 (+) — Chassis ground (-):
- CHECK** : Is the voltage between 4.5 and 5.5 V in other positions?
- YES** : Even if MIL lights up, the circuit has returned to a normal condition at this time.
- NO** : Go to step **10CD3**.

10CD3	CHECK INHIBITOR SWITCH TYPE.

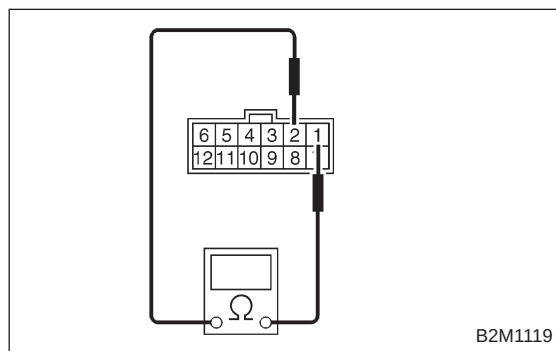
- CHECK** : Is inhibitor switch type plastic body?
- YES** : Go to step **10CD4**.
- NO** : Go to step **10CD7**.

**10CD4****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 10CD5.**10CD5****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. 11 — 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 10CD6.**10CD6****CHECK INHIBITOR SWITCH.**

Measure resistance between inhibitor switch connector receptacle's terminals.

Terminals**No. 1 — No. 2:****CHECK** : Is the resistance more than 1 MΩ in other positions?**YES** : Go to next **CHECK** .**NO** : Replace inhibitor switch.

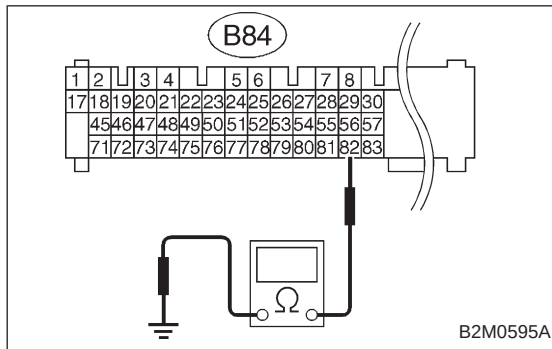
CHECK : Is there any fault in selector cable connection to inhibitor switch?

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.



10CD7

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 and chassis ground.

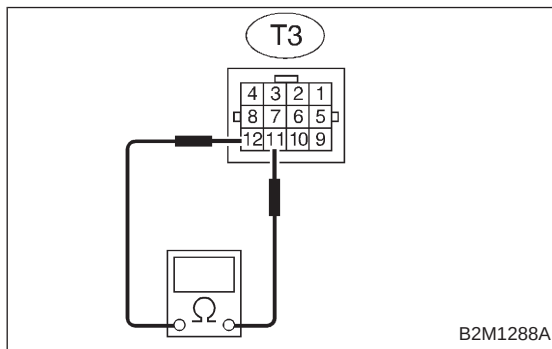
Connector & terminal

(B84) No. 82 — Chassis ground:

CHECK : Is the resistance less than 10 Ω ?

YES : Repair short circuit in harness between ECM and transmission harness connector.

NO : Go to step **10CD8**.



10CD8

CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

Connector & terminal

(T3) No. 11 — No. 12:

CHECK : Is the resistance more than 1 M Ω in other positions?

YES : Go to next **CHECK** .

NO : Replace inhibitor switch.

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.

OBD (FB1)
P1122 <BR_HI>

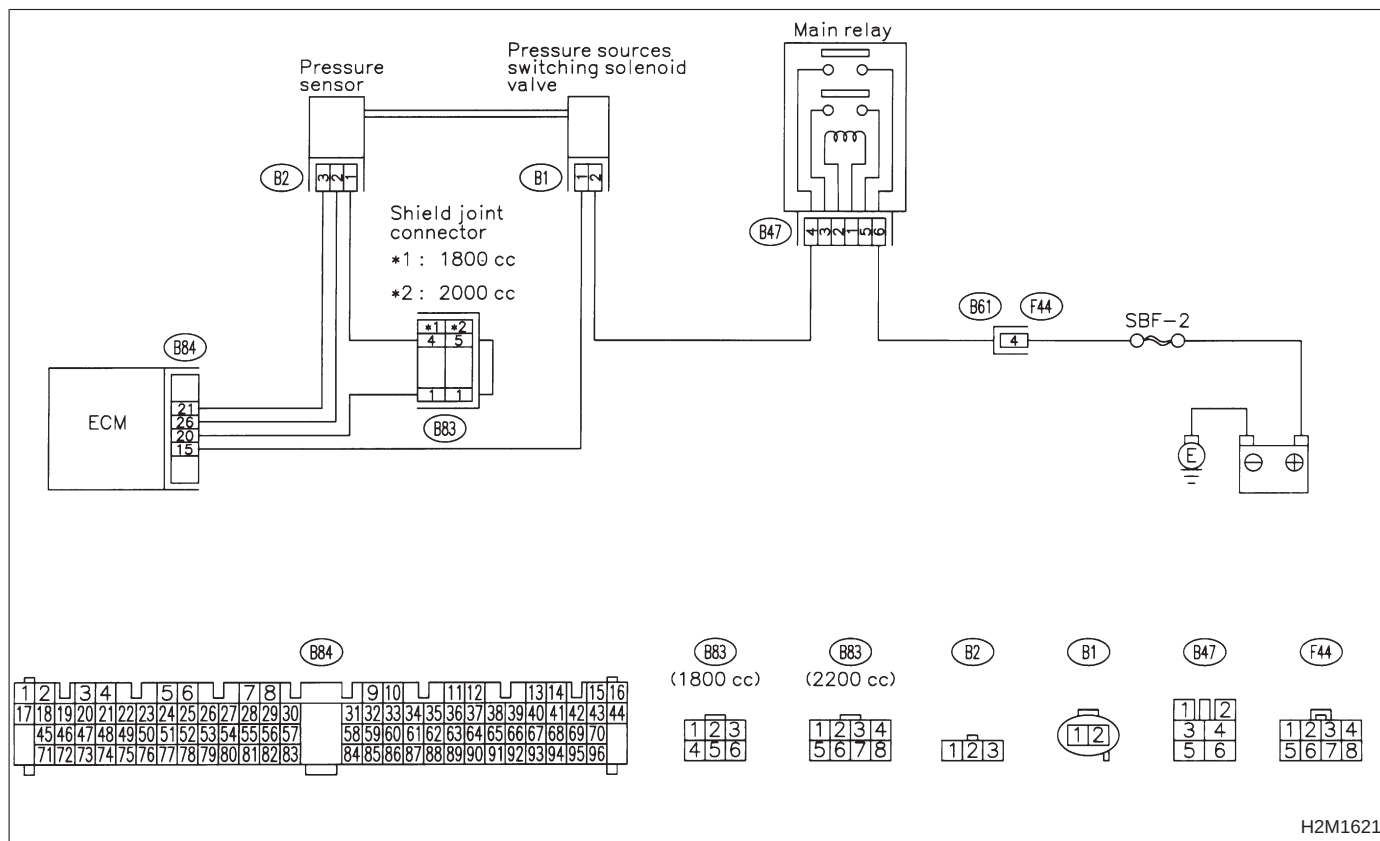
B2M1124

CE: 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

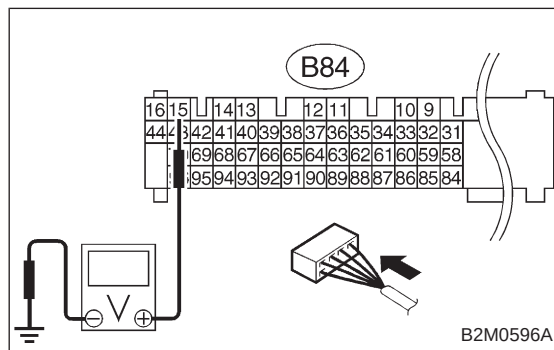
WIRING DIAGRAM:

H2M1621

CAUTION:

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

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



B2M0596A

10CE1**CHECK OUTPUT SIGNAL FROM ECM.**

- Turn ignition switch to ON.
- 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 10CE3.

NO : Go to step 10CE2.

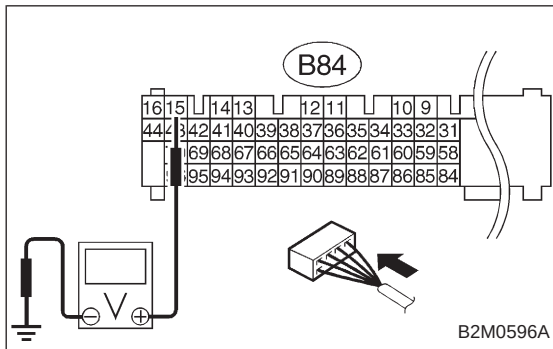
10CE2	CHECK POOR CONTACT.

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.



10CE3	CHECK WIRELESS BETWEEN LOW 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.

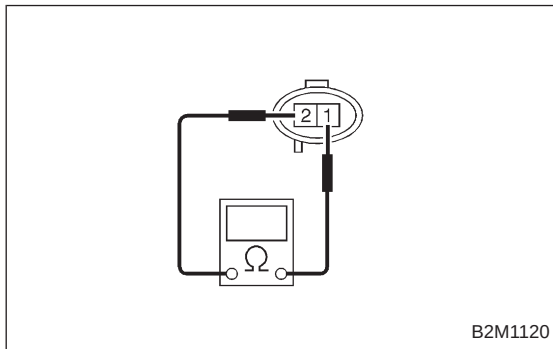
Connector & terminal

(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 next step 5).



- 5) Turn ignition switch to OFF.
- 6) Measure resistance between pressure sources switching solenoid valve connector terminals.

Terminals

No. 1 — No. 2:

CHECK : Is the resistance less than $1\ \Omega$?

YES : Replace pressure sources switching solenoid valve and ECM.

NO : Go to step **10CE4**.

10CE4	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.

OBD

(FB1)

P1141

<QA_RHI>

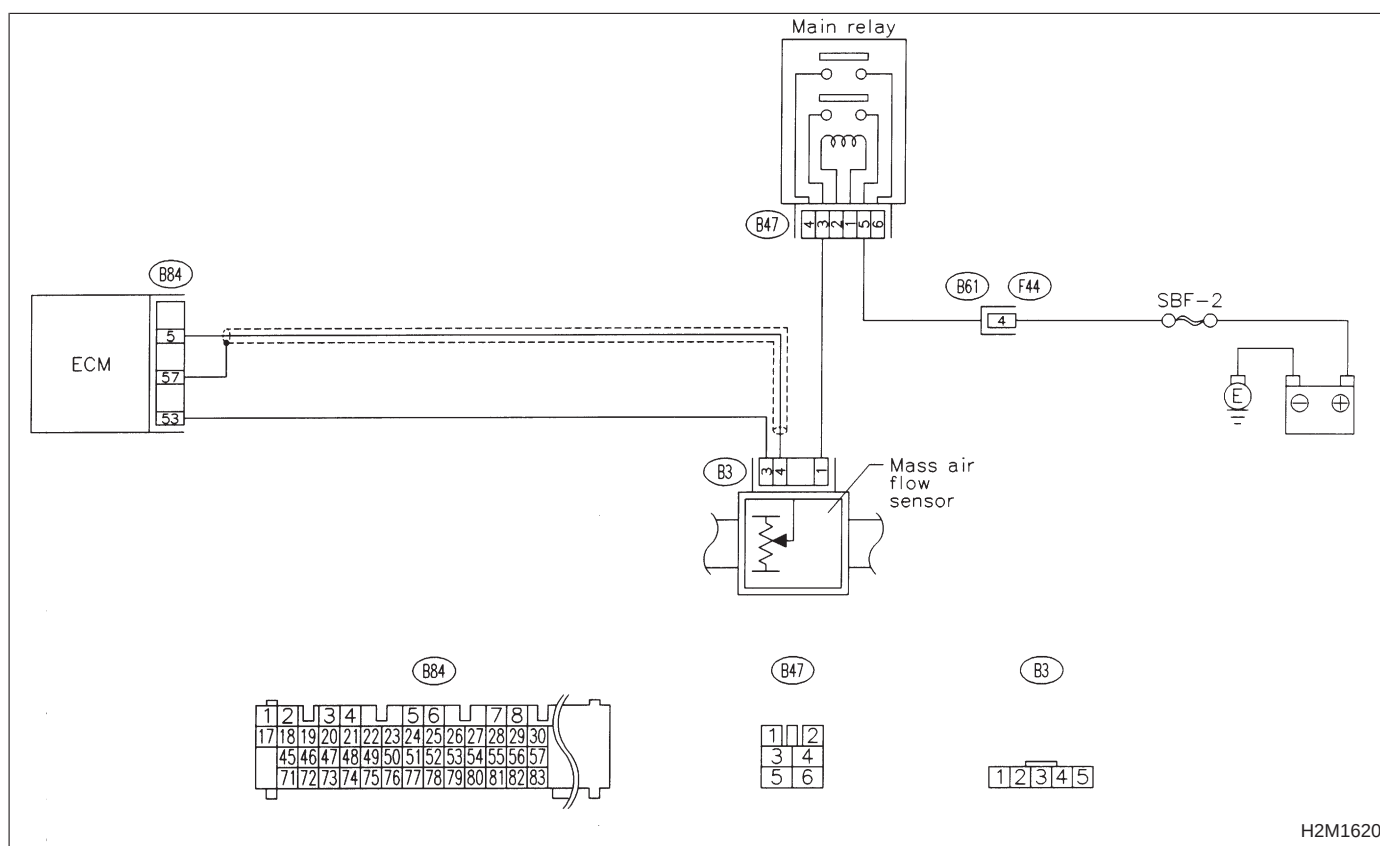
B2M1126

CF: 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

WIRING DIAGRAM:**CAUTION:**

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

10CF1**CHECK DTC P0102 OR P0103 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.**

OBD (FB1)

P1142 <TH_RLOW>

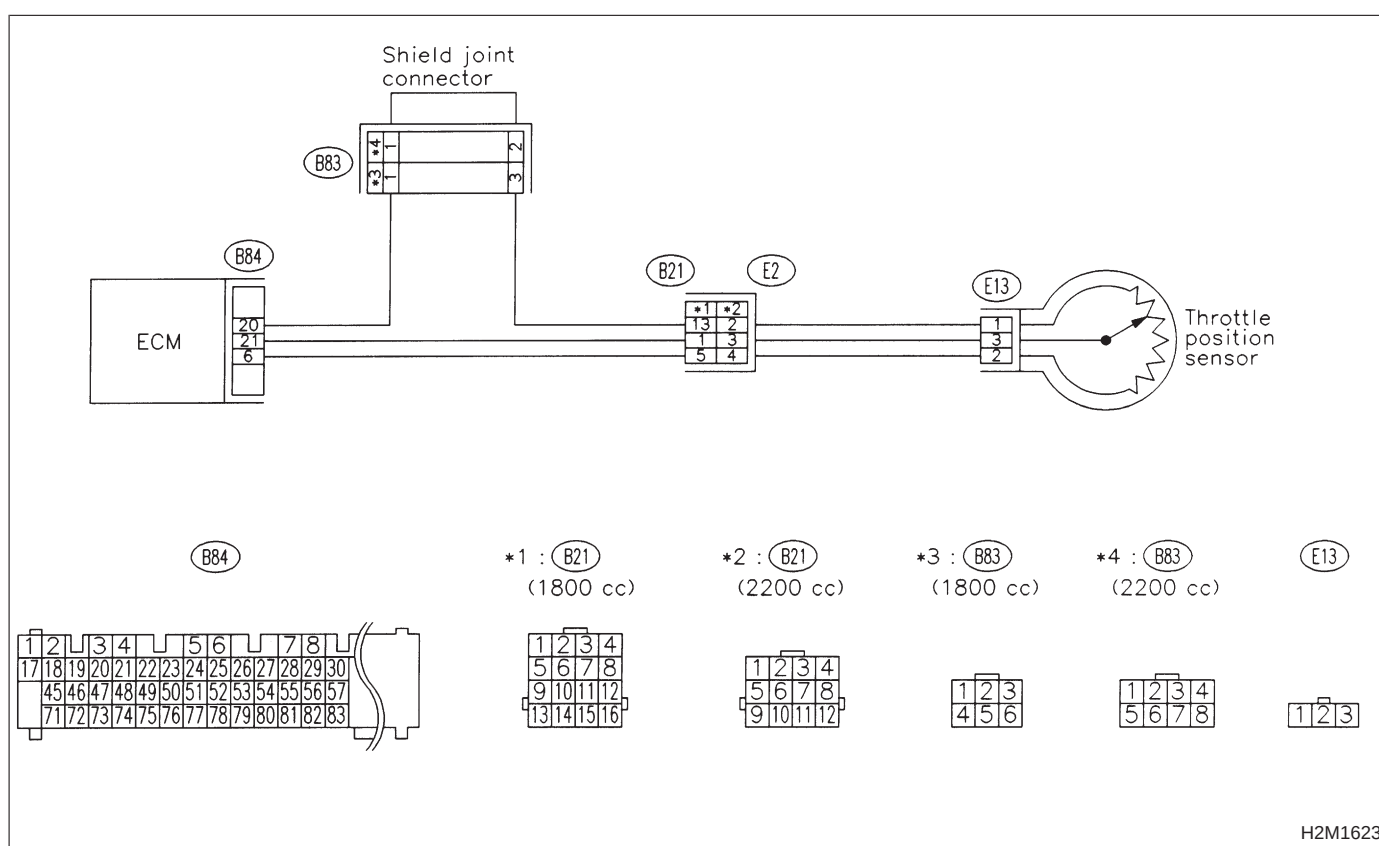
B2M1127

CG: 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

WIRING DIAGRAM:**CAUTION:**

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

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

10CG1**CHECK DTC P0122 OR P0123 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.**

OBD (FB1)

P1143 <PS_RLOW>

B2M1128

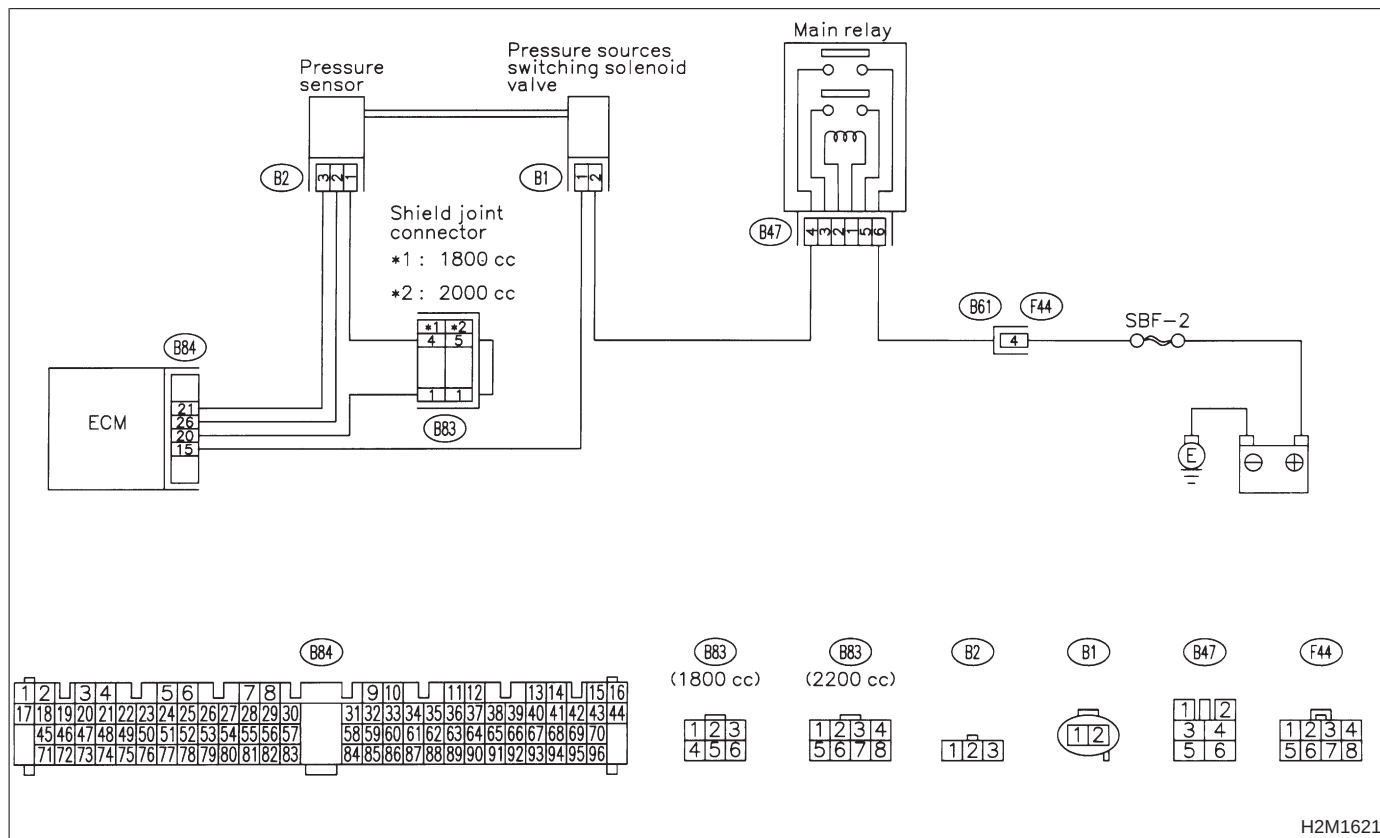
CH: DTC P1143

— PRESSURE SENSOR CIRCUIT
RANGE/PERFORMANCE PROBLEM (LOW
INPUT) —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

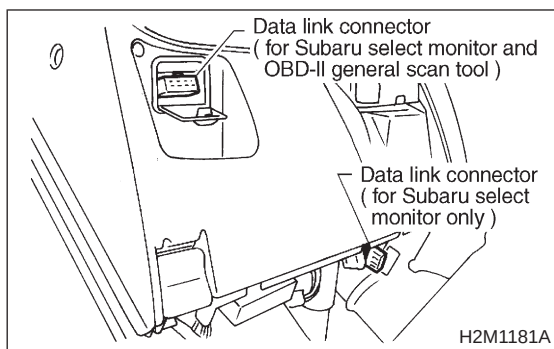


H2M1621

CAUTION:

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

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



BARO. P (F 2 0)

1 0 0 kPa 752 mmHg

B2M0755

10CH1 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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F20

- F20: Display shows pressure signal value sent from the pressure sensor.

CHECK : Is the value less than 32 kPa in function mode F20?

YES : Go to step 10CH3.

NO : Go to step 10CH2.

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

BARO. P (F 2 0)

100kPa 752mmHg

B2M0755

10CH2 CHECK PRESSURE SENSOR.

- 1) Measure actual atmospheric pressure.
- 2) Read data on Subaru Select Monitor or OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F20

- F20: Display shows pressure signal value sent from the pressure sensor.

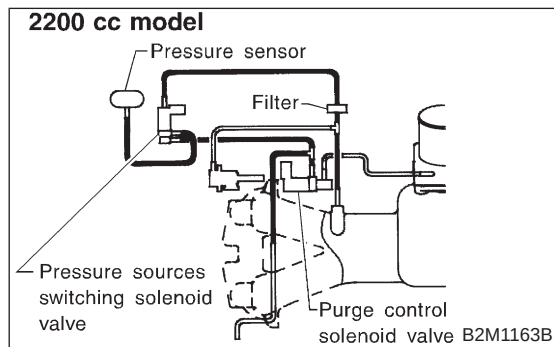
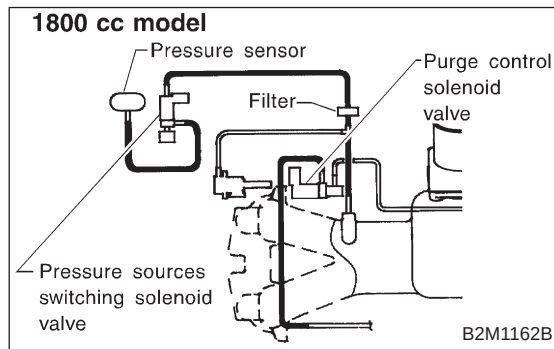
CHECK : Is the difference between absolute value of Subaru Selector Monitor indication and actual atmospheric pressure greater than 10 kPa (0.102 kg/cm², 1.45 psi)?

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.

**10CH3 CHECK VACUUM HOSE.**

CHECK : Is there a fault in vacuum hose?

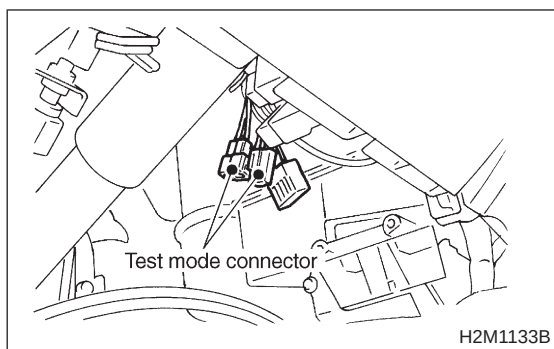
NOTE:

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.

YES : Repair or replace hoses or filter.

NO : Go to step **10CH4**.

**10CH4****CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.**

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

CHECK : ***Does pressure sources switching solenoid valve produce operating sound? (ON ↔ OFF each 1.5 sec.)***

NOTE:

Pressure sources switching solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD10). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Replace pressure sensor.

NO : Replace pressure sources switching solenoid valve.

OBD

(FB1)

P1144

<PS_RHI>

B2M1129

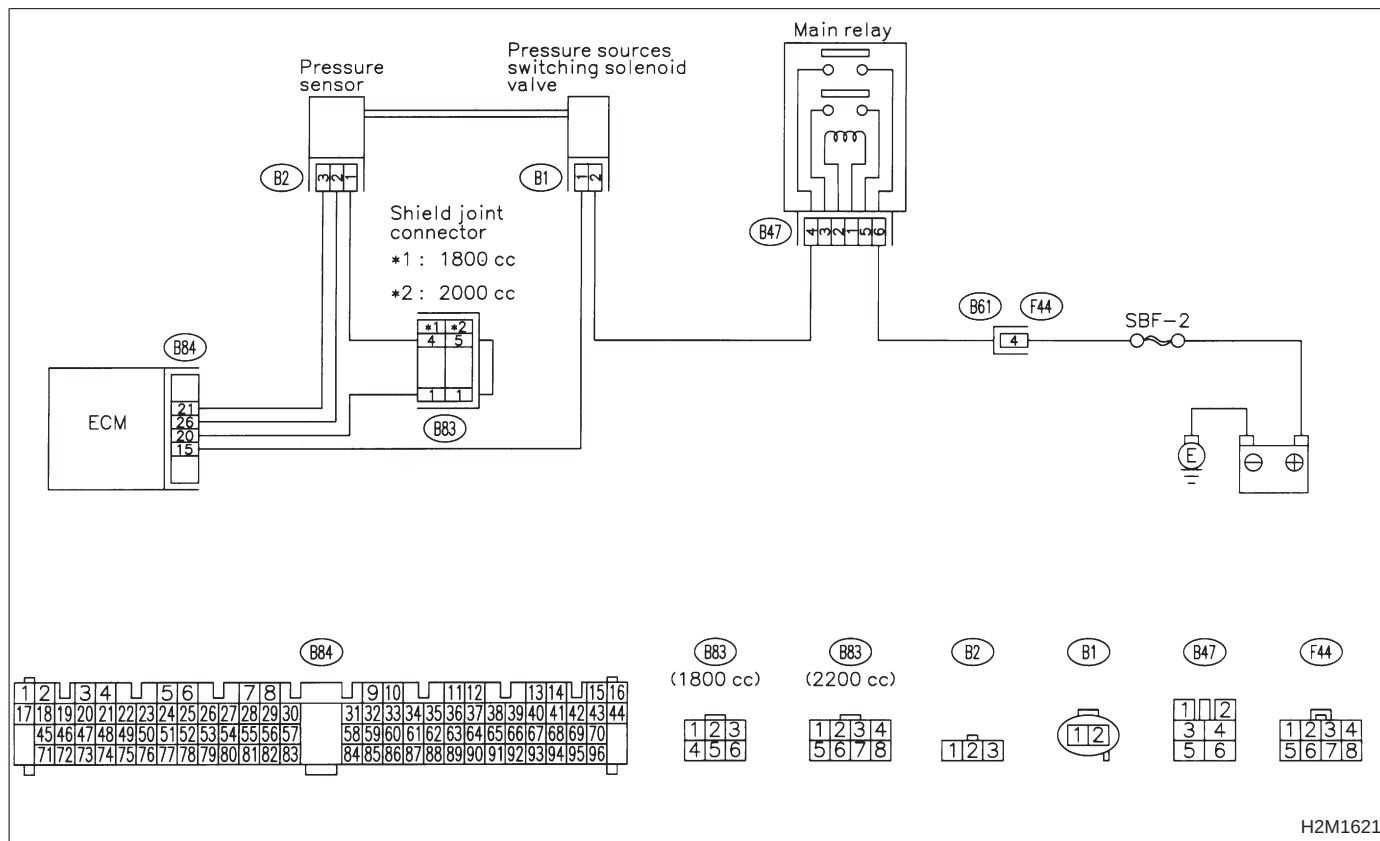
CI: DTC P1144

— PRESSURE SENSOR CIRCUIT
RANGE/PERFORMANCE PROBLEM (HIGH
INPUT) —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

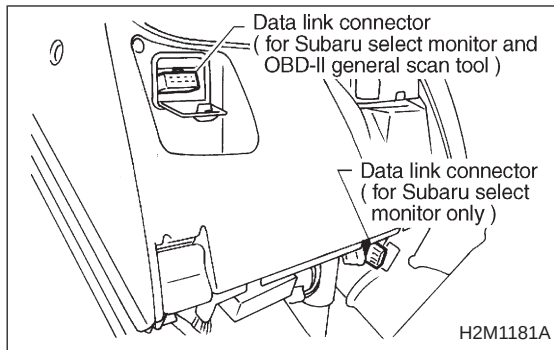


H2M1621

CAUTION:

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

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

**10C11****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 on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F20

- F20: Display shows pressure signal value sent from the pressure sensor.

