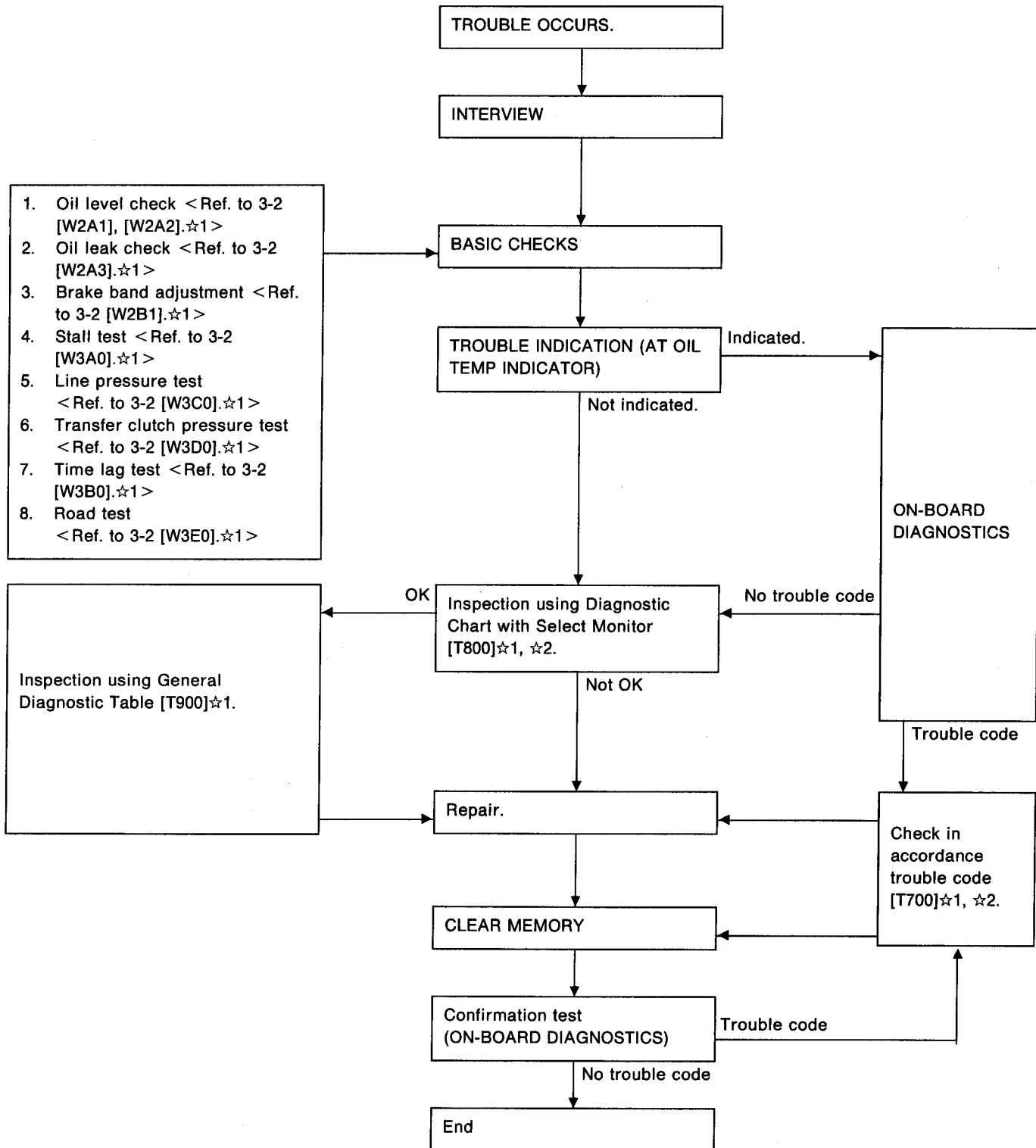


## 6. Diagnostic Chart for On-board Diagnostics System

### A: BASIC DIAGNOSTIC PROCEDURE



**D: 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.	PLDTY	—
12	Duty solenoid B	Detects open or shorted drive circuit, as well as valve seizure.	LUPTY	—
13	Shift solenoid 3	Detects open or shorted drive circuit, as well as valve seizure.	OVR	—
14	Shift solenoid 2	Detects open or shorted drive circuit, as well as valve seizure.	SFT2	—
15	Shift solenoid 1	Detects open or shorted drive circuit, as well as valve seizure.	SFT1	—
21	ATF temperature sensor	Detects open or shorted input signal circuit.	ATFT	—
22	Mass air flow signal	Detects open or shorted input signal circuit.	AFM	4
23	Engine speed signal	Detects open or shorted input signal circuit.	EREV	6
24	Duty solenoid C	Detects open or shorted drive circuit, as well as valve seizure.	4WDTY	—
25	Torque control signal	Detects open or shorted input signal circuit.	TQ.CT	8
31	Throttle position sensor	Detects open or shorted input signal circuit.	THV	10
32	Vehicle speed sensor 1	Detects open or shorted input signal circuit.	VSP1	—
33	Vehicle speed sensor 2	Detects open or shorted input signal circuit.	VSP2	—

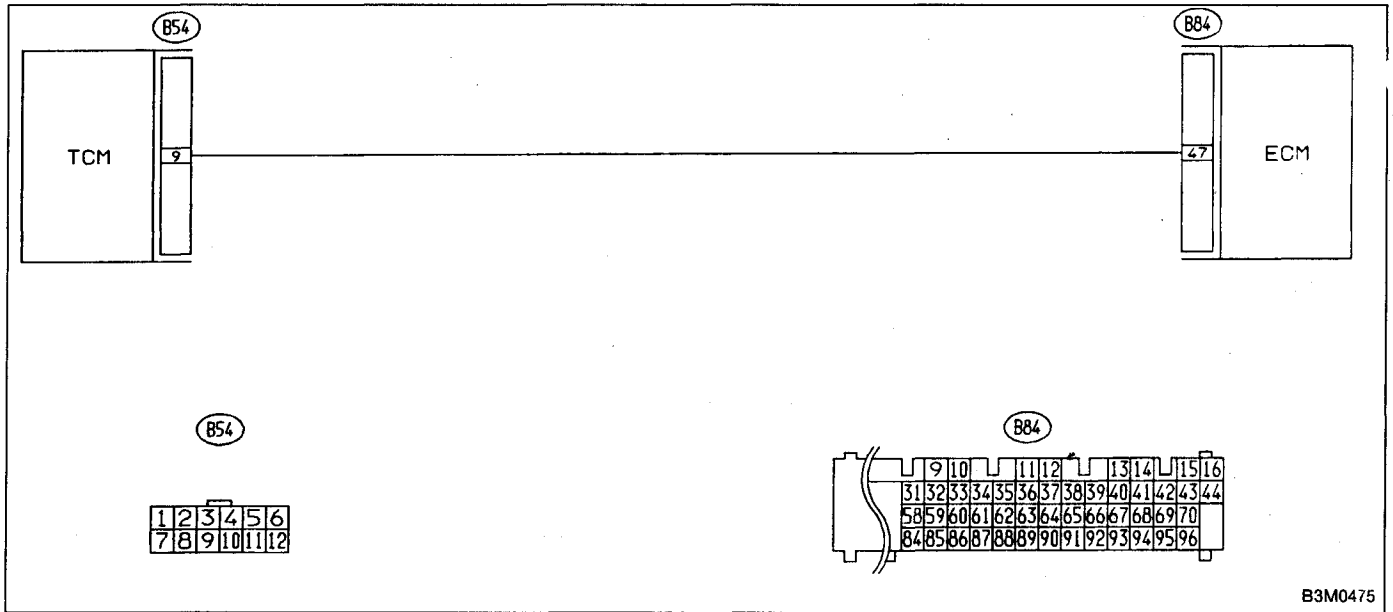
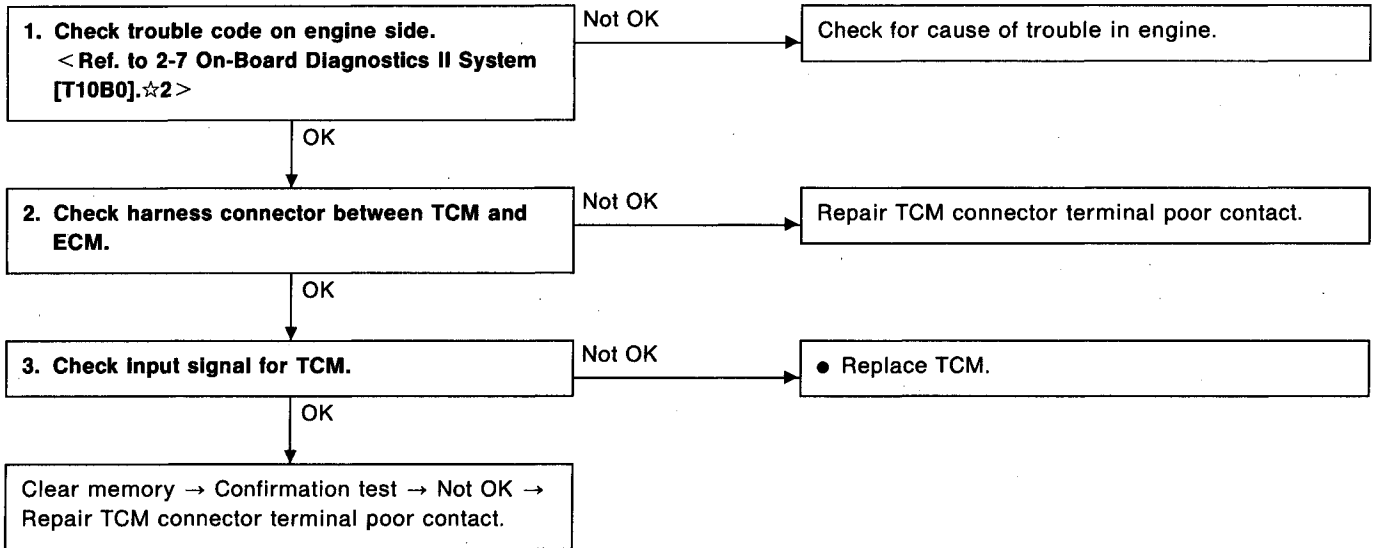
**7. Diagnostic Chart with Trouble Code**

**H: TROUBLE CODE 22**

**— MASS AIR FLOW SIGNAL —**

**DIAGNOSIS:**

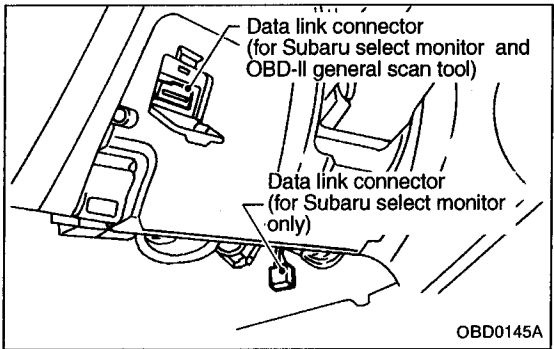
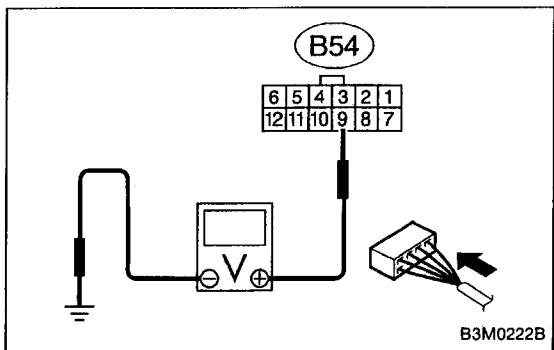
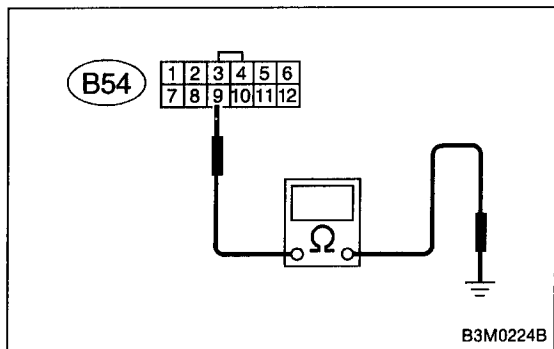
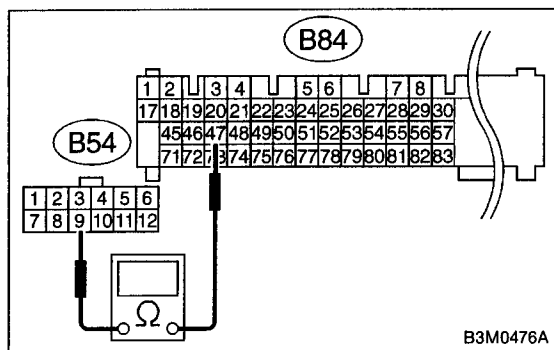
Input signal circuit of TCM from ECM is open or shorted.



B3M0475

**1. CHECK TROUBLE CODE ON ENGINE SIDE.**

Using Subaru select monitor or OBD-general scan tool, check trouble code of mass air flow sensor on engine side.



AFM (F15)

0.6V

B3M0370

**2. 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 connector between TCM and ECM.

**Connector & terminal / Specified resistance:**  
**(B54) No. 9 — (B84) No. 47 / 1 Ω, or less**

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

**Connector & terminal / Specified resistance:**  
**(B54) No. 9 — Body / 1 MΩ, or more**

**3. CHECK INPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and ECM.
- 2) Start the engine. (engine idling after warm-up)
- 3) Measure signal voltage between TCM connector terminal and body.

**Connector & terminal / Specified voltage:**  
**Engine warm-up;**  
**(B54) No. 9 — Body / 0.5 — 1.22 V**

● Using Subaru select monitor:

- (1) Connect connectors to TCM and ECM.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.
- (5) Start and warm-up the engine.

- (6) Read data on Subaru select monitor.
- (7) Designate mode using function key.

**Function mode: F15**

**SPECIFIED DATA:**

**0.5 — 1.22 V (Engine warm-up)**

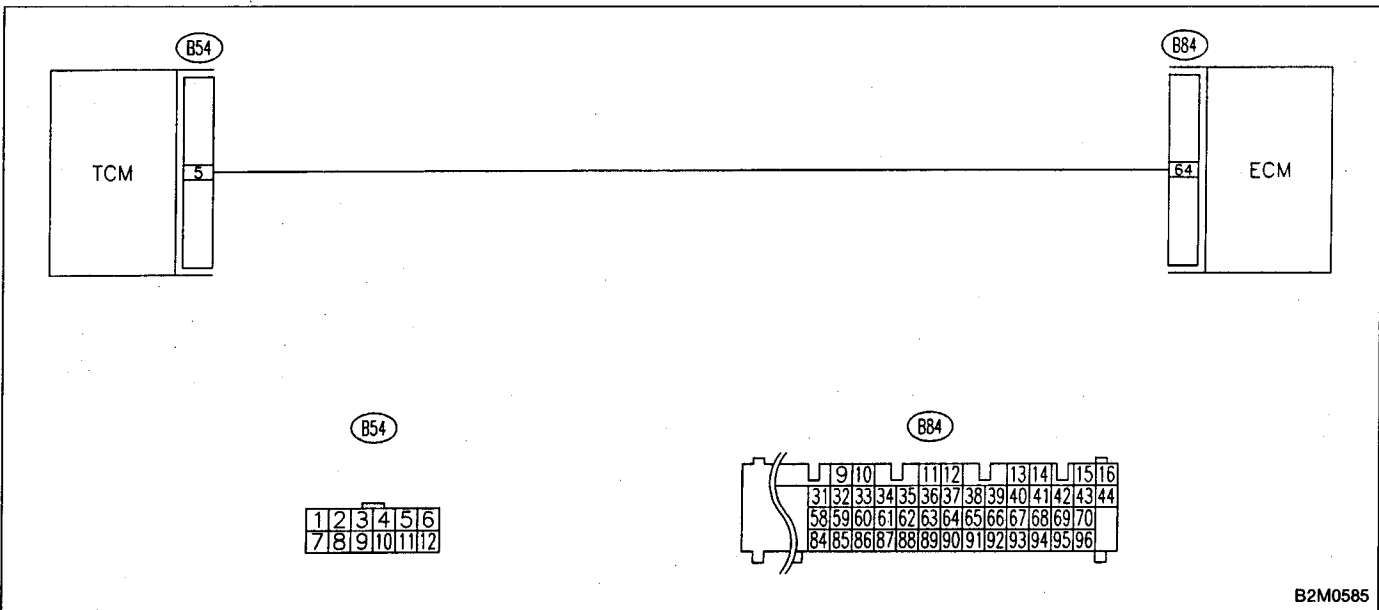
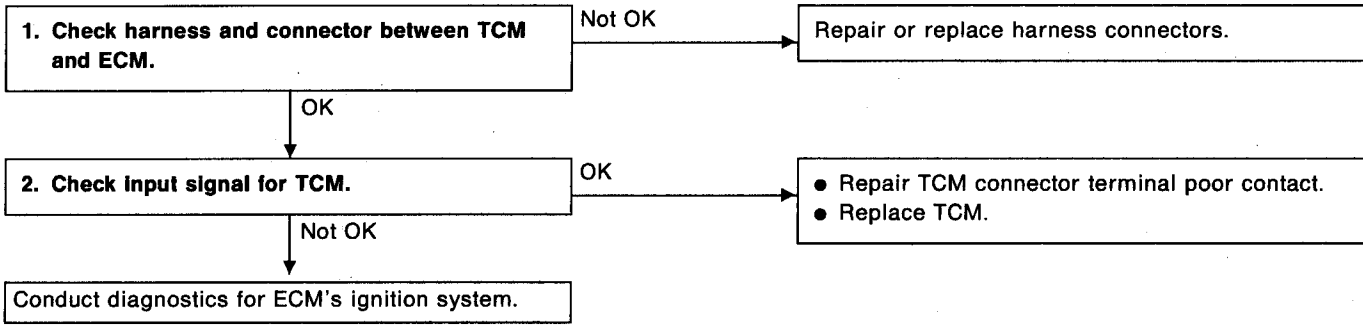
**I: TROUBLE CODE 23  
— ENGINE SPEED SIGNAL —**

**DIAGNOSIS:**

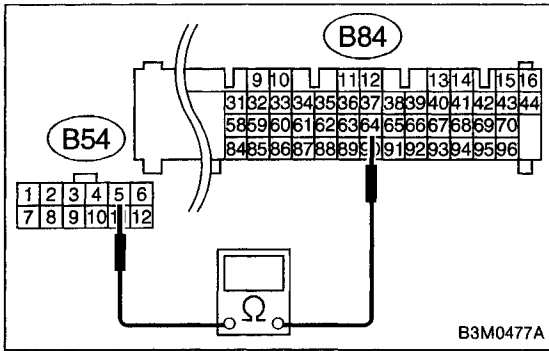
Engine speed input signal circuit is open or shorted.

**TROUBLE SYMPTOM:**

- No lock-up (after engine warm-up)
- AT OIL TEMP indicator remains on when vehicle speed is "0".



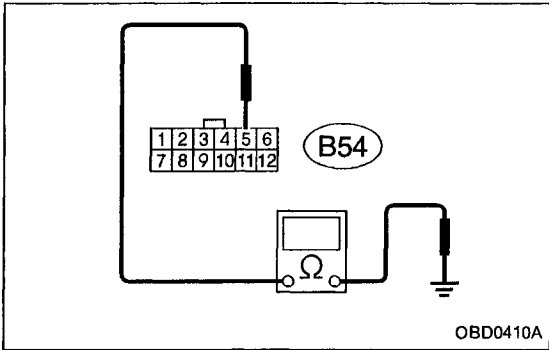
B2M0585



**1. CHECK HARNESS AND CONNECTOR BETWEEN TCM AND ECM.**

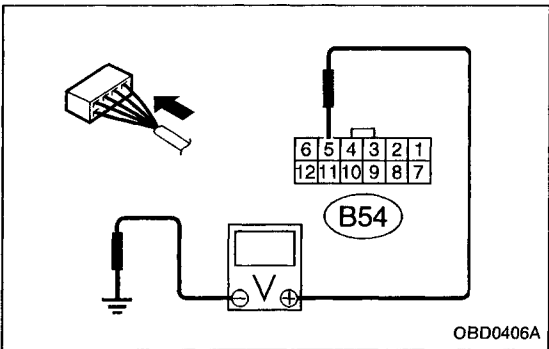
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness connector between TCM and ECM.

**Connector & terminal / Specified resistance:**  
**(B54) No. 5 — (B84) No. 64 / 1 Ω, or less**



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

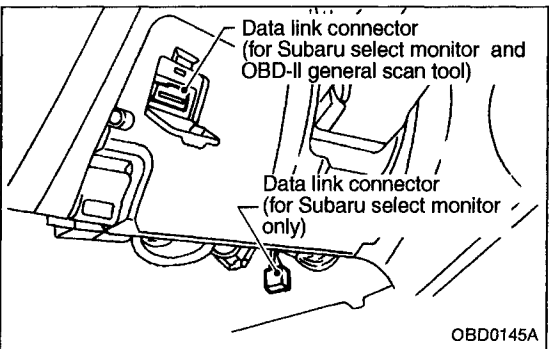
**Connector & terminal / Specified resistance:**  
**(B54) No. 5 — Body / 1 MΩ, or more**



**2. CHECK INPUT SIGNAL FOR TCM.**

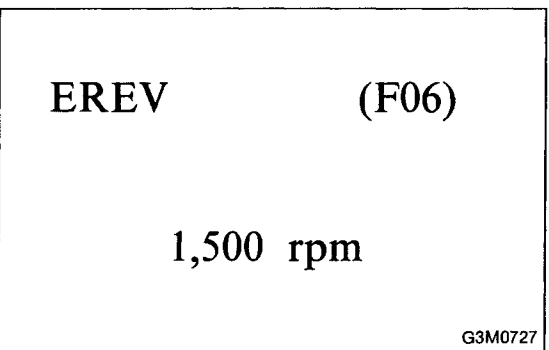
- 1) Connect connectors to ECM and TCM.
- 2) Turn ignition switch ON (with engine OFF).
- 3) Measure signal voltage for TCM.

**Connector & terminal / Specified voltage:**  
**(B54) No. 5 — Body / 10.5 V, or more**



● Using Subaru select monitor:

- (1) Connect connectors to ECM and TCM.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.



- (5) Start and warm-up the engine.
- (6) Operate at constant engine speed.
- (7) Read data on Subaru select monitor.
- (8) Designate mode using function key.

**Function mode: F06**

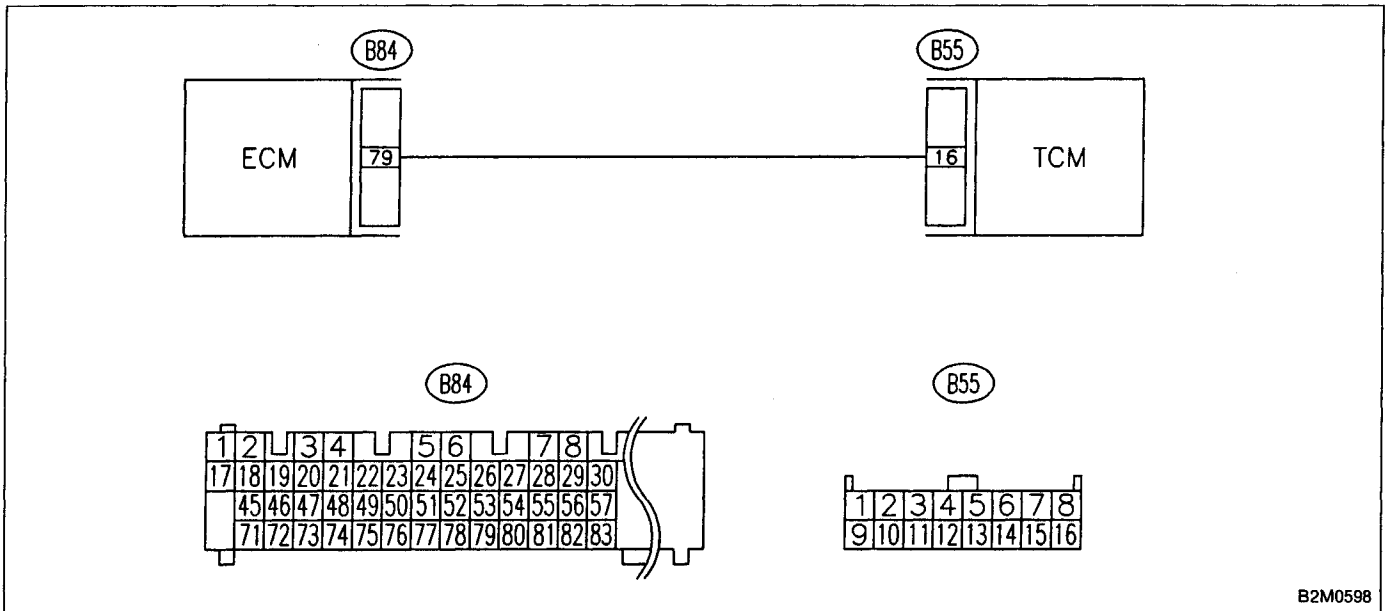
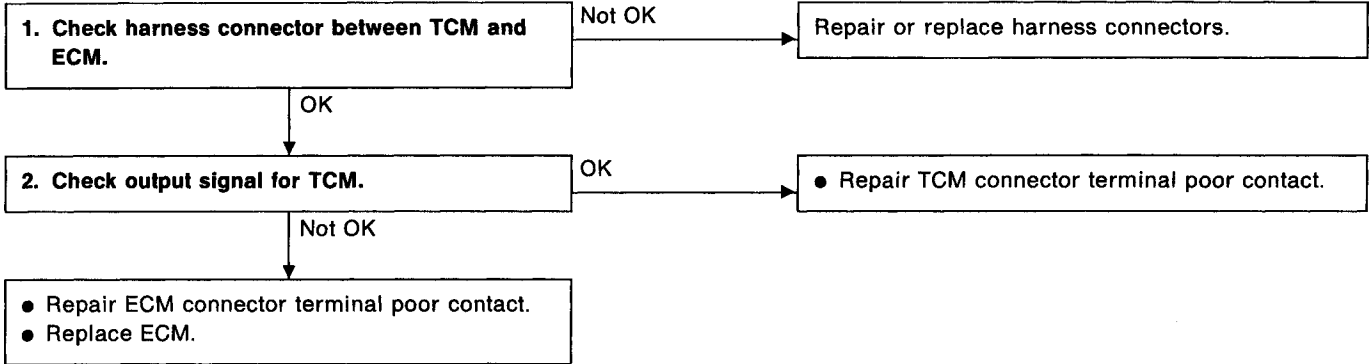
**SPECIFIED DATA:**

**Same as tachometer reading (in combination meter)**

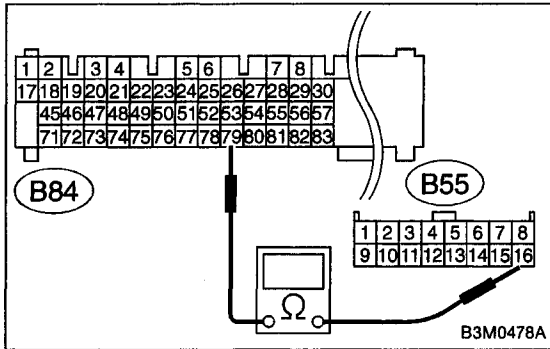
**K: TROUBLE CODE 25**  
**— TORQUE CONTROL SIGNAL —**

**DIAGNOSIS:**

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



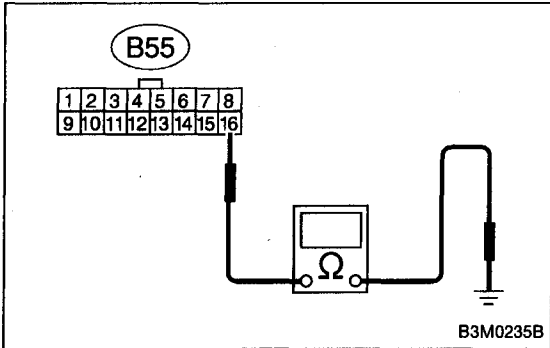
B2M0598



**1. CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.**

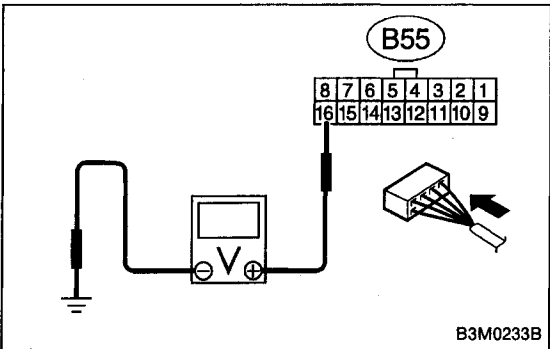
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness connector between TCM and ECM.

**Connector & terminal / Specified resistance:**  
**(B55) No. 16 — (B84) No. 79 / 1 Ω, or less**



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

**Connector & terminal / Specified resistance:**  
**(B55) No. 16 — Body / 1 MΩ, or more**



**2. CHECK OUTPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to ON.
- 3) Measure signal voltage between TCM connector terminal and body.

**Connector & terminal / Specified voltage:**  
**(B55) No. 16 — Body / 5 ± 1 V**



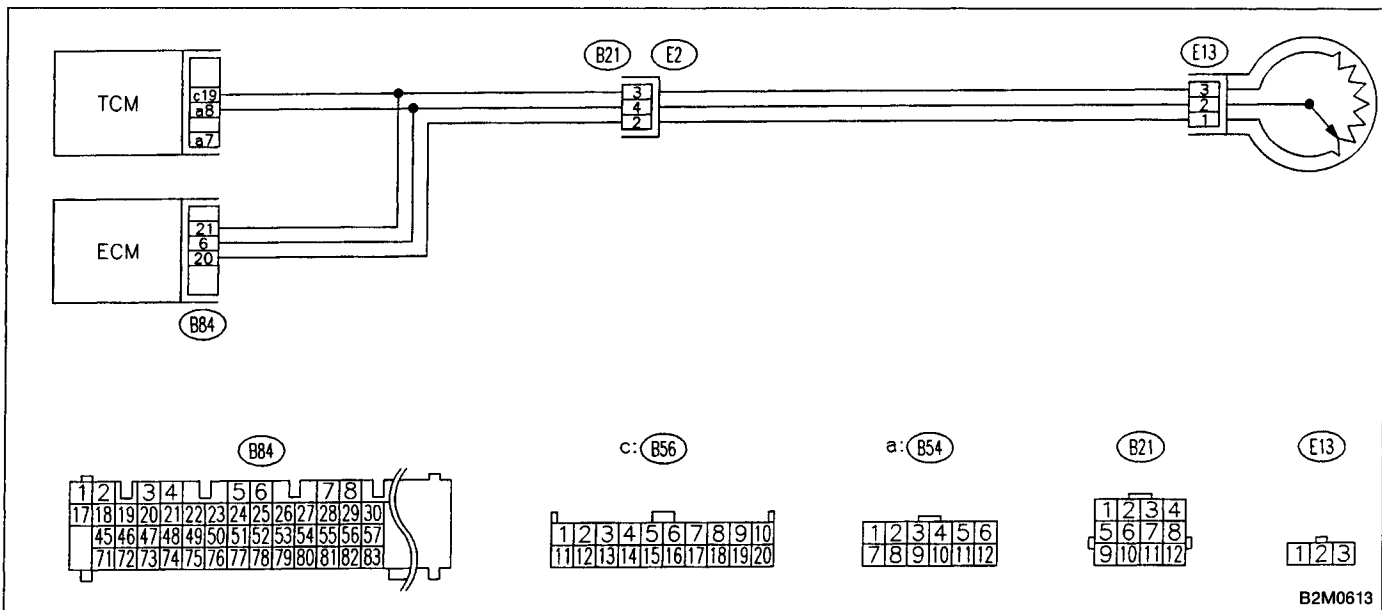
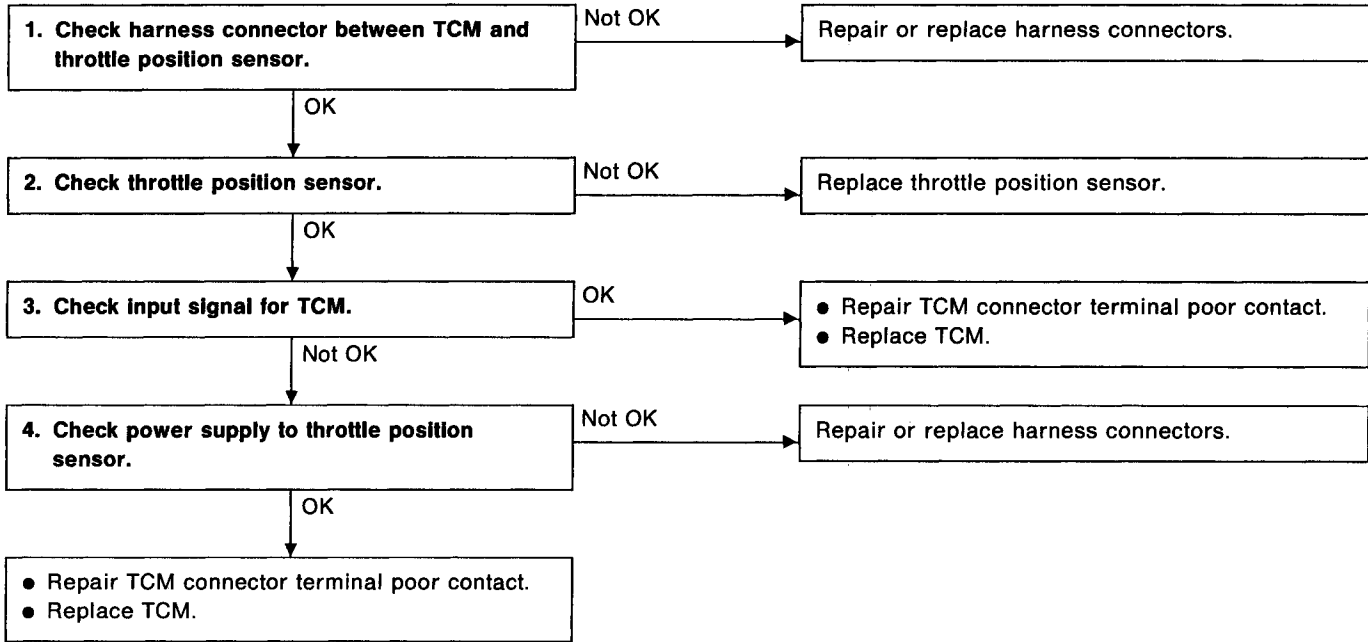
**L: TROUBLE CODE 31**  
**— THROTTLE POSITION SENSOR —**

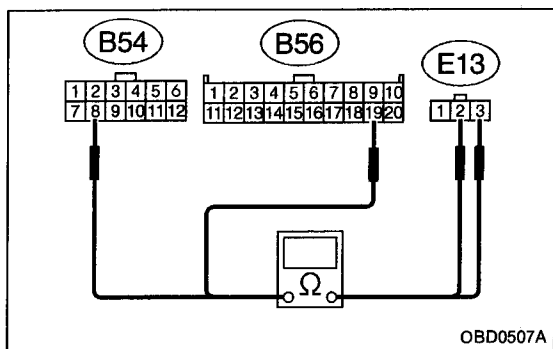
**DIAGNOSIS:**

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"

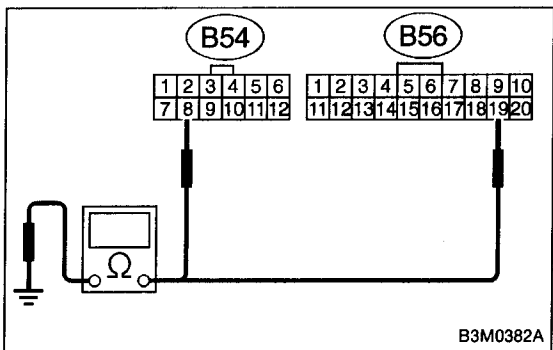




**1. CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.**

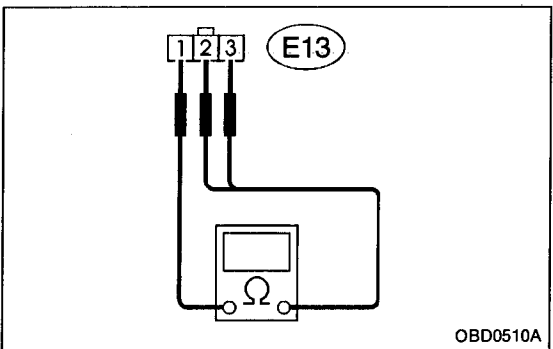
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and throttle position sensor.
- 3) Measure resistance of harness connector between TCM and throttle position sensor.

**Connector & terminal / Specified resistance:**  
**(B54) No. 8 — (E13) No. 2 / 1 Ω, or less**  
**(B56) No. 19 — (E13) No. 3 / 1 Ω, or less**



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

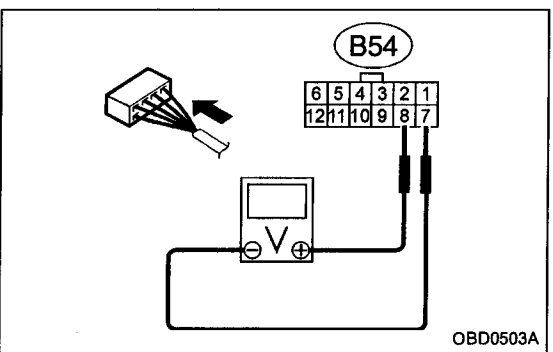
**Connector & terminal / Specified resistance:**  
**(B54) No. 8 — Body / 1 MΩ, or more**  
**(B56) No. 19 — Body / 1 MΩ, or more**



**2. CHECK THROTTLE POSITION SENSOR.**

Measure resistance between throttle position sensor terminals.

**Terminals / Specified resistance:**  
**(E13) No. 1 — No. 2 / 0.3 — 0.7 kΩ**  
*(Throttle fully closed.)*  
**3 — 6 kΩ**  
*(Throttle fully open.)*  
**(E13) No. 1 — No. 3 / 3.5 — 6.5 kΩ**



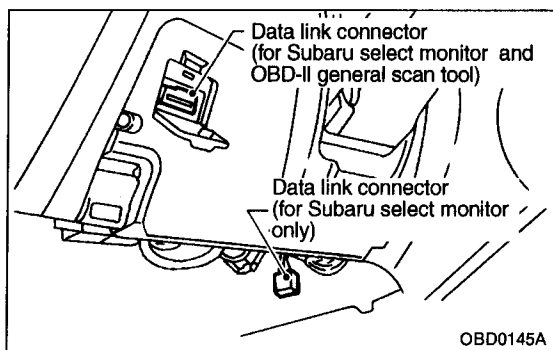
**3. CHECK INPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and throttle position sensor.
- 2) Turn ignition switch ON (with engine OFF).
- 3) Measure signal voltage input emitted from throttle position sensor with accelerator pedal fully depressed.

**Connector & terminal / Specified voltage:**  
**(B54) No. 8 — No. 7 /**  
**0.5 ± 0.2 V (Throttle fully closed.)**  
**4.6 ± 0.3 V (Throttle fully open.)**

● Using Subaru select monitor:

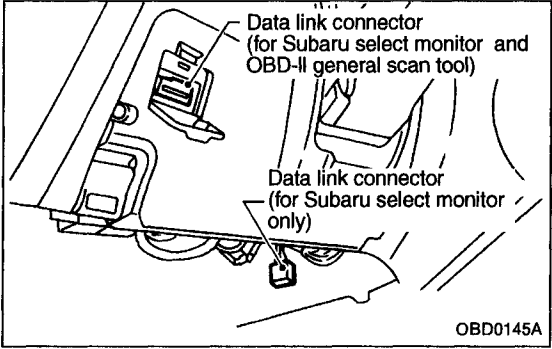
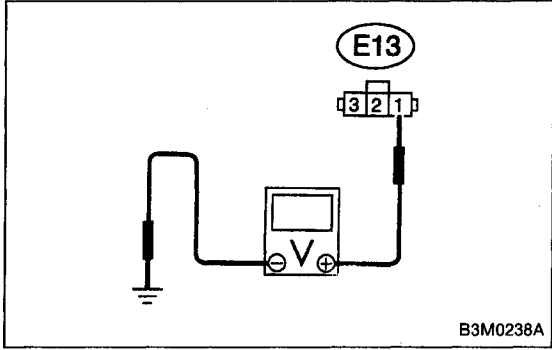
- (1) Connect connectors to TCM and throttle position sensor.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.



THV (F09)

4.6V

B3M0383



THVCC (F14)

5.2V

OBD0506

- (5) Designate mode using function key.
- (6) Read data on Subaru select monitor.

**Function mode: F09**

**SPECIFIED DATA:**

**0.5 ± 0.2 V (Throttle fully closed.)**

**4.6 ± 0.3 V (Throttle fully open.)**

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

**4. CHECK POWER SUPPLY TO THROTTLE POSITION SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from throttle position sensor.
- 3) Turn ignition switch to ON.
- 4) Measure power supply voltage to throttle position sensor.

**Connector & terminal / Specified voltage:**

**(E13) No. 1 — Body / 5.12 ± 0.1 V**

● Using Subaru select monitor:

- (1) Turn ignition switch to OFF.
- (2) Connect the Subaru select monitor to data link connector.
- (3) Turn ignition switch to ON and Subaru select monitor switch to ON.

- (4) Designate mode using function key.
- (5) Read data on Subaru select monitor.

**Function mode: F14**

**SPECIFIED DATA:**

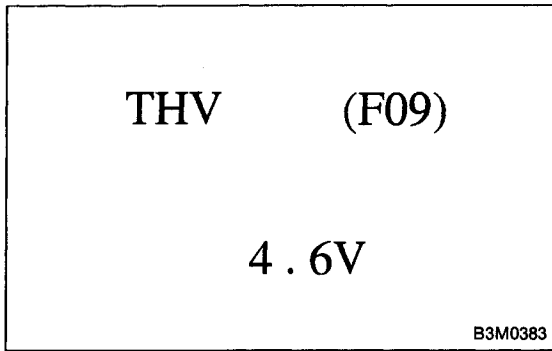
**5.12 ± 0.1 V**

## 8. Diagnostic Chart with Select Monitor

### 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.)	—
F01	Battery voltage	VB	V	Battery voltage applied to control unit.	—
F02	Vehicle speed sensor 1	VSP1	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 1.	—
F03	Vehicle speed sensor 1	VSP1	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 1.	—
F04	Vehicle speed sensor 2	VSP2	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 2.	—
F05	Vehicle speed sensor 2	VSP2	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 2.	—
F06	Engine speed	EREV	rpm	Engine speed sent from ECM.	—
F07	ATF temperature sensor	ATFT	°F	ATF temperature (°F) sent from ATF temperature sensor.	—
F08	ATF temperature sensor	ATFT	°C	ATF temperature (°C) sent from ATF temperature sensor.	—
F09	Throttle position sensor	THV	V	Voltage sent from throttle position sensor.	15
F10	Gear position	GEAR	—	Transmission gear position	—
F11	Line pressure duty	PLDTY	%	Duty ratio flowing through duty solenoid A.	16
F12	Lock-up duty	LUPTY	%	Duty ratio flowing through duty solenoid B.	17
F13	AWD duty	4WDTY	%	Duty ratio flowing through duty solenoid C.	18
F14	Throttle position sensor power supply	THVCC	V	Power supply voltage to throttle position sensor	19
F15	Mass air flow signal	AFM	V	Output voltage from air flow sensor	19



**I: MODE F09**

**— THROTTLE POSITION SENSOR (THV) —**

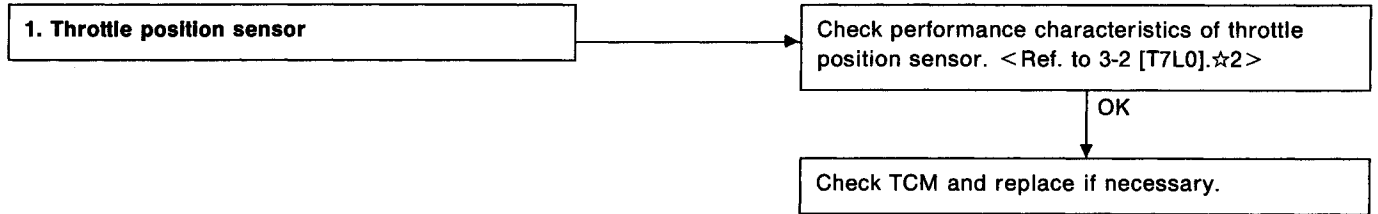
**CONDITION:**

- Ignition switch ON (with engine OFF)
- Measure voltage while operating throttle valve from a fully closed position to a fully open position.

**SPECIFIED DATA:**

- Fully closed position:  $0.5 \pm 0.2$  V
- Fully open position:  $4.6 \pm 0.3$  V
- From fully closed to fully open position: Voltage must smoothly decrease.
- Open harness:  $5.0 \pm 0.3$  V
- Shorted harness: 0.00 V

Probable cause (if outside "specified data")



PLDTY (F11)

50%

G3M0731

**K: MODE F11**  
**— LINE PRESSURE DUTY (PLDTY) —**

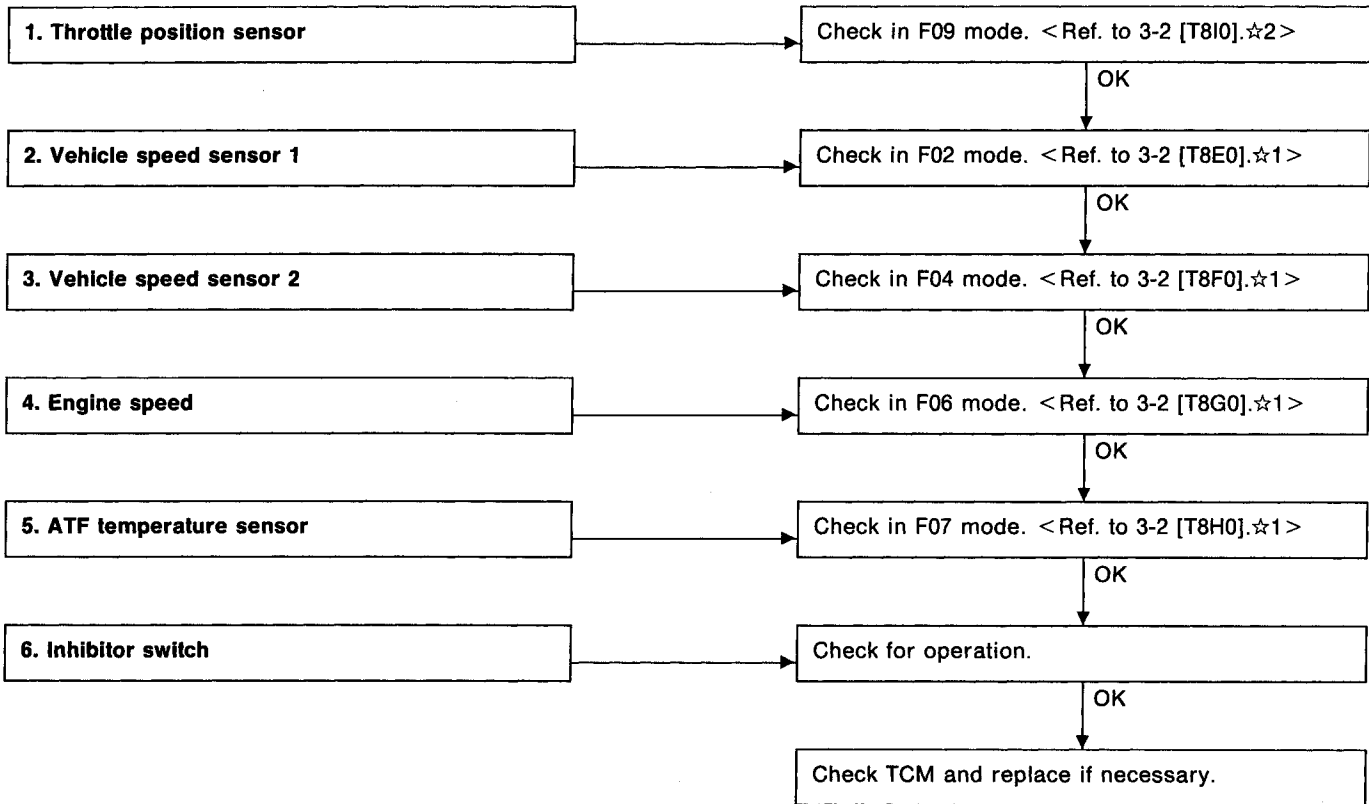
**CONDITION:**

- After sufficient warm-up
- Ignition ON (engine OFF)
- N range

**SPECIFIED DATA:**

- Throttle fully closed: 100%
- Throttle fully open : 15% or less

Probable cause (if outside "specified data")



**LUPTY**                      **(F12)**

**5%**

**G3M0732**

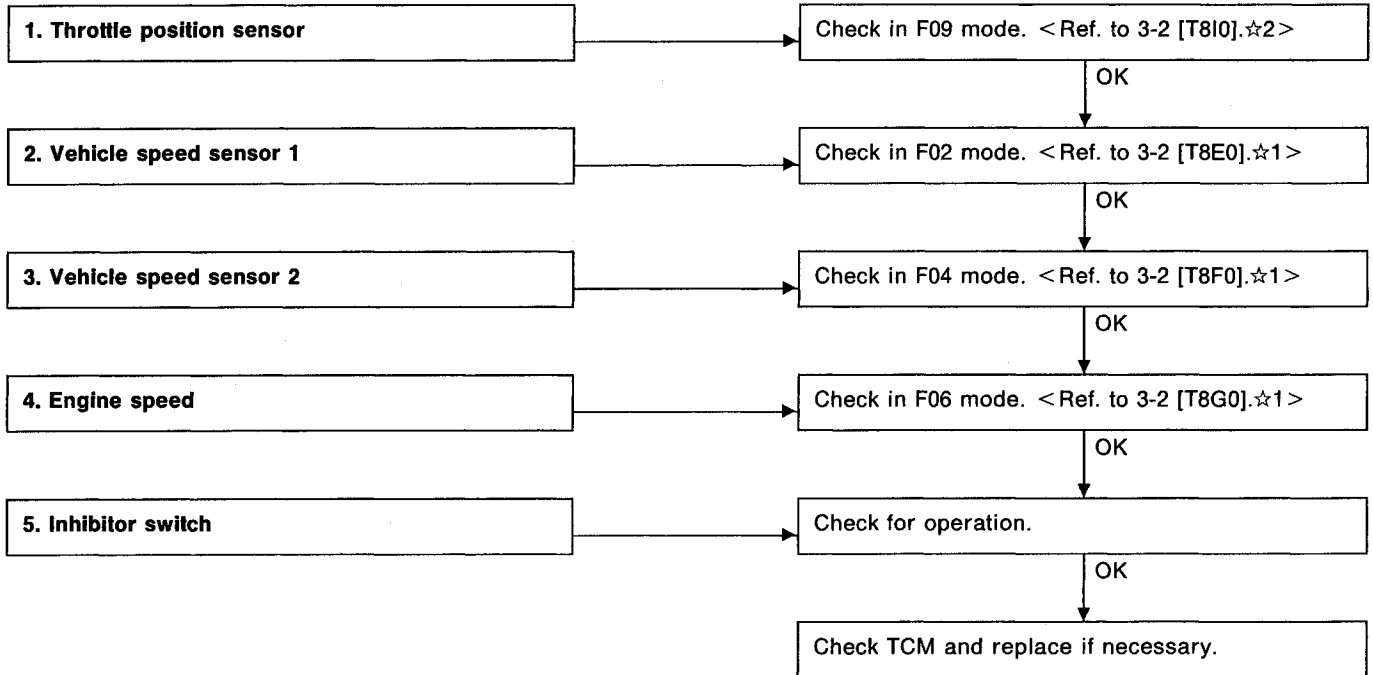
**L: MODE F12 — LOCK-UP DUTY (LUPTY) —  
CONDITION:**

- Idling (after sufficient warm-up) with lock-up system released.
- Driving at 75 km/h (47 MPH) (after sufficient warm-up) with lock-up system applied.

**SPECIFIED DATA:**

- Lock-up system released: 5%
- Lock-up system applied: 95%

Probable cause (if outside "specified data")



4WDTY (F13)

95%

G3M0733

**M: MODE F13 — AWD DUTY (4WDTY) —**

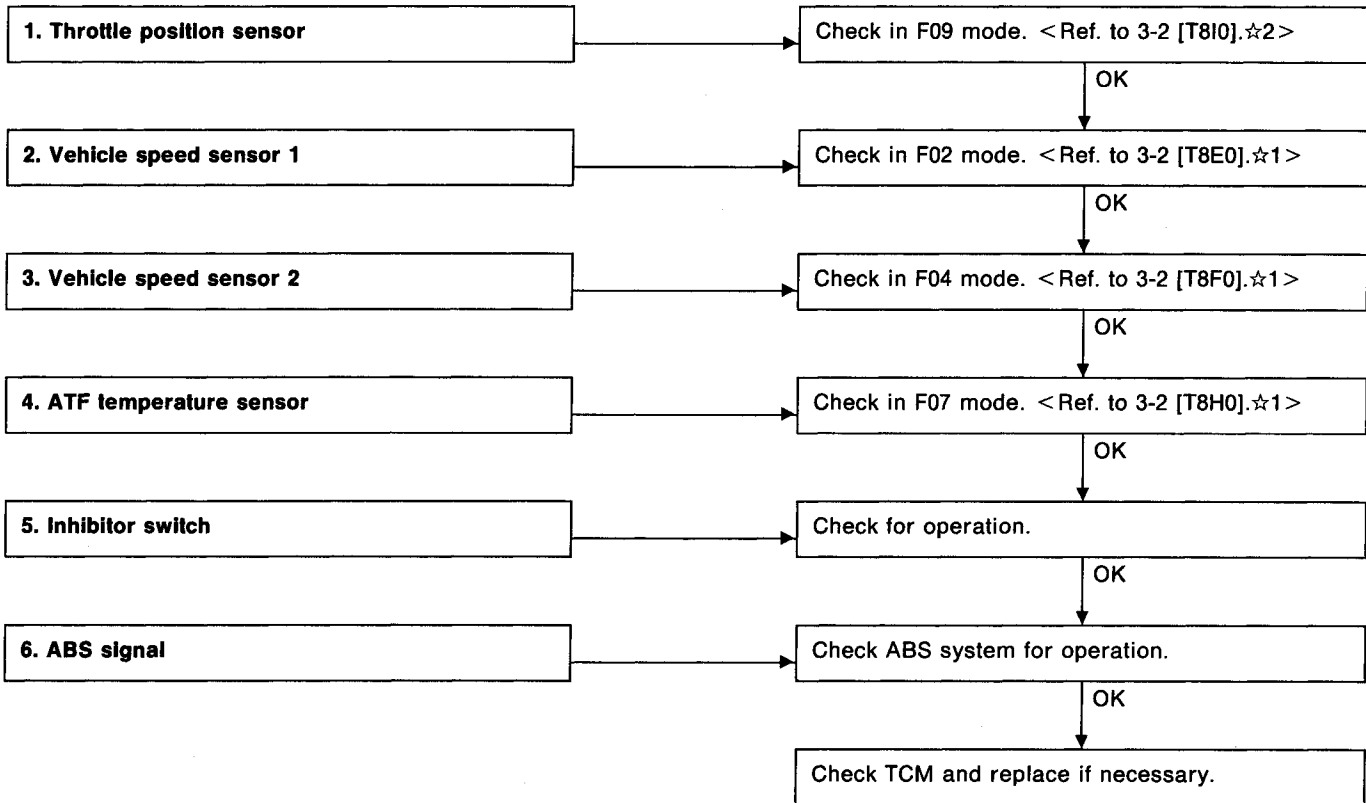
**CONDITION:**

- After sufficient warm-up
- Ignition switch ON (engine OFF)
- FWD mode
- AWD mode, D range, full throttle

**SPECIFIED DATA:**

- 95% (FWD mode)
- 25%, max. (vehicle speed 0 m/h) (AWD mode)

Probable cause (if outside "specified data")





**THVCC (F14)**  
  
**5.2 V**

B3M0259

**N: MODE F14**  
**— THROTTLE POSITION SENSOR POWER SUPPLY (THVCC) —**

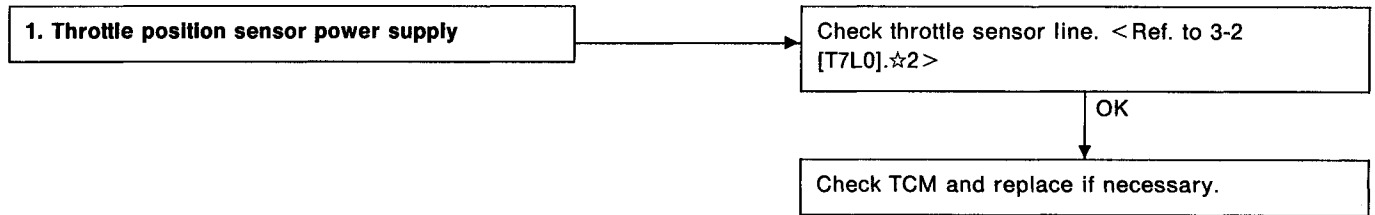
**CONDITION:**

Ignition switch ON (engine OFF)

**SPECIFIED DATA:**

5.12 ± 0.1 V

Probable cause (Item outside "specified data")



**AFM (F15)**  
  
**0.6V**

B3M0370

**O: MODE F15**  
**— MASS AIR FLOW SIGNAL (AFM) —**

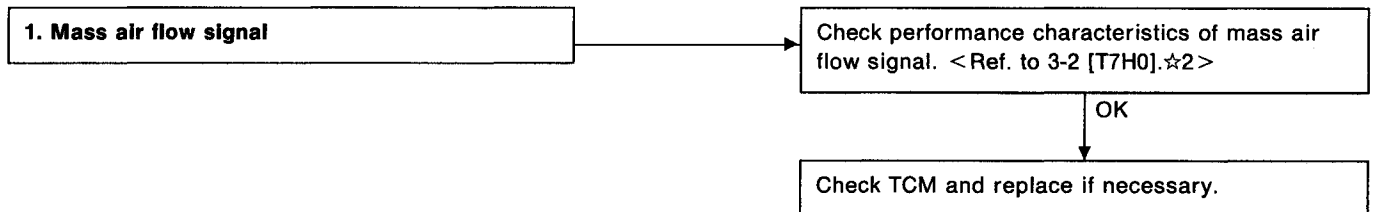
**CONDITION:**

- Ignition switch ON (engine ON)
- N range
- Idling

**SPECIFIED DATA:**

Engine warm-up: 0.5 — 1.22 V

Probable cause (if outside "specified data")



**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

**P: MODE FA0**  
**— SWITCH 1 (SW1) —**

**Reference values**

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

**NOTE:**

LED Nos. 2 and 8 do not come on.

**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

**Q: 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).

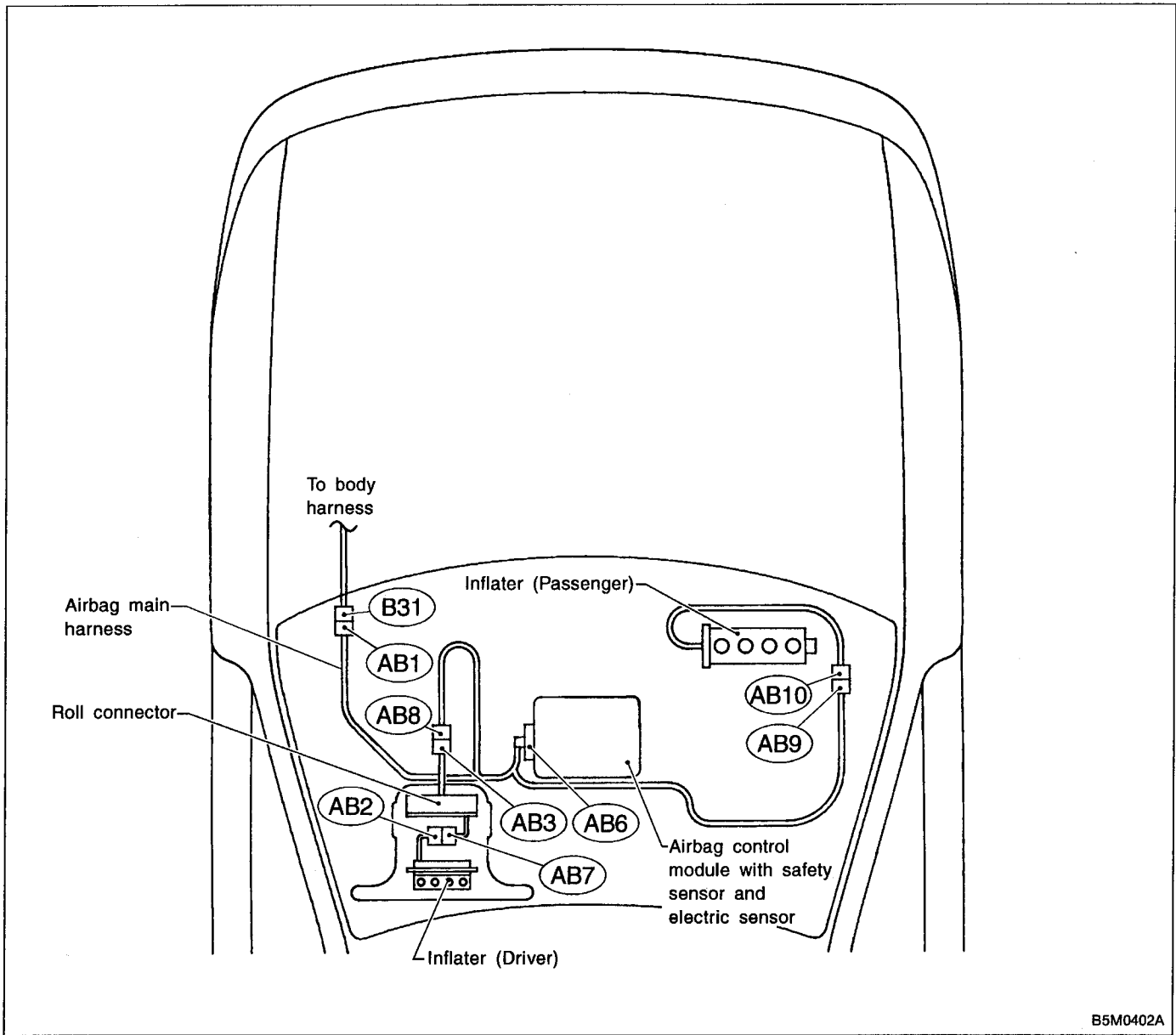
**NOTE:**

If each LED does not illuminate in the above conditions, inhibitor switch malfunction may occur. Perform diagnostics on inhibitor switch. <Ref. to 2-7 [T10AN0].☆2>

# 5-5b [T100] SUPPLEMENTAL RESTRAINT SYSTEM (ELECTRIC SENSOR TYPE)

## 1. Electrical Components Location

### 1. Electrical Components Location



B5M0402A

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

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## Important safety notice

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- 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 the used any service parts, consumables, special tools and work procedure manuals which are not approved or designated by SUBARU.

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## How to use this manual

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- This Service Manual is divided into four volumes by section so that it can be used with ease at work. Refer to the Table of Contents, select and use the necessary section.

- GENERAL INFORMATION SECTION
- REPAIR SECTION
- TROUBLESHOOTING SECTION
- WIRING DIAGRAM SECTION

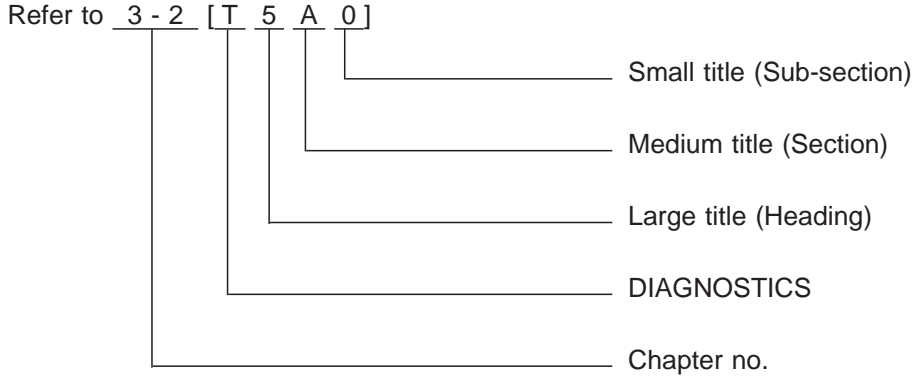
- The description of each area is provided with four types of titles different in size as shown below. The Title No. or Symbol prefixes each title in order that the construction of the article and the flow of explanation can be easily understood.

[Example of each title]

- Area title: T. DIAGNOSTICS
- Large title (Heading): 1. Diagnostics Chart with Select Monitor  
(to denote the main item of explanation)
- Medium title (Section): A: BASIC DIAGNOSTICS CHART  
(to denote the type of work in principle)
- Small title (Sub-section): 1. CHECK INPUT SIGNAL FOR ECM  
(to denote a derivative item of explanation)

- The Title Index No. is indicated on the top left (or right) side of the page as the book is opened. This is useful for retrieving the necessary portion.

(Example of usage)



Example of title placement

Title index No. 7

**AUTOMATIC TRANSMISSION AND DIFFERENTIAL** [T5A1] 3-2  
 5. Diagnostic Chart with Trouble Code

**5. Diagnostic Chart with Trouble Code**

**A: TROUBLE CODE 11**  
**— DUTY SOLENOID A —**

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

**TROUBLE SYMPTOM:**  
 Excessive shift shock

**1 Measure signal voltage output emitted from TCM.** Not OK → Repair TCM terminal poor contact. (Replace TCM.)

OK ↓

**2 Check harnesses and connectors between TCM and duty solenoid A and TCM and resistor.** Not OK → Repair or replace harness/connector.

OK ↓

Repair TCM terminal poor contact. (Replace TCM.)

**1. MEASURE SIGNAL VOLTAGE OUTPUT EMITTED FROM TCM.**

1) Warm-up the engine and transmission.  
 2) Ignition switch ON (Engine OFF).  
 3) Move shift lever to "N".  
 4) While opening and closing throttle valve, measure voltage between TCM connector and body.

**Connector & terminal / Specified resistance:**  
 (B52) No. 11 — No. 13 /  
 1.5 — 4.0 V (Throttle is fully closed.)  
 0.5 V, max. (Throttle is fully open.)

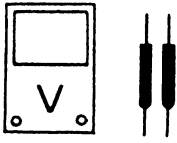
Medium title

Large title

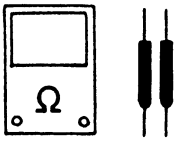
Small title

G3M0106

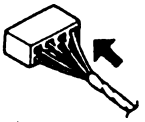
- In this manual, the following symbols are used.



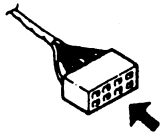
Circuit tester  
Voltage measurement



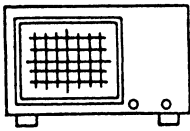
Circuit tester  
Resistance measurement



The arrow indicates that insertion of the probe or numbering of the connector pins is made from the side.



The arrow indicates that insertion of the probe or numbering of the connector pins is made from the side.



Oscilloscope



Oscilloscope positive probe



Oscilloscope earth head

- WARNING, CAUTION, NOTE

- **WARNING:** Indicates the item which must be observed precisely during performance of maintenance services in order to avoid injury to the mechanics and other persons.
- **CAUTION:** Indicates that item which must be followed precisely during performance of maintenance services so as to avoid damage and breakage to the vehicle and its parts and components.
- **NOTE:** Indicates the hints, knacks, etc. which make the maintenance job easier.

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## Basic checks

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### DISCONNECTING CONNECTORS

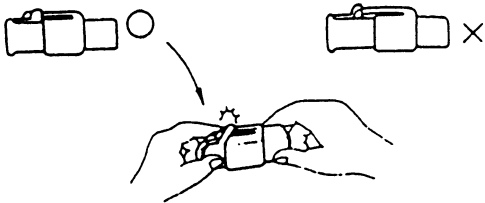
- Always hold the connector itself.  
**CAUTION:**  
Don't pull the harness.



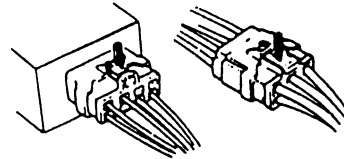
- To disconnect a locking connector, first re-lease the lock, then pull the connector off.  
<Unlock by pulling the locking tab>



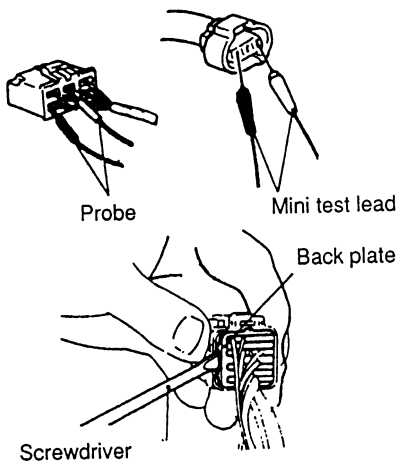
- Insert a connector by pushing it all the way in. If the connector is equipped with a locking device, push it in until a clicking sound is heard.



- <Unlock by pushing the locking tab>



### INSERTING A PROBE



- Generally, probes are inserted into connectors from the rear.
- Connectors equipped with shock protectors must be checked with a mini probe (thin), or it will be necessary to remove the shock protector.
- When removing the shock protector take care not to deform it; this also applies to waterproof connectors, which cannot be tested from the wire side.
- When the connector has a back plate, remove the plate after removing the projection of the plate first. (Be careful not to use excessive force, since the terminals might brake off).



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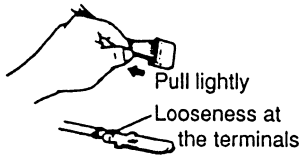
## CHECKING FOR POOR CONTACT ON PLUG-IN CONNECTORS

Most intermittent problems are caused by poor contact of plug-in connectors.

Poor contact is frequently caused by corroded terminals, dirt, foreign substances, weak contact points between male and female connectors, etc.

To help prevent the replacement of good component parts, sufficiently check the following points.

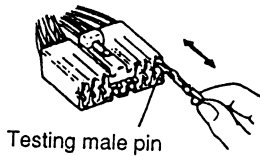
- Quite often a plug with poor contact will work perfectly again after it has been pulled off and reconnected.



- Disconnect the two connector halves.
- Check the connector pins for signs of corrosion or foreign material.
- Check the connector for loose and damaged terminals, and make sure they are set correctly in the connector.

NOTE:

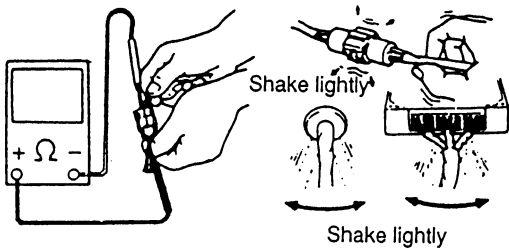
When the harness is pulled lightly, the terminals should not come out.



- Insert the male pin of the connector into the female pin, then pull it out.

NOTE:

If one of the pins pulls out easily, it is a likely source of a malfunction.

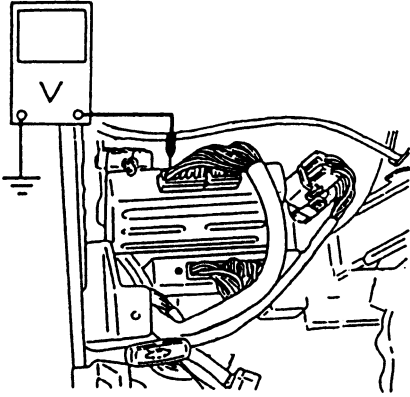


- Lightly shake the connector and the harness, and check for sudden changes in voltage or resistance.

If harness and connector checks do not reveal any defect, it can be assumed that an intermittent contact in a connector is the source of trouble.

## Diagnosis and checking procedure using instruments

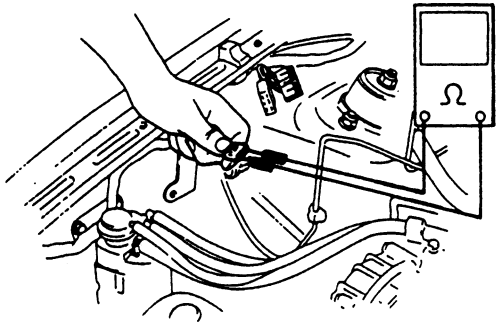
### USING A CIRCUIT TESTER



J3-1012

- **Voltage check (range set to DC V)**

Connect the positive probe to the terminal to be tested, and the negative probe to body ground (or the ground terminal of the ECM)



J3-830

- **Checking the connection (range set to Ω)**

Measure the resistance and check for open or shorted wire in the harness or the connector.

NOTE:

This check must be carried out with both connectors disconnected.

(This avoids by-passing the connection through other circuits).

1) Check for open circuit (range: Ω x 1K)

Measure the resistance between the respective pins in both connectors.

**Specified resistance:**

**1 MΩ, or more (No continuity) Open circuit**

**10 Ω, or less (Continuity) O.K.**

2) Check for correct insulation value (range: Ω x 1K)

Measure the resistance between the pins in both connectors, as well as between the suspected pin and the body (body short).

**Specified resistance:**

**1 MΩ, or more (No continuity) O.K.**

**10 Ω, or less (Continuity) Short circuit**

- **Resistance measurement (range set to Ω)**

Measuring the internal resistance of sensors, solenoid valves etc. to check the operating condition of components.

NOTE:

- Select the appropriate range for measuring the internal resistance, or the measurement will result in an incorrect reading.

- Before changing the measurement range the gauge must be reset to zero.

---

## USING A SUBARU SELECT MONITOR

With this testing procedure the defective component can be determined by directly monitoring input/output signals of the ECM or the trouble codes.

### Features

- A variety of data can be checked without movements from the drivers seat, passenger's seat or from outside the vehicle.
- This unit allows the identification of the type of malfunction, for example whether the cause is an open or shorted wire in the input/output signal line, or whether the breakdown of a component is caused by a lack of maintenance.

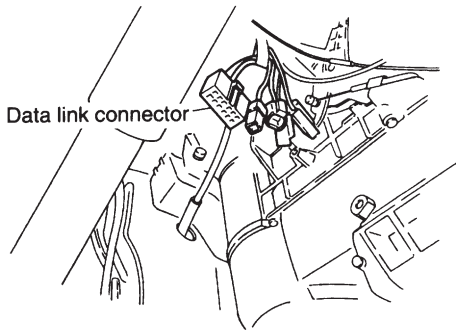
### Diagnosis

- Refer to the reference values for input/output and control data to determine whether the malfunction is caused by a worn out component, an open wire, a short etc.
- Perform the diagnostics procedure as described in chapter "Check based on trouble codes" by monitoring the trouble codes.

#### NOTE:

It will be easier to determine a malfunction if the vehicle data for normal conditions are available for comparison.

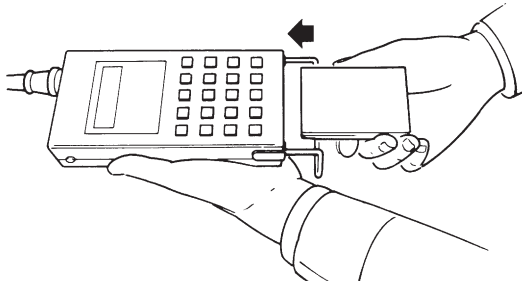
### Use of select monitor



G2H0054

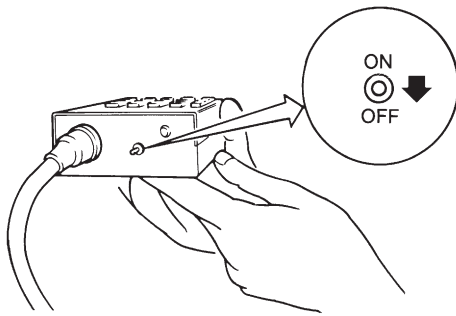
#### 1. CONNECT SELECT MONITOR.

- 1) Connect select monitor to data link connector located under instrument panel (on driver's side).



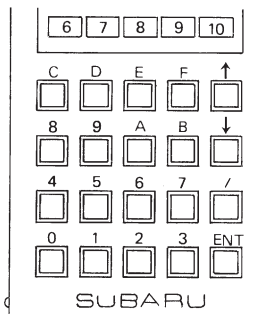
G3M0150

- 2) Insert cartridge into select monitor.



- 3) Turn ignition switch and select monitor switch ON.
- 4) After display is shown, press slash "/" key.
- 5) After AT mode is displayed, press function "[0]".  
(Display returns to AT mode when slash "/" is pressed during on-board diagnostic operation.)

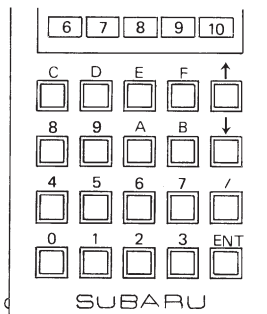
G3M0151



### 2. READ TROUBLE CODE SHOWN ON DISPLAY.

- 1) Connect select monitor.
- 2) Designate mode using function key.  
Press [F] [B] [0] [ENT] in that order.
- 3) Ensure trouble code(s) is shown.

G3M0152



### 3. PREVIOUS TROUBLE CODE READING

- 1) Connect select monitor.
- 2) Designate mode using function key.  
Press [F] [B] [1] [ENT] in that order.
- 3) Ensure displayed trouble code(s).

G3M0152

## USING AN OSCILLOSCOPE

A malfunction can be determined by displaying the waveforms of input/output signals on the oscilloscope.

### Diagnosis

A simple comparison of the waveforms may lead to an incorrect diagnosis. To exactly determine the sources of the malfunction it will be necessary to determine them under consideration about information other than waveforms.

### Applying input/output signals

Connect the probe directly with the terminal of the signal.

## 1. General

### 1. 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 trips, 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.

## A: 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-

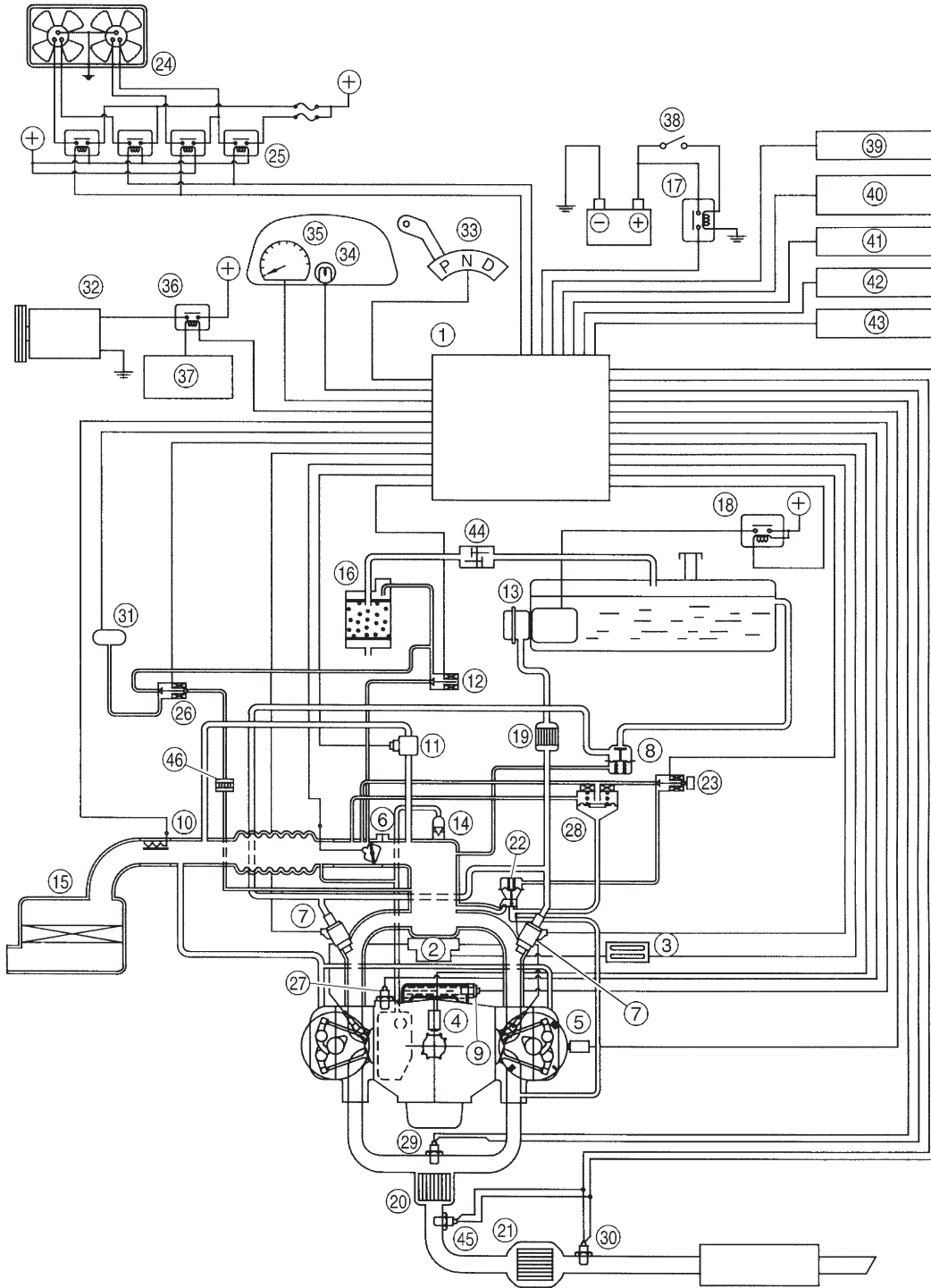
tity is determined by the duration of an electric pulse applied to the fuel injector and this permits simple, yet highly precise metering of the fuel.

- 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 (2200 cc FWD AND TAIWAN MODELS)

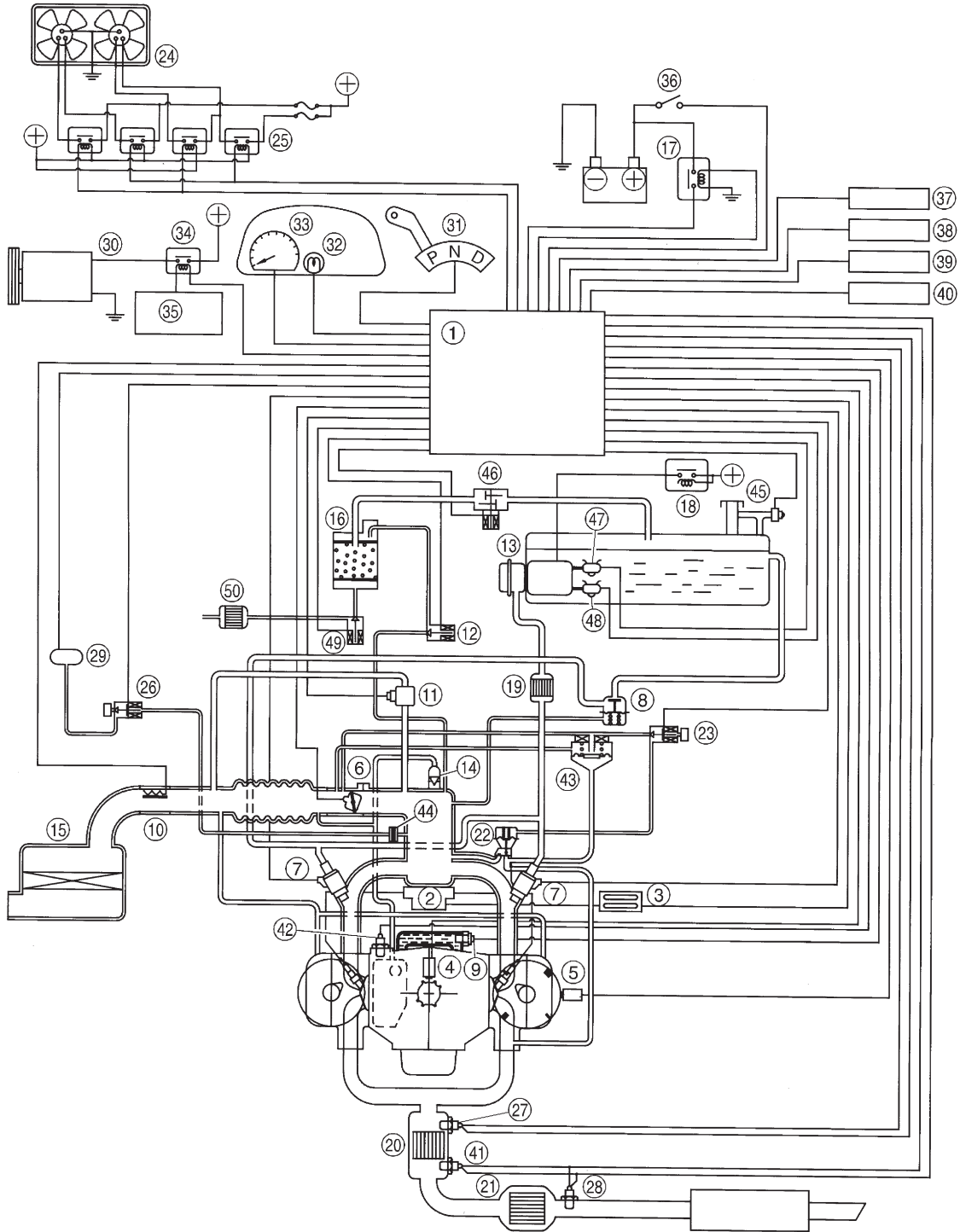


B2M0709A

- ① Engine control module (ECM)
- ② Ignition coil
- ③ Ignitor
- ④ Crankshaft position sensor
- ⑤ Camshaft position sensor
- ⑥ Throttle position sensor
- ⑦ Fuel injectors
- ⑧ Pressure regulator
- ⑨ Engine coolant temperature sensor
- ⑩ Mass air flow sensor
- ⑪ Idle air control solenoid valve
- ⑫ Purge control solenoid valve
- ⑬ Fuel pump
- ⑭ PCV valve
- ⑮ Air cleaner
- ⑯ Canister
- ⑰ Main relay
- ⑱ Fuel pump relay
- ⑲ Fuel filter
- ⑳ Front catalytic converter
- ㉑ Rear catalytic converter
- ㉒ EGR valve (AT vehicles only)
- ㉓ EGR control solenoid valve (AT vehicles only)
- ㉔ Radiator fan
- ㉕ Radiator fan relay
- ㉖ Pressure sources switching solenoid valve
- ㉗ Knock sensor
- ㉘ Back-pressure transducer (AT vehicles only)
- ㉙ Front oxygen sensor
- ㉚ Rear oxygen sensor (Except 2200 cc California model)
- ㉛ Pressure sensor
- ㉜ A/C compressor
- ㉝ Inhibitor switch
- ㉞ CHECK ENGINE malfunction indicator lamp (MIL)
- ㉟ Tachometer
- ㊱ A/C relay
- ㊲ A/C control module
- ㊳ Ignition switch
- ㊴ Transmission control module (TCM) (AT vehicles only)
- ㊵ ABS/TCS control module (TCS equipped models)
- ㊶ Vehicle speed sensor
- ㊷ Data link connector (For Subaru select monitor)
- ㊸ Data link connector (For Subaru select monitor and OBD-II general scan tool)
- ㊹ Two way valve
- ㊺ Rear oxygen sensor (2200 cc California model only)
- ㊻ Filter



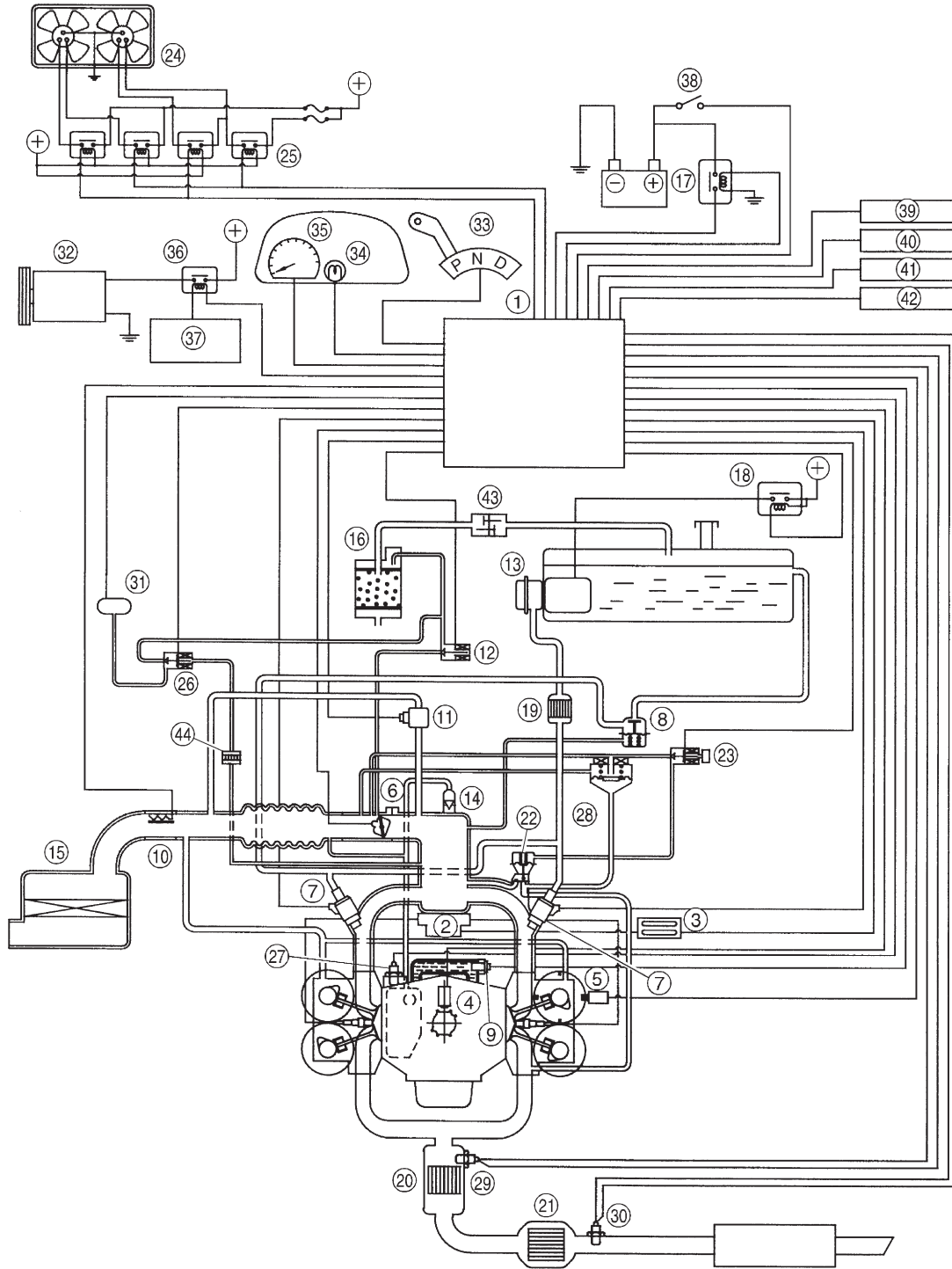
3. SCHEMATIC (2200 cc AWD EXCEPT TAIWAN MODEL)



B2M0914A

- ① Engine control module (ECM)
- ② Ignition coil
- ③ Ignitor
- ④ Crankshaft position sensor
- ⑤ Camshaft position sensor
- ⑥ Throttle position sensor
- ⑦ Fuel injectors
- ⑧ Pressure regulator
- ⑨ Engine coolant temperature sensor
- ⑩ Mass air flow sensor
- ⑪ Idle air control solenoid valve
- ⑫ Purge control solenoid valve
- ⑬ Fuel pump
- ⑭ PCV valve
- ⑮ Air cleaner
- ⑯ Canister
- ⑰ Main relay
- ⑱ Fuel pump relay
- ⑲ Fuel filter
- ⑳ Front catalytic converter
- ㉑ Rear catalytic converter
- ㉒ EGR valve (AT vehicles only)
- ㉓ EGR control solenoid valve (AT vehicles only)
- ㉔ Radiator fan
- ㉕ Radiator fan relay
- ㉖ Pressure sources switching solenoid valve
- ㉗ Front oxygen sensor
- ㉘ Rear oxygen sensor (Except 2200 cc California model)
- ㉙ Pressure sensor
- ㉚ A/C compressor (With A/C models)
- ㉛ Inhibitor switch
- ㉜ CHECK ENGINE malfunction indicator lamp (MIL)
- ㉝ Tachometer
- ㉞ A/C relay (With A/C models)
- ㉟ A/C control module (With A/C models)
- ㊱ Ignition switch
- ㊲ Transmission control module (TCM)
- ㊳ Vehicle speed sensor
- ㊴ Data link connector (For Subaru select monitor)
- ㊵ Data link connector (For Subaru select monitor and OBD-II general scan tool)
- ㊶ Rear oxygen sensor (2200 cc California model)
- ㊷ Knock sensor
- ㊸ Back-pressure transducer (AT vehicles only)
- ㊹ Filter
- ㊺ Fuel tank pressure sensor
- ㊻ Pressure control solenoid valve
- ㊼ Fuel temperature sensor
- ㊽ Fuel level sensor
- ㊾ Vent control solenoid valve
- ㊿ Air filter

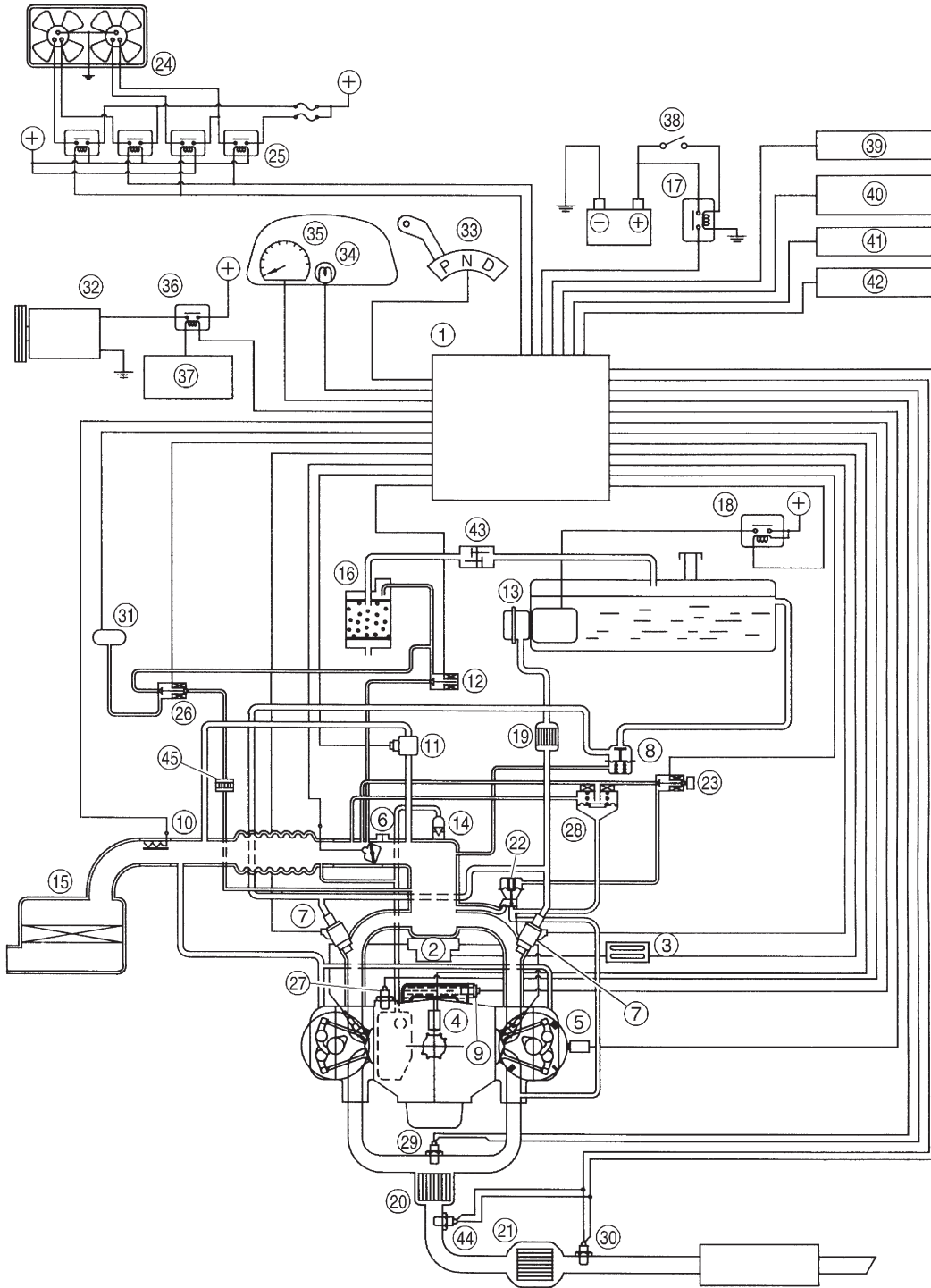
4. SCHEMATIC (2500 cc MODEL)



B2M0710A

- ① Engine control module (ECM)
- ② Ignition coil
- ③ Ignitor
- ④ Crankshaft position sensor
- ⑤ Camshaft position sensor
- ⑥ Throttle position sensor
- ⑦ Fuel injectors
- ⑧ Pressure regulator
- ⑨ Engine coolant temperature sensor
- ⑩ Mass air flow sensor
- ⑪ Idle air control solenoid valve
- ⑫ Purge control solenoid valve
- ⑬ Fuel pump
- ⑭ PCV valve
- ⑮ Air cleaner
- ⑯ Canister
- ⑰ Main relay
- ⑱ Fuel pump relay
- ⑲ Fuel filter
- ⑳ Front catalytic converter
- ㉑ Rear catalytic converter
- ㉒ EGR valve
- ㉓ EGR control solenoid valve
- ㉔ Radiator fan
- ㉕ Radiator fan relay
- ㉖ Pressure sources switching solenoid valve
- ㉗ Knock sensor
- ㉘ Back-pressure transducer
- ㉙ Front oxygen sensor
- ㉚ Rear oxygen sensor
- ㉛ Pressure sensor
- ㉜ A/C compressor
- ㉝ Inhibitor switch
- ㉞ CHECK ENGINE malfunction indicator lamp (MIL)
- ㉟ Tachometer
- ㊱ A/C relay
- ㊲ A/C control module
- ㊳ Ignition switch
- ㊴ Transmission control module (TCM)
- ㊵ Vehicle speed sensor
- ㊶ Data link connector (Subaru select monitor)
- ㊷ Data link connector (OBD-II general scan tool)
- ㊸ Two way valve
- ㊹ Filter

5. SCHEMATIC (RHD MODEL)



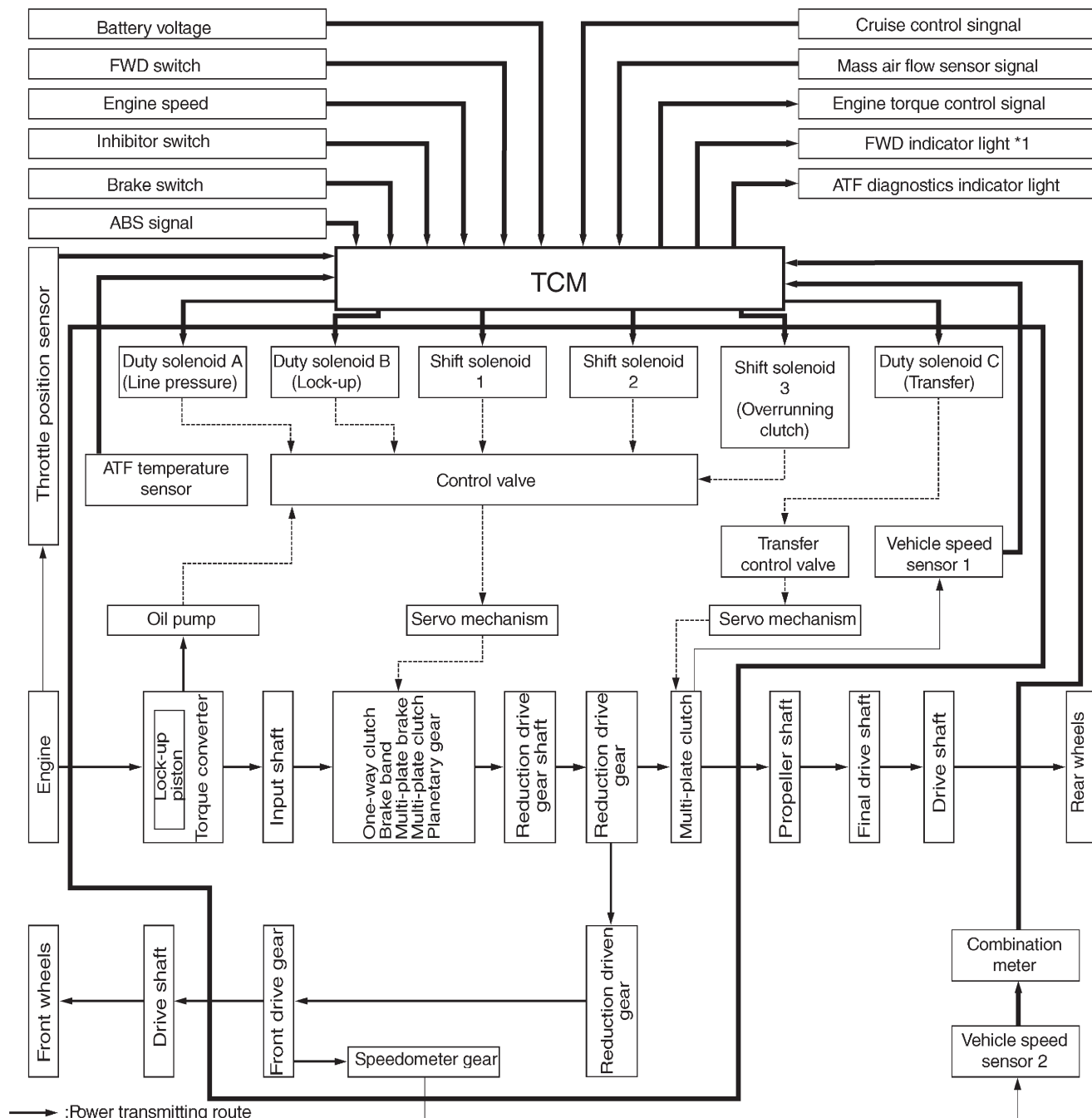
B2M0828A

- 
- ① Engine control module (ECM)
  - ② Ignition coil
  - ③ Ignitor
  - ④ Crankshaft position sensor
  - ⑤ Camshaft position sensor
  - ⑥ Throttle position sensor
  - ⑦ Fuel injectors
  - ⑧ Pressure regulator
  - ⑨ Engine coolant temperature sensor
  - ⑩ Mass air flow sensor
  - ⑪ Idle air control solenoid valve
  - ⑫ Purge control solenoid valve
  - ⑬ Fuel pump
  - ⑭ PCV valve
  - ⑮ Air cleaner
  - ⑯ Canister
  - ⑰ Main relay
  - ⑱ Fuel pump relay
  - ⑲ Fuel filter
  - ⑳ Front catalytic converter
  - ㉑ Rear catalytic converter
  - ㉒ EGR valve
  - ㉓ EGR control solenoid valve
  - ㉔ Radiator fan
  - ㉕ Radiator fan relay
  - ㉖ Pressure sources switching solenoid valve
  - ㉗ Knock sensor
  - ㉘ Back-pressure transducer
  - ㉙ Front oxygen sensor
  - ㉚ Rear oxygen sensor (Except California model)
  - ㉛ Pressure sensor
  - ㉜ A/C compressor
  - ㉝ Inhibitor switch
  - ㉞ CHECK ENGINE malfunction indicator lamp (MIL)
  - ㉟ Tachometer
  - ㊱ A/C relay
  - ㊲ A/C control module
  - ㊳ Ignition switch
  - ㊴ Transmission control module (TCM)
  - ㊵ Vehicle speed sensor 2
  - ㊶ Data link connector (For Subaru select monitor)
  - ㊷ Data link connector (For Subaru select monitor and OBD-II general scan tool)
  - ㊸ Two way valve
  - ㊹ Rear oxygen sensor (California model only)
  - ㊺ Filter

**B: 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



- :Power transmitting route
  - :Electrical signal
  - :Hydraulic pressure control circuit
  - :Mechanical signal
- \*1: AWD vehicles only

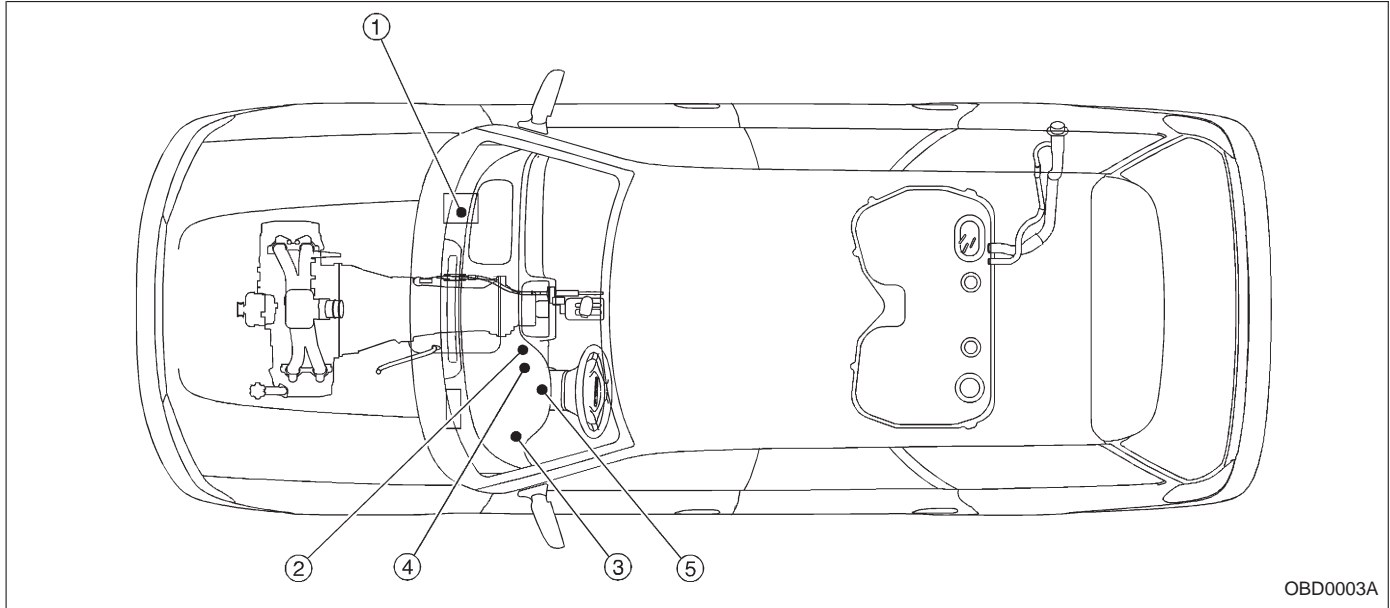
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### 2. Electrical Components Location

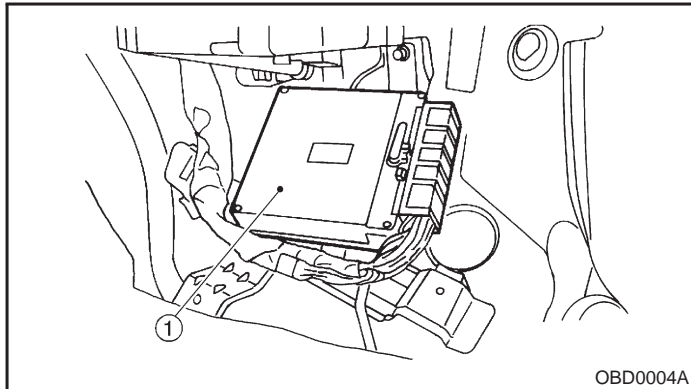
#### A: ENGINE

#### 1. MODULE

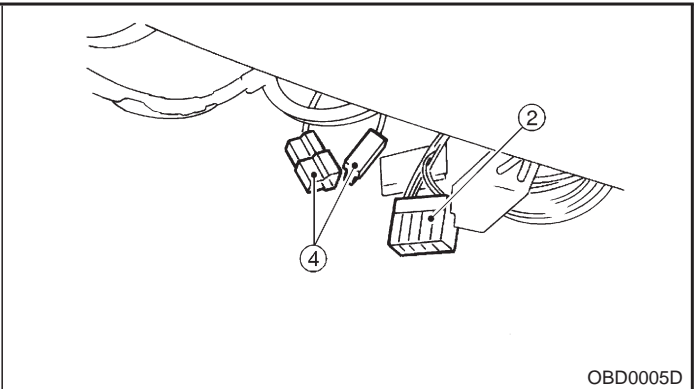


OBD0003A

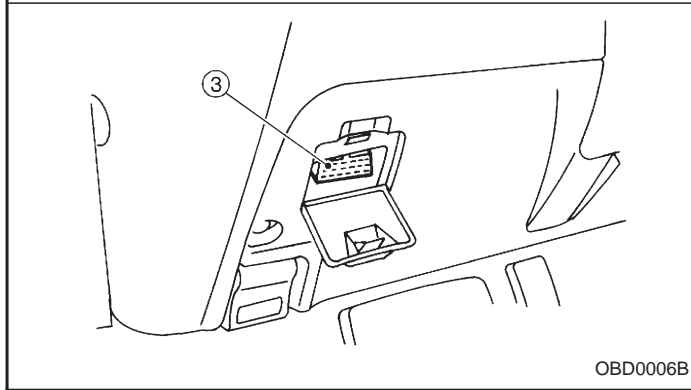
- ① Engine control module (ECM)
- ② Data link connector (for Subaru select monitor only)
- ③ Data link connector (for Subaru select monitor and OBD-II general scan tool)
- ④ Test mode connector
- ⑤ CHECK ENGINE malfunction indicator lamp (MIL)



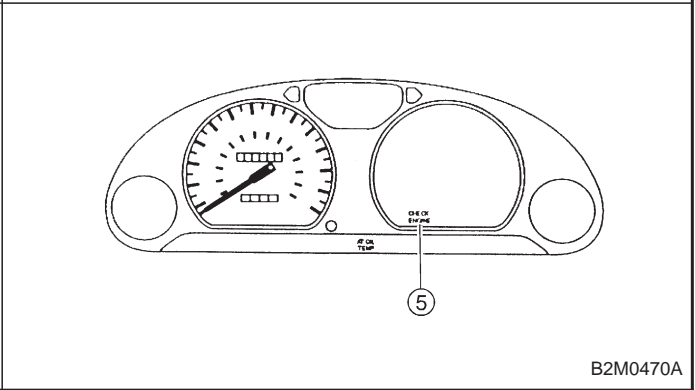
OBD0004A



OBD0005D

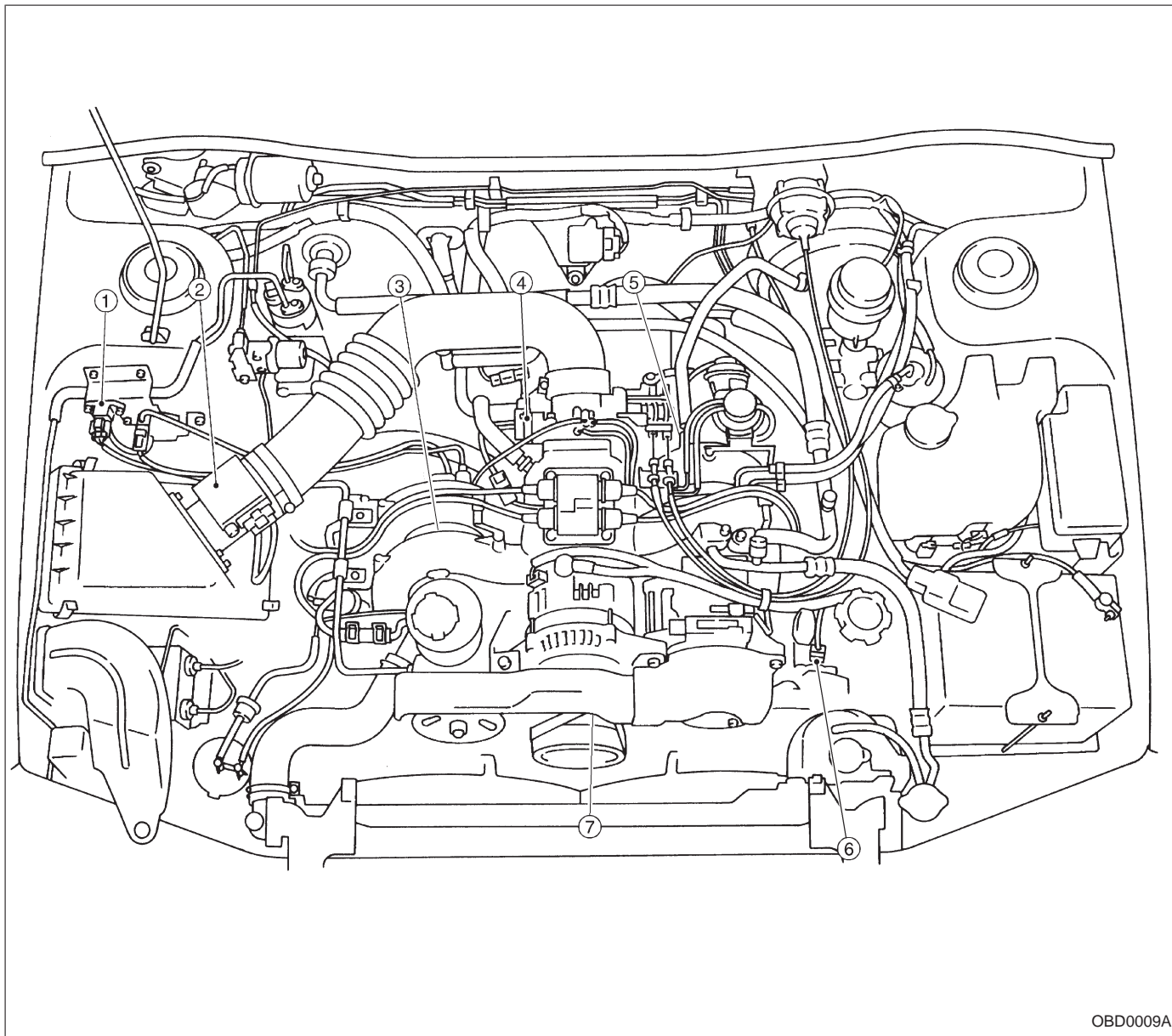


OBD0006B



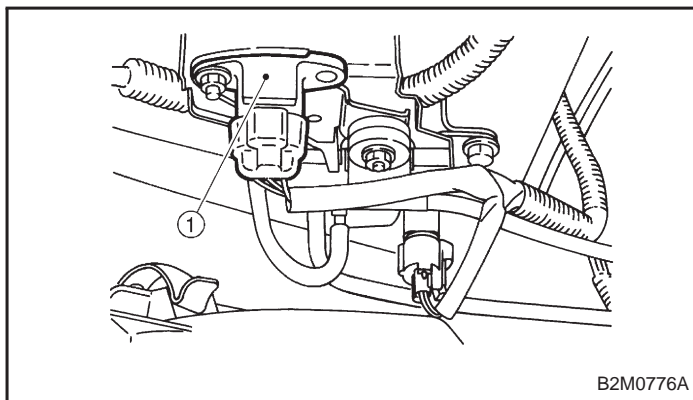
B2M0470A

2. SENSOR

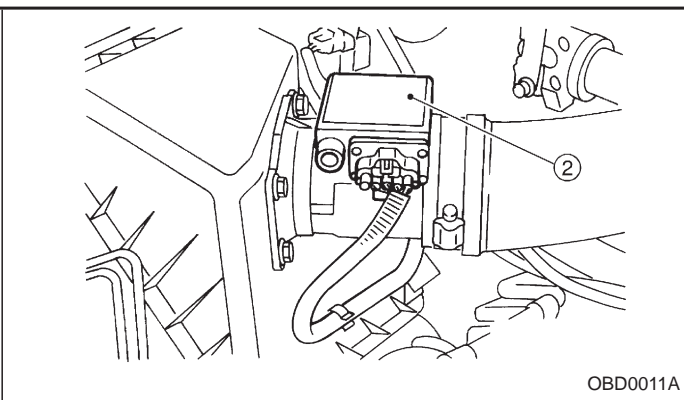


OBD0009A

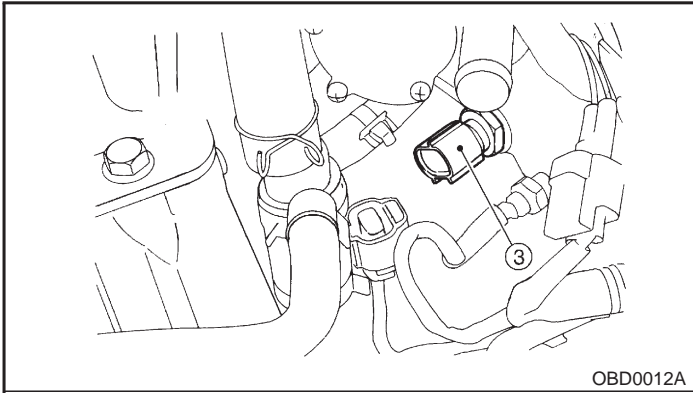
- ① Pressure sensor
- ② Mass air flow sensor
- ③ Engine coolant temperature sensor
- ④ Throttle position sensor
- ⑤ Knock sensor
- ⑥ Camshaft position sensor
- ⑦ Crankshaft position sensor



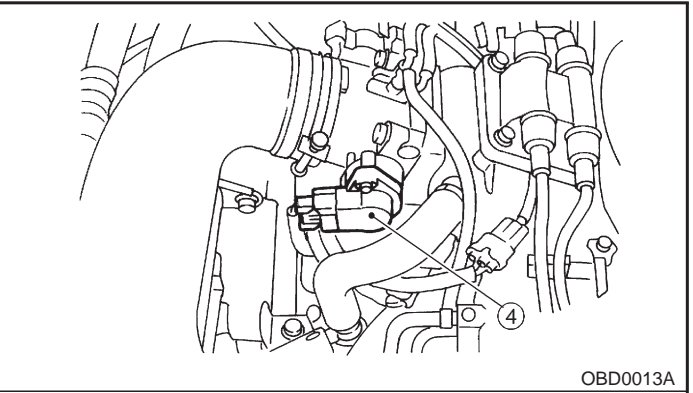
B2M0776A



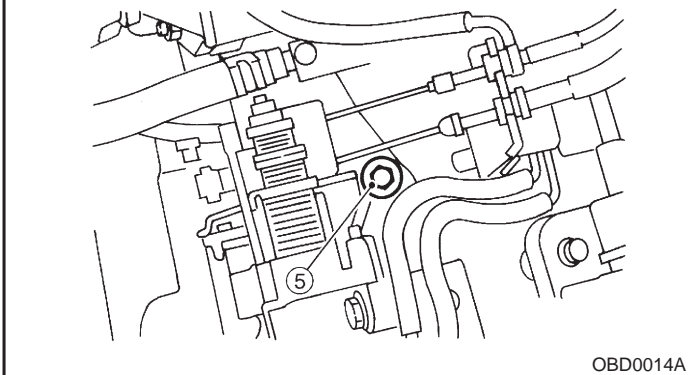
OBD0011A



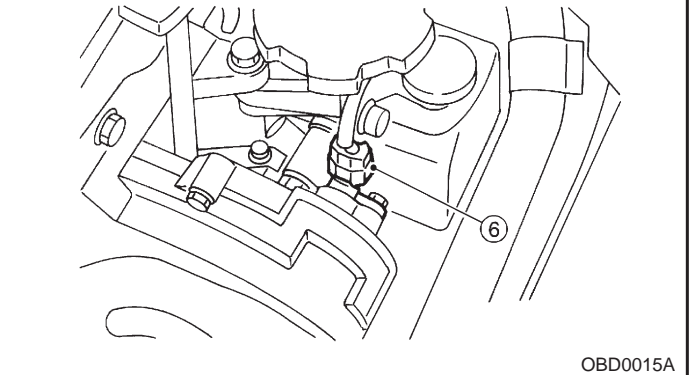
OBD0012A



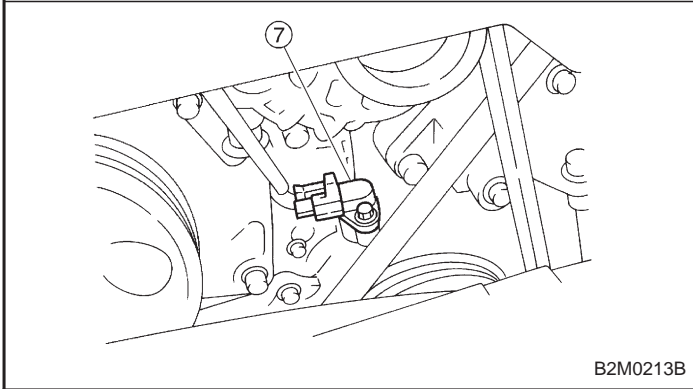
OBD0013A



OBD0014A

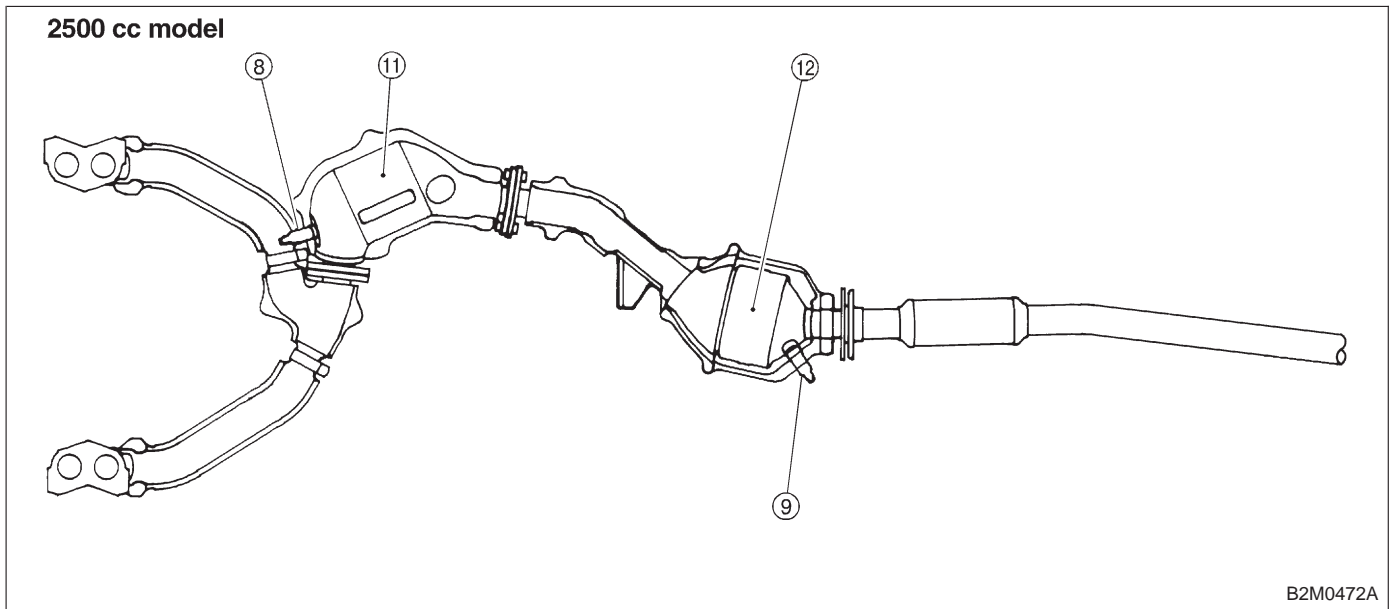
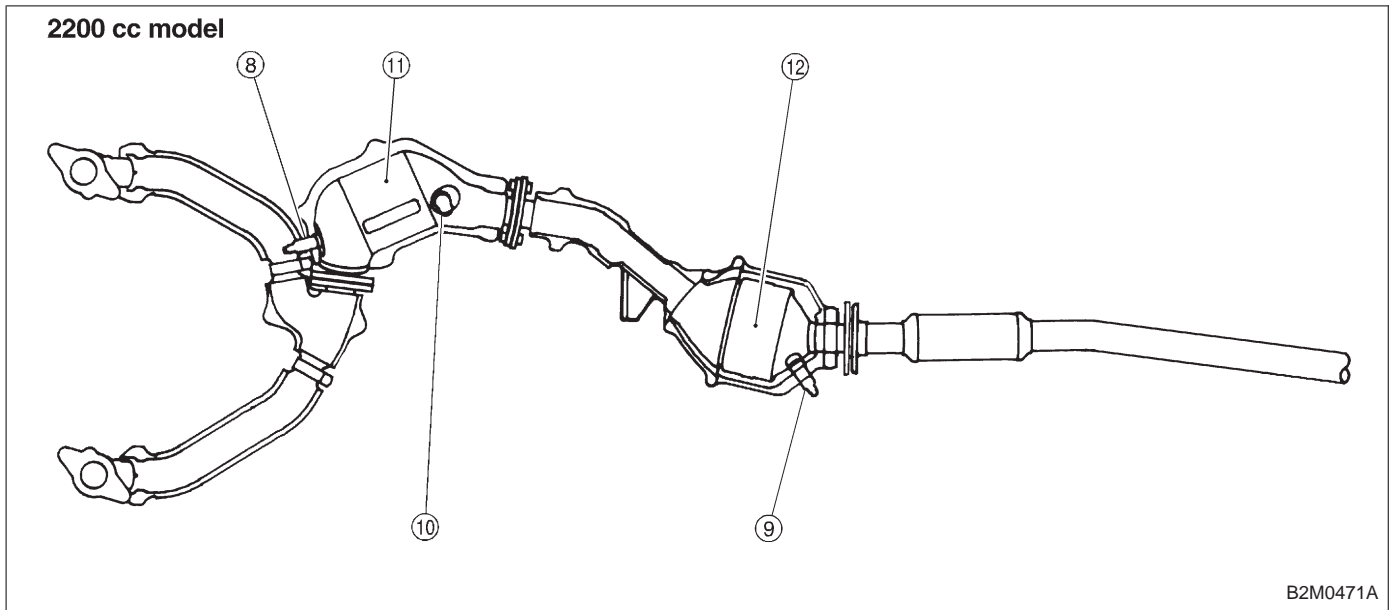


OBD0015A



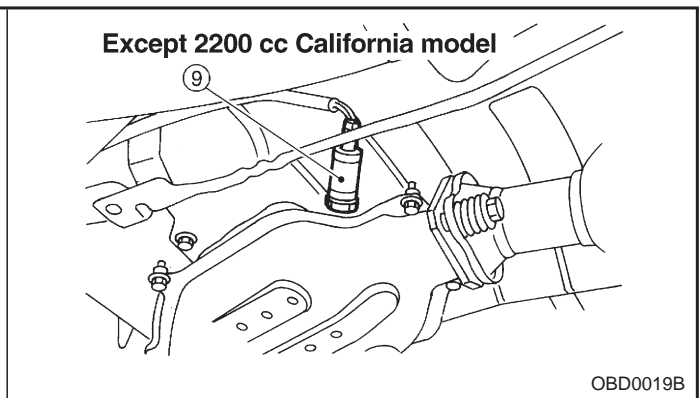
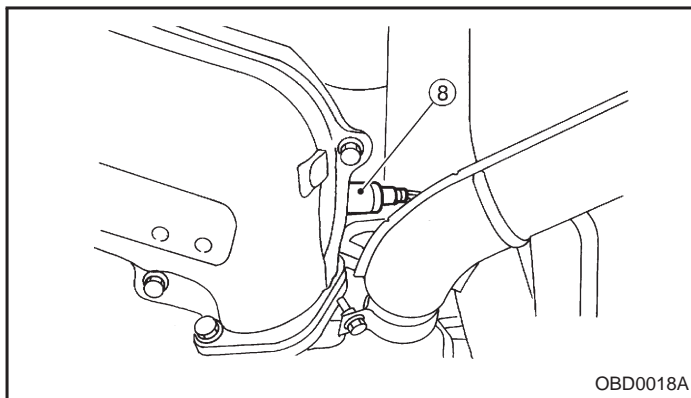
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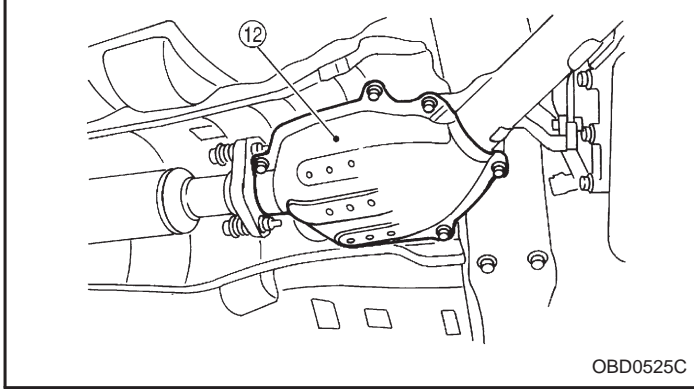
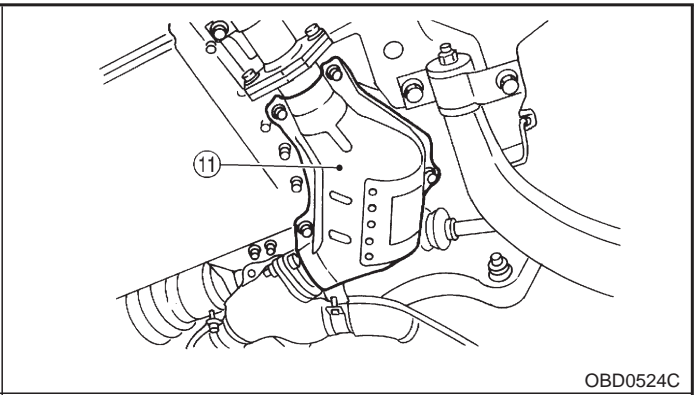
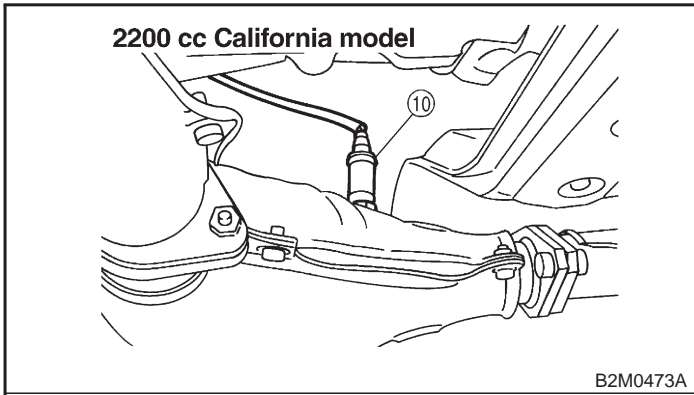


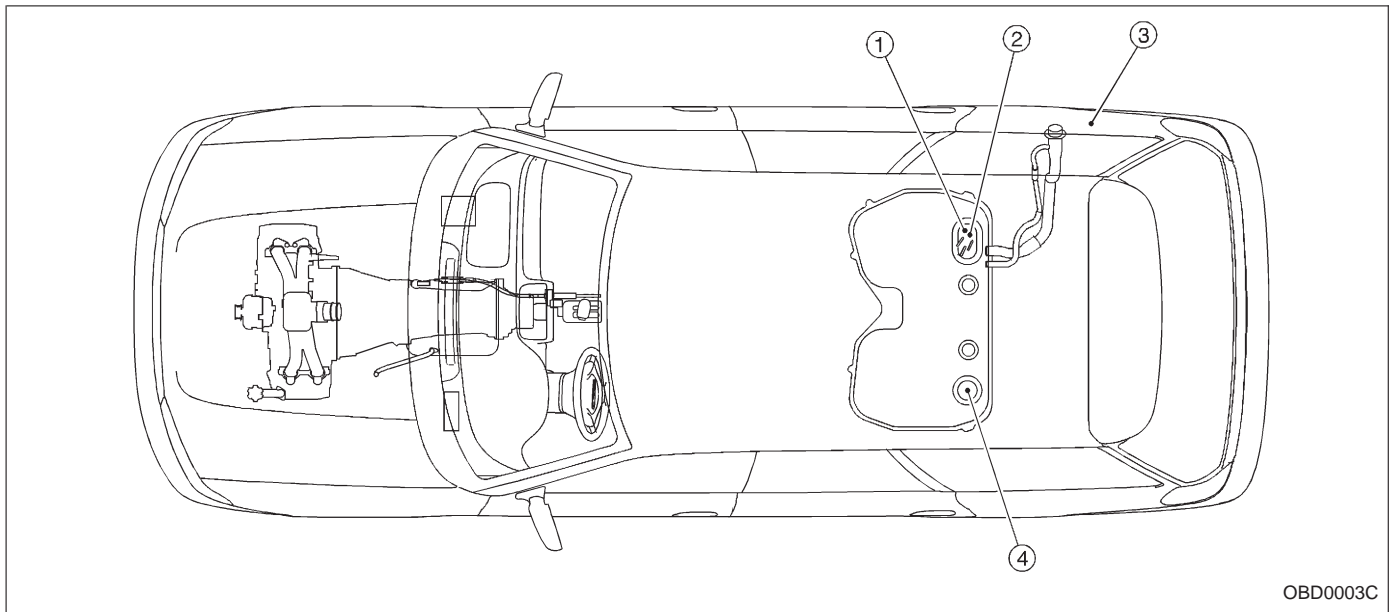


- ⑧ Front oxygen sensor
- ⑨ Rear oxygen sensor (Except 2200 cc California model)
- ⑩ Rear oxygen sensor (2200 cc California model)

- ⑪ Front catalytic converter
- ⑫ Rear catalytic converter

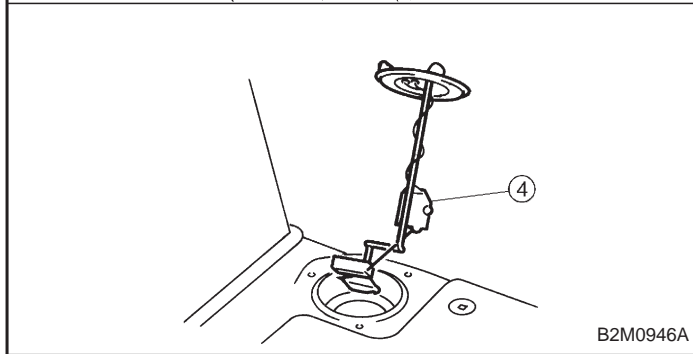
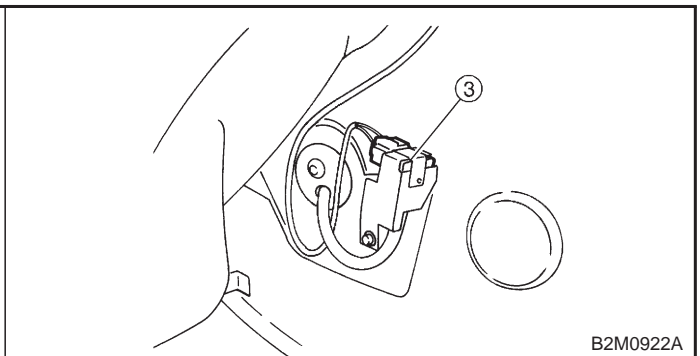
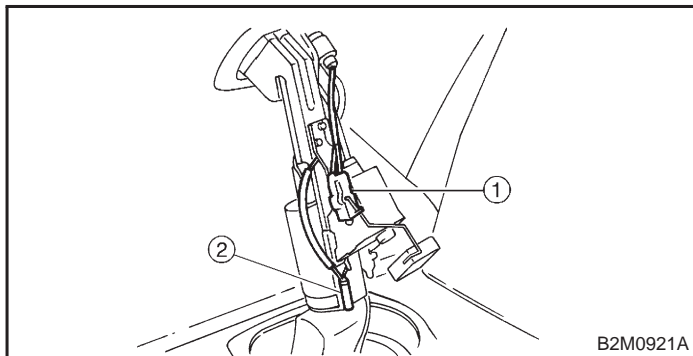






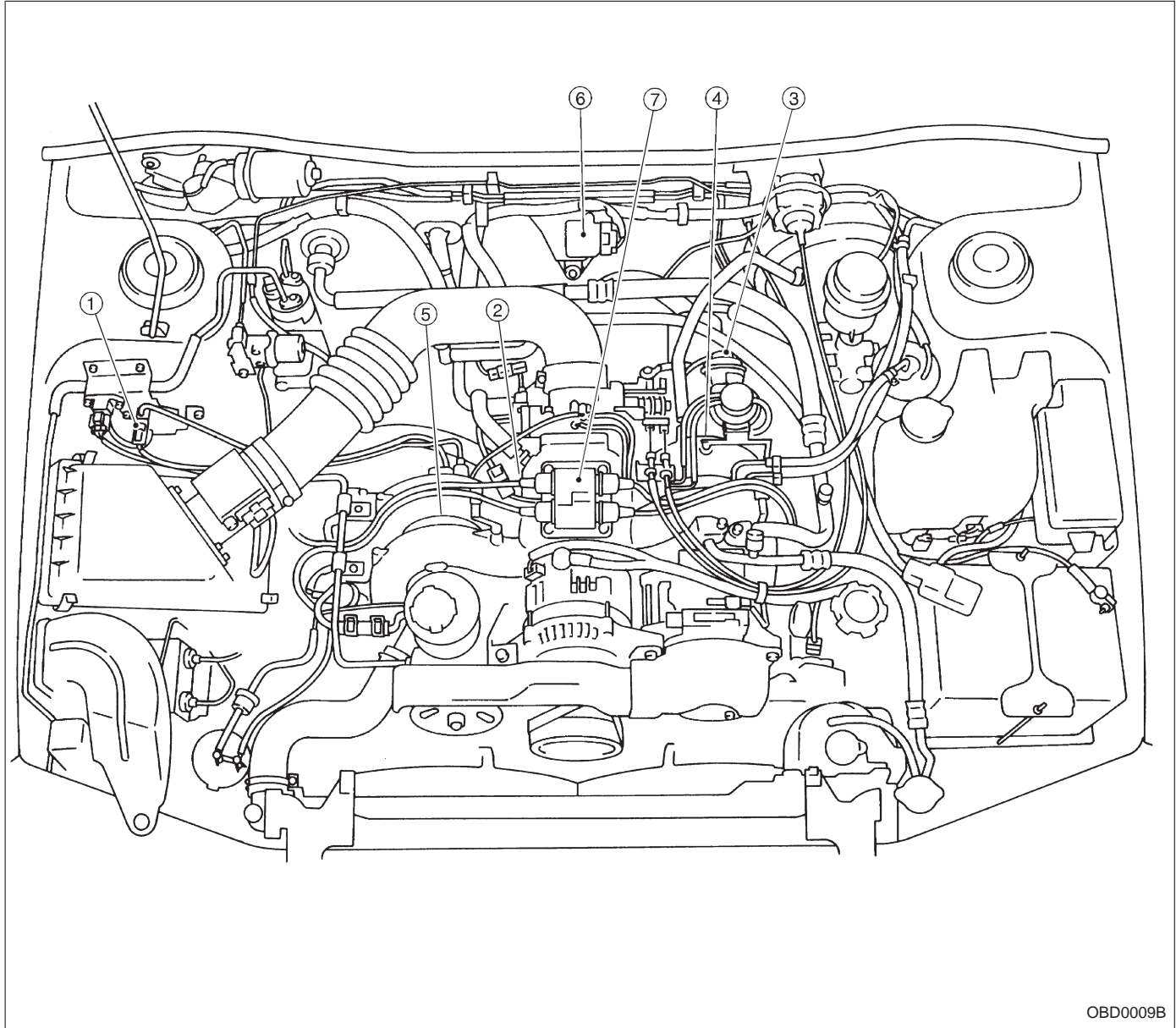
- ① Fuel level sensor
- ② Fuel temperature sensor

- ③ Fuel tank pressure sensor
- ④ Fuel sub level sensor



**SUBARU.**

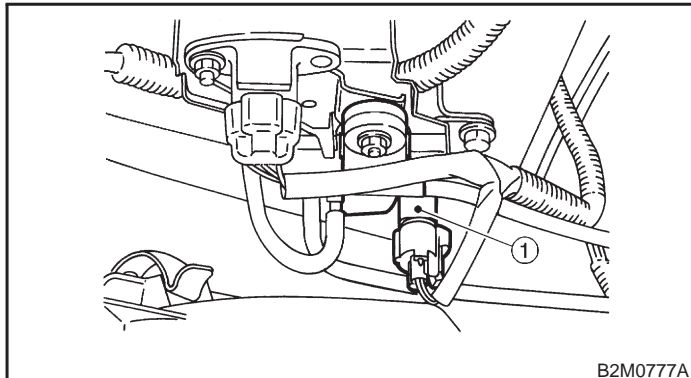
3. SOLENOID VALVE, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS



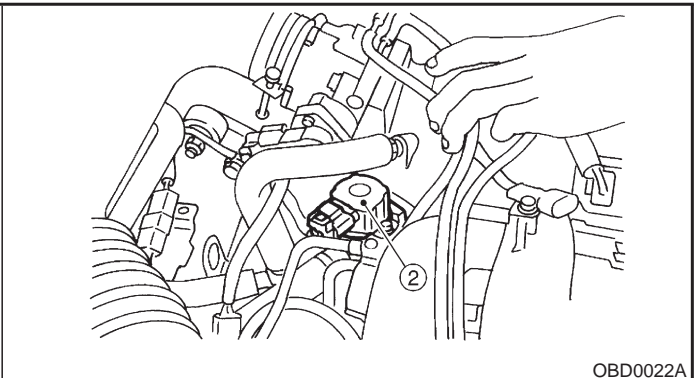
OBD0009B

- ① Pressure sources switching solenoid valve
- ② Idle air control solenoid valve
- ③ EGR valve (AT vehicles only)
- ④ EGR control solenoid valve (AT vehicles only)

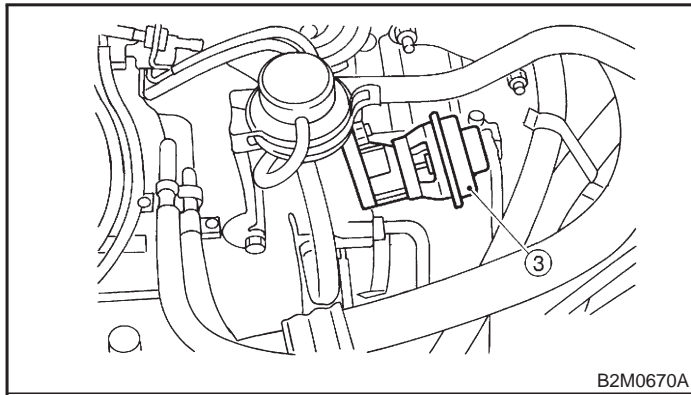
- ⑤ Purge control solenoid valve
- ⑥ Ignitor
- ⑦ Ignition coil



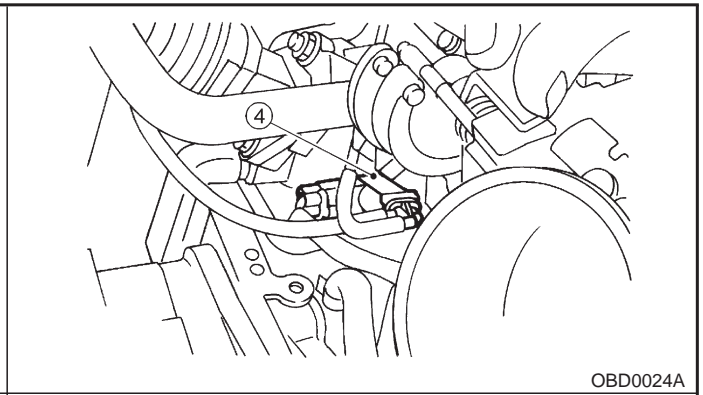
B2M0777A



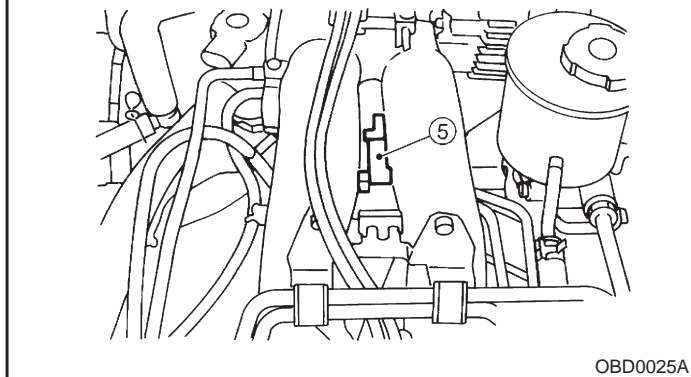
OBD0022A



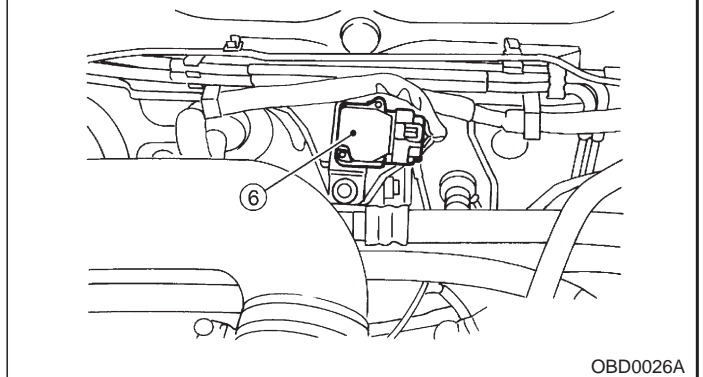
B2M0670A



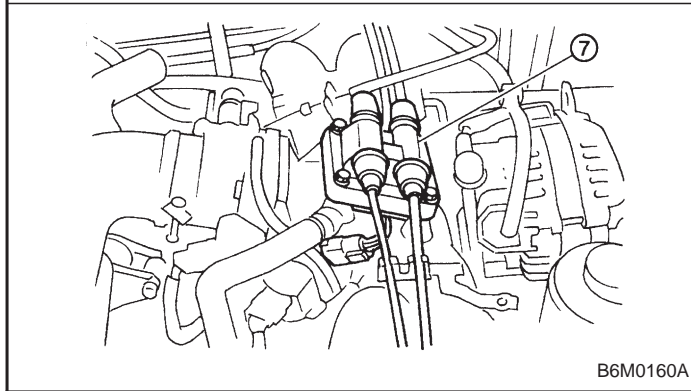
OBD0024A



OBD0025A



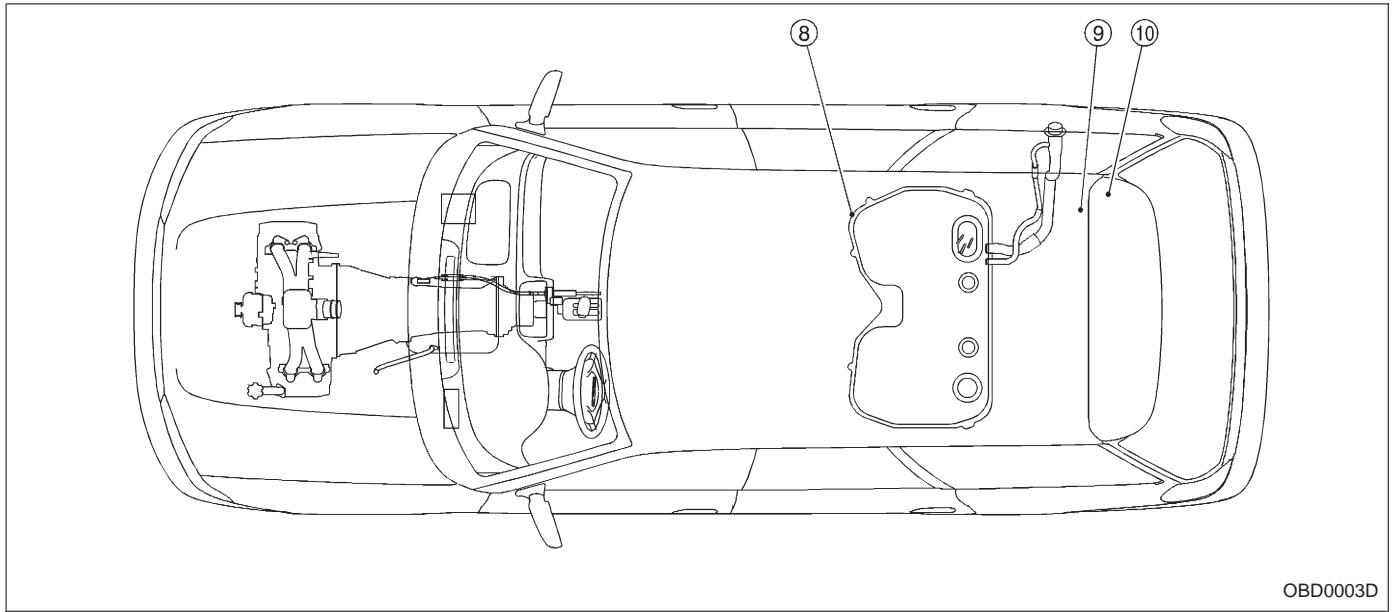
OBD0026A



B6M0160A

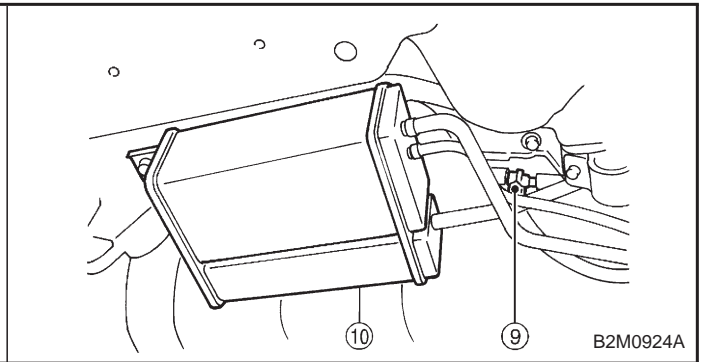
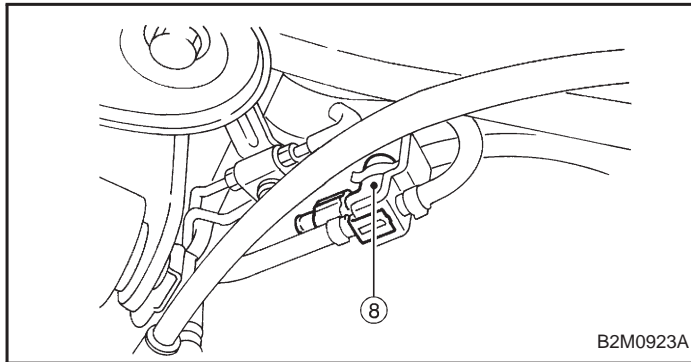


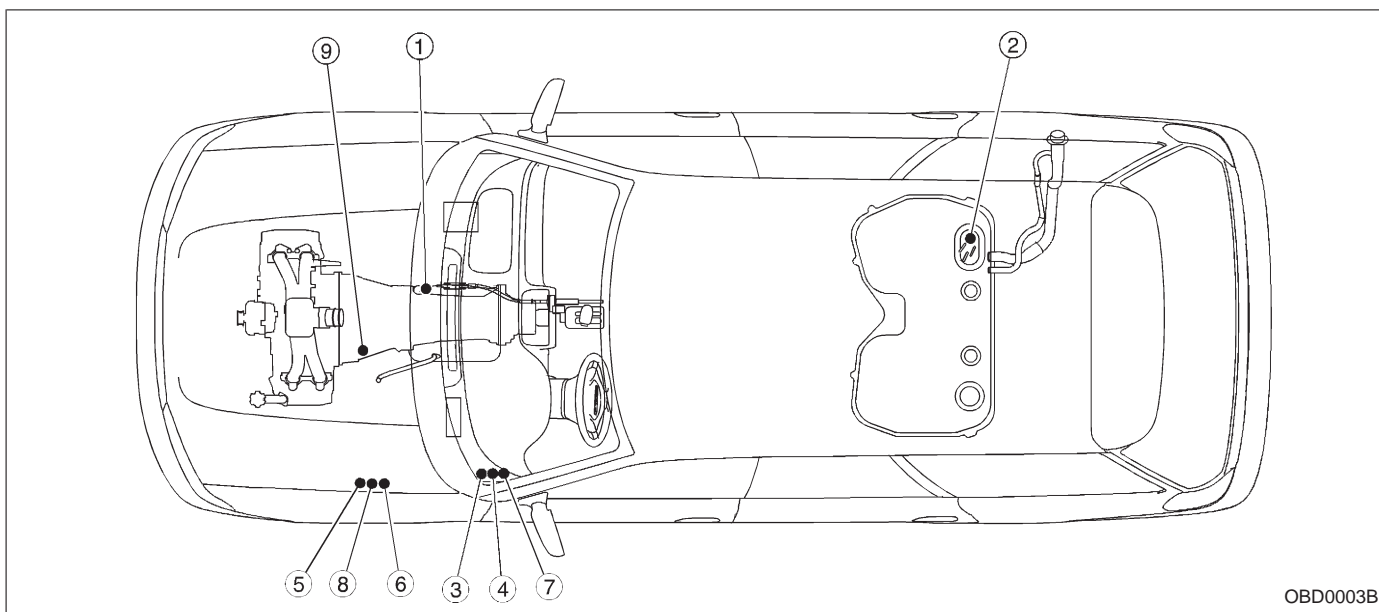




- ⑧ Pressure control solenoid valve (2200 cc AWD except Taiwan model)
- ⑨ Vent control solenoid valve (2200 cc except AWD Taiwan model)

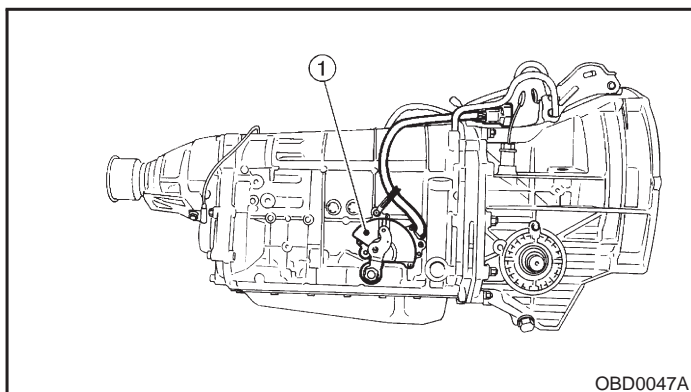
- ⑩ Canister (2200 cc AWD except Taiwan model)



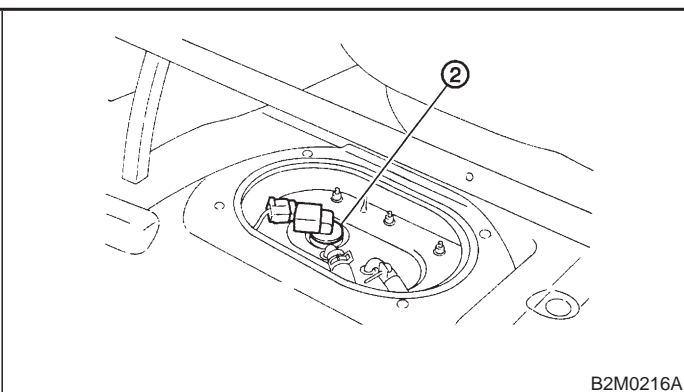


OBD0003B

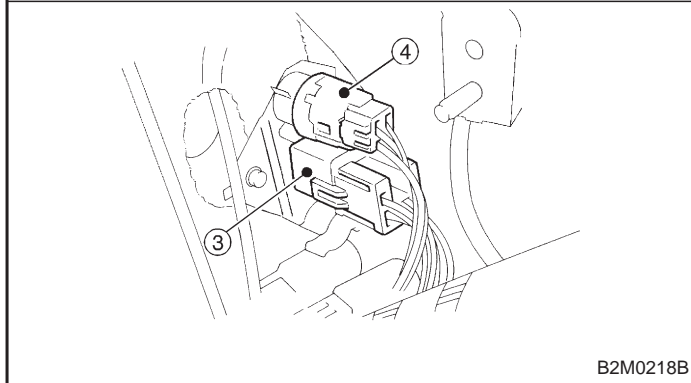
- |  |  |
|--|--|
| ① Inhibitor switch (AT vehicles only)              | ⑥ Radiator main fan relay 2 (With A/C models only)                                       |
| ② Fuel pump  | ⑦ Radiator sub fan relay 1 (With A/C models only)<br>Main fan relay (Without A/C models) |
| ③ Main relay                                       | ⑧ Radiator sub fan relay 2 (With A/C models only)  |
| ④ Fuel pump relay                                  | ⑨ Starter  |
| ⑤ Radiator main fan relay 1 (With A/C models only) |  |



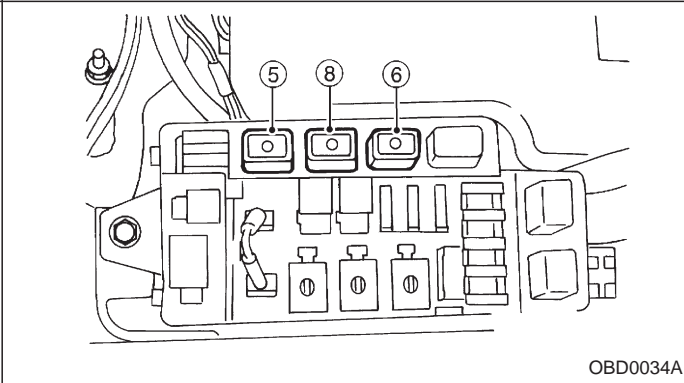
OBD0047A



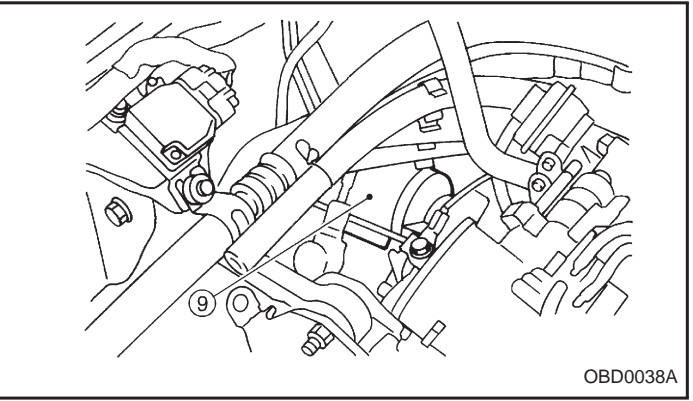
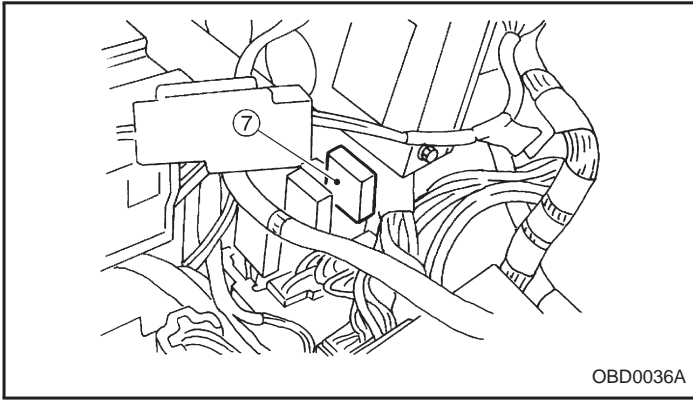
B2M0216A



B2M0218B

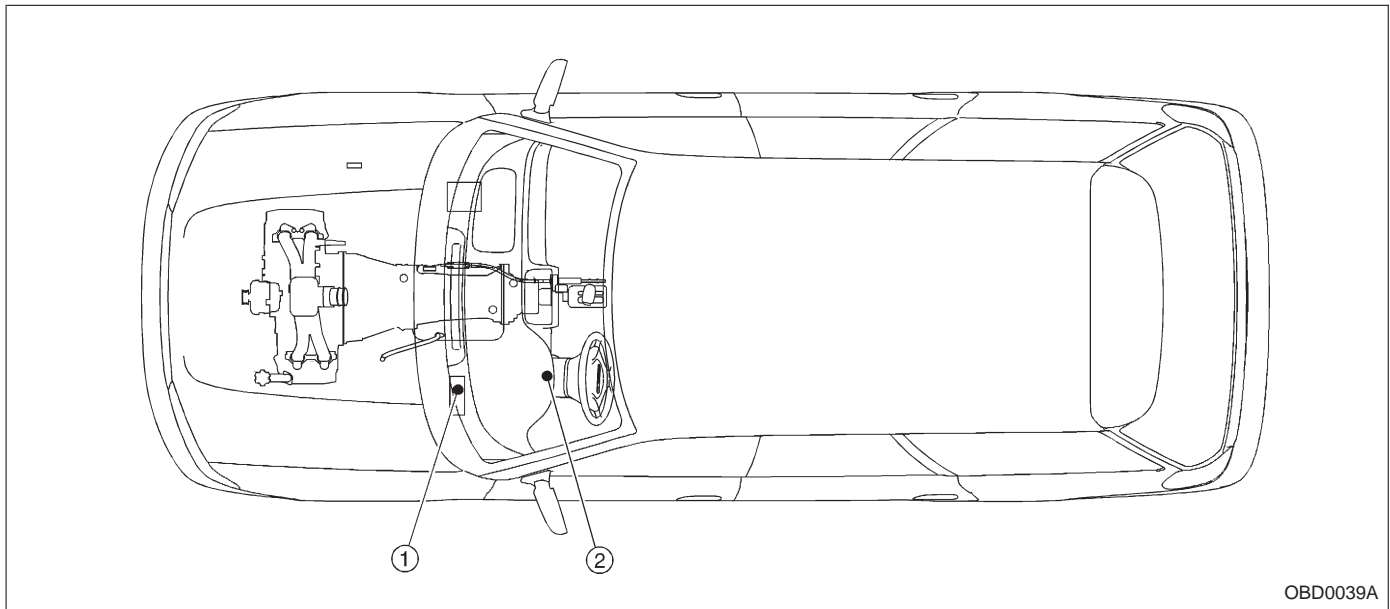


OBD0034A



**B: TRANSMISSION**

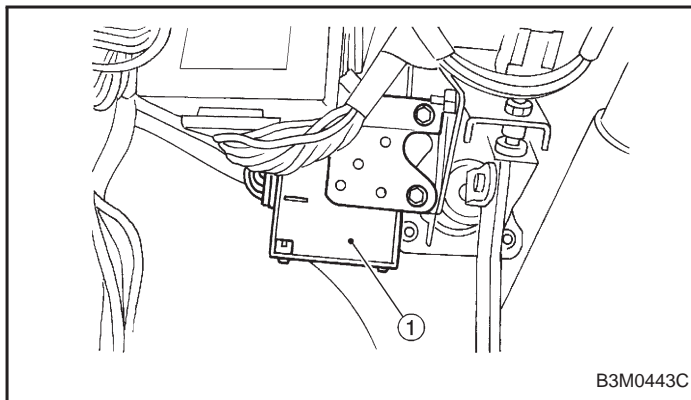
**1. MODULE**



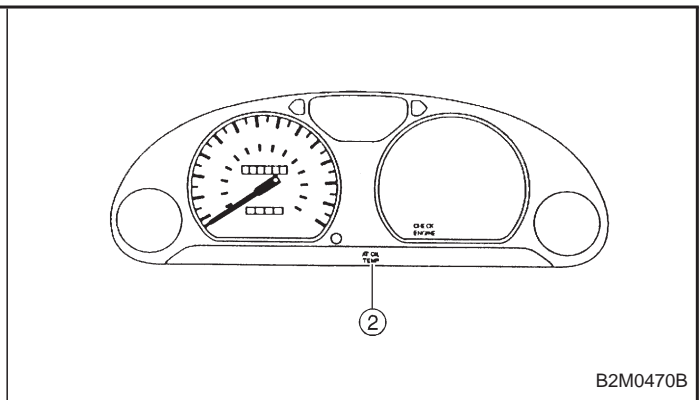
OBD0039A

① Transmission Control Module (TCM) (for AT vehicles)

② AT diagnostic indicator light (for AT vehicles)

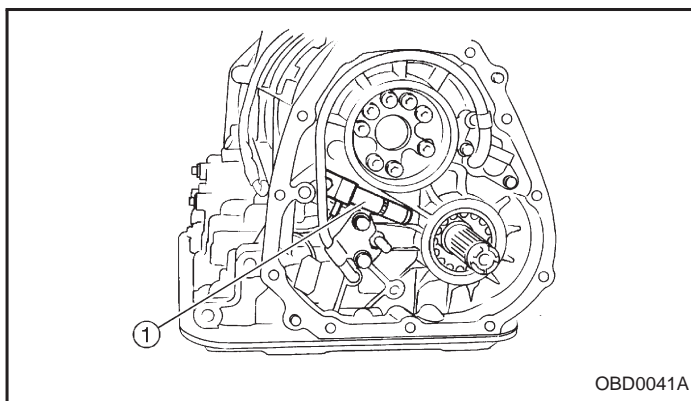


B3M0443C

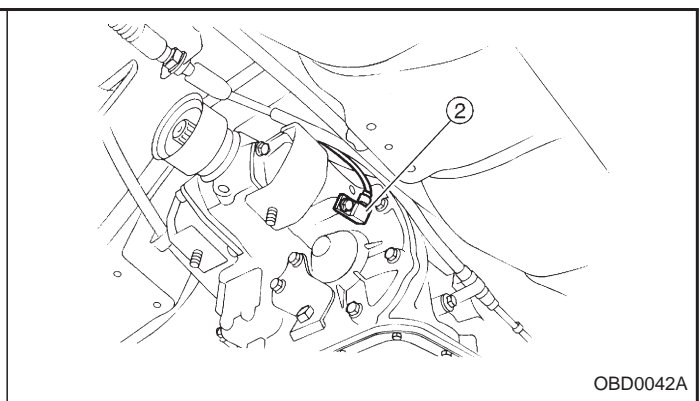


B2M0470B

**2. SENSOR**



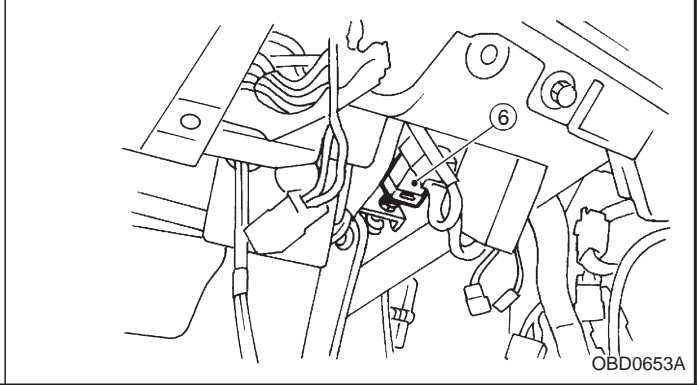
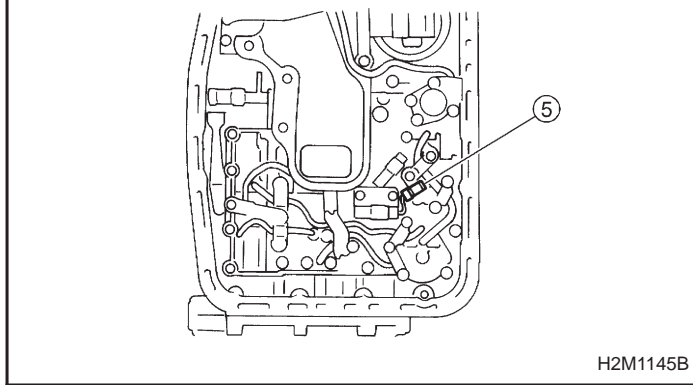
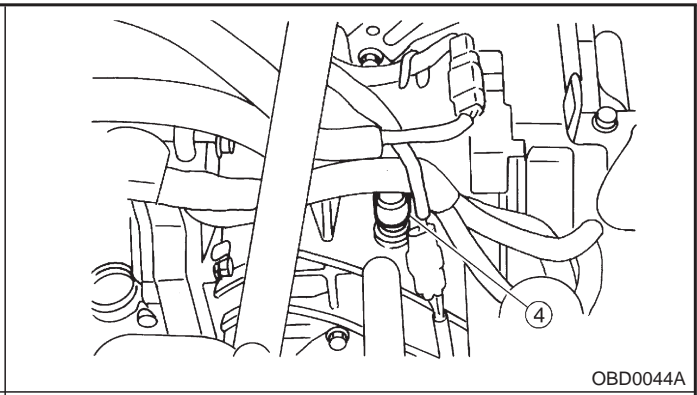
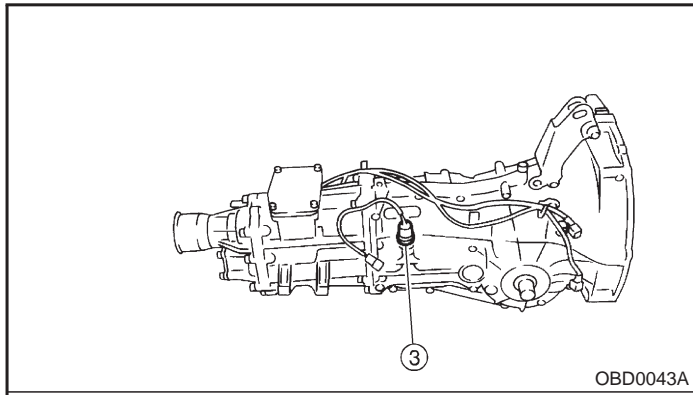
OBD0041A



OBD0042A

① Vehicle speed sensor 1 (for AT FWD vehicles)

② Vehicle speed sensor 1 (for AT AWD vehicles)

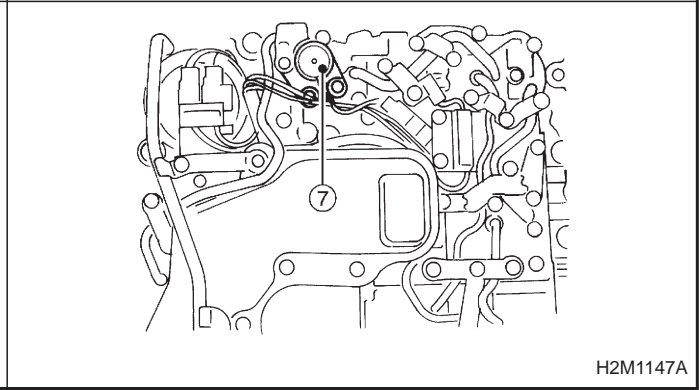
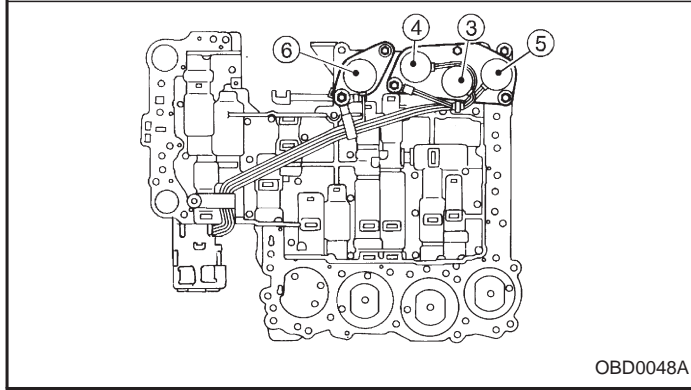
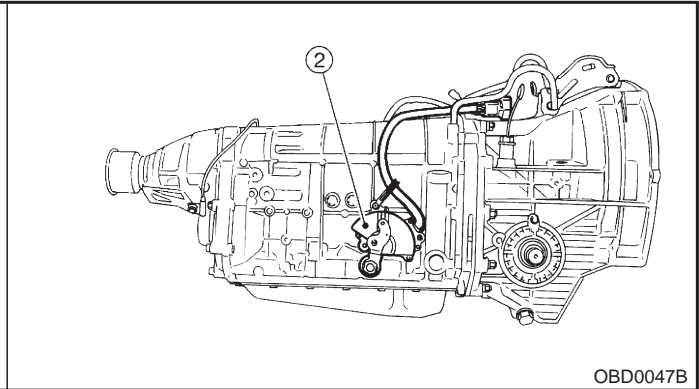
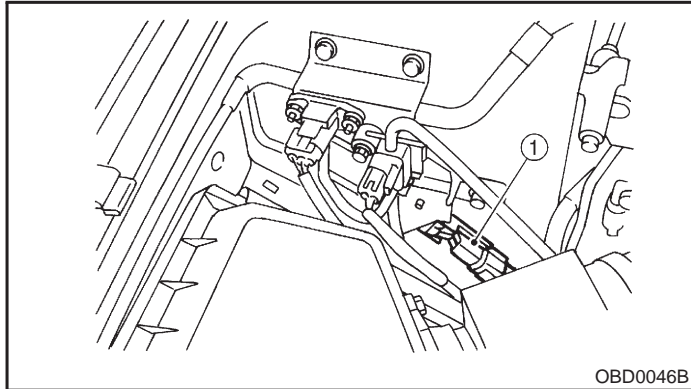


- ③ Vehicle speed sensor 2 (for MT vehicles)
- ④ Vehicle speed sensor 2 (for AT vehicles)

- ⑤ ATF temperature sensor (for AT vehicles)
- ⑥ Brake light switch

3. SOLENOID VALVE AND RELAY

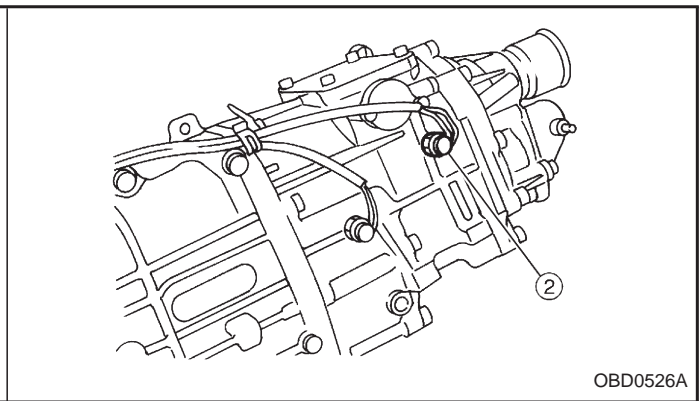
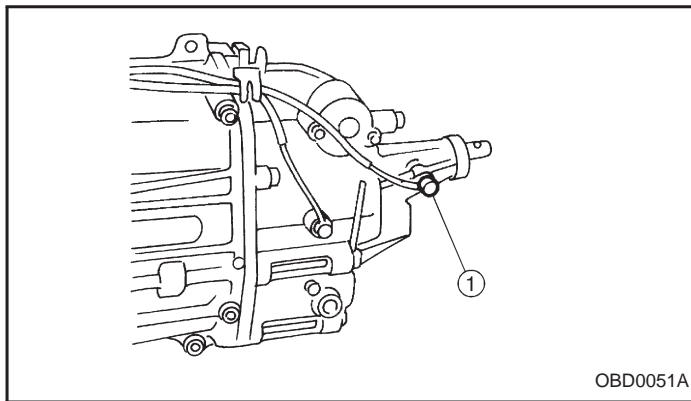
● For AT vehicles



- ① Dropping resistor
- ② Inhibitor switch
- ③ Shift solenoid valve 1
- ④ Shift solenoid valve 2

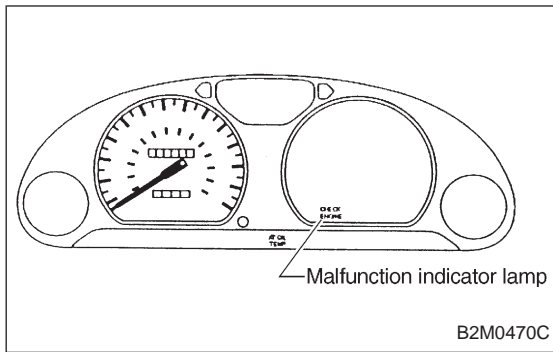
- ⑤ Shift solenoid valve 3
- ⑥ Duty solenoid valve A
- ⑦ Duty solenoid valve B

● For MT vehicles



- ① Neutral position switch (FWD models)

- ② Neutral position switch (AWD models)



### 3. Diagnosis System

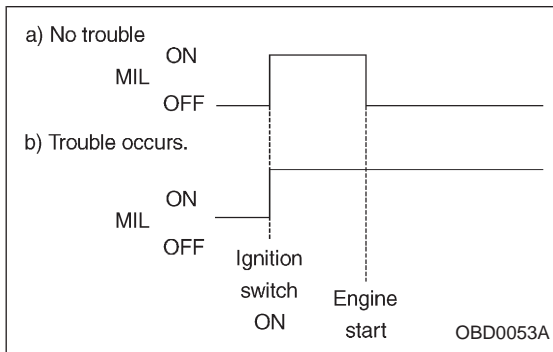
#### A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

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

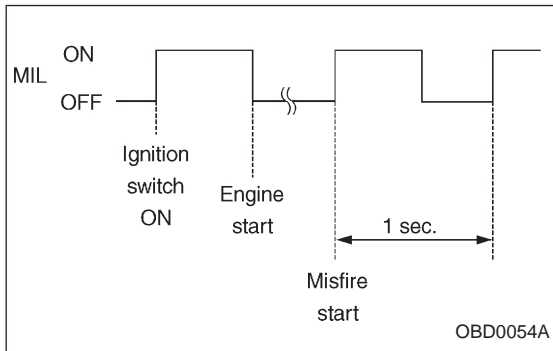
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter illuminates.

**NOTE:**

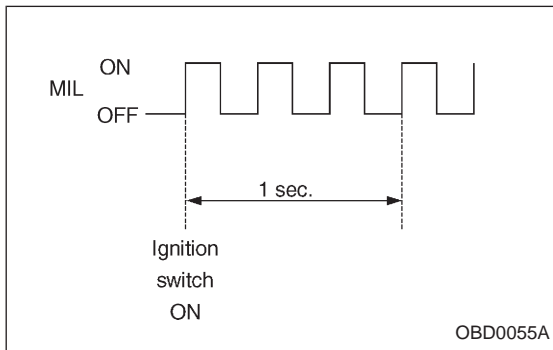
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Refer to "7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL), 2-7 [T700]".>



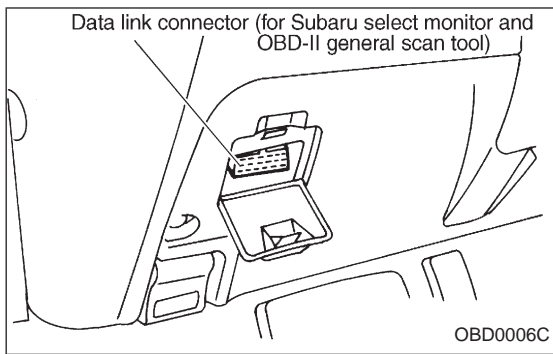
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.



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:

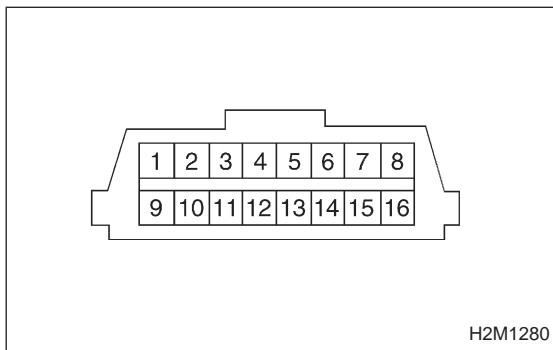
- (1) MODE \$01: Current powertrain diagnostic data
- (2) MODE \$02: Powertrain freeze frame data
- (3) MODE \$03: Emission-related powertrain diagnostic trouble codes
- (4) MODE \$04: Clear/Reset emission-related diagnostic information
- (5) MODE \$05: Oxygen sensor monitoring test results

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, 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)**

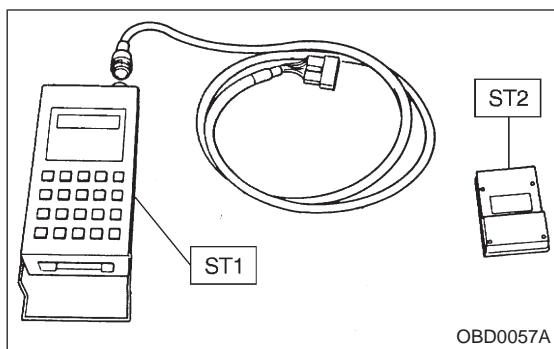
Refers to the mode using oxygen sensor output data while the on-board diagnosis system is performing diagnosis on the oxygen sensor.

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).



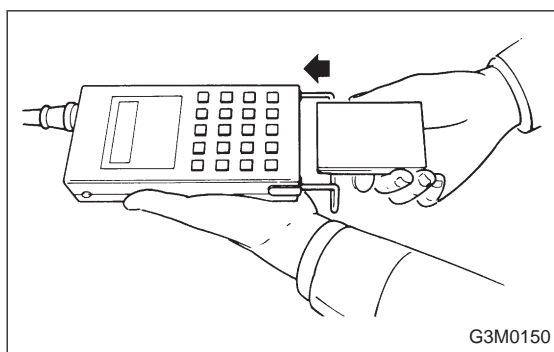
## C: SUBARU SELECT MONITOR

### 1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.

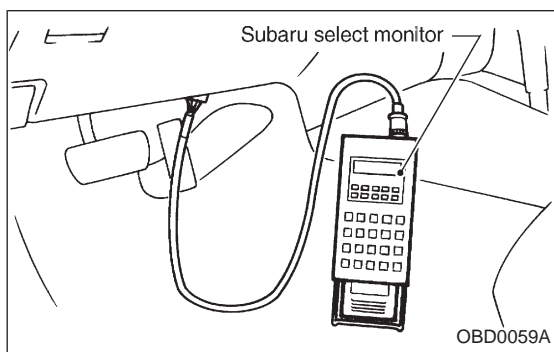
ST1 498307500 SELECT MONITOR KIT

ST2 498345700 CARTRIDGE



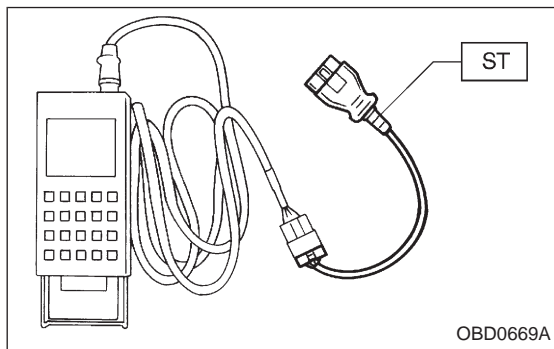
2) Turn ignition switch and Subaru select monitor switch to OFF.

3) Insert cartridge into Subaru select monitor.



4) Connect Subaru select monitor to data link connector.

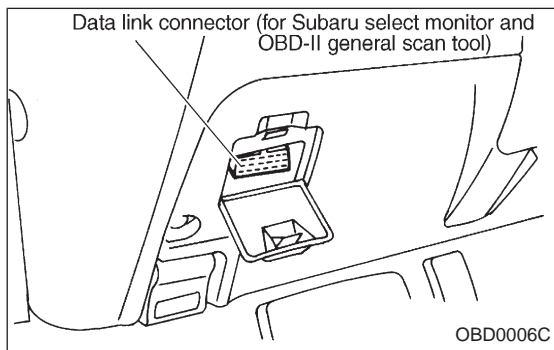
- Using data link connector for Subaru select monitor only, connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



- Using data link connector for Subaru select monitor and OBD-II general scan tool;

(1) Connect ST to Subaru select monitor cable.

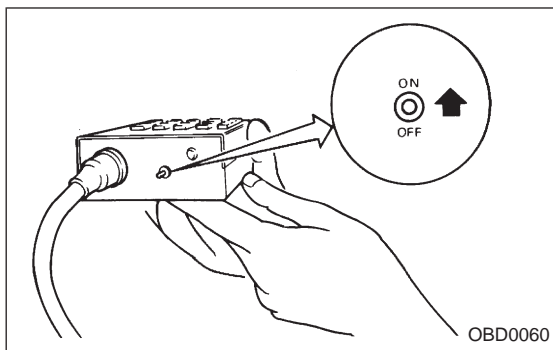
ST 498357200 ADAPTER CABLE



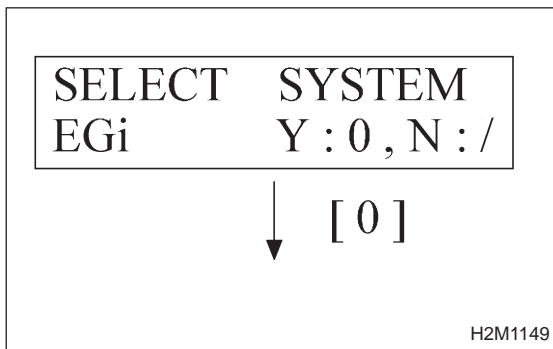
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

### CAUTION:

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

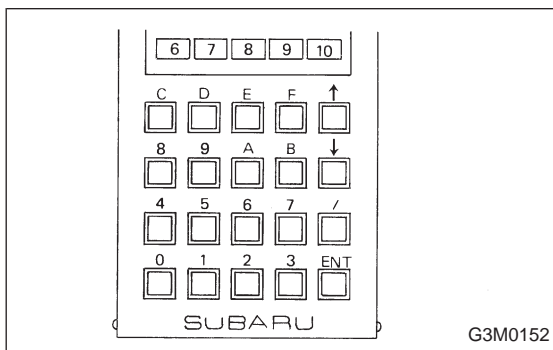


- 5) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.
- 6) Using Subaru select monitor, call up diagnostic trouble code(s) and various data, then record them.

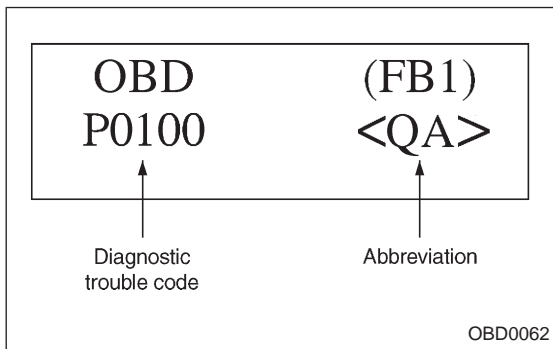


**2. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB1)**

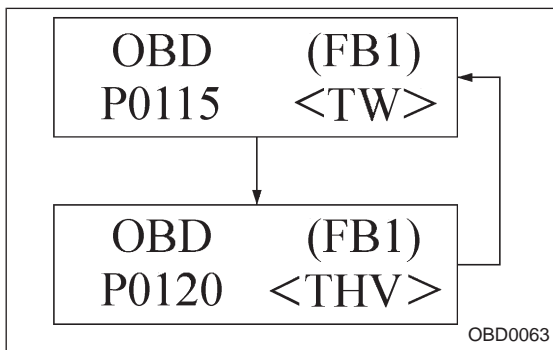
- 1) Select engine mode using function key. Press the function key [0].



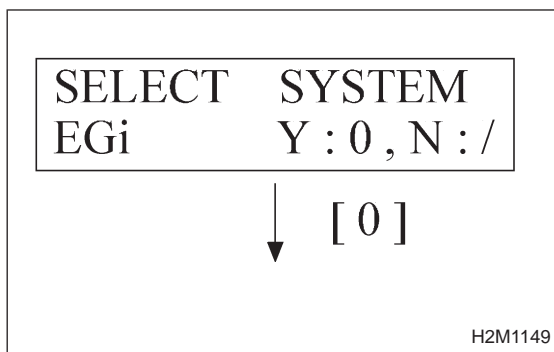
- 2) Designate mode using function key. Press [F] [B] [1] [ENT] in that order.



- 3) Ensure diagnostic trouble code(s) is shown.
  - (1) When there is only one diagnostic trouble code.

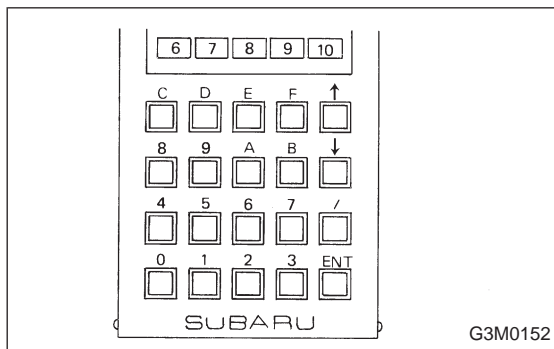


- (2) When there are multiple diagnostic trouble codes.
- NOTE:  
For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST, 2-7 [T10A0].



**3. READ CURRENT DATA SHOWN ON DISPLAY FOR ENGINE. (FUNCTION MODE)**

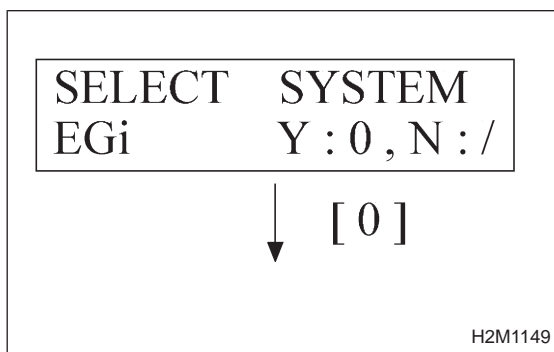
1) Select engine mode using function key.  
Press the function key [0].



2) Designate mode using function key.  
Refer to "6. READ DATA FUNCTION KEY LIST FOR ENGINE" 2-7 [T3C6].

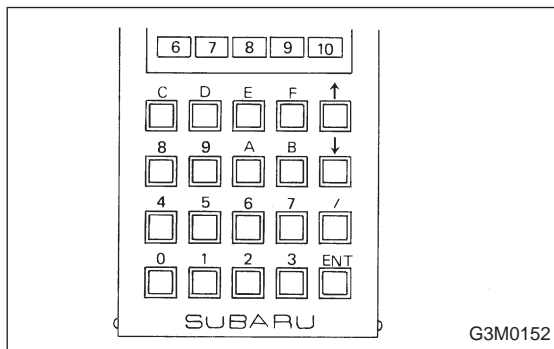
(Example: Press [F] [0] [1] [ENT] in that order.)

3) Ensure data of input or output signal is shown.

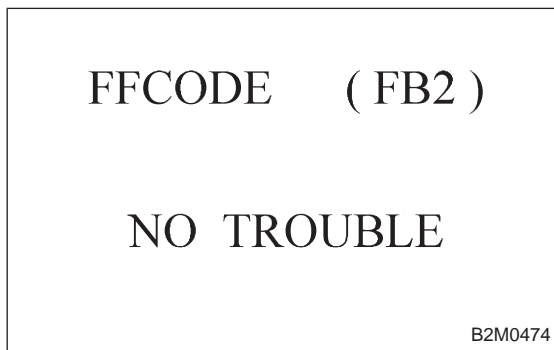


**4. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB2)**

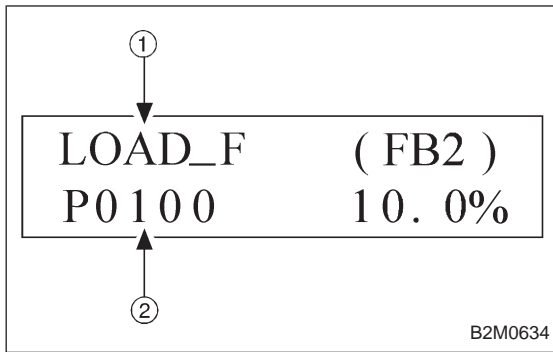
1) Select engine mode using function key.  
Press the function key [0].



2) Designate mode using function key.  
Press [F] [B] [2] [ENT] in that order.

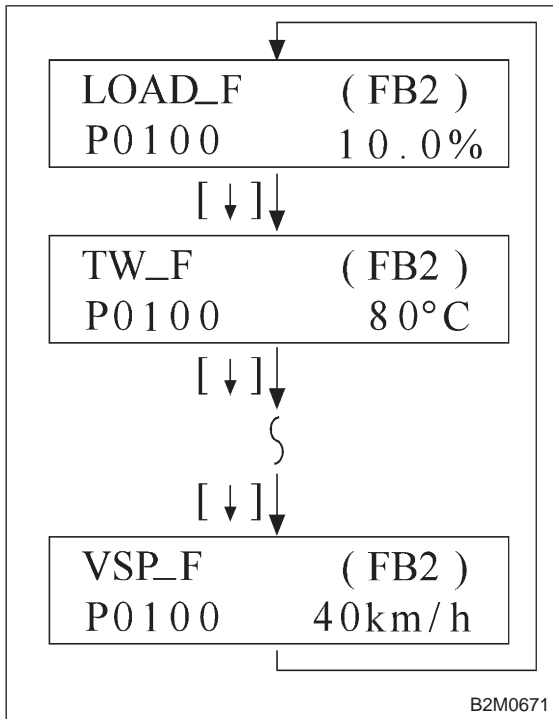


3) Ensure freeze frame data(s) is (are) shown.  
(1) When no trouble is detected, or after memory is cleared.



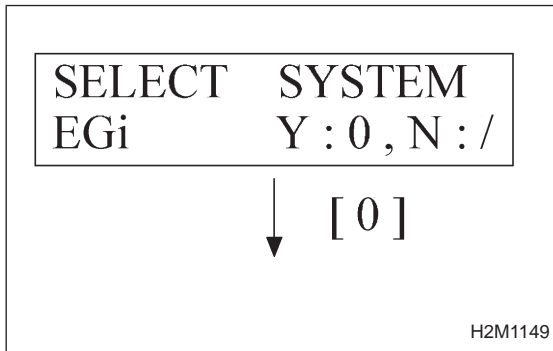
(2) When some trouble is detected.

- ① Abbreviation
- ② Diagnostic trouble code of trouble occurred



NOTE:

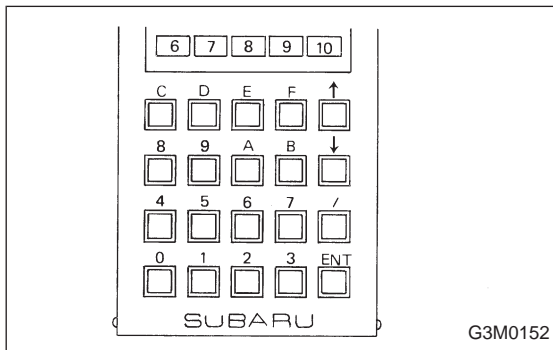
Other freeze frame data is shown on display by pushing the function key [ ↓ ].



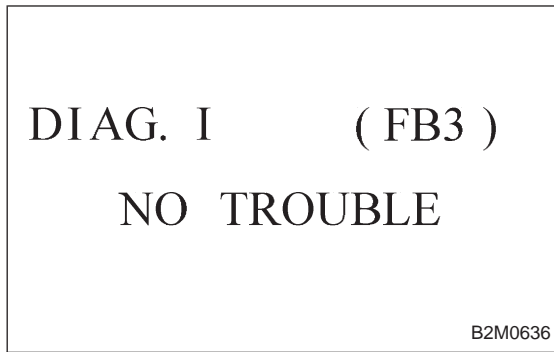
**5. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB3)**

NOTE:

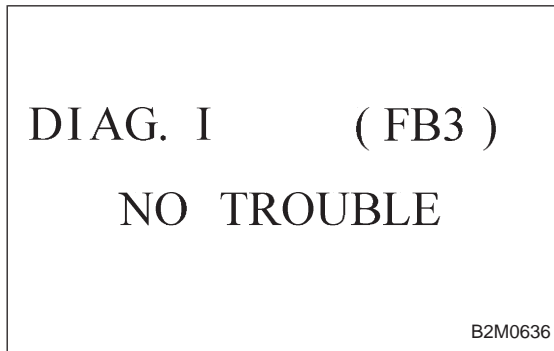
- For items and contents shown on display, refer to “6. READ DATA FUNCTION KEY LIST FOR ENGINE” 2-7 [T3C6].
  - Freeze frame data will not erase without clearing memory.
- 1) Select engine mode using function key. Press the function key [0].



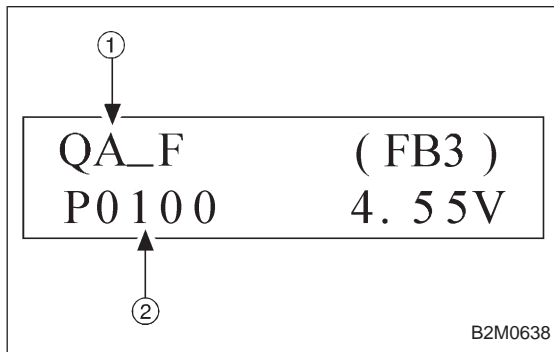
- 2) Designate mode using function key. Press [F] [B] [3] [ENT] in that order.



- 3) Ensure freeze frame data(s) is (are) shown.  
 (1) When no trouble is detected, or after memory is cleared.