BARO. P (F 2 0)

100kPa752mmHg

B2M0755

CHECK : *Is the value more than 133 kPa in function mode F20?*

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.

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

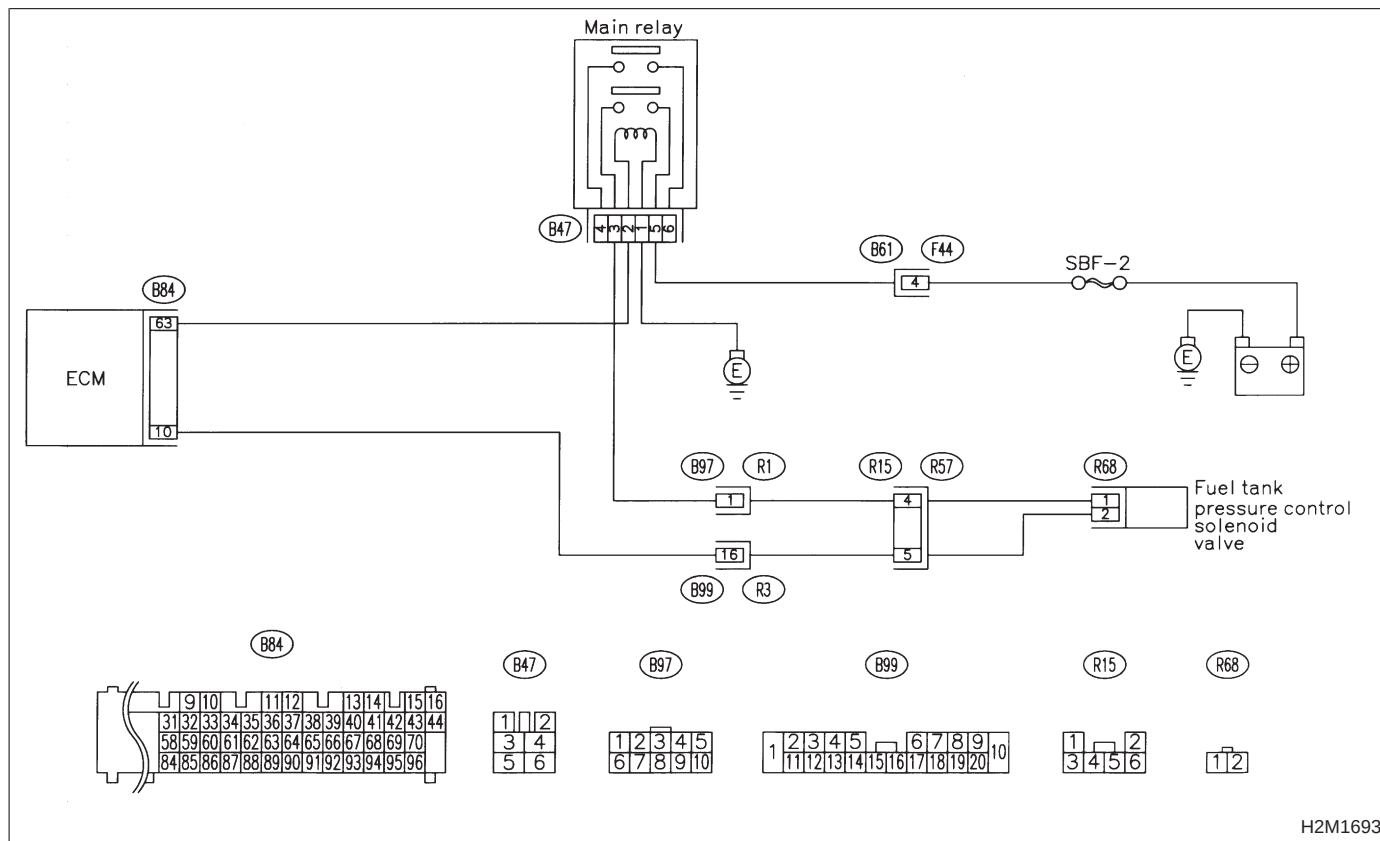
OBD (FB1)

P1400<PCVSOL_LO>

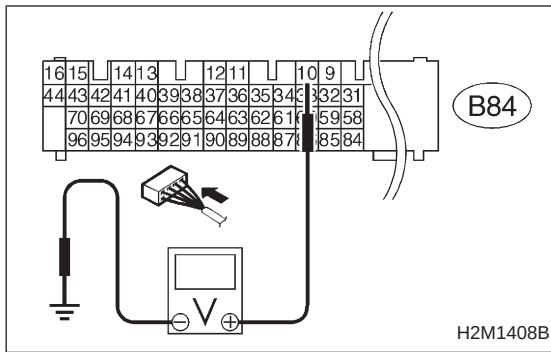
B2M1130

CJ: DTC P1400**— FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT LOW INPUT —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:**CAUTION:**

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

**10CJ1 CHECK OUTPUT SIGNAL FROM ECM.**

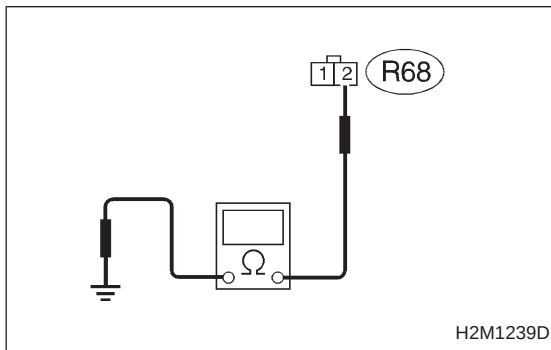
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 10 (+) — Chassis ground (-):****(CHECK) : Is the voltage more than 10 V?****(YES) : Go to step 10CJ2.****(NO) : Go to step 10CJ3.****10CJ2 CHECK POOR CONTACT.**

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

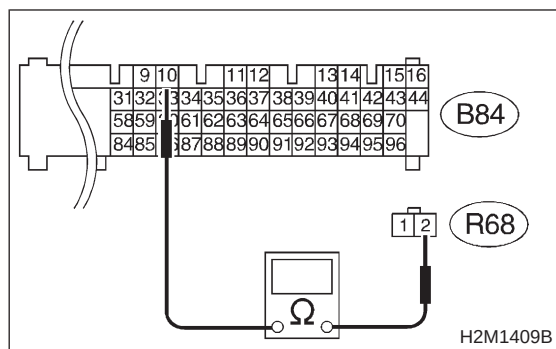
(CHECK) : Is there poor contact in ECM connector?**(YES) : Repair poor contact in ECM connector.****(NO) : Contact with SOA service.****NOTE:**

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

**10CJ3 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 next step 4).**



4) 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 resistance less than 1 Ω?

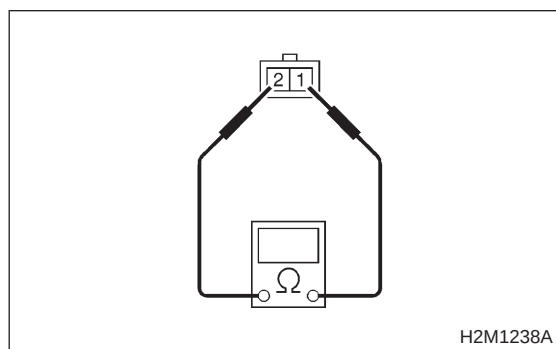
YES : Go to step **10CJ4**.

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 (B99 and R15)



10CJ4

CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

Measure resistance between fuel tank pressure control solenoid valve terminals.

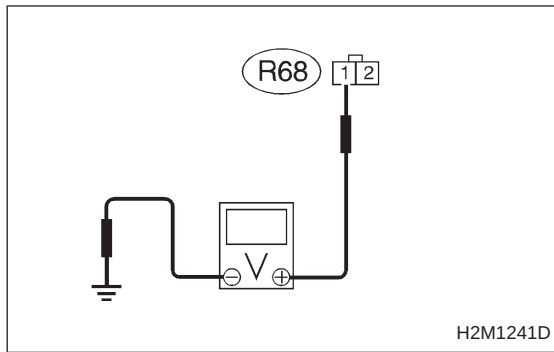
Terminals

No. 1 — No. 2:

CHECK : Is the resistance between 10 and 100 Ω?

YES : Go to step **10CJ5**.

NO : Replace fuel tank pressure control solenoid valve.

**10CJ5****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 **10CJ6**.**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 R15)
- Poor contact in main relay connector

10CJ6**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:**

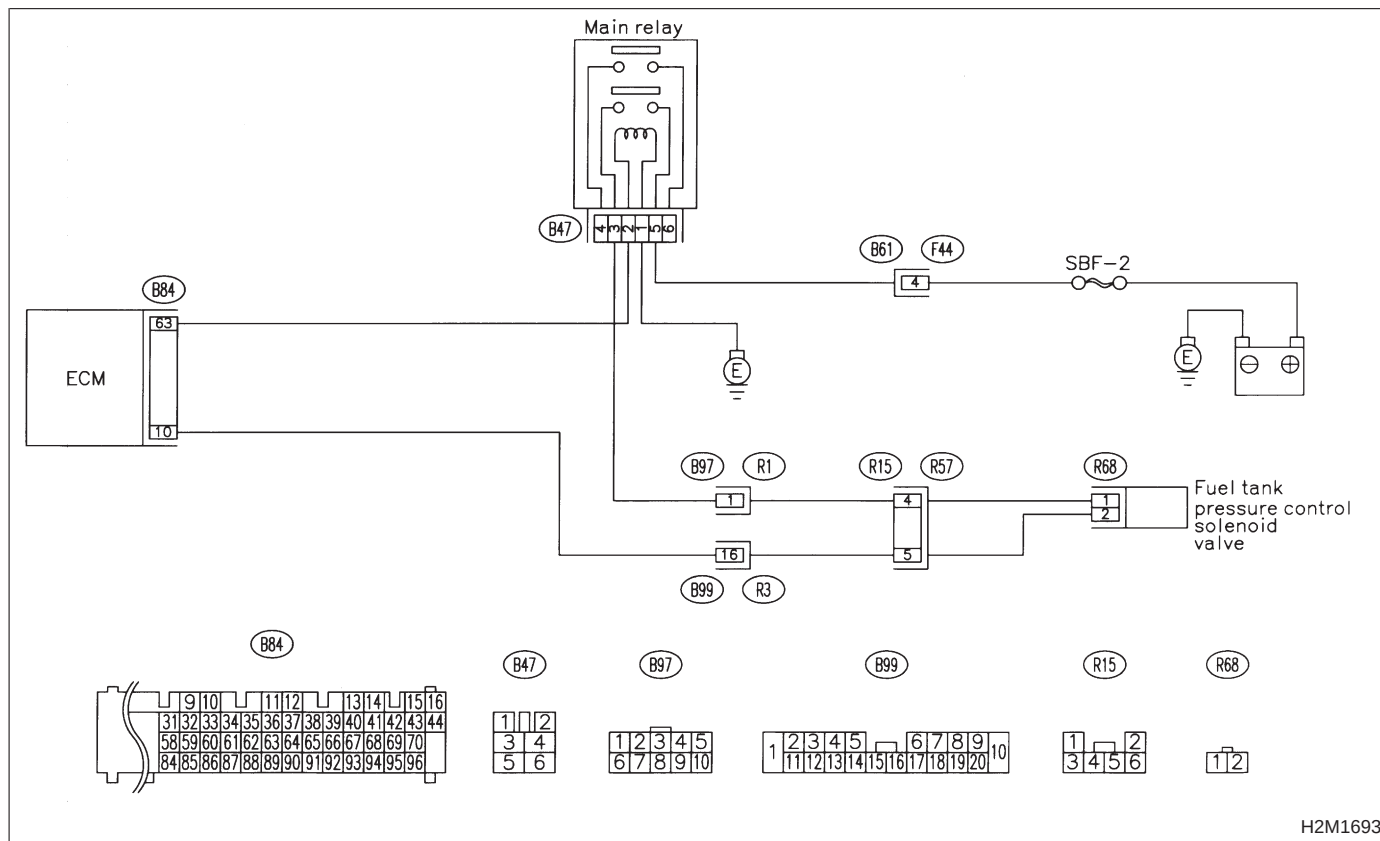
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

OBD (FB1)
P1420<PCVSOL_HI>

B2M1131

CK: DTC P1420**— FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT HIGH INPUT —****DTC DETECTING CONDITION:**

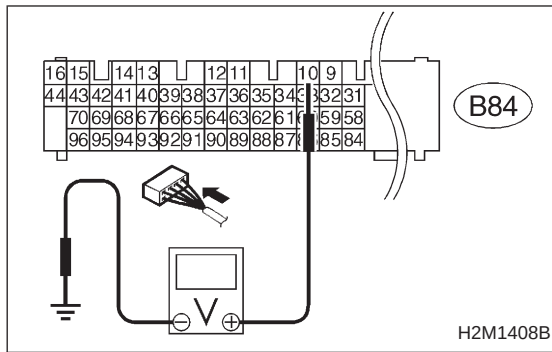
- Two consecutive driving cycles with fault

WIRING DIAGRAM:

H2M1693

CAUTION:

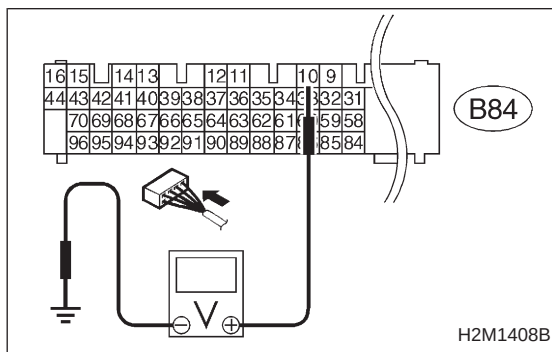
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>

**10CK1 CHECK OUTPUT SIGNAL FROM ECM.**

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

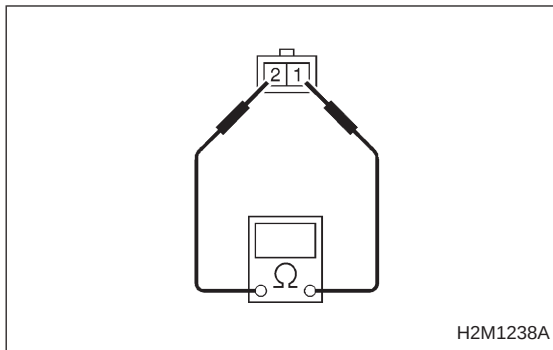
Connector & terminal**(B84) No. 10 (+) — Chassis ground (-):****(CHECK) : Is the voltage more than 10 V?****(YES) : Go to step 10CK3.****(NO) : Go to step 10CK2.****10CK2 CHECK POOR CONTACT.**

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.****10CK3 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 next step 5).**



5) Turn ignition switch to OFF.

6) 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 **10CK4**.

10CK4	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.

OBD (FB1)

P1421<EGRSOL_HI>

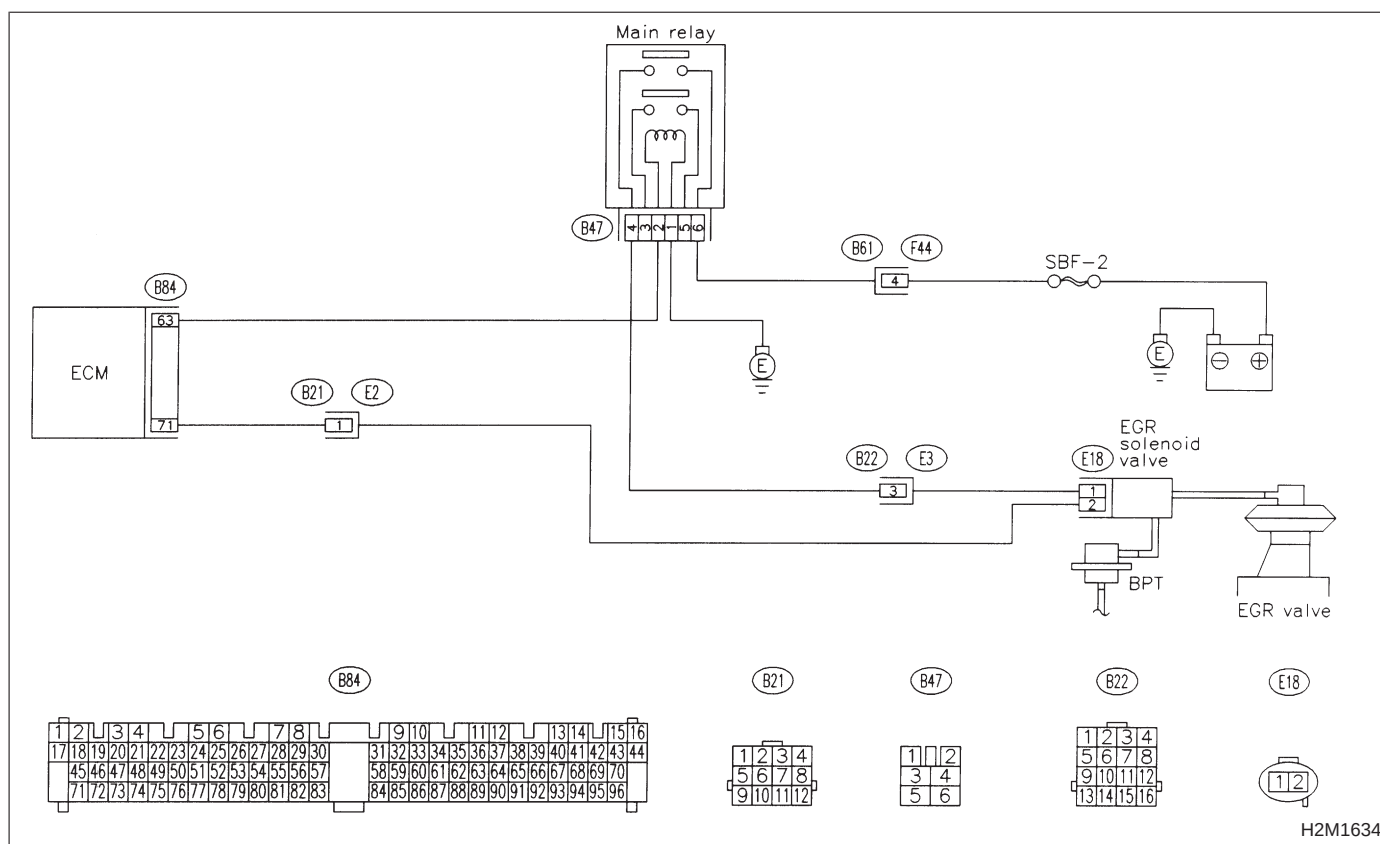
B2M1132

CL: 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

WIRING DIAGRAM:**CAUTION:**

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

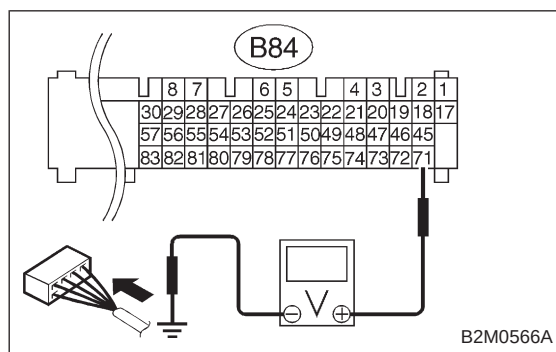
<Ref. to 2-7 [T3D0] and [T3E0].>

10CL1	CHECK TRANSMISSION TYPE.

CHECK : *Is transmission type MT?*

YES : Check AT/MT identification circuit. <Ref. to 2-7 [T10DB0].>

NO : Go to step **10CL2**.



10CL2	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 **10CL4**.

NO : Go to step **10CL3**.

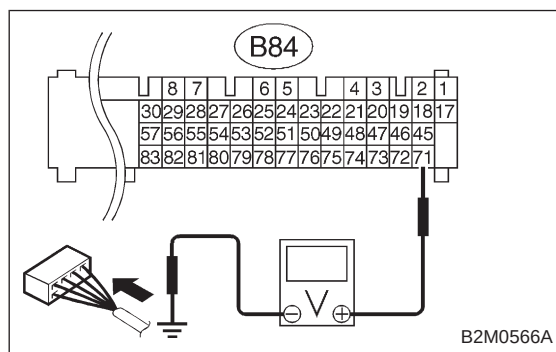
10CL3	CHECK POOR CONTACT.

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.



10CL4	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.

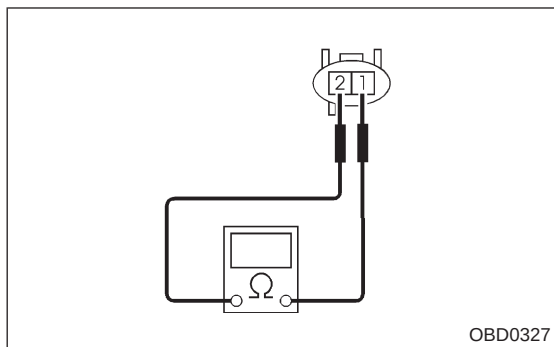
Connector & terminal

(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 next step 5).



5) Turn ignition switch to OFF.

6) 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 **10CL5**.

10CL5	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.

OBD (FB1)

P1422 <CPC_HI>

B2M1133

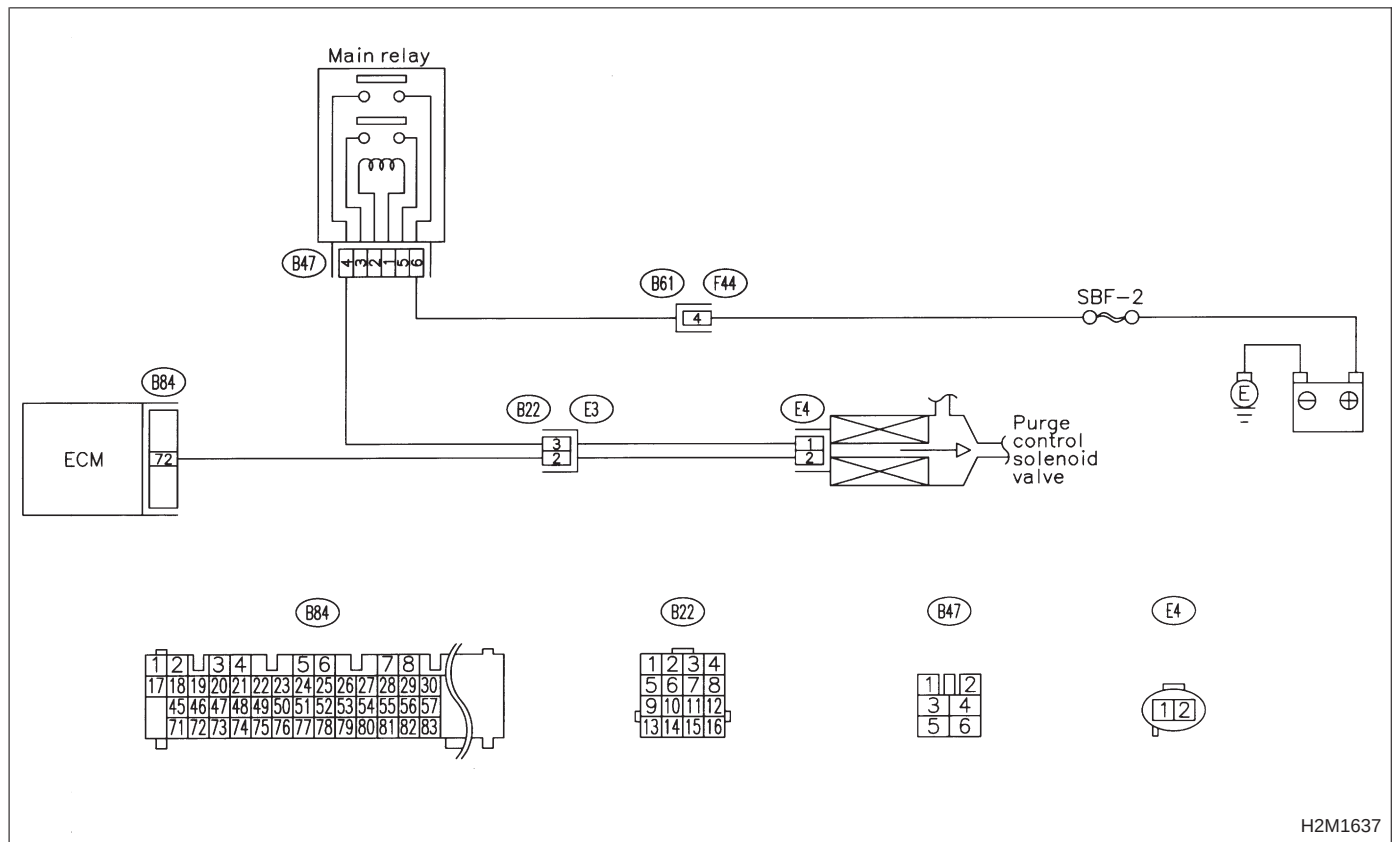
CM: DTC P1422
— EVAPORATIVE EMISSION CONTROL
SYSTEM PURGE CONTROL VALVE CIRCUIT
HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

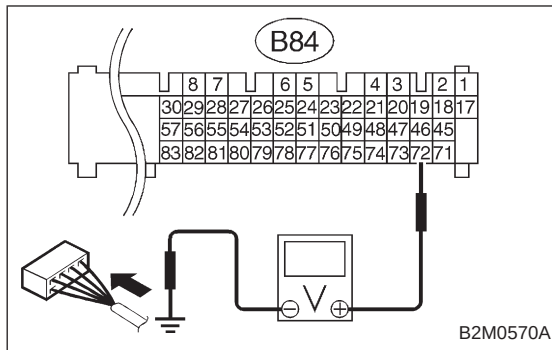
TROUBLE SYMPTOM:

- Erroneous idling

WIRING DIAGRAM:**CAUTION:**

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

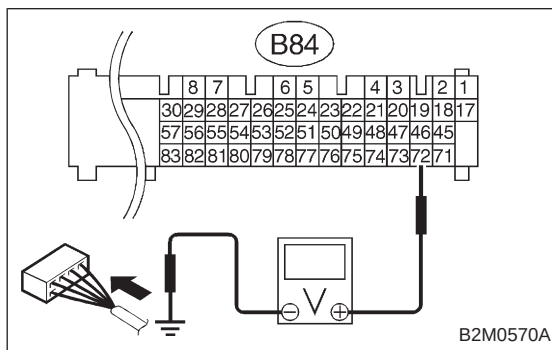
<Ref. to 2-7 [T3D0] and [T3E0].>

**10CM1 CHECK OUTPUT SIGNAL FROM ECM.**

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

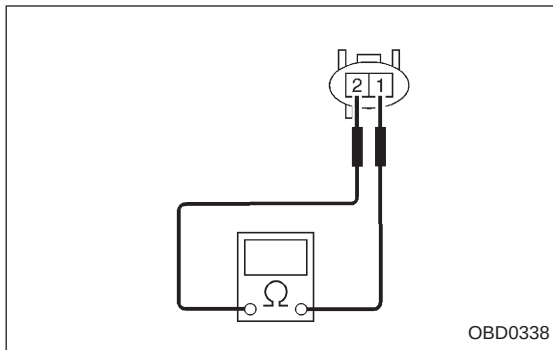
Connector & terminal**(B84) No. 72 (+) — Chassis ground (-):****CHECK : Is the voltage more than 10 V?****YES : Go to step 10CM3.****NO : Go to step 10CM2.****10CM2 CHECK POOR CONTACT.**

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 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 next step 5).**



5) Turn ignition switch to OFF.