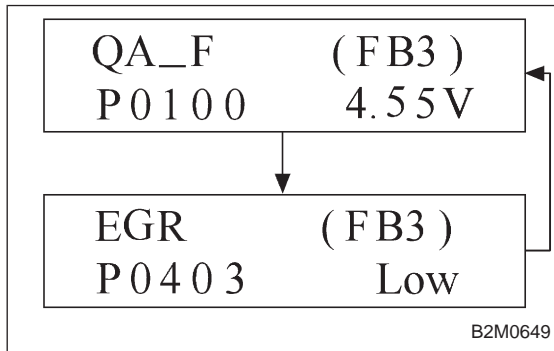


- (2) When a trouble occurs but the corresponding item is not displayed.



- (3) When only one trouble corresponding to the displayed item has occurred.

- ① Abbreviation
- ② Diagnostic trouble code of trouble occurred



- (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)	EGRmax - 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
	Throttle position signal (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	—
FD10	Compulsory pressure sources switching solenoid valve operation check	BR SOL	—

**NOTE:**

1) Subaru select monitor is also available for monitoring information other than that used for check and repair of the vehicle.

2) 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.

3) \*1: "Hi" or "Low" is shown instead of measured value.

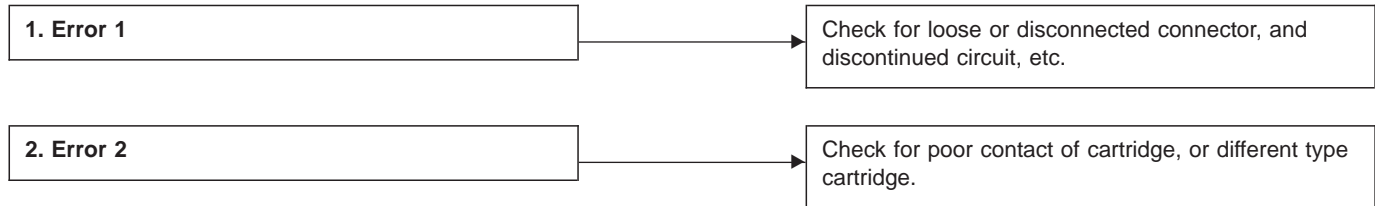
4) Because ASV solenoid valve, FICD solenoid valve and air injection system diagnosis solenoid valve are not installed, FD06, FD09 and FD11 will be displayed but non-functional.

1996	( F00 )
2 . 2	SOHC
B2M0476	

**7. FUNCTION MODE: F00**  
**— ROM ID NUMBER (YEAR) —**  
**CONDITION:**  
 Ignition switch “ON”

**SPECIFIED DATA:**  
 Presentation display

- Probable cause (Item outside “specified data”)

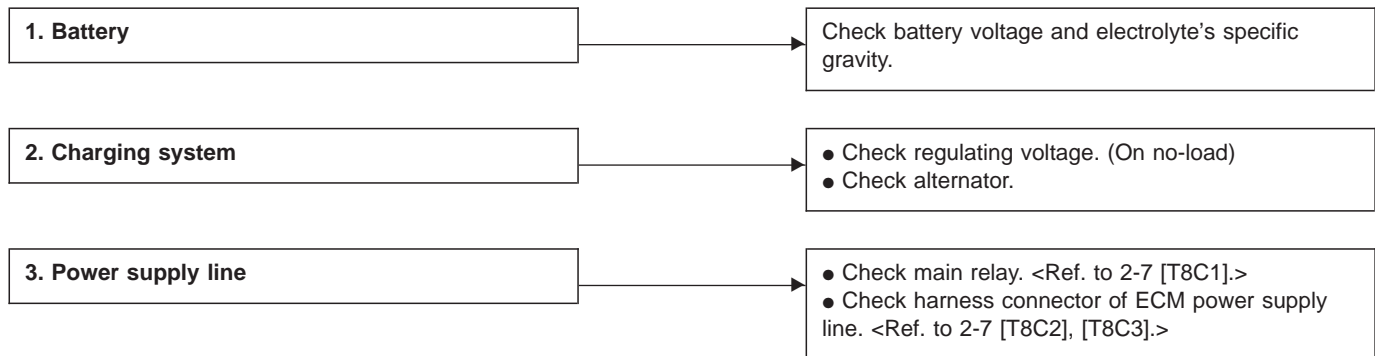


VB	(F01)
12.4 V	
B2M0270	

**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) —

O<sub>2</sub>max - min ( F12 )

0 . 80V 0 . 10V

B2M0487

**19. FUNCTION MODE: F12**

— FRONT OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (FO<sub>2</sub>MAX - MIN) —

- Front oxygen sensor maximum and minimum output signals are indicated at the same time.

RO<sub>2</sub> ( F13 )

0 . 60 V

B2M0488

**20. FUNCTION MODE: F13**

— REAR OXYGEN SENSOR OUTPUT SIGNAL (RO<sub>2</sub>) —

—

RO<sub>2</sub>max - min ( F14 )

0 . 80V 0 . 10V

B2M0489

**21. FUNCTION MODE: F14**

— REAR OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (RO<sub>2</sub>MAX - 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 0kPa 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.

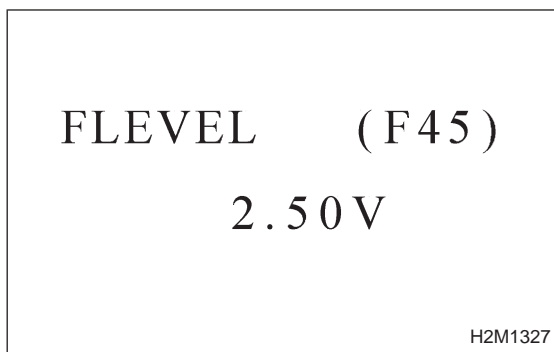
TNKP ( F43 )  
0. 1 0kPa 1mmHg  
H2M1326

**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) —





**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	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	California model identification signal	FC	When California model 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

**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.

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

**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.	Signal name	Display
1	—	—
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	—	—

—	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. 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.

#### 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	California model 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

**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 except California model.
- LED No. 8 Rear oxygen sensor mixture ratio is rich.
- LED No. 9 Front oxygen sensor mixture ratio is rich.

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

**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.	58 <Ref. to 2-7 [T3E1].>
FB1	OBD	On-board diagnostics (Read data)	Current trouble code indicated by on-board diagnostics.	32 <Ref. to 2-7 [T3C1].>
FB2	LOAD-F	Load data	<ul style="list-style-type: none"> <li>● Freeze frame data</li> <li>● Data stored at the time of trouble occurrence, is shown on display.</li> </ul>	34 <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	<ul style="list-style-type: none"> <li>● Freeze frame data</li> <li>● Data stored at the time of trouble occurrence, is shown on display.</li> </ul>	35 <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

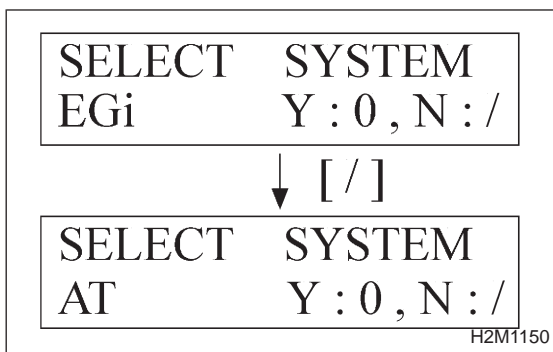
Function mode	Abbreviation	Contents	Contents of display	Page
FC0	MEMORY CLR	Back-up memory clear	Function of clearing trouble code stored in memory.	57 <Ref. to 2-7 [T3D1].>

## 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.	63 <Ref. to 2-7 [T3F1].>
FD02	CPC SOL			
FD03	RAD FAN			
FD04	A/C RELAY			
FD05	EGR SOL			
FD07	PCV SOL			
FD08	VENT SOL			
FD10	BR SOL			

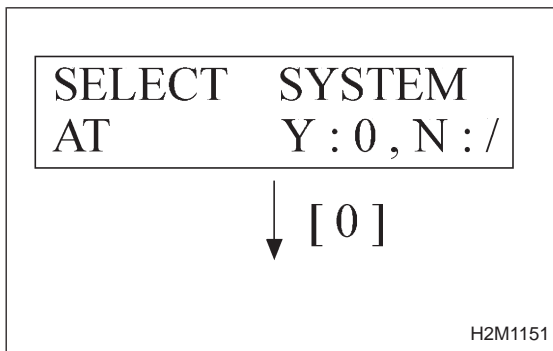
## NOTE:

Because ASV solenoid valve, FICD solenoid valve and air injection system diagnosis solenoid valve are not installed, FD06, FD09 and FD11 will be displayed but non-functional.

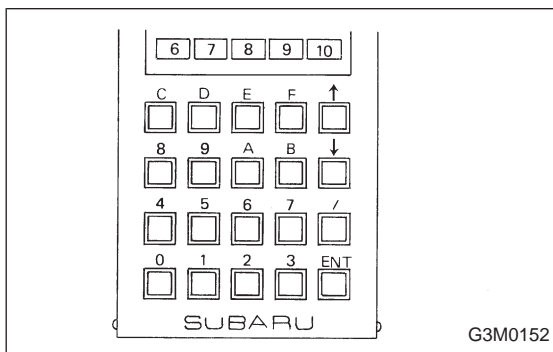


**50. READ CURRENT DATA SHOWN ON DISPLAY FOR AT. (FUNCTION MODE)**

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.  
Refer to "51. READ DATA FUNCTION KEY LIST FOR AT" 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	—	—
F01	Battery voltage	VB	V
F02	Vehicle speed sensor 1	VSP1	m/h
F03	Vehicle speed sensor 1	VSP1	km/h
F04	Vehicle speed sensor 2	VSP2	m/h
F05	Vehicle speed sensor 2	VSP2	km/h
F06	Engine speed	EREV	rpm
F07	ATF temperature sensor	ATFT	deg F
F08	ATF temperature sensor	ATFT	deg C
F09	Throttle position sensor	THV	V
F10	Gear position	GEAR	—
F11	Line pressure duty	PLDTY	%
F12	Lock-up duty	LUPTY	%
F13	AWD duty	4WDTY	%
F14	Throttle position sensor power supply	THVCC	V
F15	Mass air flow sensor	AFM	V

E-4AT	(F00)
4WD	1993
G3M0723	

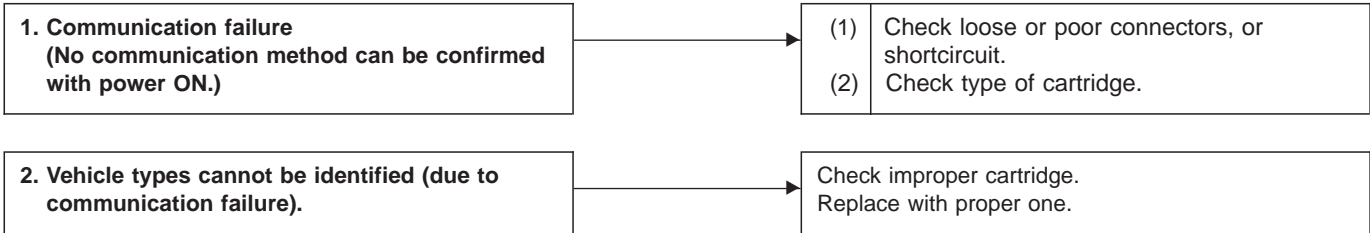
**52. FUNCTION MODE: F00**

— MODE DISPLAY —

**SPECIFIED DATA:**

Data at the left should be indicated.

Probable cause (if outside "specified data")



VB	(F01)
12.7 V	
OBD0673	

**53. FUNCTION MODE: F01**

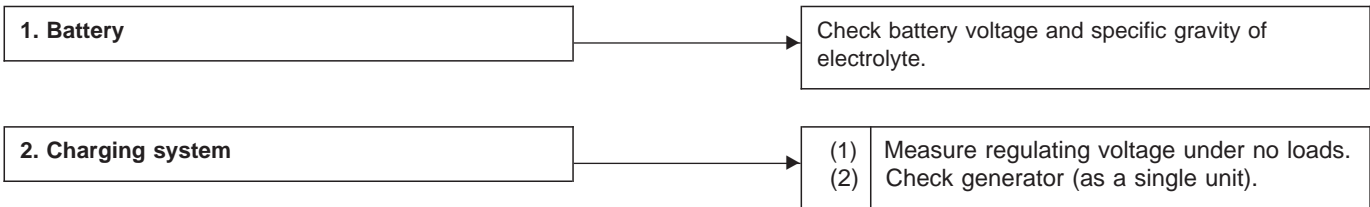
— BATTERY VOLTAGE (VB) —

**CONDITION:**

- (1) Ignition switch ON
- (2) Engine idling after warm-up

**SPECIFIED DATA:**

- (1) 12±1 V
- (2) 13±1 V





VSP1	(F02)
18 m/h	
G3M0725	

**54. FUNCTION MODE: F02****— VEHICLE SPEED SENSOR 1 (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 (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	deg F	(F07)
176 deg F		
G3M0728		

**57. FUNCTION MODE: F07****— ATF TEMPERATURE SENSOR (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 (THV) —**

GEAR (F10)  
1st  
G3M0730

59. FUNCTION MODE: F10  
— GEAR POSITION (GEAR) —

PLDTY (F11)  
50%  
G3M0731

60. FUNCTION MODE: F11  
— LINE PRESSURE DUTY (PLDTY) —

LUPTY (F12)  
5%  
G3M0732

61. FUNCTION MODE: F12  
— LOCK-UP DUTY (LUPTY) —

4WDTY (F13)  
95%  
G3M0733

62. FUNCTION MODE: F13  
— AWD DUTY (4WDTY) —

THVCC (F14)  
5.2 V  
B3M0259

63. FUNCTION MODE: F14  
— THROTTLE POSITION SENSOR POWER SUPPLY (THVCC) —

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
---	---	---	---	----

**64. 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
---	---	---	---	----

**65. 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.

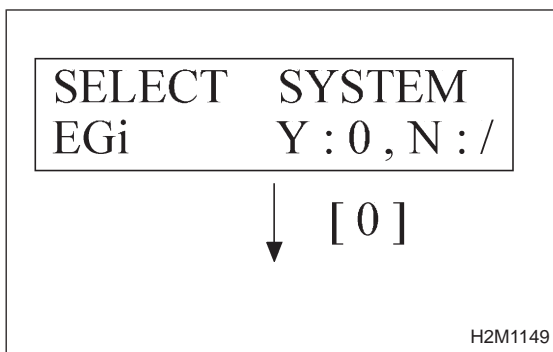
LED No. 3 "D" range is selected.

LED No. 4 "3" range is selected.

LED No. 5 "2" range is selected.

LED No. 6 "1" range is selected.

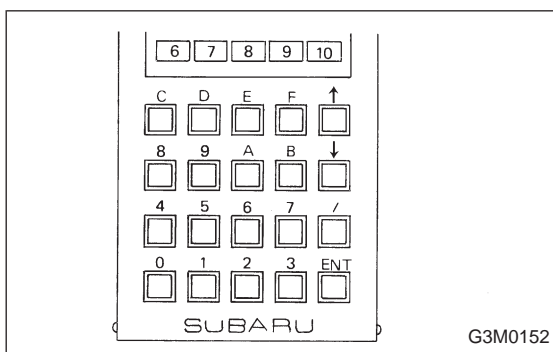
LED No. 7 Diagnosis connector is connected.



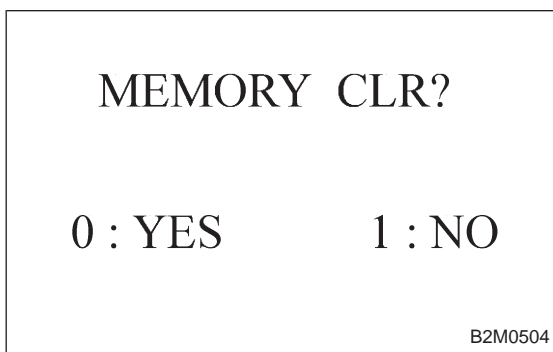
**D: CLEAR MEMORY MODE**

**1. SUBARU SELECT MONITOR**

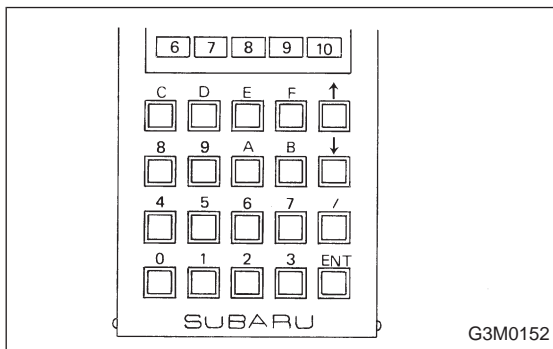
- 1) Select engine mode or AT mode using function key.
  - Engine mode:  
Press the function key [0].
  - AT mode:  
Press the function key [/] [0] in that order.



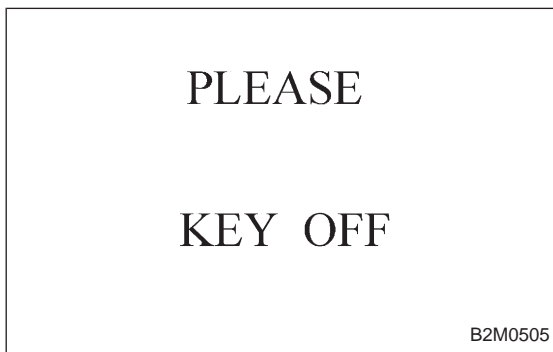
- 2) Designate mode using function key.  
Press [F] [C] [0] [ENT] in that order.



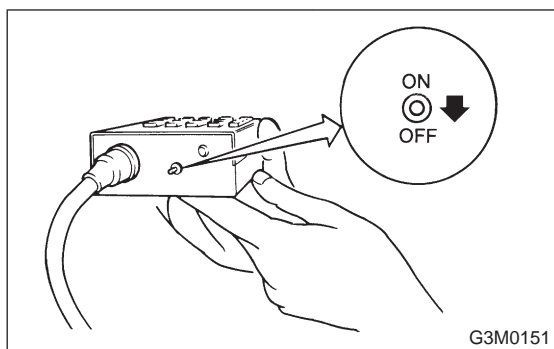
- 3) Ensure displayed message.



- 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.



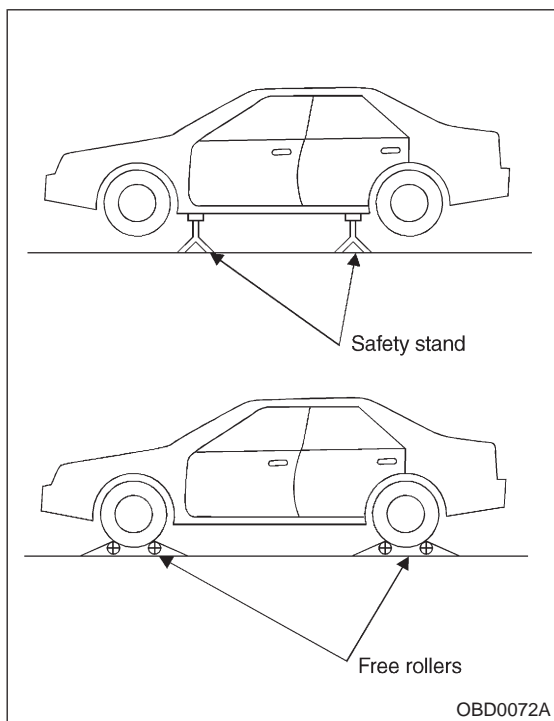
6) After the display is gone, turn Subaru select monitor switch and ignition switch to OFF.

#### 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

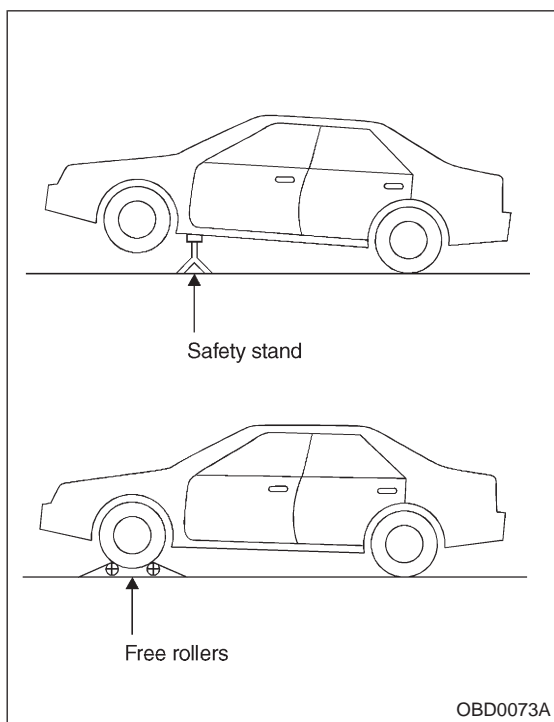
Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

#### ● 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:**

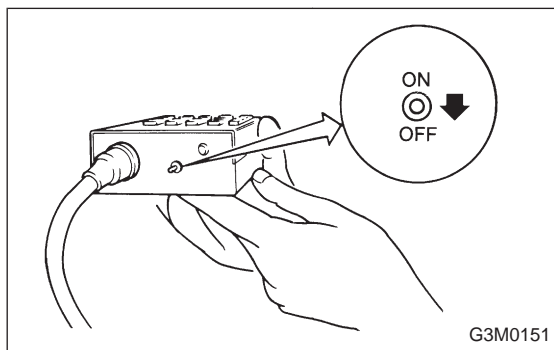
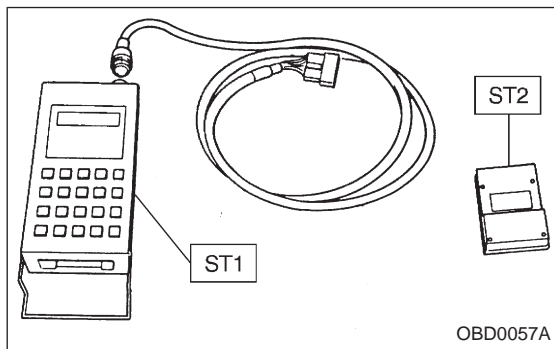
- Before raising the vehicle, ensure parking brakes are applied.
- Do not use a pantograph jack in place of a safety stand.
- If only the front wheels are raised or placed on a free roller, apply parking brakes and lock the rear wheels.
- Secure a rope or wire to the front and rear towing or tie-down 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**

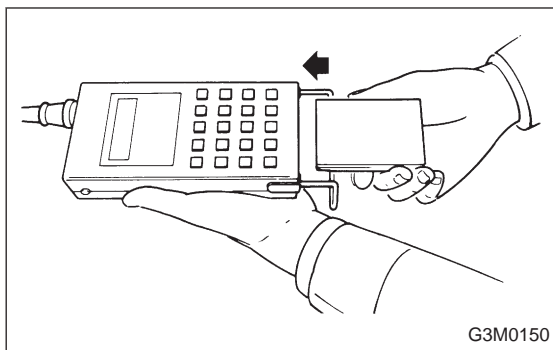
After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data.

1) Prepare Subaru select monitor and cartridge.

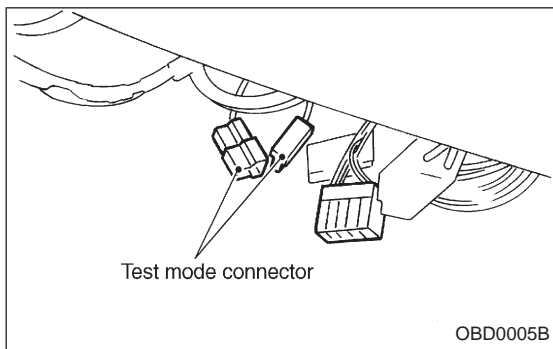
- ST1 498307500 SELECT MONITOR KIT
- ST2 498345700 CARTRIDGE



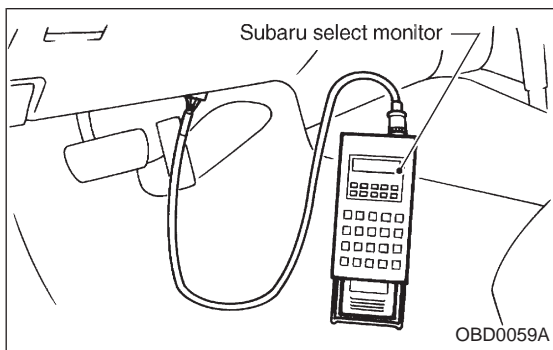
2) Turn ignition switch and Subaru select monitor switch to OFF.



3) Insert cartridge into Subaru select monitor.

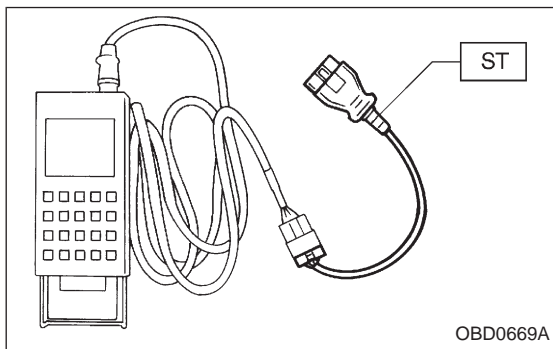


4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



5) Connect Subaru select monitor to data link connector.

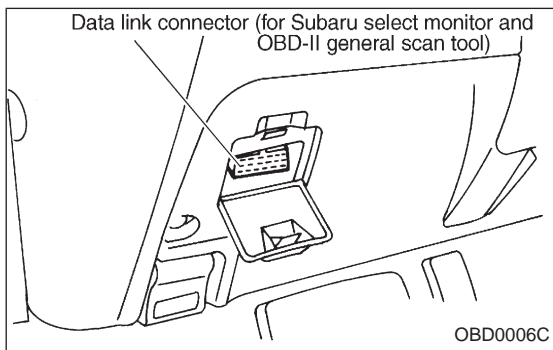
- Using data link connector for Subaru select monitor only: Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



- Using data link connector for Subaru select monitor and OBD-II general scan tool:

(1) Connect ST to Subaru select monitor cable.

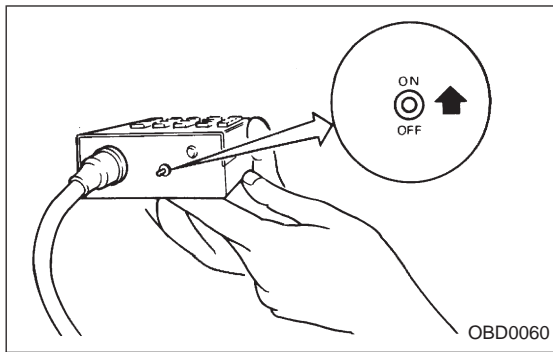
ST 498357200 ADAPTER CABLE



(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.

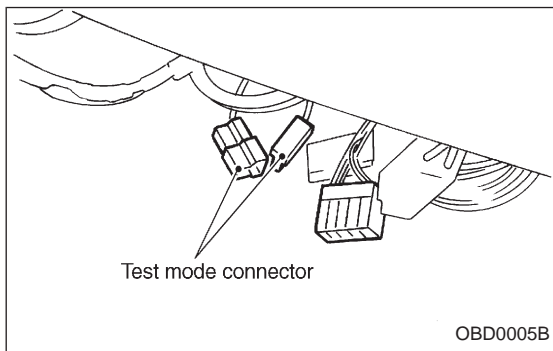
NOTE:

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:

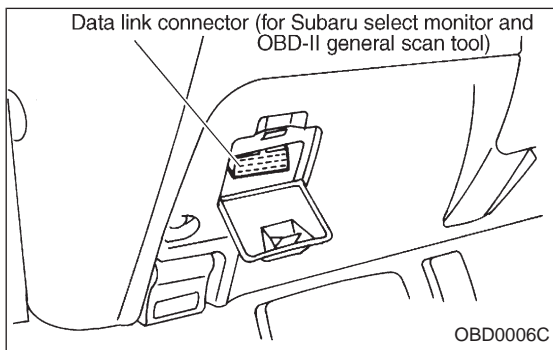
- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system. <Ref. to 4-4b [T6D2] or [T9K0], 4-4c [T6D2] or [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 either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system. <Ref. to 4-4b [T6D2] or [T9K0], 4-4c [T6D2] or [T9J0].>

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

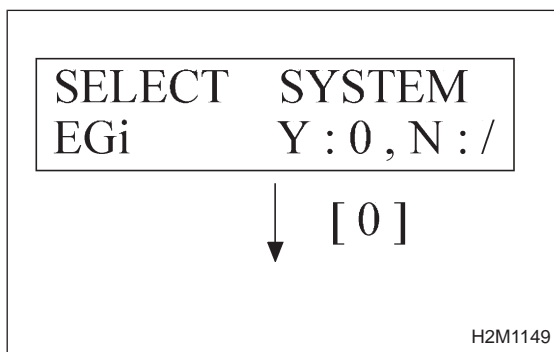
NOTE:

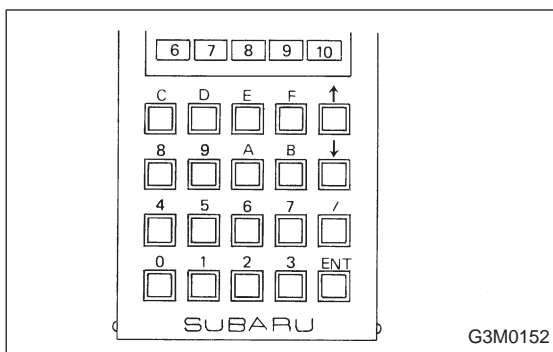
- For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.
- For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST, 2-7 [T10A0].

#### 4. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB0 <INSPECTION MODE>)

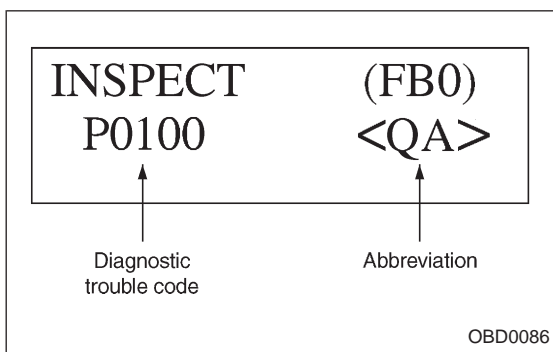
Using Subaru select monitor, check for diagnostic trouble code(s) and record the result(s).

1) Select engine mode using function key.  
Press the function key [0].

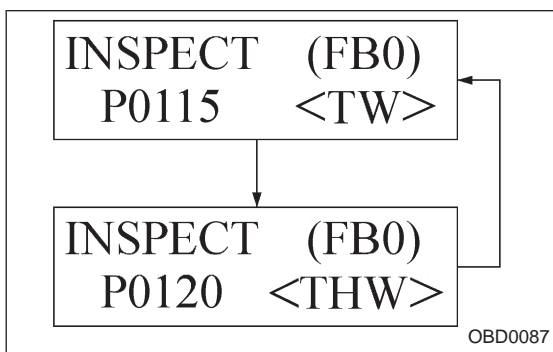




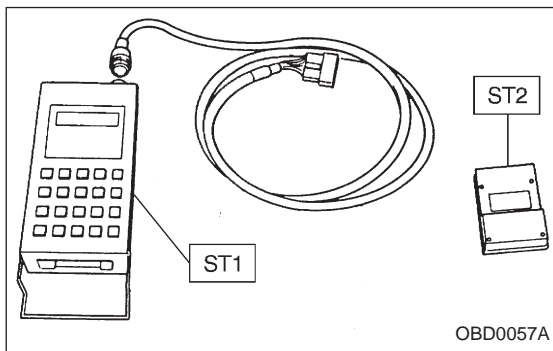
2) Designate mode using function key.  
Press [F] [B] [0] [ENT] in that order.



3) Ensure diagnostic trouble code(s) is shown.  
(1) When there is only one diagnostic trouble code.



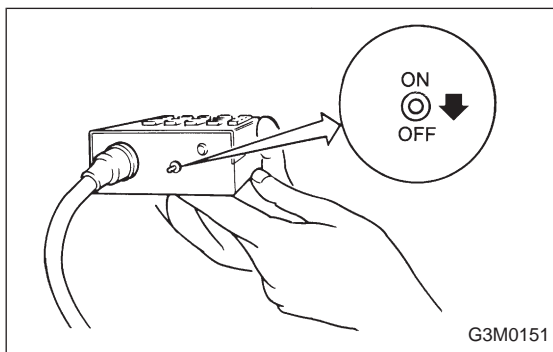
(2) When there are multiple diagnostic trouble codes.  
NOTE:  
For details concerning diagnostic trouble code(s), refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST, 2-7 [T10A0].



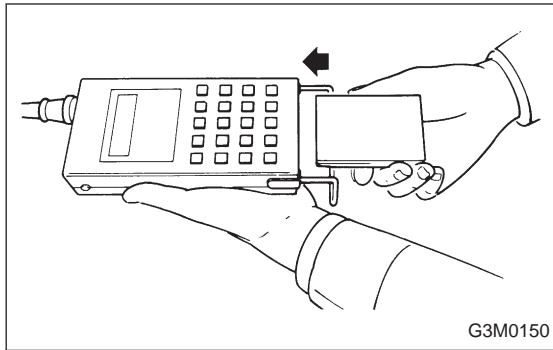
**F: COMPULSORY VALVE OPERATION CHECK MODE**

**1. SUBARU SELECT MONITOR**

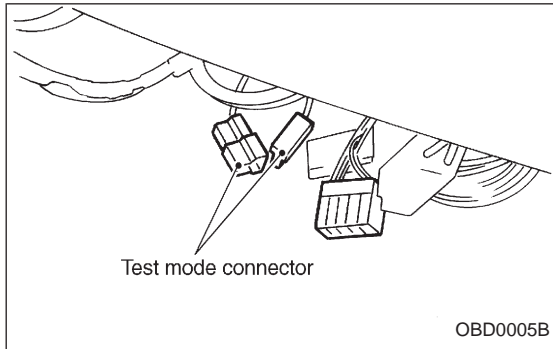
- 1) Prepare Subaru select monitor and cartridge.
- ST1 498307500 SELECT MONITOR KIT
- ST2 498345700 CARTRIDGE



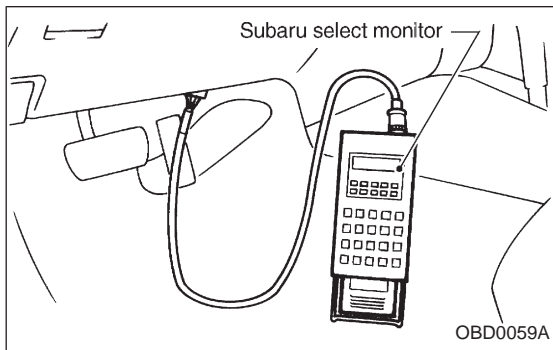
2) Turn ignition switch and Subaru select monitor switch to OFF.



3) Insert cartridge into Subaru select monitor.

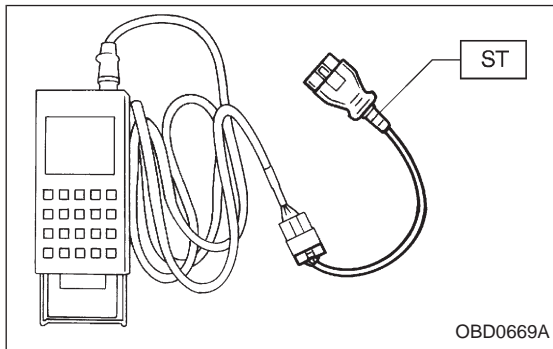


4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



5) Connect Subaru select monitor to data link connector.

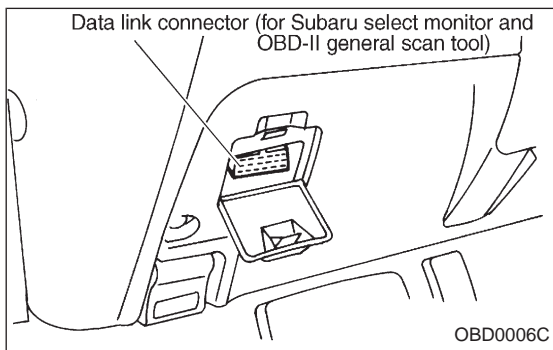
- Using data link connector for Subaru select monitor only: Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



- Using data link connector for Subaru select monitor and OBD-II general scan tool:

(1) Connect ST to Subaru select monitor cable.

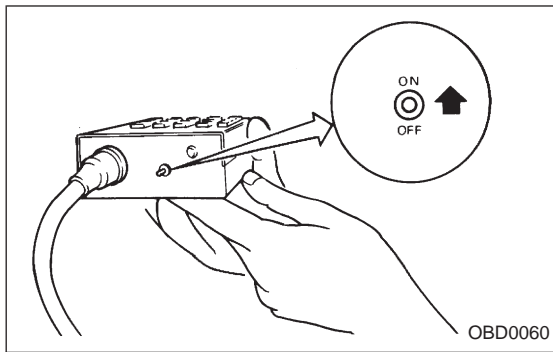
ST1 498357200 ADAPTER CABLE



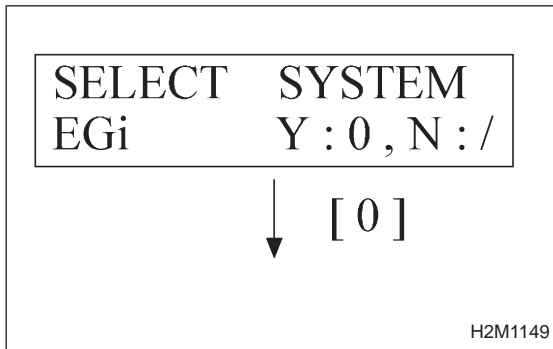
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

**CAUTION:**

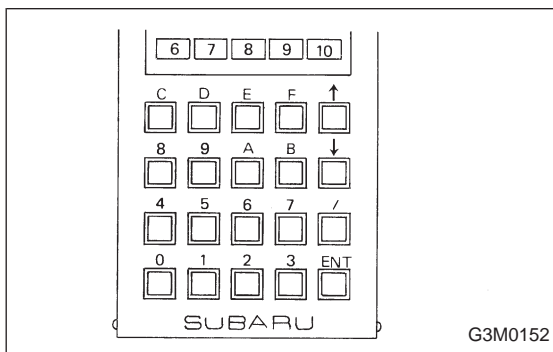
**Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.**



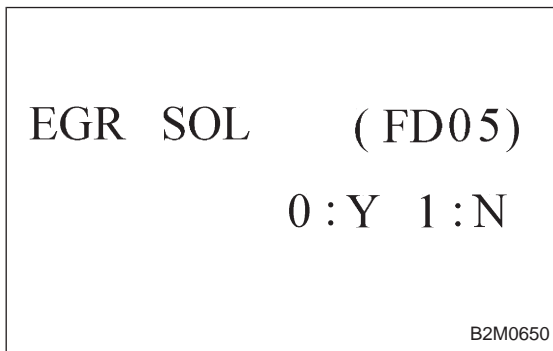
6) Turn ignition switch to ON (engine OFF) and Subaru select monitor switch to ON.



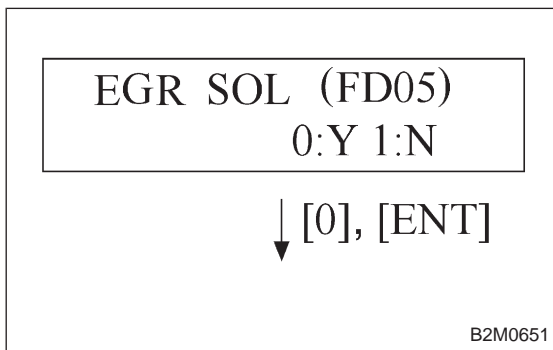
7) Select engine mode using function key. Press the function key [0].



8) Designate mode using function key. Refer to "6. READ DATA FUNCTION KEY LIST FOR ENGINE" 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

EGR SOL (FD05)

0:Y 1:N

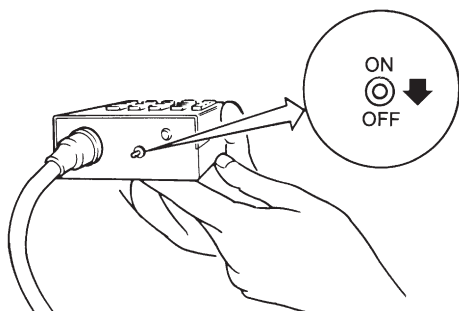
↓ [1], [ENT]

B2M0653

EGR SOL (FD05)  
END OF CHECK

1996 (F00)  
2.2 SOHC

B2M0643



G3M0151

**NOTE:**

When in compulsory valve operation check mode the monitor indicates the execution of valve check on display.

(2) When not executing or stopping the compulsory valve check mode, press the function key [1].

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.

## 4. Cautions

### A: SUPPLEMENTAL RESTRAINT SYSTEM “AIRBAG”

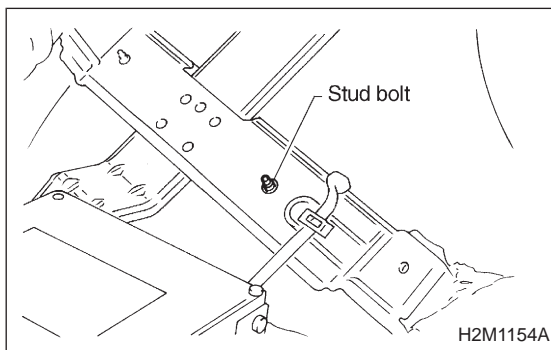
Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

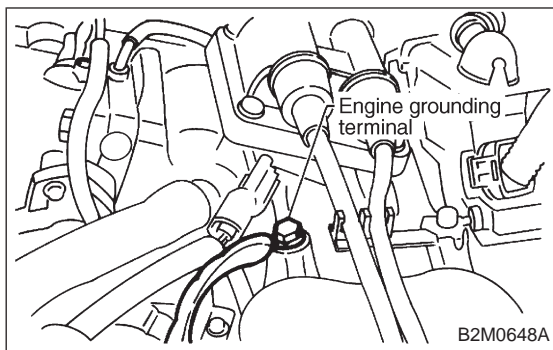
#### CAUTION:

- 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 or ABS/TCS 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 or ABS/TCS memory clearance procedure of self-diagnosis system. <Ref. to 4-4b [T6D2] or [T9K0], 4-4c [T6D2] or [T9J0].>

## C: PRE-INSPECTION

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

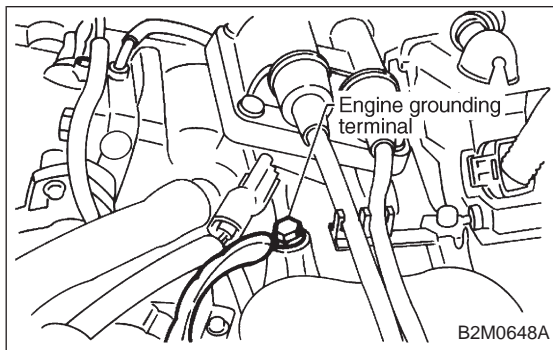
### 1. POWER SUPPLY

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.



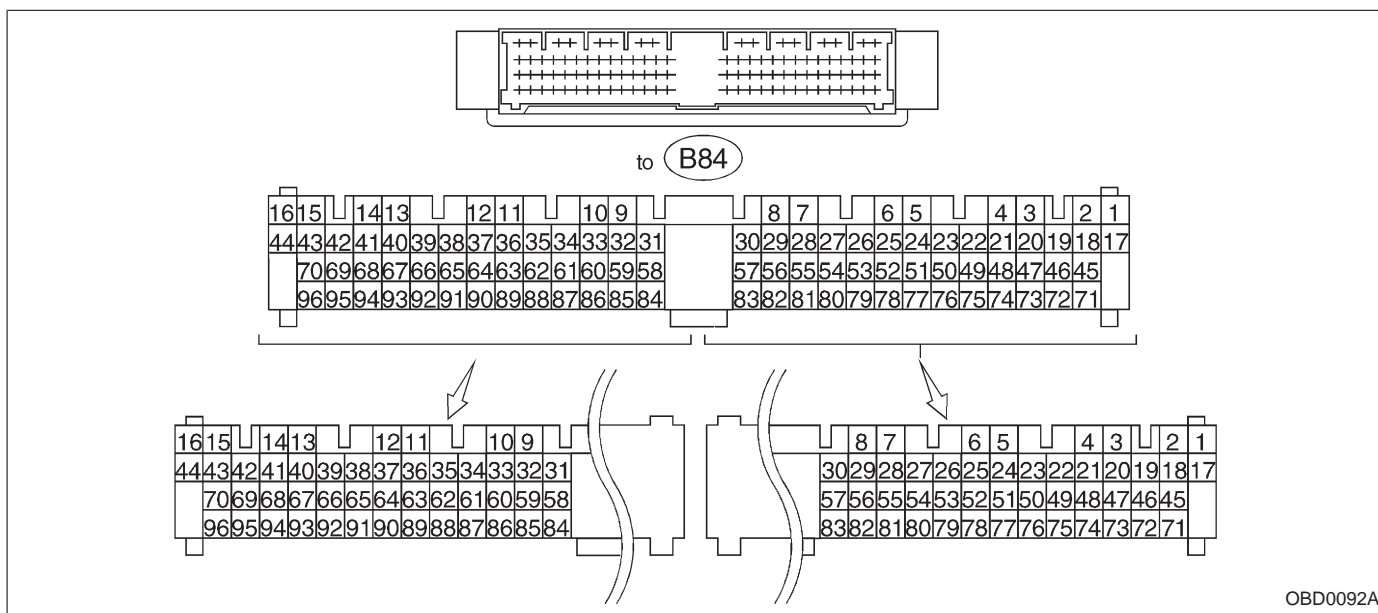
### 2. ENGINE GROUNDING

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



## 5. Specified Data

## 1. 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	54	0	0	—
Camshaft position sensor	Signal (+)	B84	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B84	28	0	0	—
	Shield	B84	54	0	0	—
Mass air flow sensor	Signal	B84	5	0 — 0.3	0.8 — 1.2	—
	Shield	B84	57	0	0	—
	GND	B84	20	0	0	—
Throttle position sensor	Signal	B84	6	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B84	21	5	5	—
	GND	B84	20	0	0	—
Front oxygen sensor	Signal	B84	23	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Rear oxygen sensor	Signal	B84	24	0	0 — 0.9	—
	Shield	B84	56	0	0	—
Engine coolant temperature sensor		B84	22	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		B84	83	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.
Starter switch		B84	86	0	0	Cranking: 8 to 14
A/C switch		B84	60	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B84	85	10 — 13	13 — 14	—
Neutral position switch (MT)	B84	82	ON: 5.0±0.5 OFF: 0		● On MT model; switch is ON when gear is in neutral position.	
Neutral position switch (AT)			ON: 0 OFF: 5.0±0.5			● On AT model; switch is ON when shift is in "N" or "P" position.
Test mode connector	B84	84	5	5	When connected: 0	

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Knock sensor	Signal	B84	3	2.8	2.8	—
	Shield	B84	56	0	0	—
AT/MT identification		B84	81	(AT) 5 (MT) 0	(AT) 5 (MT) 0	When measuring voltage between ECM and 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	—
Mass air flow signal for AT		B84	47	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		B84	72	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		B84	26	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		B84	15	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		B84	71	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		B84	38	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		B84	37	0 — 1.0	0 — 1.0	—
Fuel temperature sensor		B84	25	2.5 — 3.8	2.5 — 3.8	● 2200 cc AWD except Taiwan model ● Ambient temperature: 25°C (77°F)
Fuel level sensor		B84	27	0.12 — 4.75	0.12 — 4.75	2200 cc AWD except Taiwan model
Fuel tank pressure sensor	Signal	B84	4	2.3 — 2.7	2.3 — 2.7	● 2200 cc AWD except Taiwan model ● 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	2200 cc AWD except Taiwan model
Vent control solenoid valve		B84	35	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	2200 cc AWD except Taiwan model
TCS signal		B84	61	0 — 7	0 — 7	Waveform

Content	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
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	—

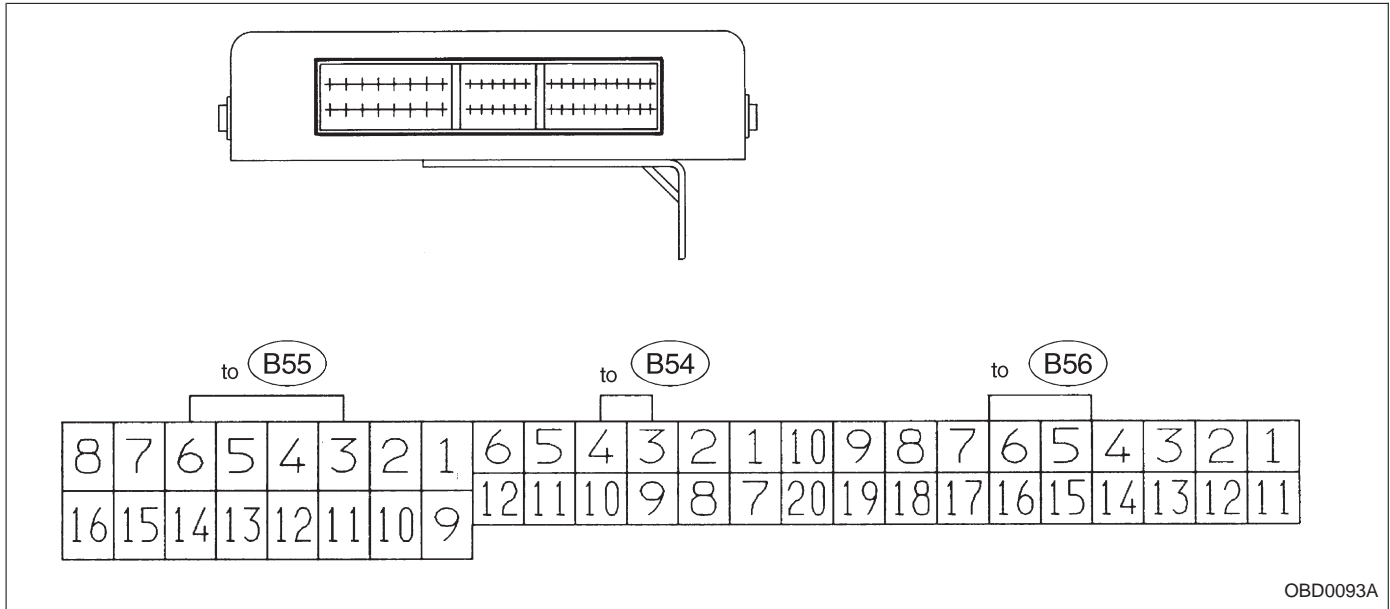
## 2. ENGINE CONDITION DATA

Content	Model	Specified data
Mass air flow	2200 cc	1.7 — 3.3 (g/sec): Idling
		7.1 — 14.2 (g/sec): 2,500 rpm racing
	2500 cc	2.2 — 4.2 (g/sec): Idling
		8.6 — 14.5 (g/sec): 2,500 rpm racing
Engine load	2200 cc	1.6 — 2.9 (%): Idling
		6.4 — 12.8 (%): 2,500 rpm racing
	2500 cc	1.9 — 3.5 (%): Idling
		7.2 — 12.1 (%): 2,500 rpm racing

Measuring condition:

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

3. TRANSMISSION CONTROL MODULE (TCM) I/O SIGNAL



OBD0093A

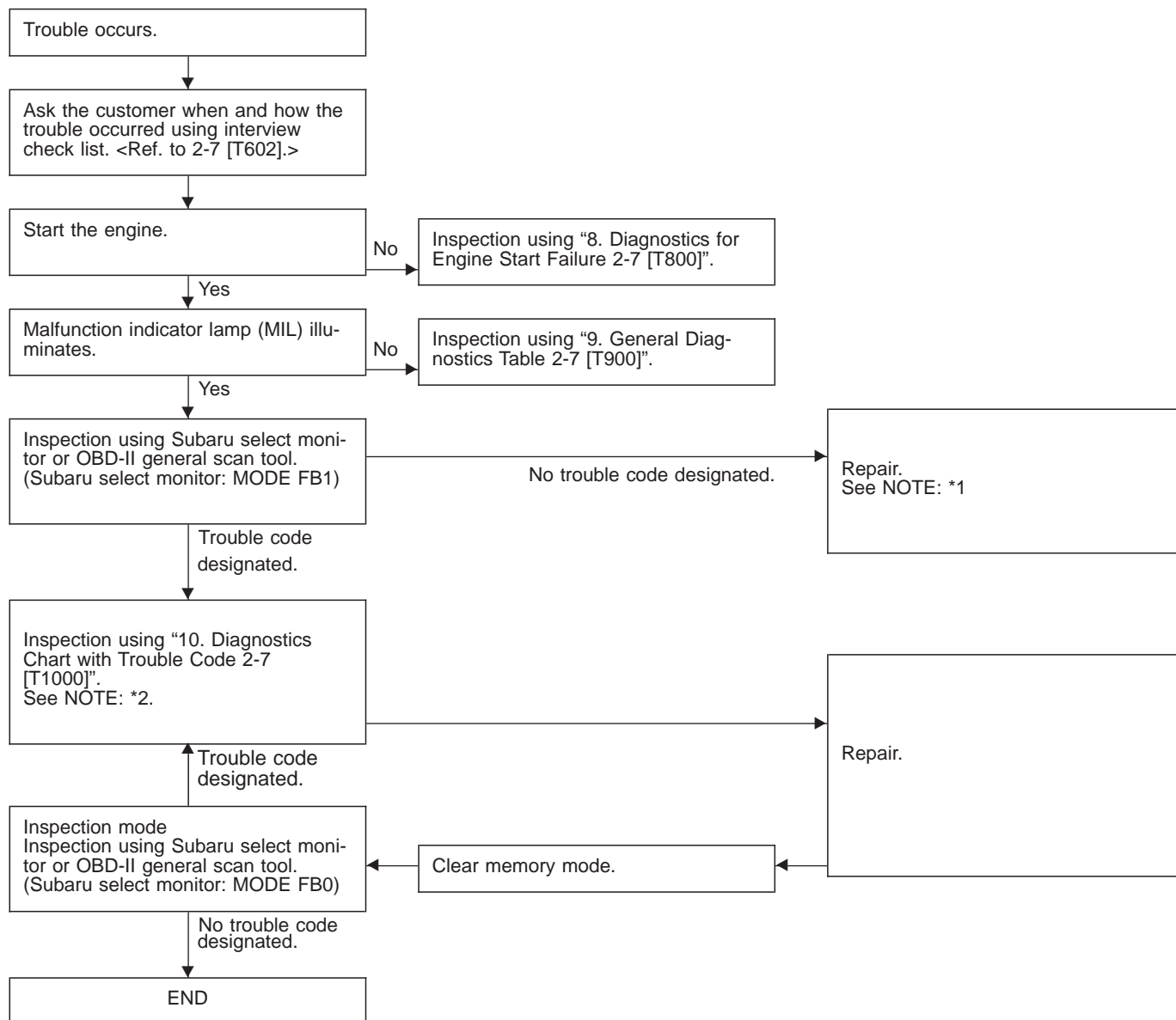
Check with ignition switch ON.

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.	1.5 — 4.0	1.5 — 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.	5 — 14	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
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 Diagnostics 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. <Refer to "7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL) 2-7 [T700].">

\*2: Carry out the basic check, only when trouble code about automatic transmission is shown on display. <Ref. to 2-7 [T601].>

**1. 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
- 2) Differential gear oil level check
- 3) ATF leak check
- 4) Differential gear oil leak check
- 5) Brake band adjustment
- 6) Stall test
- 7) Line pressure test
- 8) Transfer clutch pressure test
- 9) Time lag test
- 10) Road test
- 11) Shift characteristics

**NOTE:**

As for the method, refer to 3-2 [W2A0], [W2B1], [W300].

**2. CHECK LIST FOR INTERVIEW**

Check the following items when problem occurred.

Customer's name		Engine no.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km miles
Vin no.			
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Various/Other__		
Outdoor Temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold (approx. ___ °F/ ___ °C)		
Place	<input type="checkbox"/> Highway <input type="checkbox"/> Suburbs <input type="checkbox"/> Inner City <input type="checkbox"/> Uphill <input type="checkbox"/> Downhill <input type="checkbox"/> Rough road <input type="checkbox"/> Other _____		
Engine Temp.	<input type="checkbox"/> Cold <input type="checkbox"/> Warming-up <input type="checkbox"/> After warming-up <input type="checkbox"/> Any temp. <input type="checkbox"/> Other		
Engine speed			
Driving conditions	<input type="checkbox"/> Not affected <input type="checkbox"/> At starting <input type="checkbox"/> While idling <input type="checkbox"/> At racing <input type="checkbox"/> While accelerating <input type="checkbox"/> While cruising <input type="checkbox"/> While decelerating <input type="checkbox"/> While turning (RH/LH)		
	Vehicle speed		
Headlight	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Blower	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
A/C compressor	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Cooling fan	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Front wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Rear wiper	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Rear defogger	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Radio	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
CD/Cassette	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
Car phone	<input type="checkbox"/> ON / <input type="checkbox"/> OFF		
CB			

NOTE: Use copies of this page for interviewing customers.



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

a) Other warning lights or indicators turn on. <input type="checkbox"/> Yes / <input type="checkbox"/> No
<input type="checkbox"/> ① Low fuel warning light
<input type="checkbox"/> ② Charge indicator light
<input type="checkbox"/> ③ AT diagnostics indicator light
<input type="checkbox"/> ④ ABS warning light
<input type="checkbox"/> ⑤ TCS warning light
<input type="checkbox"/> ⑥ Engine oil pressure warning light
b) Fuel level
● Lack of gasoline: <input type="checkbox"/> Yes / <input type="checkbox"/> No
● Indicator position of fuel gauge:
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: <input type="checkbox"/> Yes / <input type="checkbox"/> No
● What:
d) Intentional connecting or disconnecting of hoses: <input type="checkbox"/> Yes / <input type="checkbox"/> No
● What:
e) Installing of parts other than genuine parts <input type="checkbox"/> Yes / <input type="checkbox"/> No
● What:
● Where:
f) Occurrence of noise <input type="checkbox"/> Yes / <input type="checkbox"/> No
● From where:
● What kind:
g) Occurrence of smell <input type="checkbox"/> Yes / <input type="checkbox"/> No
● From where:
● What kind:
h) Intrusion of water into engine compartment or passenger compartment <input type="checkbox"/> Yes / <input type="checkbox"/> No
i) Troubles occurred
<input type="checkbox"/> ① Engine does not start.
<input type="checkbox"/> ② Engine stalls during idling.
<input type="checkbox"/> ③ Engine stalls while driving.
<input type="checkbox"/> ④ Engine speed decreases.
<input type="checkbox"/> ⑤ Engine speed does not decrease.
<input type="checkbox"/> ⑥ Rough idling
<input type="checkbox"/> ⑦ Poor acceleration
<input type="checkbox"/> ⑧ Back fire
<input type="checkbox"/> ⑨ After fire
<input type="checkbox"/> ⑩ No shift
<input type="checkbox"/> ⑪ Excessive shift shock

NOTE: Use copies of this page for interviewing customers.

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

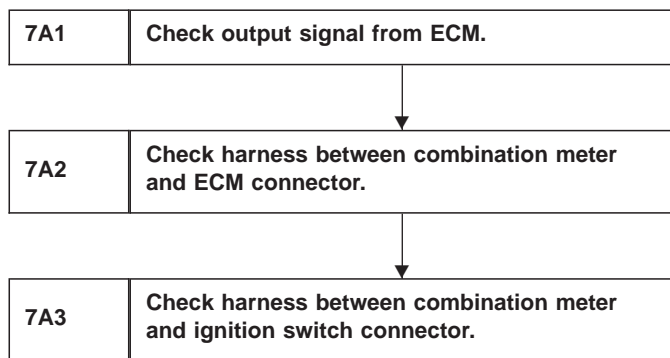
### A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON.

**DIAGNOSIS:**

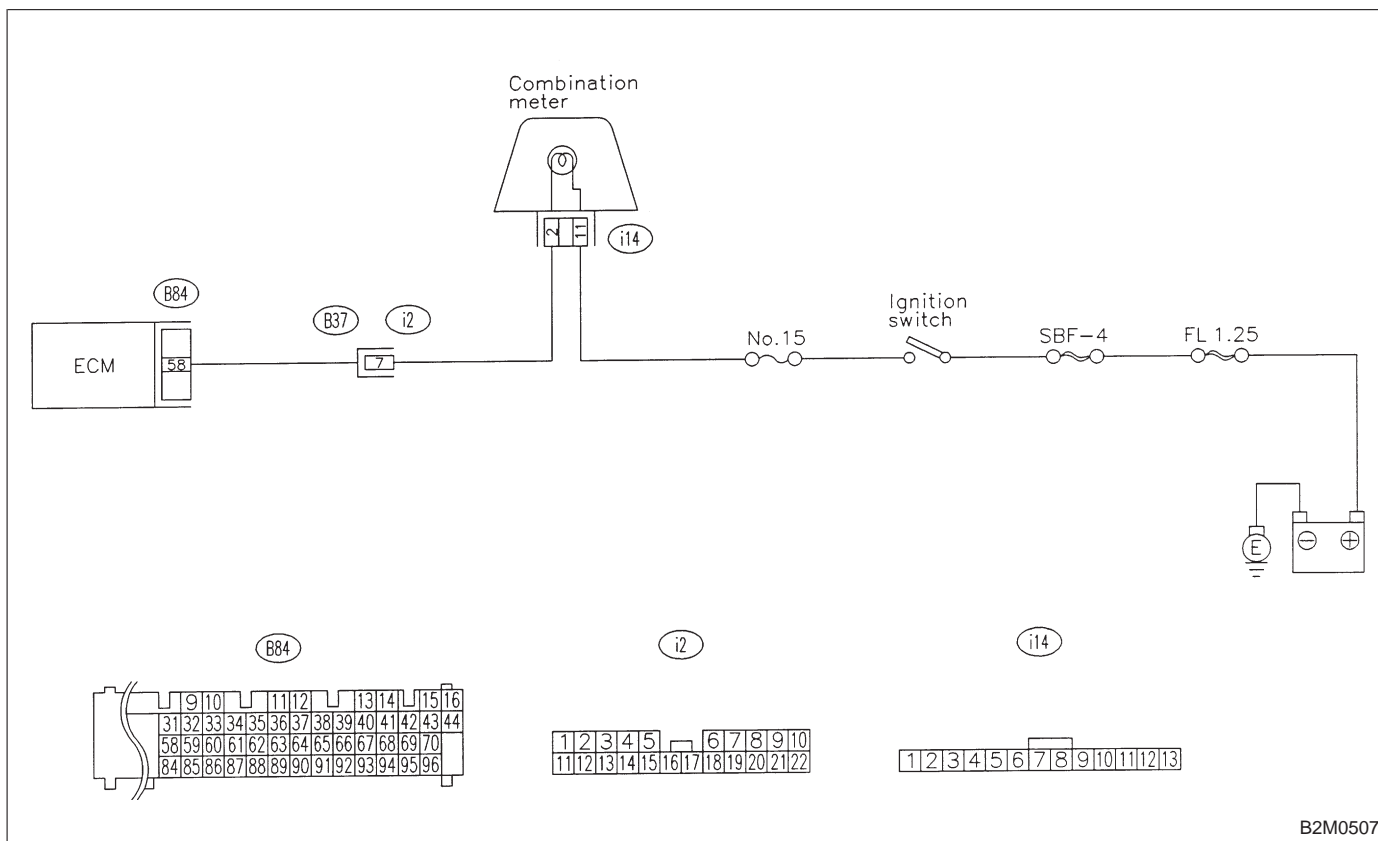
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.

**TROUBLE SYMPTOM:**

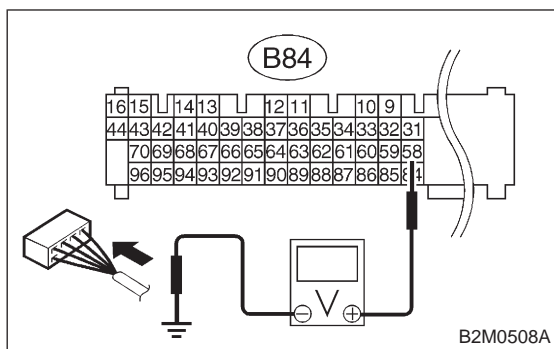
- When ignition switch is turned ON (engine OFF), MIL does not come on.



**WIRING DIAGRAM:**



B2M0507



<b>7A1</b>	<b>CHECK OUTPUT SIGNAL FROM ECM.</b>
------------	--------------------------------------

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

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

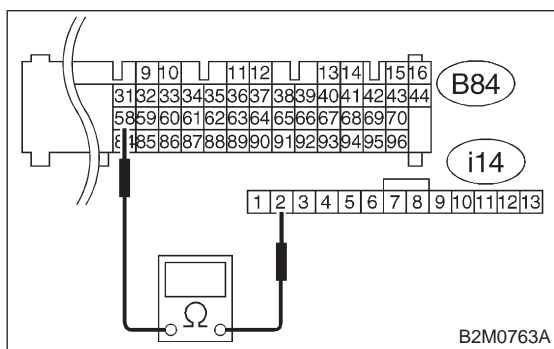
**YES** : Repair poor contact in ECM connector.

**NO** : Go to next **CHECK** .

**CHECK** : **Is ECM connector correctly connected?**

**YES** : Replace ECM.

**NO** : Repair connection of ECM connector.



<b>7A2</b>	<b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b>
------------	---

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter. <Ref. to 6-2 [W13A1].>
- 3) Disconnect connector from ECM and combination meter.
- 4) Measure resistance of harness between ECM and combination meter connector.

**CHECK** : **Connector & terminal (B84) No. 58 — (i14) No. 2: Is resistance less than 1 Ω?**

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

**NO** : Repair harness and connector.

**NOTE:**

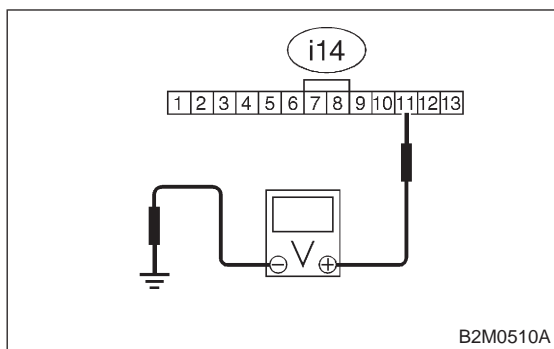
In this case, repair the following:

- Open circuit in harness between ECM and combination meter connector
- Poor contact in coupling connector (B37)

**CHECK** : **Is there poor contact in combination meter connector?**

**YES** : Repair poor contact in combination meter connector.

**NO** : Go to step **7A3**.

**7A3****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.

**CHECK** : **Connector & terminal (i14) No. 11 (+) — Chassis ground (-): Is voltage more than 10 V?**

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

**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

**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:**

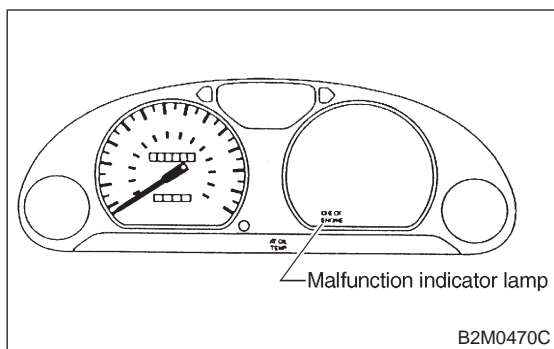
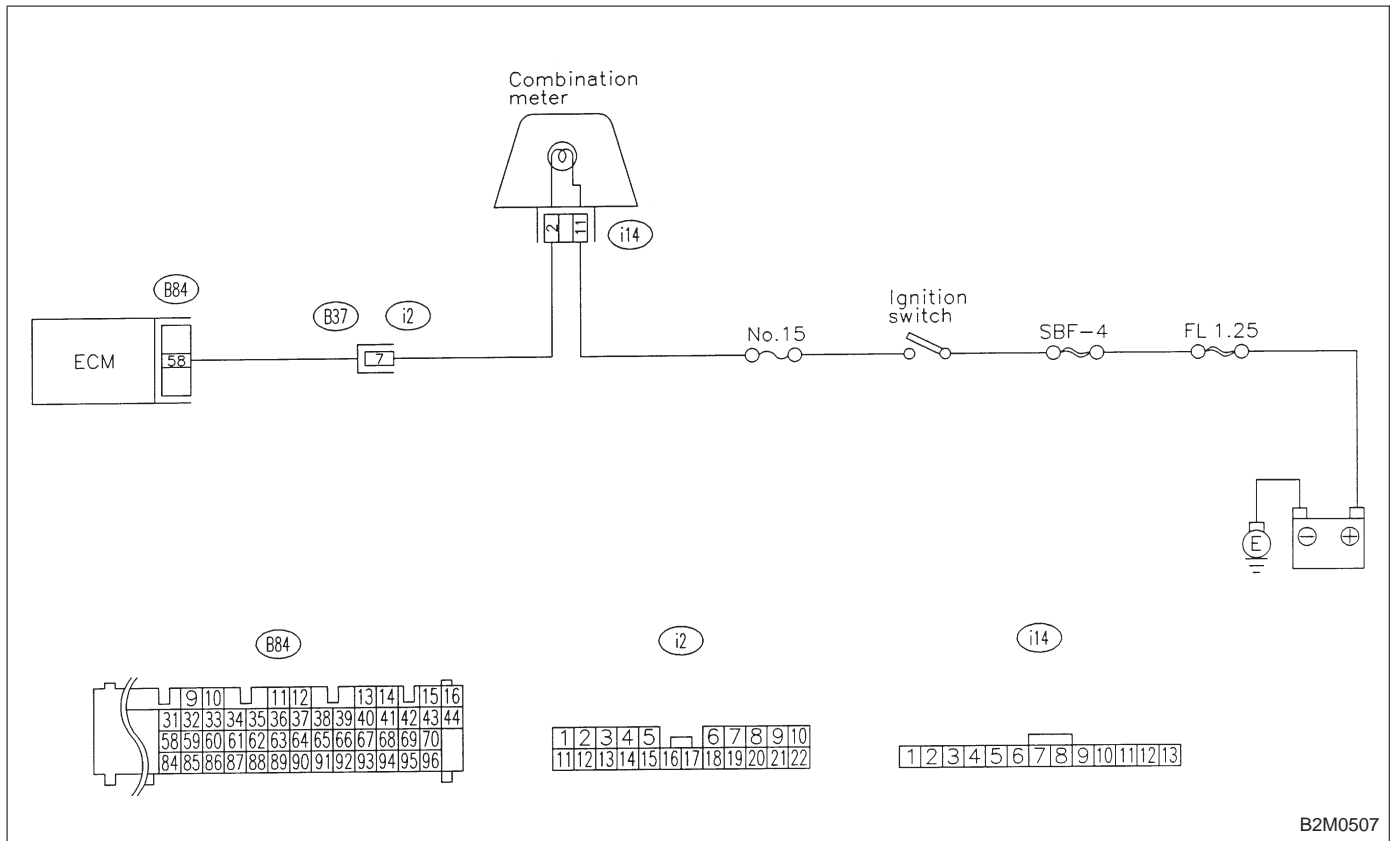
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.

**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.

<b>7B1</b>	<b>Check harness between combination meter and ECM connector.</b>
------------	---

**WIRING DIAGRAM:**



<b>7B1</b>	<b>CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.</b>
------------	---

- 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.

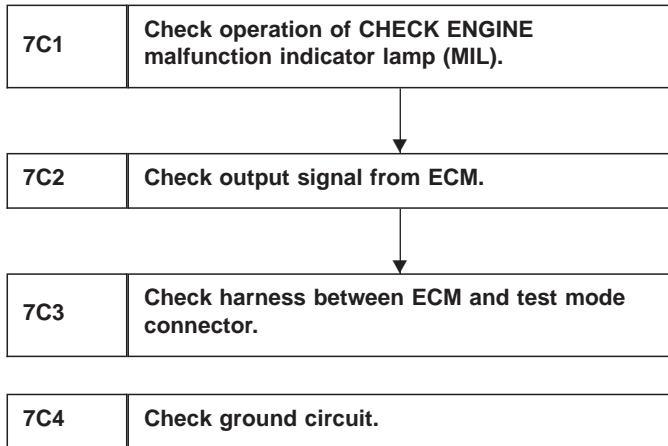
**C: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 HZ.**

**DIAGNOSIS:**

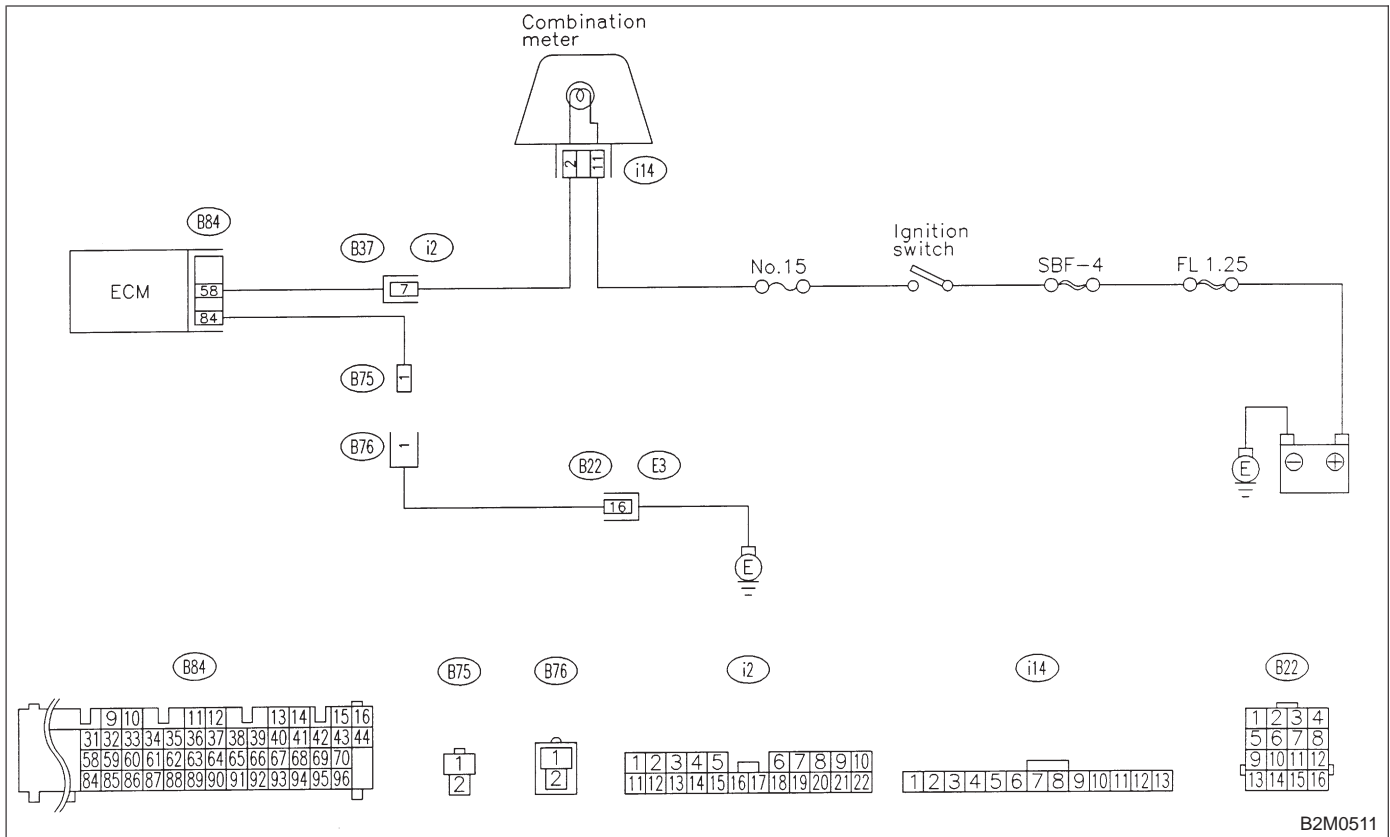
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- Test mode connector circuit is in open.

**TROUBLE SYMPTOM:**

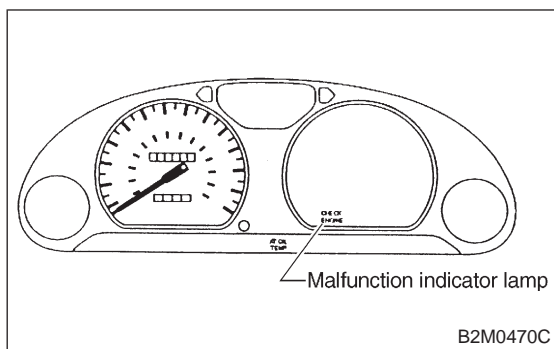
- When inspection mode, MIL does not blink at a cycle of 3 Hz.



**WIRING DIAGRAM:**



B2M0511

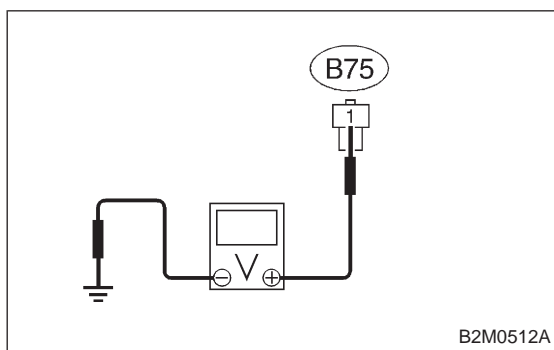
**7C1****CHECK OPERATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).**

- 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 [T7A0].>

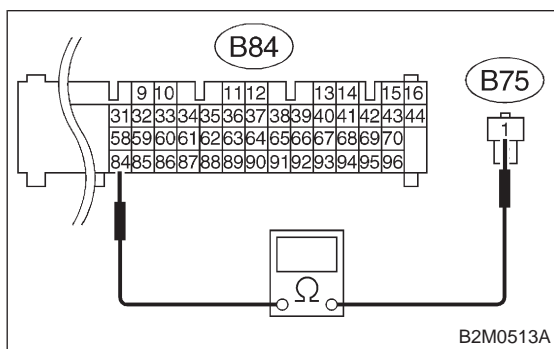
**7C2****CHECK OUTPUT SIGNAL FROM ECM.**

Measure voltage between test mode connector and chassis ground.

**CHECK** : **Connector & terminal (B75) No.1 (+) — Chassis ground (-): Is voltage less than 1 V?**

**YES** : Go to step 7C3.

**NO** : Go to step 7C4.

**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.

**CHECK** : **Connector & terminal (B84) No.84 — (B75) No.1: Is resistance less than 1 Ω?**

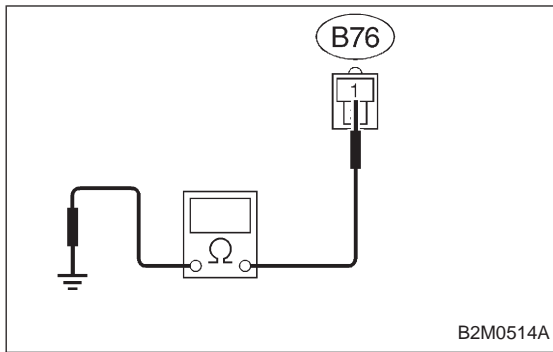
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between ECM and test mode connector.

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.

**7C4****CHECK GROUND CIRCUIT.**

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

**CHECK** : **Connector & terminal (B76) No.1 — Chassis ground: 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 coupling connector (B22)
- Open circuit in harness between coupling connector (B22) 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:**

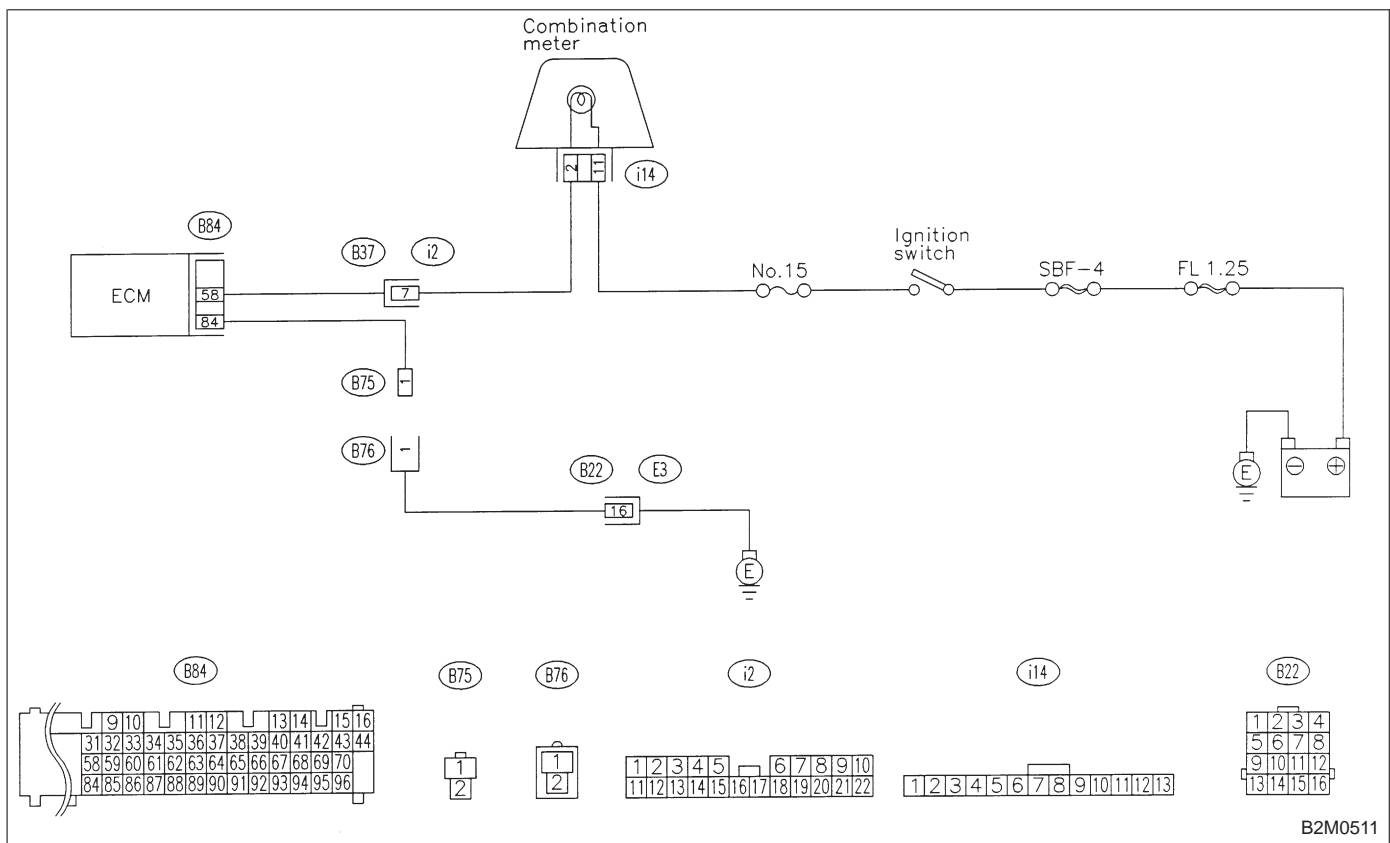
- Test mode connector circuit is shorted.

**TROUBLE SYMPTOM:**

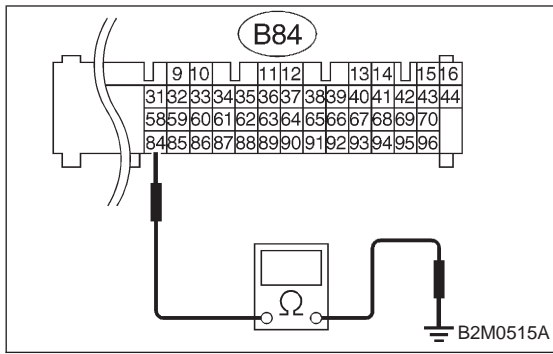
- Even though test mode connector is disconnected, MIL blinks at a cycle of 3 Hz when ignition switch is turned to ON.

7D1	Check harness between ECM connector and engine grounding terminal.
-----	--

**WIRING DIAGRAM:**



B2M0511



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.

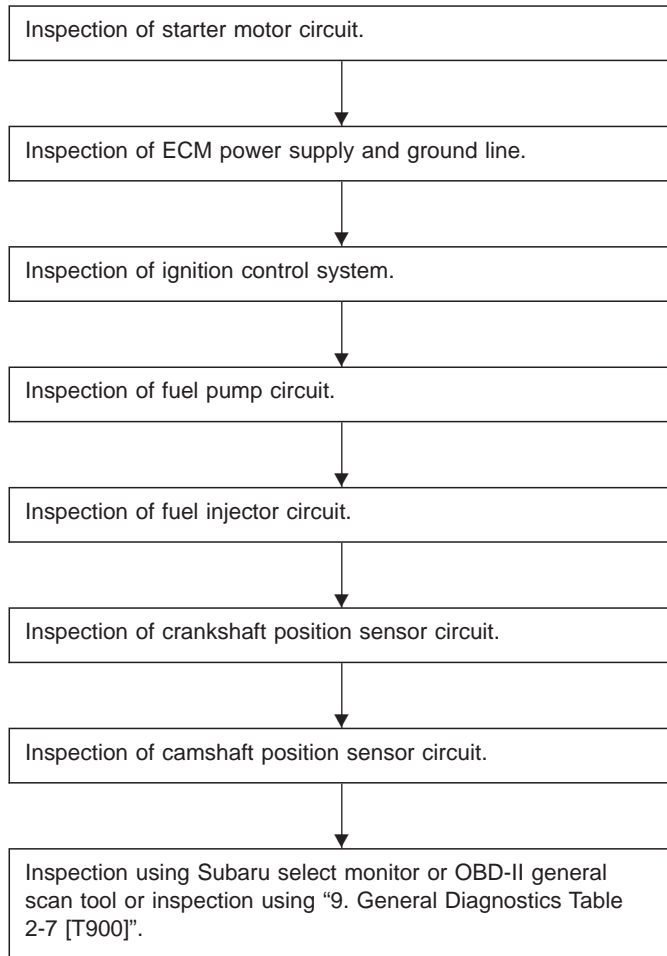
**CHECK** : **Connector & terminal (B84) No.84 — Chassis ground: Is resistance less than 5 Ω?**

**YES** : Repair short circuit in harness between ECM and test mode connector.

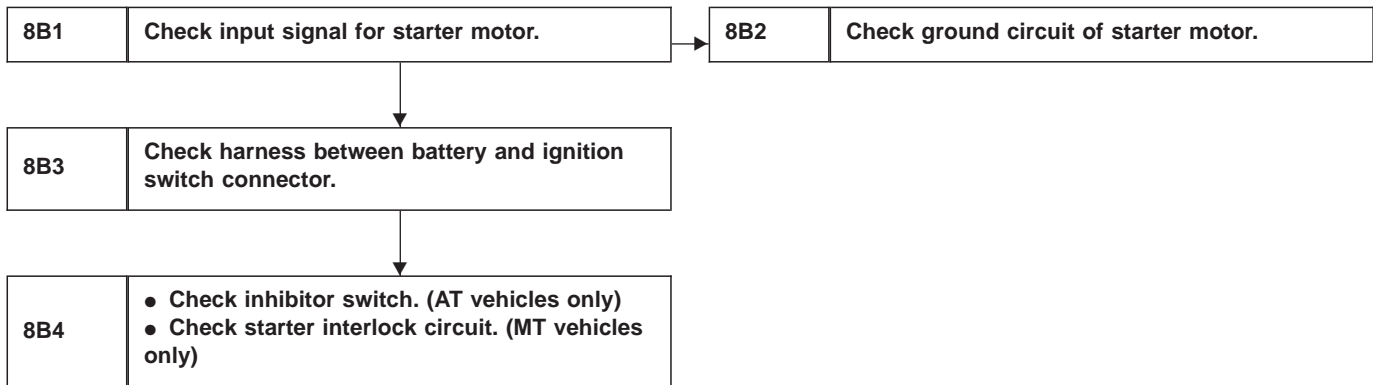
**NO** : Replace ECM.

## 8. Diagnostics for Engine Starting Failure

### A: BASIC DIAGNOSTICS CHART



**B: STARTER MOTOR CIRCUIT**

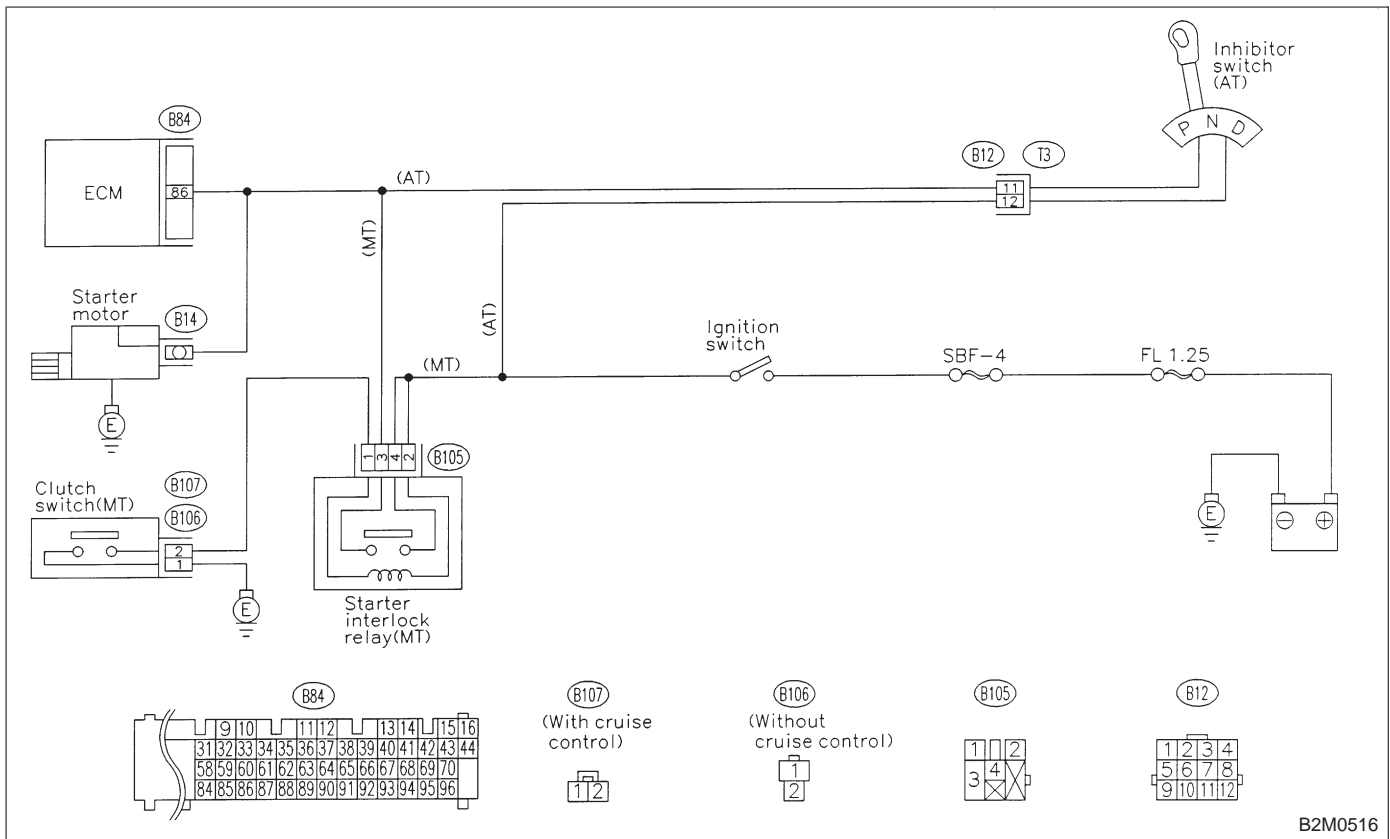


**CAUTION:**

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

**WIRING DIAGRAM:**

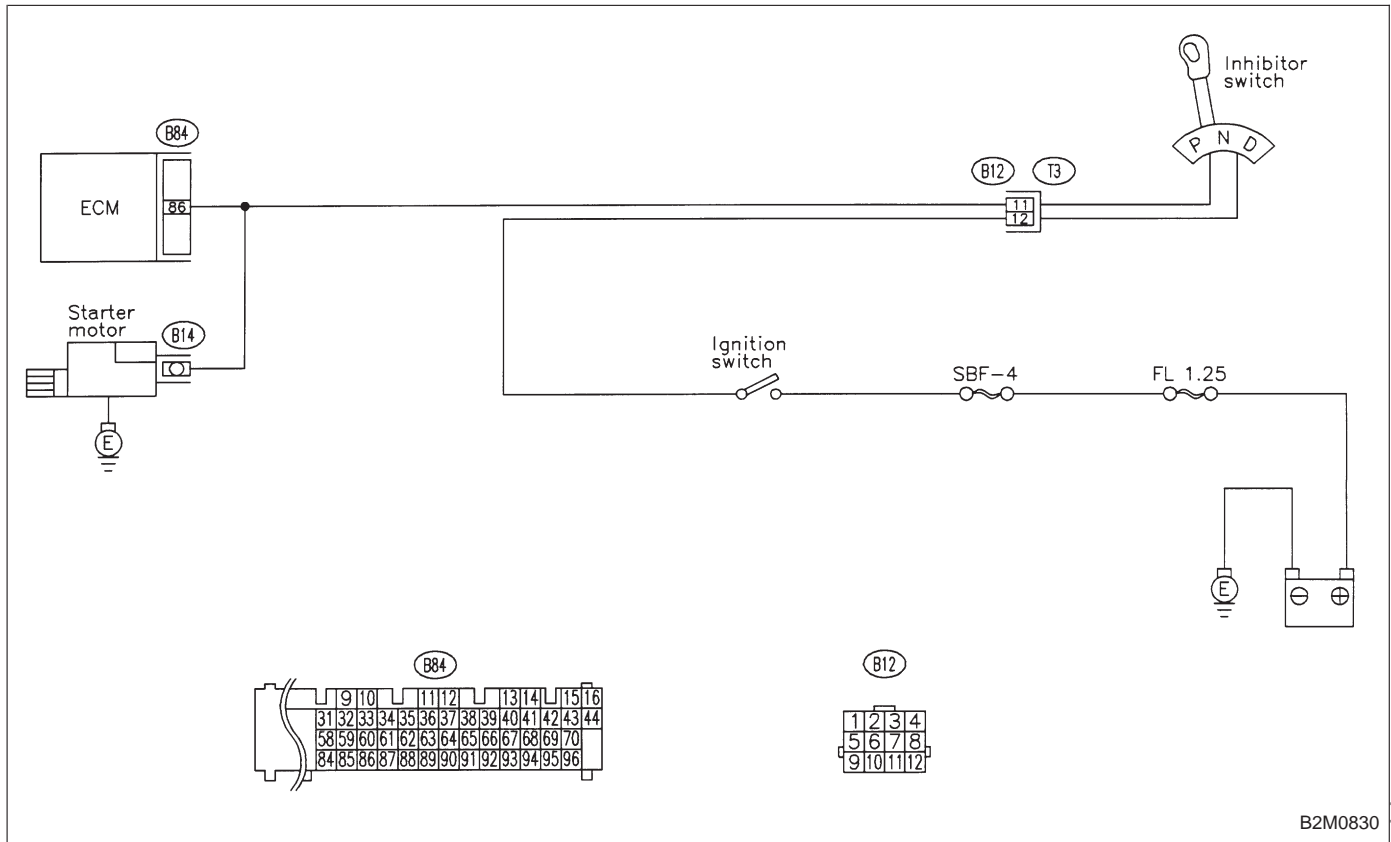
- LHD Model

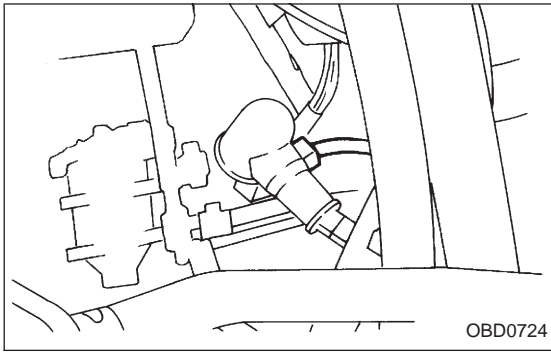


B2M0516

WIRING DIAGRAM:

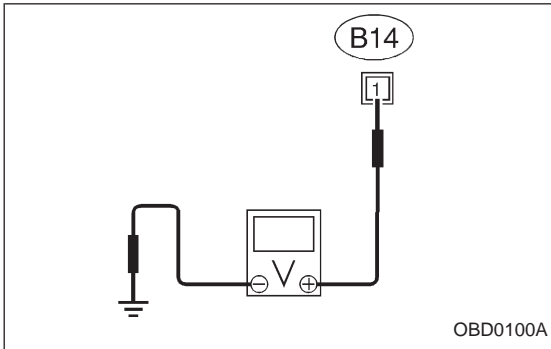
- RHD Model





**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.

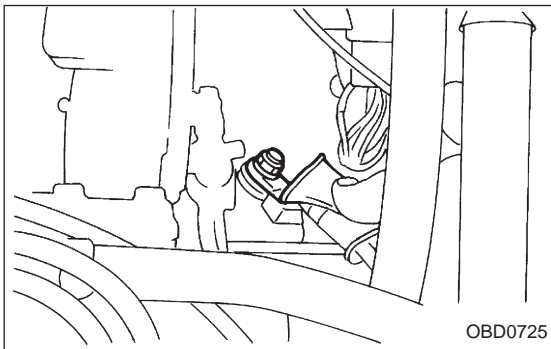
**CHECK** : **Connector & terminal (B14) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

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 [K100].>

**NO** : Repair open circuit of ground cable.

**8B3 CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.**

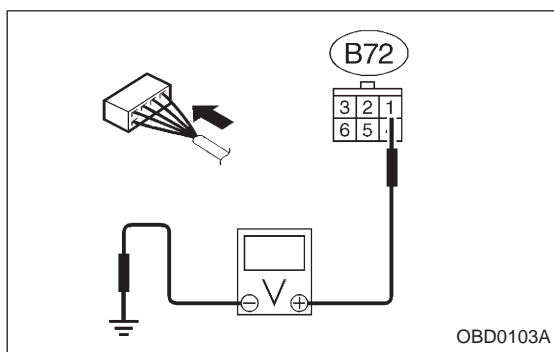
- 1) Turn ignition switch to OFF.
- 2) Remove SBF No. 4 from main fuse box.
- 3) Measure resistance of fuse.

**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.

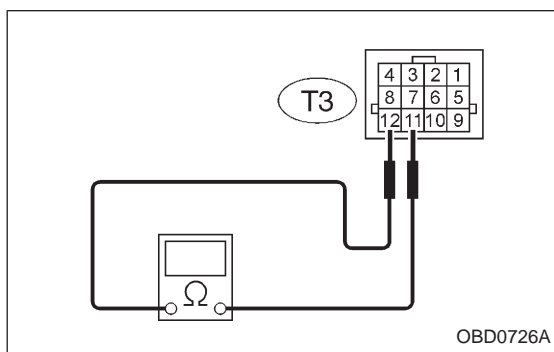


- 6) Measure power supply voltage between ignition switch connector and chassis ground.

**CHECK** : **Connector & terminal (B72) No. 1 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Go to step 8B4.

**NO** : Repair harness between ignition switch and SBF No. 4 connector.



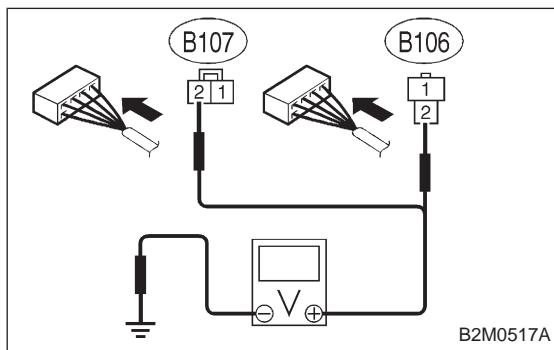
**8B4** ● **CHECK INHIBITOR SWITCH. (AT VEHICLES ONLY)**

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

**CHECK** : **Connector & terminal (T3) No. 11 — No. 12: Is the resistance less than 10 Ω?**

**YES** : Repair harness between starter motor and ignition switch connector.

**NO** : Repair or replace inhibitor switch.



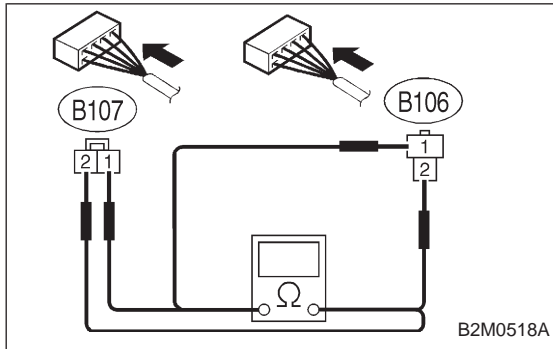
**8B4** ● **CHECK STARTER INTERLOCK CIRCUIT. (MT VEHICLES ONLY)**

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

- CHECK** : **Connector & terminal**
- **With cruise control**  
(B107) No. 2 (+) — Chassis ground (-):
  - **Without cruise control**  
(B106) No. 2 (+) — Chassis ground (-):
- 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.

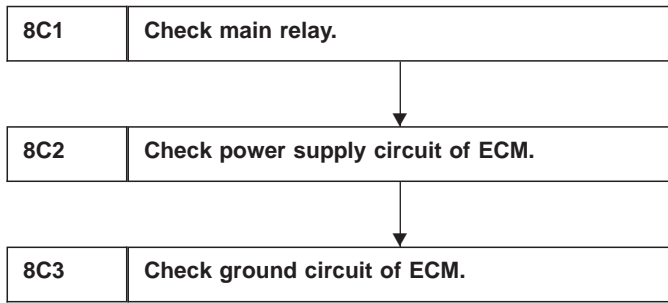
- CHECK** : **Connector & terminal**
- **With cruise control**  
(B107) No. 1 — No. 2:
  - **Without cruise control**  
(B106) No. 1 — No. 2:
- Is the resistance less than 10  $\Omega$ ?**

**YES** : Repair harness between starter motor and ignition switch connector.

**NO** : Replace clutch switch.



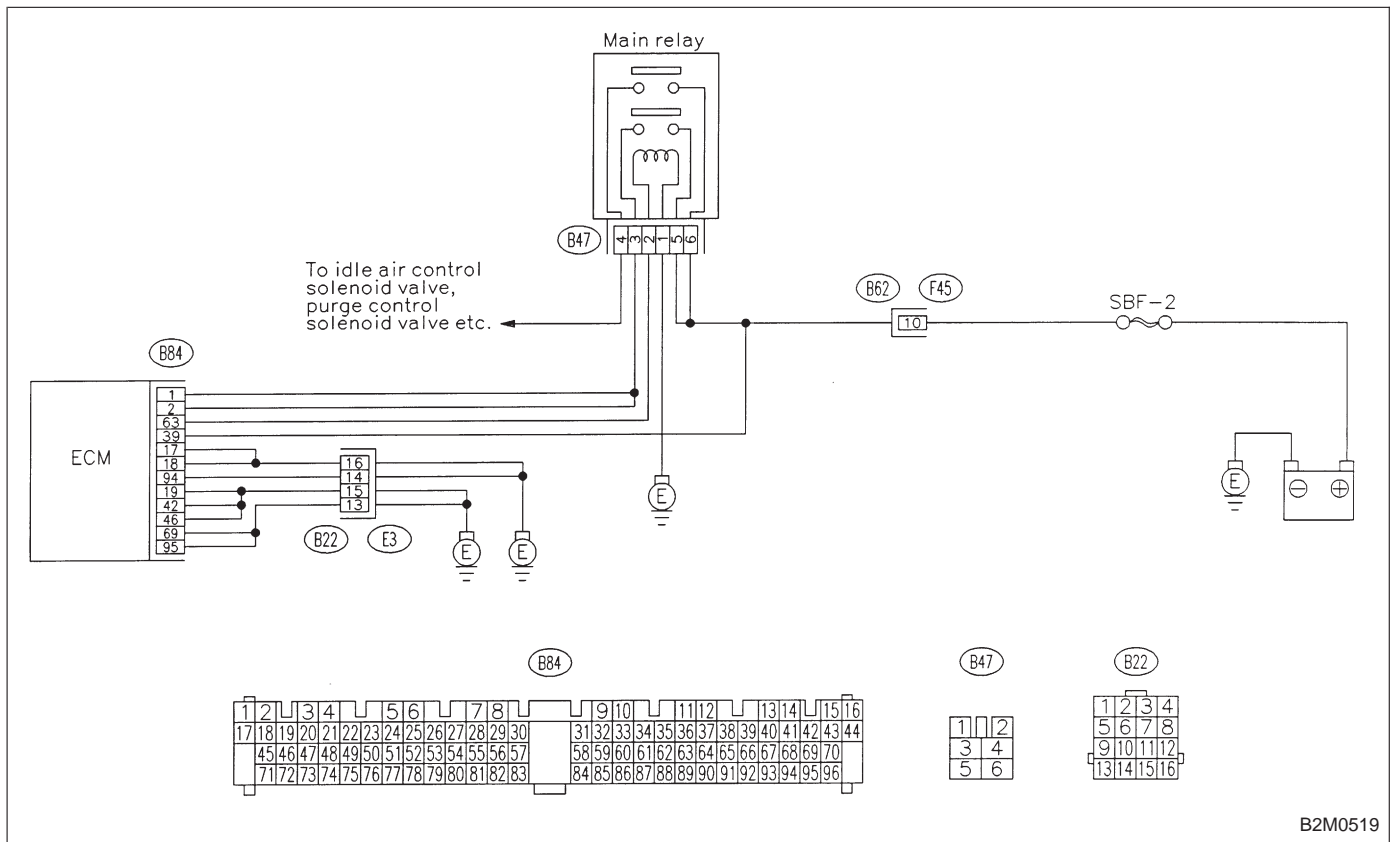
**C: CONTROL MODULE POWER SUPPLY AND GROUND LINE**



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

**WIRING DIAGRAM:**

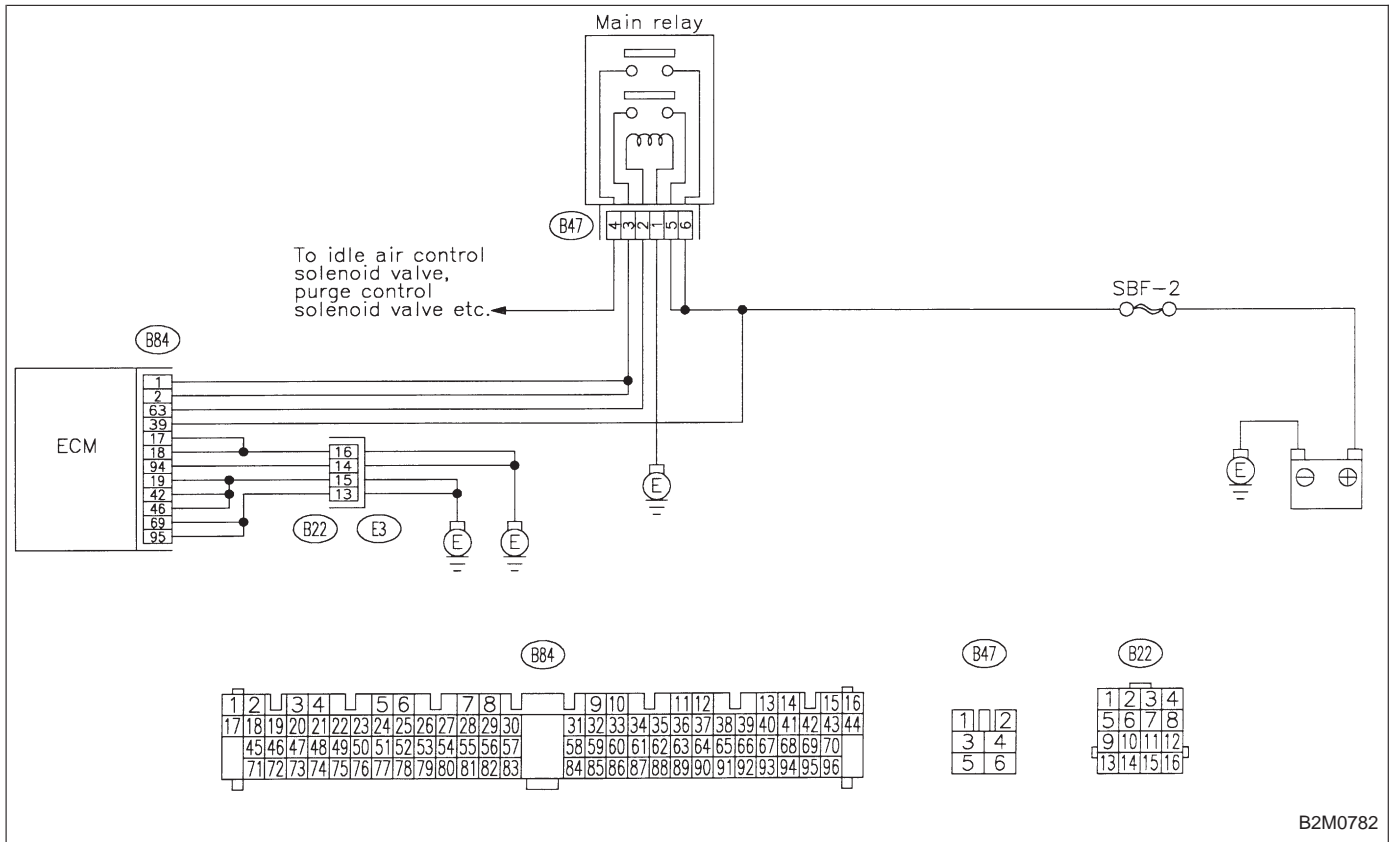
- LHD Model



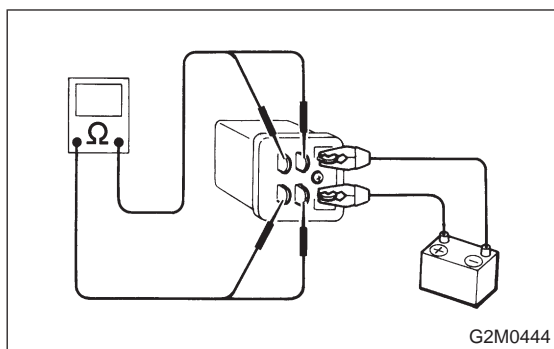
B2M0519

WIRING DIAGRAM:

- RHD Model



B2M0782

**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.

**CHECK** : **Terminals No. 3 — No. 5:**  
**Is the resistance less than 10 Ω?**

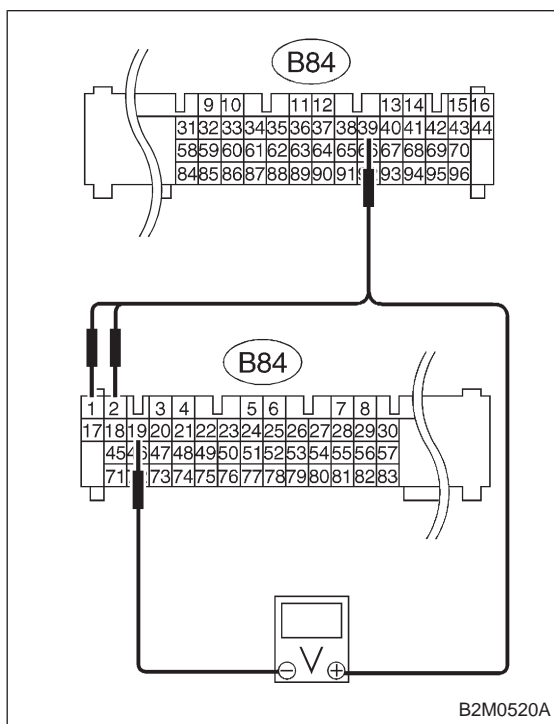
**YES** : Go to next **CHECK** .

**YES** : Replace main relay.

**CHECK** : **Terminals No. 4 — No. 6:**  
**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.

**CHECK** : **Connector & terminal (B84) No. 1 (+) — No. 19 (-):**  
**Is the voltage more than 10 V?**

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

**NO** : Repair harness of power supply circuit.

**CHECK** : **Connector & terminal (B84) No. 2 (+) — No. 19 (-):**  
**Is the voltage more than 10 V?**

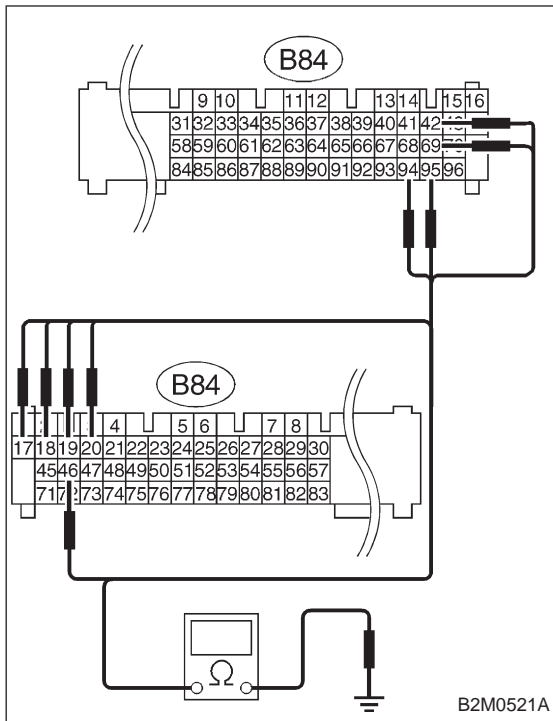
**YES** : Go to next **CHECK** .

**NO** : Repair harness of power supply circuit.

**CHECK** : **Connector & terminal (B84) No. 39 (+) — No. 19 (-):**  
**Is the voltage more than 10 V?**

**YES** : Go to step **8C3**.

**NO** : Repair harness of power supply circuit.



**8C3 CHECK GROUND CIRCUIT OF ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 17 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

**CHECK** : **Connector & terminal (B84) No. 18 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

**CHECK** : **Connector & terminal (B84) No. 19 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

**CHECK** : **Connector & terminal (B84) No. 20 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

**CHECK** : **Connector & terminal (B84) No. 42 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

**CHECK** : **Connector & terminal (B84) No. 46 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

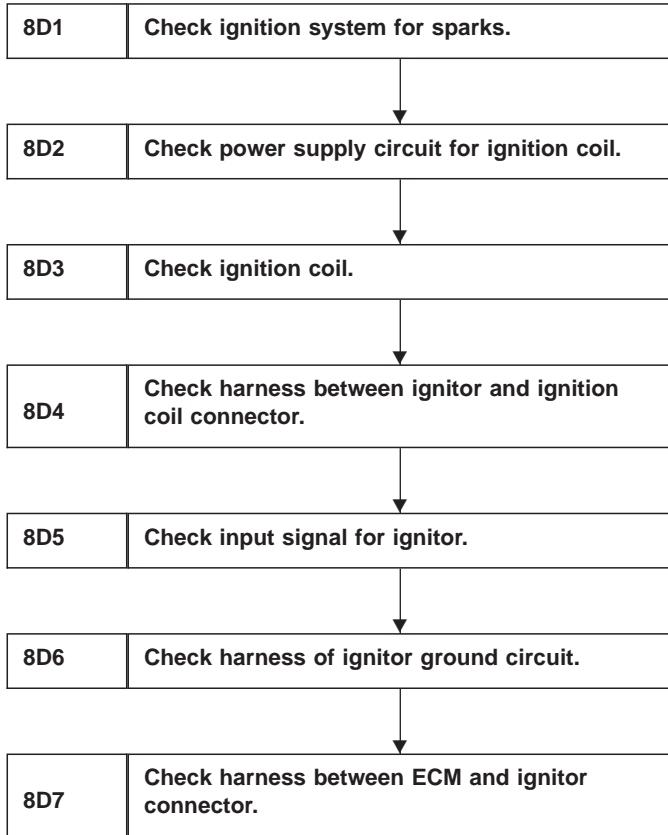
**CHECK** : **Connector & terminal (B84) No. 69 — Chassis ground: Is the resistance less than 5 Ω?**

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

**NO** : Repair harness between ECM connector and engine grounding terminal.

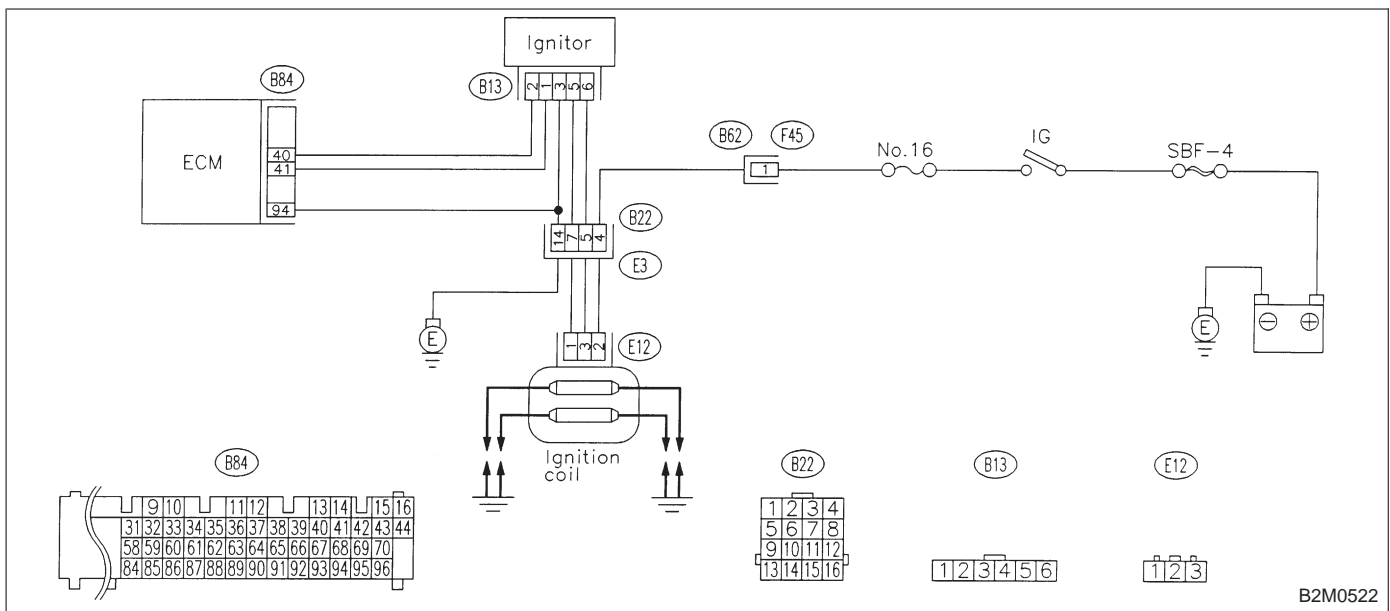
- CHECK** : **Connector & terminal**  
**(B84) No. 94 — Chassis ground:**  
**Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal**  
**(B84) No. 95 — Chassis ground:**  
**Is the resistance less than 5 Ω?**
- YES** : Check ignition control system. <Ref. to 2-7 [T8D0].>
- NO** : Repair harness between ECM connector and engine grounding terminal.

D: IGNITION CONTROL SYSTEM

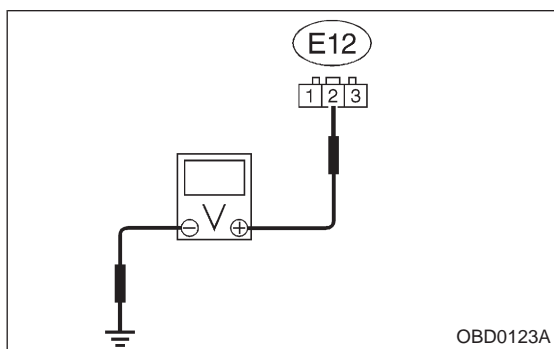
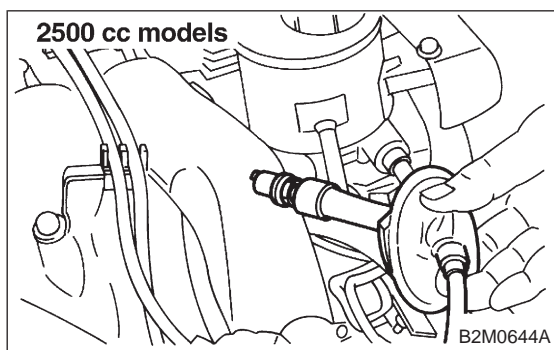
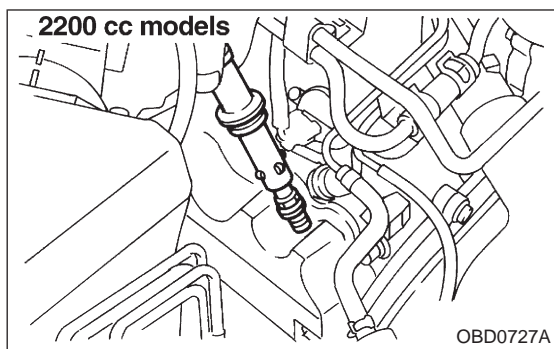


**CAUTION:**  
 After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.  
 <Ref. to 2-7 [T3D0] and [T3E0].>

WIRING DIAGRAM:



B2M0522



### 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.

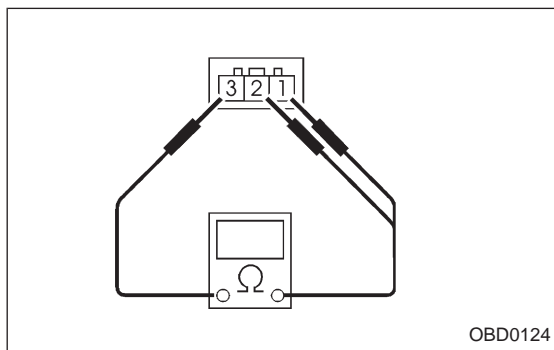
### 8D2 CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL.

- 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.

**CHECK** : **Connector & terminal (E12) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

**YES** : Go to step 8D3.

**NO** : Repair harness between ignition coil and ignition switch connector.



### 8D3 CHECK IGNITION COIL.

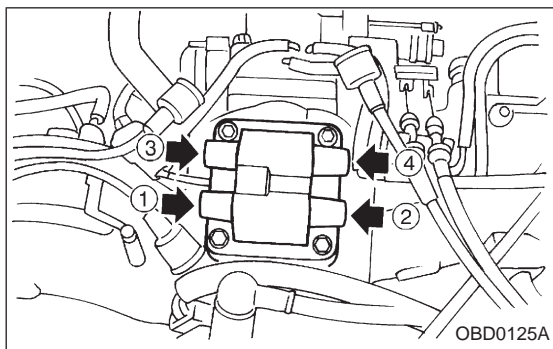
- 1) Measure resistance between ignition coil terminals to check primary coil.

**CHECK** : **Terminals No. 2 — No. 1: Is the resistance between 0.4 and 1.0 Ω?**

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

**NO** : Replace ignition coil.

- CHECK** : **Terminals**  
**No. 2 — No. 3:**  
**Is the resistance between 0.4 and 1.0 Ω?**
- NO** : Replace ignition coil.
- YES** : Go to next step 2).



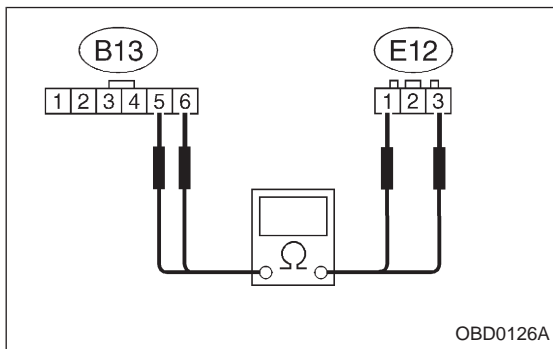
2) Measure resistance between spark plug cord contact portions to check secondary coil.

- CHECK** : **Terminals**  
**#1 — #2:**  
**Is the resistance between 18 and 24 Ω?**

- YES** : Go to next **CHECK** .
- NO** : Replace ignition coil.

- CHECK** : **Terminals**  
**#3 — #4:**  
**Is the resistance between 18 and 24 Ω?**

- YES** : Go to step 8D4.
- NO** : Replace ignition coil.



<b>8D4</b>	<b>CHECK HARNESS BETWEEN IGNITOR AND IGNITION COIL CONNECTOR.</b>
------------	---

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

- CHECK** : **Connector & terminal**  
**(B13) No. 5 — (E12) No. 1:**  
**Is the resistance less than 1 Ω?**

- YES** : Go to next **CHECK1** .
- YES** : Go to next **CHECK2** .

- CHECK1** : **Connector & terminal**  
**(B13) No. 6 — (E12) No. 3:**  
**Is the resistance less than 1 Ω?**

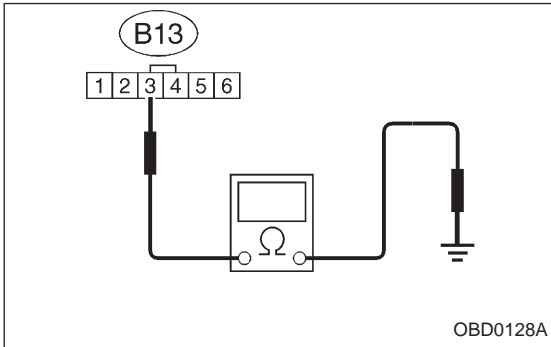
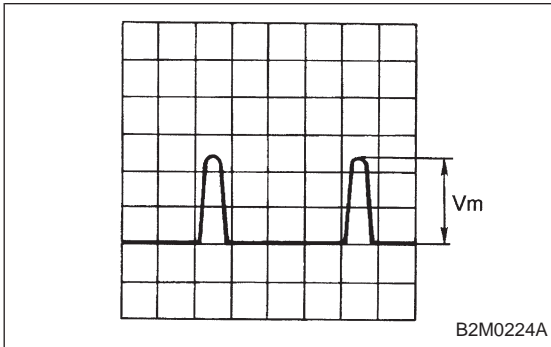
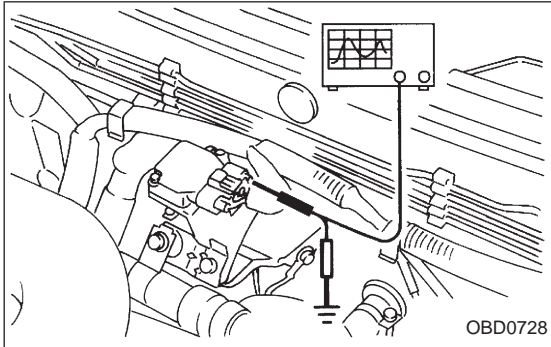
- YES** : Go to step 8D5.
- NO** : Go to next **CHECK2** .



**CHECK2** : *Is there poor contact in coupling connector (B22)?*

**YES** : Repair poor contact in coupling connector.

**NO** : Repair harness between ignition coil and ignitor connector.



### 8D5 CHECK INPUT SIGNAL FOR IGNITOR.

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

**CHECK** : **Connector & terminal:**  
**(B13) No. 1 (+) — Engine ground (-):**  
**Is the voltage more than 10 V?**

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

**NO** : Replace ignitor.

**CHECK** : **Connector & terminal:**  
**(B13) No. 2 (+) — Engine ground (-):**  
**Is the voltage more than 10 V?**

**YES** : Go to step 8D6.

**NO** : Replace ignitor.

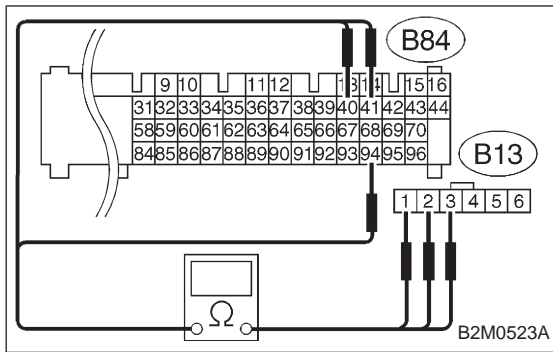
### 8D6 CHECK HARNESS OF IGNITOR GROUND CIRCUIT.

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

**CHECK** : **Connector & terminal**  
**(B13) No. 3 — Engine ground:**  
**Is the resistance less than 5 Ω?**

**YES** : Go to step 8D7.

**NO** : Repair harness between ignitor connector and engine grounding terminal.



**8D7 CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.**

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

**CHECK** : **Connector & terminal (B84) No. 41 — (B13) No. 1: Is the resistance less than 1 Ω?**

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

**NO** : Repair open circuit in harness between ECM and ignitor connector.

**CHECK** : **Connector & terminal (B84) No. 40 — (B13) No. 2: Is the resistance less than 1 Ω?**

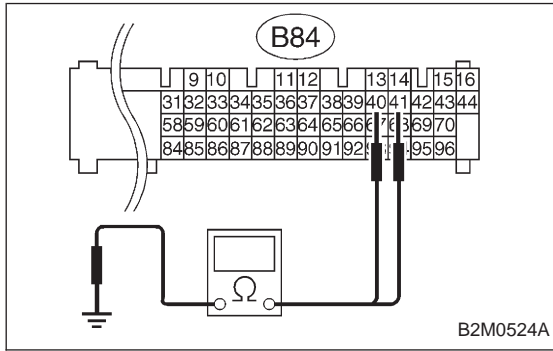
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between ECM and ignitor connector.

**CHECK** : **Connector & terminal (B84) No. 94 — (B13) No. 3: Is the resistance less than 1 Ω?**

**NO** : Repair open circuit in harness between ECM and ignitor connector.

**YES** : Go to next step 3).



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

**CHECK** : **Connector & terminal (B84) No. 41 — Chassis ground: Is the resistance more than 1 MΩ?**

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

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

**CHECK** : **Connector & terminal (B84) No. 40 — Chassis ground: Is the resistance more than 1 MΩ?**

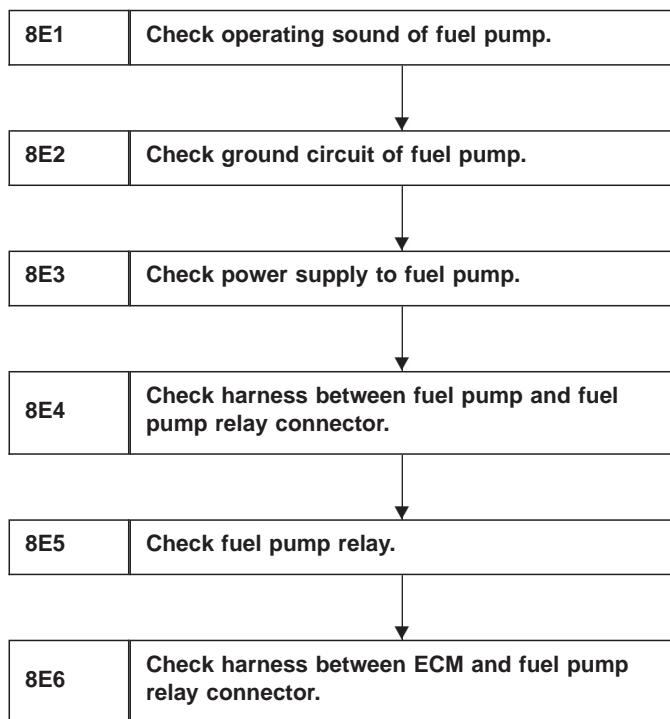
**YES** : Go to next **CHECK** .

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

**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].>

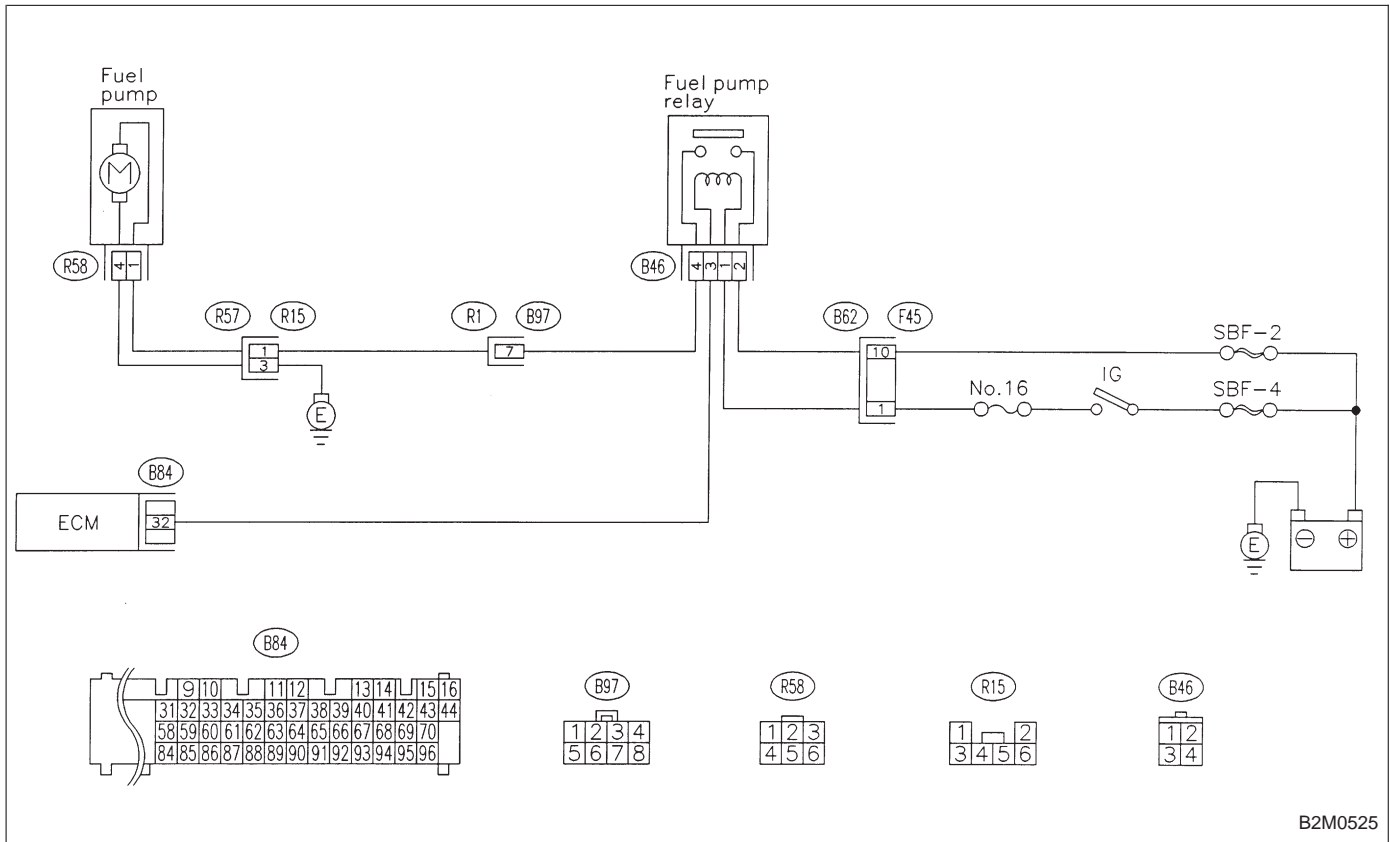
**E: FUEL PUMP CIRCUIT (2200CC FWD,  
2500CC AWD TAIWAN MODEL)****CAUTION:**

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

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

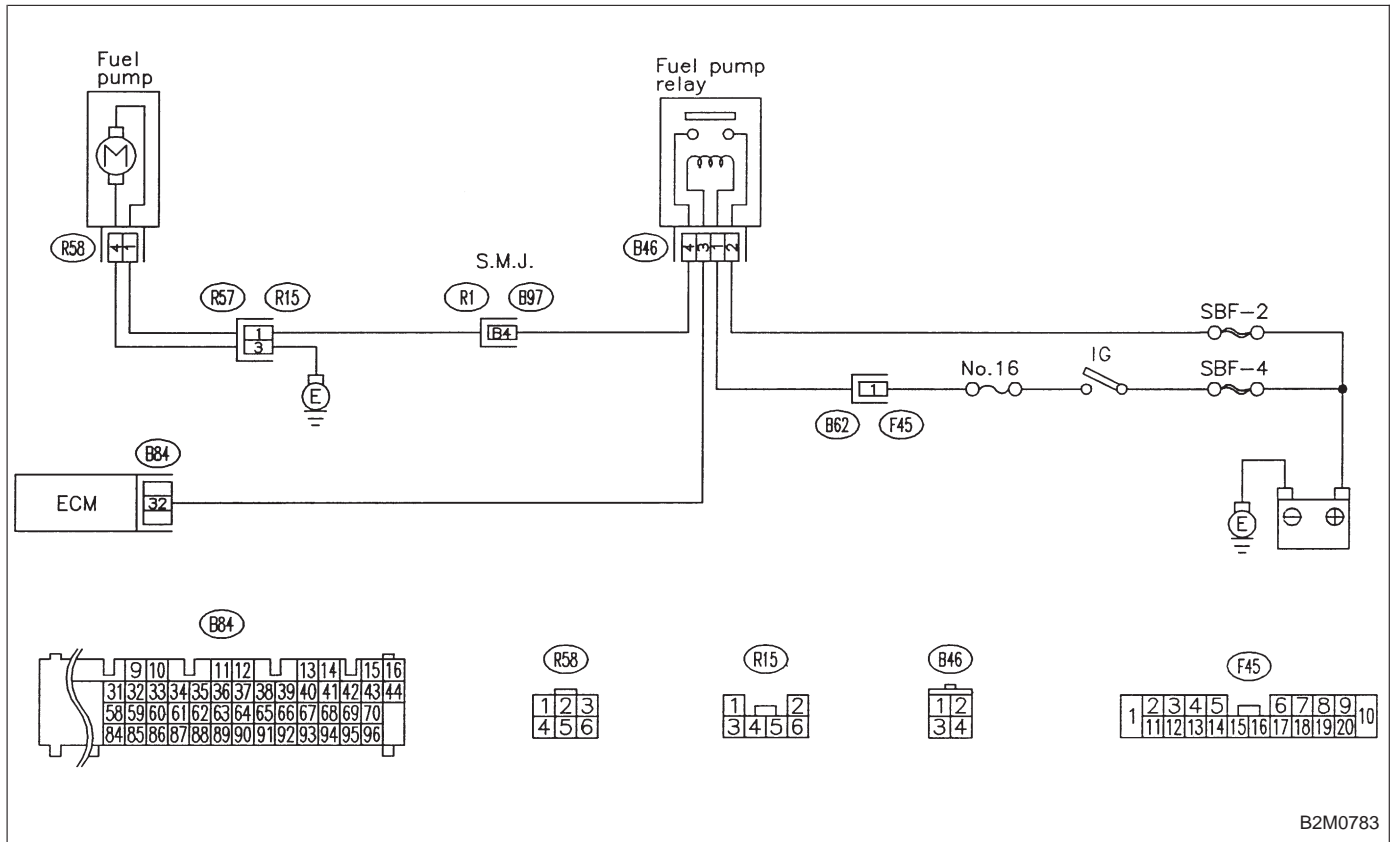
WIRING DIAGRAM:

- LHD Model



WIRING DIAGRAM:

- RHD Model



B2M0783

<b>8E1</b>	<b>CHECK OPERATING SOUND OF FUEL PUMP.</b>
------------	--

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

**CHECK** : **Does fuel pump produce operating sound?**

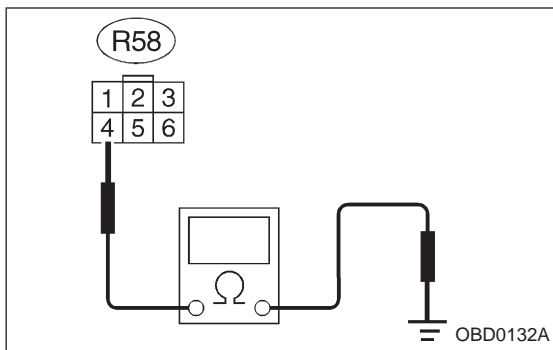
NOTE:

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" 2-7 [T3F0].

**YES** : Check fuel injector circuit. <Ref. to 2-7 [T10V0].>

**NO** : Go to step **8E2**.



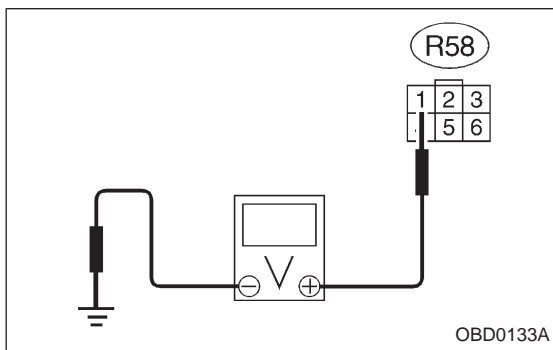
**8E2 CHECK GROUND CIRCUIT OF FUEL PUMP.**

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

**CHECK** : *Connector & terminal (R58) No. 4 — Chassis ground: Is the resistance less than 5 Ω?*

**YES** : Go to step 8E3.

**NO** : Repair open circuit in fuel pump ground circuit.



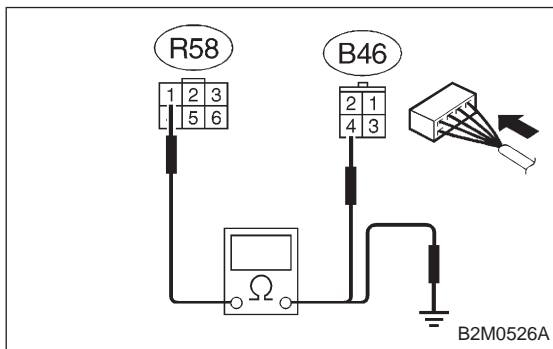
**8E3 CHECK POWER SUPPLY TO FUEL PUMP.**

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

**CHECK** : *Connector & terminal (R58) No. 1 (+) — Chassis ground (-): 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 connector between fuel pump and fuel pump relay.

**CHECK** : *Connector & terminal (R58) No. 1 — (B46) No. 4: Is the resistance less than 1 Ω?*

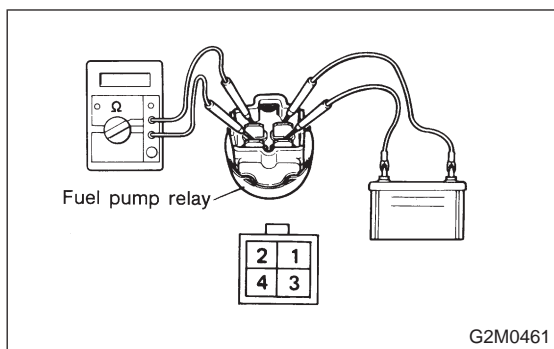
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between fuel pump and fuel pump relay connector.

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

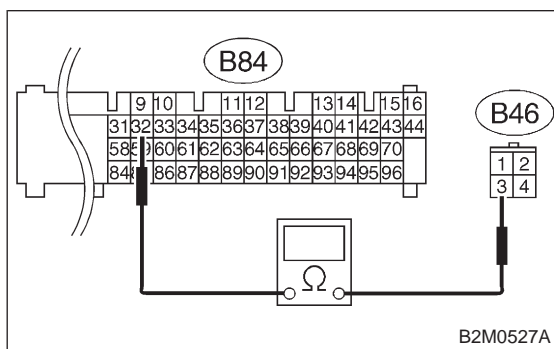
**8E5 CHECK FUEL PUMP RELAY.**

- 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.

**CHECK** : **Terminals**  
**No. 2 — No. 4:**  
**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.

**CHECK** : **Connector & terminal**  
**(B84) No. 32 — (B46) No. 3:**  
**Is the resistance less than 1 Ω?**

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

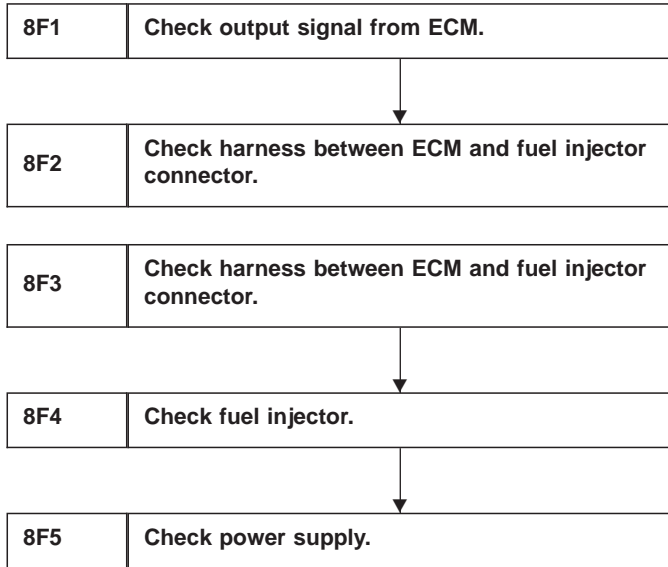
**NO** : Repair harness between ECM and fuel pump relay connector.

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Check fuel injector circuit. <Ref. to 2-7 [T8F0].>

F: FUEL INJECTOR CIRCUIT

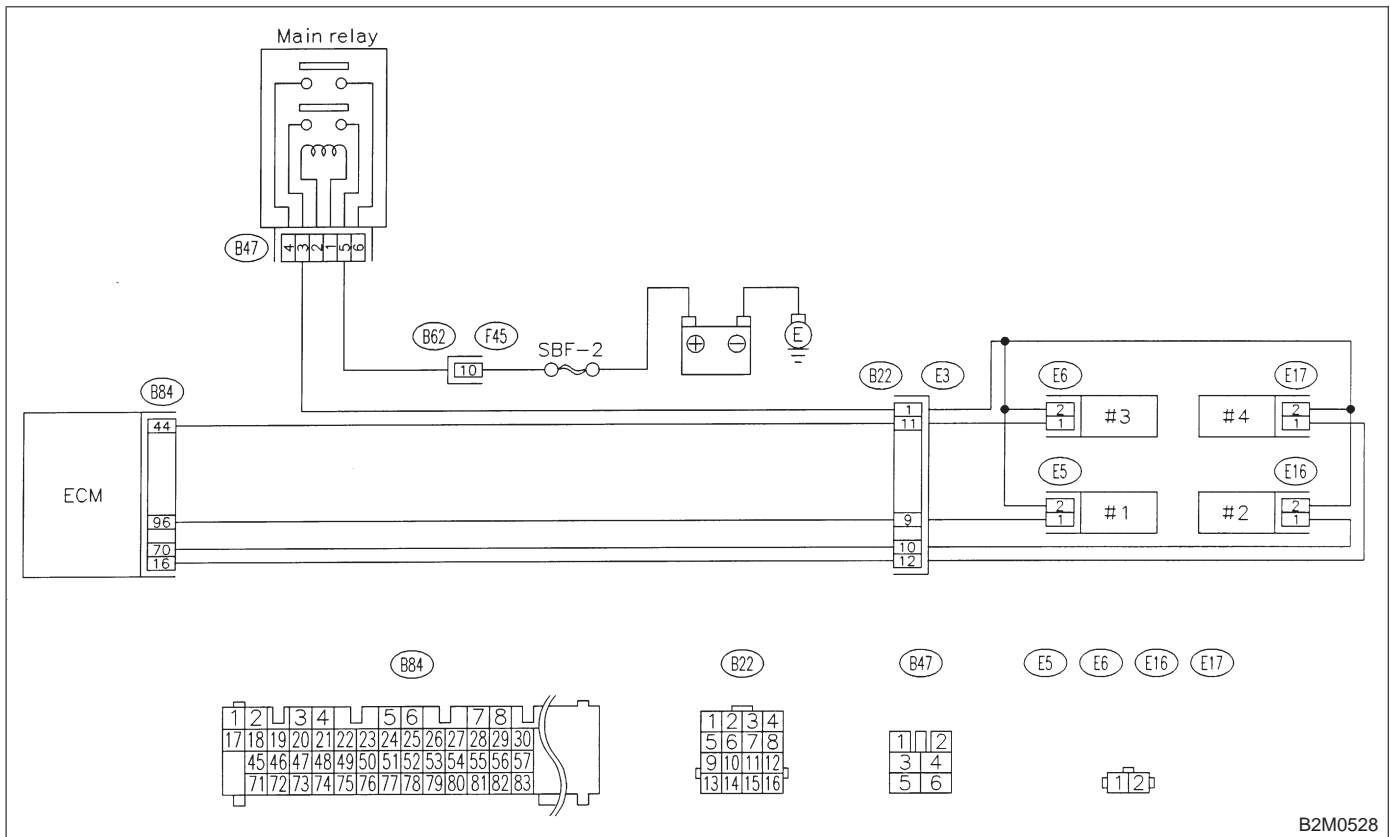


CAUTION:

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

WIRING DIAGRAM:

- LHD Model

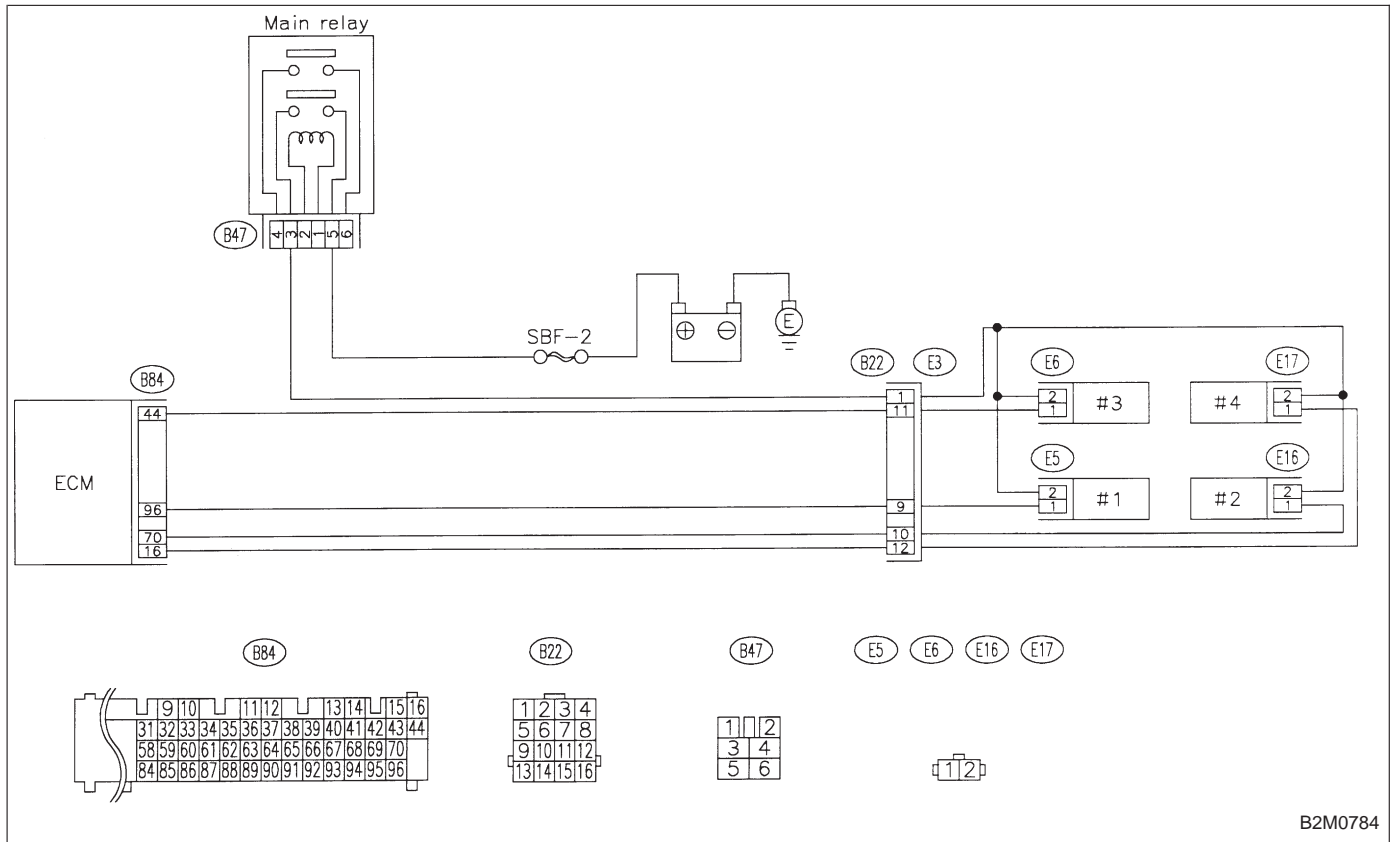


B2M0528



WIRING DIAGRAM:

- RHD Model



B2M0784

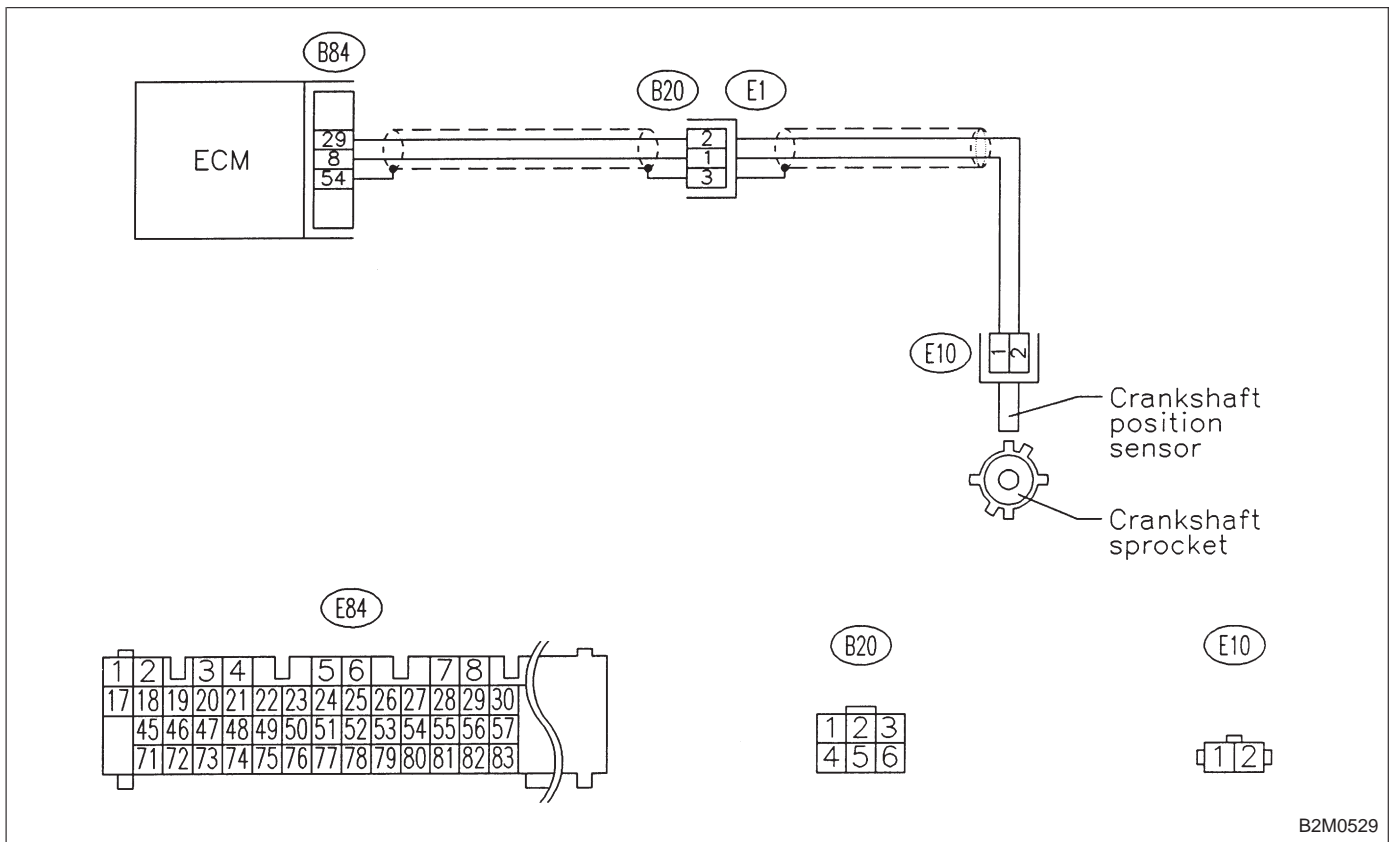
**NOTE:**  
For the diagnostic procedure on fuel injector circuit, refer to 2-7 [T10V0].

**G: CRANKSHAFT POSITION SENSOR CIRCUIT**

8G1	Check harness between ECM and crankshaft position sensor connector.
↓	
8G2	Check crankshaft position sensor.

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

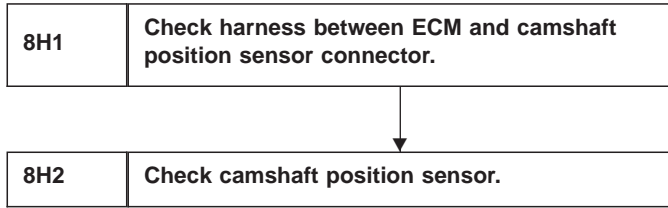
**WIRING DIAGRAM:**



B2M0529

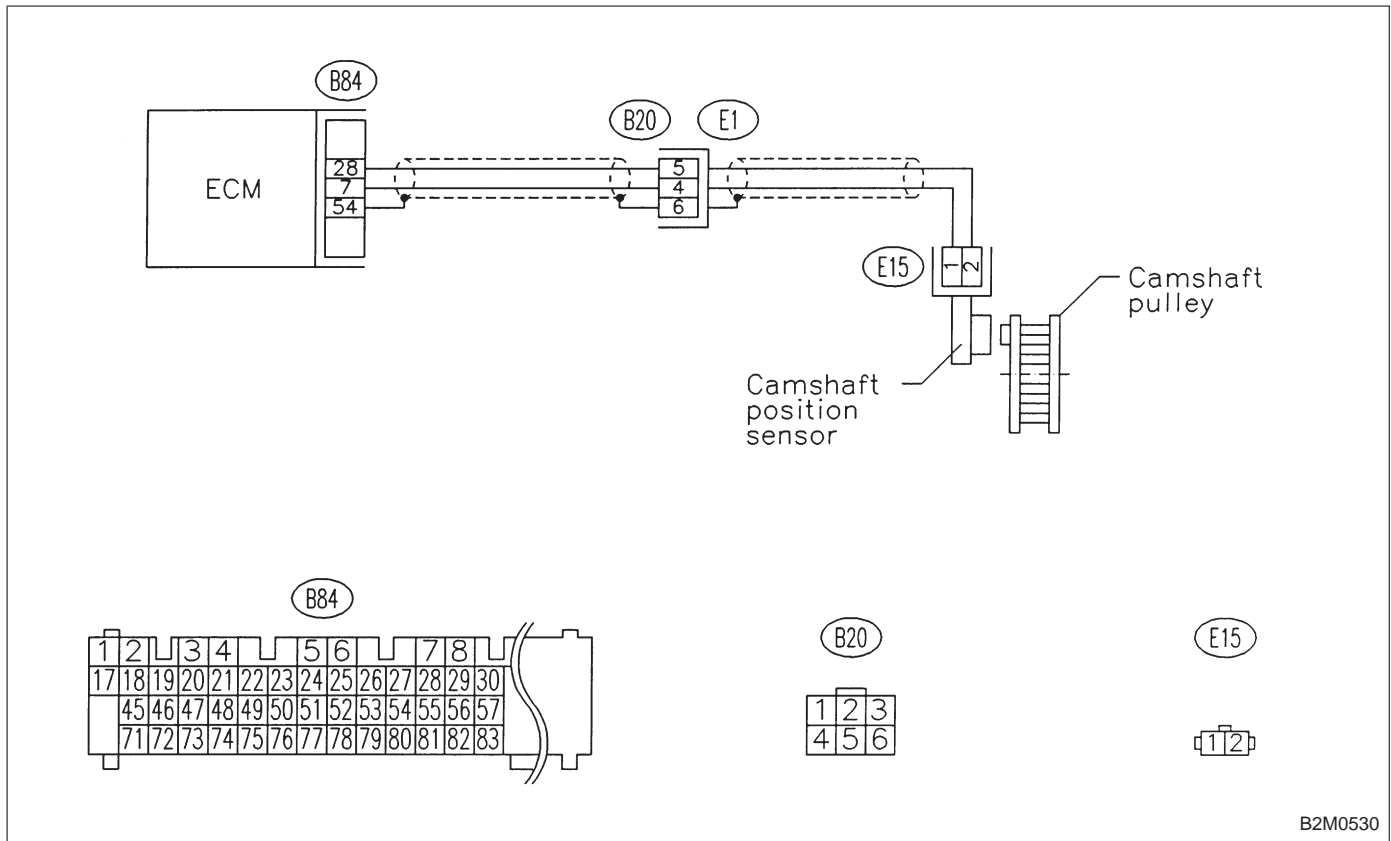
**NOTE:**  
 For the diagnostic procedure on crankshaft position sensor circuit, refer to 2-7 [T10AB0].

**H: CAMSHAFT POSITION SENSOR CIRCUIT**

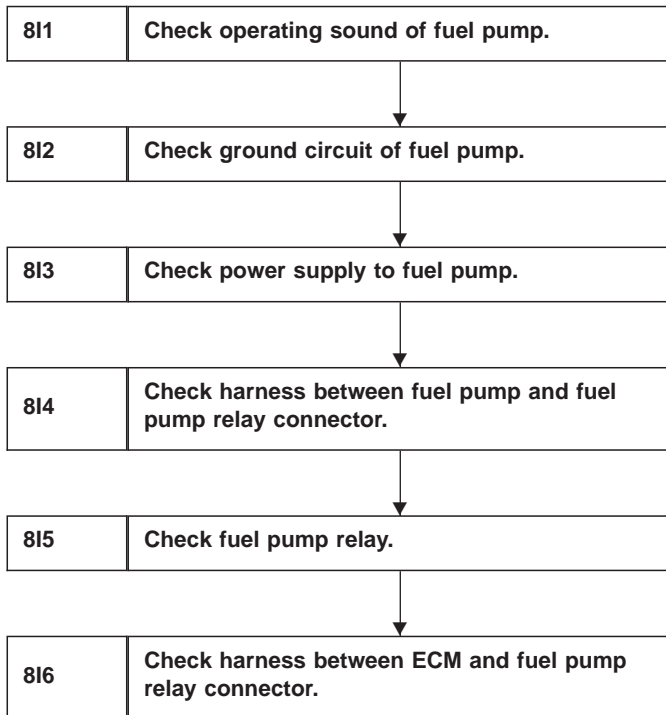


**CAUTION:**  
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.  
 <Ref. to 2-7 [T3D0] and [T3E0].>

**WIRING DIAGRAM:**



**NOTE:**  
 For the diagnostic procedure on camshaft position sensor circuit, refer to 2-7 [T10AC0].

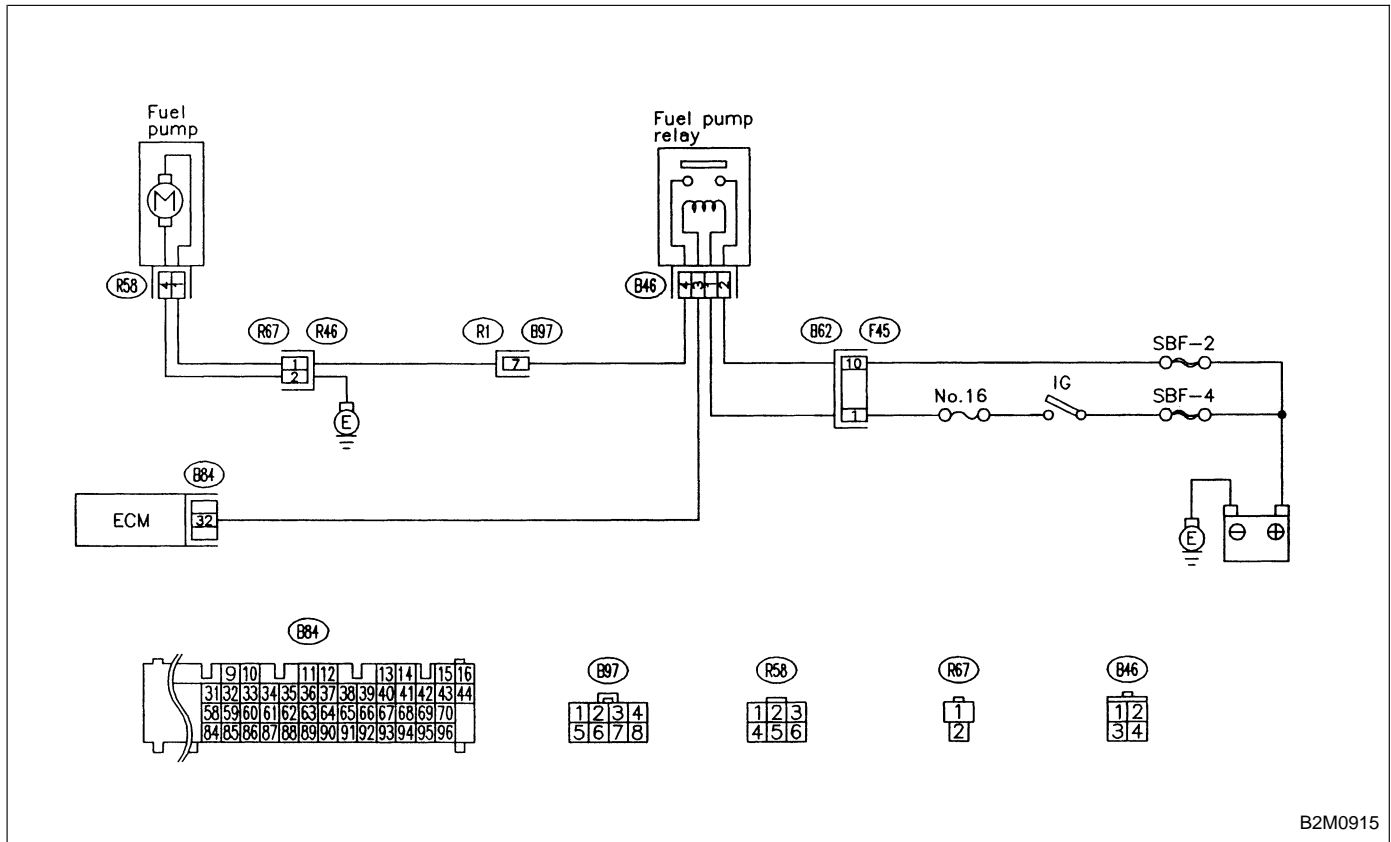
**I: FUEL PUMP CIRCUIT (2200 cc AWD  
EXCEPT TAIWAN MODEL)****CAUTION:**

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

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

WIRING DIAGRAM:

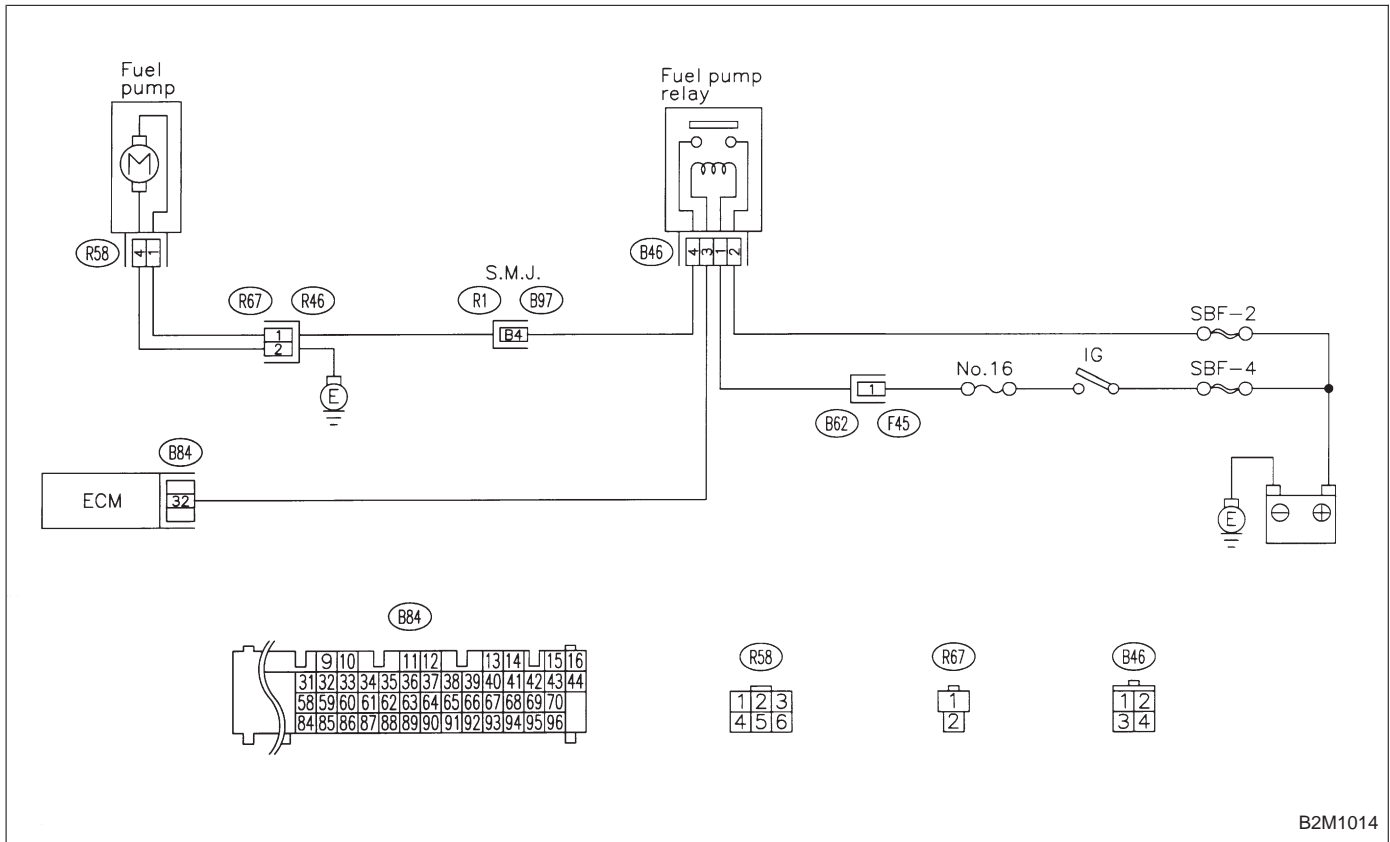
- LHD Model



B2M0915

WIRING DIAGRAM:

- RHD Model



B2M1014

**811 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?**

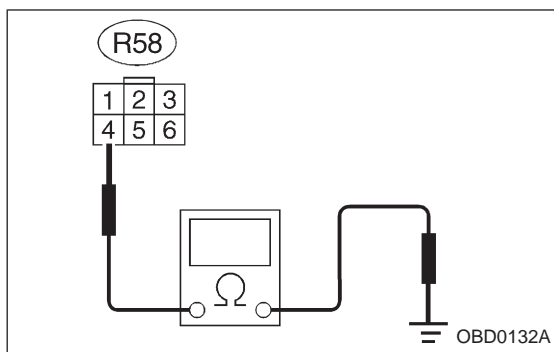
NOTE:

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" 2-7 [T3F0].

**YES** : Check fuel injector circuit. <Ref. to 2-7 [T10V0].>

**NO** : Go to step **812**.

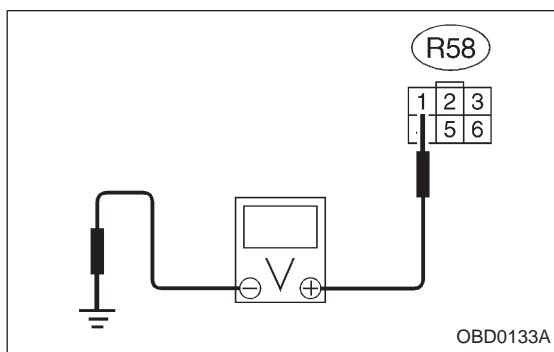
**812****CHECK GROUND CIRCUIT OF FUEL PUMP.**

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

**CHECK** : **Connector & terminal (R58) No. 4 — Chassis ground:**  
**Is the resistance less than 5 Ω?**

**YES** : Go to step **813**.

**NO** : Repair open circuit in fuel pump ground circuit.

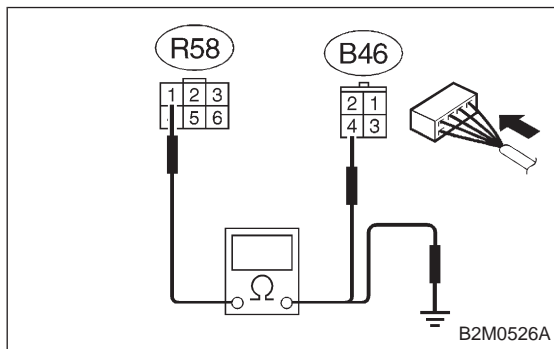
**813****CHECK POWER SUPPLY TO FUEL PUMP.**

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

**CHECK** : **Connector & terminal (R58) No. 1 (+) — Chassis ground (-):**  
**Is the voltage more than 10 V?**

**YES** : Replace fuel pump.

**NO** : Go to step **814**.

**814****CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.**

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

**CHECK** : **Connector & terminal (R58) No. 1 — (B46) No. 4:**  
**Is the resistance less than 1 Ω?**

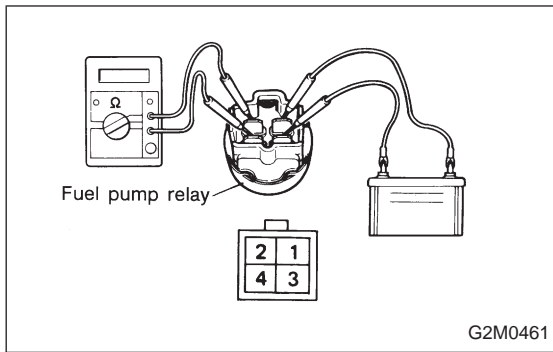
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between fuel pump and fuel pump relay connector.

**CHECK** : **Connector & terminal (R58) No. 1 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

**YES** : Go to step **815**.

**NO** : Repair short circuit in harness between fuel pump and fuel pump relay connector.

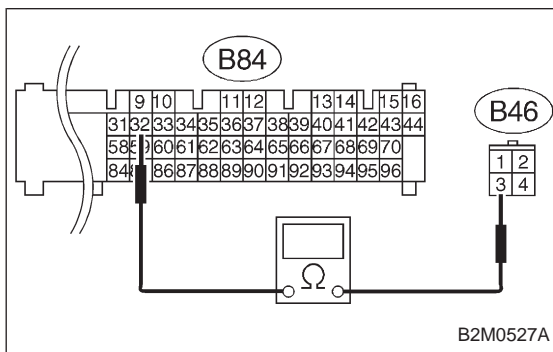


**815 CHECK FUEL PUMP RELAY.**

- 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.

**CHECK** : **Terminals No. 2 — No. 4:**  
**Is the resistance less than 10 Ω?**

- YES** : Go to step 816.  
**NO** : Replace fuel pump relay.



**816 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.

**CHECK** : **Connector & terminal (B84) No. 32 — (B46) No. 3:**  
**Is the resistance less than 1 Ω?**

- YES** : Go to next **CHECK** .  
**NO** : Repair harness between ECM and fuel pump relay connector.

**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].>



## 9. General Diagnostics Table

### 1. FOR ENGINE

Symptom		Problem parts												
		1	2	3	4	5	6	7	8	9	10	11	12	13
		Mass air flow sensor	Engine coolant temperature sensor (*1)	Throttle position sensor	Crankshaft position sensor & Camshaft position sensor (*2)	Idle air control solenoid valve	Knock sensor	Purge control solenoid valve	EGR valve	Fuel injection parts (*3)	Ignition parts (*4)	Fuel pump and relay	A/C switch and A/C cut relay	Engine torque control signal circuit
1	Engine stalls during idling.	○	△		□	○			○	○	○			
2	Rough idling	○	△	○	□	○			○					
3	Engine does not return to idle.	○		○		○								
4	Poor acceleration	○	△		□					○		○	○	○
5	Engine stalls or engine sags or hesitates at acceleration.	○	△	○	□			○	○	○		○		
6	Surge	○	△	○					○	○		○		
7	Spark knock	○					○			○		○		
8	After burning in exhaust system	○	△							○		○		

\*1: The mark, △, indicates the symptom occurring only in cold temperatures.

\*2: For items with the mark, □, ensure the secure installation of crankshaft position sensor and camshaft position sensor. Replacement is not necessary.

\*3: Check fuel injector, fuel pressure regulator and fuel filter.

\*4: Check ignitor, ignition coil and spark plug.

**NOTE:**

Malfunction of parts other than the above is also possible. Refer to 1. Engine Trouble in General [K100] in Repair Section 2-3 or 2-3b of the Service Manual.

2. FOR AT

Symptom	Problem parts																												
	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Hold switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	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
Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	○				○	○		○																					
Abnormal noise when select lever is in "P" or "N."																○												○	
Hissing noise occurs during standing starts.																○													
Noise occurs while driving in "D <sub>1</sub> " range.																													
Noise occurs while driving in "D <sub>2</sub> " range.																													
Noise occurs while driving in "D <sub>3</sub> " range.																													
Noise occurs while driving in "D <sub>4</sub> " range.																													
Engine stalls while shifting from one range to another.																							○						
Vehicle moves when select lever is in "N."																													○
Shock occurs when select lever is moved from "N" to "D."		○									○											○							
Excessive time lag occurs when select lever is moved from "N" to "D."																						○							○
Shock occurs when select lever is moved from "N" to "R."		○											○									○							
Excessive time lag occurs when select lever is moved from "N" to "R."																						○							
Vehicle does not start in any shift range (engine revving up).																○						○							
Vehicle does not start in any shift range (engine stall).																													
Vehicle does not start in "R" range only (engine revving up).					○	○																○							
Vehicle does not start in "R" range only (engine stall).																													○
Vehicle does not start in "D" or "3" range (engine revving up).																													○
Vehicle does not start in "D", "3" or "2" range (engine revving up).																													○
Vehicle does not start in "D", "3" or "2" range (engine stall).																													○
Vehicle starts in "R" range only (engine revving up).																						○							
Acceleration during standing starts is poor (high stall rpm).																						○							○
Acceleration during standing starts is poor (low stall rpm).																													
Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).		○																				○							
Acceleration is poor when select lever is in "R" (normal stall rpm).																							○						
No shift occurs from 1st to 2nd gear.		○	○	○					○											○	○	○							
No shift occurs from 2nd to 3rd gear.		○																					○						
No shift occurs from 3rd to 4th gear.		○											○	○								○	○						
No "kick-down" shifts occur.		○							○																				
Engine brake is not effected when select lever is in "3" range.	○	○							○													○							

9. General Diagnostics Table

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	Problem parts
																												Symptom	
																												Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	
							○												○					○				Abnormal noise when select lever is in "P" or "N."	
																								○				Hissing noise occurs during standing starts.	
					○												○	○							○			Noise occurs while driving in "D <sub>1</sub> " range.	
					○												○	○							○			Noise occurs while driving in "D <sub>2</sub> " range.	
					○												○	○							○			Noise occurs while driving in "D <sub>3</sub> " range.	
					○												○	○							○			Noise occurs while driving in "D <sub>4</sub> " range.	
																						○			○			Engine stalls while shifting from one range to another.	
																												Vehicle moves when select lever is in "N."	
																												Shock occurs when select lever is moved from "N" to "D."	
																												Excessive time lag occurs when select lever is moved from "N" to "D."	
																												Shock occurs when select lever is moved from "N" to "R."	
										○	○																	Excessive time lag occurs when select lever is moved from "N" to "R."	
	○	○	○	○			○									○	○	○		○								Vehicle does not start in any shift range (engine revving up).	
																										○		Vehicle does not start in any shift range (engine stall).	
											○	○																Vehicle does not start in "R" range only (engine revving up).	
																	○											Vehicle does not start in "R" range only (engine stall).	
												○																Vehicle does not start in "D" or "3" range (engine revving up).	
																												Vehicle does not start in "D", "3" or "2" range (engine revving up).	
																												Vehicle does not start in "D", "3" or "2" range (engine stall).	
																												Vehicle starts in "R" range only (engine revving up).	
																									○			Acceleration during standing starts is poor (high stall rpm).	
							○																			○		Acceleration during standing starts is poor (low stall rpm).	
								○	○									○										Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).	
○								○	○									○										Acceleration is poor when select lever is in "R" (normal stall rpm).	
									○																			No shift occurs from 1st to 2nd gear.	
												○																No shift occurs from 2nd to 3rd gear.	
																												No shift occurs from 3rd to 4th gear.	
																												No "kick-down" shifts occur.	
																												Engine brake is not effected when select lever is in "3" range.	

Symptom	Problem parts																												
	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Hold switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	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
Engine brake is not effected when select lever is in "3" or "2" range.																													
Engine brake is not effected when select lever is in "1" range.																							○						
Shift characteristics are erroneous.	○	○	○	○					○														○						
No lock-up occurs.		○							○						○								○						
Vehicle cannot be set in "D" range power mode.		○							○																				
"D" range power mode cannot be released.		○							○						○														
Parking brake is not effected.					○	○																							
Shift lever cannot be moved or is hard to move from "P" range.					○	○																							
Select lever is hard to move.					○	○																		○	○				
Select lever is too light to move (unreasonable resistance).																							○	○					
ATF spurts out.																													
Differential oil spurts out.																													
Differential oil level changes excessively.																													
Odor is produced from oil supply pipe.																										○			○
Shock occurs when select lever is moved from "1" to "2" range.		○							○			○			○		○					○							
Slippage occurs when select lever is moved from "1" to "2" range.		○							○			○			○		○					○							
Shock occurs when select lever is moved from "2" to "3" range.		○							○				○		○		○					○							
Slippage occurs when select lever is moved from "2" to "3" range.		○							○				○		○		○					○							
Shock occurs when select lever is moved from "3" to "4" range.		○							○				○		○		○					○							
Slippage occurs when select lever is moved from "3" to "4" range.		○							○				○		○		○					○							
Shock occurs when select lever is moved from "3" to "2" range.		○							○						○		○					○							
Shock occurs when select lever is moved from "D" to "1" range.		○							○						○		○					○							
Shock occurs when select lever is moved from "2" to "1" range.		○							○						○		○					○							
Shock occurs when accelerator pedal is released at medium speeds.		○							○						○		○					○							
Vibration occurs during straight-forward operation.		○																											
Select lever slips out of position during acceleration or while driving on rough terrain.					○	○																	○	○					
Vibration occurs during turns (tight corner "braking" phenomenon).		○	○	○					○	○					○											○	○		○
Front wheel slippage occurs during standing starts.		○		○			○		○	○					○							○			○	○	○	○	○
Vehicle is not set in FWD mode.		○					○																		○	○		○	
	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

9. General Diagnostics Table

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	Problem parts
																												Symptom	
																												Engine brake is not effected when select lever is in "3" or "2" range.	
																												Engine brake is not effected when select lever is in "1" range.	
																												Shift characteristics are erroneous.	
																												No lock-up occurs.	
																												Vehicle cannot be set in "D" range power mode.	
																												"D" range power mode cannot be released.	
																												Parking brake is not effected.	
																												Shift lever cannot be moved or is hard to move from "P" range.	
																												Select lever is hard to move.	
																												Select lever is too light to move (unreasonable resistance).	
																												ATF spurts out.	
																												Differential oil spurts out.	
																												Differential oil level changes excessively.	
																												Odor is produced from oil supply pipe.	
																												Shock occurs when select lever is moved from "1" to "2" range.	
																												Slippage occurs when select lever is moved from "1" to "2" range.	
																												Shock occurs when select lever is moved from "2" to "3" range.	
																												Slippage occurs when select lever is moved from "2" to "3" range.	
																												Shock occurs when select lever is moved from "3" to "4" range.	
																												Slippage occurs when select lever is moved from "3" to "4" range.	
																												Shock occurs when select lever is moved from "3" to "2" range.	
																												Shock occurs when select lever is moved from "D" to "1" range.	
																												Shock occurs when select lever is moved from "2" to "1" range.	
																												Shock occurs when accelerator pedal is released at medium speeds.	
																												Vibration occurs during straight-forward operation.	
																												Select lever slips out of position during acceleration or while driving on rough terrain.	
																												Vibration occurs during turns (tight corner "braking" phenomenon).	
																												Front wheel slippage occurs during standing starts.	
																												Vehicle is not set in FWD mode.	

## 10. Diagnostics Chart with Trouble Code

### A: DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC No.	Abbreviation (Subaru select monitor)	Item	Page
P0100	QA	Mass air flow sensor circuit malfunction	125
P0101	QA – R	Mass air flow sensor circuit range/performance problem	132
P0105	P – S	Pressure sensor circuit malfunction	134
P0106	PS – R	Pressure sensor circuit range/performance problem	142
P0115	TW	Engine coolant temperature sensor circuit malfunction	147
P0120	THV	Throttle position sensor circuit malfunction	151
P0121	TH – R	Throttle position sensor circuit range/performance problem	157
P0125	TW – CL	Insufficient coolant temperature for closed loop fuel control	159
P0130	FO2 – V	Front oxygen sensor circuit malfunction	161
P0133	FO2 – R	Front oxygen sensor circuit slow response	164
P0135	FO2H	Front oxygen sensor heater circuit malfunction	166
P0136	RO2 – V	Rear oxygen sensor circuit malfunction	172
P0139	RO2 – R	Rear oxygen sensor circuit slow response	177
P0141	RO2H	Rear oxygen sensor heater circuit malfunction	179
P0170	FUEL	Fuel trim malfunction	185
P0180	TNKT	Fuel temperature sensor A circuit malfunction	190
P0181	TNKT – F	Fuel temperature sensor A circuit range/performance problem	195
P0201	INJ1	Fuel injector circuit malfunction - #1	197
P0202	INJ2	Fuel injector circuit malfunction - #2	
P0203	INJ3	Fuel injector circuit malfunction - #3	
P0204	INJ4	Fuel injector circuit malfunction - #4	
P0301	MIS – 1	Cylinder 1 misfire detected	203
P0302	MIS – 2	Cylinder 2 misfire detected	
P0303	MIS – 3	Cylinder 3 misfire detected	
P0304	MIS – 4	Cylinder 4 misfire detected	
P0325	KNOCK	Knock sensor circuit malfunction	211
P0335	CRANK	Crankshaft position sensor circuit malfunction	215
P0340	CAM	Camshaft position sensor circuit malfunction	218
P0400	EGR	Exhaust gas recirculation flow malfunction	221
P0403	EGRSOL	Exhaust gas recirculation circuit malfunction	227
P0420	CAT	Catalyst system efficiency below threshold	233
P0440	EVAP	Evaporative emission control system malfunction	236
P0441	CPC – F	Evaporative emission control system incorrect purge flow	241
P0443	CPC	Evaporative emission control system purge control valve circuit malfunction	244
P0446	VCMSOL	Evaporative emission control system vent control malfunction	249
P0450	TNKP	Evaporative emission control system pressure sensor malfunction	255
P0451	TNKP – F	Evaporative emission control system pressure sensor range/performance problem	264

DTC No.	Abbreviation (Subaru select monitor)	Item	Page
P0500	VSP	Vehicle speed sensor malfunction	266
P0505	ISC	Idle control system malfunction	269
P0506	ISC — L	Idle control system RPM lower than expected	276
P0507	ISC — H	Idle control system RPM higher than expected	277
P0600	—	Serial communication link malfunction	278
P0601	RAM	Internal control module memory check sum error	281
P0703	ATBRK	Brake switch input malfunction	283
P0705	ATRNG	Transmission range sensor circuit malfunction	286
P0710	ATF	Transmission fluid temperature sensor circuit malfunction	293
P0720	ATVSP	Output speed sensor (vehicle speed sensor 1) circuit malfunction	294
P0725	ATNE	Engine speed input circuit malfunction	295
P0731	ATGR1	Gear 1 incorrect ratio	296
P0732	ATGR2	Gear 2 incorrect ratio	
P0733	ATGR3	Gear 3 incorrect ratio	
P0734	ATGR4	Gear 4 incorrect ratio	
P0740	ATLU — F	Torque converter clutch system malfunction	300
P0743	ATLU	Torque converter clutch system electrical	304
P0748	ATPL	Pressure control solenoid electrical	305
P0753	ATSFT1	Shift solenoid A electrical	306
P0758	ATSFT2	Shift solenoid B electrical	307
P0760	ATOVR — F	Shift solenoid C malfunction	308
P0763	ATOVR	Shift solenoid C electrical	312
P1100	ST — SW	Starter switch circuit malfunction	313
P1101	N/P — SW	Neutral position switch circuit malfunction [MT vehicles]	315
P1101	N/P — SW	Neutral position switch circuit malfunction [AT vehicles]	318
P1102	BR	Pressure sources switching solenoid valve circuit malfunction	322
P1103	TRQ	Engine torque control signal circuit malfunction	328
P1400	PCVSOL	Fuel tank pressure control solenoid valve circuit malfunction	331
P1401	PCV — F	Fuel tank pressure control system function problem	337
P1402	FLVL	Fuel level sensor circuit malfunction	339
P1500	FAN — 1	Radiator fan relay 1 circuit malfunction	351
P1502	FAN — F	Radiator fan function problem	358
P1700	ATTH	Throttle position sensor circuit malfunction for automatic transmission	361
P1701	ATCRS	Cruise control set signal circuit malfunction for automatic transmission	362
P1702	ATDIAG	Automatic transmission diagnosis input signal circuit malfunction	365
P0461*1	EXERR22	Fuel level sensor circuit range/performance problem	368

\*1: Only OBD-II general scan tool displays DTC.

OBD	(FB1)
P0100	<QA>
OBD0142	

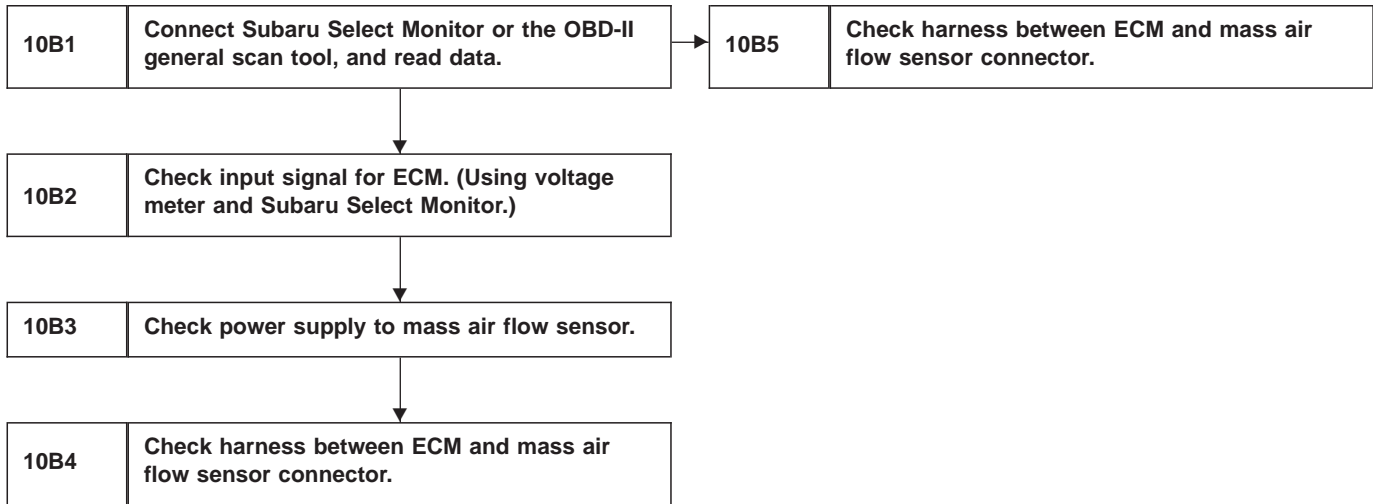
**B: DTC P0100  
— MASS AIR FLOW SENSOR CIRCUIT  
MALFUNCTION (QA) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance



**CAUTION:**

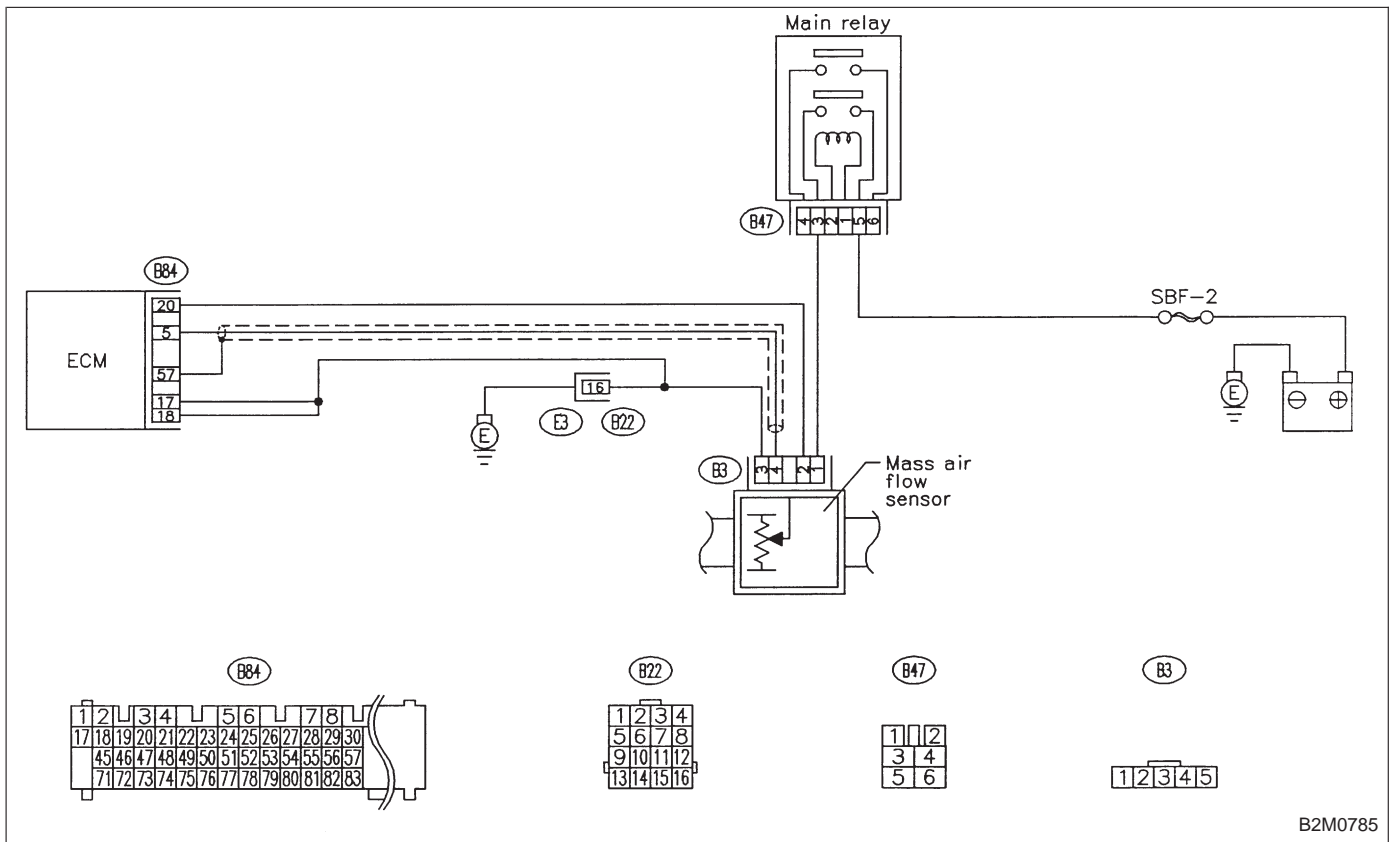
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>

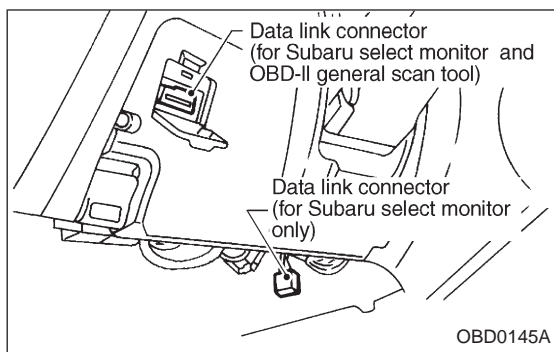




WIRING DIAGRAM:

- RHD Model





QA	( F06 )
1 . 67g / s	2 . 02V

B2M0481

10B1

### 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 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 next **CHECK** .