6) 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 **10CM4**.

10CM4	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.

OBD (FB1)

P1423<VCMSOL_HI>

B2M1134

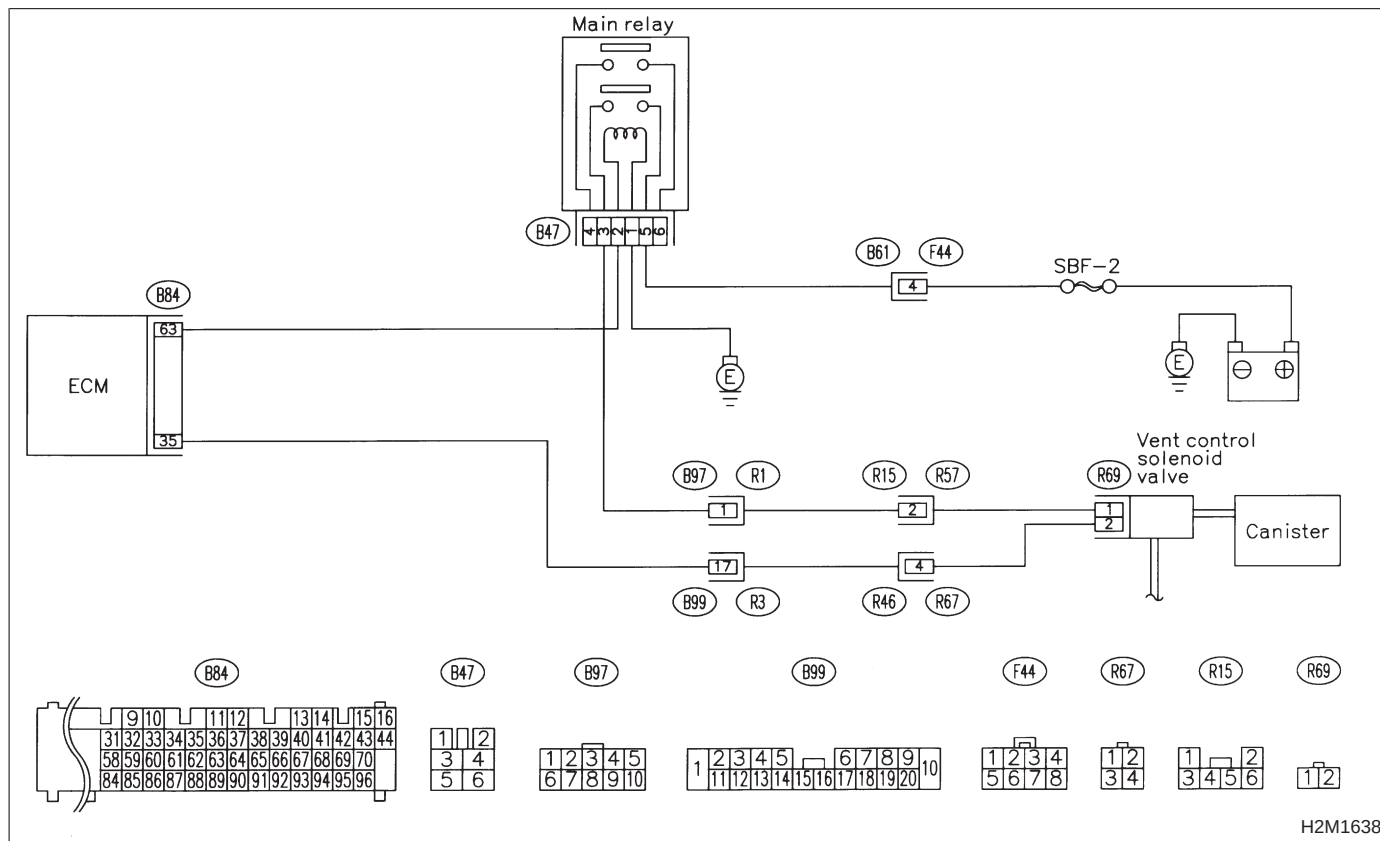
CN: DTC P1423

— EVAPORATIVE EMISSION CONTROL
SYSTEM VENT CONTROL HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

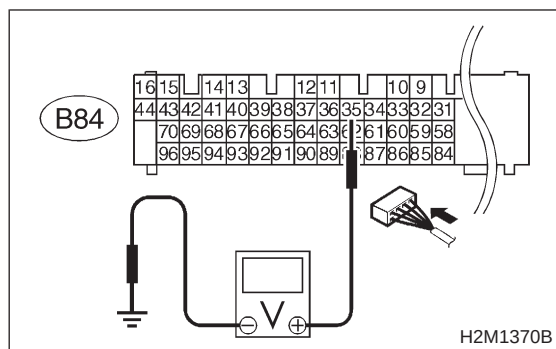
WIRING DIAGRAM:



CAUTION:

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

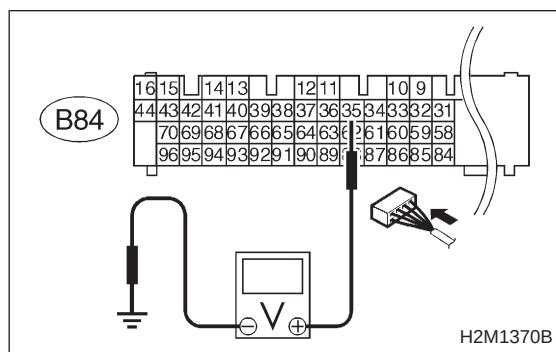
<Ref. to 2-7 [T3D0] and [T3E0].>

**10CN1 CHECK OUTPUT SIGNAL FROM ECM.**

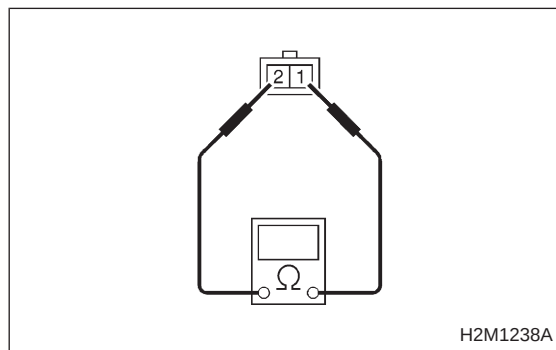
- 1) Turn ignition switch to ON.
- 2) Measure voltage between ECM and chassis ground.

Connector & terminal**(B84) No. 35 (+) — Chassis ground (-):****CHECK** : Is the voltage more than 10 V?**YES** : Go to step 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 VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from vent control solenoid 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 vent control solenoid valve connector. After repair, replace ECM.**NO** : Go to next step 5).

- 5) Turn ignition switch to OFF.
- 6) Measure resistance between vent control solenoid valve terminals.

Terminals**No. 1 — No. 2:****CHECK** : Is the resistance less than 1 Ω?**YES** : Replace vent control solenoid valve and ECM.**NO** : Go to step 10CN4.

10CN4	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.

OBD (FB1)
P1440 <PCV_FLOW>

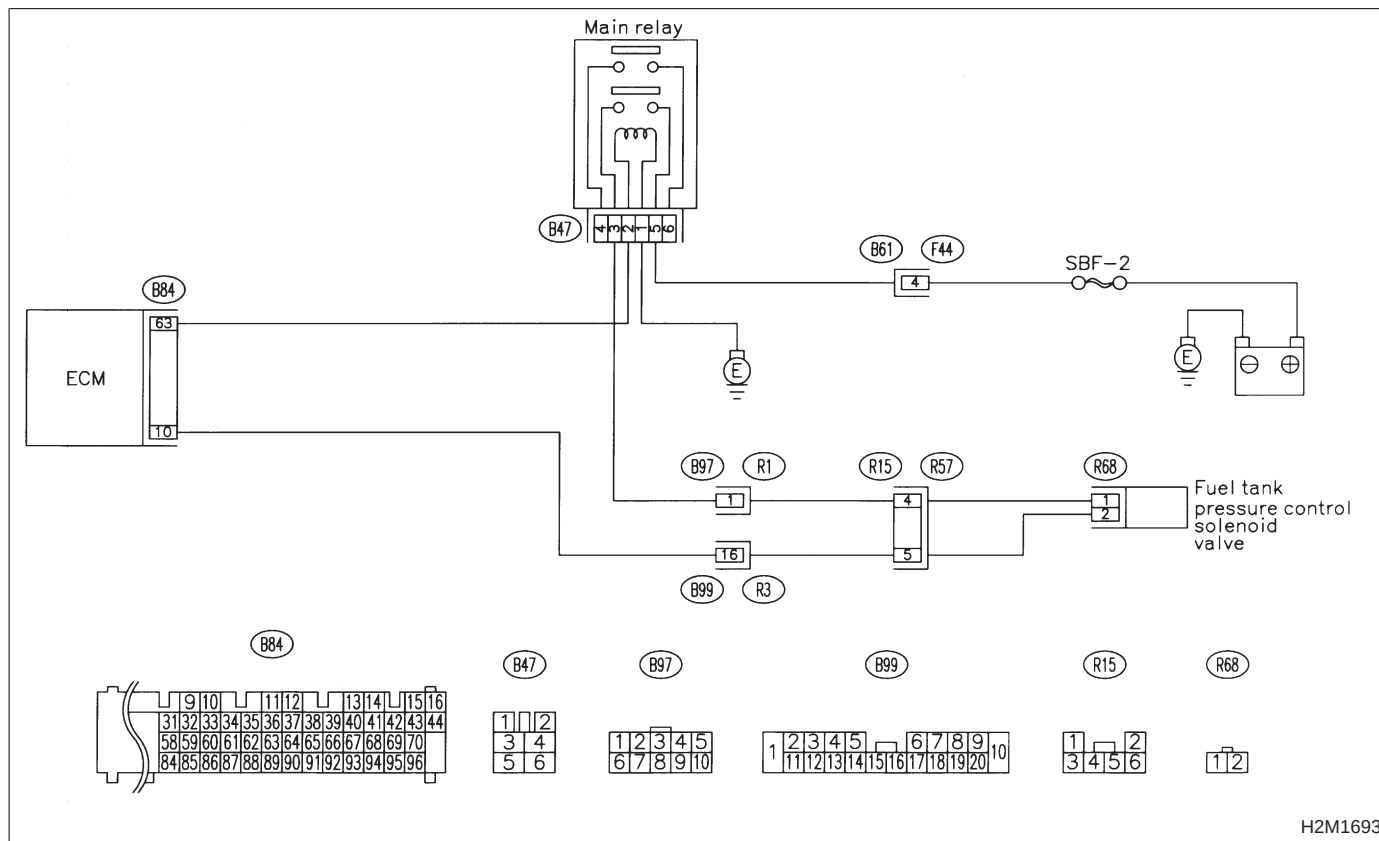
B2M1135

CO: DTC P1440
— FUEL TANK PRESSURE CONTROL
SYSTEM FUNCTION PROBLEM (LOW INPUT)
—

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

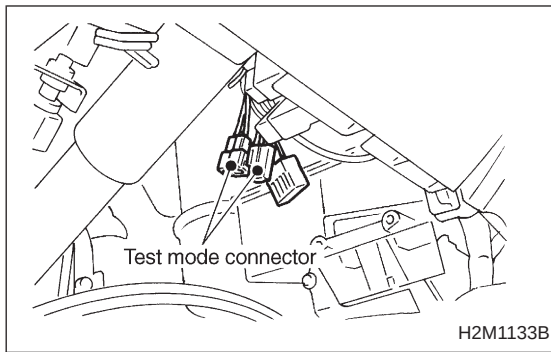
WIRING DIAGRAM:



H2M1693

CAUTION:

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



10CO1	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

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

CHECK : ***Does fuel tank pressure control solenoid valve produce operating sound?***

NOTE:

Fuel tank pressure control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD07). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CO2**.

NO : Replace fuel tank pressure control solenoid valve.

10CO2	CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.

- 1) Turn ignition switch to OFF.
- 2) Open the fuel flap.

CHECK : ***Is the fuel filler cap tightened securely?***

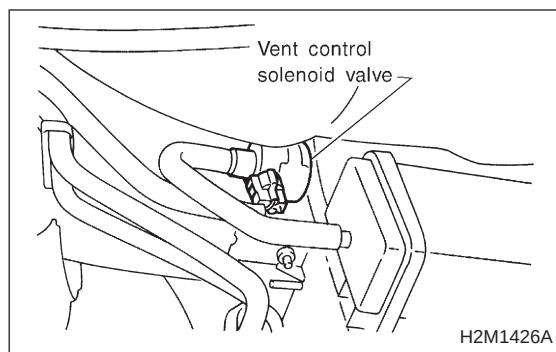
YES : Tighten fuel filler cap securely.

NO : Go to next **CHECK** .

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 **10CO3**.

**10CO3****CHECK VENT CONTROL SOLENOID VALVE.**

Turn ignition switch to ON.

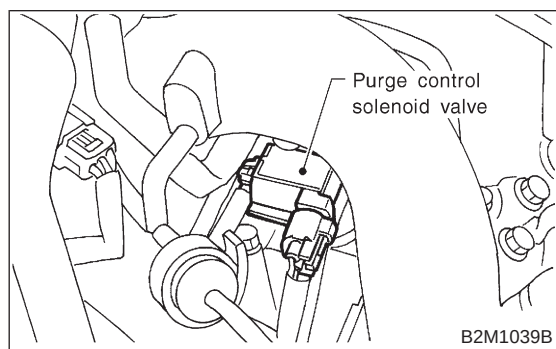
CHECK : *Does vent control solenoid valve produce operating sound?*

NOTE:

Vent control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD08). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CO4**.

NO : Replace vent control solenoid valve.

**10CO4****CHECK PURGE CONTROL SOLENOID VALVE.**

CHECK : *Does purge control solenoid valve produce operating sound?*

NOTE:

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CO5**.

NO : Replace purge control solenoid valve.

10CO5	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 next **CHECK** .

CHECK : ***Is there any damage at canister?***

YES : Repair or replace canister.

NO : Go to next **CHECK** .

CHECK : ***Is there any damage at fuel tank?***

YES : Repair or replace fuel tank.

NO : Go to next **CHECK** .

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.

OBD (FB1)

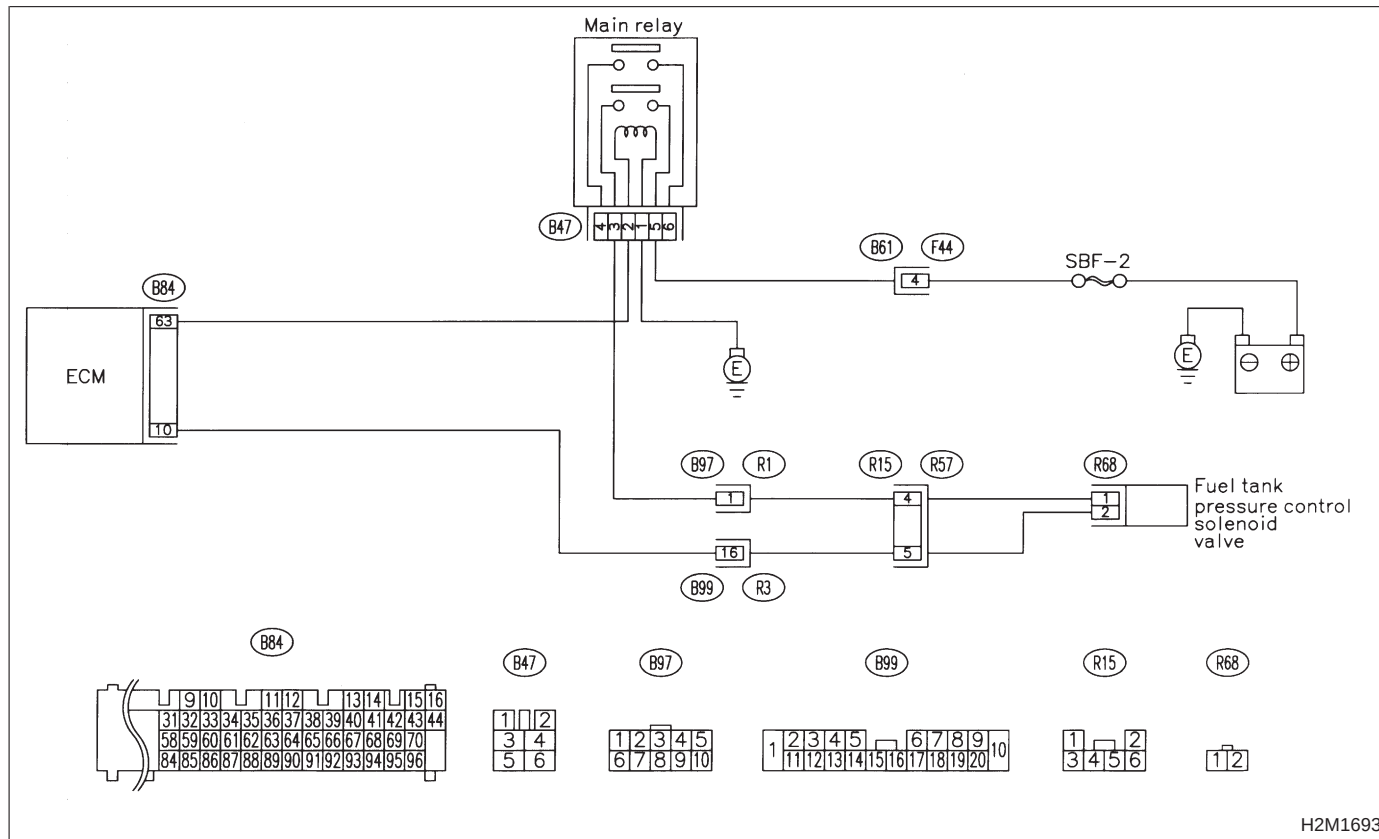
P1441 <PCV_FHI>

B2M1136

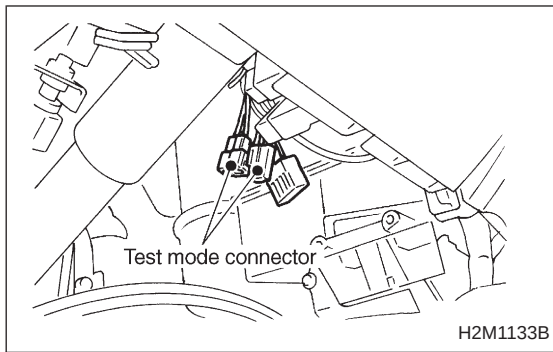
CP: DTC P1441
— FUEL TANK PRESSURE CONTROL
SYSTEM FUNCTION PROBLEM (HIGH INPUT)
—

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:**CAUTION:**

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



10CP1	CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

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

CHECK : ***Does fuel tank pressure control solenoid valve produce operating sound?***

NOTE:

Fuel tank pressure control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD07). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CP2**.

NO : Replace fuel tank pressure control solenoid valve.

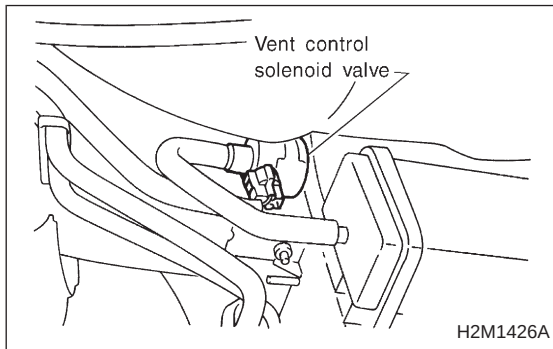
10CP2	CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.

- 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 **10CP3**.



10CP3	CHECK VENT CONTROL SOLENOID VALVE.

Turn ignition switch to ON.

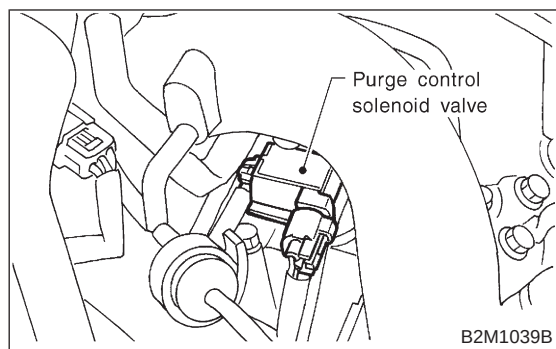
CHECK : ***Does vent control solenoid valve produce operating sound?***

NOTE:

Vent control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD08). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CP4**.

NO : Replace vent control solenoid valve.

**10CP4****CHECK PURGE CONTROL SOLENOID VALVE.**

CHECK : *Does purge control solenoid valve produce operating sound?*

NOTE:

Purge control solenoid valve operation check can also be executed using Subaru Select Monitor (Function mode: FD02). For the procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CP5**.

NO : Replace purge control solenoid valve.

10CP5**CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.**

Turn ignition switch to OFF.

CHECK : *Is there any damage at canister?*

YES : Repair or replace canister.

NO : Go to next **CHECK** .

CHECK : *Is there any damage at fuel tank?*

YES : Repair or replace fuel tank.

NO : Go to next **CHECK** .

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.

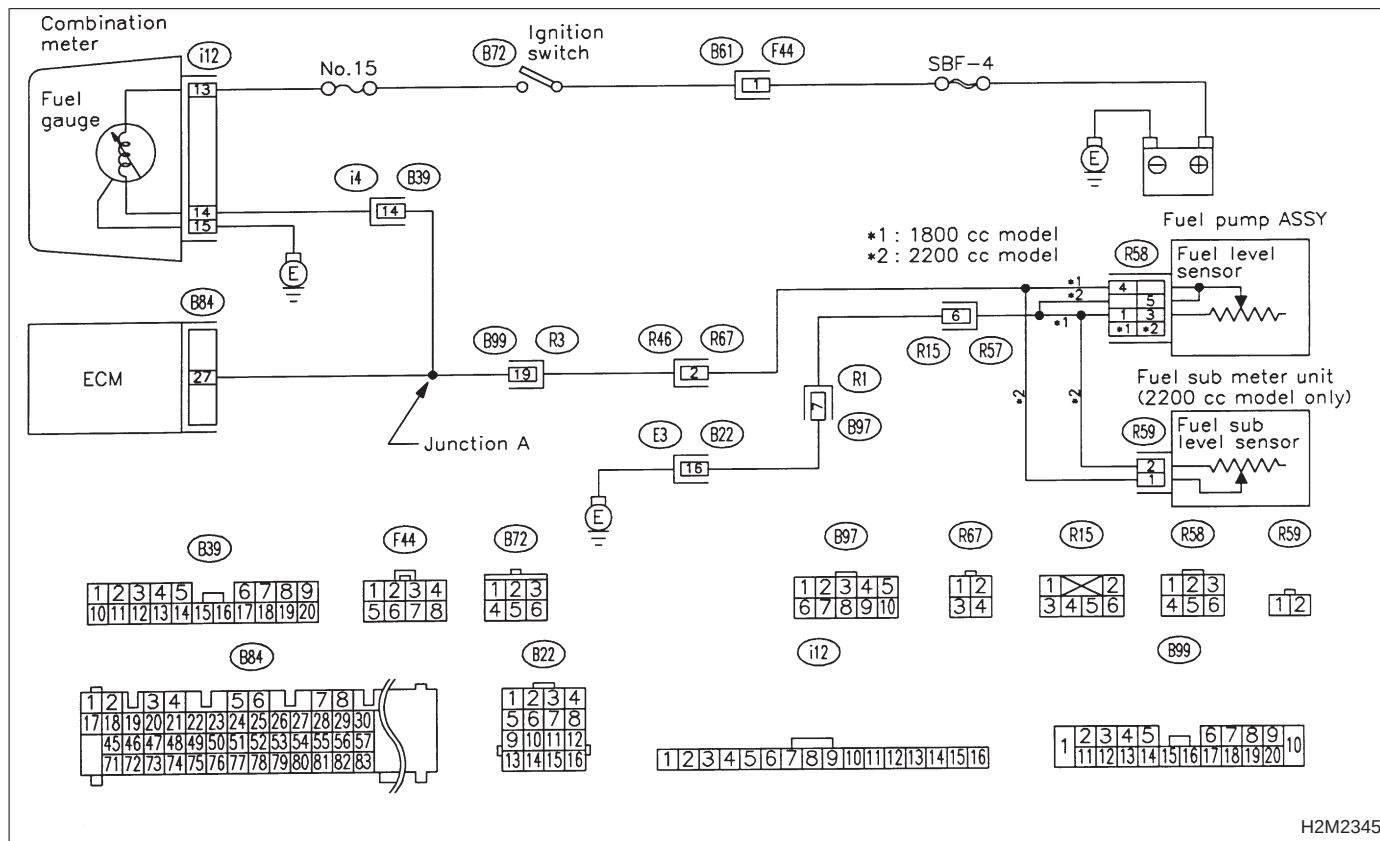
OBD (FB1)

P1442 <FLVL_R2>

B2M1137

CQ: DTC P1442**— FUEL LEVEL SENSOR CIRCUIT RANGE/
PERFORMANCE PROBLEM 2 —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:**CAUTION:**

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

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

10CQ1**CHECK DTC P0461, P0462 OR P0463 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.**

OBD (FB1)

P1500 <FAN_1>

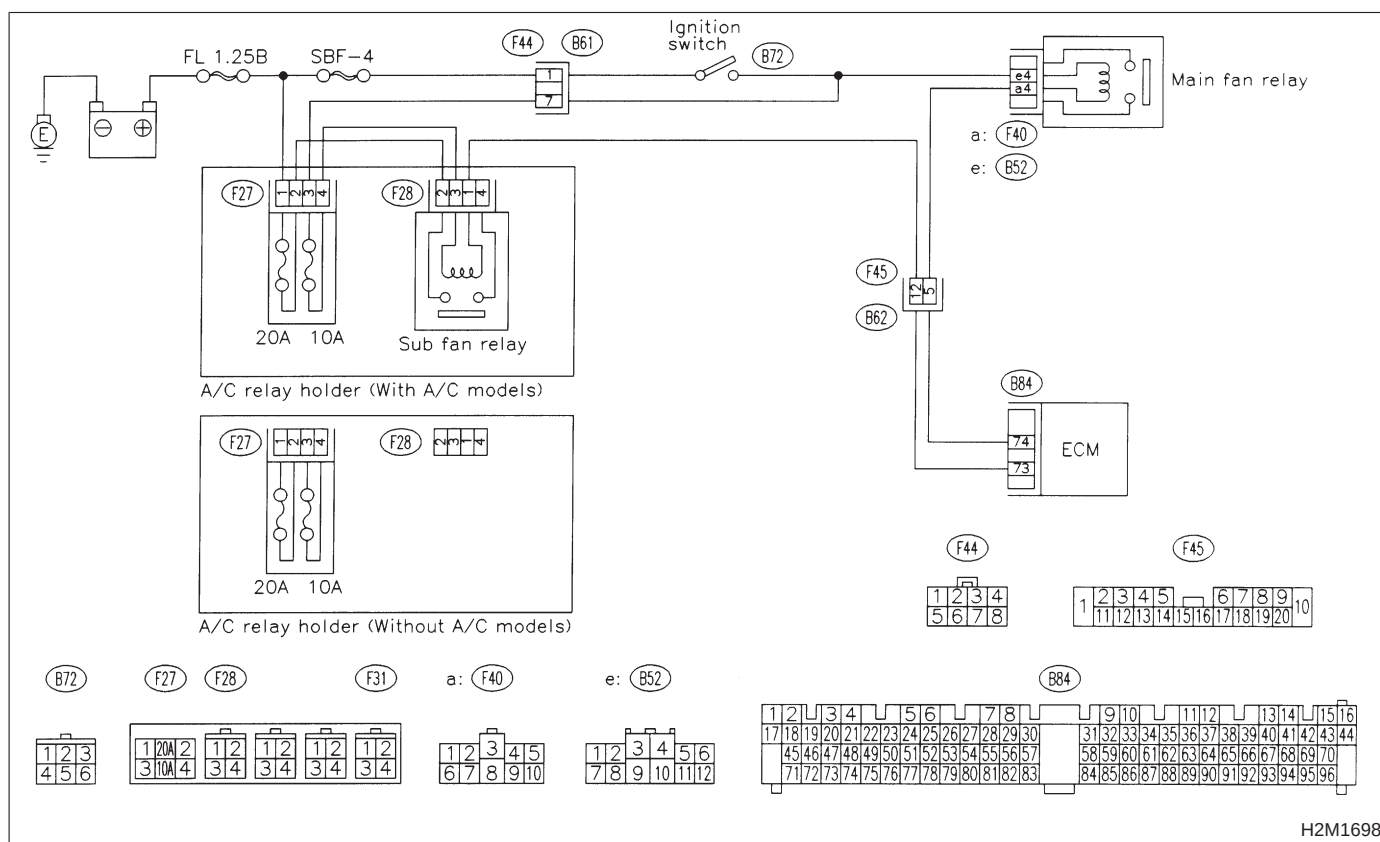
OBD0527

CR: DTC P1500**— RADIATOR FAN RELAY 1 CIRCUIT LOW INPUT —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

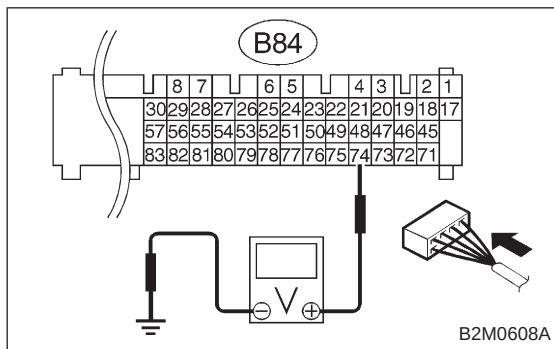
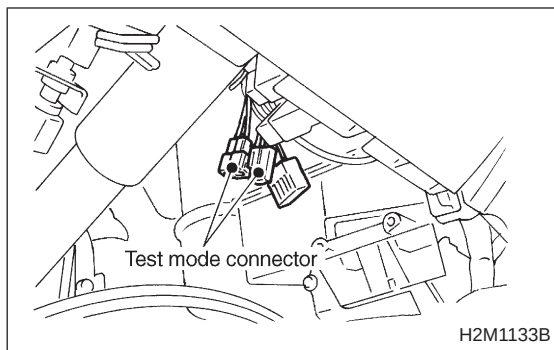
WIRING DIAGRAM:

H2M1698

CAUTION:

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

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


10CR1 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.