QA	( F06 )
1 . 67g / s	2 . 02V

B2M0481

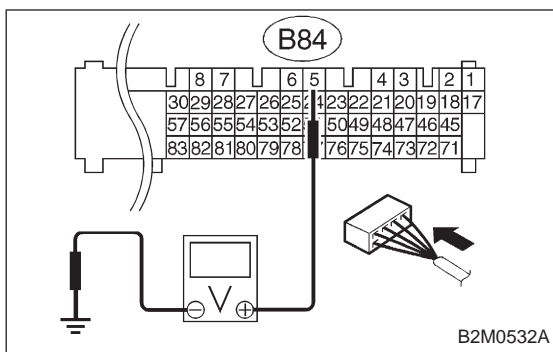
**CHECK** : *Is the value less than 1.3 g/sec or 0.3 V in function mode F06?*

**YES** : Go to step 10B2.

**NO** : Go to step 10B5.

- OBD-II general scan tool

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



**10B2** CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

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

**CHECK** : Connector & terminal (B84) No. 5 (+) — Chassis ground (-): Is the voltage less than 0.3 V?

**YES** : Go to step 10B3.

**NO** : Go to next **CHECK** .

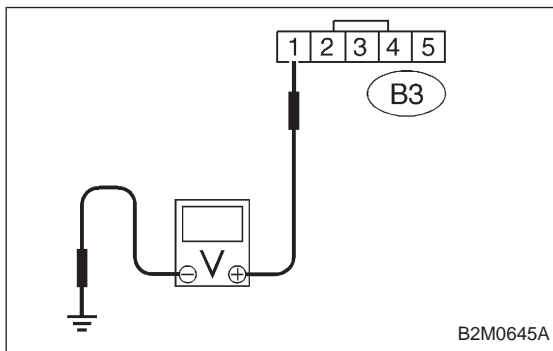
QA ( F06 )  
1 . 67g / s 2 . 02V

B2M0481

**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** : Replace ECM.



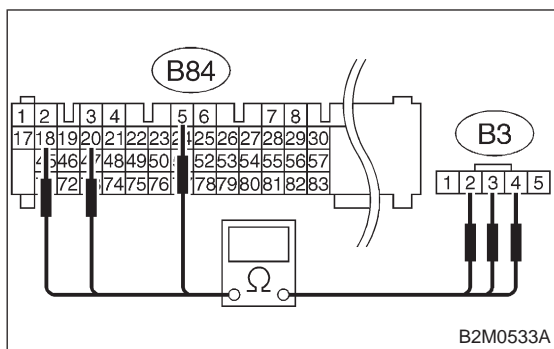
**10B3** CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.

- 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.

**CHECK** : Connector & terminal (B3) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?

**YES** : Go to step 10B4.

**NO** : Repair open circuit in harness between main relay and mass air flow sensor connector.

**10B4****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.

**CHECK** : **Connector & terminal**  
**(B84) No. 5 — (B3) No. 4:**  
**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 ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector

**CHECK** : **Connector & terminal**  
**(B84) No. 18 — (B3) No. 3:**  
**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 ECM and mass air flow sensor connector
- Poor contact in mass air flow sensor connector
- Poor contact in ECM connector

**CHECK** : **Connector & terminal**  
**(B84) No. 20 — (B3) No. 2:**  
**Is the resistance less than 1 Ω?**

**YES** : Replace mass air flow sensor.

**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

QA ( F06 )

1 . 67g / s 2 . 02V

B2M0481

10B5

**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 short circuit in harness between mass air flow sensor and ECM connector.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in mass air flow sensor connector?**

**YES** : Repair poor contact in mass air flow sensor connector.

**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)
P0101	<QA_R>
OBD0152	

**C: DTC P0101**  
**— MASS AIR FLOW SENSOR CIRCUIT**  
**RANGE/PERFORMANCE PROBLEM**  
**(QA – R) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

<b>10C1</b>	Check DTC P0100 on display.
-------------	-----------------------------

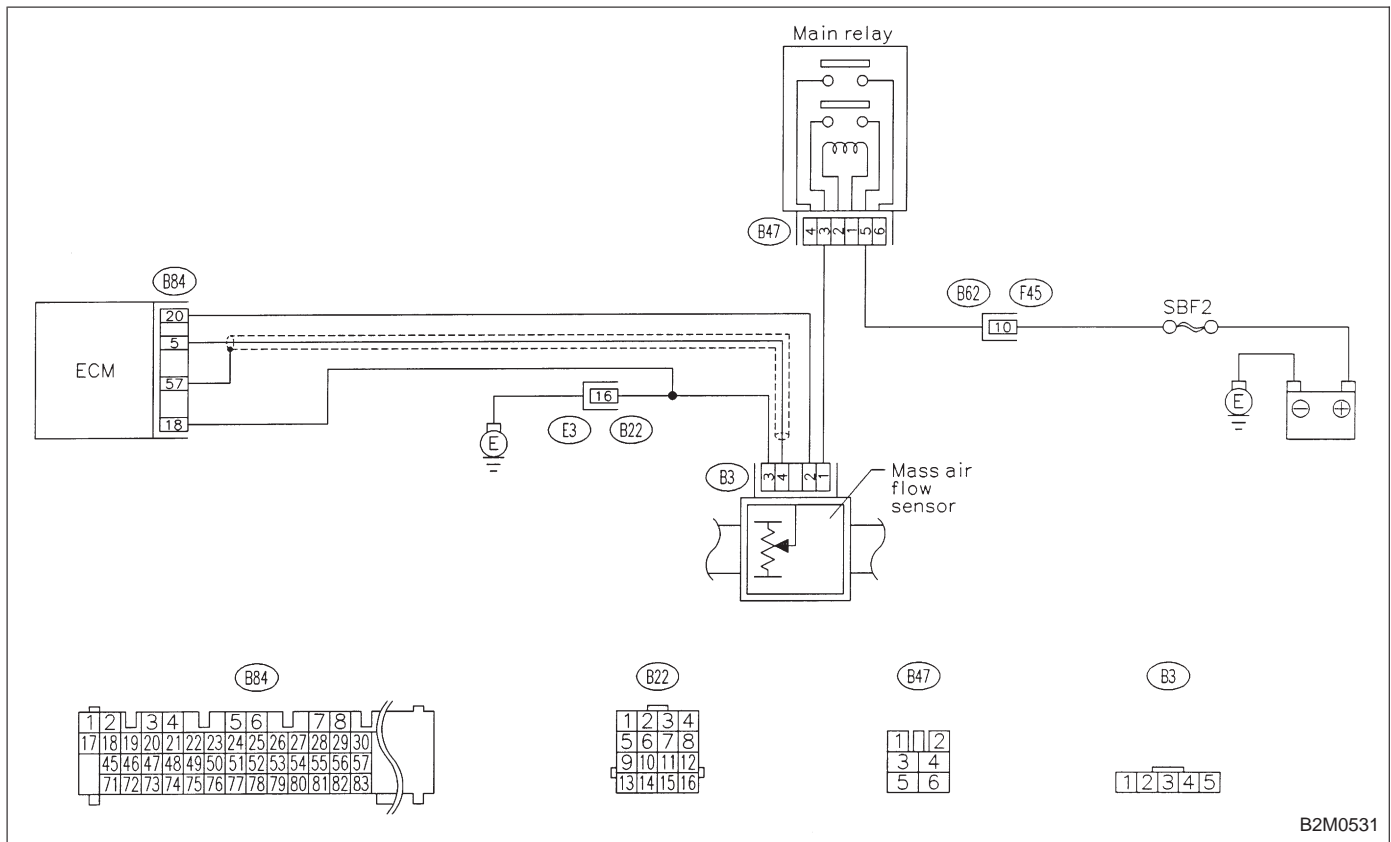
**CAUTION:**

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

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

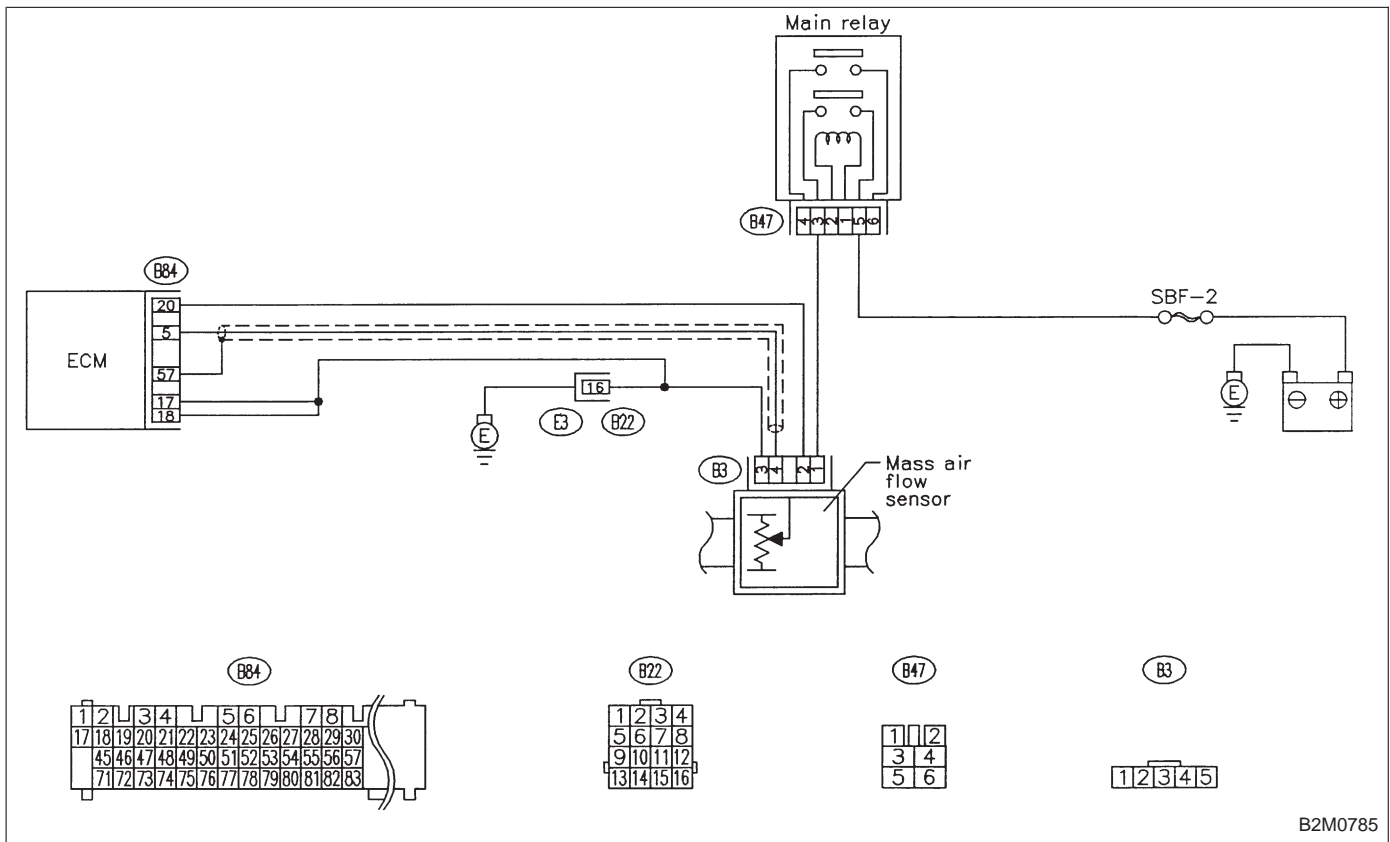
**WIRING DIAGRAM:**

- LHD Model



WIRING DIAGRAM:

- RHD Model



**10C1 CHECK DTC P0100 ON DISPLAY.**

**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0100?

**YES** : Inspect DTC P0100 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

**NOTE:**

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

**NO** : Replace mass air flow sensor.

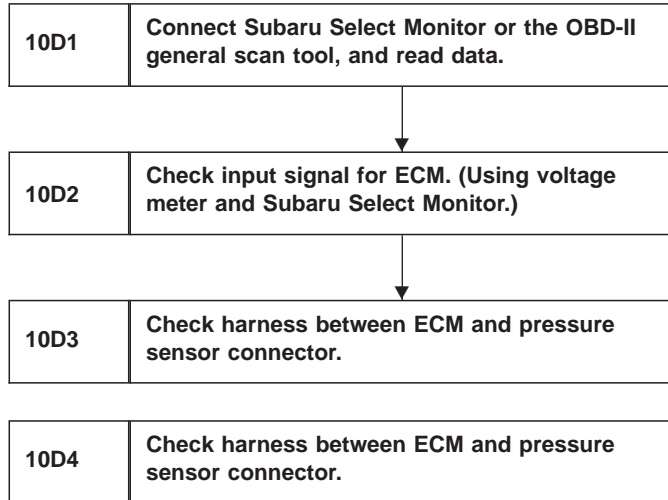


OBD	(FB1)
P0105	<P_S>
OBD0154	

**D: DTC P0105**  
**— PRESSURE SENSOR CIRCUIT**  
**MALFUNCTION (P – S) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition



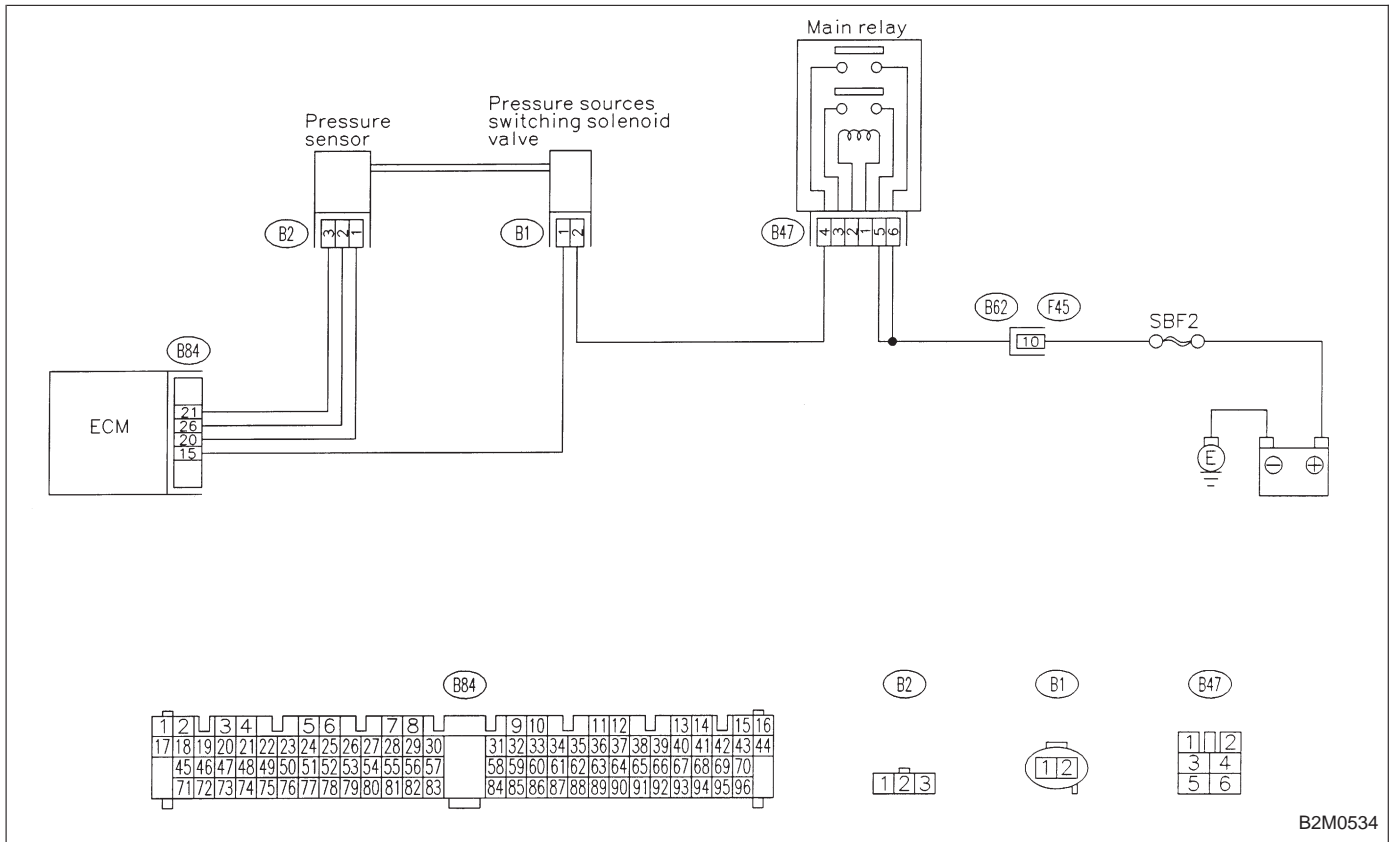
**CAUTION:**

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

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

WIRING DIAGRAM:

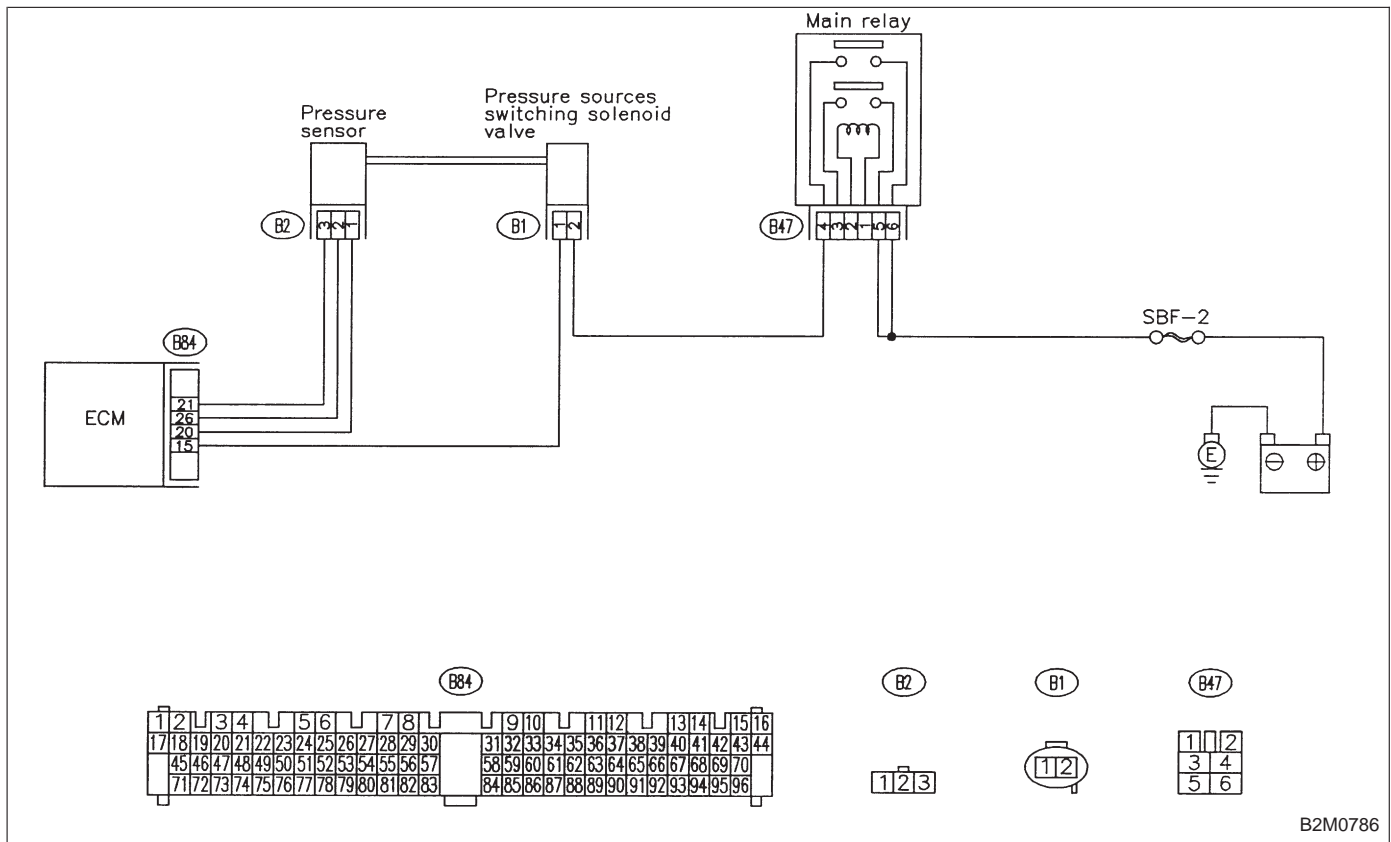
- LHD Model



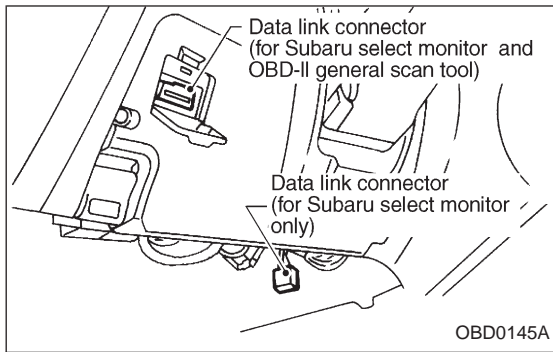
B2M0534

WIRING DIAGRAM:

- RHD Model



B2M0786



**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.

MANI.P      ( F 2 1 )

29kPa218mmHg

B2M0756

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 **10D2**.

**NO** : Go to next **CHECK** .

MANI.P      ( F 2 1 )

29kPa218mmHg

B2M0756

**CHECK** : *Is the value more than 140 kPa in function mode F21?*

**YES** : Go to step **10D4**.

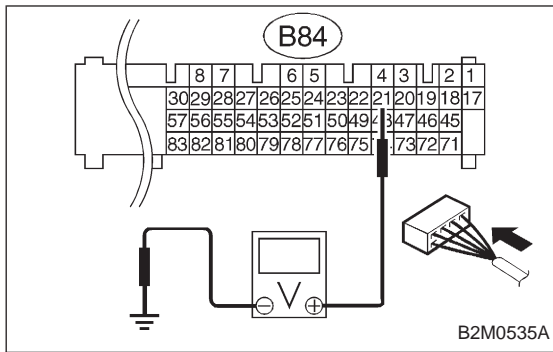
**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open or short circuit in harness between pressure sensor and ECM connector
- Poor contact in pressure sensor
- Poor contact in ECM connector
- OBD-II general scan tool

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



10D2

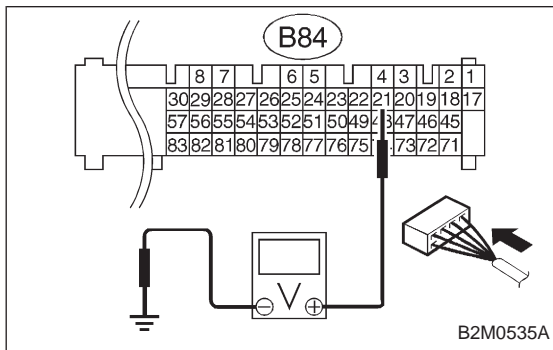
**CHECK INPUT SIGNAL FOR ECM.  
(USING VOLTAGE METER AND SUBARU  
SELECT MONITOR.)**

1) Measure voltage between ECM connector and chassis ground.

**CHECK** : *Connector & terminal  
(B84) No. 21 (+) — Chassis ground (-):  
Is the voltage more than 4.5 V?*

**YES** : Go to next step 2).

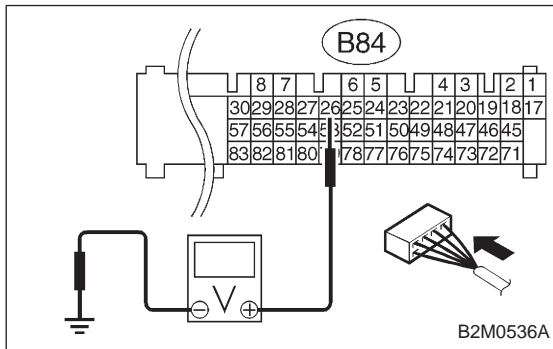
**NO** : Go to next **CHECK** .



**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** : Replace ECM.



2) Measure voltage between ECM and chassis ground.

**CHECK** : *Connector & terminal  
(B84) No. 26 (+) — Chassis ground (-):  
Is the voltage less than 0.2 V?*

**YES** : Go to step 10D3.

**NO** : Go to next **CHECK** .

BARO. P ( F 2 0 )

1 0 0 kPa 752 mmHg

B2M0755

3) Read data on Subaru Select Monitor.

- Subaru Select Monitor
- Designate mode using function key.

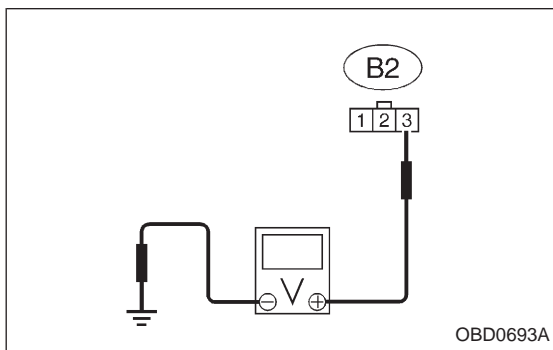
**Function mode: F20**

- 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 10D3.



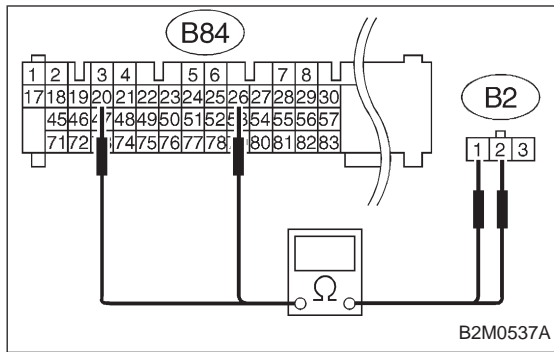
**10D3 CHECK HARNESS BETWEEN ECM AND PRESSURE SENSOR CONNECTOR.**

- 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.

**CHECK** : *Connector & terminal (B2) No. 3 (+) — Engine ground (-): 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.

**CHECK** : **Connector & terminal**  
**(B84) No. 26 — (B2) No. 2:**  
**Is the resistance less than 1 Ω?**

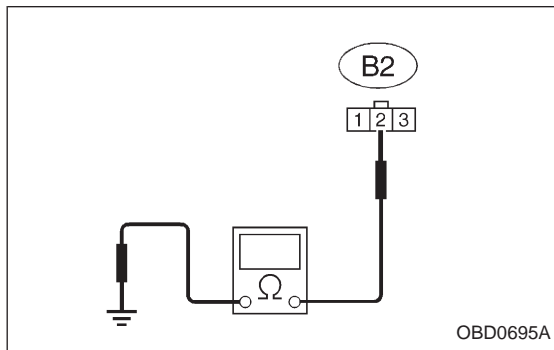
**YES** : Go to next **CHECK** .

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

**CHECK** : **Connector & terminal**  
**(B84) No. 20 — (B2) No. 1:**  
**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 pressure sensor connector and engine ground.

**CHECK** : **Connector & terminal**  
**(B2) No. 2 — Engine ground:**  
**Is the resistance more than 500 kΩ?**

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

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

**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

10D4

**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?*

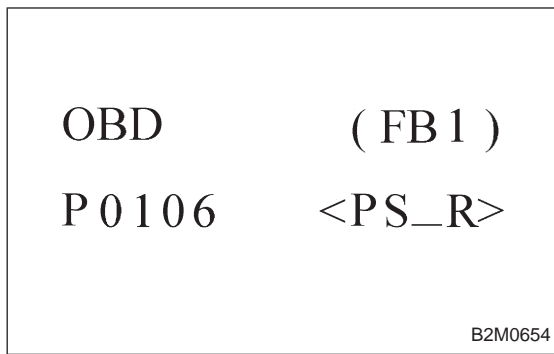
**YES** : Repair short circuit in harness between ECM and pressure sensor connector.

**NO** : Replace pressure sensor.

- OBD-II general scan tool

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

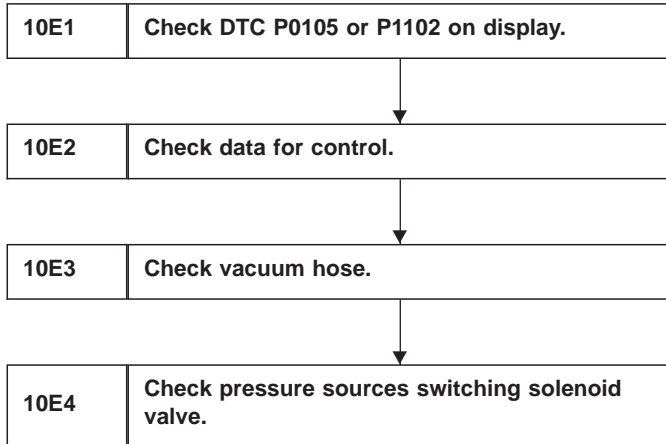




**E: DTC P0106**  
**— PRESSURE SENSOR CIRCUIT**  
**RANGE/PERFORMANCE PROBLEM (PS — R)**  
**—**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

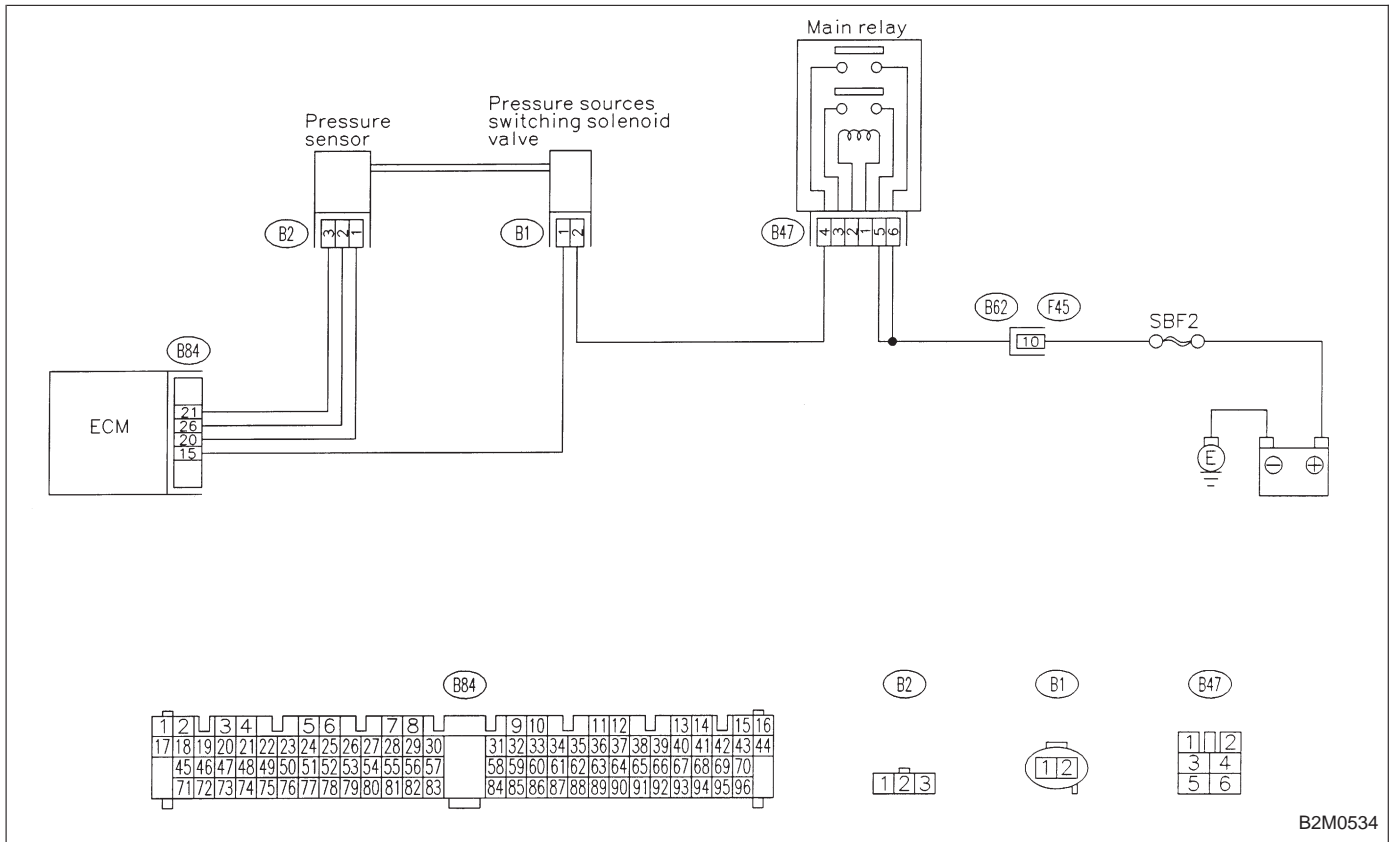


**CAUTION:**

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

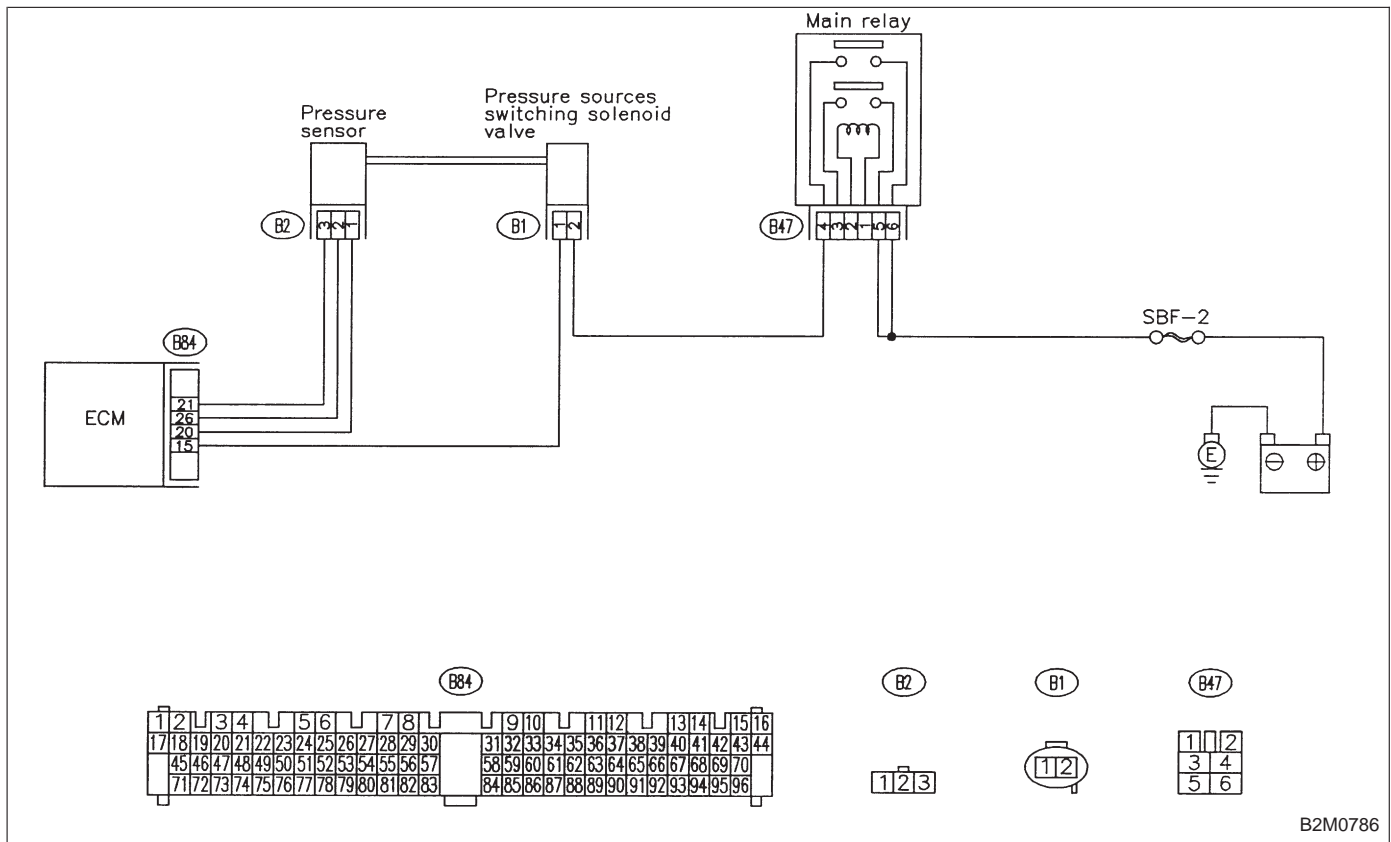
WIRING DIAGRAM:

- LHD Model



WIRING DIAGRAM:

- RHD Model



B2M0786

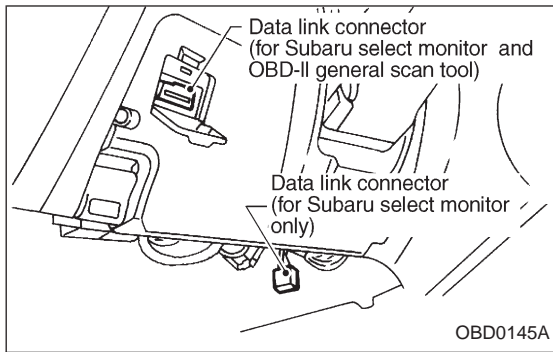
**10E1** CHECK DTC P0105 OR P1102 ON DISPLAY.

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0105 or P1102?
- YES** : Inspect DTC P0105 or P1102 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

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.

MANI. P ( F 2 1 )

29kPa218mmHg

B2M0756

- 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 **CHECK** .

BARO. P ( F 2 0 )

100kPa752mmHg

B2M0755

**CHECK** : *Is the value less than 32 kPa in function mode F20?*

**YES** : Go to step **10E4**.

**NO** : Go to next **CHECK** .

BARO. P ( F 2 0 )

100kPa752mmHg

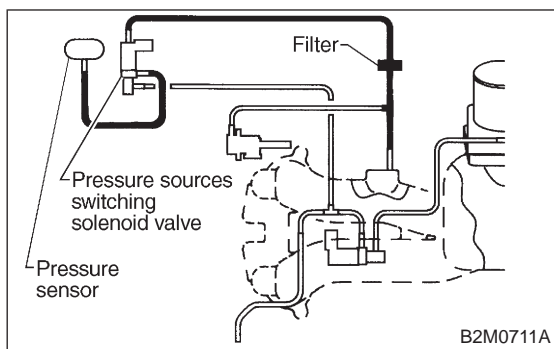
B2M0755

**CHECK** : *Is the value more than 133 kPa in function mode F20?*

**YES** : Replace pressure sensor.

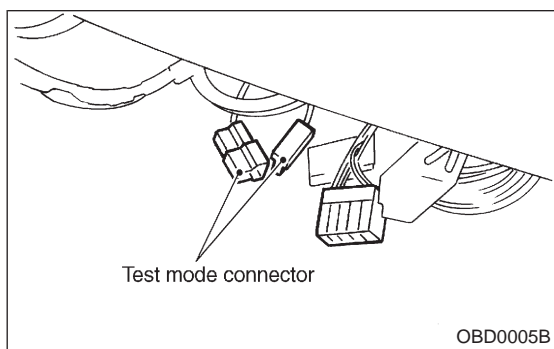
**NO** : Repair poor contact in pressure sensor connector, pressure sources switching solenoid valve connector, and ECM connector.

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

**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" 2-7 [T3F0].

**YES** : Replace pressure sensor.**NO** : Replace pressure sources switching solenoid valve.

OBD	(FB1)
P0115	<TW>
OBD0172	

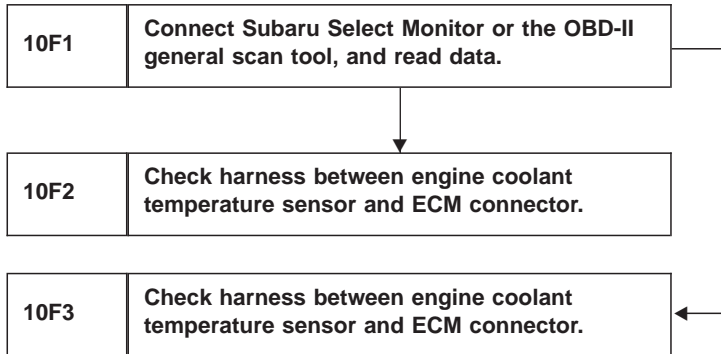
**F: DTC P0115**  
**— ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT MALFUNCTION (TW) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Hard to start
- Erroneous idling
- Poor driving performance

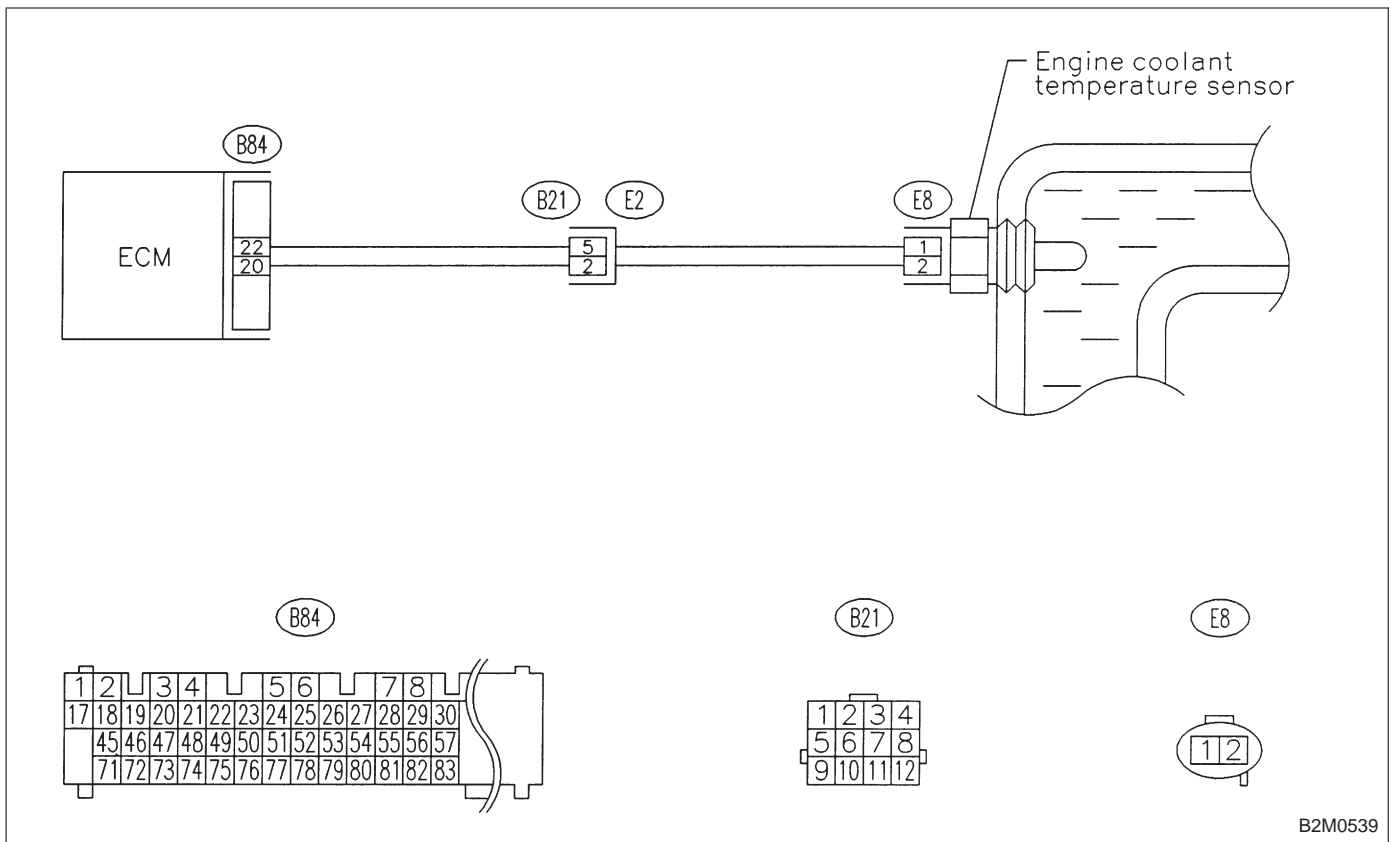


**CAUTION:**

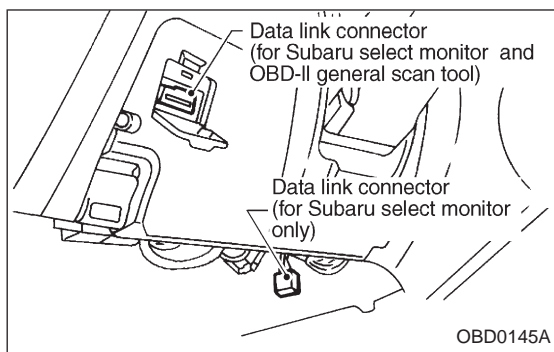
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

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

**WIRING DIAGRAM:**



B2M0539



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 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 greater than 150°C or 300°F in function mode F04?*

**YES** : Go to step **10F2**.

**NO** : Go to next **CHECK** .

TW ( F04 )

80 ° C 176 ° F

B2M0479

TW ( F04 )

80 ° C 176 ° F

B2M0479

**CHECK** : *Is the value less than -40°C or -40°F in function mode F04?*

**YES** : Go to step **10F3**.

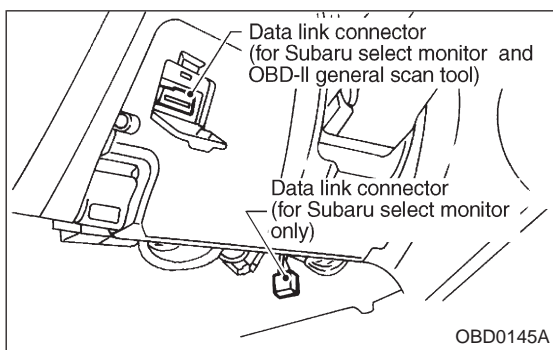
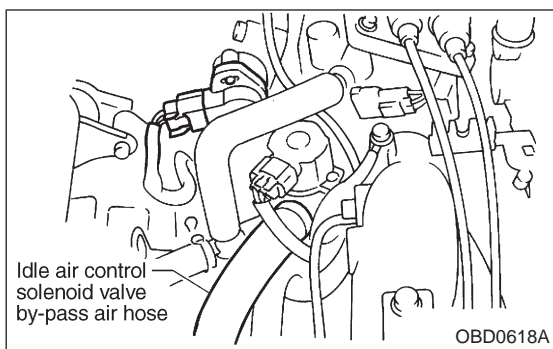
**NO** : Repair poor contact.

**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.



TW	( F04 )
80 ° C	176 ° F

B2M0479

**10F2 CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove idle air control solenoid valve by-pass air hose.
- 3) Disconnect connector from engine coolant temperature sensor.

- 4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- 5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.

- 6) Read data 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?*

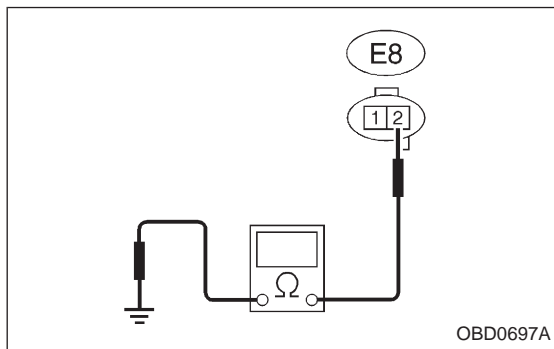
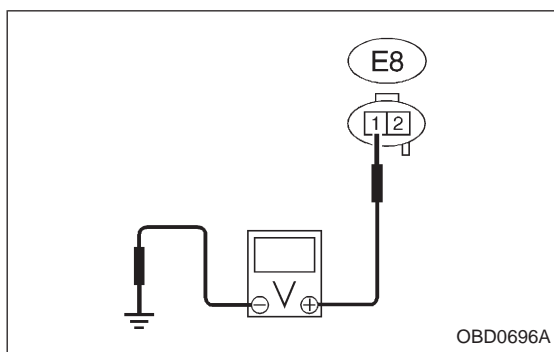
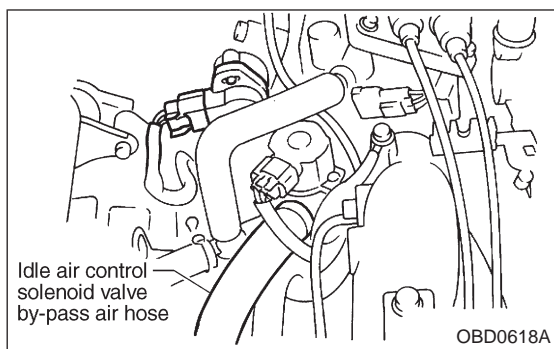
**YES** : Replace engine coolant temperature sensor.

**NO** : Repair 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.





10F3

**CHECK HARNESS BETWEEN ENGINE COOLANT TEMPERATURE SENSOR AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove idle air control solenoid valve by-pass air hose.
- 3) Disconnect connector from engine coolant temperature sensor.
- 4) Turn ignition switch to ON.

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

**CHECK** : **Connector & terminal (E8) No. 1 (+) — Engine ground (-): Is the voltage more than 4 V?**

**YES** : Go to next step 6).

**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)

- 6) Turn ignition switch to OFF.

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

**CHECK** : **Connector & terminal (E8) No. 2 — Engine ground: Is the resistance less than 5 Ω?**

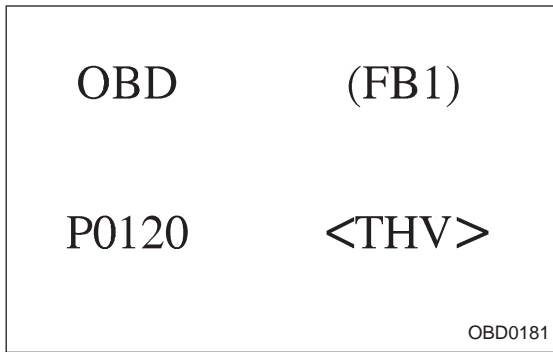
**YES** : Replace engine coolant temperature sensor.

**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)



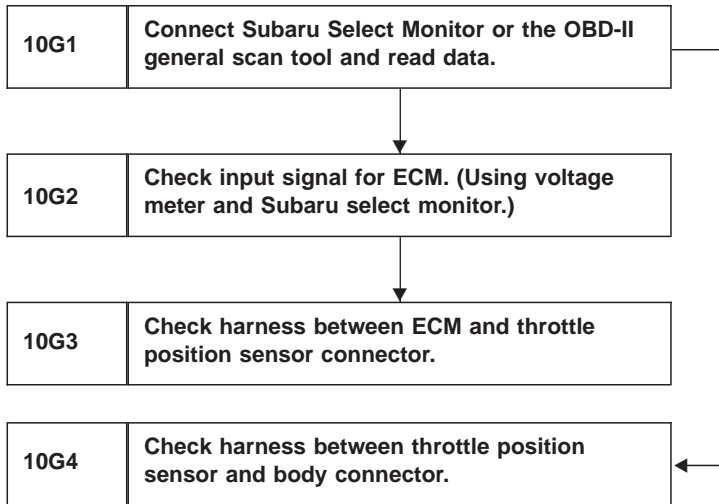
**G: DTC P0120**  
**— THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION (THV) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

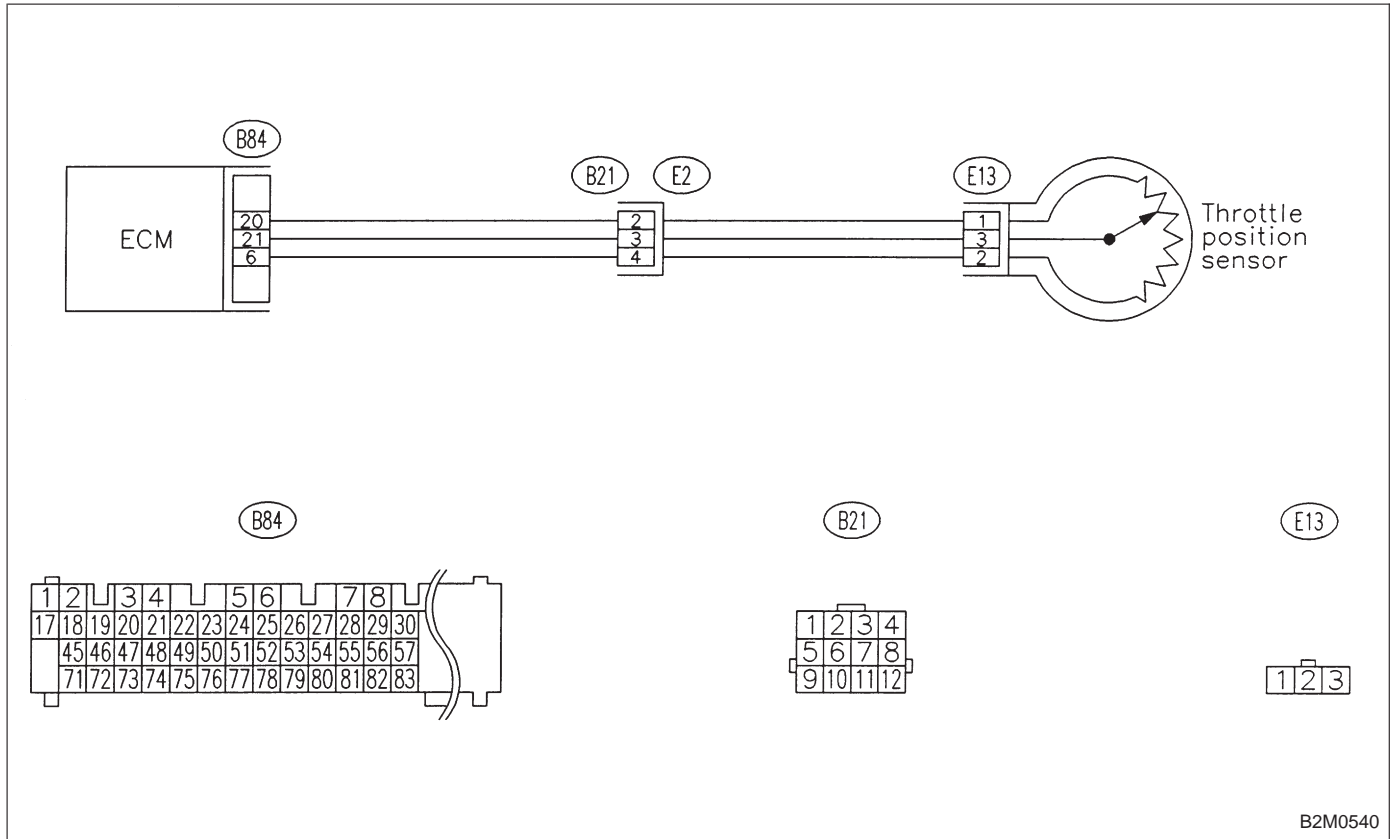
- Erroneous idling
- Engine stalls.
- Poor driving performance

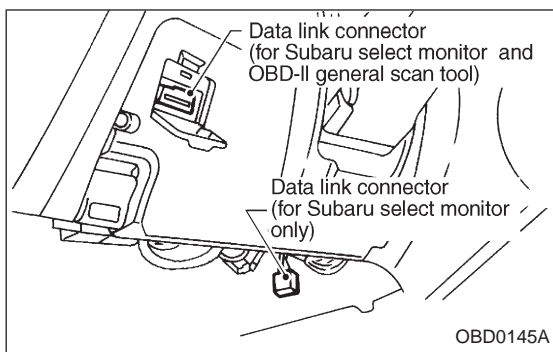


**CAUTION:**

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

WIRING DIAGRAM:





**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 OBD-II general scan tool switch to ON.
- 4) Start engine.

THV                      ( F07 )

0% 0.21V

B2M0482

- 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** : Go to next **CHECK** .

THV                      ( F07 )

0% 0.21V

B2M0482

**CHECK** : *Is the value more than 4.9 V in function mode F07?*

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

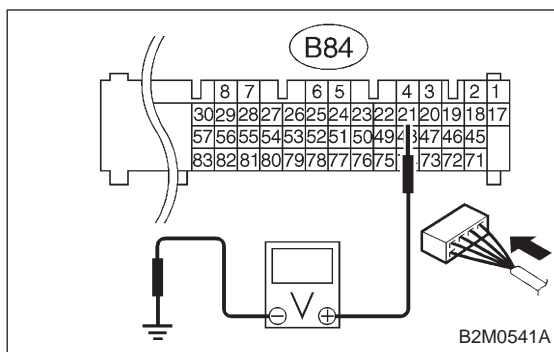
**NO** : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

**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.



10G2

**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.

**CHECK** : **Connector & terminal  
(B84) No. 21 (+) — Chassis ground (-):  
Is the voltage more than 4.5 V?**

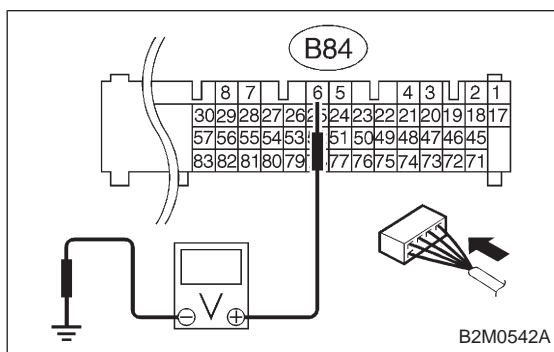
**YES** : Go to next step 2).

**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** : Replace ECM.



2) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal  
(B84) No. 6 (+) — Chassis ground (-):  
Is the voltage less than 0.1 V?**

**YES** : Go to step 10G3.

**NO** : Go to next **CHECK** .

**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?**

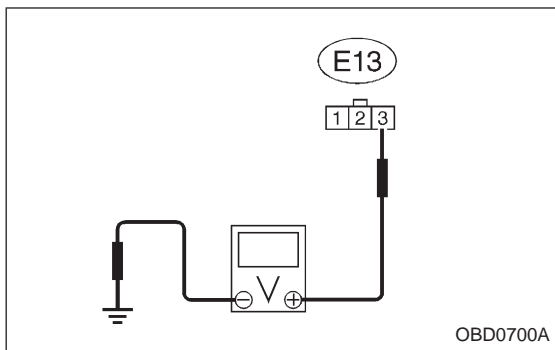
**YES** : Repair poor contact in ECM connector.

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

THV (F07)

0% 0.21V

B2M0482



**10G3 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.

**CHECK** : **Connector & terminal (E13) No. 3 (+) — Engine ground (-): Is the voltage more than 4.5 V?**

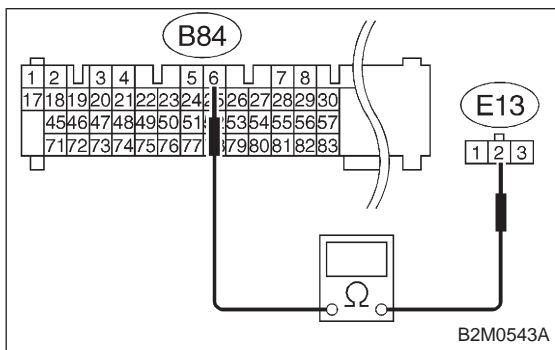
**YES** : Go to next step 5).

**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.

**CHECK** : **Connector & terminal (B84) No. 6 — (E13) No. 2: Is the resistance less than 1 Ω?**

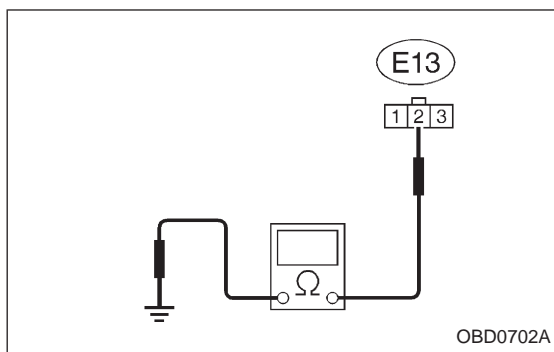
**YES** : Go to next step 7).

**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.

**CHECK** : **Connector & terminal (E13) No. 2 — Engine ground:**  
**Is the resistance less than 10 Ω?**

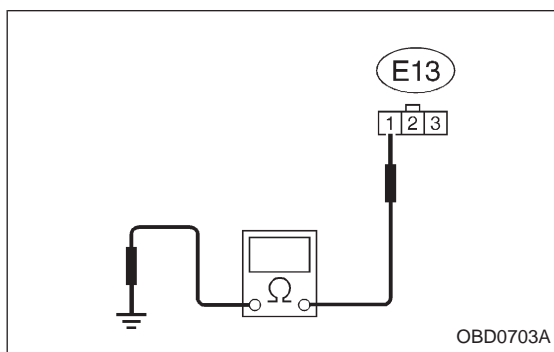
**YES** : Repair short circuit in harness between throttle position sensor and ECM connector.

**NO** : Go to next **CHECK** .

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

**YES** : Repair poor contact in throttle position sensor connector.

**NO** : Replace throttle position sensor.



**10G4**

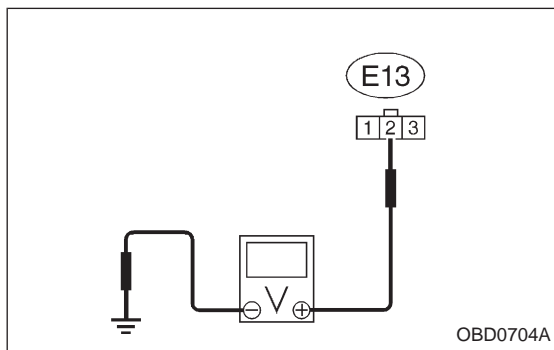
**CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND BODY CONNECTOR.**

- 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.

**CHECK** : **Connector & terminal (E13) No. 1 — Engine ground:**  
**Is the resistance less than 5 Ω?**

**YES** : Go to next step 4).

**NO** : Repair open circuit in harness between throttle position sensor and ECM connector.



4) Turn ignition switch to ON.

5) Measure voltage between throttle position sensor connector and engine ground.

**CHECK** : **Connector & terminal (E13) No. 2 (+) — Engine ground (-):**  
**Is the voltage more than 4.9 V?**

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

**NO** : Replace throttle position sensor.

OBD	(FB1)
P0121	<TH_R>
OBD0189	

**H: DTC P0121**  
**— THROTTLE POSITION SENSOR CIRCUIT**  
**RANGE/PERFORMANCE PROBLEM**  
**(TH – R) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Poor driving performance

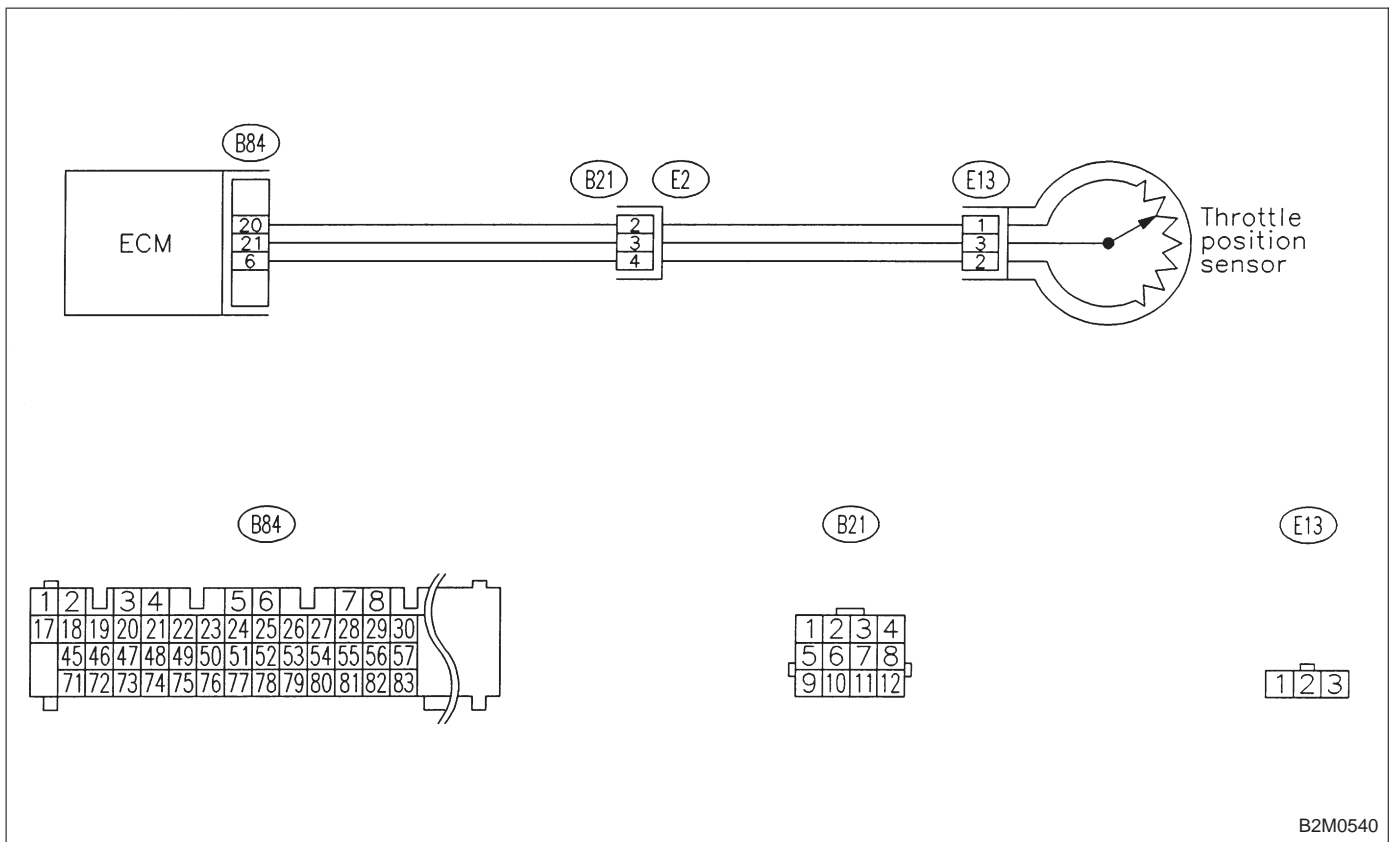
10H1	Check DTC P0120 on display.
------	-----------------------------

**CAUTION:**

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

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

**WIRING DIAGRAM:**





10H1	CHECK DTC P0120 ON DISPLAY.
------	-----------------------------

**CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0120?*

**YES** : Inspect DTC P0120 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

NOTE:

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

**NO** : Replace throttle position sensor.

OBD	(FB1)
P0125	<TW_CL>
OBD0191	

**I: DTC P0125**  
**— INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL (TW – CL) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Engine would not return to idling.

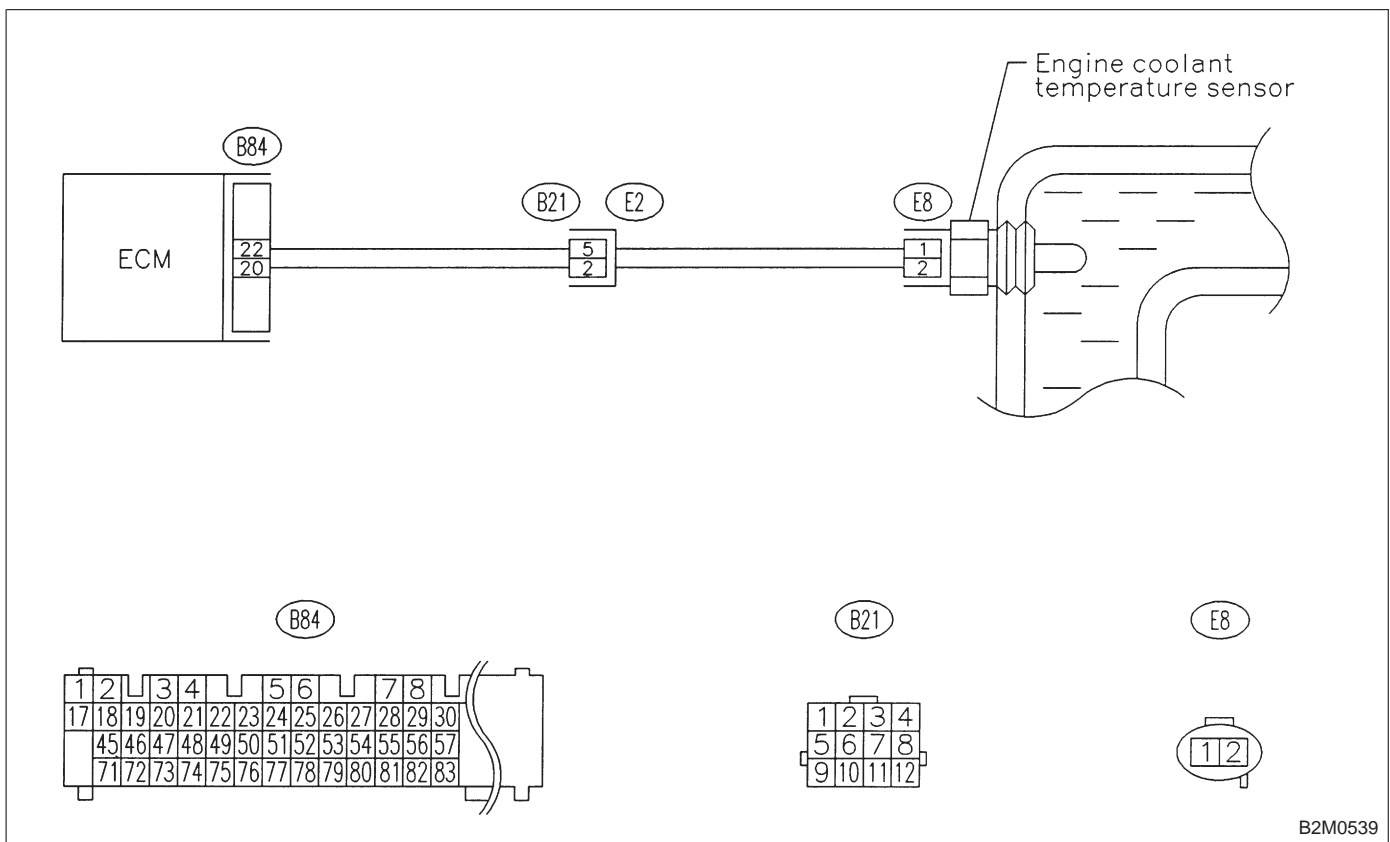
1011	Check DTC P0115 on display.
------	-----------------------------

**CAUTION:**

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

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

**WIRING DIAGRAM:**



10I1	CHECK DTC P0115 ON DISPLAY.
------	-----------------------------

**CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0115?*

**YES** : Inspect DTC P0115 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

NOTE:

In this case, it is not necessary to inspect DTC P0125.

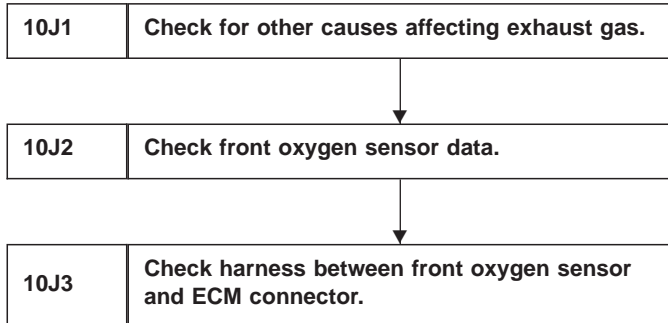
**NO** : Replace engine coolant temperature sensor.

OBD	(FB1)
P0130	<FO2_V>
OBD0199	

**J: DTC P0130**  
**— FRONT OXYGEN SENSOR CIRCUIT MALFUNCTION (FO2 – V) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

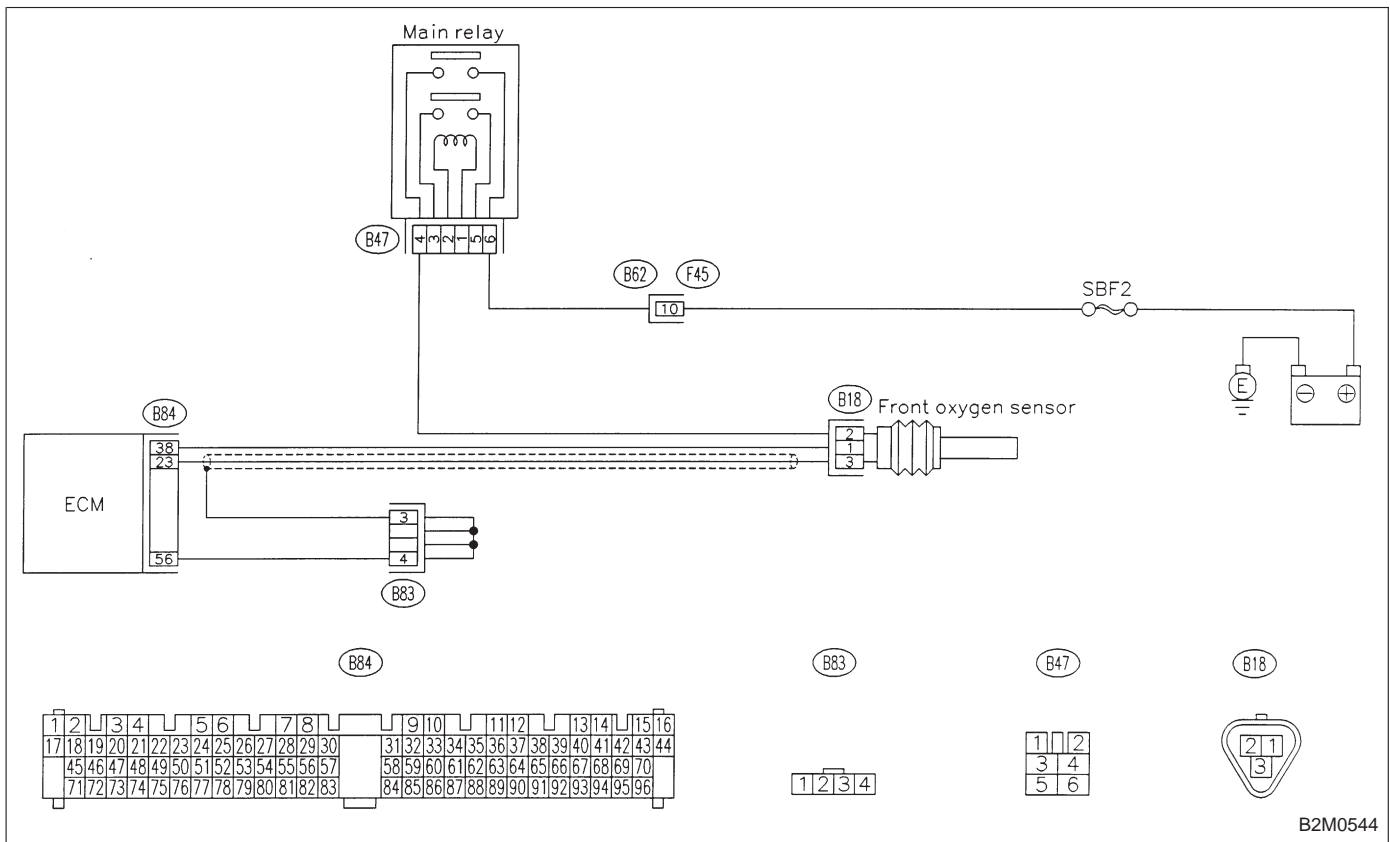


**CAUTION:**

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

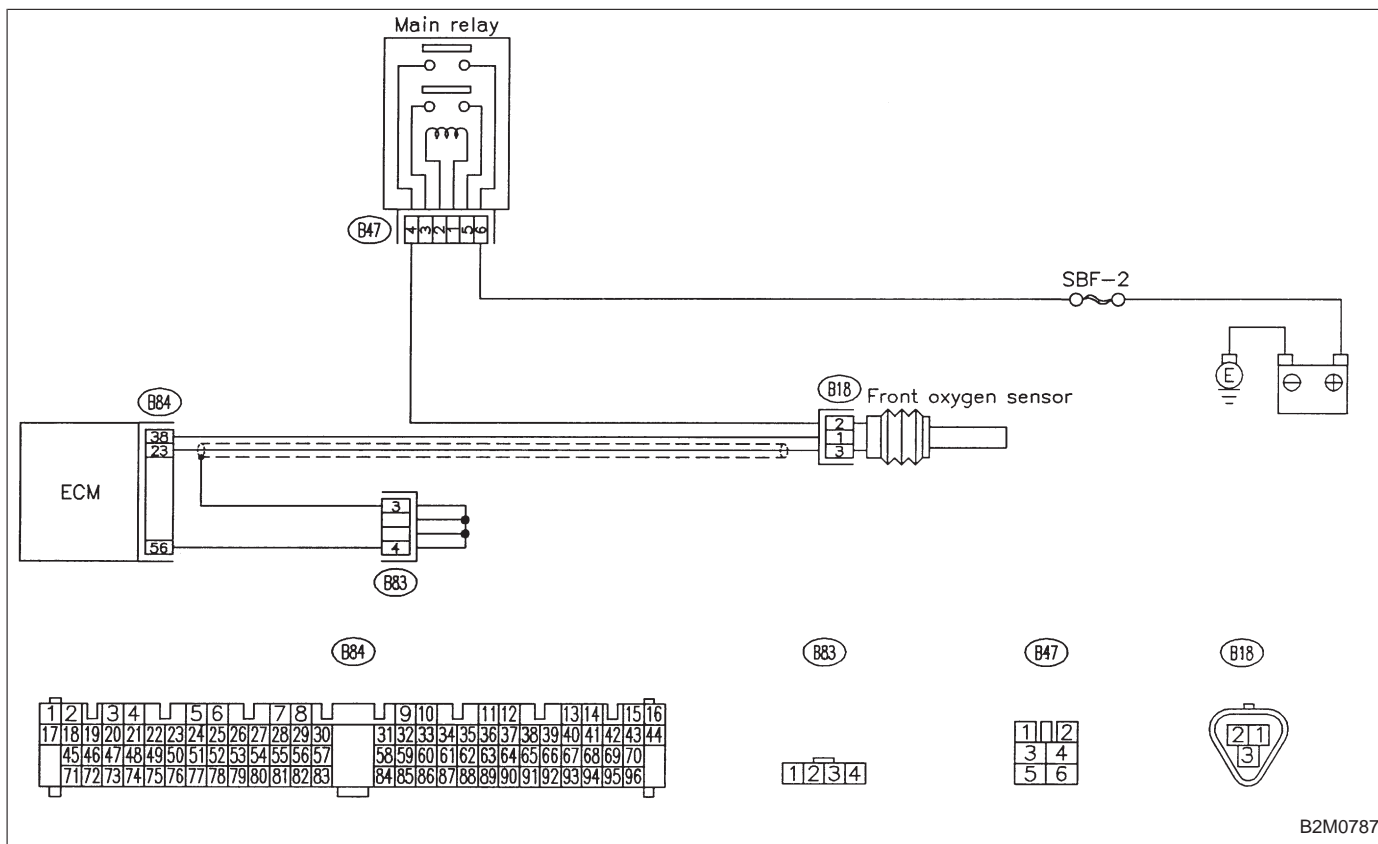
**WIRING DIAGRAM:**

- LHD Model



**WIRING DIAGRAM:**

- RHD Model



B2M0787

**10J1 CHECK FOR OTHER CAUSES AFFECTING EXHAUST GAS.**

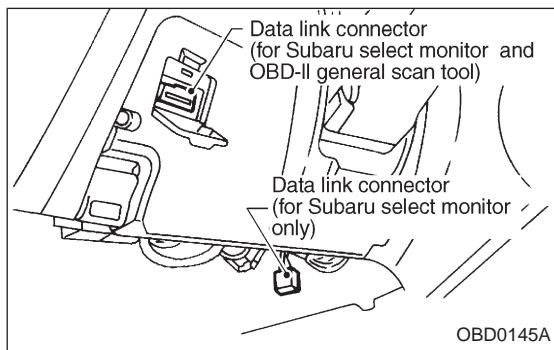
**CHECK** : Is CO % more than 2 % after engine warm-up?

**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 10J2.



**10J2 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.

O<sub>2</sub>max - min ( F12 )

0 . 80V    0 . 10V

B2M0487

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.

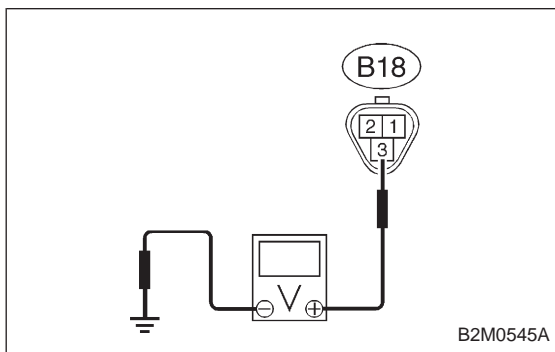
**CHECK** : *Is the difference of voltage less than 0.1 V between the value of max. output and min. output with function mode F12?*

**YES** : Go to step 10J3.

**NO** : Replace front oxygen sensor.

- OBD-II general scan tool

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



**10J3    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.

**CHECK** : **Connector & terminal (B18) No. 3 (+) — Engine ground (-): Is the voltage more than 0.2 V?**

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

**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

**CHECK** : **Is there poor contact in front oxygen sensor connector?**

**YES** : Repair poor contact in front oxygen sensor connector.

**NO** : Replace front oxygen sensor.

OBD	(FB1)
P0133	<FO2_R>
OBD0209	

**K: DTC P0133**  
**— FRONT OXYGEN SENSOR CIRCUIT SLOW RESPONSE (FO2 – R) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**10K1** | Check DTC P0130 on display.



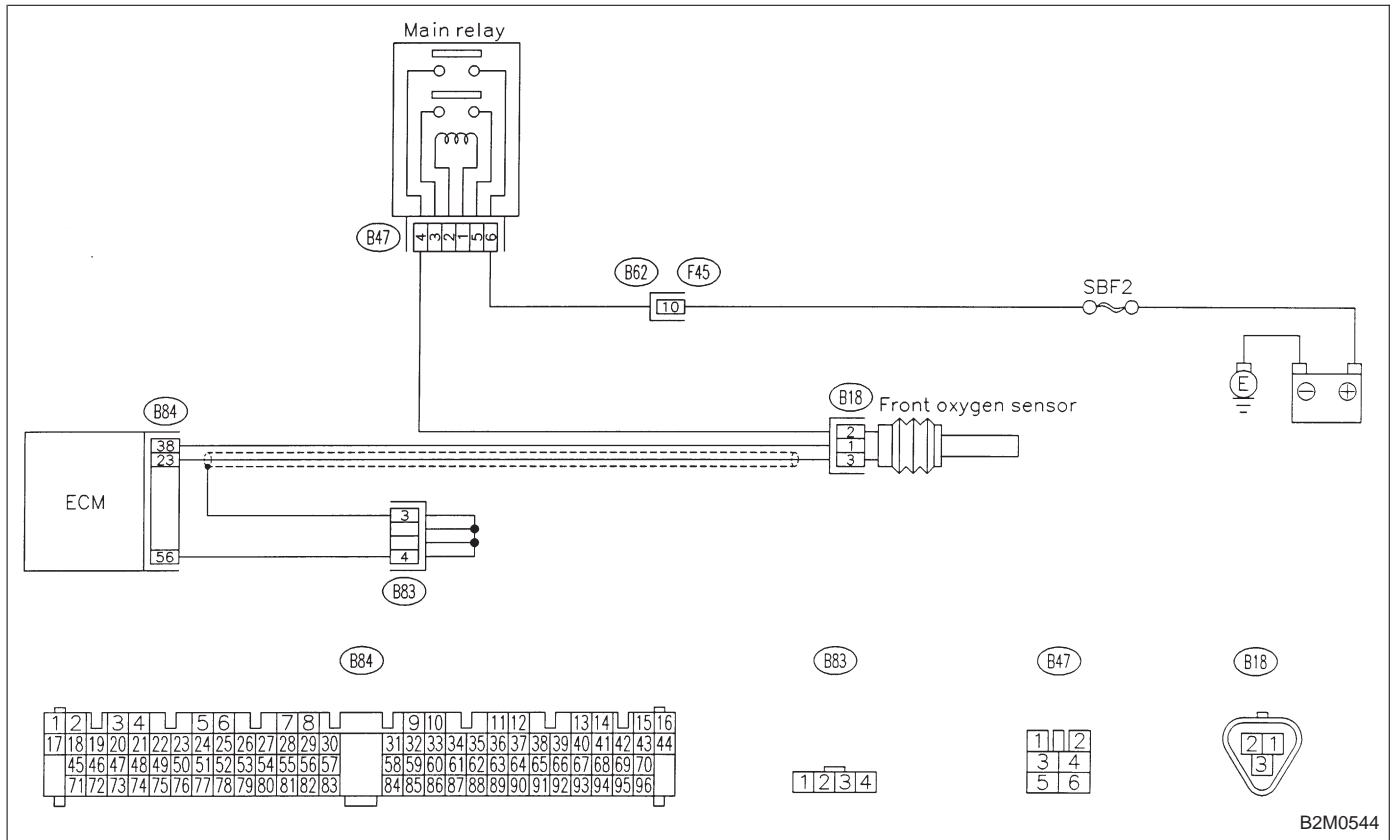
**10K2** | Check exhaust system.

**CAUTION:**

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

**WIRING DIAGRAM:**

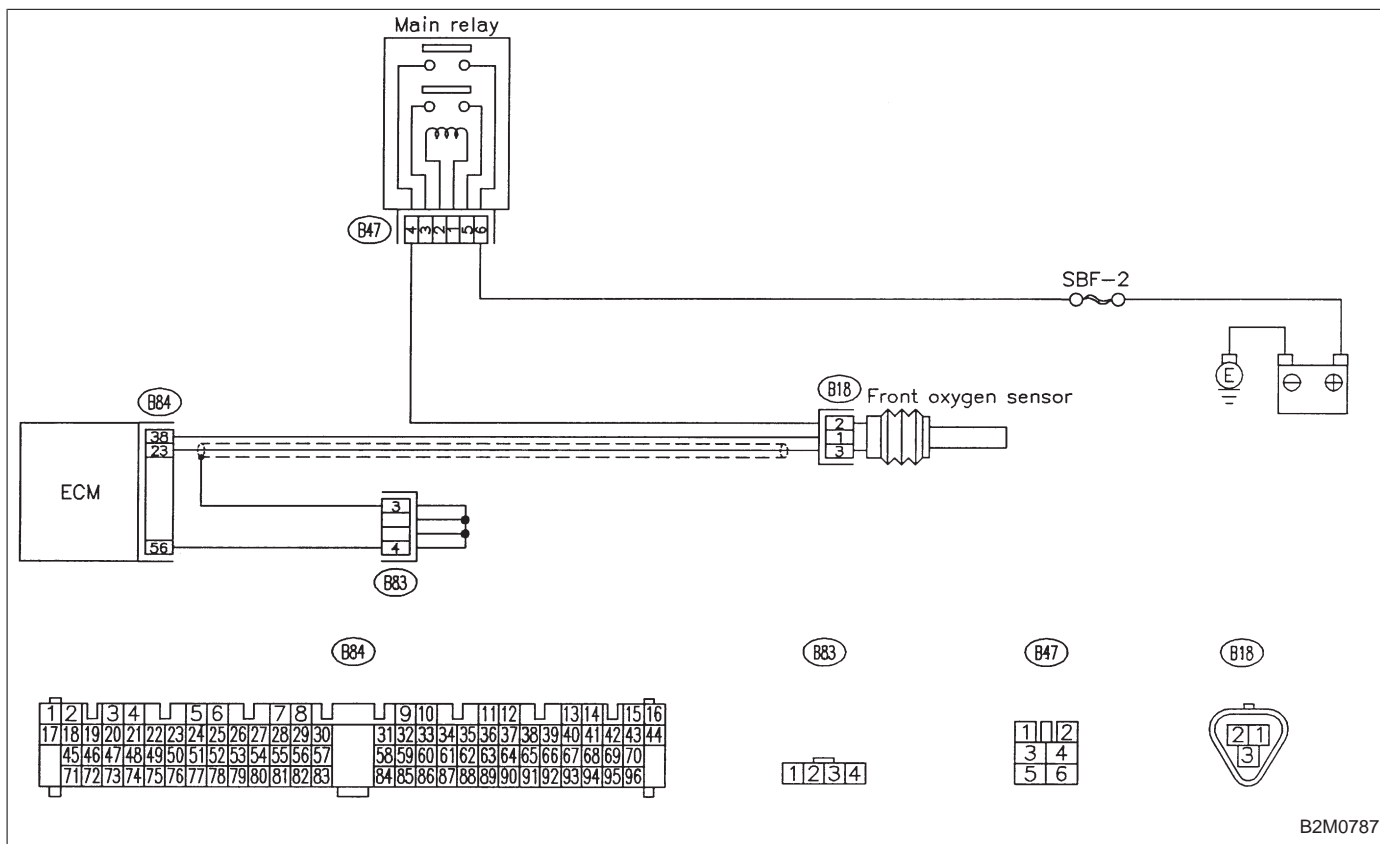
- LHD Model



B2M0544

**WIRING DIAGRAM:**

- RHD Model



B2M0787

**10K1 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 2-7 [T1000]”.

**NOTE:**

In this case, it is not necessary to inspect DTC P0133.

- NO** : Go to step 10K2.

**10K2 CHECK EXHAUST SYSTEM.**

- CHECK** : Is there a fault in exhaust system?

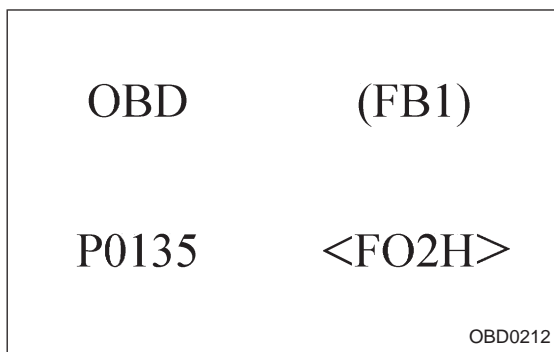
**NOTE:**

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.

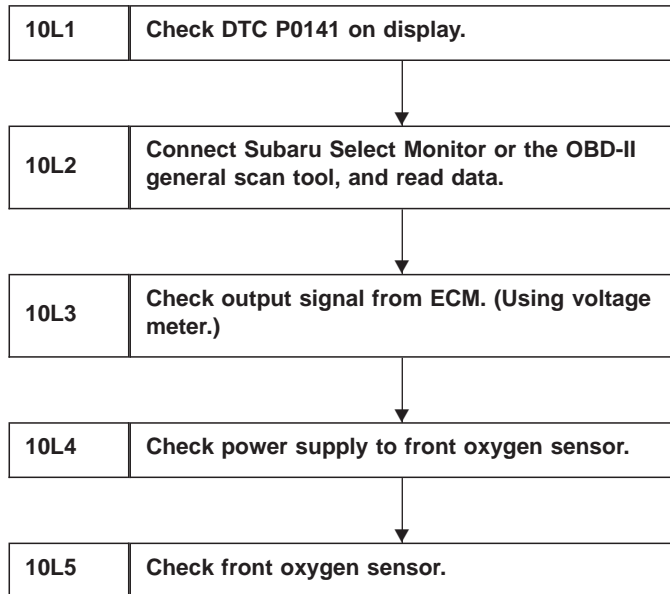




**L: DTC P0135**  
**— FRONT OXYGEN SENSOR HEATER**  
**CIRCUIT MALFUNCTION (FO2H) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault



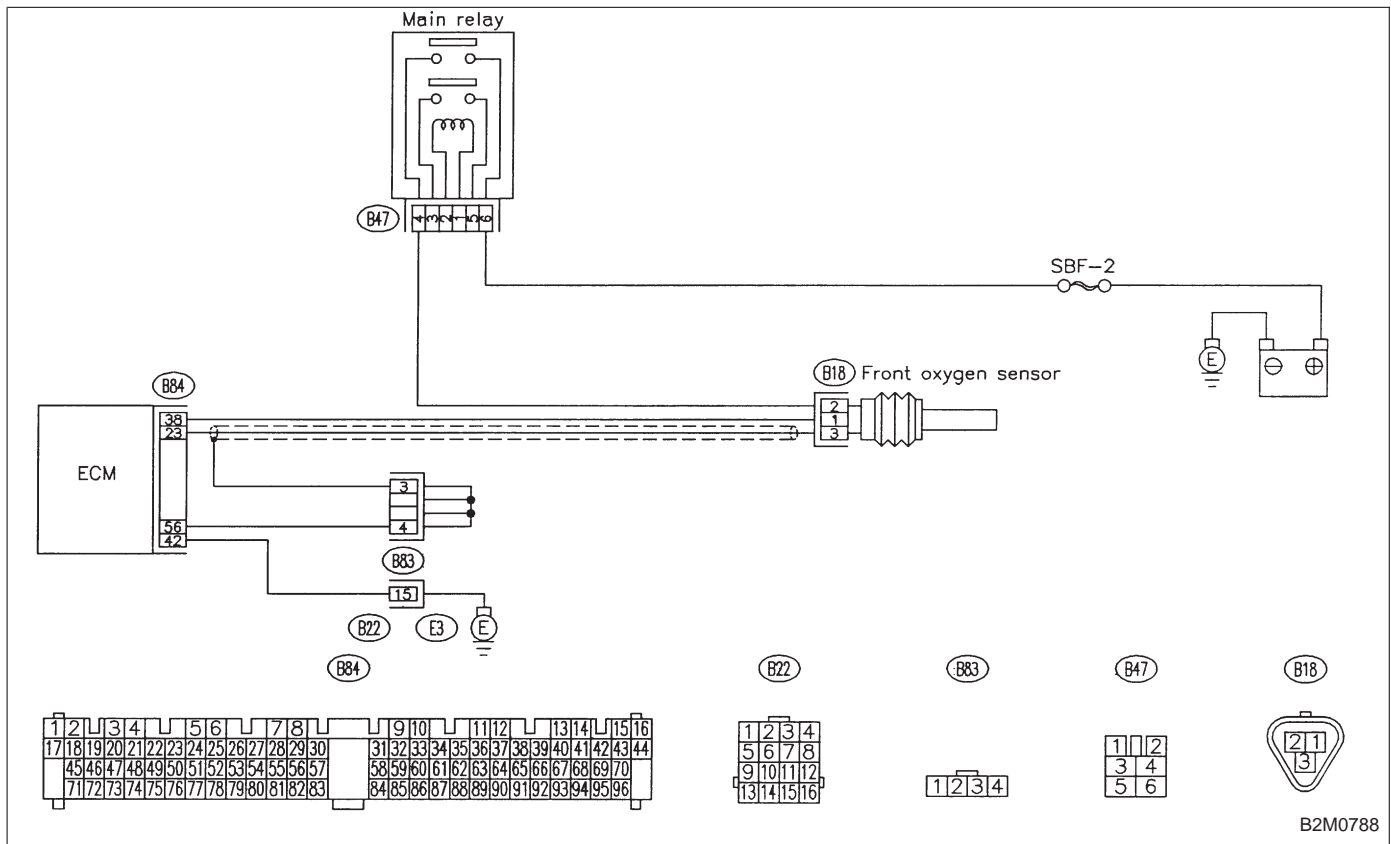
**CAUTION:**

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



WIRING DIAGRAM:

- RHD Model

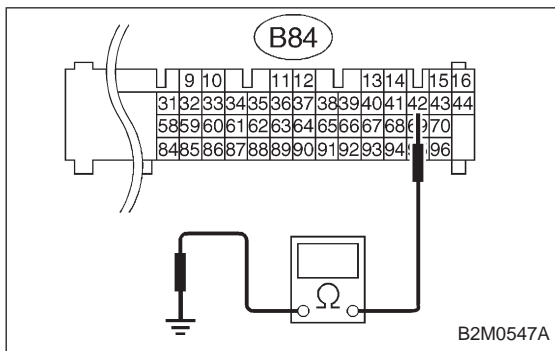


<b>10L1</b>	<b>CHECK DTC P0141 ON DISPLAY.</b>
-------------	------------------------------------

**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 **10L2**.



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

**CHECK** : **Connector & terminal (B84) No. 42 — Chassis ground: Is the resistance less than 5 Ω?**

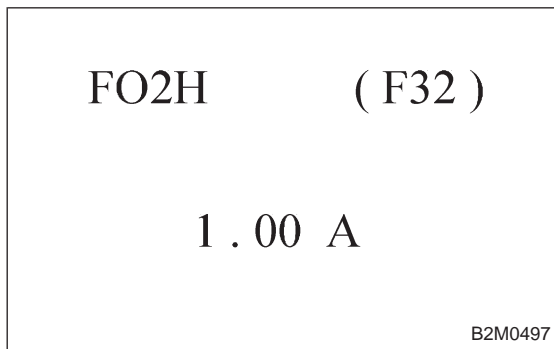
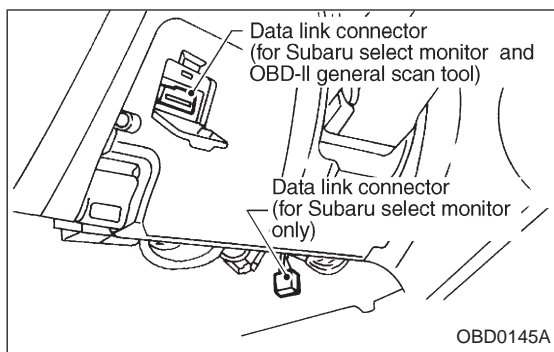
**YES** : Repair poor contact in ECM connector.

**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)



10L2

**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: 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:**

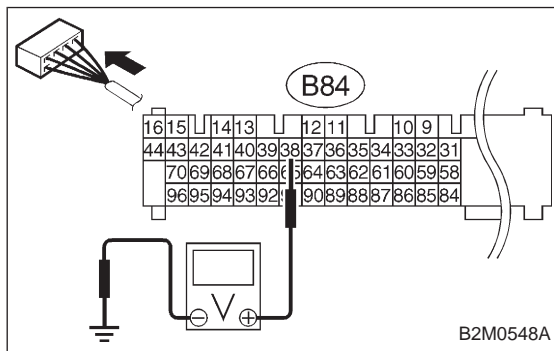
In this case, repair the following:

- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

**NO** : Go to step **10L3**.

- OBD-II scan tool

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



10L3

**CHECK OUTPUT SIGNAL FROM ECM. (USING VOLTAGE METER.)**

- 1) Start and idle the engine.
- 2) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 38 (+) — Chassis ground (-): Is the voltage less than 1.0 V?**

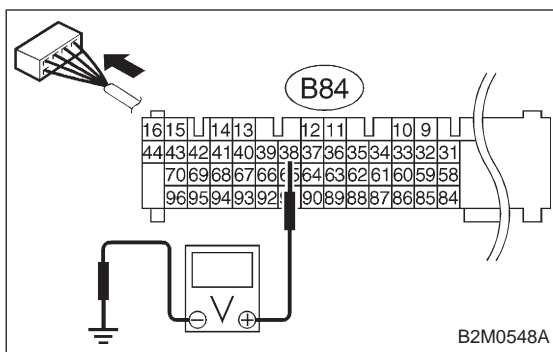
**YES** : Go to step **10L4**.

**NO** : Go to next **CHECK** .

**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.

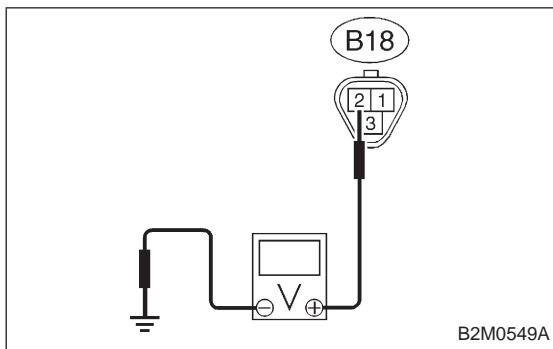
**NO** : Go to next step 3).



- 3) Disconnect connector from front oxygen sensor.
- 4) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 38 (+) — Chassis ground (-): Is the voltage less than 1.0 V?**

- YES** : Replace ECM.  
**NO** : Repair short circuit in harness between ECM and front oxygen sensor connector. After repair short circuit of harness, replace ECM.



**10L4 CHECK POWER SUPPLY TO FRONT OXYGEN SENSOR.**

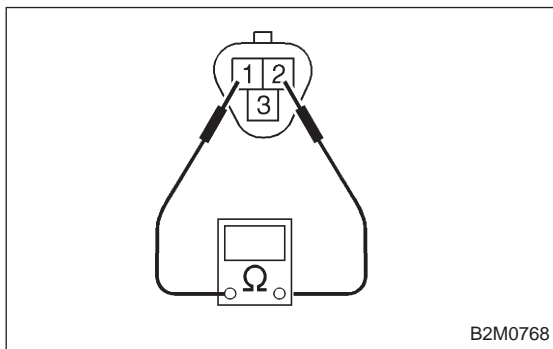
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from front oxygen sensor.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between front oxygen sensor connector and engine ground.

**CHECK** : **Connector & terminal (B18) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

- YES** : Go to step 10L5.  
**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



**10L5 CHECK FRONT OXYGEN SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between front oxygen sensor connector terminals.

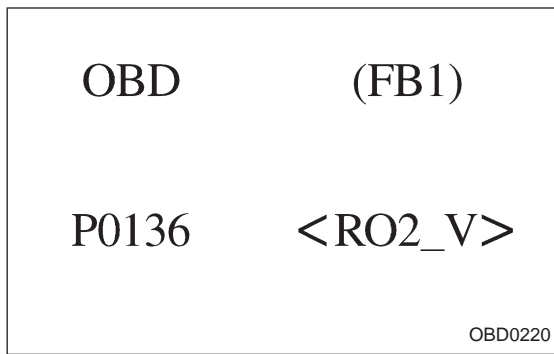
**CHECK** : **Terminals No. 1 — No. 2: Is the resistance less than 30 Ω?**

- 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

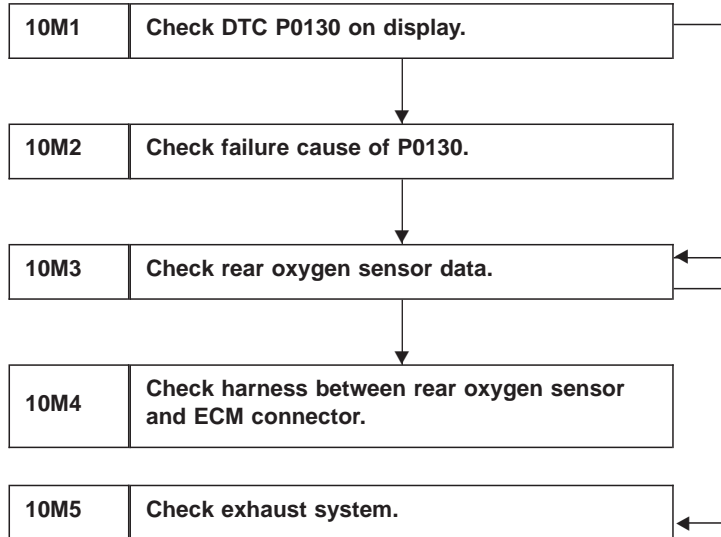
- NO** : Replace front oxygen sensor.



**M: DTC P0136**  
**— REAR OXYGEN SENSOR CIRCUIT**  
**MALFUNCTION (RO2 – V) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault



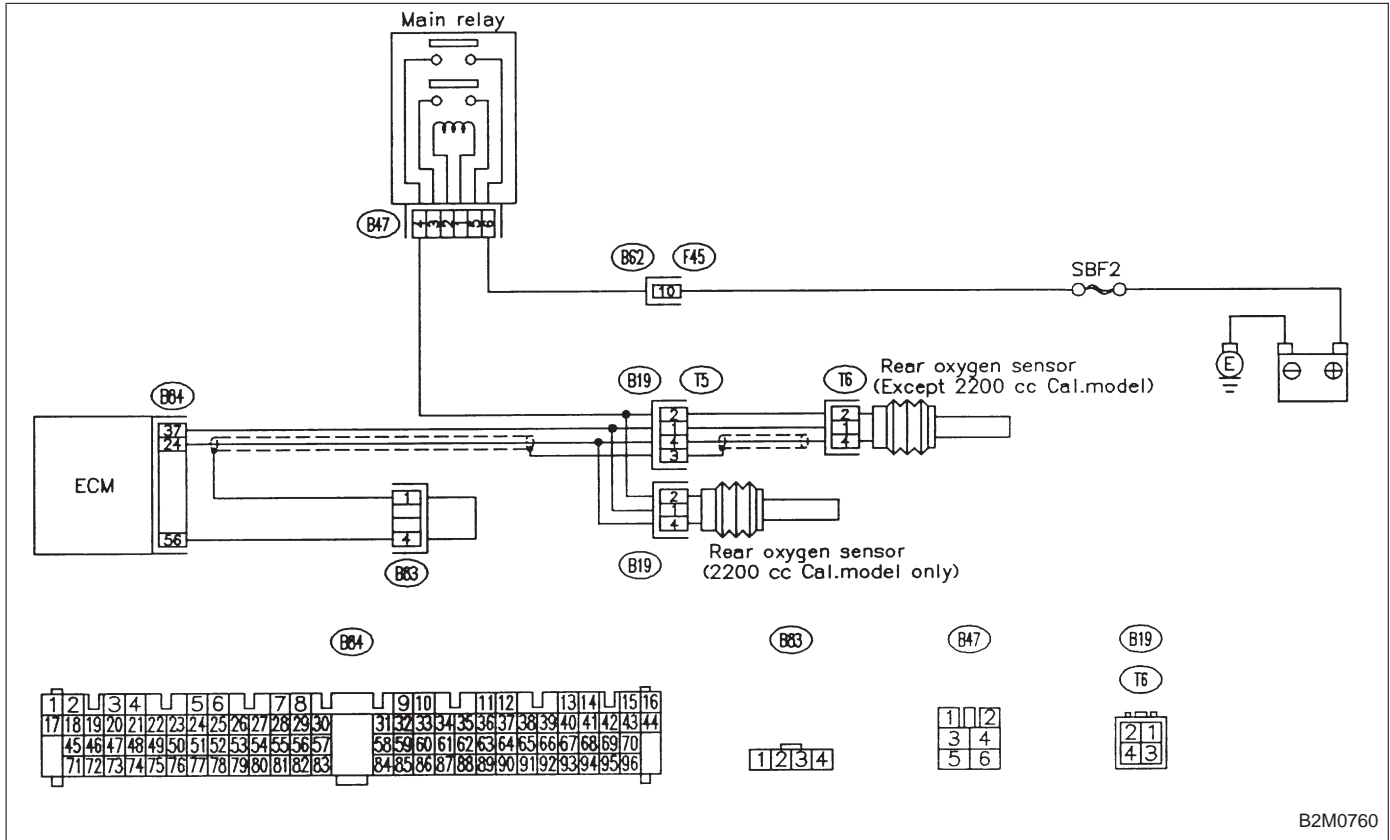
**CAUTION:**

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

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

WIRING DIAGRAM:

- LHD Model

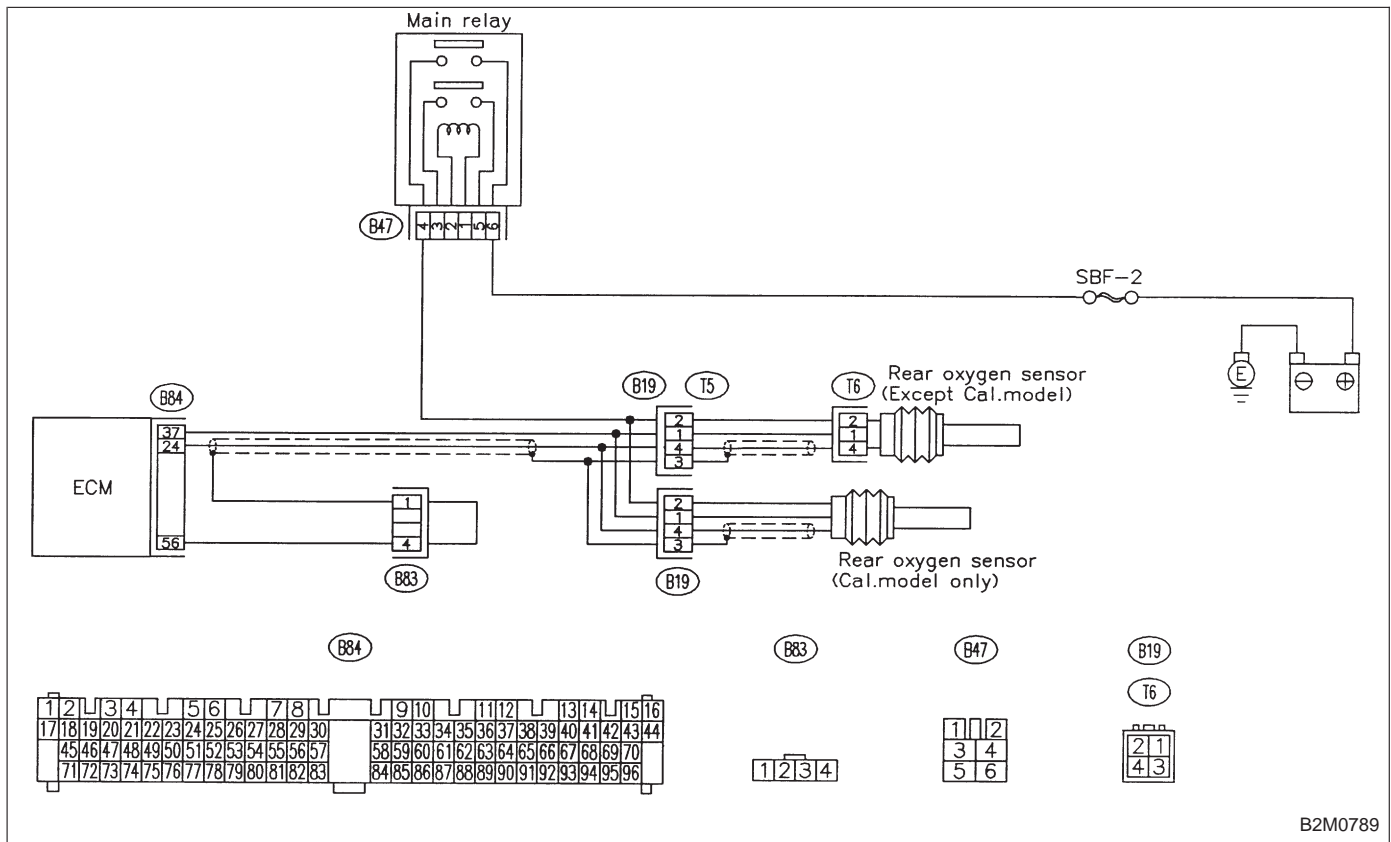


B2M0760



WIRING DIAGRAM:

- RHD Model



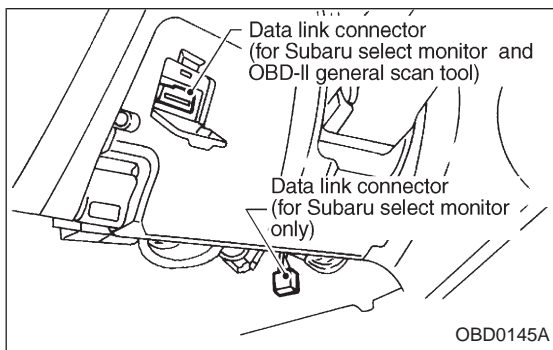
B2M0789

<b>10M1</b>	<b>CHECK DTC P0130 ON DISPLAY.</b>
-------------	------------------------------------

- CHECK** : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130?*
- YES** : Go to step **10M2**.
- NO** : Go to step **10M3**.

<b>10M2</b>	<b>CHECK FAILURE CAUSE OF P0130.</b>
-------------	--------------------------------------

- Perform the step 1 of DTC P0130.
- 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 **10M3**.

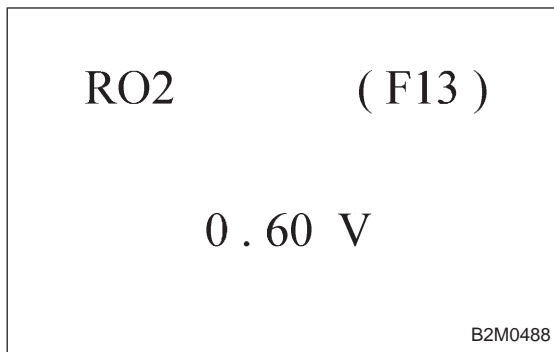


<b>10M3</b>	<b>CHECK REAR OXYGEN SENSOR DATA.</b>
-------------	---------------------------------------

- 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.

<p style="font-size: 2em;">RO2                      ( F13 )</p> <p style="font-size: 2em; margin-top: 20px;">0 . 60 V</p>
B2M0488

- 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 **10M5**.
  - NO** : Go to next **CHECK** .



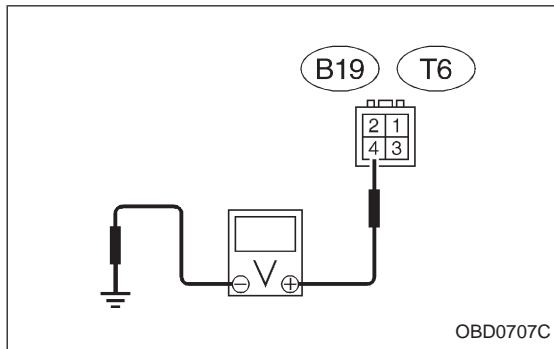
**CHECK** : *Is the value fixed between 0.2 and 0.4 V in function mode F13?*

**YES** : Go to step 10M4.

**NO** : Replace rear oxygen sensor.

- OBD-II general scan tool

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

**10M4****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.

**CHECK** : **Connector & terminal**

- **2200 cc California model (B19) No. 4 (+) — Engine ground (-):**
  - **Except 2200 cc California model (T6) No. 4 (+) — Chassis ground (-):**
- 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 (Except 2200 cc California model)

**10M5****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	

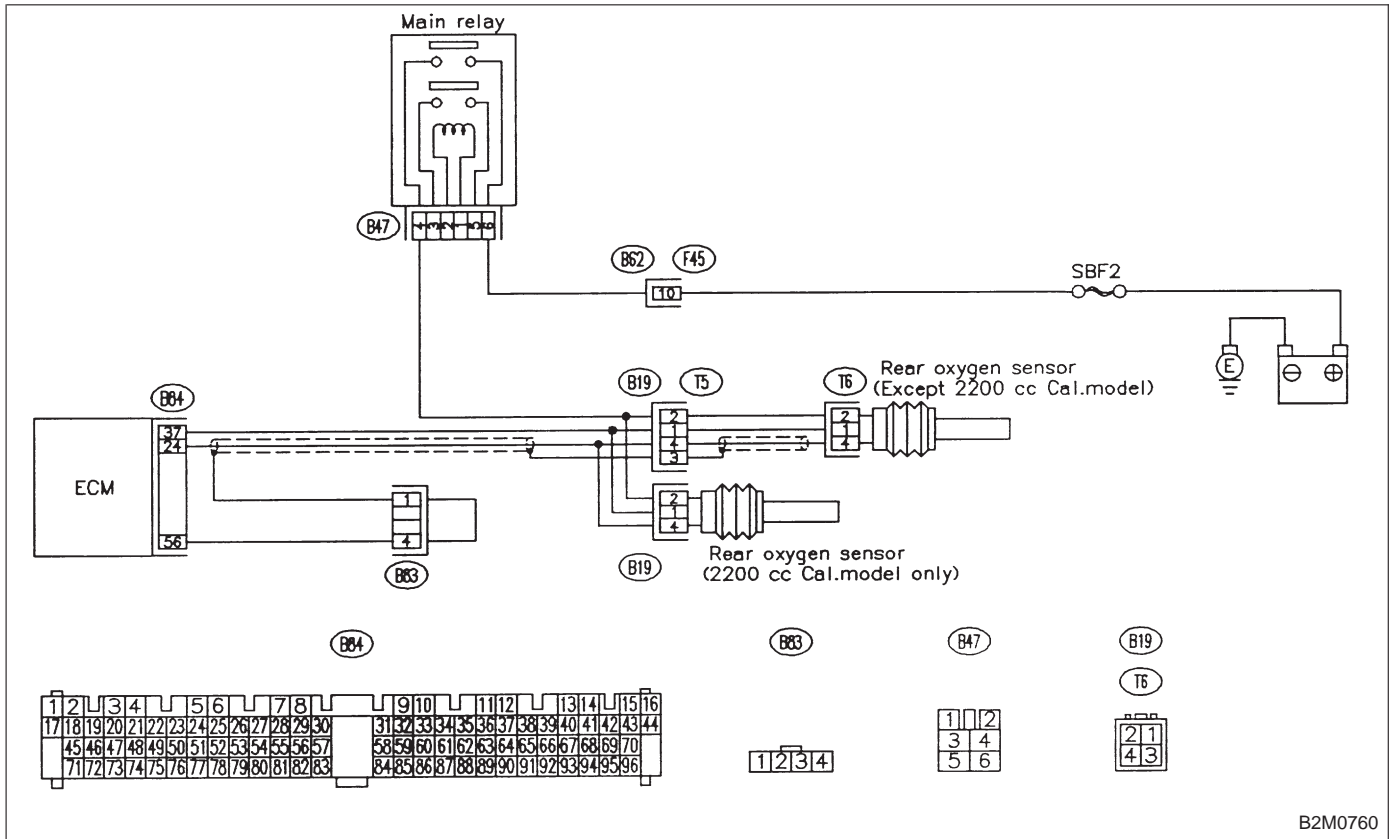
**N: DTC P0139**  
**— REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE (RO2 – R) —**

- DTC DETECTING CONDITION:**
- Two consecutive trips with fault

10N1	Check DTC P0136 on display.
------	-----------------------------

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

- WIRING DIAGRAM:**
- LHD Model



B2M0760

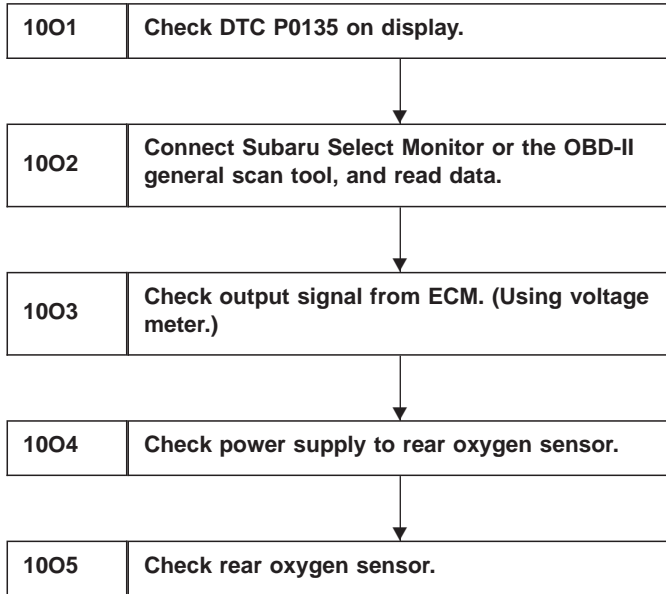


OBD	(FB1)
P0141	<RO2H>
OBD0232	

**O: DTC P0141**  
**— REAR OXYGEN SENSOR HEATER**  
**CIRCUIT MALFUNCTION (RO2H) —**

**DTC DETECTING CONDITION:**

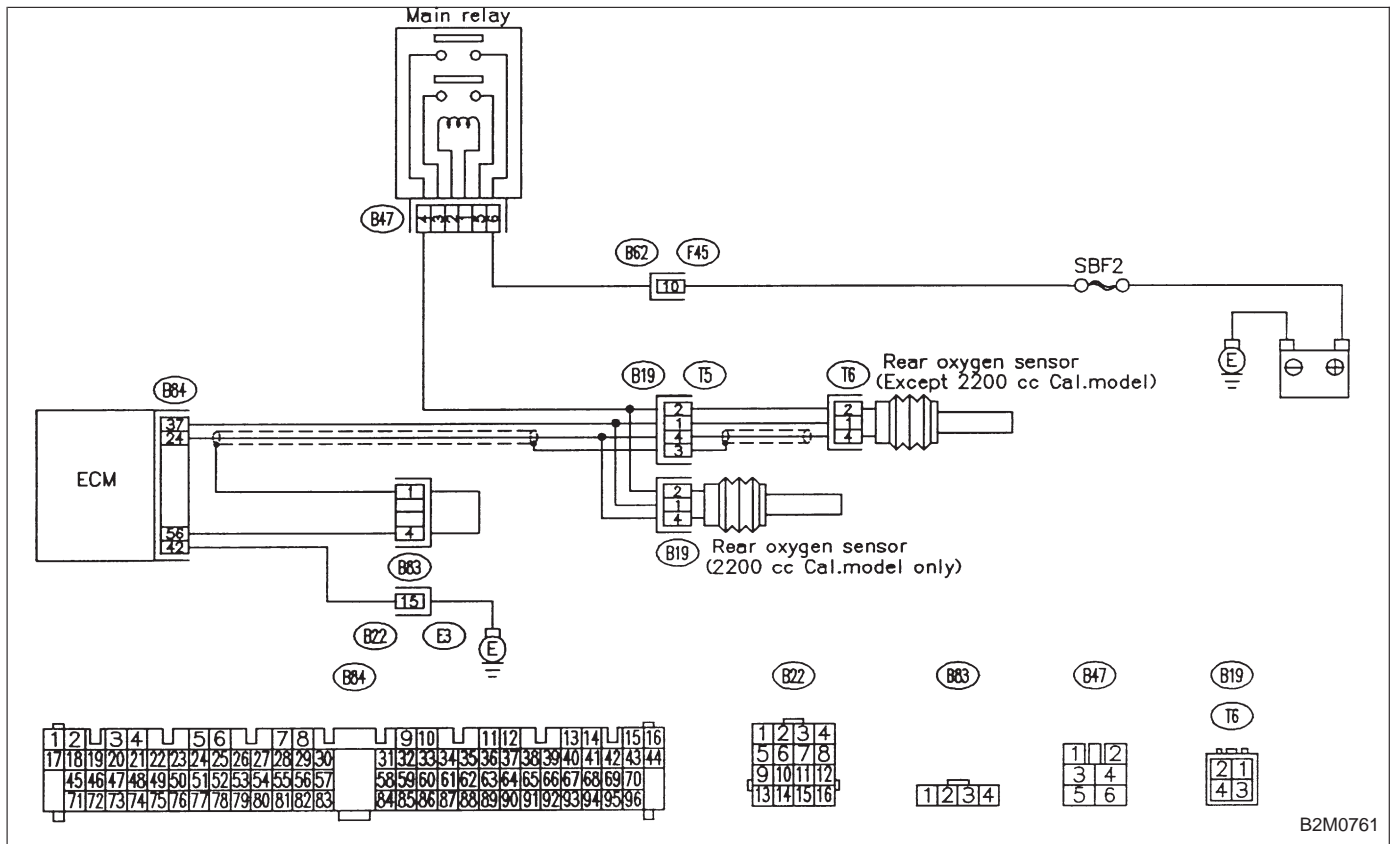
- Two consecutive trips with fault



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

WIRING DIAGRAM:

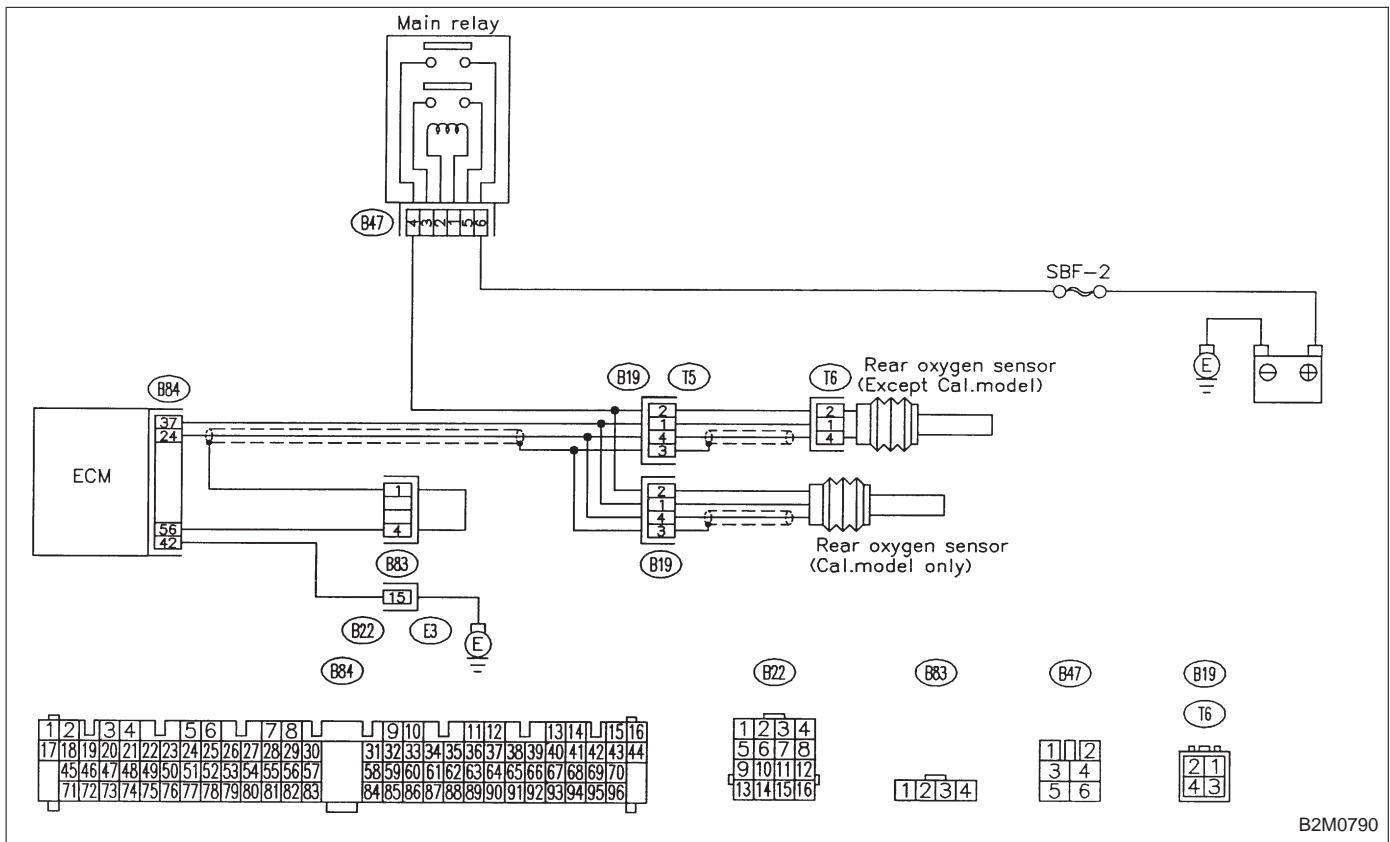
- LHD Model



B2M0761

WIRING DIAGRAM:

- RHD Model



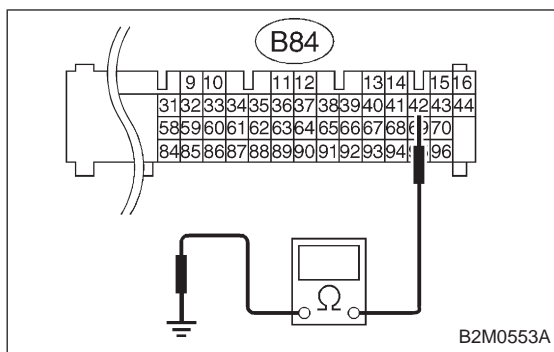
<b>1001</b>	<b>CHECK DTC P0135 ON DISPLAY.</b>
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**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0141 and P0135 at the same time?

**YES** : Go to next step 1).

**NO** : Go to step 1002.





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

**CHECK** : **Connector & terminal (B84) No. 42 — Chassis ground: Is the resistance less than 5 Ω?**

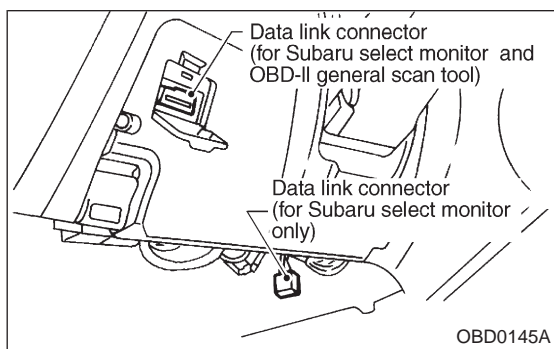
**YES** : Repair poor contact in ECM connector.

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and coupling connector (B22)
- Open circuit in harness between coupling connector (B22) and engine grounding terminal
- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector (B19)
- Poor contact in coupling connector (B22)



**1002**

**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:**

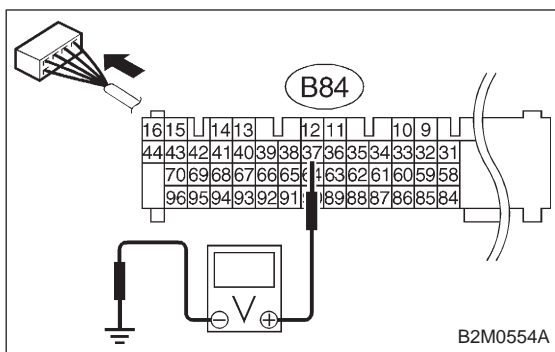
In this case, repair the following:

- 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 **1003**.

- OBD-II scan tool

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



**1003 CHECK OUTPUT SIGNAL FROM ECM. (USING VOLTAGE METER.)**

- 1) Start and idle the engine.
- 2) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 37 (+) — Chassis ground (-): Is the voltage less than 1.0 V?**

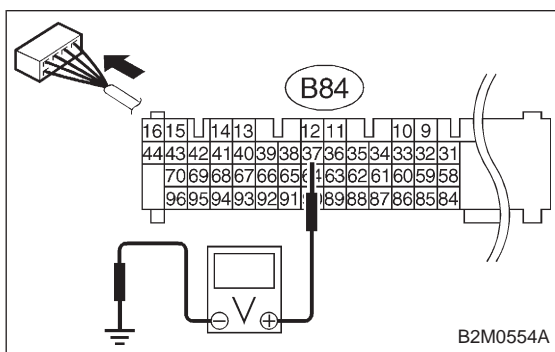
**YES** : Go to step 1004.

**NO** : Go to next **CHECK** .

**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 3).

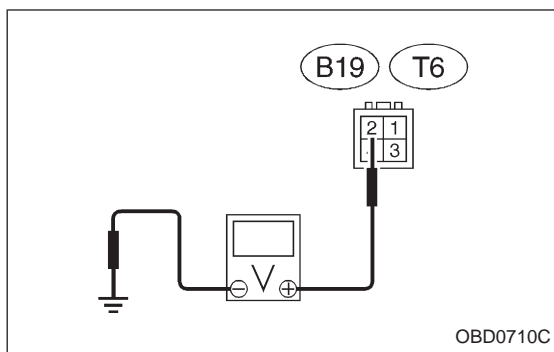


- 3) Disconnect connector from rear oxygen sensor.
- 4) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 37 (+) — Chassis ground (-): Is the voltage less than 1.0 V?**

**YES** : Replace ECM.

**NO** : Repair short circuit in harness between ECM and rear oxygen sensor connector. After repair short circuit in harness, replace ECM.

**1004****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.

**CHECK** : **Connector & terminal**

- **2200 cc California model (B19) No. 2 (+) — Engine ground (-):**
- **Except 2200 cc California model (T6) No. 2 (+) — Chassis ground (-):**

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

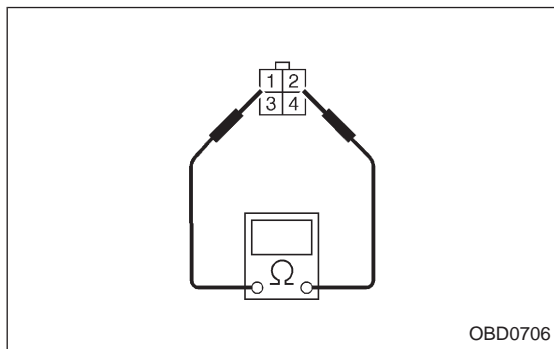
**YES** : Go to step **1005**.

**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 (Except 2200 cc California model)

**1005****CHECK REAR OXYGEN SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between rear oxygen sensor connector terminals.

**CHECK** : **Terminals**

**No. 1 — No. 2:**

**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>
<small>OBD0240</small>	

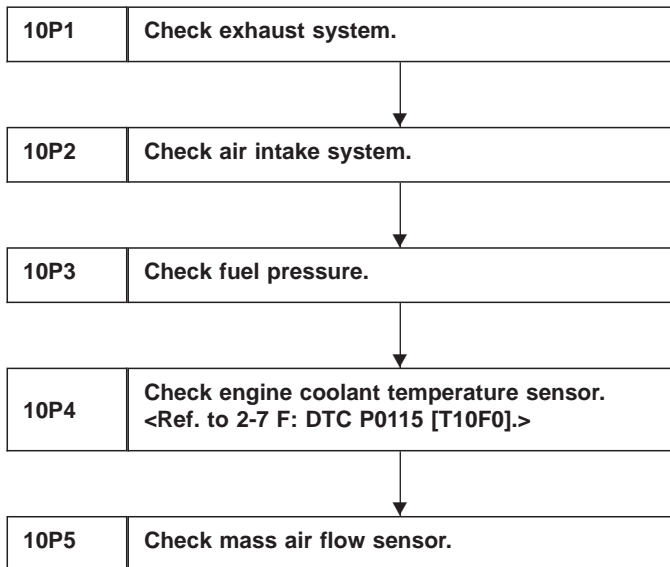
**P: DTC P0170**  
**— FUEL TRIM MALFUNCTION (FUEL) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips 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].>

<b>10P1</b>	<b>CHECK EXHAUST SYSTEM.</b>
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**CHECK** : *Are there holes or loose bolts on exhaust system?*

**YES** : Repair exhaust system.

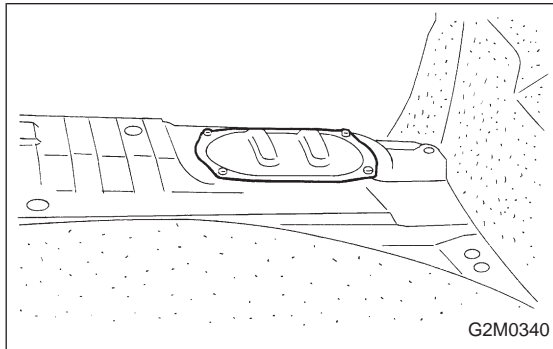
**NO** : Go to step **10P2**.

<b>10P2</b>	<b>CHECK AIR INTAKE SYSTEM.</b>
-------------	---------------------------------

**CHECK** : *Are there holes, loose bolts or disconnection of hose on air intake system?*

**YES** : Repair air intake system.

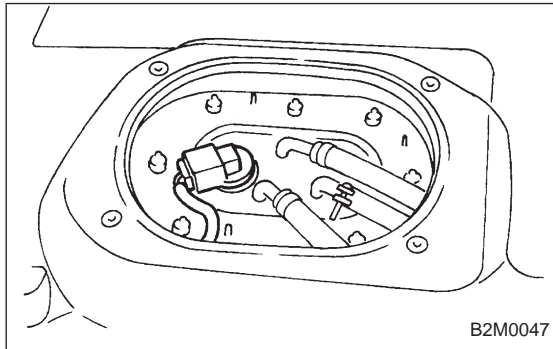
**NO** : Go to step **10P3**.



<b>10P3</b>	<b>CHECK FUEL PRESSURE.</b>
-------------	-----------------------------

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).

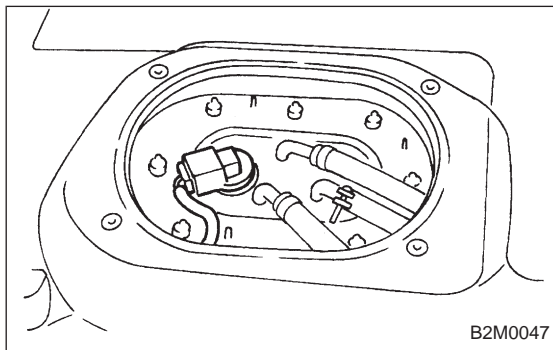


(2) Disconnect connector from fuel tank.

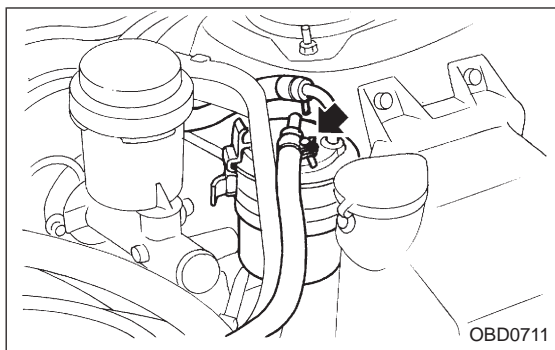
(3) Start the engine, and run it until it stalls.

(4) After stopping the engine, crank the engine for 5 to 7 seconds to reduce fuel pressure.

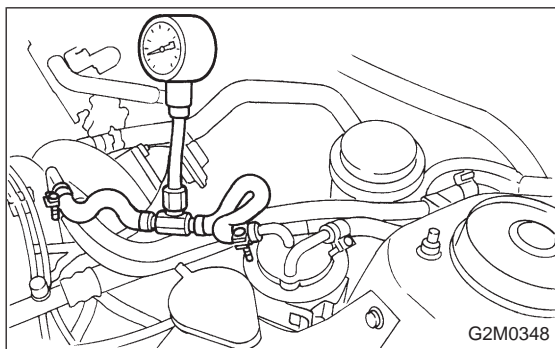
(5) Turn ignition switch to OFF.



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/cm<sup>2</sup>, 33 — 40 psi)?*

**YES** : Go to next step 6).

**NO** : Repair the following items.

Fuel pressure too high	<ul style="list-style-type: none"> <li>● Clogged fuel return line or bent hose</li> </ul>
Fuel pressure too low	<ul style="list-style-type: none"> <li>● Improper fuel pump discharge</li> <li>● Clogged fuel supply line</li> </ul>

6) After connecting pressure regulator vacuum hose, measure fuel pressure.

**CHECK** : *Is fuel pressure between 157 and 206 kPa (1.6 — 2.1 kg/cm<sup>2</sup>, 23 — 30 psi)?*

**YES** : Go to step 10P4.

**NO** : Repair the following items.

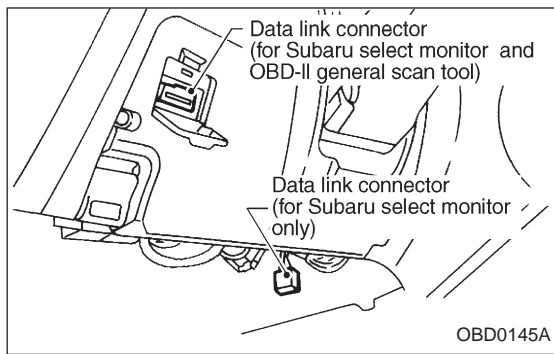
Fuel pressure too high	<ul style="list-style-type: none"> <li>● Faulty pressure regulator</li> <li>● Clogged fuel return line or bent hose</li> </ul>
Fuel pressure too low	<ul style="list-style-type: none"> <li>● Faulty pressure regulator</li> <li>● Improper fuel pump discharge</li> <li>● Clogged fuel supply line</li> </ul>

**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 step 6), check or replace pressure regulator and pressure regulator vacuum hose.



TW	( F04 )
80 ° C	176 ° F

B2M0479

**10P4****CHECK ENGINE COOLANT TEMPERATURE SENSOR.****<REF. TO 2-7 F: DTC P0115 [T10F0].>**

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- 3) Start the engine and warm-up completely.

4) Read data 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".

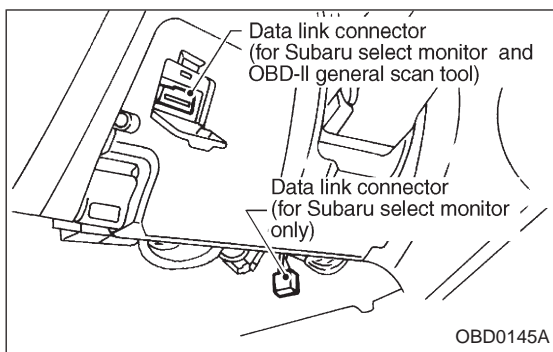
**CHECK** : **Is temperature greater than 60°C or 140°F in function mode F04?**

**YES** : Go to step **10P5**.

**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.



QA ( F06 )

1 . 67g / s      2 . 02V

B2M0481

**10P5      CHECK MASS AIR FLOW SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- 3) Start the engine and warm-up engine until coolant temperature is greater than 60°C (140°F).
- 4) Place the selector lever in "N" or "P" position.
- 5) Turn A/C switch to OFF.
- 6) Turn all accessory switches to OFF.

7) 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
2200 cc	Idling	1.7 — 3.3 (g/sec)
	2,500 rpm	7.1 — 14.2 (g/sec)
2500 cc	Idling	2.2 — 4.2 (g/sec)
	2,500 rpm	8.6 — 14.5 (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.

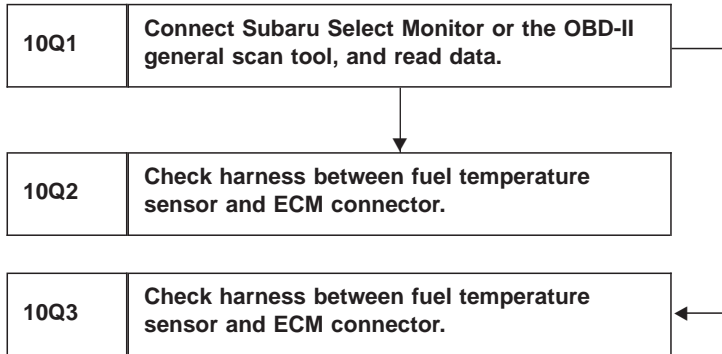
- OBD-II general scan tool  
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



OBD (FB1)  
 P0180 <TNKT>  
 H2M1306

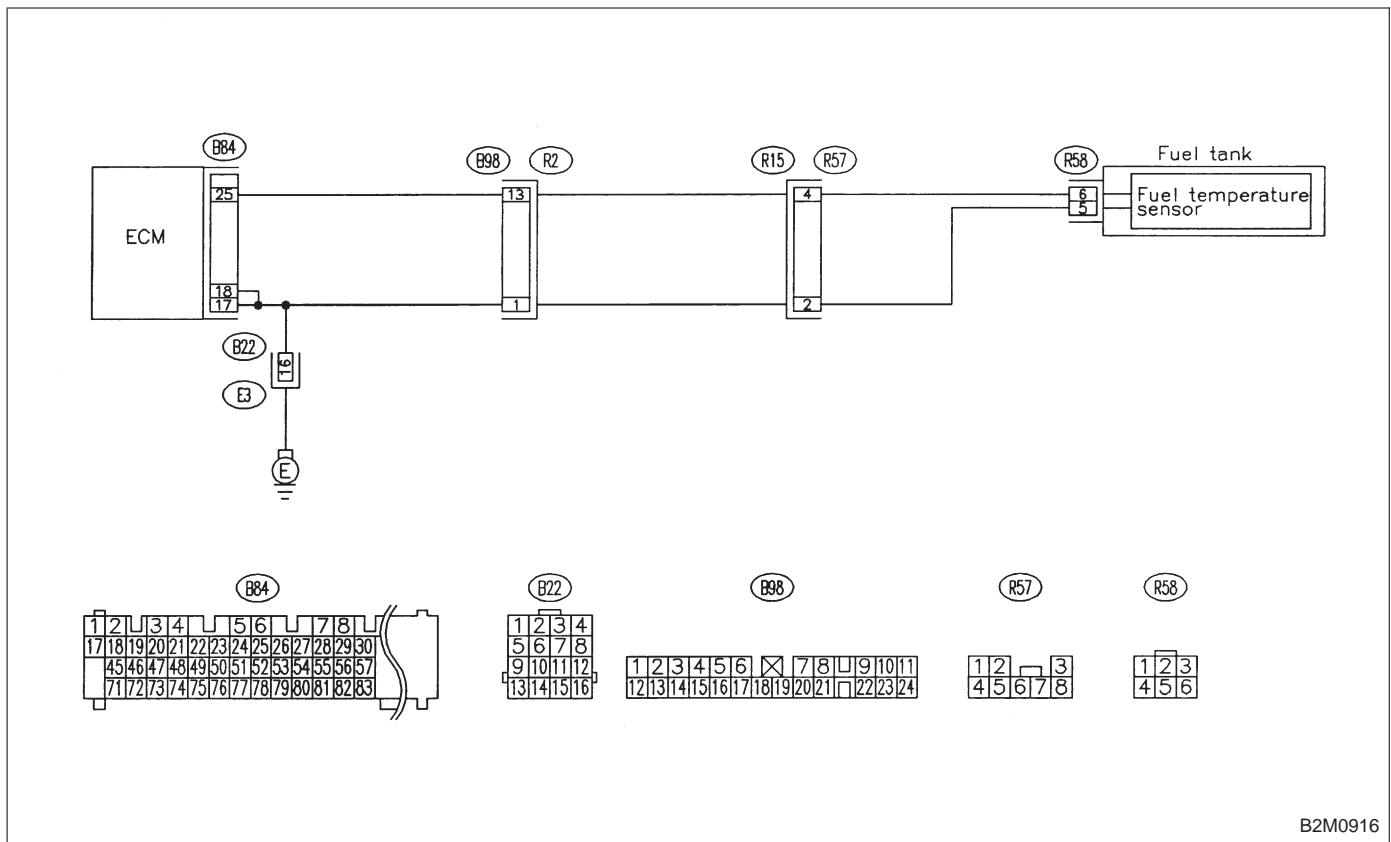
**Q: DTC P0180**  
**— FUEL TEMPERATURE SENSOR A CIRCUIT MALFUNCTION (TNKT) —**

**DTC DETECTING CONDITION:**  
 ● Immediately at fault recognition



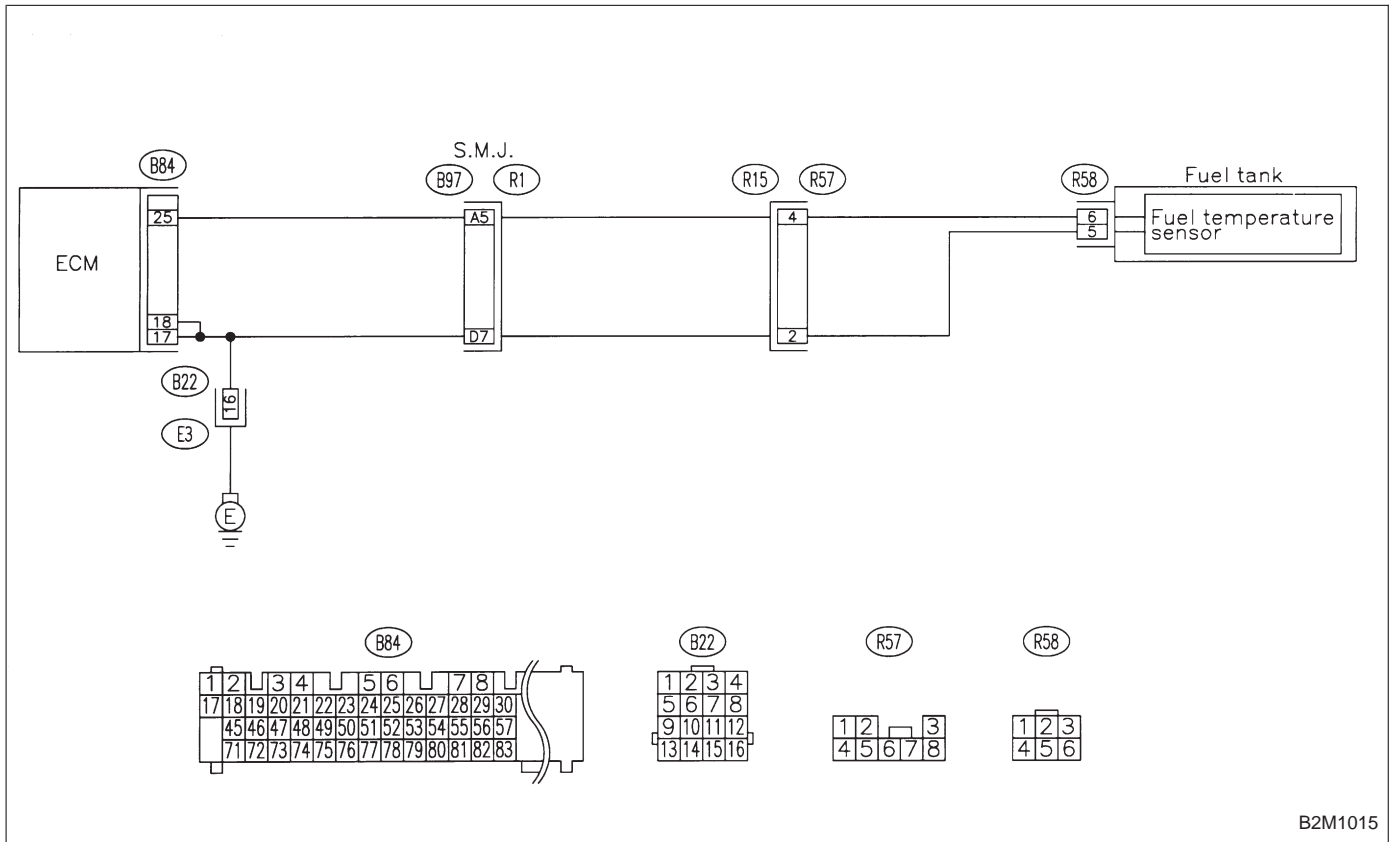
**CAUTION:**  
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.  
 <Ref. to 2-7 [T3D0] and [T3E0].>

**WIRING DIAGRAM:**  
 ● LHD Model

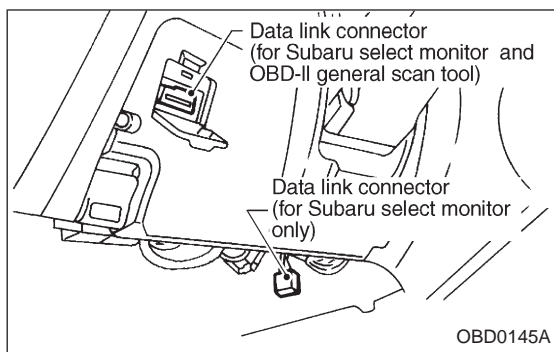


WIRING DIAGRAM:

- RHD Model



B2M1015



10Q1

**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 **10Q2**.

**NO** : Go to next **CHECK** .

TNKT (F44)

20°C 68°F

H2M1308

TNKT (F44)

20°C 68°F

H2M1308

**CHECK** : *Is the value less than -40°C or -40°F in function mode F44?*

**YES** : Go to step **10Q3**.

**NO** : Repair poor contact.

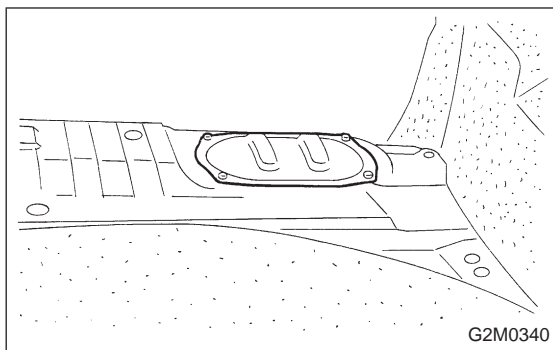
**NOTE:**

In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B22, B98 (LHD)/B97 (RHD), and R57)

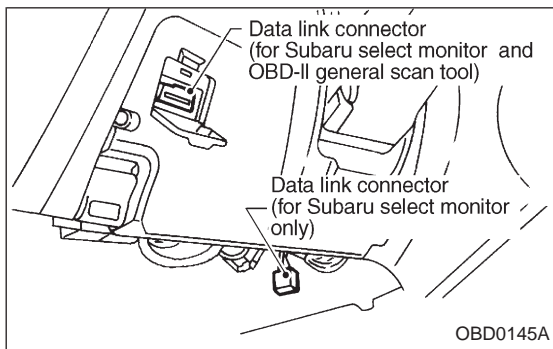
- OBD-II general scan tool

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

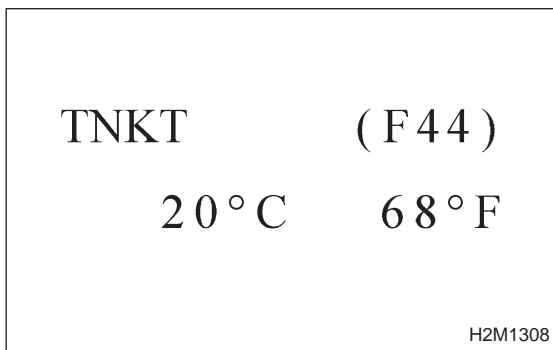


**10Q2**      **CHECK HARNESS BETWEEN FUEL TEMPERATURE SENSOR AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove access hole lid.
- 3) Disconnect connector from fuel pump.



- 4) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- 5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.



- 6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor  
Designate mode using function key.

**Function mode: F44**

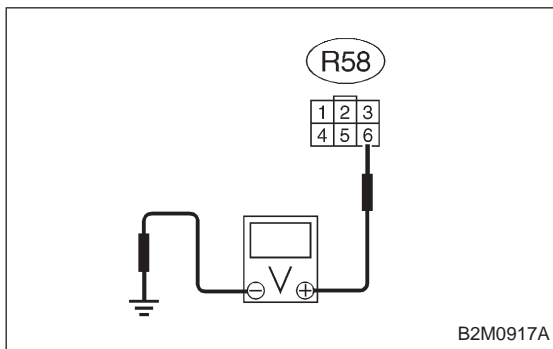
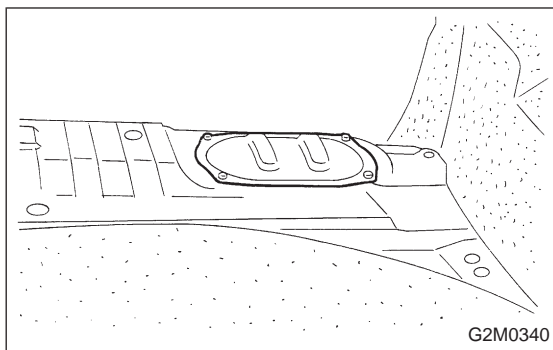
- F44: Fuel temperature is indicated in “°C” and “°F”.

**CHECK** : *Is the value less than -40°C or -40°F in function mode F44?*

**YES** : Replace fuel temperature sensor.

**NO** : Repair 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.



10Q3

**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) Turn ignition switch to ON.

5) Measure voltage between fuel pump connector and chassis ground.

**CHECK** : **Connector & terminal (R58) No. 6 (+) — Chassis ground (-): Is the voltage more than 4 V?**

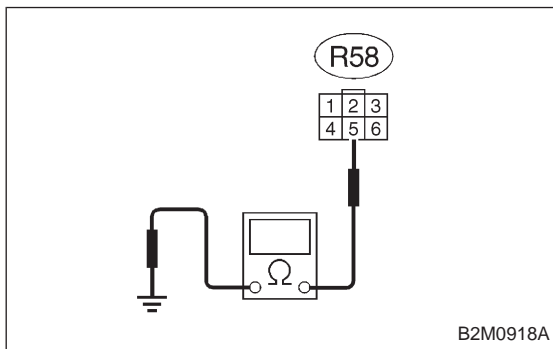
**YES** : Go to next step 6).

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and fuel pump connector
- Poor contact in fuel pump connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (B98 (LHD)/B97 (RHD), and R57)



6) Turn ignition switch to OFF.

7) 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** : 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, B98 (LHD)/B97 (RHD), and R57)

OBD (FB1)  
 P0181 <TNKT\_F>  
 H2M1350

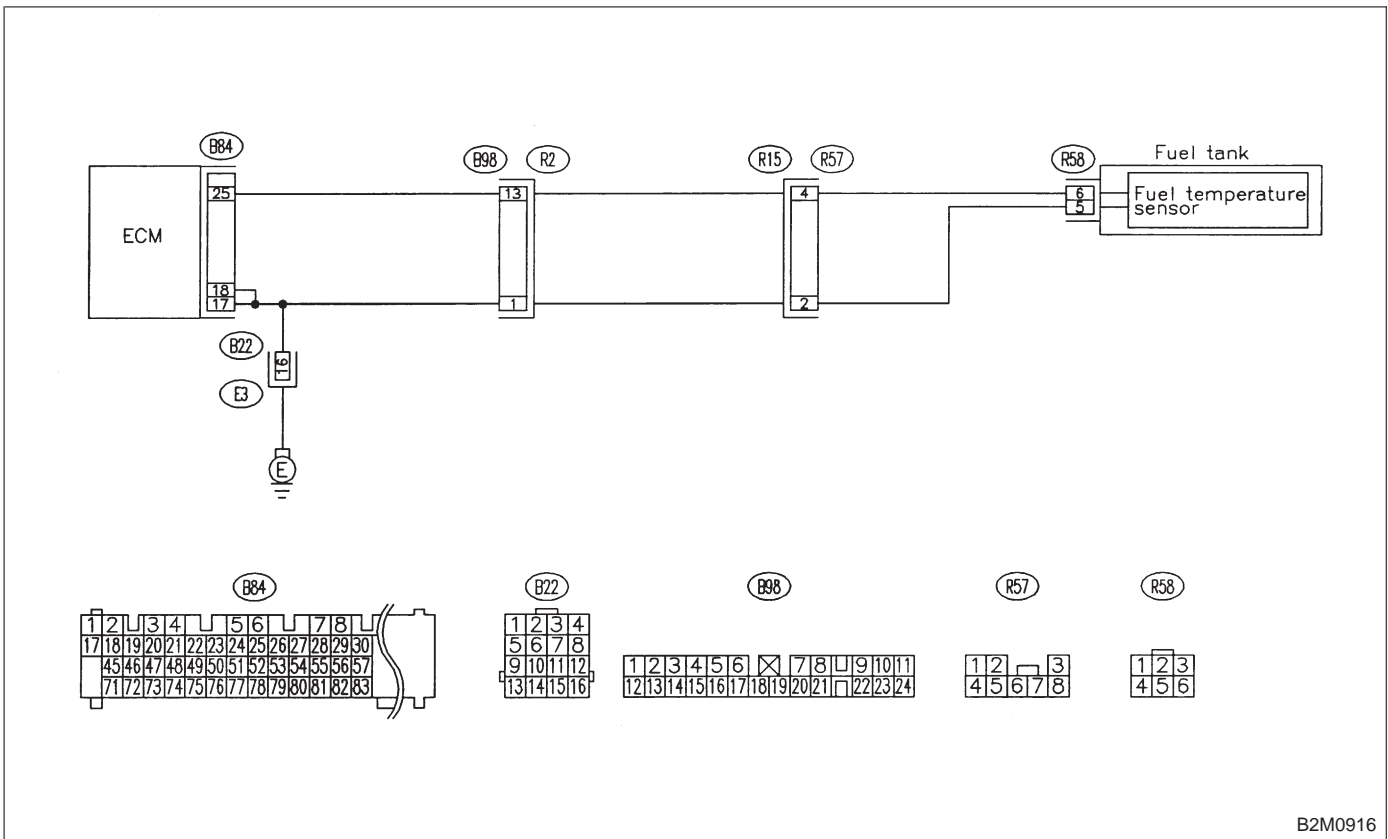
**R: DTC P0181**  
**— FUEL TEMPERATURE SENSOR A CIRCUIT**  
**RANGE/PERFORMANCE PROBLEM**  
**(TNKT – F) —**

**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

10R1 Check DTC P0180 on display.

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

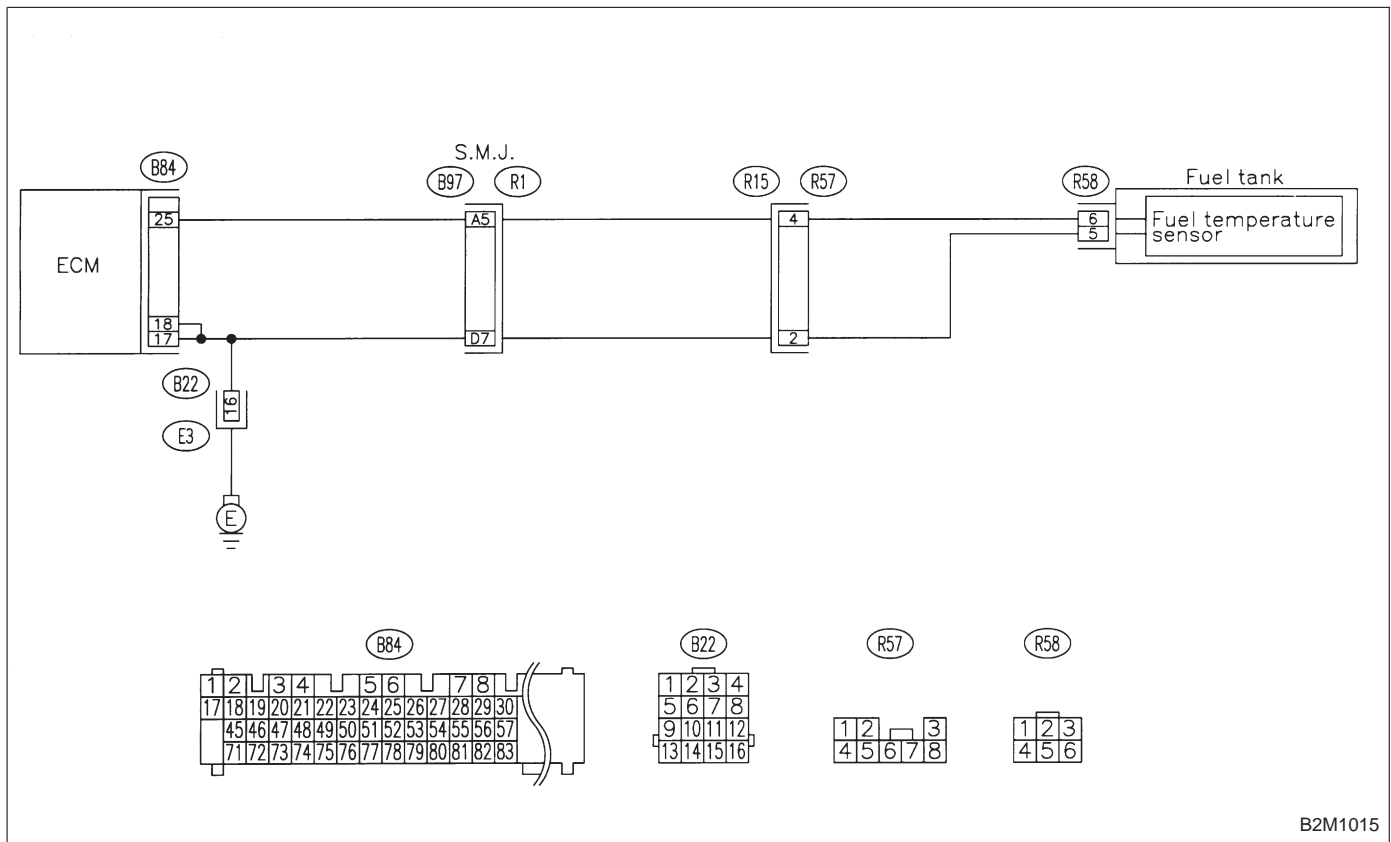
**WIRING DIAGRAM:**  
 ● LHD Model



B2M0916

**WIRING DIAGRAM:**

- RHD Model



B2M1015

<b>10R1</b>	<b>CHECK DTC P0180 ON DISPLAY.</b>
-------------	------------------------------------

**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0180?

**YES** : Inspect DTC P0180 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

**NOTE:**

In this case, it is not necessary to inspect DTC P0181.

**NO** : Replace fuel temperature sensor.

OBD	(FB1)
P0201	<INJ1>
OBD0261	

**S: DTC P0201**  
**— FUEL INJECTOR CIRCUIT MALFUNCTION - #1 (INJ1) —**

OBD	(FB1)
P0202	<INJ2>
OBD0262	

**T: DTC P0202**  
**— FUEL INJECTOR CIRCUIT MALFUNCTION - #2 (INJ2) —**

OBD	(FB1)
P0203	<INJ3>
OBD0263	

**U: DTC P0203**  
**— FUEL INJECTOR CIRCUIT MALFUNCTION - #3 (INJ3) —**

OBD	(FB1)
P0204	<INJ4>
OBD0264	

**V: DTC P0204**  
**— FUEL INJECTOR CIRCUIT MALFUNCTION - #4 (INJ4) —**

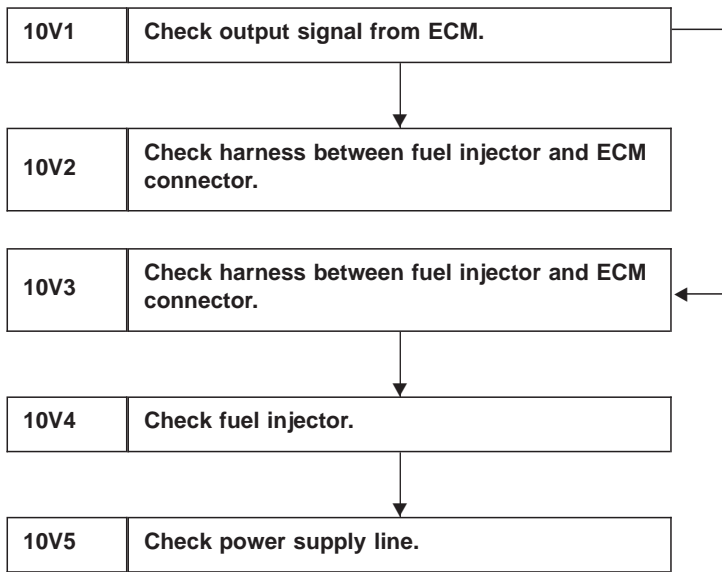
**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving



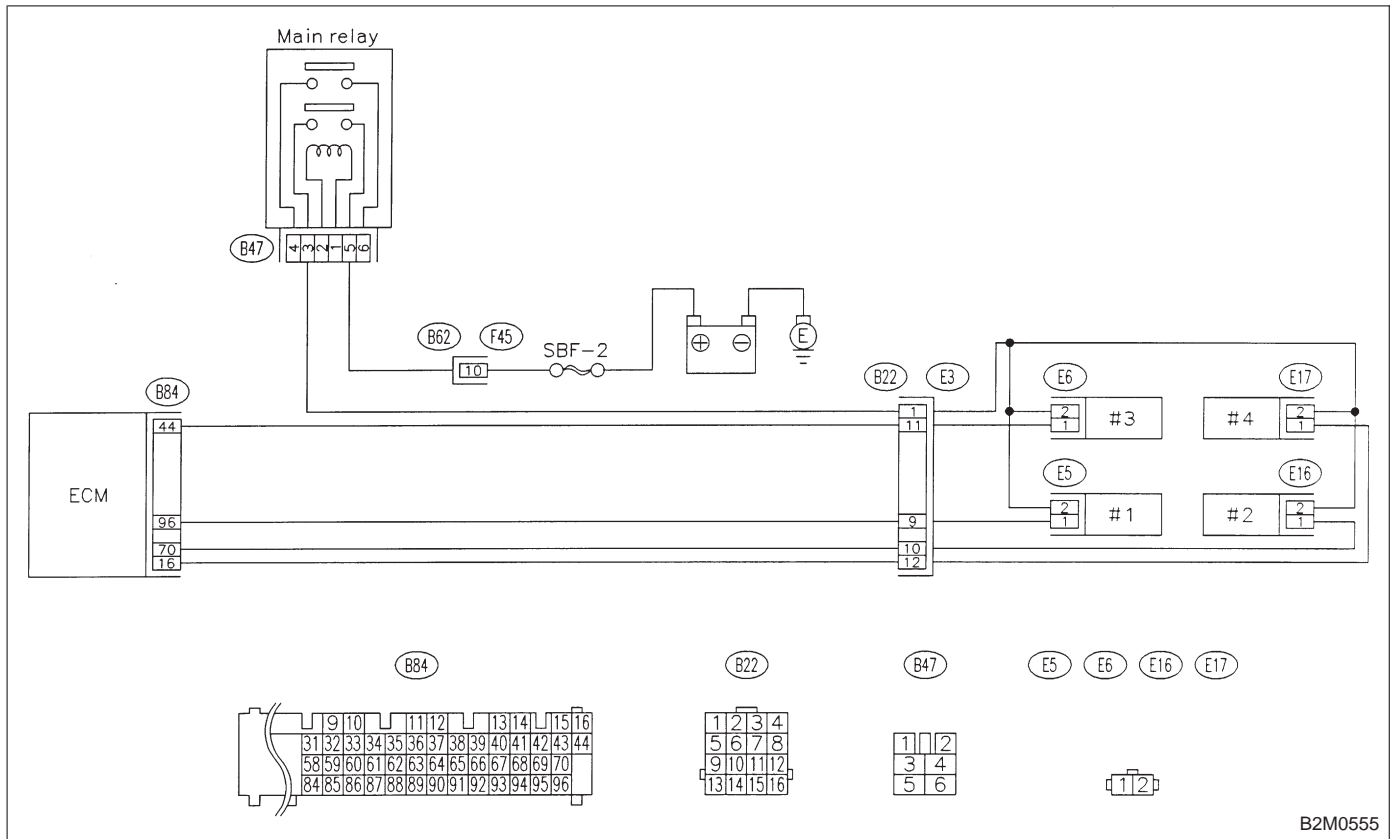


**CAUTION:**

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

**WIRING DIAGRAM:**

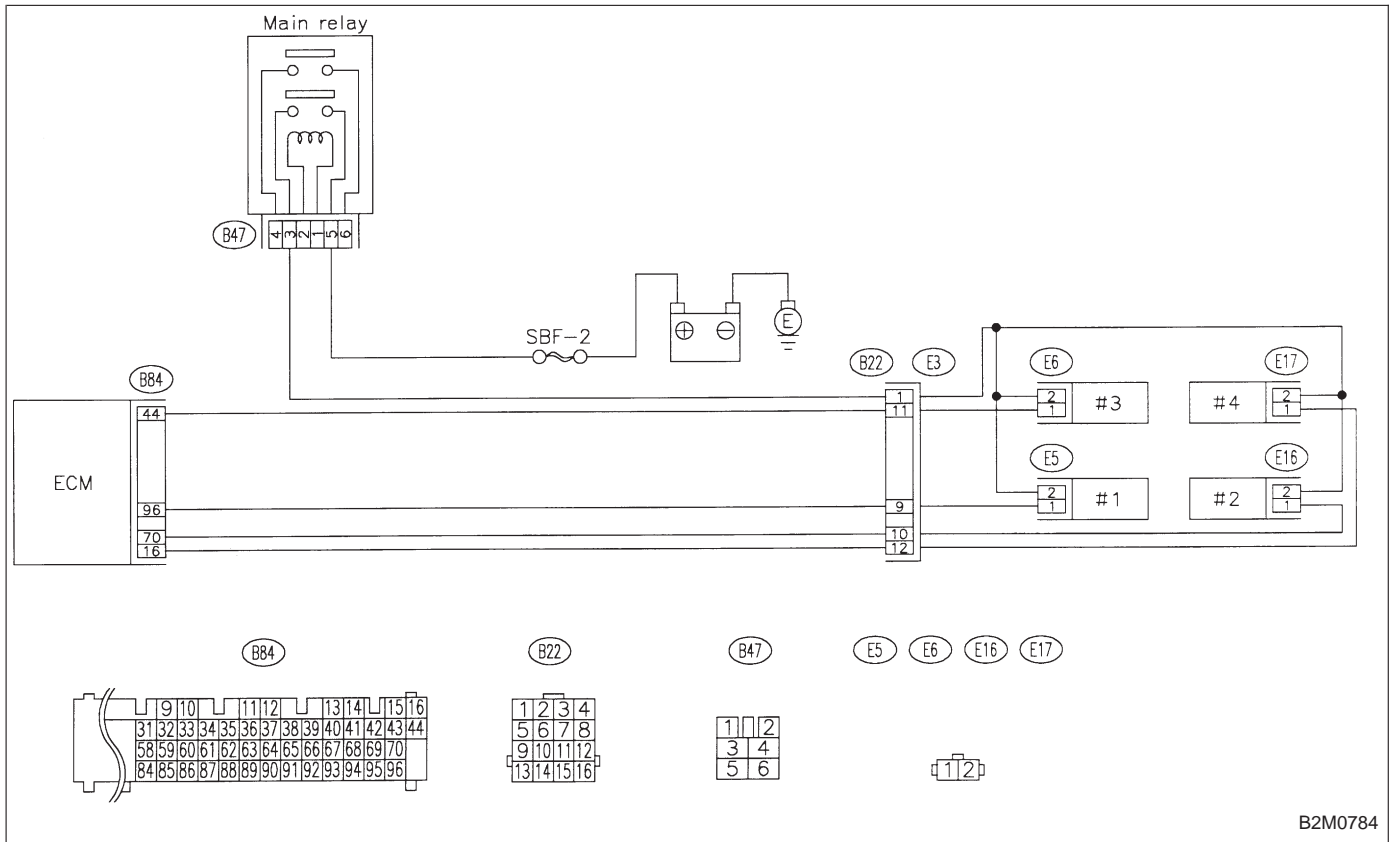
- LHD Model



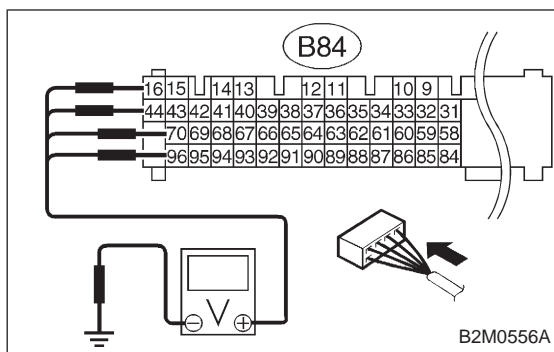
B2M0555

WIRING DIAGRAM:

- RHD Model



B2M0784

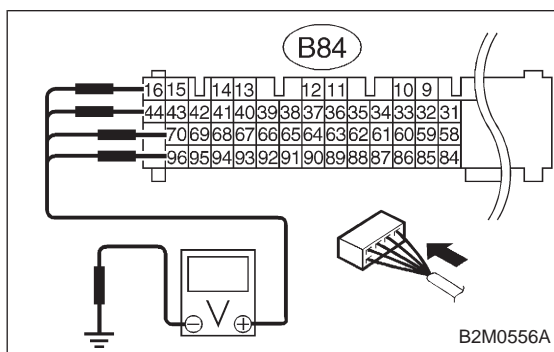
**10V1 CHECK OUTPUT SIGNAL FROM ECM.**

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

**CHECK** : **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 (-):**  
**Is the voltage more than 10 V?**

**YES** : Go to step 10V2.

**NO** : Go to step 10V3.

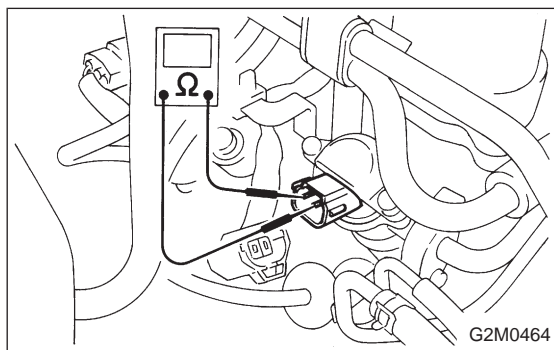
**10V2 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.**

- 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.

**CHECK** : **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 (-):**  
**Is the voltage more than 10 V?**

**YES** : Repair short circuit in harness between ECM and fuel injector. After repair, replace ECM.

**NO** : Go to next step 5).



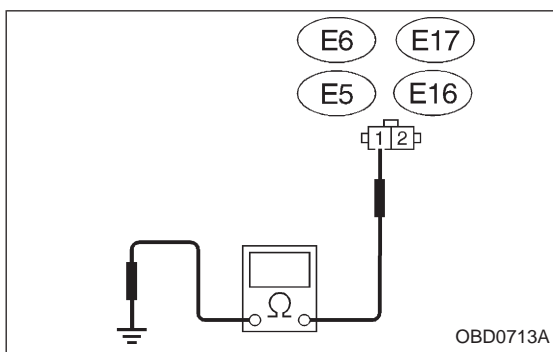
- 5) Turn ignition switch to OFF.
- 6) Measure resistance between fuel injector terminals on faulty cylinder.

**CHECK** : **Terminals**  
**No. 1 — No. 2 :**  
**Is the resistance less than 1  $\Omega$ ?**

**YES** : Replace faulty fuel injector and ECM.

**NO** : Go to next **CHECK** .

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

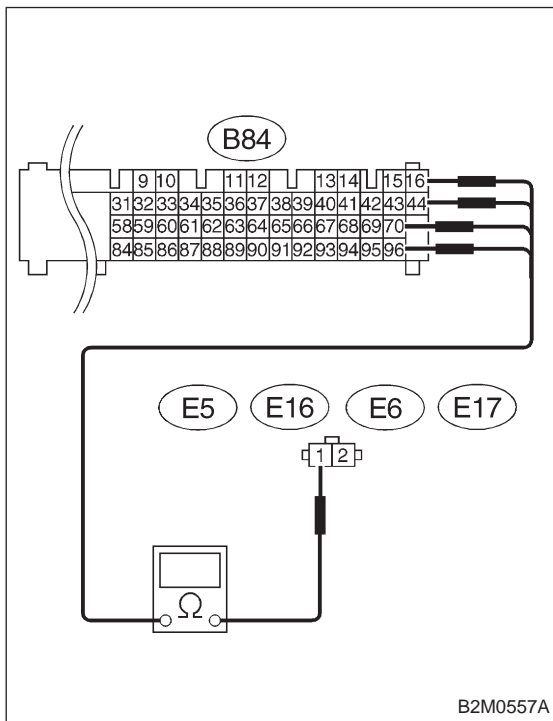


**10V3 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.**

- 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.

- CHECK** : **Connector & terminal**  
 #1 (E5) No. 1 — Engine ground:  
 #2 (E16) No. 1 — Engine ground:  
 #3 (E6) No. 1 — Engine ground:  
 #4 (E17) No. 1 — Engine ground:  
**Is the resistance less than 10 Ω?**

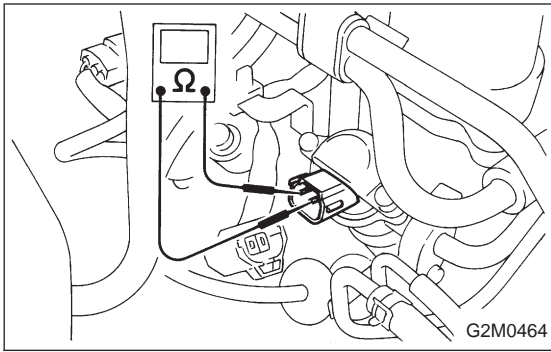
- YES** : Repair short circuit in harness between fuel injector and ECM connector.
- NO** : Go to next step 4).



- 4) Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders.

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

- YES** : Go to step 10V4.
- NO** : Repair open circuit in harness between ECM and fuel injector connector.

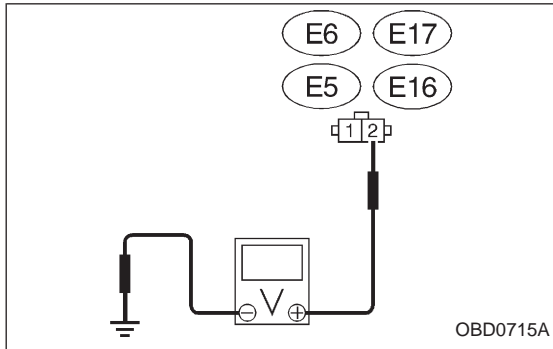
**10V4 CHECK FUEL INJECTOR.**

Measure resistance between fuel injector terminals on faulty cylinder.

**CHECK** : **Terminals**  
**No. 1 — No. 2:**  
**Is the resistance between 5 and 20  $\Omega$ ?**

**NO** : Replace faulty fuel injector.

**YES** : Go to step **10V5**.

**10V5 CHECK POWER SUPPLY LINE.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between fuel injector and engine ground on faulty cylinders.

**CHECK** : **Connector & terminal**  
**#1 (E5) No. 2 (+) — Engine ground (-):**  
**#2 (E16) No. 2 (+) — Engine ground (-):**  
**#3 (E6) No. 2 (+) — Engine ground (-):**  
**#4 (E17) No. 2 (+) — Engine ground (-):**  
**Is the voltage 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 main relay connector
- Poor contact in fuel injector connector on faulty cylinders

OBD	(FB1)
P0301	<MIS_1>
OBD0277	

**W: DTC P0301**  
**— CYLINDER 1 MISFIRE DETECTED**  
**(MIS – 1) —**

OBD	(FB1)
P0302	<MIS_2>
OBD0278	

**X: DTC P0302**  
**— CYLINDER 2 MISFIRE DETECTED**  
**(MIS – 2) —**

OBD	(FB1)
P0303	<MIS_3>
OBD0279	

**Y: DTC P0303**  
**— CYLINDER 3 MISFIRE DETECTED**  
**(MIS – 3) —**

OBD	(FB1)
P0304	<MIS_4>
OBD0280	

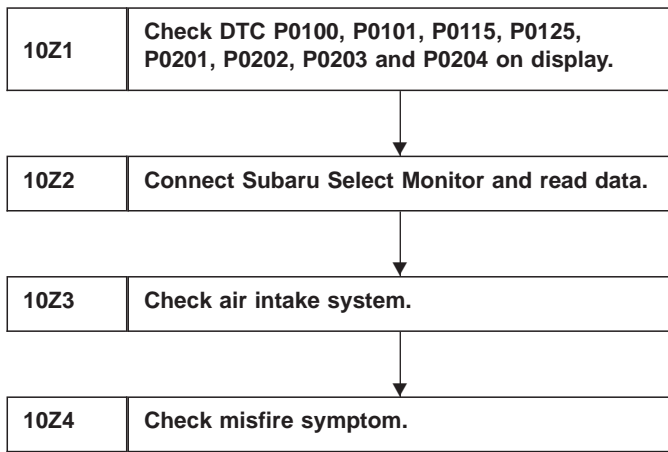
**Z: DTC P0304**  
**— CYLINDER 4 MISFIRE DETECTED**  
**(MIS – 4) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

**TROUBLE SYMPTOM:**

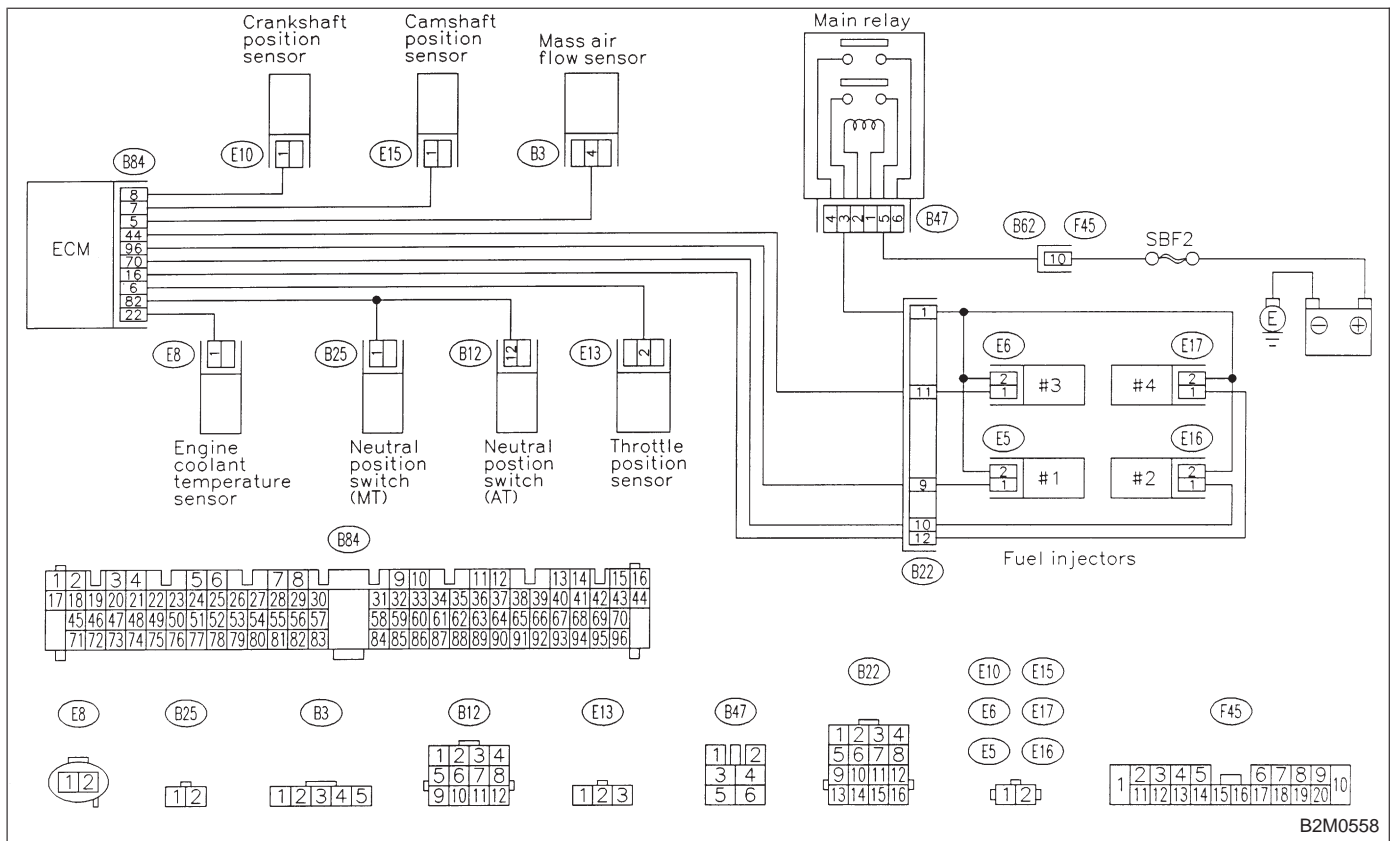
- Engine stalls.
- Erroneous idling
- Rough driving



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

**WIRING DIAGRAM:**

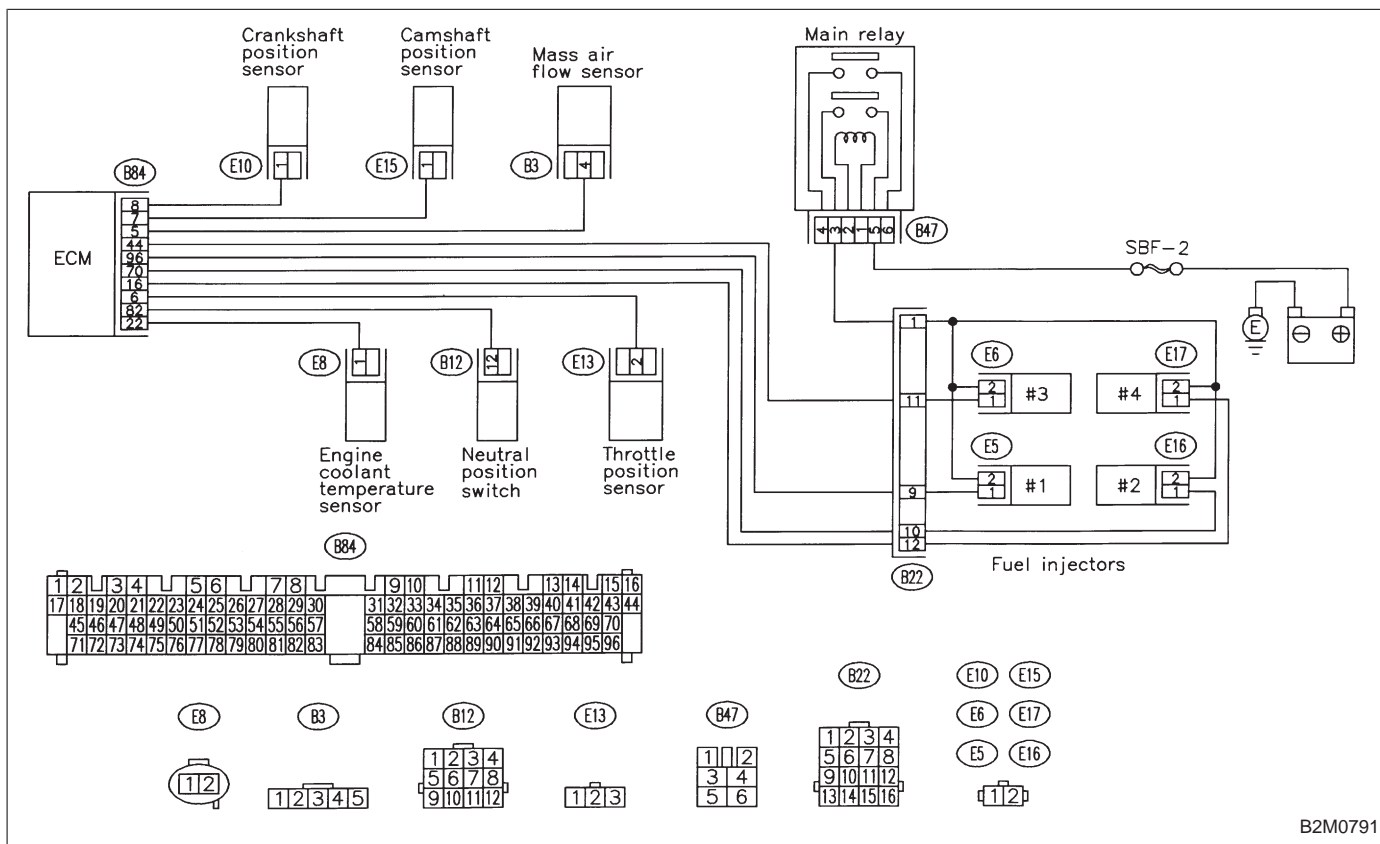
- LHD Model



B2M0558

WIRING DIAGRAM:

● RHD Model



B2M0791

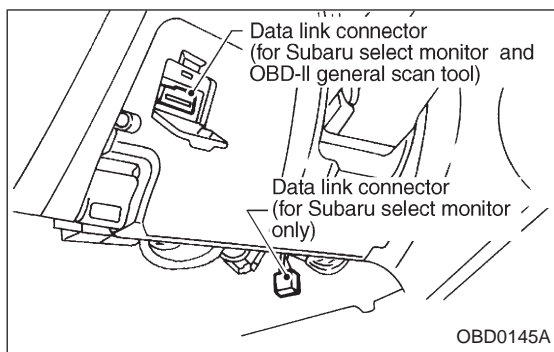
<b>10Z1</b>	<b>CHECK DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203, AND P0204 ON DISPLAY.</b>
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- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203 and P0204?
- YES** : Inspect DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203 and P0204 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

**NOTE:**  
In this case, it is not necessary to inspect DTC P0301, P0302, P0303 and P0304.

- NO** : Go to step **10Z2**.



**10Z2****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.

EGRmax-min (F4 2 )

100kPa      4 kPa

B2M0759

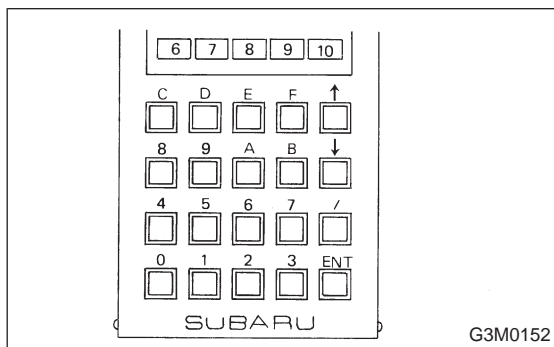
- 4) Read data on Subaru Select Monitor. Designate mode use function key.

**Function mode: F42**

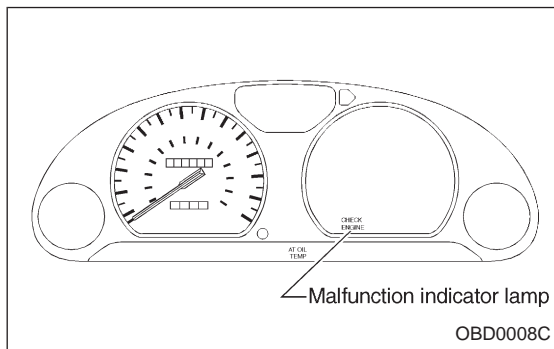
NOTE:

F42: Maximum and minimum EGR system pressure value are indicated at the same time.

- 5) Print out the displayed data on paper.



- 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 10Z3.**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 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)

<b>10Z3</b>	<b>CHECK AIR INTAKE SYSTEM.</b>
-------------	---------------------------------

- CHECK** : *Is there a fault in air intake system?*

NOTE:

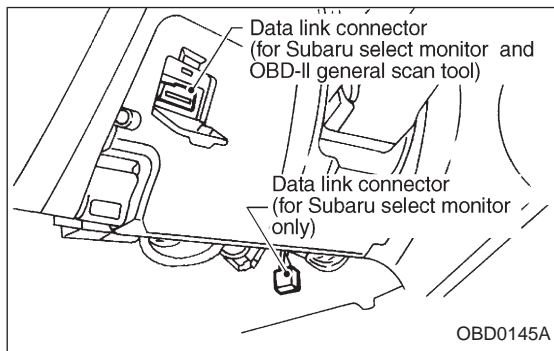
Check the following items:

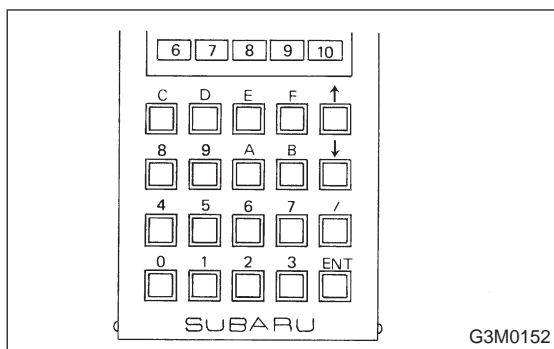
- Are there air leaks or air suction caused by loose or dislocated nuts and bolts?
- Are there cracks or any disconnection of hoses?

- YES** : Repair air intake system.
- NO** : Go to step **10Z4**.

<b>10Z4</b>	<b>CHECK MISFIRE SYMPTOM.</b>
-------------	-------------------------------

- 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.

DTC	Next action
Only one cylinder	Go to step ①.
P0301 and P0302	Go to step ②.
P0303 and P0304	Go to step ③.
P0301 and P0303	Go to step ④.
P0302 and P0304	Go to step ⑤.
Others	Go to step ⑥.

**① 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** : Go to next **CHECK** .

**NO** : Go to DTC P0170, 2-7 [T10P3], [T10P4] and [T10P5].

**② 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

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

**NO** : Go to DTC P0170, 2-7 [T10P3], [T10P4] and [T10P5].

**NOTE:**

If no abnormal is discovered, check for "8. F: IGNITION SYSTEM" of #1 and #2 cylinders side.

**③ 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

**YES** : Go to next **CHECK** .**NO** : Go to DTC P0170, 2-7 [T10P3], [T10P4] and [T10P5].

NOTE:

If no abnormal is discovered, check for "8. F: IGNITION SYSTEM" of #3 and #4 cylinders side.

**④ 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** : Go to next **CHECK** .**NO** : Go to DTC P0170, 2-7 [T10P3], [T10P4] and [T10P5].**⑤ 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** : Go to next **CHECK** .**NO** : Go to DTC P0170, 2-7 [T10P3], [T10P4] and [T10P5].**⑥ THE CYLINDER AT RANDOM****CHECK** : *Is the engine idle rough?***YES** : Go to next **CHECK** .**NO** : Go to DTC P0170, 2-7 [T10P3], [T10P4] and [T10P5].

EGRmax-min (F4 2 )

1 0 0kPa      4 kPa

B2M0759

**CHECK** : *Is the minimum EGR system pressure value (value of function mode (F42) less than 1 kPa?*

NOTE:

Use the value read in step **10Z2** 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, 2-7 [T10P3], [T10P4] and [T10P5].