- 4) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 74 (+) — Chassis ground:

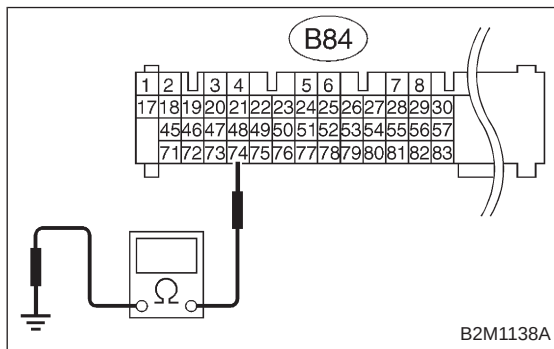
CHECK : Does voltage change between 0 and 10 volts?

NOTE:

Radiator fan relay operation check can be executed using Subaru Select Monitor (Function mode: FD03). For procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Repair poor contact in ECM connector.

NO : Go to step **10CR2**.


10CR2 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.

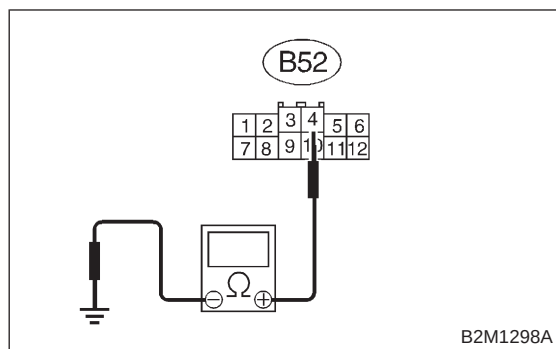
Connector & terminal

(B84) No. 74 — Chassis ground:

CHECK : Is the resistance less than 10 Ω ?

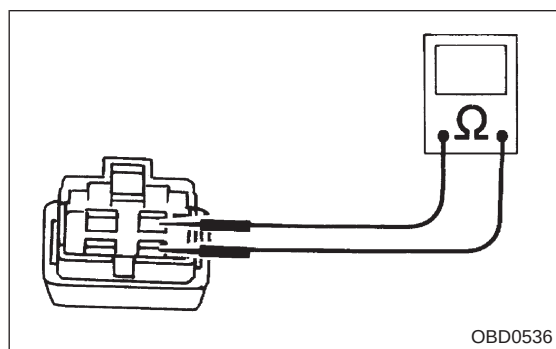
YES : Repair ground short circuit in radiator fan relay 1 control circuit.

NO : Go to step **10CR3**.



10CR3	CHECK POWER SUPPLY FOR RELAY.

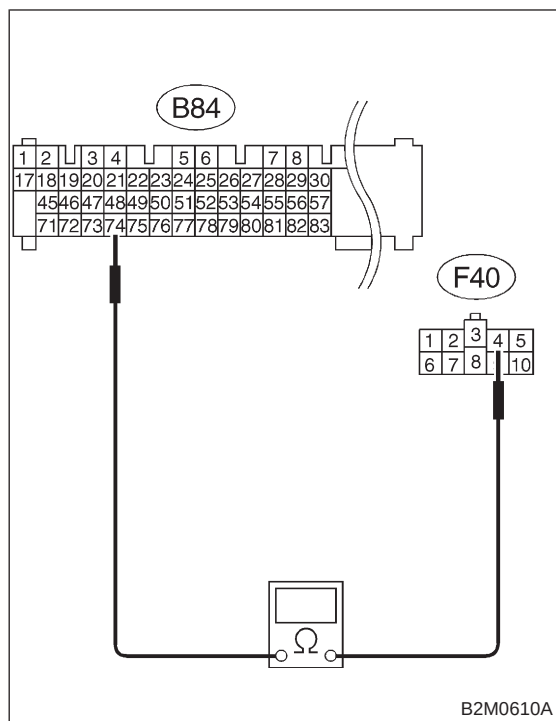
- 1) Disconnect connector (B52) from fuse and relay box (F/B).
- 2) Turn ignition switch to ON.
- 3) Measure voltage between fuse and relay box (F/B) connector and chassis ground.

Connector & terminal**(B52) No. 4 (+) — Chassis ground (-):****CHECK** : Is the voltage more than 10 V?**YES** : Go to step **10CR4**.**NO** : Repair open circuit in harness between ignition switch and fuse and relay box (F/B) connector.

10CR4	CHECK MAIN FAN RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove main fan relay.
- 3) Measure resistance between main fan relay terminals.

Terminal**No. 1 — No. 3:****CHECK** : Is the resistance between 83 and 117 Ω ?**YES** : Go to step **10CR5**.**NO** : Replace main fan relay.

**10CR5****CHECK OPEN CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.**

- 1) Disconnect connector (F40) from fuse and relay box (F/B).
- 2) Measure resistance of harness between ECM and main fan relay connector.

Connector & terminal**(B84) No. 74 — (F40) No. 4:****(CHECK) : Is the resistance less than 1 Ω?****(YES) : Go to step 10CR6.****(NO) : Repair harness and connector.****NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and main fan relay connector
- Poor contact in coupling connector (F45)

10CR6**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.

OBD

(FB1)

P1502

<FAN_F>

OBD0538

CS: DTC P1502

— RADIATOR FAN FUNCTION PROBLEM —

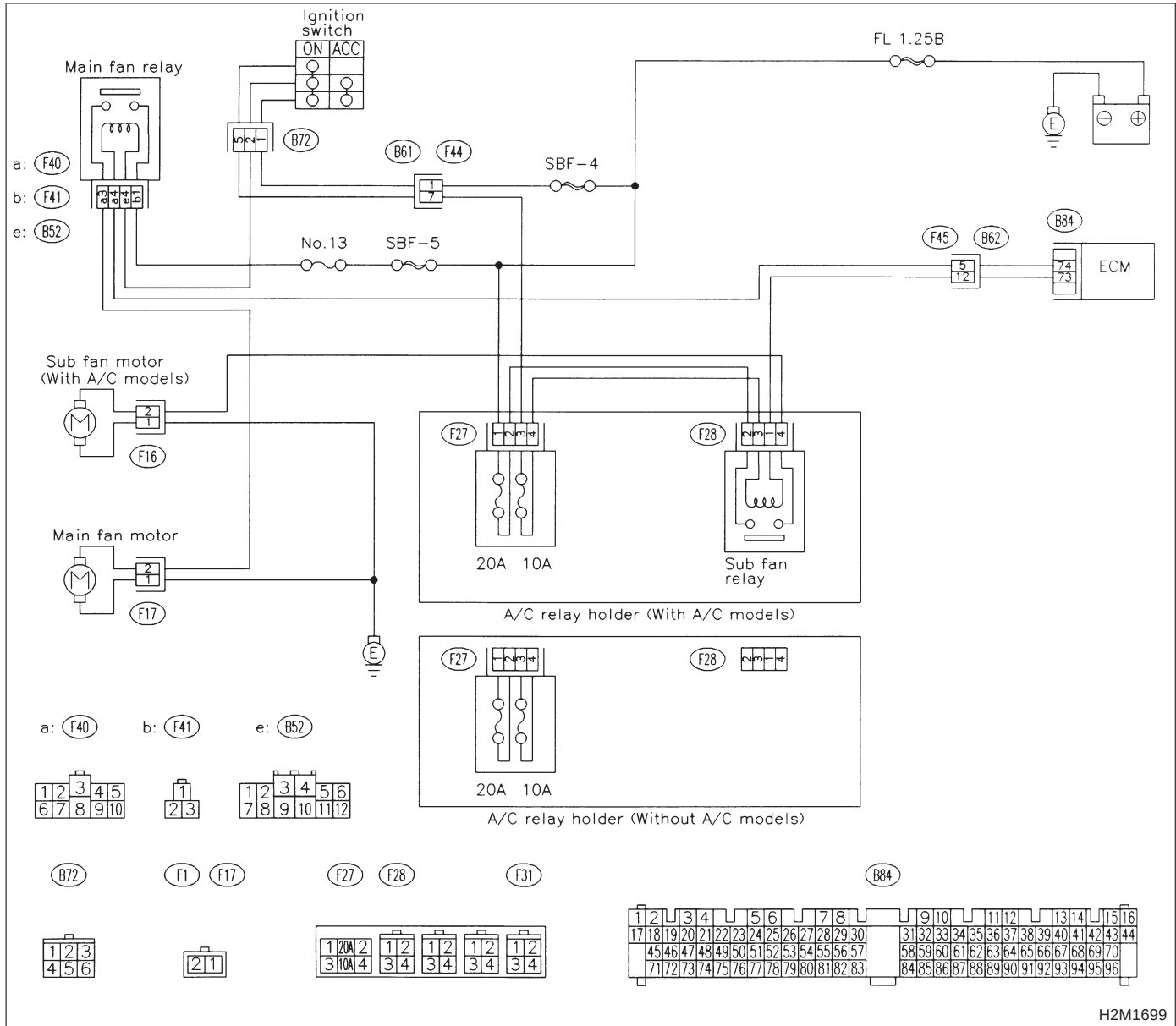
DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Occurrence of noise
- Overheating

WIRING DIAGRAM:



H2M1699

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.

10CS1	CHECK ANY OTHER DTC (BESIDE DTC P1502) 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 [K100].>

OBD (FB1)

P1507 <ISC_SHI>

B2M1140

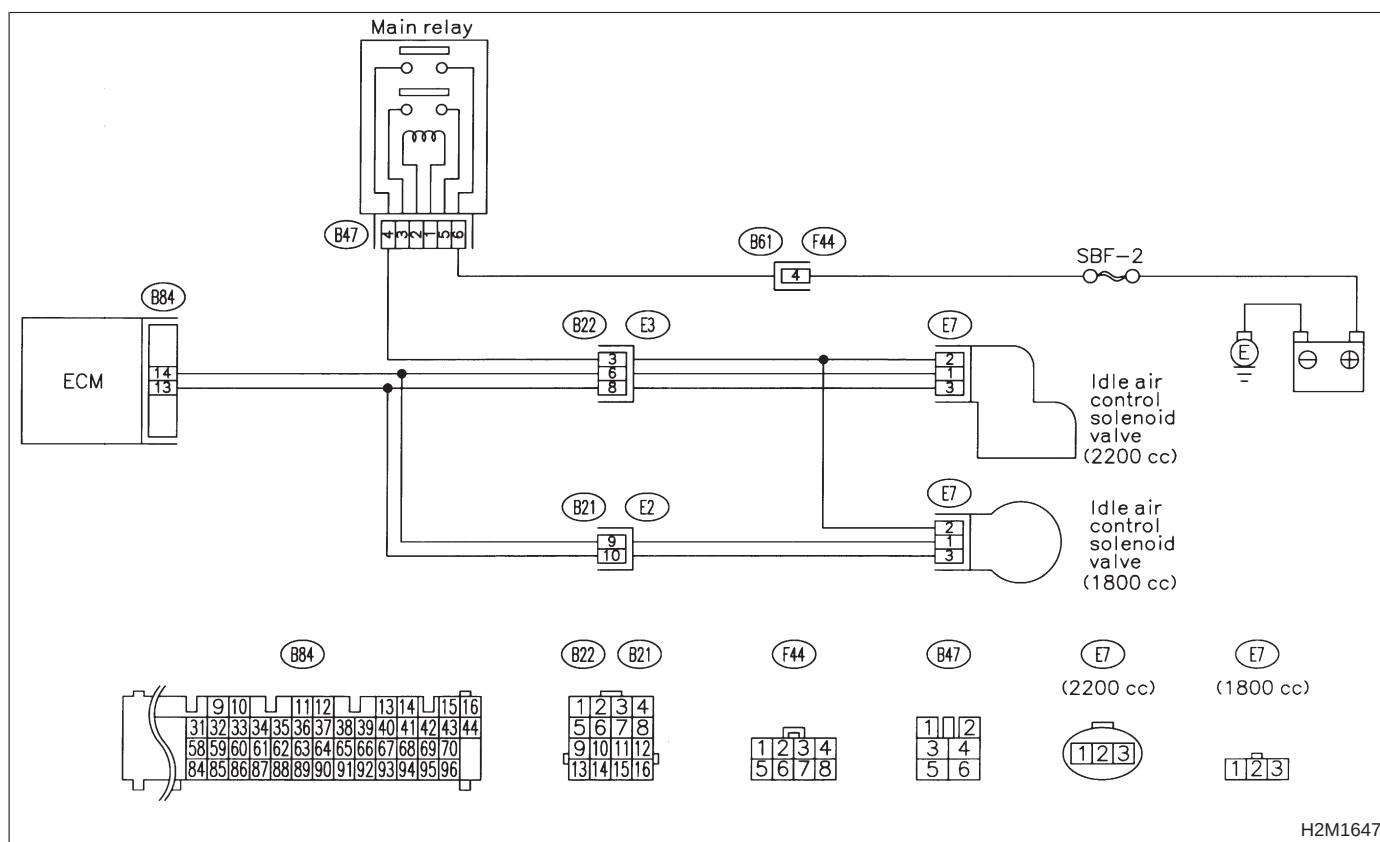
CT: DTC P1507

— 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.

WIRING DIAGRAM:

H2M1647

CAUTION:

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

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

10CT1	CHECK DTC P0505 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.

CHECK : *Is there a fault in air intake system?*

NOTE:

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

YES : Repair air suction and leaks.

NO : Replace idle air control solenoid valve.

OBD (FB1)

P1520 <FAN_1HI>

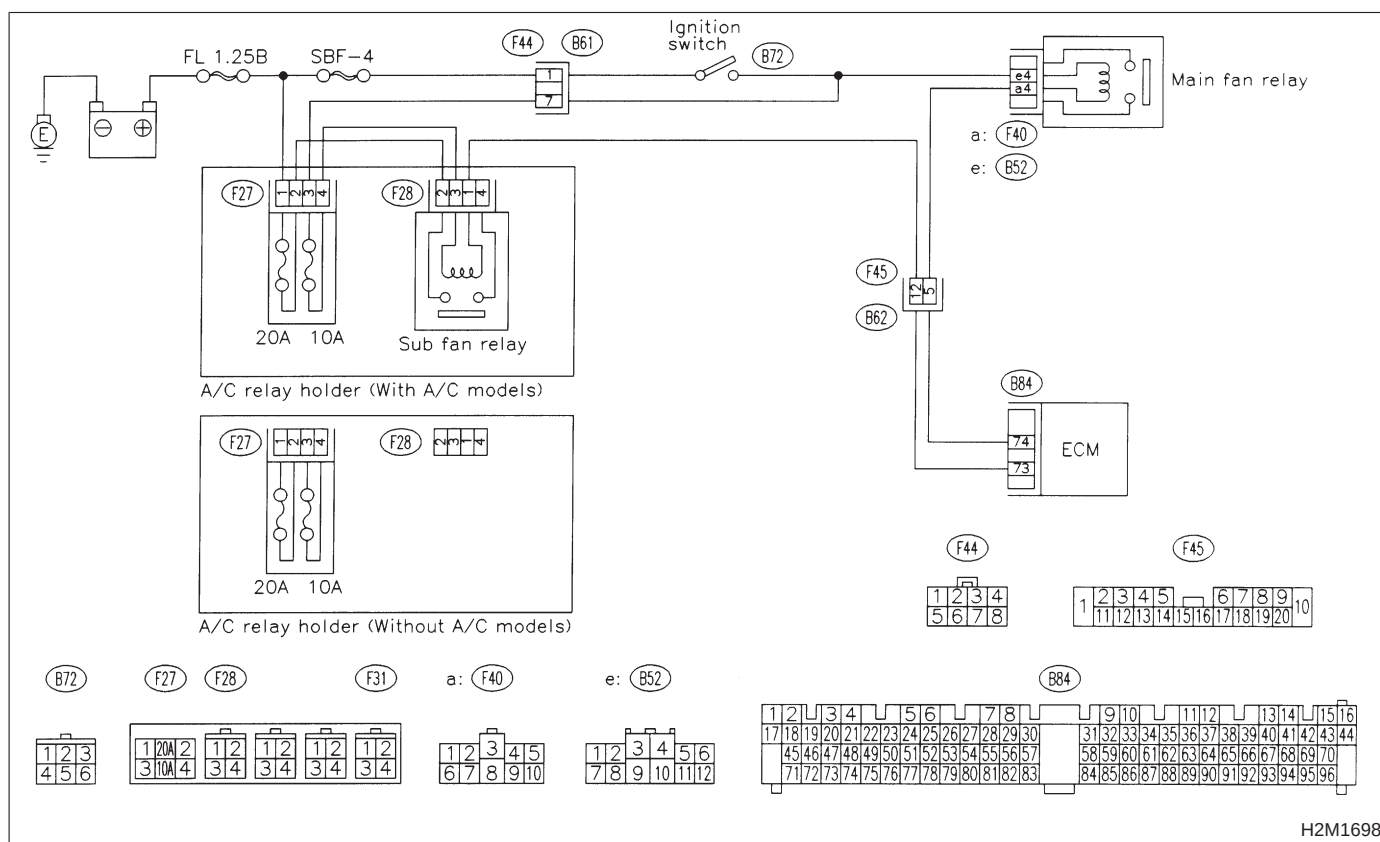
B2M1141

CU: DTC P1520**— RADIATOR FAN RELAY 1 CIRCUIT HIGH INPUT —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

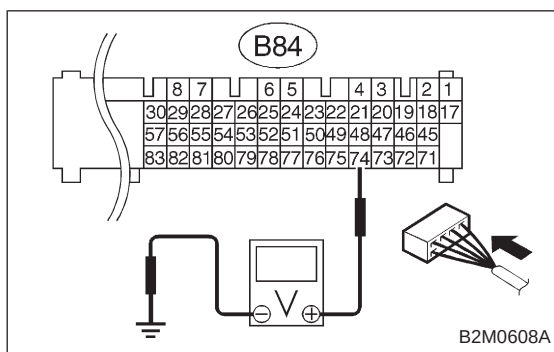
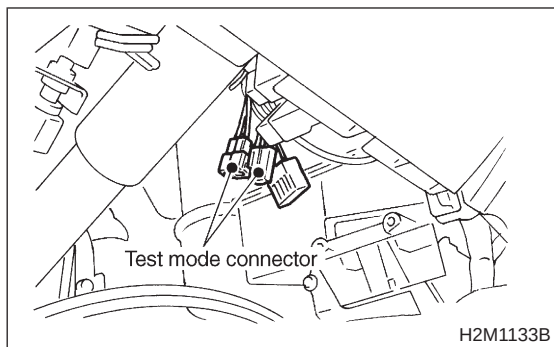
WIRING DIAGRAM:

H2M1698

CAUTION:

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

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



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.

- 4) Measure voltage between ECM and chassis ground.

Connector & terminal

(B84) No. 74 (+) — Chassis ground:

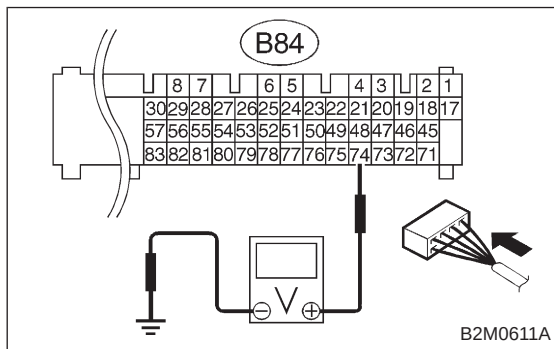
CHECK : Does voltage change between 0 and 10 volts?

NOTE:

Radiator fan relay operation check can be executed using Subaru Select Monitor (Function mode: FD03). For procedure, refer to "COMPULSORY VALVE OPERATION CHECK MODE". <Ref. to 2-7 [T3F0].>

YES : Go to step **10CU2**.

NO : 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.



10CU2 CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Remove main fan relay 1 and sub fan relay 1. (with A/C models)
Remove main fan relay. (without A/C models)
- 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.

OBD (FB1)
P1540 <VSP_S>

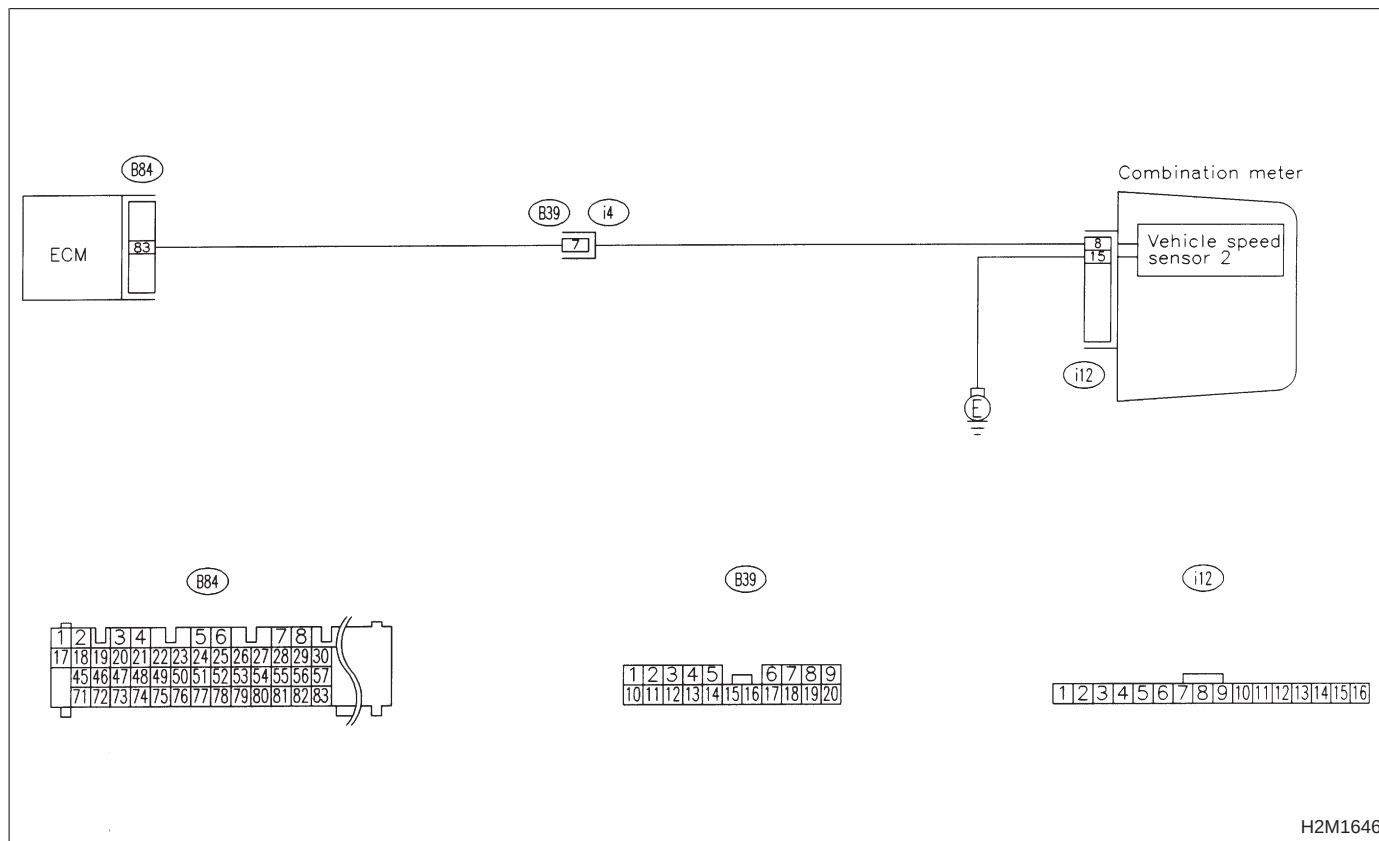
B2M1142

CV: DTC P1540
— VEHICLE SPEED SENSOR MALFUNCTION
2 —

DTC DETECTING CONDITION:

- Immediately at fault recognition

WIRING DIAGRAM:

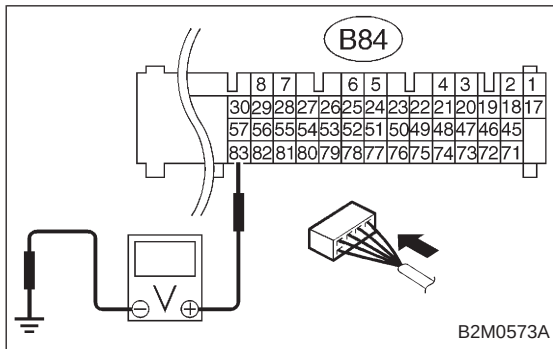


H2M1646

CAUTION:

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

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

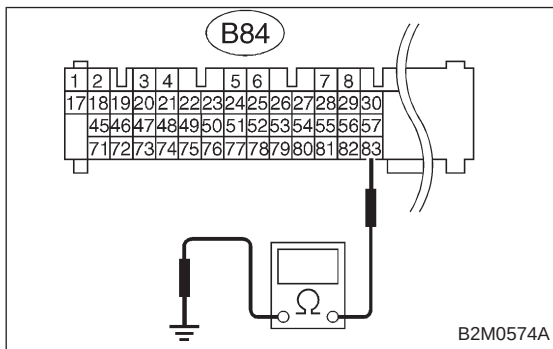
10CV1**CHECK SPEEDOMETER OPERATION IN COMBINATION METER.****CHECK** : *Does speedometer operate normally?***YES** : Go to step **10CV2**.**NO** : Check speedometer and vehicle speed sensor 2.
<Ref. to 6-2 [K2A0].>**10CV2****CHECK HARNESS BETWEEN ECM AND COMBINATION METER CONNECTOR.**

- 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:**

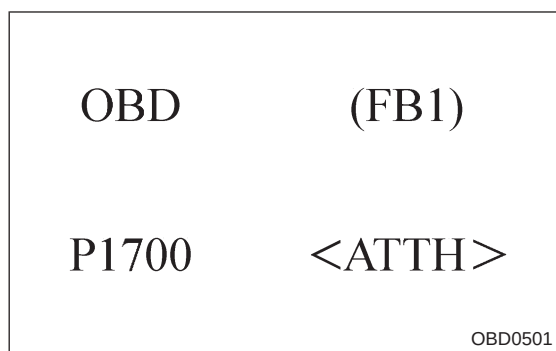
In this case, repair the following:

- 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 (B39)

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 —

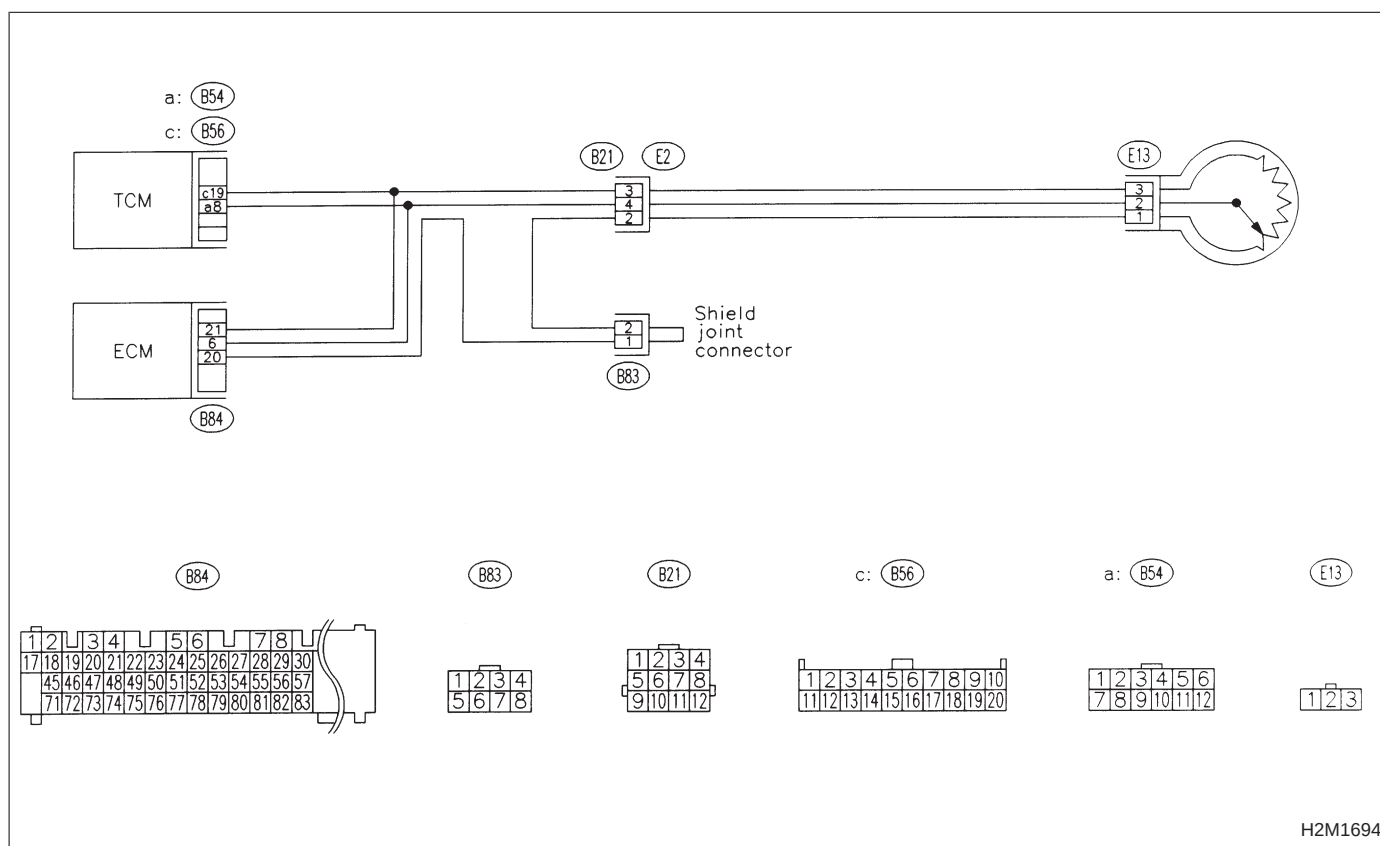
DTC DETECTING CONDITION:

- 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"

WIRING DIAGRAM:



H2M1694

CAUTION:

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

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.

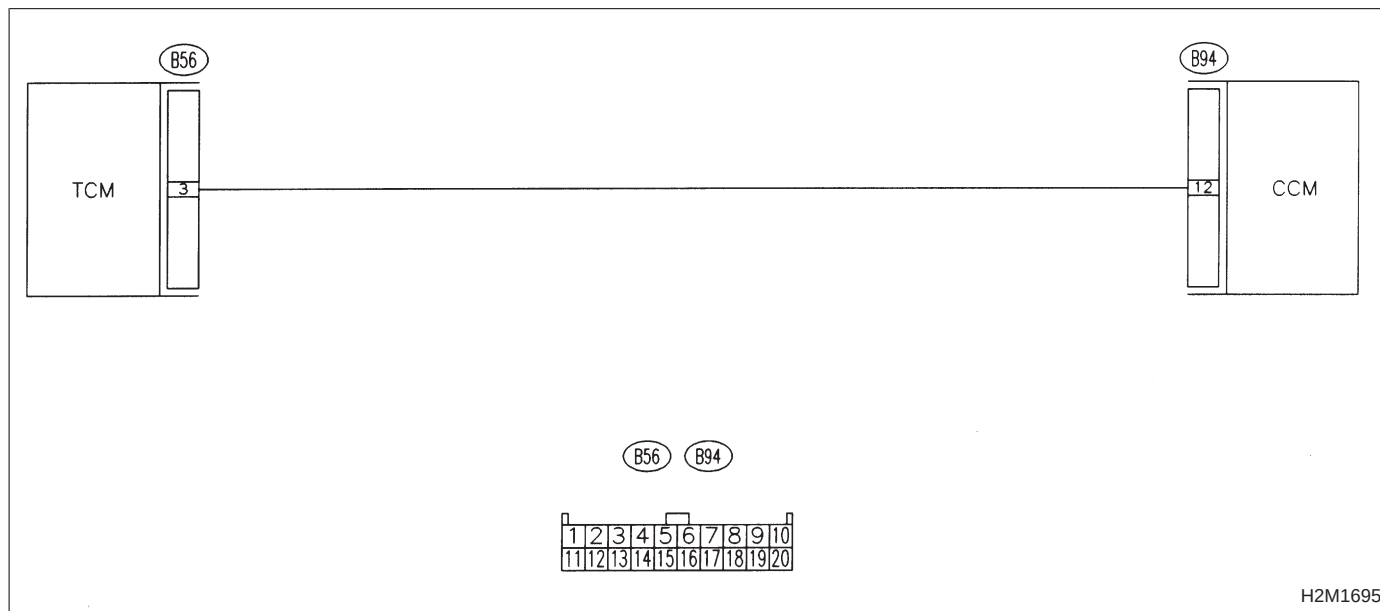
OBD (FB1)

P1701 <ATCRS>

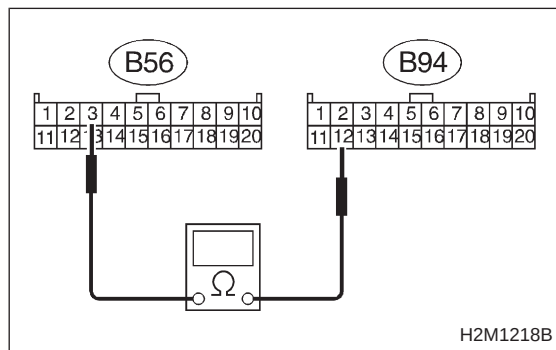
B2M0669

CX: DTC P1701**— CRUISE CONTROL SET SIGNAL CIRCUIT
MALFUNCTION FOR AUTOMATIC
TRANSMISSION —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:**CAUTION:**

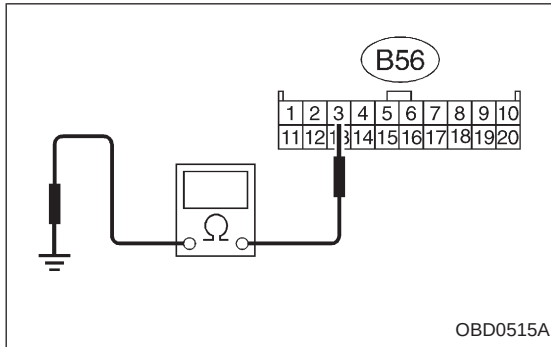
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
 <Ref. to 2-7 [T3D0] and [T3E0].>

**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:

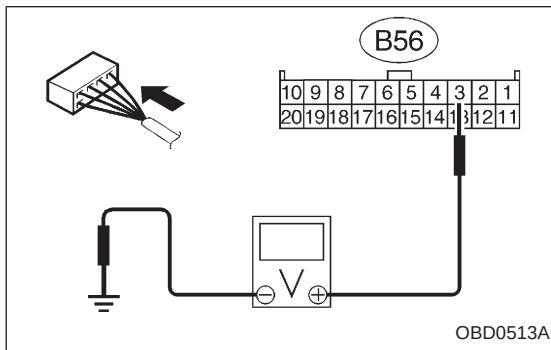
- CHECK** : Is the resistance less than 1 Ω ?
YES : Go to next step 4).
NO : Repair open circuit in harness between TCM and CCM connector.



4) 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 short circuit in harness between TCM and CCM connector.
NO : Go to step 10CX2.



10CX2	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) TCS OFF switch to ON. (with TCS models only)
- 6) Move selector lever to "D" and slowly increase vehicle speed to 50 km/h (31 MPH).
- 7) Cruise control set switch to ON.
- 8) 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 10CX3.
NO : Check cruise control set circuit. <Ref. to 6-3 [D5011].>

10CX3	CHECK POOR CONTACT.

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

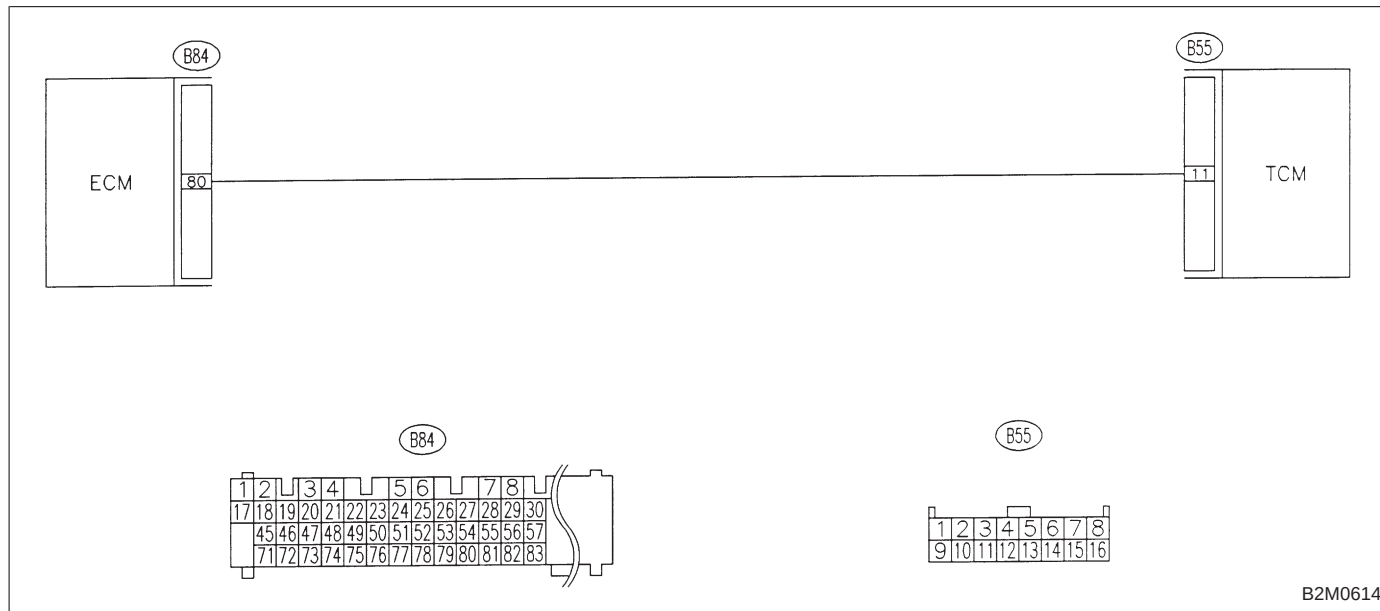
- CHECK** : Is there poor contact in TCM connector?
YES : Repair poor contact in TCM connector.
NO : Replace TCM.

OBD (FB1)
P1702<ATDIAG_LO>

B2M1143

CY: DTC P1702**— AUTOMATIC TRANSMISSION DIAGNOSIS
INPUT SIGNAL CIRCUIT LOW INPUT —****DTC DETECTING CONDITION:**

- Two consecutive driving cycles with fault

WIRING DIAGRAM:

B2M0614

CAUTION:

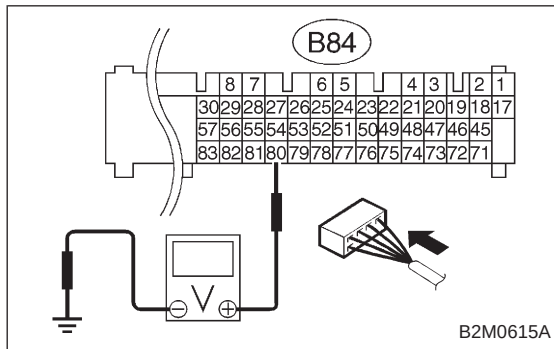
After repair or replacement of faulty parts, conduct
CLEAR MEMORY and **INSPECTION MODES**.
<Ref. to 2-7 [T3D0] and [T3E0].>

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?*

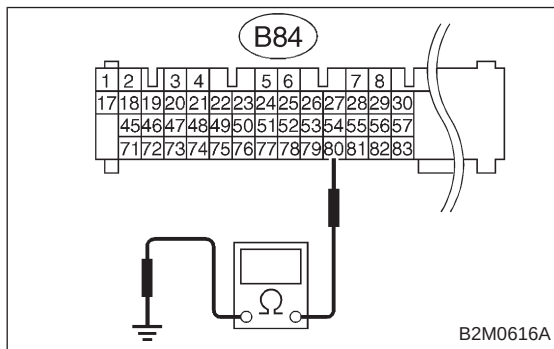
YES : Go to step **10CY3**.

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.

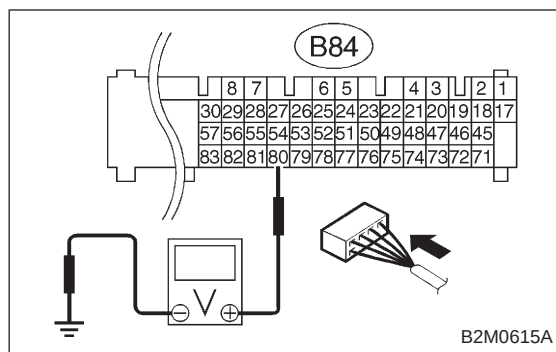
Connector & terminal

(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 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.

OBD (FB1)
P1722<ATDIAG_HI>

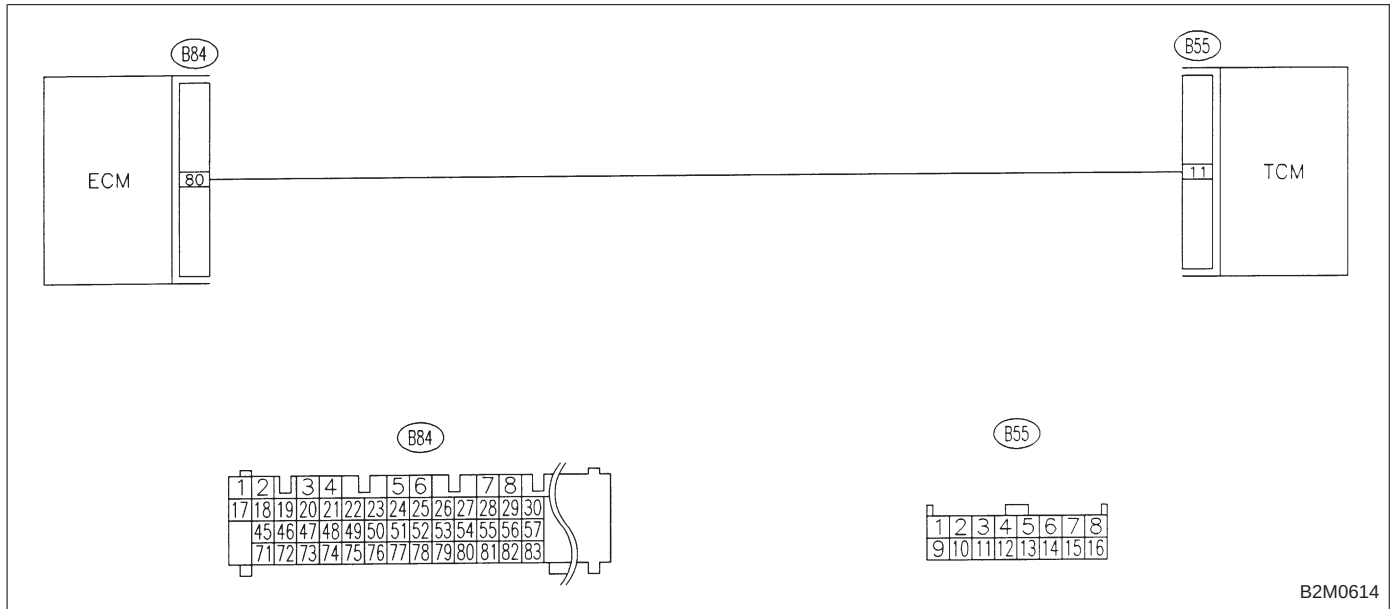
B2M1144

CZ: DTC P1722
— AUTOMATIC TRANSMISSION DIAGNOSIS
INPUT SIGNAL CIRCUIT HIGH INPUT —

DTC DETECTING CONDITION:

- Two consecutive driving cycles with fault

WIRING DIAGRAM:



B2M0614

CAUTION:

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

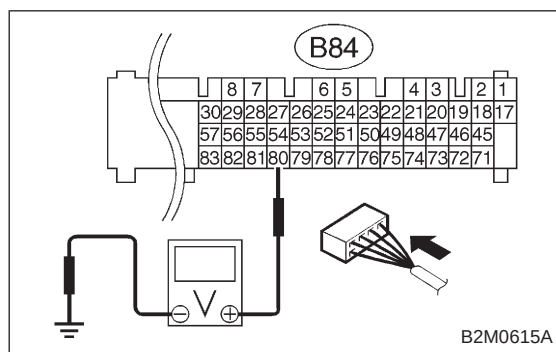
<Ref. to 2-7 [T3D0] and [T3E0].>

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.

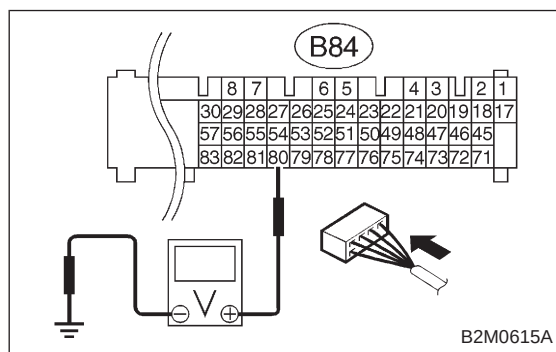
Connector & terminal

(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.

1) Measure voltage between ECM and chassis ground.

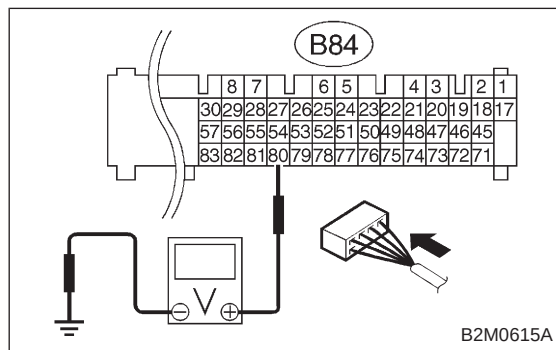
Connector & terminal

(B84) No. 80 (+) — Chassis ground (-):

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

YES : Go to step **10CZ4**.

NO : Go to next step 2).



2) Measure voltage between ECM and chassis ground.

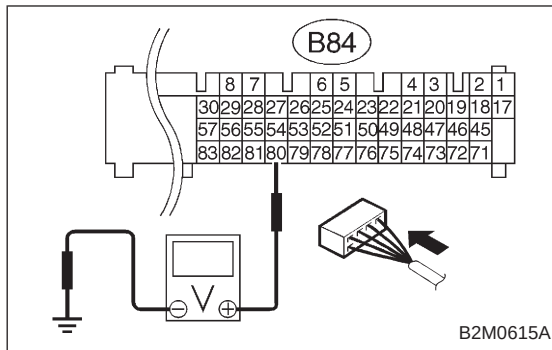
Connector & terminal

(B84) No. 80 (+) — Chassis ground (-):

CHECK : *Is the voltage less than 1 V?*

YES : Repair poor contact in ECM connector.

NO : Go to next step 3).



3) 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:

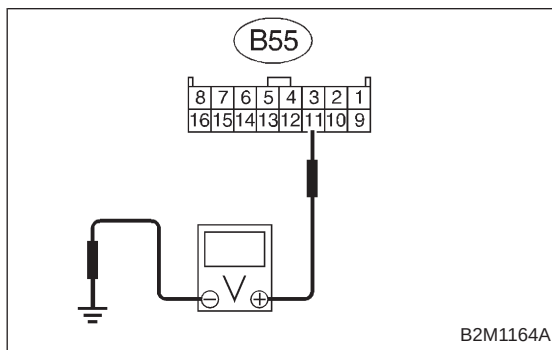
In this case, repair the following:

- 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.



10CZ4

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 **10CZ5**.

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

10CZ5

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.

OBD (FB1)

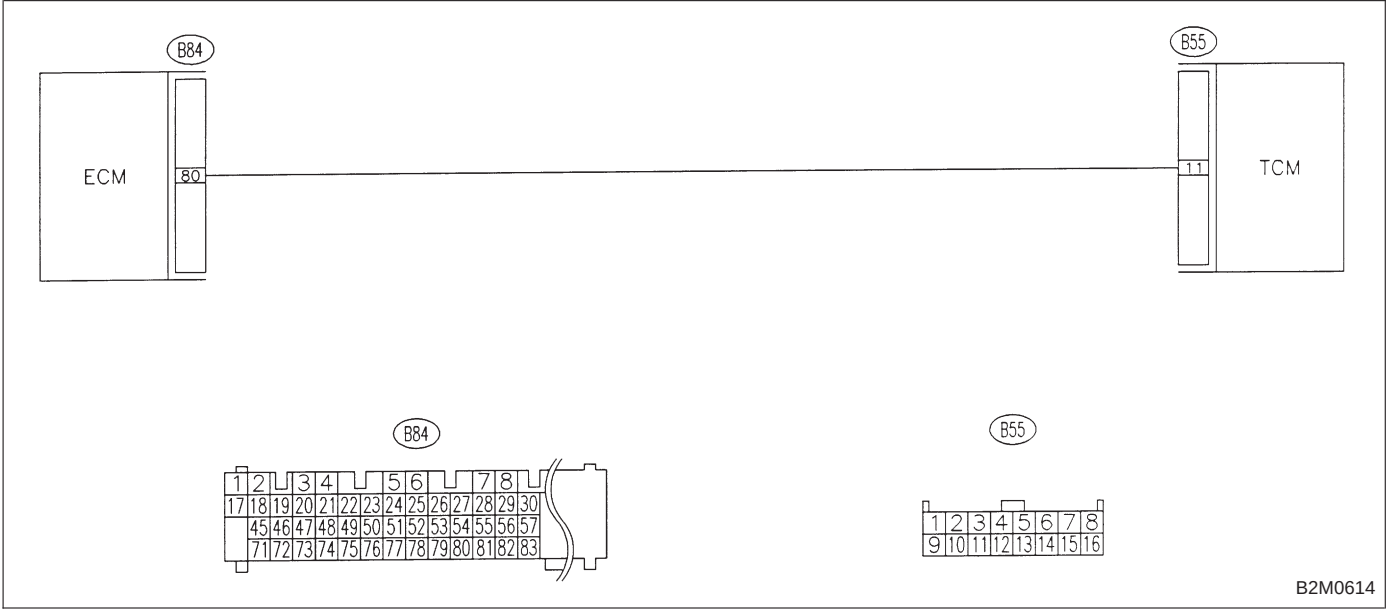
P1742 <ATDIAG_2>

B2M1147

DA: DTC P1742
— AUTOMATIC TRANSMISSION DIAGNOSIS
INPUT SIGNAL CIRCUIT MALFUNCTION —

- DTC DETECTING CONDITION:
- Two consecutive driving cycles with fault

WIRING DIAGRAM:



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

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.

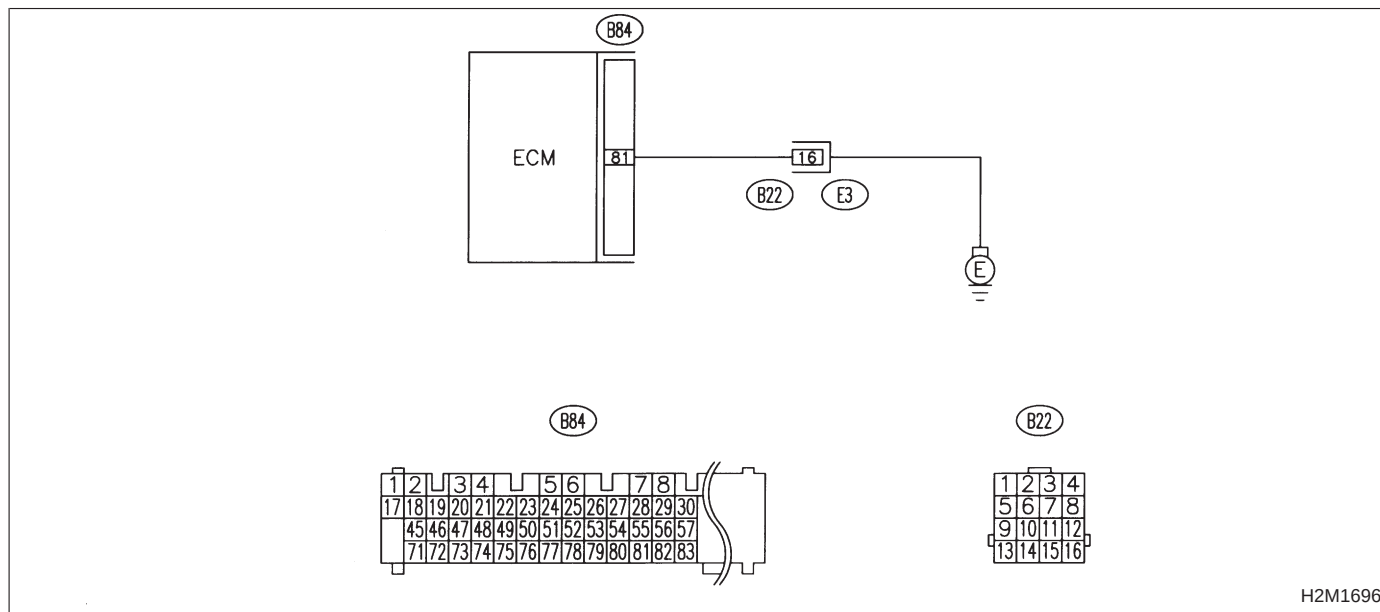
CHECK : *Are car phone and/or CB installed on vehicle?*

YES : Repair grounding line of car phone or CB system.

NO : Replace TCM.

DB: — AT/MT IDENTIFICATION CIRCUIT MALFUNCTION [MT VEHICLES] —

WIRING DIAGRAM:

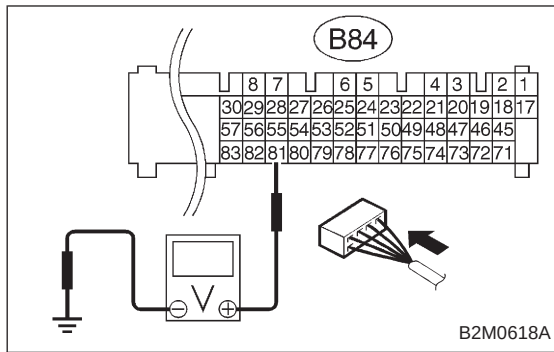


H2M1696

CAUTION:

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

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

**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:

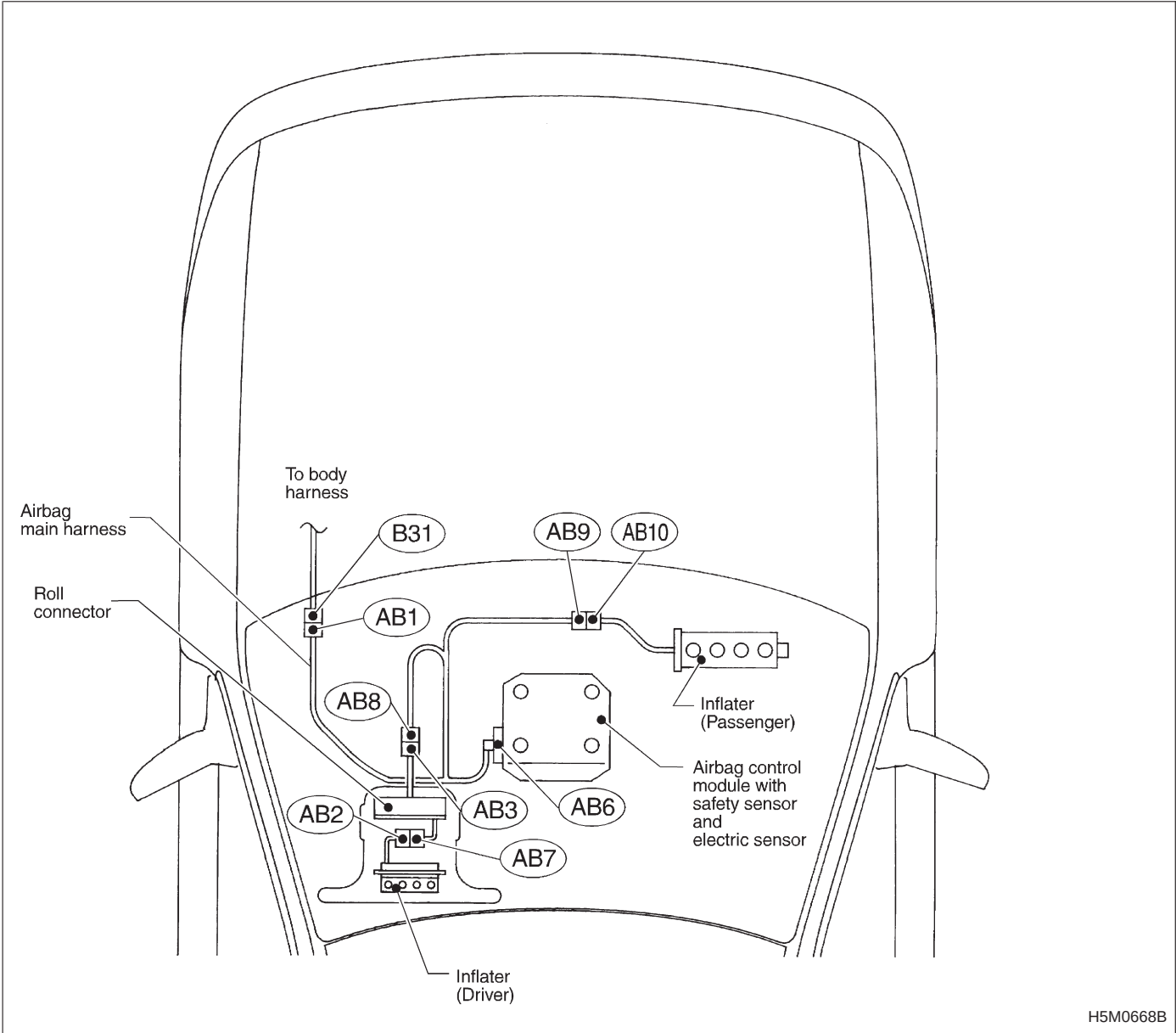
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

SUPPLEMENTAL RESTRAINT SYSTEM

5-5

	Page
T DIAGNOSTICS	2
1. Electrical Components Location	2
2. Schematic	3
3. Tools for Diagnostics.....	4
4. Diagnostics Chart for On-board Diagnostic System	8
5. Diagnostics Chart with Trouble Code	14

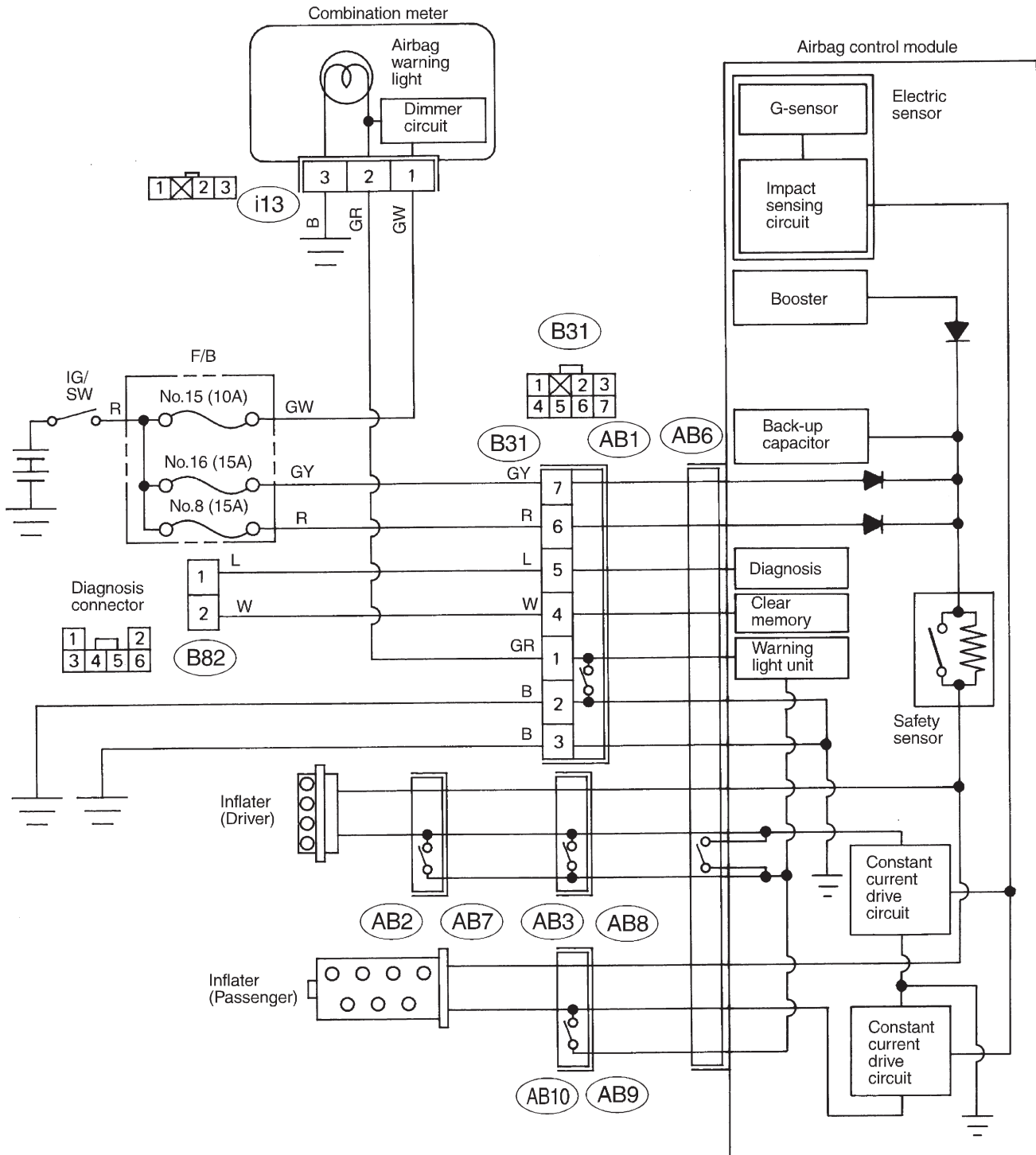
1. Electrical Components Location



H5M0668B

Connector No.	(AB1)	(AB2)	(AB3)	(AB6)	(AB7)	(AB8)	(AB9)	(AB10)
Pole	7	3	3	12	3	3	3	3
Color	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Male/Female	Male	Female	Female	Female	Male	Male	Male	Female

2. Schematic



H5M0667B

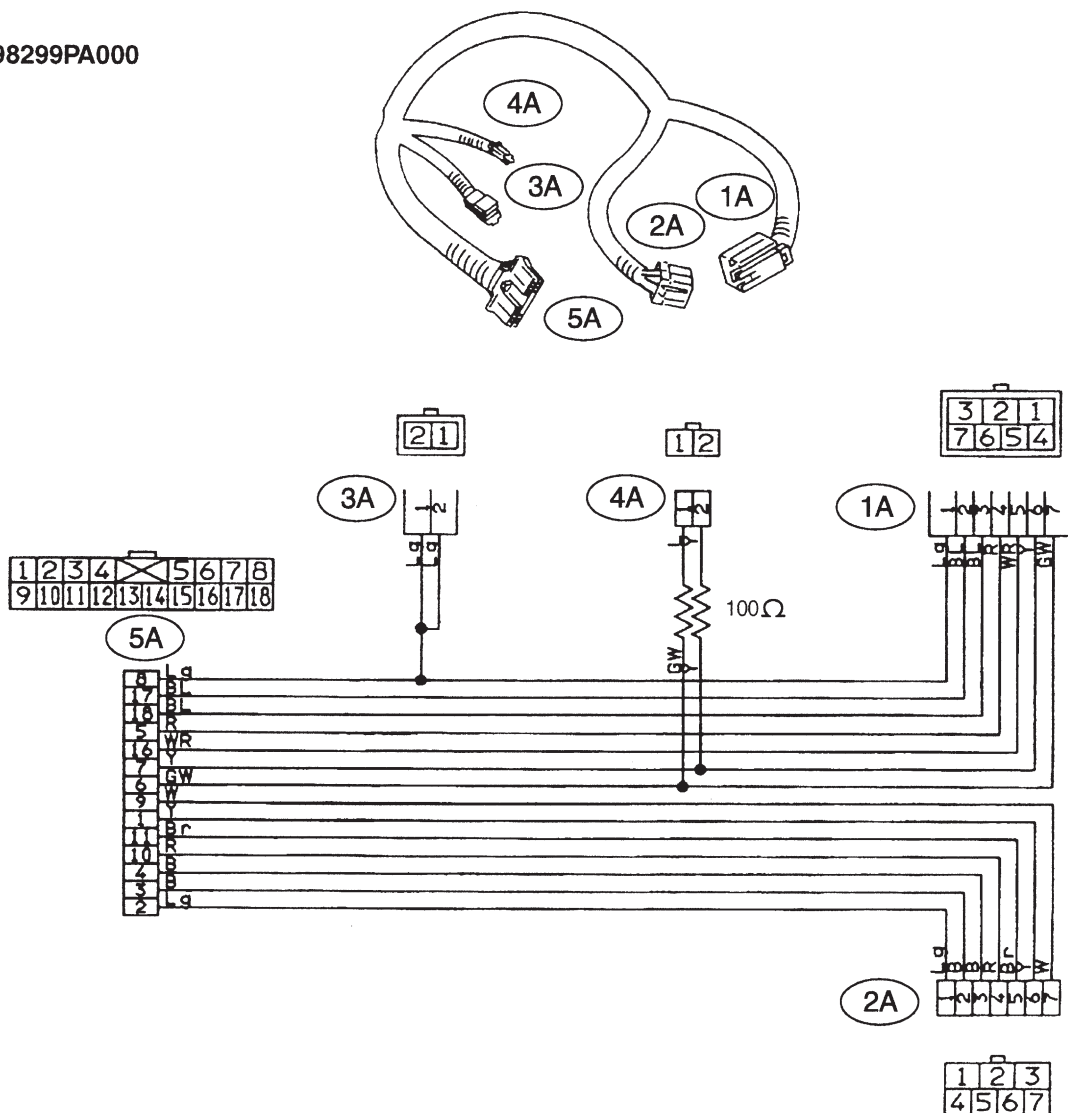
3. Tools for Diagnostics

CAUTION:

Be sure to use specified test harness A, B or C when measuring voltage, resistance, etc. of AIRBAG system component parts.

A: TEST HARNESS A

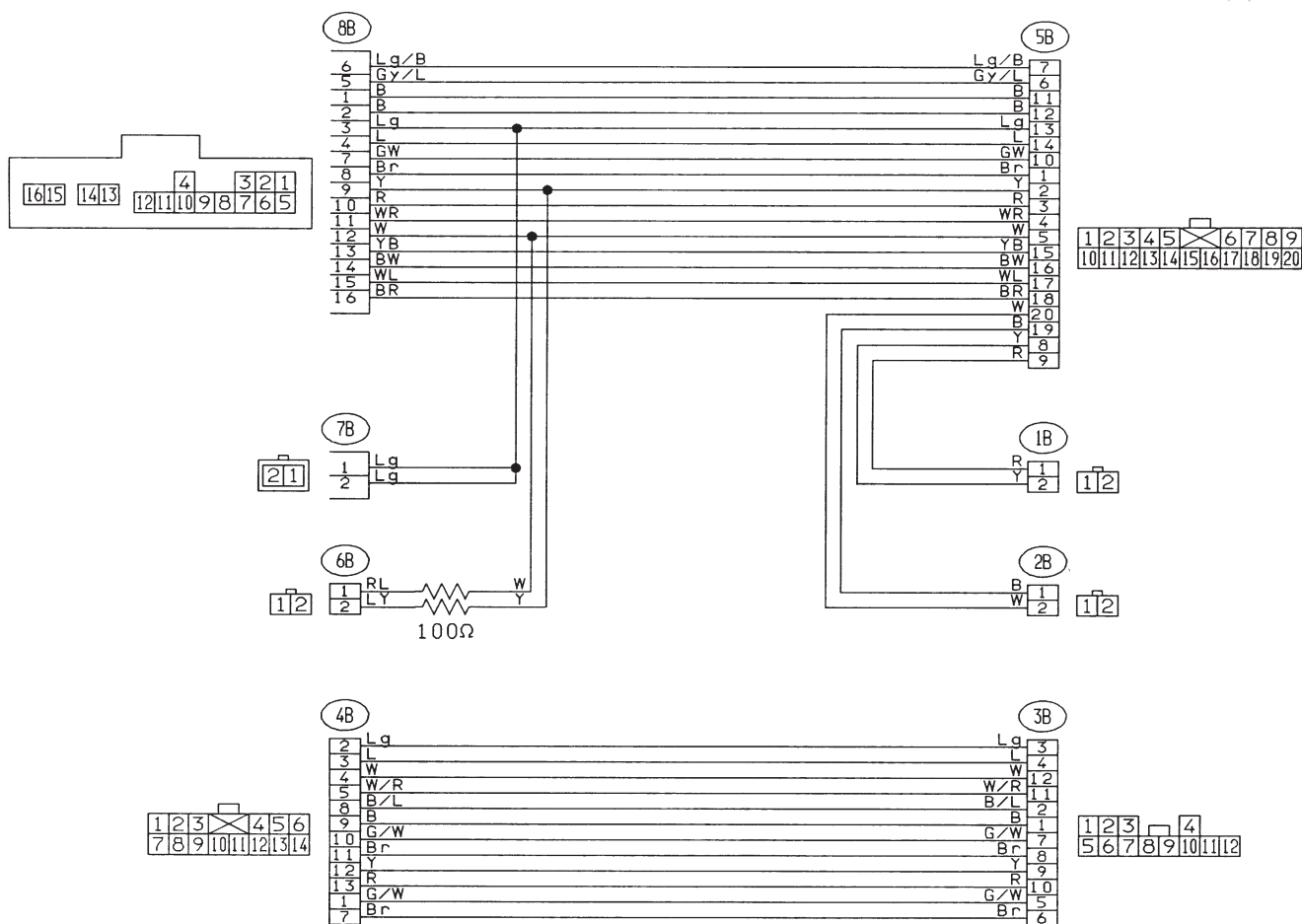
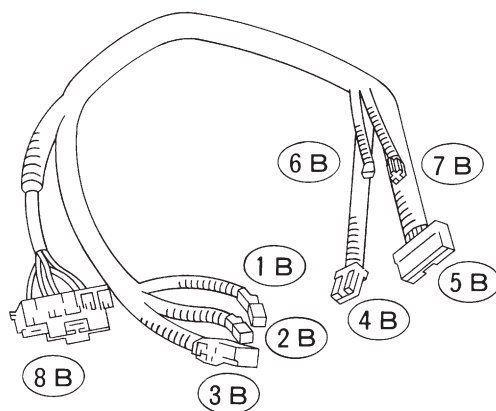
PN 98299PA000



B5M0112A

B: TEST HARNESS B2

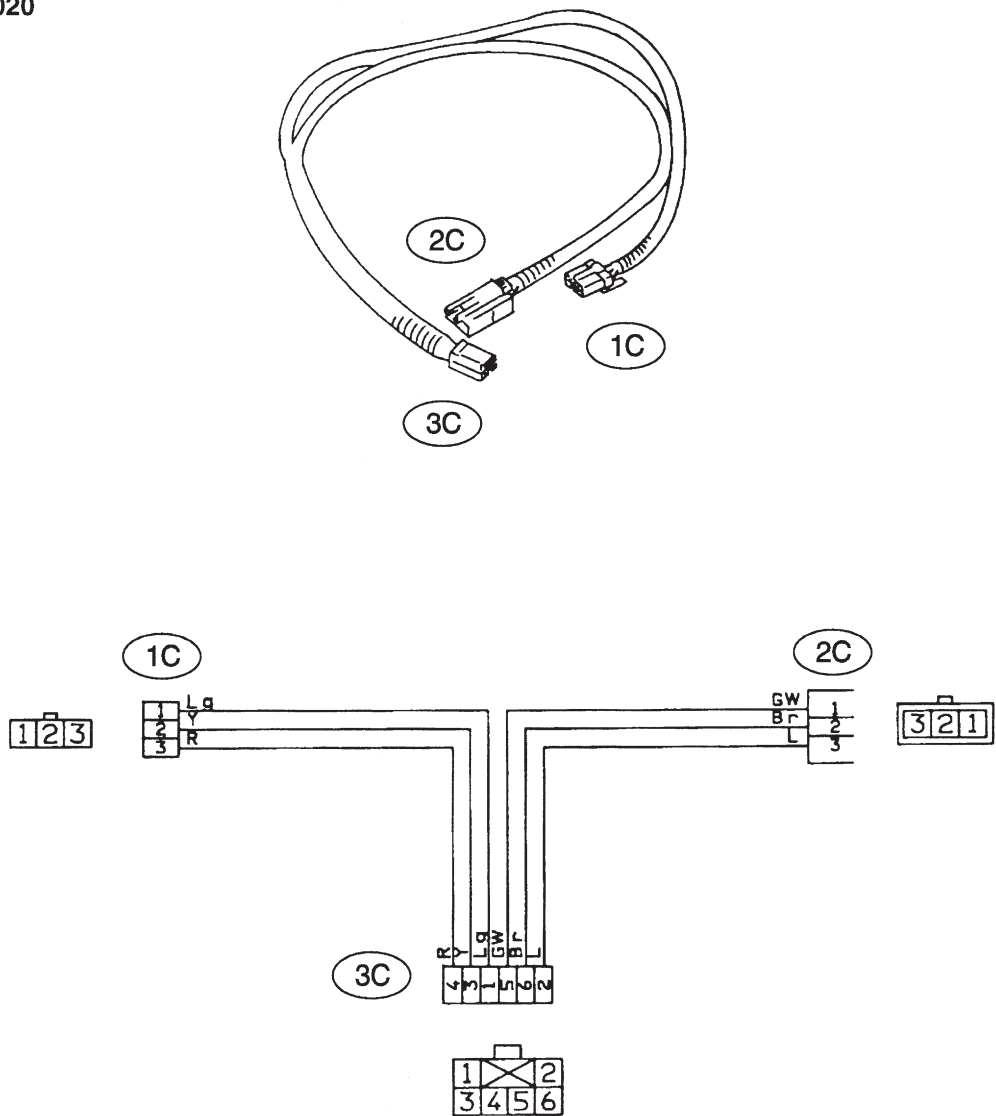
PN 98299PA011



G5M0593

C: TEST HARNESS C

PN 98299PA020

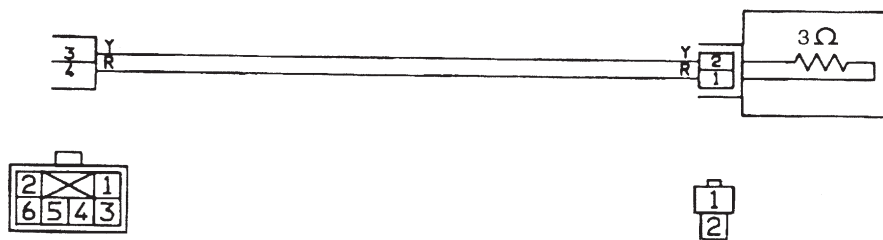
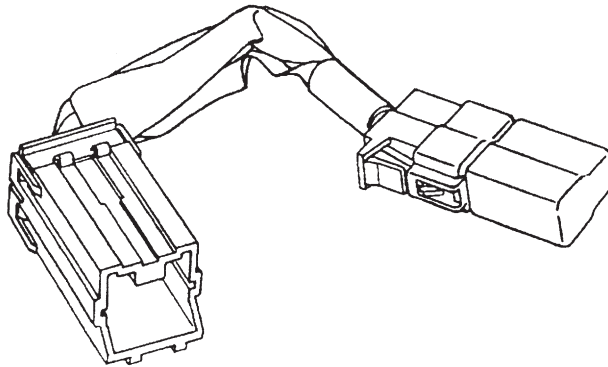


B5M0113A

D: 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**.

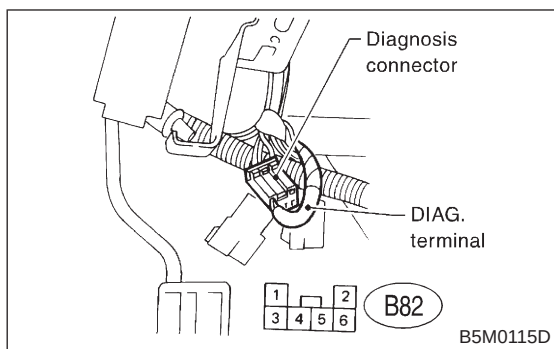
4A4	CHECK AIRBAG WARNING LIGHT ILLUMINATES.

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**.

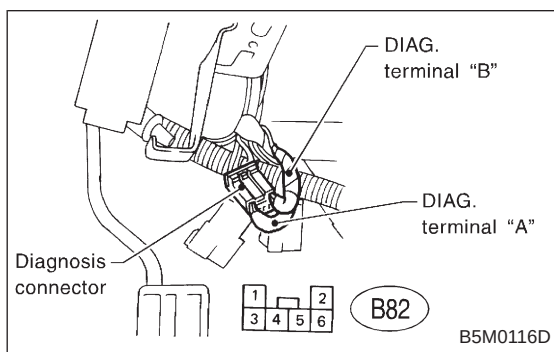


B: ON-BOARD DIAGNOSTIC

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.

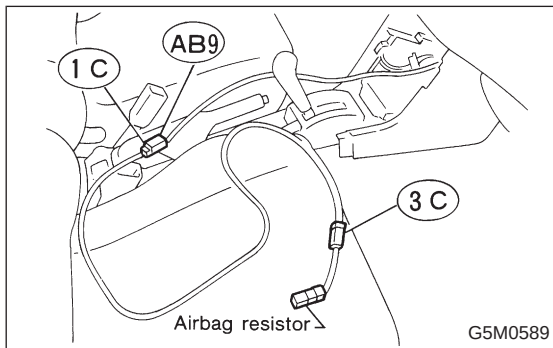
CHECK : **Are trouble codes 12, 13, 41, 43 indicated?** <Ref. to 5-5 [T5A2].>

YES : Go to step **4D4**.

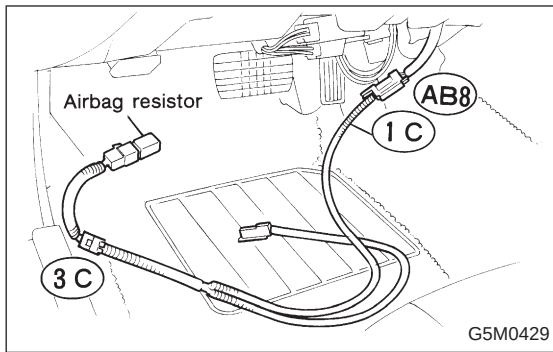
NO : Go to step **4D8**.

4D4	CHECK AIRBAG WARNING LIGHT ILLUMINATES.

- 1) Turn ignition switch to OFF. Disconnect battery ground cable, and wait 20 seconds.
- 2) Disconnect passenger's airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].>



- 3) Connect test harness C connector (1C) to (AB9).
- 4) Connect airbag resistor to test harness C connector (3C).



5) Remove lower cover panel and connect test harness C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C).

6) Connect battery ground cable and turn ignition switch to ON.

7) Check airbag warning light illuminates.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

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.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

YES : Go to step **4D6**.

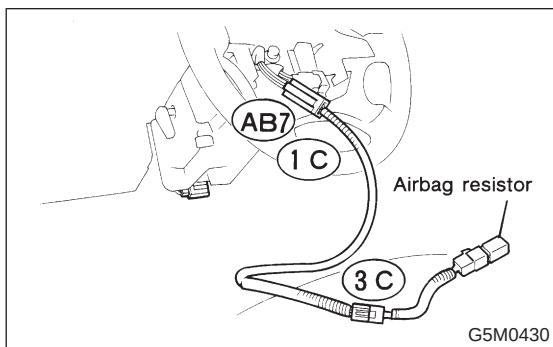
NO : Replace with a new passenger's airbag module. <Ref. to 5-5 [W3A2].> Then go to step **4D5**.