OBD  P0325	(FB1)  <KNOCK>
------------------	----------------------

OBD0283

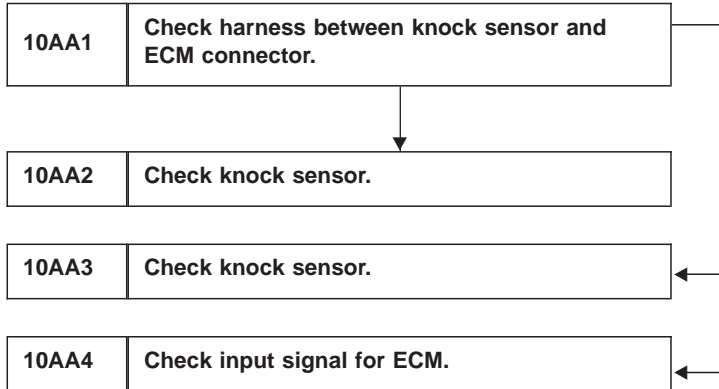
**AA: DTC P0325**  
**— KNOCK SENSOR CIRCUIT MALFUNCTION (KNOCK) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

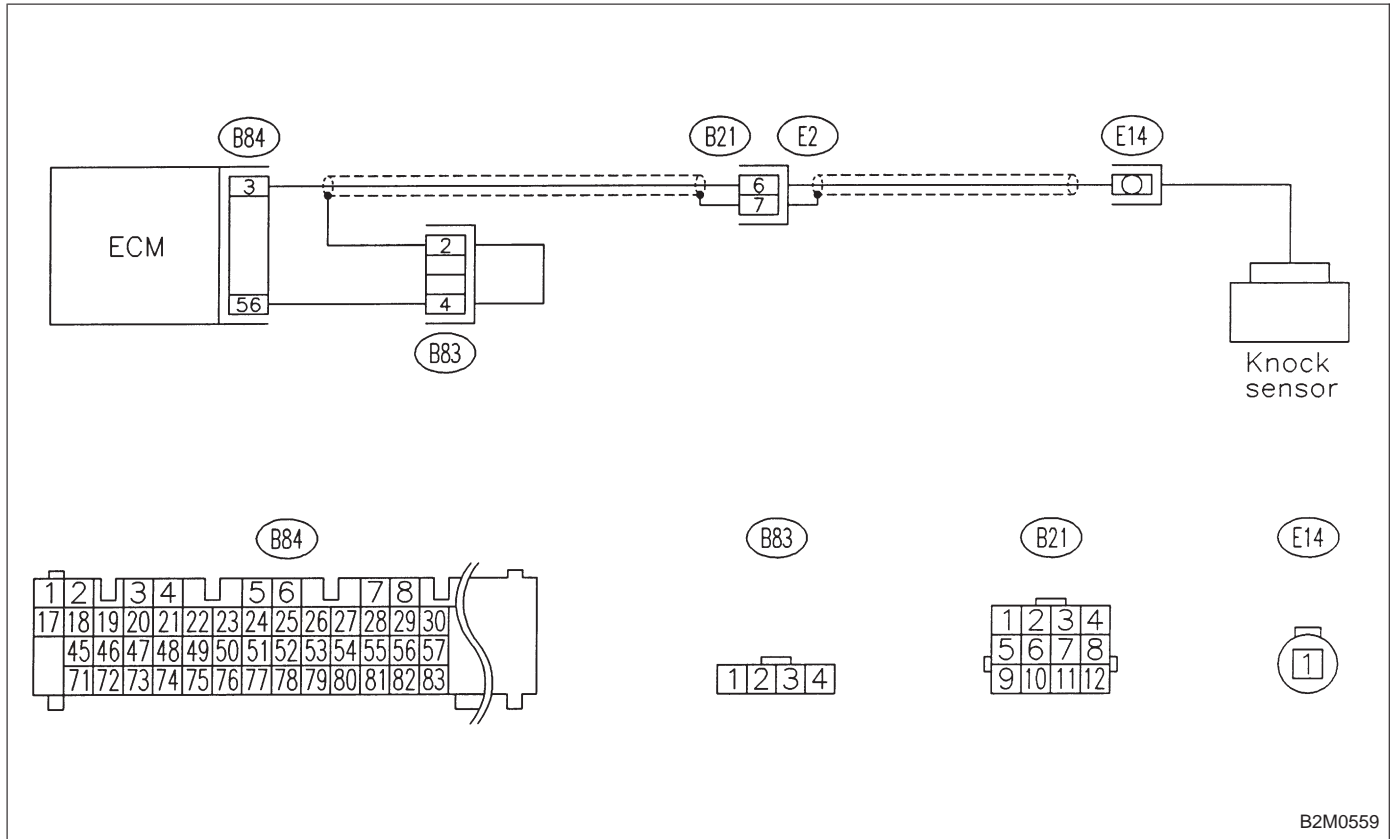
**TROUBLE SYMPTOM:**

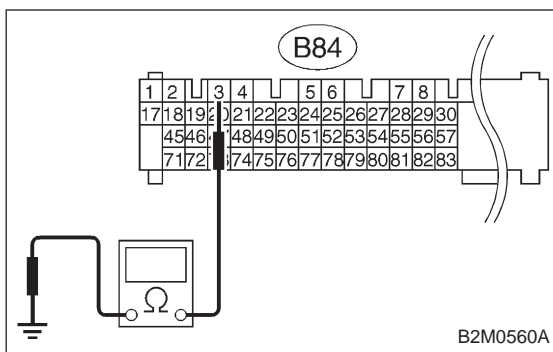
- Poor driving performance
- Knocking occurs.



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

WIRING DIAGRAM:





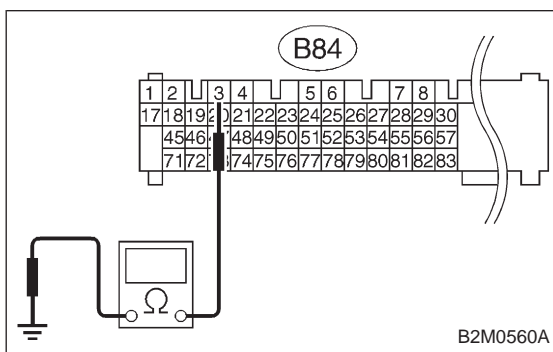
**10AA1 CHECK HARNESS BETWEEN KNOCK SENSOR AND ECM CONNECTOR.**

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

**CHECK** : **Connector & terminal (B84) No. 3 — Chassis ground: Is the resistance more than 700 kΩ?**

**YES** : Go to step 10AA2.

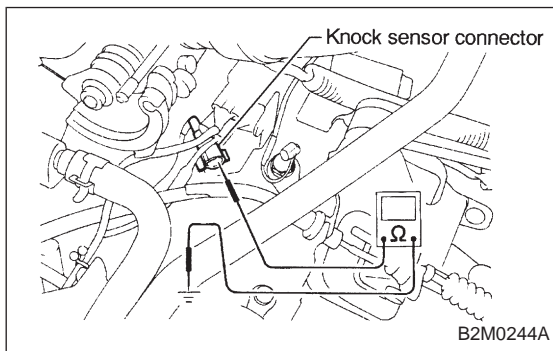
**NO** : Go to next **CHECK** .



**CHECK** : **Connector & terminal (B84) No. 3 — Chassis ground: Is the resistance less than 400 kΩ?**

**YES** : Go to step 10AA3.

**NO** : Go to step 10AA4.



**10AA2 CHECK KNOCK SENSOR.**

- 1) Disconnect connector from knock sensor.
- 2) Measure resistance between knock sensor connector terminal and engine ground.

**CHECK** : **Terminal No. 1 — Engine ground: Is the resistance more than 700 kΩ?**

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

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

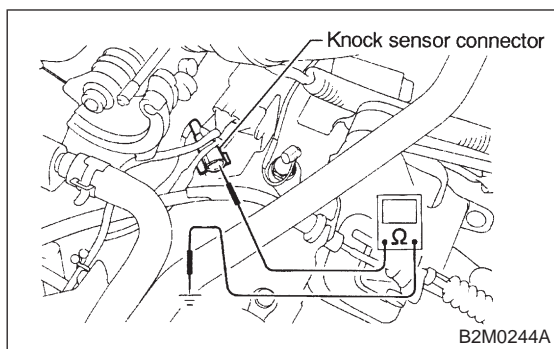
- Open circuit in harness between knock sensor and ECM connector
- Poor contact in knock sensor connector
- Poor contact in coupling connector (B21)

**CHECK** : **Is the knock sensor installation bolt tightened securely?**

**YES** : Replace knock sensor.

**NO** : Tighten knock sensor installation bolt securely.



**10AA3 CHECK KNOCK SENSOR.**

- 1) Disconnect connector from knock sensor.
- 2) Measure resistance between knock sensor connector terminal and engine ground.

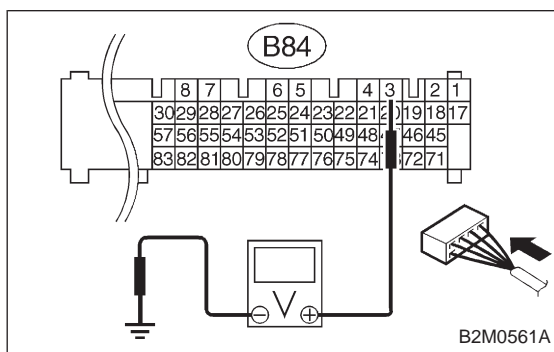
**CHECK** : **Terminal No. 1 — Engine ground:**  
**Is the resistance less than 400 k $\Omega$ ?**

**YES** : Replace knock sensor.

**NO** : Repair 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.

**10AA4 CHECK INPUT SIGNAL FOR ECM.**

- 1) Connect connectors to ECM and knock sensor.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ECM and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 3 (+) — Chassis ground (-):**  
**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.

OBD	(FB1)
P0335	<CRANK>
OBD0292	

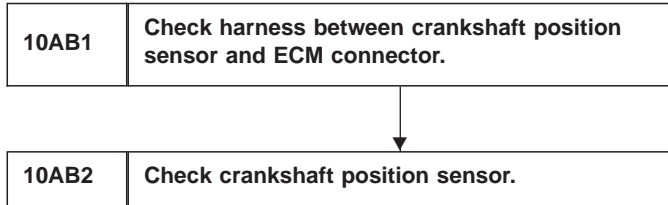
**AB: DTC P0335**  
**— CRANKSHAFT POSITION SENSOR**  
**CIRCUIT MALFUNCTION (CRANK) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

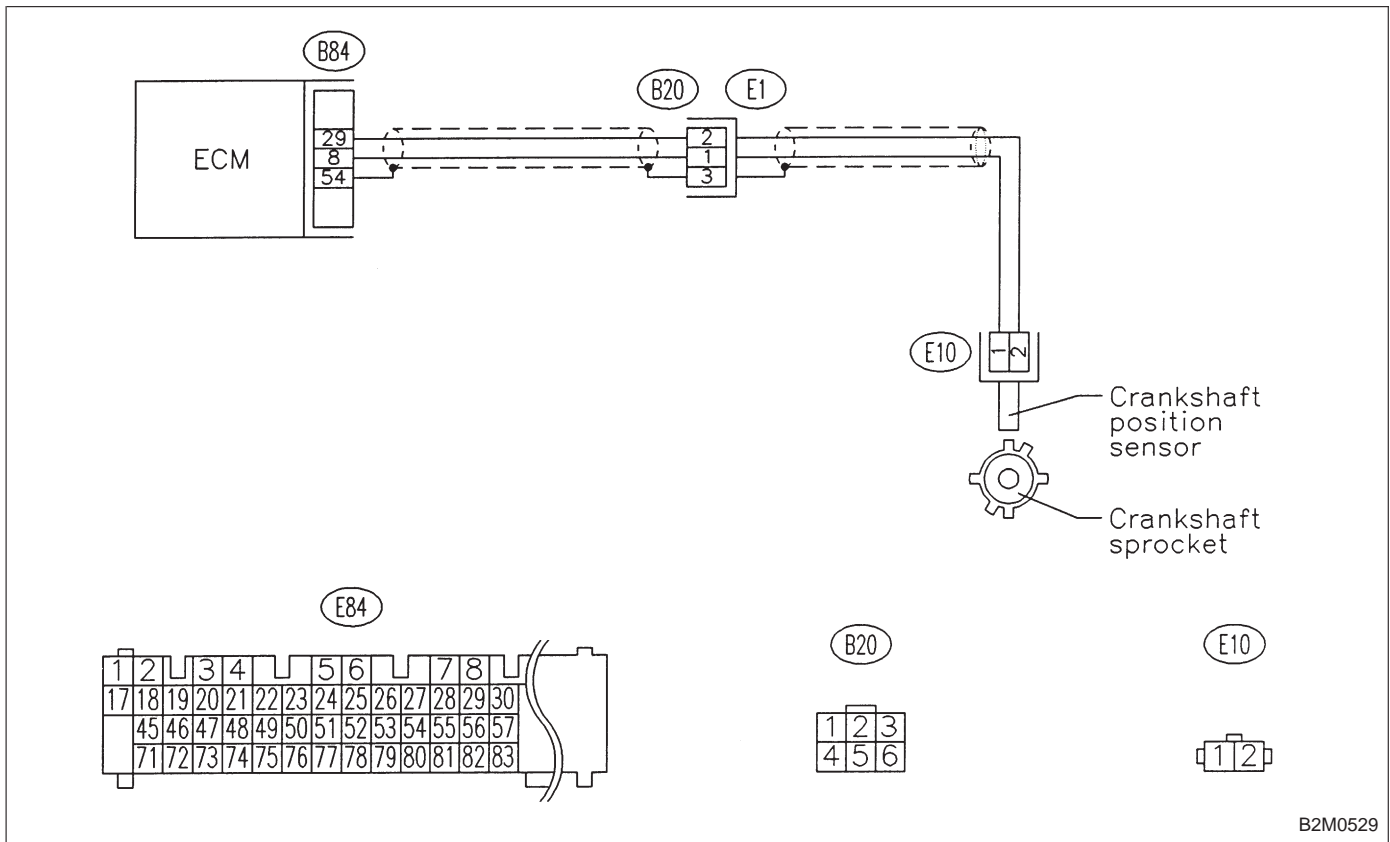
- Engine stalls.
- Failure of engine to start



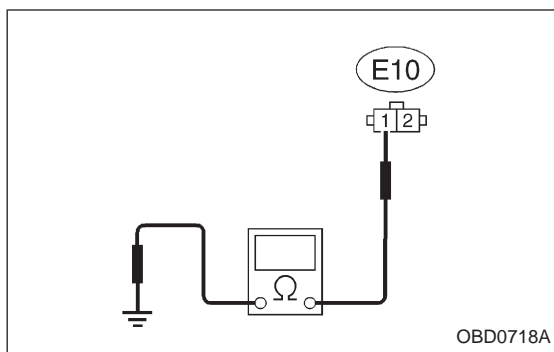
**CAUTION:**

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

**WIRING DIAGRAM:**



B2M0529

**10AB1**
**CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR AND ECM CONNECTOR.**

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

**CHECK** : **Connector & terminal (E10) No. 1 — Engine ground: Is the resistance more than 100 kΩ?**

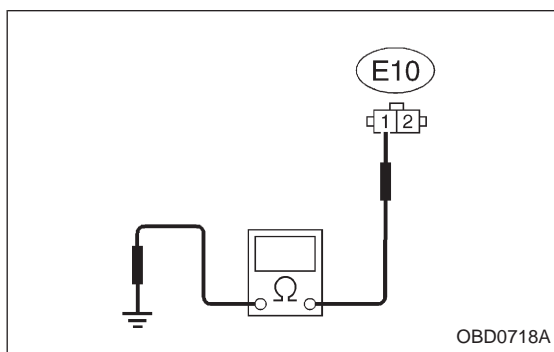
**YES** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

**NO** : Go to next **CHECK** .



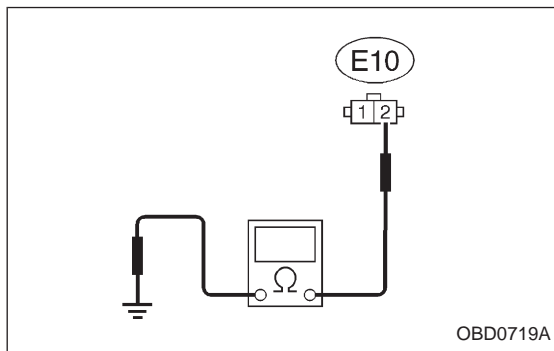
**CHECK** : **Connector & terminal (E10) No. 1 — Engine ground: Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between crankshaft position sensor and ECM connector.

**NOTE:**

The harness between both connectors are shielded. Repair short circuit in harness together with shield.

**NO** : Go to next **CHECK** .



**CHECK** : **Connector & terminal (E10) No. 2 — Engine ground: Is the resistance less than 5 Ω?**

**YES** : Go to step **10AB2**.

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

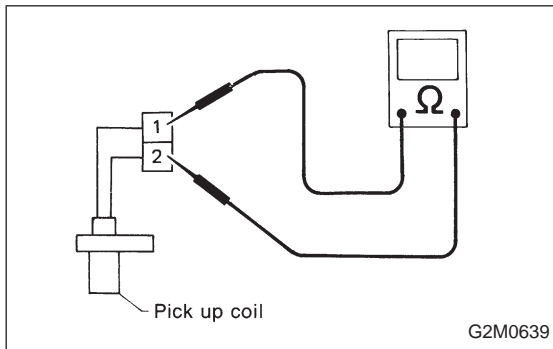
- Open circuit in harness between crankshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

**10AB2****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.

**CHECK** : **Terminals**  
**No. 1 — No. 2:**  
*Is the resistance between 1 and 4 kΩ?*

**YES** : Repair poor contact in crankshaft position sensor connector.

**NO** : Replace crankshaft position sensor.

OBD	(FB1)
P0340	<CAM>
OBD0304	

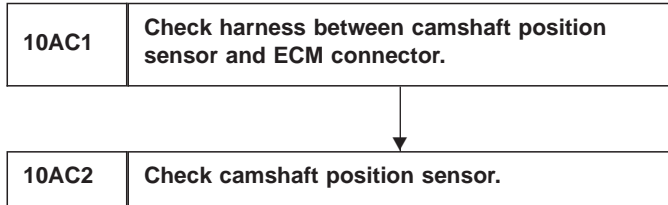
**AC: DTC P0340**  
**— CAMSHAFT POSITION SENSOR CIRCUIT**  
**MALFUNCTION (CAM) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

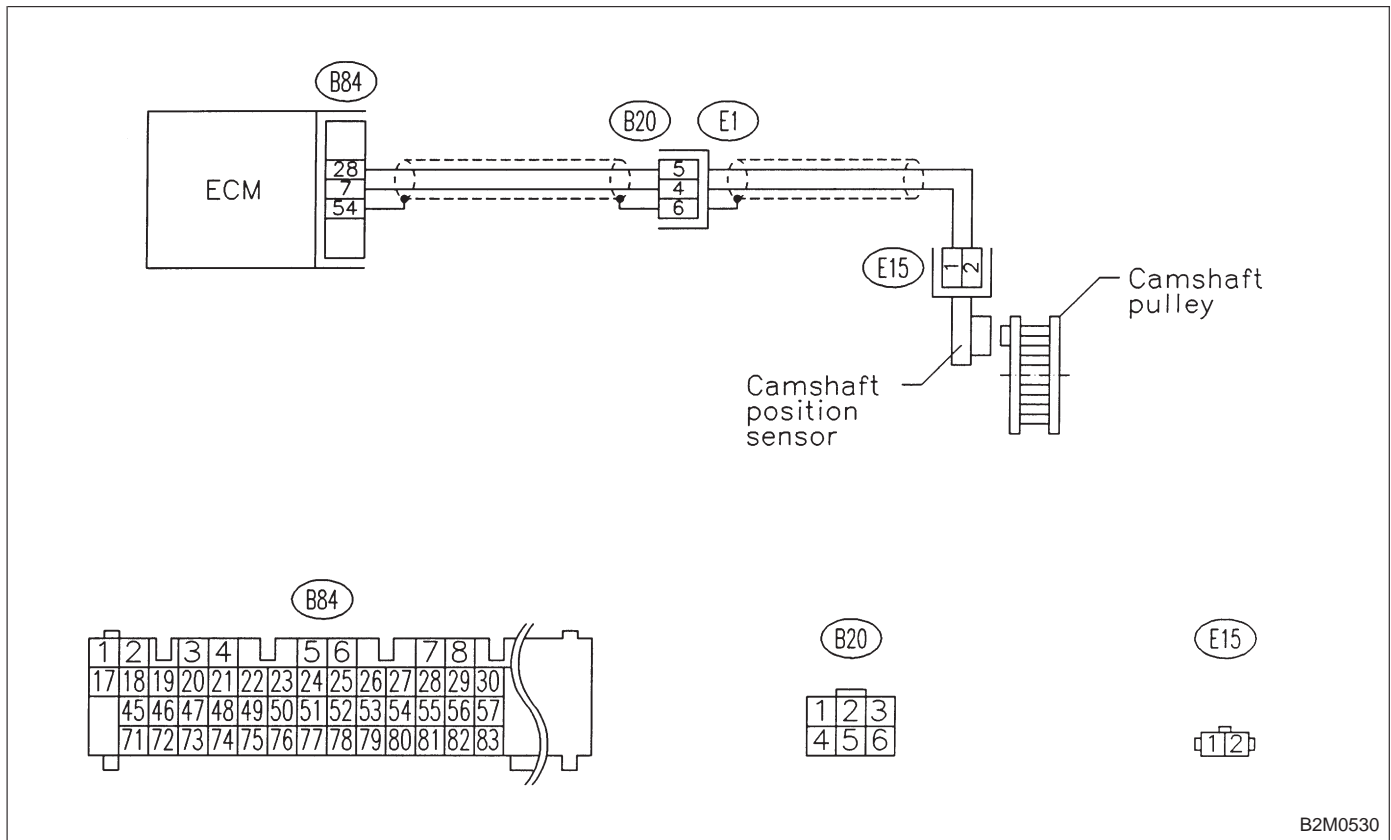
- Engine stalls.
- Failure of engine to start



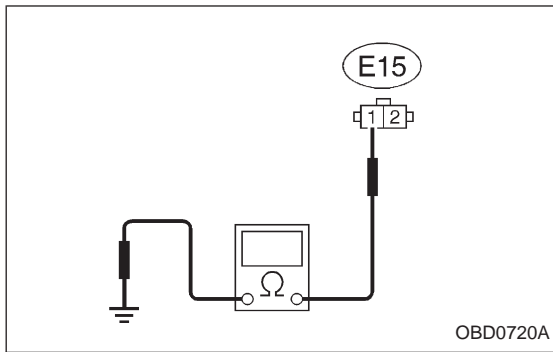
**CAUTION:**

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

**WIRING DIAGRAM:**



B2M0530



**10AC1 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.

**CHECK** : **Connector & terminal (E15) No. 1 — Engine ground: Is the resistance more than 100 kΩ?**

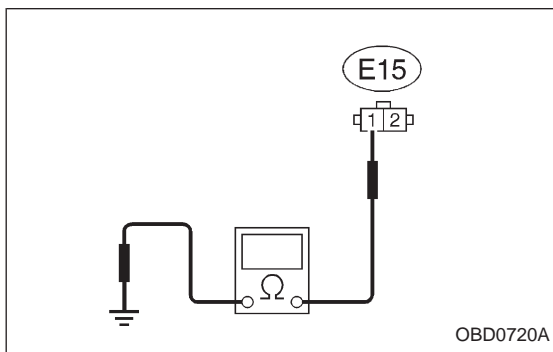
**YES** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

**NO** : Go to next **CHECK** .



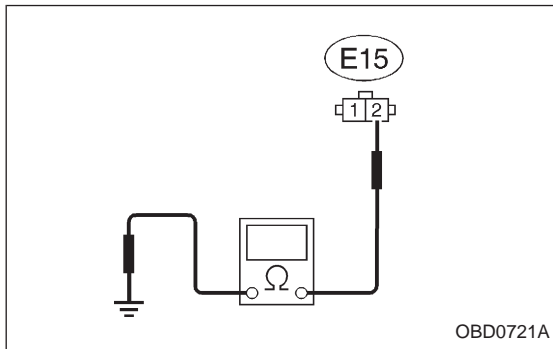
**CHECK** : **Connector & terminal (E15) No. 1 — Engine ground: Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between camshaft position sensor connector and ECM connector.

**NOTE:**

The harness between both connectors are shielded. Repair short circuit in harness together with shield.

**NO** : Go to next **CHECK** .



**CHECK** : **Connector & terminal (E15) No. 2 — Engine ground: Is the resistance less than 5 Ω?**

**YES** : Go to step **10AC2**.

**NO** : Repair harness and connector.

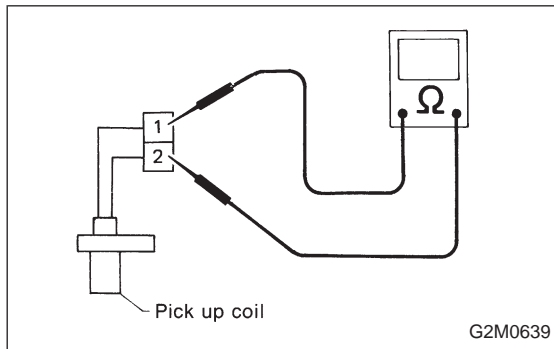
**NOTE:**

In this case, repair the following:

- Open circuit in harness between camshaft position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B20)

<b>10AC2</b>	<b>CHECK CAMSHAFT POSITION SENSOR.</b>
--------------	--

- 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.

- CHECK** : **Terminals No. 1 — No. 2:**  
*Is the resistance between 1 and 4 kΩ?*
- YES** : Repair poor contact in camshaft position sensor connector.
- NO** : Replace camshaft position sensor.

OBD	(FB1)
P0400	<EGR>
<small>OBD0315</small>	

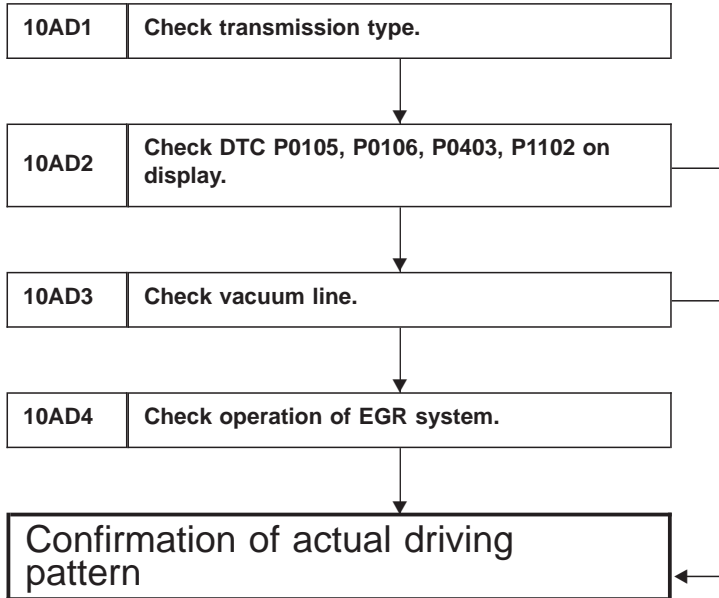
**AD: DTC P0400**  
**— EXHAUST GAS RECIRCULATION FLOW MALFUNCTION (EGR) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Poor driving performance on low engine speed



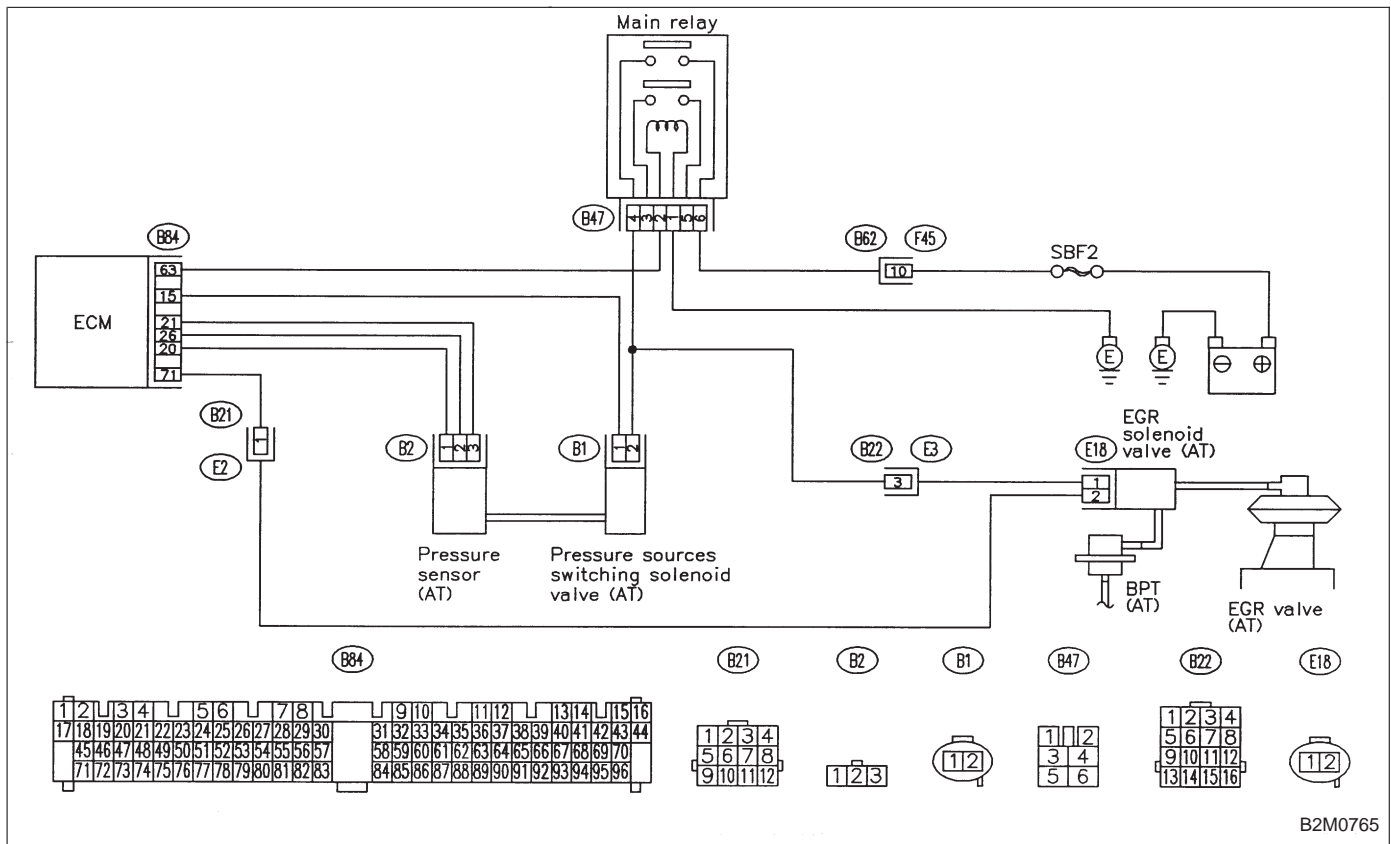
**CAUTION:**

Before confirmation of actual driving pattern, conduct **CLEAR MEMORY** and **INSPECTION MODES**.  
 <Ref. to 2-7 [T3D0] and [T3E0].>



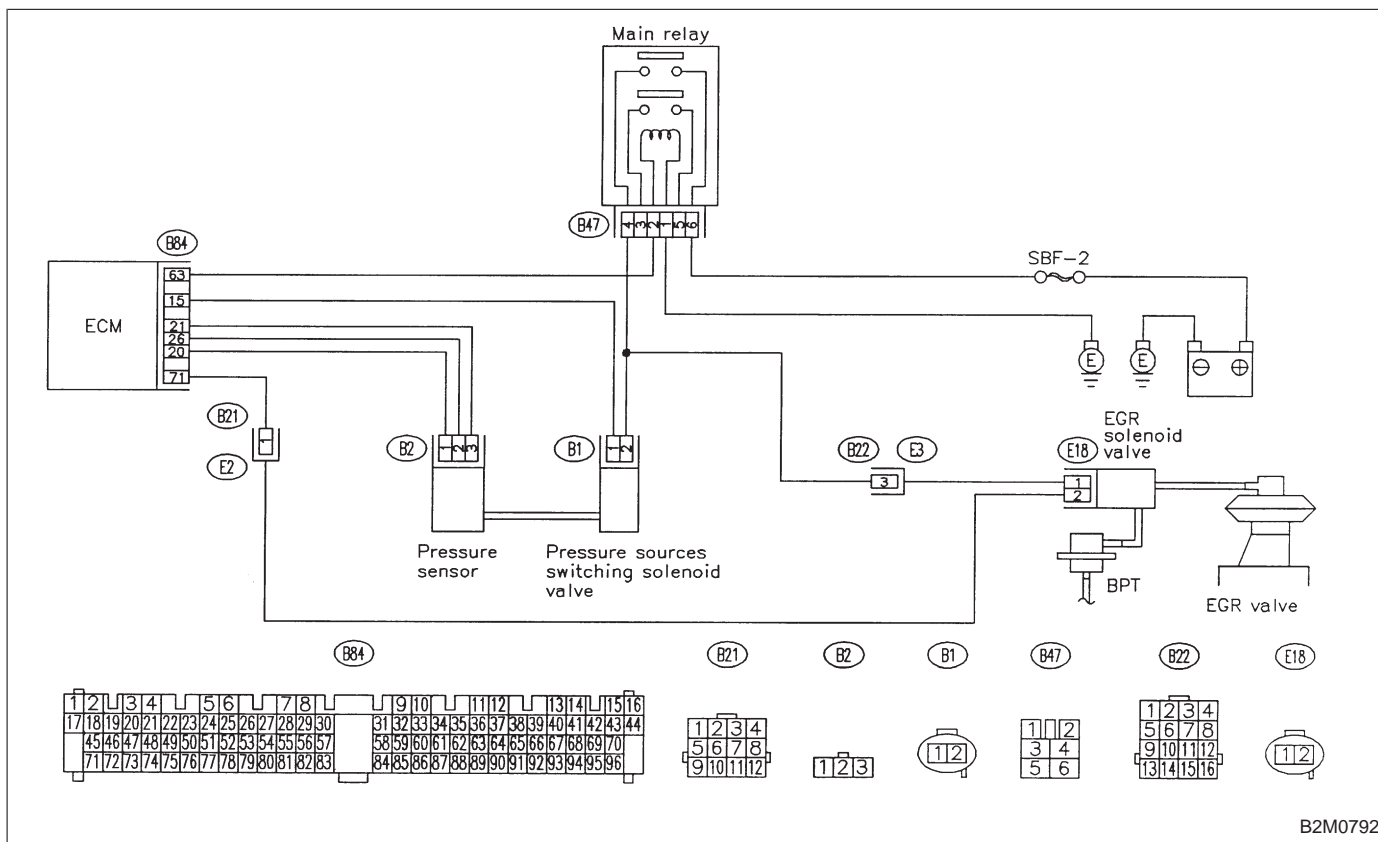
WIRING DIAGRAM:

- LHD Model



**WIRING DIAGRAM:**

- RHD Model



B2M0792

**10AD1 CHECK TRANSMISSION TYPE.**

- CHECK** : Is transmission type AT?
- YES** : Go to step 10AD2.
- NO** : Check AT/MT identification circuit. <Ref. to 2-7 [T10BW0].>

**10AD2 CHECK DTC P0105, P0106, P0403, P1102 ON DISPLAY.**

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0105, P0106, P0403 or P1102?
- YES** : ● Inspect DTC P0105, P0106, P0403 or P1102 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".  
● Manually check that EGR valve diaphragm is not stuck.

**WARNING:**

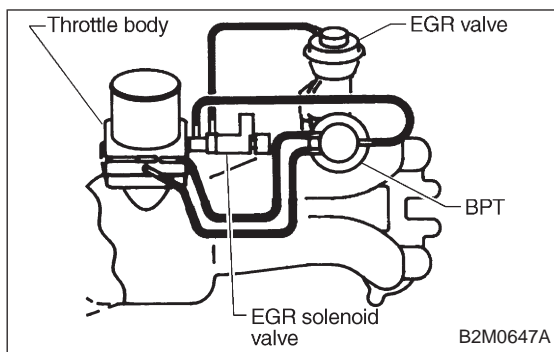
Be careful when checking EGR valve, since it may be extremely hot.

**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 10AD3.

**10AD3 CHECK VACUUM LINE.**

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

**NOTE:**

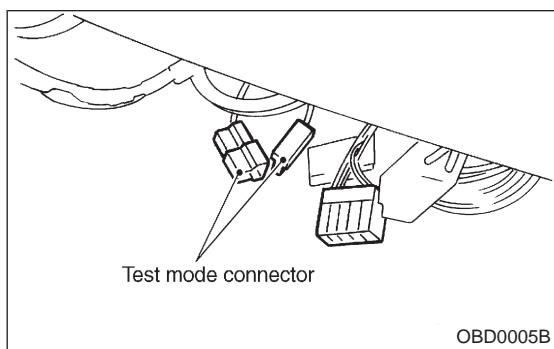
Check the following items.

- 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 10AD4.

**10AD4 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" 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 **CHECK** .

**NO** : Go to next **CHECK** .

**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**.

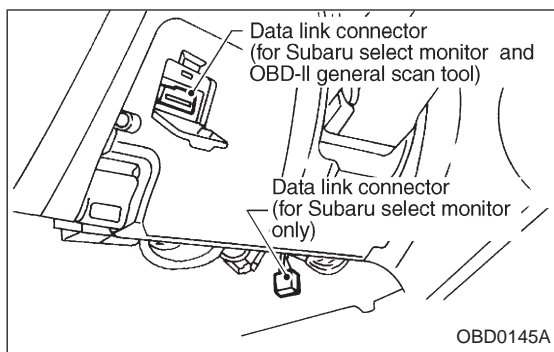
**NO** : Clean EGR valve. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**.

CAUTION:

**Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.**

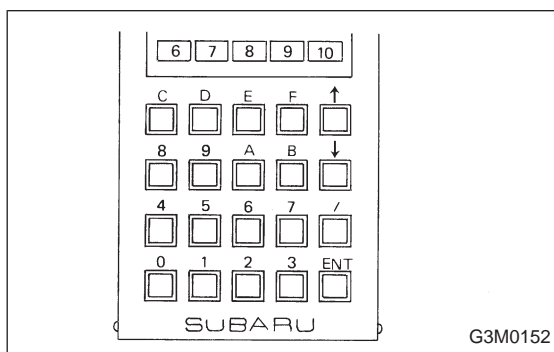
NOTE:

- 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.

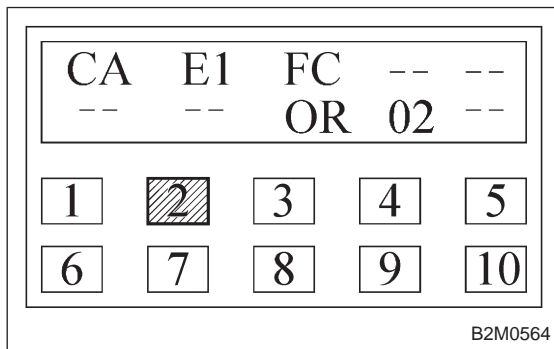


**CONFIRMATION OF ACTUAL DRIVING PATTERN.**

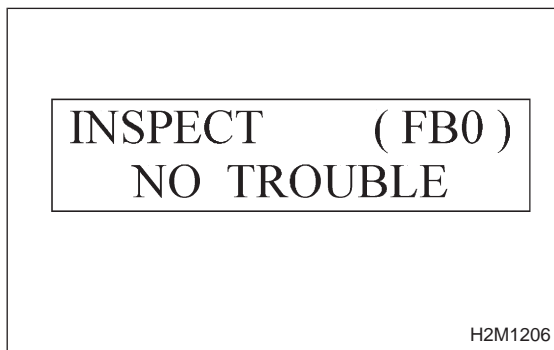
- 1) Conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7 [T3D0] and [T3E0].>
- 2) Connect Subaru select monitor to its data link connector.
- 3) Start and warm-up the engine until the radiator fan makes one complete rotation. (All accessory switches are OFF.)
- 4) Turn Subaru select monitor switch 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  P0403	(FB1)  <EGRSOL>
OBD0323	

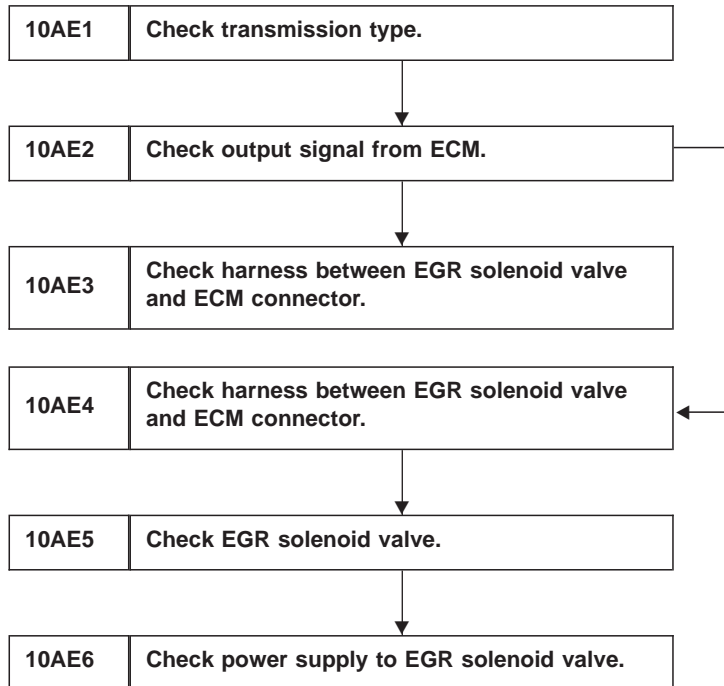
**AE: DTC P0403**  
**— EXHAUST GAS RECIRCULATION CIRCUIT MALFUNCTION (EGRSOL) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Poor driving performance on low engine speed

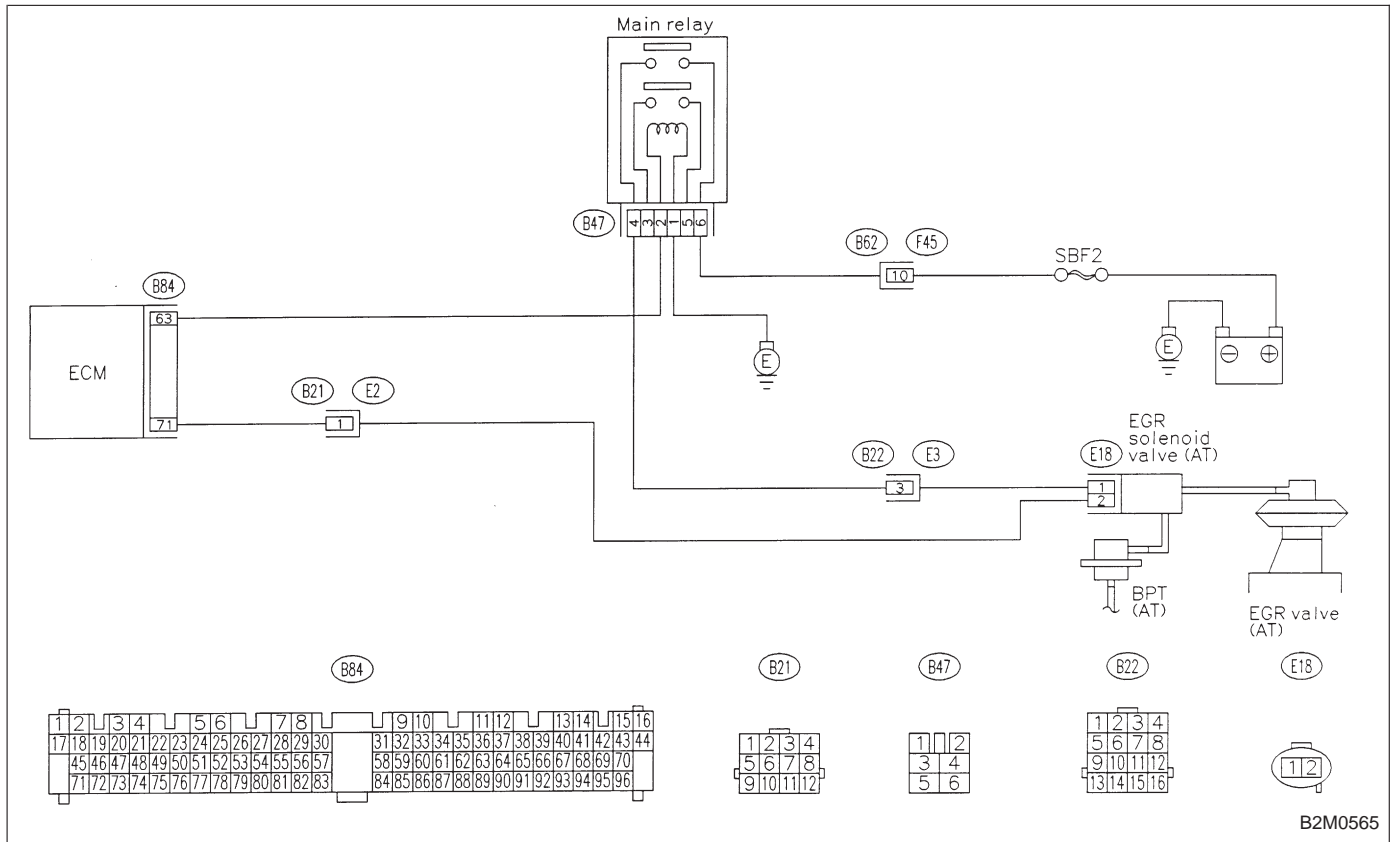


**CAUTION:**

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

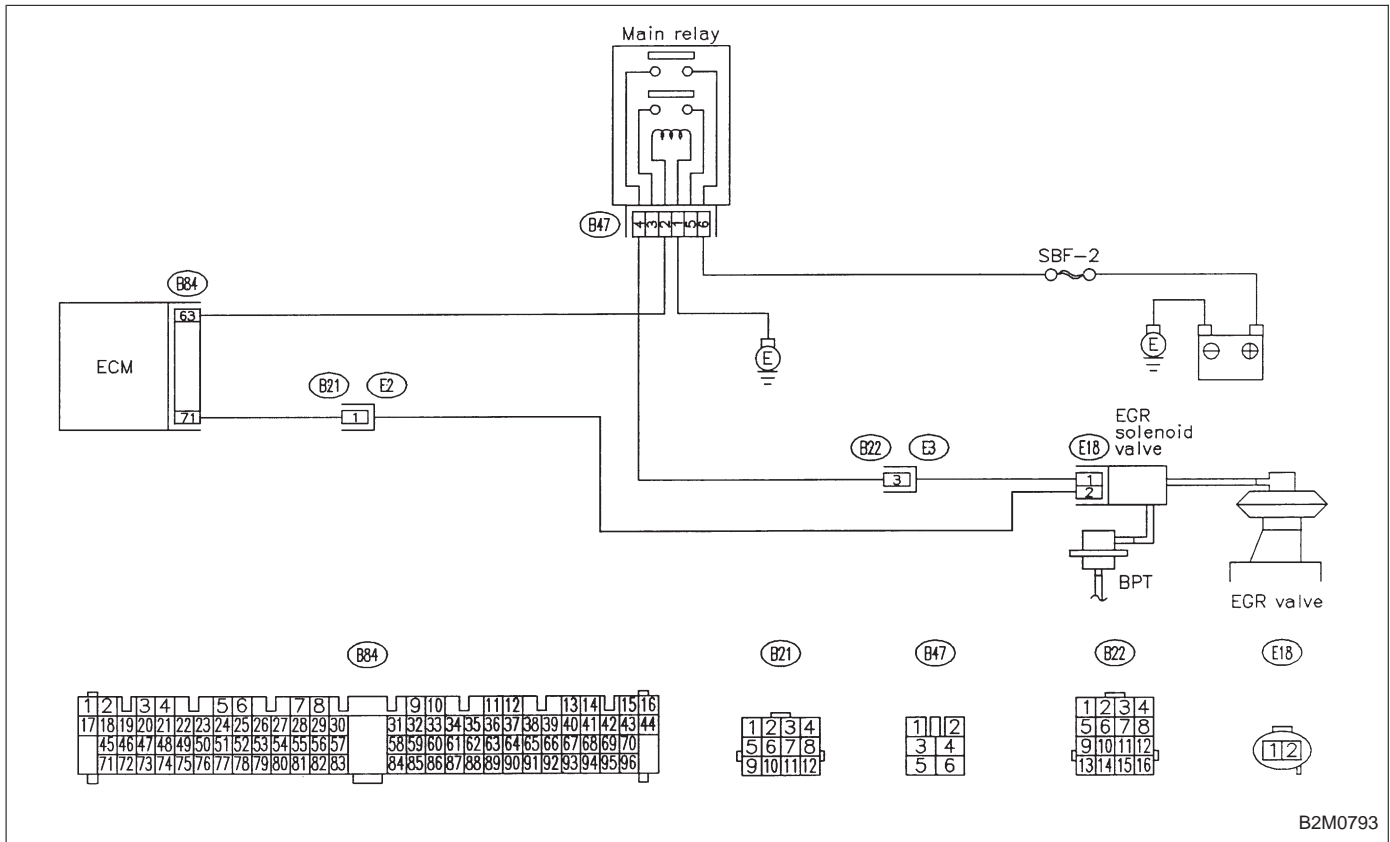
WIRING DIAGRAM:

- LHD Model



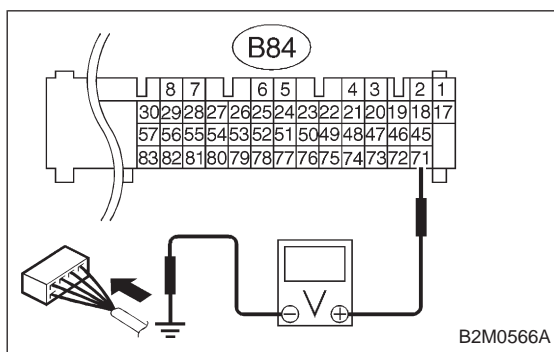
WIRING DIAGRAM:

- RHD Model

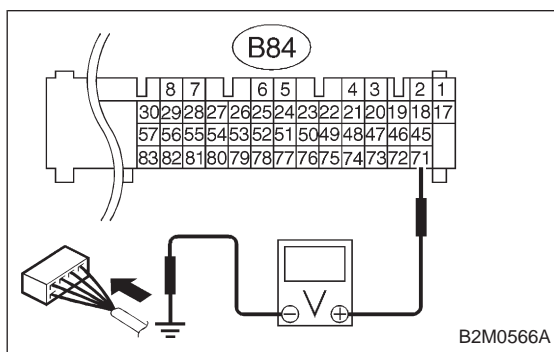


B2M0793



**10AE1 CHECK TRANSMISSION TYPE.****CHECK** : *Is transmission type AT?***YES** : Go to step 10AE2.**NO** : Check AT/MT identification circuit. <Ref. to 2-7 [T10BW0].>**10AE2 CHECK OUTPUT SIGNAL FROM ECM.**

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

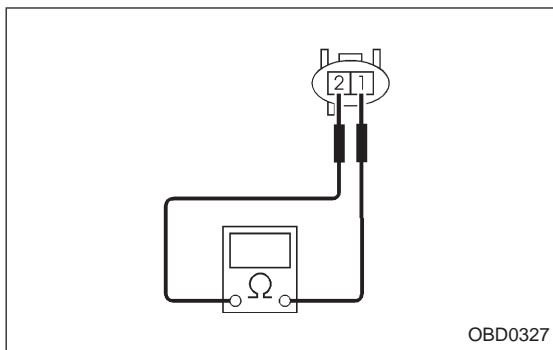
**CHECK** : **Connector & terminal**  
**(B84) No. 71 (+) — Chassis ground (-):**  
**Is the voltage more than 10 V?****YES** : Go to step 10AE3.**NO** : Go to step 10AE4.**10AE3 CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.**

- 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.

**CHECK** : **Connector & terminal**  
**(B84) No. 71 (+) — Chassis ground (-):**  
**Is the voltage more than 10 V?****YES** : Repair short circuit in harness and replace ECM.**NOTE:**

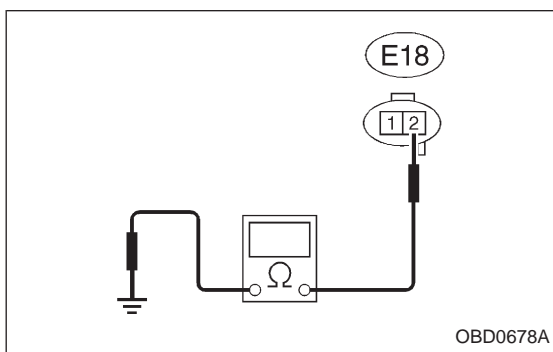
The harness between ECM and EGR solenoid valve is in short circuit.

**NO** : Go to next step 5).



- 5) Turn ignition switch to OFF.
- 6) Measure resistance between EGR solenoid valve terminals.

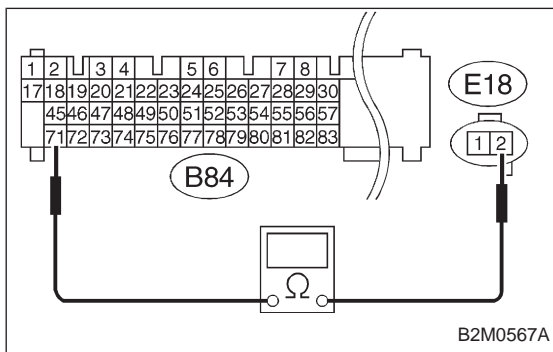
- CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance less than 1 Ω?**
- YES** : Replace EGR solenoid valve and ECM.  
**NO** : Go to next **CHECK** .
- CHECK** : **Is there poor contact in ECM connector?**
- YES** : Repair poor contact in ECM connector.  
**NO** : Replace ECM.



**10AE4 CHECK HARNESS BETWEEN EGR SOLENOID VALVE AND ECM CONNECTOR.**

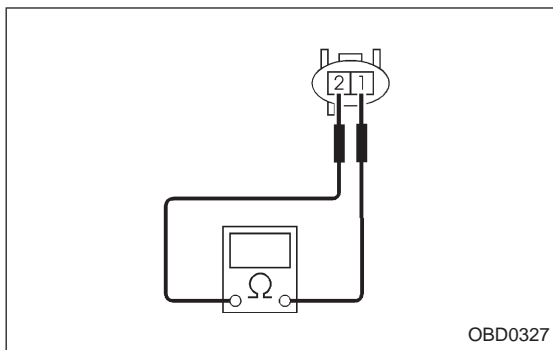
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from EGR solenoid valve and ECM.
- 3) Measure resistance of harness between EGR solenoid valve connector and engine ground.

- CHECK** : **Connector & terminal (E18) No. 2 — Engine ground:**  
**Is the resistance less than 10 Ω?**
- YES** : Repair short circuit in harness between ECM and EGR solenoid valve connector.  
**NO** : Go to next step 4).



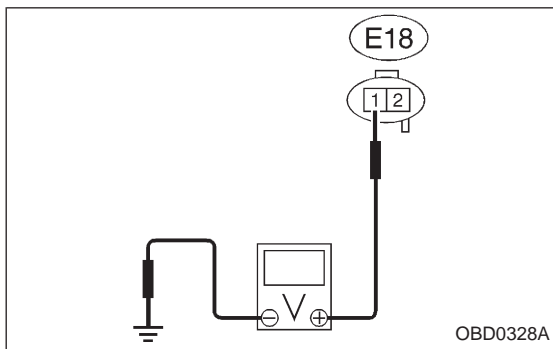
- 4) Measure resistance of harness between ECM and EGR solenoid valve connector.

- CHECK** : **Connector & terminal (B84) No. 71 — (E18) No. 2:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to step 10AE5.  
**NO** : Repair open circuit in harness between ECM and EGR solenoid valve connector.

**10AE5 CHECK EGR SOLENOID VALVE.**

Measure resistance between EGR solenoid valve terminals.

- CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance between 10 and 100 Ω?**
- YES** : Go to step **10AE6**.
- NO** : Replace EGR solenoid valve.

**10AE6 CHECK POWER SUPPLY TO EGR SOLENOID VALVE.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between EGR solenoid valve and engine ground.

- CHECK** : **Connector & terminal (E18) No. 1 (+) — Engine ground (-):**  
**Is the voltage more than 10 V?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between main relay and EGR solenoid valve connector.
- 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	

**AF: DTC P0420**  
**— CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (CAT) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition (2200 cc all states except California model only)
- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Engine stalls.
- Idle mixture is out of specifications.

10AF1	Check any other DTC P0130, P0133, P0135, P0136, P0139 and P0141 on display.
10AF2	Check exhaust system.
10AF3	Check rear catalytic converter.

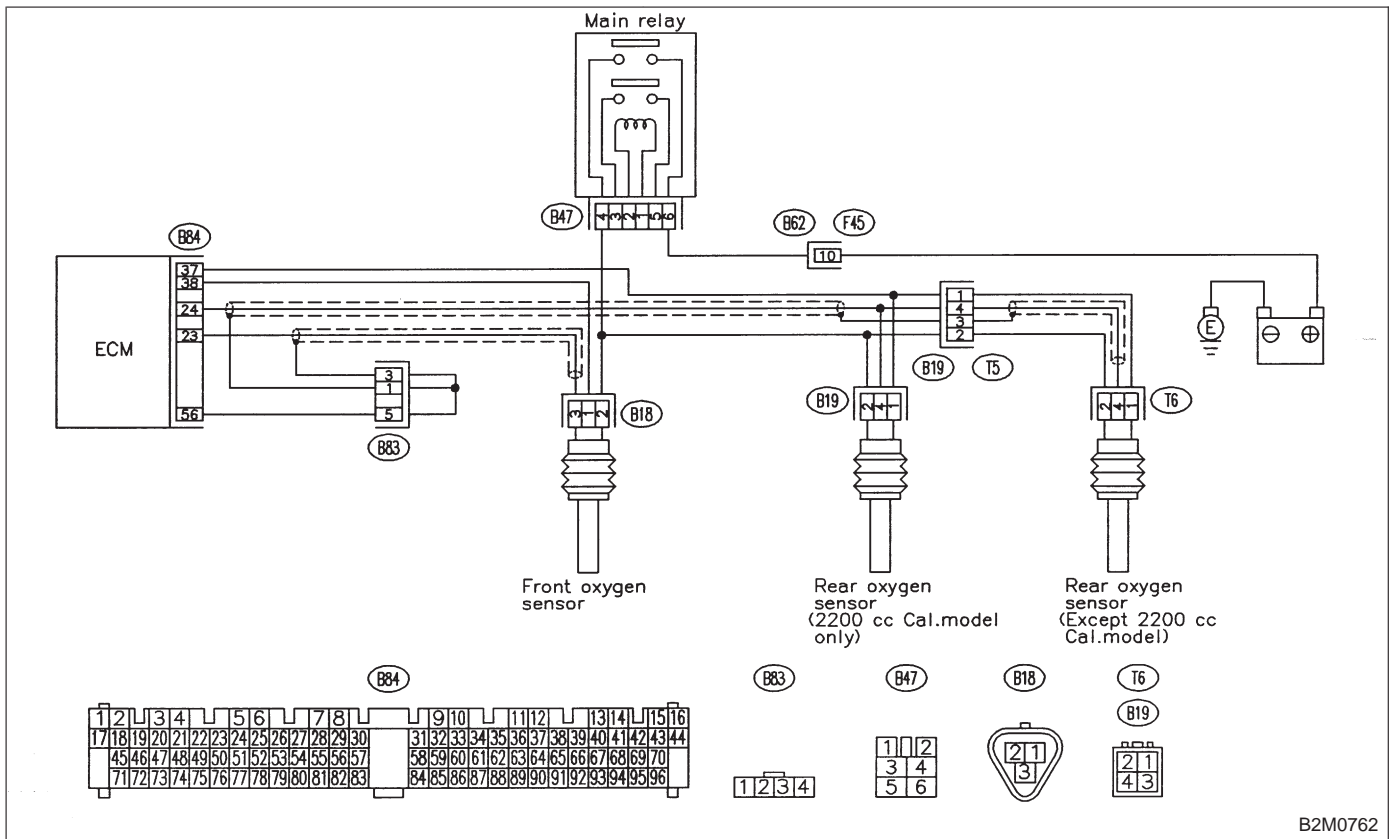
**CAUTION:**

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

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

**WIRING DIAGRAM:**

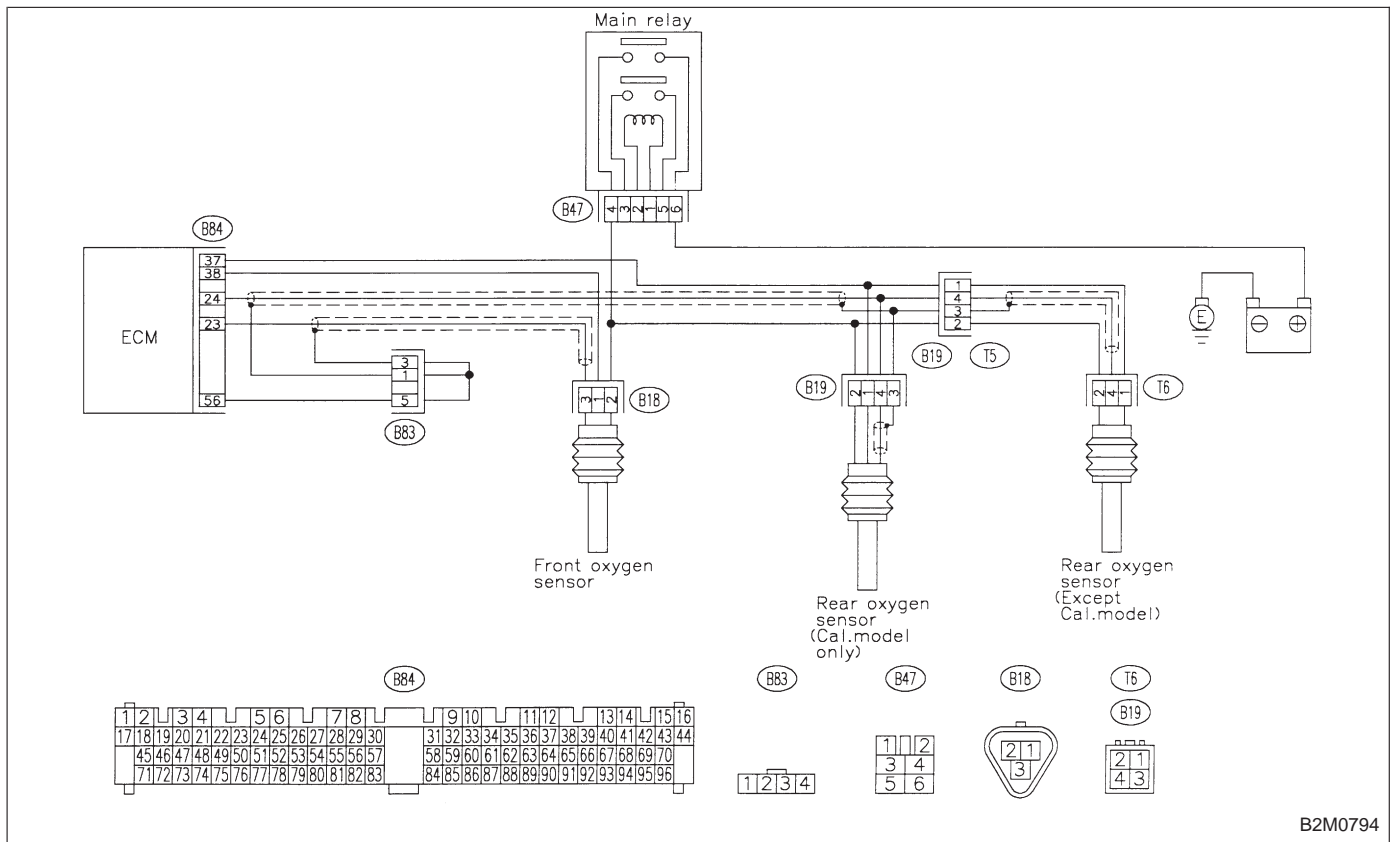
- LHD Model



B2M0762

WIRING DIAGRAM:

- RHD Model



B2M0794

<b>10AF1</b>	<b>CHECK ANY OTHER DTC P0130, P0133, P0135, P0136, P0139 AND P0141 ON DISPLAY.</b>
--------------	--

**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 2-7 [T1000]".

NOTE:

In this case, it is not necessary to inspect DTC P0420.

**NO** : Go to step **10AF2**.

<b>10AF2</b>	<b>CHECK EXHAUST SYSTEM.</b>
--------------	------------------------------

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?*

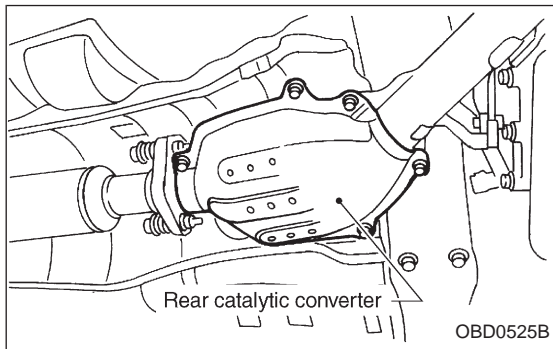
NOTE:

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 **10AF3**.



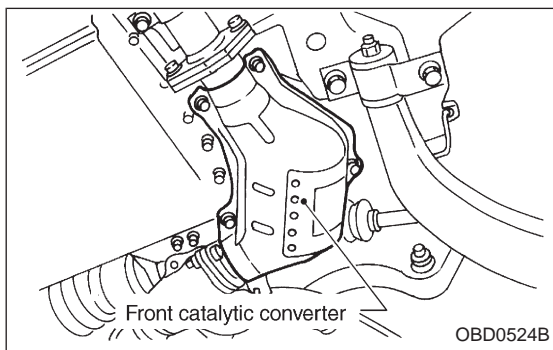
<b>10AF3</b>	<b>CHECK REAR CATALYTIC CONVERTER.</b>
--------------	--

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.

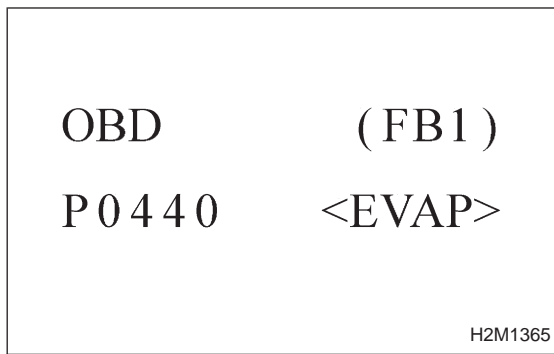
**CHECK** : *Is there damage at rear face or front face of front catalyst?*

**YES** : Replace front catalytic converter.

**NO** : Contact with SOA service.

NOTE:

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



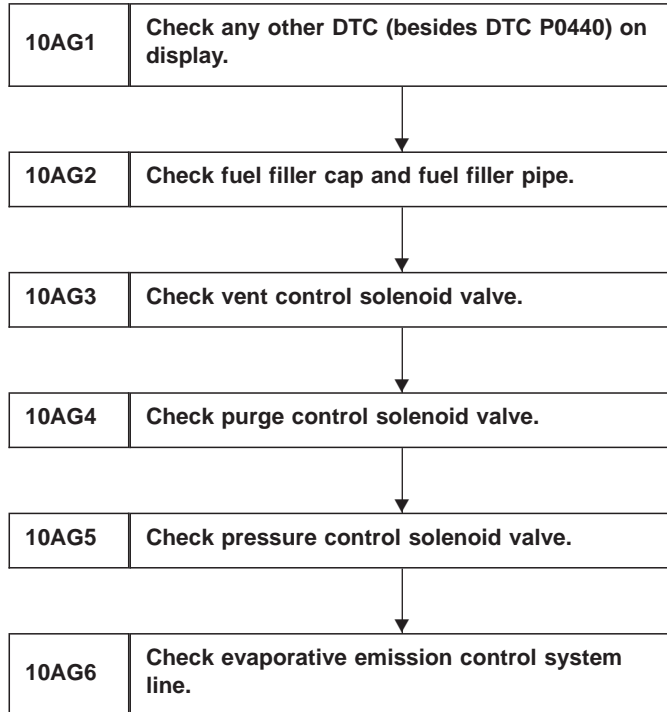
**AG: DTC P0440**  
**— EVAPORATIVE EMISSION CONTROL**  
**SYSTEM MALFUNCTION (EVAP) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Gasoline smell

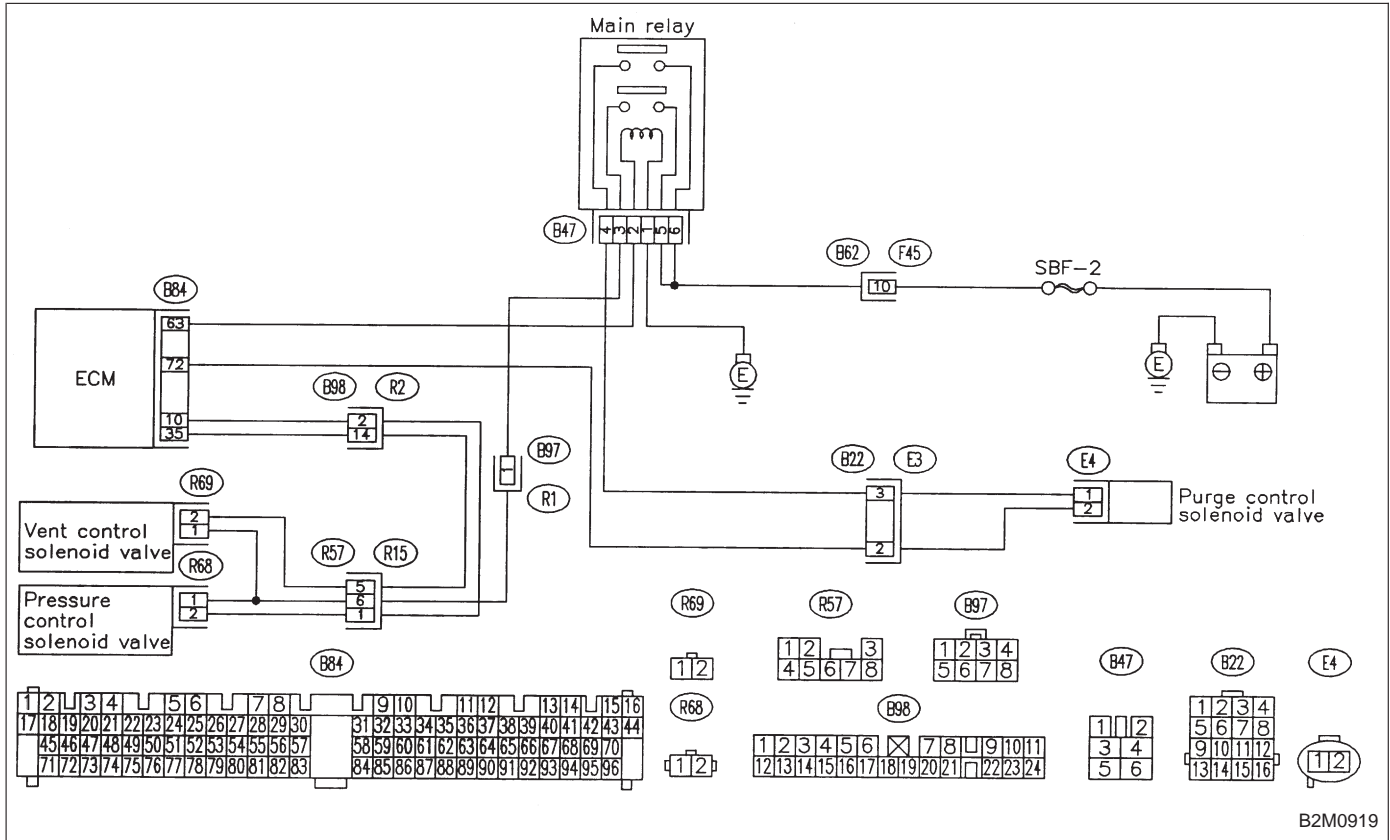


**CAUTION:**

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

WIRING DIAGRAM:

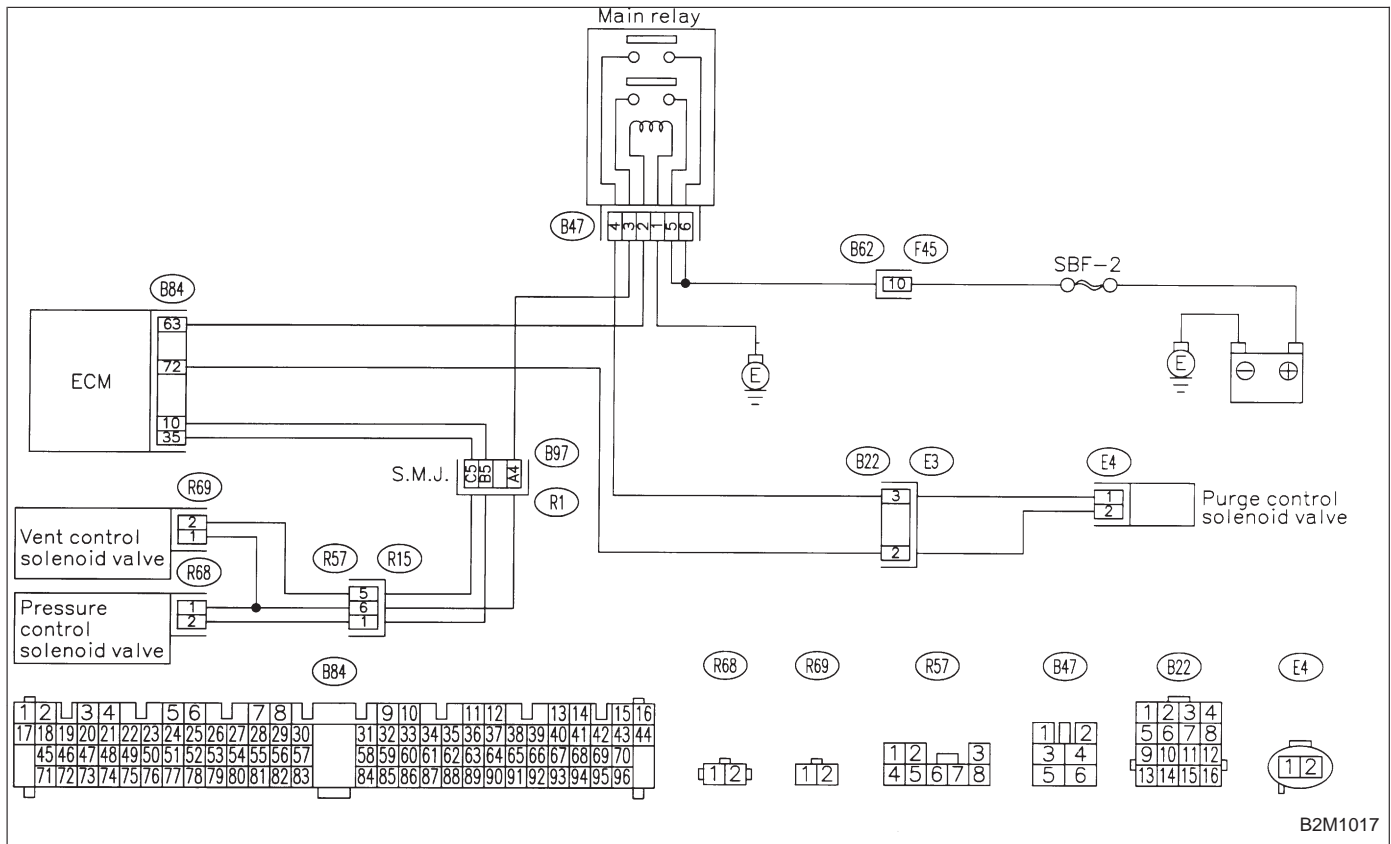
- LHD Model





**WIRING DIAGRAM:**

● RHD Model



B2M1017

**10AG1 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, 2-7 [T1000]".
- NO** : Go to step **10AG2**.

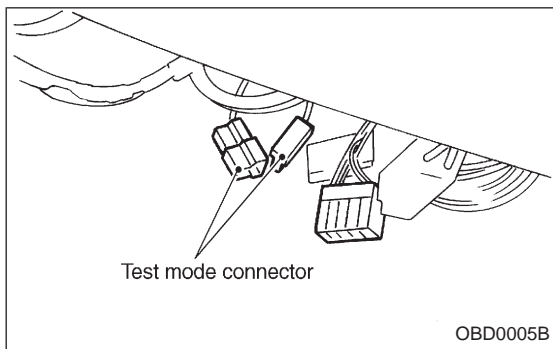
**10AG2 CHECK FUEL FILLER CAP AND FUEL FILLER PIPE.**

- 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?*

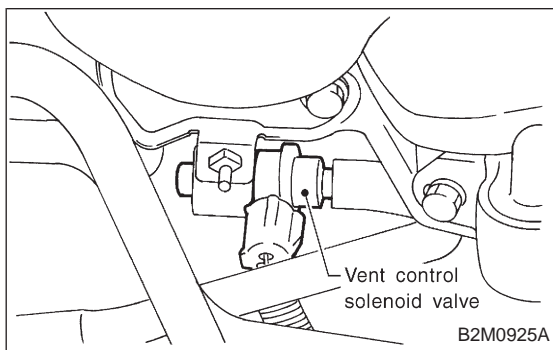
**YES** : Repair or replace fuel filler cap and fuel filler pipe.

**NO** : Go to step **10AG3**.



**10AG3 CHECK VENT CONTROL SOLENOID VALVE.**

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



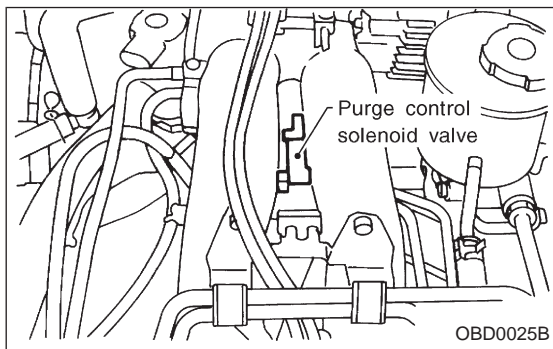
**CHECK** : *Does vent control solenoid valve produce operating sound?*

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" 2-7 [T3F0].

**YES** : Go to step **10AG4**.

**NO** : Replace vent control solenoid valve.



**10AG4 CHECK PURGE CONTROL SOLENOID VALVE.**

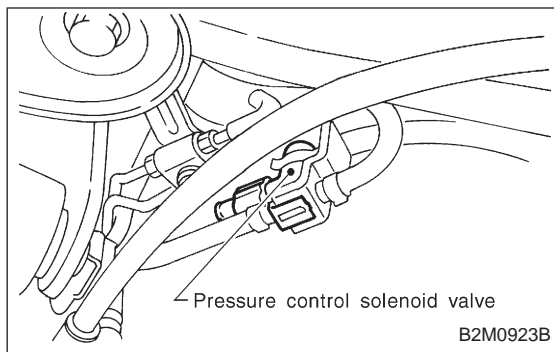
**CHECK** : *Does purge control solenoid valve produce operating sound?*

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" 2-7 [T3F0].

**YES** : Go to step **10AG5**.

**NO** : Replace purge control solenoid valve.



<b>10AG5</b>	<b>CHECK PRESSURE CONTROL SOLENOID VALVE.</b>
--------------	---

**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" 2-7 [T3F0].

**YES** : Go to step **10AG6**.

**NO** : Replace pressure control solenoid valve.

<b>10AG6</b>	<b>CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.</b>
--------------	--

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	

**AH: DTC P0441**  
**— EVAPORATIVE EMISSION CONTROL SYSTEM INCORRECT PURGE FLOW (CPC – F) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**10AH1**    Check any other DTC P0105, P0106, P0443 and P1102 on display.

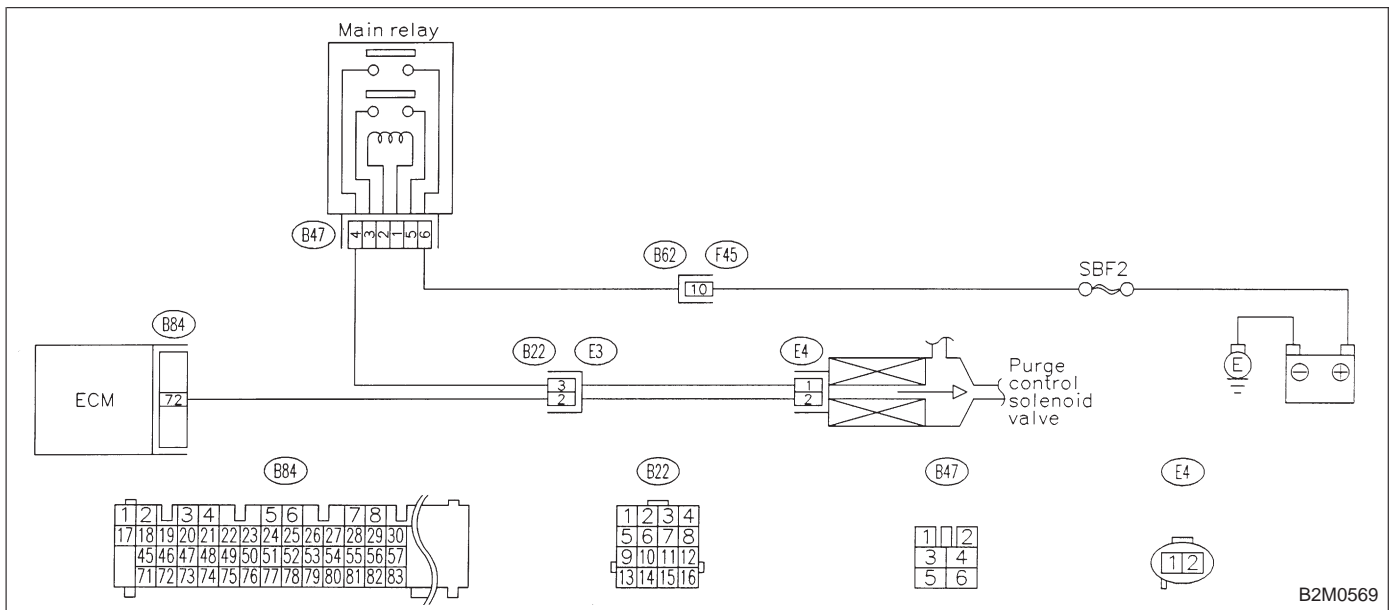


**10AH2**    Check purge control solenoid valve operation.

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

**WIRING DIAGRAM:**

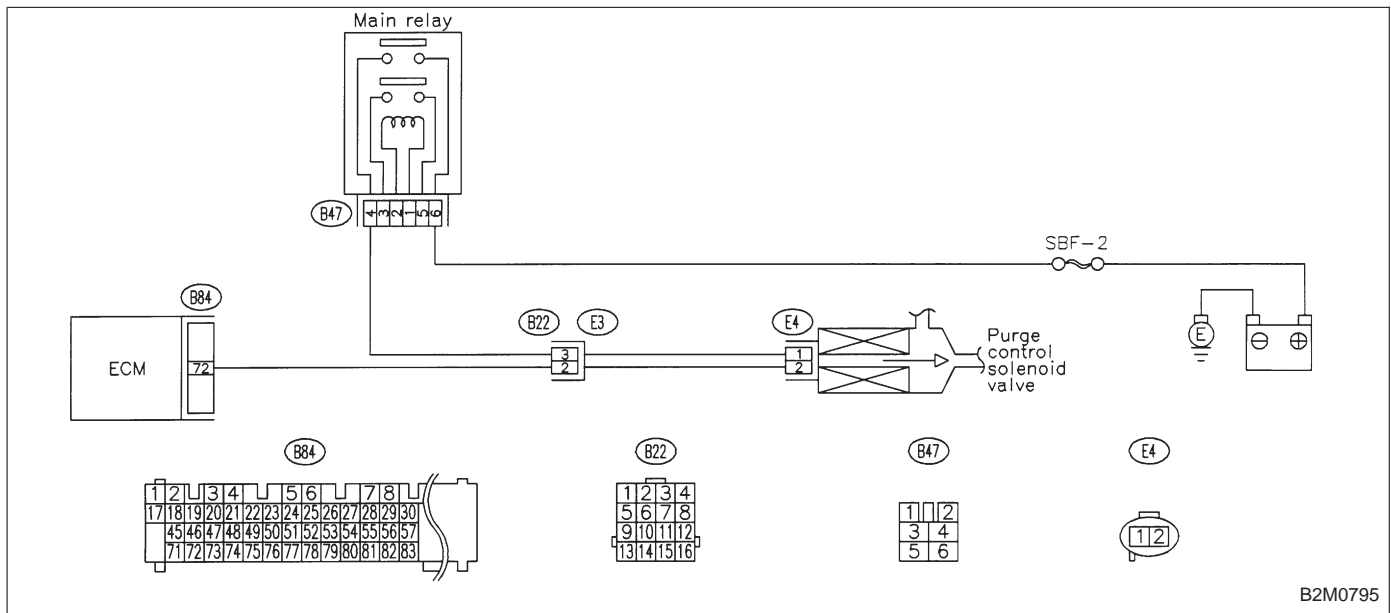
- LHD Model



B2M0569

WIRING DIAGRAM:

- RHD Model



B2M0795

10AH1

**CHECK ANY OTHER DTC P0105, P0106, P0443 AND P1102 ON DISPLAY.**

**CHECK**

: Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0105, P0106, P0443, and P1102?

**YES**

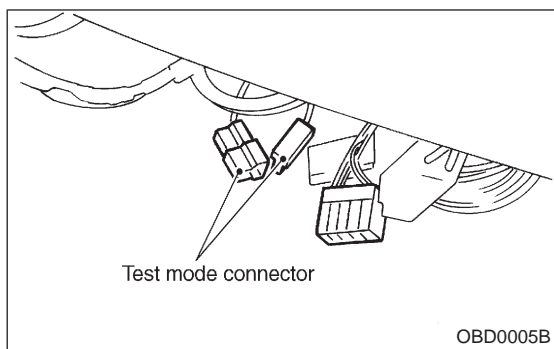
: Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

NOTE:

In this case, it is not necessary to inspect DTC P0441.

**NO**

: Go to step 10AH2.



10AH2

**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" 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?***

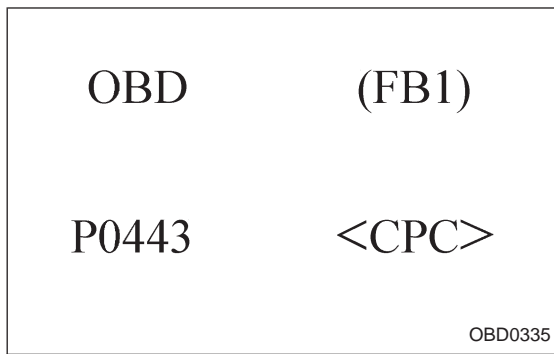
**YES** : Repair or replace evaporation line.

**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.



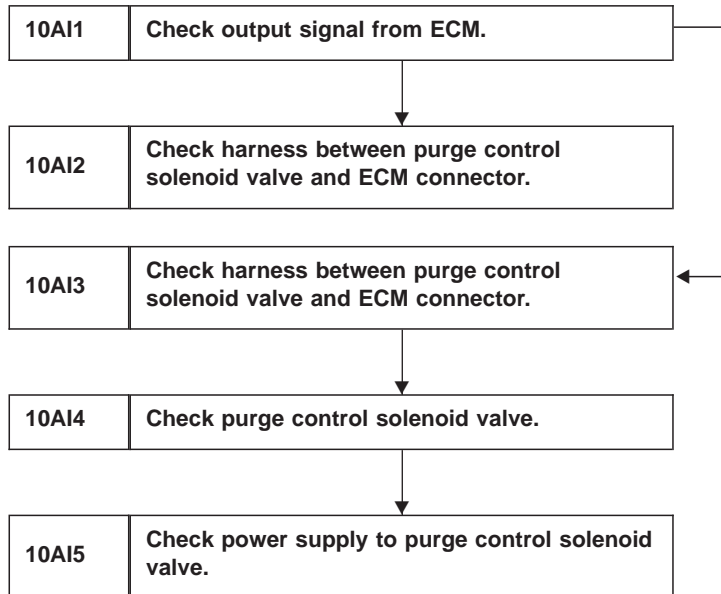
**AI: DTC P0443**  
**— EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT MALFUNCTION (CPC) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Erroneous idling



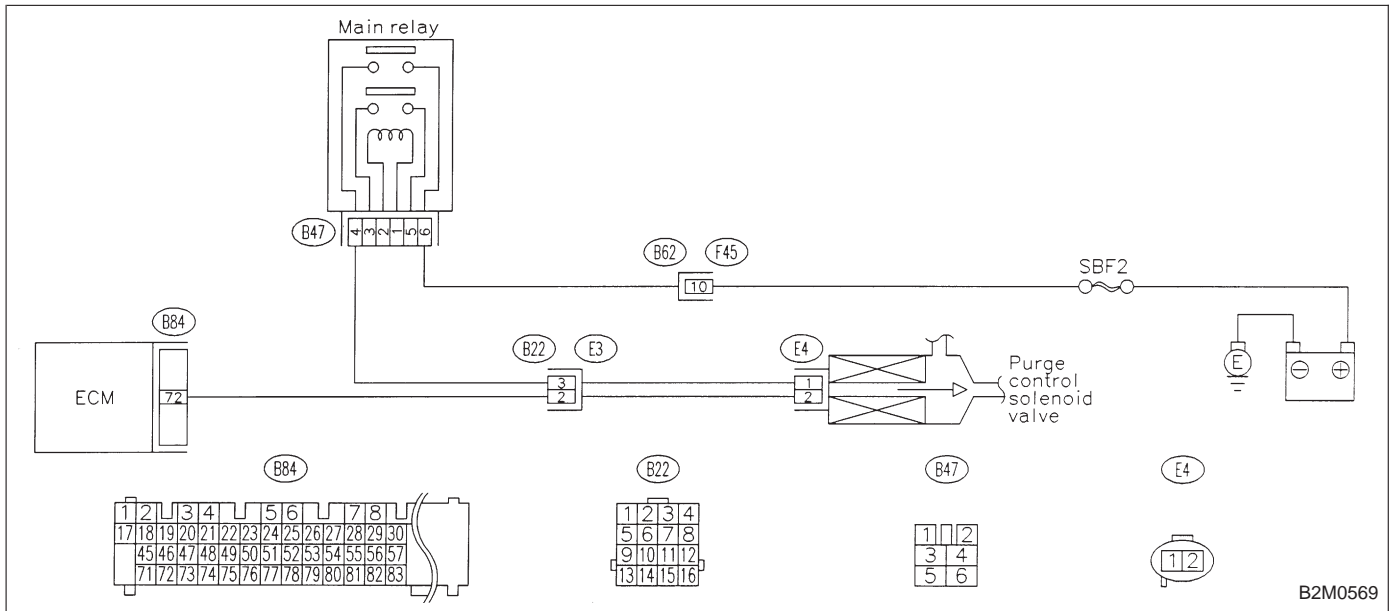
**CAUTION:**

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

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

**WIRING DIAGRAM:**

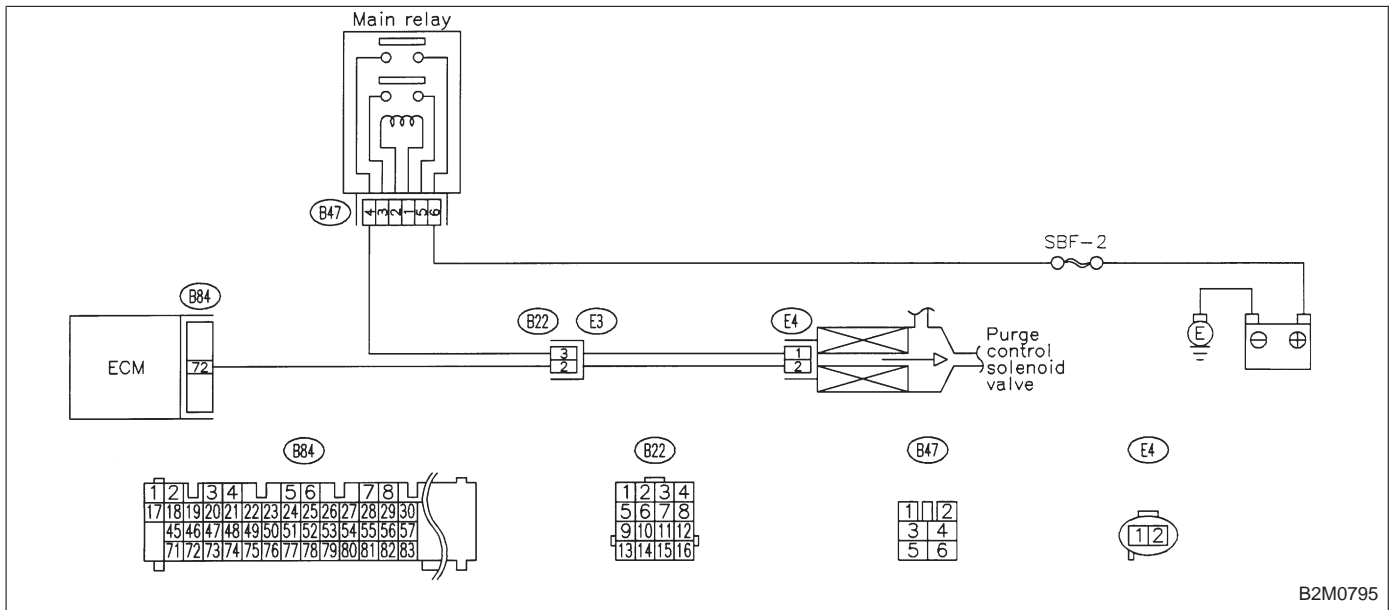
- LHD Model



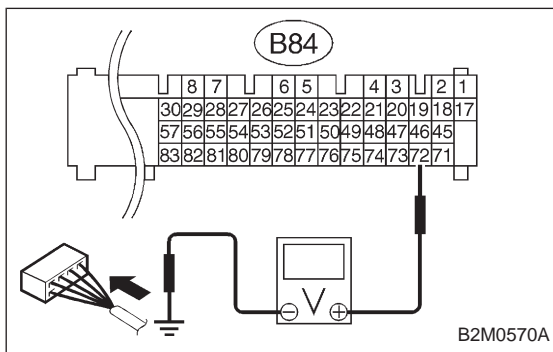
B2M0569

**WIRING DIAGRAM:**

- RHD Model



B2M0795



B2M0570A

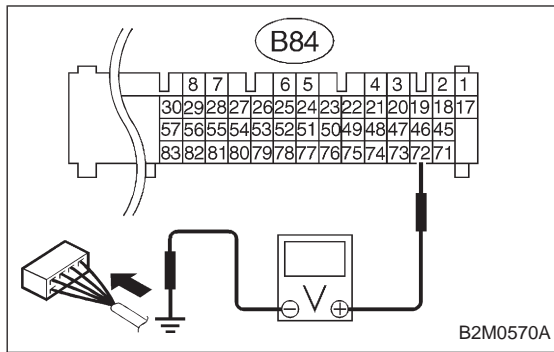
**10A11 CHECK OUTPUT SIGNAL FROM ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 72 (+) — Chassis ground (-): Is the voltage more than 10 V?**

- YES** : Go to step 10A12.
- NO** : Go to step 10A13.





10A12

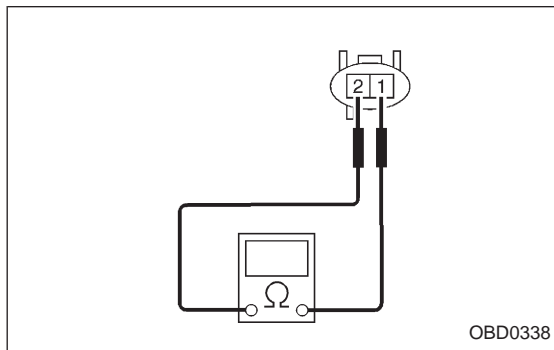
### CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 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.

**CHECK** : **Connector & terminal (B84) No. 72 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Repair short circuit in harness between ECM and purge control solenoid valve connector.

**NO** : Go to next step 5).



- 5) Turn ignition switch to OFF.
- 6) Measure resistance between purge control solenoid valve terminals.

**CHECK** : **Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?**

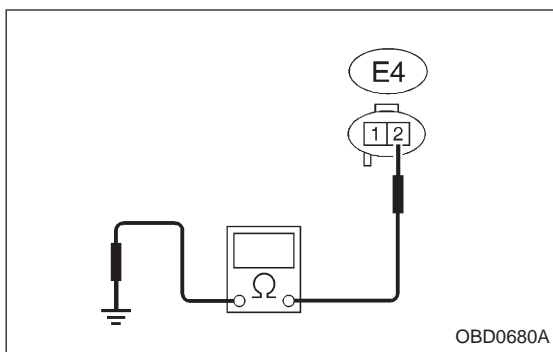
**YES** : Replace purge control solenoid valve and ECM.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.



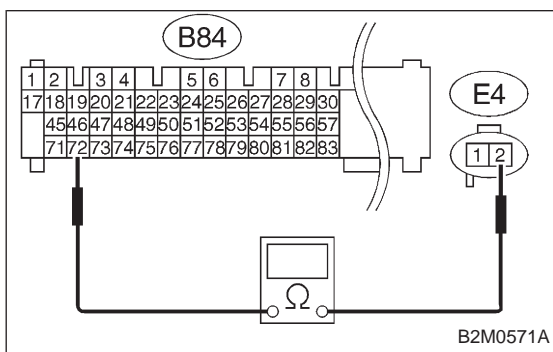
**10AI3 CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.**

- 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.

**CHECK** : **Connector & terminal (E4) No. 2 — Engine ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between ECM and purge control solenoid valve connector.

**NO** : Go to next step 4).

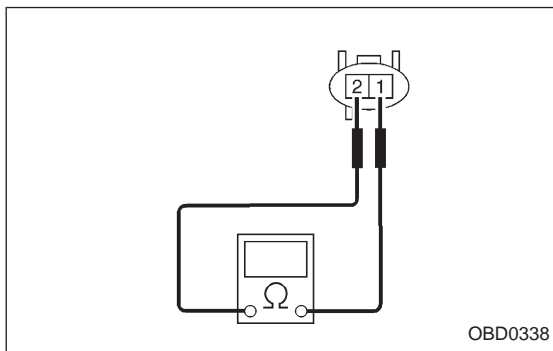


- 4) Measure resistance of harness between ECM and purge control solenoid valve of harness connector.

**CHECK** : **Connector & terminal (B84) No. 72 — (E4) No. 2:**  
**Is the resistance less than 1 Ω?**

**YES** : Go to step 10AI4.

**NO** : Repair open circuit in harness between ECM and purge control solenoid valve connector.



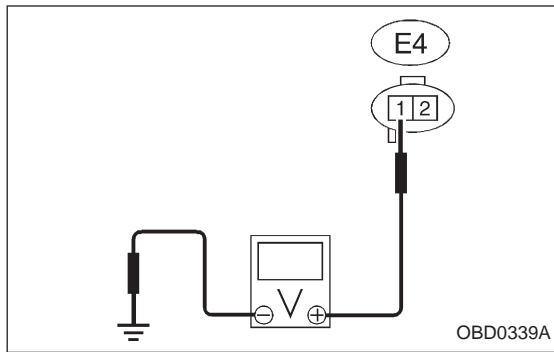
**10AI4 CHECK PURGE CONTROL SOLENOID VALVE.**

- 1) Remove purge control solenoid valve.
- 2) Measure resistance between purge control solenoid valve terminals.

**CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance between 10 and 100 Ω?**

**YES** : Go to step 10AI5.

**NO** : Replace purge control solenoid valve.

**10A15****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.

**CHECK** : **Connector & terminal (E4) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

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

**NO** : Repair open circuit in harness between main relay and purge control solenoid valve connector.

**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:**

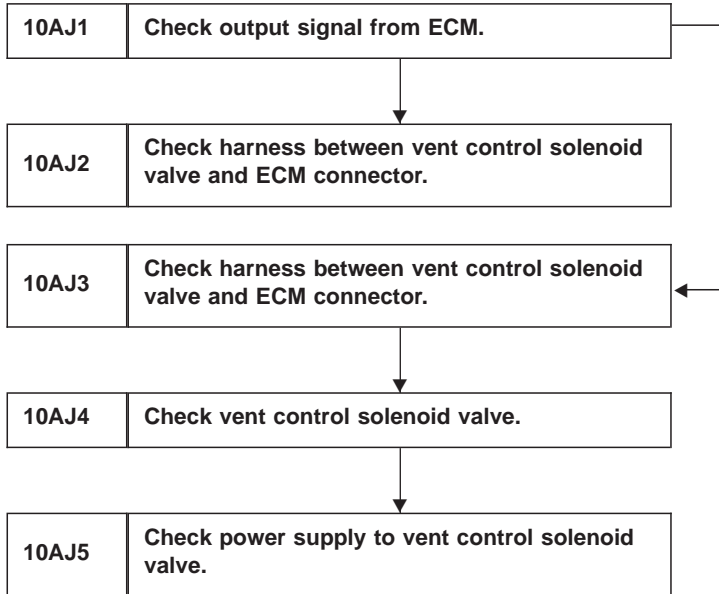
Inspection by DTM is required, because probable cause is deterioration of multiple parts.

<p>OBD (FB1)</p> <p>P0446 &lt;VCMSOL&gt;</p> <p style="text-align: right; font-size: small;">H2M1368</p>
--

**AJ: DTC P0446**  
**— EVAPORATIVE EMISSION CONTROL SYSTEM VENT CONTROL MALFUNCTION (VCMSOL) —**

**DTC DETECTING CONDITION:**

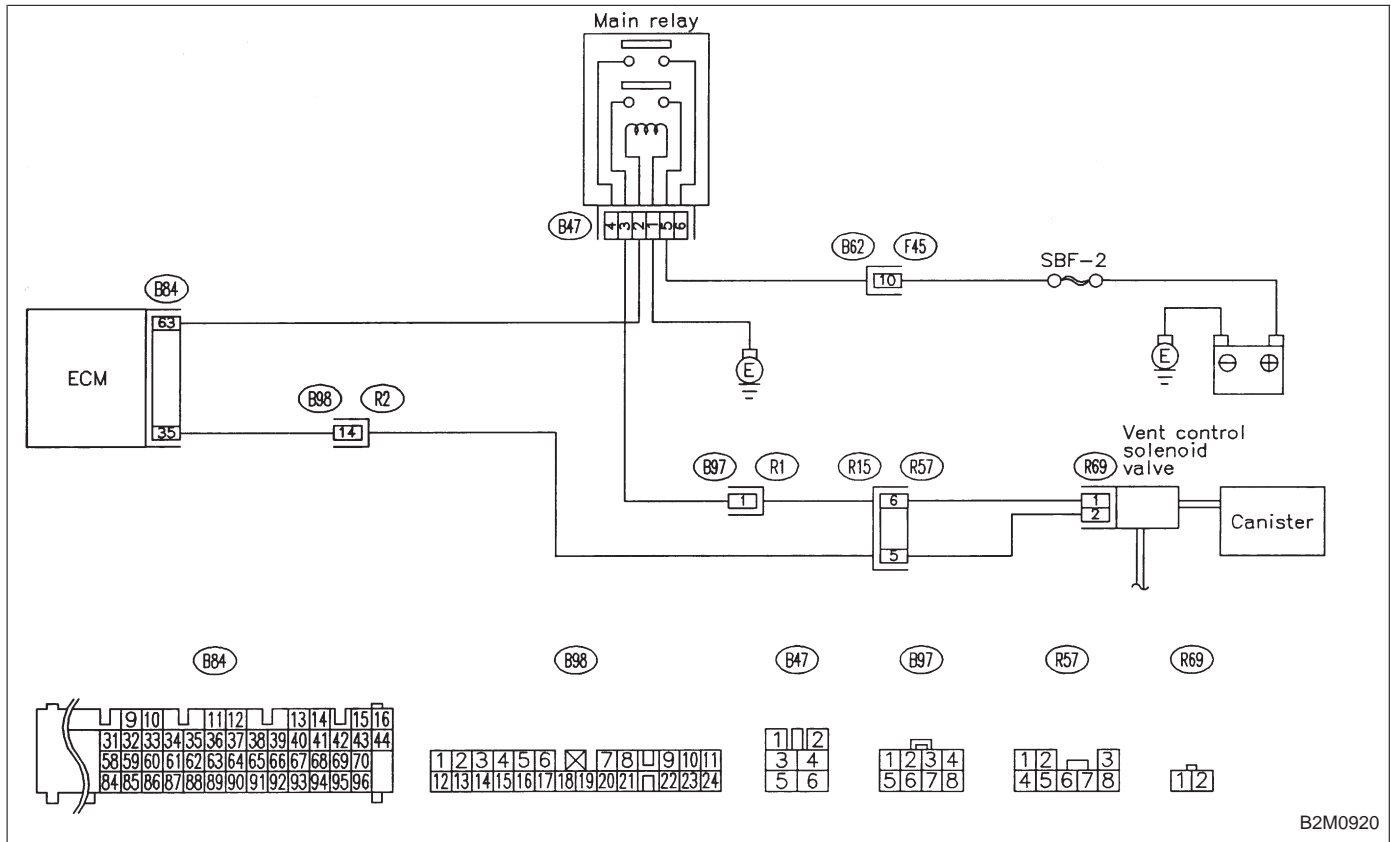
- Two consecutive trips with fault



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

**WIRING DIAGRAM:**

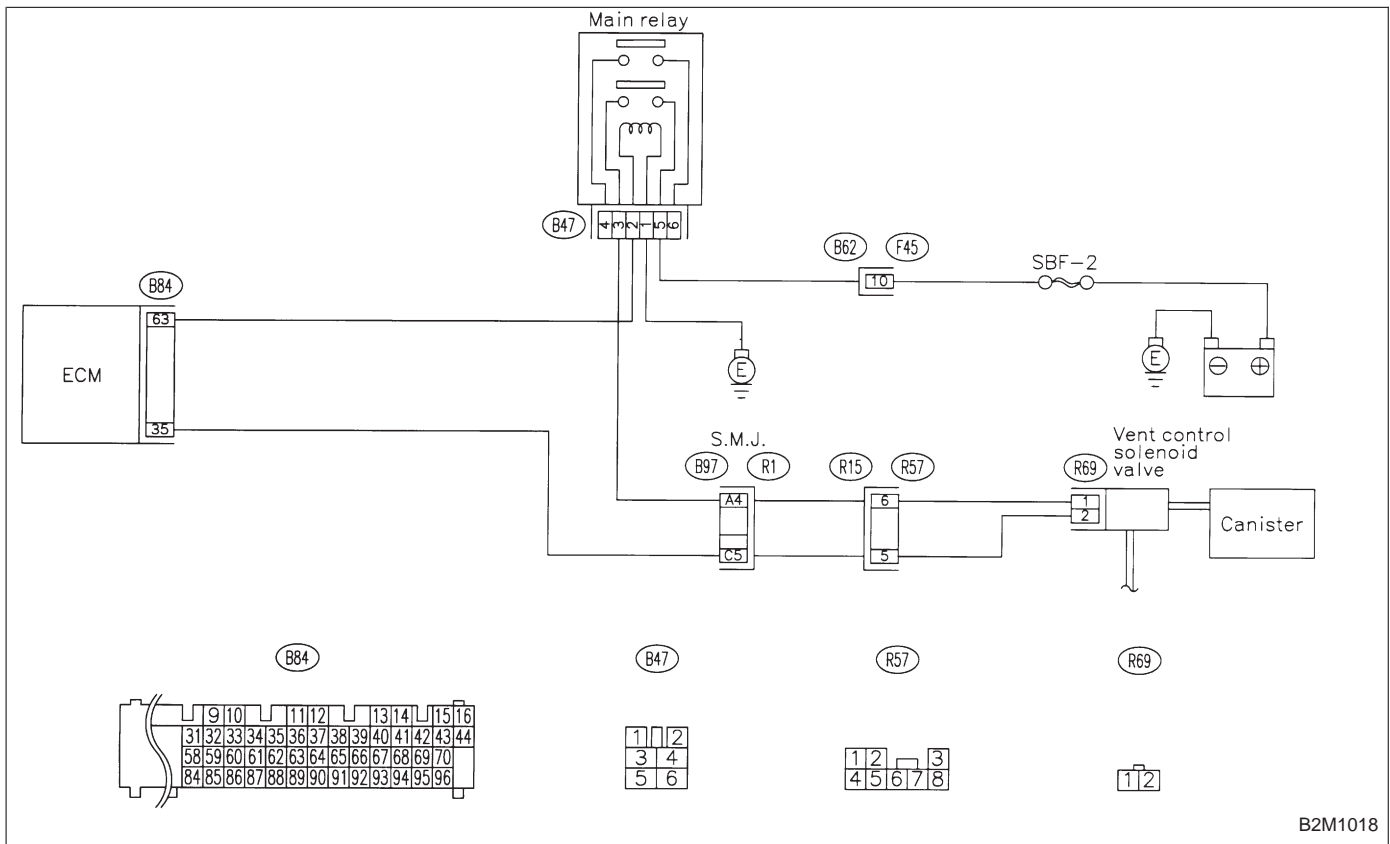
● LHD Model



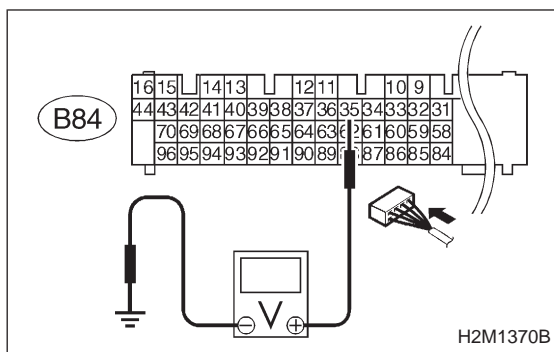
B2M0920

WIRING DIAGRAM:

- RHD Model



B2M1018

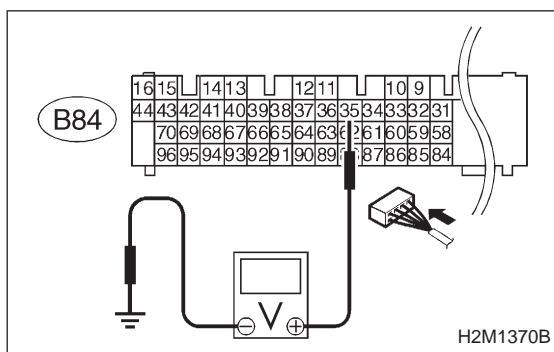
**10AJ1 CHECK OUTPUT SIGNAL FROM ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 35 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Go to step 10AJ2.

**NO** : Go to step 10AJ3.

**10AJ2 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.

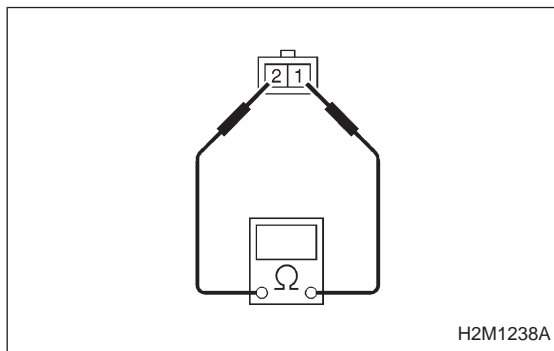
**CHECK** : **Connector & terminal (B84) No. 35 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Repair short circuit in harness and replace ECM.

**NOTE:**

The harness between ECM and vent control solenoid valve is in short circuit.

**NO** : Go to next step 5).



- 5) Turn ignition switch to OFF.
- 6) Measure resistance between vent control solenoid valve terminals.

**CHECK** : **Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?**

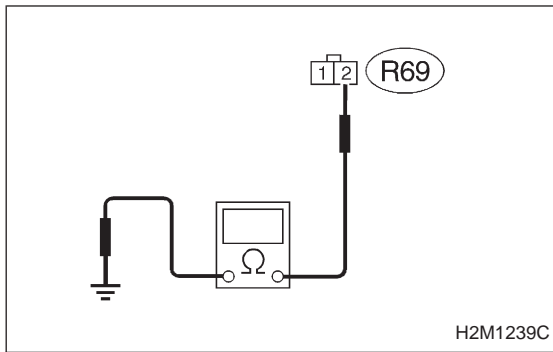
**YES** : Replace vent control solenoid valve and ECM.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.



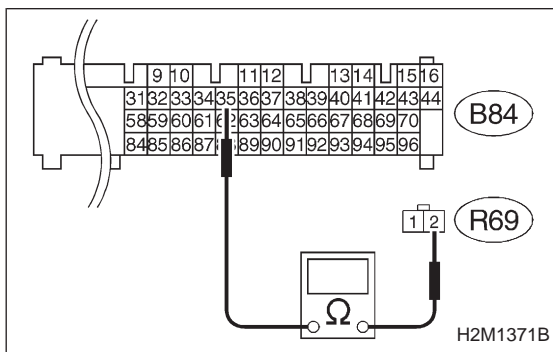
**10AJ3 CHECK HARNESS BETWEEN VENT CONTROL SOLENOID VALVE AND ECM CONNECTOR.**

- 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.

**CHECK** : **Connector & terminal (R69) No. 2 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair 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.

**CHECK** : **Connector & terminal (B84) No. 35 — (R69) No. 2:**  
**Is the resistance less than 1 Ω?**

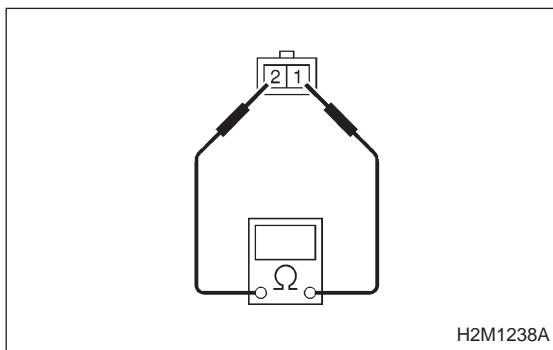
**YES** : Go to step 10AJ4.

**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 (B98 (LHD)/B97 (RHD), and R57)



**10AJ4 CHECK VENT CONTROL SOLENOID VALVE.**

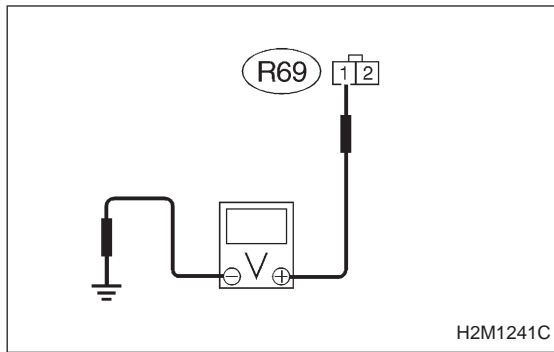
Measure resistance between vent control solenoid valve terminals.

**CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance between 10 and 100 Ω?**

**YES** : Go to step 10AJ5.

**NO** : Replace vent control solenoid valve.



**10AJ5****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.

**CHECK** : **Connector & terminal (R69) No. 1 (+) — Chassis ground (-): Is the voltage more than 10 V?**

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

**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 R57)
- Poor contact in main relay connector

**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.

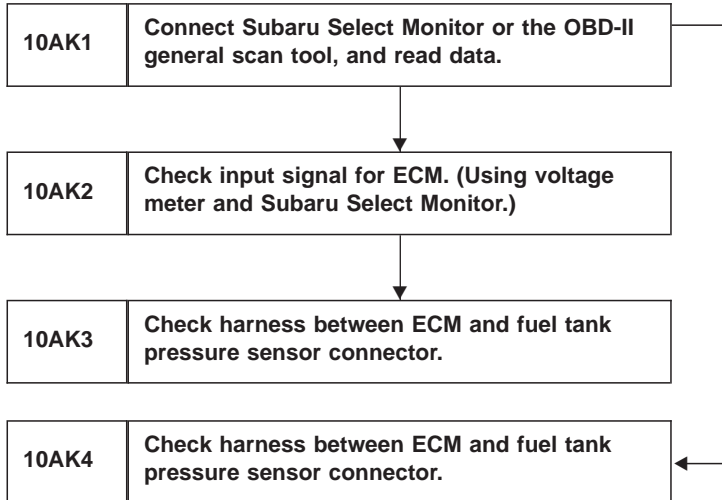
**NOTE:**

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

OBD (FB1) P0450 <TNKP>
H2M1372

**AK: DTC P0450**  
**— EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR MALFUNCTION (TNKP) —**

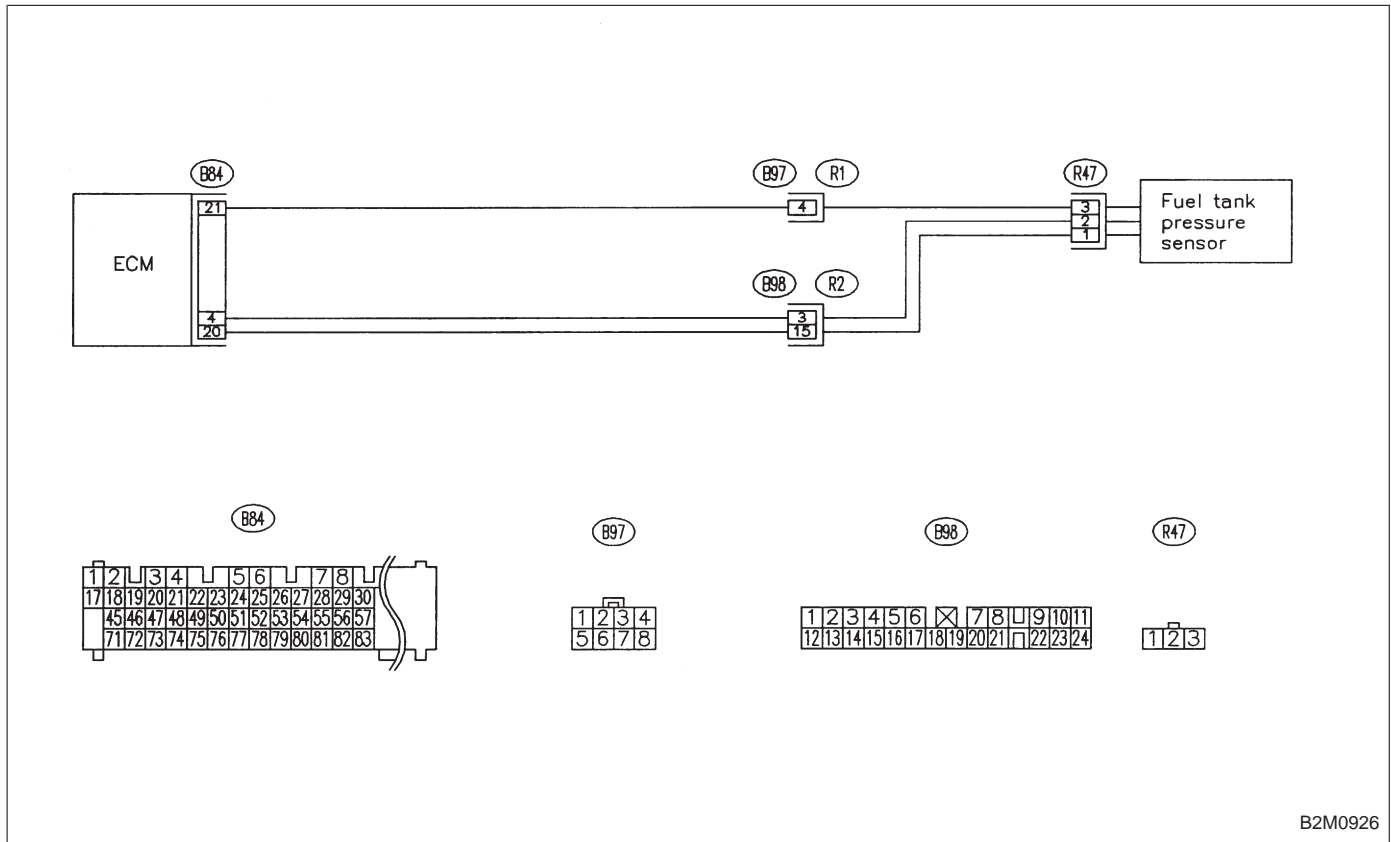
- DTC DETECTING CONDITION:**
- Immediately at fault recognition



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

WIRING DIAGRAM:

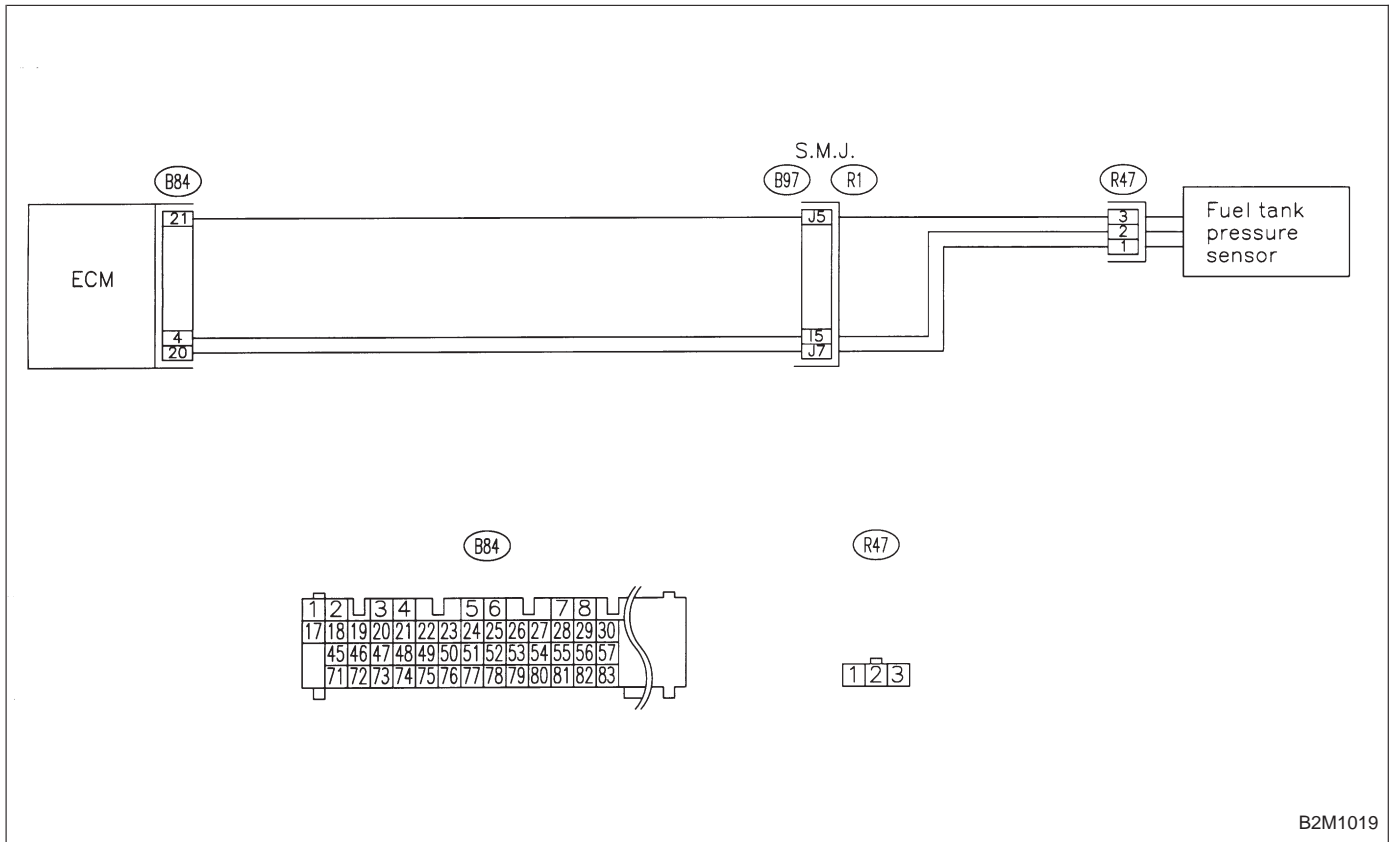
- LHD Model



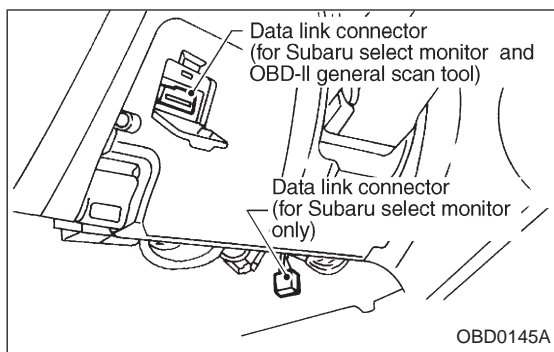
B2M0926

WIRING DIAGRAM:

- RHD Model



B2M1019

**10AK1**
**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 **10AK2**.

**NO** : Go to next **CHECK** .

TNKP ( F43 )

0.10kPa 1mmHg

H2M1326

TNKP ( F43 )

0.10kPa 1mmHg

H2M1326

**CHECK** : *Is the value more than 2.8 kPa in function mode F43?*

**YES** : Go to step **10AK4**.

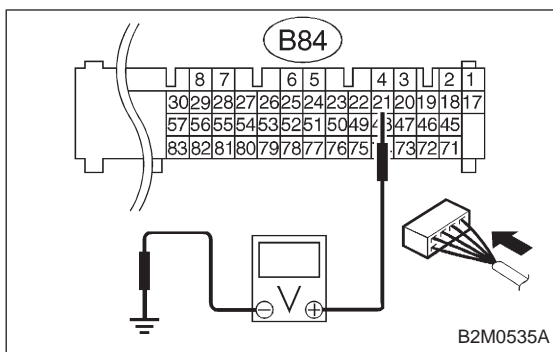
**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open or short circuit in harness between fuel tank pressure sensor and ECM connector
- Poor contact in coupling connectors (B97, and B98 (LHD only))
- Poor contact in fuel tank pressure sensor
- Poor contact in ECM connector
- OBD-II general scan tool

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



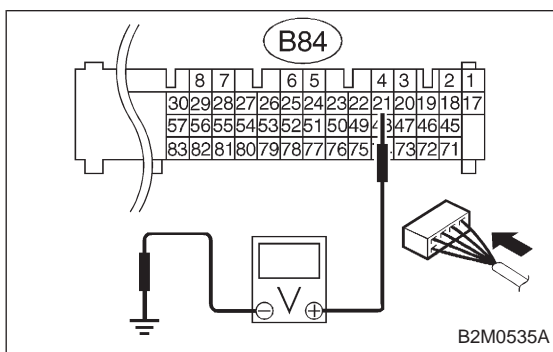
**10AK2** **CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)**

1) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 21 (+) — Chassis ground (-): Is the voltage more than 4.5 V?**

**YES** : Go to next step 2).

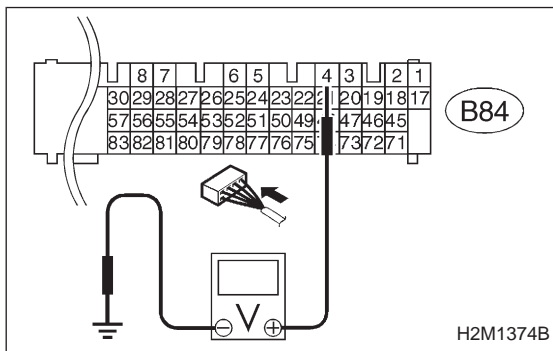
**NO** : Go to next **CHECK** .



**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** : Replace ECM.



2) Measure voltage between ECM and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 4 (+) — Chassis ground (-): Is the voltage less than 0.2 V?**

**YES** : Go to step 10AK3.

**NO** : Go to next step 3).

TNKP ( F43 )  
0. 10kPa 1mmHg

H2M1326

3) Read data on Subaru Select Monitor.

- Subaru Select Monitor Designate mode using function key.

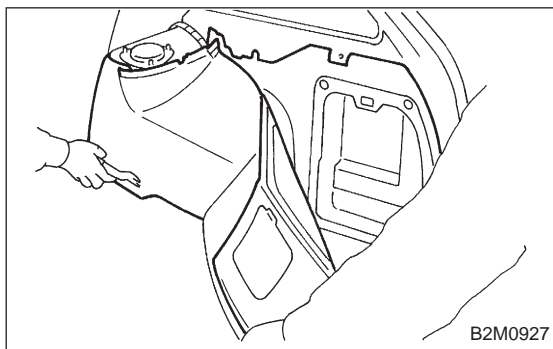
**Function mode: F43**

- F43: Display shows pressure signal value sent from fuel tank pressure sensor.

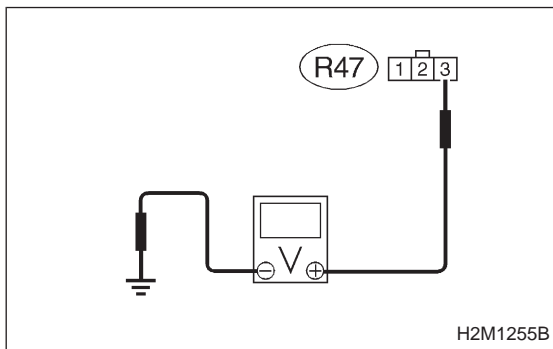
**CHECK** : Does the value change more than  $-2.8$  kPa by shaking harness and connector of ECM while monitoring the value with Subaru select monitor?

**YES** : Repair poor contact in ECM connector.

**NO** : Go to step **10AK3**.

**10AK3****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) Remove right side rear quarter trim pocket (Wagon model only).
- 4) Detach right side rear quarter insulator (Wagon model only).



- 5) Disconnect connector from fuel tank pressure sensor.
- 6) Turn ignition switch to ON.
- 7) Measure voltage between fuel tank pressure sensor connector and chassis ground.

**CHECK** : **Connector & terminal (R47) No. 3 (+) — Chassis ground (-): Is the voltage more than 4.5 V?**

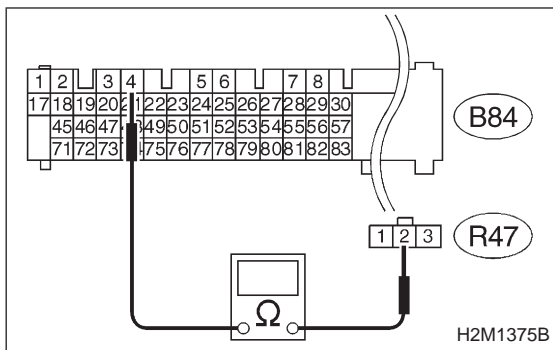
**YES** : Go to next step 8).

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure sensor connector
- Poor contact in coupling connector (B97)



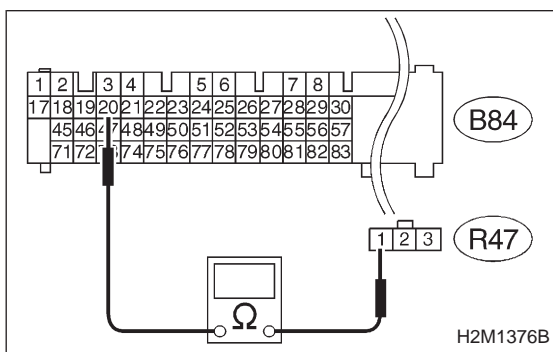
- 8) Turn ignition switch to OFF.
- 9) Disconnect connector from ECM.
- 10) Measure resistance of harness between ECM and pressure sensor connector.

**CHECK** : **Connector & terminal (B84) No. 4 — (R47) No. 2:**  
**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 ECM and fuel tank pressure sensor connector
  - Poor contact in coupling connector (B98 (LHD)/B97 (RHD))



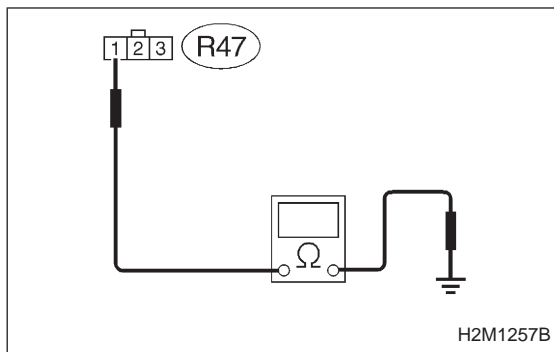
**CHECK** : **Connector & terminal (B84) No. 20 — (R47) No. 1:**  
**Is the resistance less than 1 Ω?**

- YES** : Go to next step 11).
- 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 (B98 (LHD)/B97 (RHD))





11) Measure resistance of harness between fuel tank pressure sensor connector and chassis ground.

**CHECK** : **Connector & terminal (R47) No. 1 — Chassis ground:**  
**Is the resistance more than 500 kΩ?**

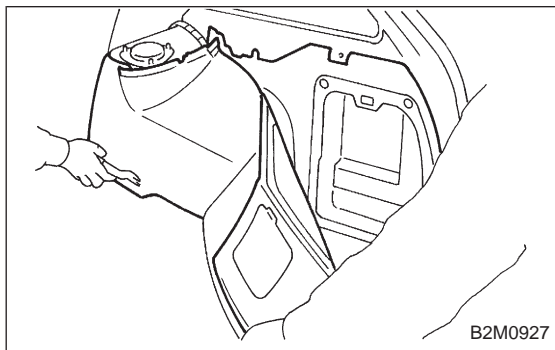
**YES** : Go to next **CHECK** .

**NO** : Repair short circuit in harness between ECM and fuel tank pressure sensor connector.

**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.



**10AK4**

**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).

3) Remove right side rear quarter trim pocket (Wagon model only).

4) Detach right side rear quarter insulator (Wagon model only).

TNKP	( F 43 )
0 . 1 0 k P a	1 m m H g

H2M1326

- 5) Disconnect connector from fuel tank pressure sensor.
- 6) Remove fuel filler cap.
- 7) Install fuel filler cap.
- 8) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
- 9) 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 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)  
 P0451 <TNKP\_F>  
 H2M1377

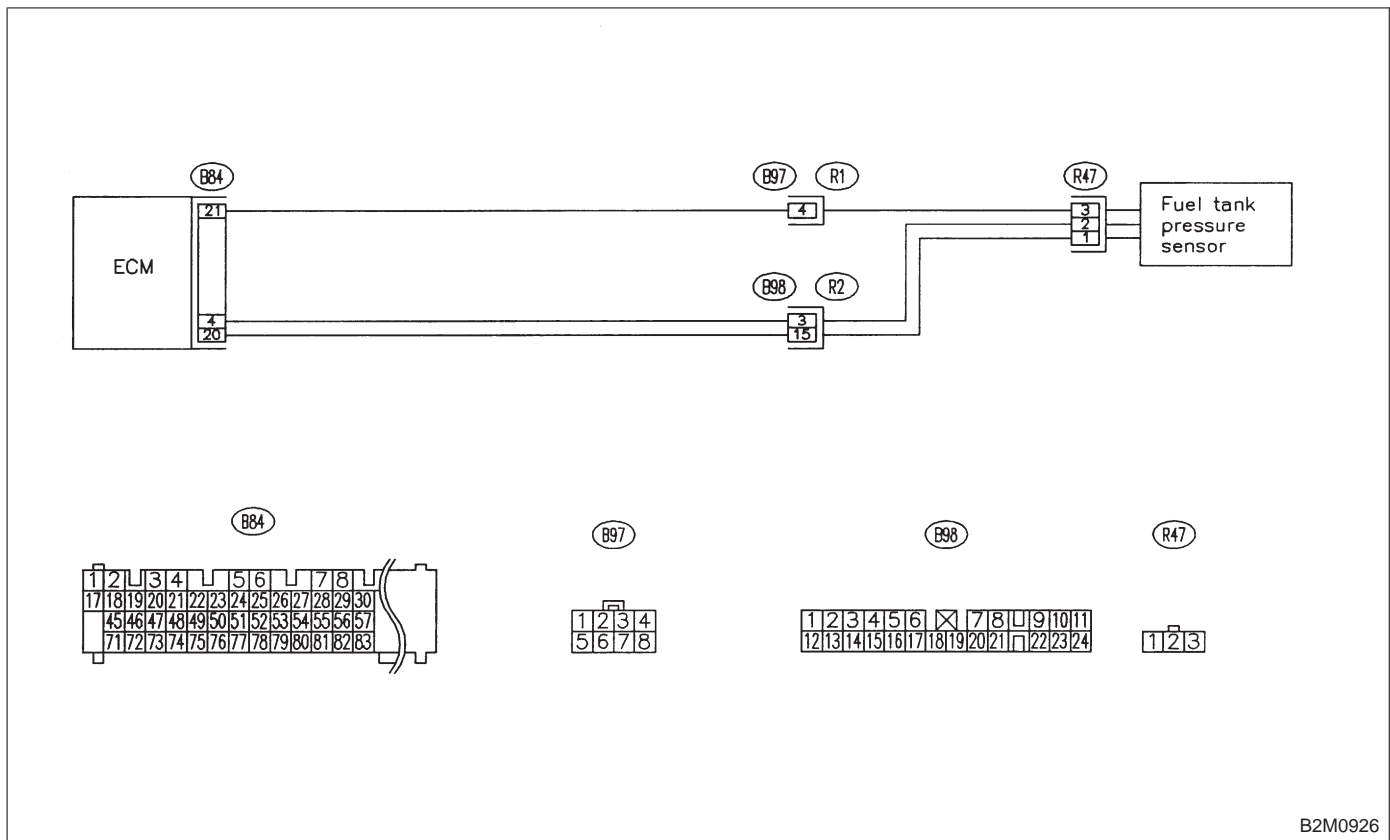
**AL: DTC P0451**  
**— EVAPORATIVE EMISSION CONTROL SYSTEM PRESSURE SENSOR RANGE/PERFORMANCE PROBLEM (TNKP – F) —**

- DTC DETECTING CONDITION:**
- Two consecutive trips with fault

10AL1	Check pressure/vacuum line.
-------	-----------------------------

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

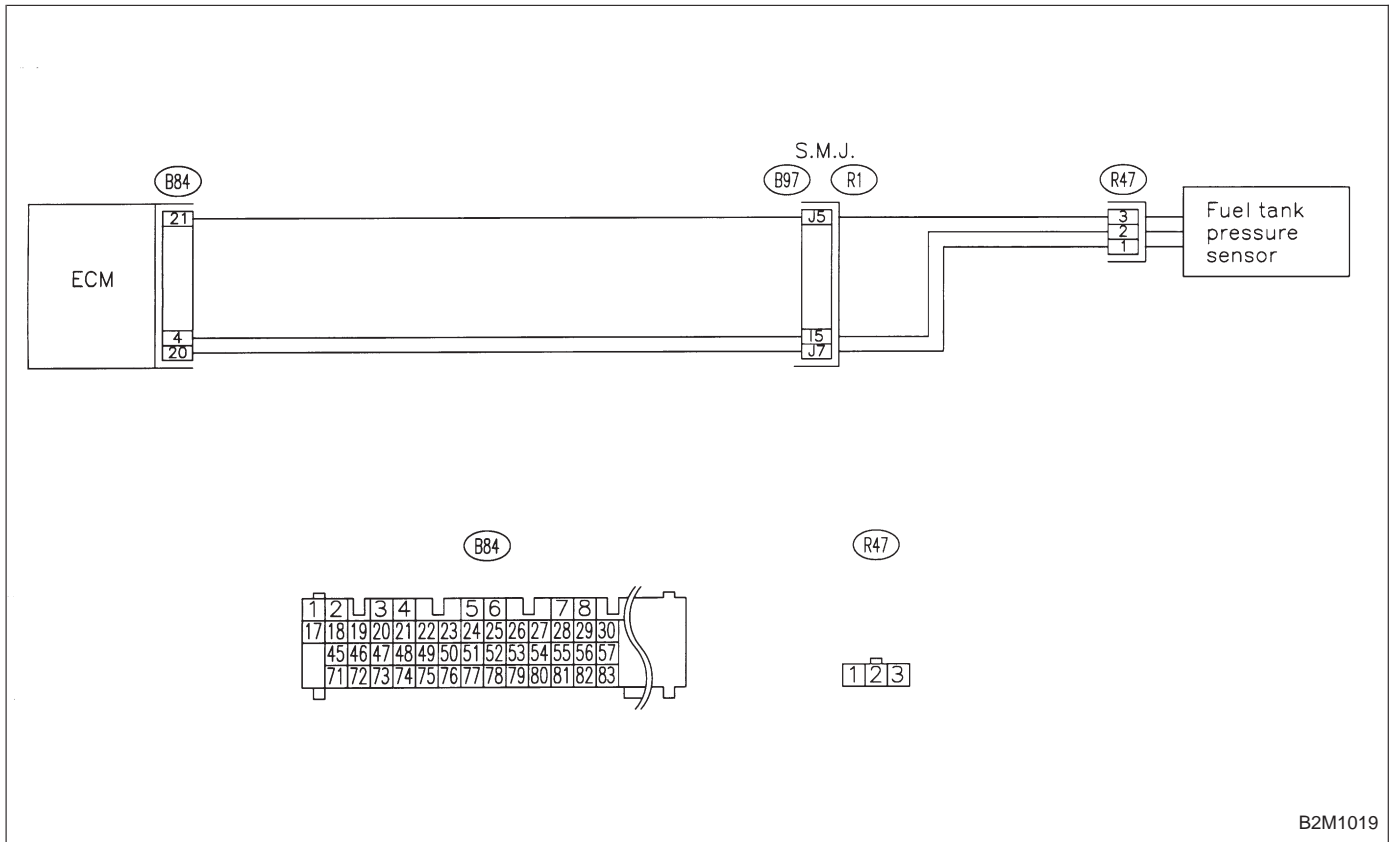
- WIRING DIAGRAM:**
- LHD Model



B2M0926

**WIRING DIAGRAM:**

- RHD Model



B2M1019

**10A11 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.

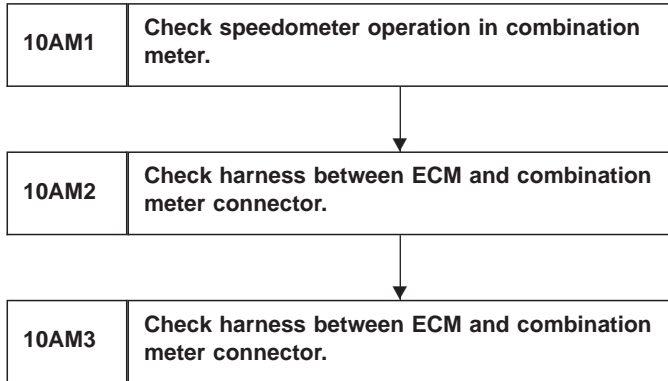
**NO** : Replace fuel tank pressure sensor.

OBD	(FB1)
P0500	<VSP>
OBD0340	

**AM: DTC P0500**  
**— VEHICLE SPEED SENSOR MALFUNCTION (VSP) —**

**DTC DETECTING CONDITION:**

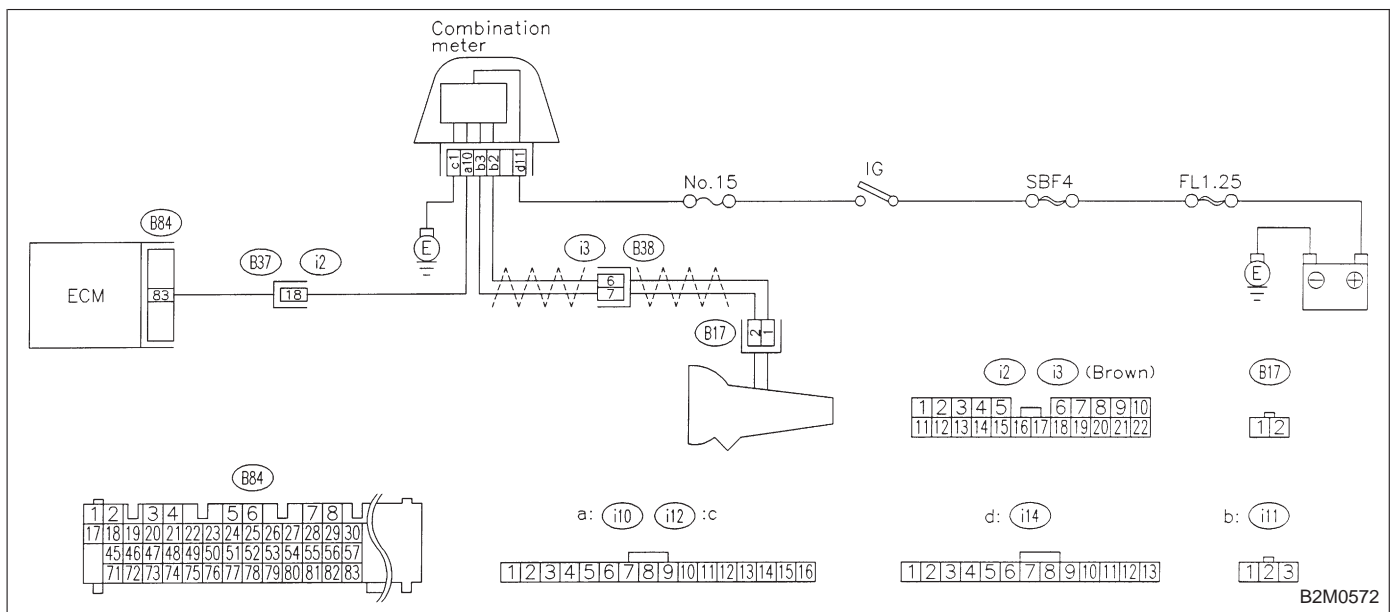
- Immediately at fault recognition



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

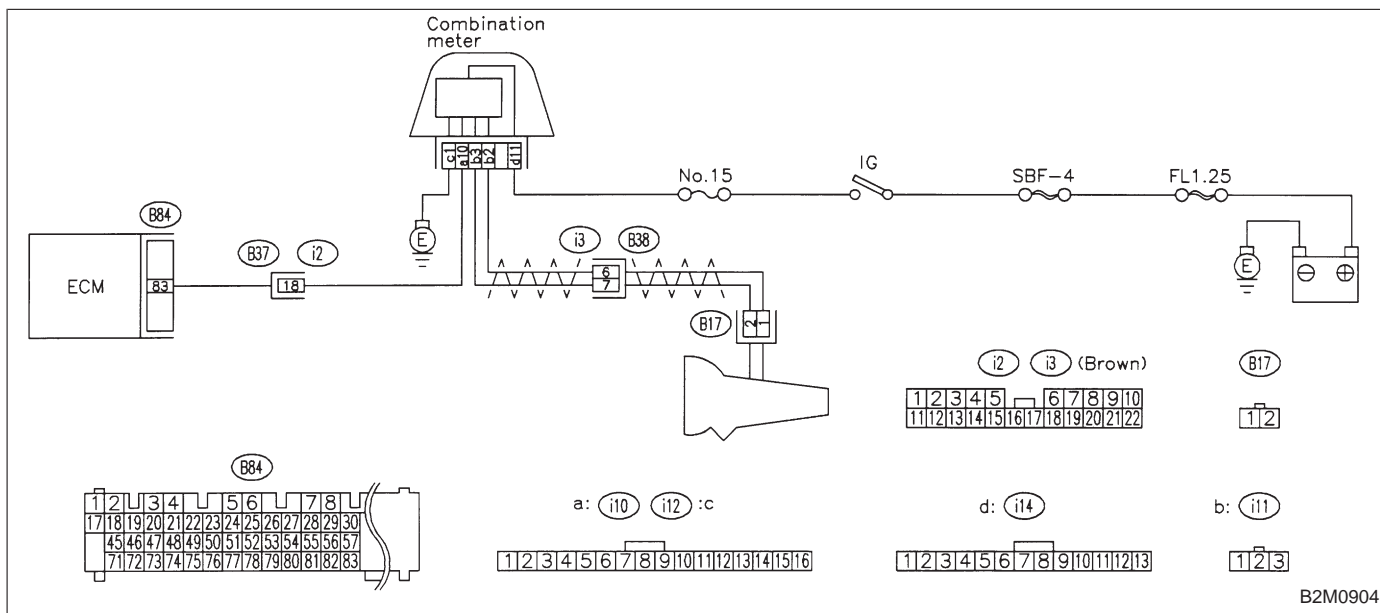
**WIRING DIAGRAM:**

- LHD Model



WIRING DIAGRAM:

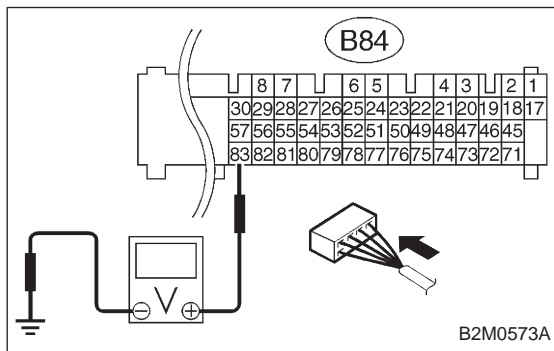
- RHD Model



B2M0904

**10AM1 CHECK SPEEDOMETER OPERATION IN COMBINATION METER.**

- CHECK** : Does speedometer operate normally?
- YES** : Go to step 10AM2.
- NO** : Check speedometer and vehicle speed sensor <Ref. to 6-2 [K3A0].>



B2M0573A

**10AM2 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.

**CHECK** : **Connector & terminal (B84) No. 83 (+) — Chassis ground (-): Is the voltage more than 2 V?**

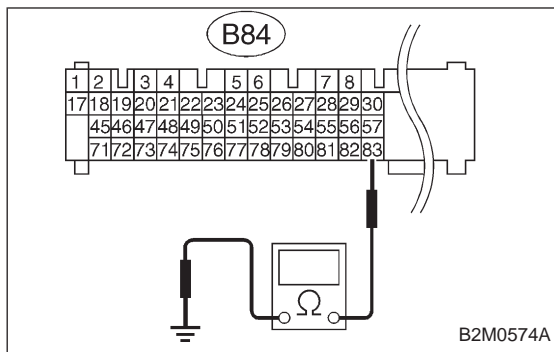
**YES** : Repair harness and connector.

**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 (B37)

**NO** : Go to step 10AM3.

**10AM3****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.

**CHECK****: Connector & terminal****(B84) No. 83 — Chassis ground:****Is the resistance less than 10  $\Omega$ ?****YES****: Repair short circuit in harness between ECM and combination meter connector.****NO****: Repair poor contact in ECM connector.**

OBD	(FB1)
P0505	<ISC>
OBD0358	

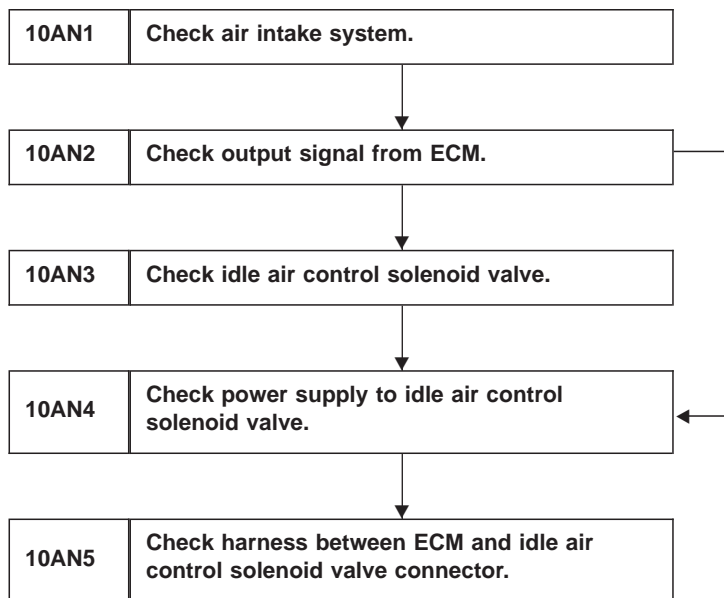
**AN: DTC P0505  
— IDLE CONTROL SYSTEM MALFUNCTION (ISC) —**

**DTC DETECTING CONDITION:**

- Immediately at fault recognition

**TROUBLE SYMPTOM:**

- Erroneous idling
- Engine stalls.
- Engine breathing



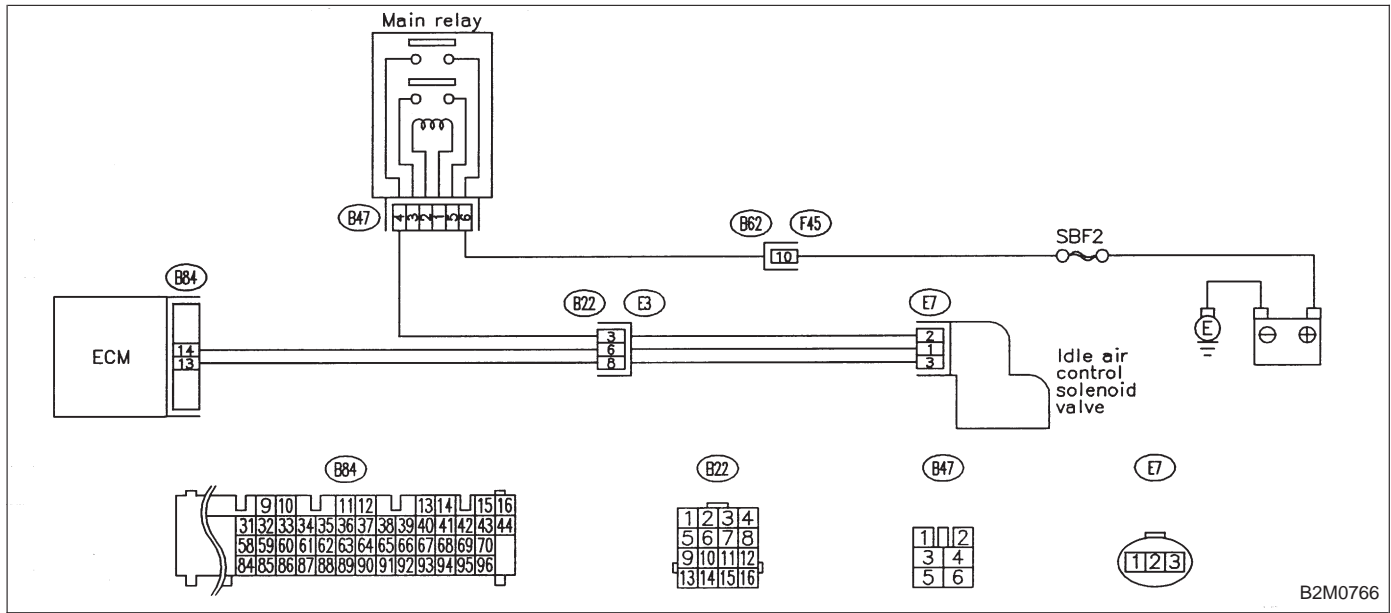
**CAUTION:**

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



WIRING DIAGRAM:

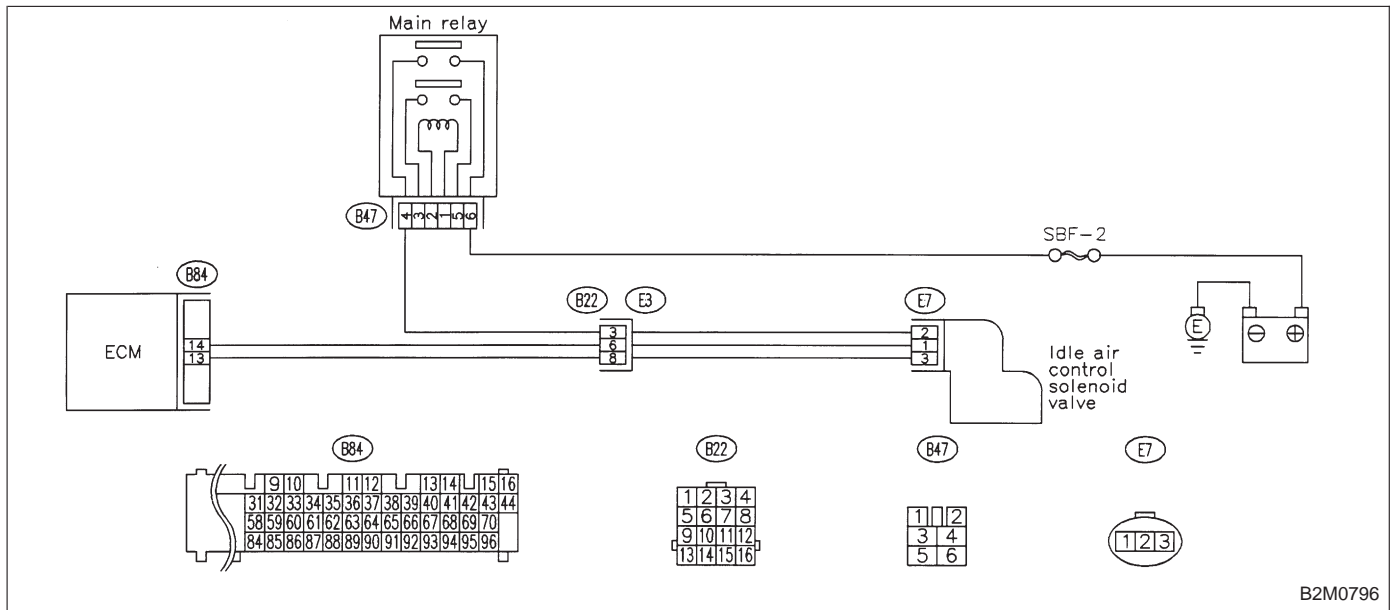
- LHD Model



B2M0766

WIRING DIAGRAM:

- RHD Model



B2M0796

**10AN1 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?*

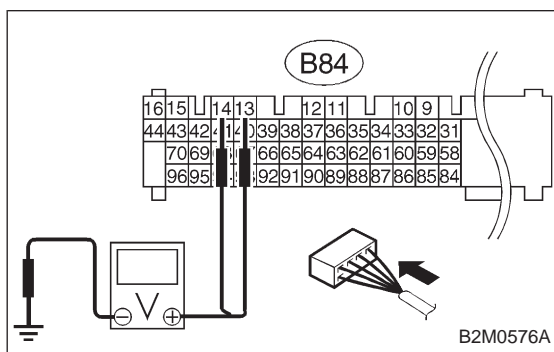
NOTE:

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 **10AN2**.



**10AN2 CHECK OUTPUT SIGNAL FROM ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 13 (+) — Chassis ground (-): Is the voltage more than 3 V?**

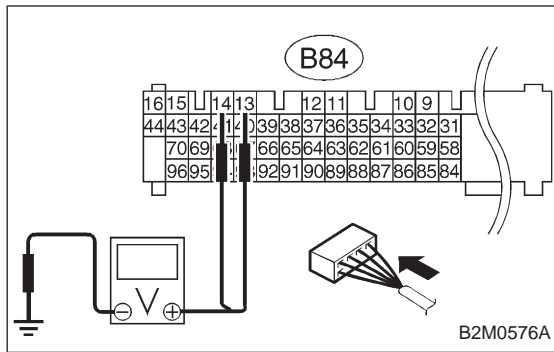
**YES** : Go to next **CHECK** .

**NO** : Go to step **10AN4**.

**CHECK** : **Connector & terminal (B84) No. 14 (+) — Chassis ground (-): Is the voltage more than 3 V?**

**YES** : Go to next step 3).

**NO** : Go to step **10AN4**.



- 3) Turn ignition switch to OFF.
- 4) Disconnect connector from idle air control solenoid valve.
- 5) Turn ignition switch to ON.
- 6) Measure voltage between ECM and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 13 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Repair short circuit in harness between ECM and idle air control solenoid valve connector.

**NO** : Go to next **CHECK** .

**CHECK** : **Connector & terminal (B84) No. 14 (+) — Chassis ground (-): Is the voltage more than 10 V?**

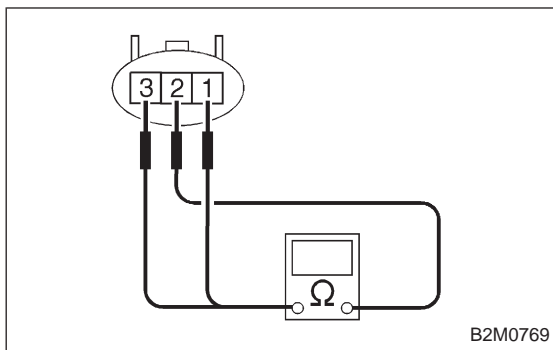
**YES** : Repair short circuit in harness between ECM and idle air control solenoid valve connector and replace ECM.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Go to step **10AN3**.



**10AN3 CHECK IDLE AIR CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between idle air control solenoid valve connector terminals.

**CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance more than 20 Ω?**

**YES** : Replace idle air control solenoid valve.

**NO** : Go to next **CHECK** .

**CHECK** : **Terminals No. 2 — No. 3:**  
**Is the resistance more than 20 Ω?**

**YES** : Replace idle air control solenoid valve.

**NO** : Go to next **CHECK** .

**CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance less than 5 Ω?**

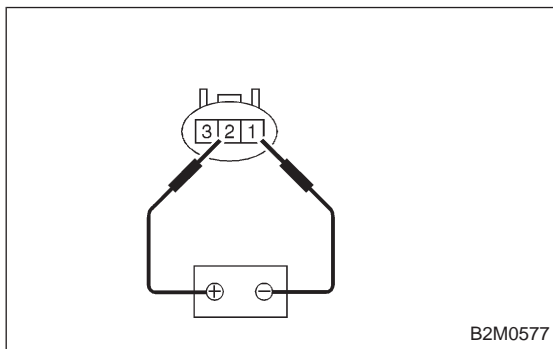
**YES** : Replace idle air control solenoid valve and ECM.

**NO** : Go to next **CHECK** .

**CHECK** : **Terminals No. 2 — No. 3:**  
**Is the resistance less than 5 Ω?**

**YES** : Replace idle air control solenoid valve and ECM.

**NO** : Go to next step 3).



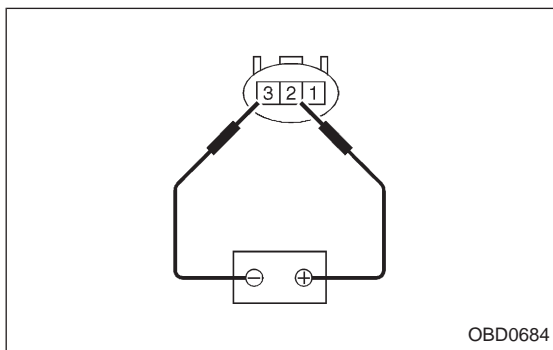
- 3) Remove idle air control solenoid valve. <Ref. to 2-7 [W12A0].>

- 4) 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 **CHECK** .

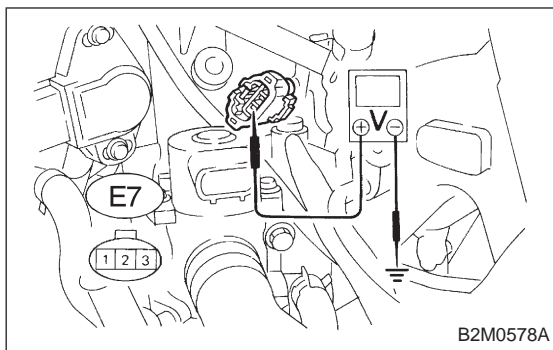
**NO** : Clean idle air control solenoid valve. <Ref. to 2-7 [W12B0].>



**CHECK** : **Is idle air control solenoid valve fully closed when applying the battery to terminals No. 2 (+) and No. 3 (-)?**

**YES** : Go to step 10AN4.

**NO** : Clean idle air control solenoid valve. <Ref. to 2-7 [W12B0].>

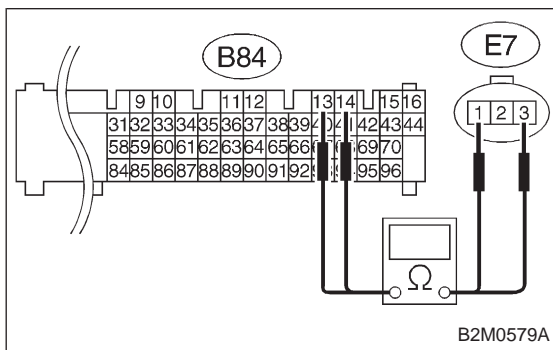

**10AN4 CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.**

- 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.

**CHECK** : **Connector & terminal (E7) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

**YES** : Go to step 10AN5.

**NO** : Repair open circuit in harness between idle air control solenoid valve and main relay connector.


**10AN5 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.

**CHECK** : **Connector & terminal (B84) No. 14 — (E7) No. 1: Is the resistance less than 1 Ω?**

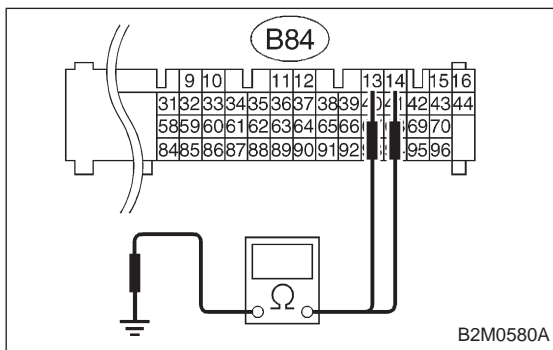
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between ECM and idle air control solenoid valve connector.

**CHECK** : **Connector & terminal (B84) No. 13 — (E7) No. 3: Is the resistance less than 1 Ω?**

**YES** : Go to next step 4).

**NO** : Repair open circuit in harness between ECM and idle air control solenoid valve connector.



- 4) Measure resistance of harness between ECM and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 13 — Chassis ground: Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between ECM and idle air control solenoid valve connector.

**NO** : Go to next **CHECK** .

- CHECK** : **Connector & terminal**  
**(B84) No. 14 — Chassis ground:**  
**Is the resistance less than 10  $\Omega$ ?**
- YES** : Repair short circuit in harness between ECM and idle air control solenoid valve connector.
- NO** : Go to next **CHECK** .
- 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_L>
OBD0370	

**AO: DTC P0506**  
**— IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED (ISC — L) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Engine is difficult to start.
- Engine does not start.
- Erroneous idling
- Engine stalls.

10AO1	Check DTC P0505 on display.
-------	-----------------------------



10AO2	Check air intake system.
-------	--------------------------

**CAUTION:**

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

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

10AO1	<b>CHECK DTC P0505 ON DISPLAY.</b>
-------	------------------------------------

**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 2-7 [T1000]".

**NOTE:**

In this case, it is not necessary to inspect DTC P0506.

**NO** : Go to step **10AO2**.

10AO2	<b>CHECK AIR INTAKE SYSTEM.</b>
-------	---------------------------------

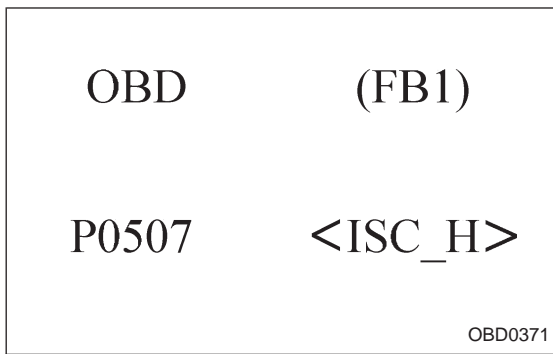
1) Turn ignition switch to ON.

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.



**AP: DTC P0507**  
**— IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED (ISC — H) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Engine keeps running at higher revolution than specified idling revolution.

<b>10AP1</b>	Check DTC P0505 on display.
--------------	-----------------------------



<b>10AP2</b>	Check air intake system.
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**CAUTION:**

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

<b>10AP1</b>	<b>CHECK DTC P0505 ON DISPLAY.</b>
--------------	------------------------------------

**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 2-7 [T1000]".

**NOTE:**

In this case, it is not necessary to inspect DTC P0507.

**NO** : Go to step **10AP2**.

<b>10AP2</b>	<b>CHECK AIR INTAKE SYSTEM.</b>
--------------	---------------------------------

- 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.



**AQ: DTC P0600  
— SERIAL COMMUNICATION LINK  
MALFUNCTION —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

<b>10AQ1</b>	<b>Check harness between ECM and data link connector.</b>
--------------	---

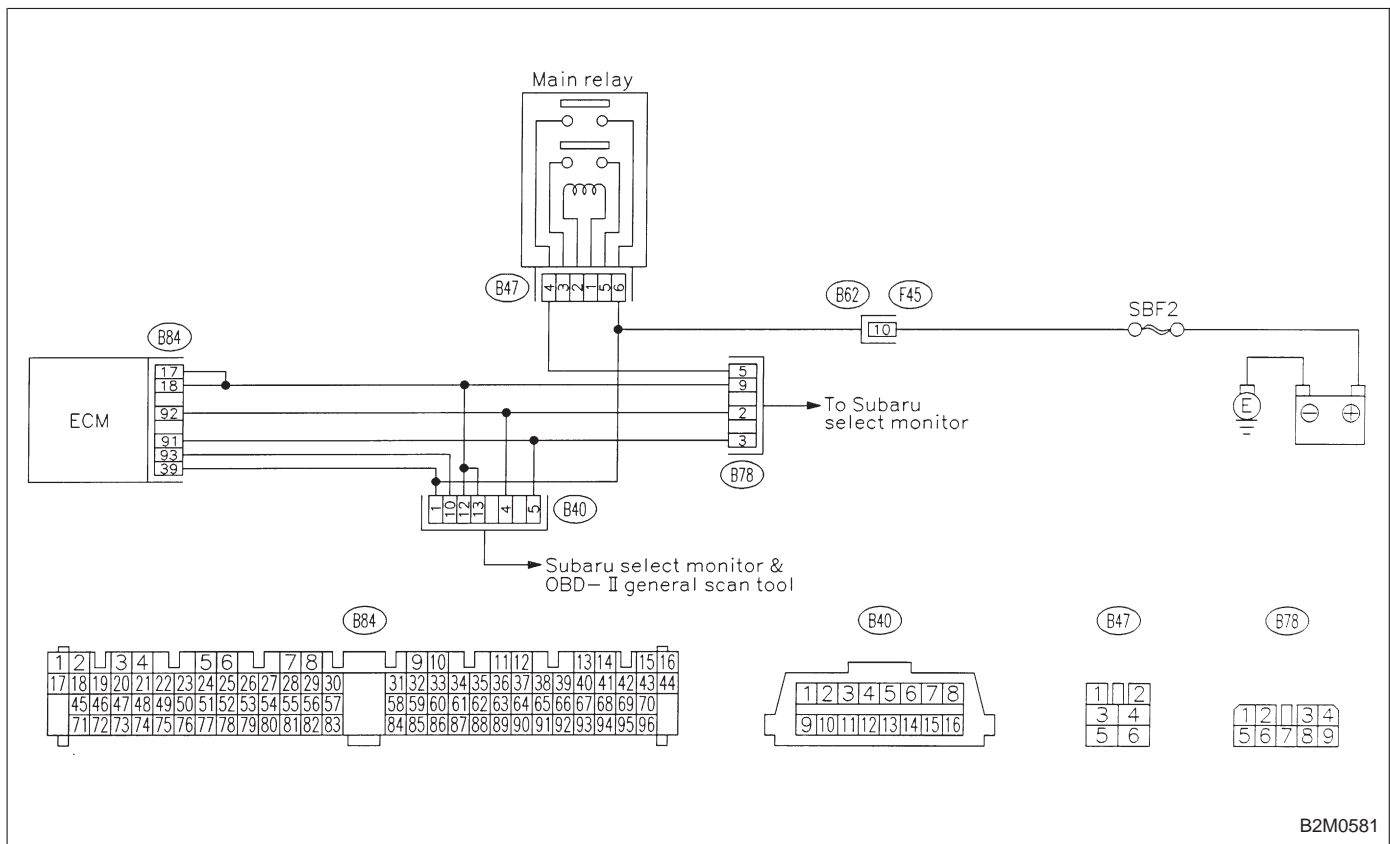
**CAUTION:**

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

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

**WIRING DIAGRAM:**

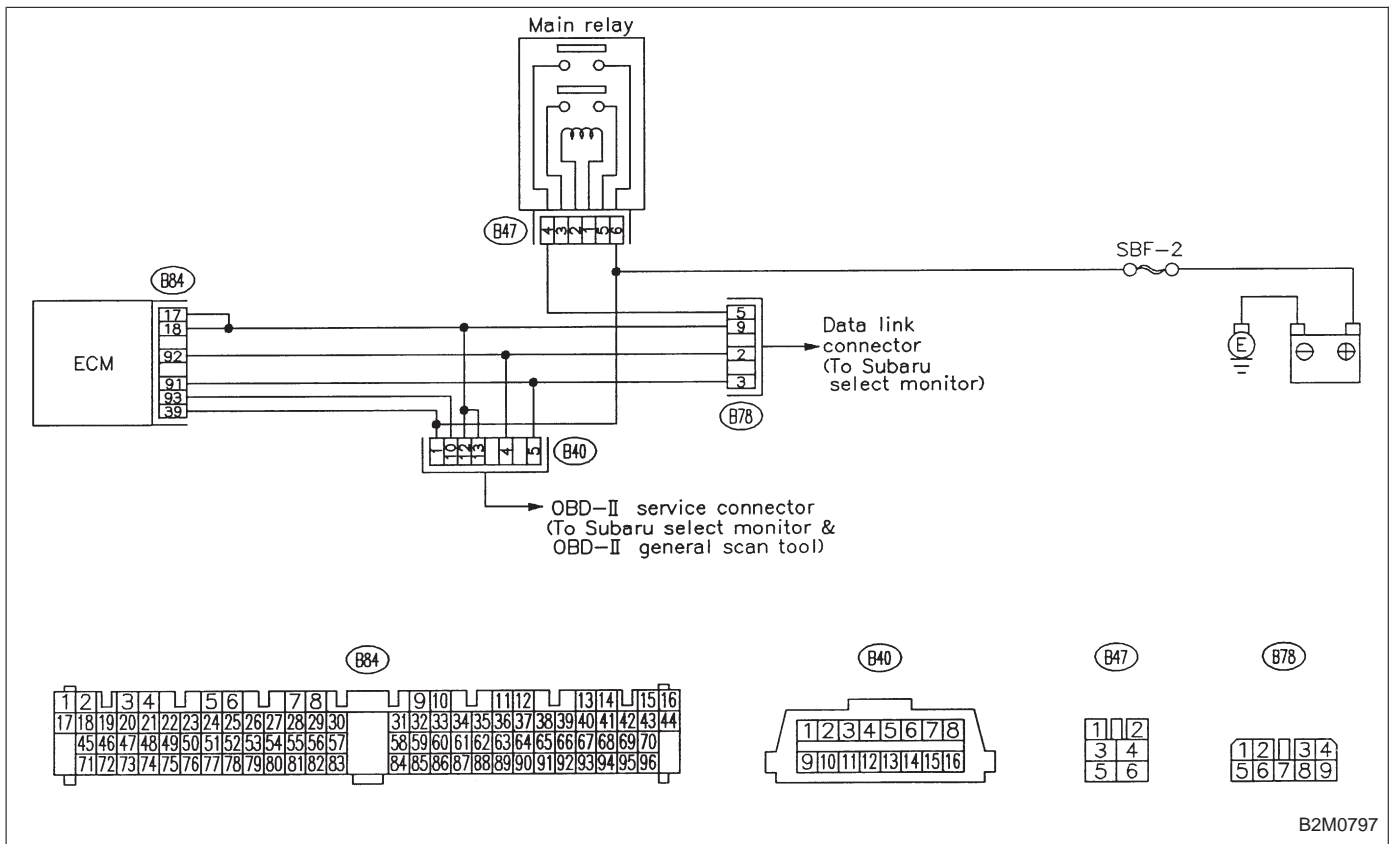
- LHD Model



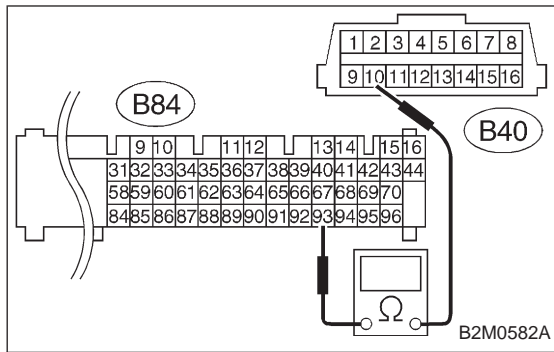
B2M0581

WIRING DIAGRAM:

- RHD Model



B2M0797



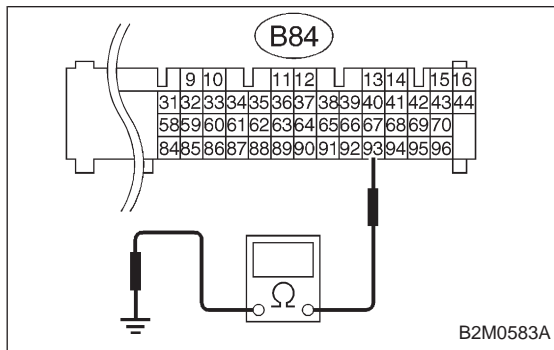
### 10AQ1 CHECK HARNESS BETWEEN ECM AND DATA LINK CONNECTOR.

- 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).

**CHECK** : **Connector & terminal (B84) No. 93 — (B40) No. 10:**  
**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.

**CHECK** : **Connector & terminal (B84) No. 93 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair 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	

**AR: DTC P0601  
— INTERNAL CONTROL MODULE MEMORY  
CHECK SUM ERROR (RAM) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Engine does not start.
- Engine stalls.

10AR1	Check DTC P0601 on display.
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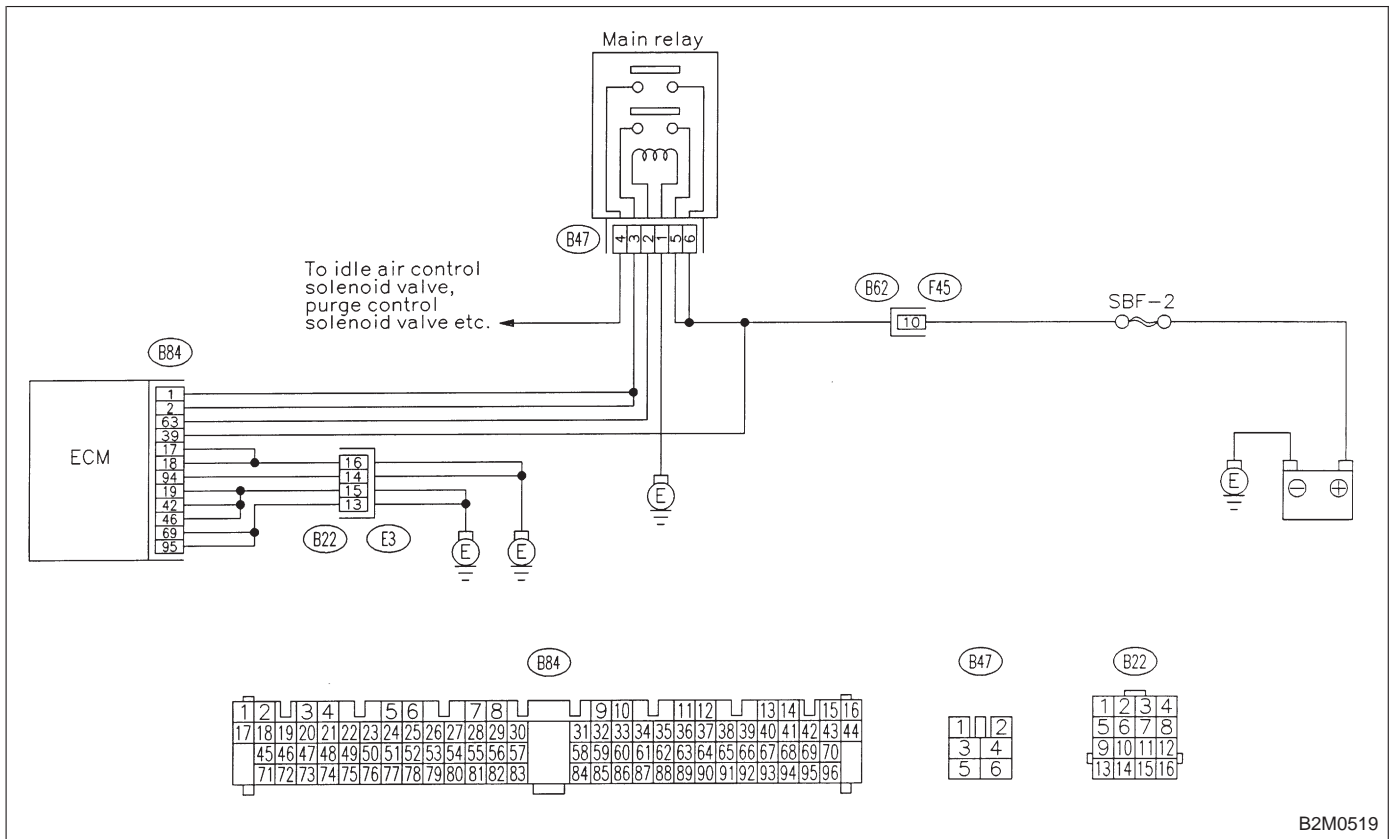
**CAUTION:**

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

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

**WIRING DIAGRAM:**

- LHD Model



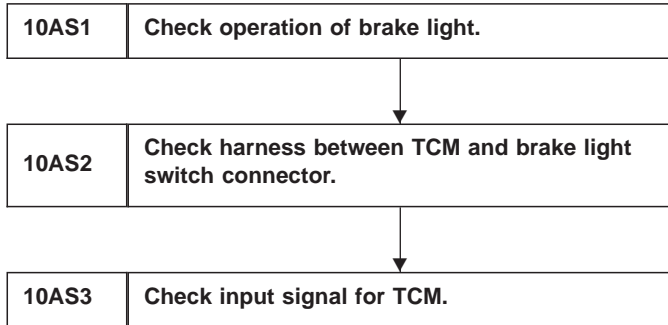
B2M0519



OBD (FB1)  
 P0703 <ATBRK>  
 B2M0655

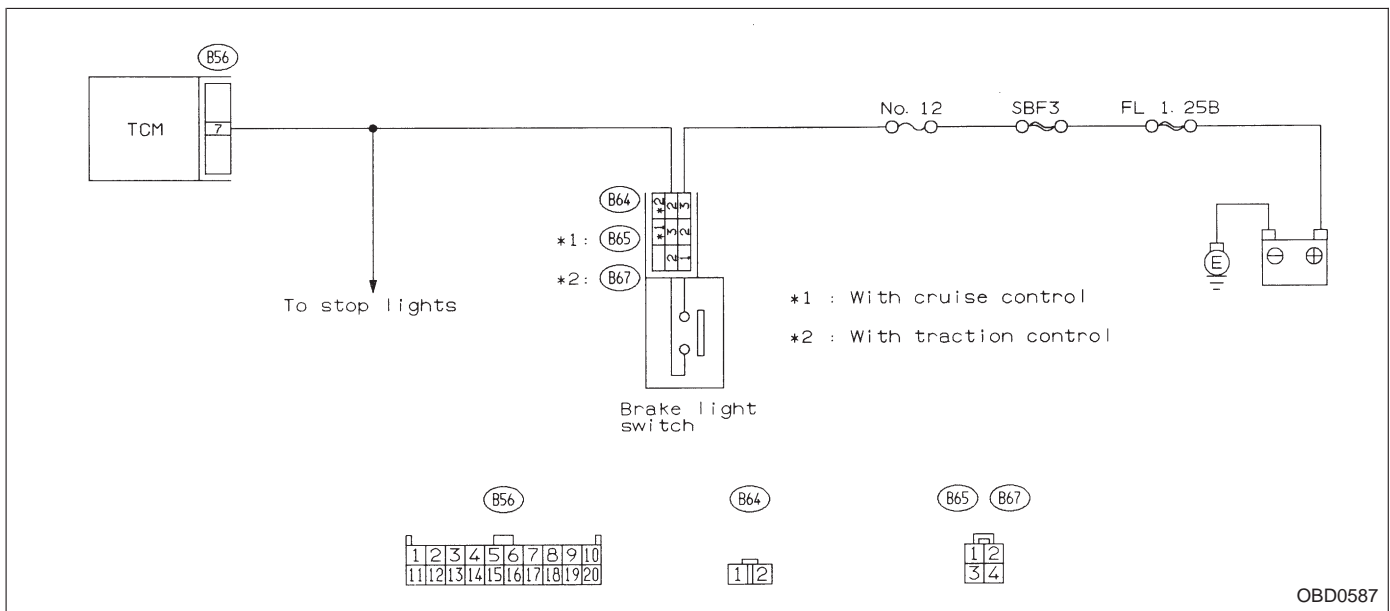
**AS: DTC P0703  
 — BRAKE SWITCH INPUT MALFUNCTION  
 (ATBRK) —**

- DTC DETECTING CONDITION:**
- Two consecutive trips with fault



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

**WIRING DIAGRAM:**

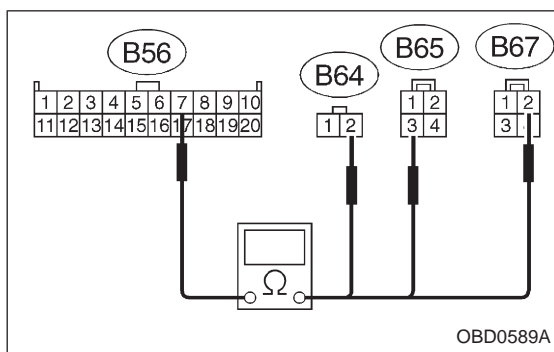


**10AS1 CHECK OPERATION OF BRAKE LIGHT.**

**CHECK** : Does brake light come on when depressing the brake pedal?

**YES** : Go to step 10AS2.

**NO** : Repair or replace brake light circuit.

**10AS2 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.

**CHECK** : **Connector & terminal**  
**(B56) No. 7 — (B64) No. 2:**  
**(B56) No. 7 — (B65) No. 3 (With cruise control):**  
**(B56) No. 7 — (B67) No. 2 (With traction control):**  
**Is the resistance less than 1 Ω?**

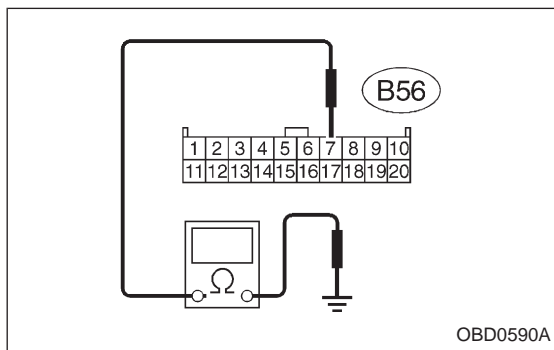
**YES** : Go to next step 3).

**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

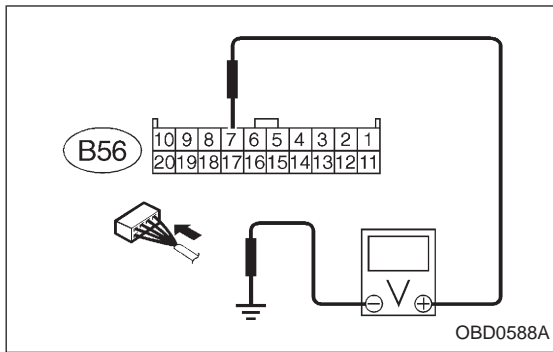


3) Measure resistance of harness between TCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(B56) No. 7 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

**YES** : Go to step 10AS3.

**NO** : Repair short circuit in harness between TCM and brake light switch connector.



**10AS3 CHECK INPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and brake light switch.
- 2) Measure voltage between TCM and chassis ground.

**CHECK** : **Connector & terminal (B56) No. 7 (+) — Chassis ground (-): Is the voltage less than 1 V when releasing the brake pedal?**

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

**NO** : Adjust or replace brake light switch.

**CHECK** : **Connector & terminal (B56) No. 7 (+) — Chassis ground (-): Is the voltage more than 10 V when depressing the brake pedal?**

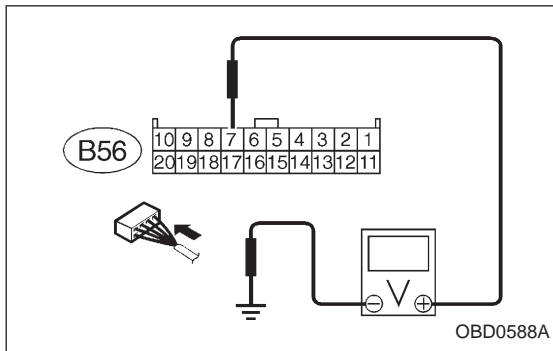
**YES** : Go to next **CHECK** .

**NO** : Adjust or replace brake light switch.

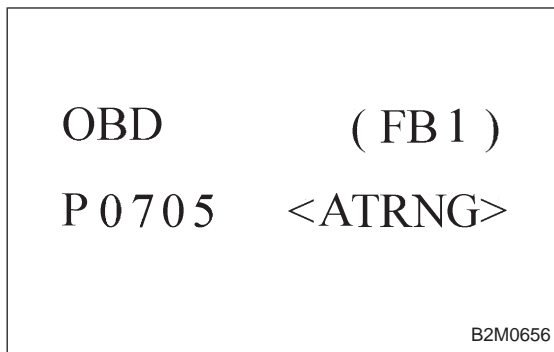
**CHECK** : **Is there poor contact in TCM connector?**

**YES** : Repair poor contact in TCM connector.

**NO** : Replace TCM.







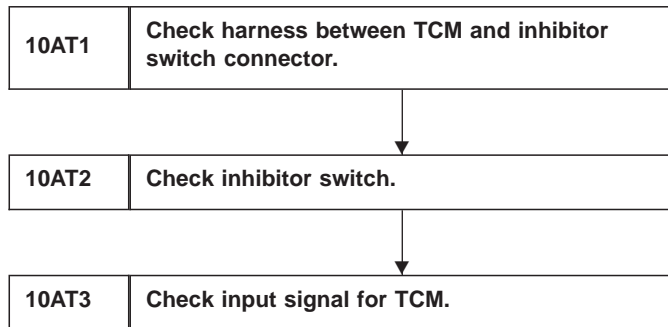
**AT: DTC P0705**  
**— TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION (ATRNG) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

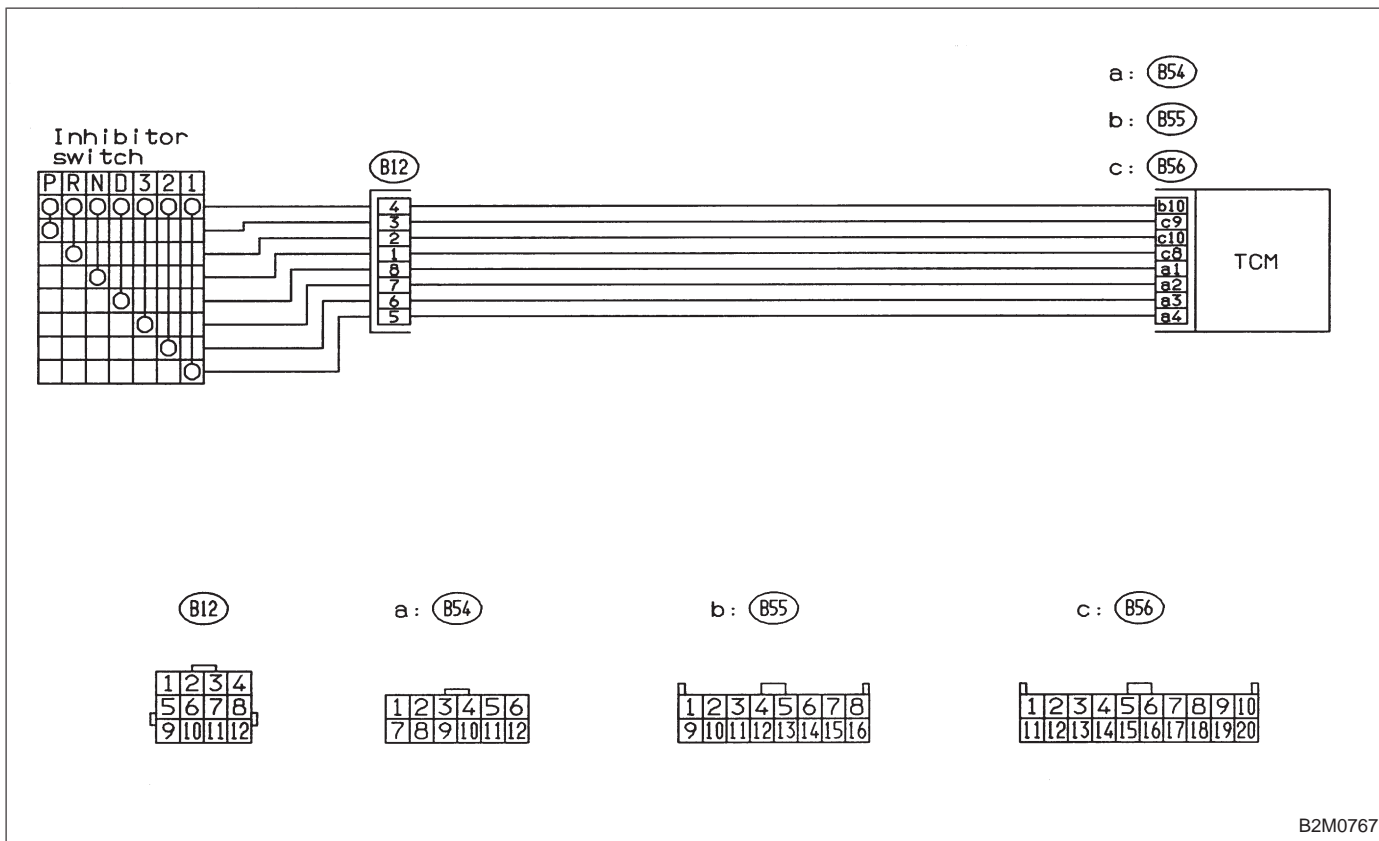
- Starter does not rotate when selector lever is in “P” or “N” range.
- Starter rotates when selector lever is in “R”, “D”, “3”, “2” or “1” range.
- Engine brake is not effected when selector lever is in “3” range.
- Shift characteristics are erroneous.

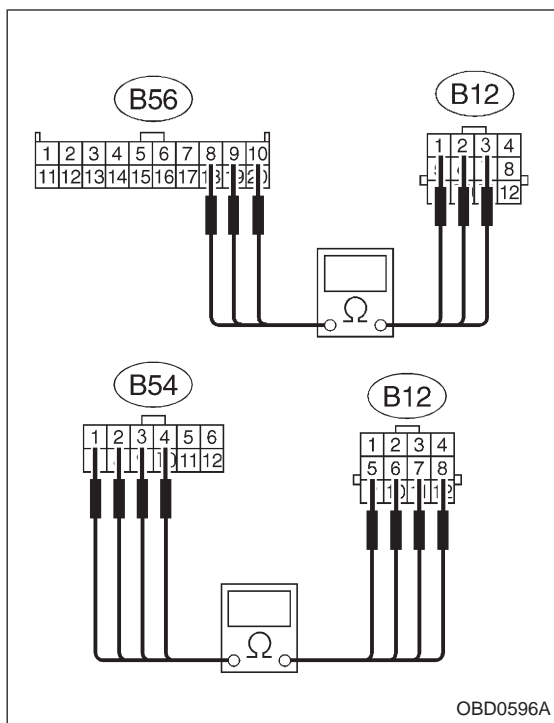


**CAUTION:**

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

WIRING DIAGRAM:



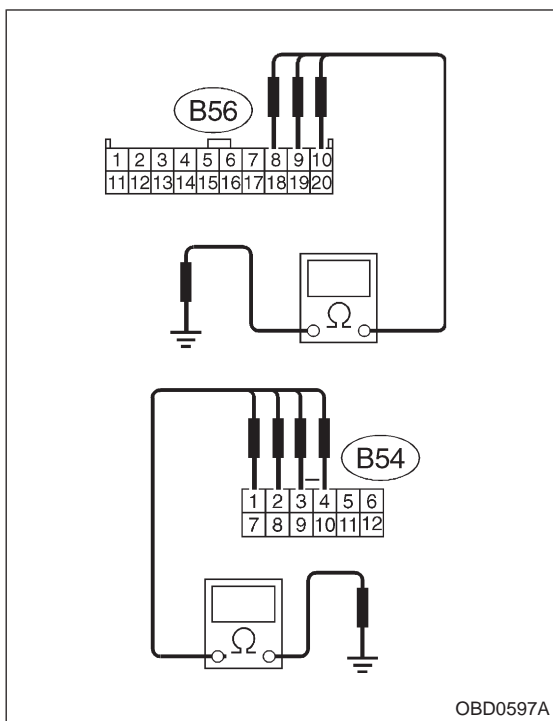


10AT1

**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.

- CHECK** : **Connector & terminal (B56) No. 9 — (B12) No. 3:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between TCM and transmission harness connector.
- CHECK** : **Connector & terminal (B56) No. 10 — (B12) No. 2:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between TCM and transmission harness connector.
- CHECK** : **Connector & terminal (B56) No. 8 — (B12) No. 1:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between TCM and transmission harness connector.
- CHECK** : **Connector & terminal (B54) No. 1 — (B12) No. 8:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between TCM and transmission harness connector.
- CHECK** : **Connector & terminal (B54) No. 2 — (B12) No. 7:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between TCM and transmission harness connector.
- CHECK** : **Connector & terminal (B54) No. 3 — (B12) No. 6:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between TCM and transmission harness connector.
- CHECK** : **Connector & terminal (B54) No. 4 — (B12) No. 5:**  
**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.

**CHECK** : **Connector & terminal (B56) No. 9 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

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

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

**CHECK** : **Connector & terminal (B56) No. 10 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

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

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

**CHECK** : **Connector & terminal (B56) No. 8 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

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

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

**CHECK** : **Connector & terminal (B54) No. 1 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

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

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

**CHECK** : **Connector & terminal (B54) No. 2 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

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

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

**CHECK** : **Connector & terminal (B54) No. 3 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

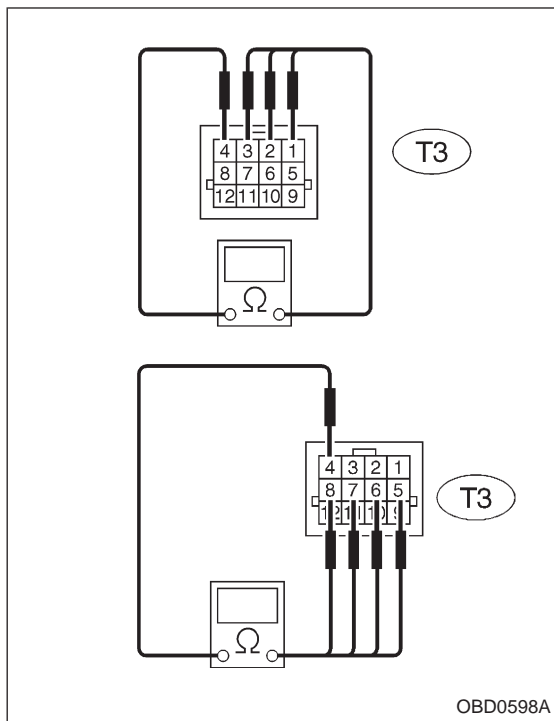
**YES** : Go to next **CHECK** .

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

**CHECK** : **Connector & terminal (B54) No. 4 — Chassis ground:**  
**Is the resistance more than 1 MΩ?**

**YES** : Go to step **10AT2**.

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

**10AT2 CHECK INHIBITOR SWITCH.**

Measure resistance between transmission harness connector receptacle's terminals.

- CHECK** : **Connector & terminal (T3) No. 3 — No. 4**
- Is the resistance less than 1  $\Omega$  in "P" position?
  - Is the resistance more than 1 M $\Omega$  in other positions?
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal (T3) No. 2 — No. 4**
- Is the resistance less than 1  $\Omega$  in "R" position?
  - Is the resistance more than 1 M $\Omega$  in other positions?
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal (T3) No. 1 — No. 4**
- Is the resistance less than 1  $\Omega$  in "N" position?
  - Is the resistance more than 1 M $\Omega$  in other positions?
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal (T3) No. 8 — No. 4**
- Is the resistance less than 1  $\Omega$  in "D" position?
  - Is the resistance more than 1 M $\Omega$  in other positions?
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal (T3) No. 7 — No. 4**
- Is the resistance less than 1  $\Omega$  in "3" position?
  - Is the resistance more than 1 M $\Omega$  in other positions?
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .

**CHECK** : **Connector & terminal (T3) No. 6 — No. 4**

- Is the resistance less than 1 Ω in “2” position?
- Is the resistance more than 1 MΩ in other positions?

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

**NO** : Go to **CHECK1** .

**CHECK** : **Connector & terminal (T3) No. 5 — No. 4**

- Is the resistance less than 1 Ω in “1” position?
- Is the resistance more than 1 MΩ in other positions?

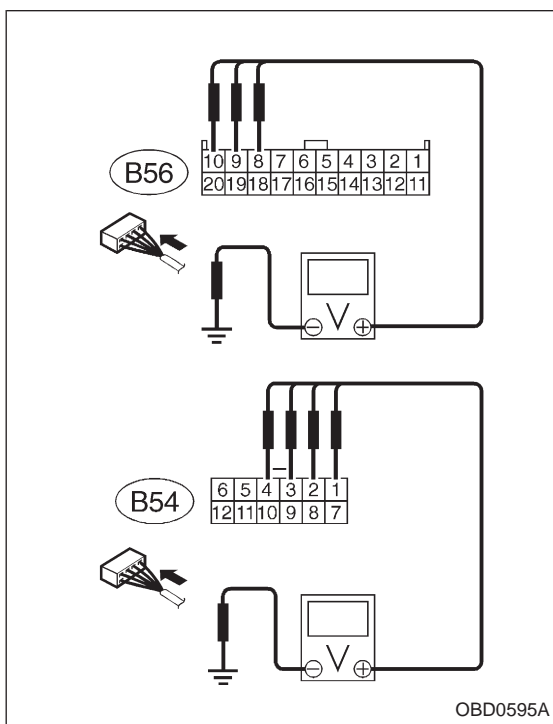
**YES** : Go to step 10AT3.

**NO** : Go to **CHECK1** .

**CHECK1** : **Is there faulty connection in the selector cable?**

**YES** : Repair connection of selector cable.

**NO** : Replace inhibitor switch.



**10AT3 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.

**CHECK** : **Connector & terminal (B56) No. 9 (+) — Chassis ground (-):**

- 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 next **CHECK** .

**NO** : Go to **CHECK1** .

**CHECK** : **Connector & terminal (B56) No. 10 (+) — Chassis ground (-):**

- Is the voltage less than 1 V in “R” position?
- Is the voltage more than 6 V in other positions?

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

**NO** : Go to **CHECK1** .

**CHECK** : **Connector & terminal (B56) No. 8 (+) — Chassis ground (-):**

- 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 next **CHECK** .

**NO** : Go to **CHECK1** .

- CHECK** : **Connector & terminal**  
**(B54) No. 1 (+) — Chassis ground (-):**
- **Is the voltage less than 1 V in “D” position?**
  - **Is the voltage more than 6 V in other positions?**
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal**  
**(B54) No. 2 (+) — Chassis ground (-):**
- **Is the voltage less than 1 V in “3” position?**
  - **Is the voltage more than 6 V in other positions?**
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal**  
**(B54) No. 3 (+) — Chassis ground (-):**
- **Is the voltage less than 1 V in “2” position?**
  - **Is the voltage more than 6 V in other positions?**
- YES** : Go to next **CHECK** .
- NO** : Go to **CHECK1** .
- CHECK** : **Connector & terminal**  
**(B54) No. 4 (+) — Chassis ground (-):**
- **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 **CHECK1** .
- CHECK1** : **Is there poor contact in TCM connector?**
- YES** : Repair poor contact in TCM connector.
- NO** : Replace TCM.

OBD	(FB1)
P0710	<ATF>
OBD0380	

**AU: DTC P0710**  
**— TRANSMISSION FLUID TEMPERATURE**  
**SENSOR CIRCUIT MALFUNCTION (ATF) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- No shift up to 4th speed (after engine warm-up)
- No lock-up (after engine warm-up)
- Excessive shift shock

<b>10AU1</b>	<b>Check DTC P0710 on display.</b>
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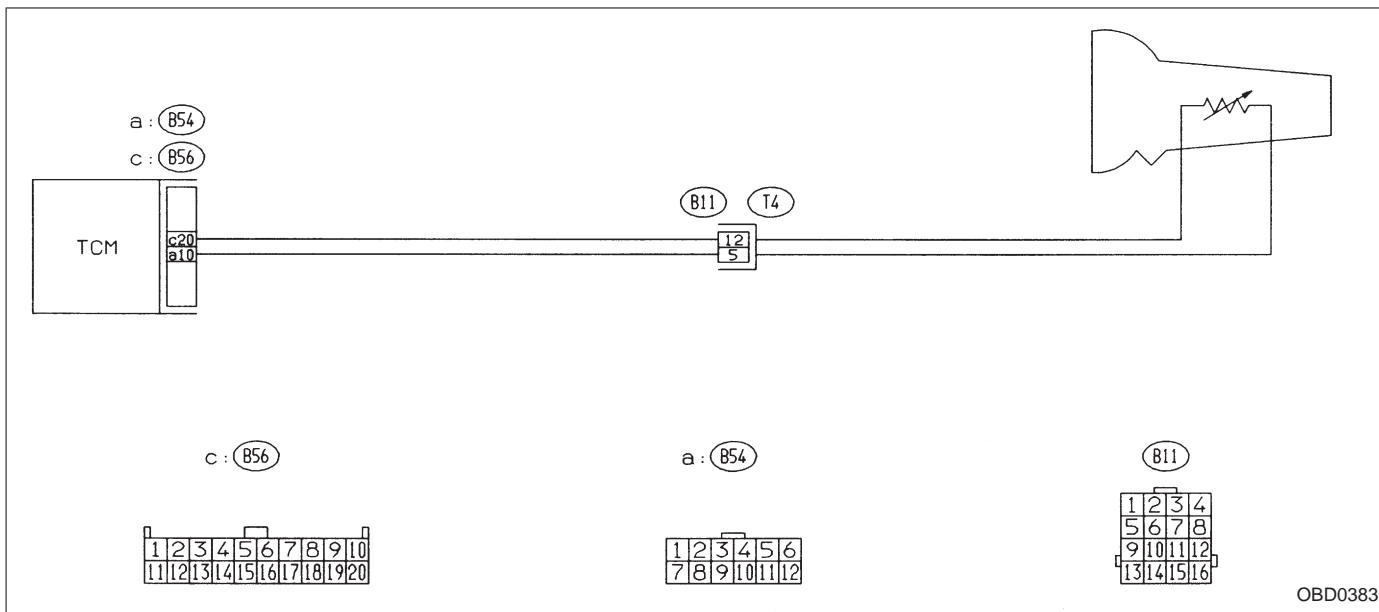
↓

Check ATF temperature sensor circuit. <Ref. to 3-2 [T7F0].>
---

**CAUTION:**

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

**WIRING DIAGRAM:**



<b>10AU1</b>	<b>CHECK DTC P0710 ON DISPLAY.</b>
--------------	------------------------------------

**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0710?

**YES** : Check ATF temperature sensor circuit.

**NOTE:**

For the diagnostic procedure on transmission fluid temperature sensor circuit, refer to 3-2 [T7F0].



OBD	(FB1)
P0720	<ATVSP>
OBD0392	

**AV: DTC P0720**  
**— OUTPUT SPEED SENSOR (VEHICLE SPEED SENSOR 1) CIRCUIT MALFUNCTION (ATVSP) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- No shift or excessive tight corner “braking”

<b>10AV1</b>	<b>Check DTC P0720 on display.</b>
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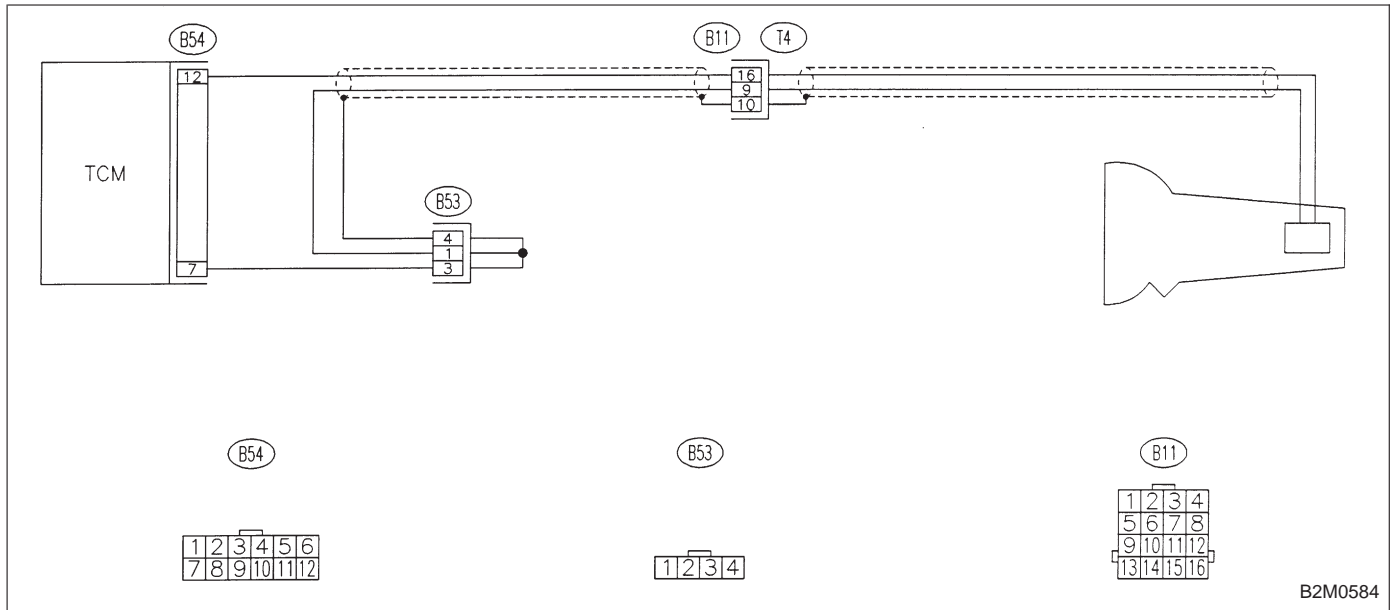


Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T7L0].>
---

**CAUTION:**

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

**WIRING DIAGRAM:**



<b>10AV1</b>	<b>CHECK DTC P0720 ON DISPLAY.</b>
--------------	------------------------------------

**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0720?

**YES** : Check vehicle speed sensor 1 circuit.

**NOTE:**

For the diagnostic procedure on vehicle speed sensor 1 circuit, refer to 3-2 [T7L0].

OBD  P0725	(FB1)  <ATNE>
------------------	---------------------

OBD0404

**AW: DTC P0725  
— ENGINE SPEED INPUT CIRCUIT  
MALFUNCTION (ATNE) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips 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".

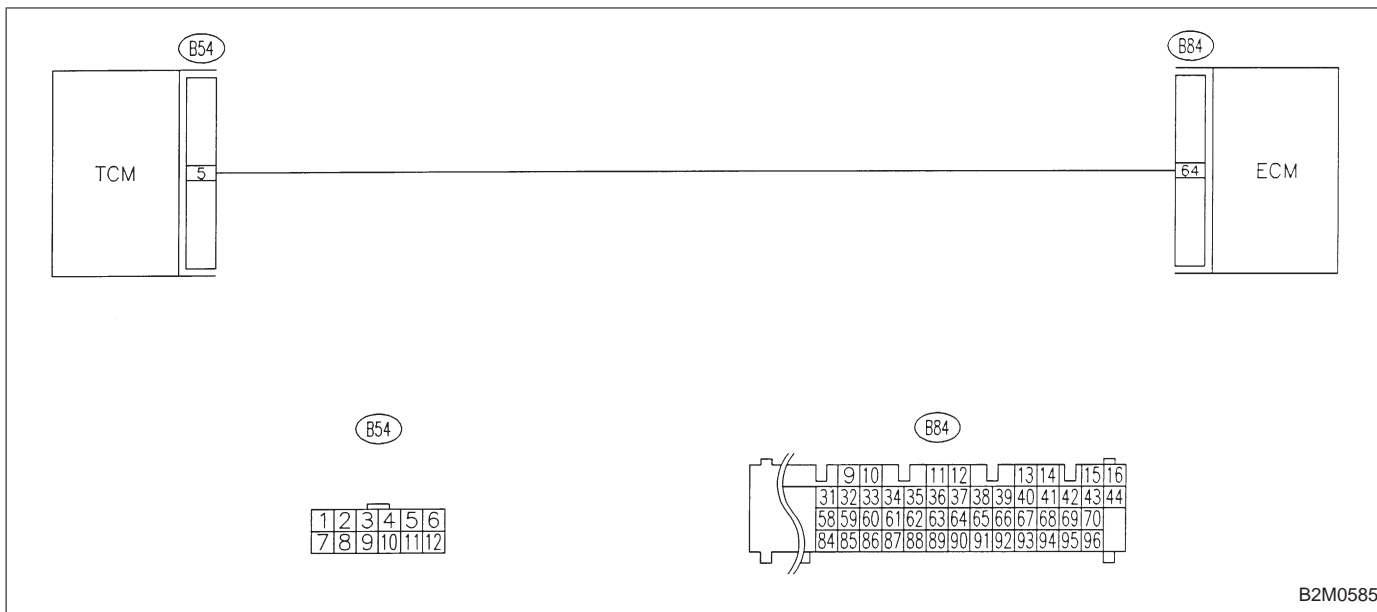
**10AW1** | Check DTC P0725 on display.

Check engine speed input signal circuit. <Ref. to 3-2 [T7H0].>

**CAUTION:**

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

**WIRING DIAGRAM:**



**10AW1** | 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.

**NOTE:**

For the diagnostic procedure on engine speed input circuit, refer to 3-2 [T7H0].

OBD (FB1)

P0731 <ATGR1>

B2M0657

**AX: DTC P0731**

**— GEAR 1 INCORRECT RATIO (ATGR1) —**

OBD (FB1)

P0732 <ATGR2>

B2M0658

**AY: DTC P0732**

**— GEAR 2 INCORRECT RATIO (ATGR2) —**

OBD (FB1)

P0733 <ATGR3>

B2M0659

**AZ: DTC P0733**

**— GEAR 3 INCORRECT RATIO (ATGR3) —**

OBD (FB1)

P0734 <ATGR4>

B2M0660

**BA: DTC P0734**

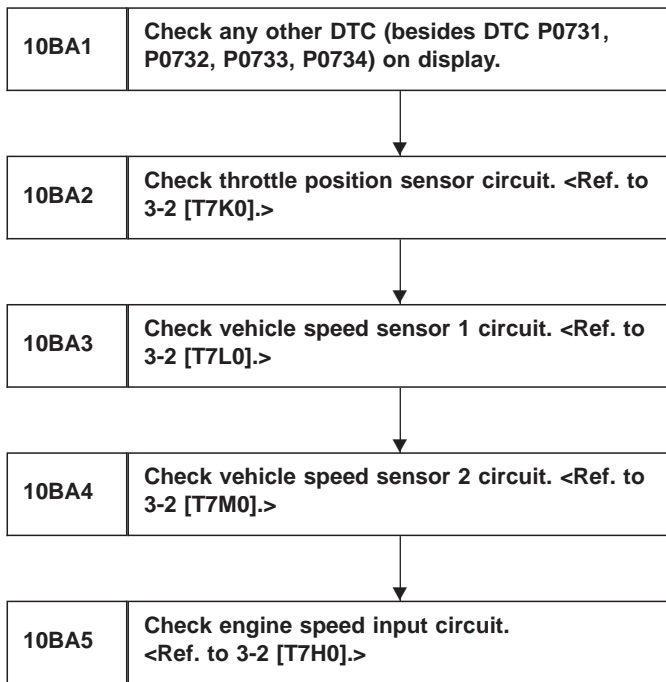
**— GEAR 4 INCORRECT RATIO (ATGR4) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

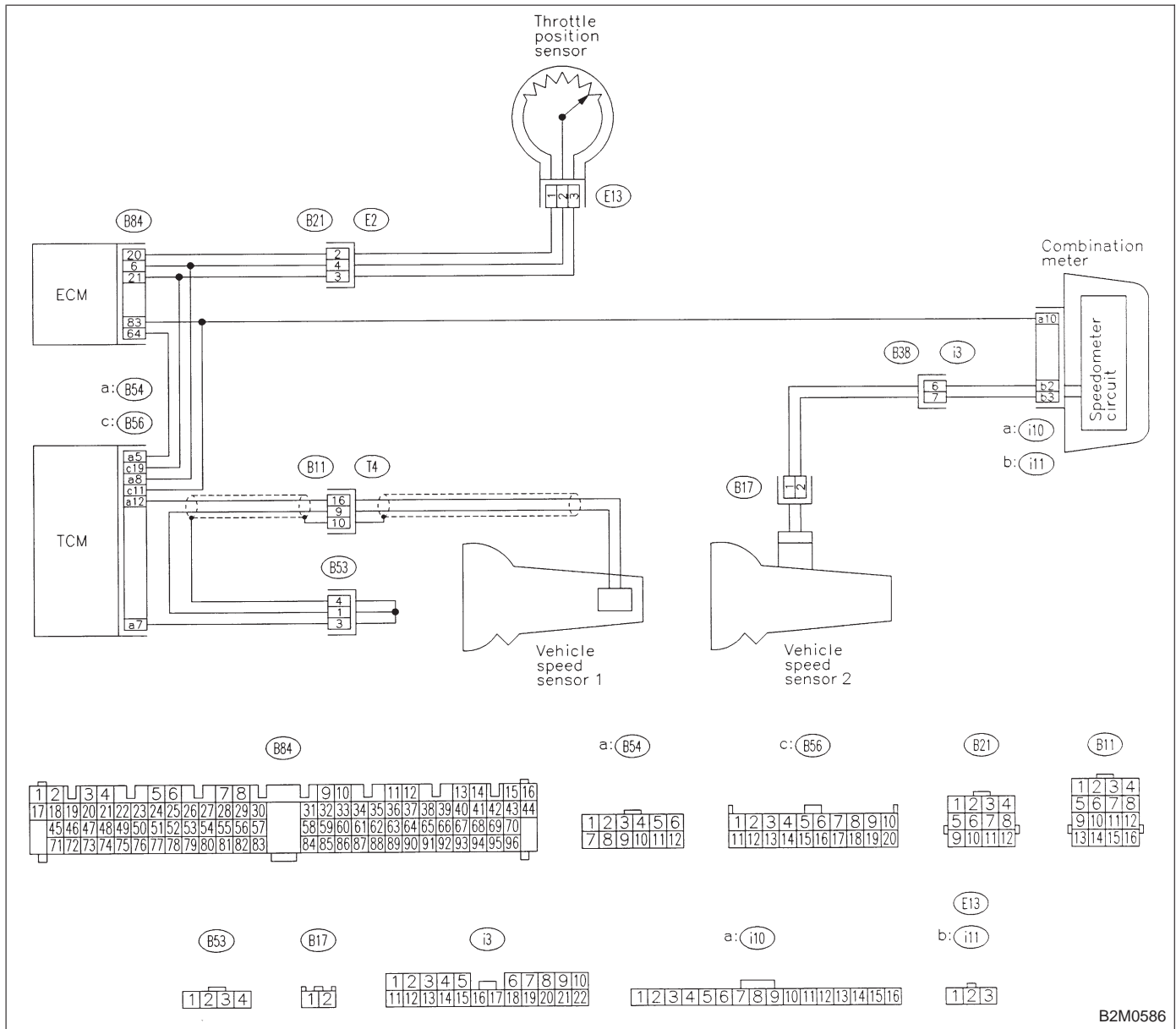
**TROUBLE SYMPTOM:**

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

**CAUTION:**

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

WIRING DIAGRAM:



B2M0586

**10BA1** 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, 2-7 [T1000]".
- NO** : Go to step **10BA2**.

<b>10BA2</b>	<b>CHECK THROTTLE POSITION SENSOR CIRCUIT.</b>
--------------	--

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

NOTE:

For the diagnostic procedure on throttle position sensor circuit, refer to 3-2 [T7K0].

**YES** : Repair or replace throttle position sensor circuit.

**NO** : Go to step **10BA3**.

<b>10BA3</b>	<b>CHECK VEHICLE SPEED SENSOR 1 CIRCUIT.</b>
--------------	--

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

NOTE:

For the diagnostic procedure on vehicle speed sensor 1 circuit, refer to 3-2 [T7L0].

**YES** : Repair or replace vehicle speed sensor 1 circuit.

**NO** : Go to step **10BA4**.

<b>10BA4</b>	<b>CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.</b>
--------------	--

**CHECK** : *Is there any trouble in vehicle speed sensor 2 circuit?*

NOTE:

For the diagnostic procedure on vehicle speed sensor 2 circuit, refer to 3-2 [T7M0].

**YES** : Repair or replace vehicle speed sensor 2 circuit.

**NO** : Go to step **10BA5**.

<b>10BA5</b>	<b>CHECK ENGINE SPEED INPUT CIRCUIT.</b>
--------------	--

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

NOTE:

For the diagnostic procedure on engine speed input signal circuit, refer to 3-2 [T7H0].

**YES** : Repair or replace engine speed input circuit.

**NO** : Go to next **CHECK** .

**CHECK** : *Is there poor contact in TCM connector?*

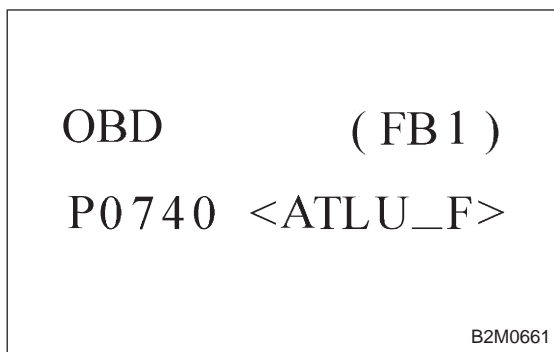
**YES** : Repair poor contact in TCM connector.

**NO** : Go to next **CHECK** .

**CHECK** : *Is there any mechanical trouble in automatic transmission?*

**YES** : Repair or replace automatic transmission.

**NO** : Replace TCM.



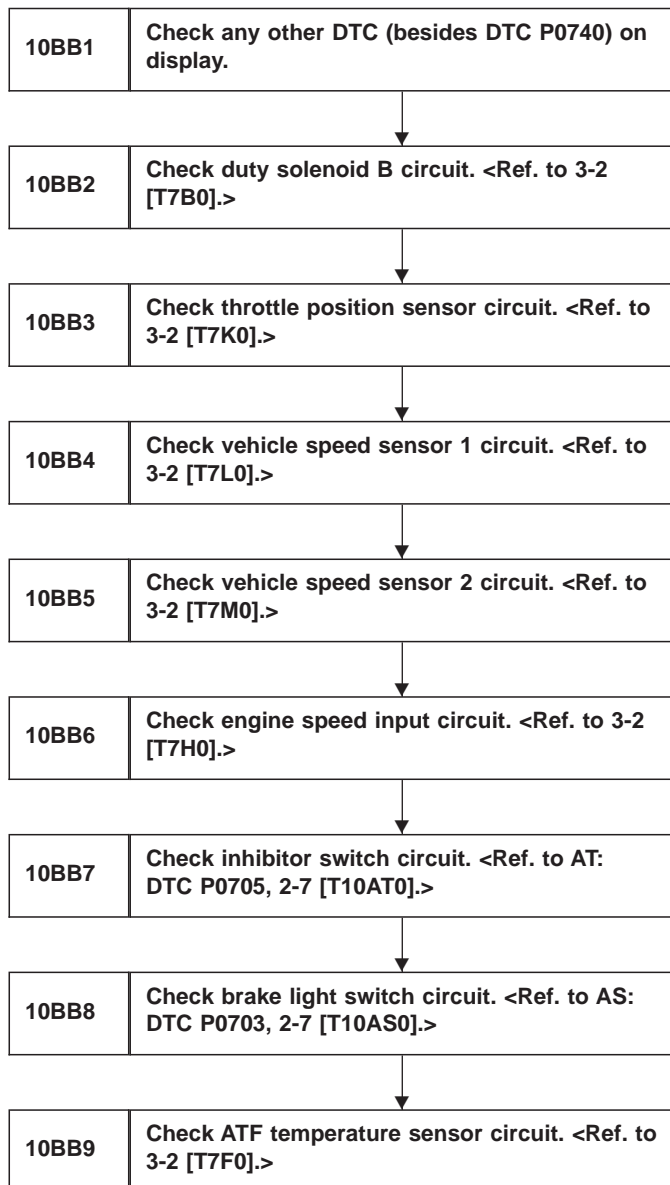
**BB: DTC P0740**  
**— TORQUE CONVERTER CLUTCH SYSTEM**  
**MALFUNCTION (ATLU – F) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

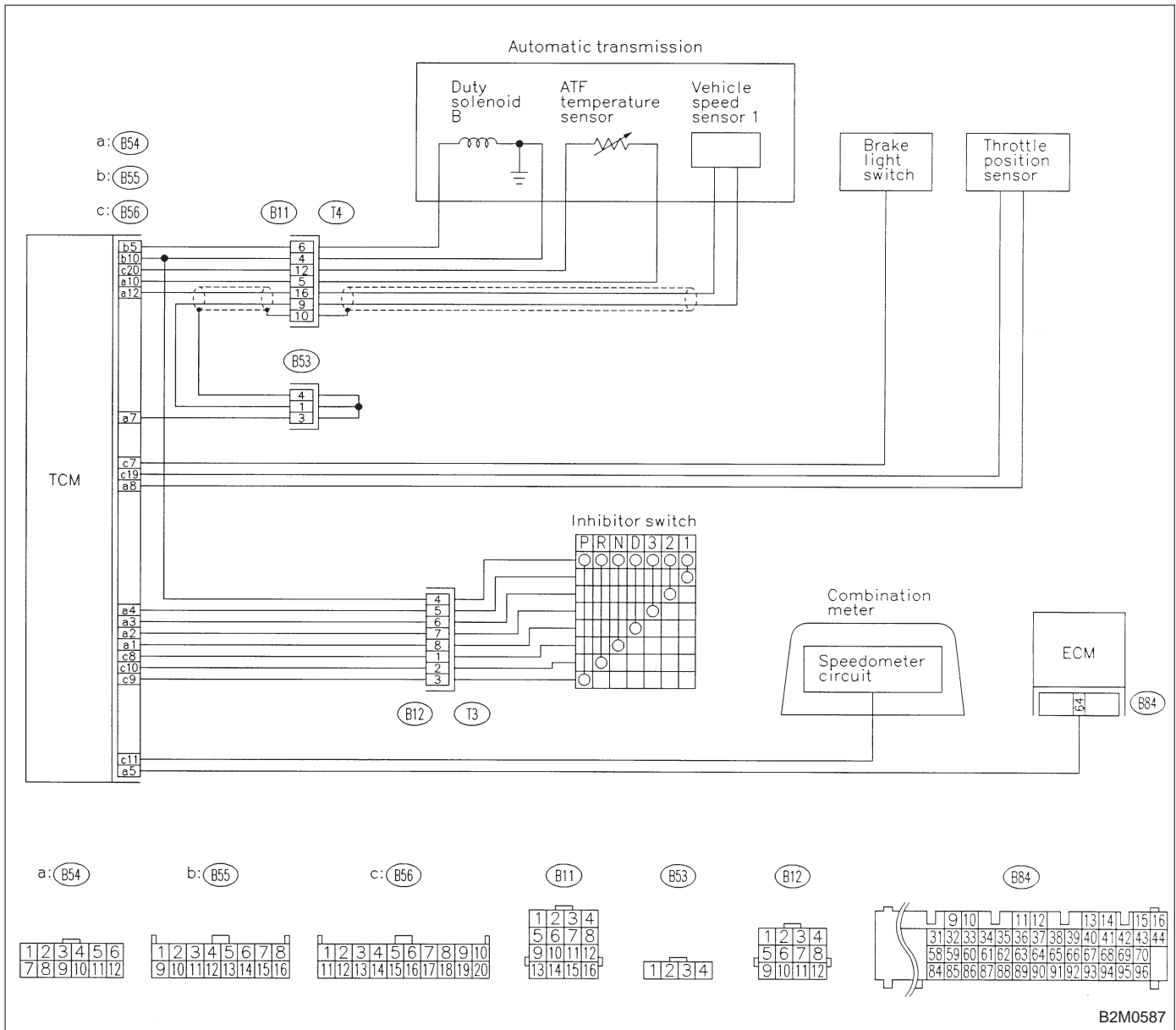
- No lock-up (after engine warm-up)
- No shift or excessive tight corner “braking”



**CAUTION:**

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

WIRING DIAGRAM:



B2M0587

**10BB1 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, 2-7 [T1000]".
- NO** : Go to step 10BB2.



**10BB2 CHECK DUTY SOLENOID B CIRCUIT.**

**CHECK** : *Is there any trouble in duty solenoid B circuit?*

NOTE:

For the diagnostic procedure on duty solenoid B circuit, refer to 3-2 [T7B0].

**YES** : Repair or replace duty solenoid B circuit.

**NO** : Go to step **10BB3**.

**10BB3 CHECK THROTTLE POSITION SENSOR CIRCUIT.**

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

NOTE:

For the diagnostic procedure on throttle position sensor circuit, refer to 3-2 [T7K0].

**YES** : Repair or replace throttle position sensor circuit.

**NO** : Go to step **10BB4**.

**10BB4 CHECK VEHICLE SPEED SENSOR 1 CIRCUIT.**

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

NOTE:

For the diagnostic procedure on vehicle speed sensor 1 circuit, refer to 3-2 [T7L0].

**YES** : Repair or replace vehicle speed sensor 1 circuit.

**NO** : Go to step **10BB5**.

**10BB5 CHECK VEHICLE SPEED SENSOR 2 CIRCUIT.**

**CHECK** : *Is there any trouble in vehicle speed sensor 2 circuit?*

NOTE:

For the diagnostic procedure on vehicle speed sensor 2 circuit, refer to 3-2 [T7M0].

**YES** : Repair or replace vehicle speed sensor 2 circuit.

**NO** : Go to step **10BB6**.

**10BB6 CHECK ENGINE SPEED INPUT CIRCUIT.**

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

NOTE:

For the diagnostic procedure on engine speed input signal circuit, refer to 3-2 [T7H0].

**YES** : Repair or replace engine speed input circuit.

**NO** : Go to step **10BB7**.

**10BB7 CHECK INHIBITOR SWITCH CIRCUIT.**

**CHECK** : *Is there any trouble in inhibitor switch circuit?*

NOTE:

For the diagnostic procedure on inhibitor switch circuit, refer to 2-7 [T10AT0].

**YES** : Repair or replace inhibitor switch circuit.

**NO** : Go to step **10BB8**.

**10BB8 CHECK BRAKE LIGHT SWITCH CIRCUIT.**

**CHECK** : *Is there any trouble in brake light switch circuit?*

NOTE:

For the diagnostic procedure on brake light switch circuit, refer to 2-7 [T10AS0].

**YES** : Repair or replace brake light switch circuit.

**NO** : Go to step **10BB9**.

**10BB9 CHECK ATF TEMPERATURE SENSOR CIRCUIT.**

**CHECK** : *Is there any trouble in ATF temperature sensor circuit?*

NOTE:

For the diagnostic procedure on ATF temperature sensor circuit, refer to 3-2 [T7F0].

**YES** : Repair or replace ATF temperature sensor circuit.

**NO** : Go to next **CHECK** .

**CHECK** : *Is there poor contact in TCM connector?*

**YES** : Repair poor contact in TCM connector.

**NO** : Go to next **CHECK** .

**CHECK** : *Is there any mechanical trouble in automatic transmission?*

**YES** : Repair or replace automatic transmission.

**NO** : Replace TCM.

<p>OBD (FB1)</p> <p>P0743 &lt;ATLU&gt;</p> <p style="text-align: right; font-size: small;">B2M0662</p>
--

**BC: DTC P0743**  
**— TORQUE CONVERTER CLUTCH SYSTEM**  
**(DUTY SOLENOID B) ELECTRICAL (ATLU)**  
 —

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- No lock-up (after engine warm-up)

<b>10BC1</b>	<b>Check DTC P0743 on display.</b>
--------------	------------------------------------



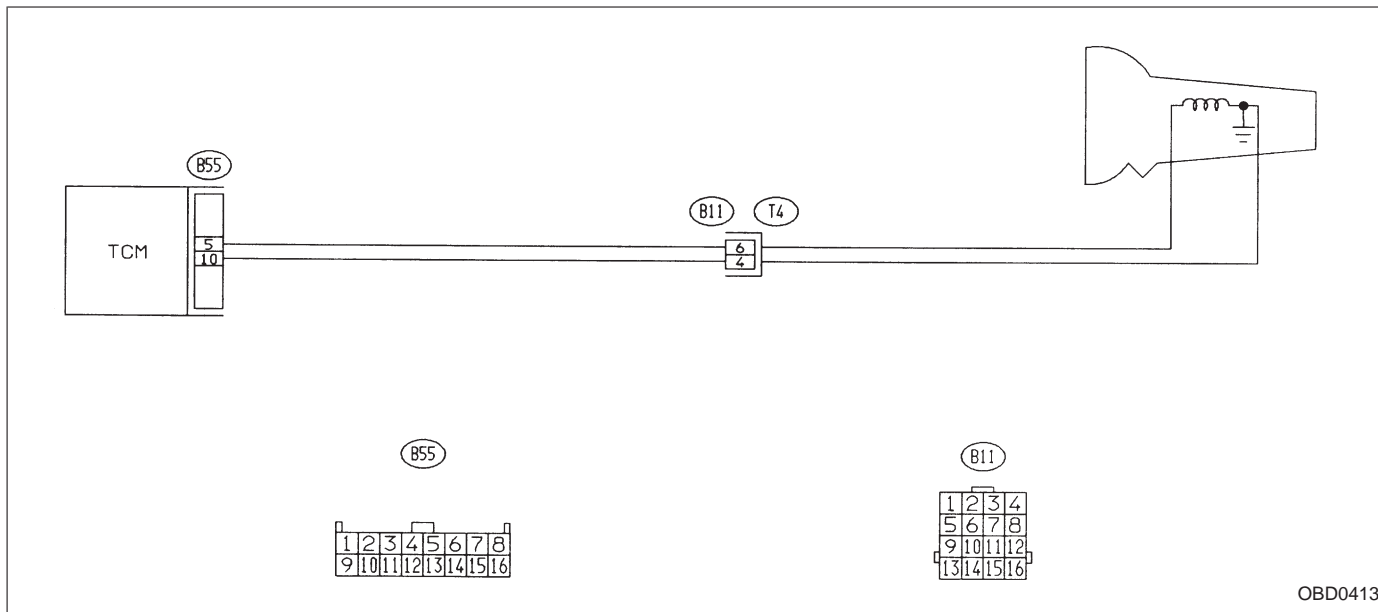
Check duty solenoid B circuit. <Ref. to 3-2 [T7B0].>
--

**CAUTION:**

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

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

**WIRING DIAGRAM:**



OBD0413

<b>10BC1</b>	<b>CHECK DTC P0743 ON DISPLAY.</b>
--------------	------------------------------------

**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0743?

**YES** : Check duty solenoid B circuit.

**NOTE:**

For the diagnostic procedure on duty solenoid B circuit, refer to 3-2 [T7B0].

OBD (FB1)  
 P0748 <ATPL>  
 B2M0663

**BD: DTC P0748**  
**— PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL (ATPL) —**

**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

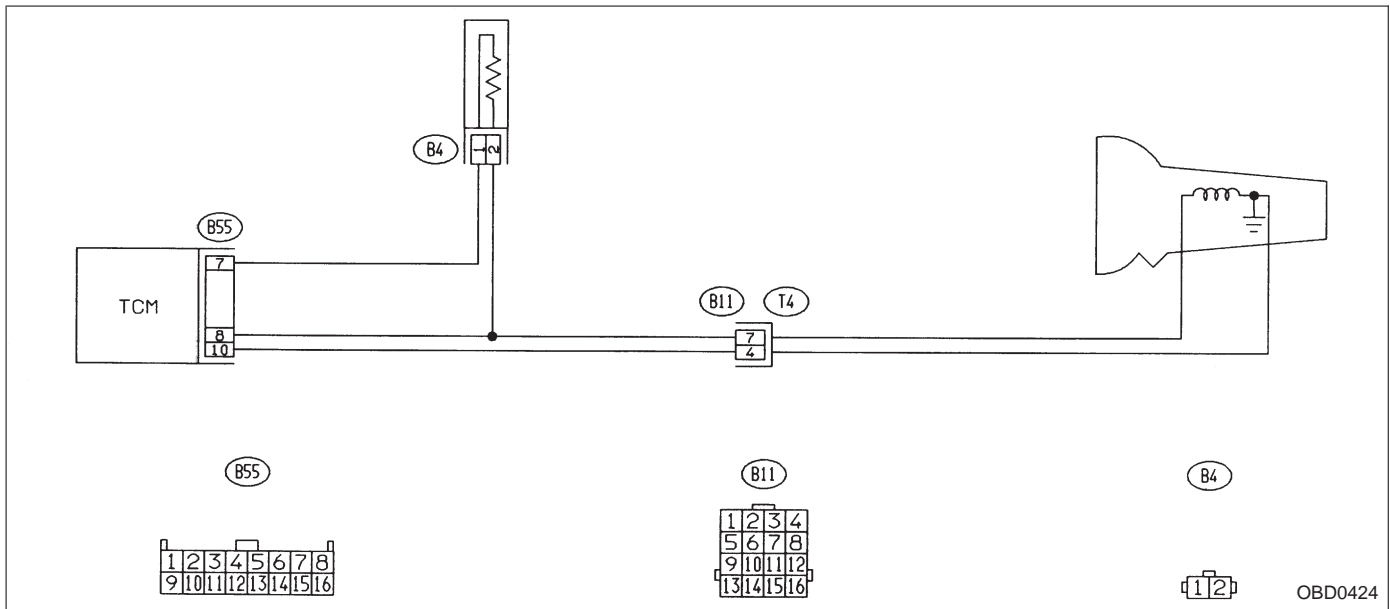
**TROUBLE SYMPTOM:**  
 ● Excessive shift shock

**10BD1** Check DTC P0748 on display.

Check duty solenoid A circuit. <Ref. to 3-2 [T7A0].>

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

**WIRING DIAGRAM:**



**10BD1** 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.

**NOTE:**  
 For the diagnostic procedure on duty solenoid A circuit, refer to 3-2 [T7A0].

OBD (FB1)  
 P0753 <ATSFT1>  
 B2M0664

**BE: DTC P0753**  
**— SHIFT SOLENOID A (SHIFT SOLENOID 1)**  
**ELECTRICAL (ATSFT1) —**

**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

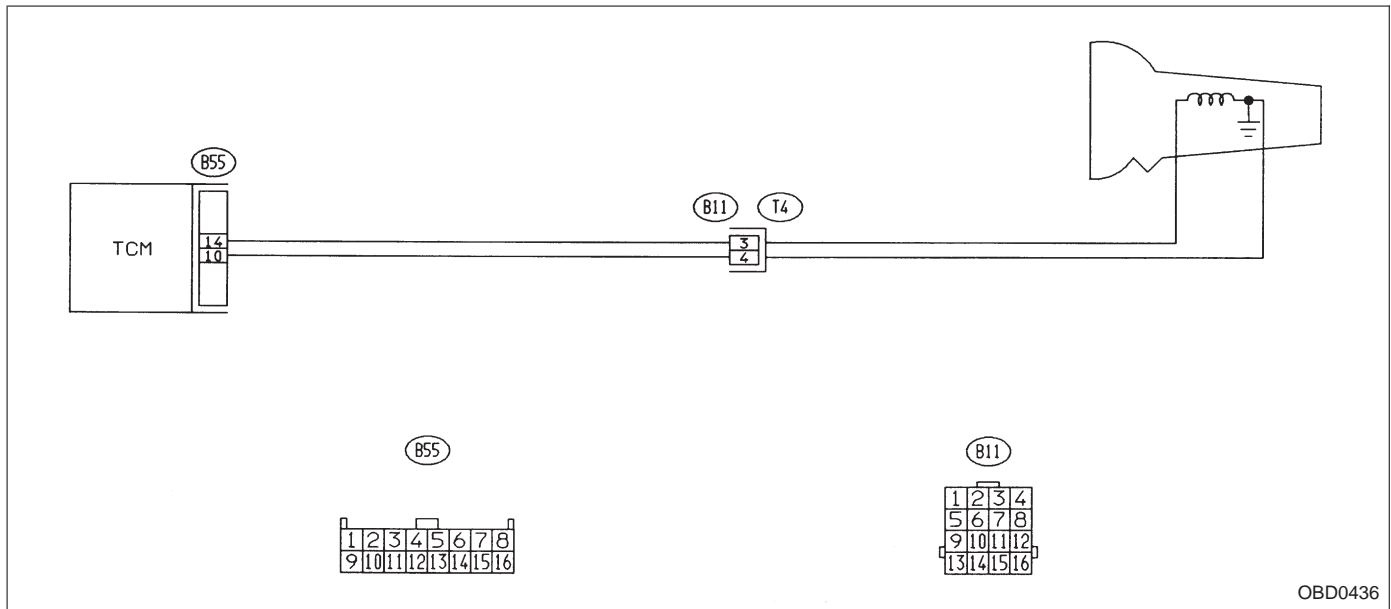
**TROUBLE SYMPTOM:**  
 ● No shift

**10BE1** Check DTC P0753 on display.

Check shift solenoid 1 circuit. <Ref. to 3-2 [T7E0].>

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

**WIRING DIAGRAM:**



**10BE1** 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.

**NOTE:**  
 For the diagnostic procedure on shift solenoid 1 circuit, refer to 3-2 [T7E0].

OBD (FB1)  
 P0758 <ATSFT2>  
 B2M0665

**BF: DTC P0758**  
**— SHIFT SOLENOID B (SHIFT SOLENOID 2)**  
**ELECTRICAL (ATSFT2) —**

**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

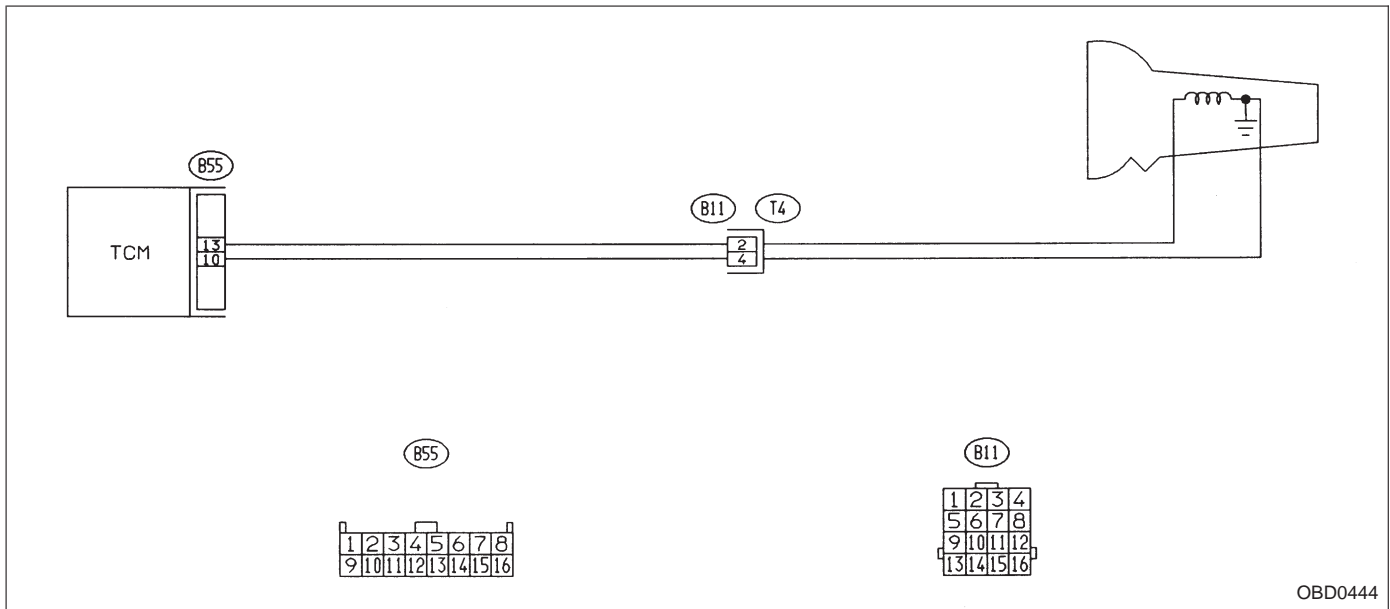
**TROUBLE SYMPTOM:**  
 ● No shift

**10BF1** Check DTC P0758 on display.

Check shift solenoid 2 circuit. <Ref. to 3-2 [T7D0].>

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

**WIRING DIAGRAM:**



OBD0444

**10BF1** 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.

**NOTE:**  
 For the diagnostic procedure on shift solenoid 2 circuit, refer to 3-2 [T7D0].

<p>OBD (FB1)</p> <p>P0760&lt;ATOVR_F&gt;</p> <p style="text-align: right; font-size: small;">B2M0666</p>
--

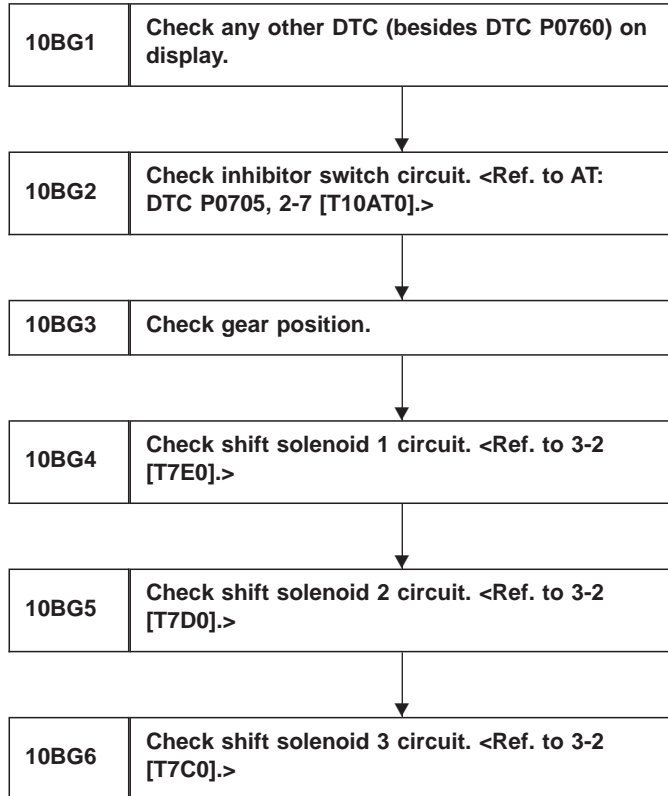
**BG: DTC P0760**  
**— SHIFT SOLENOID C (SHIFT SOLENOID 3)**  
**MALFUNCTION (ATOVR — F) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Ineffective engine brake with selector lever in “3”

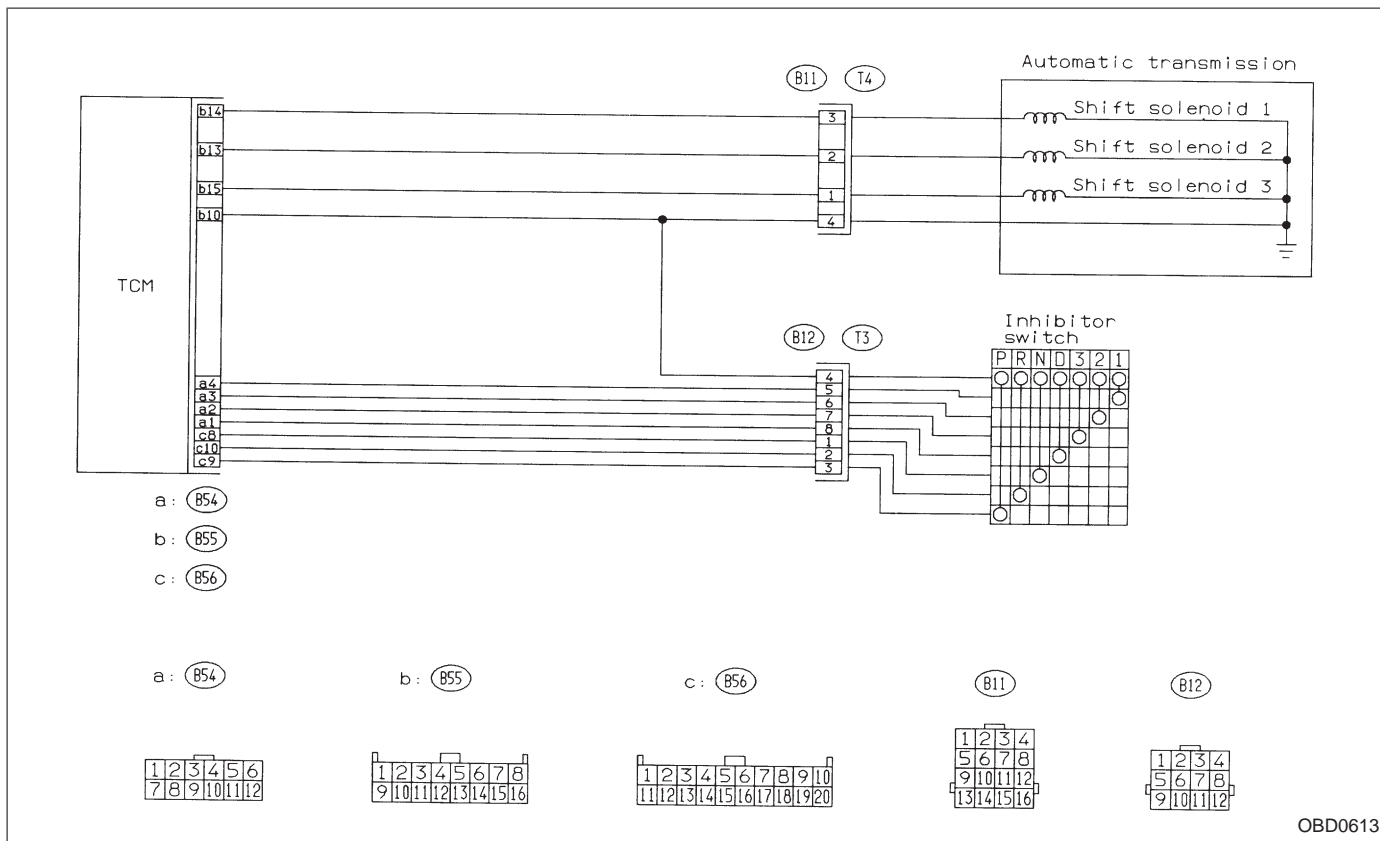


**CAUTION:**

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

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

WIRING DIAGRAM:



OBD0613

**10BG1 CHECK ANY OTHER DTC (BESIDES DTC P0760) ON DISPLAY.**

- CHECK** : *Is there any other DTC on display?*
- YES** : Inspect relevant DTC using "10. Diagnostics Chart with Trouble Code, 2-7 [T1000]".
- NO** : Go to step **10BG2**.

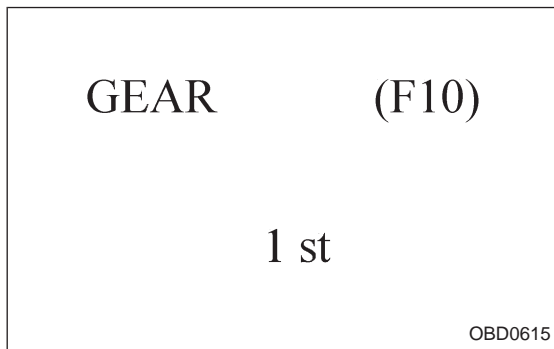
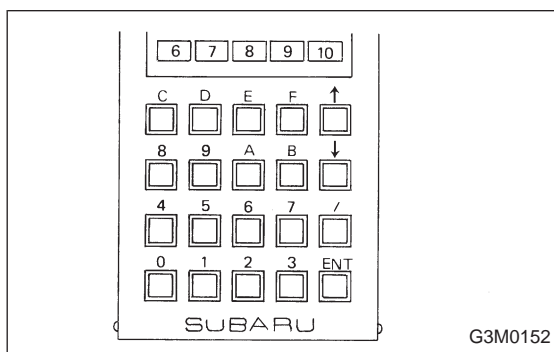
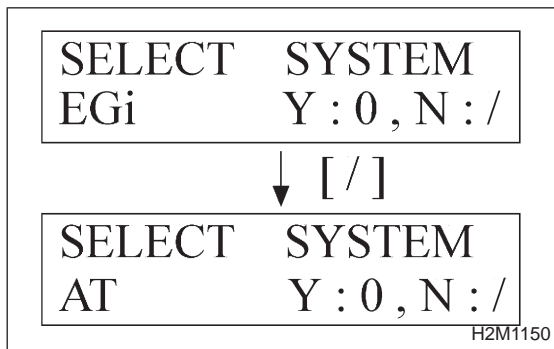
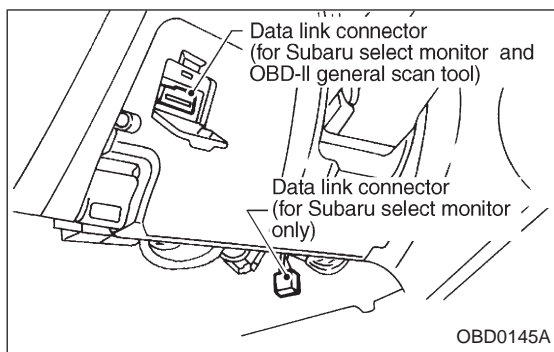
**10BG2 CHECK INHIBITOR SWITCH CIRCUIT.**

- CHECK** : *Is there any trouble in inhibitor switch circuit?*

**NOTE:**  
For the diagnostic procedure on inhibitor switch circuit, refer to 2-7 [T10AT0].

- YES** : Repair or replace inhibitor switch circuit.
- NO** : Go to step **10BG3**.



**10BG3 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 ].

- 8) Designate mode using function key.

**Function mode for AT: F10**

- 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 next **CHECK** .

**NO** : Go to step **10BG4**.

**CHECK** : **Is there poor contact in TCM connector?**

**YES** : Repair poor contact in TCM connector.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there any mechanical trouble in automatic transmission?**

**YES** : Repair or replace automatic transmission.

**NO** : Replace TCM.

**10BG4 CHECK SHIFT SOLENOID 1 CIRCUIT.**

**CHECK** : *Is there any trouble in shift solenoid 1 circuit?*

NOTE:

For the diagnostic procedure on shift solenoid 1 circuit, refer to 3-2 [T7E0].

**YES** : Repair or replace shift solenoid 1 circuit.

**NO** : Go to step **10BG5**.

**10BG5 CHECK SHIFT SOLENOID 2 CIRCUIT.**

**CHECK** : *Is there any trouble in shift solenoid 2 circuit?*

NOTE:

For the diagnostic procedure on shift solenoid 2 circuit, refer to 3-2 [T7D0].

**YES** : Repair or replace shift solenoid 2 circuit.

**NO** : Go to step **10BG6**.

**10BG6 CHECK SHIFT SOLENOID 3 CIRCUIT.**

**CHECK** : *Is there any trouble in shift solenoid 3 circuit?*

NOTE:

For the diagnostic procedure on shift solenoid 3 circuit, refer to 3-2 [T7C0].

**YES** : Repair or replace shift solenoid 3 circuit.

**NO** : Go to next **CHECK** .

**CHECK** : *Is there poor contact in TCM connector?*

**YES** : Repair poor contact in TCM connector.

**NO** : Go to next **CHECK** .

**CHECK** : *Is there any mechanical trouble in automatic transmission?*

**YES** : Repair or replace automatic transmission.

**NO** : Replace TCM.

OBD (FB1)  
 P0763 <ATOVR>  
 B2M0667

**BH: DTC P0763**  
**— SHIFT SOLENOID C (SHIFT SOLENOID 3)**  
**ELECTRICAL (ATOVR) —**

**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

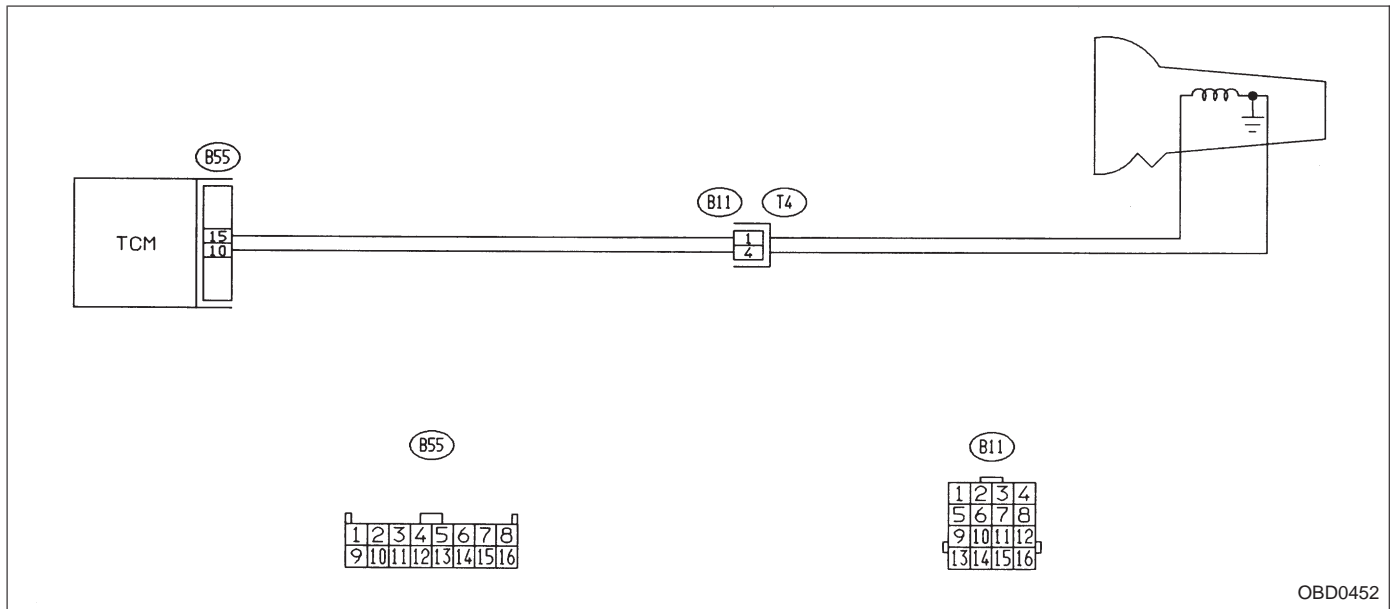
**TROUBLE SYMPTOM:**  
 ● Ineffective engine brake with selector lever in “3”

**10BH1** Check DTC P0763 on display.

Check shift solenoid 3 circuit. <Ref. to 3-2 [T7C0].>

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

**WIRING DIAGRAM:**



OBD0452

**10BH1** 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.

**NOTE:**  
 For the diagnostic procedure on shift solenoid 3 circuit, refer to 3-2 [T7C0].

OBD	(FB1)
P1100	<ST_SW>
OBD0458	

**BI: DTC P1100**  
**— STARTER SWITCH CIRCUIT**  
**MALFUNCTION (ST – SW) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Failure of engine to start

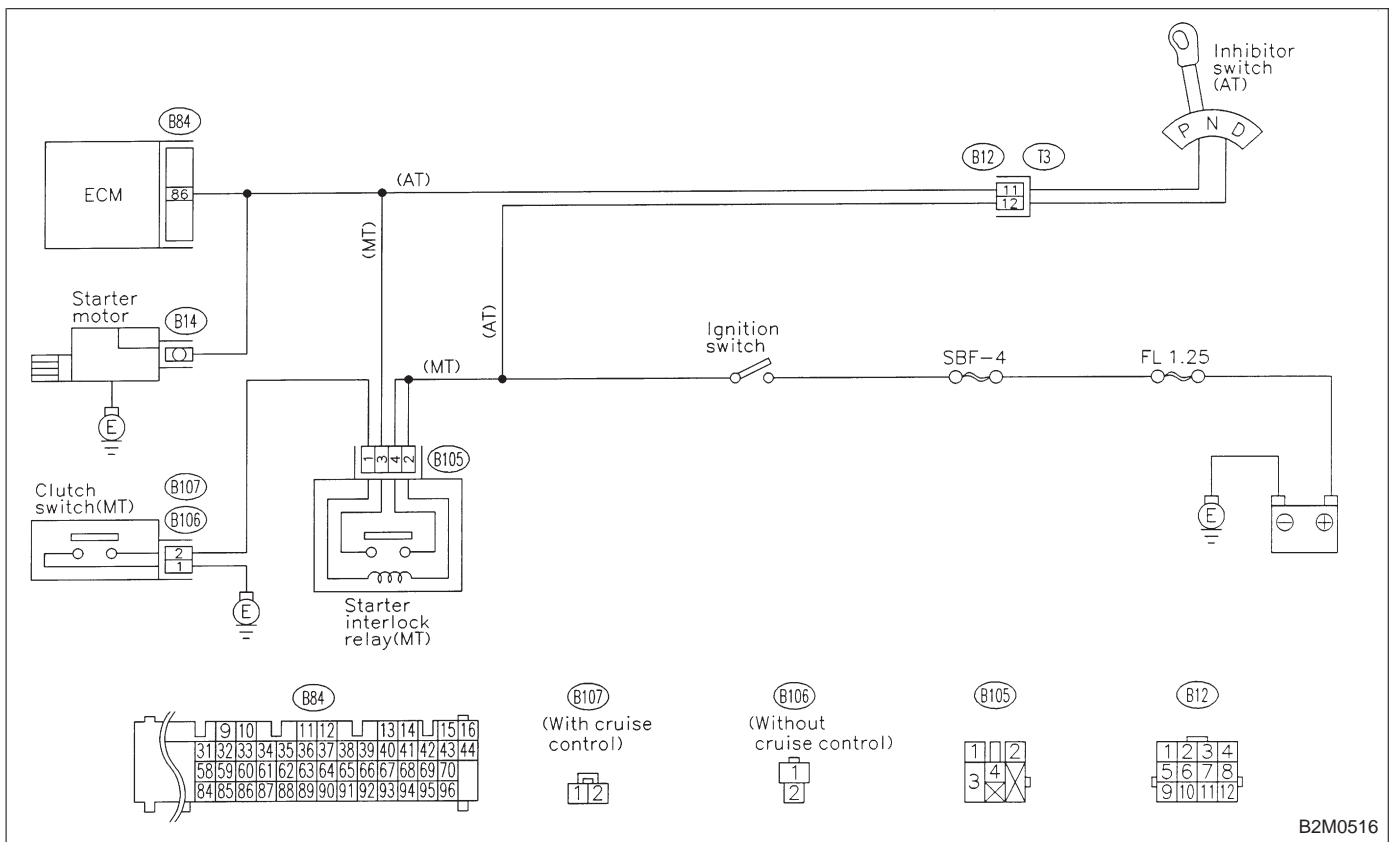
<b>10B11</b>	<b>Check operation of starter motor.</b>
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**CAUTION:**

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

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

**WIRING DIAGRAM:**



B2M0516

**10B11****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 circuit in harness between ECM and starter motor connector.
- Poor contact in ECM connector.

**NO** : Check starter motor circuit.

NOTE:

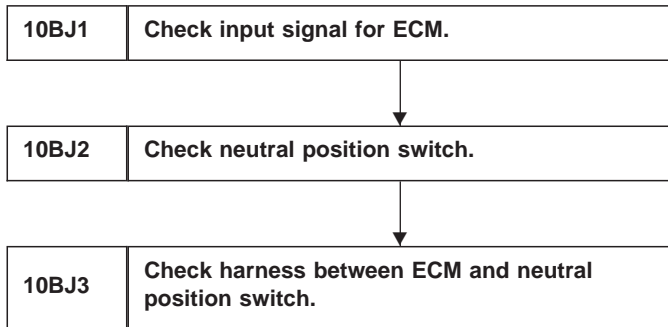
For the diagnostic procedure on starter motor circuit, refer to 2-7 [T8B0].

OBD (FB1)  
 P1101 <N/P\_SW>  
 B2M0668

**BJ: DTC P1101**  
**— NEUTRAL POSITION SWITCH CIRCUIT MALFUNCTION [MT VEHICLES] (N/P — SW) —**

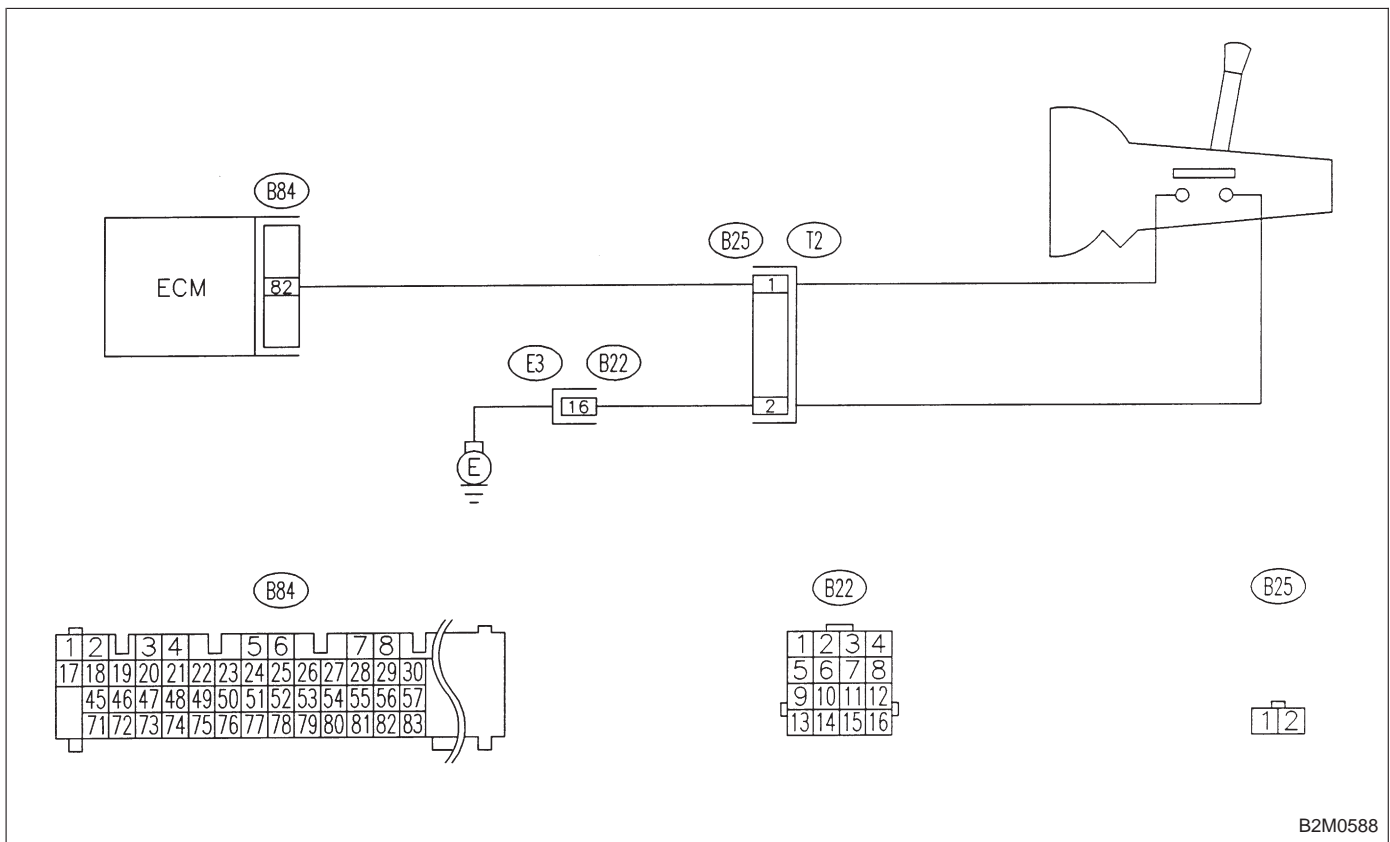
**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

**TROUBLE SYMPTOM:**  
 ● Erroneous idling

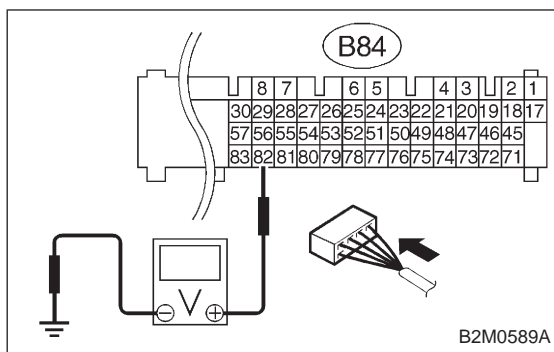


**CAUTION:**  
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.  
 <Ref. to 2-7 [T3D0] and [T3E0].>

**WIRING DIAGRAM:**



B2M0588

**10BJ1 CHECK INPUT SIGNAL FOR ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 82 (+) — Chassis ground (-): Is the voltage between 4.5 and 5.5 V in neutral position?**

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

**NO** : Go to step **10BJ2**.

**CHECK** : **Connector & terminal (B84) No. 82 (+) — Chassis ground (-): Is the voltage less than 1 V in other positions?**

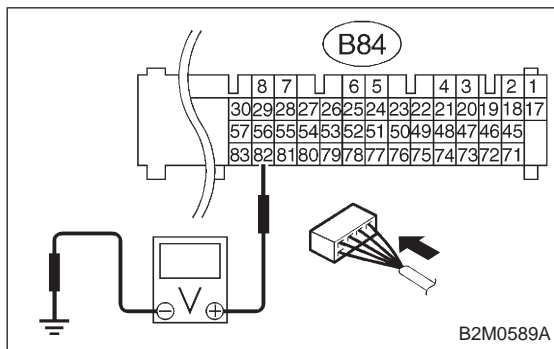
**YES** : Go to next **CHECK** .

**NO** : Go to step **10BJ2**.

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.

**10BJ2 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.

**CHECK** : **Connector & terminal (T2) No. 1 — No. 2: Is the resistance more than 1 MΩ in neutral position?**

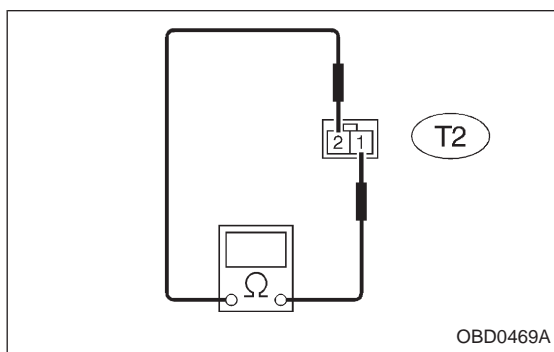
**YES** : Go to next **CHECK** .

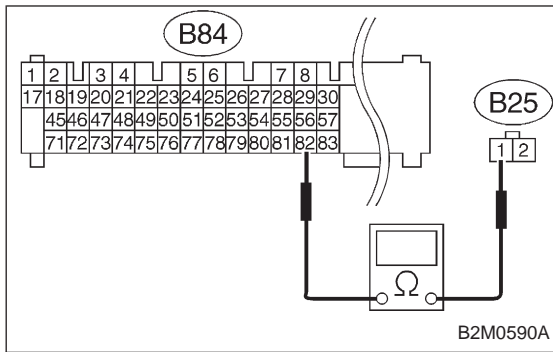
**NO** : Repair short circuit in transmission harness or replace neutral position switch.

**CHECK** : **Connector & terminal (T2) No. 1 — No. 2: Is the resistance less than 1 Ω in other positions?**

**YES** : Go to step **10BJ3**.

**NO** : Repair open circuit in transmission harness or replace neutral position switch.





10BJ3

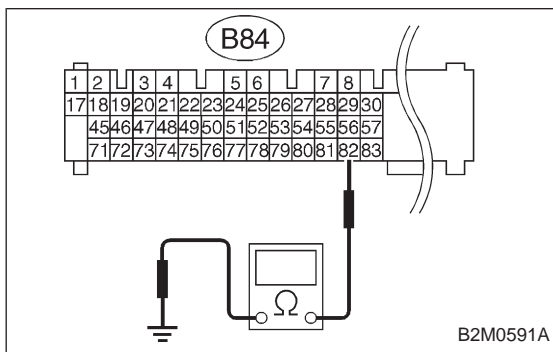
**CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH.**

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

**CHECK** : **Connector & terminal (B84) No. 82 — (B25) No. 1: 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.

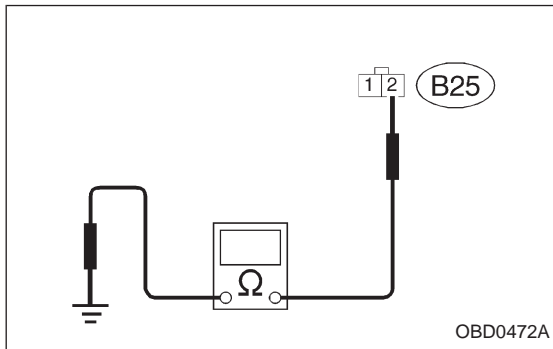


- 3) Measure resistance between ECM and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 82 — Chassis ground: Is the resistance less than 10 Ω?**

**YES** : Repair 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.

**CHECK** : **Connector & terminal (B25) No. 2 — Engine ground: Is the resistance less than 5 Ω?**

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

**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)

**CHECK** : **Is there poor contact in transmission harness connector?**

**YES** : Repair poor contact in transmission harness connector.

**NO** : Replace ECM.



<p>OBD (FB1)</p> <p>P1101 &lt;N/P_SW&gt;</p> <p style="text-align: right;">B2M0668</p>
--

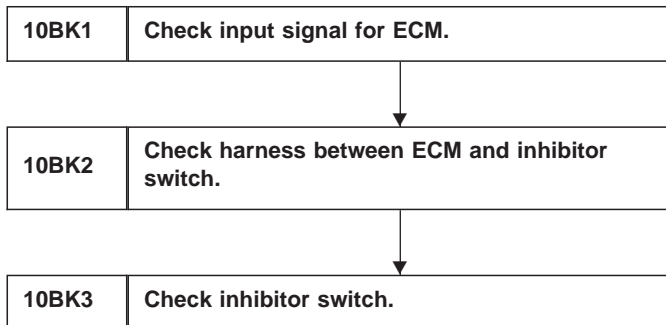
**BK: DTC P1101**  
**— NEUTRAL POSITION SWITCH CIRCUIT MALFUNCTION [AT VEHICLES] (N/P – SW)**  
 —

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Erroneous idling

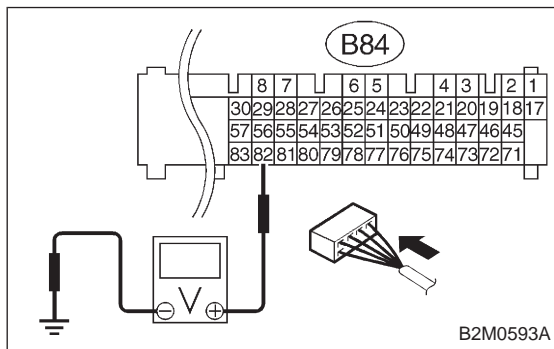
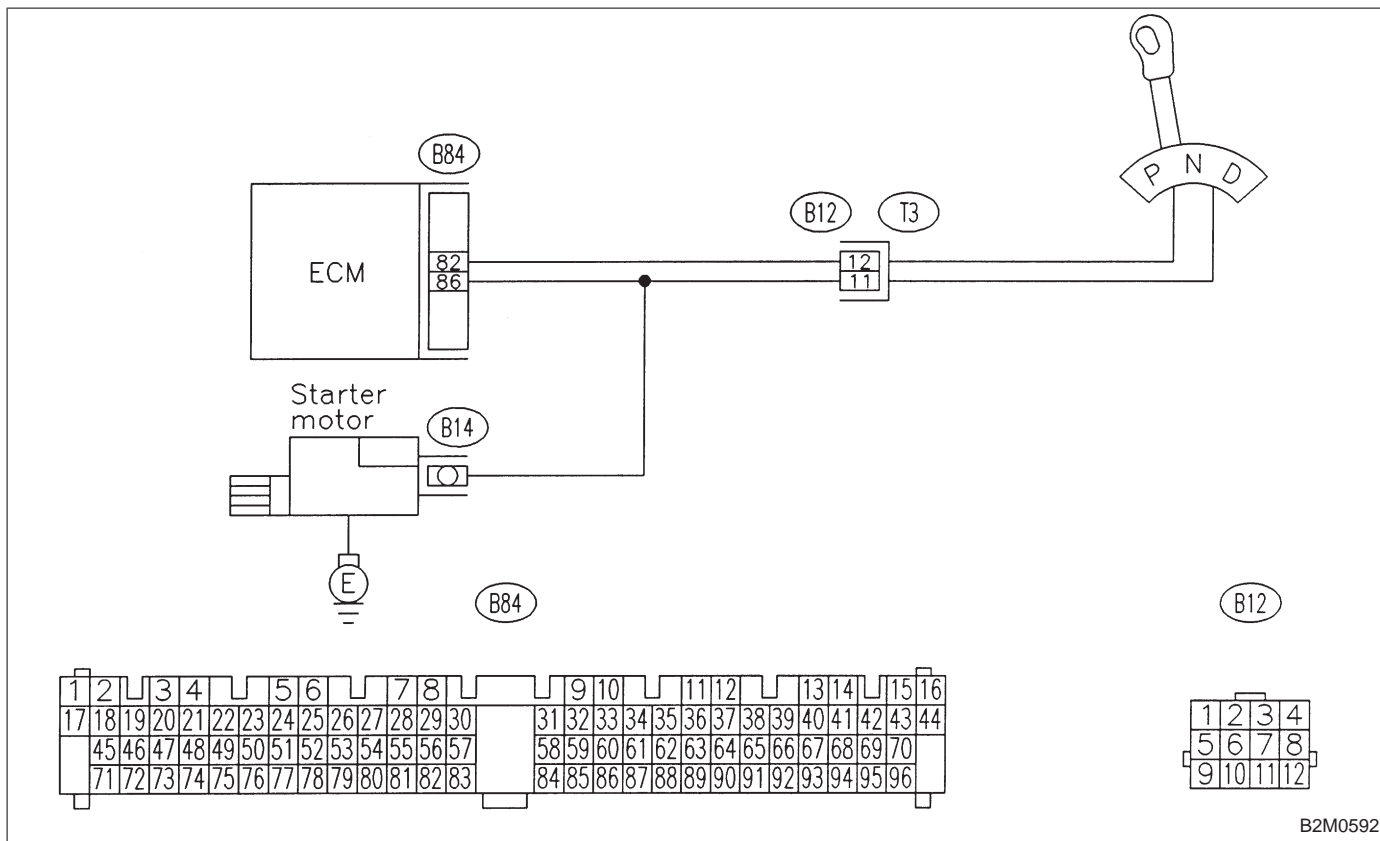


**CAUTION:**

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

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

WIRING DIAGRAM:



**10BK1 CHECK INPUT SIGNAL FOR ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 82 (+) — Chassis ground (-): Is the voltage less than 1 V in “N” and “P” positions?**

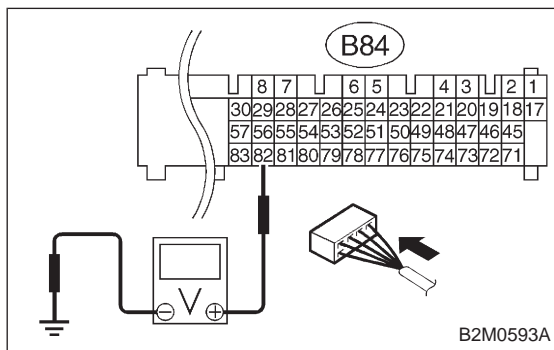
- YES** : Go to next **CHECK** .
- NO** : Go to step **10BK2**.

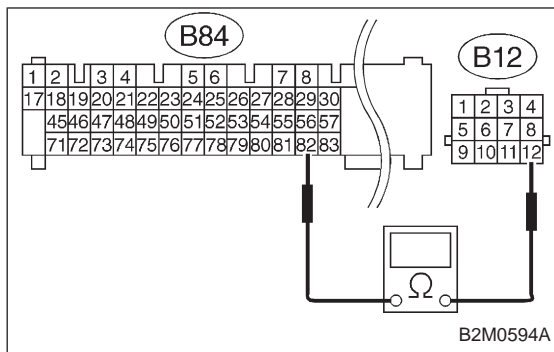
**CHECK** : **Connector & terminal (B84) No. 82 (+) — Chassis ground (-): Is the voltage between 4.5 and 5.5 V in other positions?**

- YES** : Go to next **CHECK** .
- NO** : Go to step **10BK2**.

**CHECK** : **Is there poor contact in ECM connector?**

- YES** : Repair poor contact in ECM connector.
- NO** : Replace ECM.



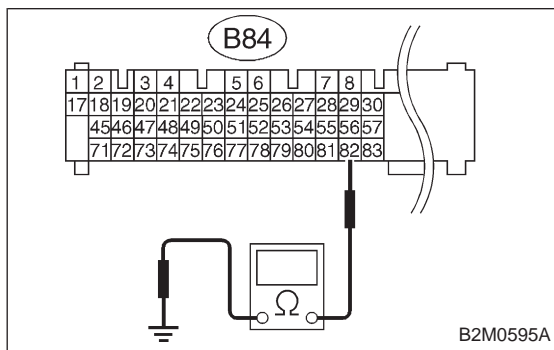

**10BK2 CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH.**

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

**CHECK** : **Connector & terminal**  
**(B84) No. 82 — (B12) No. 12:**  
**Is the resistance less than 1 Ω?**

**YES** : Go to next step 4).

**NO** : Repair open circuit in harness between ECM and transmission harness connector.

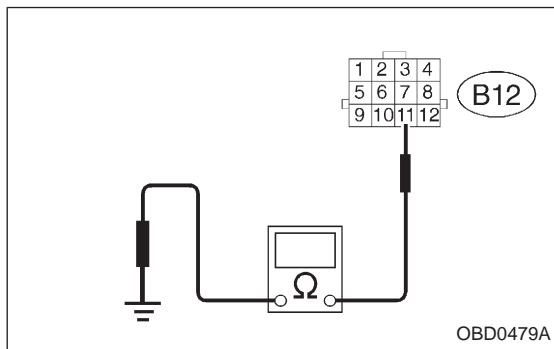


- 4) Measure resistance of harness between ECM and chassis ground.

**CHECK** : **Connector & terminal**  
**(B84) No. 82 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between ECM and transmission harness connector.

**NO** : Go to next step 5).

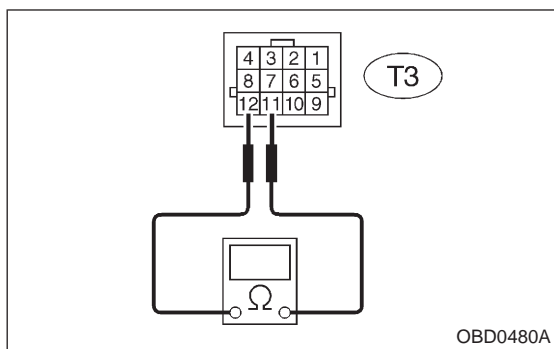


- 5) Measure resistance of harness between transmission harness connector and engine ground.

**CHECK** : **Connector & terminal**  
**(B12) No. 11 — Engine ground:**  
**Is the resistance less than 5 Ω?**

**YES** : Go to step 10BK3.

**NO** : Repair open circuit in inhibitor switch ground line.

**10BK3 CHECK INHIBITOR SWITCH.**

Measure resistance between transmission harness connector receptacle's terminals.

- CHECK** : **Connector & terminal (T3) No. 12 — No. 11:**  
**Is the resistance less than 1 Ω in "N" and "P" positions?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in transmission harness or replace inhibitor switch.
- CHECK** : **Connector & terminal (T3) No. 12 — No. 11:**  
**Is the resistance more than 1 MΩ in other positions?**
- YES** : Go to next **CHECK** .
- NO** : Repair short circuit in transmission harness or replace inhibitor switch.
- CHECK** : **Is there any fault in selector cable connection to inhibitor switch?**
- YES** : Repair selector cable connection. <Ref. to 3-2 [W2B2].>
- NO** : Replace ECM.

OBD	(FB1)
P1102	 
OBD0481	

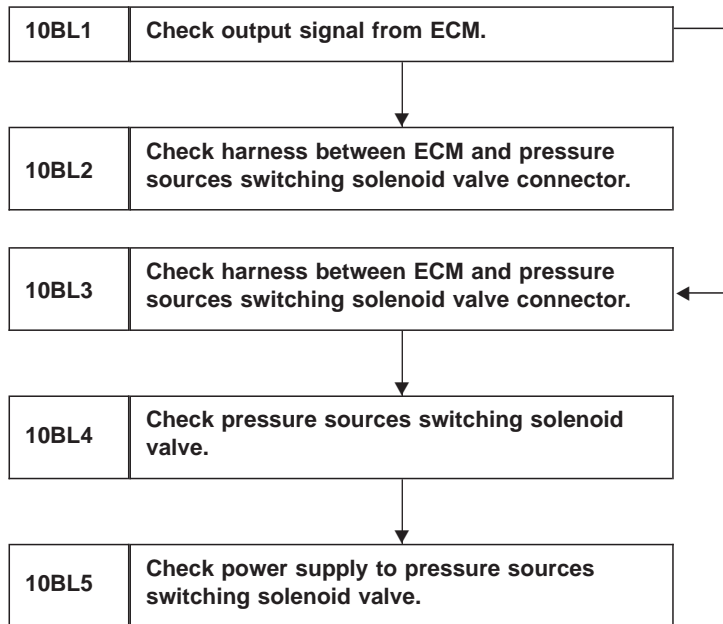
**BL: DTC P1102**  
**— PRESSURE SOURCES SWITCHING**  
**SOLENOID VALVE CIRCUIT MALFUNCTION**  
**(BR) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Erroneous idling
- Failure of engine to start



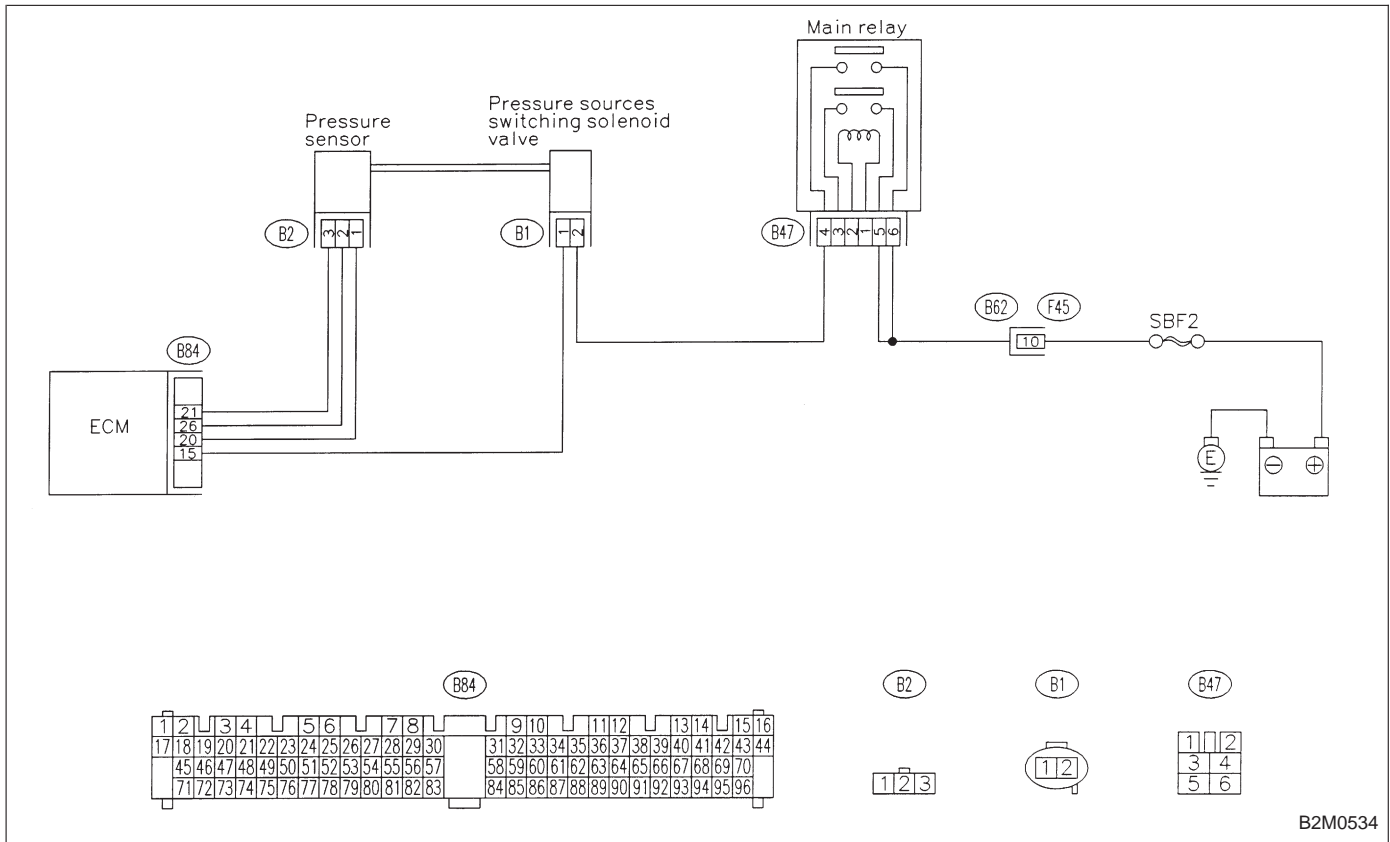
**CAUTION:**

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

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

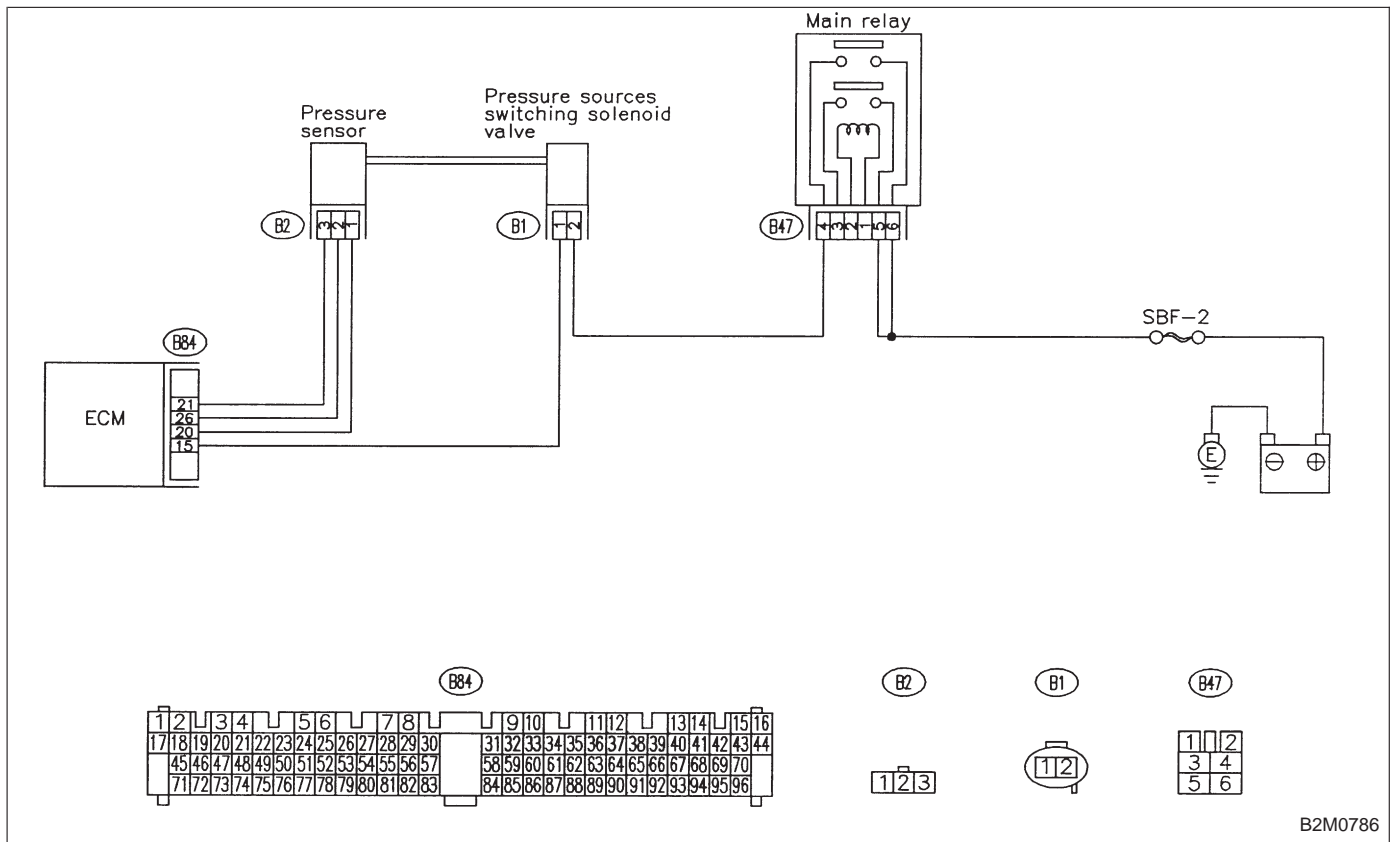
WIRING DIAGRAM:

- LHD Model

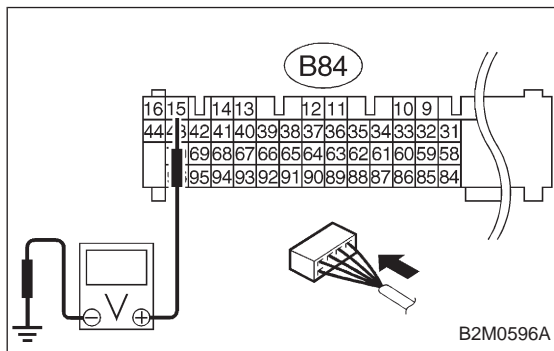


WIRING DIAGRAM:

- RHD Model



B2M0786



B2M0596A

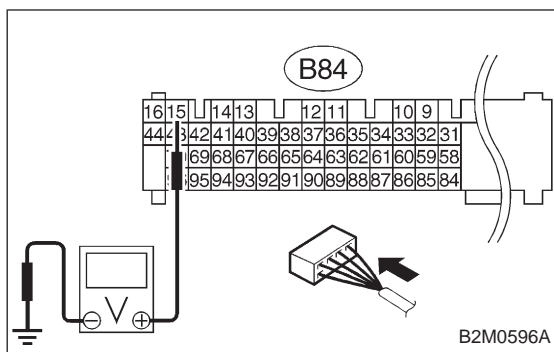
**10BL1 CHECK OUTPUT SIGNAL FROM ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 15 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Go to step 10BL2.

**NO** : Go to step 10BL3.



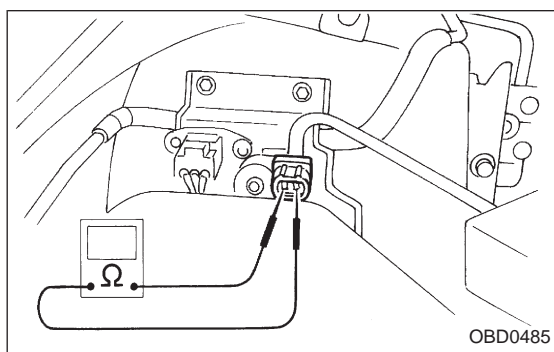
**10BL2 CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from pressure sources switching solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 15 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Repair short circuit in harness between ECM and pressure sources switching solenoid valve connector and 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.

**CHECK** : **Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?**

**YES** : Replace pressure sources switching solenoid valve and ECM.

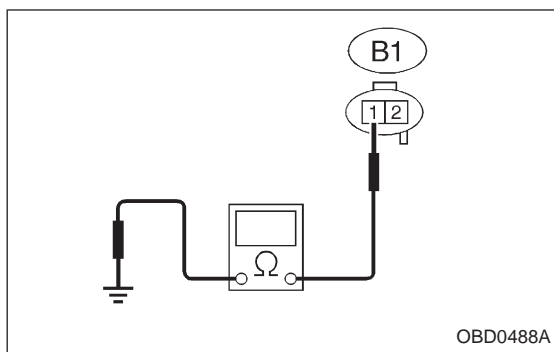
**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.



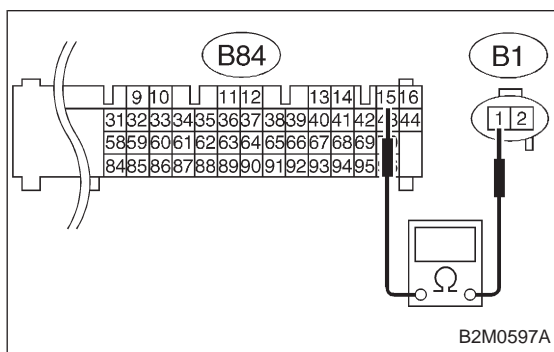
**10BL3****CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.**

- 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.

**CHECK** : **Connector & terminal (B1) No. 1 — Engine ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between ECM and pressure sources switching solenoid valve connector.

**NO** : Go to next step 4).

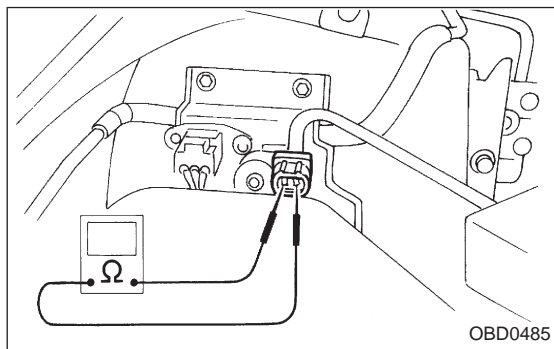


- 4) Measure resistance of harness between ECM and pressure sources switching solenoid valve connector.

**CHECK** : **Connector & terminal (B84) No. 15 — (B1) No. 1:**  
**Is the resistance less than 1 Ω?**

**YES** : Go to step 10BL4.

**NO** : Repair open circuit in harness between ECM and pressure sources switching solenoid valve connector.

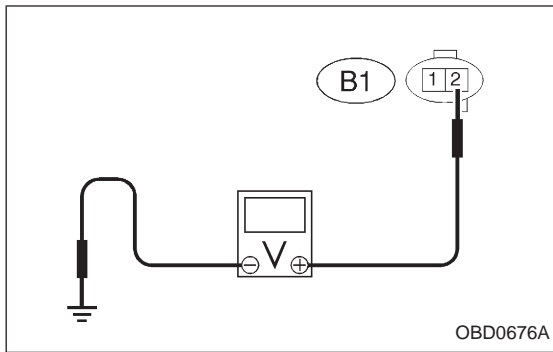
**10BL4****CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.**

Measure resistance between pressure sources switching solenoid valve connector terminals.

**CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance between 10 and 100 Ω?**

**YES** : Go to step 10BL5.

**NO** : Replace pressure sources switching solenoid valve.

**10BL5**
**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.

**CHECK** : **Connector & terminal (B1) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

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

**NO** : Repair open circuit in harness between main relay and pressure sources switching solenoid valve connector.

**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  P1103  OBD0489	(FB1)  <TRQ>
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**BM: DTC P1103**  
**— ENGINE TORQUE CONTROL SIGNAL**  
**CIRCUIT MALFUNCTION (TRQ) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Excessive shift shock

<b>10BM1</b>	Check input signal for ECM.
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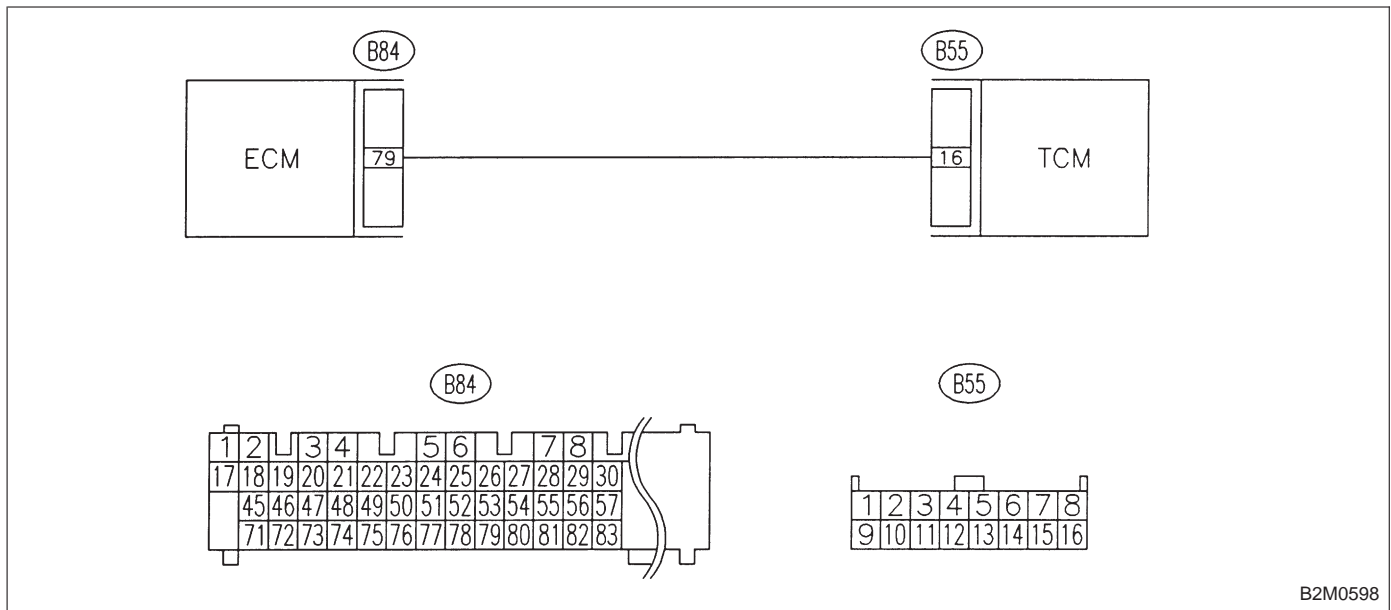


<b>10BM2</b>	Check harness between ECM and TCM connector.
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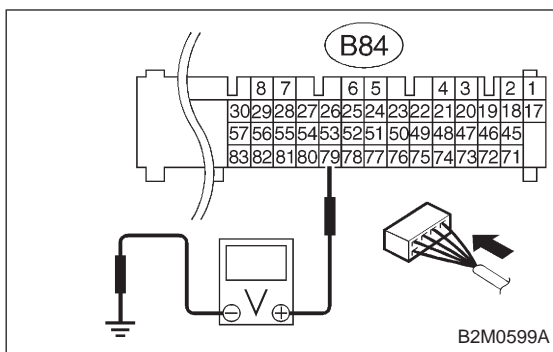
**CAUTION:**

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

**WIRING DIAGRAM:**



B2M0598



**10BM1 CHECK INPUT SIGNAL FOR ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 79 (+) — Chassis ground (-): Is the voltage more than 4.5 V?**

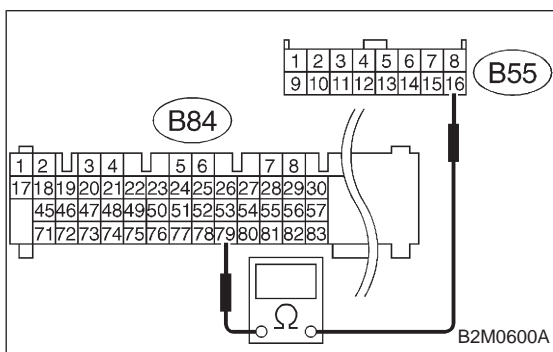
**YES** : Go to next **CHECK** .

**NO** : Go to step **10BM2**.

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.



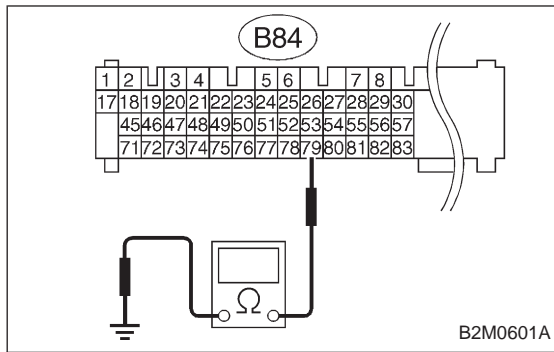
**10BM2 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.**

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

**CHECK** : **Connector & terminal (B84) No. 79 — (B55) No. 16: 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.

**CHECK** : **Connector & terminal (B84) No. 79 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between ECM and TCM connector.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in TCM connector?**

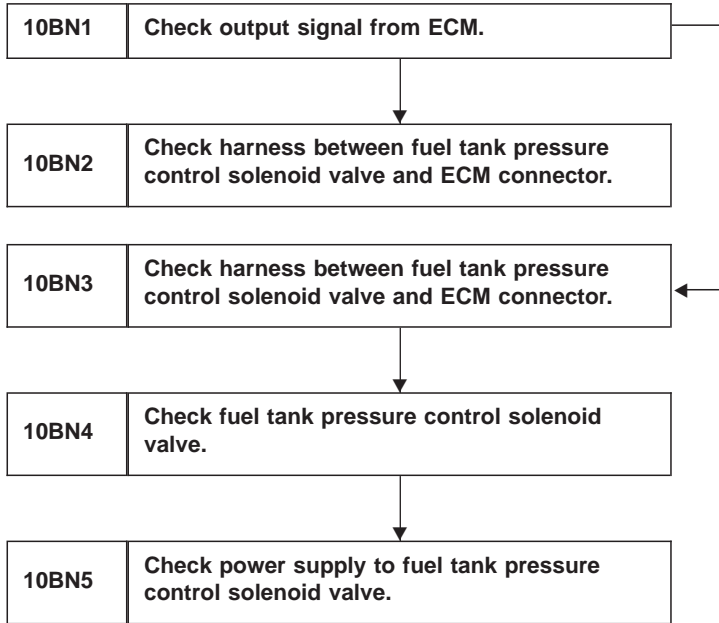
**YES** : Repair poor contact in TCM connector.

**NO** : Replace TCM.

OBD (FB1)  P1400 <PCVSOL>
H2M1406

**BN: DTC P1400**  
**— FUEL TANK PRESSURE CONTROL SOLENOID VALVE CIRCUIT MALFUNCTION (PCVSOL) —**

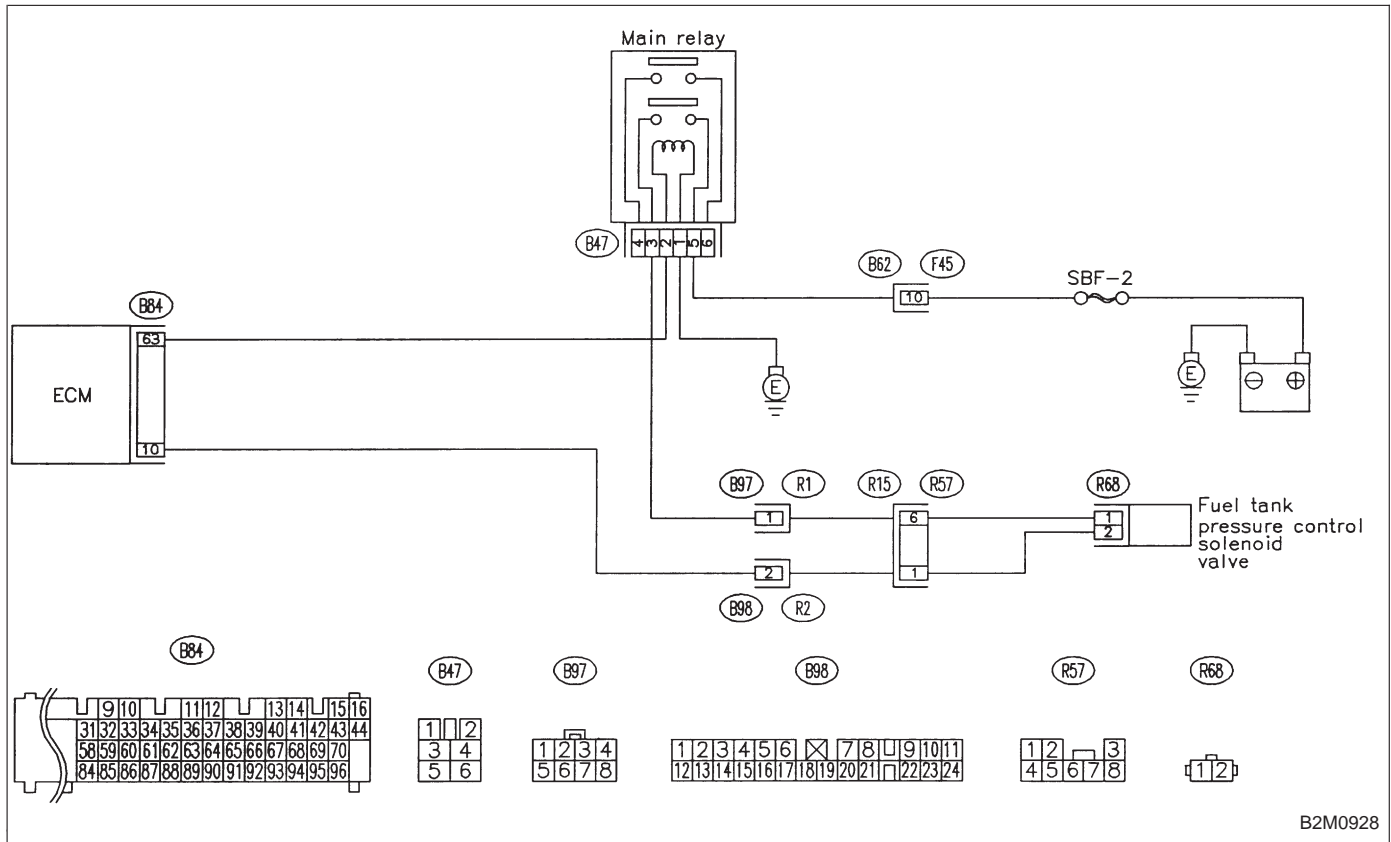
- DTC DETECTING CONDITION:**
- Two consecutive trips with fault



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

WIRING DIAGRAM:

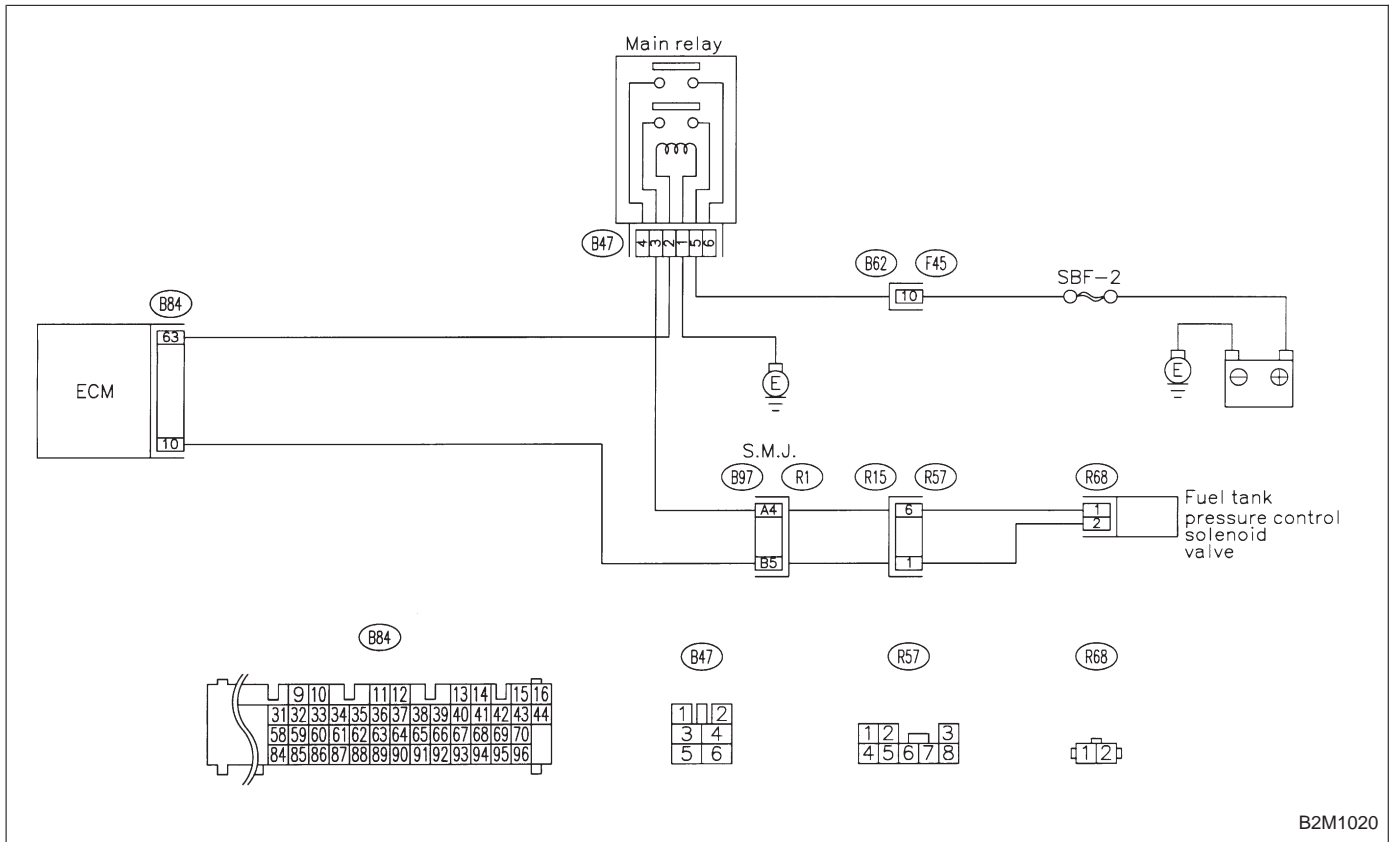
- LHD Model



B2M0928

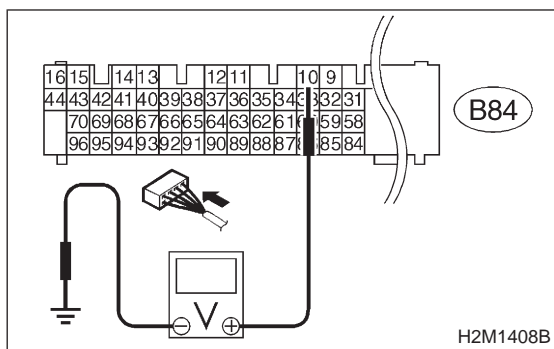
WIRING DIAGRAM:

- RHD Model



B2M1020



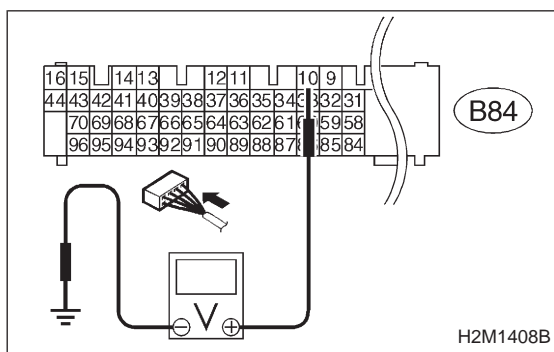
**10BN1 CHECK OUTPUT SIGNAL FROM ECM.**

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

**CHECK** : **Connector & terminal (B84) No. 10 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Go to step 10BN2.

**NO** : Go to step 10BN3.

**10BN2 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.

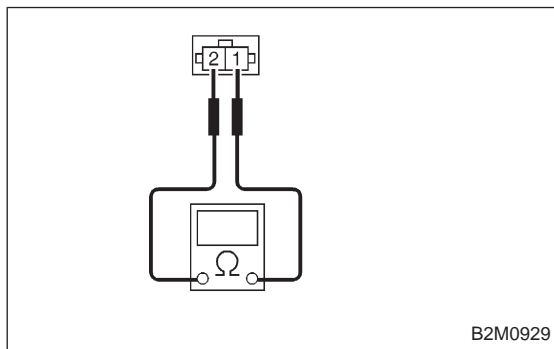
**CHECK** : **Connector & terminal (B84) No. 10 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Repair short circuit in harness and replace ECM.

**NOTE:**

The harness between ECM and fuel tank pressure control solenoid valve is in short circuit.

**NO** : Go to next step 5).



- 5) Turn ignition switch to OFF.
- 6) Measure resistance between fuel tank pressure control solenoid valve terminals.

**CHECK** : **Terminals No. 1 — No. 2: Is the resistance less than 1 Ω?**

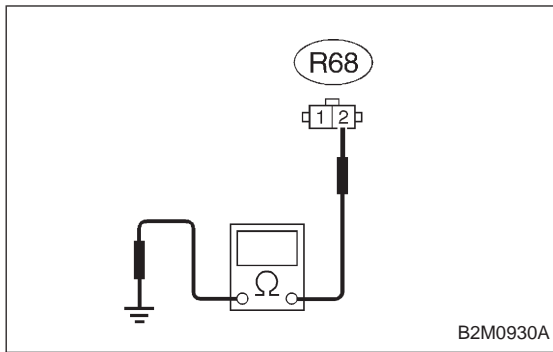
**YES** : Replace fuel tank pressure control solenoid valve and ECM.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.



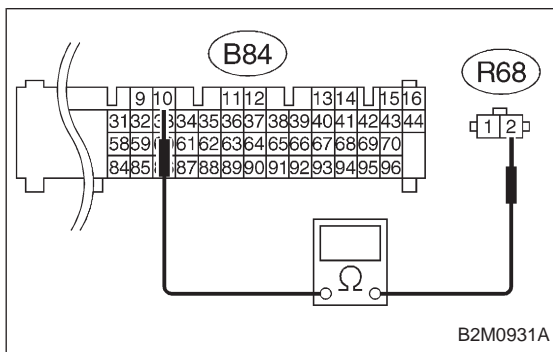
**10BN3** CHECK HARNESS BETWEEN FUEL TANK PRESSURE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 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.

**CHECK** : **Connector & terminal (R68) No. 2 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair 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.

**CHECK** : **Connector & terminal (B84) No. 10 — (R68) No. 2:**  
**Is the resistance less than 1 Ω?**

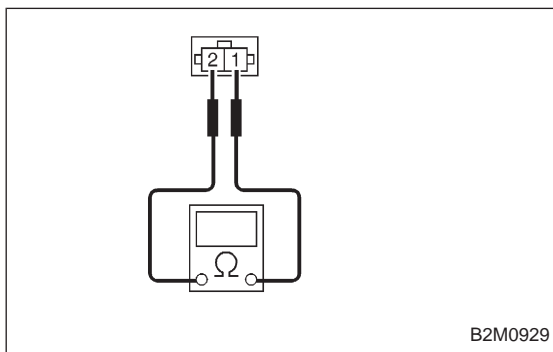
**YES** : Go to step 10BN4.

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between ECM and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B98 (LHD)/B97 (RHD), and R57)



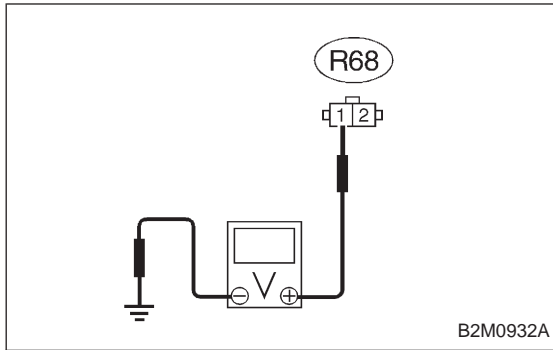
**10BN4** CHECK FUEL TANK PRESSURE CONTROL SOLENOID VALVE.

Measure resistance between fuel tank pressure control solenoid valve terminals.

**CHECK** : **Terminals No. 1 — No. 2:**  
**Is the resistance between 10 and 100 Ω?**

**YES** : Go to step 10BN5.

**NO** : Replace fuel tank pressure control solenoid valve.

**10BN5**
**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.

**CHECK** : **Connector & terminal (R68) No. 1 (+) — Chassis ground (-): Is the voltage more than 10 V?**

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

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between main relay and fuel tank pressure control solenoid valve connector
- Poor contact in coupling connectors (B97 and R57)
- Poor contact in main relay connector

**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)  
 P1401 <PCV\_F>  
 H2M1410

**BO: DTC P1401**  
**— FUEL TANK PRESSURE CONTROL SYSTEM FUNCTION PROBLEM (PCV — F) —**

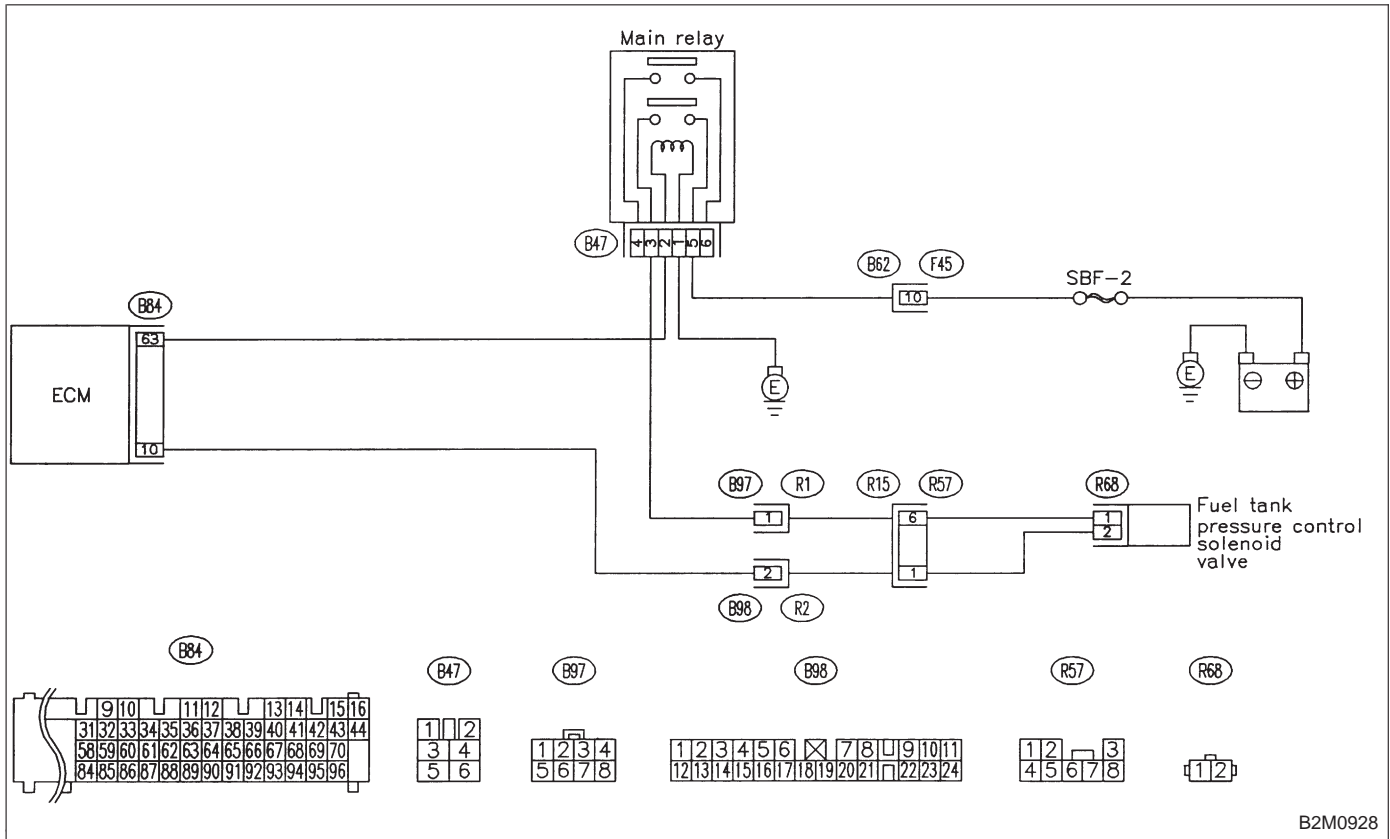
- DTC DETECTING CONDITION:**
- Two consecutive trips with fault

**10BO1** Check fuel tank pressure control solenoid valve.

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

**WIRING DIAGRAM:**

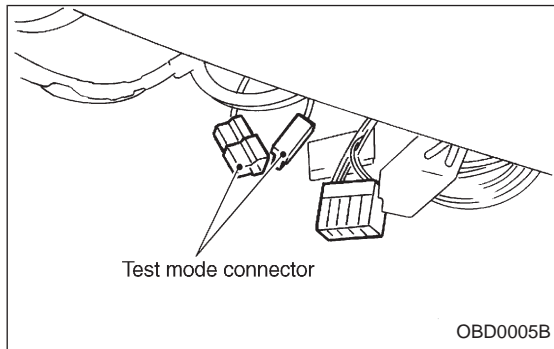
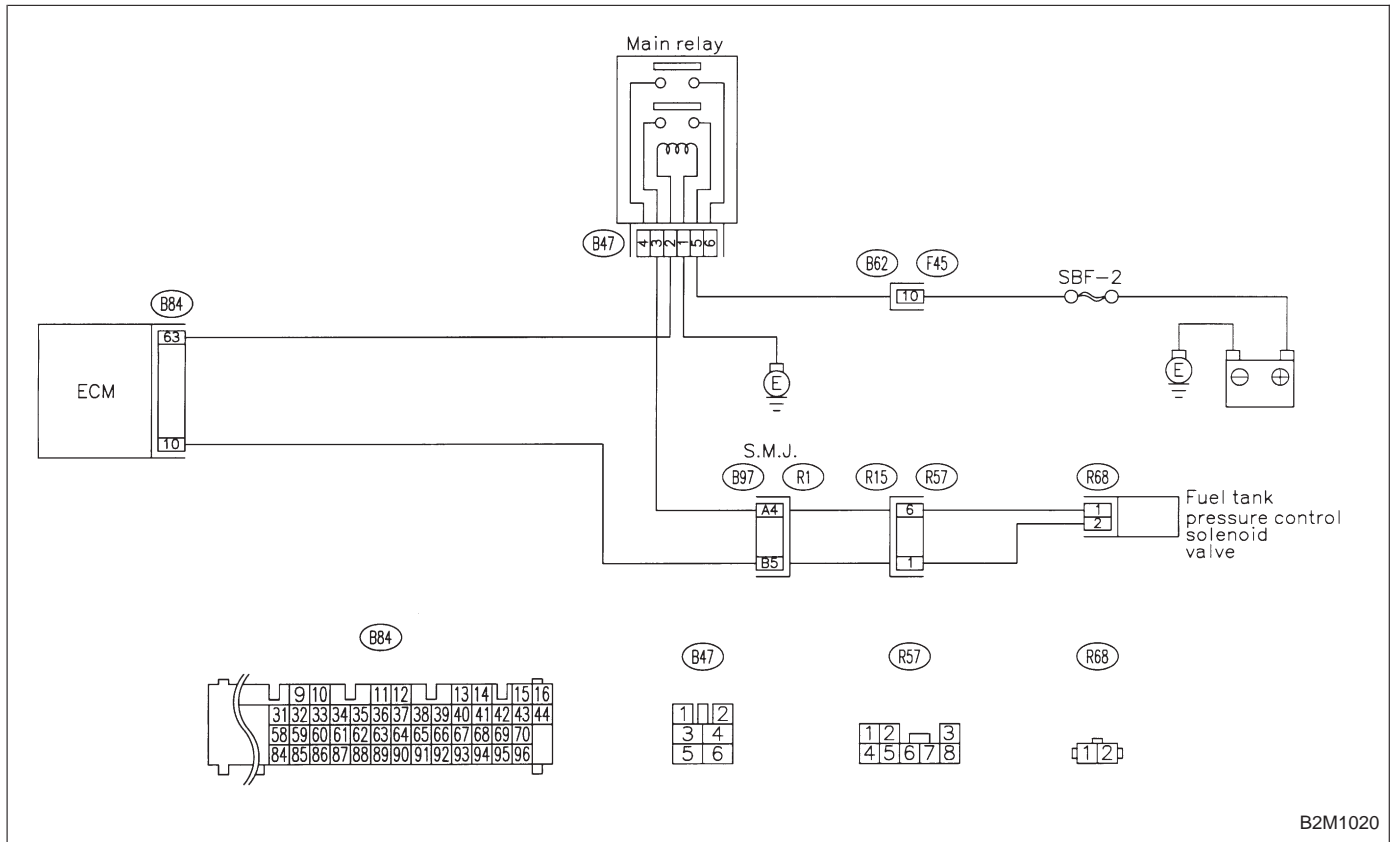
- LHD Model



B2M0928

**WIRING DIAGRAM:**

- RHD Model



**10B01 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" 2-7 [T3F0].

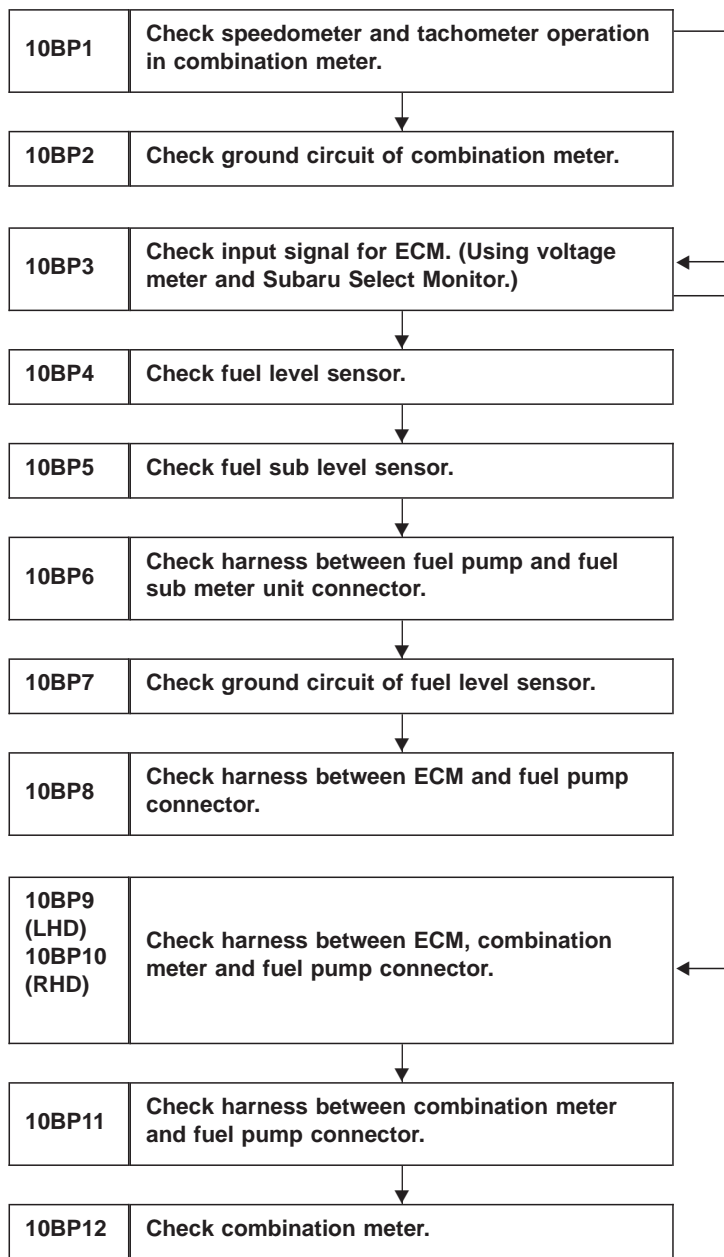
**YES** : Check evaporative emission control system.  
<Ref. to 2-7 [T10BN0].>

**NO** : Replace fuel tank pressure control solenoid valve.

<p>OBD (FB1) P1402 &lt;FLVL&gt;</p> <p style="text-align: right; font-size: small;">H2M1411</p>
---

**BP: DTC P1402  
— FUEL LEVEL SENSOR CIRCUIT  
MALFUNCTION (FLVL) —**

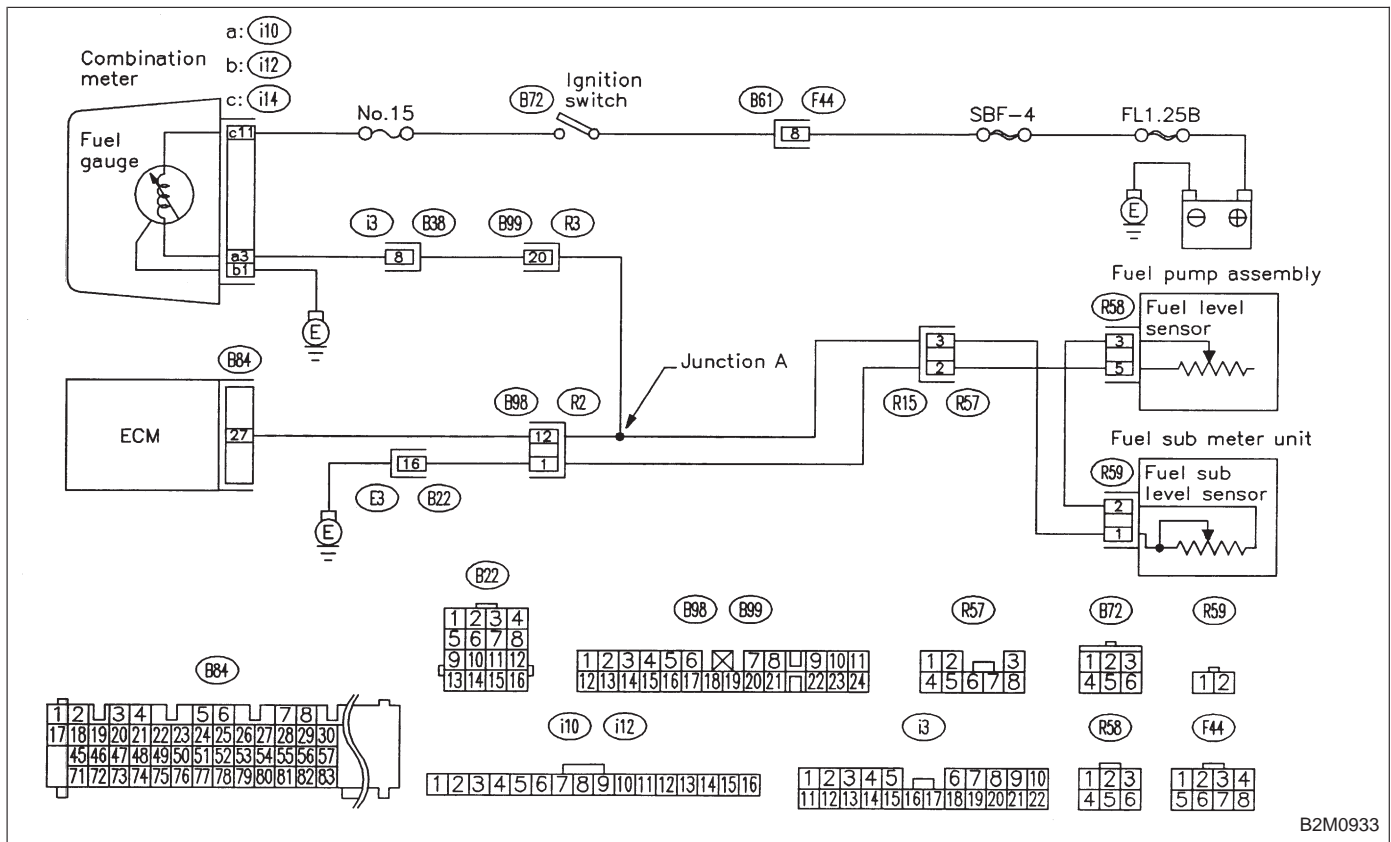
- DTC DETECTING CONDITION:**
- Two consecutive trips with fault



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

WIRING DIAGRAM:

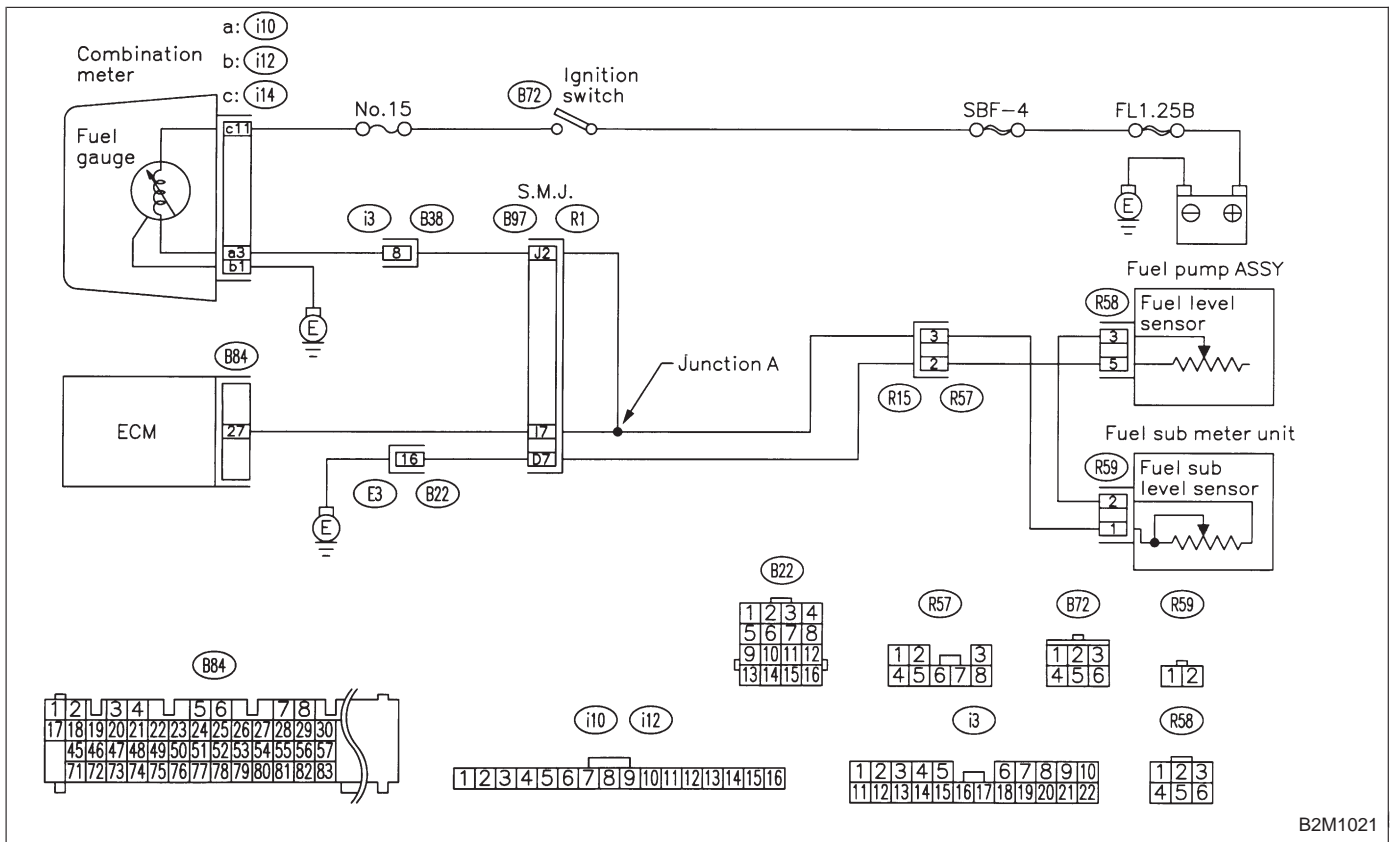
● LHD Model



B2M0933

WIRING DIAGRAM:

● RHD Model



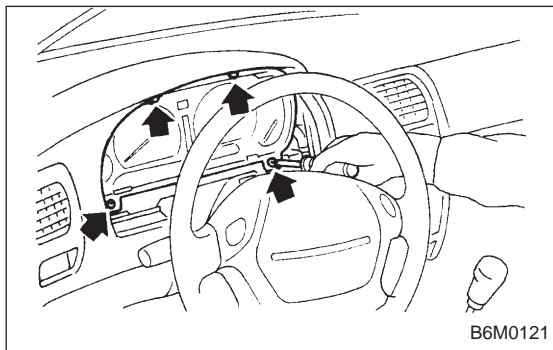
B2M1021

**10BP1 CHECK SPEEDOMETER AND TACHOMETER OPERATION IN COMBINATION METER.**

**CHECK** : Does speedometer and tachometer operate normally?

**YES** : Go to step 10BP3.

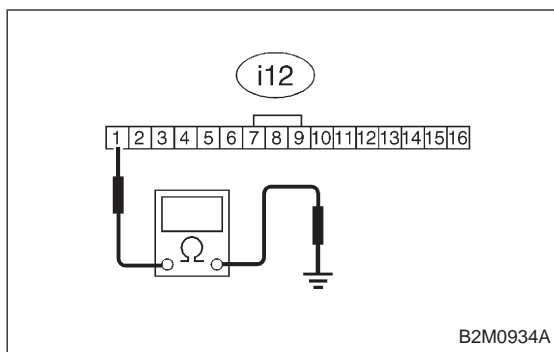
**NO** : Go to step 10BP2.



**10BP2 CHECK GROUND CIRCUIT OF COMBINATION METER.**

- 1) Turn ignition switch to OFF.
- 2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
- 3) Disconnect connector from combination meter.





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

**CHECK** : **Connector & terminal (i12) No. 1 — Chassis ground: Is resistance less than 5  $\Omega$ ?**

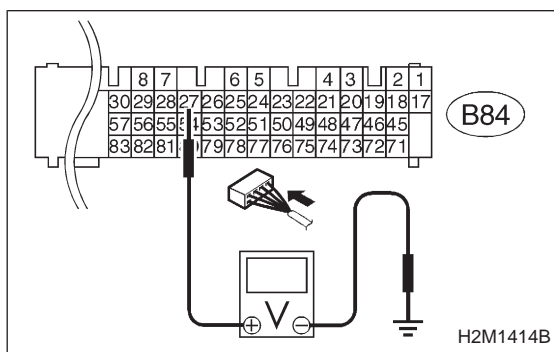
**YES** : Repair or replace combination meter.

**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



**10BP3**

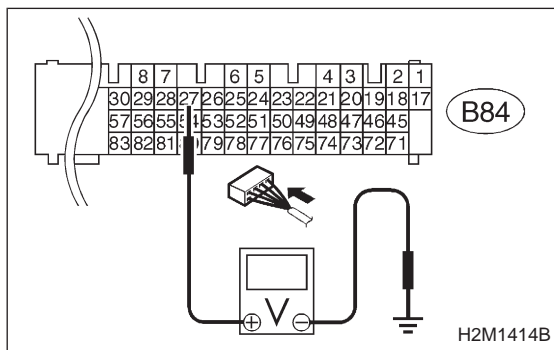
**CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)**

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 10BP4.

**NO** : Go to next step 3).



3) Measure voltage between ECM connector and chassis ground.

**CHECK** : **Connector & terminal (B84) No. 27 (+) — Chassis ground (-): Is the voltage less than 0.12 V?**

**YES** : Go to step 10BP9 (LHD) or 10BP10 (RHD).

**NO** : Go to next **CHECK** .

FLEVEL (F45)  
2.50V

H2M1327

**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.

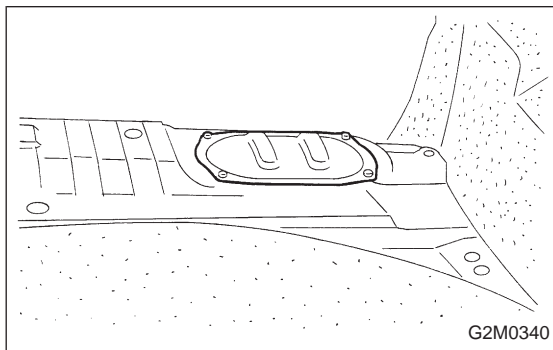
**YES** : Repair poor contact in ECM connector.

**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:**

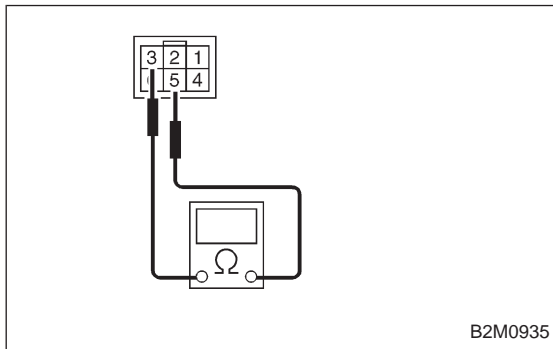
In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in combination meter connector
- Poor contact in ECM connector
- Poor contact in coupling connectors (i3, B99 (LHD only), B22, B98 (LHD)/B97 (RHD), and R57)



**10BP4 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).



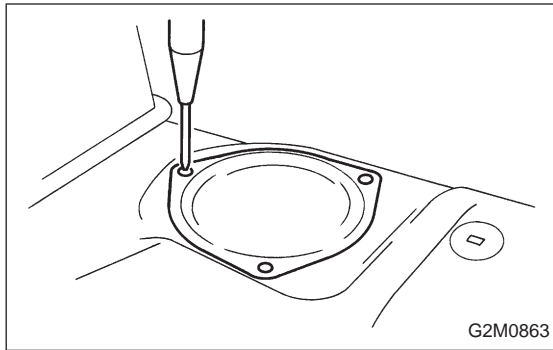
- 3) Disconnect connector from fuel pump.

- 4) Measure resistance between connector terminals of fuel pump.

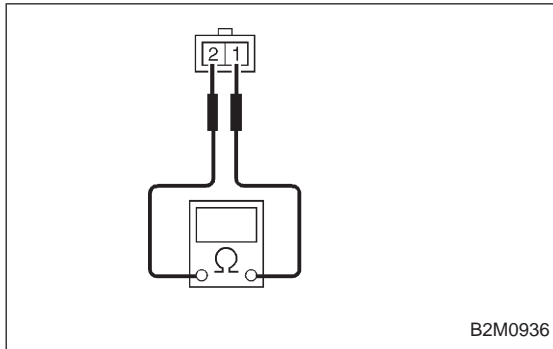
**CHECK** : **Terminals No. 3 — No. 5:**  
Is the resistance less than 100 Ω?

**YES** : Go to step 10BP5.

**NO** : Replace fuel sending unit.

**10BP5 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).

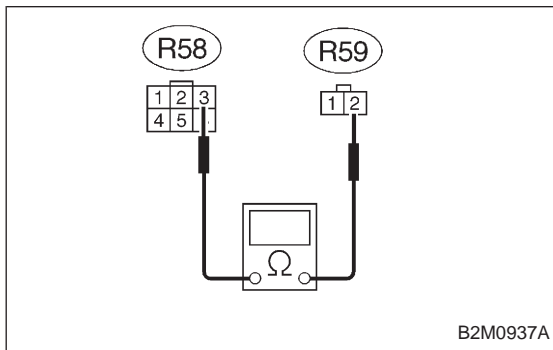


2) Disconnect connector from fuel sub meter unit.  
3) Measure resistance between connector terminals of fuel sub meter unit.

**CHECK** : **Terminals**  
**No. 1 — No. 2:**  
**Is the resistance less than 100 Ω?**

**YES** : Go to step 10BP6.

**NO** : Replace fuel sub meter unit.

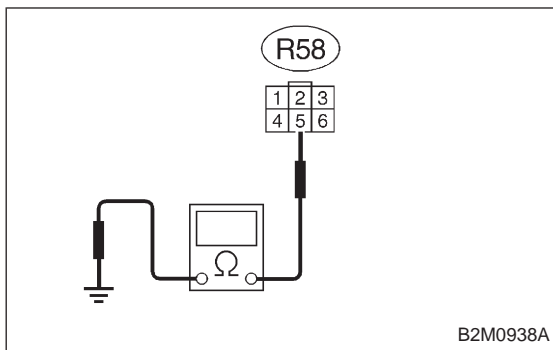
**10BP6 CHECK HARNESS BETWEEN FUEL PUMP AND FUEL SUB METER UNIT CONNECTOR.**

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 10BP7.

**NO** : Repair open circuit in harness between fuel pump and fuel sub meter unit connector.



**10BP7 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?**

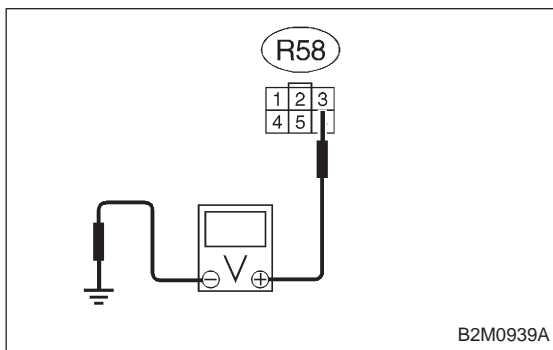
**YES** : Go to step 10BP8.

**NO** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

- Open circuit in harness between fuel pump connector and chassis grounding terminal
- Poor contact in fuel pump connector
- Poor contact in coupling connectors (R57, B98 (LHD)/ B97 (RHD), and B22)



**10BP8 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?**

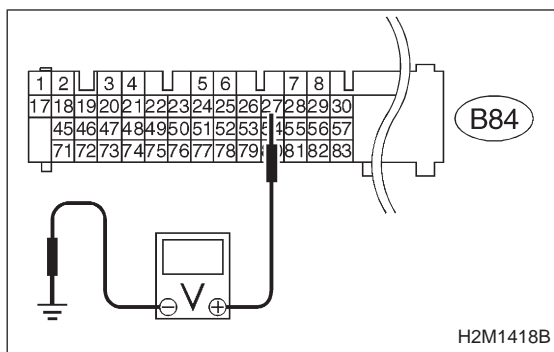
**YES** : Repair harness and connector.

**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 connector (R57)

**NO** : Go to next step 4).



- 4) Turn ignition switch to OFF.
- 5) Disconnect connector from ECM.
- 6) Turn ignition switch to ON.
- 7) 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:

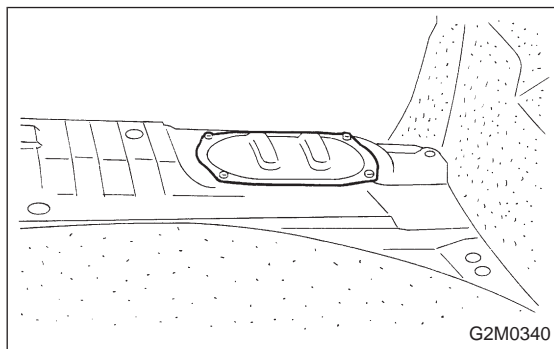
- Open circuit in harness between ECM connector and junction A on rear wiring harness
- Poor contact in coupling connector (B98 (LHD)/B97 (RHD))

**NO** : Repair connector.

**NOTE:**

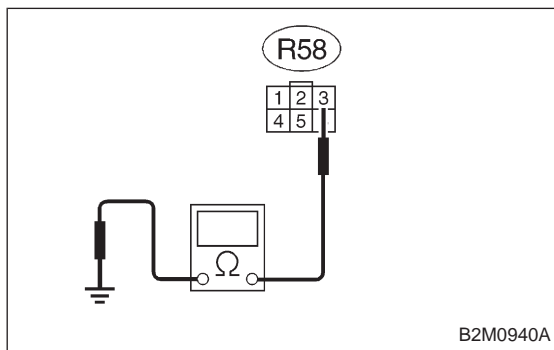
In this case, repair the following:

- Poor contact in fuel pump connector
- Poor contact in fuel sub meter unit
- Poor contact in ECM connector



**10BP9**      **CHECK HARNESS BETWEEN ECM, COMBINATION METER AND FUEL PUMP CONNECTOR. (LHD MODEL)**

- 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).

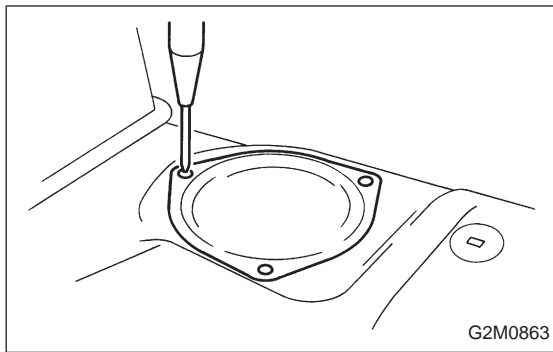


- 3) Disconnect connector from fuel pump.
- 4) Measure resistance of harness between fuel pump connector and chassis ground.

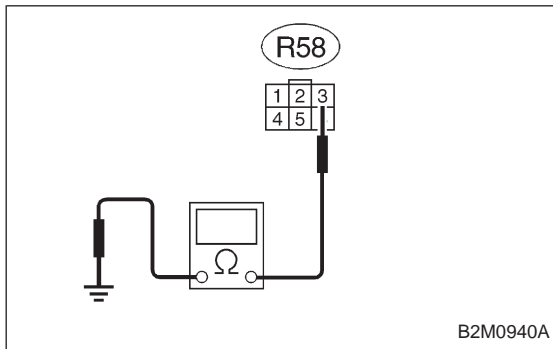
**CHECK** : **Connector & terminal (R58) No. 3 — Chassis ground: Is the resistance less than 10 Ω?**

**YES** : Go to next step 5).

**NO** : Go to step 10BP11.



5) Remove service hole cover located on the left rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).

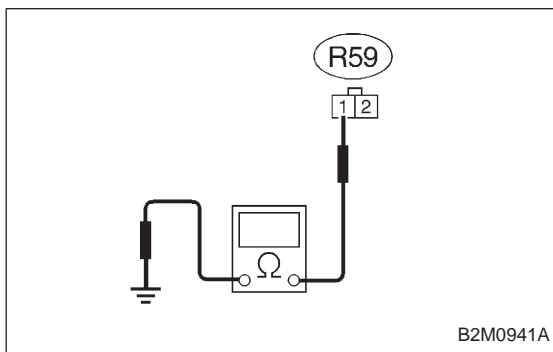


6) Disconnect connector from fuel sub meter unit.  
7) Measure resistance of harness between fuel pump connector and chassis ground.

**CHECK** : **Connector & terminal (R58) No. 3 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in harness between fuel pump and fuel sub meter unit connector.

**NO** : Go to next step 8).

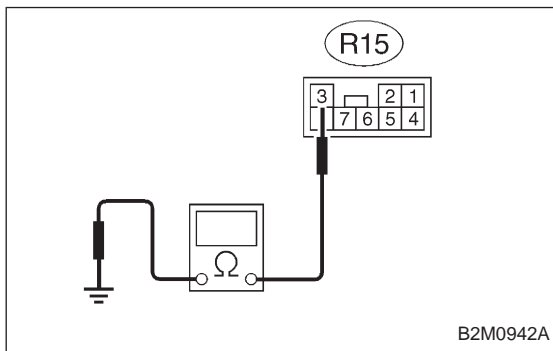


8) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15).  
9) Measure resistance of harness between fuel sub meter unit connector and chassis ground.

**CHECK** : **Connector & terminal (R59) No. 1 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in fuel tank cord.

**NO** : Go to next step 10).



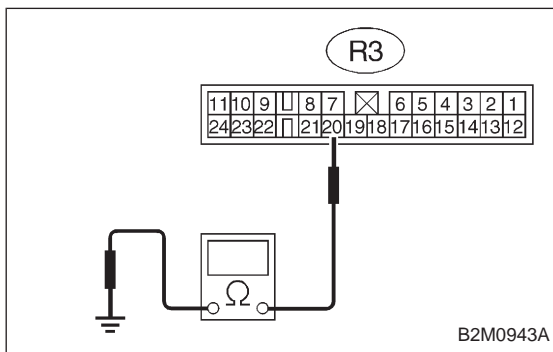
10) Separate rear wiring harness connector (R2) and bulkhead wiring harness connector (B98).

11) Measure resistance of harness between rear wiring harness connector and chassis ground.

**CHECK** : **Connector & terminal (R15) No. 3 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Go to next step 12).

**NO** : Repair short circuit in bulkhead wiring harness.



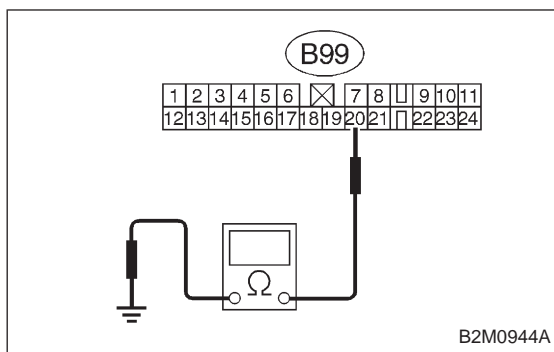
12) Separate rear wiring harness connector (R3) and bulkhead wiring harness connector (B99).

13) Measure resistance of harness between rear wiring harness connector and chassis ground.

**CHECK** : **Connector & terminal (R3) No. 20 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

**YES** : Repair short circuit in rear wiring harness.

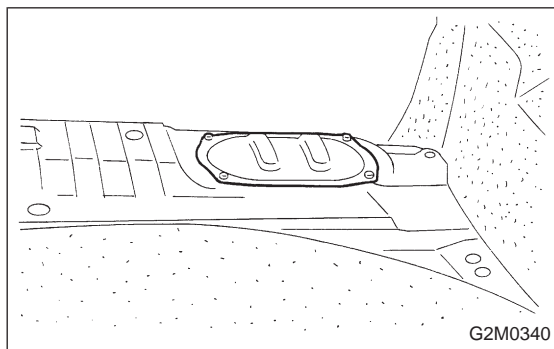
**NO** : Go to next step 14).



- 14) Separate bulkhead wiring harness connector (B38) and instrument panel wiring harness connector (i3).  
 15) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

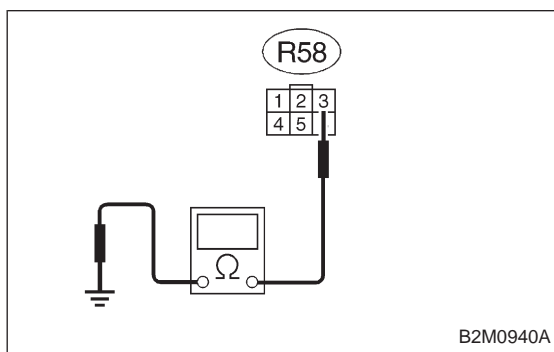
**CHECK** : **Connector & terminal (B99) No. 20 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

- YES** : Repair short circuit in bulkhead wiring harness.  
**NO** : Repair short circuit in instrument panel wiring harness.



**10BP10 CHECK HARNESS BETWEEN ECM, COMBINATION METER AND FUEL PUMP CONNECTOR. (RHD MODEL)**

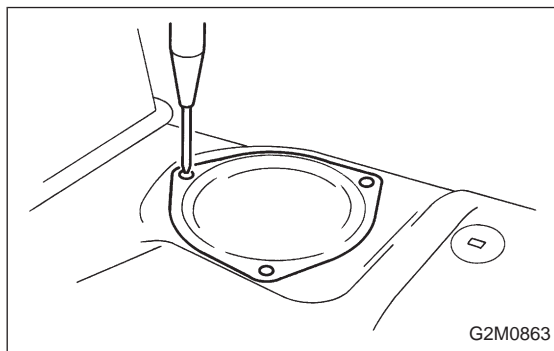
- 1) Turn ignition switch to OFF.  
 2) Remove fuel pump access hole lid located on the right rear of luggage compartment floor.



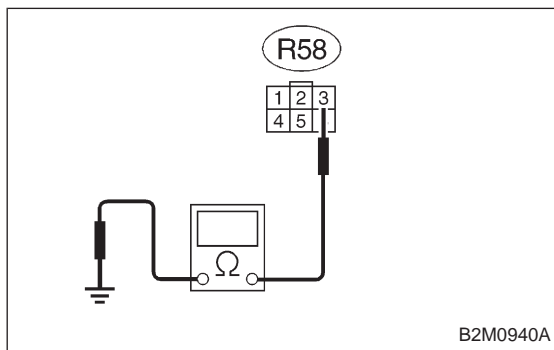
- 3) Disconnect connector from fuel pump.  
 4) Measure resistance of harness between fuel pump connector and chassis ground.

**CHECK** : **Connector & terminal (R58) No. 3 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

- YES** : Go to next step 5).  
**NO** : Go to step 10BP11.



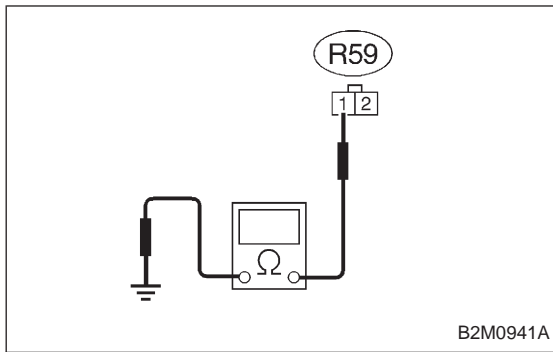
- 5) Remove service hole cover located on the left rear of luggage compartment floor.



- 6) Disconnect connector from fuel sub meter unit.  
 7) 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?**

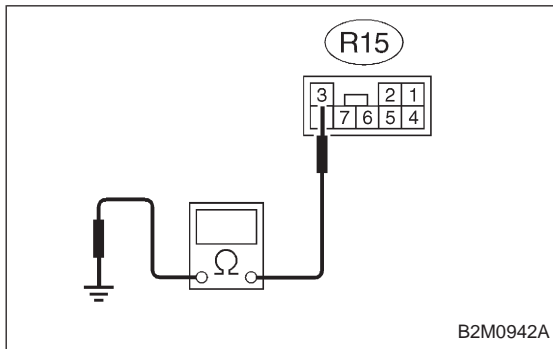
- YES** : Repair short circuit in harness between fuel pump and fuel sub meter unit connector.  
**NO** : Go to next step 8).



- 8) Separate fuel tank cord connector (R57) and rear wiring harness connector (R15).
- 9) 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?**

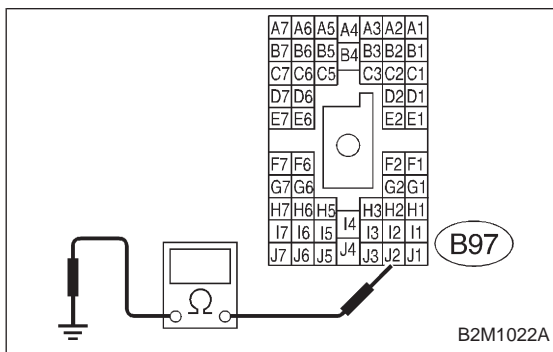
- YES** : Repair short circuit in fuel tank cord.
- NO** : Go to next step 10).



- 10) Separate rear wiring harness connector (R1) and bulkhead wiring harness connector (B97).
- 11) Measure resistance of harness between rear wiring harness connector and chassis ground.

**CHECK** : **Connector & terminal (R15) No. 3 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

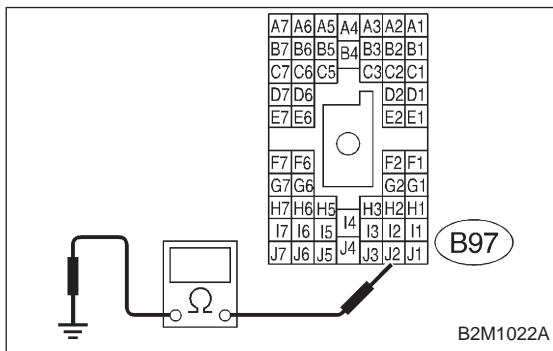
- YES** : Go to next step 12).
- NO** : Repair short circuit in rear wiring harness.



- 12) Measure resistance of harness between bulkhead wiring connector and chassis ground.

**CHECK** : **Connector & terminal (B97) No. J2 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

- YES** : Go to next step 13).
- NO** : Repair short circuit in harness between S.M.J. and ECM connector.

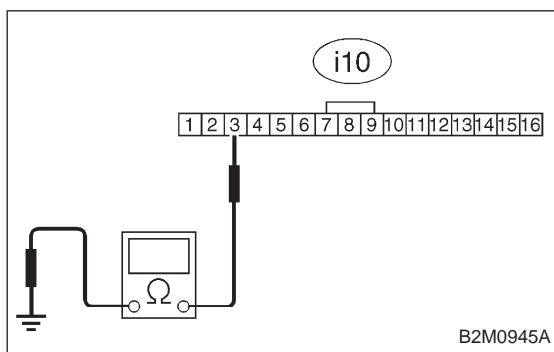
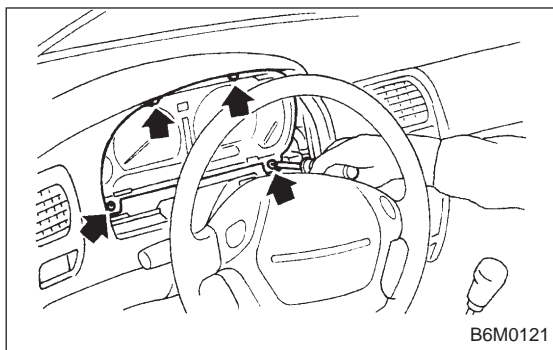


- 13) Separate bulkhead wiring harness connector (B38) and instrument panel wiring harness connector (i3).
- 14) Measure resistance of harness between bulkhead wiring harness connector and chassis ground.

**CHECK** : **Connector & terminal (B97) No. J2 — Chassis ground:**  
**Is the resistance less than 10 Ω?**

- YES** : Repair short circuit in bulkhead wiring harness.
- NO** : Repair short circuit in instrument panel wiring harness.





<b>10BP11</b>	<b>CHECK HARNESS BETWEEN COMBINATION METER AND FUEL PUMP CONNECTOR.</b>
---------------	---

- 1) Connect connector to fuel pump.
- 2) Pull out combination meter from instrument panel. <Ref. to 6-2 [W13A1].>
- 3) Disconnect connector from combination meter.

- 4) Measure resistance of harness between combination meter connector and chassis ground.

**CHECK** : **Connector & terminal (i10) No. 3 — Chassis ground: Is the resistance less than 200 Ω?**

**YES** : Go to step 10BP12.

**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 connectors (i3, and B99 (LHD)/ B97 (RHD))

<b>10BP12</b>	<b>CHECK COMBINATION METER.</b>
---------------	---------------------------------

- 1) Disconnect speedometer cable from combination meter and remove combination meter.

**CHECK** : **Is the fuel meter installation screw tightened securely?**

**YES** : Go to next step 2).

**NO** : Tighten fuel meter installation screw securely.

- 2) 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)
P1500	<FAN_1>
OBD0527	

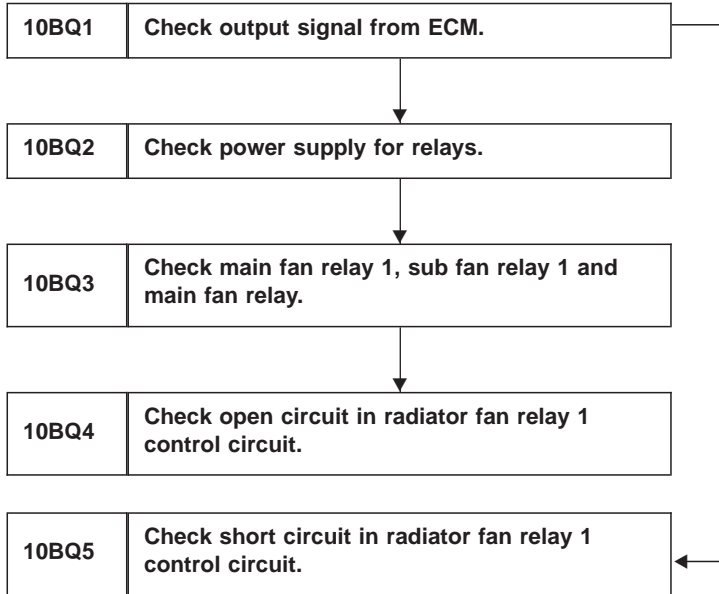
**BQ: DTC P1500  
— RADIATOR FAN RELAY 1 CIRCUIT  
MALFUNCTION (FAN — 1) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Radiator fan does not operate properly.
- Overheating



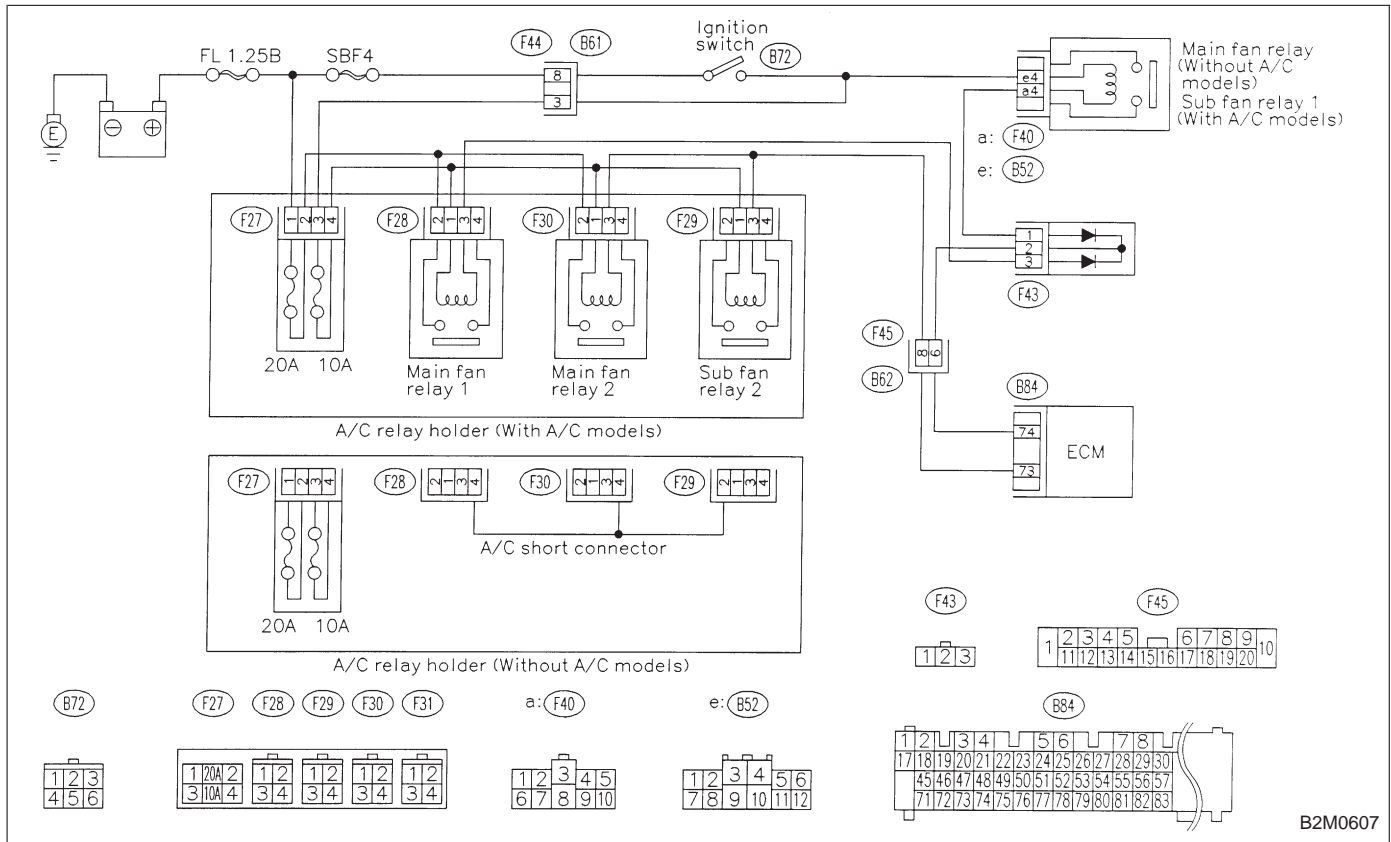
**CAUTION:**

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

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

WIRING DIAGRAM:

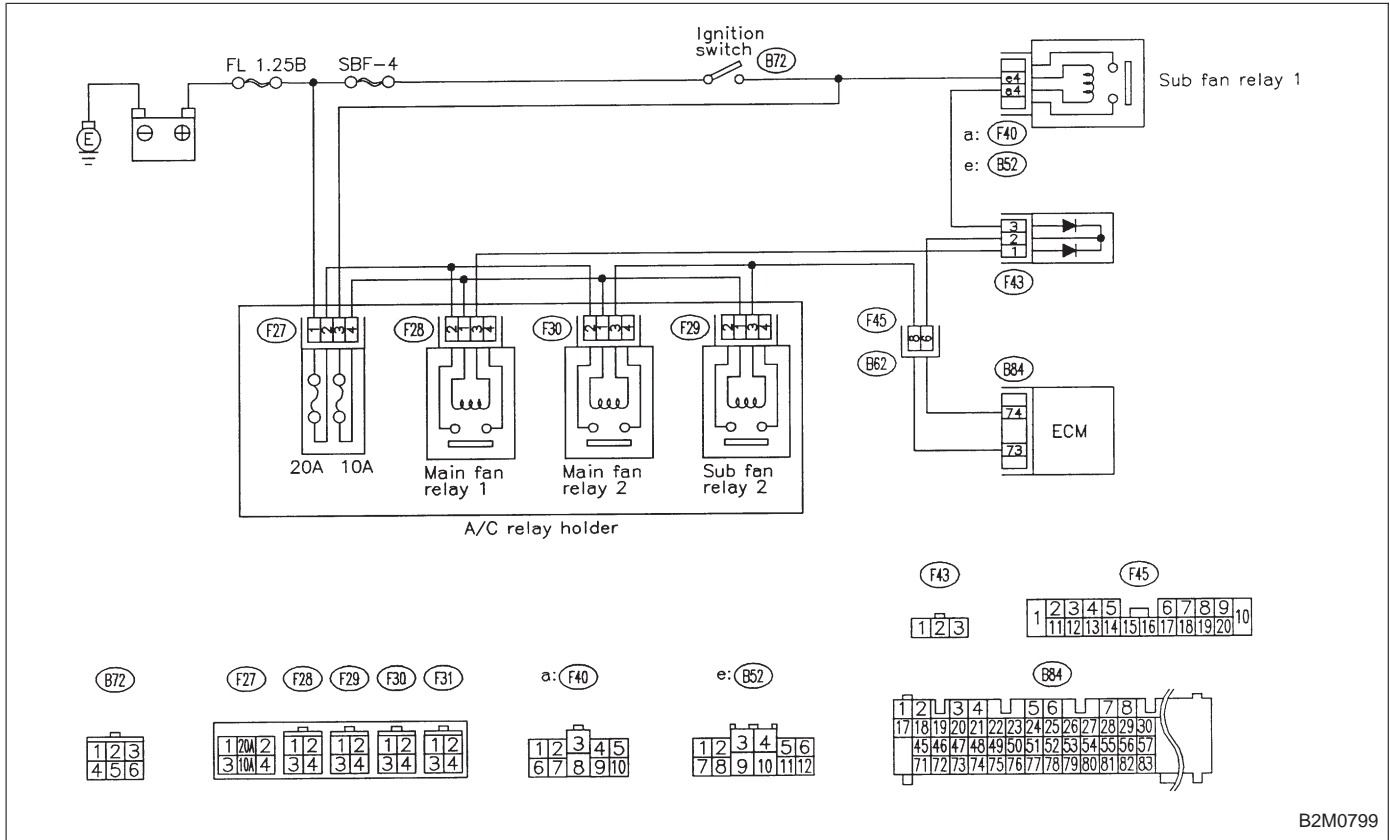
● LHD Model



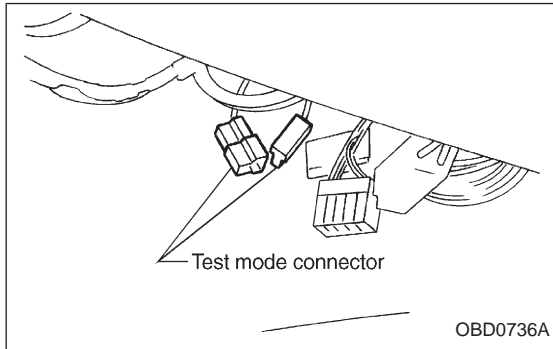
B2M0607

WIRING DIAGRAM:

● RHD Model

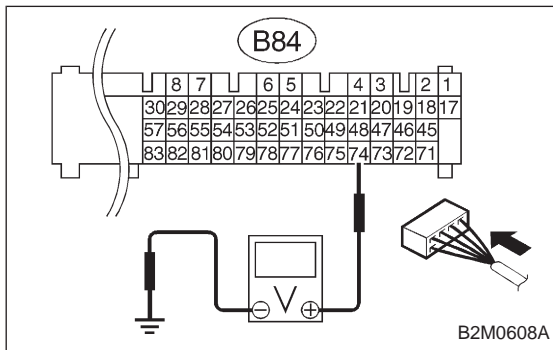


B2M0799



**10BQ1 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.

**CHECK** : **Connector & terminal (B84) No. 74 (+) — Chassis ground: Is the voltage more than 10 V?**

**YES** : Go to step 10BQ5.

**NO** : Go to step 10BQ2.

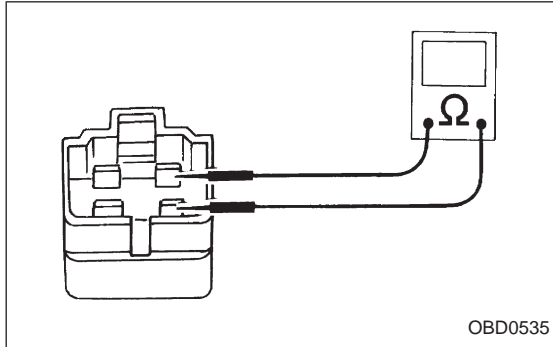
**10BQ2 CHECK POWER SUPPLY FOR RELAYS.**

Turn ignition switch to OFF.

**CHECK** : *Is the fuse in power supply circuit broken?*

**YES** : Replace the fuse.

**NO** : Go to step **10BQ3**.

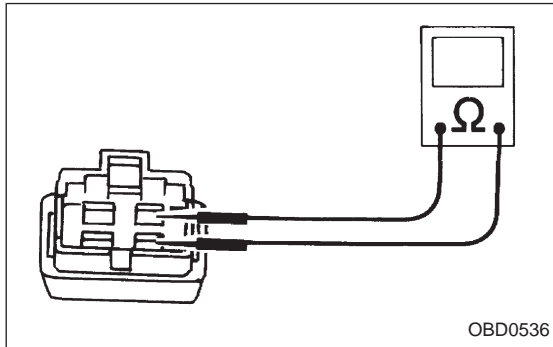
**10BQ3 CHECK MAIN FAN RELAY 1, SUB FAN RELAY 1 AND MAIN FAN RELAY.**

- 1) Remove main fan relay 1. (With A/C models only)
- 2) Measure resistance between main fan relay 1 terminals.

**CHECK** : *Terminal No. 1 — No. 3:  
Is the resistance between 87 and 107 Ω?*

**YES** : Go to next step 3).

**NO** : Replace main fan relay 1.

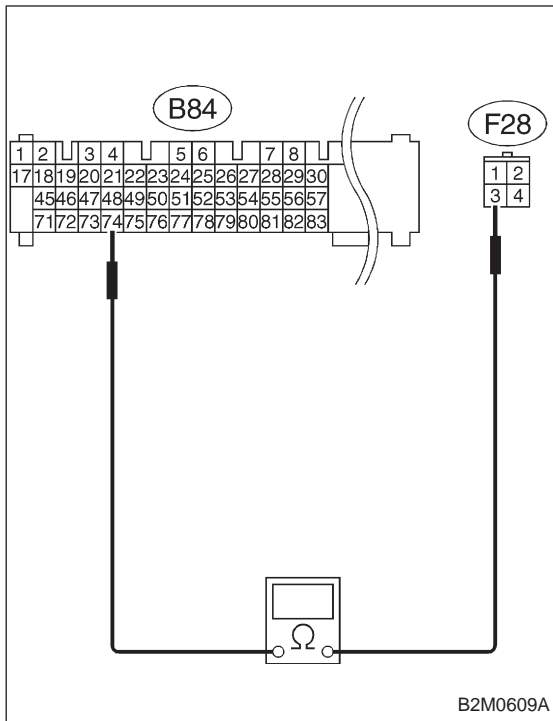


- 3) Remove sub fan relay 1. (With A/C models only)
- Remove main fan relay. (Without A/C models only)
- 4) Measure resistance between sub fan relay 1 or main fan relay terminals.

**CHECK** : *Terminal No. 1 — No. 3:  
Is the resistance between 83 and 117 Ω?*

**YES** : Go to step **10BQ4**.

**NO** : Replace sub fan relay 1.



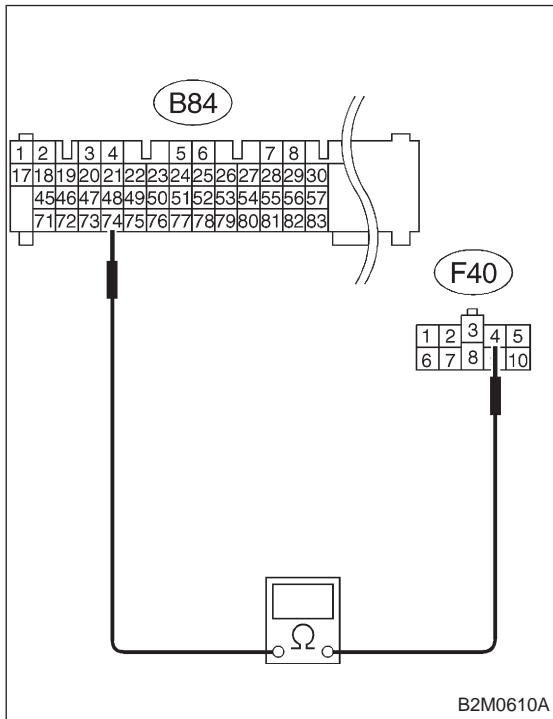
**10BQ4 CHECK OPEN CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.**

- 1) Disconnect connector from ECM.
- 2) Disconnect connector from sub fan relay 1 or main fan relay.
- 3) Measure resistance of harness between ECM and main fan relay 1 connector.

**NOTE:**

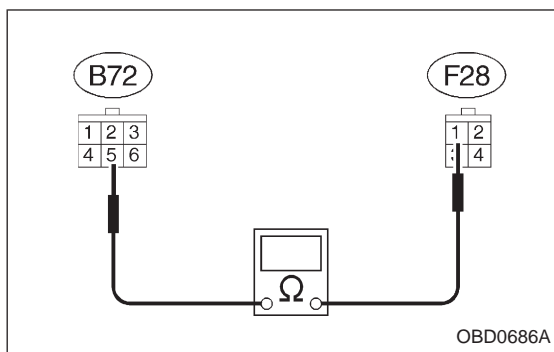
With A/C models only.

- CHECK** : **Connector & terminal (B84) No. 74 — (F28) No. 3:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM and main fan relay 1 connector.
- CHECK** : **Is there poor contact in ECM or main fan relay 1 connector?**
- YES** : Repair poor contact in ECM or main fan relay 1 connector.
- NO** : Go to next step 4).



- 4) Measure resistance of harness between ECM and sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector.

- CHECK** : **Connector & terminal (B84) No. 74 — (F40) No. 4:**  
**Is the resistance less than 1 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM and sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector.
- CHECK** : **Is there poor contact in ECM or sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector?**
- YES** : Repair poor contact in ECM or sub fan relay 1 (with A/C models) or main fan relay (without A/C models) connector.
- NO** : Go to next step 5) (with A/C models) or step 6) (without A/C models).



5) Measure resistance of harness between main fan relay 1 and ignition switch connector.

NOTE:

With A/C models only.

**CHECK** : **Connector & terminal (F28) No. 1 — (F72) No. 5:**  
**Is the resistance less than 1 Ω?**

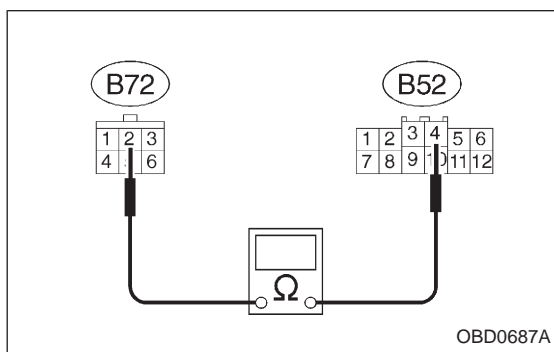
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between main fan relay 1 and ignition switch connector.

**CHECK** : **Is there poor contact in main fan relay 1 or ignition switch connector?**

**YES** : Repair main fan relay 1 or ignition switch connector.

**NO** : Go to next step 6).



6) Measure resistance of harness between sub fan relay 1 (with A/C models) or main fan relay (without A/C models) and ignition switch connector.

**CHECK** : **Connector & terminal (B52) No. 4 — (F72) No. 2:**  
**Is the resistance less than 1 Ω?**

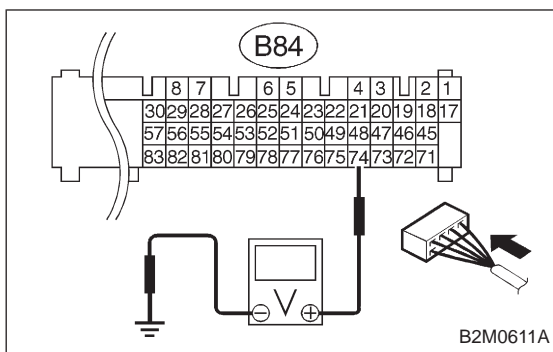
**YES** : Go to next **CHECK** .

**NO** : Repair open circuit in harness between sub fan relay 1 (with A/C models) or main fan relay (without A/C models) and ignition switch connector.

**CHECK** : **Is there poor contact in sub fan relay 1 (with A/C models) or main fan relay (without A/C models) or ignition switch connector?**

**YES** : Repair poor contact in sub fan relay 1 (with A/C models) or main fan relay (without A/C models) or ignition switch connector.

**NO** : Replace ECM.



**10BQ5 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.

**CHECK** : **Connector & terminal (B84) No. 74 (+) — Chassis ground (-): Is the voltage more than 10 V?**

**YES** : Repair short circuit in radiator fan relay 1 control circuit and replace ECM.

**NO** : Go to next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Replace ECM.



OBD	(FB1)
P1502	<FAN_F>
	OBD0538

**BR: DTC P1502**  
**— RADIATOR FAN FUNCTION PROBLEM**  
**(FAN — F) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips with fault

**TROUBLE SYMPTOM:**

- Occurrence of noise
- Overheating

10BR1	Check any other DTC (beside DTC P1502) on display.
-------	--

**CAUTION:**

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

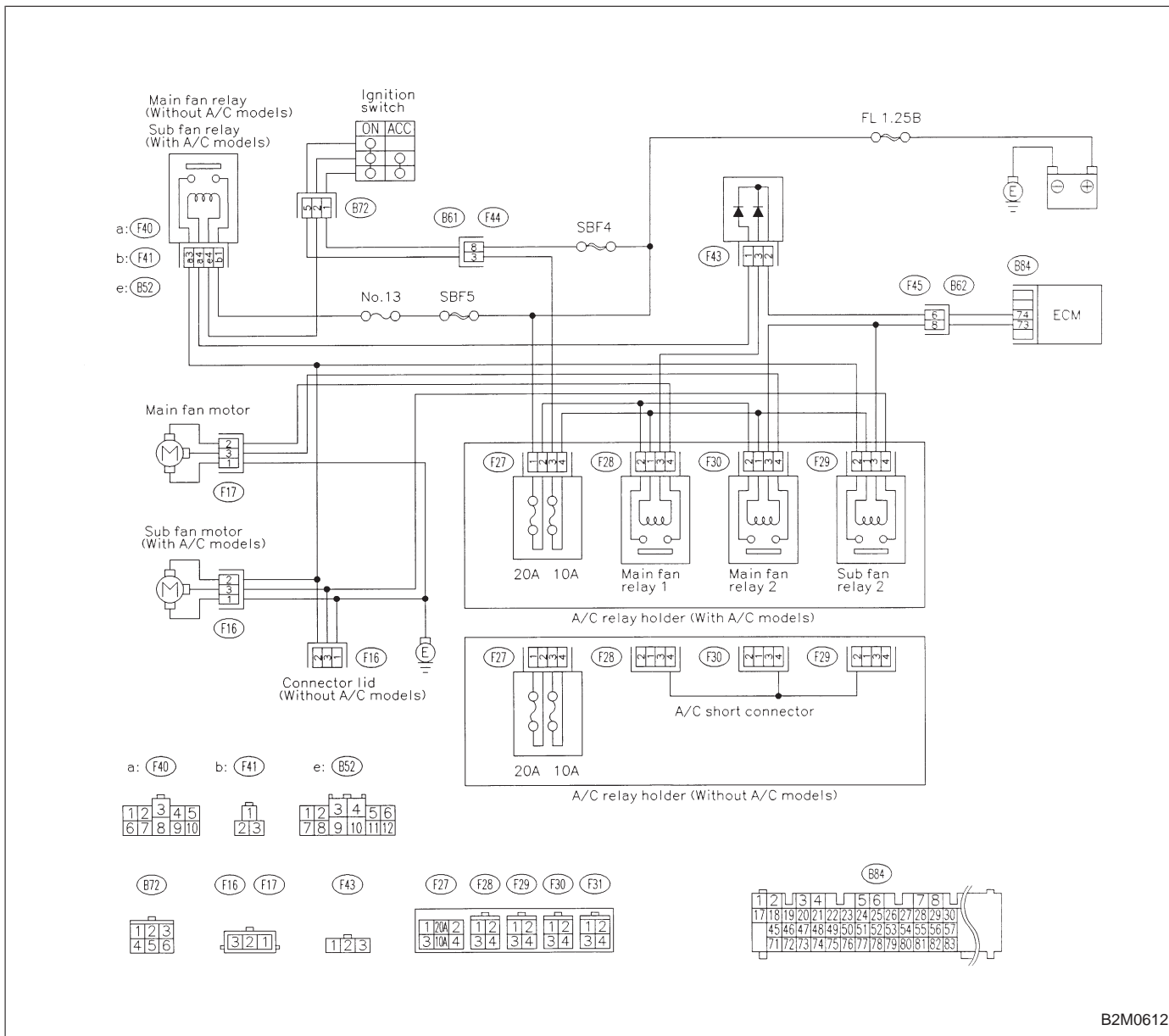
<Ref. to 2-7 [T3D0] and [T3E0].>

**NOTE:**

If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

WIRING DIAGRAM:

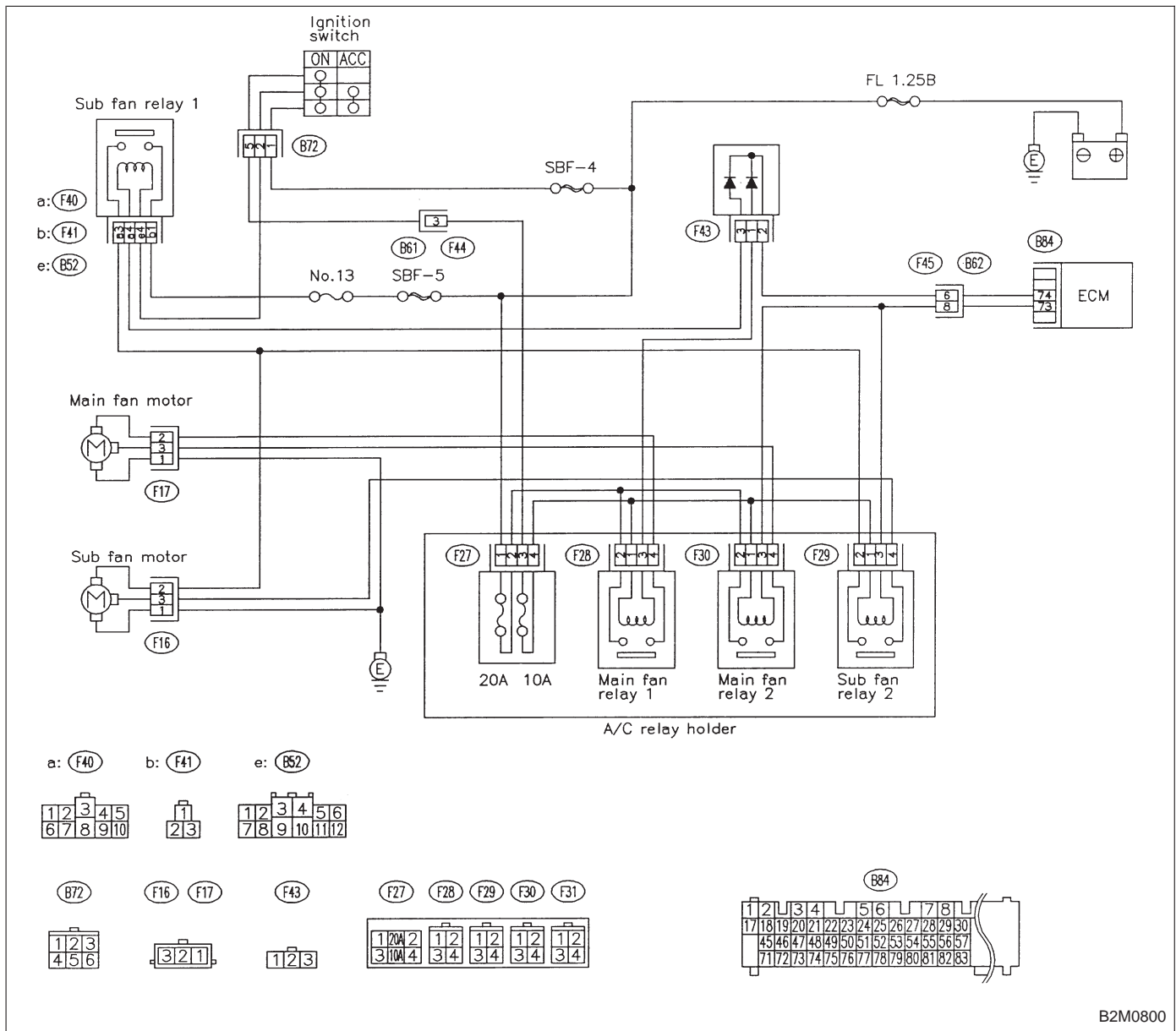
● LHD Model



B2M0612

WIRING DIAGRAM:

● RHD Model



B2M0800

10BR1

**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, 2-7 [T1000]".
- NO** : Check engine cooling system. <Ref. to 2-5 [K100].>

OBD	(FB1)
P1700	<ATTH>
OBD0501	

**BS: DTC P1700**  
**— THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION (ATTH) —**

**DTC DETECTING CONDITION:**

- Two consecutive trips 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”

**10BS1** Check DTC P1700 on display.

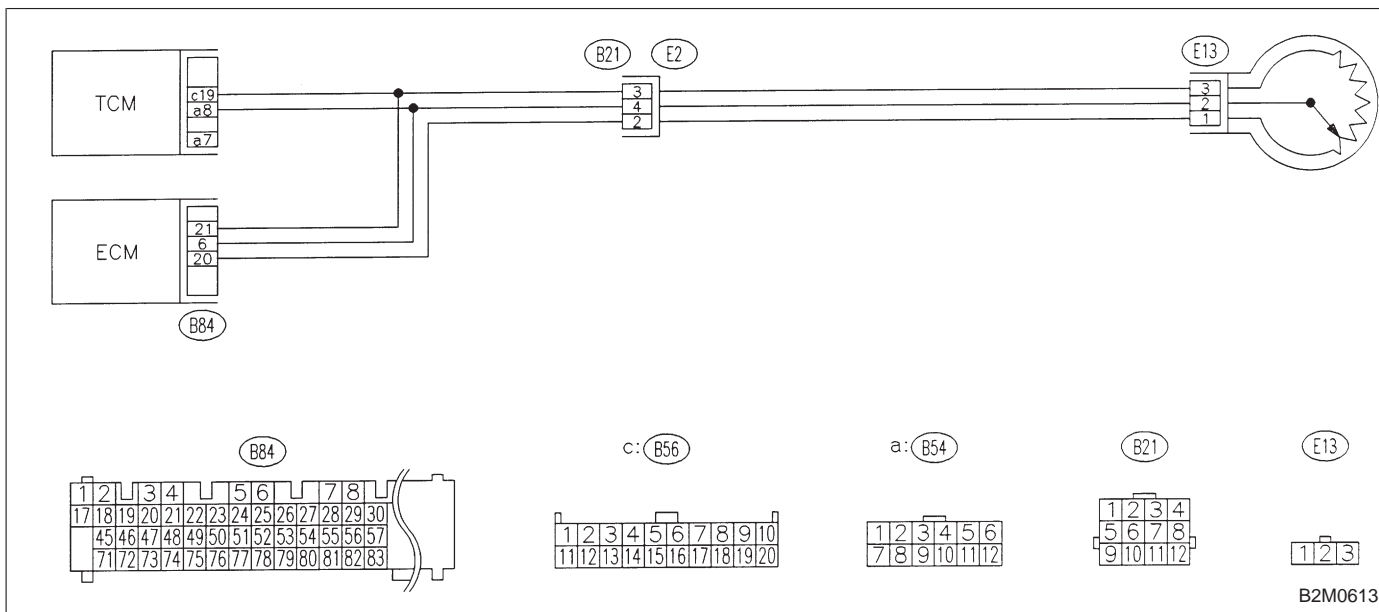


Check throttle position sensor circuit. <Ref. to 3-2 [T7K0].>

**CAUTION:**

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

**WIRING DIAGRAM:**



**10BS1** 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.

**NOTE:**

For the diagnostic procedure on throttle position sensor circuit, refer to 3-2 [T7K0].