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 C connector (1C) to (AB7). <Ref. to 5-5 [W3A1].>

4) Connect airbag resistor to test harness C connector (3C).

5) Connect battery ground cable and turn ignition switch to ON.

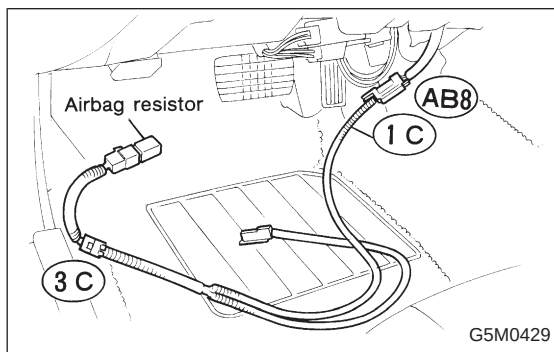
6) Check airbag warning light illuminates.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

- 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 C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C).

3) Connect battery ground cable and turn ignition switch to ON.

4) Check airbag warning light illuminates.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

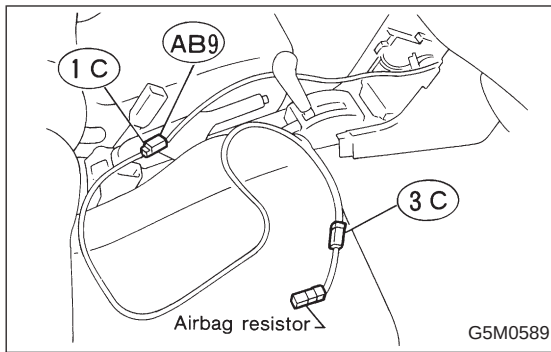
YES : Go to step **4D6**.

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 C connector (1C) to (AB9).
- 4) Connect airbag resistor to test harness C connector (3C).
- 5) Connect battery ground cable and turn ignition switch to ON.
- 6) Check airbag warning light illuminates.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

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.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

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.

CHECK : ***Does airbag warning light go off after about 7 seconds and remain off for more than 30 seconds? <Ref. to 5-5 [T4D11].>***

YES : Perform clear memory. <Ref. to 5-5 [T4C0].>

NO : Then go to step **4D1**.

4D11**NOTES**

- Always remember to secure the green double locks before turning the ignition switch to ON.
- 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.

5. Diagnostics Chart with Trouble Code

A: TROUBLE CODES

1. LIST OF TROUBLE CODES

Trouble code/ Contents of troubles	Memory function	Contents of diagnosis	Ref. to
04	Provided.	1) Airbag main harness circuit is shorted. 2) Passenger's airbag module harness circuit is shorted. 3) Airbag control module is faulty.	<Ref. to 5-5 [T5B0].>
11	Provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 8 is blown. 4) Body harness circuit is open.	<Ref. to 5-5 [T5C0].>
12	Provided.	1) Airbag main harness circuit is open. 2) Driver's airbag module harness circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty.	<Ref. to 5-5 [T5D0].>
13	Provided.	1) Airbag main harness circuit is shorted. 2) Driver's airbag module harness is shorted. 3) Roll connector circuit is shorted. 4) Airbag control module is faulty.	<Ref. to 5-5 [T5E0].>
14	Not provided.	1) (AB9) and (AB10) are not connected properly. 2) (AB2) and (AB7) are not connected properly. 3) (AB3) and (AB8) are not connected properly. 4) (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.	1) Airbag main harness circuit is open. 2) Passenger's airbag module harness circuit is open. 3) Airbag control module is faulty.	<Ref. to 5-5 [T5H0].>
31	Not provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 16 is blown. 4) Body harness circuit is open.	<Ref. to 5-5 [T5I0].>
33	Provided.	Airbag module is inflated.	<Ref. to 5-5 [T5J0].>
34	Provided.	1) Passenger's airbag main harness circuit is shorted to power supply. 2) Passenger's airbag module harness is shorted to power supply. 3) Airbag control module is faulty.	<Ref. to 5-5 [T5K0].>
41	Provided.	1) Driver's airbag main harness circuit is shorted to ground. 2) Driver's airbag module harness circuit is shorted to ground. 3) Roll connector circuit is shorted to ground. 4) Airbag control module is faulty.	<Ref. to 5-5 [T5L0].>
42	Provided.	1) Passenger's airbag main harness circuit is shorted to ground. 2) Passenger's airbag module harness circuit is shorted to ground. 3) Airbag control module is faulty.	<Ref. to 5-5 [T5M0].>
43	Provided.	1) Driver's airbag main harness circuit is shorted to power supply. 2) Driver's airbag module harness is shorted to power supply. 3) Roll connector is shorted to power supply. 4) Airbag control module is faulty.	<Ref. to 5-5 [T5N0].>

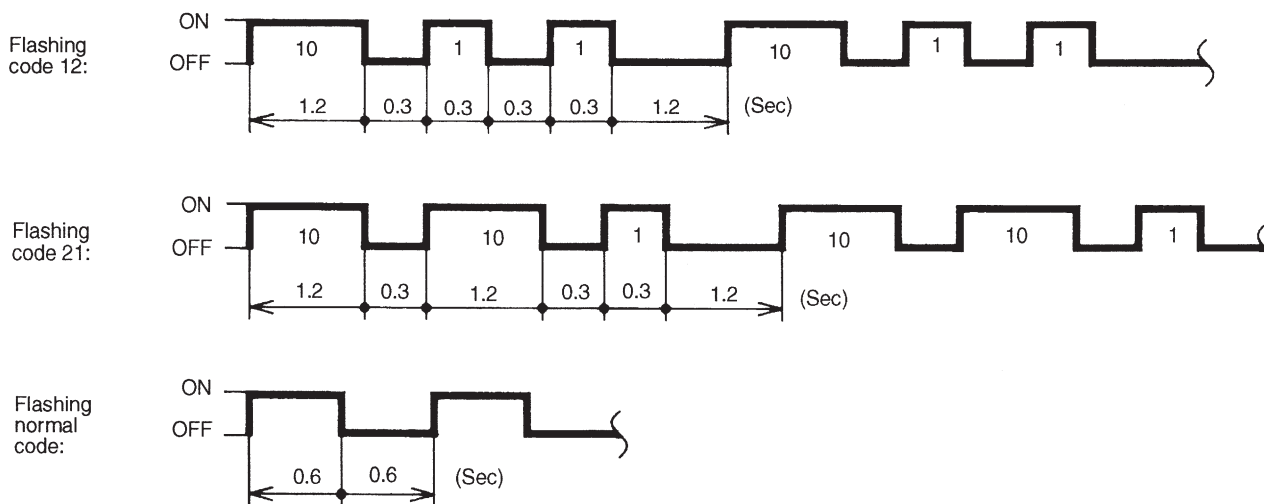
Trouble code/ Contents of troubles	Memory function	Contents of diagnosis	Ref. to
Airbag warning light remains on.	Not provided.	1) Airbag warning light is faulty. 2) Airbag control module to airbag warning light harness circuit is shorted or open. 3) Grounding circuit is faulty. 4) Airbag control module is faulty. 5) (AB1) and (B31) are not connected properly.	<Ref. to 5-5 [T5O0].>
Airbag warning light remains off.	Not provided.	1) Fuse No. 15 is blown. 2) Body harness circuit is open. 3) Airbag warning light is faulty. 4) Airbag main harness is faulty. 5) 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.	1) Airbag connector is faulty. 2) Fuse No. 16 is blown. 3) Airbag main harness is faulty. 4) Airbag control module is faulty. 5) 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

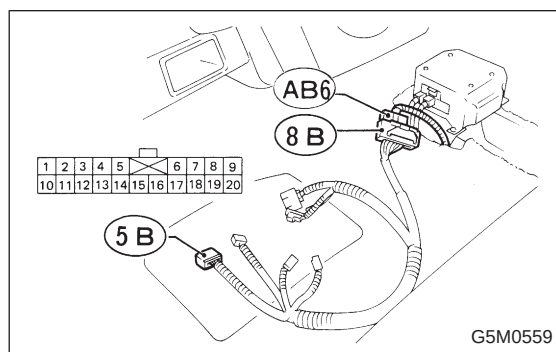
DIAGNOSIS:

- 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 B2 connector (8B).
- 2) Measure resistance between test harness B2 connector (5B) terminal.

Connector & terminal
(5B) No. 6 — (5B) No. 7:

- CHECK** : *Is resistance more than 10 kΩ?*
- YES** : Replace airbag control module. <Ref. to 5-5 [W500].>
- NO** : Replace airbag main harness. <Ref. to 5-5 [W400].>

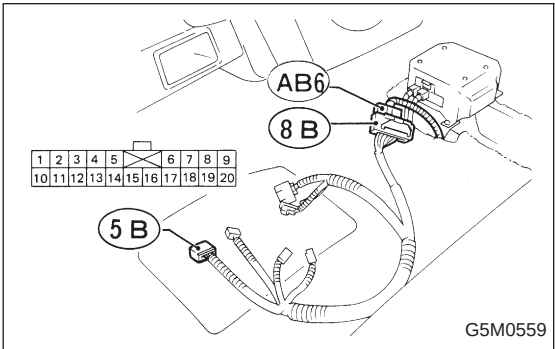
C: TROUBLE CODE 11

DIAGNOSIS:

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 8 is blown.
- 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 INSPEC- TION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W5A0].> and connect it to test harness B2 connector (8B).
- 2) Connect battery ground cable and turn ignition switch “ON”. (engine off)
- 3) Measure voltage across connector (5B) terminal and chassis ground.

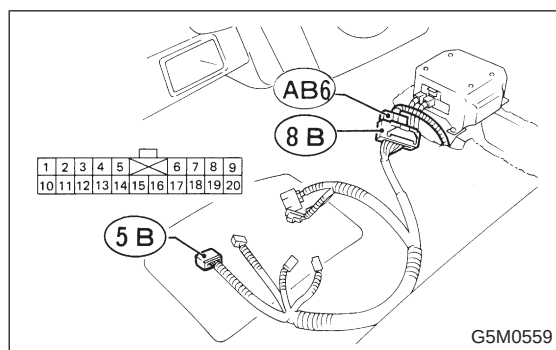
Connector & terminal
(5B) No. 2 (+) — Chassis ground (–):

- CHECK** : Is voltage more than 10 V?
- YES** : Replace airbag control module. <Ref. to 5-5 [W500].>
- 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 AIR BAG 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.



G5M0559

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 B2 connector (5B) terminal.

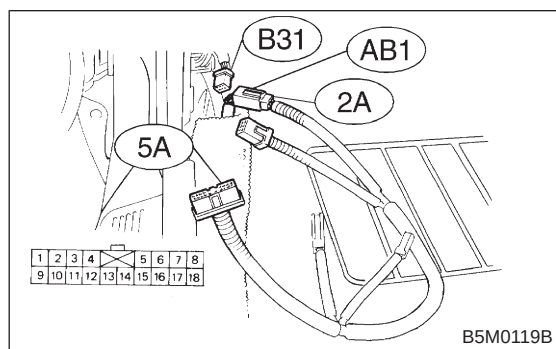
Connector & terminal

(5A) No. 1 — (5B) No. 2:

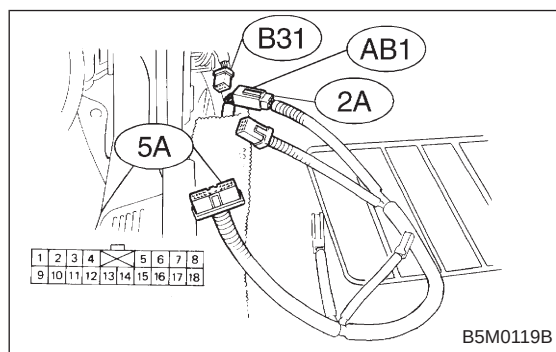
CHECK : Is resistance less than 10 Ω?

YES : Go to step 5C3.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



B5M0119B



B5M0119B

5C3**AIRBAG MAIN HARNESS INSPECTION**

Measure resistance between (5A) connector terminal and chassis ground.

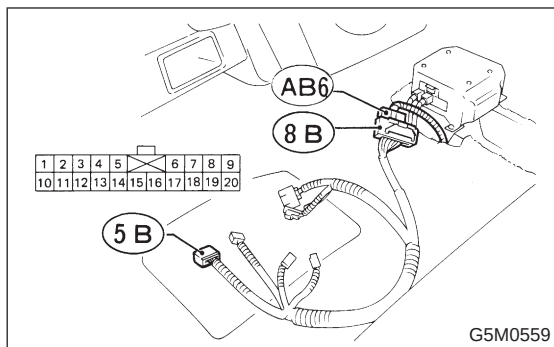
Connector & terminal

(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 [W400].>



5C4

AIRBAG MAIN HARNESS INSPECTION

Measure resistance between (5B) connector terminal and chassis ground.

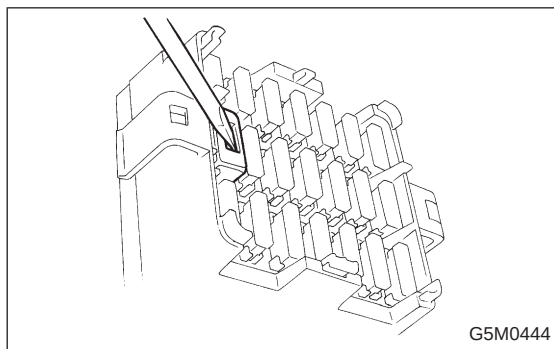
Connector & terminal

(5B) No. 2 (+) — Chassis ground (-):

CHECK : Is resistance more than 10 kΩ?

YES : Go to step 5C5.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5C5

FUSE No. 8 INSPECTION

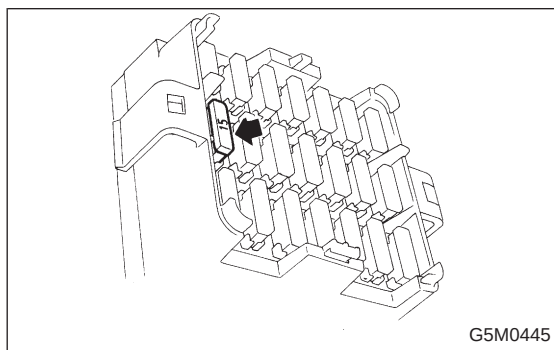
1) Turn ignition switch "OFF", and remove airbag fuse protector.

2) Remove and visually check fuse No. 8.

CHECK : Is fuse No. 8 blown?

YES : Replace fuse No. 8 if fuse No. 8 blows again, repair body harness.

NO : Repair body harness.

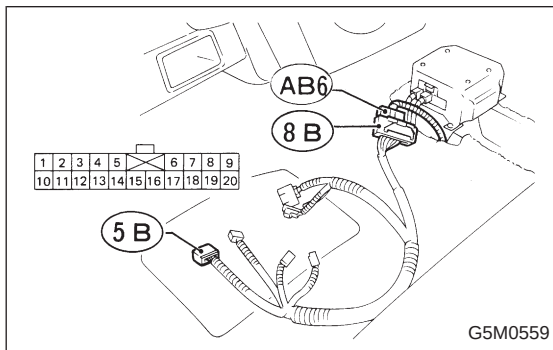
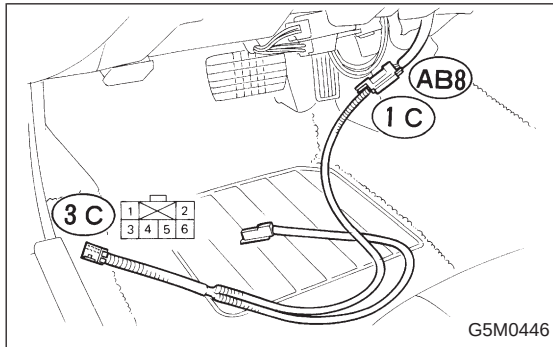


D: TROUBLE CODE 12**DIAGNOSIS:**

- 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 C connector (1C).

2) Disconnect connector (AB6) <Ref. to 5-5 [W5A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

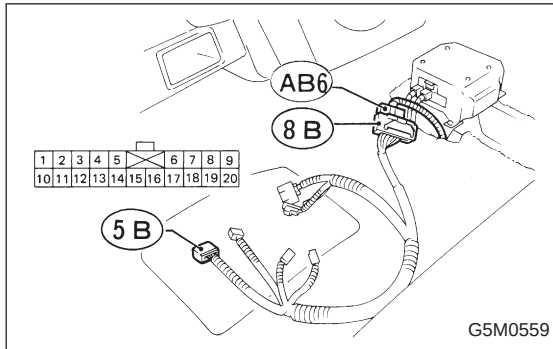
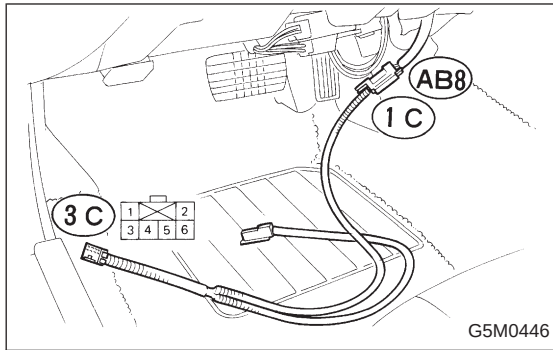
Connector & terminal

(5B) No. 14 — (3C) No. 4:

CHECK : Is resistance less than 10 Ω?

YES : Go to step 5D2.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5D2

AIRBAG MAIN HARNESS INSPECTION

Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

Connector & terminal

(5B) No. 1 — (3C) No. 3:

CHECK : Is resistance less than 10 Ω ?

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

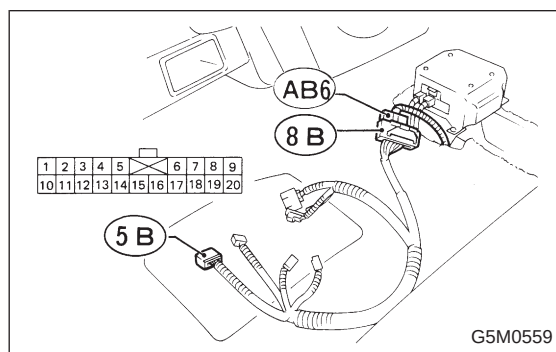
E: TROUBLE CODE 13**DIAGNOSIS:**

- 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 B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminal.

Connector & terminal**(5B) No. 1 — (5B) No. 14:**

CHECK : Is resistance more than 10 kΩ?

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

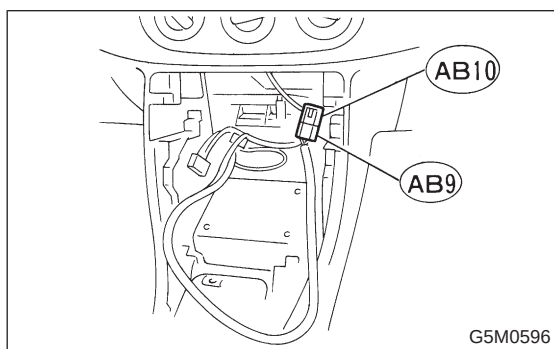
NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

F: TROUBLE CODE 14**DIAGNOSIS:**

- (AB9) and (AB10) are not connected properly.
- (AB2) and (AB7) are not connected properly.
- (AB3) and (AB8) 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.

**5F1****DOUBLE LOCK INSPECTION FOR CONNECTORS (AB9) AND (AB10)**

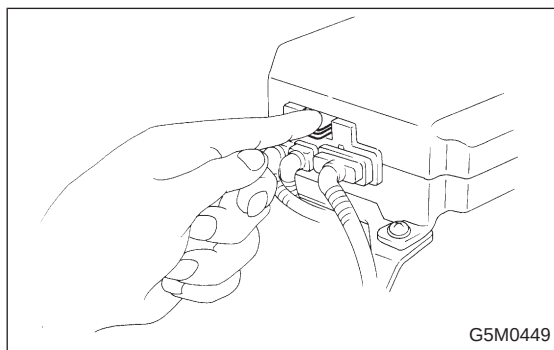
1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A5].>

2) Check double lock of connectors (AB9) and (AB10).

CHECK : *Is there poor contact in double lock of connectors (AB9) and (AB10)?*

YES : Repair poor contact in double lock of connectors (AB9) and (AB10).

NO : Go to step **5F2**.

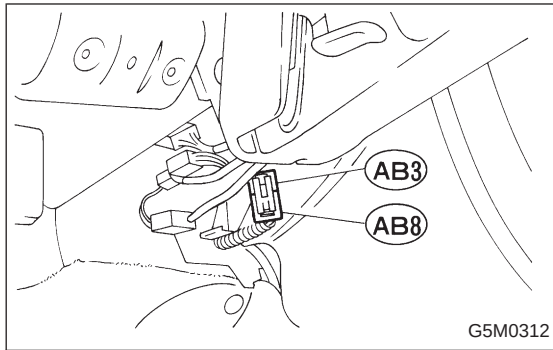
**5F2****AIRBAG CONTROL MODULE DOUBLE LOCK INSPECTION AT CONNECTOR (AB6)**

Check double lock of connector (AB6) connected to airbag control module. <Ref. to 5-5 [W5A0].>

CHECK : *Is there poor contact in double lock of connector (AB6)?*

YES : Repair poor contact in double lock of connector (AB6).

NO : Go to step **5F3**.

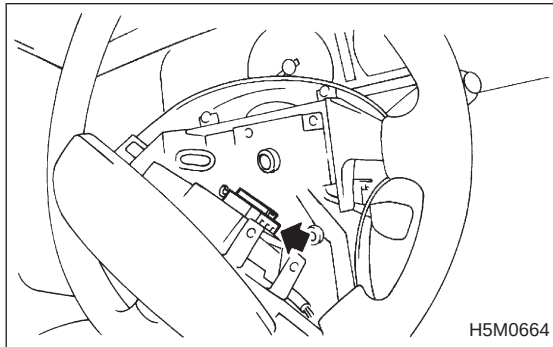
**5F3****DOUBLE LOCK INSPECTION FOR CONNECTORS (AB3) AND (AB8)**

- 1) Remove lower cover panel. <Ref. to 5-4 [W1A0].>
- 2) Check double lock of connectors (AB3) and (AB8) below steering column.

CHECK : *Is there poor contact in double lock of connectors (AB3) and (AB8)?*

YES : Repair poor contact in double lock of connectors (AB3) and (AB8).

NO : Go to step **5F4**.

**5F4****ROLL CONNECTOR DOUBLE LOCK INSPECTION AT CONNECTORS (AB2) AND (AB7)**

Remove driver's airbag module <Ref. to 5-5 [W3A1].>, and check double lock of connectors (AB2) and (AB7) at roll connector.

CHECK : *Is there poor contact in double lock of connectors (AB2) and (AB7)?*

YES : Repair poor contact in double lock of connectors (AB2) and (AB7).

NO : Replace airbag control module. <Ref. to 5-5 [W500].>

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 [W500].>

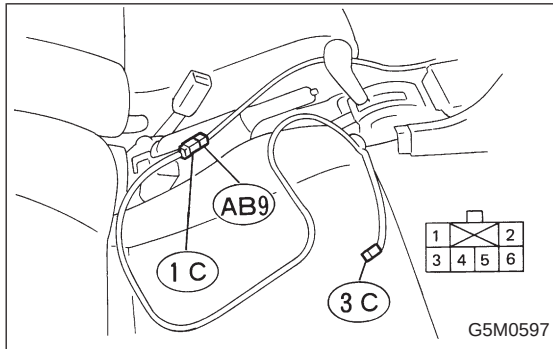
NO : Perform clear memory. <Ref. to 5-5 [T4C0].>

H: TROUBLE CODE 22**DIAGNOSIS:**

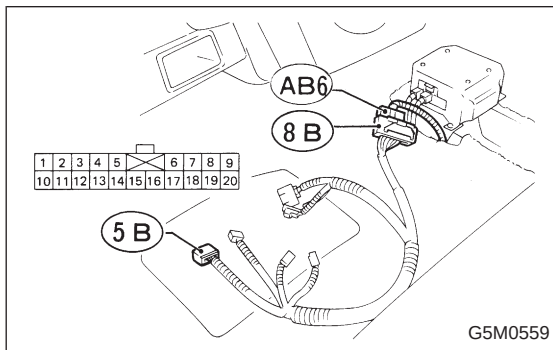
- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.

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 front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A5].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5 [W5A0].> from airbag control module, and connect it to test harness B2 connector (8B) terminal.

3) Measure resistance between test harness B2 connector (5B) and test harness C connector (3C) terminals.

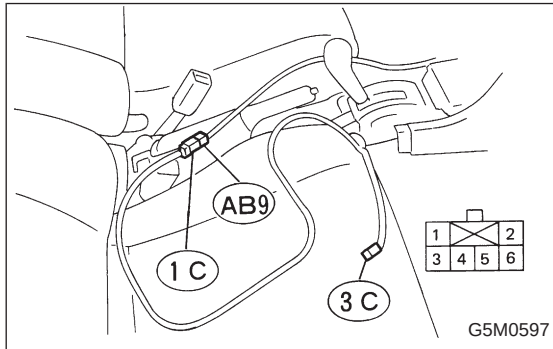
Connector & terminal

(5B) No. 6 — (3C) No. 4:

CHECK : Is resistance less than 10 Ω?

YES : Go to step 5H2.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>





AIRBAG MAIN HARNESS INSPECTION

**Connector & terminal
(5B) No. 7 — (3C) No. 3:**

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

(NO) : Replace airbag main harness. <Ref. to 5-5 [W400].>

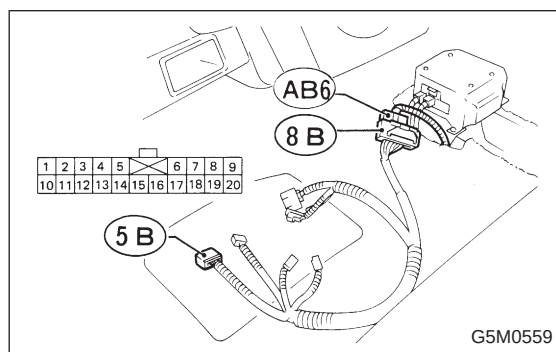
I: TROUBLE CODE 31**DIAGNOSIS:**

- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 16 is blown.
- 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 B2 connector (8B).

2) Connect battery ground cable and turn ignition switch "ON" (engine off).

3) Measure voltage across connector (5B) terminal and chassis ground.

Connector & terminal

(5B) No. 5 (+) — Chassis ground (–):

CHECK : Is voltage more than 10 V?

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

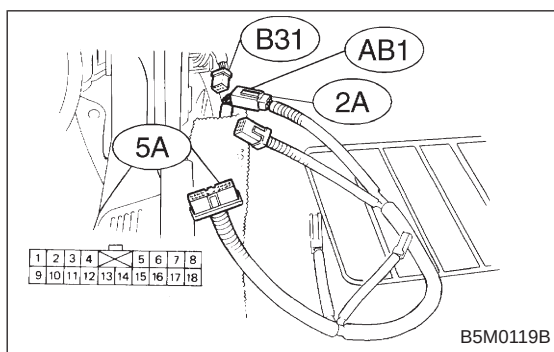
NO : Go to step 5I2.

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 B2 connector (5B) terminals.

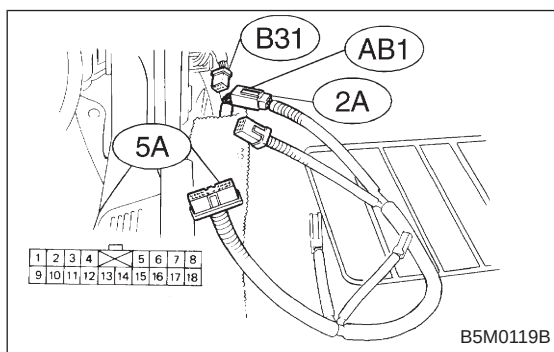
Connector & terminal

(5A) No. 9 — (5B) No. 5:

CHECK : Is resistance less than 10 Ω ?