OBD (FB1)  
 P1701 <ATCRS>  
 B2M0669

**BT: DTC P1701**  
**— CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION (ATCRS) —**

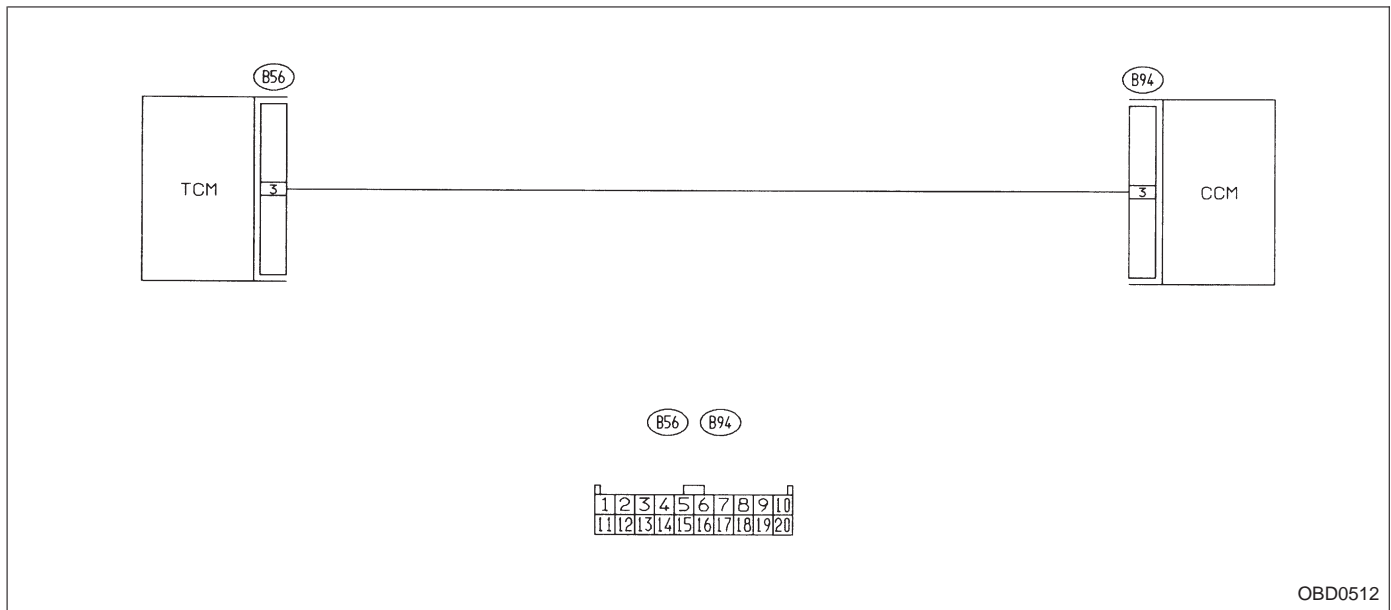
**DTC DETECTING CONDITION:**  
 ● Two consecutive trips with fault

**10BT1** Check harness between TCM and CCM connector.

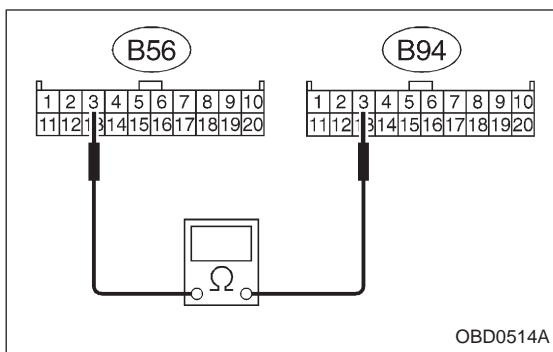
**10BT2** Check input signal for TCM.

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

**WIRING DIAGRAM:**



OBD0512



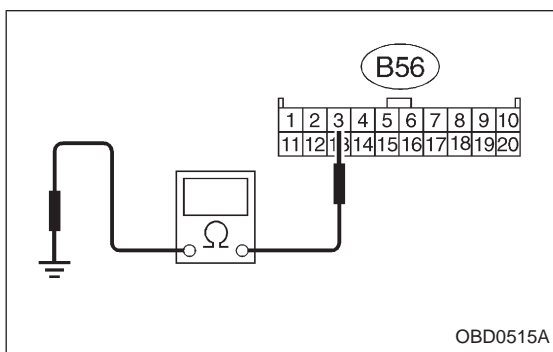
**10BT1 CHECK HARNESS BETWEEN TCM AND CCM CONNECTOR.**

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

**CHECK** : *Connector & terminal (B56) No. 3 — (B94) No. 3: Is the resistance less than 1 Ω?*

**YES** : Go to next step 4).

**NO** : Repair open circuit in harness between TCM and CCM connector.

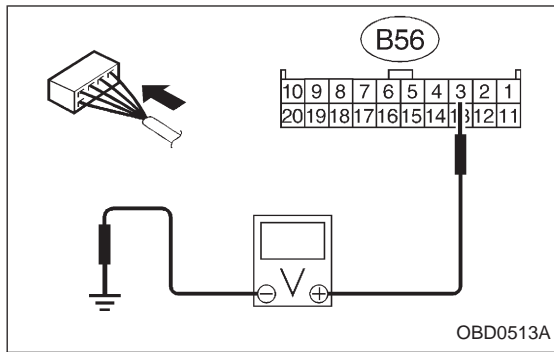


- 4) Measure resistance of harness between TCM and chassis ground.

**CHECK** : *Connector & terminal (B56) No. 3 — Chassis ground: Is the resistance less than 10 Ω?*

**YES** : Repair short circuit in harness between TCM and CCM connector.

**NO** : Go to step **10BT2**.

**10BT2 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.

**CHECK** : **Connector & terminal (B56) No. 3 (+) — Chassis ground (-): Is the voltage less than 1 V?**

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

**NO** : Check cruise control set circuit. <Ref. to 6-2 [T7A0].>

**CHECK** : **Is there poor contact in TCM connector?**

**YES** : Repair poor contact in TCM connector.

**NO** : Replace TCM.

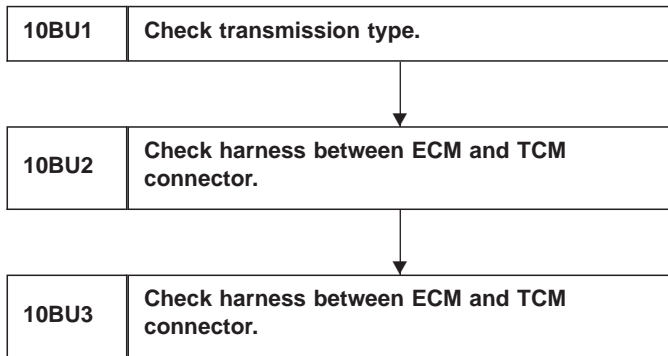
OBD (FB1)

P1702 <ATDIAG>

OBD0516

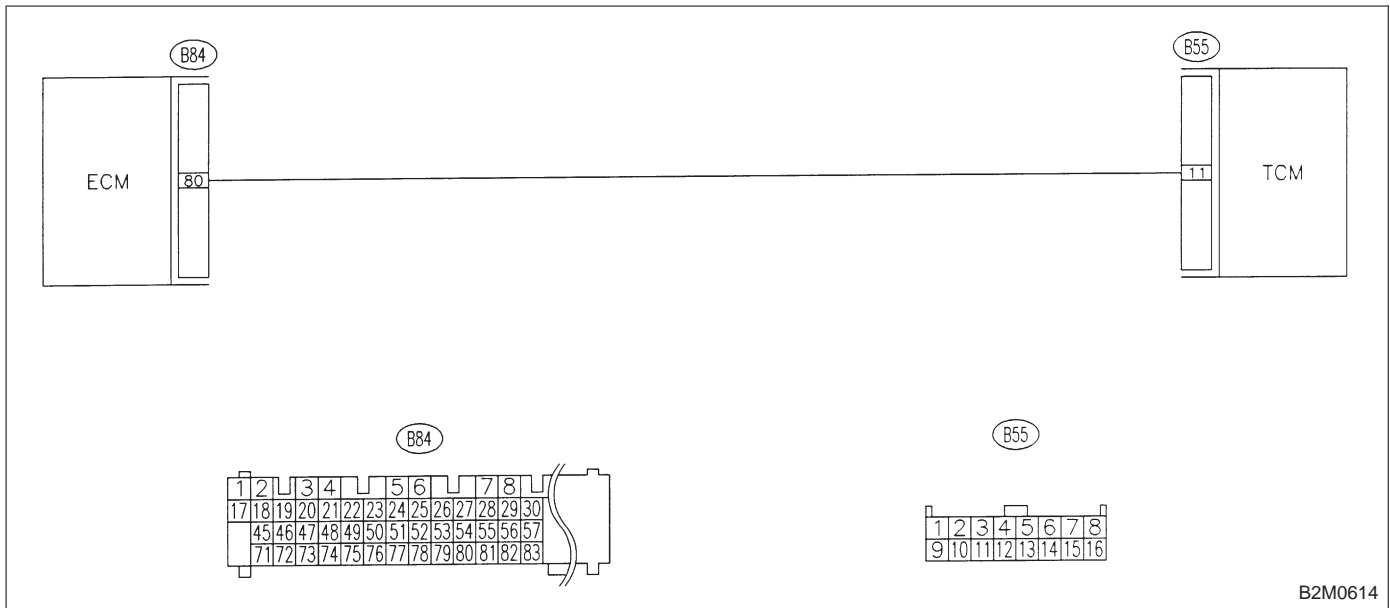
**BU: DTC P1702**  
**— AUTOMATIC TRANSMISSION DIAGNOSIS**  
**INPUT SIGNAL CIRCUIT MALFUNCTION**  
**(ATDIAG) —**

- DTC DETECTING CONDITION:**
- Two consecutive trips with fault



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

**WIRING DIAGRAM:**

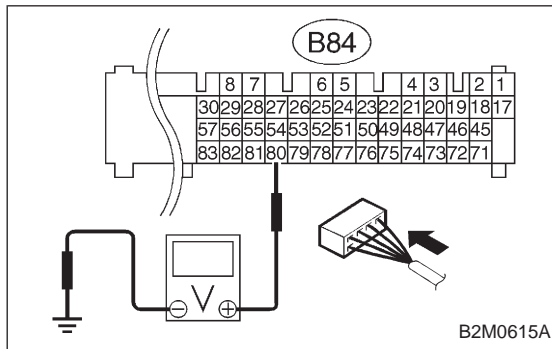


B2M0614



<b>10BU1</b>	<b>CHECK TRANSMISSION TYPE.</b>
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- CHECK** : *Is transmission type AT?*
- YES** : Go to step 10BU2.
- NO** : Check AT/MT identification circuit. <Ref. to 2-7 [T10BW0].>



<b>10BU2</b>	<b>CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.</b>
--------------	---

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

**CHECK** : **Connector & terminal (B84) No. 80 (+) — Chassis ground (-): Is the voltage more than 4 V?**

**YES** : Repair harness and connector.

**NOTE:**

In this case, repair the following:

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

**NO** : Go to next **CHECK** .

**CHECK** : **Connector & terminal (B84) No. 80 (+) — Chassis ground (-): Is the voltage less than 1 V?**

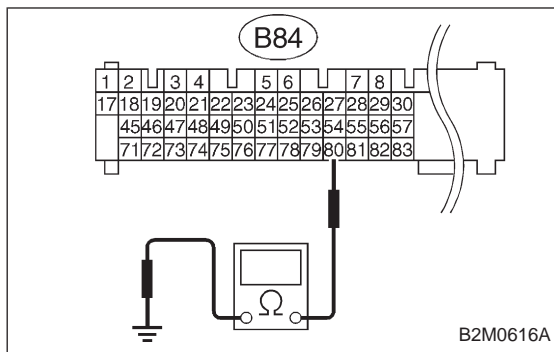
**YES** : Go to step 10BU3.

**NO** : Although MIL illuminates, circuit is now normal.

**NOTE:**

In this case, repair the following:

- Poor contact in ECM connector
- Poor contact in TCM connector

**10BU3****CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.**

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

**CHECK**: **Connector & terminal****(B84) No. 80 — Chassis ground:****Is the resistance less than 10 Ω?****YES**

: Repair short circuit in harness between ECM and TCM connector.

**NO**

: Repair poor contact in ECM connector.

OBD (FB1)

EXERR22

B2M0947

**BV: DTC P0461**  
**— FUEL LEVEL SENSOR CIRCUIT RANGE/ PERFORMANCE PROBLEM (EXERR22) —**

**DTC DETECTING CONDITION:**

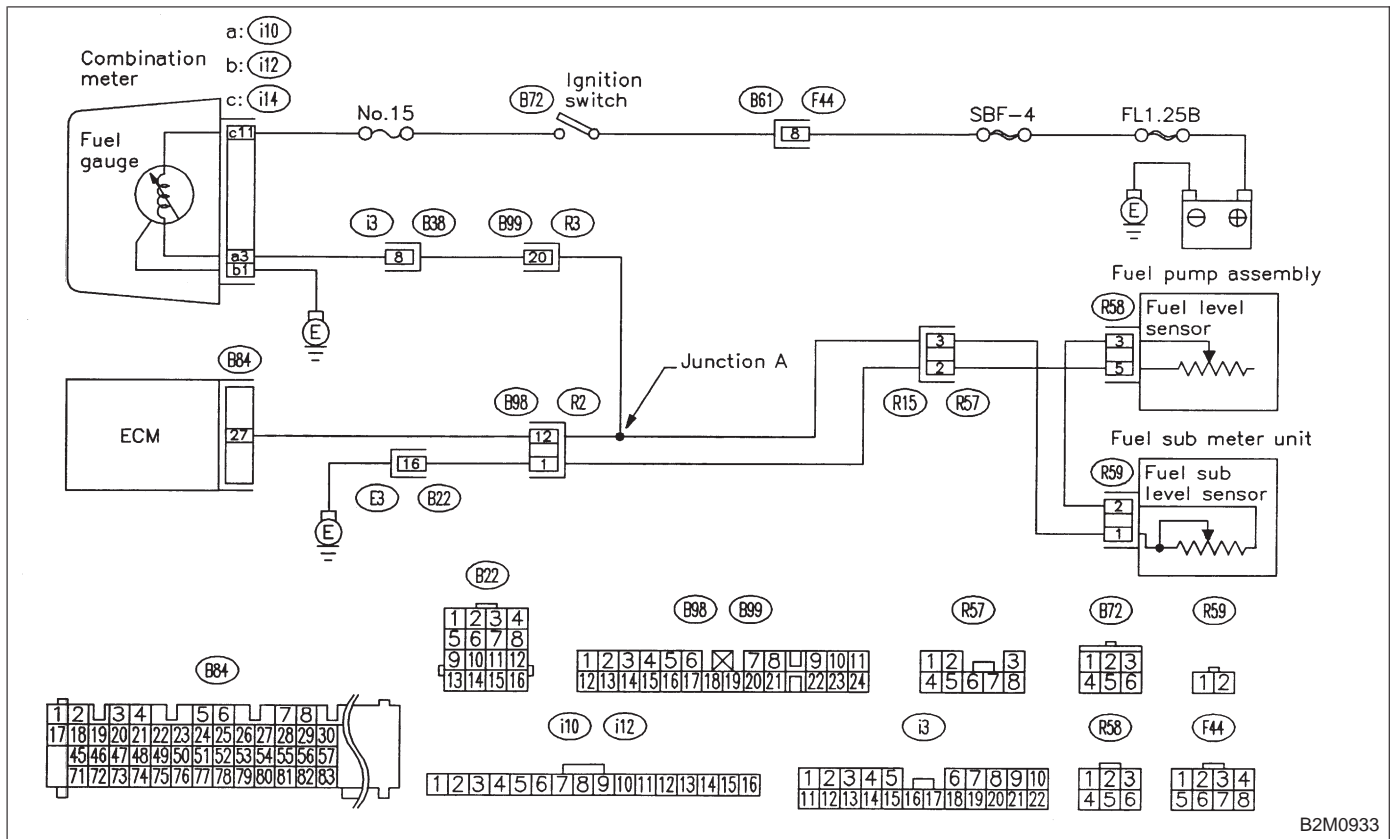
- Two consecutive trips with fault

<b>10BV1</b>	Check DTC P1402 on display.
--------------	-----------------------------

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

**WIRING DIAGRAM:**

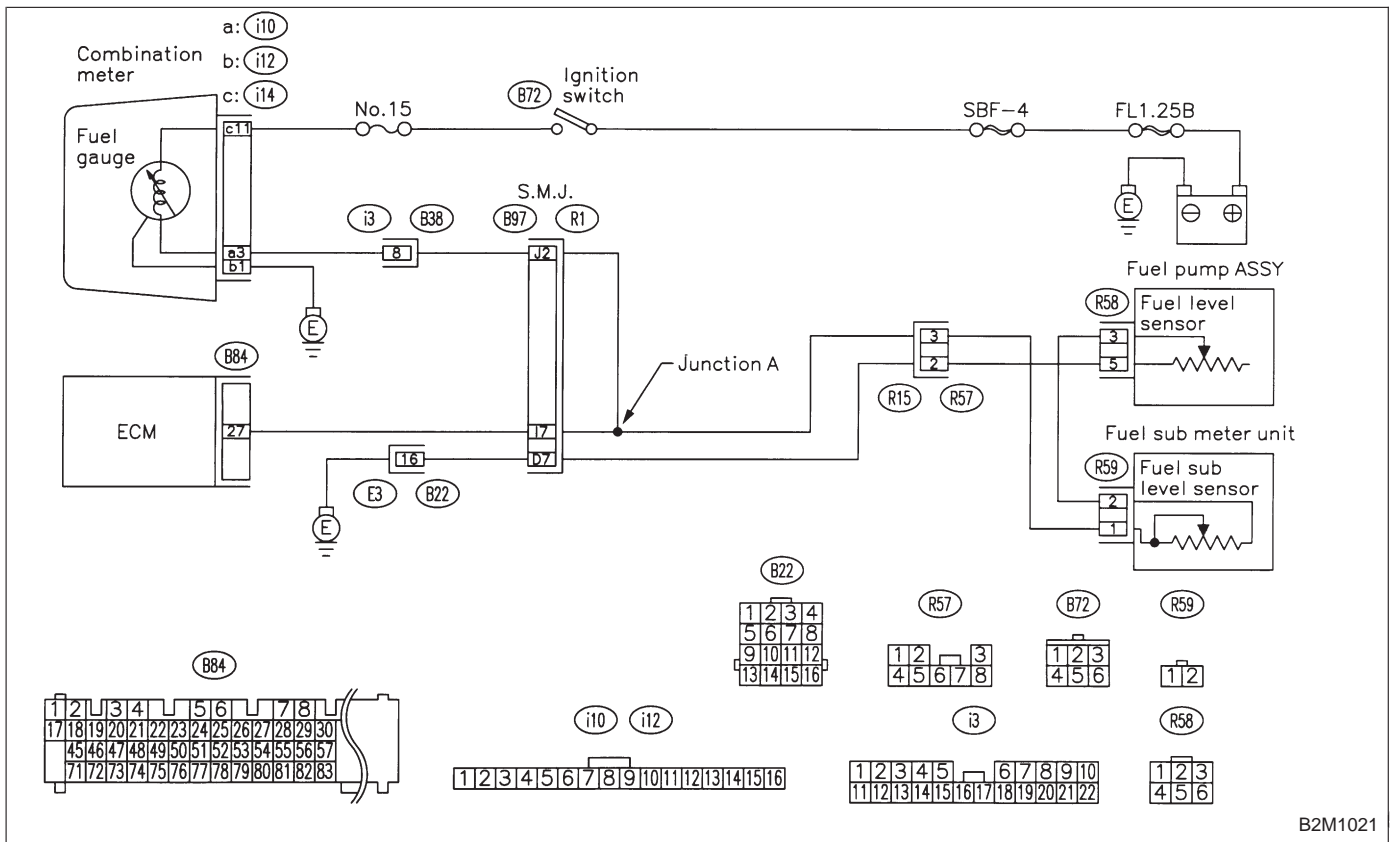
- LHD Model



B2M0933

WIRING DIAGRAM:

- RHD Model



B2M1021

**10BV1** CHECK DTC P1402 ON DISPLAY.

**CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P1402?

**YES** : Inspect DTC P1402 using "10. Diagnostics Chart with Trouble Code 2-7 [T1000]".

**NOTE:**  
In this case, it is not necessary to inspect this trouble.

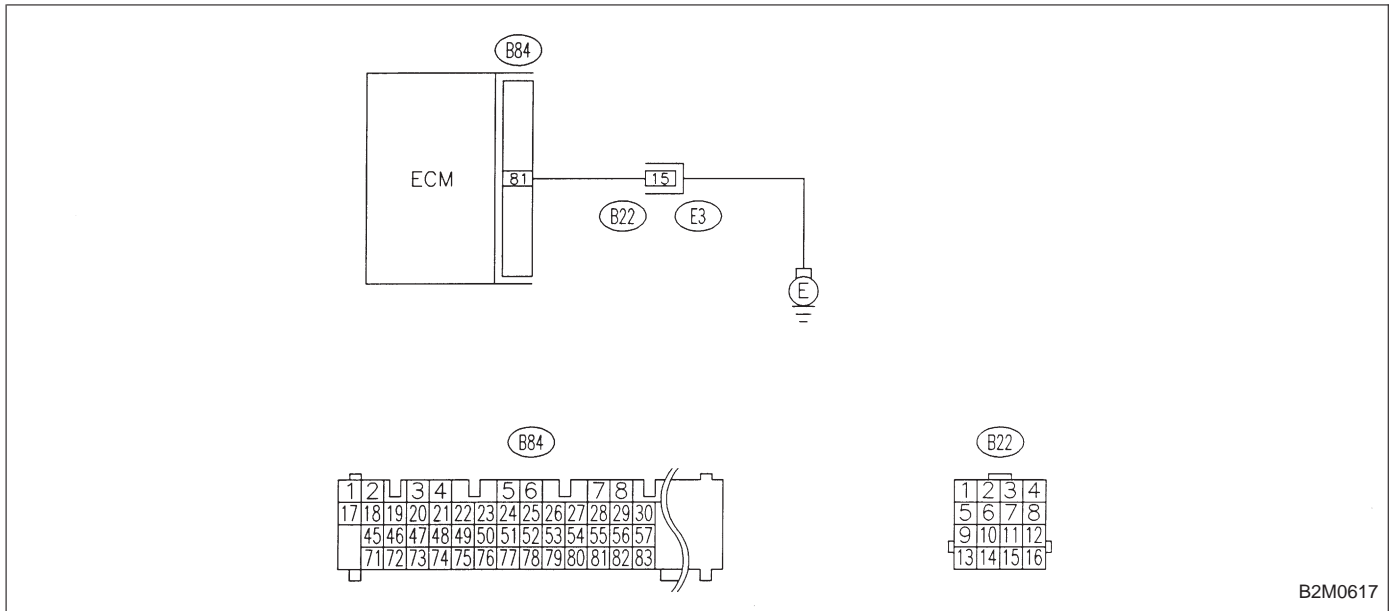
**NO** : Replace fuel sending unit and fuel sub meter unit.

**BW: — AT/MT IDENTIFICATION CIRCUIT  
MALFUNCTION [MT VEHICLES] —**

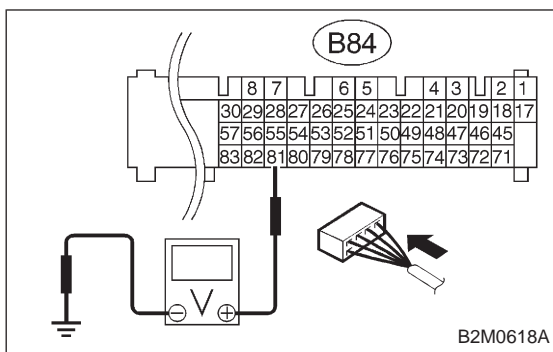
<b>10BW1</b>	<b>Check harness between ECM connector and engine grounding terminal.</b>
--------------	---

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

**WIRING DIAGRAM:**



B2M0617



**10BW1 CHECK HARNESS BETWEEN ECM CONNECTOR AND ENGINE GROUNDING TERMINAL.**

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

**CHECK** : **Connector & terminal (B84) No. 81 (+) — Chassis ground (-): 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 next **CHECK** .

**CHECK** : **Is there poor contact in ECM connector?**

**YES** : Repair poor contact in ECM connector.

**NO** : Contact with SOA service.

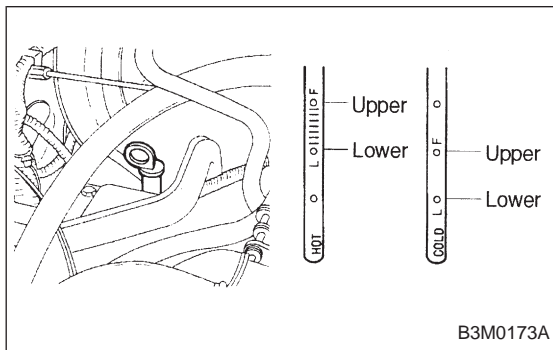
**NOTE:**

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

## 1. Supplemental Restraint System "Airbag"

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

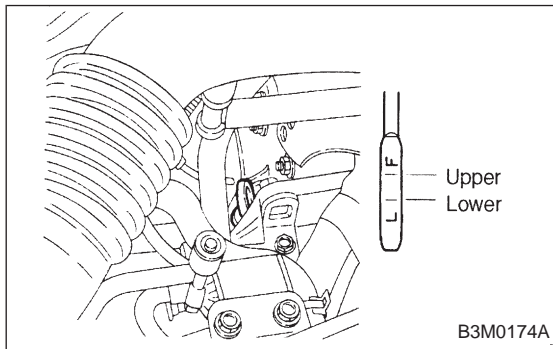
- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when performing diagnostics and servicing the TCM.



## 2. Pre-inspection

### 1. ATF LEVEL

Make sure that ATF level is in the specification.



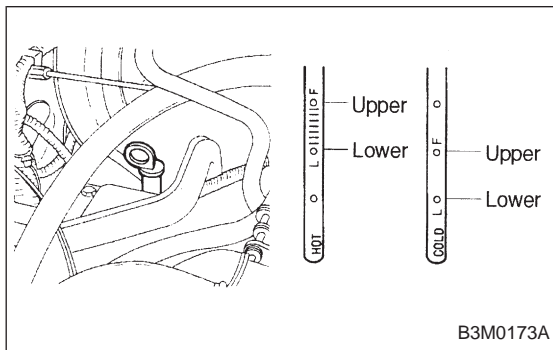
### 2. FRONT DIFFERENTIAL OIL LEVEL

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

## 1. Supplemental Restraint System "Airbag"

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

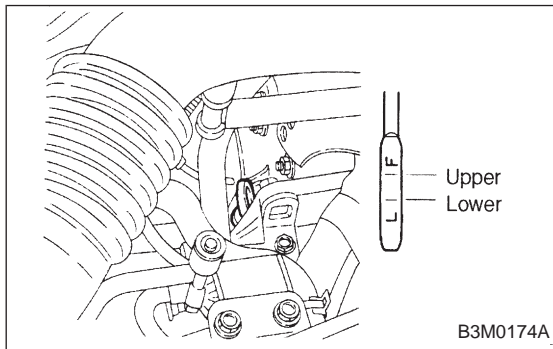
- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuit.
- Be careful not to damage Airbag system wiring harness when performing diagnostics and servicing the TCM.



## 2. Pre-inspection

### 1. ATF LEVEL

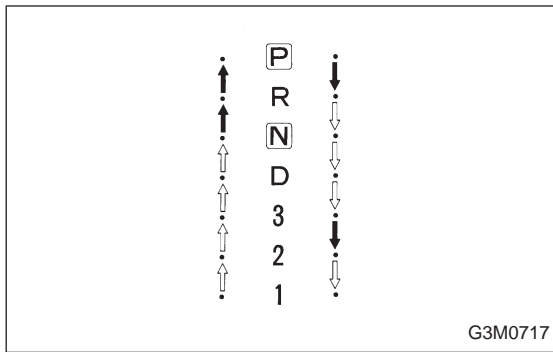
Make sure that ATF level is in the specification.



### 2. FRONT DIFFERENTIAL OIL LEVEL

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





**3. OPERATION OF SHIFT SELECTOR LEVER**

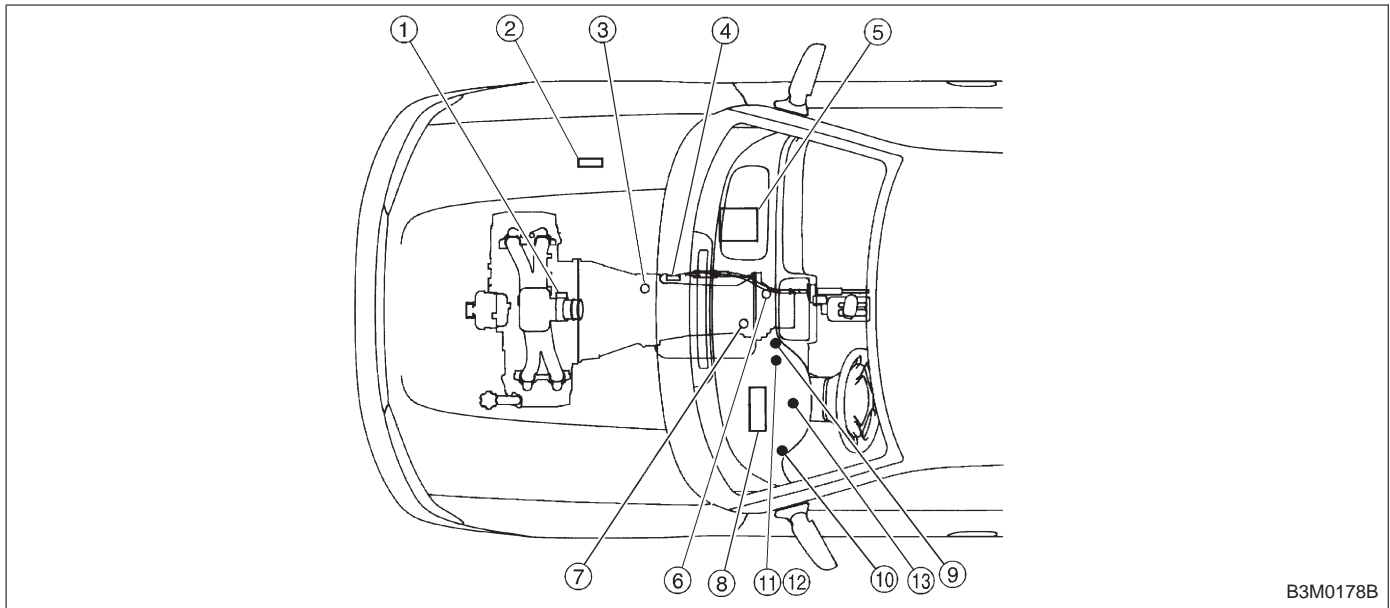
**WARNING:**

**Stop the engine while checking operation of selector lever.**

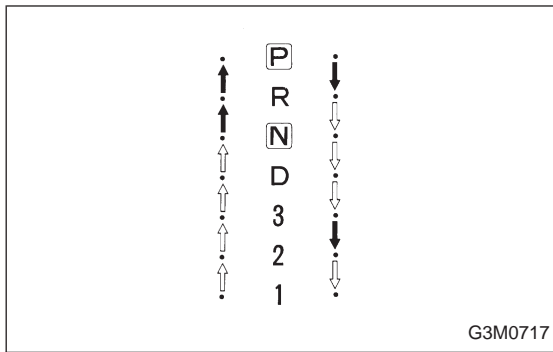
- 1) Check that selector lever does not move from “N” to “R” without pushing the button.
- 2) Check that selector lever does not move from “R” to “P” without pushing the button.
- 3) Check that selector lever does not move from “P” to “R” without pushing the button.
- 4) Check that selector lever does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

**3. Electrical Components Location**

**1. SENSOR AND CONTROL MODULE**



- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>① Throttle position sensor</li> <li>② Dropping resistor</li> <li>③ Vehicle speed sensor 2</li> <li>④ Inhibitor switch</li> <li>⑤ ECM</li> <li>⑥ Vehicle speed sensor 1 (AWD)</li> <li>⑦ Vehicle speed sensor 1 (FWD)</li> <li>⑧ TCM</li> </ul> | <ul style="list-style-type: none"> <li>⑨ Data link connector (for Subaru select monitor only)</li> <li>⑩ Data link connector (for Subaru select monitor and OBD-II general scan tool)</li> <li>⑪ Diagnosis connector</li> <li>⑫ Diagnosis terminal</li> <li>⑬ AT OIL TEMP indicator light (AT diagnostic indicator light)</li> </ul> |
|---|--|



**3. OPERATION OF SHIFT SELECTOR LEVER**

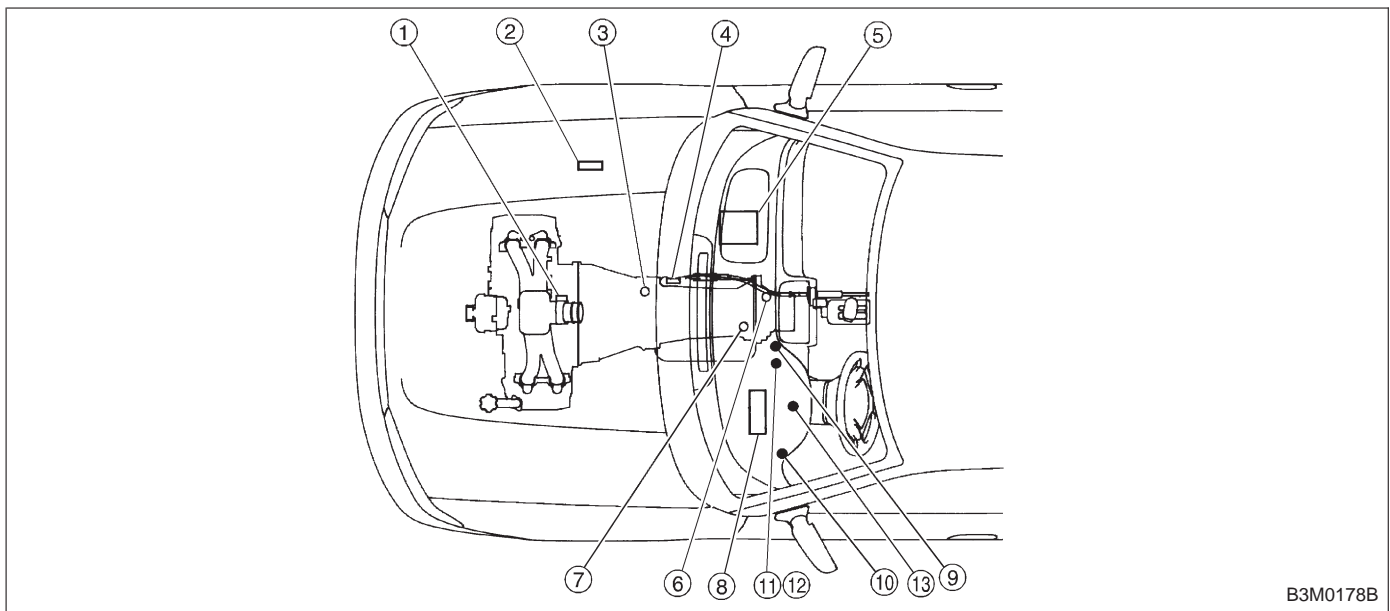
**WARNING:**

**Stop the engine while checking operation of selector lever.**

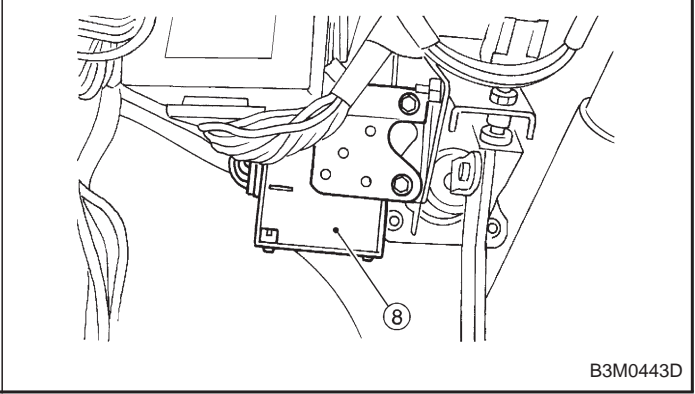
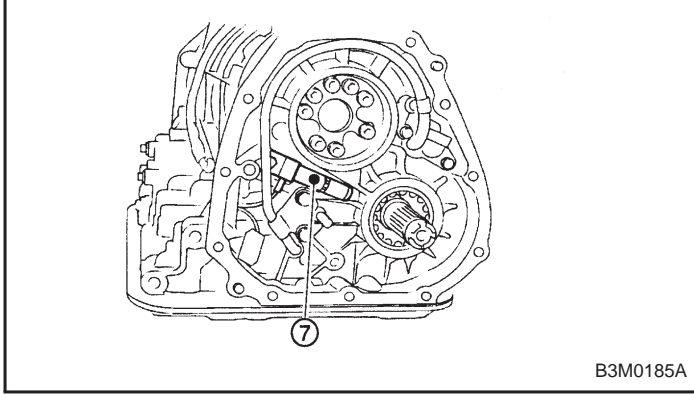
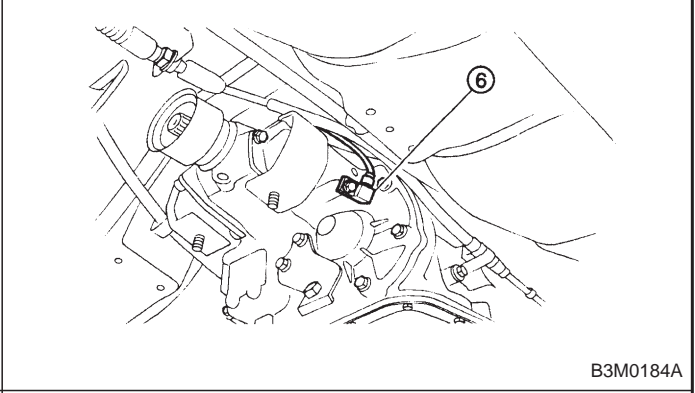
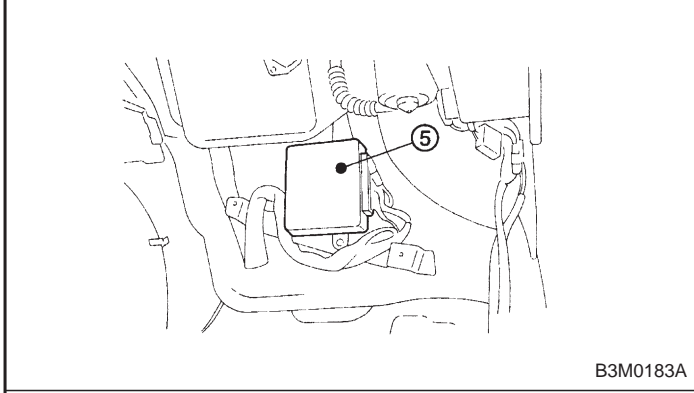
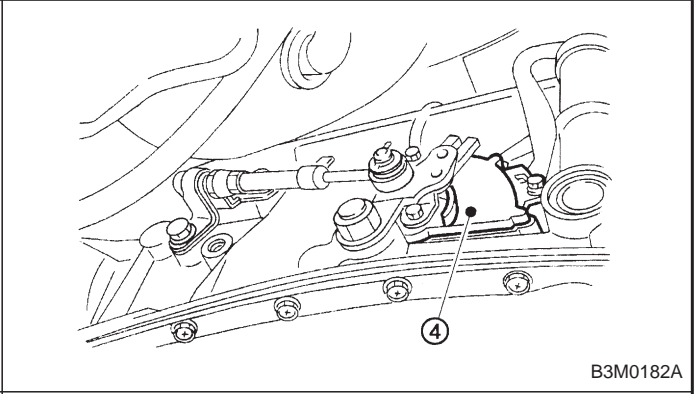
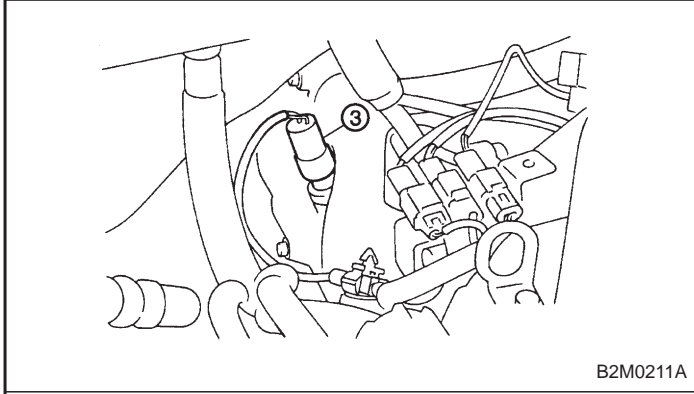
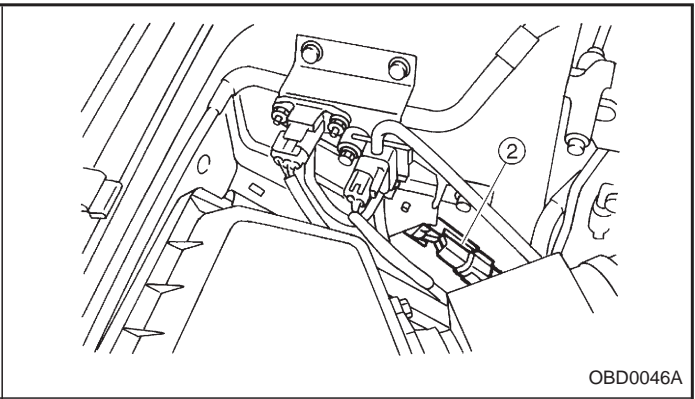
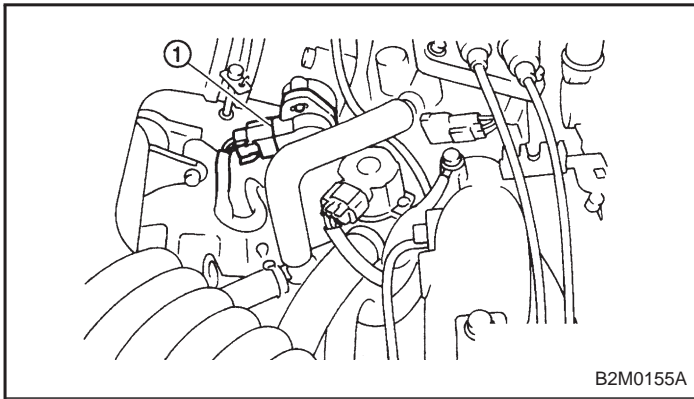
- 1) Check that selector lever does not move from “N” to “R” without pushing the button.
- 2) Check that selector lever does not move from “R” to “P” without pushing the button.
- 3) Check that selector lever does not move from “P” to “R” without pushing the button.
- 4) Check that selector lever does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

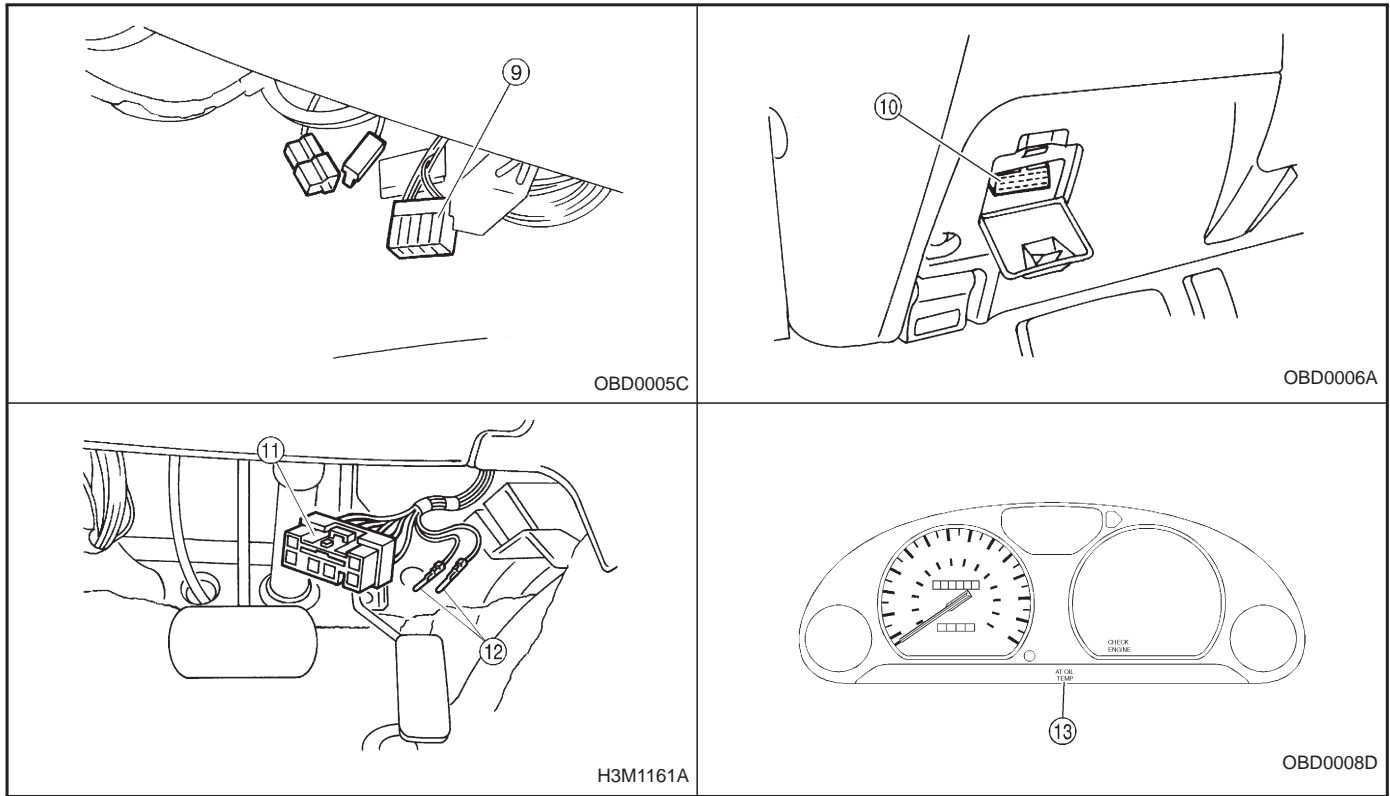
**3. Electrical Components Location**

**1. SENSOR AND CONTROL MODULE**

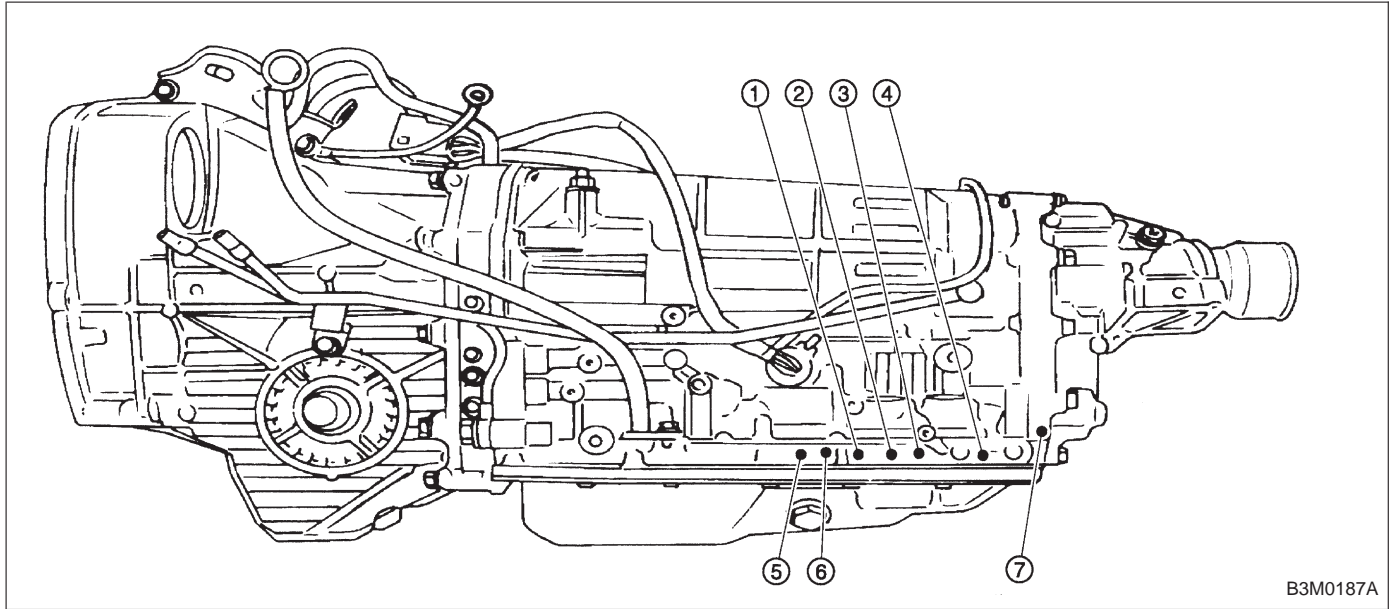


- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>① Throttle position sensor</li> <li>② Dropping resistor</li> <li>③ Vehicle speed sensor 2</li> <li>④ Inhibitor switch</li> <li>⑤ ECM</li> <li>⑥ Vehicle speed sensor 1 (AWD)</li> <li>⑦ Vehicle speed sensor 1 (FWD)</li> <li>⑧ TCM</li> </ul> | <ul style="list-style-type: none"> <li>⑨ Data link connector (for Subaru select monitor only)</li> <li>⑩ Data link connector (for Subaru select monitor and OBD-II general scan tool)</li> <li>⑪ Diagnosis connector</li> <li>⑫ Diagnosis terminal</li> <li>⑬ AT OIL TEMP indicator light (AT diagnostic indicator light)</li> </ul> |
|---|--|



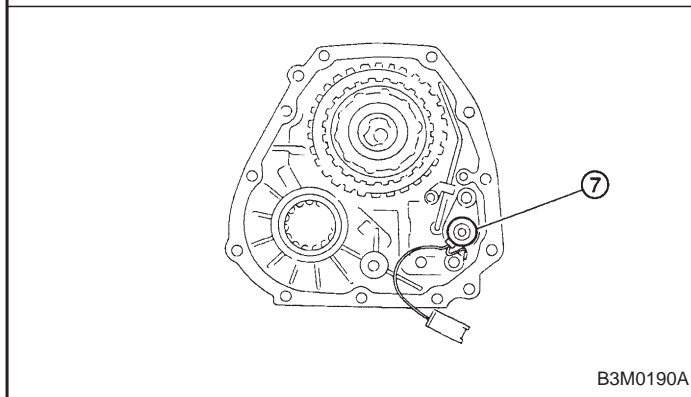
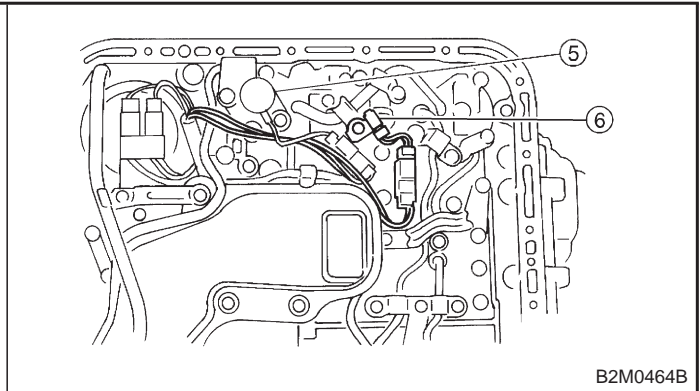
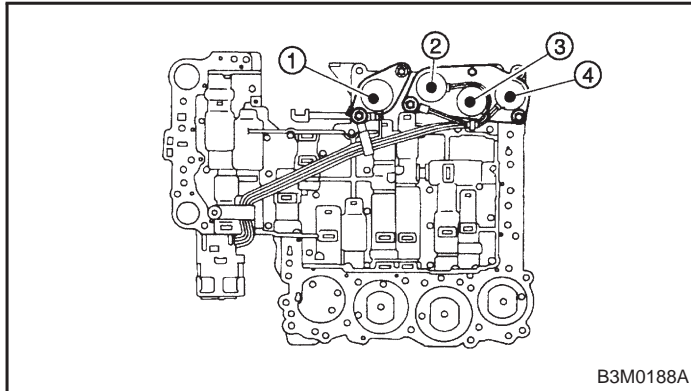


**2. SOLENOID**



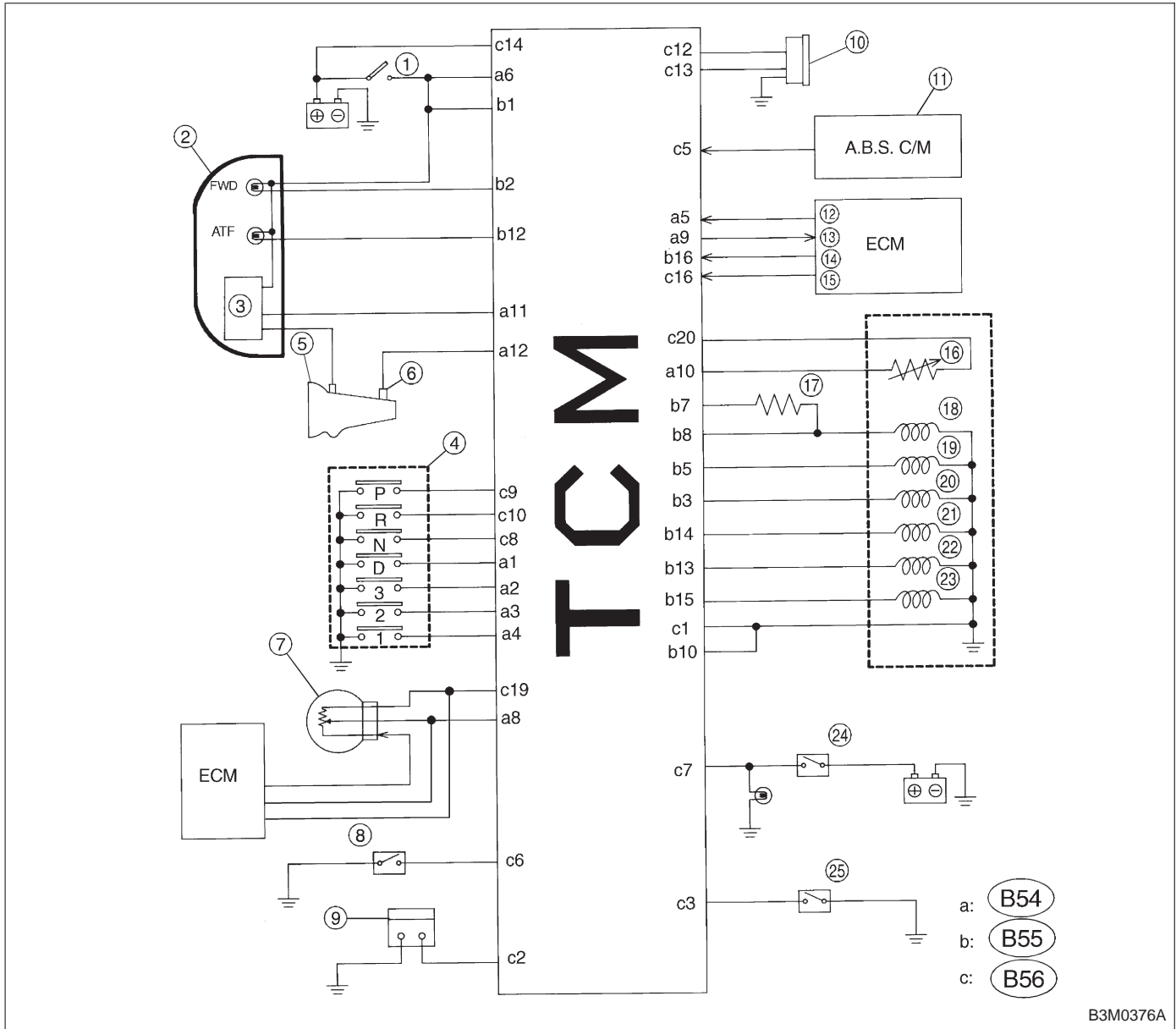
- ① Duty solenoid A
- ② Solenoid 2
- ③ Solenoid 1
- ④ Solenoid 3

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



**SUBARU.**

4. Schematic

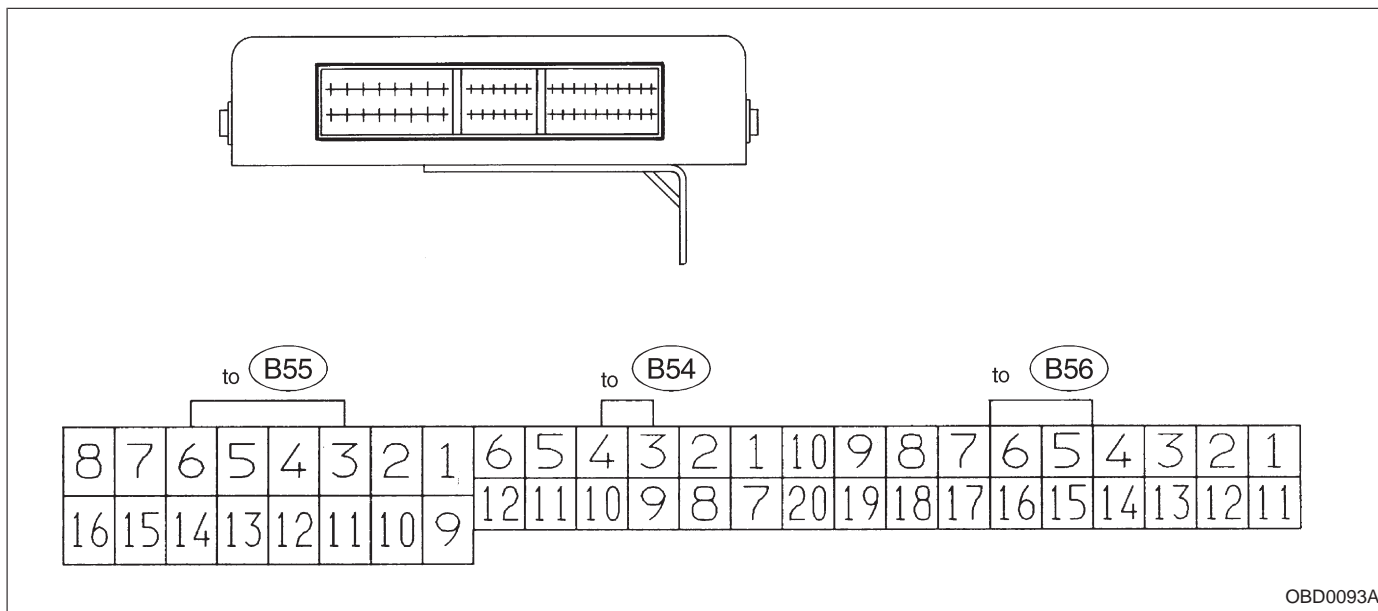


- ① Ignition switch
- ② Combination meter
- ③ Speedometer circuit
- ④ Inhibitor switch
- ⑤ Vehicle speed sensor 2
- ⑥ Vehicle speed sensor 1
- ⑦ Throttle position sensor
- ⑧ Diagnosis switch
- ⑨ FWD switch (AWD)

- ⑩ Data link connector
- ⑪ ABS control module
- ⑫ Engine speed signal
- ⑬ Torque control signal
- ⑭ Mass air flow signal
- ⑮ ATF temperature sensor
- ⑯ Dropping resistor

- ⑰ Duty solenoid A
- ⑱ Duty solenoid B
- ⑲ Duty solenoid C (AWD)
- ⑳ Shift solenoid 1
- ㉑ Shift solenoid 2
- ㉒ Shift solenoid 3
- ㉓ Brake switch
- ㉔ Cruise set switch

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



**Check with ignition switch ON.**

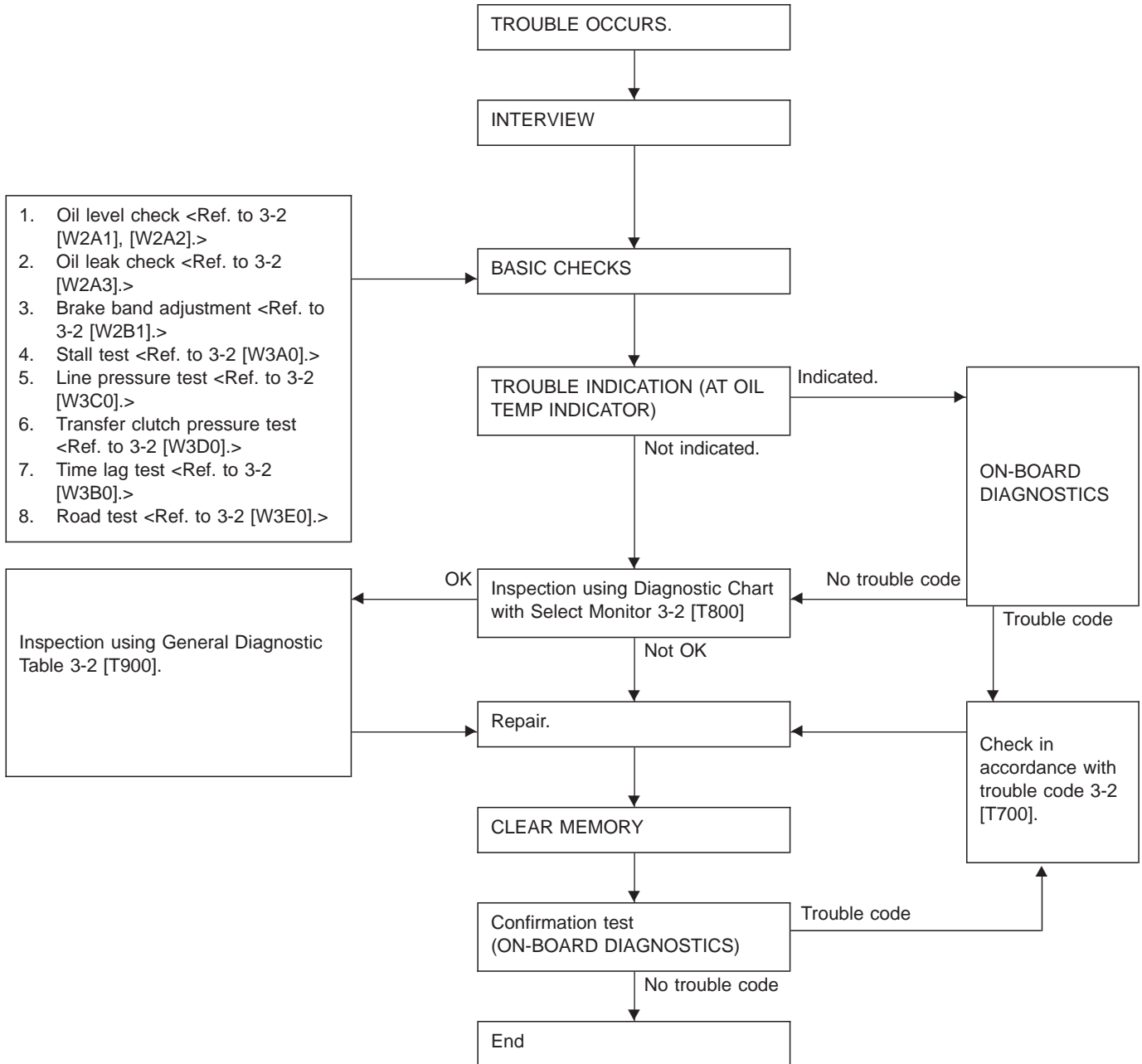
Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B56	14	Ignition switch OFF	10 — 16
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16
		B55	1		
Inhibitor switch	"P" range switch	B56	9	Select lever in "P" range	Less than 1
				Select lever 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	12	Ignition switch ON (With engine OFF)	Less than 1
				Ignition switch ON (With engine ON)	More than 10

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B54	8	Throttle fully closed.	0.5±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	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	5±1	—
Torque control cut signal	B56	16	Ignition switch ON	6 — 9	—
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 (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	



## 6. Diagnostic Chart for On-board Diagnostic System

### A: BASIC DIAGNOSTICS PROCEDURE



**B: ABNORMAL DISPLAY ON AT OIL TEMP INDICATOR**

When any on-board diagnostic item is malfunctioning, the display on the AT OIL TEMP indicator blinks immediately after the engine starts.

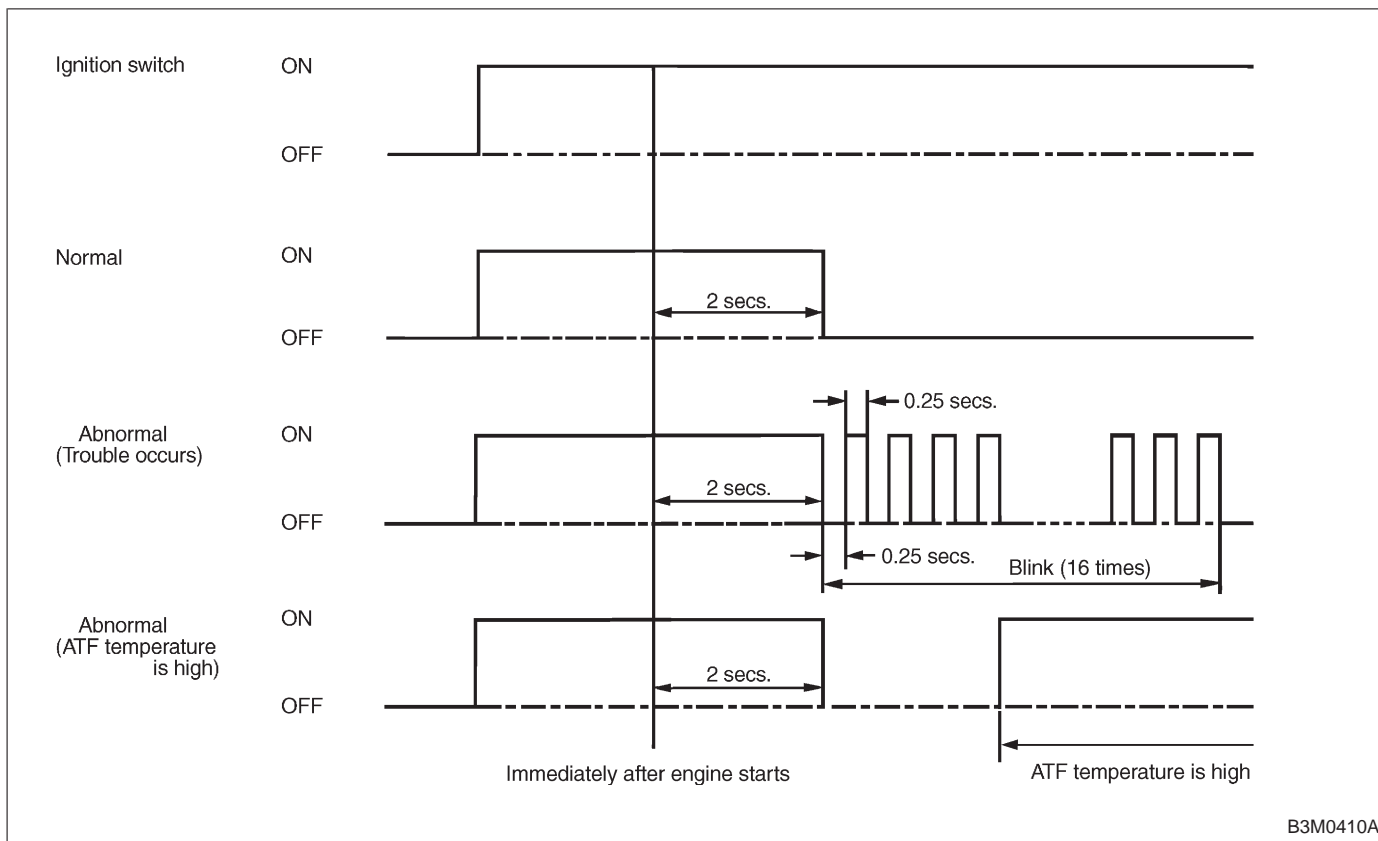
The malfunctioning part or unit can be determined by a trouble code during on-board diagnostic operation. Problems which occurred previously can also be identified through the memory function.

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.

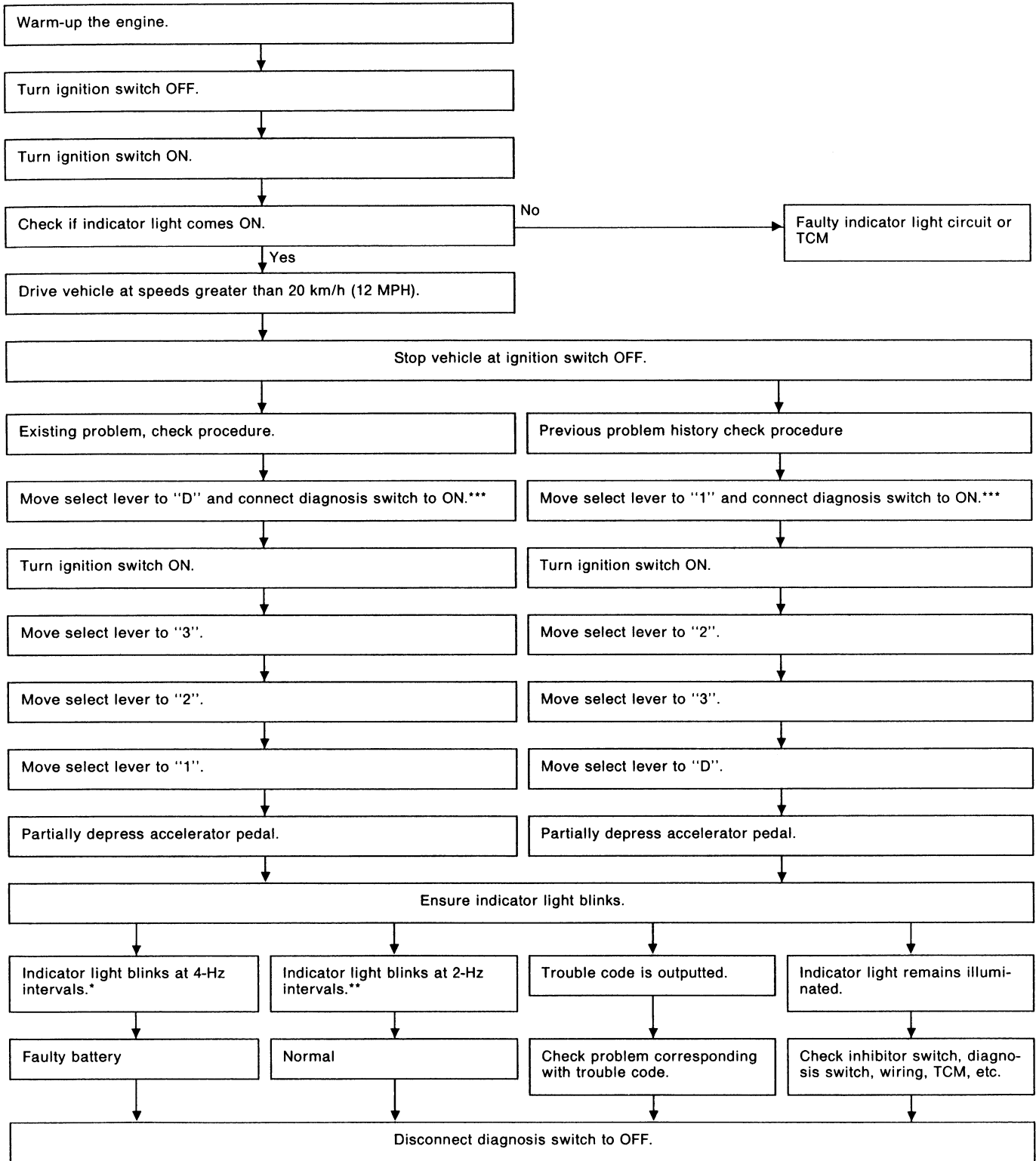
**WARNING:**

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



B3M0410A

**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.

**D: LIST OF TROUBLE CODE**

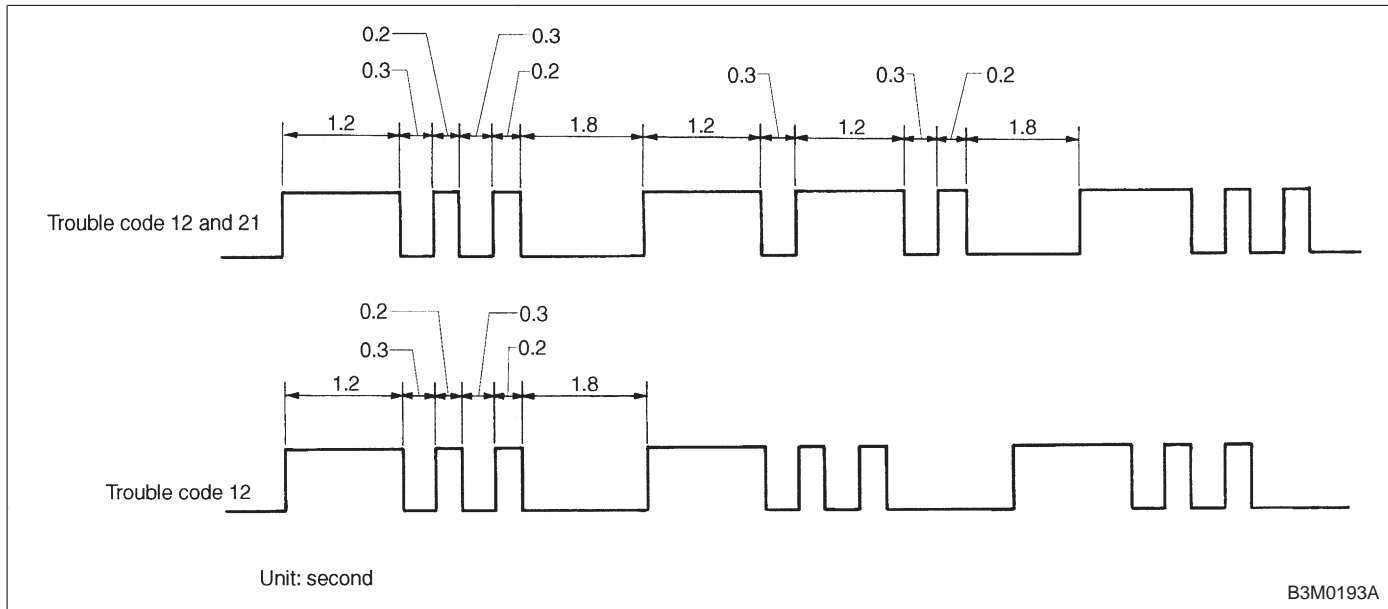
**1. TROUBLE CODE**

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.	PLDTY	15
12	Duty solenoid B	Detects open or shorted drive circuit, as well as valve seizure.	LUPTY	19
13	Shift solenoid 3	Detects open or shorted drive circuit, as well as valve seizure.	OVR	23
14	Shift solenoid 2	Detects open or shorted drive circuit, as well as valve seizure.	SFT2	25
15	Shift solenoid 1	Detects open or shorted drive circuit, as well as valve seizure.	SFT1	27
21	ATF temperature sensor	Detects open or shorted input signal circuit.	ATFT	29
22	Mass air flow signal	Detects open or shorted input signal circuit.	AFM	32
23	Engine speed signal	Detects open or shorted input signal circuit.	EREV	34
24	Duty solenoid C	Detects open or shorted drive circuit, as well as valve seizure.	4WPTY	36
25	Torque control signal	Detects open or shorted input signal circuit.	TQ.CT	38
31	Throttle position sensor	Detects open or shorted input signal circuit.	THV	40
32	Vehicle speed sensor 1	Detects open or shorted input signal circuit.	VSP1	43
33	Vehicle speed sensor 2	Detects open or shorted input signal circuit.	VSP2	47

## 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".



## E: CLEAR MEMORY

Current trouble codes shown on the display are cleared by turning the ignition switch OFF after conducting on-board diagnostic 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 ABS/TCS control module. Removal of this fuse clears the previous trouble codes stored in the TCM and ABS/TCS control module memory.
- Be sure to remove the No. 14 fuse for at least the specified length of time. Otherwise, trouble codes may not be cleared.

### 7. Diagnostic Chart with Trouble Code

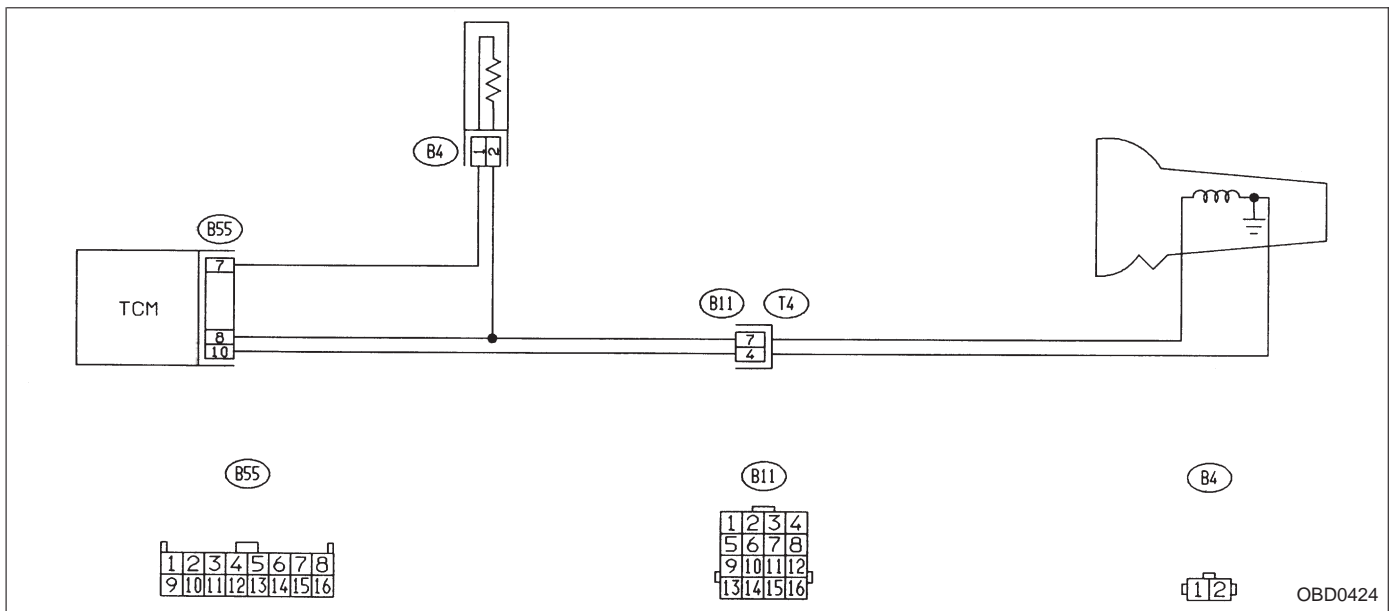
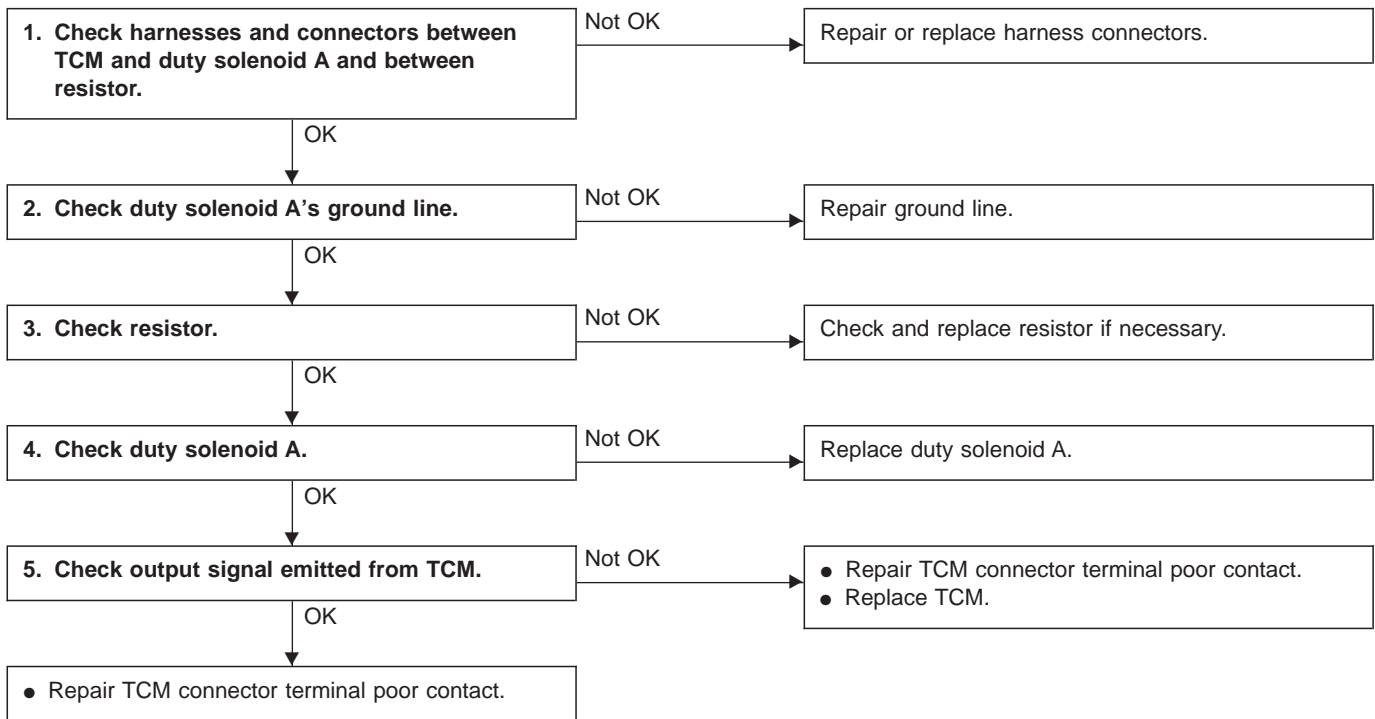
#### A: TROUBLE CODE 11 — DUTY SOLENOID A —

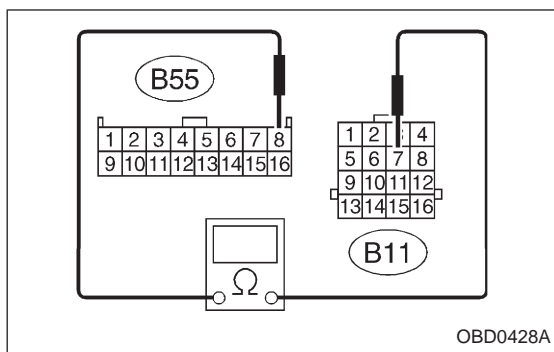
**DIAGNOSIS:**

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

**TROUBLE SYMPTOM:**

Excessive shift shock

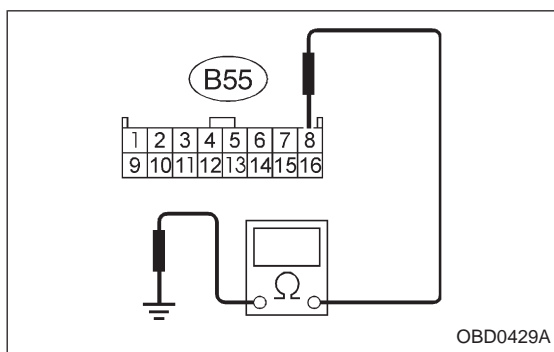




**1. CHECK HARNESSES AND CONNECTORS BETWEEN TCM AND DUTY SOLENOID A AND BETWEEN RESISTOR.**

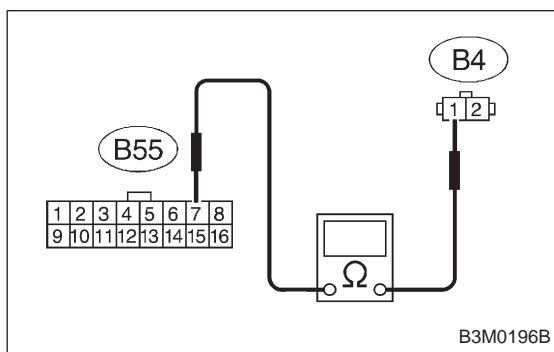
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM, transmission and resistor.
- 3) Measure resistance of harness connector between TCM and transmission.

**Connector & terminal / Specified resistance:**  
**(B55) No. 8 — (B11) No. 7 / 1 Ω, or less**



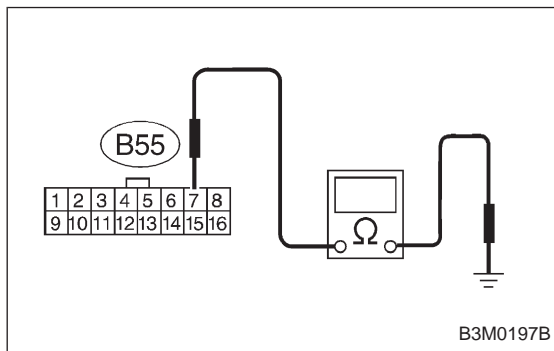
- 4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

**Connector & terminal / Specified resistance:**  
**(B55) No. 8 — Body / 1 MΩ, or more**



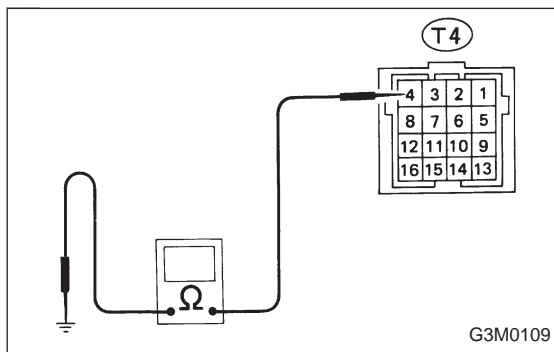
- 5) Measure resistance of harness connector between TCM and resistor connector.

**Connector & terminal / Specified resistance:**  
**(B55) No. 7 — (B4) No. 1 / 1 Ω, or less**



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

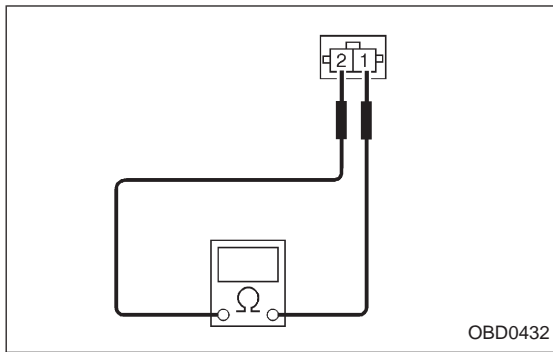
**Connector & terminal / Specified resistance:**  
**(B55) No. 7 — Body / 1 MΩ, or more**



**2. CHECK DUTY SOLENOID A's GROUND LINE.**

Measure resistance between transmission connector receptacle (on transmission) and transmission case.

**Connector & terminal / Specified resistance:**  
**(T4) No. 4 — Transmission / 1 Ω, or less**

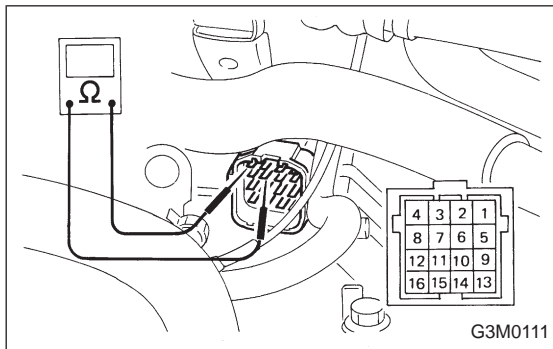


**3. CHECK RESISTOR.**

Measure resistance between resistor terminals.

**Specified resistance:**

**(B4) No. 1 — No. 2 / 9 — 15 Ω**

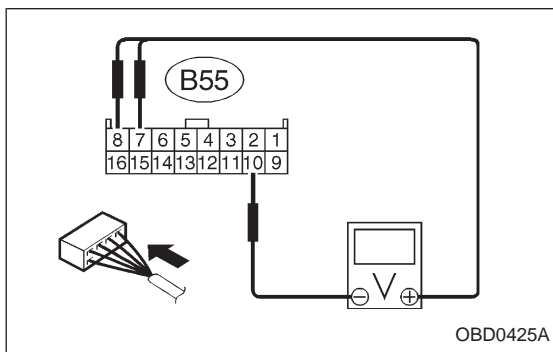


**4. CHECK DUTY SOLENOID A.**

Measure resistance between transmission connector receptacle (on transmission) terminals.

**Connector & terminal / Specified resistance:**

**(T4) No. 7 — No. 4 / 1.5 — 4.5 Ω**



**5. CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

- 1) Connect connectors to TCM, transmission and resistor.
- 2) Start and warm-up the engine and transmission.
- 3) Ignition switch ON (Engine OFF).
- 4) Move selector lever to "N".
- 5) Measure voltage between TCM connector and body while opening and closing throttle position sensor.

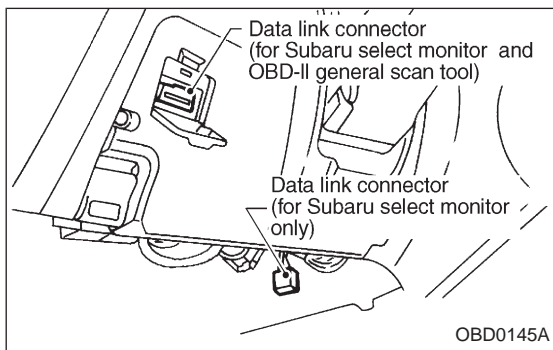
**Connector & terminal / Specified voltage:**

**(B55) No. 8 — No. 10 / 1.5 — 4.0 V (Throttle is fully closed.)**

**(B55) No. 8 — No. 10 / 1 V, or less (Throttle is fully open.)**

**(B55) No. 7 — No. 10 / 5 — 14 V (Throttle is fully closed.)**

**(B55) No. 7 — No. 10 / 1 V, or less (Throttle is fully open.)**



● **Using Subaru select monitor:**

- (1) Connect connectors to TCM, transmission and resistor.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.



PLDTY (F11)

100%

OBD0427

- (5) Start and warm-up the engine and transmission.
- (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****SPECIFIED DATA:**

- 100% (Throttle is fully closed.)
- 15% (Throttle is fully open.)

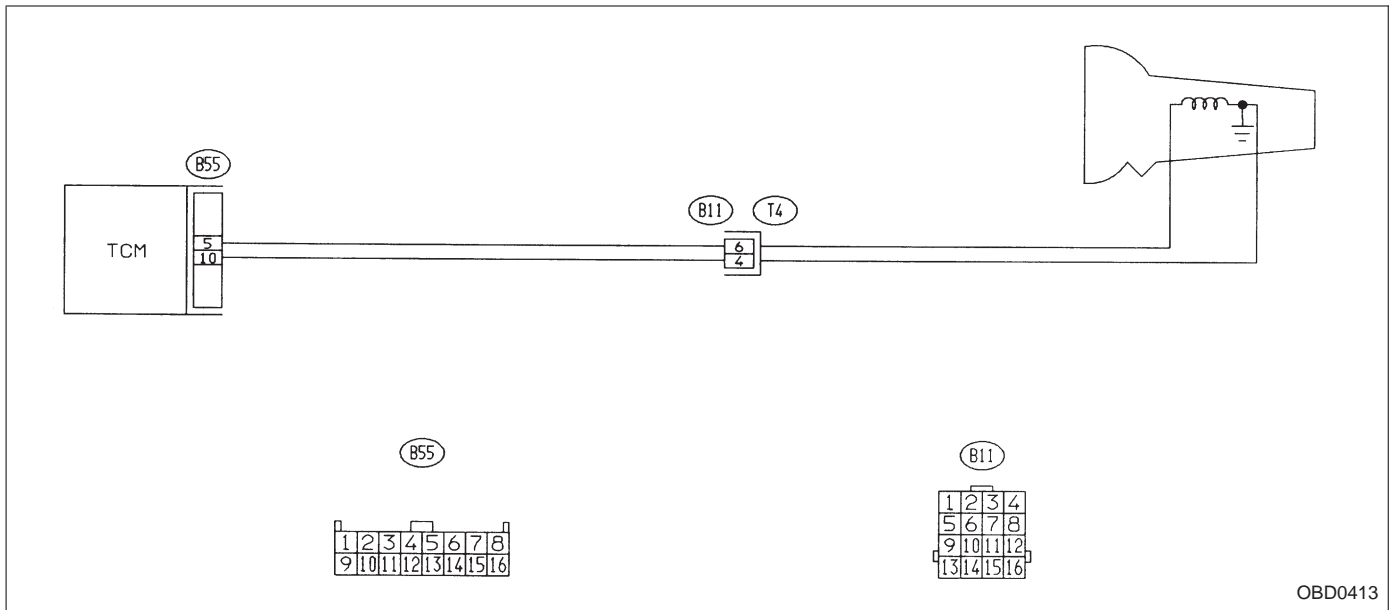
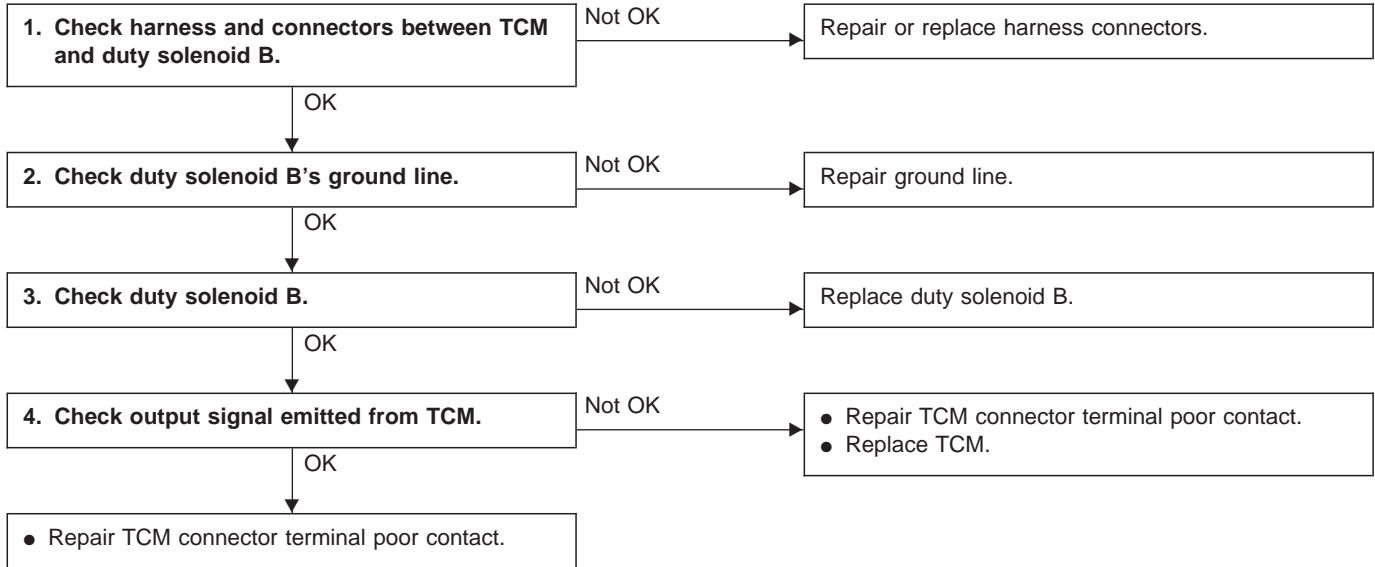
**B: TROUBLE CODE 12  
— DUTY SOLENOID B —**

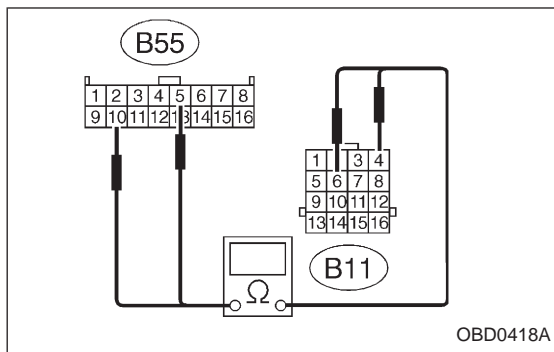
**DIAGNOSIS:**

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

**TROUBLE SYMPTOM:**

No “locking-up” (after engine warm-up)

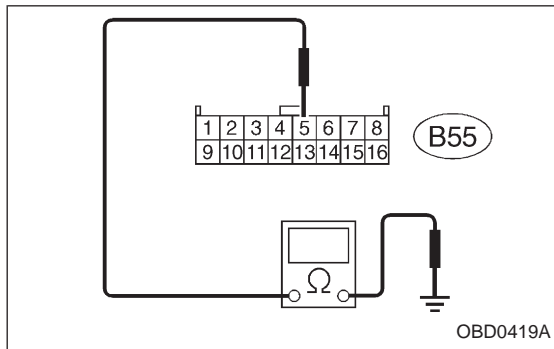




**1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND DUTY SOLENOID B.**

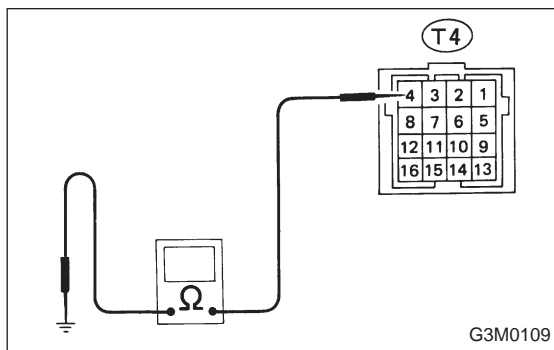
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and transmission.
- 3) Measure resistance of harness connector between TCM and transmission connector.

**Connector & terminal / Specified resistance:**  
 (B55) No. 5 — (B11) No. 6 / 1 Ω, or less  
 (B55) No. 10 — (B11) No. 4 / 1 Ω, or less



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

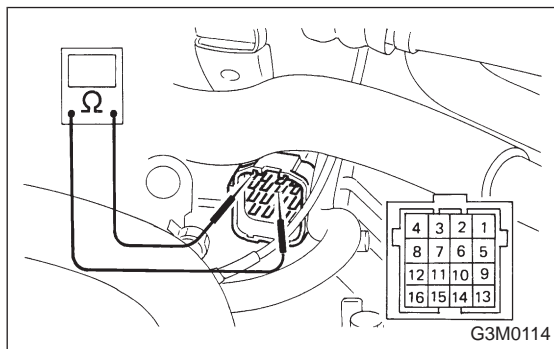
**Connector & terminal / Specified resistance:**  
 (B55) No. 5 — Body / 1 MΩ, or more



**2. CHECK DUTY SOLENOID B's GROUND LINE.**

Measure resistance between transmission connector receptacle and transmission case.

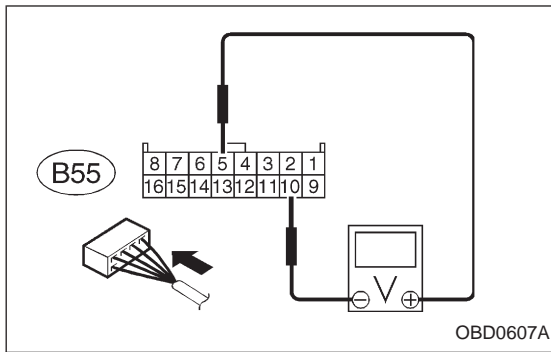
**Connector & terminal / Specified resistance:**  
 (T4) No. 4 — Transmission / 1 Ω, or less



**3. CHECK DUTY SOLENOID B.**

Measure resistance between transmission connector receptacle's terminals.

**Connector & terminal / Specified resistance:**  
 (T4) No. 6 — No. 4 / 9 — 17 Ω



**4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

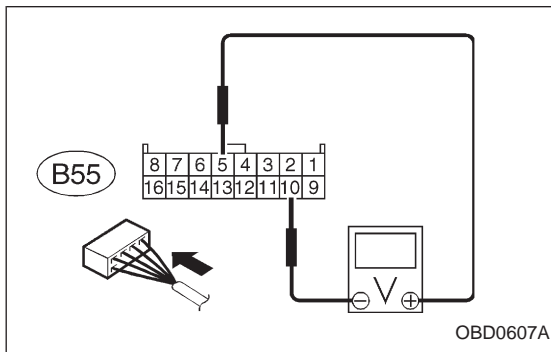
- 1) Connect connectors to TCM and transmission.
- 2) Lift-up the vehicle or set the vehicle on free roller.

**CAUTION:**

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

- 3) Start and warm-up the engine and transmission.
- 4) Push the TCS OFF switch to ON. (With TCS models)
- 5) Move selector lever to "D" and slowly increase vehicle speed to 75 km/h (47 MPH).
- 6) Measure voltage between TCM connector terminals.

**Connector & terminal / Specified voltage:**  
**(B55) No. 5 — No. 10 / 8.5 V, or more (when wheels are locked-up.)**

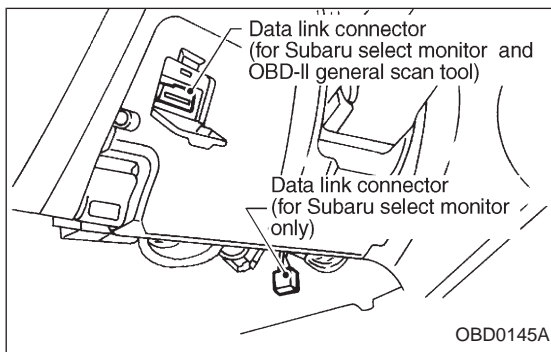


- 7) Return the engine to idling speed and move selector lever to "N".
- 8) Measure voltage between TCM connector terminals.

**Connector & terminal / Specified voltage:**  
**(B55) No. 5 — No. 10 / 0.5 V, or less**

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.  
 <Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>



● **Using Subaru select monitor:**

- (1) Connect connectors to TCM and transmission.
- (2) Lift-up the vehicle or set the vehicle on free roller.

**CAUTION:**

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

- (3) Turn ignition switch to OFF.
- (4) Connect the Subaru select monitor to data link connector.
- (5) Turn ignition switch to ON and Subaru select monitor switch to ON.

LUPTY	(F12)
5 %	
	OBD0417

- (6) Start and warm-up the engine and transmission.
- (7) Push the TCS OFF switch to ON. (With TCS models)
- (8) Designate mode using function key.

**Function mode: F12**

- (9) Move selector lever to "D" and slowly increase vehicle speed to 75 km/h (47 MPH).
- (10) Read data on Subaru select monitor.

**SPECIFIED DATA:**

- 95% (*Wheel locked-up*)
- 5% (*Released*)

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

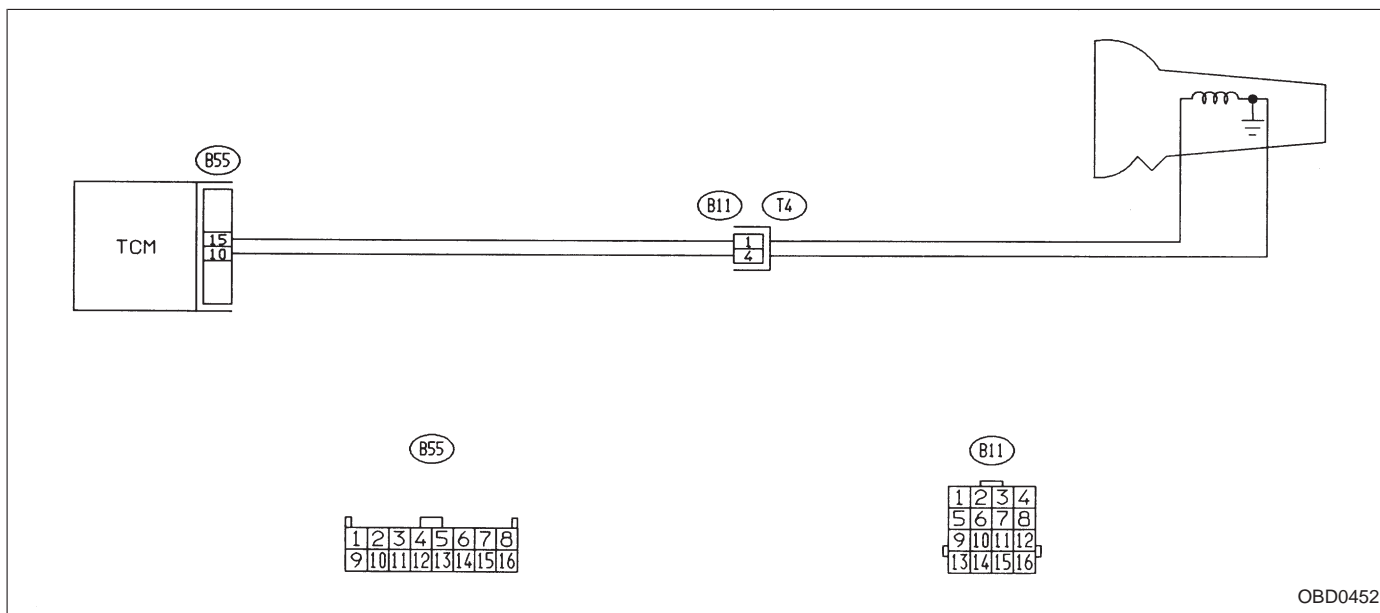
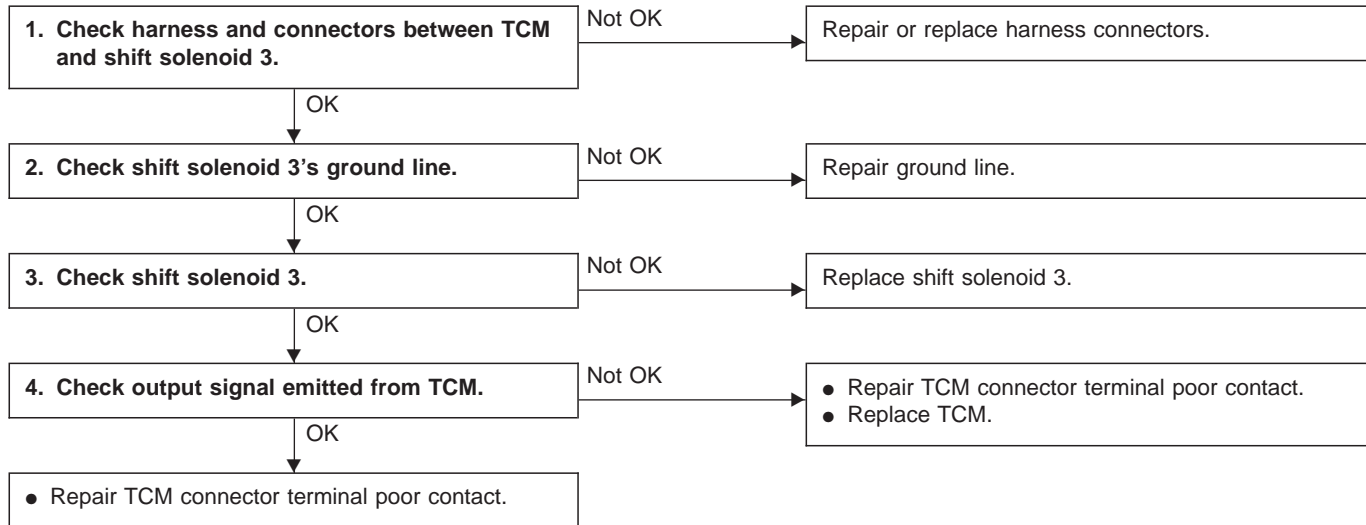
**C: TROUBLE CODE 13  
— SHIFT SOLENOID 3 —**

**DIAGNOSIS:**

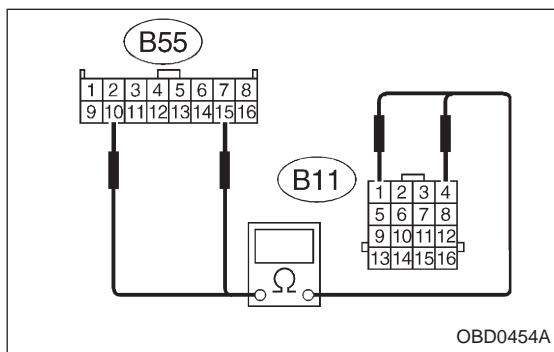
Output signal circuit of shift solenoid 3 is open or shorted.

**TROUBLE SYMPTOM:**

Ineffective engine brake with shift lever in "3"



OBD0452

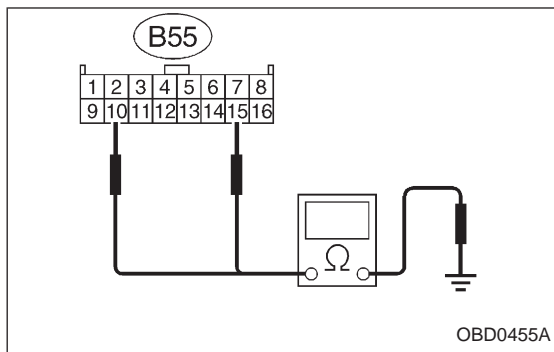


OBD0454A

**1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND SHIFT SOLENOID 3.**

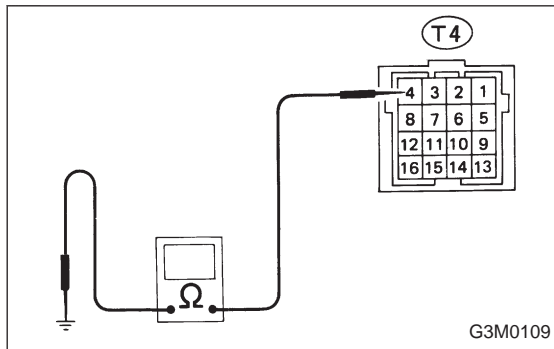
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and transmission.
- 3) Measure resistance of harness connector between TCM and transmission connector.

**Connector & terminal / Specified resistance:**  
 (B55) No. 15 — (B11) No. 1 / 1 Ω, or less  
 (B55) No. 10 — (B11) No. 4 / 1 Ω, or less



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

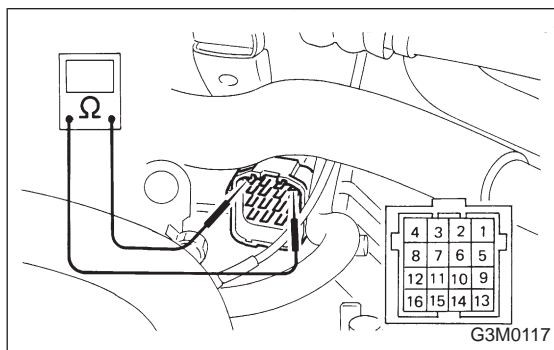
**Connector & terminal / Specified resistance:**  
 (B55) No. 15 — Body / 1 M $\Omega$ , or more  
 (B55) No. 10 — Body / 1 M $\Omega$ , or more



## 2. CHECK SHIFT SOLENOID 3's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

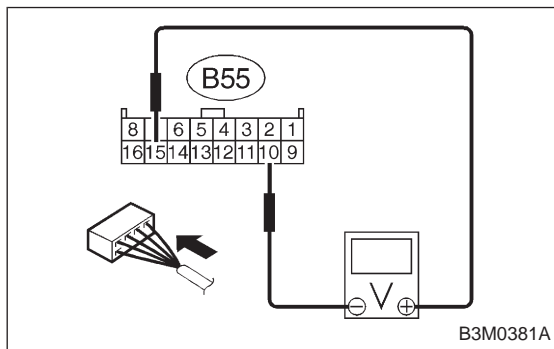
**Connector & terminal / Specified resistance:**  
 (T4) No. 4 — Transmission / 1  $\Omega$ , or less



## 3. CHECK SHIFT SOLENOID 3.

Measure resistance between transmission connector receptacle's terminals.

**Connector & terminal / Specified resistance:**  
 (T4) No. 1 — No. 4 / 20 — 32  $\Omega$



## 4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

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

### CAUTION:

**On AWD models, raise all wheels off ground.**

- 3) Start and warm-up the engine and transmission.
- 4) Idle the engine.
- 5) Move selector lever to "D".
- 6) Measure voltage between TCM connector terminals.

**Connector & terminal / Specified voltage:**  
 (B55) No. 15 — No. 10 / 9 V, or more

### NOTE:

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

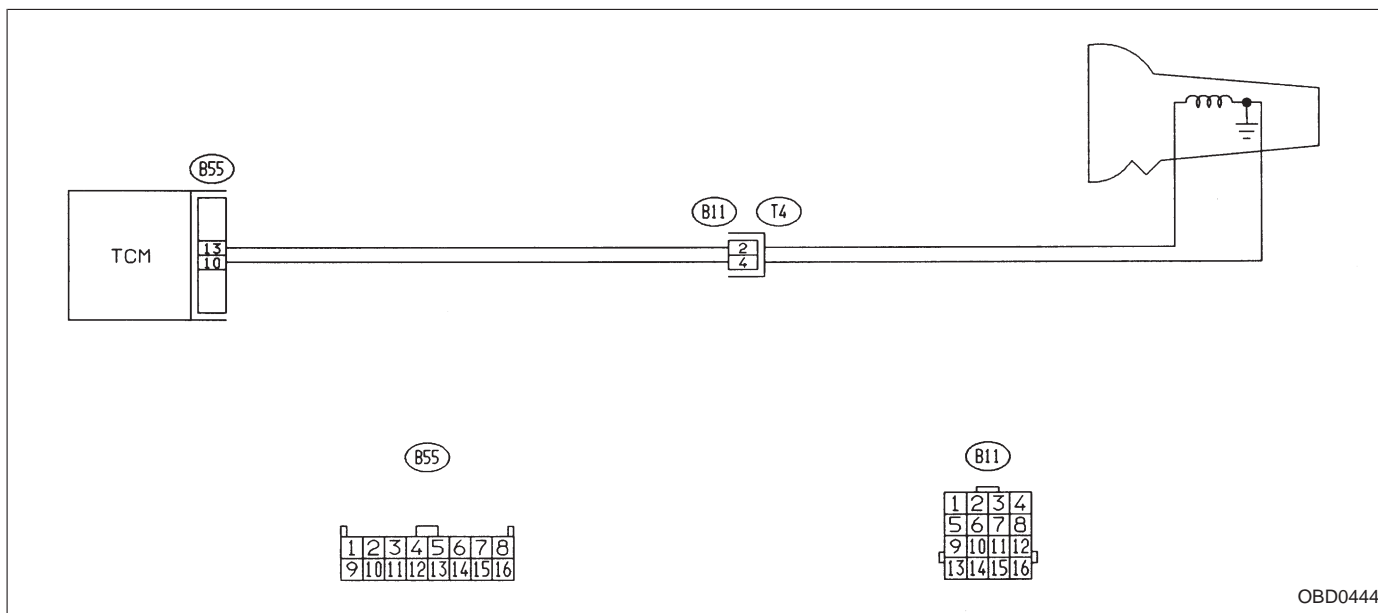
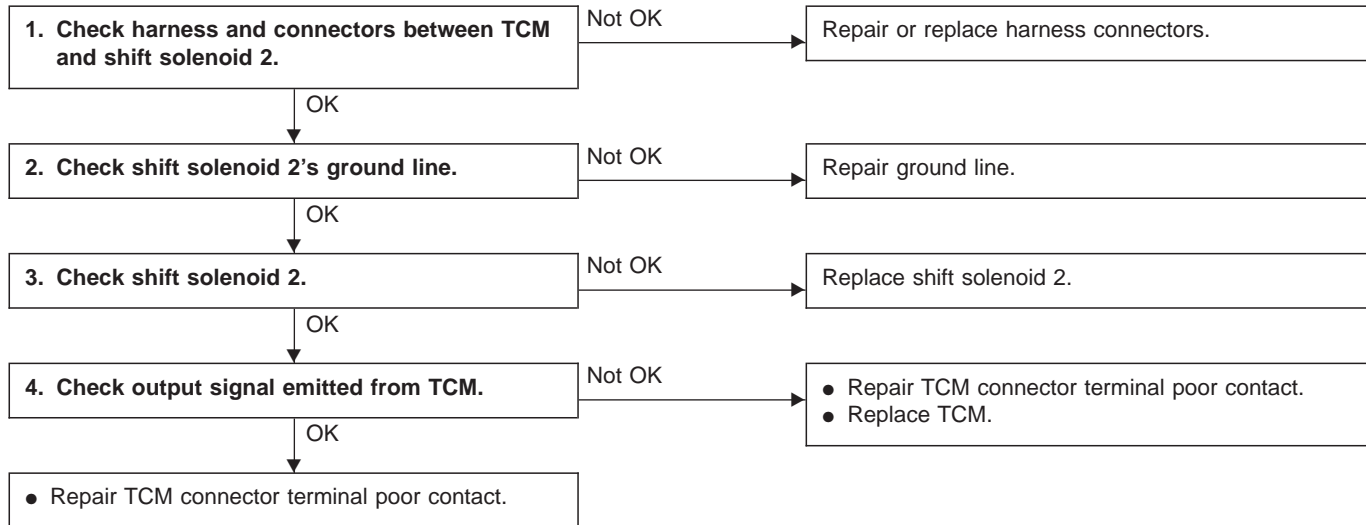
**D: TROUBLE CODE 14**  
**— SHIFT SOLENOID 2 —**

**DIAGNOSIS:**

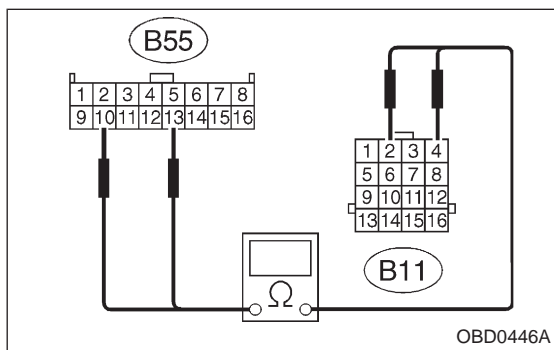
Output signal circuit of shift solenoid 2 is open or shorted.

**TROUBLE SYMPTOM:**

No shift



OBD0444



OBD0446A

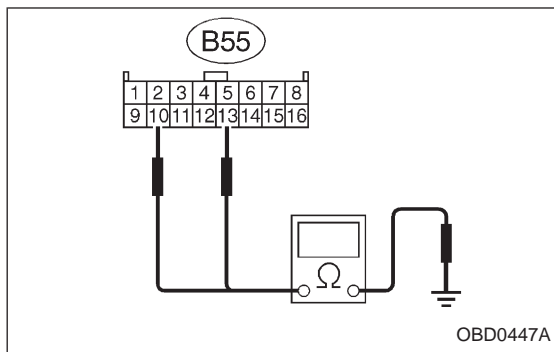
**1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND SHIFT SOLENOID 2.**

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

**Connector & terminal / Specified resistance:**

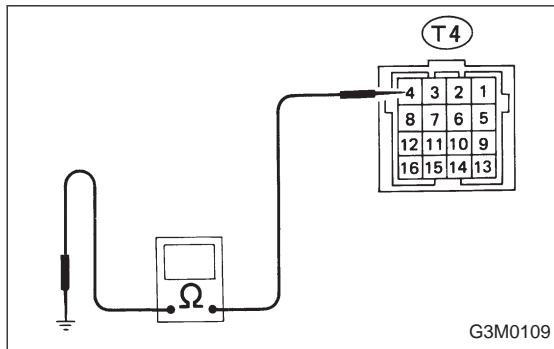
- (B55) No. 13 — (B11) No. 2 / 1 Ω, or less
- (B55) No. 10 — (B11) No. 4 / 1 Ω, or less





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

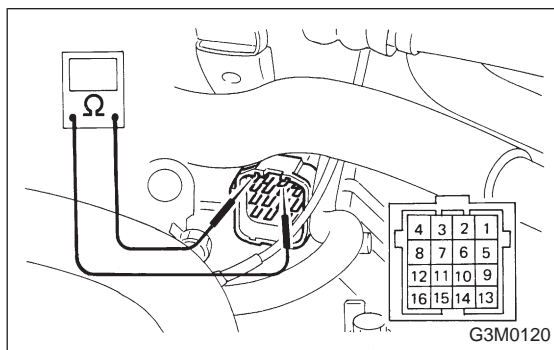
**Connector & terminal / Specified resistance:**  
**(B55) No. 13 — Body / 1 MΩ, or more**  
**(B55) No. 10 — Body / 1 MΩ, or more**



## 2. CHECK SHIFT SOLENOID 2's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

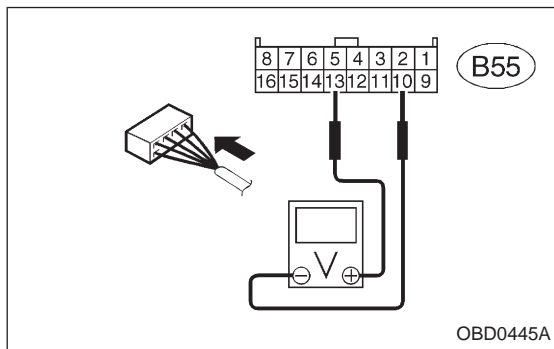
**Connector & terminal / Specified resistance:**  
**(T4) No. 4 — Transmission / 1 Ω, or less**



## 3. CHECK SHIFT SOLENOID 2.

Measure resistance between transmission connector receptacle's terminals.

**Connector & terminal / Specified resistance:**  
**(T4) No. 2 — No. 4 / 20 — 32 Ω**



## 4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

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

### CAUTION:

**On AWD models, raise all wheels off ground.**

- 3) Start and warm-up the engine and transmission.
- 4) Idle the engine.
- 5) Move selector lever to "D".
- 6) Measure voltage between TCM connector terminals.

**Connector & terminal / Specified voltage:**  
**(B55) No. 13 — No. 10 / 9 V, or more**

### NOTE:

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

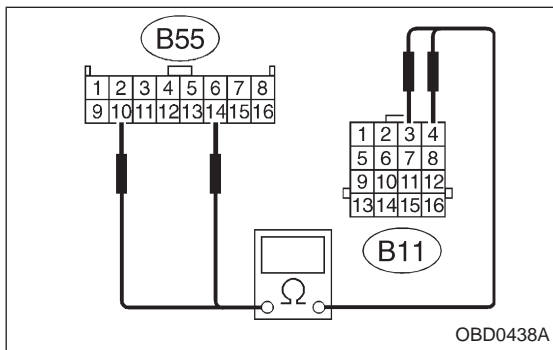
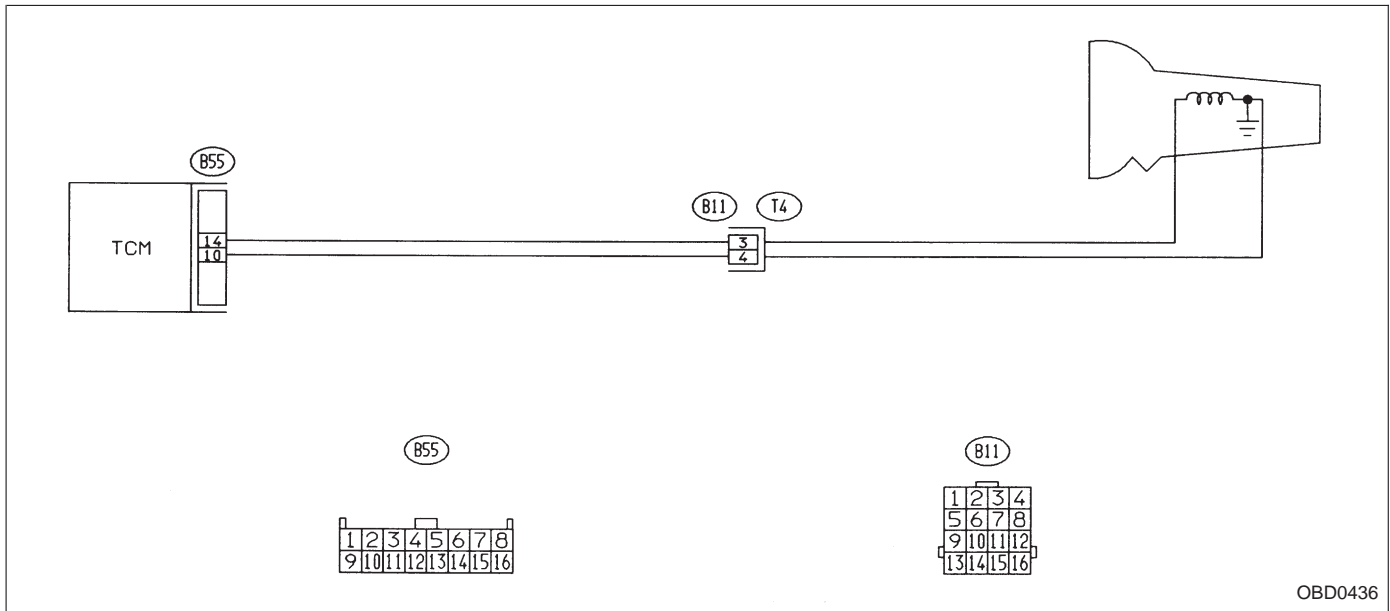
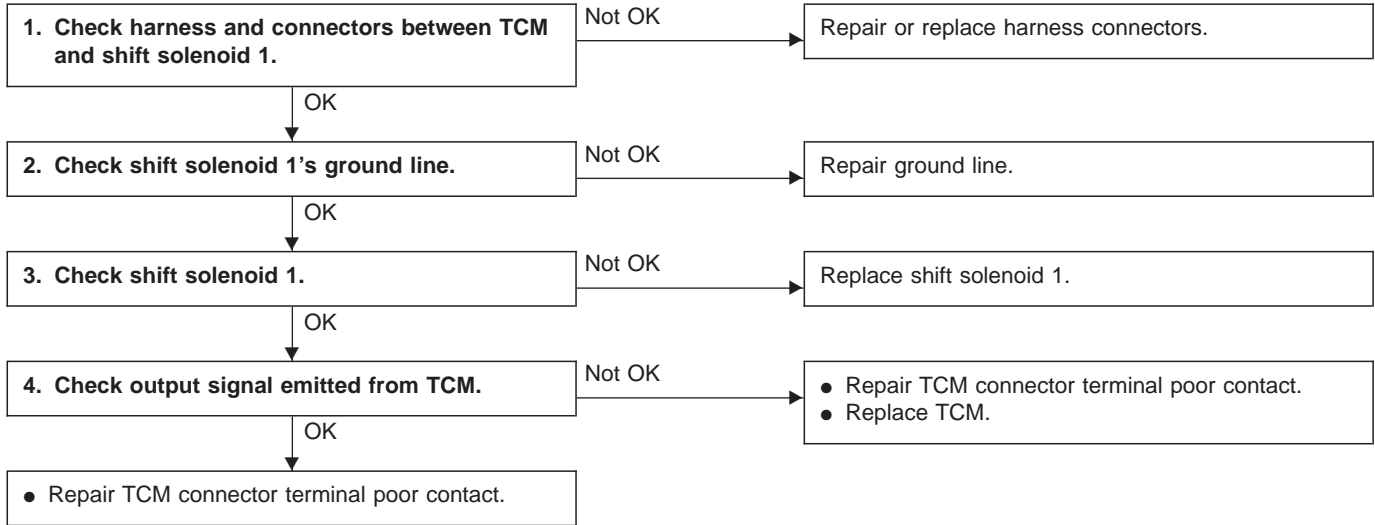
**E: TROUBLE CODE 15  
— SHIFT SOLENOID 1 —**

**DIAGNOSIS:**

Output signal circuit of shift solenoid 1 is open or shorted.

**TROUBLE SYMPTOM:**

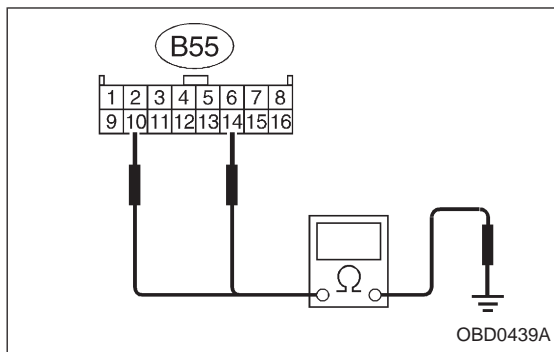
No shift



**1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND SHIFT SOLENOID 1.**

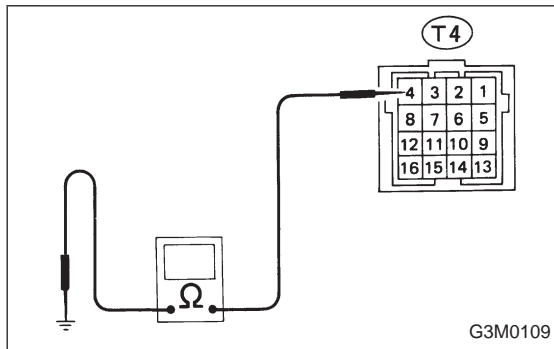
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and transmission.
- 3) Measure resistance of harness connector between TCM and transmission connector.

**Connector & terminal / Specified resistance:**  
**(B55) No. 14 — (B11) No. 3 / 1 Ω, or less**  
**(B55) No. 10 — (B11) No. 4 / 1 Ω, or less**



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

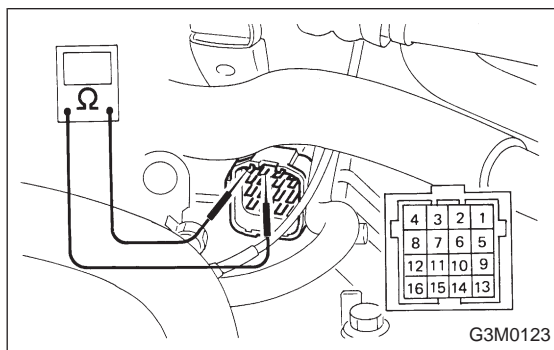
**Connector & terminal / Specified resistance:**  
 (B55) No. 14 — Body / 1 M $\Omega$ , or more  
 (B55) No. 10 — Body / 1 M $\Omega$ , or more



## 2. CHECK SHIFT SOLENOID 1's GROUND LINE.

Measure resistance between transmission connector receptacle and transmission case.

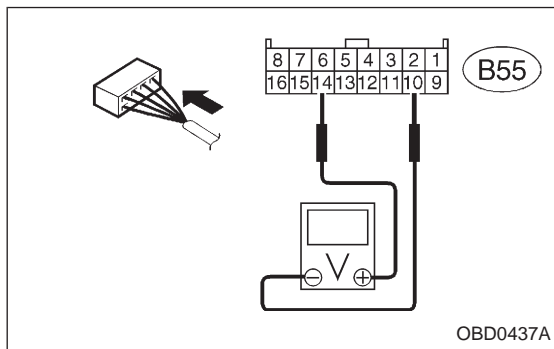
**Connector & terminal / Specified resistance:**  
 (T4) No. 4 — Transmission / 1  $\Omega$ , or less



## 3. CHECK SHIFT SOLENOID 1.

Measure resistance between transmission connector receptacle's terminals.

**Connector & terminal / Specified resistance:**  
 (T4) No. 3 — No. 4 / 20 — 32  $\Omega$



## 4. CHECK OUTPUT SIGNAL EMITTED FROM TCM.

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

### CAUTION:

**On AWD models, raise all wheels off ground.**

- 3) Start and warm-up the engine and transmission.
- 4) Idle the engine.
- 5) Move selector lever to "D".
- 6) Measure voltage between TCM connector terminals.

**Connector & terminal / Specified voltage:**  
 (B55) No. 14 — No. 10 / 9 V, or more

### NOTE:

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

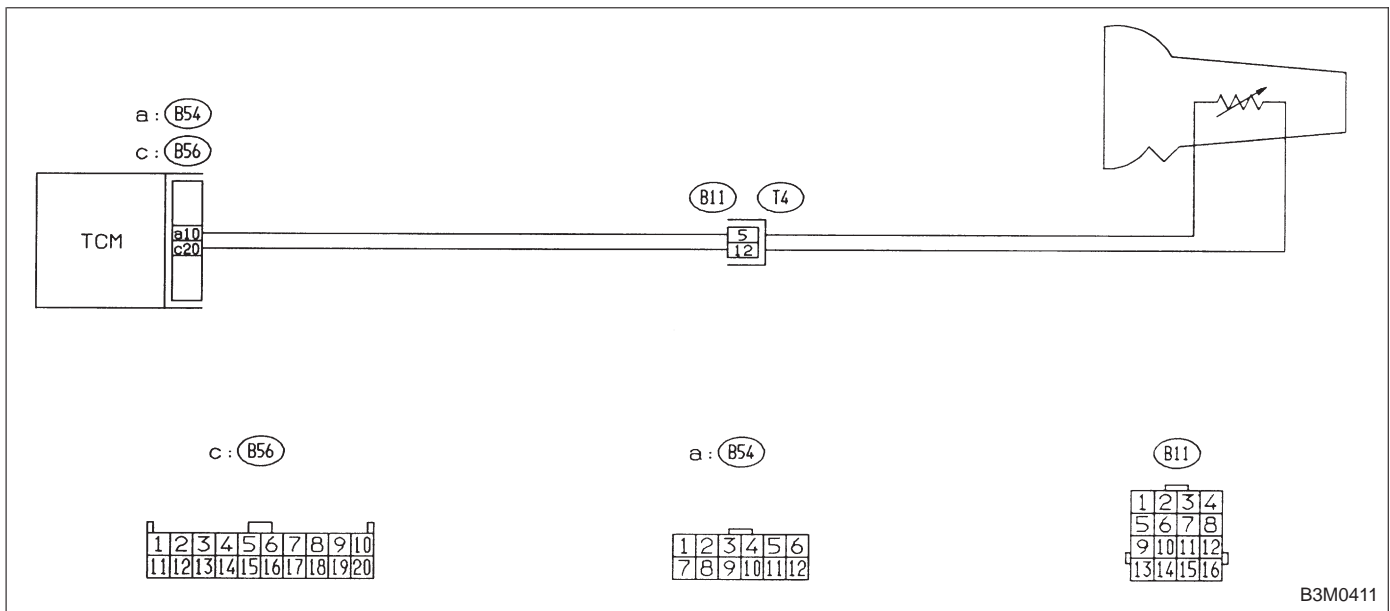
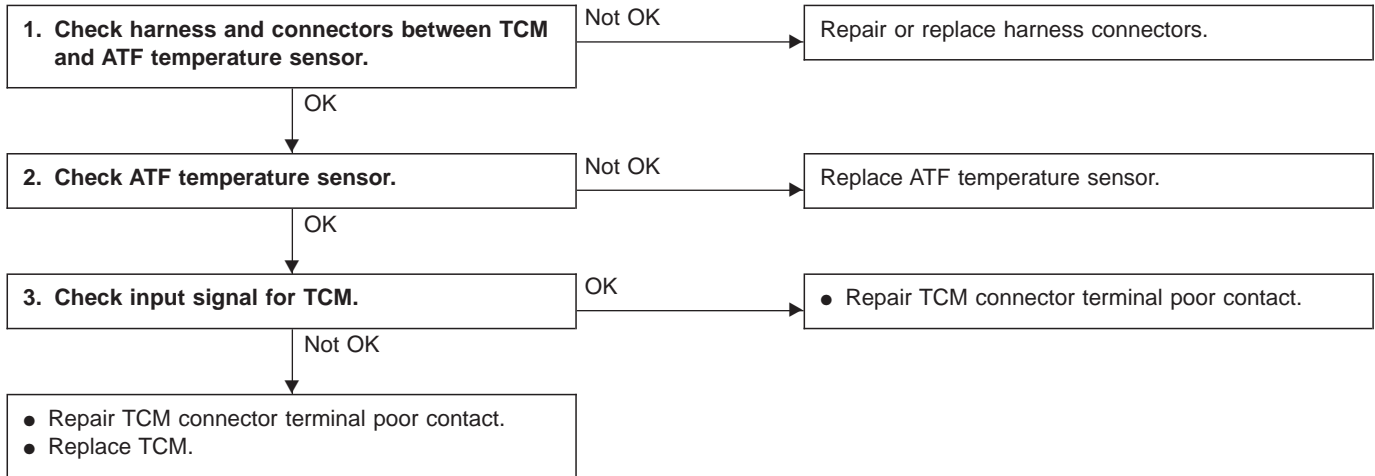
**F: TROUBLE CODE 21  
— ATF TEMPERATURE SENSOR —**

**DIAGNOSIS:**

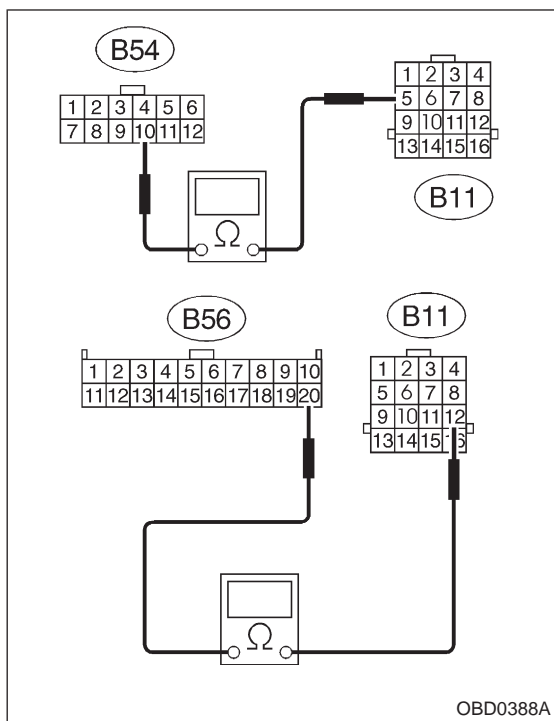
Input signal circuit of TCM to ATF temperature sensor is open or shorted.

**TROUBLE SYMPTOM:**

Excessive shift shock



B3M0411



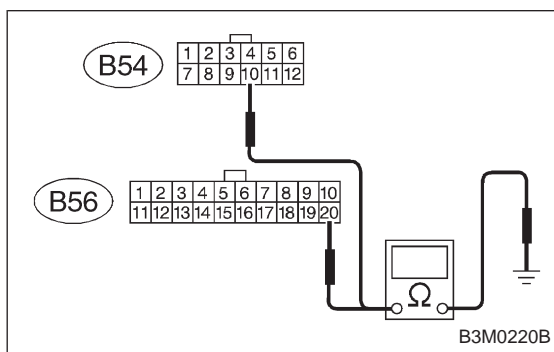
### 1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND ATF TEMPERATURE SENSOR.

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

#### **Connector & terminal / Specified resistance:**

(B54) No. 10 — (B11) No. 5 / 1 Ω, or less

(B56) No. 20 — (B11) No. 12 / 1 Ω, or less

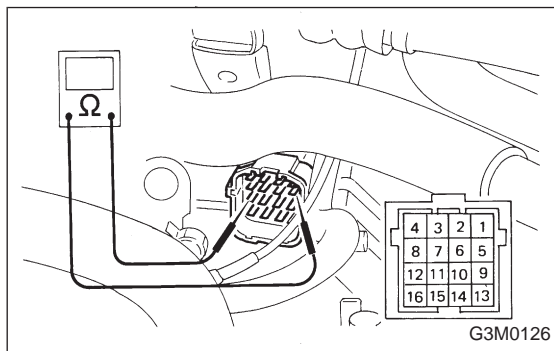


- 4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

#### **Connector & terminal / Specified resistance:**

(B54) No. 10 — Body / 1 MΩ, or more

(B56) No. 20 — Body / 1 MΩ, or more



### 2. CHECK ATF TEMPERATURE SENSOR.

- 1) Measure resistance between transmission connector receptacle's terminals.

#### **Connector & terminal / Specified resistance:**

(T4) No. 5 — No. 12 /

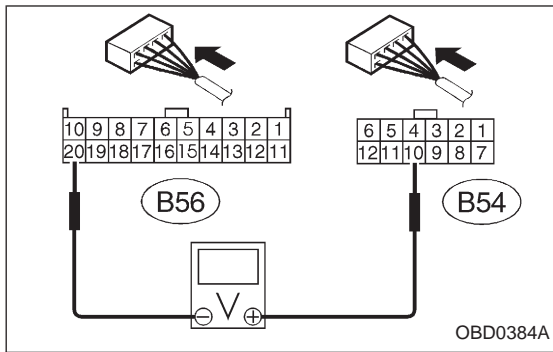
2.1 — 2.9 kΩ [ATF temperature: 20°C (68°F)]

- 2) Connect connectors to transmission and TCM.
- 3) Start and warm-up the engine until ATF temperature has increased.
- 4) Stop the engine and disconnect connector from transmission.
- 5) Measure resistance between transmission connector receptacle's terminals.

#### **Connector & terminal / Specified resistance:**

(T4) No. 5 — No. 12 /

275 — 375 Ω [ATF temperature: 80°C (176°F)]

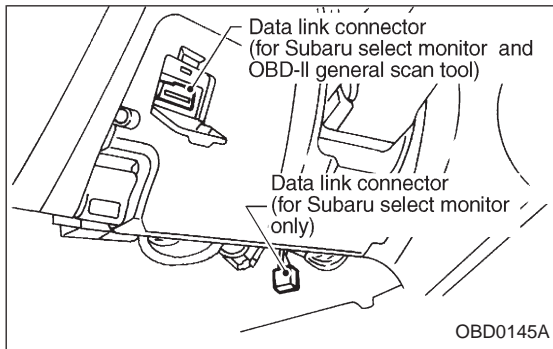


**3. CHECK INPUT SIGNAL FOR TCM.**

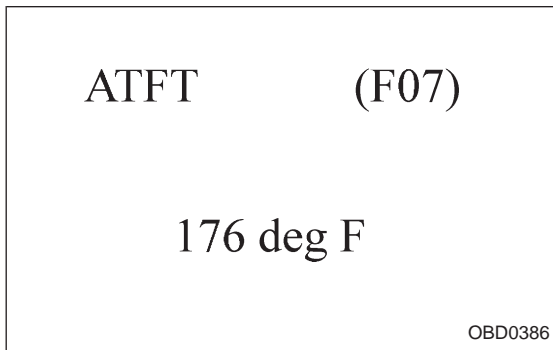
- 1) Turn ignition switch ON (with engine OFF) and measure signal voltage input of TCM.
- 2) Start and warm-up the engine. Measure signal voltage input of TCM.

**Connector & terminal / Specified voltage:**

**(B54) No. 10 — (B56) No. 20 /**  
**3.45±0.55 V [ATF temperature: 20°C (68°F)]**  
**1.2±0.2 V [ATF temperature: 80°C (176°F)]**



- Using Subaru select monitor:
  - (1) Turn ignition switch to OFF.
  - (2) Connect the Subaru select monitor to data link connector.
  - (3) Turn ignition switch to ON and Subaru select monitor switch to ON.

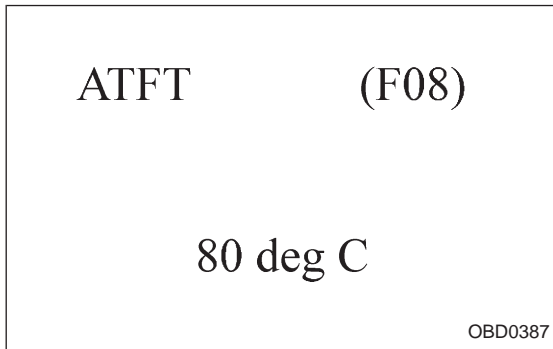


- (4) Start and warm-up the engine.
- (5) Read data on Subaru select monitor.
- (6) Designate mode using function key.

**Function mode: F07 or F08**

**SPECIFIED DATA:**

- F07:**
- Ambient temperature: ±50 deg F
  - ATF temperature: 158 — 230 deg F
  - Open harness: 176 deg F
  - Shorted harness: 320 deg F
- F08:**
- Ambient temperature: ±10 deg C
  - ATF temperature: 70 — 110 deg C
  - Open harness: 80 deg C
  - Shorted harness: 160 deg C

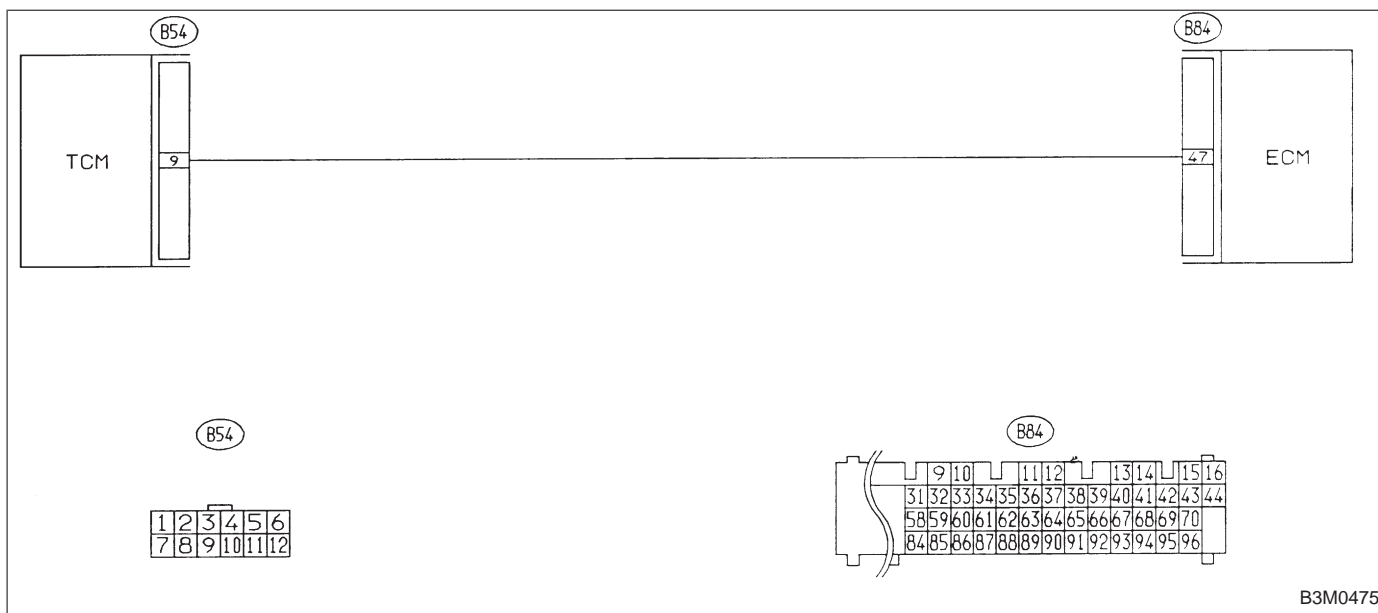
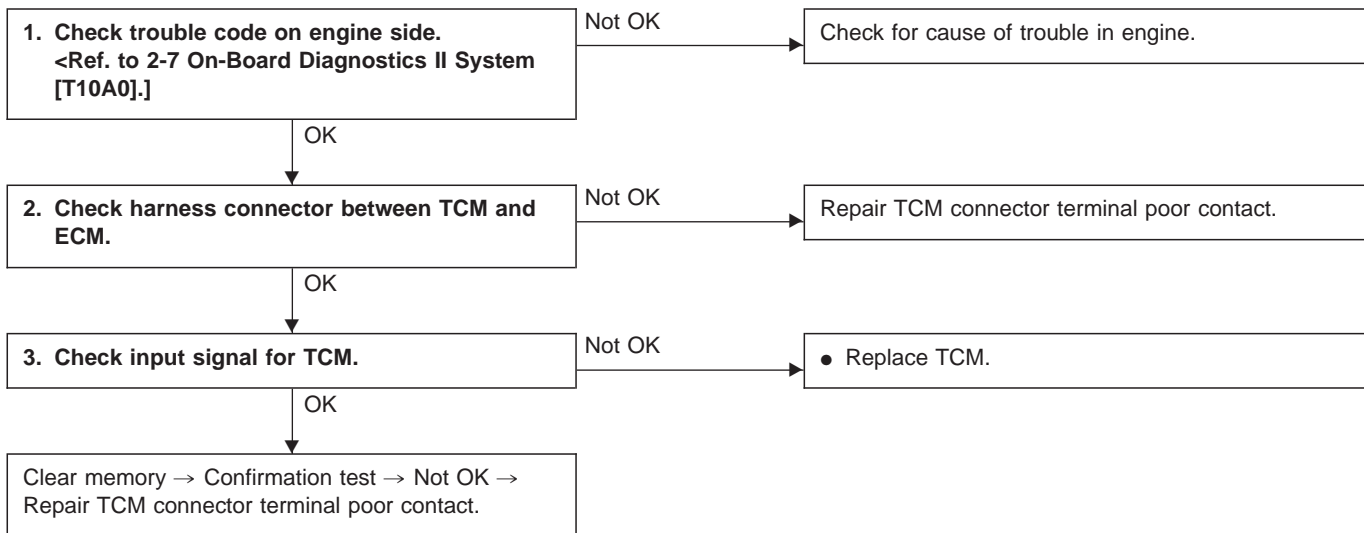


- F07: ATF temperature is indicated in “deg F”.
- F08: ATF temperature is indicated in “deg C”.

**G: TROUBLE CODE 22  
— MASS AIR FLOW SIGNAL —**

**DIAGNOSIS:**

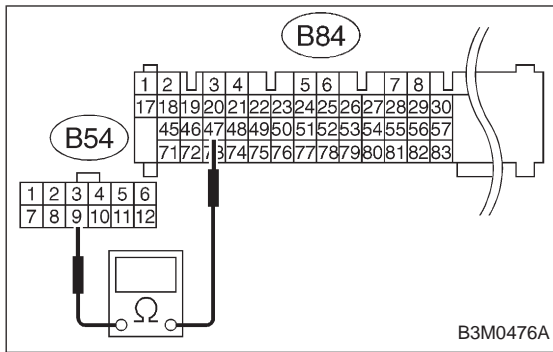
Input signal circuit of TCM from ECM is open or shorted.



B3M0475

**1. CHECK TROUBLE CODE ON ENGINE SIDE.**

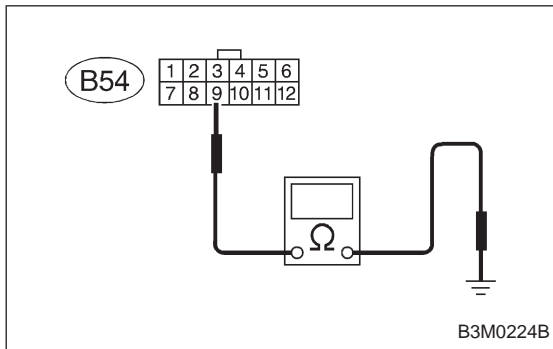
Using Subaru select monitor or OBD-general scan tool, check trouble code of mass air flow sensor on engine side.



**2. CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.**

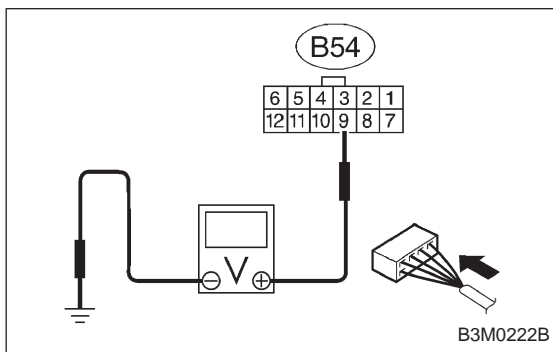
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness connector between TCM and ECM.

**Connector & terminal / Specified resistance:**  
**(B54) No. 9 — (B84) No. 47 / 1 Ω, or less**



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

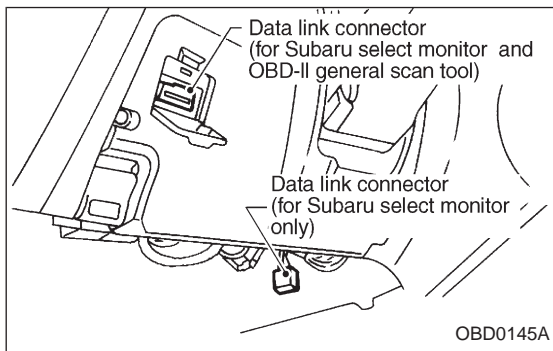
**Connector & terminal / Specified resistance:**  
**(B54) No. 9 — Body / 1 MΩ, or more**



**3. CHECK INPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and ECM.
- 2) Start the engine. (engine idling after warm-up)
- 3) Measure signal voltage between TCM connector terminal and body.

**Connector & terminal / Specified voltage:**  
**Engine warm-up;**  
**(B54) No. 9 — Body / 0.5 — 1.22 V**



● Using Subaru select monitor:

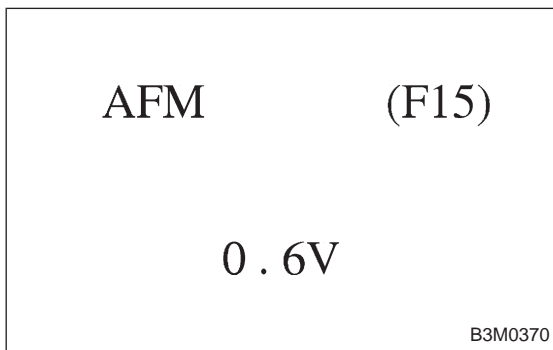
- (1) Connect connectors to TCM and ECM.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.
- (5) Start and warm-up the engine.

- (6) Read data on Subaru select monitor.
- (7) Designate mode using function key.

**Function mode: F15**

**SPECIFIED DATA:**

**0.5 — 1.22 V (Engine warm-up)**





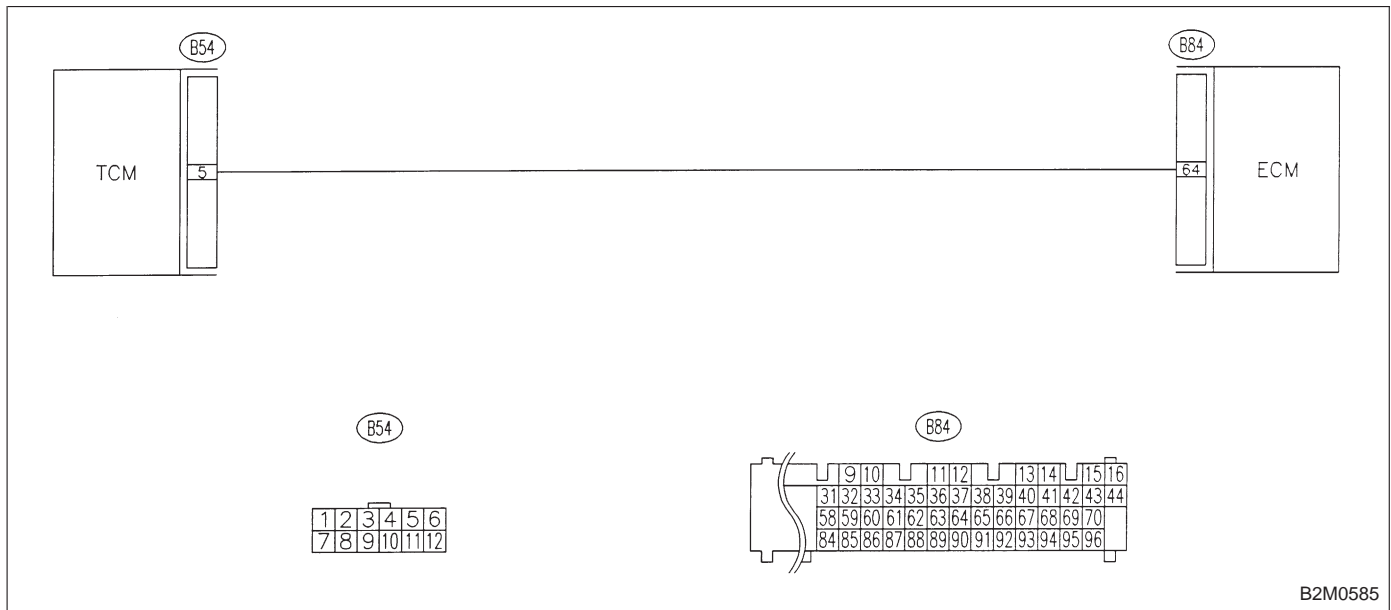
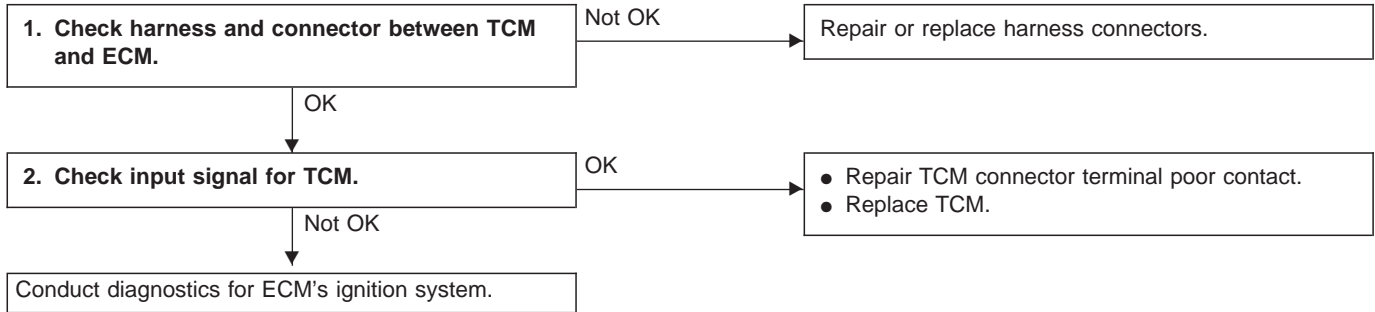
**H: TROUBLE CODE 23  
— ENGINE SPEED SIGNAL —**

**DIAGNOSIS:**

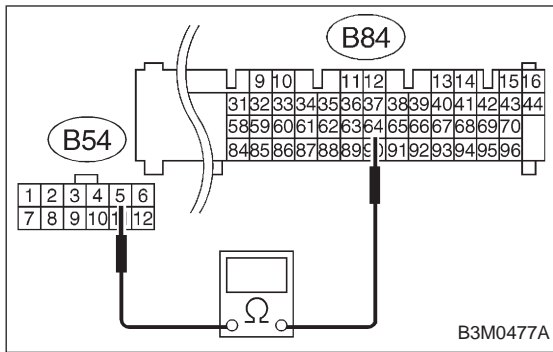
Engine speed input signal circuit is open or shorted.

**TROUBLE SYMPTOM:**

- No lock-up (after engine warm-up)
- AT OIL TEMP indicator remains on when vehicle speed is "0".



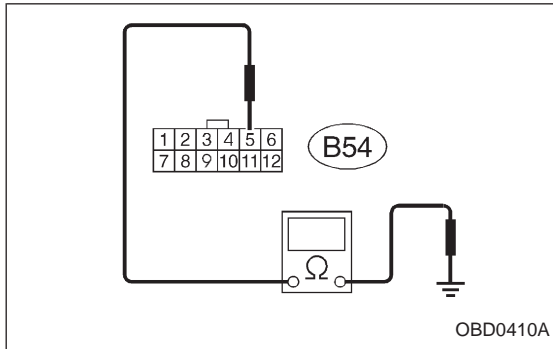
B2M0585



**1. CHECK HARNESS AND CONNECTOR BETWEEN TCM AND ECM.**

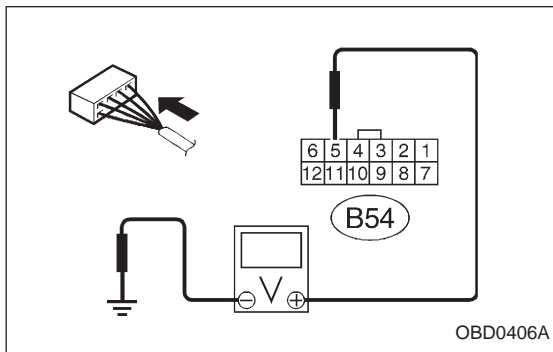
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness connector between TCM and ECM.

**Connector & terminal / Specified resistance:**  
**(B54) No. 5 — (B84) No. 64 / 1 Ω, or less**



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

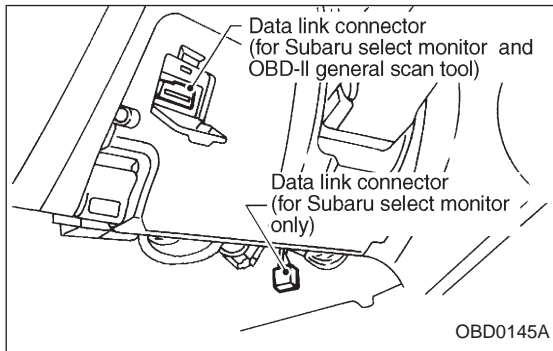
**Connector & terminal / Specified resistance:**  
**(B54) No. 5 — Body / 1 MΩ, or more**



**2. CHECK INPUT SIGNAL FOR TCM.**

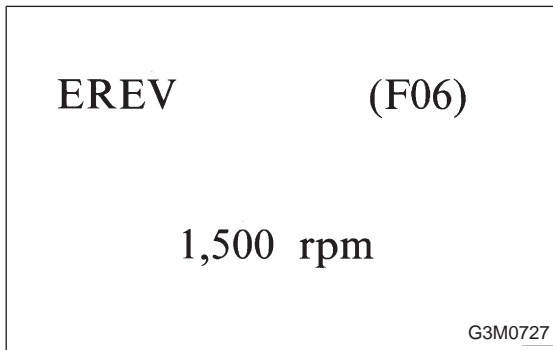
- 1) Connect connectors to ECM and TCM.
- 2) Turn ignition switch ON (with engine OFF).
- 3) Measure signal voltage for TCM.

**Connector & terminal / Specified voltage:**  
**(B54) No. 5 — Body / 10.5 V, or more**



● Using Subaru select monitor:

- (1) Connect connectors to ECM and TCM.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.



- (5) Start and warm-up the engine.
- (6) Operate at constant engine speed.
- (7) Read data on Subaru select monitor.
- (8) Designate mode using function key.

**Function mode: F06**

**SPECIFIED DATA:**

**Same as tachometer reading (in combination meter)**

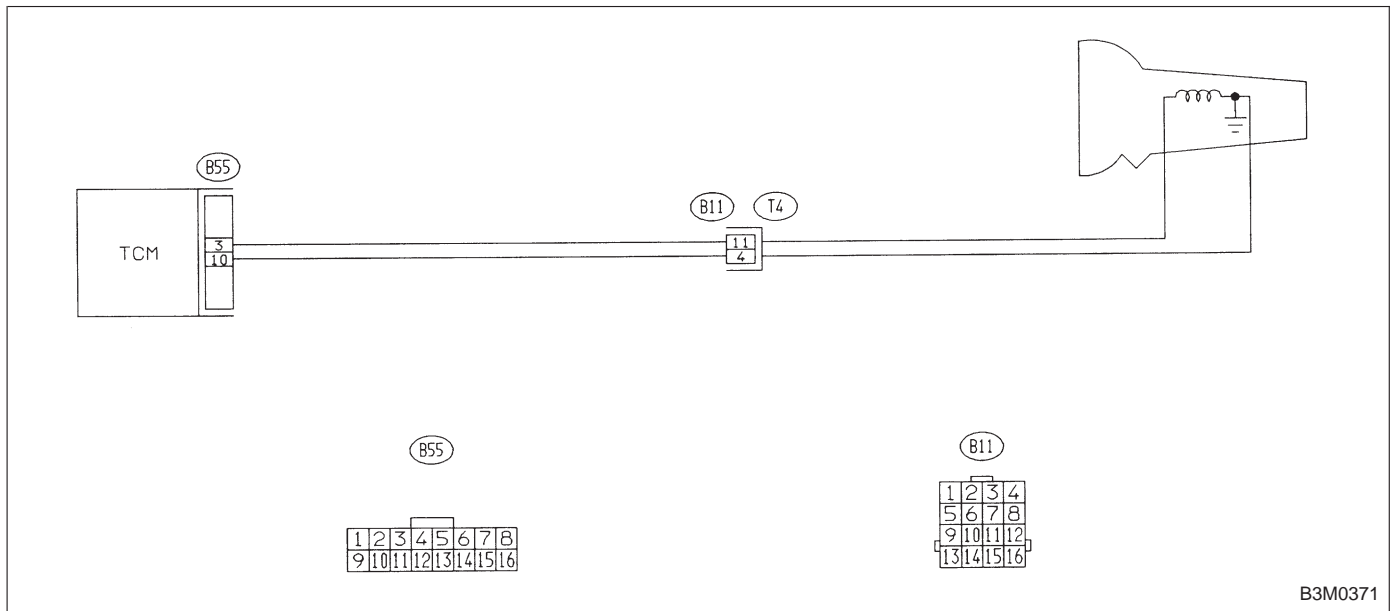
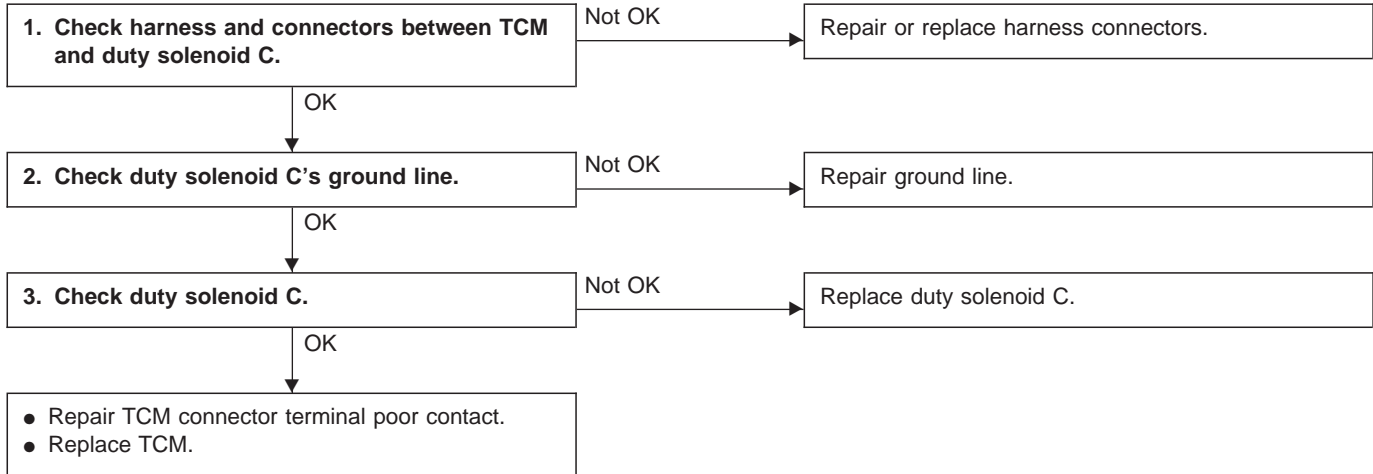
**I: TROUBLE CODE 24  
— DUTY SOLENOID C —**

**DIAGNOSIS:**

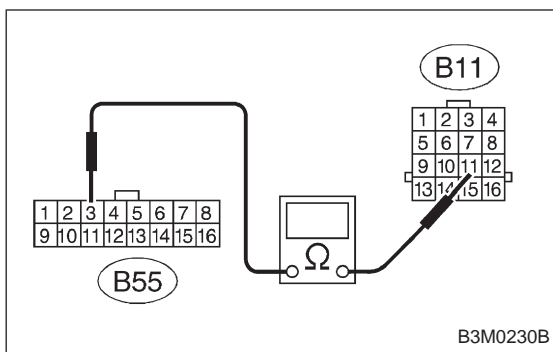
Output signal circuit of duty solenoid C is open or shorted.

**TROUBLE SYMPTOM:**

Excessive “braking” in tight corners



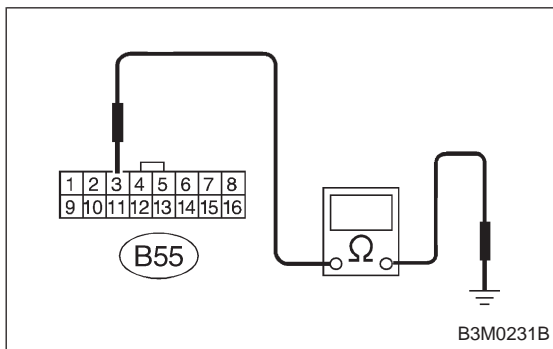
B3M0371



**1. CHECK HARNESS AND CONNECTORS BETWEEN TCM AND DUTY SOLENOID C.**

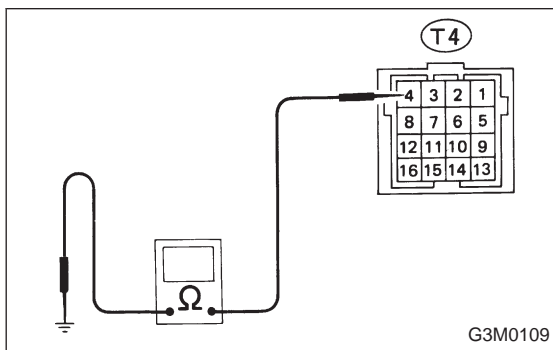
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and transmission.
- 3) Measure resistance of harness connector between TCM and transmission.

**Connector & terminal / Specified resistance:**  
**(B55) No. 3 — (B11) No. 11 / 1 Ω, or less**



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

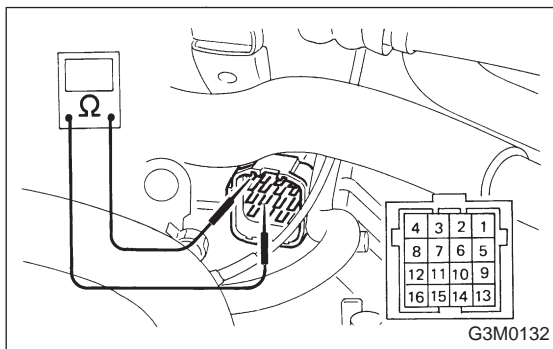
**Connector & terminal / Specified resistance:**  
**(B55) No. 3 — Body / 1 MΩ, or more**



**2. CHECK DUTY SOLENOID C's GROUND LINE.**

Measure resistance between transmission connector receptacle and transmission case.

**Connector & terminal / Specified resistance:**  
**(T4) No. 4 — Transmission / 1 Ω, or less**



**3. CHECK DUTY SOLENOID C.**

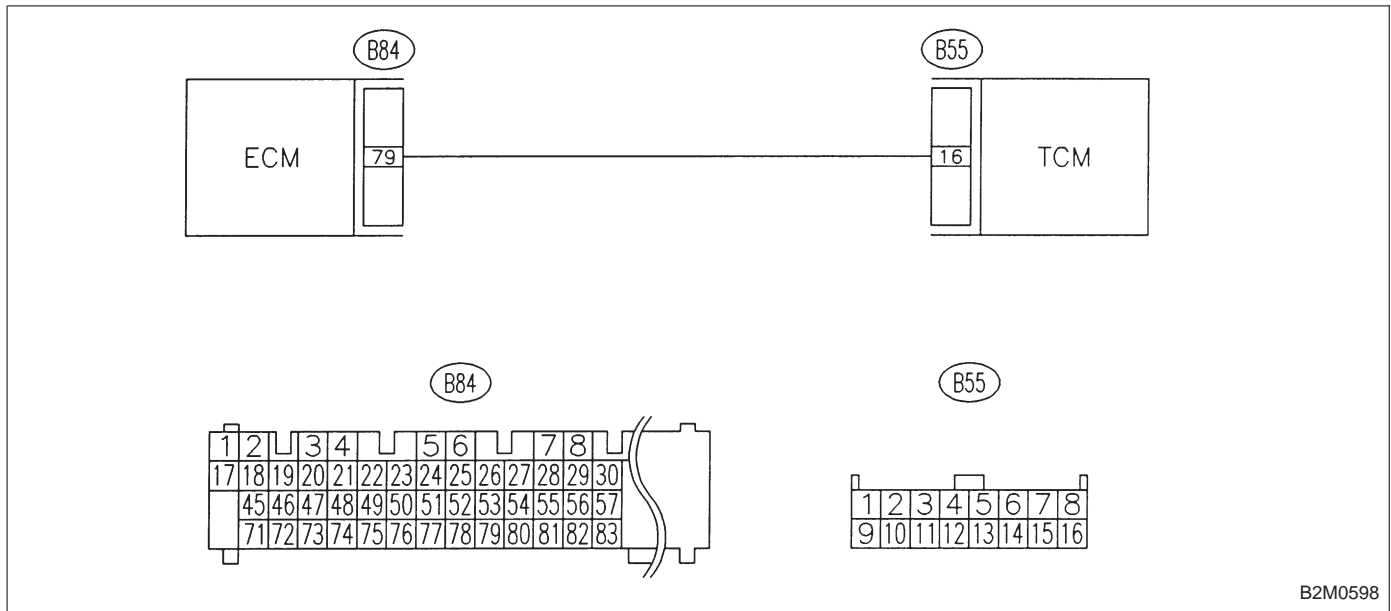
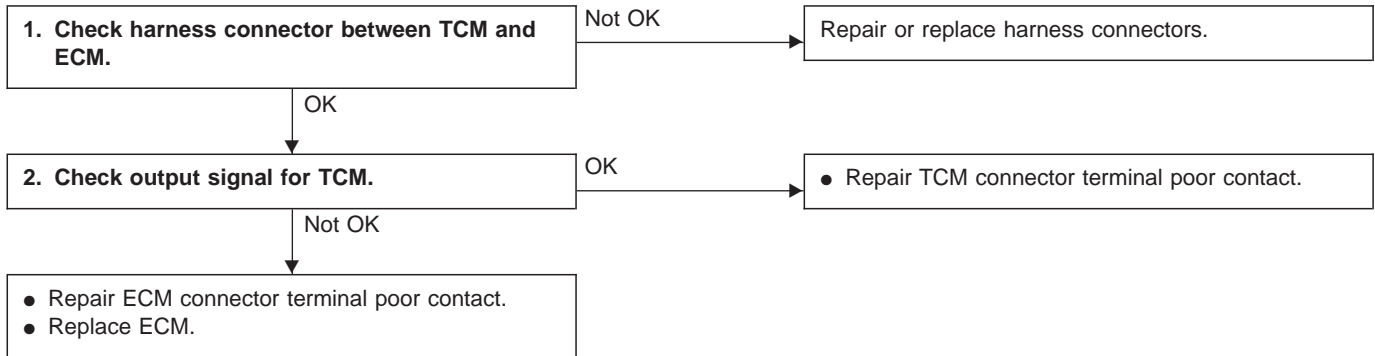
Measure resistance between transmission connector receptacle's terminals.

**Connector & terminal / Specified resistance:**  
**(T4) No. 11 — No. 4 / 9 — 17 Ω**

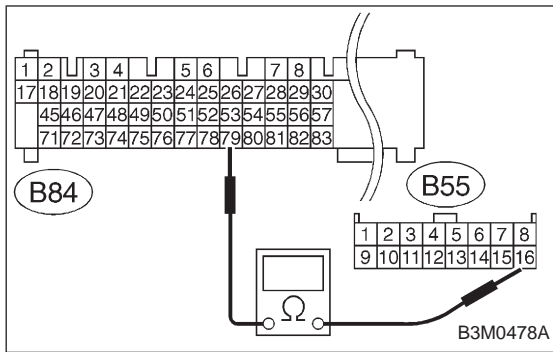
**J: TROUBLE CODE 25  
— TORQUE CONTROL SIGNAL —**

**DIAGNOSIS:**

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



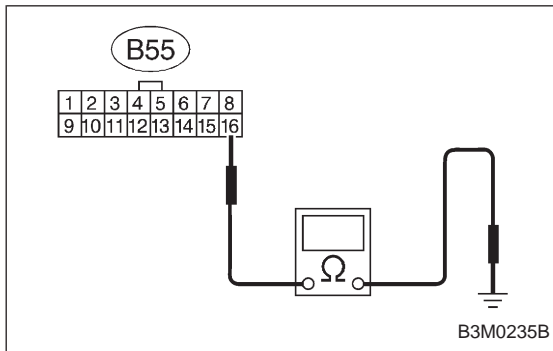
B2M0598



**1. CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.**

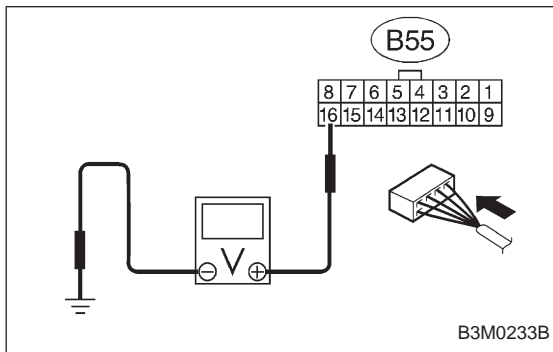
- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from TCM and ECM.
- 3) Measure resistance of harness connector between TCM and ECM.

**Connector & terminal / Specified resistance:**  
**(B55) No. 16 — (B84) No. 79 / 1 Ω, or less**



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

**Connector & terminal / Specified resistance:**  
**(B55) No. 16 — Body / 1 MΩ, or more**



**2. CHECK OUTPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and ECM.
- 2) Turn ignition switch to ON.
- 3) Measure signal voltage between TCM connector terminal and body.

**Connector & terminal / Specified voltage:**  
**(B55) No. 16 — Body / 5±1 V**

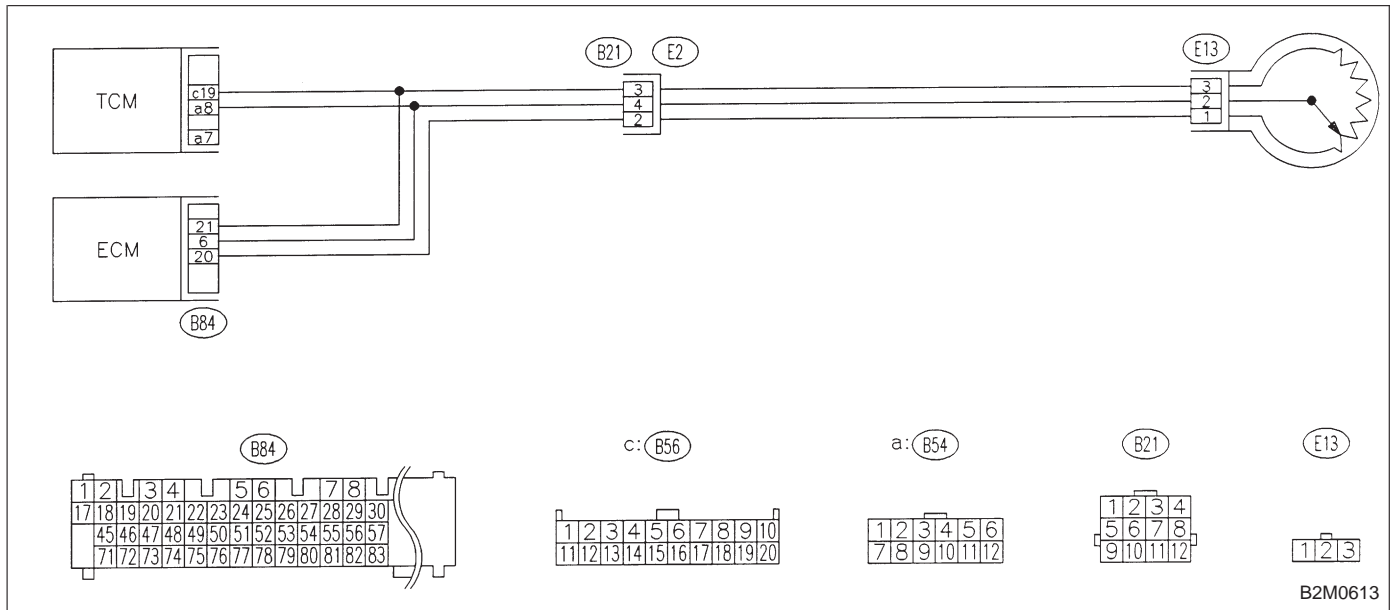
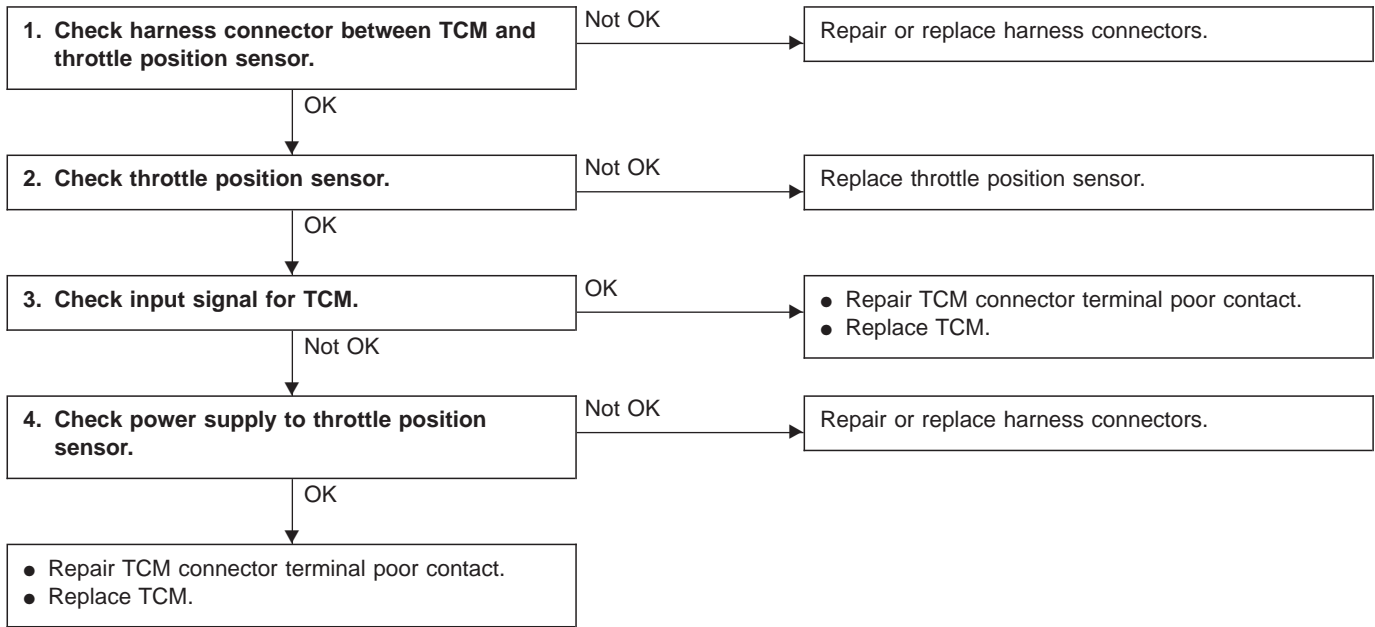
**K: TROUBLE CODE 31  
— THROTTLE POSITION SENSOR —**

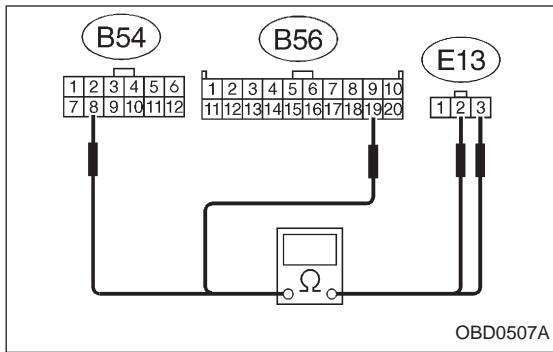
**DIAGNOSIS:**

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"

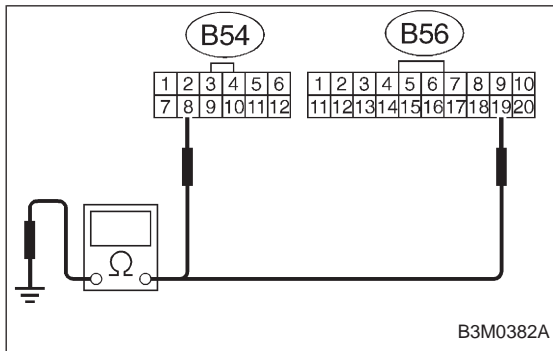




**1. CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.**

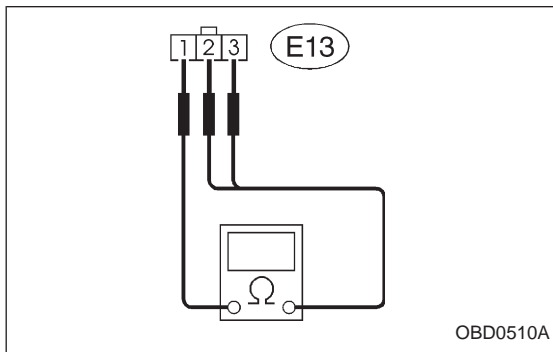
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM and throttle position sensor.
- 3) Measure resistance of harness connector between TCM and throttle position sensor.

**Connector & terminal / Specified resistance:**  
**(B54) No. 8 — (E13) No. 2 / 1 Ω, or less**  
**(B56) No. 19 — (E13) No. 3 / 1 Ω, or less**



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

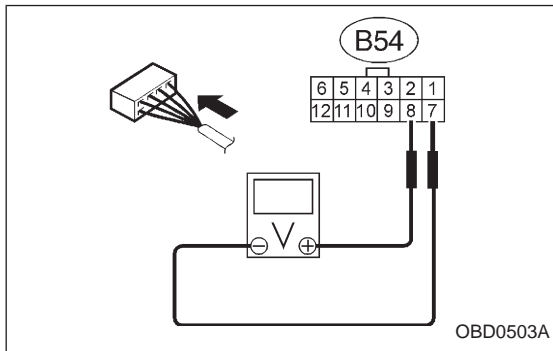
**Connector & terminal / Specified resistance:**  
**(B54) No. 8 — Body / 1 MΩ, or more**  
**(B56) No. 19 — Body / 1 MΩ, or more**



**2. CHECK THROTTLE POSITION SENSOR.**

Measure resistance between throttle position sensor terminals.

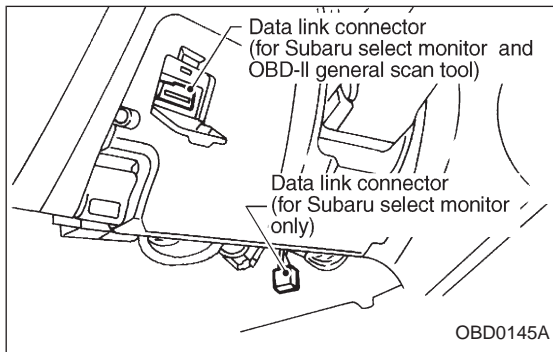
**Terminals / Specified resistance:**  
**(E13) No. 1 — No. 2 / 0.3 — 0.7 kΩ**  
**(Throttle fully closed.)**  
**3 — 6 kΩ**  
**(Throttle fully open.)**  
**(E13) No. 1 — No. 3 / 3.5 — 6.5 kΩ**



**3. CHECK INPUT SIGNAL FOR TCM.**

- 1) Connect connectors to TCM and throttle position sensor.
- 2) Turn ignition switch ON (with engine OFF).
- 3) Measure signal voltage input emitted from throttle position sensor with accelerator pedal fully depressed.

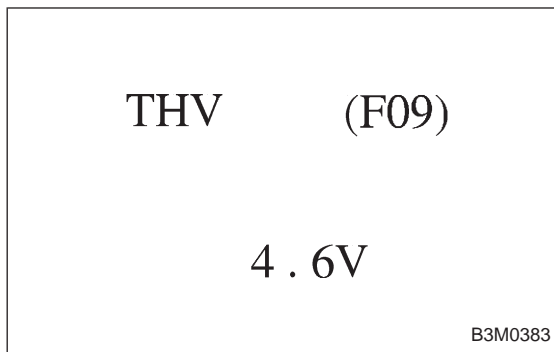
**Connector & terminal / Specified voltage:**  
**(B54) No. 8 — No. 7 /**  
**0.5±0.2 V (Throttle fully closed.)**  
**4.6±0.3 V (Throttle fully open.)**



- Using Subaru select monitor:

- (1) Connect connectors to TCM and throttle position sensor.
- (2) Turn ignition switch to OFF.
- (3) Connect the Subaru select monitor to data link connector.
- (4) Turn ignition switch to ON and Subaru select monitor switch to ON.





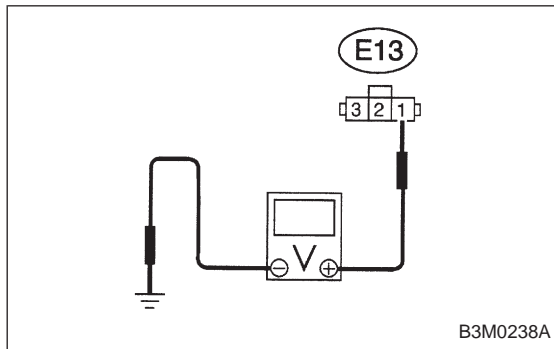
- (5) Designate mode using function key.
- (6) Read data on Subaru select monitor.

**Function mode: F09****SPECIFIED DATA:**

**0.5±0.2 V (Throttle fully closed.)**

**4.6±0.3 V (Throttle fully open.)**

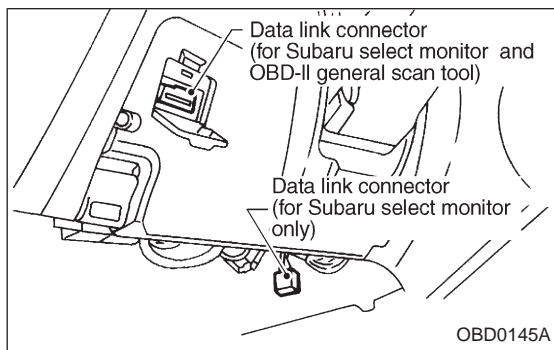
**[Must be changed correspondingly with accelerator pedal operation (from “released” to “depressed” position).]**

**4. CHECK POWER SUPPLY TO THROTTLE POSITION SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from throttle position sensor.
- 3) Turn ignition switch to ON.
- 4) Measure power supply voltage to throttle position sensor.

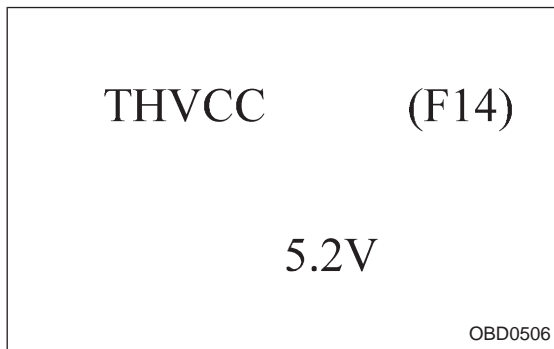
**Connector & terminal / Specified voltage:**

**(E13) No. 1 — Body / 5.12±0.1 V**



- Using Subaru select monitor:

- (1) Turn ignition switch to OFF.
- (2) Connect the Subaru select monitor to data link connector.
- (3) Turn ignition switch to ON and Subaru select monitor switch to ON.



- (4) Designate mode using function key.
- (5) Read data on Subaru select monitor.

**Function mode: F14****SPECIFIED DATA:**

**5.12±0.1 V**

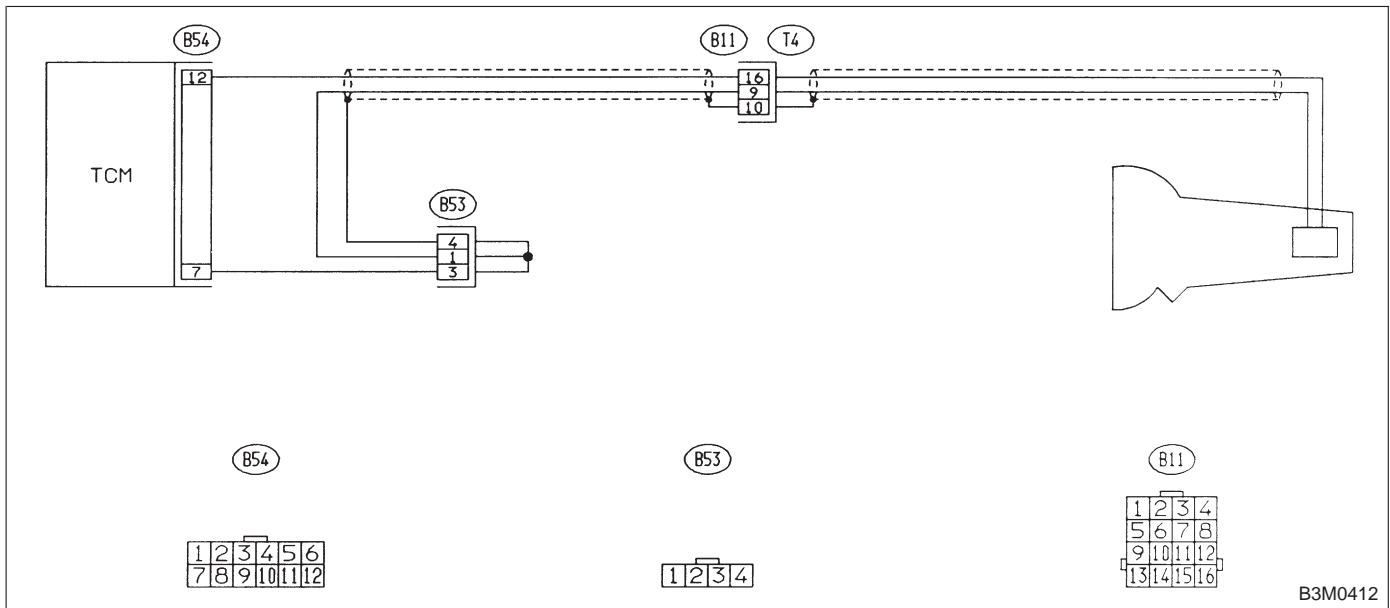
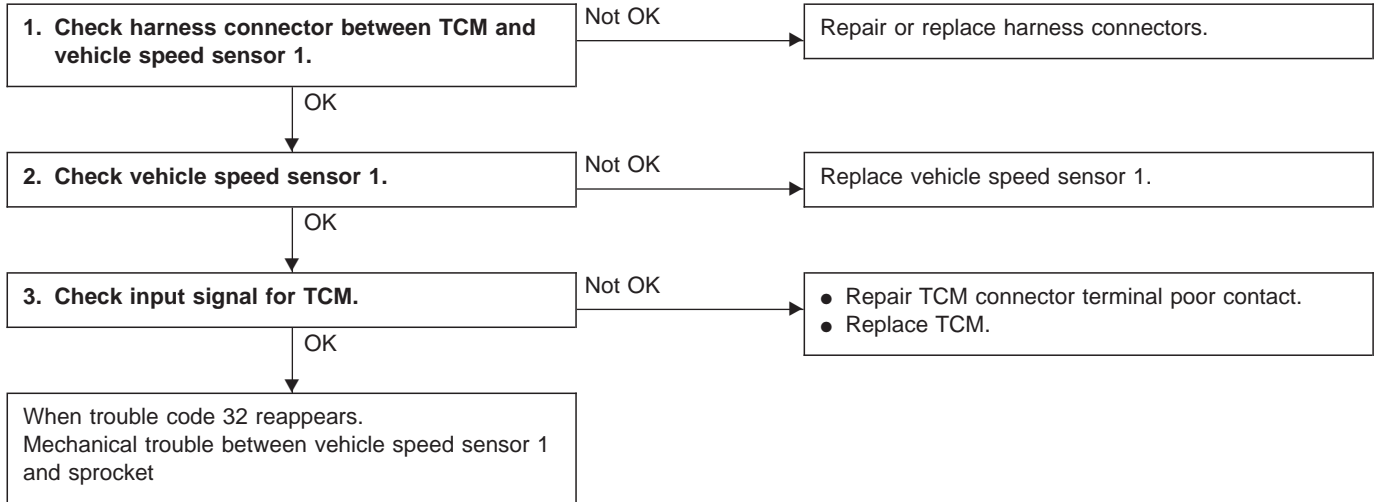
**L: TROUBLE CODE 32  
— VEHICLE SPEED SENSOR 1 —**

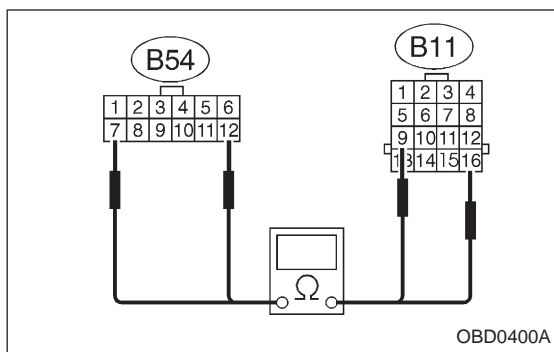
**DIAGNOSIS:**

Input signal circuit of TCM is open or shorted.

**TROUBLE SYMPTOM:**

No locking-up or excessive tight corner “braking”





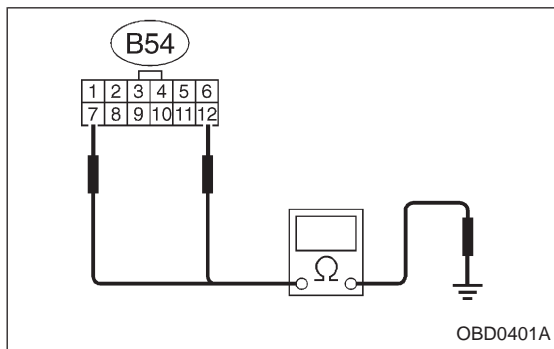
### 1. CHECK HARNESS CONNECTOR BETWEEN TCM AND VEHICLE SPEED SENSOR 1.

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

**Connector & terminal / Specified resistance:**

(B54) No. 12 — (B11) No. 16 / 1  $\Omega$ , or less

(B54) No. 7 — (B11) No. 9 / 1  $\Omega$ , or less

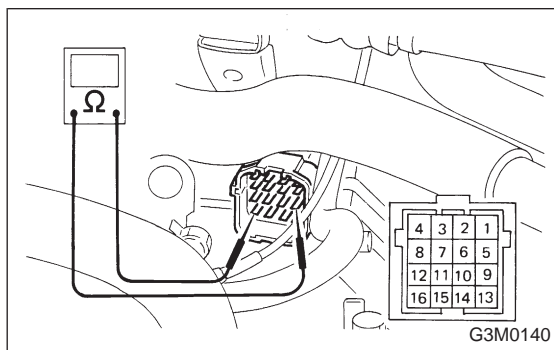


- 4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

**Connector & terminal / Specified resistance:**

(B54) No. 7 — Body / 1 M $\Omega$ , or more

(B54) No. 12 — Body / 1 M $\Omega$ , or more

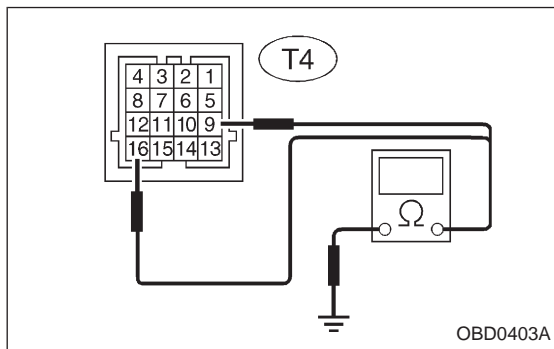


### 2. CHECK VEHICLE SPEED SENSOR 1.

- 1) Measure resistance between transmission connector receptacle's terminals.

**Connector & terminal / Specified resistance:**

(T4) No. 16 — No. 9 / 450 — 720  $\Omega$

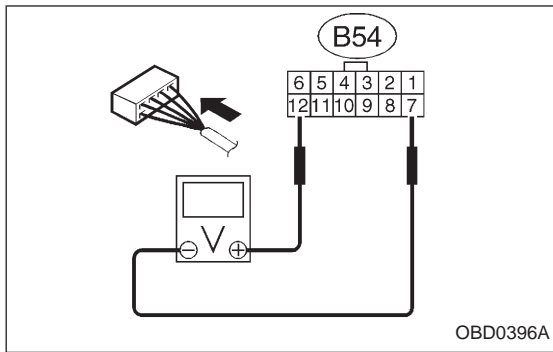


- 2) Measure resistance of harness connector between transmission connector and transmission case to make sure that circuit does not short.

**Connector & terminal / Specified resistance:**

(T4) No. 16 — Transmission / 1 M $\Omega$ , or more

(T4) No. 9 — Transmission / 1 M $\Omega$ , or more



**3. CHECK INPUT SIGNAL FOR TCM.**

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

**CAUTION:**

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

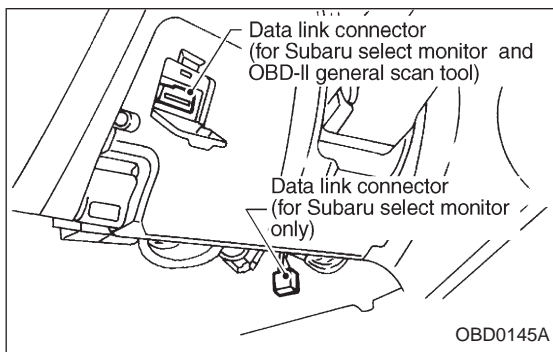
- 3) Push the TCS OFF switch to ON. (With TCS models)
- 4) Start the engine and set vehicle in 20 km/h (12 MPH) condition.
- 5) Measure voltage between TCM connector terminals.

**Connector & terminal / Specified voltage:**  
**(B54) No. 12 — No. 7 / AC 1 V, or more**

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>



● Using Subaru select monitor:

- (1) Connect connectors to TCM and transmission.
- (2) Turn ignition switch to OFF.
- (3) Connect the 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 Subaru select monitor switch to ON.
- (6) Push the TCS OFF switch to ON. (With TCS models)
- (7) Start the engine and operate at constant speed.
- (8) Read data on Subaru select monitor.
- (9) Designate mode using function key.

**Function mode: F02 or F03**

**SPECIFIED DATA:**

- F02: Compare speedometer with monitor indications.**
- F03: Compare speedometer with monitor indications.**

VSP1 ( F02 )

18 m/h

B3M0413

VSP1 (F03)

15 km/h

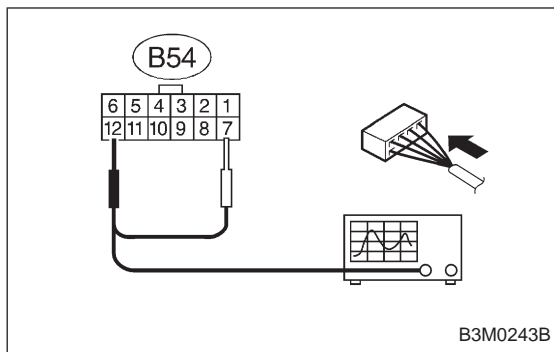
OBD0399

- F02: Vehicle speed is indicated in “m/h”.
- F03: Vehicle speed is indicated in “km/h”.

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>



- Using oscilloscope:
  - (1) Connect connectors to TCM and transmission.
  - (2) Lift-up the vehicle and place safety stands.

**WARNING:**

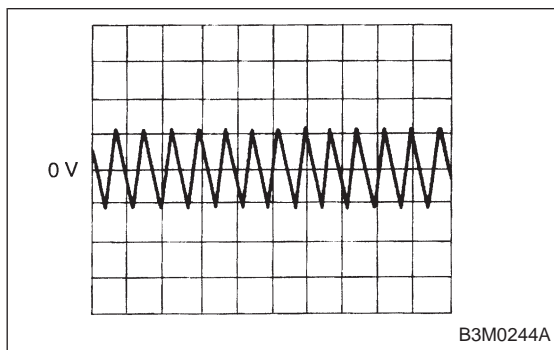
**On AWD models, make sure that all wheels are raised off floor.**

- (3) Set oscilloscope to TCM connector terminals.

**Connector & terminals:**

**Positive probe; (B54) No. 12**

**Earth lead; (B54) No. 7**



- (4) Push the TCS OFF switch to ON. (With TCS models)
- (5) Start the engine, and set vehicle in 20 km/h (12 MPH) condition.
- (6) Measure signal voltage indicated on oscilloscope.

**Specified voltage: AC 1 V, or more****NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

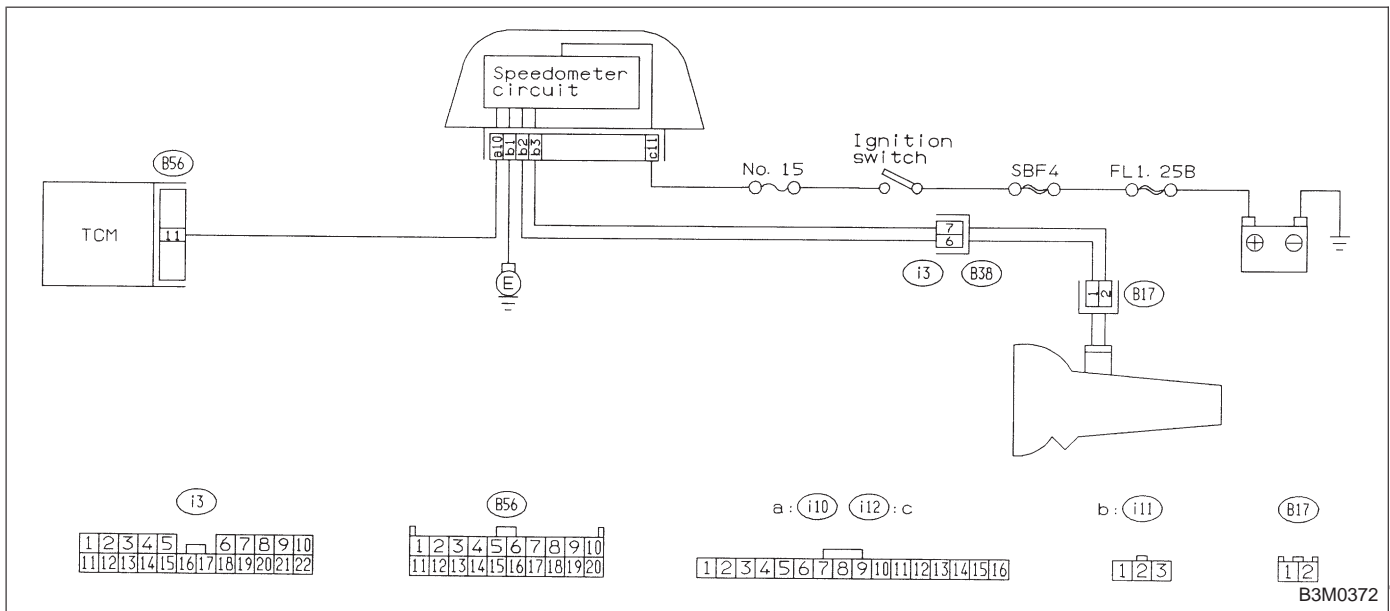
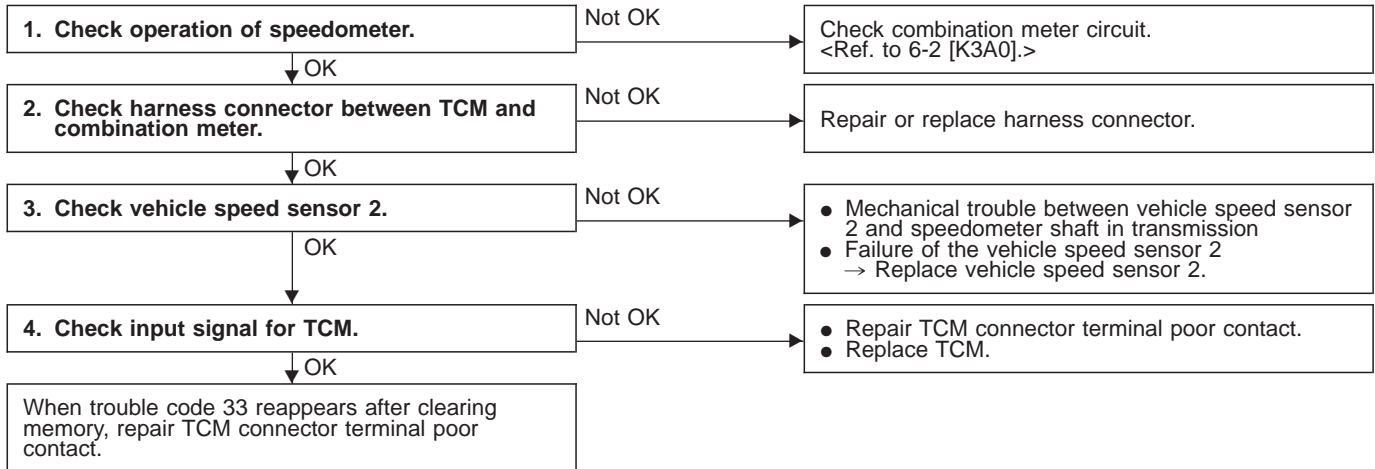
**M: TROUBLE CODE 33  
— VEHICLE SPEED SENSOR 2 —**

**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:**

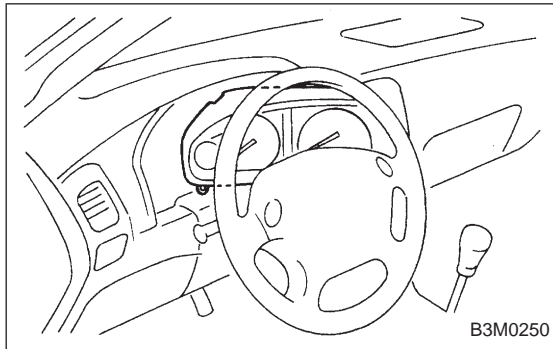
- Erroneous idling
- Engine stalls.
- Poor driving performance



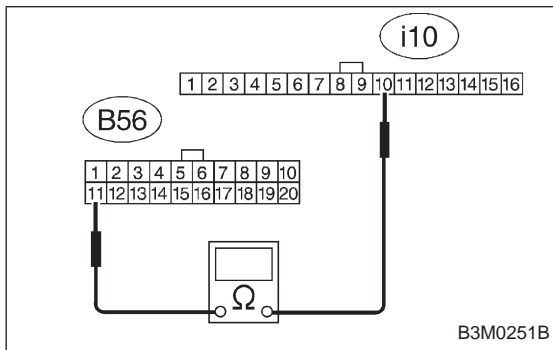
B3M0372

**1. CHECK OPERATION OF SPEEDOMETER.**

Make sure that speedometer indicates the vehicle speed by driving the vehicle.

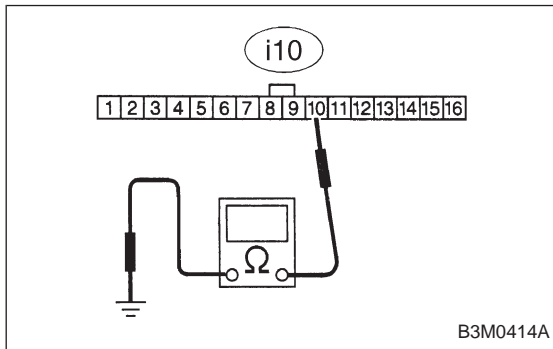
**2. CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.**

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



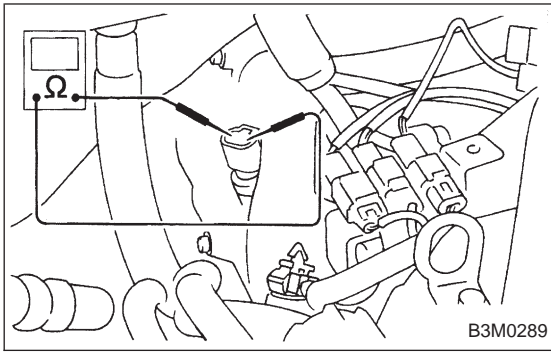
- 3) Disconnect connectors from TCM.
- 4) Measure resistance of harness connector between TCM and combination meter.

**Connector & terminal / Specified resistance:**  
**(B56) No. 11 — (i10) No. 10 / 1 Ω, or less**



- 5) Measure resistance of harness connector between combination meter and body to make sure that circuit does not short.

**Connector & terminal / Specified resistance:**  
**(i10) No. 10 — Body / 1 MΩ, or more**



**3. CHECK VEHICLE SPEED SENSOR 2.**

- 1) Install combination meter.
- 2) Connect connector to TCM.
- 3) Lift-up the vehicle and place safety stand.

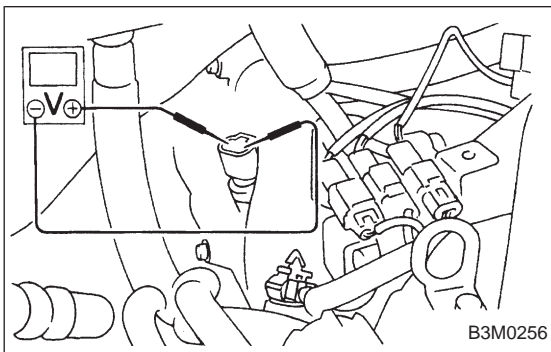
**CAUTION:**

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

- 4) Disconnect connector from vehicle speed sensor 2.
- 5) Measure resistance between terminals of vehicle speed sensor 2.

**Terminals / Specified resistance:**

- (B17) No. 1 — No. 2 / 350 — 450 Ω
- No. 1 — Body / 1 MΩ, or more
- No. 2 — Body / 1 MΩ, or more



- 6) Push the TCS OFF switch to ON. (With TCS models)
- 7) Start the engine and set vehicle in 20 km/h (12 MPH) condition.
- 8) Measure output signal of vehicle speed sensor 2.

**WARNING:**

**Be careful not to be caught up by the running wheels.**

- 9) Using a voltage meter; measure voltage between terminals of vehicle speed sensor 2.

**Terminals / Specified voltage:**

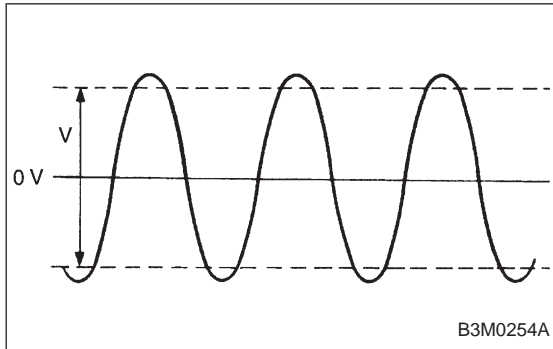
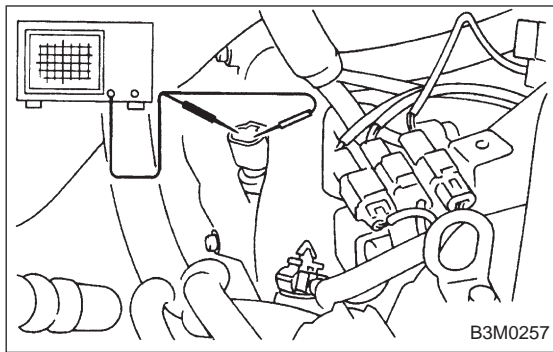
- (B17) No. 1 — No. 2 / AC 2 V, or more

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>





- Using oscilloscope:
  - (1) Install combination meter.
  - (2) Connect connector to TCM.
  - (3) Lift-up the vehicle and place safety stand.

**WARNING:**

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

- (4) Set oscilloscope to vehicle speed sensor 2.

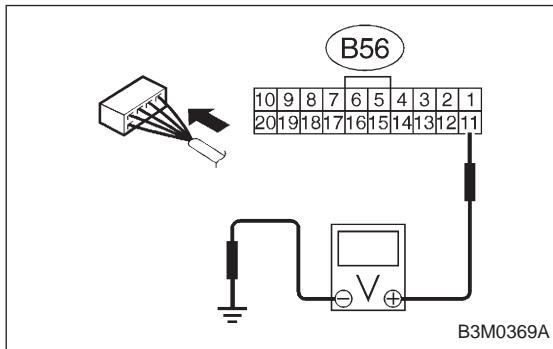
**Connector & terminal / No. 1 — No. 2**

- (5) Push the TCS OFF switch to ON. (With TCS models)
- (6) Start the engine, and drive the wheels slowly.
- (7) Measure signal voltage indicated on oscilloscope.

**Specified voltage: AC 2 V, or more****NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

**4. CHECK INPUT SIGNAL FOR TCM.**

- 1) Connect connector to vehicle speed sensor 2.
- 2) Lift-up the vehicle or set the vehicle on free roller.

**CAUTION:**

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

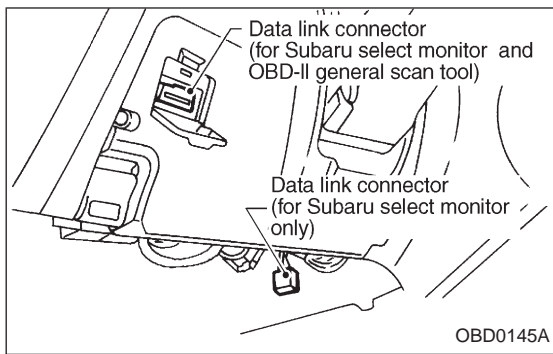
- 3) Push the TCS OFF switch to ON. (With TCS models)
- 4) Start the engine, and drive the wheels slowly.
- 5) Measure voltage between TCM and body.

**Connector & terminal / Specified voltage:**  
**(B56) No. 11 — Body / Less than 1 ↔ more than 9 V**

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

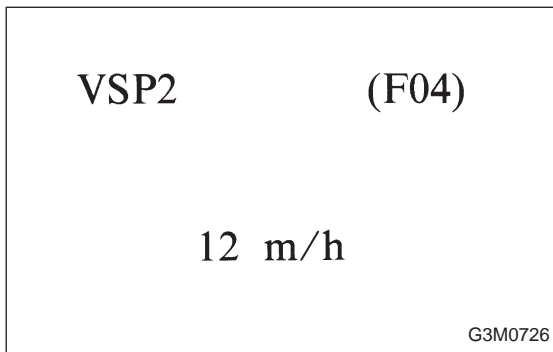


- Using Subaru select monitor:
  - (1) Install combination meter.
  - (2) Connect connectors to TCM and vehicle speed sensor 2.
  - (3) Lift-up the vehicle or set the vehicle on free roller.
  - (4) Turn ignition switch to OFF.
  - (5) Connect the Subaru select monitor to data link connector.
  - (6) Turn ignition switch to ON and Subaru select monitor switch to ON.

**CAUTION:**

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

- (7) Push the TCS OFF switch to ON. (With TCS models)



- (8) Start the engine, and drive the wheels.
- (9) Read data on Subaru select monitor.
- (10) Designate mode using function key.

**Function mode: F04 or F05**

**SPECIFIED DATA:**

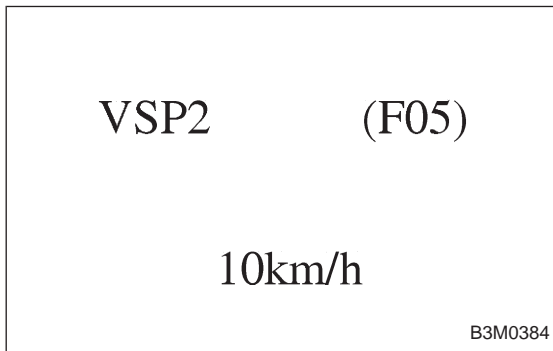
**Compare speedometer with select monitor indications.**

- F04: Vehicle speed is indicated in mile per hour (MPH).
- F05: Vehicle speed is indicated in kilometer per hour (km/h).

**NOTE:**

The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>



- Using oscilloscope:

- (1) Connect connector to vehicle speed sensor 2.
- (2) Lift-up the vehicle or set the vehicle on free rollers.

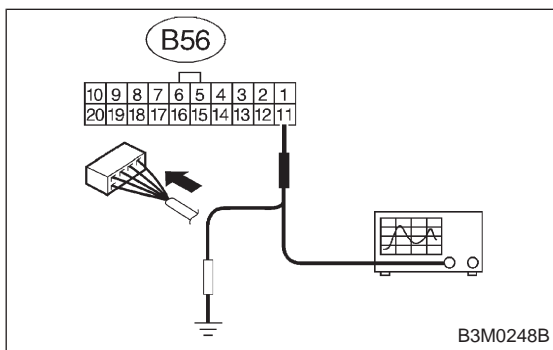
**CAUTION:**

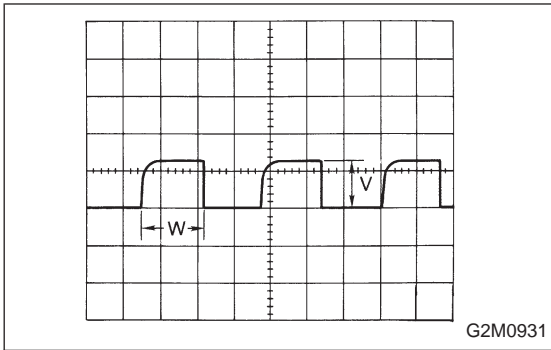
**On AWD models, raise all wheels off floor.**

- (3) Set oscilloscope to TCM connector terminals.

**Connector & terminals:**

**Positive probe; (B56) No. 11**  
**Earth lead; Body**





- (4) Push the TCS OFF switch to ON. (with TCS models)
- (5) Start the engine.
- (6) Shift on the gear position, and keep the vehicle speed at constant.
- (7) Measure signal voltage.

**Specified voltage: 2 V, or more**

NOTE:

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

NOTE:

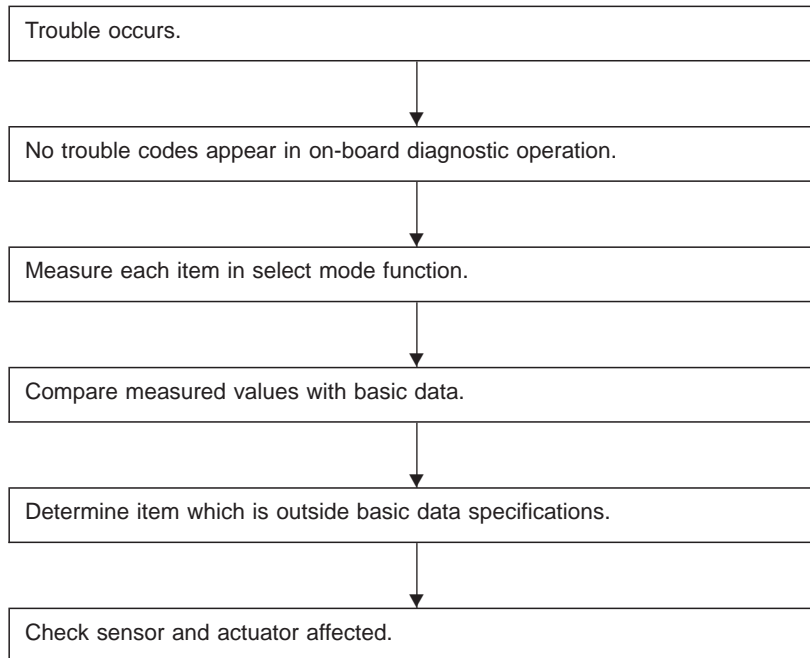
The speed difference between front and rear wheels may light either the ABS or the ABS/TCS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS or the ABS/TCS memory clearance procedure of self-diagnosis system.

<Ref. to 4-4b [T6D2] or [T9K0], or 4-4c [T6D2] or [T9J0].>

## 8. Diagnostic Chart with Select Monitor

### A: BASIC DIAGNOSTIC CHART

If no trouble codes appear in the on-board diagnostic 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.



**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.)	56
F01	Battery voltage	VB	V	Battery voltage applied to control unit.	56
F02	Vehicle speed sensor 1	VSP1	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 1.	57
F03	Vehicle speed sensor 1	VSP1	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 1.	57
F04	Vehicle speed sensor 2	VSP2	m/h	Vehicle speed (miles/h) sent from vehicle speed sensor 2.	57
F05	Vehicle speed sensor 2	VSP2	km/h	Vehicle speed (km/h) sent from vehicle speed sensor 2.	57
F06	Engine speed	EREV	rpm	Engine speed sent from ECM.	58
F07	ATF temperature sensor	ATFT	°F	ATF temperature (°F) sent from ATF temperature sensor.	58
F08	ATF temperature sensor	ATFT	°C	ATF temperature (°C) sent from ATF temperature sensor.	58
F09	Throttle position sensor	THV	V	Voltage sent from throttle position sensor.	59
F10	Gear position	GEAR	—	Transmission gear position	59
F11	Line pressure duty	PLDTY	%	Duty ratio flowing through duty solenoid A.	60
F12	Lock-up duty	LUPTY	%	Duty ratio flowing through duty solenoid B.	61
F13	AWD duty	4WDTY	%	Duty ratio flowing through duty solenoid C.	62
F14	Throttle position sensor power supply	THVCC	V	Power supply voltage to throttle position sensor	63
F15	Mass air flow signal	AFM	V	Output voltage from air flow sensor	63

**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.	—
	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.	65
	8	—	—		—
	9	—	—		—
	10	—	—		—

NOTE; LED Nos. 2 and 8 cannot be turned on.

**3. DIAGNOSIS MODE**

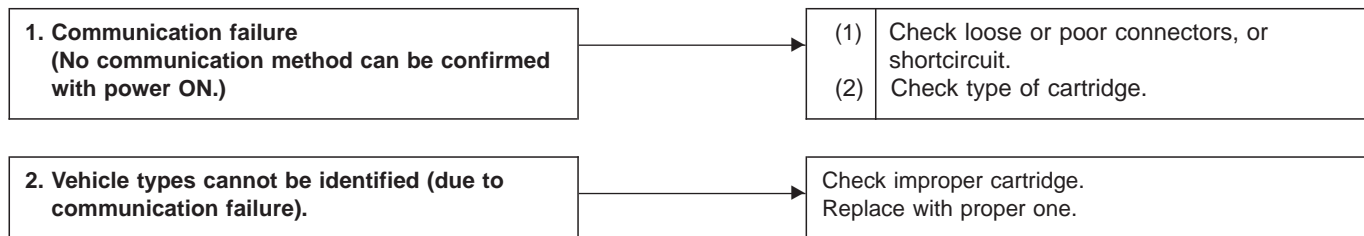
Mode	Contents	Abbr.	Contents of display
FB0	On-board diagnostics	DIAG.U	Current trouble code determined by on-board diagnostics.
FB1	On-board diagnostics	DIAG.M	Previous trouble code stored in memory by on-board diagnostics.
FC0	Back-up clear	—	Function of clearing trouble code stored in memory.

<p><b>E-4AT</b>                      <b>(F00)</b></p> <p><b>4WD</b>                              <b>1993</b></p>
G3M0723

**C: MODE F00 — MODE DISPLAY — SPECIFIED DATA:**

Data at the left should be indicated.

Probable cause (if outside "specified data")



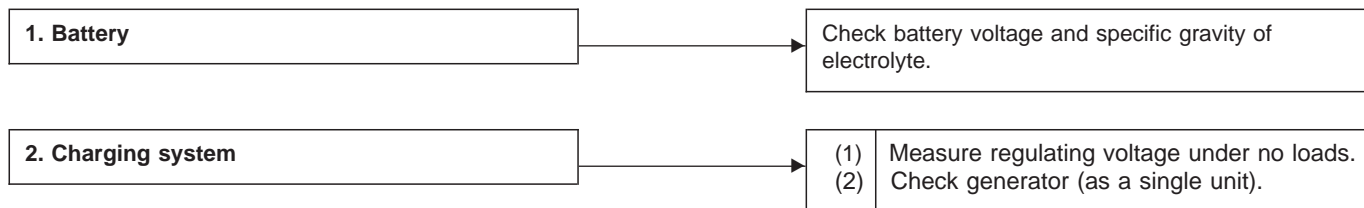
<p><b>VB</b>                              <b>(F01)</b></p> <p><b>12 V</b></p>
G3M0724

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

- Ignition switch ON
- Engine idling after warm-up

**SPECIFIED DATA:**

VB: 10 — 16 V



VSP1 (F02)

18 m/h

G3M0725

**E: MODE F02**

**— VEHICLE SPEED SENSOR 1 (VSP1) —**

**F03 = vehicle speed (VSP1):**  
to be indicated in “km/h”.

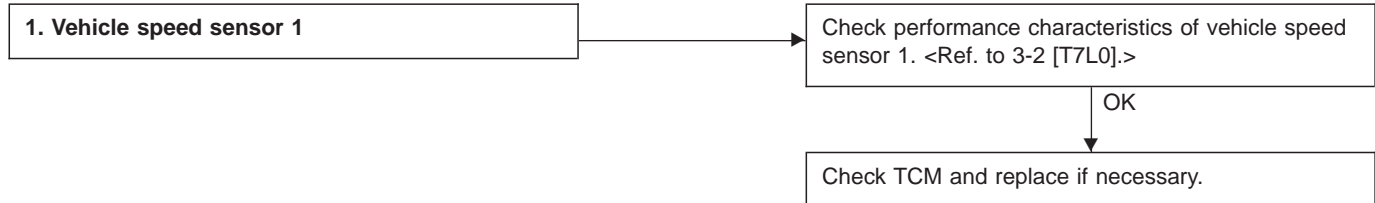
**CONDITION:**

Raise vehicle off ground and operate at constant speed.

**SPECIFIED DATA:**

Compare speedometer with monitor indications.

Probable cause (if outside “specified data”)



VSP2 (F04)

12 m/h

G3M0726

**F: MODE F04**

**— VEHICLE SPEED SENSOR 2 (VSP2) —**

**F05 = vehicle speed (VSP2):**  
to be indicated in “km/h”.

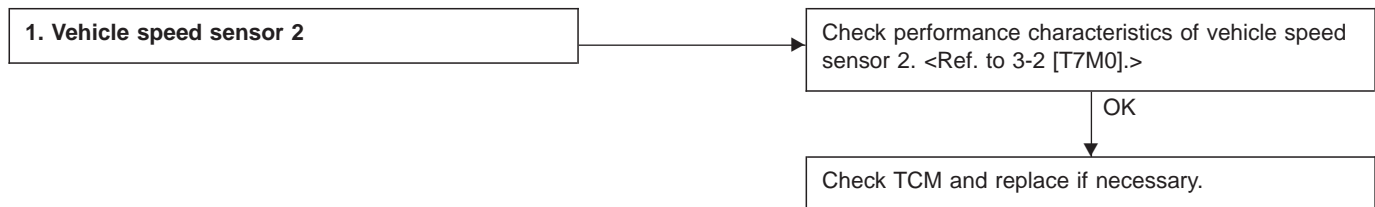
**CONDITION:**

Raise vehicle off ground and operate at constant speed.

**SPECIFIED DATA:**

Compare speedometer with monitor indications.

Probable cause (if outside “specified data”)





EREV (F06)

1,500 rpm

G3M0727

**G: MODE F06 — ENGINE SPEED (EREV) —**

**CONDITION:**

Measure with engine operating at constant speed.

**SPECIFIED DATA:**

Same as tachometer reading (in combination meter)

Probable cause (if outside "specified data")



ATFT (F07)

176 deg F

OBD0386

**H: MODE F07**

**— ATF TEMPERATURE SENSOR (ATFT) —**

**F08 = ATF temperature (ATFT): to be indicated in "deg C".**

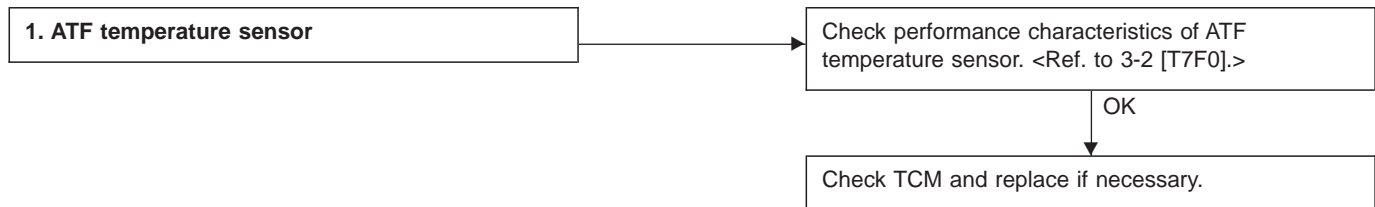
**CONDITION:**

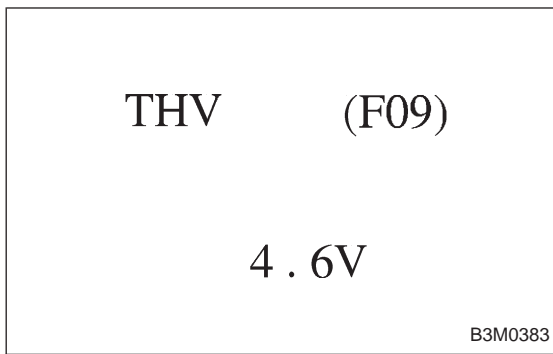
- Low ATF temperature (before engine/vehicle starts.)
- High ATF temperature (after driving vehicle for warm-up.)

**SPECIFIED DATA:**

- Ambient temperature: ±50°F (±10°C)  
(Low ATF temperature)
- ATF temperature: 158 — 230°F (70 — 110°C)  
(High ATF temperature)
- Open harness: 176 deg F (80 deg C)
- Shorted harness: 320 deg F (160 deg C)

Probable cause (if outside "specified data")





**I: MODE F09 — THROTTLE POSITION SENSOR (THV) —**

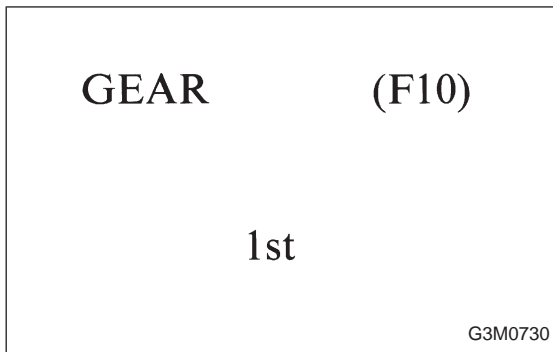
**CONDITION:**

- Ignition switch ON (with engine OFF)
- Measure voltage while operating throttle valve from a fully closed position to a fully open position.

**SPECIFIED DATA:**

- Fully closed position:  $0.5 \pm 0.2$  V
- Fully open position:  $4.6 \pm 0.3$  V
- From fully closed to fully open position: Voltage must smoothly decrease.
- Open harness:  $5.0 \pm 0.3$  V
- Shorted harness: 0.00 V

Probable cause (if outside "specified data")



**J: MODE F10 — GEAR POSITION (GEAR) —**

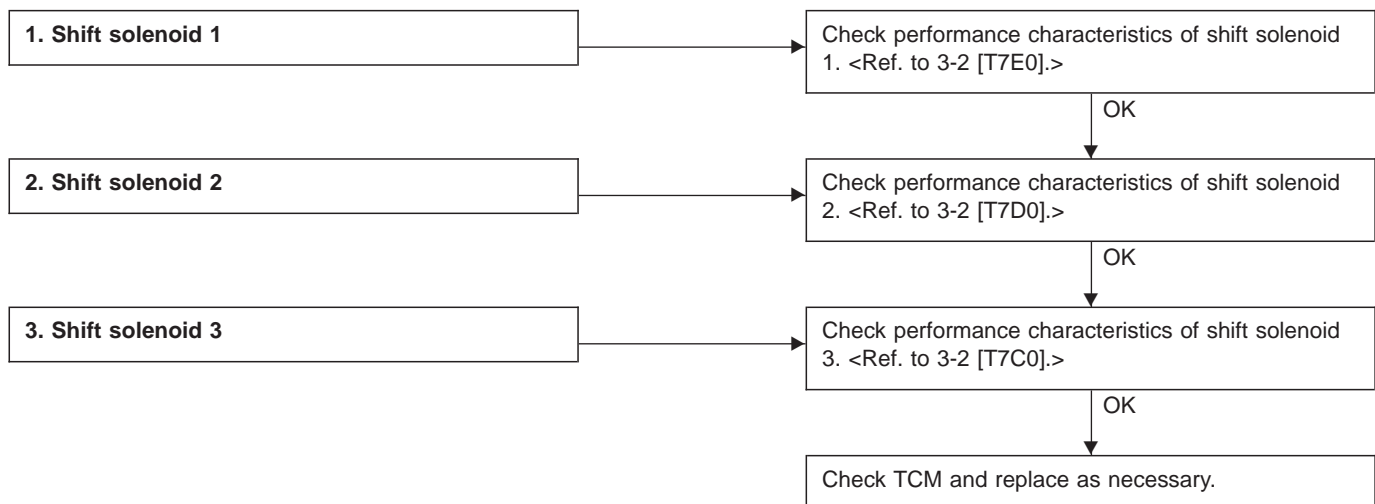
**CONDITION:**

Check while driving vehicle (after warm-up).

**SPECIFIED DATA:**

Gear position (Refer to shift performance characteristics chart.)

Probable cause (item outside "specified data")



PLDTY (F11)

50%

G3M0731

**K: MODE F11**  
**— LINE PRESSURE DUTY (PLDTY) —**

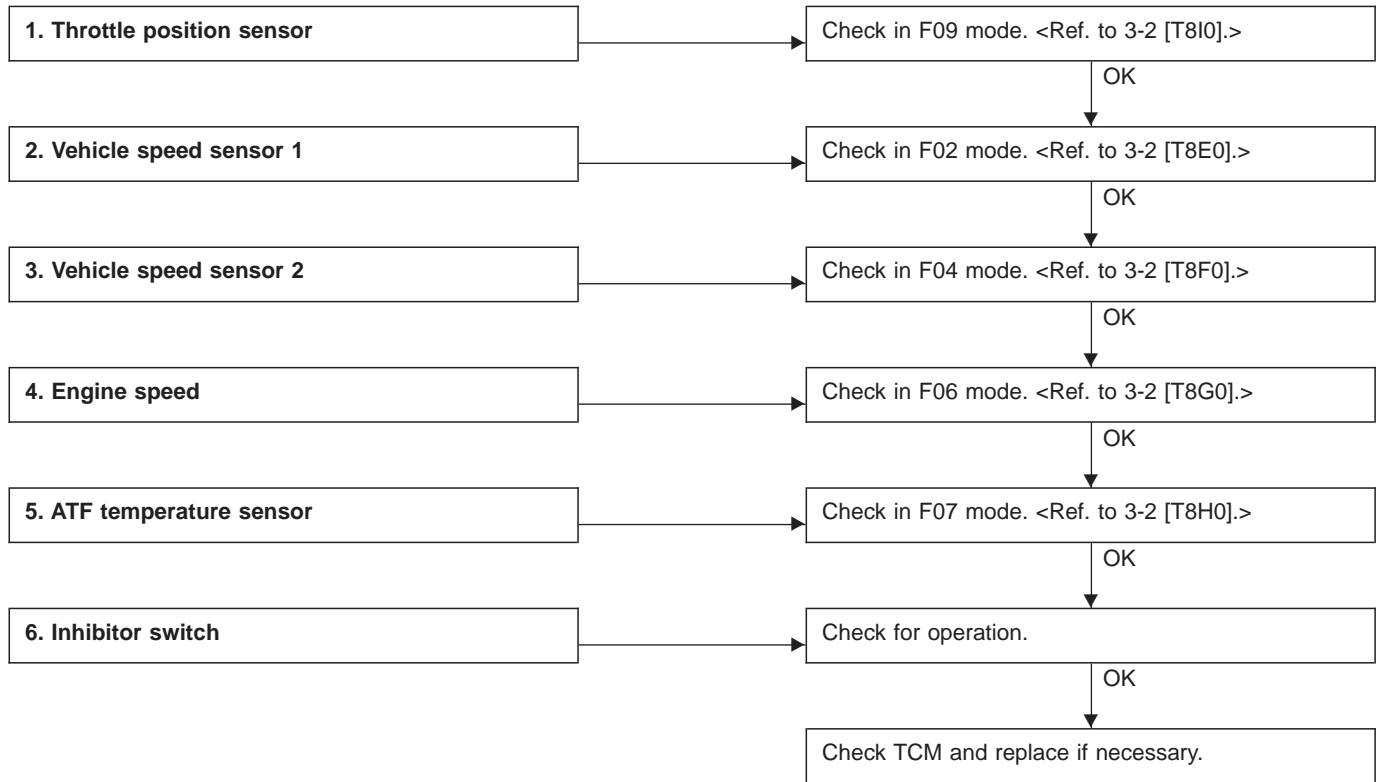
**CONDITION:**

- After sufficient warm-up
- Ignition ON (engine OFF)
- N range

**SPECIFIED DATA:**

- Throttle fully closed: 100%
- Throttle fully open : 15% or less

Probable cause (if outside "specified data")



**LUPTY (F12)**

5%

G3M0732

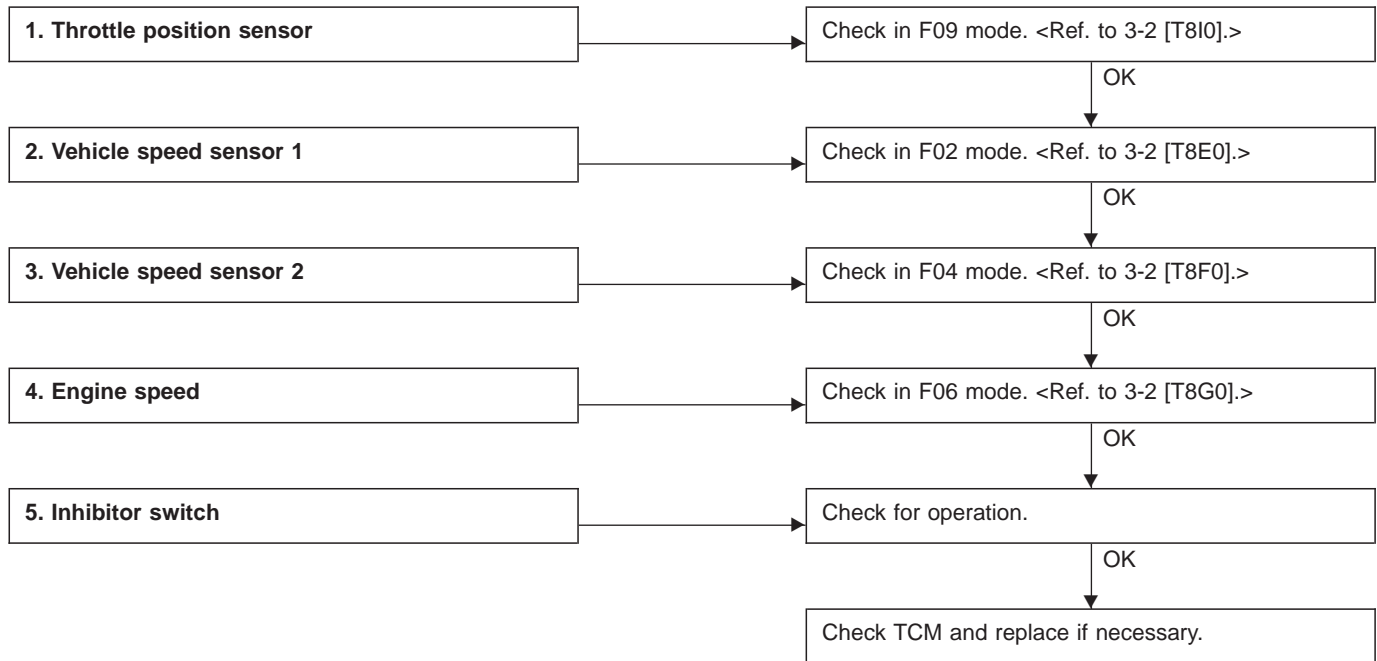
**L: MODE F12 — LOCK-UP DUTY (LUPTY) — CONDITION:**

- Idling (after sufficient warm-up) with lock-up system released.
- Driving at 75 km/h (47 MPH) (after sufficient warm-up) with lock-up system applied.

**SPECIFIED DATA:**

- Lock-up system released: 5%
- Lock-up system applied: 95%

Probable cause (if outside "specified data")



4WDTY (F13)

95%

G3M0733

**M: MODE F13 — AWD DUTY (4WDTY) —**

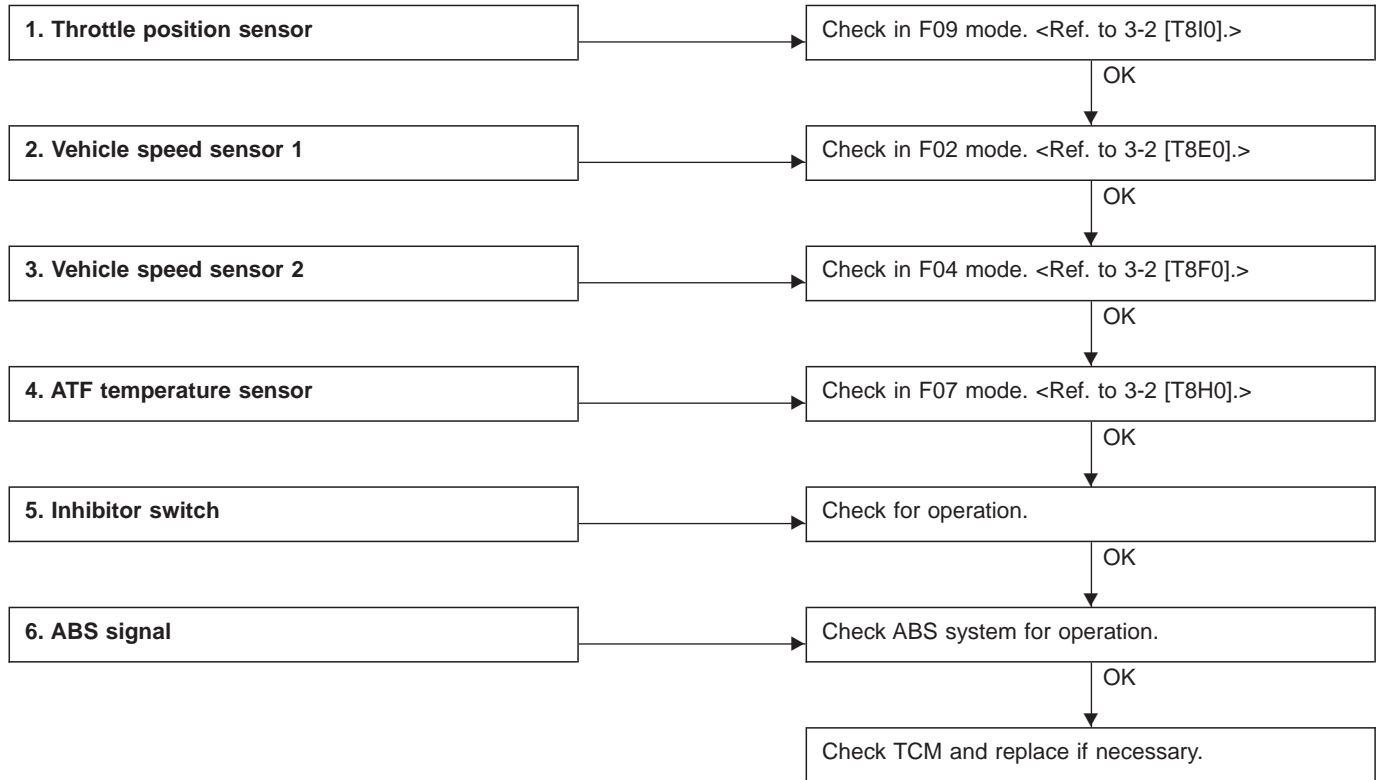
**CONDITION:**

- After sufficient warm-up
- Ignition switch ON (engine OFF)
- FWD mode
- AWD mode, D range, full throttle

**SPECIFIED DATA:**

- 95% (FWD mode)
- 25%, max. (vehicle speed 0 m/h) (AWD mode)

Probable cause (if outside "specified data")



THVCC (F14)

5.2 V

B3M0259

**N: MODE F14**  
**— THROTTLE POSITION SENSOR POWER SUPPLY (THVCC) —**

**CONDITION:**

Ignition switch ON (engine OFF)

**SPECIFIED DATA:**

5.12±0.1 V

Probable cause (Item outside "specified data")



AFM (F15)

0.6V

B3M0370

**O: MODE F15**  
**— MASS AIR FLOW SIGNAL (AFM) —**

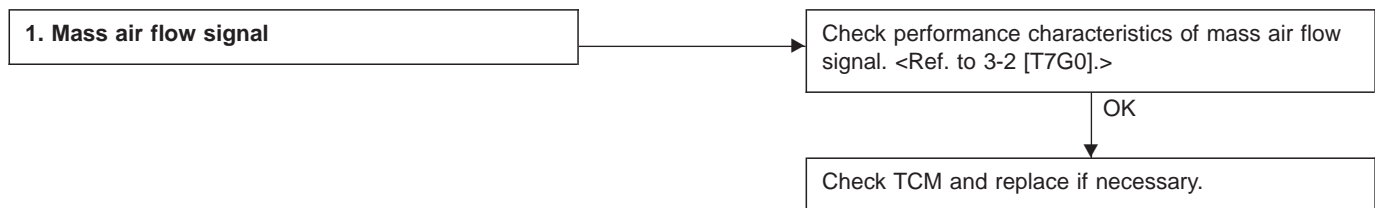
**CONDITION:**

- Ignition switch ON (engine ON)
- N range
- Idling

**SPECIFIED DATA:**

Engine warm-up: 0.5 — 1.22 V

Probable cause (if outside "specified data")



## 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

## 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:

LED Nos. 2 and 8 do not come on.

## 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

## Q: 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).

## NOTE:

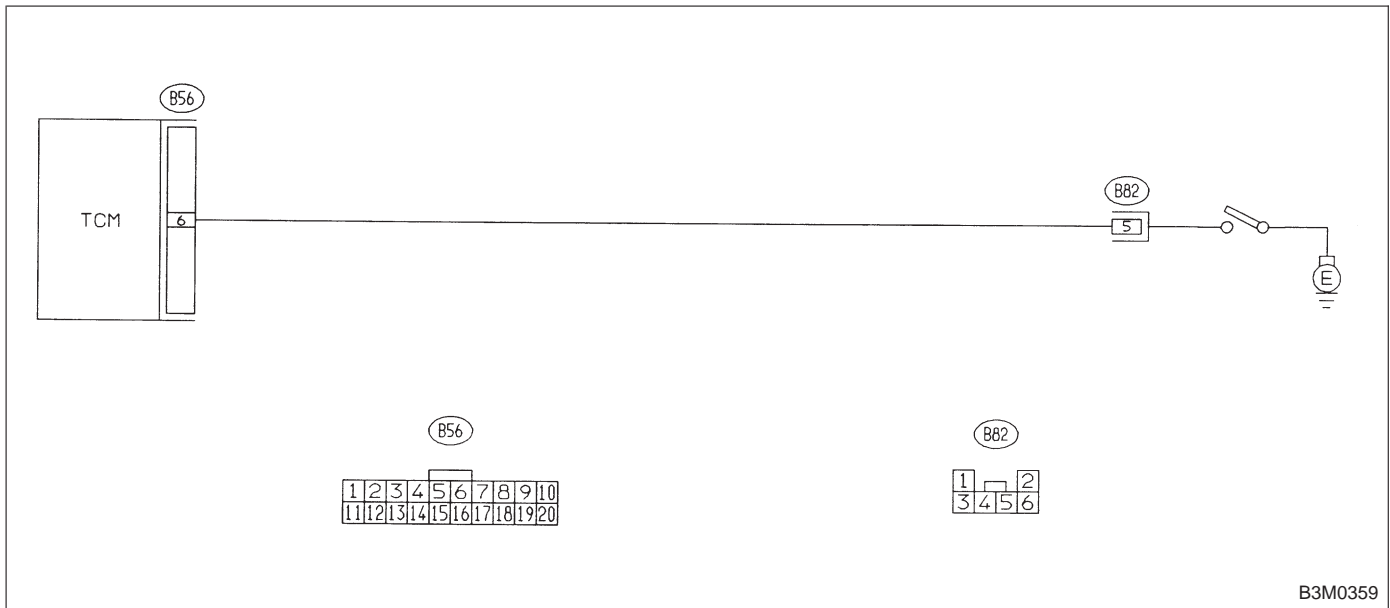
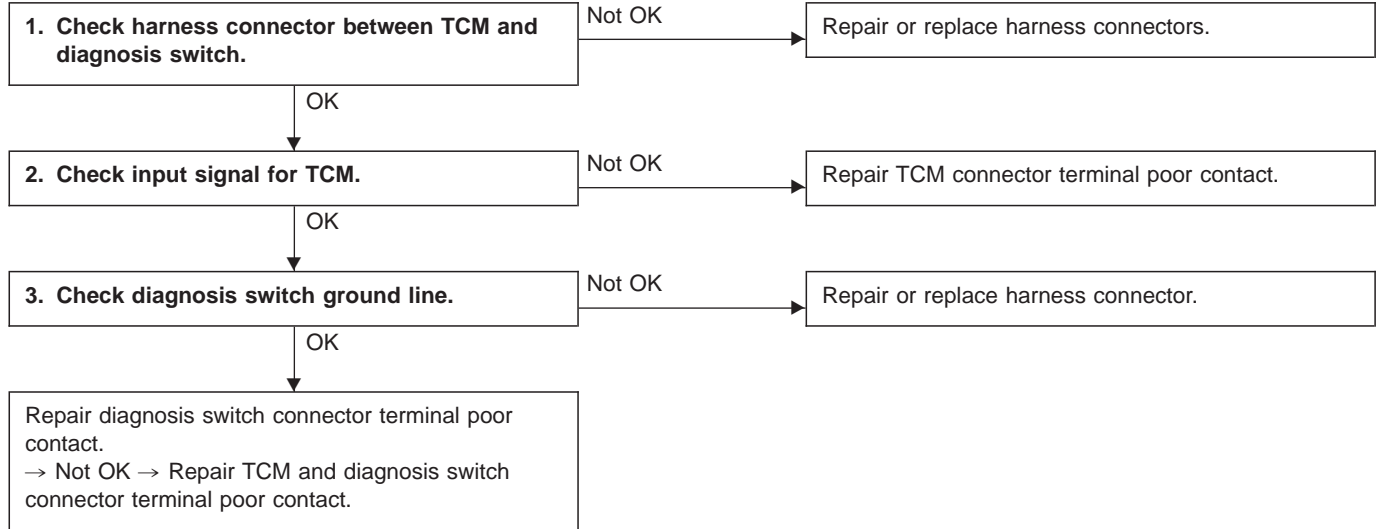
If each LED does not illuminate in the above conditions, inhibitor switch malfunction may occur. Perform diagnostics on inhibitor switch. <Ref. to 2-7 [T10AT0].>

**R: MODE FA1**  
**— LED No. 7, DIAGNOSIS SWITCH —**

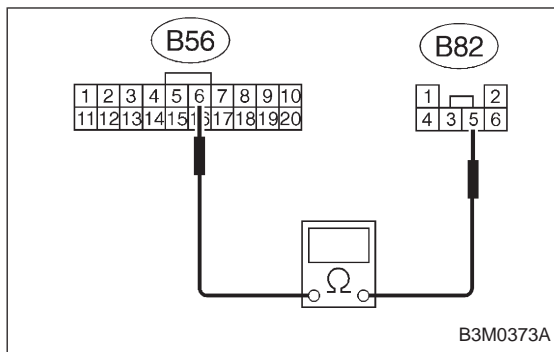
**DIAGNOSIS:**

- LED does not come on when diagnosis switch is ON.
- Diagnosis switch circuit is open or shorted.

Probable cause (if outside "specified data")



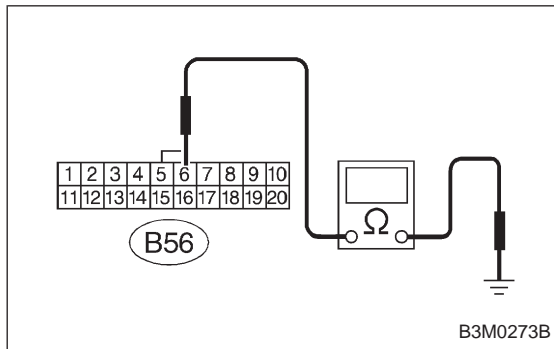




### 1. CHECK HARNESS CONNECTOR BETWEEN TCM AND DIAGNOSIS SWITCH.

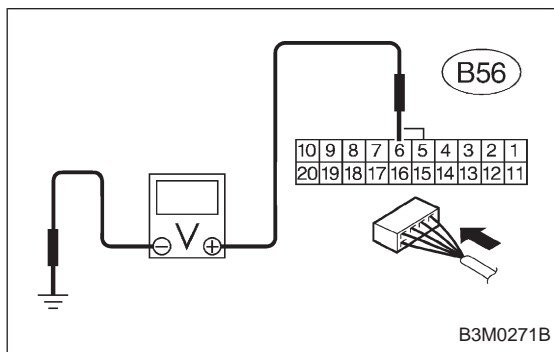
- 1) Turn ignition switch OFF.
- 2) Disconnect connector from TCM.
- 3) Measure resistance of harness connector between TCM and diagnosis switch.

**Connector & terminal / Specified resistance:**  
**(B56) No. 6 — (B82) No. 5 / 1  $\Omega$ , or less.**



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

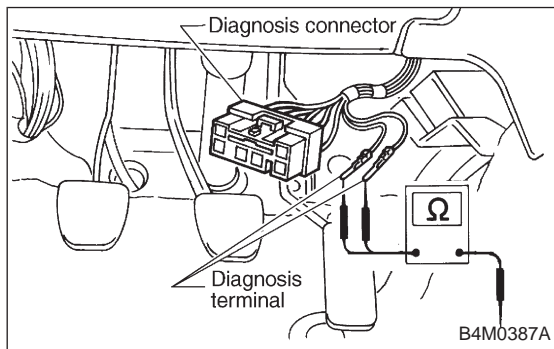
**Connector & terminal / Specified resistance:**  
**(B56) No.6 — Body / 1 M  $\Omega$ , or more**



### 2. CHECK INPUT SIGNAL FOR TCM.

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

**Connector & terminal / Specified voltage:**  
**(B56) No. 6 — Body / Less than 1 V (Connected)**  
**More than 6 V (Disconnected)**



### 3. CHECK DIAGNOSIS SWITCH GROUND LINE.

Measure resistance of harness terminal between diagnosis terminal and body.

**Connector & terminal / Specified resistance:**  
**(B81) — Body / 1  $\Omega$ , or less**

**9. General Diagnostic Table**

Symptom	Problem parts																												
	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Diagnosis switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	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
Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	X				X	X		X																					
Abnormal noise when select lever is in "P" or "N."																X													X
Hissing noise occurs during standing starts.																X													
Noise occurs while driving in "D <sub>1</sub> " range.																													
Noise occurs while driving in "D <sub>2</sub> " range.																													
Noise occurs while driving in "D <sub>3</sub> " range.																													
Noise occurs while driving in "D <sub>4</sub> " range.																													
Engine stalls while shifting from one range to another.																						X							
Vehicle moves when select lever is in "N."																													X
Shock occurs when select lever is moved from "N" to "D."		X									X											X							
Excessive time lag occurs when select lever is moved from "N" to "D."																						X							X
Shock occurs when select lever is moved from "N" to "R."		X										X										X							
Excessive time lag occurs when select lever is moved from "N" to "R."																						X							
Vehicle does not start in any shift range (engine revving up).																X						X							
Vehicle does not start in any shift range (engine stall).																													
Vehicle does not start in "R" range only (engine revving up).					X	X																X							
Vehicle does not start in "R" range only (engine stall).																													X
Vehicle does not start in "D" or "3" range (engine revving up).																													X
Vehicle does not start in "D", "3" or "2" range (engine revving up).																													X
Vehicle does not start in "D", "3" or "2" range (engine stall).																													
Vehicle starts in "R" range only (engine revving up).																						X							
Acceleration during standing starts is poor (high stall rpm).																						X							X
Acceleration during standing starts is poor (low stall rpm).																													
Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).		X																				X							
Acceleration is poor when select lever is in "R" (normal stall rpm).																						X							
No shift occurs from 1st to 2nd gear.		X	X	X					X											X	X	X							
No shift occurs from 2nd to 3rd gear.		X																				X							
No shift occurs from 3rd to 4th gear.		X											X	X								X	X						
No "kick-down" shifts occur.		X							X																				
Engine brake is not effected when select lever is in "3" range.	X	X							X													X							



Symptom	Problem parts																												
	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Diagnosis switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	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
Engine brake is not effected when select lever is in "3" or "2" range.																													
Engine brake is not effected when select lever is in "1" range.																							X						
Shift characteristics are erroneous.	X	X	X	X					X													X							
No lock-up occurs.		X							X						X							X							
Vehicle cannot be set in "D" range power mode.		X							X																				
"D" range power mode cannot be released.		X							X						X														
Parking brake is not effected.					X	X																							
Shift lever cannot be moved or is hard to move from "P" range.					X	X																							
Select lever is hard to move.					X	X																		X	X				
Select lever is too light to move (unreasonable resistance).																							X	X					
ATF spurts out.																													
Differential oil spurts out.																													
Differential oil level changes excessively.																													
Odor is produced from oil supply pipe.																										X			X
Shock occurs when select lever is moved from "1" to "2" range.		X							X			X			X		X					X							
Slippage occurs when select lever is moved from "1" to "2" range.		X							X			X			X		X					X							
Shock occurs when select lever is moved from "2" to "3" range.		X							X				X	X	X		X					X							
Slippage occurs when select lever is moved from "2" to "3" range.		X							X				X	X	X		X					X							
Shock occurs when select lever is moved from "3" to "4" range.		X							X			X	X	X	X		X					X							
Slippage occurs when select lever is moved from "3" to "4" range.		X							X			X	X	X	X		X					X							
Shock occurs when select lever is moved from "3" to "2" range.		X							X						X		X					X							
Shock occurs when select lever is moved from "D" to "1" range.		X							X						X		X					X							
Shock occurs when select lever is moved from "2" to "1" range.		X							X						X		X					X							
Shock occurs when accelerator pedal is released at medium speeds.		X							X						X		X					X							
Vibration occurs during straight-forward operation.		X																	X										
Select lever slips out of position during acceleration or while driving on rough terrain.					X	X																	X	X					
Vibration occurs during turns (tight corner "braking" phenomenon).		X	X	X					X						X										X	X		X	X
Front wheel slippage occurs during standing starts.		X		X			X		X						X							X			X	X	X	X	X
Vehicle is not set in FWD mode.		X					X																		X	X		X	
	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	Problem parts	Symptom
X																													Engine brake is not effected when select lever is in "3" or "2" range.	
									X																				Engine brake is not effected when select lever is in "1" range.	
																										X			Shift characteristics are erroneous.	
																					X								No lock-up occurs.	
																													Vehicle cannot be set in "D" range power mode.	
																											X		"D" range power mode cannot be released.	
																											X		Parking brake is not effected.	
																											X		Shift lever cannot be moved or is hard to move from "P" range.	
																													Select lever is hard to move.	
																													Select lever is too light to move (unreasonable resistance).	
																								X					ATF spurts out.	
																									X				Differential oil spurts out.	
					X									X															Differential oil level changes excessively.	
X							X	X	X	X											X	X							Odor is produced from oil supply pipe.	
								X															X			X			Shock occurs when select lever is moved from "1" to "2" range.	
								X																					Slippage occurs when select lever is moved from "1" to "2" range.	
							X	X															X		X				Shock occurs when select lever is moved from "2" to "3" range.	
							X	X																					Slippage occurs when select lever is moved from "2" to "3" range.	
X								X															X		X				Shock occurs when select lever is moved from "3" to "4" range.	
								X																					Slippage occurs when select lever is moved from "3" to "4" range.	
X								X															X						Shock occurs when select lever is moved from "3" to "2" range.	
																							X						Shock occurs when select lever is moved from "D" to "1" range.	
									X														X						Shock occurs when select lever is moved from "2" to "1" range.	
																								X		X			Shock occurs when accelerator pedal is released at medium speeds.	
																						X	X						Vibration occurs during straight-forward operation.	
																													Select lever slips out of position during acceleration or while driving on rough terrain.	
																							X						Vibration occurs during turns (tight corner "braking" phenomenon).	
																													Front wheel slippage occurs during standing starts.	
																													Vehicle is not set in FWD mode.	



## 1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the ABS/TCS 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/TCS control module, ABS sensor and hydraulic control unit.

## 2. Pre-inspection

Before performing diagnostics, check the following items which might affect ABS/TCS 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].>

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Check brake pad and rotor. <Ref. to 4-4 [K100].>

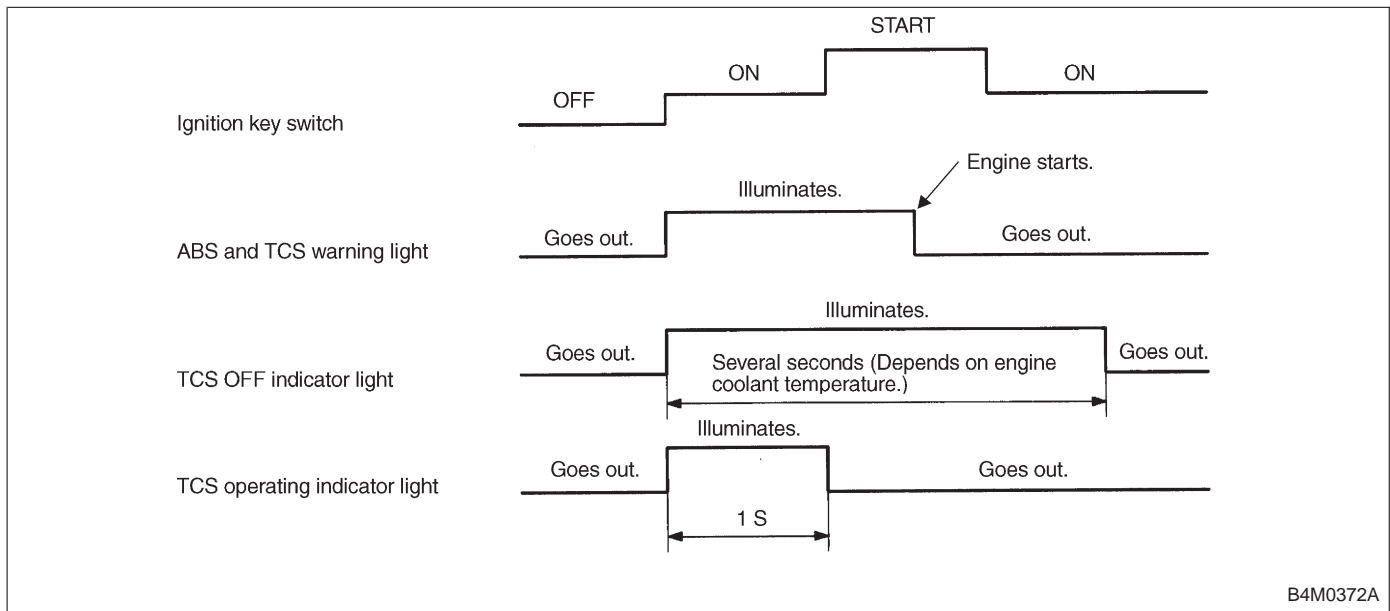
#### 5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A0].>



**B: ELECTRICAL INSPECTION**

**1. WARNING LAMP ILLUMINATION PATTERN**



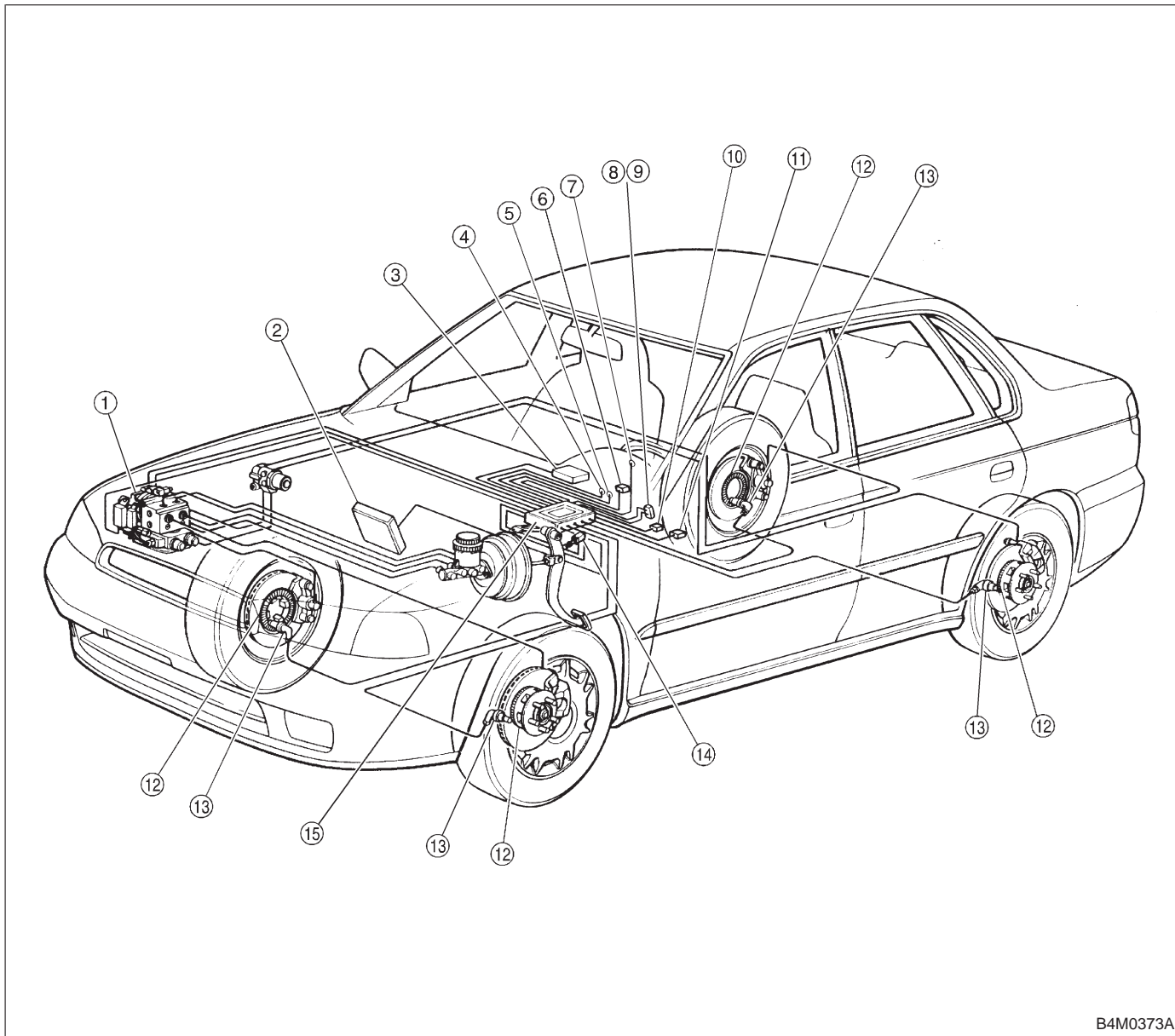
B4M0372A

**2. DISPLAY SYSTEM TYPE AND LIGHTING CONDITIONS**

○: Illuminated

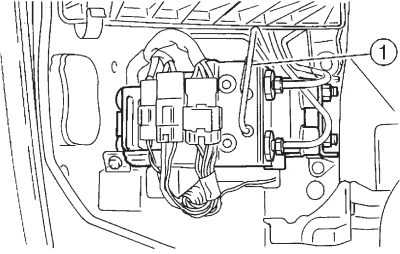
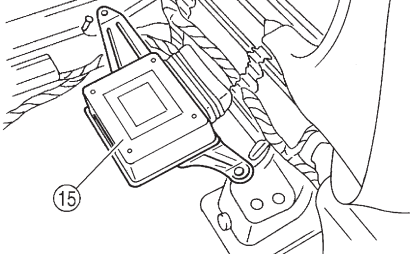
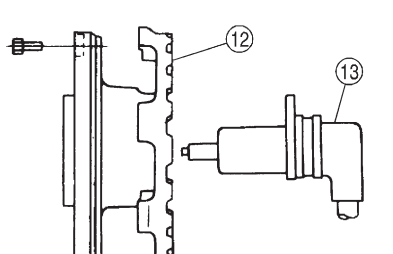
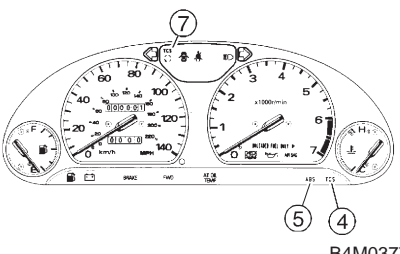
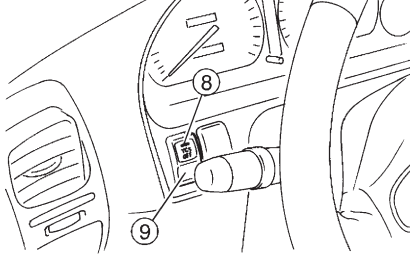
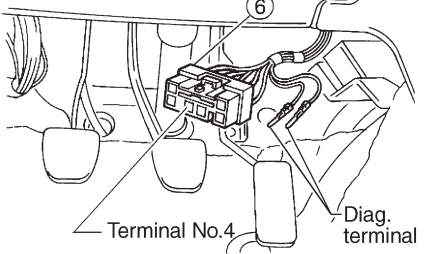
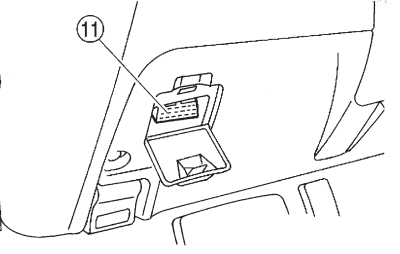
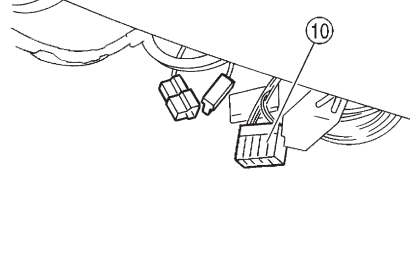
Mode	ABS warning	TCS warning	TCS OFF	TCS operating	Lighting conditions
Bulb check	○	○			Illuminated with IGN. ON, extinguished with E/G RUN
			○		Illuminated with IGN. ON, extinguished after a few seconds.
				○	Illuminated with IGN. ON, extinguished after 1 second.
ABS failure	○	○			Illuminated during ABS failure (ABS and TCS functions stop)
TCS failure		○			Illuminated during TCS failure (Only TCS functions stop)
TCS OFF			○		Illuminated when TCS operation is prohibited by E/G (low temperature, high temperature, etc.); illuminated during TCS OFF conditions resulting from operation of TCS OFF SW.
TCS operation				○	Illuminated during TCS operation
Pad temperature warning			○		Illuminated when pad temperature reaches 400°C (752°F) or more when TCS is functioning, and extinguished when temperature drops below 350°C (662°F).

3. Electrical Components Location

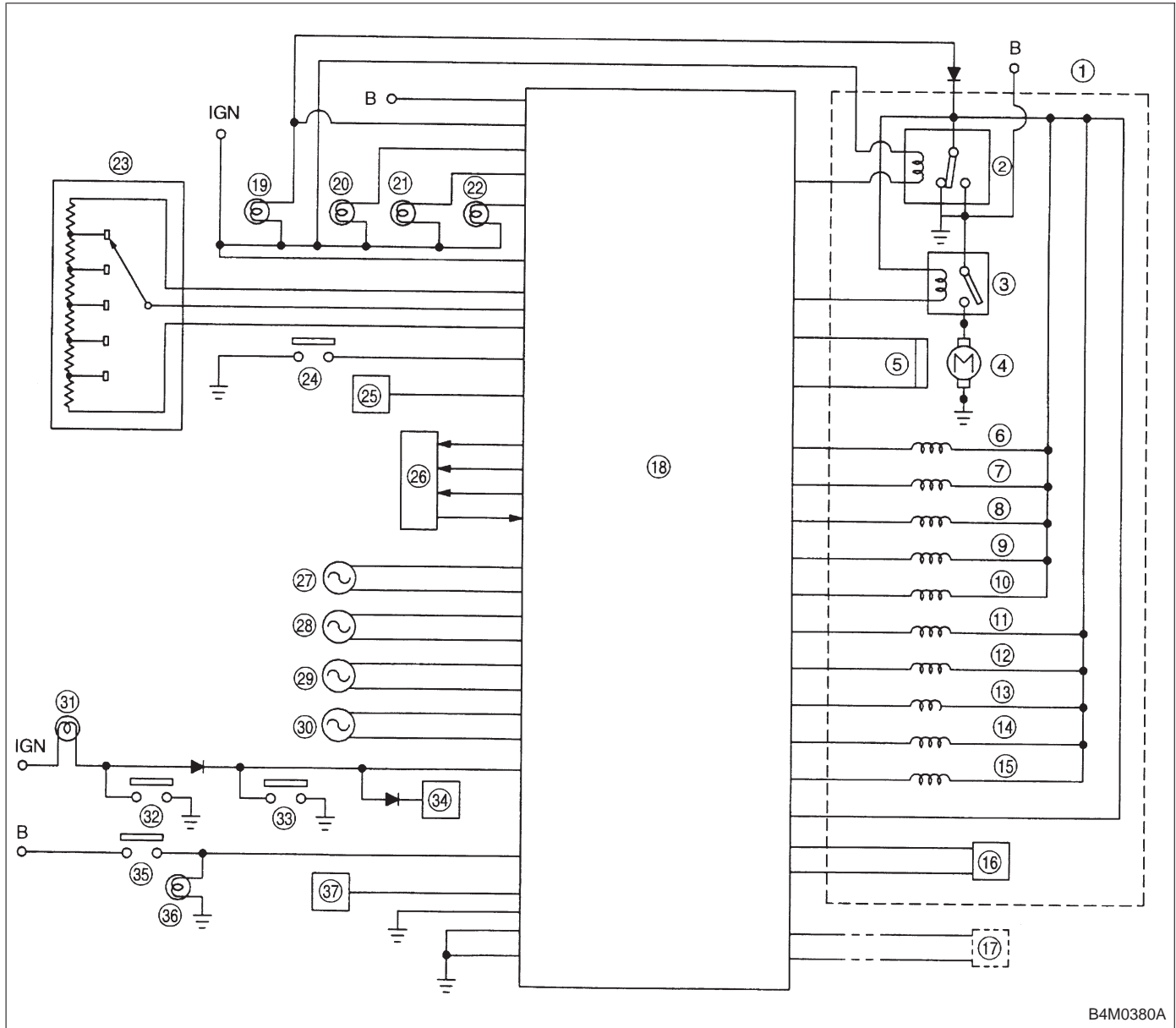


B4M0373A

- |                                 |  |
|---------------------------------|--|
| ① Hydraulic control unit        | ⑨ TCS OFF switch   |
| ② Engine control module         | ⑩ Data link connector (for Subaru select monitor)                              |
| ③ AT control module             | ⑪ Data link connector (for Subaru select monitor and OBD-II general scan tool) |
| ④ TCS warning light             | ⑫ Tone wheel   |
| ⑤ ABS warning light             | ⑬ ABS sensor   |
| ⑥ Diagnosis connector           | ⑭ Stroke sensor  |
| ⑦ TCS operating indicator light | ⑮ ABS/TCS control module   |
| ⑧ TCS OFF indicator light       |  |

 <p>B4M0374A</p>	 <p>B4M0376A</p>	 <p>B4M0646A</p>
 <p>B4M0377A</p>	 <p>B4M0379A</p>	 <p>B4M0378A</p>
 <p>B4M0375A</p>	 <p>B4M0645A</p>	<p>SUBARU.</p>

4. Schematic



B4M0380A

- |                                     |                                   |                            |
|-------------------------------------|-----------------------------------|----------------------------|
| ① Hydraulic control unit            | ⑭ Rear left outlet solenoid valve | ⑳ Engine control module    |
| ② Valve relay                       | ⑮ TCS solenoid valve 1            | ㉑ Rear right ABS sensor    |
| ③ Motor relay                       | ⑯ Pressure switch                 | ㉒ Front right ABS sensor   |
| ④ Motor                             | ⑰ Data link connector             | ㉓ Front left ABS sensor    |
| ⑤ Motor sensor                      | ⑱ ABS/TCS control module          | ㉔ Rear left ABS sensor     |
| ⑥ Front left inlet solenoid valve   | ㉑ ABS warning light               | ㉕ Brake warning light      |
| ⑦ Front left outlet solenoid valve  | ㉒ TCS operating indicator light   | ㉖ Parking brake switch     |
| ⑧ Rear right inlet solenoid valve   | ㉓ TCS OFF indicator light         | ㉗ Brake fluid level sensor |
| ⑨ Rear right outlet solenoid valve  | ㉔ TCS warning light               | ㉘ Generator                |
| ⑩ TCS solenoid valve 2              | ㉕ Stroke sensor                   | ㉙ Stop lamp switch         |
| ⑪ Front right inlet solenoid valve  | ㉖ TCS OFF switch                  | ㉚ Stop lamp                |
| ⑫ Front right outlet solenoid valve | ㉗ Diagnosis connector             | ㉛ AT control module        |
| ⑬ Rear left inlet solenoid valve    |                                   |                            |

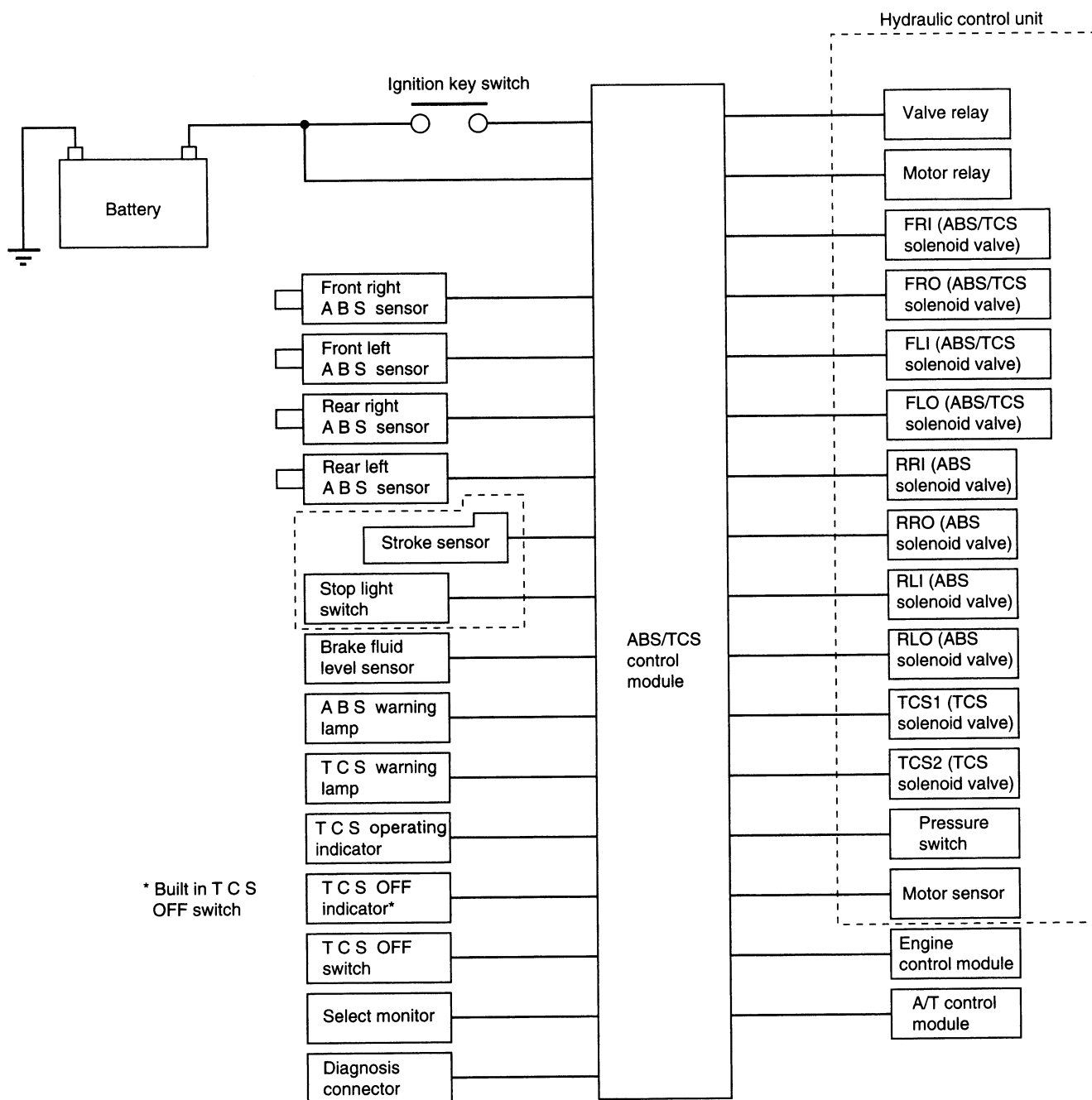
## 5. Control Module I/O Signal

### 1. I/O SIGNAL VOLTAGE

Contents		Connector No.	Terminal No.	Input/Output signals	
				Measured value and measuring conditions	
ABS sensor (Wheel speed sensor)	Front left wheel	P7	1—11	0.12 — 1 V (When it is 10 Hz.)	
	Front right wheel	P6	8—16	0.12 — 1 V (When it is 10 Hz.)	
	Rear left wheel	P6	7—15	0.12 — 1 V (When it is 10 Hz.)	
	Rear right wheel	P7	2—12	0.12 — 1 V (When it is 10 Hz.)	
Hydraulic unit	Solenoid valve	Front left outlet	P4	1—GND	10 — 14 V when the valve is OFF. Less than 1.5 V when the valve is ON.
		Front right outlet	P5	3—GND	
		Rear left outlet	P5	8—GND	
		Rear right outlet	P4	3—GND	
		Front left inlet	P4	2—GND	10 — 14 V when the valve is OFF. Less than 1.0 V when the valve is ON.
		Front right inlet	P5	2—GND	
		Rear left inlet	P5	7—GND	
		Rear right inlet	P4	4—GND	
	TCS 1	P4	5—GND	10 — 14 V when the valve is OFF. Less than 1.0 V when the valve is ON.	
	TCS 2	P5	6—GND		
	Valve power supply	P6	6—GND	Ignition switch ON, 10 — 14 V	
	Valve relay power supply	P6	1—GND	Less than 1.2 V when IGN is ON. 10 — 14 V when the system is down.	
	Motor relay power supply	P6	9—GND	Less than 1.0 V when the motor is ON. 10 — 14 V when the motor is OFF.	
	Motor sensor signals	P7	3—GND	Cyclic waveform of more than 180 Hz when the motor across terminals is ON. Less than 70 Hz when the motor is OFF.	
P7		13—GND			
Pressure switch	P7	6—GND	H/L toggle signal with the brake pedal off (Cycle 14 mS, H: 10 —14 V, L: less than 0.7 V). 10 — 14 V with the brake pedal depressed.		
Pedal stroke sensor	Output signals	P7	5—GND	0.7 — 0.9 V with the brake pedal off.	
	Power supply	P7	4—14	5±0.4 V	
Stop light switch	Switch	P7	7—GND	Less than 2 V when the stop light is off. 10 — 12 V when the stop light is on.	
	Switch test signal	P7	18—GND	H/L toggle signal with the brake pedal off (Cycle 14 mS, H: 10 —12 V, L: less than 0.7 V). Less than 2 V with the brake pedal depressed.	
TCS OFF switch		P7	16—GND	Less than 2.0 V with the switch pressed and 10 — 12 V with it released.	
Indicator light	TCS OFF	P6	10—GND	Less than 2 V when the light is on and 10 — 12 V when it is off.	
	TCS operation	P6	11—GND		
	TCS warning	P6	3—GND		
	ABS warning	P6	2—GND		

Contents		Connector No.	Terminal No.	Input/Output signals
				Measured value and measuring conditions
TCS control unit ECM communication	TCS → ECM communication (torque command)	P6	14—GND	Less than 0.7 V when the vehicle stands still.
	TCS → ECM communication (torque command)	P6	5—GND	Less than 5 V when the vehicle stands still.
	TCS → ECM communication (TCS operates)	P6	12—GND	4 — 5.4 V when TCS controls no operations. Less than 0.7 V when it controls operations.
	ECM → TCS communication (engine control)	P6	4—GND	H/L toggle signal with the accelerator pedal off (Cycle 20 mS, H: 10 — 14 V, L: less than 0.7 V). Less than 2.0 V with the accelerator pedal depressed. Also when TCS OFF indicator light comes on by TCS OFF switch.
ABS operation signal		P6	13—GND	10 — 14 V when the ABS control does not operate still and less than 0.7 V when ABS operates.
Fluid level sensor		P7	20—GND	Less than 2 V when IGN is ON and 10 — 14 V when idling.
Select monitor	Data is received.	P7	9—GND	4 — 4.5 V when no data is received.
	Data is sent.	P7	19—GND	4 — 4.5 V when no data is sent.
Diagnosis connector		P7	8—GND	10 — 14 V when IGN is ON.
Power supply	Ignition	P5	1—GND	10 — 14 V when IGN is ON.
	Battery	P5	4—GND	10 — 14 V
Grounding line	Power	P5	5—body	1 Ω or less
	Digital	P7	15—body	1 Ω or less
	Power	P4	6—body	1 Ω or less

2. I/O SIGNAL DIAGRAM



B4H0336

3. LIST OF ABS/TCS ON-BOARD DIAGNOSTICS FUNCTIONS

Trouble code	Diagnostic items <detailed diagnostic items>	Detection timing					Indicator light ON			Parts concerned
		At initial checking	Under no control	Under ABS control	Under TCS control	In diagnostic mode	ABS warning light	TCS warning light	TCS OFF indicator light	
21 FR 23 FL 25 RR 27 RL	Detection of fault in ABS sensor hardware <open/short circuits of sensor>	○	○	○	○		○	○	—	ABS sensor (ABS/TCS C/M)
22 FR 24 FL 26 RR 28 RL	Detection of fault in ABS sensor software <variations in wheel speed>		○	○	○		○	○	—	ABS sensor (ABS/TCS C/M)
	Detection of fault in ABS sensor software <decompression mode>		○	○	○		○	○	—	ABS sensor harness circuit (ABS/TCS C/M)
				○			○	○	—	ABS sensor and solenoid valve (ABS/TCS C/M)
	Detection of fault in sensor software <speed higher than prescribed>		○	○	○		○	○	—	ABS sensor (ABS/TCS C/M)
31 FRI 32 FRO 33 FLI 34 FLO 35 RRI 36 RRO 37 RLI 38 RLO 61 TCS1 62 TCS2	Abnormal valve <Abnormal valve>									Solenoid valve (ABS/TCS C/M)
		○	○	○	○	○*	○	○	—	
41	Abnormal ABS/TCS C/M <Abnormal ABS/TCS C/M>	○	○	○	○		○	○	—	ABS/TCS C/M
42	Abnormal line voltage <Abnormal line voltage>	○	○	○	○	○	○	○	—	Power source operating environment (ABS/TCS C/M)
—	Power source voltage drop <Power source voltage drop>	○	○	○	○		○	○	—	
		○	○	○	○	○	○		—	

\*: Except when trouble code is being displayed.

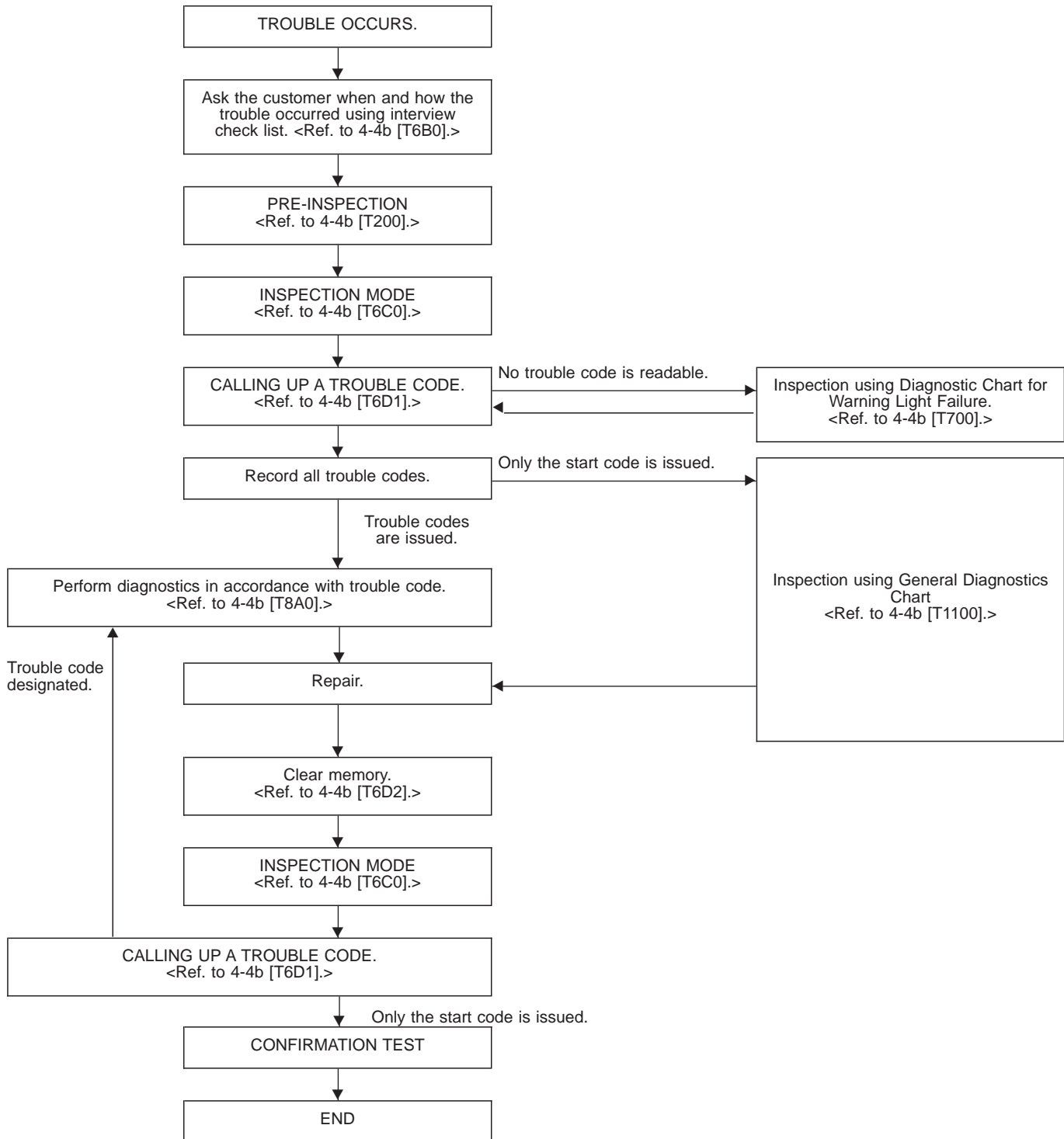


Trouble code	Diagnostic items <detailed diagnostic items>	Detection timing					Indicator light ON			Parts concerned
		At initial checking	Under no control	Under ABS control	Under TCS control	In diagnostic mode	ABS warning light	TCS warning light	TCS OFF indicator light	
43	Abnormal EGI communication line <Abnormal EGI communication line>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			—	<input type="radio"/>	—	AET communication line (ABS/TCS C/M)
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			—	<input type="radio"/>	—	
					<input type="radio"/>		—	<input type="radio"/>	—	AEB communication line (ABS/TCS C/M)
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		—	<input type="radio"/>	—	
				<input type="radio"/>	<input type="radio"/>		—	<input type="radio"/>	—	AEC communication line (ABS/TCS C/M)
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		—	<input type="radio"/>	—	
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		—	<input type="radio"/>	—	
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		—	<input type="radio"/>	—	
—	Abnormal EGI communication line <Abnormal EGI communication line>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			—	<input type="radio"/>	EAM communication line (ABS/TCS C/M)	
51	Abnormal valve relay <failure of valve relay ON> <failure of valve relay OFF>	<input type="radio"/>					<input type="radio"/>	<input type="radio"/>	—	Valve relay (ABS/TCS C/M)
	Abnormal valve relay <failure of valve relay OFF>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	—	Valve relay (ABS/TCS C/M)
		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	—	
52	Abnormal motor system <failure of motor relay OFF>		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>	—	Motor (ABS/TCS C/M)
	Abnormal motor system <failure of motor relay ON>		<input type="radio"/>	<input type="radio"/>			<input type="radio"/>	<input type="radio"/>	—	Motor (ABS/TCS C/M)
	Abnormal motor system <failure of motor relay OFF>		<input type="radio"/>				<input type="radio"/>	<input type="radio"/>	—	

Trouble code	Diagnostic items <detailed diagnostic items>	Detection timing					Indicator light ON			Parts concerned
		At initial checking	Under no control	Under ABS control	Under TCS control	In diagnostic mode	ABS warning light	TCS warning light	TCS OFF indicator light	
54	Abnormal pedal stroke sensor and stop light switch <open/short circuits of stroke sensor>	○	○	○			○	○	—	Pedal stroke sensor (ABS/TCS C/M)
	Abnormal pedal stroke sensor and stop light switch <comparison of acceleration and stroke sensor>		○				○	○	—	Pedal stroke sensor (ABS/TCS C/M)
	Abnormal pedal stroke sensor and stop light switch <comparison of stroke sensor and brake lamp switch>		○				○	○	—	Stop light switch, pedal stroke sensor (ABS/TCS C/M)
	Abnormal pedal stroke sensor and stop light switch <comparison of stroke sensor and pump excitation>			○			○	○	—	Pump, pedal stroke sensor (ABS/TCS C/M)
	Abnormal stroke sensor and stop light switch <open circuit of stop light switch>		○	○	○		—	○	—	Stop light switch circuit (ABS/TCS C/M)
57	Abnormal fluid level sensor <Abnormal fluid level sensor>	○					○	○	—	Fluid level sensor circuit
—	Abnormal fluid level sensor <Abnormal fluid level sensor> <Insufficient brake fluid>	○	○	○	○		○	○	—	Fluid level sensor circuit, reservoir
58	Abnormal pressure switch <Abnormal pressure switch>	○	○	○	○		—	○	—	Pressure switch (ABS/TCS C/M)
		○	○	○			—	○	—	Pressure switch, stop light switch (ABS/TCS C/M)
			○	○	○		—	○	—	Pressure switch (ABS/TCS C/M)

## 6. Diagnostics Chart for On-board Diagnosis System

### A: BASIC DIAGNOSTICS PROCEDURE



**NOTE:**

- To check harness for broken wires or short circuits, shake it while holding it or the connector.
- When TCS warning light illuminates, read and record trouble code indicated by TCS warning light.

**B: CHECK LIST FOR INTERVIEW**

Check the following items about the vehicle's state.

**1. THE STATE OF THE WARNING LIGHTS**

a. ABS warning light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When/how long does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed ___miles/h → ___miles/h) ④ While traveling at a constant speed (Speed ___miles/h) ⑤ When decelerating (Speed ___miles/h → ___miles/h) ⑥ When turning (To right, to left, steering angle ___deg., steering time ___sec) ⑦ When other electrical parts move (Part name: ____, Operating condition _____) ⑧ When moving other electrical parts (Part name: ____, Operating condition _____)
b. TCS warning light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed ___miles/h → ___miles/h) ④ While traveling at a constant speed (Speed ___miles/h) ⑤ When decelerating (Speed ___miles/h → ___miles/h) ⑥ When turning (To right, to left, steering angle ___deg., steering time ___sec) ⑦ When other electrical parts move (Part name: ____, Operating condition _____) ⑧ When moving other electrical parts (Part name: ____, Operating condition _____)
c. TCS OFF indicator light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When/how long does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed ___miles/h → ___miles/h) ④ While traveling at a constant speed (Speed ___miles/h) ⑤ When decelerating (Speed ___miles/h → ___miles/h) ⑥ When turning (To right, to left, steering angle ___deg., steering time ___sec) ⑦ When other electrical parts move (Part name: ____, Operating condition _____) ⑧ When moving other electrical parts (Part name: ____, Operating condition _____)
d. TCS operation indicator light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed ___miles/h → ___miles/h) ④ While traveling at a constant speed (Speed ___miles/h) ⑤ When decelerating (Speed ___miles/h → ___miles/h) ⑥ When turning (To right, to left, steering angle ___deg., steering time ___sec) ⑦ When other electrical parts move (Part name: ____, Operating condition _____) ⑧ When moving other electrical parts (Part name: ____, Operating condition _____)

e. Malfunction indicator light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed ___ miles/h → ___ miles/h) ④ While traveling at a constant speed (Speed ___ miles/h) ⑤ When decelerating (Speed ___ miles/h → ___ miles/h) ⑥ When turning (To right, to left, steering angle ___ deg., steering time ___ sec) ⑦ When other electrical parts move (Part name: ____, Operating condition _____) ⑧ When moving other electrical parts (Part name: ____, Operating condition _____)

**2. SYMPTOMS**

ABS operating condition	① Performs no work. ② Operates only when abruptly applying brakes. (Conditions: vehicle speed ___ miles/h, how to step on brake pedal ___) ③ Operating time ( ___ sec., etc. _____) ④ Operating noise (Produced/Not produced) ⑤ What kind of noise? (Knock, gong gong, bong, buzz, gong gong buzz, etc. _____) ⑥ Reaction force of brake pedal (Stick, pressed down once with a clunk, pressed and released, etc. _____)
TCS operating condition	① Performs no work. ② Operates only when abruptly accelerating. (Conditions: vehicle speed ___ miles/h, how to step on accelerator pedal ___) ③ Operating time ( ___ sec., etc. _____) ④ Operating noise (Produced/Not produced) ⑤ What kind of noise? (Knock, gong gong, bong, buzz, gong gong buzz, etc. _____) ⑥ Whether or not operation indicator light comes on. (Come on/Does not come on, Others _____)
Behavior of vehicle	① Directional stability cannot be obtained or steering arm refuses to work when applying brakes (vehicle turns to right, turns to left, spins, etc. _____). ② Directional stability cannot be obtained or steering arm refuses to work when accelerating (vehicle turns to right, turns to left, spins, etc. _____). ③ Brakes are out of order (braking distance is long, brakes lock or drag, pedal stroke is long, pedal sticks, etc. _____). ④ Poor acceleration (fails to accelerate, engine stalls, etc. _____). ⑤ Vibration, abnormal noise (operating noise is loud, noise is produced during operation from the front of vehicle (right, left) (tones: ___), noise is produced during operation from the rear of vehicle (tones: ____, others _____)) ⑥ Other phenomena (concrete symptoms _____)

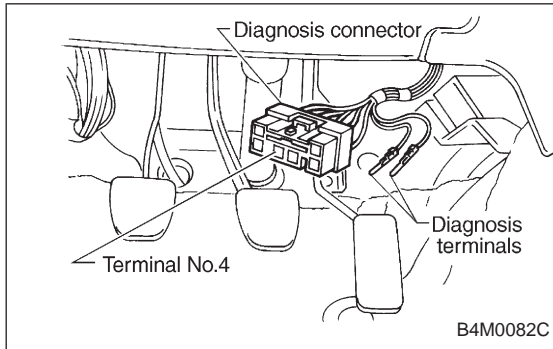
**3. CONDITIONS UNDER WHICH TROUBLE OCCURS**

Environment	① Weather (fine, cloudy, rain, snow, etc. ___) ② Ambient temperature ( ___ °C/°F) ③ Road (urban area, suburbs, highway, general road, ascending slope, descending slope, paved road, gravel road, muddy road, sandy place, etc. ___) ④ Road surface (dry, wet, new-fallen snow, compressed snow, frozen slope, etc. _____)
Conditions	① Brakes (deceleration ___ g, continuous/intermittent) ② Accelerator (acceleration ___ g, continuous/intermittent) ③ Travel speed ( ___ miles, advancing, accelerating, reducing speed, low speed, turning, etc. _____) ④ Condition of tire of each wheel (air pressure ____, degree of wear ____, whether or not genuine parts are used, whether or not chain is passed around tires, whether or not T tire is used.) others ( _____) ⑤ Condition of suspension alignment ( _____) ⑥ Loading state ( _____)

**4. REPAIRED PARTS ARE USED OR NOT**

**C: INSPECTION MODE**

The on-board diagnosis system is designed to detect problems while the vehicle is being driven. If a problem is found, the ABS and TCS warning light will illuminate to inform the driver of the occurrence of a problem. When the warning light is on, the ABS/TCS system will be inactive and the normal braking function will work. It is possible for the most recent trouble code and history of problem to be stored in memory until cleared.



**D: TROUBLE CODES**

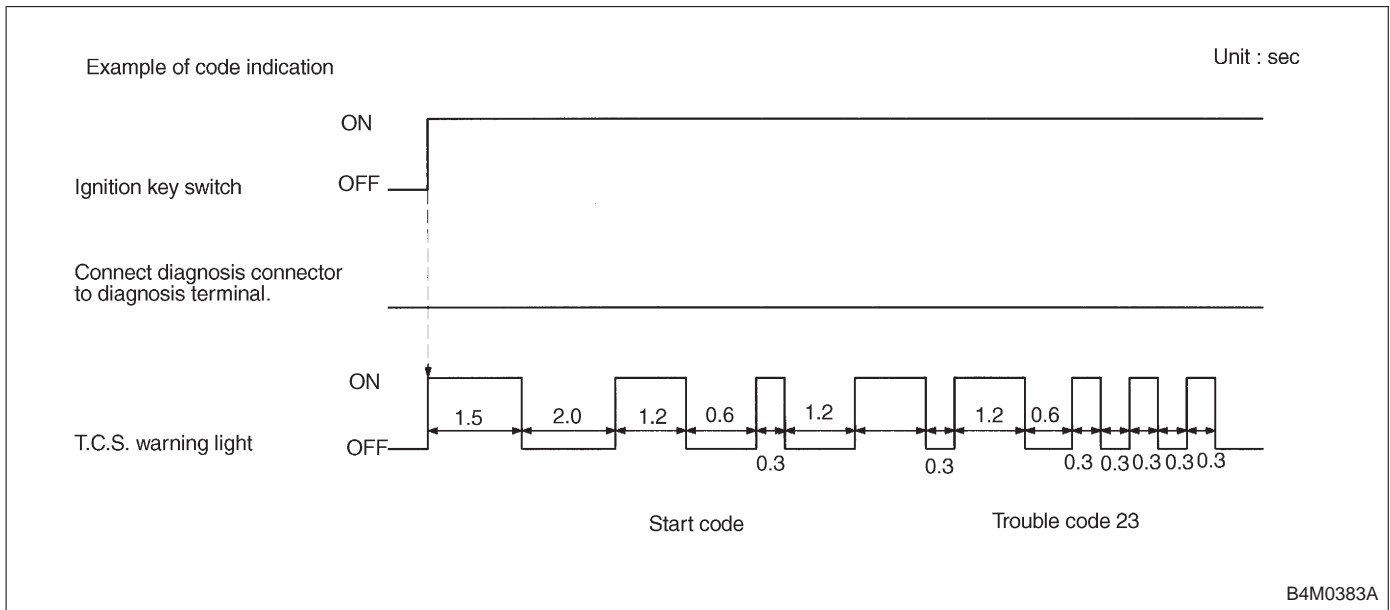
When on-board diagnosis of the ABS/TCS control module detects a problem, the information will be stored in the EEPROM as a trouble code. (Stored codes will stay in memory until they are cleared.)

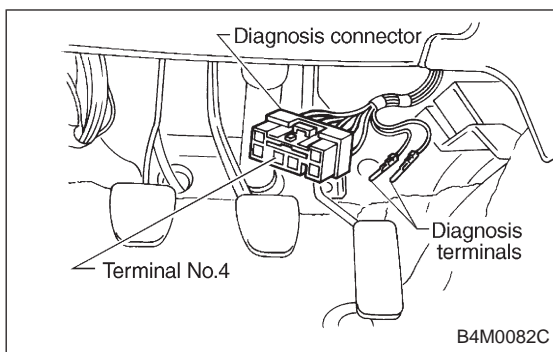
**1. CALLING UP A TROUBLE CODE**

- 1) Take out diagnosis connector from side of driver's seat heater unit.
- 2) Turn ignition switch OFF.
- 3) Connect diagnosis connector terminal No. 4 to diagnosis terminal.
- 4) Turn ignition switch ON.
- 5) TCS 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.

**NOTE:**

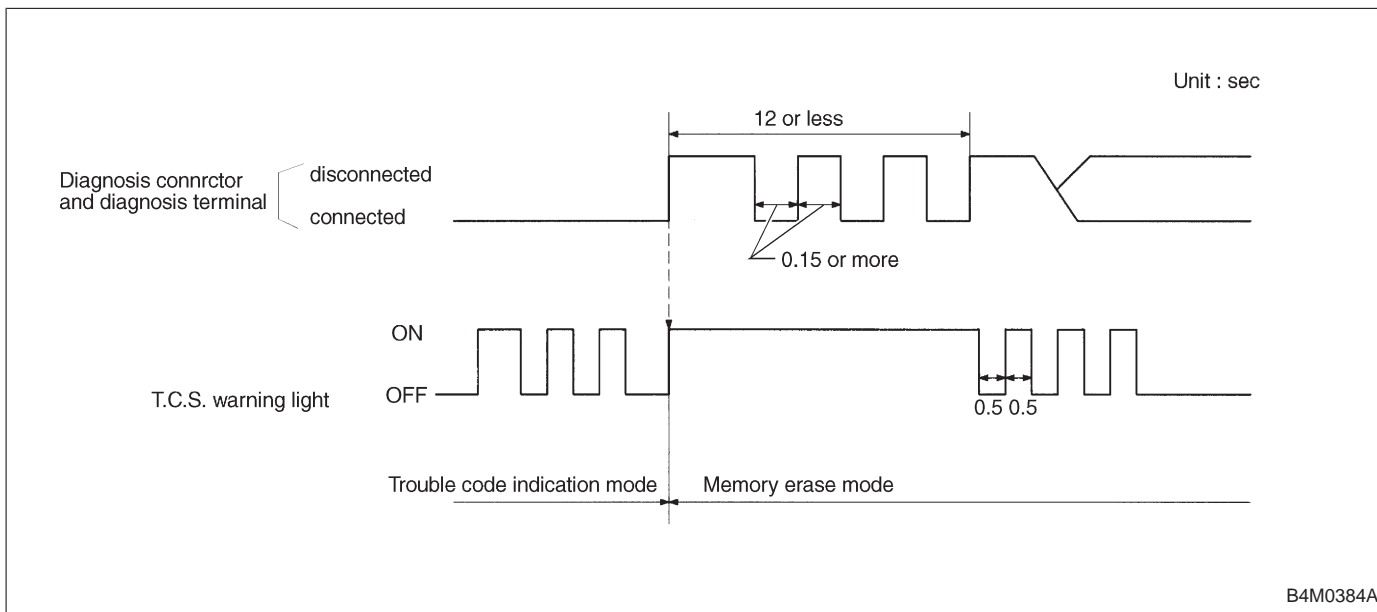
When there are no trouble codes in memory, only the start code (11) is shown.





**2. CLEARING MEMORY**

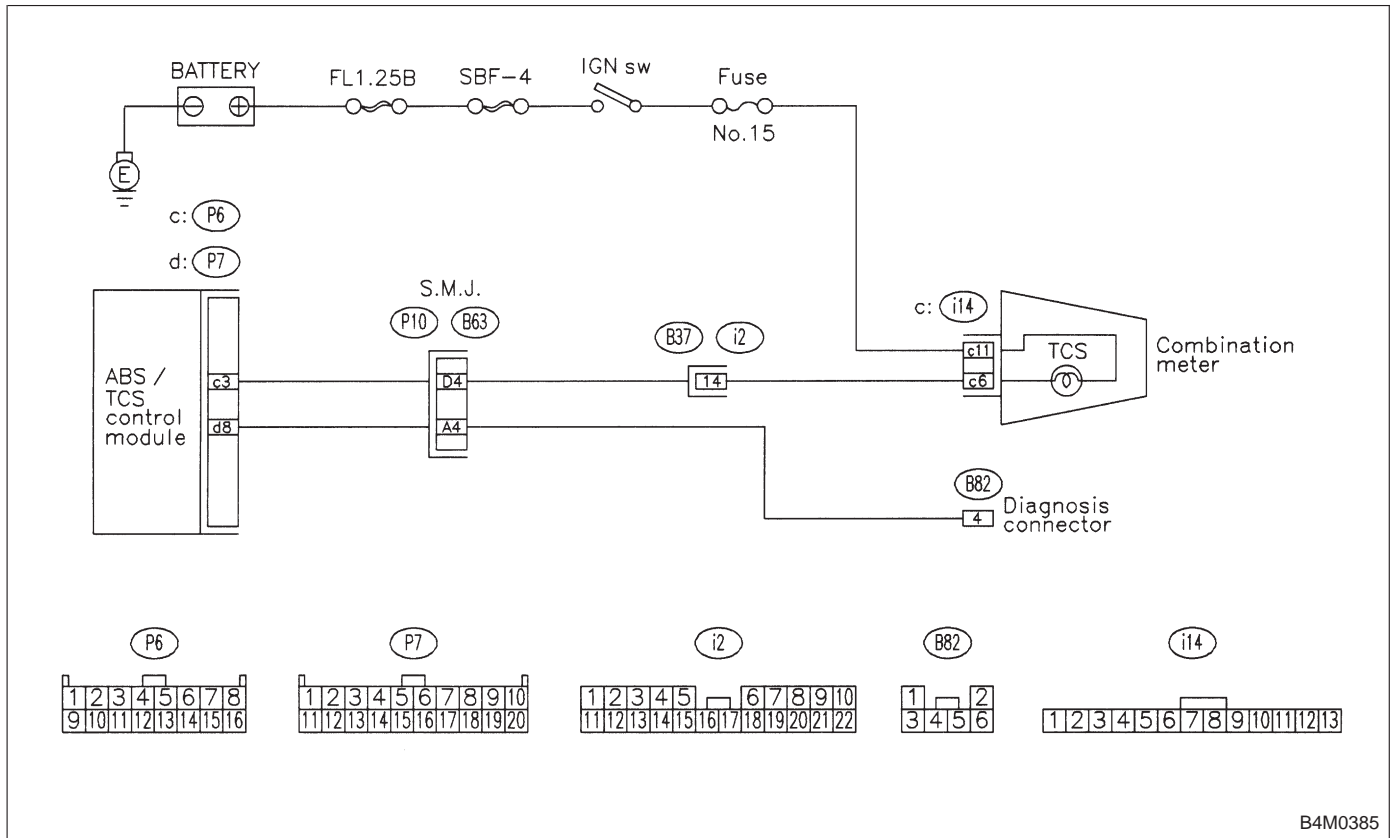
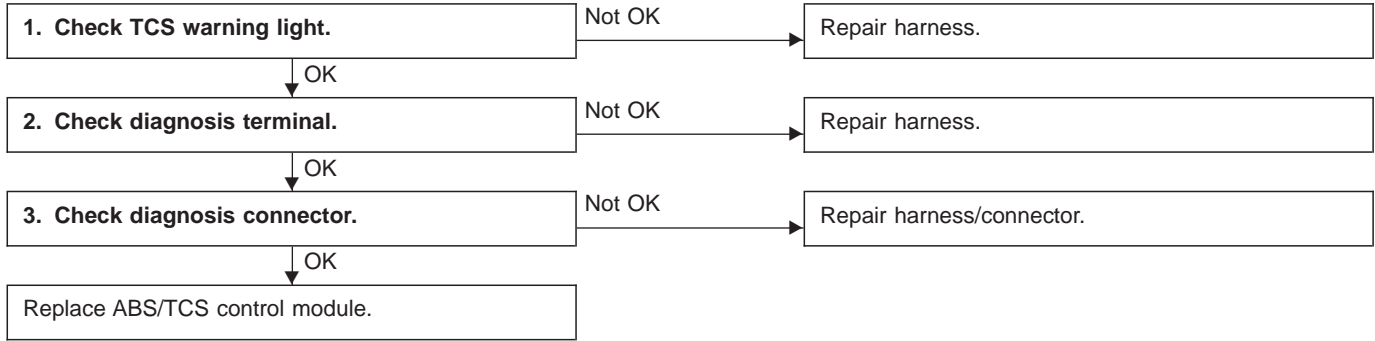
- 1) After calling up a trouble code, disconnect ABS check connector terminal No. 4 from diagnosis terminal.
- 2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal No. 4 and diagnosis terminal for at least 0.15 seconds each time.
- 3) Turn off the ignition key.



**NOTE:**  
 After diagnostics is completed, make sure to clear memory. Make sure only start code (11) is shown after memory is cleared.

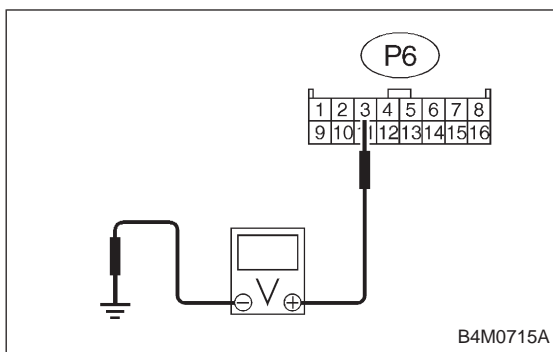
### 7. Diagnostics Chart for Warning Light Circuit Failure

**A: TROUBLE CODE DOES NOT APPEAR. — TCS WARNING LIGHT COMES ON WHEN STARTING THE ENGINE. —**



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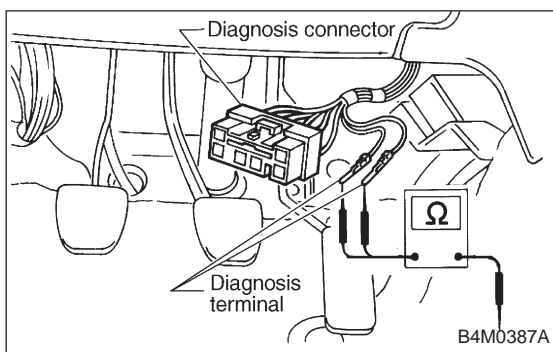




**1. CHECK TCS WARNING LIGHT.**

- 1) Turn ignition switch OFF.
- 2) Disconnect all connectors from ABS/TCS control module.
- 3) Turn ignition switch ON.
- 4) Measure voltage between ABS/TCS control module connector and body.

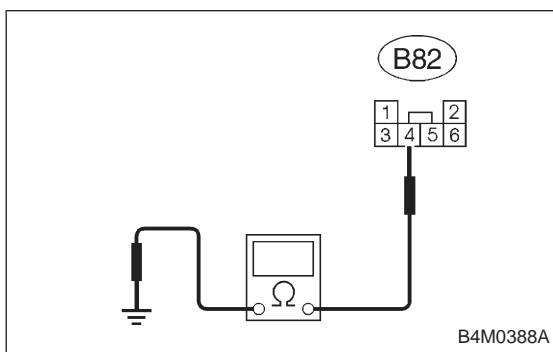
**Connector & terminal / Specified voltage:**  
**(P6) No. 3 — body / 10 — 14 V**



**2. CHECK DIAGNOSIS TERMINAL.**

- 1) Turn ignition switch OFF.
- 2) Measure resistance between diagnosis terminal and body.

**Connector/Specified resistance:**  
**B81 — body / 0 Ω**

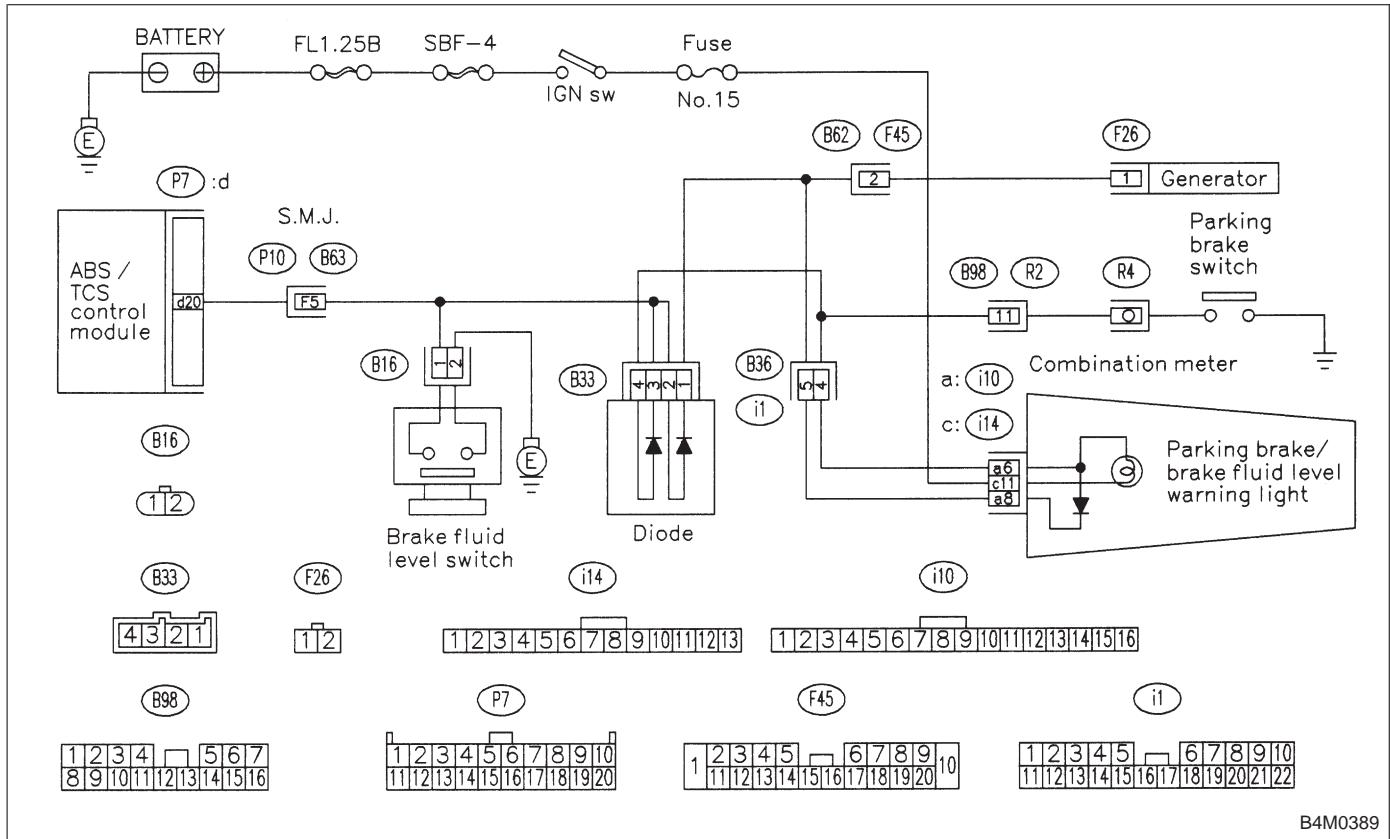
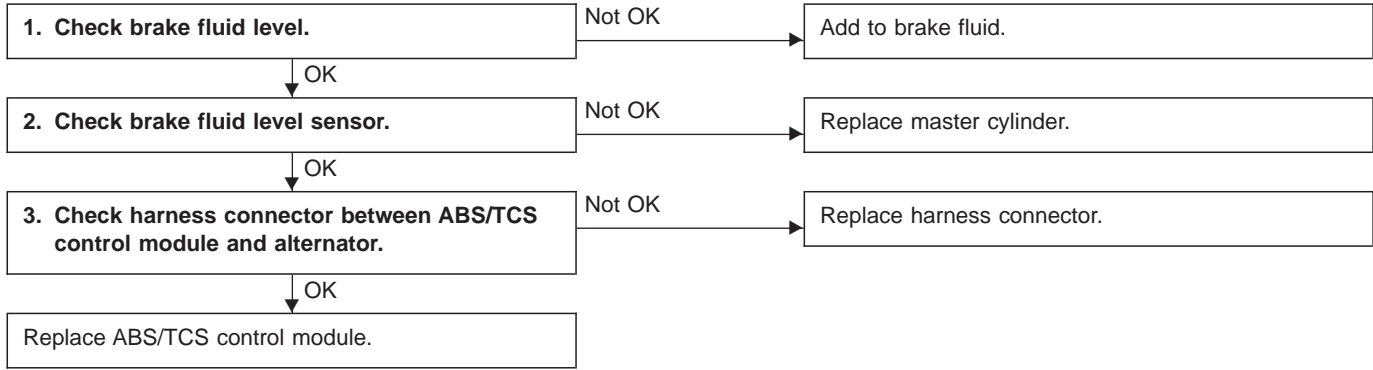


**3. CHECK DIAGNOSIS CONNECTOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect all connectors from ABS/TCS control module.
- 3) Measure resistance between diagnosis connector and body.

**Connector & terminal / Specified resistance:**  
**(B82) No. 4 — body / 0 Ω**

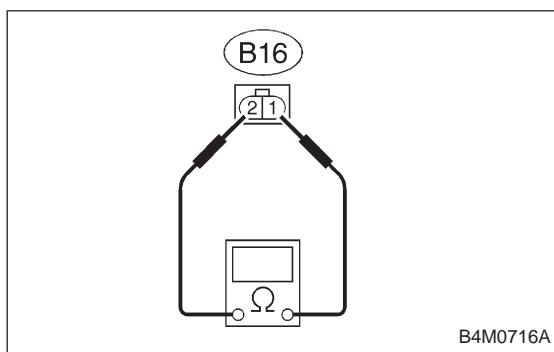
**B: ABS AND TCS WARNING LIGHT DO NOT GO OFF.**  
**— TCS OFF AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY WHEN STARTING THE ENGINE, WHILE ABS WARNING AND TCS WARNING LIGHTS KEEP ON. —**



B4M0389

**1. CHECK BRAKE FLUID LEVEL.**

Check that brake fluid level is above the MIN indication on the reservoir tank.



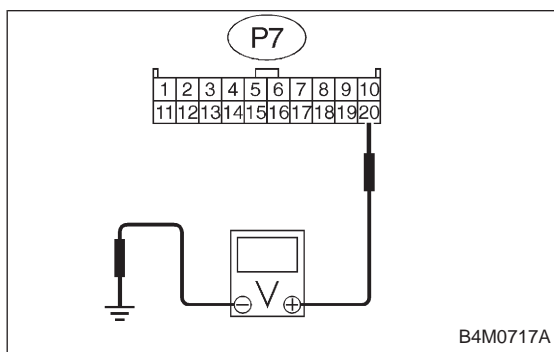
**2. CHECK BRAKE FLUID LEVEL SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from brake fluid level sensor.

**Connector & terminal / Specified resistance:**

**(B16) No. 1 — No. 2 / 0 Ω (Leaving float where it is.)**

**(B16) No. 1 — No. 2 / 1 MΩ (When pushing float down.)**



**3. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND ALTERNATOR.**

- 1) Turn ignition switch OFF.
- 2) Connect connector from brake fluid level sensor.
- 3) Disconnect all connectors from ABS/TCS control module.
- 4) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**

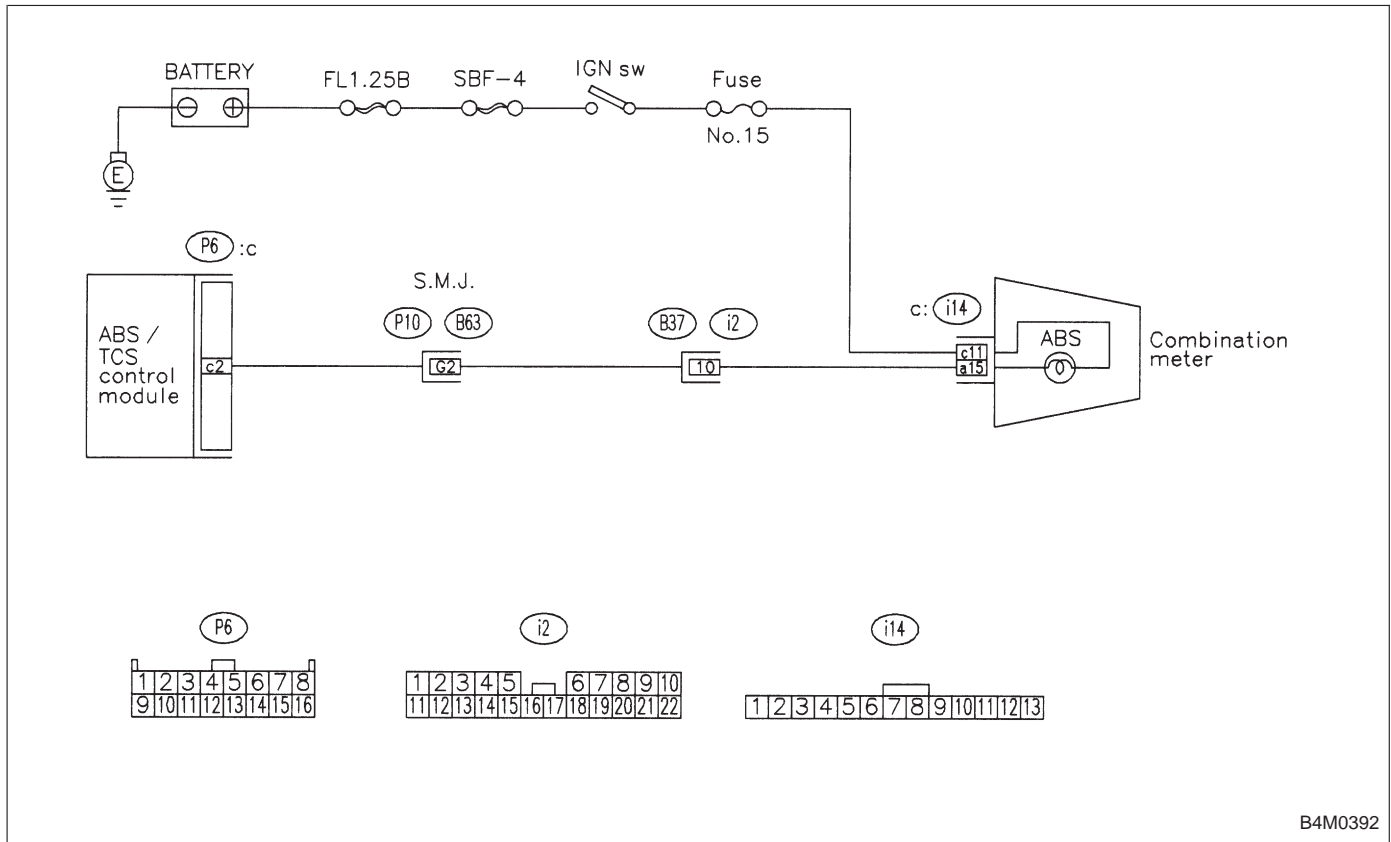
**(P7) No. 20 — body / 2 V or less**

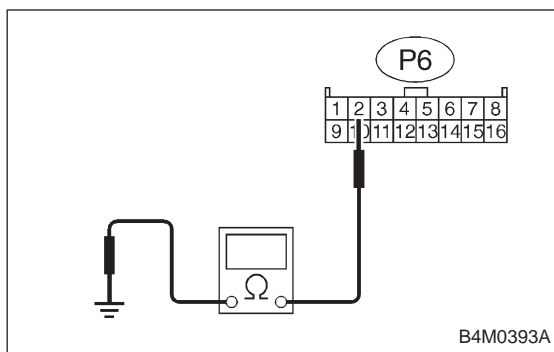
- 5) Start the engine.
- 6) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**

**(P7) No. 20 — body / 10 — 14 V**

**C: TCS WARNING LIGHT AND TCS INDICATOR OFF AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY, WHILE ABS WARNING LIGHT DOES NOT GO OFF.**  
**— TCS WARNING LIGHT AND TCS OFF INDICATOR AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY WHEN STARTING THE ENGINE, WHILE ABS WARNING LIGHT DOES NOT GO OFF. —**



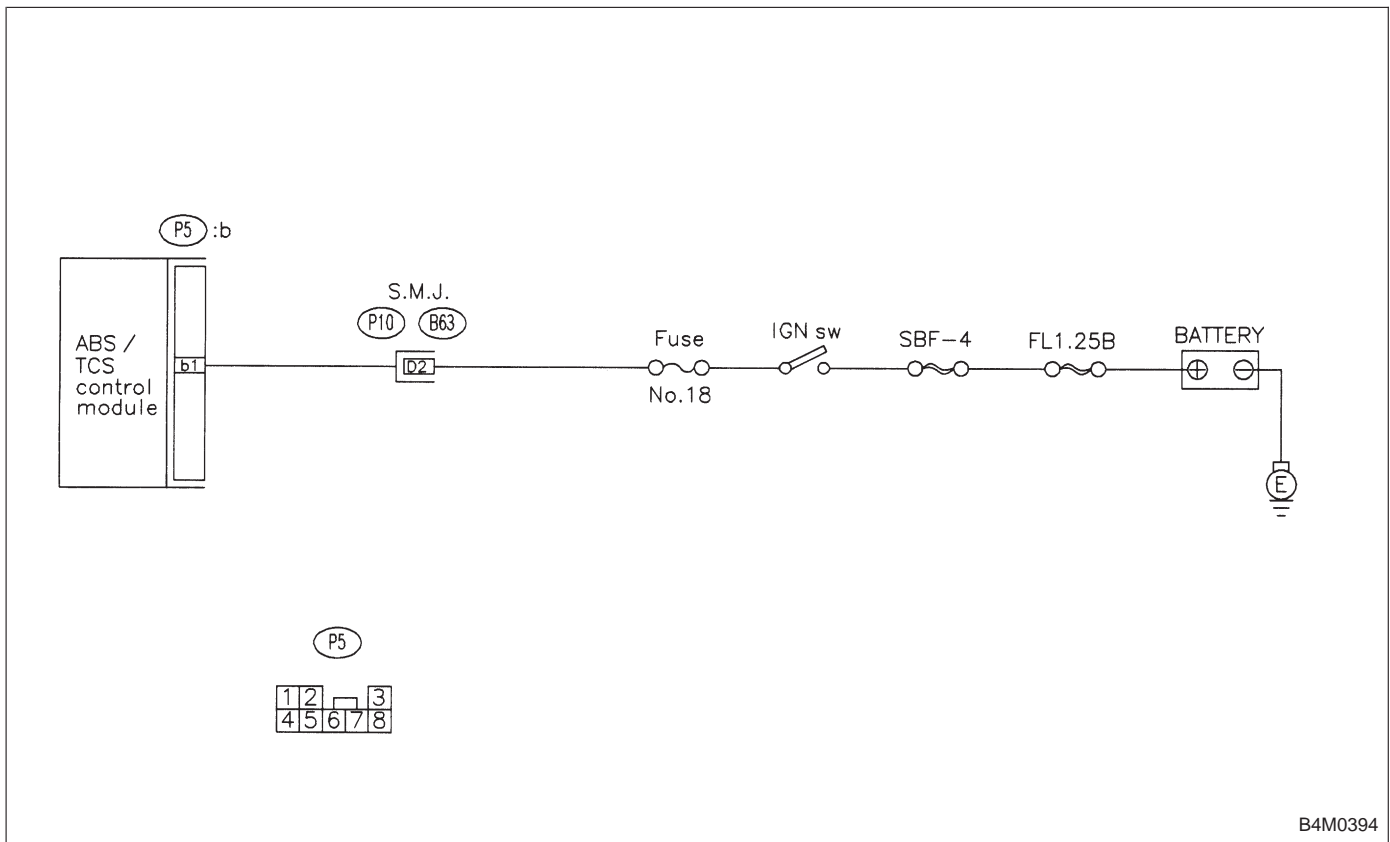
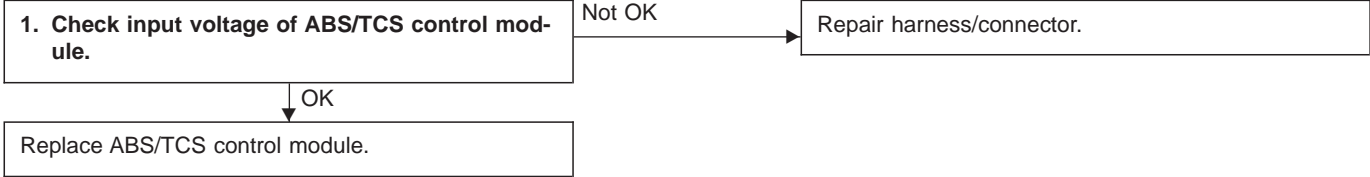


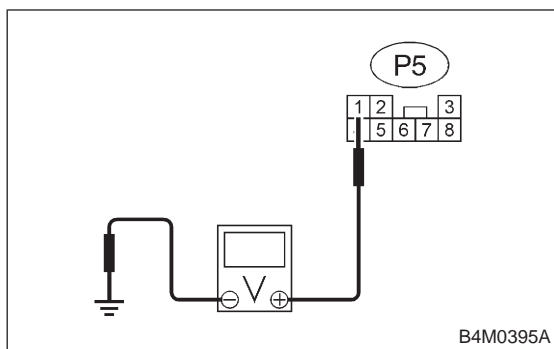
### 1. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND ABS WARNING LIGHT.

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module and TCS valve relay.
- 3) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**  
**(P6) No. 2 — body / 1 MΩ or more**

**D: ABS WARNING LIGHT ONLY REMAINS ILLUMINATED.**  
**— WHEN STARTING THE ENGINE, NEITHER TCS WARNING, TCS OFF INDICATOR NOR TCS OPERATING INDICATOR LIGHT COMES ON EVEN ONCE, AND ABS WARNING LIGHT AND MALFUNCTION INDICATOR LAMP ILLUMINATE. —**





### 1. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module.
- 3) Turn ignition switch ON.
- 4) Measure voltage between ABS/TCS control module connector and body.

#### **Connector & terminal / Specified voltage:**

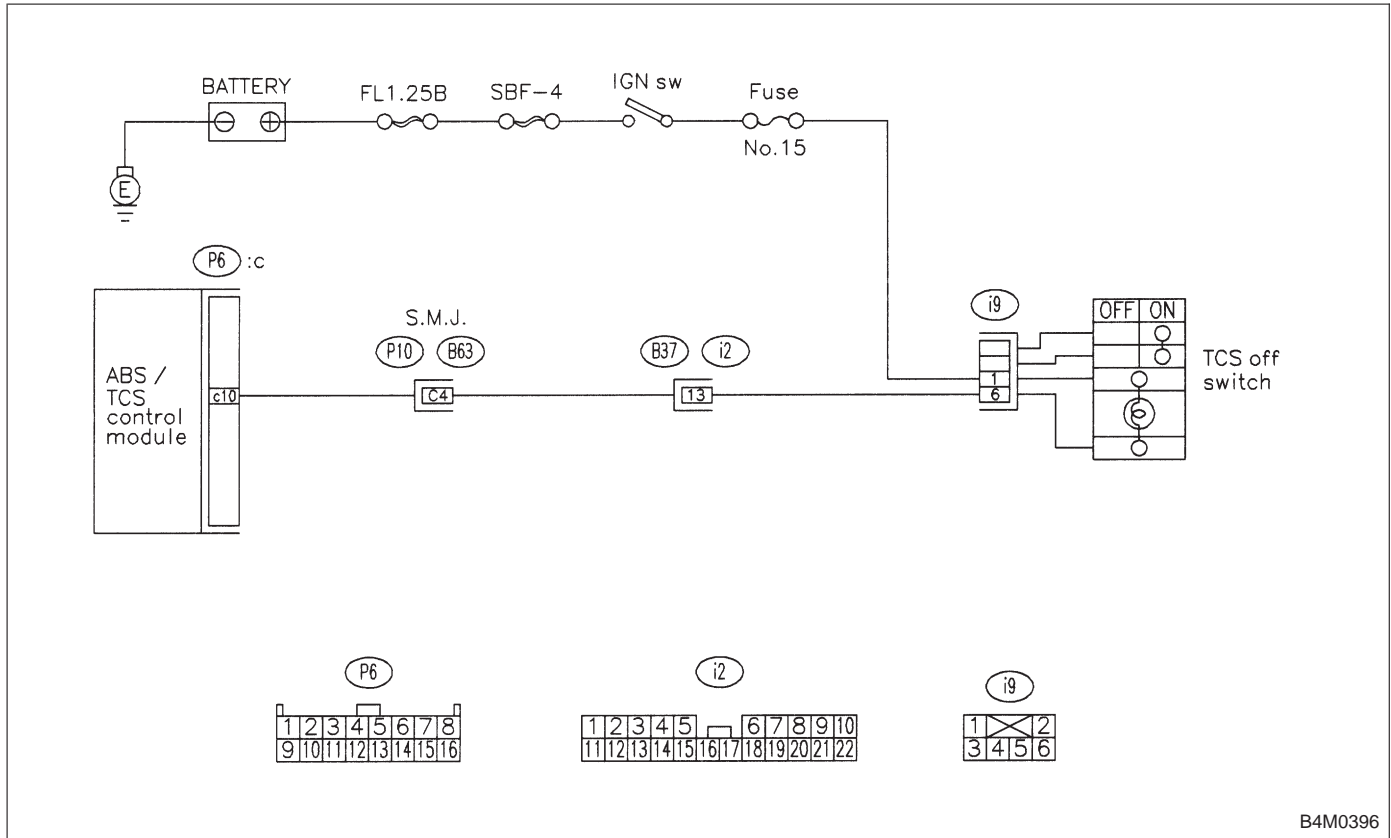
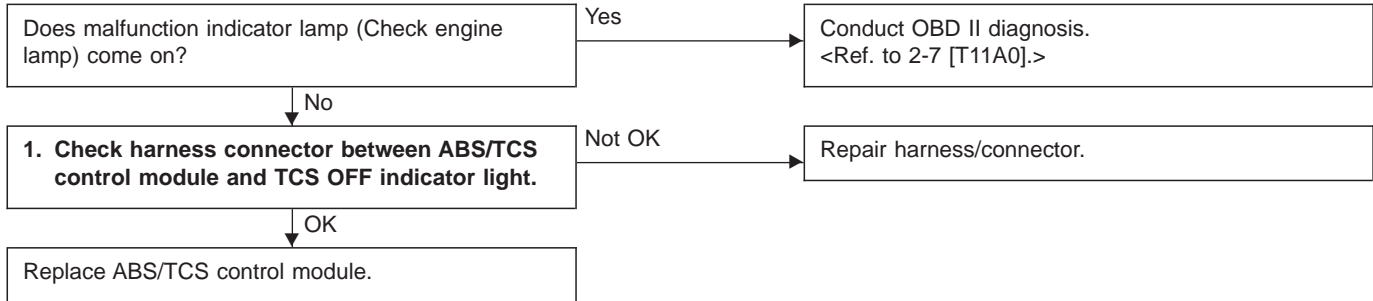
**(P5) No. 1 — body / 10 — 13 V**

#### **NOTE:**

- When ABS/TCS control module is defective, the same condition occurs.
- Confirm that ABS/TCS control module is installed.

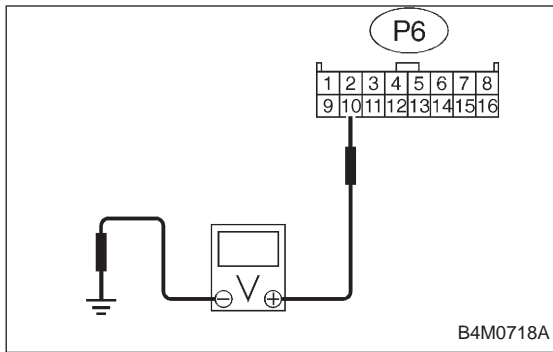
**E: TCS OFF INDICATOR LIGHT DOES NOT GO OFF.**

— ABS WARNING, TCS WARNING AND TCS OPERATING INDICATOR LIGHTS COME ON AND GO OFF PROPERLY WHEN STARTING THE ENGINE, BUT TCS OFF INDICATOR DOES NOT GO OFF FOR MORE THAN 30 SECONDS AFTER ENGINE RUNNING. —



B4M0396





**1. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND TCS OFF INDICATOR LIGHT.**

- 1) Turn ignition switch OFF.
- 2) Disconnect all connectors from ABS/TCS control module.
- 3) Turn ignition switch ON.
- 4) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**  
**(P6) No. 10 — body / 10 — 13 V**

**F: TCS OPERATING INDICATOR LIGHT DOES NOT GO OFF.**  
 — WHEN STARTING THE ENGINE, ABS WARNING, TCS WARNING AND TCS OFF INDICATOR LIGHTS COME ON AND GO OFF PROPERLY BUT TCS OPERATING INDICATOR LIGHT ONLY KEEPS ON. —

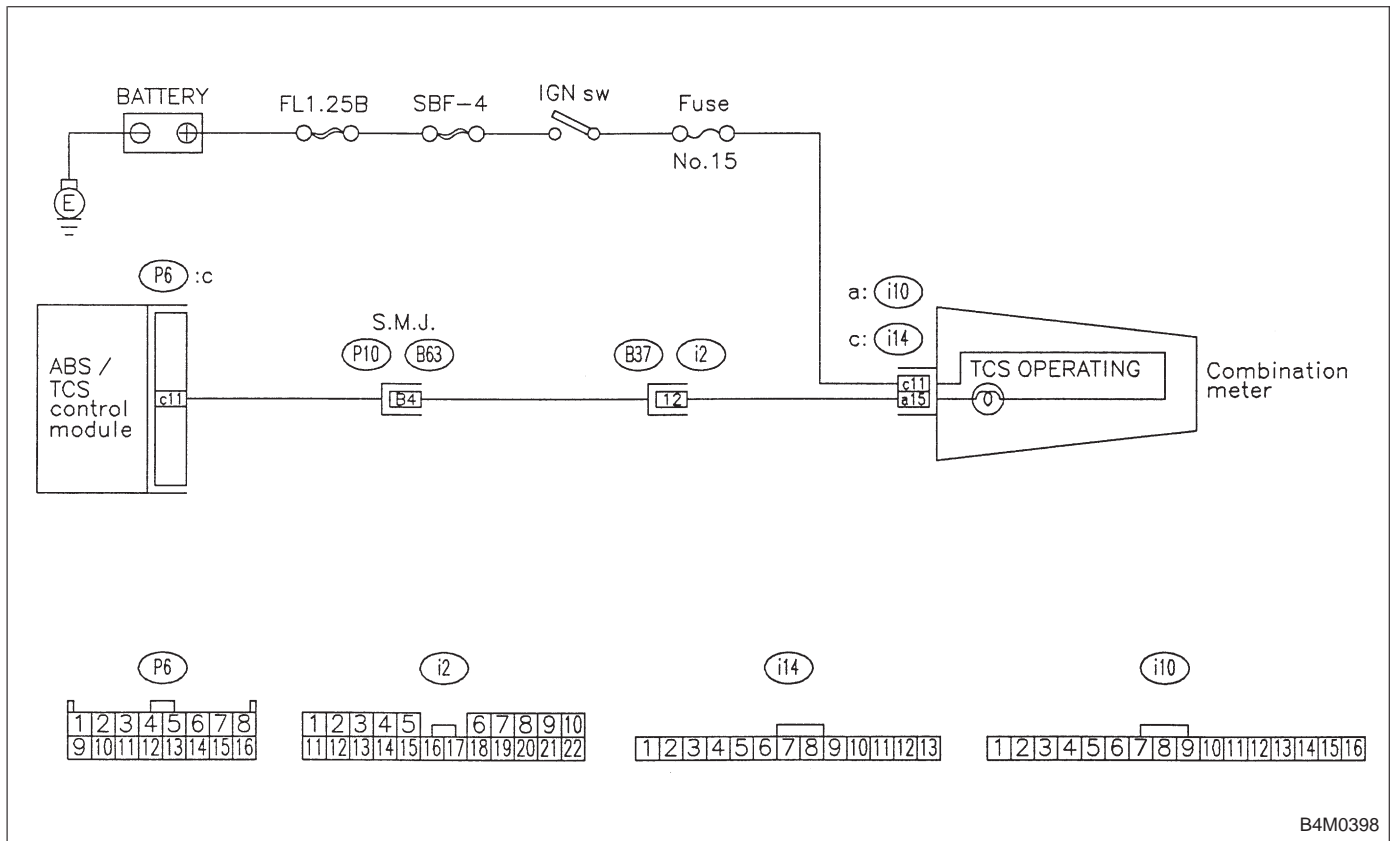
1. Check harness connector between ABS/TCS control module and TCS operating indicator light.

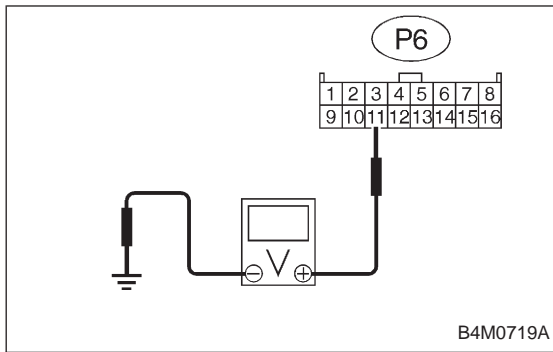
Not OK

Repair harness/connector.

OK

Replace ABS/TCS control module.



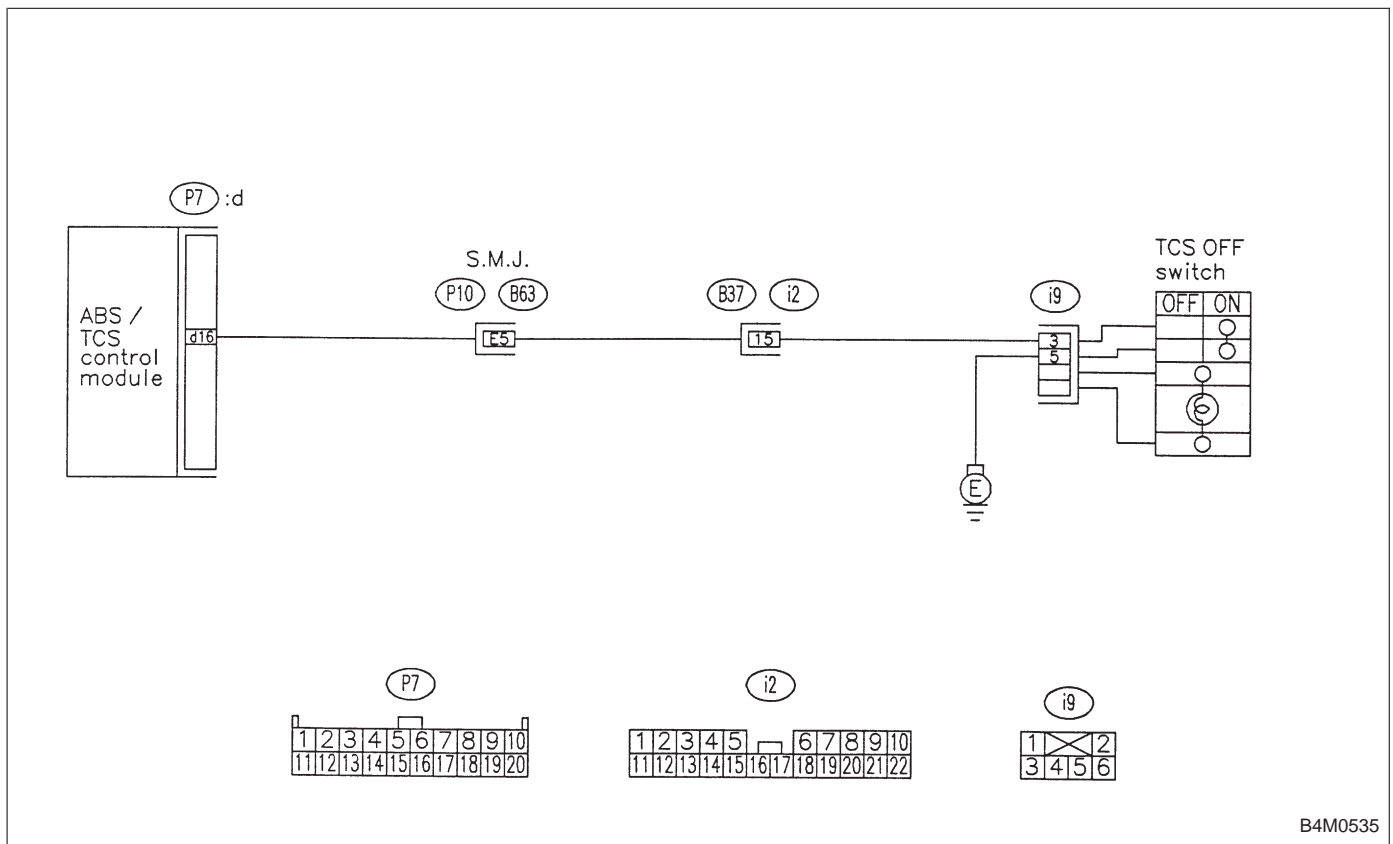
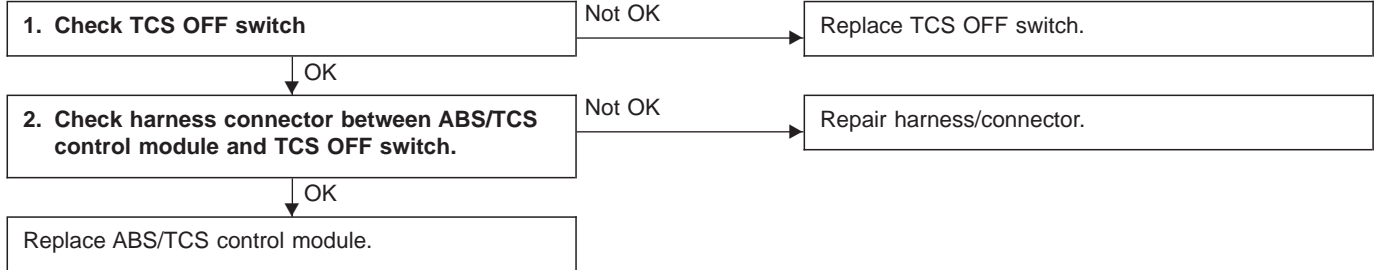


**1. CHECK HARNESS CONNECTOR BETWEEN ABS/TCS CONTROL MODULE AND TCS OPERATING INDICATOR LIGHT.**

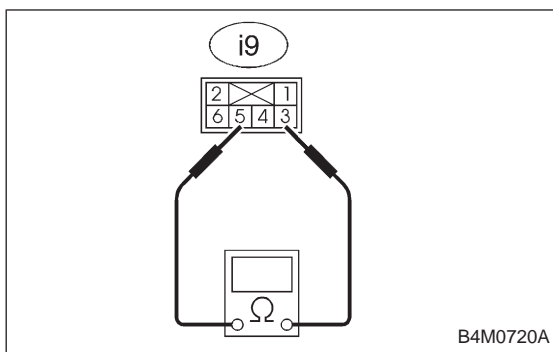
- 1) Turn ignition switch OFF.
- 2) Disconnect all connectors from ABS/TCS control module.
- 3) Turn ignition switch ON.
- 4) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**  
**(P6) No. 11 — body / 10 — 13 V**

**G: TCS OFF SWITCH DOES NOT FUNCTION. — TCS OFF INDICATOR LIGHT COMES ON AND GOES OFF PROPERLY WHEN STARTING THE ENGINE, WHILE THIS LIGHT NEITHER COMES ON NOR GOES OFF WHEN PUSHING THE TCS OFF SWITCH. —**



B4M0535



**1. CHECK TCS OFF SWITCH.**

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

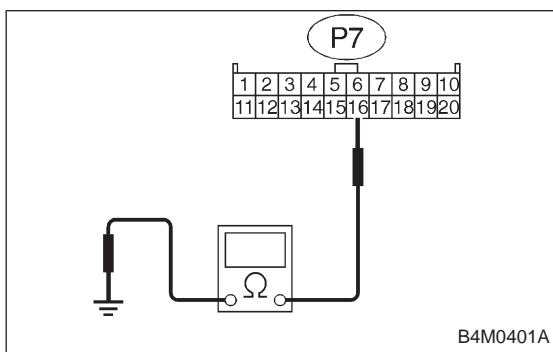
**Connector & terminal / Specified resistance:**

**(i9) No. 5 — No. 3 / 1 Ω or less**

**(When the switch is pressed, turns ON.)**

**/ 1 MΩ or less**

**(When the switch is released, turns OFF.)**



**2. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND TCS OFF SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector to TCS OFF switch.
- 3) Disconnect connector from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**Connector & terminal / Specified resistance:**

**(P7) No. 16 — body / 1 Ω or less (When the switch is pressed, turns ON.)**

**/ 1 MΩ or more (When the switch is released, turns OFF.)**

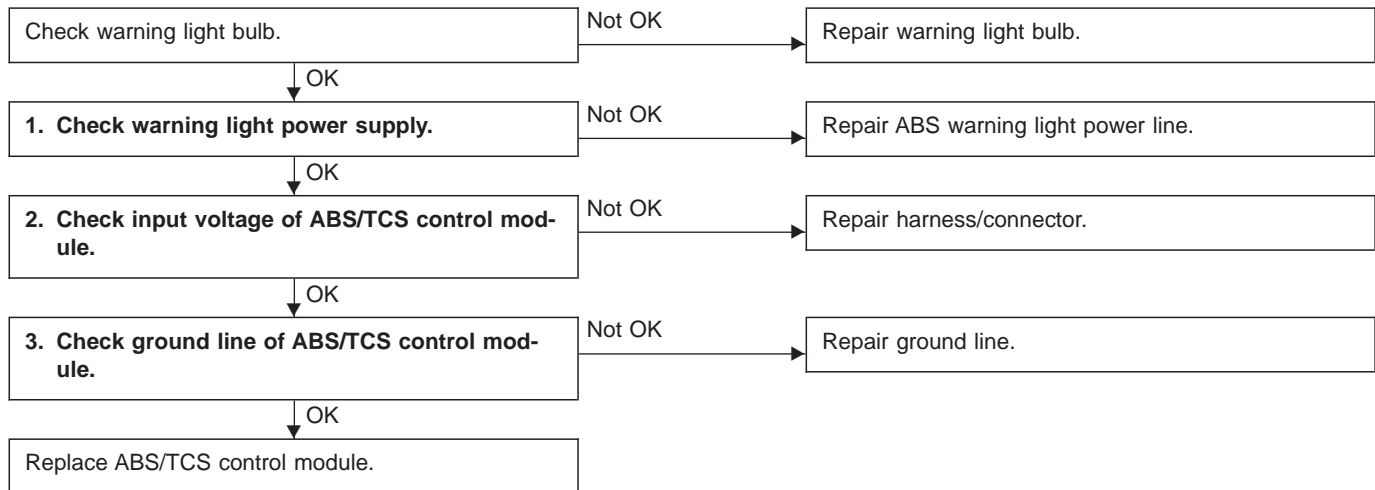
**H: ABS WARNING, TCS WARNING, TCS OPERATING INDICATOR AND/OR TCS OFF INDICATOR LIGHTS DO NOT COME ON. — TROUBLE IN WARNING LIGHT DRIVE CIRCUIT —**

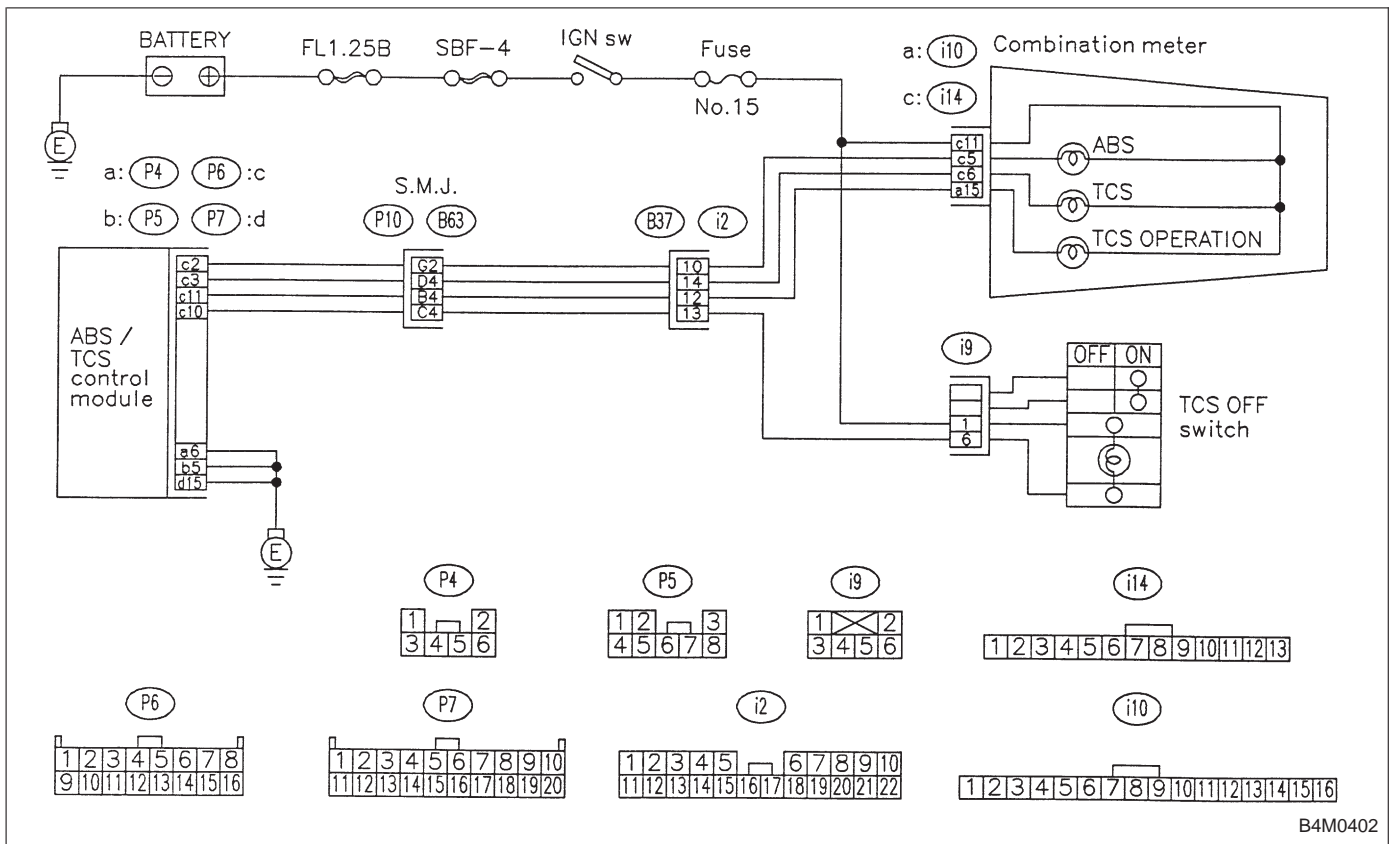
**DIAGNOSIS:**

- Faulty ABS warning light
- Faulty TCS warning light
- Faulty TCS OFF light
- Faulty TCS operating indicator light
- Faulty harness connector
- Faulty ABS/TCS control module

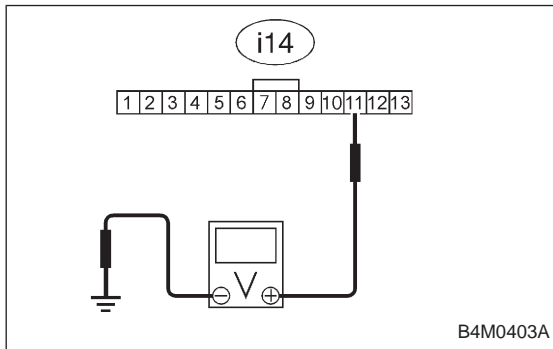
**TROUBLE SYMPTOM:**

- Warning light does not illuminate.
- Impossible to read trouble code.





B4M0402

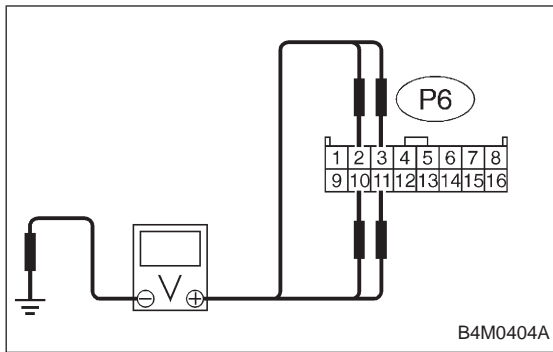


B4M0403A

**1. CHECK WARNING LIGHT POWER SUPPLY.**

- 1) Turn ignition switch OFF.
- 2) Disconnect combination meter.
- 3) Turn ignition switch ON.
- 4) Measure voltage between combination meter connector and body.

**Connector & terminal / Specified voltage:**  
*(i14) No. 11 — body / 10 — 13 V*



**2. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF and connect combination meter connector.
- 2) Disconnect all connectors from ABS/TCS control module.
- 3) Remove ABS/TCS valve relay.
- 4) Turn ignition switch ON.
- 5) Measure voltage between ABS/TCS control module and body.

**Connector & terminal / Specified voltage:**

**ABS warning:**

**(P6) No. 2 — body / 10 — 13 V**

**TCS warning:**

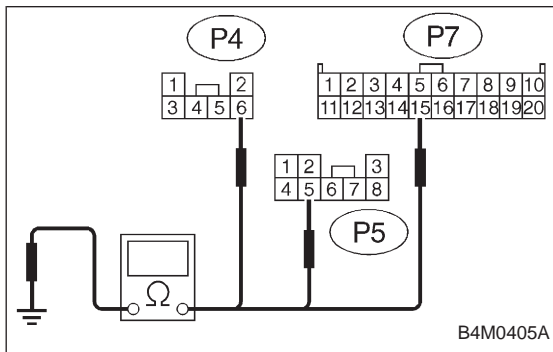
**(P6) No. 3 — body / 10 — 13 V**

**TCS operation:**

**(P6) No. 11 — body / 10 — 13 V**

**TCS OFF:**

**(P6) No. 10 — body / 10 — 13 V**



**3. CHECK GROUND LINE OF ABS/TCS CONTROL MODULE.**

Measure resistance between ABS/TCS control module and body.

**Connector & terminal / Specified resistance:**

**(P4) No. 6 — body / 1 Ω or less**

**(P5) No. 5 — body / 1 Ω or less**

**(P7) No. 15 — body / 1 Ω or less**



## 8. Diagnostics Chart with Trouble Code

## A: LIST OF TROUBLE CODE

Trouble code	Contents of diagnosis		Ref. to 4-4b
11	Start code ● Trouble code is shown after start code. ● Only start code is shown in normal condition.		—
21	Faulty ABS sensor (Open circuit or short circuit)	Front right wheel speed sensor	[T8B0]
23		Front left wheel speed sensor	
25		Rear right wheel speed sensor	
27		Rear left wheel speed sensor	
22	Faulty ABS sensor (Faulty ABS sensor signal)	Front right wheel speed sensor	[T8C0]
24		Front left wheel speed sensor	
26		Rear right wheel speed sensor	
28		Rear left wheel speed sensor	
31	Faulty solenoid valve circuit(s) in hydraulic unit	Front right inlet valve	[T8D0]
32		Front right outlet valve	[T8E0]
33		Front left inlet valve	[T8D0]
34		Front left outlet valve	[T8E0]
35		Rear right inlet valve	[T8D0]
36		Rear right outlet valve	[T8E0]
37		Rear left inlet valve	[T8D0]
38		Rear left outlet valve	[T8E0]
41	Faulty ABS/TCS control module		[T8F0]
42	Source voltage is high.		[T8G0]
43	Faulty engine control module communication cables		[T8H0]
51	Faulty valve relay		[T8I0]
52	Faulty motor, motor sensor and/or motor relay		[T8J0]
54	Faulty stroke sensor and/or stop light switch		[T8K0]
57	Faulty fluid level sensor		[T8L0]
58	Faulty pressure switch		[T8M0]
61	Faulty solenoid valve circuit(s) in hydraulic unit	TCS 1 valve	[T8D0]
62		TCS 2 valve	[T8D0]

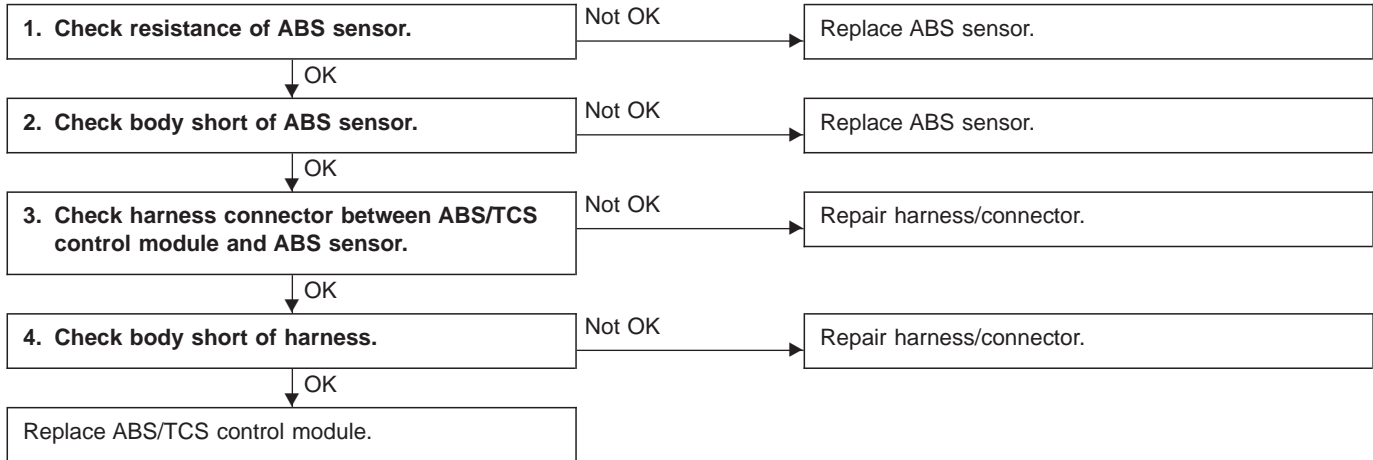
**B: TROUBLE CODE 21, 23, 25 AND 27  
— FAULTY ABS SENSOR (OPEN CIRCUIT OR  
SHORT CIRCUIT) —**

**DIAGNOSIS:**

- Faulty ABS sensor
- Faulty harness/connector
- Faulty ABS/TCS control module

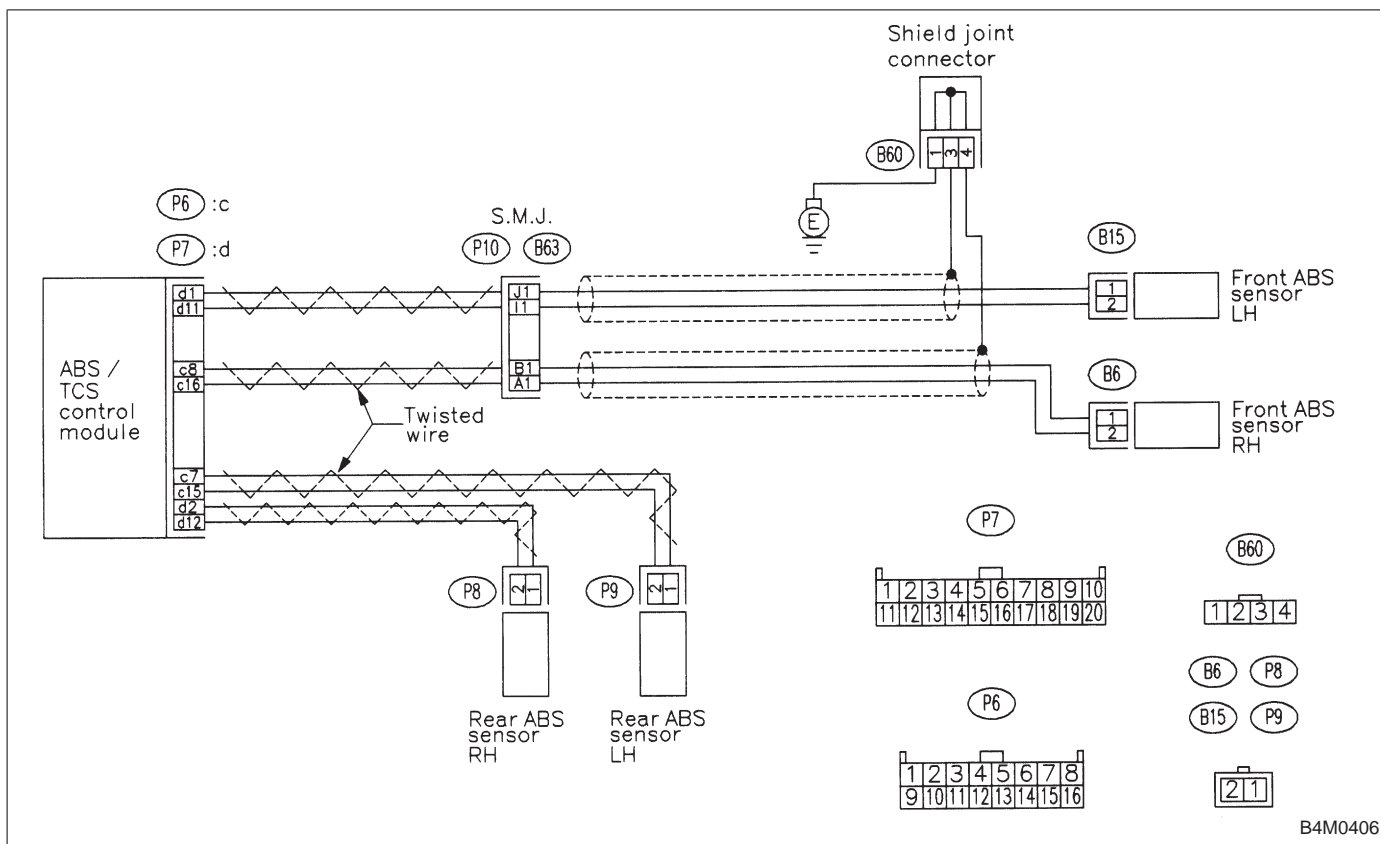
**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.

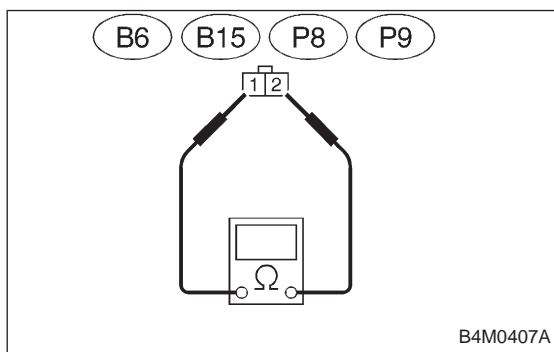


**NOTE:**

When checking ABS sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.



B4M0406



B4M0407A

**1. CHECK RESISTANCE OF ABS SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminals.

**TRUBLE CODE / Connector & terminal:**

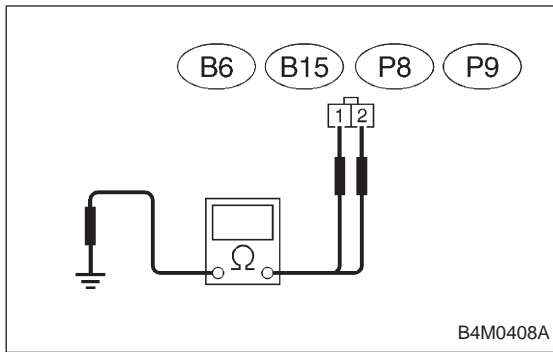
21 / (B6) No. 1 — No. 2

23 / (B15) No. 1 — No. 2

25 / (P8) No. 1 — No. 2

27 / (P9) No. 1 — No. 2

**Specified resistance: 0.8 — 1.2 kΩ**

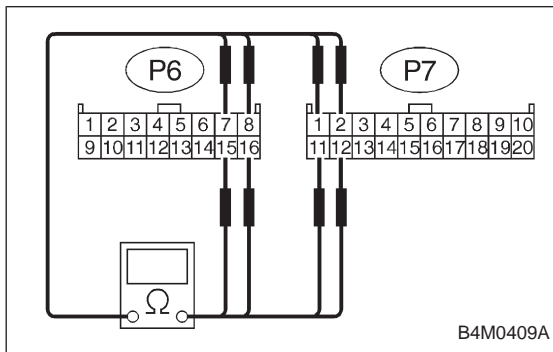


**2. CHECK BODY SHORT OF ABS SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminal and body.

**TROUBLE CODE / Connector & terminal:**

- 21 / (B6) No. 1 — body
  - / (B6) No. 2 — body
  - 23 / (B15) No. 1 — body
  - / (B15) No. 2 — body
  - 25 / (P8) No. 1 — body
  - / (P8) No. 2 — body
  - 27 / (P9) No. 1 — body
  - / (P9) No. 2 — body
- Specified resistance: 1 MΩ or more**

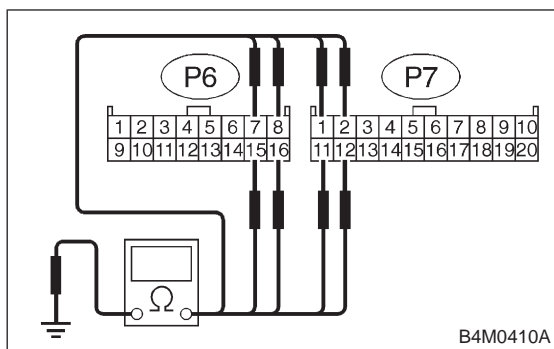


**3. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND ABS SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Connect connector to ABS sensor.
- 3) Disconnect all connectors from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**TROUBLE CODE / Connector & terminal:**

- 21 / (P6) No. 8 — No. 16
  - 23 / (P7) No. 1 — No. 11
  - 25 / (P7) No. 2 — No. 12
  - 27 / (P6) No. 7 — No. 15
- Specified resistance: 0.8 — 1.2 kΩ**



#### 4. CHECK BODY SHORT OF HARNESS.

- 1) Turn ignition switch OFF.
- 2) Connect connector to ABS sensor.
- 3) Disconnect all connectors from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

#### ***TROUBLE CODE / Connector & terminal:***

- 21 / (P6) No. 8 — body***
- / (P6) No. 16 — body***
- 23 / (P7) No. 1 — body***
- / (P7) No. 11 — body***
- 25 / (P7) No. 2 — body***
- / (P7) No. 12 — body***
- 27 / (P6) No. 7 — body***
- / (P6) No. 15 — body***

***Specified resistance: 1 M $\Omega$  or more***

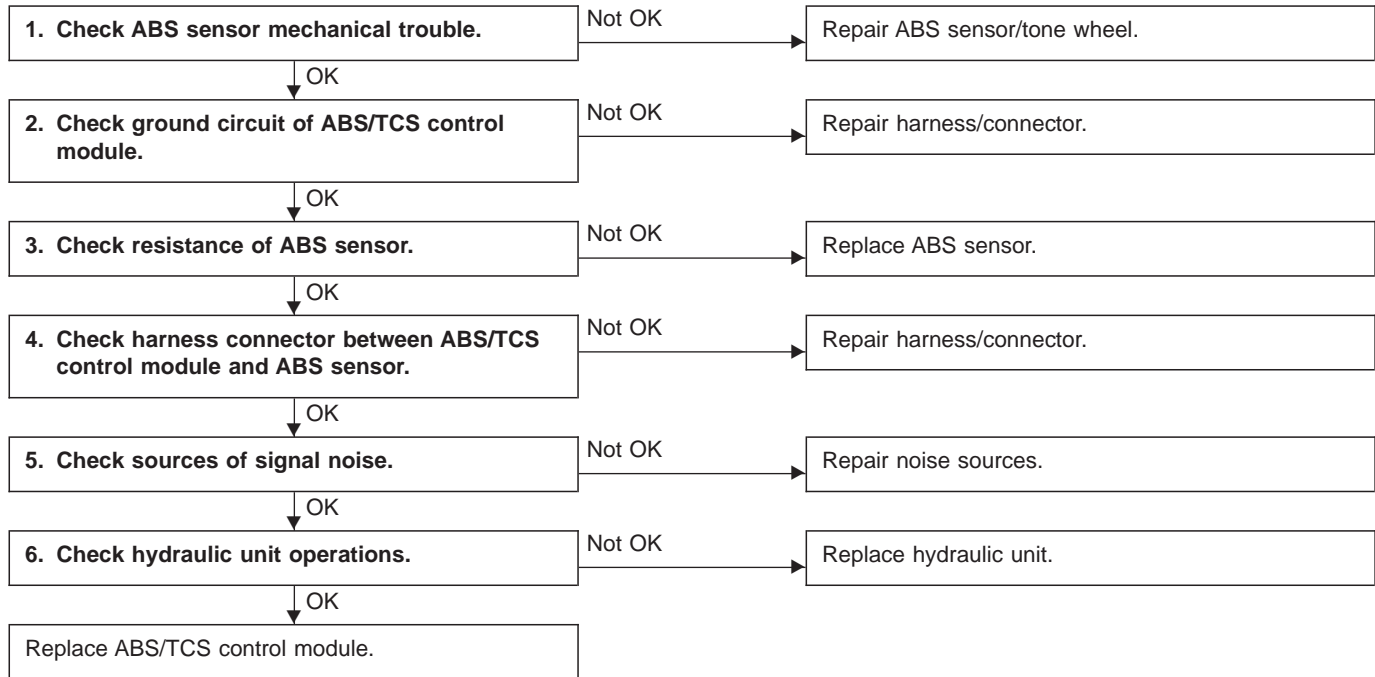
**C: TROUBLE CODE 22, 24, 26 AND 28  
— FAULTY ABS SENSOR (FAULTY ABS  
SENSOR SIGNAL) —**

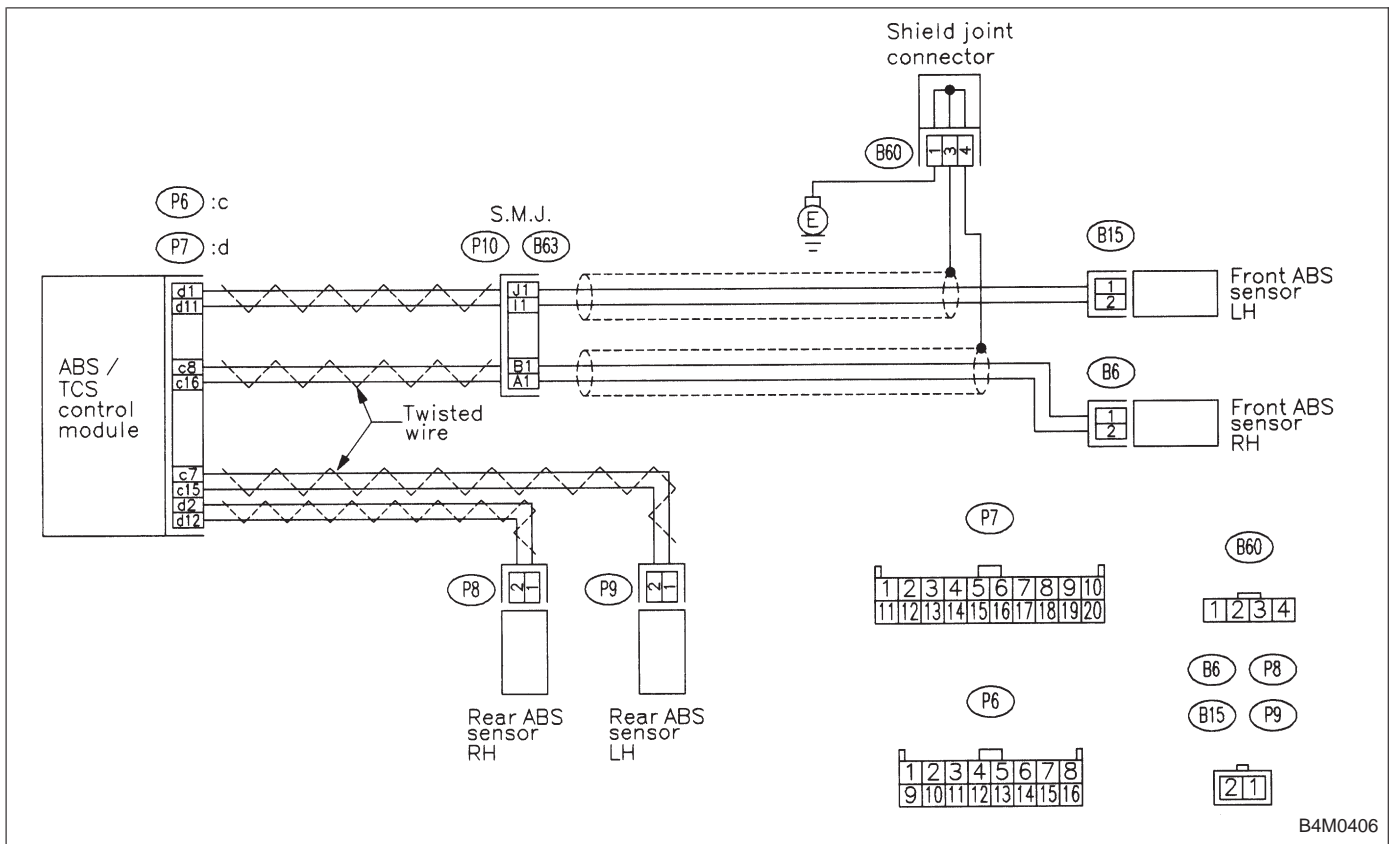
**DIAGNOSIS:**

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

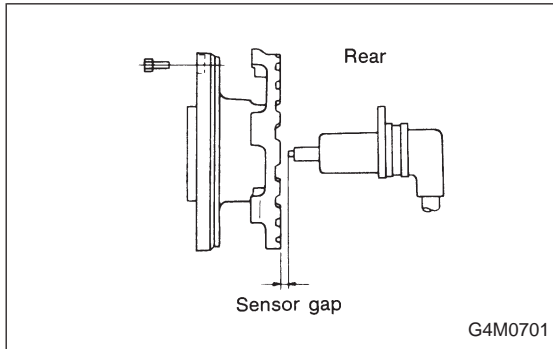
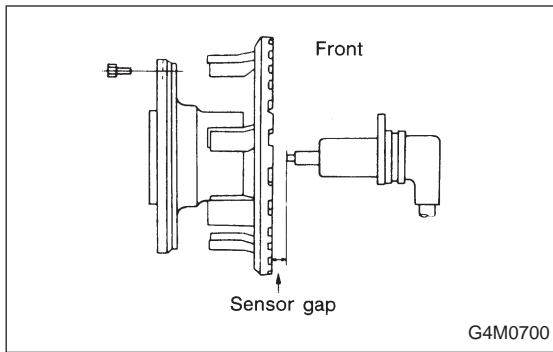
**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.
- TCS operates when should not.





B4M0406



**1. CHECK ABS SENSOR MECHANICAL TROUBLE.**

- 1) Dismount brake as outlined in manual to gain access to ABS sensor and tone wheel for inspection.
- 2) Check pole piece and tone wheel for accumulation of foreign particles. If necessary, remove foreign particles and clean.
- 3) Check tone wheel teeth for cracks for deformities. If necessary, replace tone wheel (No. of teeth: 44) with a new one.
- 4) Check tone wheel for looseness.

**Tightening torque:**

**10 — 16 N·m (1 — 1.6 kg-m, 7 — 12 ft-lb)**

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

Specifications	Front wheel	Rear wheel
	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)

If measurements check out "Not OK", adjust the gap using spacers (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

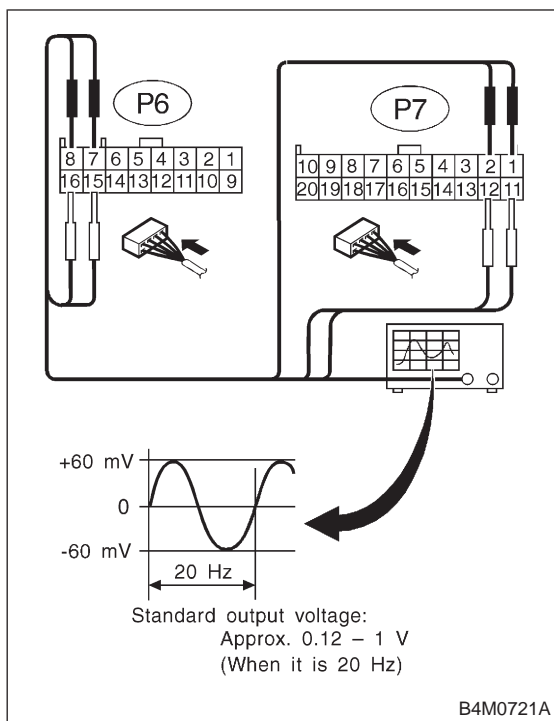
- 6) Check hub runout.

Specifications	0.05 mm (0.0020 in)
----------------	---------------------

- 7) The following checks can be made if an oscilloscope is available.

- (1) Raise all four wheels of ground.
- (2) Turn ignition switch OFF.
- (3) Connect all connectors to ABS control module.
- (4) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.
- (5) Turn ignition switch ON.





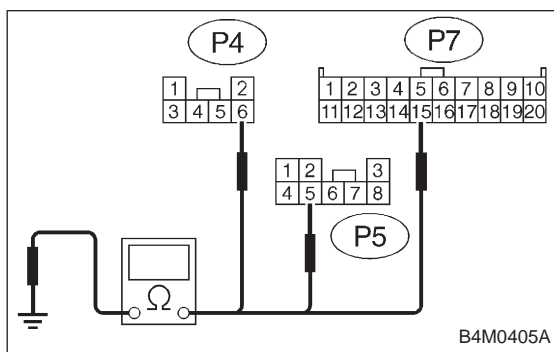
(6) Rotate wheels and measure voltage at specified frequency.

**NOTE:**

When this inspection is completed, the ABS/TCS control module sometimes stores the trouble code.

**TROUBLE CODE / Connector & terminal:**

- 22 / (P6) No. 8 — No.16 (Connect terminal to oscilloscope earth head.)
  - 24 / (P7) No. 1 — No.11 (Connect terminal to oscilloscope earth head.)
  - 26 / (P7) No. 2 — No.12 (Connect terminal to oscilloscope earth head.)
  - 28 / (P6) No. 7 — No.15 (Connect terminal to oscilloscope earth head.)
- Specified voltage: 0.12 — 1 V (When it is 20 Hz.)**

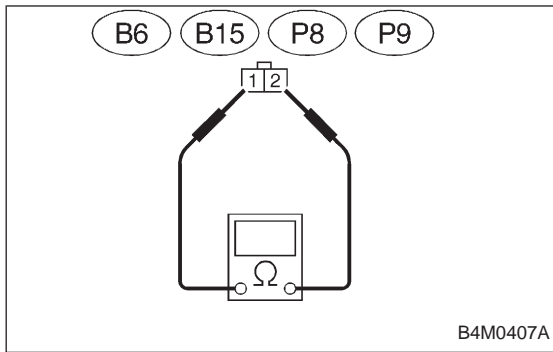


**2. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module.
- 3) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**

- (P4) No. 6 — body / 1 Ω or less
- (P5) No. 5 — body / 1 Ω or less
- (P7) No. 15 — body / 1 Ω or less



### 3. CHECK RESISTANCE OF ABS SENSOR.

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminals.

#### ***TROUBLE CODE / Connector & terminal:***

***22 / (B6) No. 1 — No. 2***

***24 / (B15) No. 1 — No. 2***

***26 / (P8) No. 1 — No. 2***

***28 / (P9) No. 1 — No. 2***

***Specified resistance: 0.8 — 1.2 kΩ***

### 4. CHECK HARNESS CONNECTOR BETWEEN ABS/ TCS CONTROL MODULE AND ABS SENSOR.

Check for poor contacts in plug-in connectors. Refer to "Basic checks" in "FOREWORD".