YES : Go to step 5I3.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5I3

AIRBAG MAIN HARNESS INSPECTION

Measure resistance between each terminal of connectors (5A) and chassis ground.

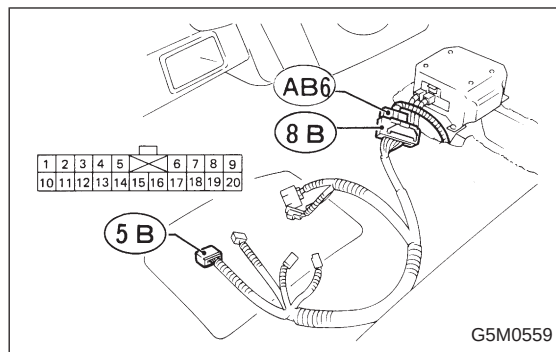
Connector & terminal

(5A) No. 9 (+) — Chassis ground (-):

CHECK : Is resistance more than 10 k Ω ?

YES : Go to step 5I4.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

**5I4****AIRBAG MAIN HARNESS INSPECTION**

Measure resistance between each terminal of connectors (5B) and chassis ground.

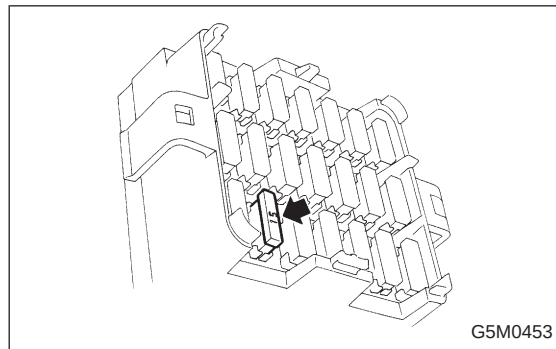
Connector & terminal

(5B) No. 5 (+) — Chassis ground (-):

CHECK : *Is resistance more than 10 kΩ?*

YES : Go to step 5I5.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

**5I5****FUSE No. 16 INSPECTION**

Make sure ignition switch is turned "OFF", then remove and visually check fuse No. 16.

CHECK : *Is fuse No. 16 blown?*

YES : Replace fuse No. 16. If fuse No. 16 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 [W500].>

NO : Perform clear memory. <Ref. to 5-5 [T4C0].>

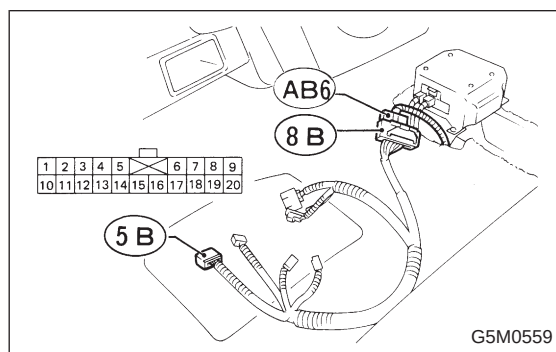
K: TROUBLE CODE 34**DIAGNOSIS:**

- 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 B2 connector (8B).
- 2) Connect battery ground cable and turn ignition switch "ON" (engine off).
- 3) Measure voltage across each test harness B2 connector (5B) terminal and chassis ground.

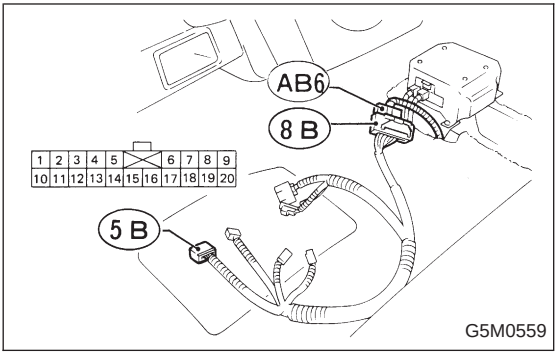
Connector & terminal

(5B) No. 6 (+) — Chassis ground (-):

CHECK : Is voltage less than 1 V?

YES : Go to step 5K2.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5K2	AIRBAG MAIN HARNESS INSPECTION

Measure voltage across each test harness B2 connector (5B) terminal and chassis ground.

Connector & terminal
(5B) No. 7 (+) — Chassis ground (-):

CHECK : *Is voltage less than 1 V?*

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

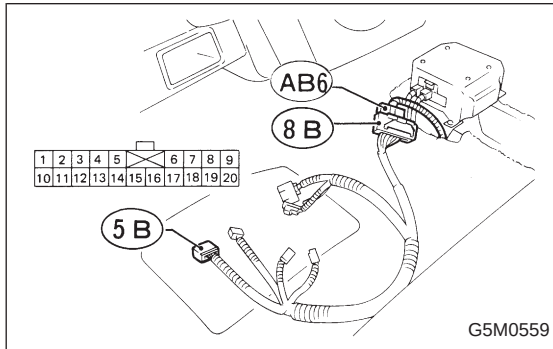
L: TROUBLE CODE 41**DIAGNOSIS:**

- 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 B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

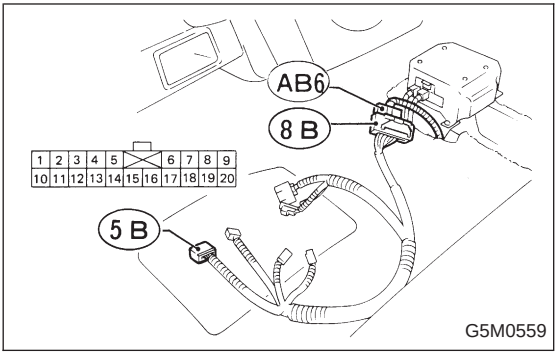
Connector & terminal

(5B) No. 1 (+) — Chassis ground (—):

CHECK : Is resistance more than 200 Ω?

YES : Go to step 5L2.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5L2	AIRBAG MAIN HARNESS INSPECTION

Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

Connector & terminal
(5B) No. 14 (+) — Chassis ground (–):

CHECK : *Is resistance more than 200 Ω?*

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

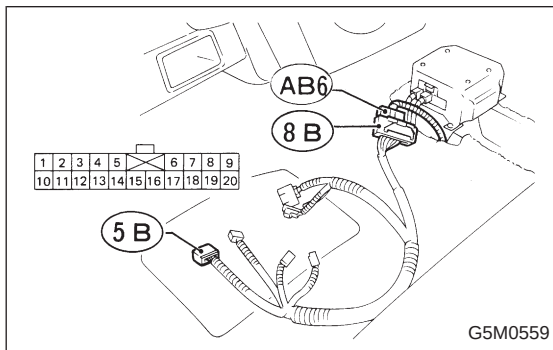
M: TROUBLE CODE 42**DIAGNOSIS:**

- 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 B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

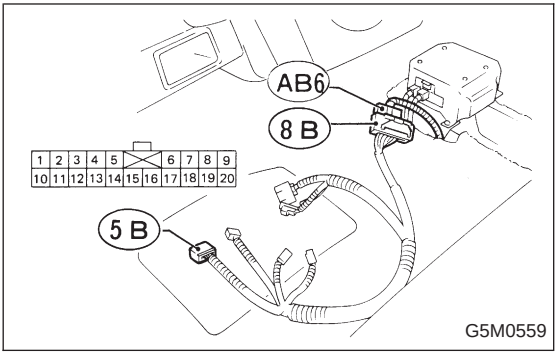
Connector & terminal

(5B) No. 6 (+) — Chassis ground (—):

CHECK : Is resistance more than 200 Ω?

YES : Go to step 5M2.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5M2	AIRBAG MAIN HARNESS INSPECTION
Measure resistance between test harness B2 connector (5B) terminals and chassis ground.	
Connector & terminal	
(5B) No. 7 (+) — Chassis ground (–):	
CHECK	: Is resistance more than 200 Ω?
YES	: Replace airbag control module. <Ref. to 5-5 [W500].>
NO	: Replace airbag main harness. <Ref. to 5-5 [W400].>

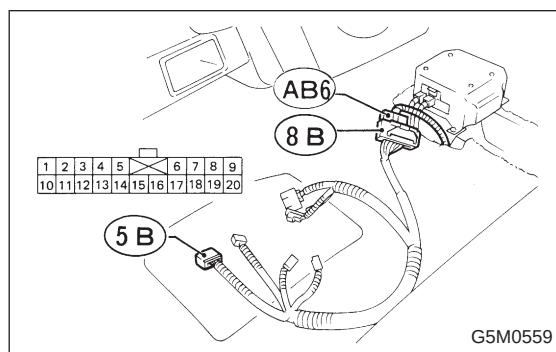
N: TROUBLE CODE 43**DIAGNOSIS:**

- 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 B2 connector (8B).
- 2) Connect battery ground cable and turn ignition switch "ON" (engine off).
- 3) Measure voltage across each test harness B2 connector (5B) terminal and chassis ground.

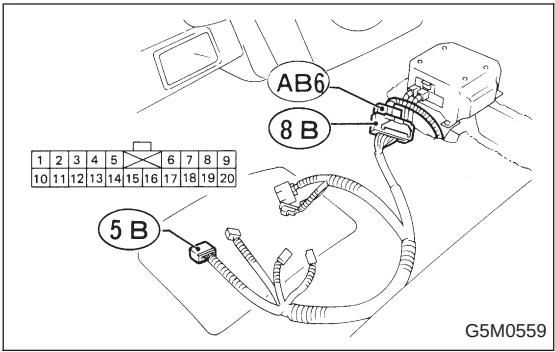
Connector & terminal

(5B) No. 1 (+) — Chassis ground (-):

CHECK : Is voltage less than 1 V?

YES : Go to step 5N2.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>



5N2	AIRBAG MAIN HARNESS INSPECTION

Measure voltage across each test harness B2 connector (5B) terminal and chassis ground.

Connector & terminal
(5B) No. 14 (+) — Chassis ground (-):

CHECK : *Is voltage less than 1 V?*

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

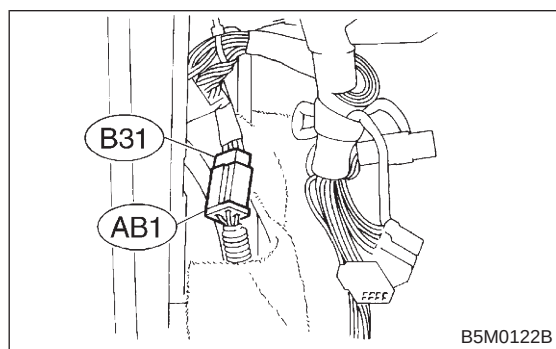
NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

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.

CAUTION:

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

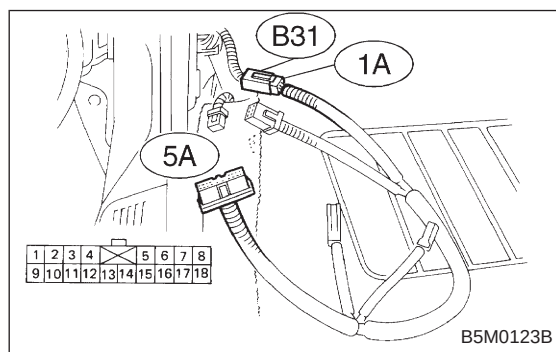
**501****DOUBLE LOCK INSPECTION FOR CONNECTORS (AB1) AND (B31)**

- 1) Remove front pillar lower trim (Driver side).
- 2) Check double lock of connectors (AB1) and (B31).

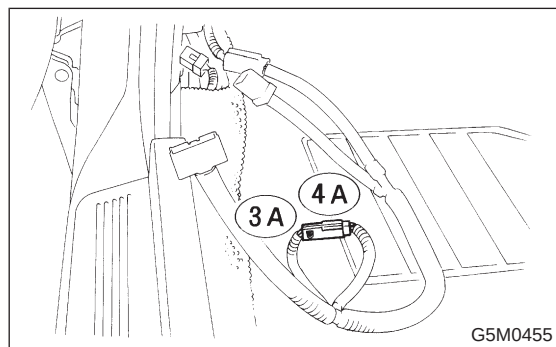
CHECK : *Is there poor contact in double lock of connectors (AB1) and (B31)?*

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).

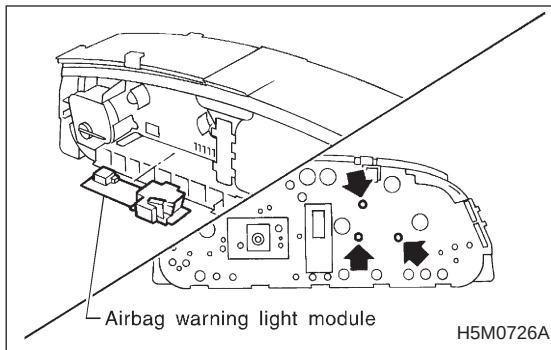


- 2) Connect battery ground cable and turn ignition switch "ON", (engine off) and connect connectors (3A) and (4A).

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.

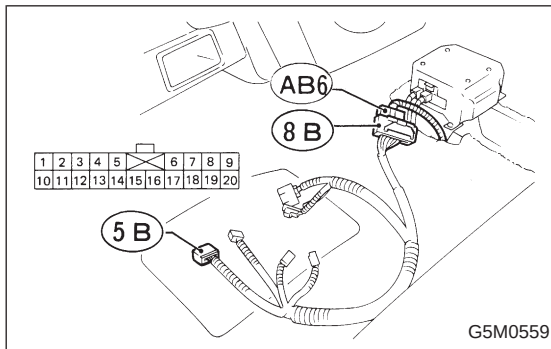
CHECK : *Is there anything unusual to body harness?*

YES : Repair body harness.

NO : Replace airbag warning light module.

NOTE:

After problem has been eliminated, disconnect connectors (3A) and (4A).



504 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 B2 connector (8B).

3) Connect battery ground cable and turn ignition switch "ON", (engine off) and connect connectors (6B) and (7B).

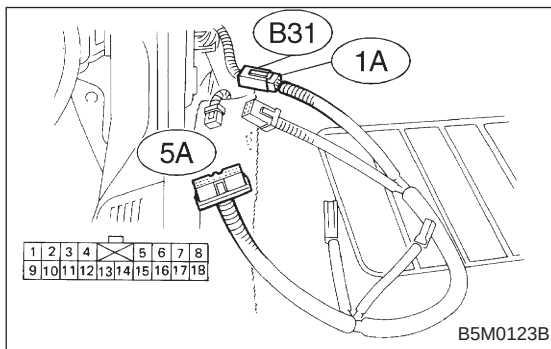
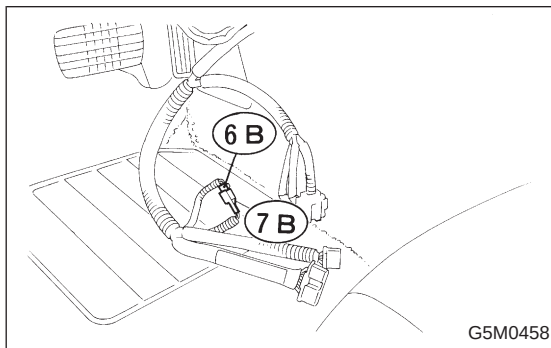
CHECK : *Does the airbag warning light come on?*

YES : Go to step 505.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

NOTE:

After problem has been eliminated, disconnect connectors (6B) and (7B).



505 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.

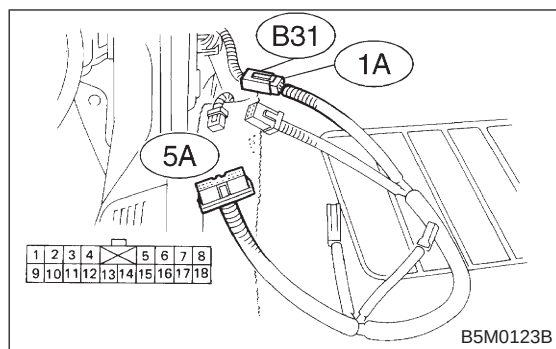
Connector & terminal

(5A) No. 17 (+) — Chassis ground (-):

CHECK : *Is resistance less than 10 Ω?*

YES : Go to step 506.

NO : Repair body grounding circuit.

**506****GROUNDING CIRCUIT INSPECTION**

Measure resistance between connector (5A) terminal and chassis ground.

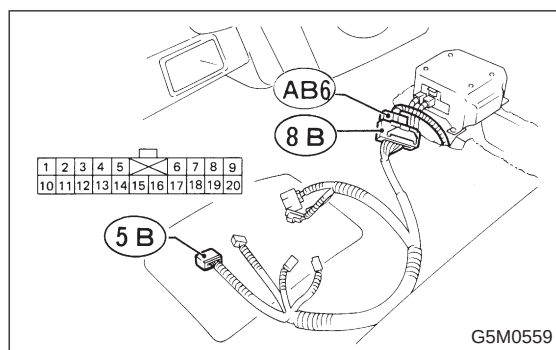
Connector & terminal

(5A) No. 18 (+) — Chassis ground (-):

CHECK : Is resistance less than 10 Ω?

YES : Go to step 507.

NO : Repair body grounding circuit.

**507****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 B2 connector (8B).

2) Measure resistance between each test harness B2 connector (5B) terminal and chassis ground.

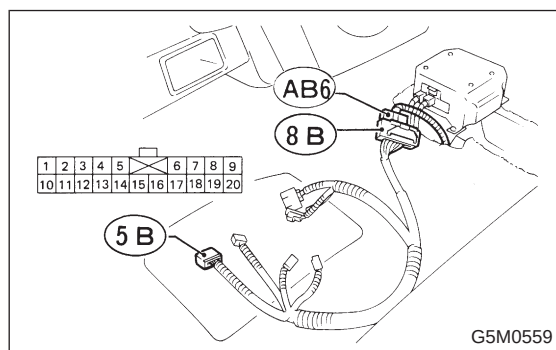
Connector & terminal

(5B) No. 11 (+) — Chassis ground (-):

CHECK : Is resistance less than 10 Ω?

YES : Go to step 508.

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

**508****INSPECTION OF AIRBAG MAIN HARNESS**

Measure resistance between each test harness B2 connector (5B) terminal and chassis ground.

Connector & terminal

(5B) No. 12 (+) — Chassis ground (-):

CHECK : Is resistance less than 10 Ω?

YES : Replace airbag control module. <Ref. to 5-5 [W500].>

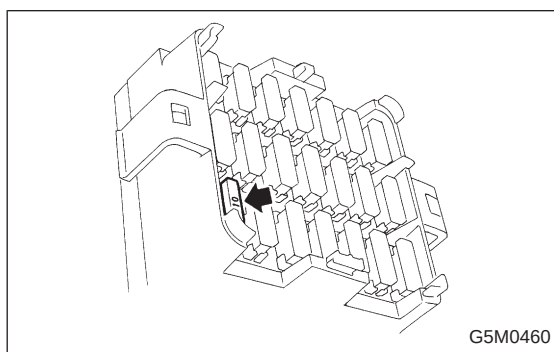
NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

P: AIRBAG WARNING LIGHT REMAINS OFF.**DIAGNOSIS:**

- Fuse No. 15 is blown.
- 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. 15 INSPECTION**

Remove and visually check fuse No. 15.

CHECK : *Is fuse No. 15 blown?*

YES : Replace fuse No. 15.
If fuse No. 15 blows again, go to step **5P2**.

NO : Go to step **5P2**.

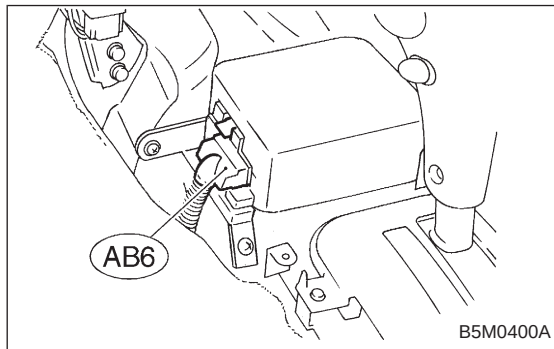
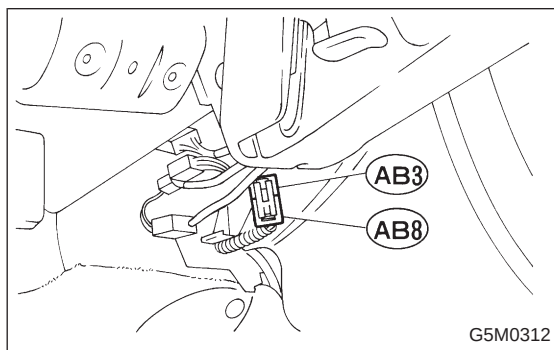
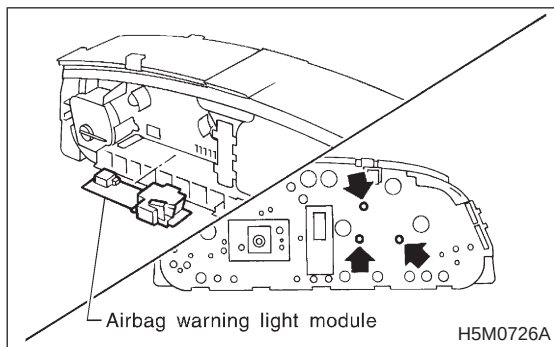
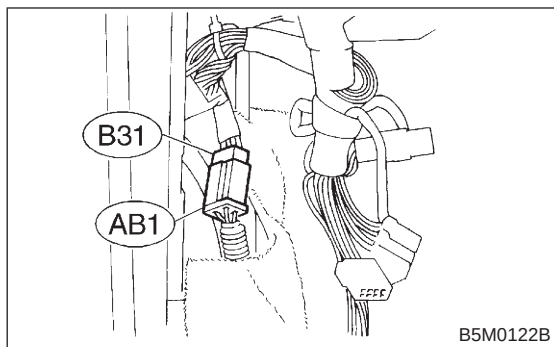
5P2**BODY HARNESS INSPECTION**

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 module.

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 [W500].>

NO : Replace airbag main harness. <Ref. to 5-5 [W400].>

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 APPEAR-
ANCE 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	Refer to
04	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	<5-5 [W300].> <5-5 [W400].> <5-5 [W500].>
11	● Fuse No. 8 ● Airbag main harness ● Airbag control module ● Body harness	<5-5 [T5C5].> <5-5 [W400].> <5-5 [W500].> —
12	● Roll connector ● Airbag module (Driver) ● Airbag main harness ● Airbag control module	<5-5 [W600].> <5-5 [W300].> <5-5 [W400].> <5-5 [W500].>
13	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	<5-5 [W300].> <5-5 [W600].> <5-5 [W400].> <5-5 [W500].>
21	● Airbag control module	<5-5 [W500].>
22	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	<5-5 [W300].> <5-5 [W400].> <5-5 [W500].>
33	● Airbag control module	<5-5 [W500].>
34	● Airbag main harness ● Airbag module (Passenger) ● Airbag control module	<5-5 [W400].> <5-5 [W300].> <5-5 [W500].>
41	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	<5-5 [W300].> <5-5 [W600].> <5-5 [W400].> <5-5 [W500].>
42	● Airbag module (Passenger) ● Airbag main harness ● Airbag control module	<5-5 [W300].> <5-5 [W400].> <5-5 [W500].>
43	● Airbag module (Driver) ● Roll connector ● Airbag main harness ● Airbag control module	<5-5 [W300].> <5-5 [W600].> <5-5 [W400].> <5-5 [W500].>

3) Conduct appearance inspection on parts selected.

CHECK : *Is there anything unusual about the appearance of airbag component parts?*

YES : Replace faulty airbag component parts.

NO : Go to step 5Q2.

NOTE:

Also check connector terminals, wiring harness, case, etc. for damage.

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.

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].>

NOTE:

Also check wiring harnesses as water may leak along them and get airbag component parts wet.

**R: WARNING LIGHT INDICATES TROUBLE CODE, THEN NORMAL CODE.
— FLASHING NORMAL CODE. —**

DIAGNOSIS:

- Airbag connector is faulty.
- Fuse No. 16 is blown.
- 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].>

CHECK : ***Is there anything unusual about the appearance of connectors (AB2) through (AB8)?***

YES : Replace faulty airbag component parts.

NO : Go to step **5R2**.

NOTE:

Check terminals, case and wiring harnesses for damage.

5R2	AIRBAG CONNECTOR VIBRATION INSPECTION

Conduct vibration inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5 [T100].>

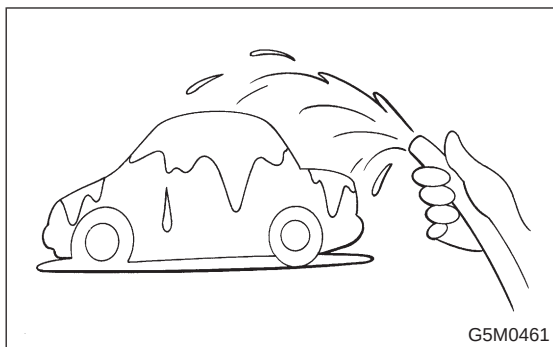
CHECK : ***Do the connectors (AB2) through (AB8) malfunction again when shaking?***

YES : Replace faulty airbag component parts.

NO : Go to step **5R3**.

NOTE:

Gently shake each airbag connector.

**5R3****SHOWERING INSPECTION TO BODY**

Spray water on vehicle body.

CAUTION:

Do not directly spray water on airbag components.

CHECK : *Does water leak into the passenger compartment when showering vehicle?*

YES : Replace faulty airbag component parts.

NO : Go to step **5R4**.

NOTE:

If leaks are noted, also check wiring harnesses as water may leak along them and wet airbag connectors.

5R4**FUSE No. 16, AIRBAG MAIN HARNESS, AIRBAG CONTROL MODULE, BODY HARNESS APPEARANCE INSPECTION**

Conduct appearance inspection on fuse No. 16 <Ref. to 5-5 [T515].>, airbag main harness <Ref. to 5-5 [W400].>, airbag control module <Ref. to 5-5 [W500].> and body harness.

CHECK : *Is there anything unusual about the appearance of fuse No. 16, airbag main harness, airbag control module or body harness?*

YES : Replace faulty airbag component parts.

NO : Go to step **5R5**.

NOTE:

Also check connectors, terminals, wiring harness and case for damage.

5R5**FUSE No. 16, AIRBAG MAIN HARNESS, BODY HARNESS VIBRATION INSPECTION**

Conduct vibration inspection on fuse No. 16, airbag main harness and body harness.

CAUTION:

Do not shake or vibrate airbag control module.

CHECK : *Do fuse No. 16, airbag main harness or body harness malfunction again when shaking?*

YES : Replace faulty airbag component parts.

NO : Go to step **5R6**.

NOTE:

Gently shake each part.

**5R6****SHOWERING INSPECTION TO BODY**

Spray water on vehicle body.

CAUTION:

Do not directly spray water on each part.

CHECK : *Does water leak into the passenger compartment when showering vehicle?*

YES : Replace faulty airbag component parts.

NO : Go to step **5R7**.

NOTE:

If leaks are noted, check wiring harnesses as water may leak along them and get parts wet.

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].>

WIRING DIAGRAM SECTION

FOREWORD

This portion of the service manual has been prepared to provide SUBARU service personnel with the necessary information and data for the correct maintenance and repair of SUBARU vehicle.

The manual include the procedures for maintenance disassembling, reassembling, inspection and adjustment of components and diagnostics for guidance of both the fully qualified and the less-experienced mechanics.

Please peruse and utilize this manual fully to ensure complete repair work for satisfying our customers by keeping their vehicle in optimum condition. When replacement of parts during repair work is needed, be sure to use SUBARU genuine parts.

All information, illustration and specifications contained in this manual are based on the latest product information available at the time of publication approval.

FUJI HEAVY INDUSTRIES LTD.

WIRING DIAGRAM	6-3

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.

All right reserved. This book may not be reproduced or copied, in whole or in part, without the written permission of FUJI HEAVY INDUSTRIES LTD., TOKYO JAPAN

SUBARU,  and  are trademarks of FUJI HEAVY INDUSTRIES LTD.

© Copyright 1996 FUJI HEAVY INDUSTRIES LTD.