**5. CHECK SOURCES OF SIGNAL NOISE.**

- 1) Check that the mobile phone, personal radio and other wireless apparatus are correctly installed.
- 2) Check that the antenna and other possible noise sources are distant enough from the sensor harness.
- 3) Check that the sealed wires of the front harness sensor (in the engine room) are securely grounded.
- 4) Check that between ABS/TCS control module and the rear sensor harness has the correct twist pitch.

***Twist pitch:***

***25 mm (0.98 in) or less***

**6. CHECK HYDRAULIC UNIT OPERATIONS.**

- 1) Operate the ABS sequence control and check that the brake fluid pressure at the malfunctioning brake line increases and decreases properly. <Ref. to 4-4 [W20C0].>

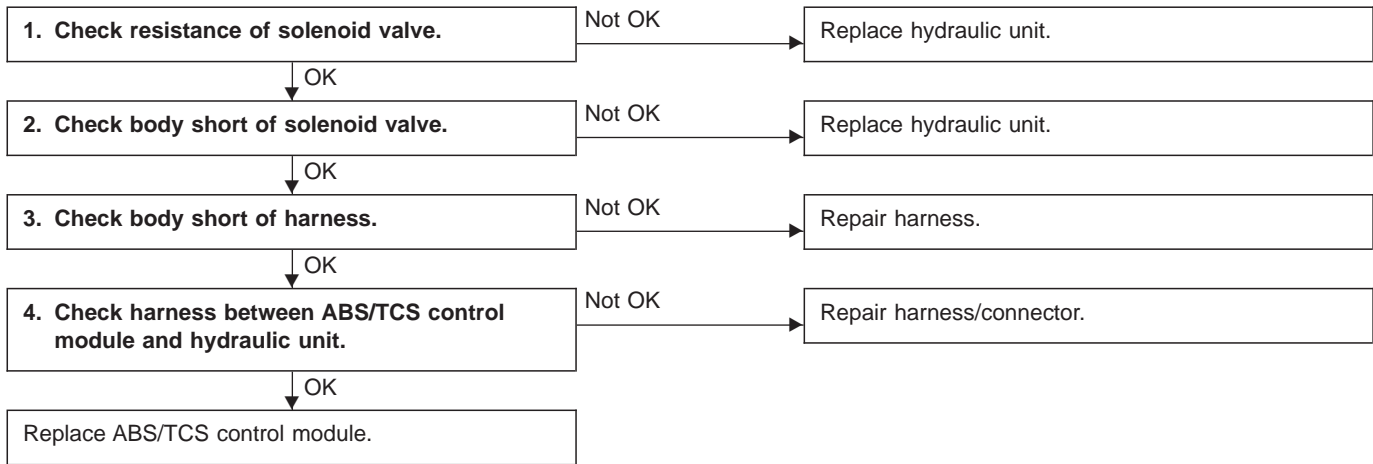
**D: TROUBLE CODE 31, 33, 35, 37, 61 AND 62  
— FAULTY INLET SOLENOID VALVE  
CIRCUIT(S) AND TCS SOLENOID VALVE  
CIRCUIT(S) IN HYDRAULIC UNIT —**

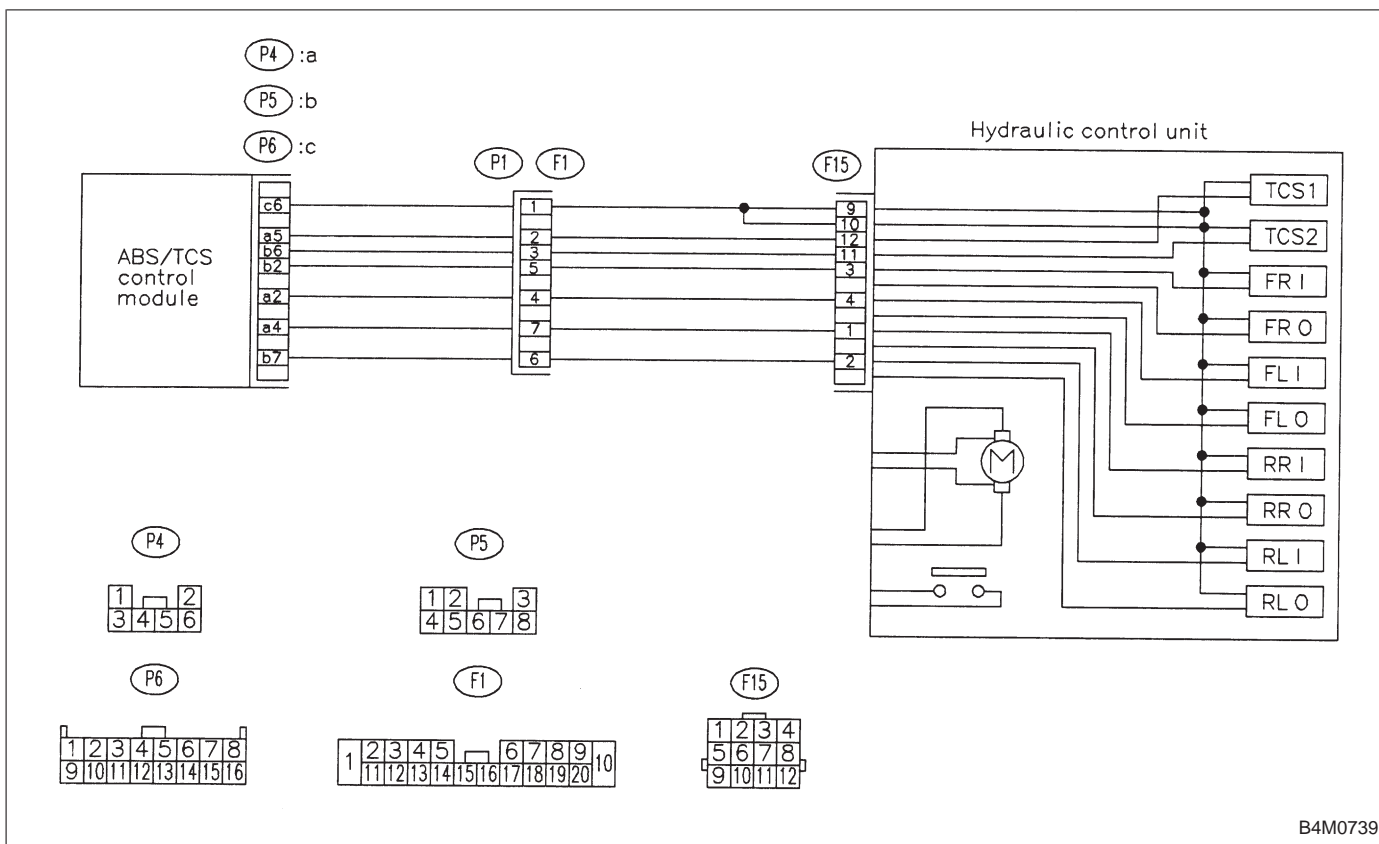
**DIAGNOSIS:**

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

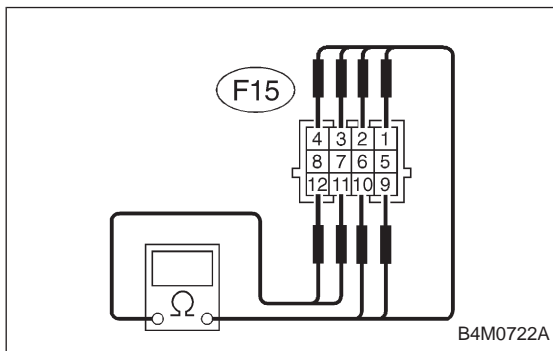
**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.





B4M0739



B4M0722A

**1. CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure resistance between hydraulic unit terminals.

**TROUBLE CODE / Connector & terminal:**

31 / (F15) No. 3 — No. 9

33 / (F15) No. 4 — No. 10

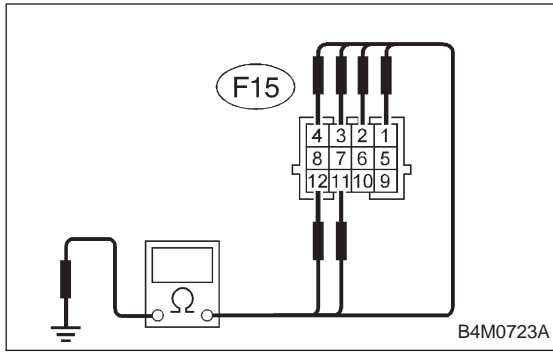
35 / (F15) No. 1 — No. 10

37 / (F15) No. 2 — No. 9

61 / (F15) No. 12 — No. 9

62 / (F15) No. 11 — No. 10

**Specified resistance: approx. 6±1 Ω**

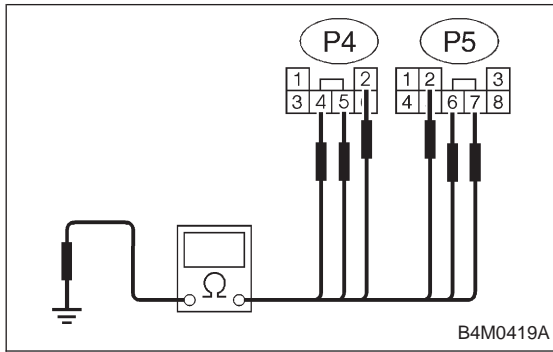


**2. CHECK BODY SHORT OF SOLENOID VALVE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure resistance between hydraulic unit terminals.

**TRUBLE CODE / Connector & terminal:**

- 31 / (F15) No. 3 — body
  - 33 / (F15) No. 4 — body
  - 35 / (F15) No. 1 — body
  - 37 / (F15) No. 2 — body
  - 61 / (F15) No. 12 — body
  - 62 / (F15) No. 11 — body
- Specified resistance: 1 MΩ or more**

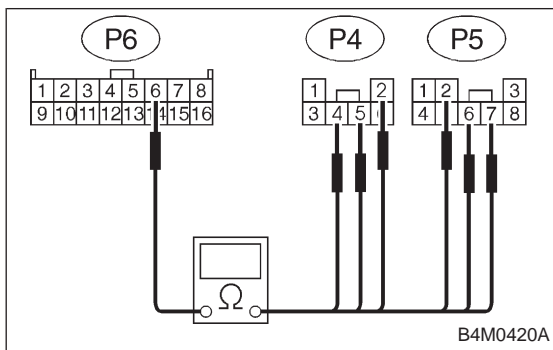


**3. CHECK BODY SHORT OF HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Disconnect connector from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**TRUBLE CODE / Connector & terminal:**

- 31 / (P5) No. 2 — body
  - 33 / (P4) No. 2 — body
  - 35 / (P4) No. 4 — body
  - 37 / (P5) No. 7 — body
  - 61 / (P4) No. 5 — body
  - 62 / (P5) No. 6 — body
- Specified resistance: 1 MΩ or more**



**4. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND HYDRAULIC UNIT.**

- 1) Turn ignition switch OFF.
- 2) Connect connector to hydraulic unit.
- 3) Disconnect connector from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**TRUBLE CODE / Connector & terminal:**

- 31 / (P5) No. 2 — (P6) No. 6
- 33 / (P4) No. 2 — (P6) No. 6

**35 / (P4) No. 4 — (P6) No. 6**

**37 / (P5) No. 7 — (P6) No. 6**

**61 / (P4) No. 5 — (P6) No. 6**

**62 / (P5) No. 6 — (P6) No. 6**

**Specified resistance:  $6.2 \pm 1.0 \Omega$**

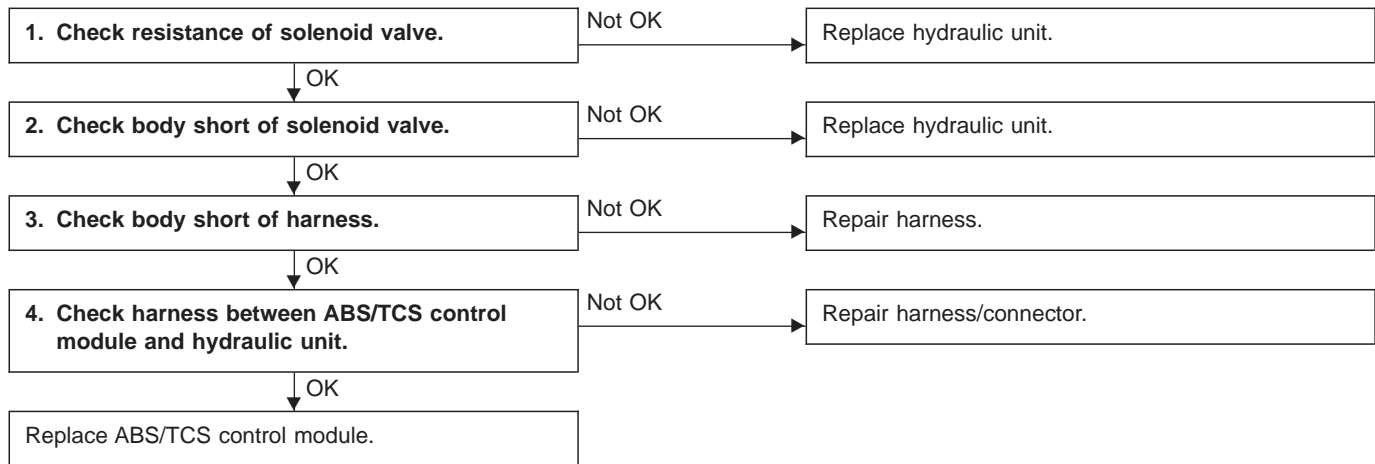
## E: TROUBLE CODE 32, 34, 36 AND 38 — FAULTY OUTLET SOLENOID VALVE CIRCUIT(S) IN HYDRAULIC UNIT —

### DIAGNOSIS:

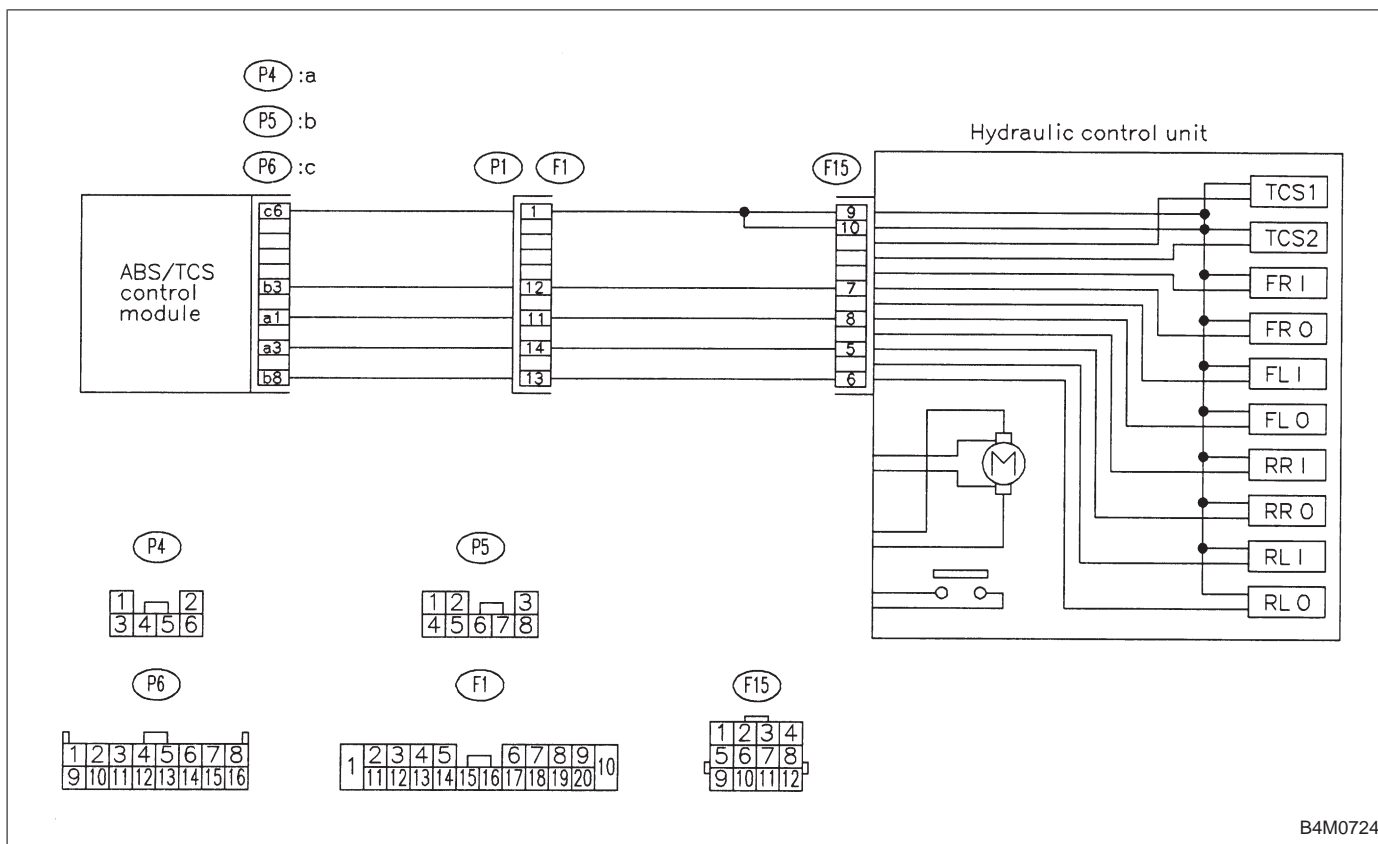
- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

### TROUBLE SYMPTOM:

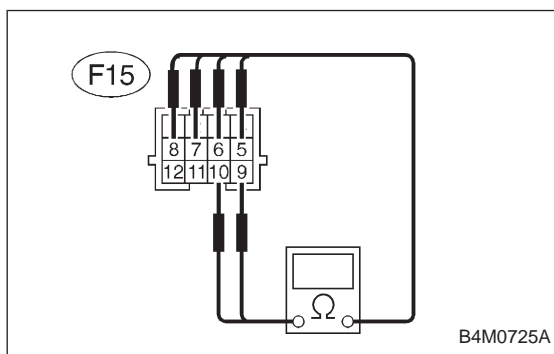
- ABS does not operate.
- TCS does not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.







B4M0724



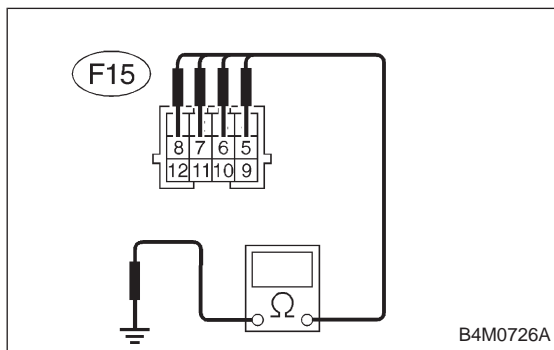
B4M0725A

**1. CHECK RESISTANCE OF SOLENOID VALVE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure resistance between hydraulic unit terminals.

**TROUBLE CODE / Connector & terminal:**

- 32 / (F15) No. 7 — No. 9
  - 34 / (F15) No. 8 — No. 10
  - 36 / (F15) No. 5 — No. 10
  - 38 / (F15) No. 6 — No. 9
- Specified resistance:  $3.5 \pm 1.0 \Omega$**



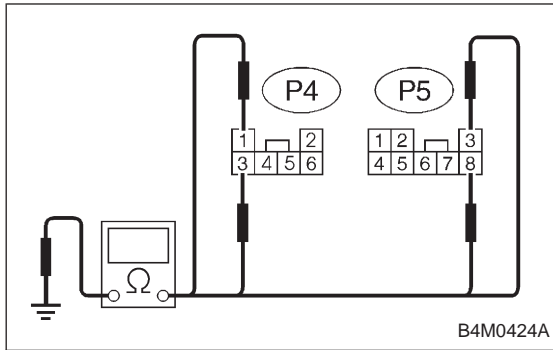
B4M0726A

**2. CHECK BODY SHORT OF SOLENOID VALVE.**

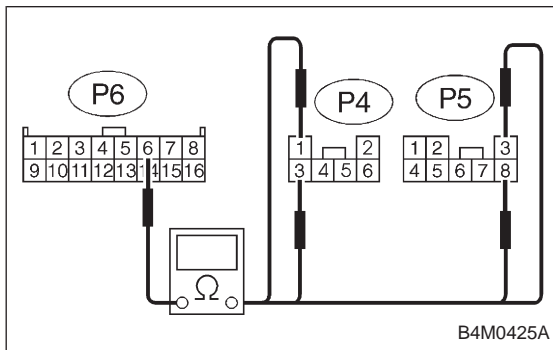
- 1) Turn ignition switch OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Measure resistance between hydraulic unit terminals.

**TROUBLE CODE / Connector & terminal:**

- 32 / (F15) No. 7 — body
  - 34 / (F15) No. 8 — body
  - 36 / (F15) No. 5 — body
  - 38 / (F15) No. 6 — body
- Specified resistance:  $1 M\Omega$  or more**

**3. CHECK BODY SHORT OF HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from hydraulic unit.
- 3) Disconnect connector from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**TROUBLE CODE / Connector & terminal:****32 / (P5) No. 3 — body****34 / (P4) No. 1 — body****36 / (P4) No. 3 — body****38 / (P5) No. 8 — body****Specified resistance: 1 MΩ or more****4. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND HYDRAULIC UNIT.**

- 1) Turn ignition switch OFF.
- 2) Connect connector to hydraulic unit.
- 3) Disconnect connector from ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**TROUBLE CODE / Connector & terminal:****32 / (P5) No. 3 — (P6) No. 6****34 / (P4) No. 1 — (P6) No. 6****36 / (P4) No. 3 — (P6) No. 6****38 / (P5) No. 8 — (P6) No. 6****Specified resistance: 3.7±1.0 Ω**

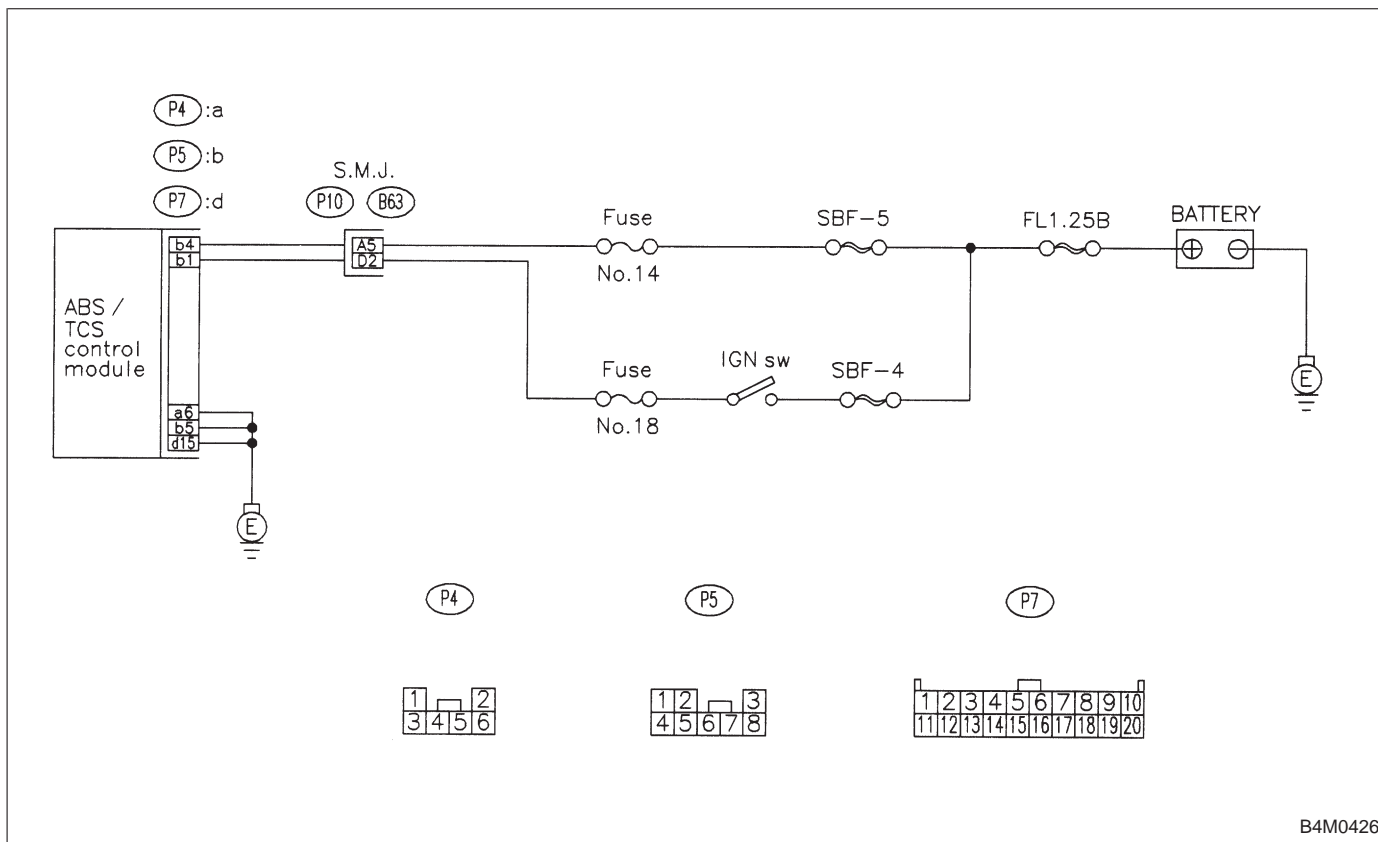
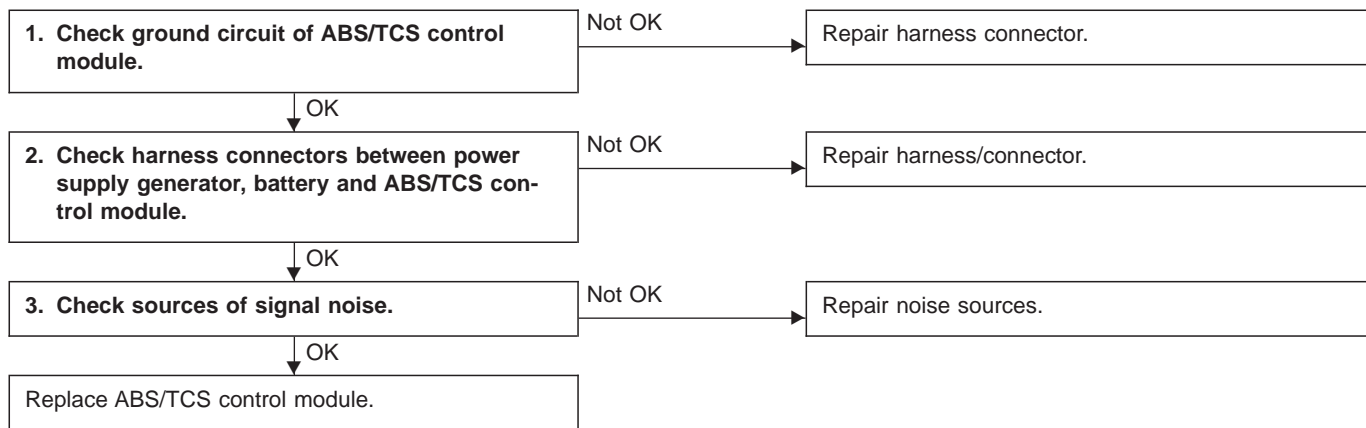
**F: TROUBLE CODE 41  
— FAULTY ABS/TCS CONTROL  
MODULE —**

**DIAGNOSIS:**

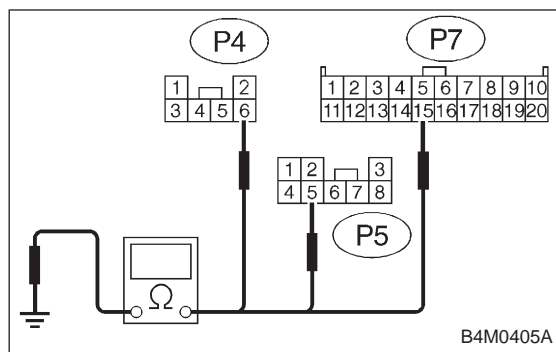
- Faulty ABS/TCS control module
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



B4M0426



### 1. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module.
- 3) Measure resistance between ABS/TCS control module connector and body.

#### **Connector & terminal / Specified resistance:**

**(P4) No. 6 — body / 1  $\Omega$  or less**

**(P5) No. 5 — body / 1  $\Omega$  or less**

**(P7) No. 15 — body / 1  $\Omega$  or less**

### 2. CHECK HARNESS CONNECTORS BETWEEN POWER SUPPLY GENERATOR, BATTERY AND ABS/TCS CONTROL MODULE.

Check for poor contacts in plug-in connectors. Refer to "Basic checks" in "FOREWORD".

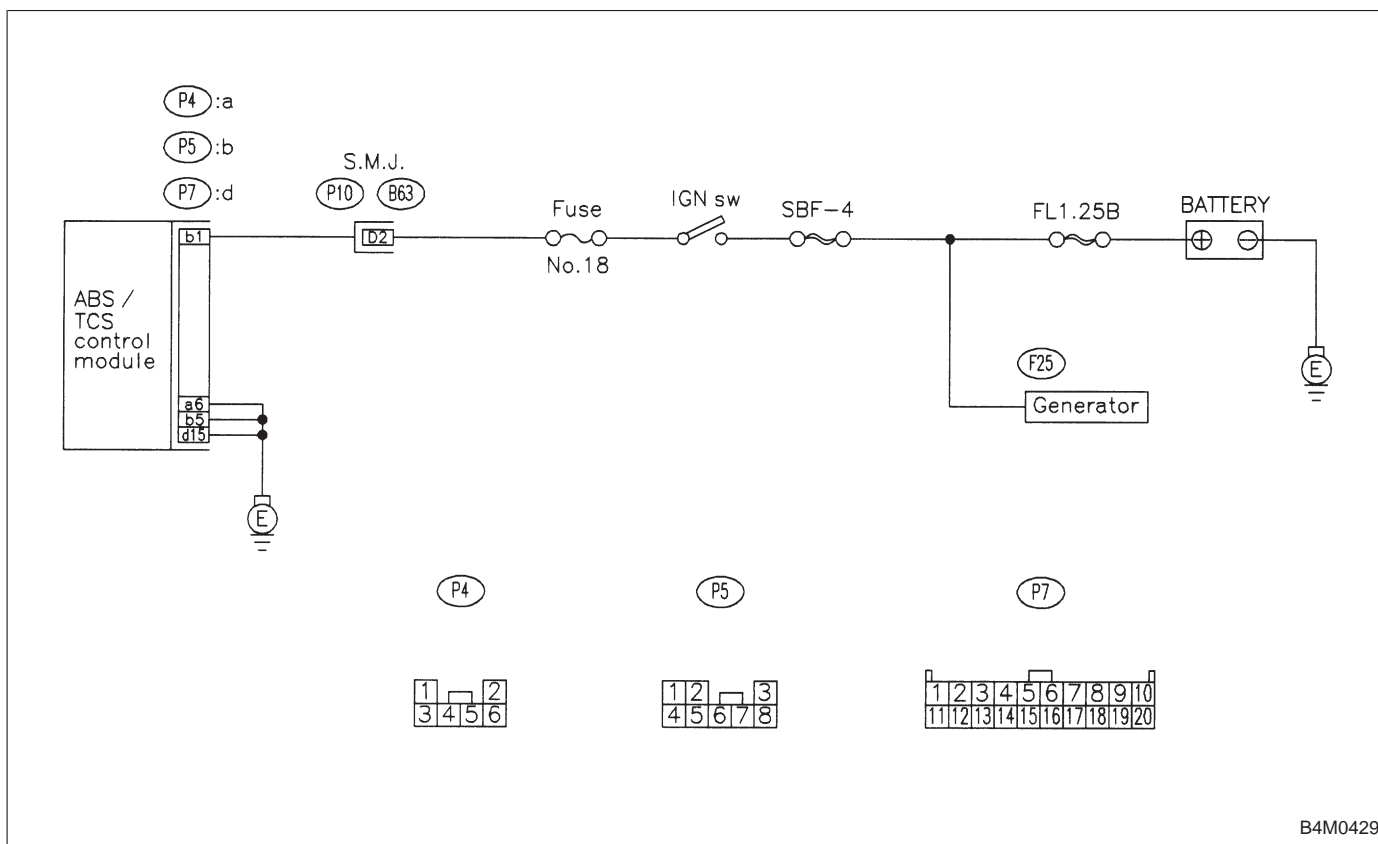
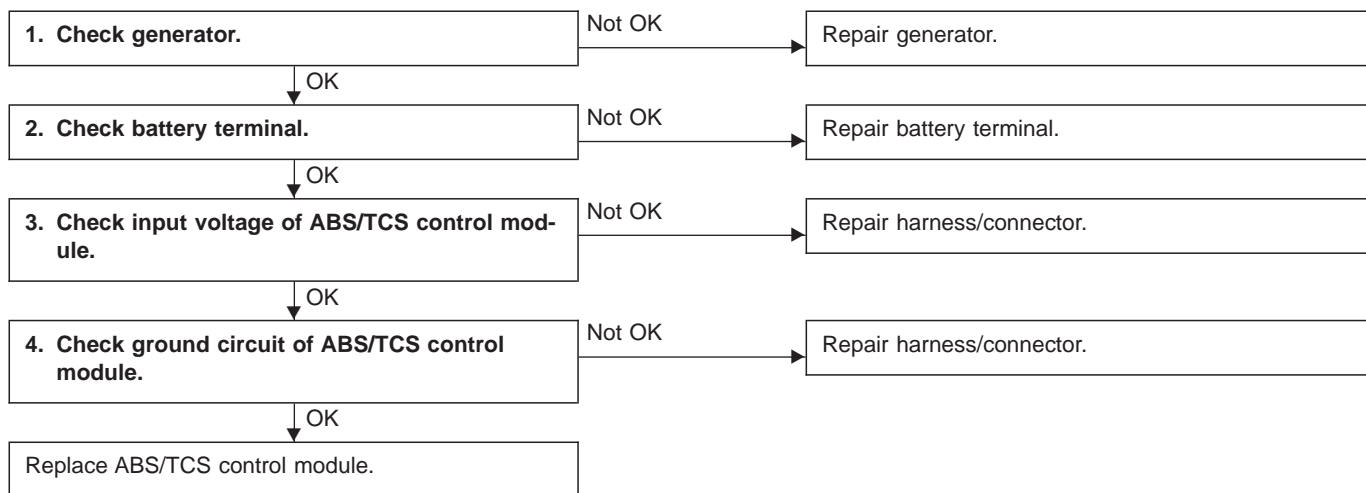
**G: TROUBLE CODE 42**  
**— SOURCE VOLTAGE IS HIGH. —**

**DIAGNOSIS:**

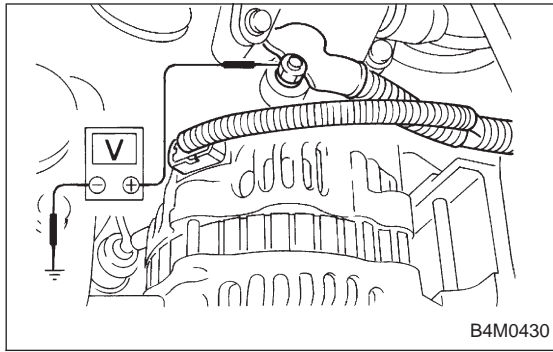
- Power source voltage of the ABS/TCS control module is more than 18 V.
- Faulty ABS/TCS control module
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



B4M0429



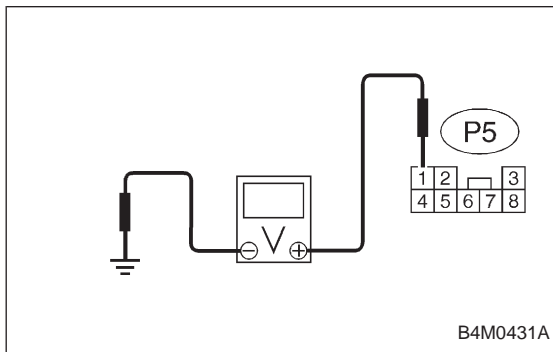
**1. CHECK GENERATOR.**

- 1) Idling after warm-up.
- 2) Measure voltage between generator B terminal and body.

**Connector / Specified voltage:**  
**(F25) — body / 10 — 15 V**

**2. CHECK BATTERY TERMINAL.**

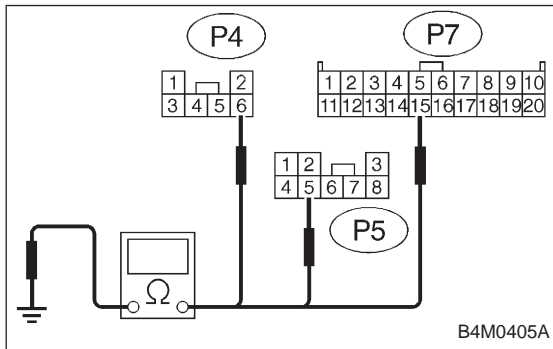
Check that the positive and negative battery terminals are firmly fixed.



**3. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module.
- 3) Run the engine at idle.
- 4) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**  
**(P5) No. 1 — body / 10 — 15 V**



**4. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module.
- 3) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**  
**(P4) No. 6 — body / 1 Ω or less**  
**(P5) No. 5 — body / 1 Ω or less**  
**(P7) No. 15 — body / 1 Ω or less**

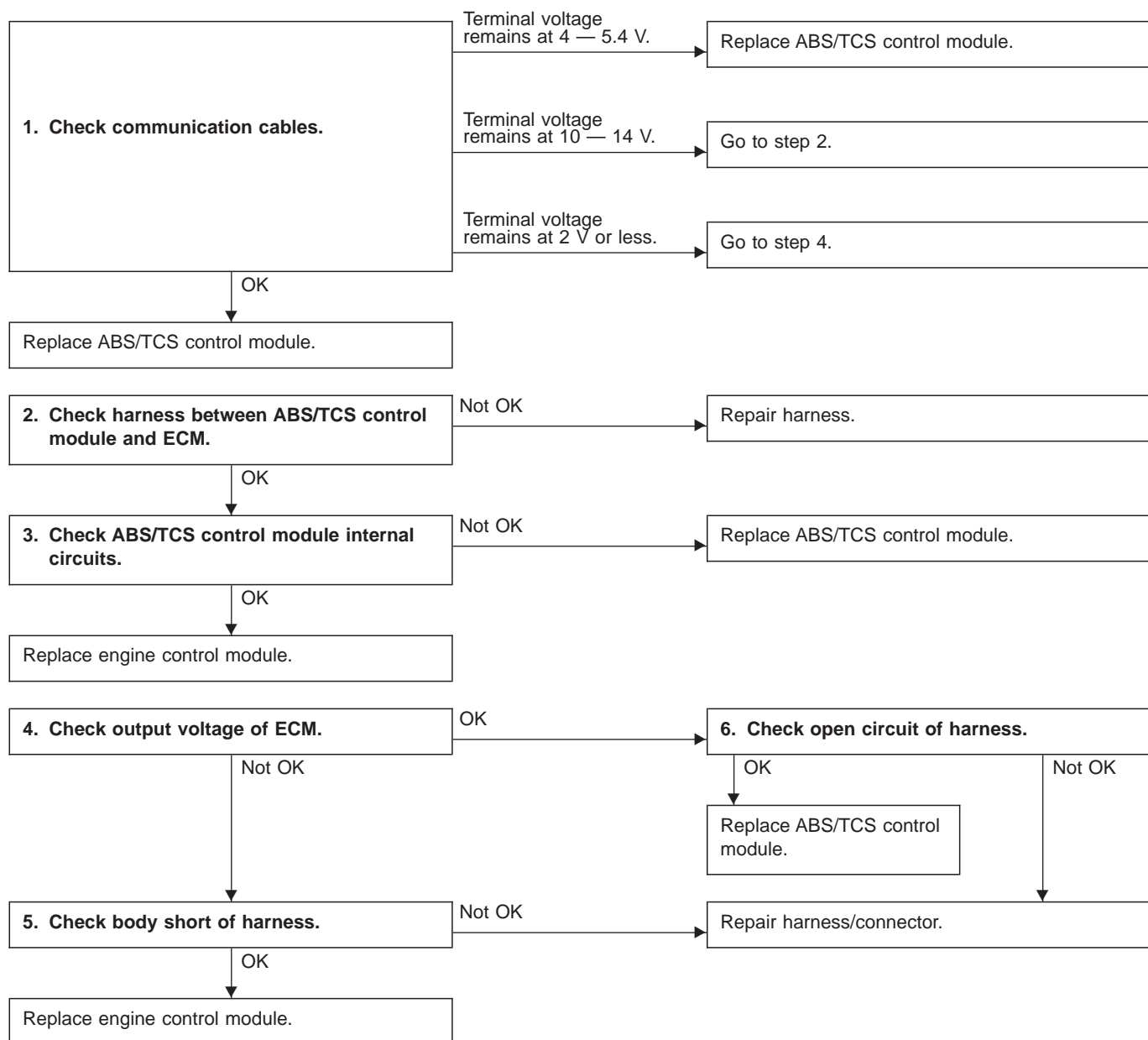
**H: TROUBLE CODE 43  
— FAULTY ENGINE CONTROL MODULE  
COMMUNICATION CABLES —**

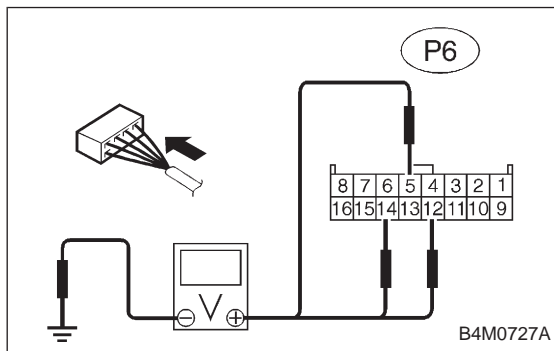
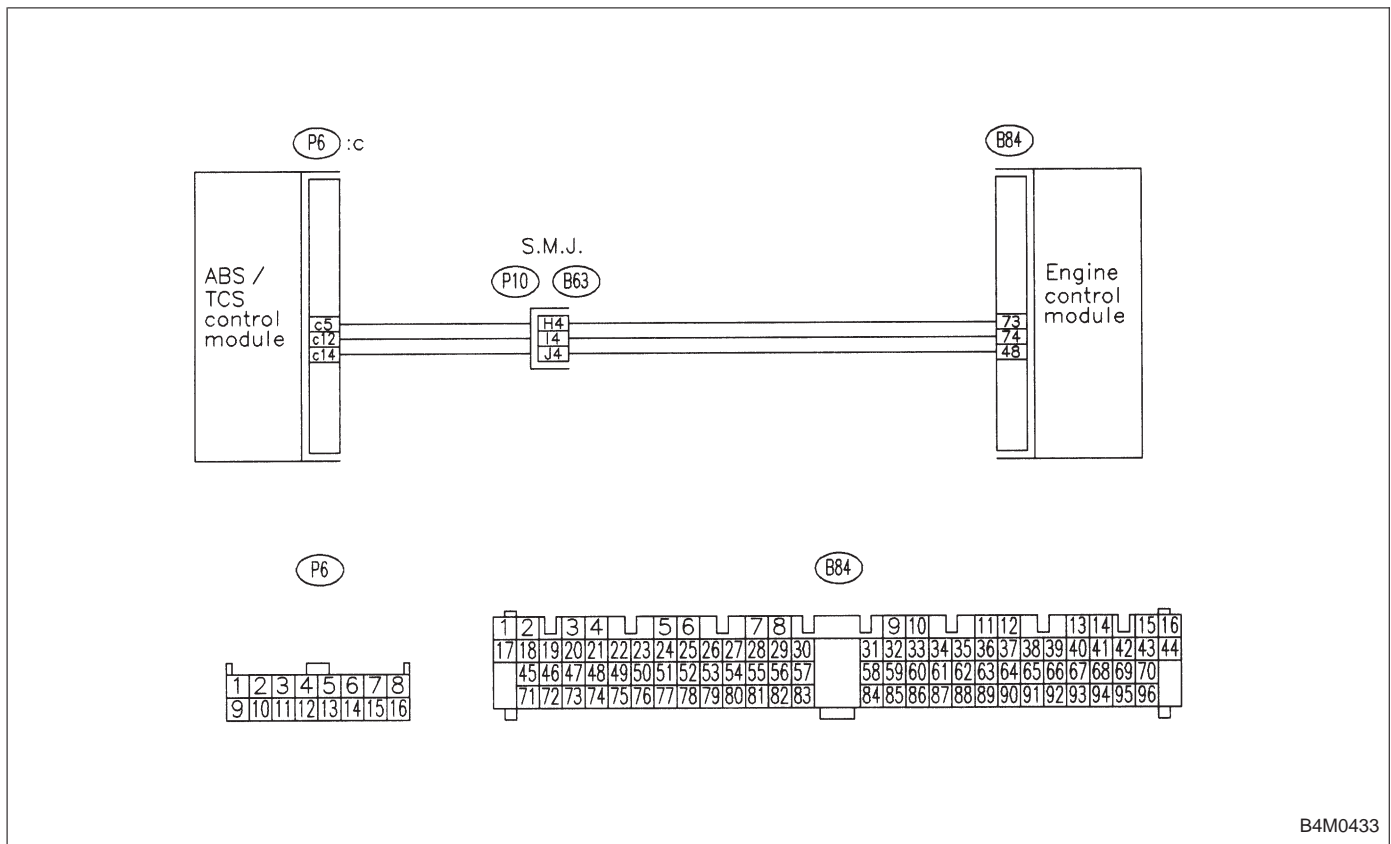
**DIAGNOSIS:**

- AET communication cable is broken or short circuited.
- AEB communication cable is broken or short circuited.
- AEC communication cable is broken or short circuited.
- Faulty ABS/TCS control module
- Faulty engine control module

**TROUBLE SYMPTOM:**

- TCS does not operate.





**1. CHECK COMMUNICATION CABLES.**

- 1) Operate the TCS sequence control.  
<Ref. to 4-4 [W20F0].>
- 2) Measure the voltage between ABS/TCS control module and the body during the TCS check sequence operation.

**Connector & terminal:**

- (P6) No. 12 — body (AET communication cable)
- (P6) No. 5 — body (AEB communication cable)
- (P6) No. 14 — body (AEC communication cable)

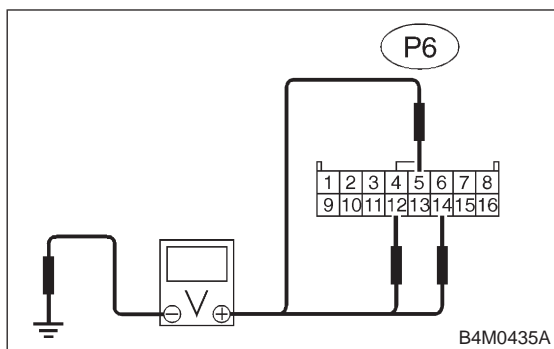
**Specified voltage:**

**High voltage: 4 — 5.4 V**

**Low voltage: 2 V or less**

**Check that each of the above voltage reading are displayed.**





## 2. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND ENGINE CONTROL MODULE.

- 1) Turn ignition switch OFF.
- 2) Disconnect engine control module.
- 3) Disconnect ABS/TCS control module.
- 4) Measure voltage between ABS/TCS control module connector and body.

### Connector & terminal / Specified voltage:

**(P6) No. 12 — body / 0 V (AET communication cable)**

**(P6) No. 5 — body / 0 V (AEB communication cable)**

**(P6) No. 14 — body / 0 V (AEC communication cable)**

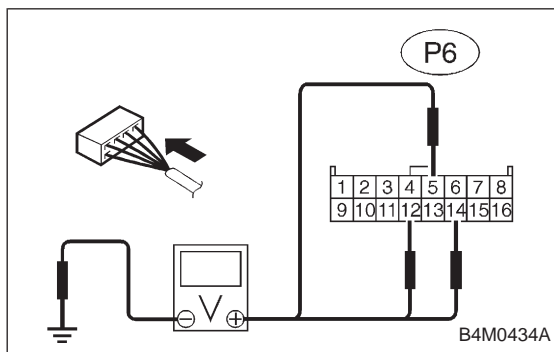
- 5) Turn ignition switch ON.
- 6) Measure voltage between ABS/TCS control module connector and body.

### Connector & terminal / Specified voltage:

**(P6) No. 12 — body / 0 V (AET communication cable)**

**(P6) No. 5 — body / 0 V (AEB communication cable)**

**(P6) No. 14 — body / 0 V (AEC communication cable)**



## 3. CHECK ABS/TCS CONTROL MODULE INTERNAL CIRCUITS.

- 1) Turn ignition switch OFF.
- 2) Disconnect engine control module.
- 3) Connect ABS/TCS control module.
- 4) Measure voltage between ABS/TCS control module connector and body.

### Connector & terminal / Specified voltage:

**(P6) No. 12 — body / 2 V or less (AET communication cable)**

**(P6) No. 5 — body / 2 V or less (AEB communication cable)**

**(P6) No. 14 — body / 2 V or less (AEC communication cable)**

- 5) Turn ignition switch ON.
- 6) Measure voltage between ABS/TCS control module connector and body.

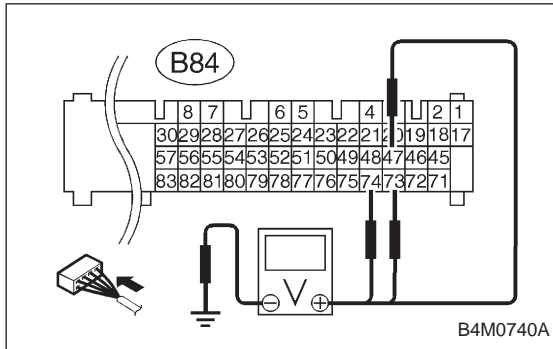
### Connector & terminal / Specified voltage:

**(P6) No. 12 — body / 2 V or less (AET communication cable)**

**(P6) No. 5 — body / 2 V or less (AEB communication cable)**

*tion cable)*

*(P6) No. 14 — body / 2 V or less (AEC communication cable)*

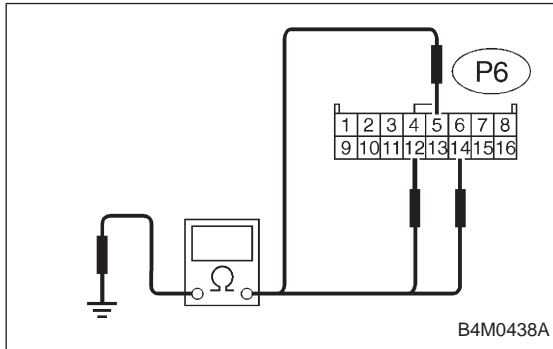


**4. CHECK OUTPUT VOLTAGE OF ENGINE CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Connect engine control module.
- 3) Connect ABS/TCS control module.
- 4) Turn ignition switch ON.
- 5) Measure voltage between engine control module connector and body.

**Connector & terminal / Specified voltage:**

- (B84) No. 74 — body / 4 — 5.4 V (AET communication cable)*
- (B84) No. 73 — body / 4 — 5.4 V (AEB communication cable)*
- (B84) No. 47 — body / 4 — 5.4 V (AEC communication cable)*

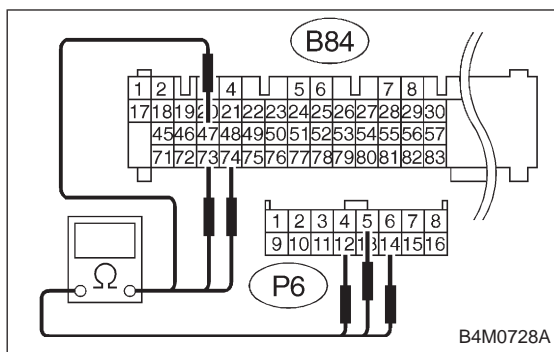


**5. CHECK BODY SHORT OF HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Disconnect engine control module.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**

- (P6) No. 12 — body / 1 MΩ or more (AET communication cable)*
- (P6) No. 5 — body / 1 MΩ or more (AEB communication cable)*
- (P6) No. 14 — body / 1 MΩ or more (AEC communication cable)*



### 6. CHECK OPEN CIRCUIT OF HARNESS.

- 1) Turn ignition switch OFF.
- 2) Disconnect engine control module.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector and engine control module connector.

**(P6) No. 12 — (B84) No. 74 / 1 Ω or less (AET communication cable)**

**(P6) No. 5 — (B84) No. 73 / 1 Ω or less (AEB communication cable)**

**(P6) No. 14 — (B84) No. 47 / 1 Ω or less (AEC communication cable)**

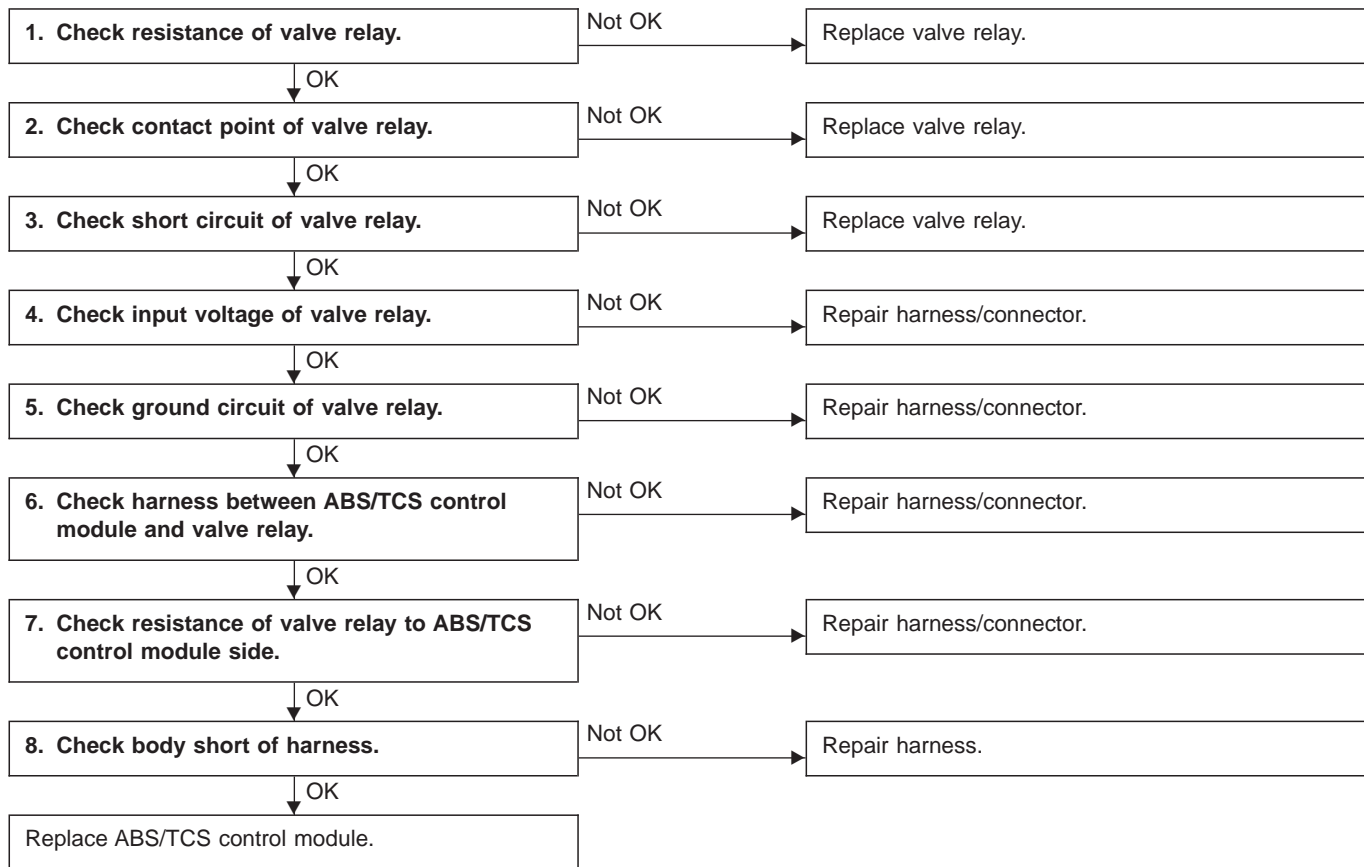
**I: TROUBLE CODE 51  
— FAULTY VALVE RELAY —**

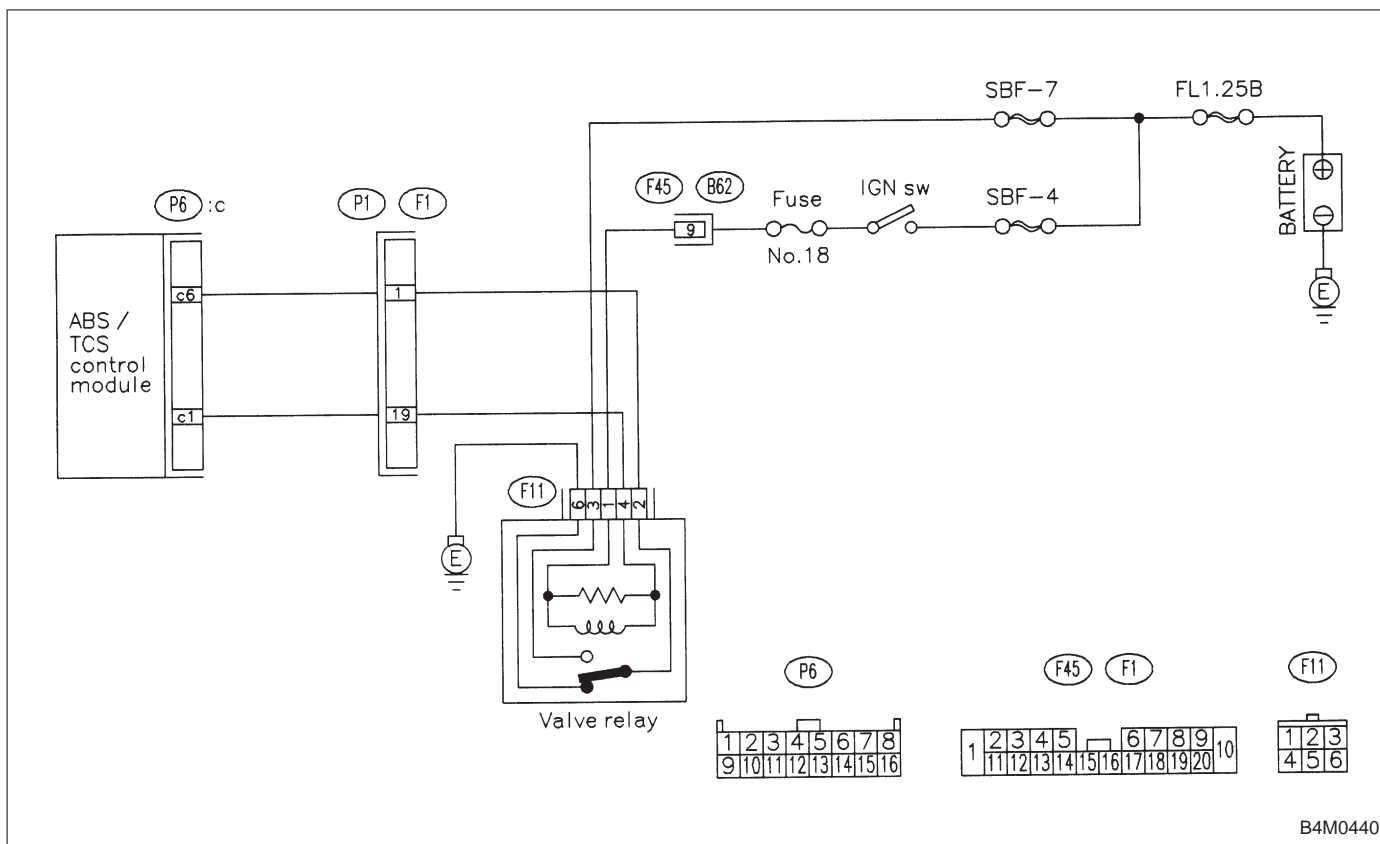
**DIAGNOSIS:**

- Faulty valve relay
- Faulty harness/connector
- Faulty ABS/TCS control module

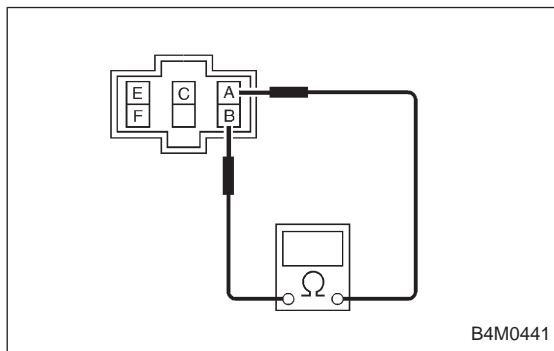
**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.





B4M0440



B4M0441

**1. CHECK RESISTANCE OF VALVE RELAY.**

- 1) Turn ignition switch OFF.
- 2) Remove valve relay.
- 3) Measure resistance between valve relay terminals.

**Terminal / Specified resistance:**

**No. A — B /  $90 \pm 10 \Omega$**

**2. CHECK CONTACT POINT OF VALVE RELAY.**

- 1) Turn ignition switch OFF.
- 2) Remove valve relay.
- 3) Attach circuit tester probes to terminals as shown in figure.
- 4) Measure resistance between respective terminals.

**Terminal / Specified resistance:**

**No. C — E /  $1 \Omega$  or less (When 12 volts applied.)**

**No. C — E /  $1 M\Omega$  or more**

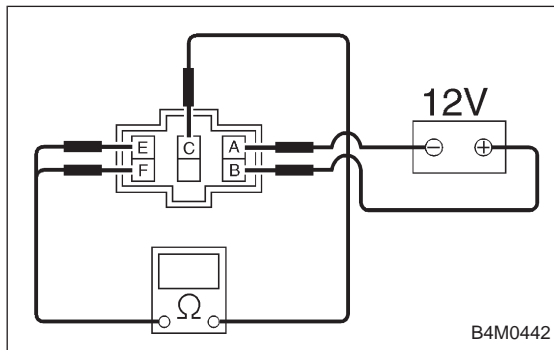
**(When no voltage is applied.)**

**No. C — F /  $1 M\Omega$  or more**

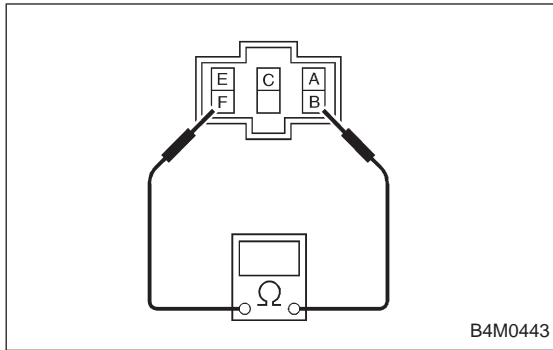
**(When 12 volts applied.)**

**No. C — F /  $1 \Omega$  or less**

**(When no voltage is applied.)**



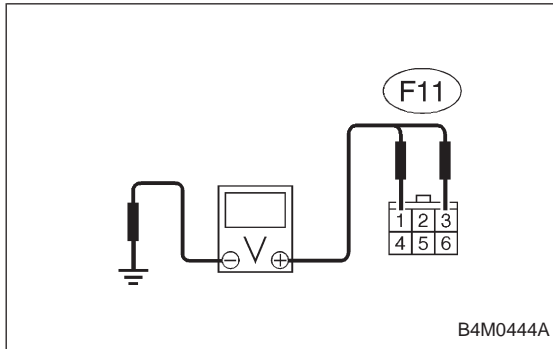
B4M0442

**3. CHECK SHORT CIRCUIT OF VALVE RELAY.**

- 1) Turn ignition switch OFF.
- 2) Remove valve relay.
- 3) Measure resistance between valve relay terminals.

**Terminal / Specified resistance:**

**No. B — F / 1 M $\Omega$  or more**

**4. CHECK INPUT VOLTAGE OF VALVE RELAY.**

- 1) Turn ignition switch OFF.
- 2) Disconnect valve relay.
- 3) Measure voltage between valve relay connector and body.

**Connector & terminal / Specified voltage:**

**(F11) No. 1 — body / 0 V**

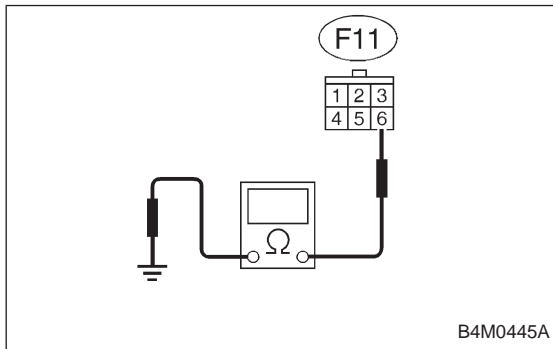
**(F11) No. 3 — body / 10 — 13 V**

- 4) Turn ignition switch ON.
- 5) Measure voltage between valve relay connector and body.

**Connector & terminal / Specified voltage:**

**(F11) No. 1 — body / 10 — 13 V**

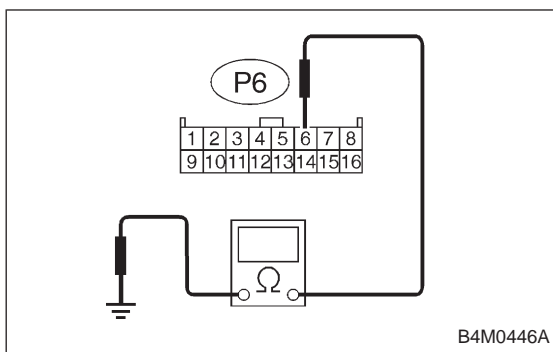
**(F11) No. 3 — body / 10 — 13 V**

**5. CHECK GROUND CIRCUIT OF VALVE RELAY.**

- 1) Turn ignition switch OFF.
- 2) Disconnect valve relay.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between valve relay connector and body.

**Connector & terminal / Specified resistance:**

**(F11) No. 6 — body / 1  $\Omega$  or less**



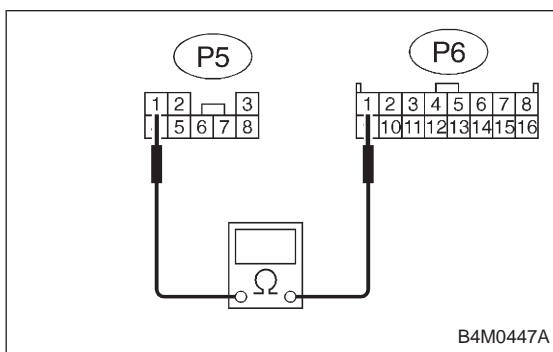
**6. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND VALVE RELAY.**

- 1) Turn ignition switch OFF.
- 2) Disconnect valve relay.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**  
**(P6) No. 6 — body / 1 MΩ or more**

- 5) Connect valve relay.
- 6) Measure resistance between ABS/TCS control module connector and body.

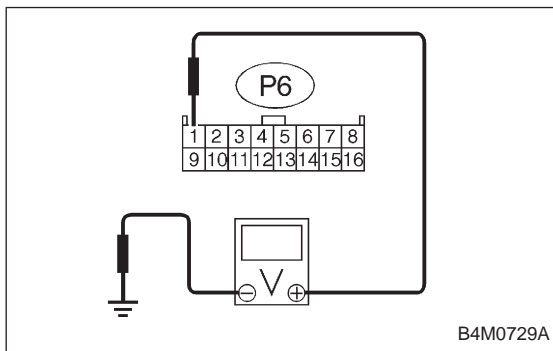
**Connector & terminal / Specified resistance:**  
**(P6) No. 6 — body / 1 Ω or less**



**7. CHECK RESISTANCE OF VALVE RELAY TO ABS/ TCS CONTROL MODULE SIDE.**

- 1) Turn ignition switch OFF.
- 2) Connect valve relay.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**Connector & terminal / Specified resistance:**  
**(P5) No. 1 — (P6) No. 1 / 90±10 Ω**



**8. CHECK BODY SHORT OF HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Connect valve relay.
- 3) Disconnect ABS/TCS control module.
- 4) Turn ignition switch ON.
- 5) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**  
**(P6) No. 1 — body / 10 — 13 V**

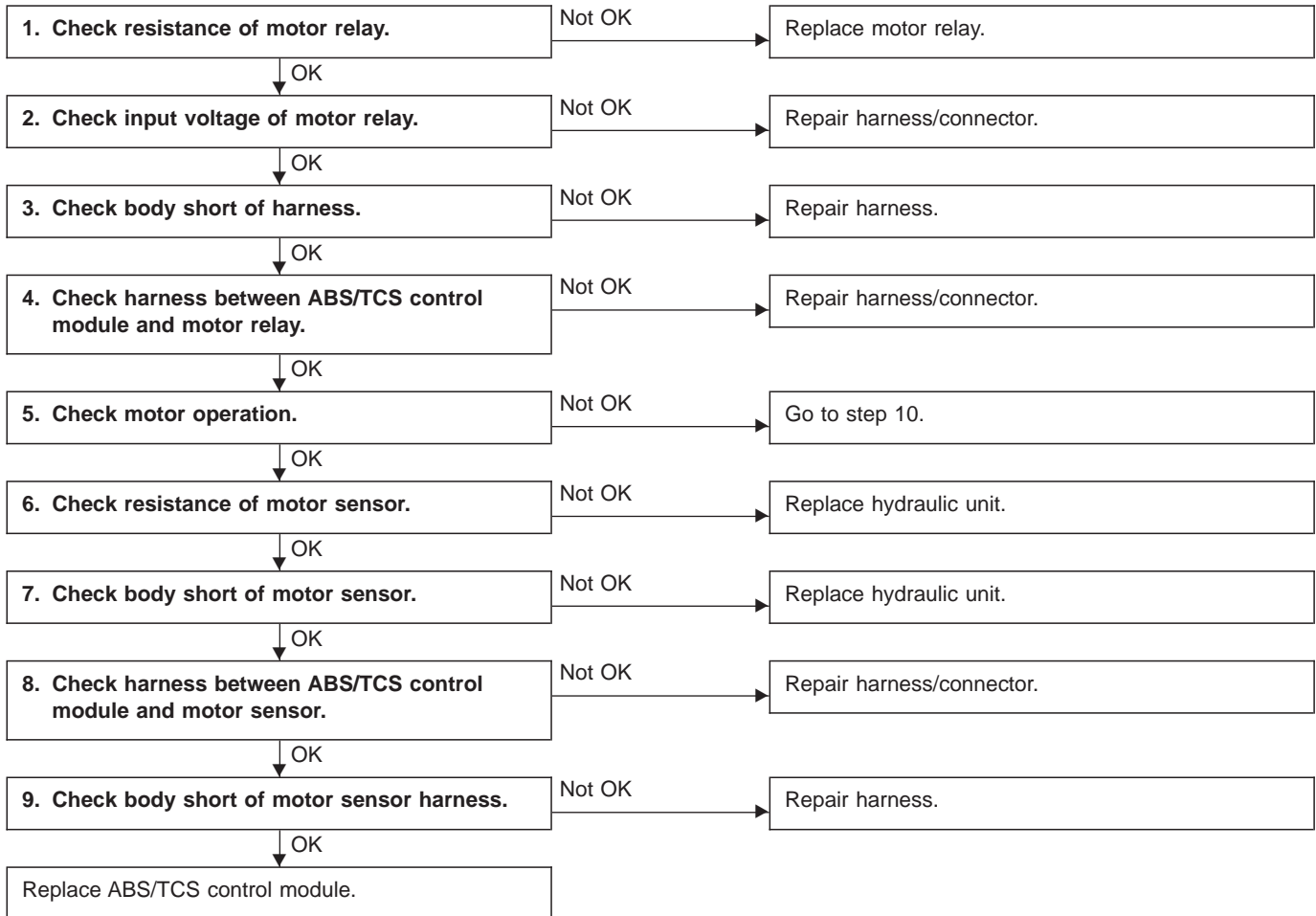
**J: TROUBLE CODE 52  
— FAULTY MOTOR, MOTOR SENSOR AND/  
OR MOTOR RELAY —**

**DIAGNOSIS:**

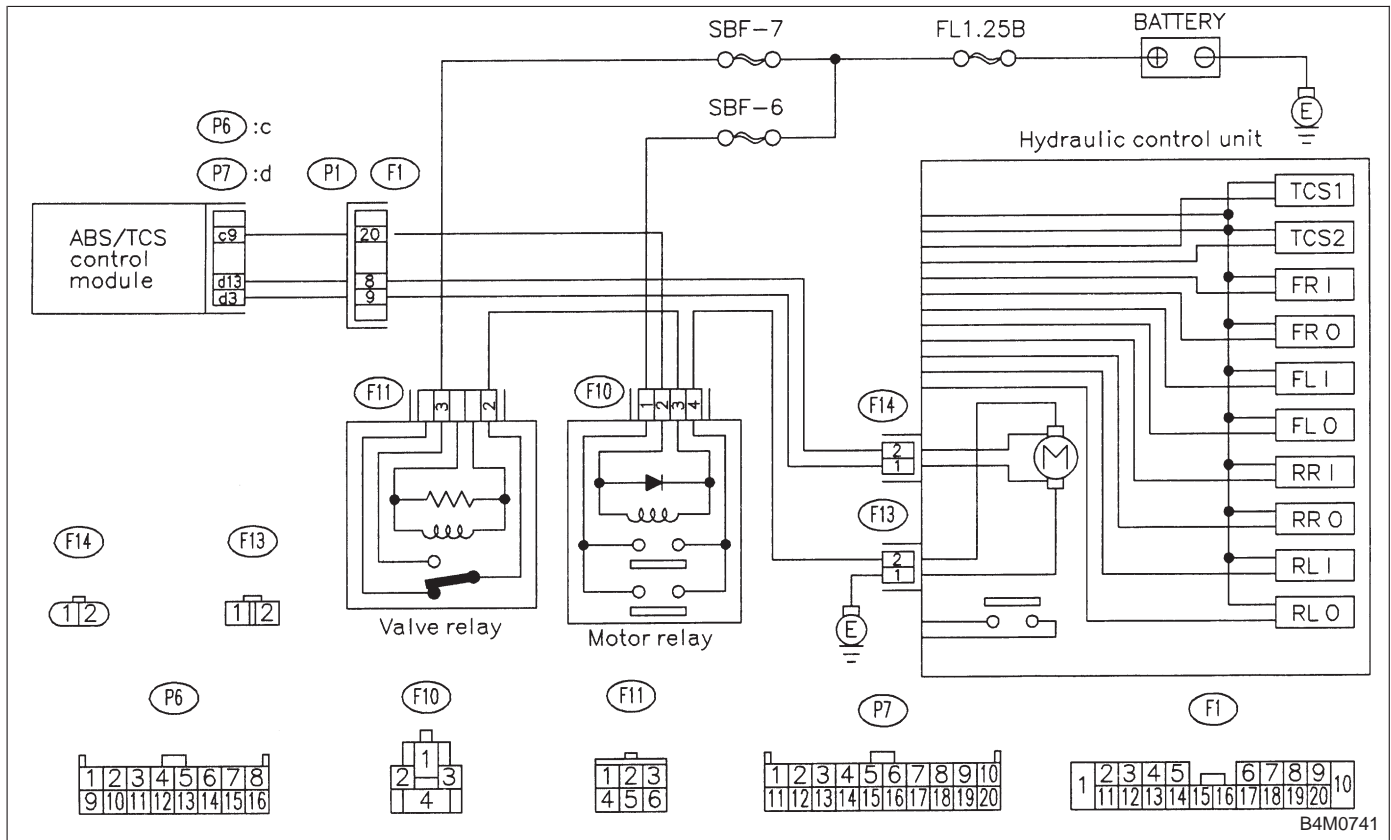
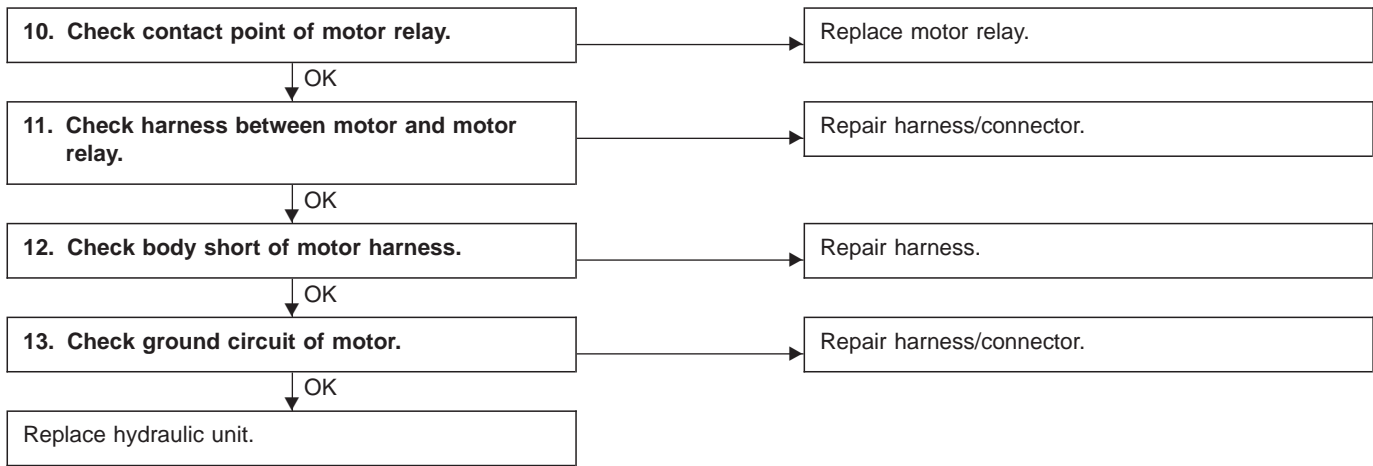
- Faulty motor relay
- Faulty motor
- Faulty motor sensor
- Faulty harness/connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

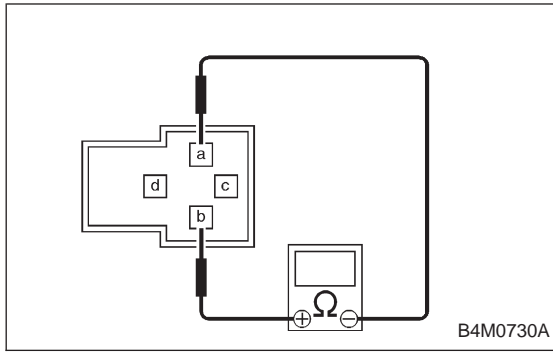
- ABS does not operate.
- TCS does not operate.







B4M0741



**1. CHECK RESISTANCE OF MOTOR RELAY.**

- 1) Turn ignition switch OFF.
- 2) Remove motor relay.
- 3) Measure resistance between motor relay terminals.

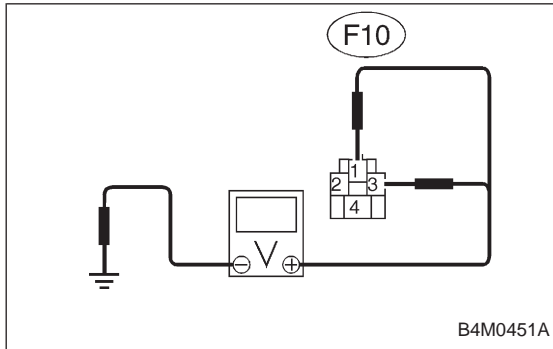
**Terminal / Specified resistance:**

**No. a — b / 57 Ω**

NOTE:

Apply + to b terminal.

Apply - to a terminal.



**2. CHECK INPUT VOLTAGE OF MOTOR RELAY.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor relay.
- 3) Measure voltage between motor relay connector and body.

**Connector & terminal / Specified voltage:**

**(F10) No. 1 — body / 10 — 13 V**

**(F10) No. 3 — body / 0 V**

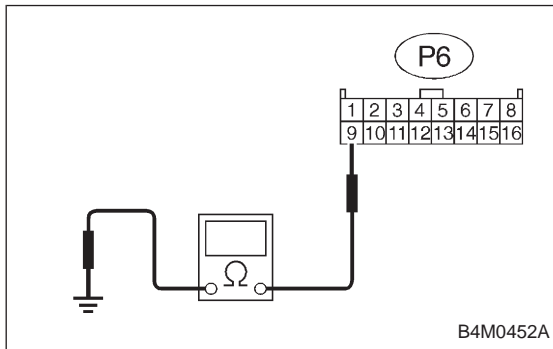
- 4) Turn ignition switch ON.

- 5) Measure voltage between motor relay connector and body.

**Connector & terminal / Specified voltage:**

**(F10) No. 1 — body / 10 — 13 V**

**(F10) No. 3 — body / 10 — 13 V (In 1 second after turning ignition key ON.)**

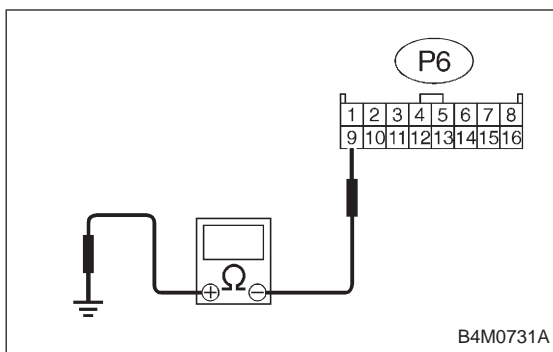


**3. CHECK BODY SHORT OF HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor relay.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**

**(P6) No. 9 — body / 1 MΩ or more**



**4. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND MOTOR RELAY.**

- 1) Turn ignition switch OFF.
- 2) Connect motor relay.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector and body.

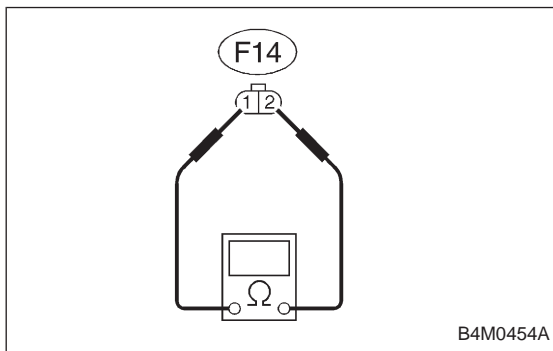
**NOTE:**

Apply + to GND.  
Apply - to (P6) No. 9.

**Connector & terminal / Specified resistance:**  
**(P6) No. 9 — body /  $57 \pm 6 \Omega$**

**5. CHECK MOTOR OPERATION.**

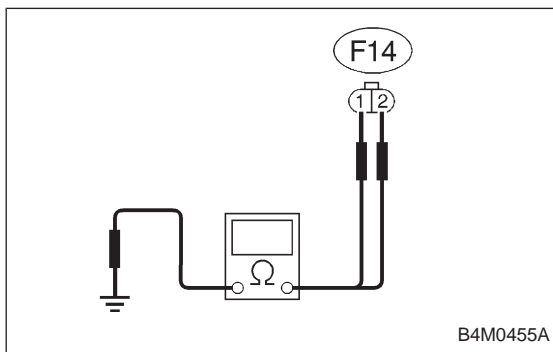
- 1) Connect motor relay.
- 2) Connect ABS/TCS control module.
- 3) Operate the TCS sequence check.  
<Ref. to 4-4 [W20F0]. >
- 4) By the whirring sound check that the motor rotates.



**6. CHECK RESISTANCE OF MOTOR SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor sensor connector.
- 3) Measure resistance between motor sensor connector terminals.

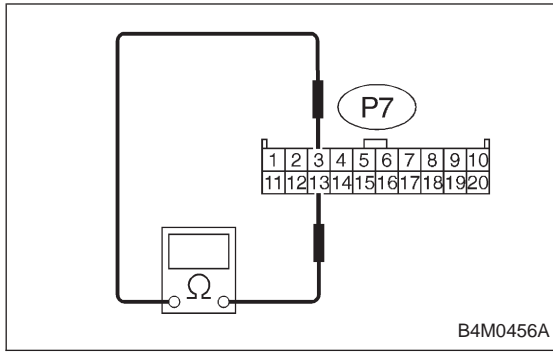
**Connector & terminal / Specified resistance:**  
**(F14) No. 1 — No. 2 /  $72 - 98 \Omega$**



**7. CHECK BODY SHORT OF MOTOR SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor sensor connector.
- 3) Measure resistance between motor sensor connector and body.

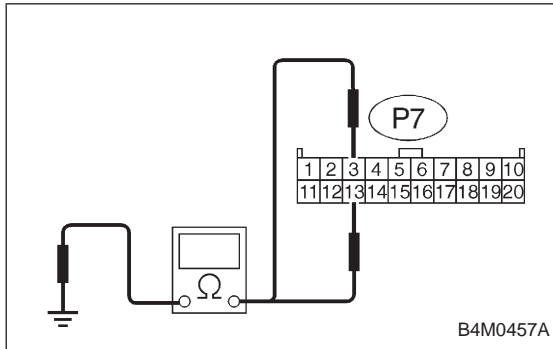
**Connector & terminal / Specified resistance:**  
**(F14) No. 1 — body /  $1 M\Omega$  or more**  
**(F14) No. 2 — body /  $1 M\Omega$  or more**



**8. CHECK HARNESS BETWEEN ABS/TCS CONTROL MODULE AND MOTOR SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Connect motor sensor connector.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module connector terminals.

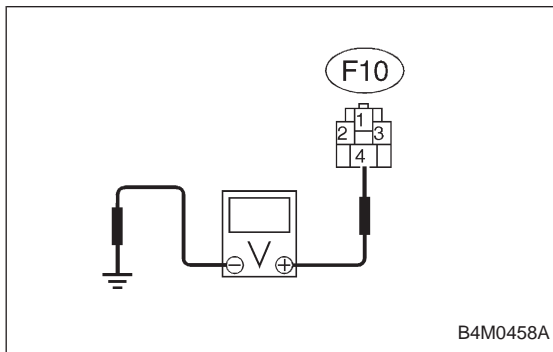
**Connector & terminal / Specified resistance:**  
**(P7) No. 3 — No. 13 / 72 — 98 Ω**



**9. CHECK BODY SHORT OF MOTOR SENSOR HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Connect motor sensor connector.
- 3) Disconnect ABS/TCS control module.
- 4) Measure resistance between ABS/TCS control module and body.

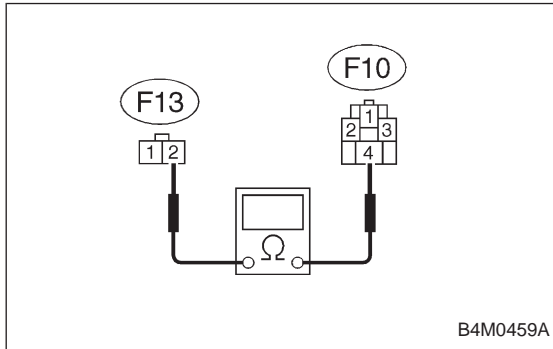
**Connector & terminal / Specified resistance:**  
**(P7) No. 3 — body / 1 MΩ or more**  
**(P7) No. 13 — body / 1 MΩ or more**



**10. CHECK CONTACT POINT OF MOTOR RELAY.**

- 1) Connect motor relay.
- 2) Connect ABS/TCS control module.
- 3) Operate the TCS sequence check. <Ref. to 4-4 [W20F0].>
- 4) Measure voltage between motor relay connector and body.

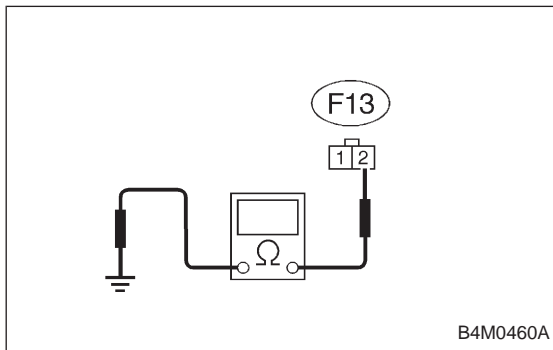
**Connector & terminal / Specified voltage:**  
**(F10) No. 4 — body / 10 — 14 V (While TCS operating indicator light is ON.)**



**11. CHECK HARNESS BETWEEN MOTOR AND MOTOR RELAY.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor relay.
- 3) Disconnect motor connector.
- 4) Measure resistance between motor relay connector and motor connector.

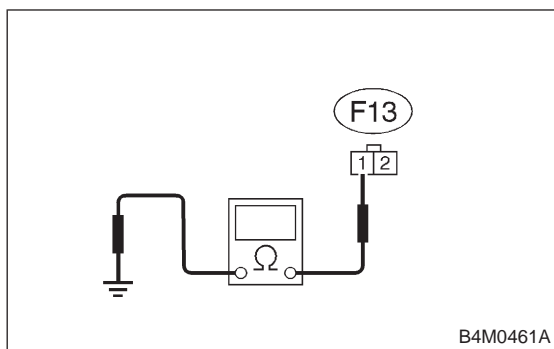
**Connector & terminal / Specified resistance:**  
**(F13) No. 2 — (F10) No. 4 / 1 Ω or less**



**12. CHECK BODY SHORT OF MOTOR HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor relay.
- 3) Disconnect motor connector.
- 4) Measure resistance between motor connector and body.

**Connector & terminal / Specified resistance:**  
**(F13) No. 2 — body / 1 MΩ or more**

**13. CHECK GROUND CIRCUIT OF MOTOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect motor connector.
- 3) Measure resistance between motor connector and body.

**Connector & terminal / Specified resistance:**  
**(F13) No. 1 — body / 1  $\Omega$  or less**

**NOTE:**

The check can also be made by analyzing the waves of the motor sensor output signal with oscilloscope during the TCS sequence control operation. If the ECM female connector end gives correct value, skip steps 6 through 9 above.

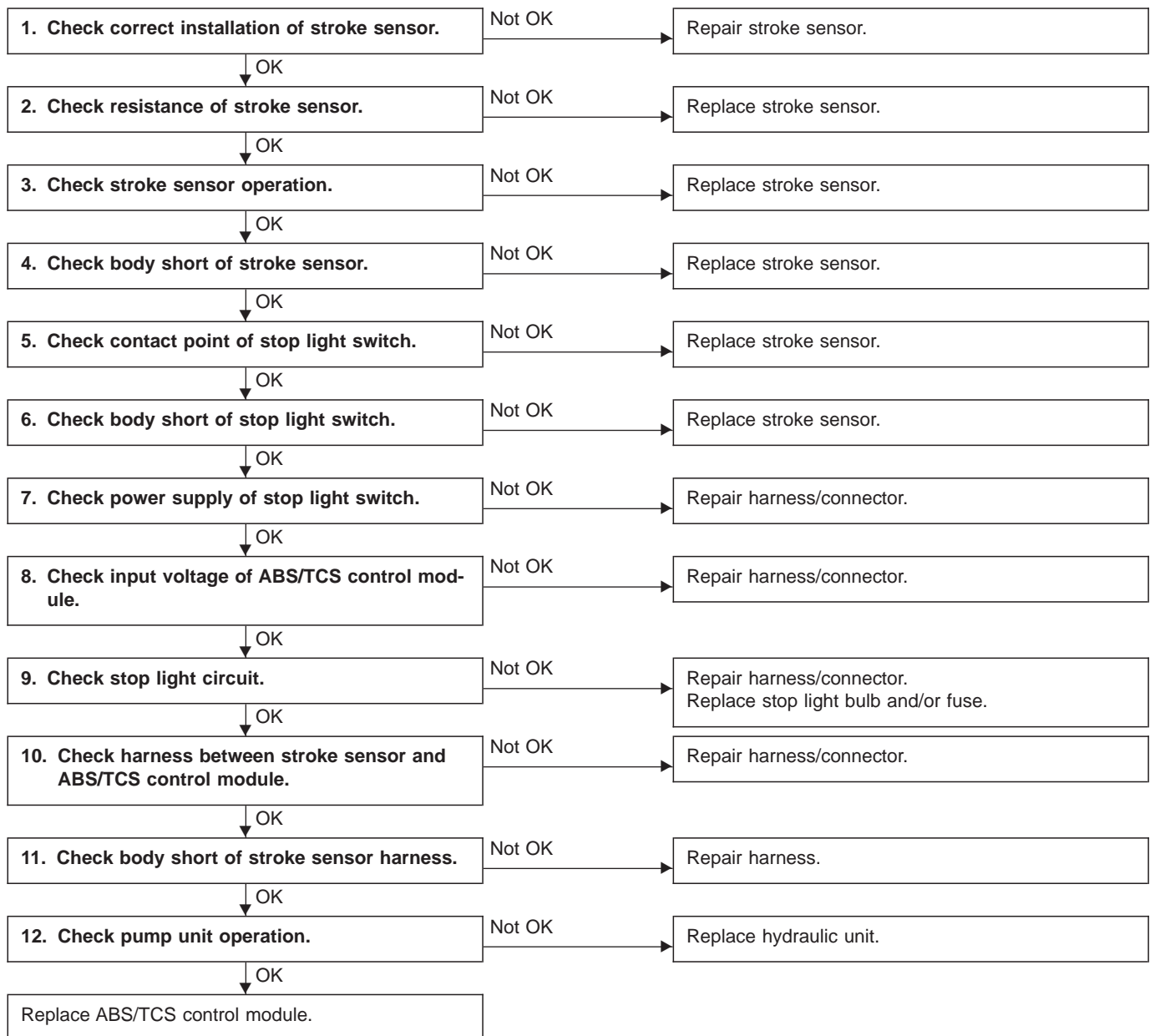
If not, operate the TCS sequence control again and measure the value at motor sensor male connector end with the motor sensor connector removed. If the value is OK, proceed with steps 8 and 9 above.

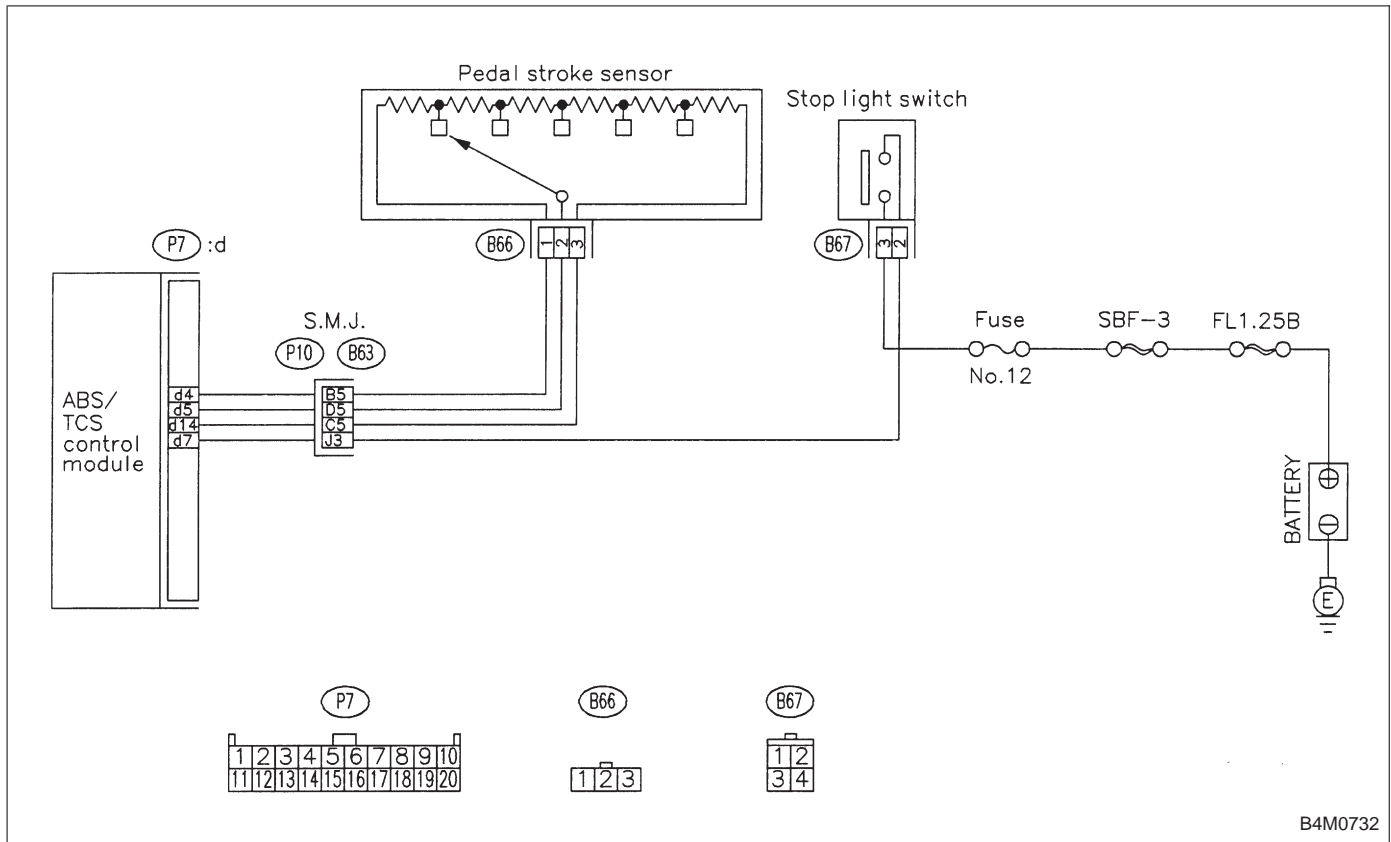
**K: TROUBLE CODE 54  
— FAULTY STROKE SENSOR AND/OR STOP  
LIGHT SWITCH —****DIAGNOSIS:**

- Faulty stroke sensor
- Faulty stop light switch
- Faulty pump unit in hydraulic unit
- Faulty ABS/TCS control module
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.
- No kick-back occurs while ABS is functioning.
- Only when the stop light switch circuit is broken, the ABS functions while TCS does not. (TCS warning light only illuminates.)

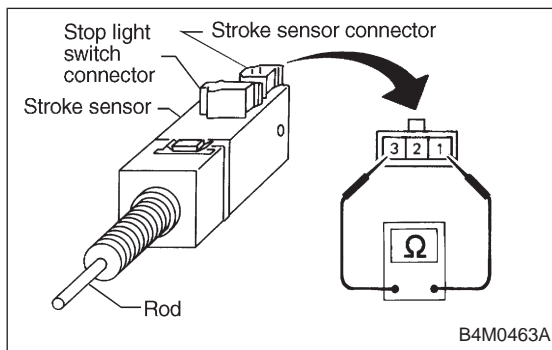




B4M0732

**1. CHECK CORRECT INSTALLATION OF STROKE SENSOR.**

- 1) Check that the stroke sensor is firmly installed without play.
- 2) Check that the stop lamp does not remain illuminated.

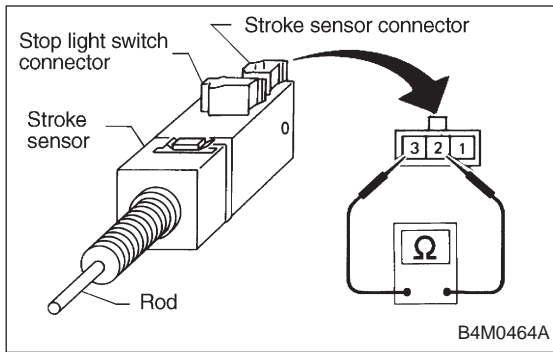


**2. CHECK RESISTANCE OF STROKE SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connectors.
- 3) Remove stroke sensor.
- 4) Measure resistance between stroke sensor terminals.

**Terminal / Specified resistance:**  
**No. 1 — No. 3 / 570 — 630 Ω**





**3. CHECK STROKE SENSOR OPERATION.**

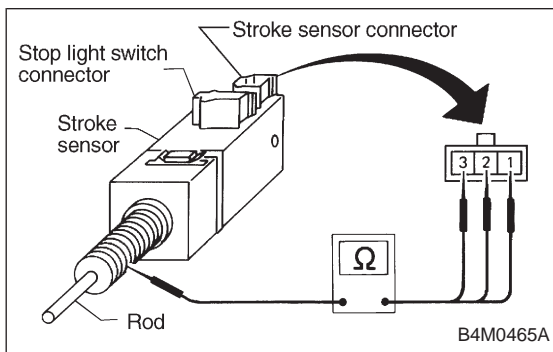
- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connectors.
- 3) Remove stroke sensor.
- 4) Measure the stroke sensor resistance against the rod stroke.

**Terminal:**  
**No. 3 — No. 2**

Stroke	Unit: mm (in)	Specified resistance
0 — 3.1±0.5 (0 — 0.122±0.020)		95 — 105 Ω
3.1 — 5.5±0.5 (0.122 — 0.217±0.020)		190 — 210 Ω
5.5 — 7.9±0.5 (0.217 — 0.311±0.020)		285 — 315 Ω
7.9 — 10.3±0.5 (0.311 — 0.406±0.020)		380 — 420 Ω
10.3 — 18±0.5 (0.406 — 0.709±0.020)		475 — 525 Ω

**NOTE:**

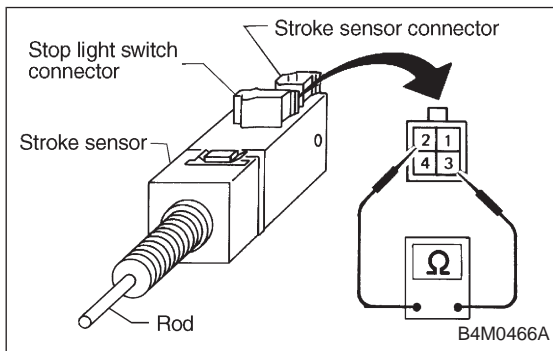
Stroke = 0 when the stroke sensor rod is completely drawn into the sensor unit.



**4. CHECK BODY SHORT OF STROKE SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connectors.
- 3) Remove stroke sensor.
- 4) Measure resistance between stroke sensor terminal and stroke sensor threads.

**Terminal / Specified resistance:**  
**No. 1 — stroke sensor threads/ 1 MΩ or more**  
**No. 2 — stroke sensor threads/ 1 MΩ or more**  
**No. 3 — stroke sensor threads/ 1 MΩ or more**



**5. CHECK CONTACT POINT OF STOP LIGHT SWITCH.**

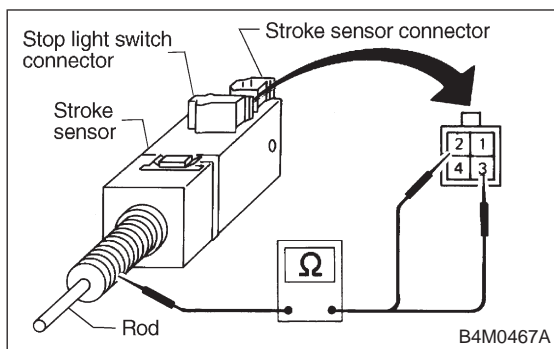
- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connectors.
- 3) Remove stroke sensor.
- 4) Measure resistance between stroke sensor terminals.

**Terminal:**  
**No. 2 — No. 3**

Stroke	Unit mm (in)	Specified resistance
0 — 2.2±1.0 (0 — 0.087±0.039)		1 MΩ or more
2.2±1.0 — 18.0±0.5 (0.087±0.039 — 0.709±0.020)		1 Ω or less

**NOTE:**

Stroke = 0 when the rod is completely drawn in.

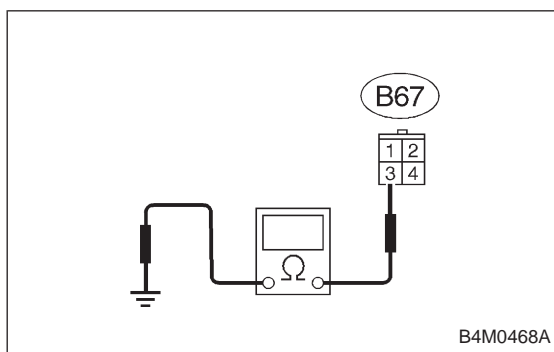
**6. CHECK BODY SHORT OF STOP LIGHT SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connectors.
- 3) Remove stroke sensor.
- 4) Measure resistance between stroke sensor terminal and stroke sensor threads.

**Terminal / Specified resistance:**

**No. 2 — stroke sensor threads / 1 MΩ or more**

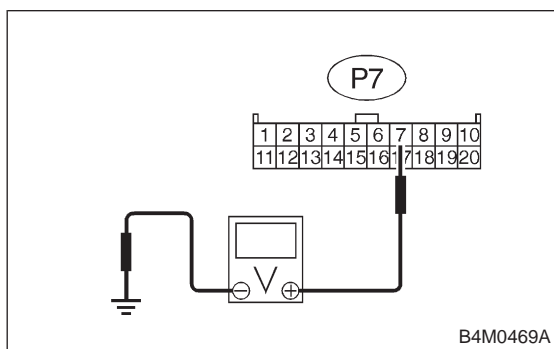
**No. 3 — stroke sensor threads / 1 MΩ or more**

**7. CHECK POWER SUPPLY OF STOP LIGHT SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connector.
- 3) Measure voltage between stroke sensor connector and body.

**Connector & terminal / Specified voltage:**

**(B67) No. 3 — body / 10 — 13 V**

**8. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Install stroke sensor.
- 3) Connect stop light switch connector.
- 4) Disconnect ABS/TCS control module connector.
- 5) Measure voltage between ABS/TCS control module connector and body.

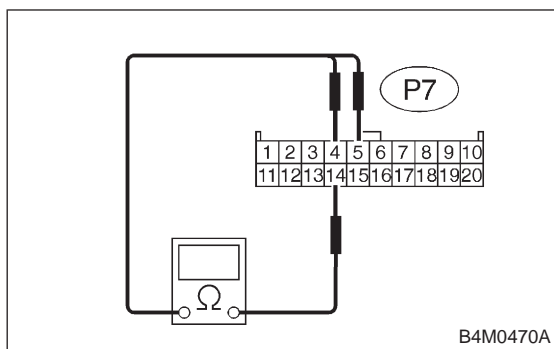
**Connector & terminal / Specified voltage:**

**(P7) No. 7 — body / 10 — 13 V (With brake pedal depressed)**

**(P7) No. 7 — body / 0 V (Without brake pedal depressed)**

**9. CHECK STOP LIGHT CIRCUIT.**

- 1) Turn ignition switch OFF.
- 2) Install stroke sensor.
- 3) Connect stroke sensor connector.
- 4) Connect ABS/TCS control module connector.
- 5) Depress brake pedal and check that the stop light comes on.



### 10. CHECK HARNESS BETWEEN STROKE SENSOR AND ABS/TCS CONTROL MODULE.

- 1) Turn ignition switch OFF.
- 2) Install stroke sensor.
- 3) Connect stroke sensor connector.
- 4) Disconnect ABS/TCS control module connector.
- 5) Measure resistance between ABS/TCS control module connector terminals.

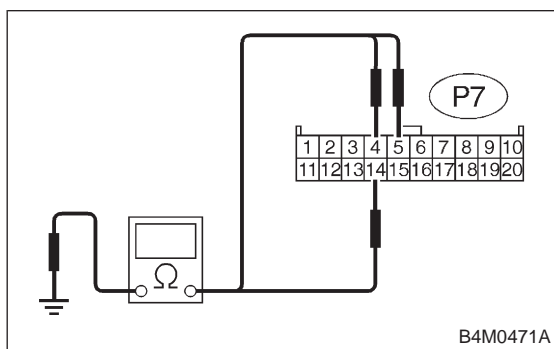
#### **Connector & terminal / Specified resistance:**

(P7) No. 4 — No. 14 / 570 — 630  $\Omega$

(P7) No. 5 — No. 14 / 95 — 105  $\Omega$

#### **NOTE:**

Do not depress brake pedal.



### 11. CHECK BODY SHORT OF STROKE SENSOR HARNESS.

- 1) Turn ignition switch OFF.
- 2) Connect stroke sensor connector.
- 3) Disconnect ABS/TCS control module connector.
- 4) Measure resistance between ABS/TCS control module connector and body.

#### **Connector & terminal / Specified resistance:**

(P7) No. 4 — body / 1 M $\Omega$  or more

(P7) No. 5 — body / 1 M $\Omega$  or more

(P7) No. 14 — body / 1 M $\Omega$  or more

### 12. CHECK PUMP UNIT OPERATION.

- 1) Turn ignition switch OFF.
- 2) Connect stroke sensor connector.
- 3) Connect stop light switch connector.
- 4) Connect ABS/TCS control module connector.
- 5) Operate the TCS sequence control and check that the front brake fluid pressure increases and decreases correctly. <Ref. to 4-4 [W20F0].>

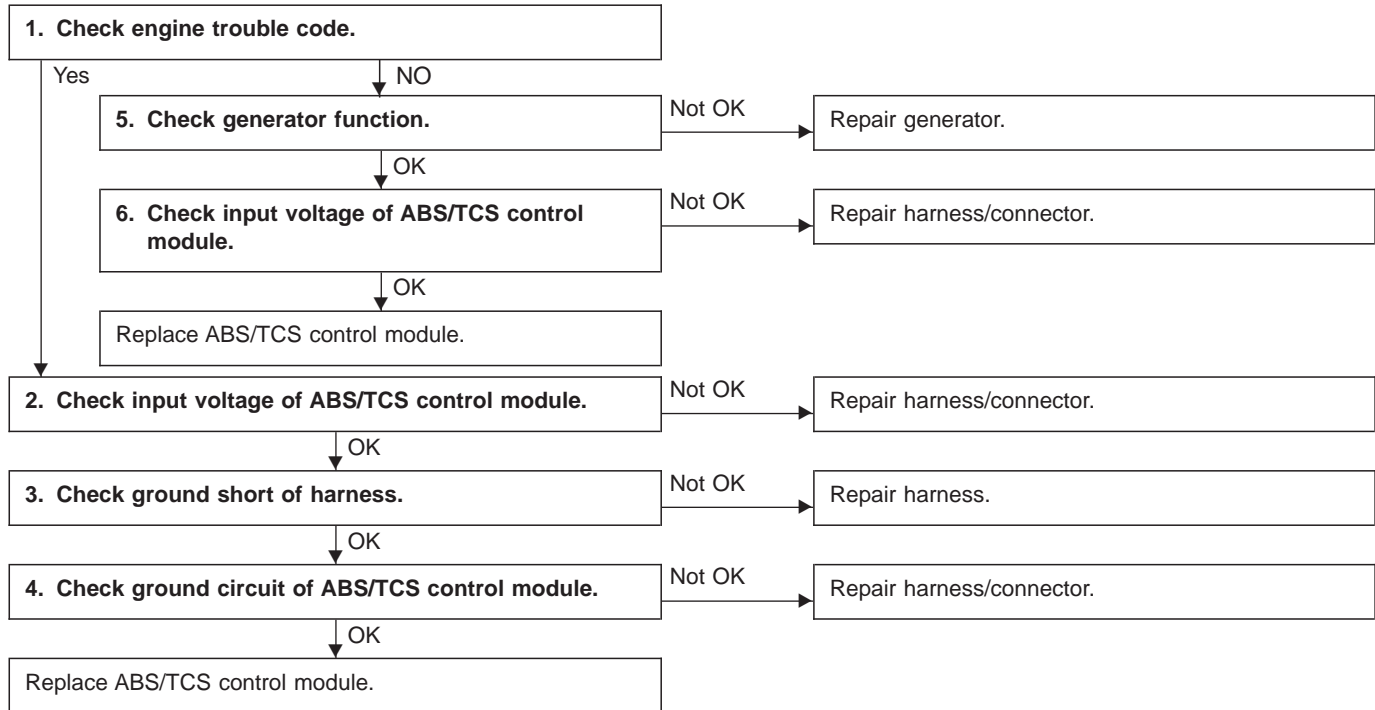
**L: TROUBLE CODE 57  
— FAULTY FLUID LEVEL SENSOR —**

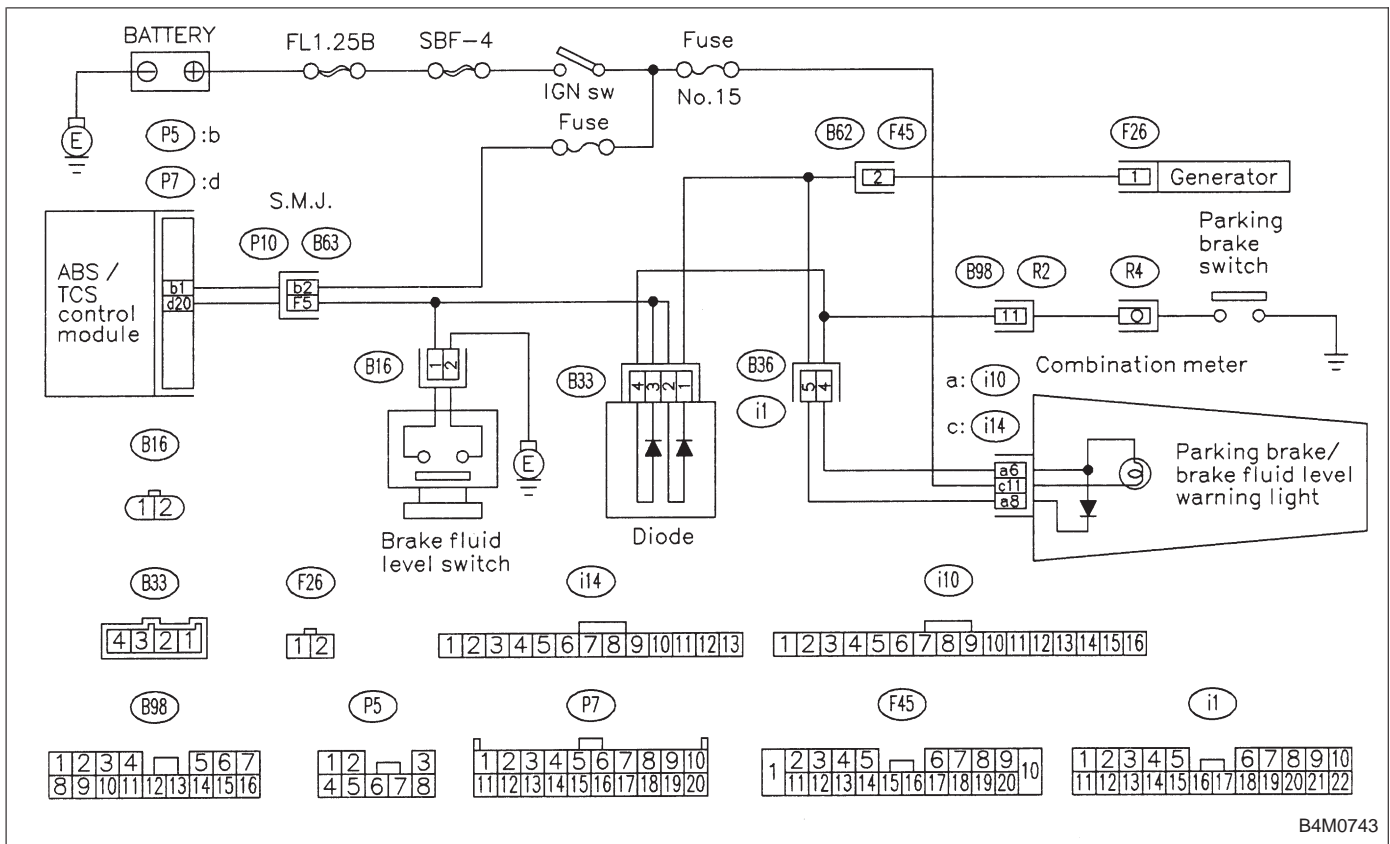
**DIAGNOSIS:**

- Faulty fluid level sensor circuit
- Faulty harness/connector
- Faulty ABS/TCS control module
- Faulty generator

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.





B4M0743

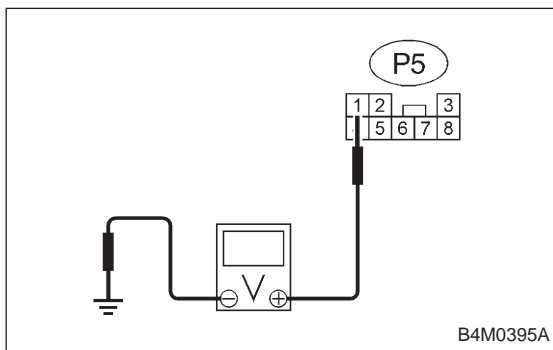
**1. CHECK ENGINE TROUBLE CODE.**

- 1) Read out engine trouble code.
- 2) Is trouble code 39 in memory?

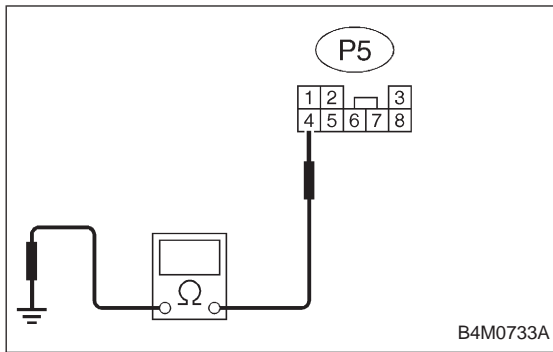
**2. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect ABS/TCS control module connectors.
- 3) Turn ignition switch ON, while engine is idling.
- 4) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**  
**(P5) No. 1 — body / 14.5±0.3 V**



B4M0395A

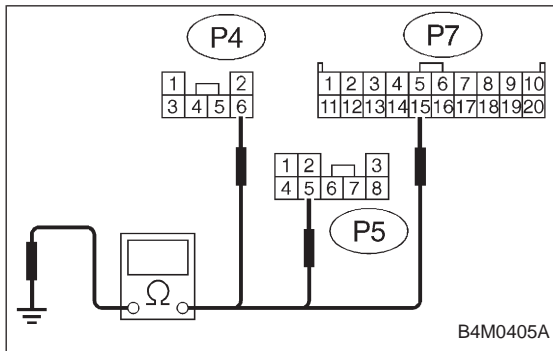


**3. CHECK GROUND SHORT OF HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Remove No. 18 fuse from fuse and joint box.
- 3) Disconnect ABS/TCS control module connectors.
- 4) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**

**(P5) No. 1 — body / 1 MΩ or more**



**4. CHECK GROUND CIRCUIT OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS/TCS control module.
- 3) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**

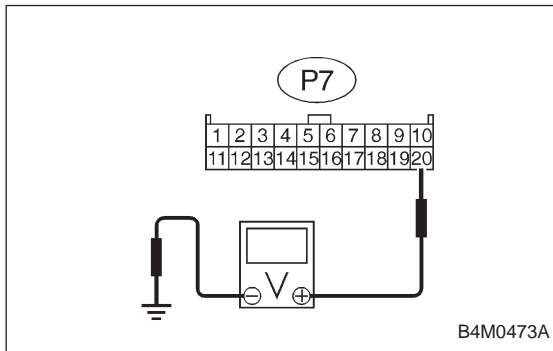
**(P4) No. 6 — body / 1 Ω or less**

**(P5) No. 5 — body / 1 Ω or less**

**(P7) No. 15 — body / 1 Ω or less**

**5. CHECK GENERATOR FUNCTION.**

- 1) When the ignition key is at OFF, check the charge warning light is off.
- 2) Turn the key ON and ensure the light comes on.
- 3) Keep the engine running at idle and ensure the light goes off.



**6. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.**

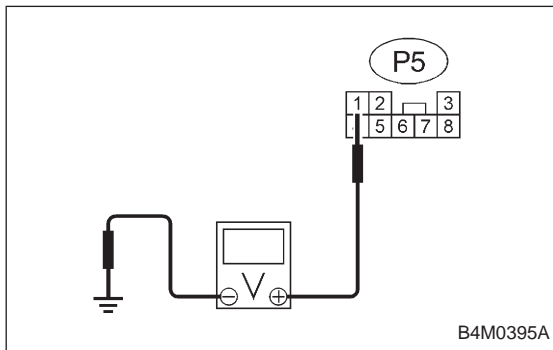
- 1) Turn ignition switch OFF.
- 2) Disconnect ABS/TCS control module connectors.
- 3) Turn ignition switch ON.
- 4) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**

**(P7) No. 20 — body / 2 V or less (Engine OFF)**

**(P7) No. 20 — body / 10 — 14 V (Engine idling)**

**(P5) No. 1 — body / 10 — 13 V (Engine OFF)**



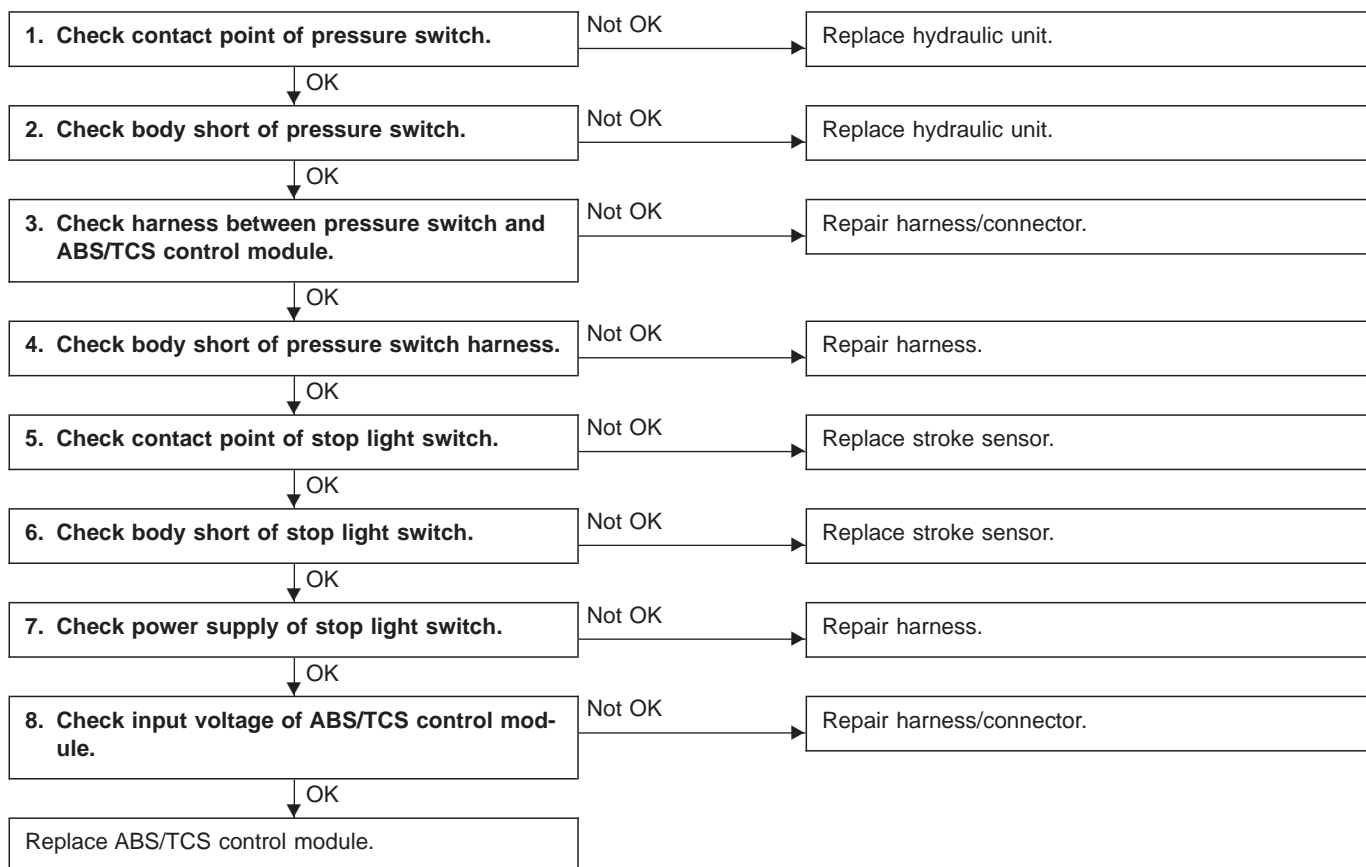
**M: TROUBLE CODE 58  
— FAULTY PRESSURE SWITCH —**

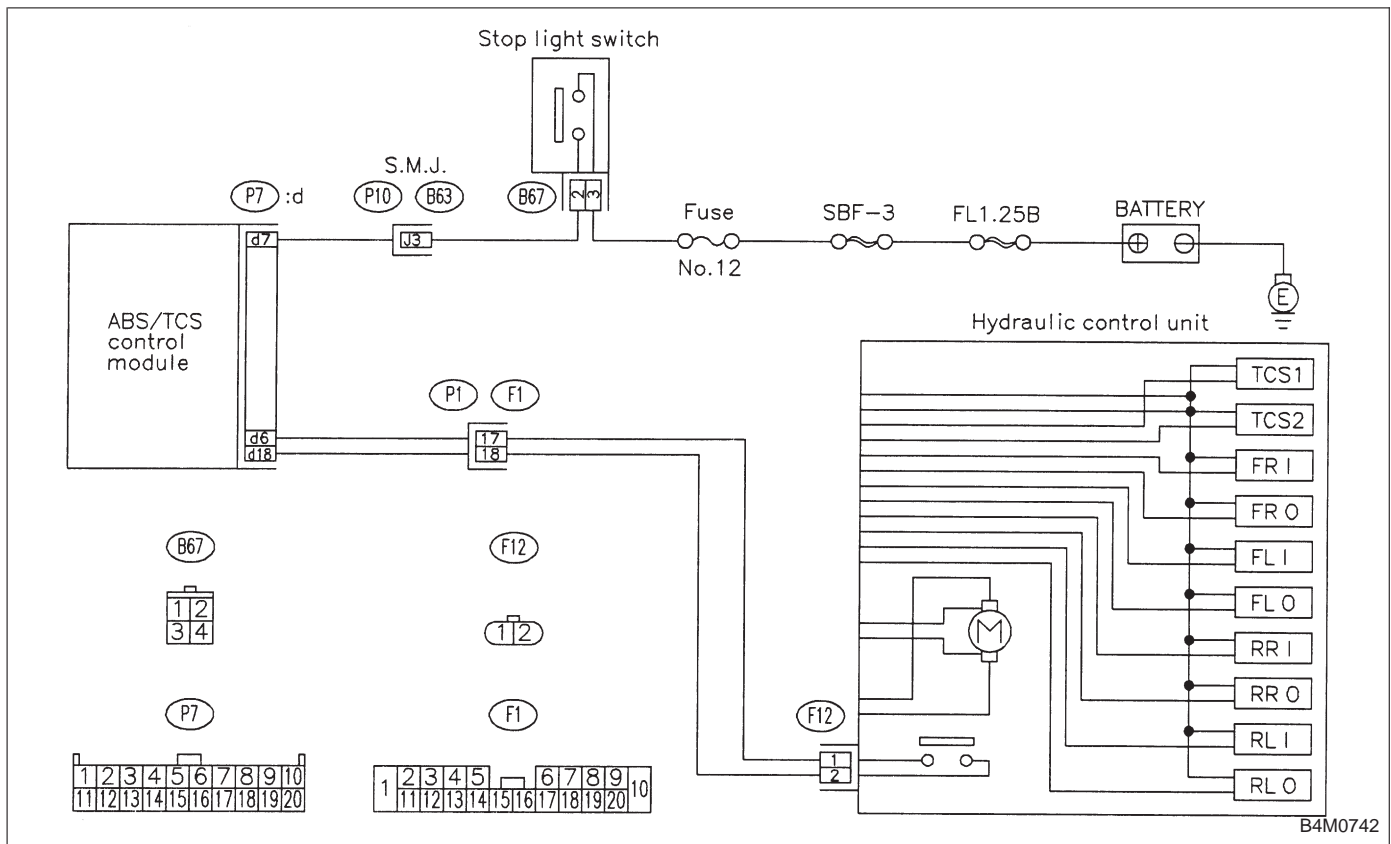
**DIAGNOSIS:**

- Faulty pressure switch
- Faulty stop light switch
- Faulty harness/connector
- Faulty ABS/TCS control module

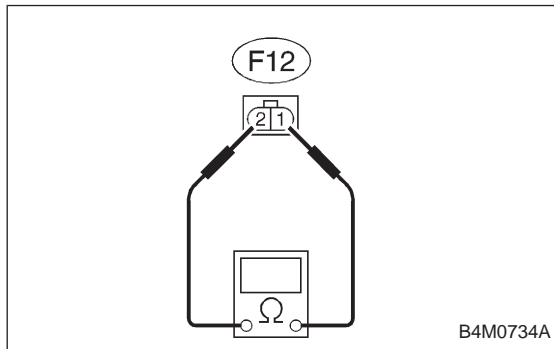
**TROUBLE SYMPTOM:**

- TCS does not operate.





B4M0742



B4M0734A

**1. CHECK CONTACT POINT OF PRESSURE SWITCH.**

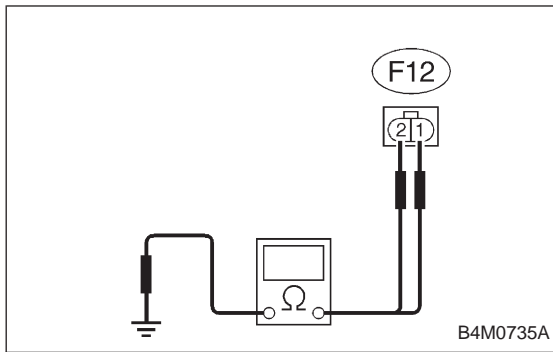
- 1) Turn ignition switch OFF.
- 2) Disconnect hydraulic unit connector.
- 3) Measure resistance between hydraulic unit connector terminals.

**Connector & terminal / Specified resistance:**

**(F12) No. 1 — No. 2 / 1 MΩ or more (With brake pedal depressed)**

**(F12) No. 1 — No. 2 / 1 Ω or less (Without brake pedal depressed)**





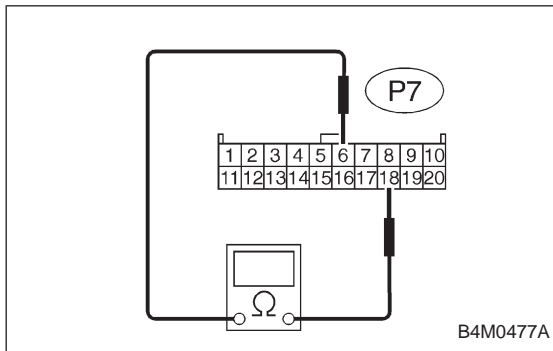
**2. CHECK BODY SHORT OF PRESSURE SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect hydraulic unit connector.
- 3) Measure resistance between hydraulic unit connector and body.

**Connector & terminal / Specified resistance:**

(F12) No. 1 — body / 1 MΩ or more

(F12) No. 2 — body / 1 MΩ or more



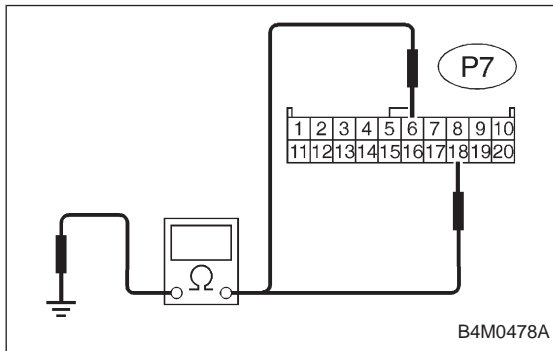
**3. CHECK HARNESS BETWEEN PRESSURE SWITCH AND ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Connect hydraulic unit connector.
- 3) Disconnect ABS/TCS control module connector.
- 4) Measure resistance between ABS/TCS control module connector terminals.

**Connector & terminal / Specified resistance:**

(P7) No. 6 — No. 18 / 1 MΩ or more (With brake pedal depressed)

(P7) No. 6 — No. 18 / 1 Ω or less (Without brake pedal depressed)



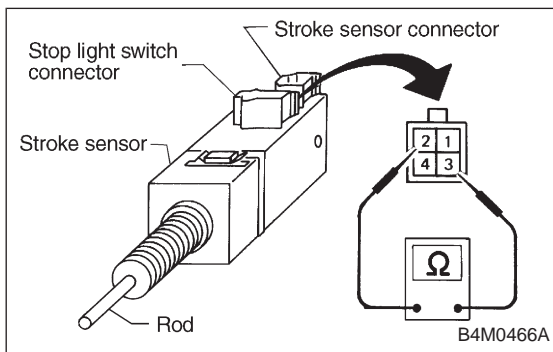
**4. CHECK BODY SHORT OF PRESSURE SWITCH HARNESS.**

- 1) Turn ignition switch OFF.
- 2) Disconnect ABS/TCS control module connector.
- 3) Measure resistance between ABS/TCS control module connector and body.

**Connector & terminal / Specified resistance:**

(P7) No. 6 — body / 1 MΩ or more

(P7) No. 18 — body / 1 MΩ or more



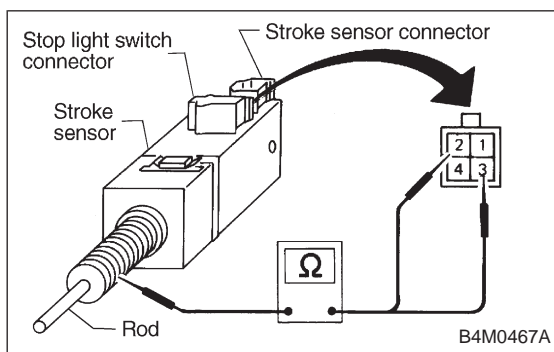
**5. CHECK CONTACT POINT OF STOP LIGHT SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stop light switch connectors.
- 3) Remove stroke sensor.
- 4) Measure resistance between stroke sensor terminals.

**Terminal:**  
**No. 2 — No. 3**

Stroke	Unit: mm (in)	Specified resistance
0 — 2.2±1.0 (0 — 0.087±0.039)		1 MΩ or more
2.2±1.0 — 18.0±0.5 (0.087±0.039 — 0.709±0.020)		1 Ω or less

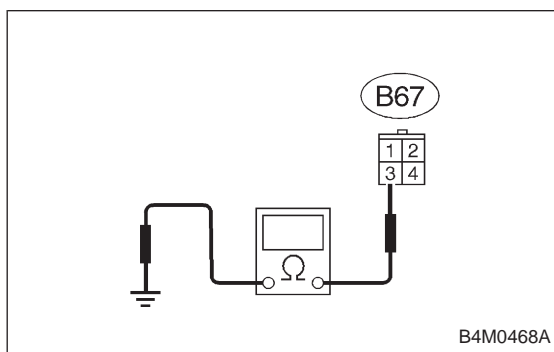
NOTE:  
Stroke = 0 when the rod is completely drawn in.



**6. CHECK BODY SHORT OF STOP LIGHT SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connectors.
- 3) Remove stroke sensor.
- 4) Measure resistance between stroke sensor terminal and stroke sensor threads.

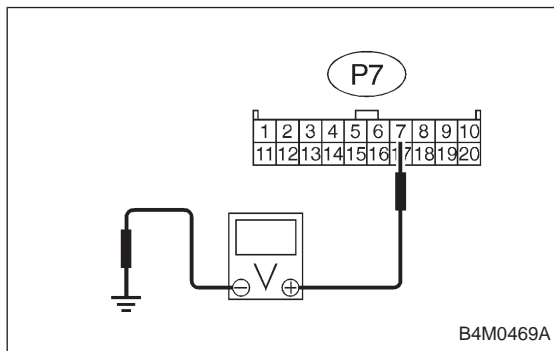
**Terminal / Specified resistance:**  
**No. 2 — stroke sensor threads / 1 MΩ or more**  
**No. 3 — stroke sensor threads / 1 MΩ or more**



**7. CHECK POWER SUPPLY OF STOP LIGHT SWITCH.**

- 1) Turn ignition switch OFF.
- 2) Disconnect stroke sensor connector.
- 3) Measure voltage between stroke sensor connector and body.

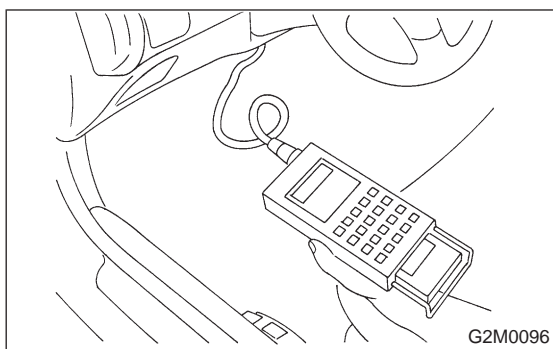
**Connector & terminal / Specified voltage:**  
**(B67) No. 3 — body / 10 — 13 V**



**8. CHECK INPUT VOLTAGE OF ABS/TCS CONTROL MODULE.**

- 1) Turn ignition switch OFF.
- 2) Install stroke sensor.
- 3) Connect stroke sensor connector.
- 4) Disconnect ABS/TCS control module connector.
- 5) Measure voltage between ABS/TCS control module connector and body.

**Connector & terminal / Specified voltage:**  
**(P7) No. 7 — body / 10 — 13 V (With brake pedal depressed)**  
**(P7) No. 7 — body / 0 V (Without brake pedal depressed)**



## 9. Select Monitor Function Mode

Applicable cartridge of select monitor: No. 498349601

### 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 4-4b
Code	Abbreviation				
F00	ROM	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 wheel speed sensor is displayed in mile/h.	Possible	[T9C0]
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL wheel speed sensor is displayed in mile/h.	Possible	[T9D0]
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR wheel speed sensor is displayed in mile/h.	Possible	[T9E0]
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL wheel speed sensor is displayed in mile/h.	Possible	[T9F0]
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR wheel speed sensor is displayed in km/h.	Possible	[T9C0]
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL wheel speed sensor is displayed in km/h.	Possible	[T9D0]
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR wheel speed sensor is displayed in km/h.	Possible	[T9E0]
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL wheel speed sensor is displayed in km/h.	Possible	[T9F0]
F09	PSS	Pedal stroke sensor output	The number of output steps of the pedal stroke sensor is displayed.	Possible	[T9G0]

**2. FA MODE (ON/OFF DATA ARE DISPLAYED.)**

If the system is in normal condition with the engine run at idle speed (when the brake pedal is off), the LED of EC (AEC signal) of FA2 will come on, the LED of EM (EAM signal) blink and all other LED's go out.

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
FA0	OF	OFF.SW	LED 1 comes on with the OFF switch on.	Possible	[T9H0]
	B1	Stop light switch	LED 2 comes on with the switch on (with the brake pedal down).		
	VR	Valve relay signal	LED 3 comes on with the valve relay off.		
	VM	Valve relay monitor	LED 4 comes on with the valve relay off.		
	MR	Motor relay signal	LED 5 comes on with the motor on.		
	MS	Motor sensor	LED 6 comes on with the motor on.		
	FS	Fluid level sensor	LED 7 comes on with the sensor on (the fluid level is lowered).		
FA1	FI	FR.IN valve	LED 1 comes on when the FR.IN valve is operating.	Possible	[T9I0]
	RO	FR.OUT valve	LED 2 comes on when the FR.OUT valve is operating.		
	FL	FL.IN valve	LED 3 comes on when the FL.IN valve is operating.		
	LO	FL.OUT valve	LED 4 comes on when the FL.OUT valve is operating.		
	T1	TCS1 valve	LED 5 comes on when the TCS1 valve is operating.		
	RI	RR.IN valve	LED 6 comes on when the RR.IN valve is operating.		
	RO	RR.OUT valve	LED 7 comes on when the RR.OUT valve is operating.		
	RI	RL.IN valve	LED 8 comes on when the RL.IN valve is operating.		
	LO	RL.OUT valve	LED 9 comes on when the RL.OUT valve is operating.		
	T2	TCS2 valve	LED 10 comes on when the TCS2 valve is operating.		
FA2	AW	ABS warning light	LED 1 comes on when the warning light is on.	Possible	[T9J0]
	TW	TCS warning light	LED 2 comes on when the warning light is on.		
	TO	TCS OFF indicator light	LED 3 comes on when the indicator light is on.		
	TI	TCS operation indicator light	LED 4 comes on when the indicator light is on.		
	EC	AEC signal	With the engine run at idle speed, LED 6 (AEC) comes on and LED 7 (AEB) goes out (They go on and off depending on the behavior of a vehicle.)		
	EB	AEB signal			
	ET	AET signal	LED 8 comes on with the TCS control on.		
	EM	EAM signal	LED 9 comes on or blinks when the engine control is enabled.		
AT	AAT signal	LED 10 comes on when ABS control is on.			

**3. FB MODE (TROUBLE CODES ARE DISPLAYED.)**

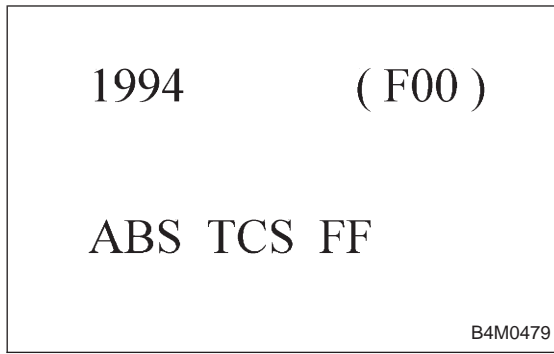
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
FB0	D-NEW	The most recent failures are displayed.	Trouble codes, trouble spots and symptoms for the most recent failure are displayed.	Possible	[T10B0]
FB1	D-ALL	Historical troubles are displayed.	Trouble codes, trouble spots and symptoms for all historical failures are displayed.	Possible	[T10B0]

**4. FC MODE (TROUBLE CODES ARE ERASED.)**

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to 4-4b
Code	Abbreviation				
FC0	D-CLR	Trouble codes are erased.	Function of clearing trouble code stored in memory.	Possible	[T9K0]

**5. FD MODE (SEQUENCE CHECK AND AIR RELEASE MODE)**

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FD1	A-CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	4-4 [W20D0]
FD2	T-CHK	TCS sequence control	Perform TCS sequence control by operating the valve and pump motor sequentially.	Impossible	4-4 [W20F0]
FD3	AIR	Air bleeding control	Manually operate the valve and pump motor to bleed air.	Impossible	4-4 [W19A0]



**B: MODE F00**  
**— ROM ID NUMBER (ROM) —**

**CONDITION:**

Ignition switch ON

**SPECIFIED DATA:**

Presentation display

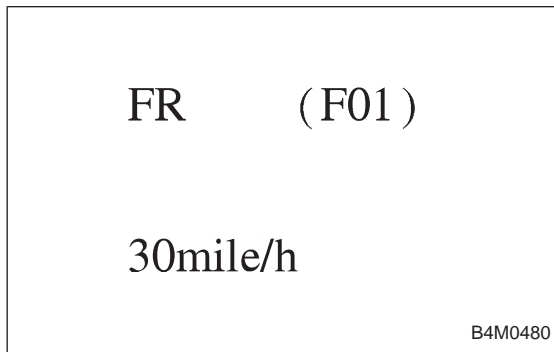
- Probable cause (Item outside "specified data")

1. Error 1

Check for loose or disconnected connector, and discontinued circuit, etc.

2. Error 2

Check for poor contact of cartridge, or different type cartridge.

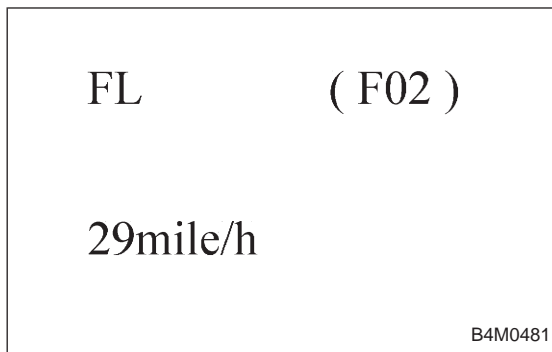


**C: MODE F01 AND F05**  
**— FRONT RIGHT WHEEL SPEED SIGNAL (FR) —**

- 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 mile/h.

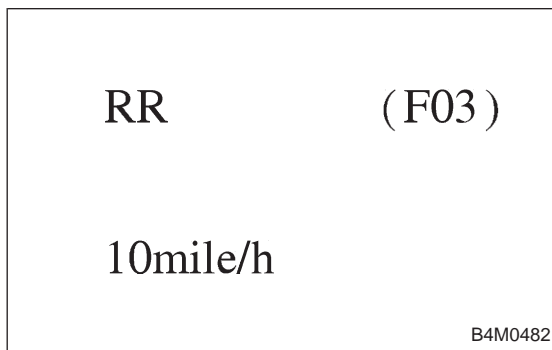


**D: MODE F02 AND F06**  
**— FRONT LEFT WHEEL SPEED SIGNAL**  
**(FL) —**

- 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 mile/h.

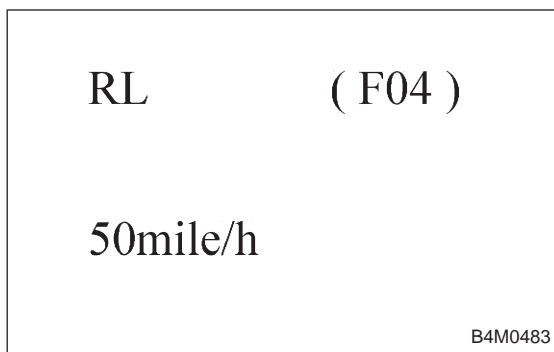


**E: MODE F03 AND F07**  
**— REAR RIGHT WHEEL SPEED SIGNAL**  
**(RR) —**

- 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 mile/h.

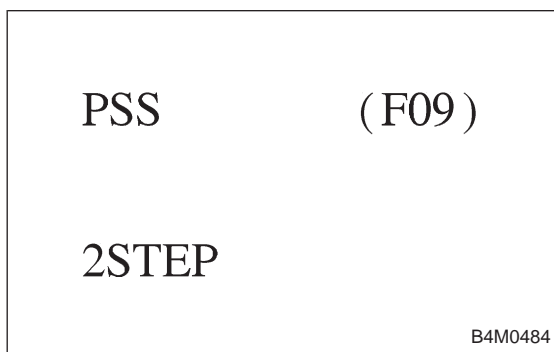


**F: MODE F04 AND F08**  
**— REAR LEFT WHEEL SPEED SIGNAL (RL)**  
**—**

- 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 mile/h.



**G: MODE F09**  
**— PEDAL STROKE SENSOR SIGNAL (PSS)**  
**—**

- Indicates the output step number of the pedal stroke sensor.

LED No.	Signal name	Display
1	TCS OFF switch	OF
2	Stop light switch	B1
3	Valve relay signal	VR
4	Valve relay monitor	VM
5	Motor relay signal	MR
6	Motor sensor	MS
7	Brake fluid level sensor	FS
8	—	—
9	—	—
10	—	—

**H: MODE FA0**  
**— ON ↔ OFF SIGNAL —**

Requirement for LED "ON"

- LED No. 1 T.C.S OFF switch is turned ON.
- LED No. 2 Stop light switch is turned ON. (With brake pedal depressed.)
- LED No. 3 Valve relay is turned OFF.
- LED No. 4 Valve relay is turned OFF.
- LED No. 5 Motor relay is turned ON.
- LED No. 6 Motor is rotating.
- LED No. 7 Brake fluid level sensor is turned ON. (Brake fluid is insufficient.)

OF	B1	VR	VM	MR
MS	FS	—	—	—

1	2	3	4	5
6	7	8	9	10



LED No.	Signal name	Display
1	Front right inlet solenoid valve	FI
2	Front right outlet solenoid valve	RO
3	Front left inlet solenoid valve	FI
4	Front left outlet solenoid valve	LO
5	Traction control solenoid valve 1	T1
6	Rear right inlet solenoid valve	RI
7	Rear right outlet solenoid valve	RO
8	Rear left inlet solenoid valve	RI
9	Rear left outlet solenoid valve	LO
10	Traction control solenoid valve 2	T2

FI	RO	FI	LO	T1
RI	RO	RI	LO	T2

1	2	3	4	5
6	7	8	9	10

LED No.	Signal name	Display
1	ABS warning light	AW
2	TCS warning light	TW
3	TCS OFF indicator light	TO
4	TCS operating indicator light	TI
5	—	—
6	AEC signal	EC
7	AEB signal	EB
8	AET signal	ET
9	EAM signal	EM
10	AAT signal	AT

AW	TW	TO	TI	—
EC	EB	ET	EM	AT

1	2	3	4	5
6	7	8	9	10

**I: MODE FA1**

**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”

- LED No. 1 Front right inlet solenoid valve is in function.
- LED No. 2 Front right outlet solenoid valve is in function.
- LED No. 3 Front left inlet solenoid valve is in function.
- LED No. 4 Front left outlet solenoid valve is in function.
- LED No. 5 Traction control solenoid valve 1 is in function.
- LED No. 6 Rear right inlet solenoid valve is in function.
- LED No. 7 Rear right outlet solenoid valve is in function.
- LED No. 8 Rear left inlet solenoid valve is in function.
- LED No. 9 Rear left outlet solenoid valve is in function.
- LED No. 10 Traction control solenoid valve 2 is in function.

**J: MODE FA2**

**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”

- LED No. 1 ABS warning light is on.
- LED No. 2 TCS warning light is on.
- LED No. 3 TCS OFF indicator light is on.
- LED No. 4 TCS operating indicator light is on.
- LED No. 6 Engine is running at idle. (LED comes on or goes off depending on vehicle movement.)
- LED No. 7 Engine is running at idle. (LED comes on or goes off depending on vehicle movement.)
- LED No. 8 TCS control operates.
- LED No. 9 Engine control is permitted.
- LED No. 10 ABS control operates.

**NOTE:**

If the system is normal when idling the engine without depressing brake pedal, LED No. 6 comes on, LED No. 9 blinks and all other LED’s are off.

D . CLR      ( FC0 )

0 : YES      1 : NO

B4M0485

**K: MODE FC0****— CLEAR MEMORY MODE (D·CLR) —**

- Deletes the recorded trouble codes in ABS/TCS control module.

F C O ENT

B4M0736

1) Use function keys to put in F C O ENT.

D . CLR      ( FC0 )

0 : YES      1 : NO

B4M0487

2) System indicates as shown.

D . CLR      ( FC0 )

※0 : YES      1 : NO

B4M0488

3) Key in 0, to clear memories. The indication of ※ is added to screen.

PLEASE

KEY OFF

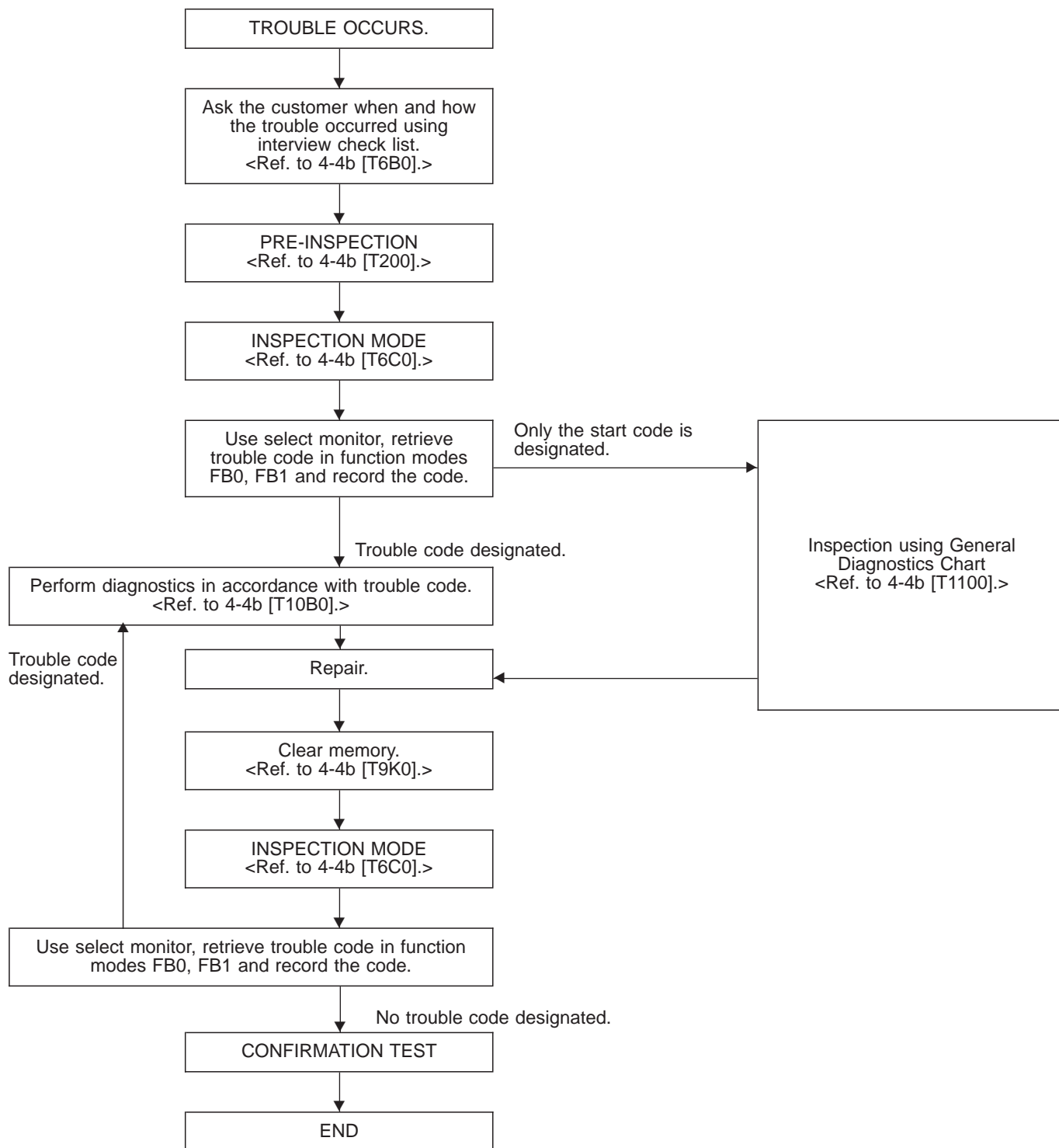
B4M0489

4) Key in ENT. System indicates as shown.

5) Turn the key OFF.

## 10. Diagnostic Chart with Select Monitor

### A: BASIC DIAGNOSTIC CHART



**NOTE:**

To check harness for broken wires or short circuits, shake it while holding it or the connector.

## B: LIST OF TROUBLE CODE

Diagnostic items (select monitor FB0)	Code	Display screen (FB0)	Diagnostic items (select monitor FB1)	Display screen (FB1)	Ref. to 4-4b
Normal	11	NO TROUBLE	Normal	NO TROUBLE	[T10C0]
Detection of FR sensor hardware	21	FR.SS HARD	Open circuit of FR sensor	FR.SS OPEN	[T10D1]
			Short circuit of FR sensor	FR.SS SHORT	[T10D2]
Detection of FR sensor software	22	FR.SS SOFT	FR sensor, variations in wheel speed	FR.SS W.SPEED	[T10E1]
			FR sensor, reduced pressure mode	FR.SS OR MV	[T10E2]
			FR sensor, wheel speed higher than prescribed	FR.SS OVER	[T10E3]
Detection of FL sensor hardware	23	FL.SS HARD	Open circuit of FL sensor	FL.SS OPEN	[T10F1]
			Short circuit of FL sensor	FL.SS SHORT	[T10F2]
Detection of FL sensor software	24	FL.SS SOFT	FL sensor, variations in wheel speed	FL.SS W.SPEED	[T10G1]
			FL sensor, reduced pressure mode	FL.SS OR MV	[T10G2]
			FL sensor, wheel speed higher than prescribed	FL.SS OVER	[T10G3]
Detection of RR sensor hardware	25	RR.SS HARD	Open circuit of RR sensor	RR.SS OPEN	[T10H1]
			Short circuit of RR sensor	RR.SS SHORT	[T10H2]
Detection of RR sensor software	26	RR.SS SOFT	RR sensor, variations in wheel speed	RR.SS W.SPEED	[T10I1]
			RR sensor, reduced pressure mode	RR.SS OR MV	[T10I2]
			RR sensor, wheel speed higher than prescribed	RR.SS OVER	[T10I3]
Detection of RL sensor hardware	27	RL.SS HARD	Open circuit of RL sensor	RL.SS OPEN	[T10J1]
			Short circuit of RL sensor	RL.SS SHORT	[T10J2]
Detection of RL sensor software	28	RL.SS SOFT	RL sensor, variations in wheel speed	RL.SS W.SPEED	[T10K1]
			RL sensor, reduced pressure mode	RL.SS OR MV	[T10K2]
			RL sensor, wheel speed higher than prescribed	RL.SS OVER	[T10K3]
Abnormal FR.IN valve	31	FR.IN VALVE	Abnormal FR.IN valve	FR.IN VALVE	[T10L0]
Abnormal FR.OUT valve	32	FR.OUT VALVE	Abnormal FR.OUT valve	FR.OUT VALVE	[T10M0]
Abnormal FL.IN valve	33	FL.IN VALVE	Abnormal FL.IN valve	FL.IN VALVE	[T10N0]
Abnormal FL.OUT valve	34	FL.OUT VALVE	Abnormal FL.OUT valve	FL.OUT VALVE	[T10O0]
Abnormal RR.IN valve	35	RR.IN VALVE	Abnormal RR.IN valve	RR.IN VALVE	[T10P0]
Abnormal RR.OUT valve	36	RR.OUT VALVE	Abnormal RR.OUT valve	RR.OUT VALVE	[T10Q0]
Abnormal RL.IN valve	37	RL.IN VALVE	Abnormal RL.IN valve	RL.IN VALVE	[T10R0]
Abnormal RL.OUT valve	38	RL.OUT VALVE	Abnormal RL.OUT valve	RL.OUT VALVE	[T10S0]
Abnormal ECM	41	ECU	Abnormal ECM	ECU	[T10T0]
Abnormal line voltage	42	HIGH VOLTAGE	Abnormal line voltage	HIGH VOLTAGE	[T10U0]
Abnormal EGI communication line	43	EGI LINE	Abnormal EGI communication line	EGI LINE	[T10V0]
Abnormal valve relay	51	V.RELAY	Valve relay ON failure	V.RELAY ON	[T10W1]
			Valve relay OFF failure	V.RELAY OFF	[T10W2]
Abnormal motor system	52	MOTOR	Motor relay ON failure	MOTOR ON	[T10X1]
			Motor relay OFF failure	MOTOR OFF	[T10X2]

Diagnostic items (select monitor FB0)	Code	Display screen (FB0)	Diagnostic items (select monitor FB1)	Display screen (FB1)	Ref. to 4-4b
Abnormal stroke sensor and stop light switch	54	PSS & BLS	Open/short circuits of stroke sensor	B.SW HARD	[T10Y1]
			Comparison of stroke sensor and acceleration	B.SW SOFT(G)	[T10Y2]
			Comparison of stroke sensor and stop light switch	B.SW SOFT(B)	[T10Y3]
			Comparison of stroke sensor and pump	B.SW SOFT(P)	[T10Y4]
			Open circuit of stop light switch	B.SW SOFT(O)	[T10Y5]
Abnormal fluid level sensor line	57	FLUID LEVEL SS	Abnormal fluid level sensor line	FLUID LEVEL SS	[T10Z0]
Abnormal pressure switch	58	PRESSURE SW	Abnormal pressure switch	PRESSURE SW	[T10AA0]
Abnormal TCS1 valve	61	TCS1 VALVE	Abnormal TCS1 valve	TCS1 VALVE	[T10AB0]
Abnormal TCS2 valve	62	TCS2 VALVE	Abnormal TCS2 valve	TCS2 VALVE	[T10AC0]

**1. IF THE SELECT MONITOR IS USED FOR TROUBLESHOOTING, IT IS ADVISED TO FOLLOW THE PROCEDURE BELOW**

- 1) Activate function FB0 to read the most recent trouble code and record it.
- 2) Activate function FB1 to read all trouble codes and record them.

(If troubles occur in the wheel speed sensor, stop & brake switch, valve relay or motor system, detailed data on troubles are displayed by the FB1 function, allowing you to easily locate points where need repair.)

- 3) Perform troubleshooting mainly in the FB1 mode.

D . ALL 11 (FB1)

NO TROUBLE

B4M0490

**C: TROUBLE CODE 11**

**— NO TROUBLE —**

**DIAGNOSIS:**

- ABS/TCS control module does not store troubles.

D . ALL 21 (FB1)

FR . SS OPEN

B4M0491

**D: TROUBLE CODE 21**

**1. FR.SS OPEN**

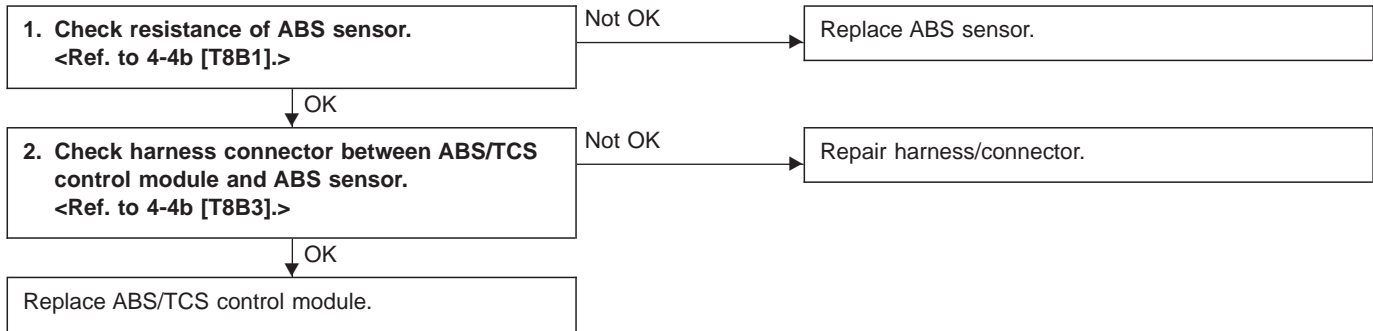
**— Faulty front right ABS sensor (Open circuit) —**

**DIAGNOSIS:**

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



**NOTE:**

When checking ABS sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.

D . ALL 21 ( FB1 )

FR . SS SHORT

B4M0492

**2. FR.SS SHORT**

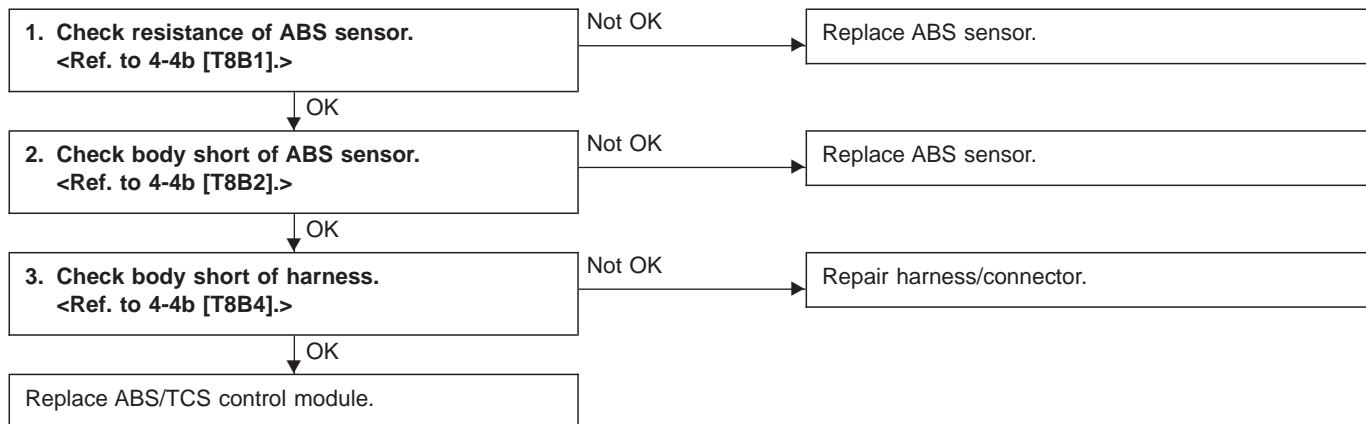
— Faulty front right ABS sensor (Short circuit) —

**DIAGNOSIS:**

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.
- TCS does not operate.



**NOTE:**

When checking ABS sensor, carefully bend or swing connector and harness to check for improper contacts or open circuits.

D . ALL 22 ( FB1 )

FR . SS W. SPEED

B4M0493

**E: TROUBLE CODE 22**

**1. FR.SS W.SPEED**

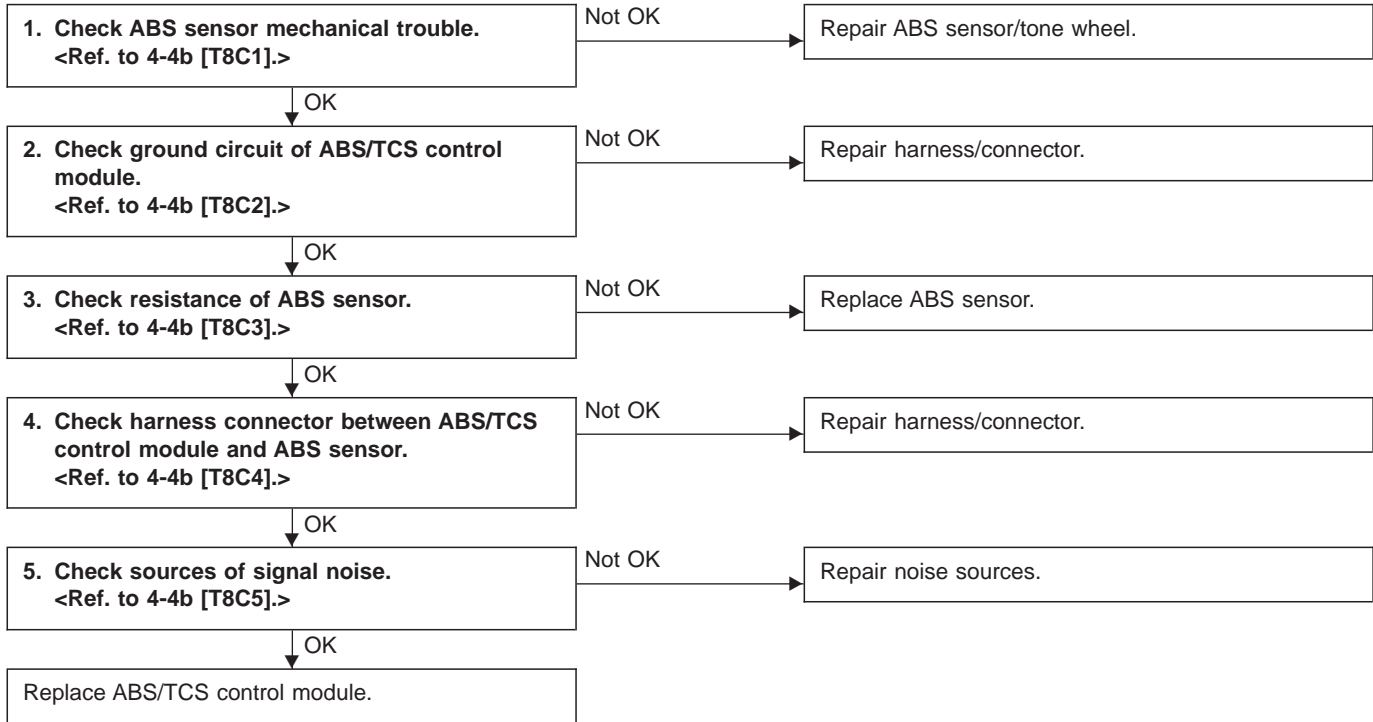
— Irregular signals from front right ABS sensor —

**DIAGNOSIS:**

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

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.





D. ALL 22 (FB1)

FR. SS OR MV

B4M0494

**2. FR.SS OR MV**

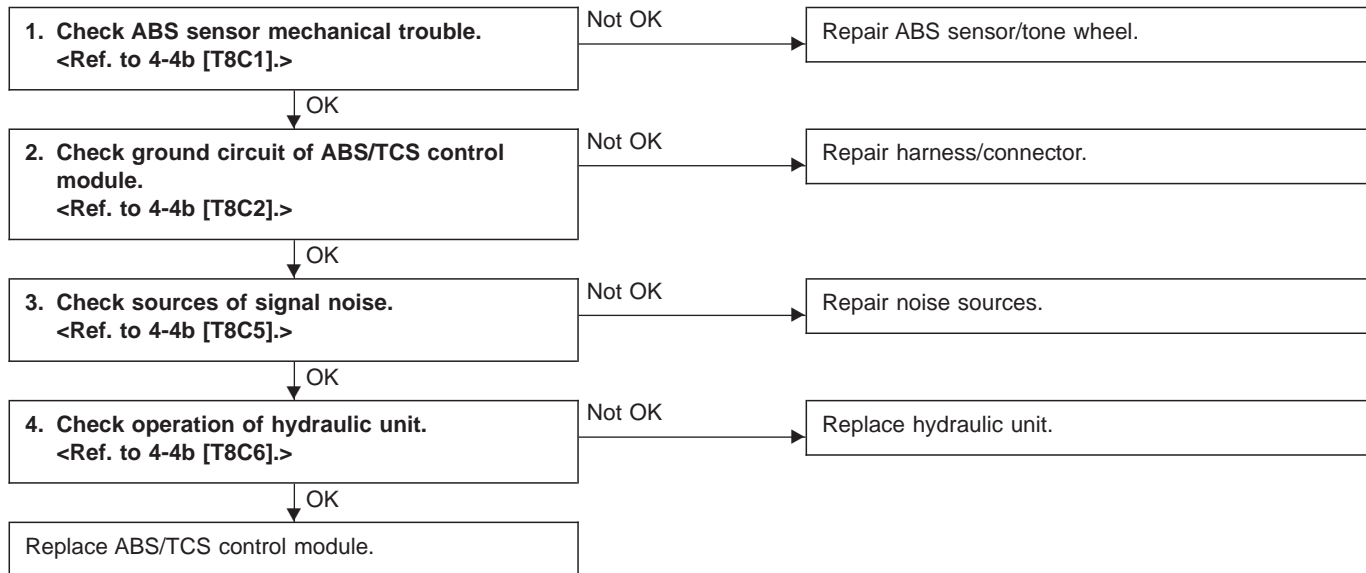
— Irregular signals from front right ABS sensor in decompressing mode —

**DIAGNOSIS:**

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



D. ALL 22 (FB1)

FR. SS OVER

B4M0495

**3. FR.SS OVER**

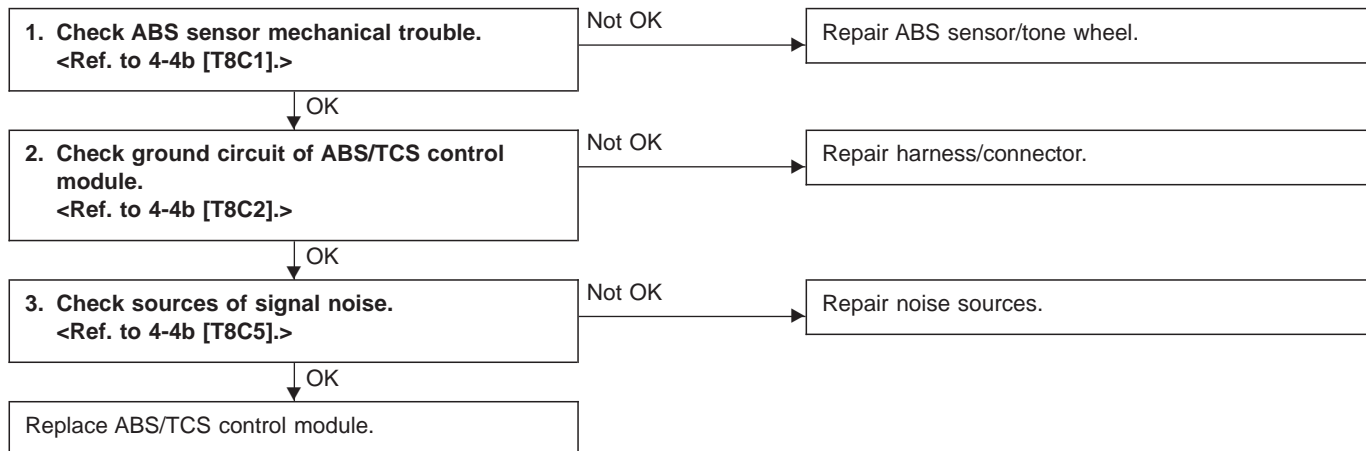
— Excessive speed of front right ABS sensor signal —

**DIAGNOSIS:**

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

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.



D . ALL 23 ( FB1 )

FL . SS OPEN

B4M0496

## F: TROUBLE CODE 23

### 1. FL.SS OPEN

— Faulty front left ABS sensor (Open circuit) —

#### DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS OPEN.

<Ref. to 4-4b [T10D1].>

D . ALL 23 ( FB1 )

FL . SS SHORT

B4M0497

### 2. FL.SS SHORT

— Faulty front left ABS sensor (Short circuit) —

#### DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS SHORT.

<Ref. to 4-4b [T10D2].>

D . ALL 24 ( FB1 )

FL . SS W . SPEED

B4M0498

### G: TROUBLE CODE 24

#### 1. FL.SS W.SPEED

— Irregular signals from front left ABS sensor —

##### DIAGNOSIS:

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

##### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

##### NOTE:

The procedures used are the same as those for FR.SS W.SPEED.

<Ref. to 4-4b [T10E1].>

D . ALL 24 ( FB1 )

FL . SS OR MV

B4M0499

#### 2. FL.SS OR MV

— Irregular signals from front left ABS sensor in decompressing mode —

##### DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

##### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

##### NOTE:

The procedures used are the same as those for FR.SS OR MV.

<Ref. to 4-4b [T10E2].>

D . ALL 24 ( FB1 )

FL . SS OVER

B4M0500

#### 3. FL.SS OVER

— Excessive speed of front left ABS sensor signal —

##### DIAGNOSIS:

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

##### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

##### NOTE:

The procedures used are the same as those for FR.SS OVER.

<Ref. to 4-4b [T10E3].>

D . ALL 25 ( FB1 )

RR . SS OPEN

B4M0501

## H: TROUBLE CODE 25

### 1. RR.SS OPEN

— Faulty rear right ABS sensor (Open circuit) —

#### DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS OPEN.

<Ref. to 4-4b [T10D1].>

D . ALL 25 ( FB1 )

RR . SS SHORT

B4M0502

### 2. RR.SS SHORT

— Faulty rear right ABS sensor (Short circuit) —

#### DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS SHORT.

<Ref. to 4-4b [T10D2].>

D . ALL 26 ( FB1 )

RR . SS W . SPEED

B4M0503

## I: TROUBLE CODE 26

### 1. RR.SS W.SPEED

— Irregular signals from rear right ABS sensor —

#### DIAGNOSIS:

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

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS W.SPEED.

<Ref. to 4-4b [T10E1].>

D . ALL 26 ( FB1 )

RR . SS OR MV

B4M0504

### 2. RR.SS OR MV

— Irregular signals from rear right ABS sensor in decompressing mode —

#### DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS OR MV.

<Ref. to 4-4b [T10E2].>

D . ALL 26 ( FB1 )

RR . SS OVER

B4M0505

### 3. RR.SS OVER

— Excessive speed of rear right ABS sensor signal —

#### DIAGNOSIS:

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

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS OVER.

<Ref. to 4-4b [T10E3].>

D . ALL 27 ( FB1 )

RL . SS OPEN

B4M0506

## J: TROUBLE CODE 27

### 1. RL.SS OPEN

— Faulty rear left ABS sensor (Open circuit) —

#### DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS OPEN.

<Ref. to 4-4b [T10D1].>

D . ALL 27 ( FB1 )

RL . SS SHORT

B4M0507

### 2. RL.SS SHORT

— Faulty rear left ABS sensor (Short circuit) —

#### DIAGNOSIS:

- Faulty ABS sensor
- Faulty harness and connector
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

#### NOTE:

The procedures used are the same as those for FR.SS SHORT.

<Ref. to 4-4b [T10D2].>

D . ALL 28 ( FB1 )

RL . SS W . SPEED

B4M0508

### K: TROUBLE CODE 28

#### 1. RL.SS W.SPEED

— Irregular signals from rear left ABS sensor —

##### DIAGNOSIS:

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

##### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

##### NOTE:

The procedures used are the same as those for FR.SS W.SPEED.

<Ref. to 4-4b [T10E1].>

D . ALL 28 ( FB1 )

RL . SS OR MV

B4M0509

#### 2. RL.SS OR MV

— Irregular signals from rear left ABS sensor in decompressing mode —

##### DIAGNOSIS:

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty hydraulic unit
- Faulty harness/connector
- Faulty ABS/TCS control module

##### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

##### NOTE:

The procedures used are the same as those for FR.SS OR MV.

<Ref. to 4-4b [T10E2].>

D . ALL 28 ( FB1 )

RL . SS OVER

B4M0510

#### 3. RL.SS OVER

— Excessive speed of rear left ABS sensor signal —

##### DIAGNOSIS:

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

##### TROUBLE SYMPTOM:

- ABS and TCS do not operate.

##### NOTE:

The procedures used are the same as those for FR.SS OVER.

<Ref. to 4-4b [T10E3].>



D . ALL 31 ( FB1 )

FR . IN VALVE

B4M0511

**L: TROUBLE CODE 31**

**FR.IN VALVE**

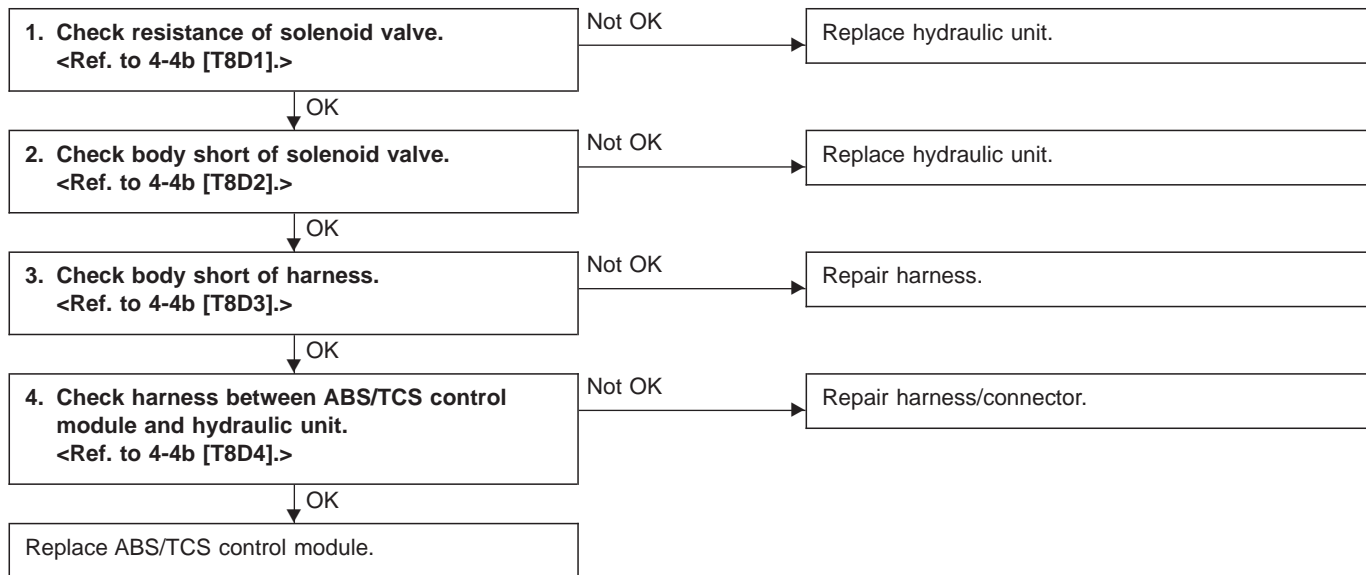
— Faulty front right inlet solenoid valve —

**DIAGNOSIS:**

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.



D . ALL 32 ( FB1 )

FR . OUT VALVE

B4M0512

**M: TROUBLE CODE 32**

**FR.OUT VALVE**

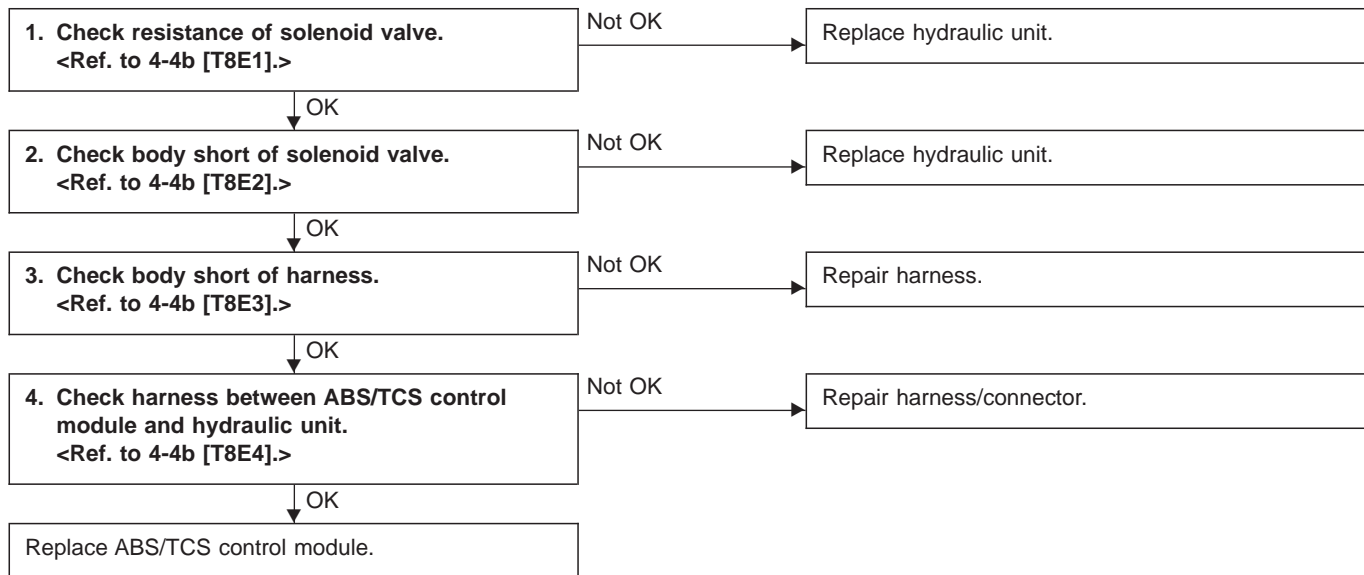
— Faulty front right outlet solenoid valve —

**DIAGNOSIS:**

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.



D . ALL 33 ( FB1 )

FL . IN VALVE

B4M0513

**N: TROUBLE CODE 33**

**FL.IN VALVE**

— Faulty front left inlet solenoid valve —

**DIAGNOSIS:**

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

**NOTE:**

The procedures used are the same as those for FR.IN VALVE.

<Ref. to 4-4b [T10L0].>

D . ALL 34 ( FB1 )

FL . OUT VALVE

B4M0514

### O: TROUBLE CODE 34

#### FL.OUT VALVE

— Faulty front left outlet solenoid valve —

#### DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

#### NOTE:

The procedures used are the same as those for FR.OUT VALVE.

<Ref. to 4-4b [T10M0].>

D . ALL 35 ( FB1 )

RR . IN VALVE

B4M0515

### P: TROUBLE CODE 35

#### RR.IN VALVE

— Faulty rear right inlet solenoid valve —

#### DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

#### NOTE:

The procedures used are the same as those for FR.IN VALVE.

<Ref. to 4-4b [T10L0].>

D . ALL 36 ( FB1 )

RR . OUT VALVE

B4M0516

### Q: TROUBLE CODE 36

#### RR.OUT VALVE

— Faulty rear right outlet solenoid valve —

#### DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

#### NOTE:

The procedures used are the same as those for FR.OUT VALVE.

<Ref. to 4-4b [T10M0].>

D . ALL 37 ( FB1 )

RL . IN VALVE

B4M0517

### R: TROUBLE CODE 37

#### RL.IN VALVE

— Faulty rear left inlet solenoid valve —

#### DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

#### NOTE:

The procedures used are the same as those for FR.IN VALVE.

<Ref. to 4-4b [T10L0].>

D . ALL 38 (FB1)

RL . OUT VALVE

B4M0518

**S: TROUBLE CODE 38**

**RL.OUT VALVE**

— Faulty rear left outlet solenoid valve —

**DIAGNOSIS:**

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

**NOTE:**

The procedures used are the same as those for FR.OUT VALVE.

<Ref. to 4-4b [T10M0].>

D . ALL 41 (FB1)

ECU

B4M0519

**T: TROUBLE CODE 41**

**ECU**

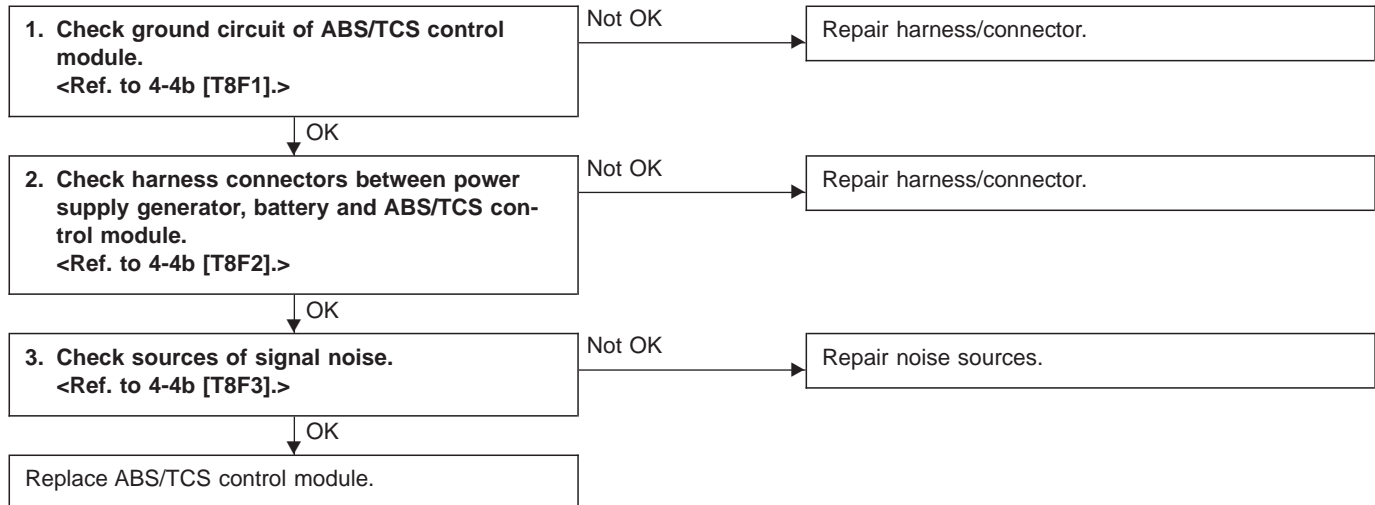
— Faulty ABS/TCS control module —

**DIAGNOSIS:**

- Faulty ABS/TCS control module
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



D . ALL 42 ( FB1 )

HIGH VOLTAGE

B4M0520

**U: TROUBLE CODE 42**

**HIGH VOLTAGE**

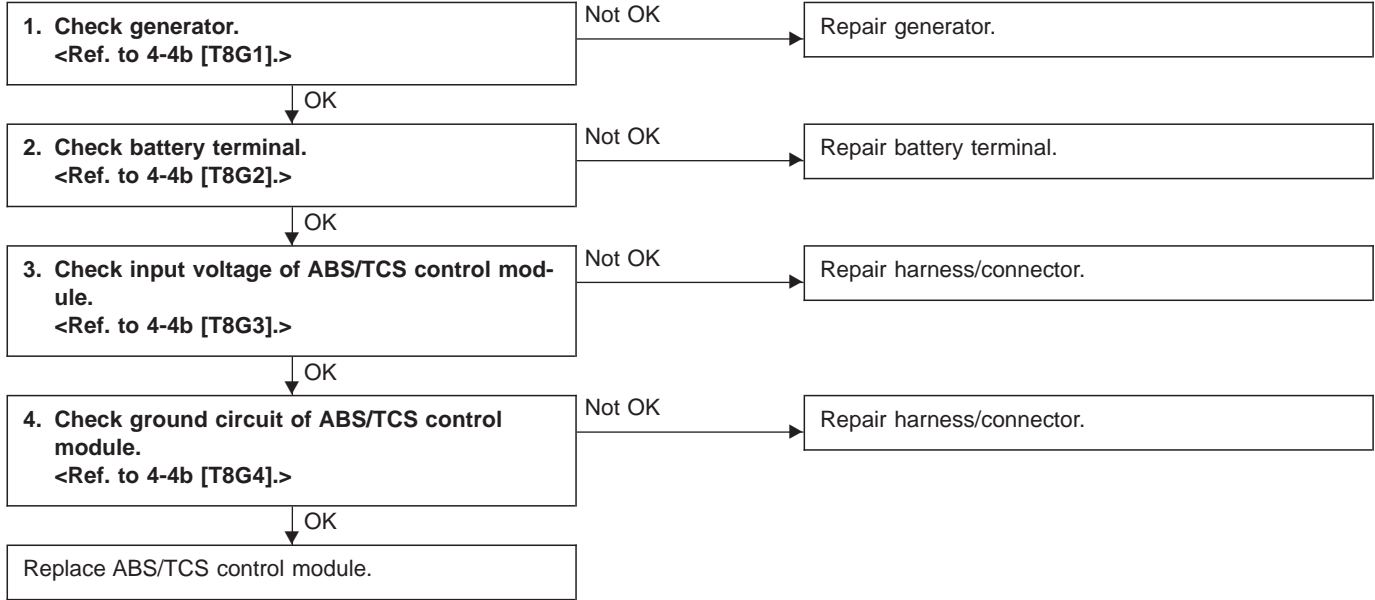
— Source voltage is high —

**DIAGNOSIS:**

- Power source voltage of the ABS/TCS control module is more than 18 V.
- Faulty ABS/TCS control module
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



D . ALL 43 ( FB1 )

EGI LINE

B4M0521

**V: TROUBLE CODE 43**

**EGI LINE**

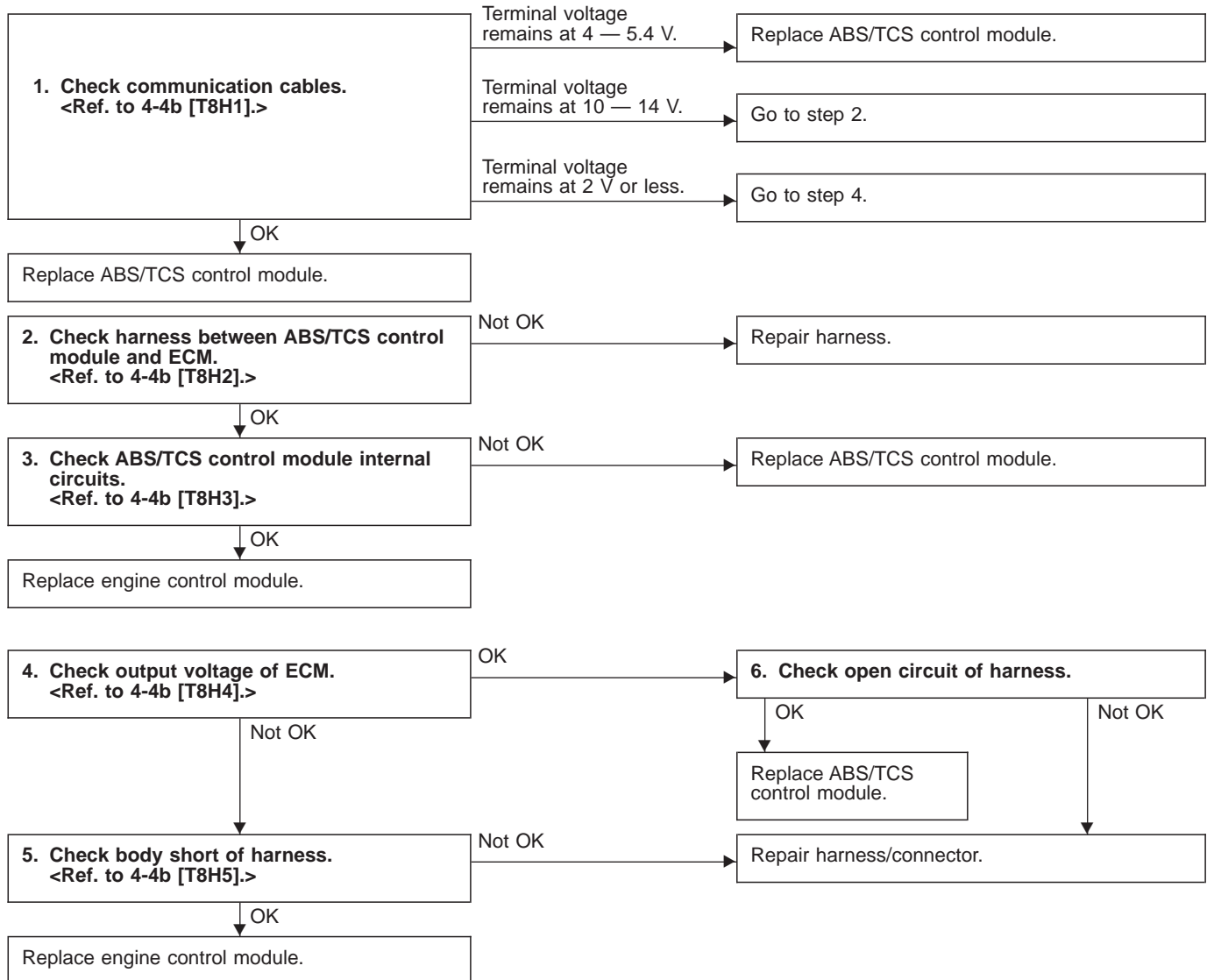
— Faulty engine control module communication cables —

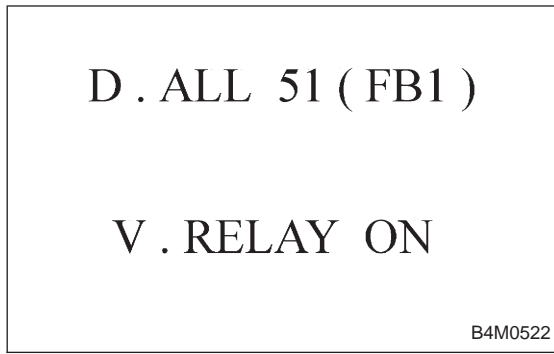
**DIAGNOSIS:**

- AET communication cable is broken or short circuited.
- AEB communication cable is broken or short circuited.
- AEC communication cable is broken or short circuited.
- Faulty ABS/TCS control module
- Faulty engine control module

**TROUBLE SYMPTOM:**

- TCS does not operate.





**W: TROUBLE CODE 51**

**1. V.RELAY ON**

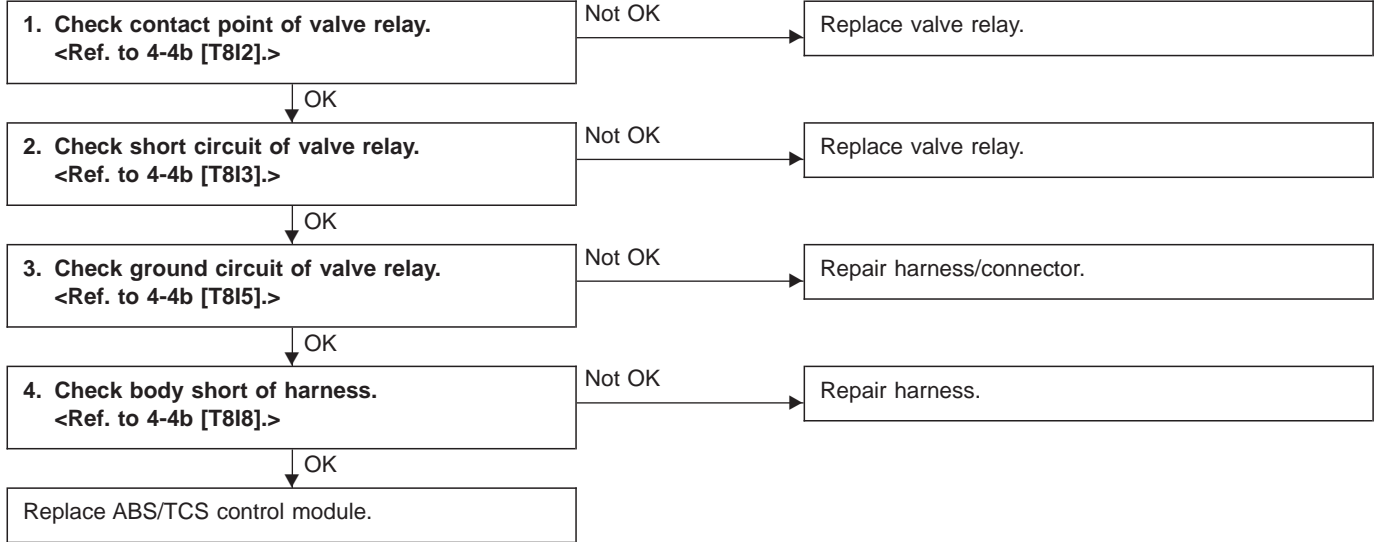
— Valve relay ON malfunction —

**DIAGNOSIS:**

- Faulty valve relay
- Faulty harness/connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.





D . ALL 51 ( FB1 )

V . RELAY OFF

B4M0523

**2. V.RELAY OFF**

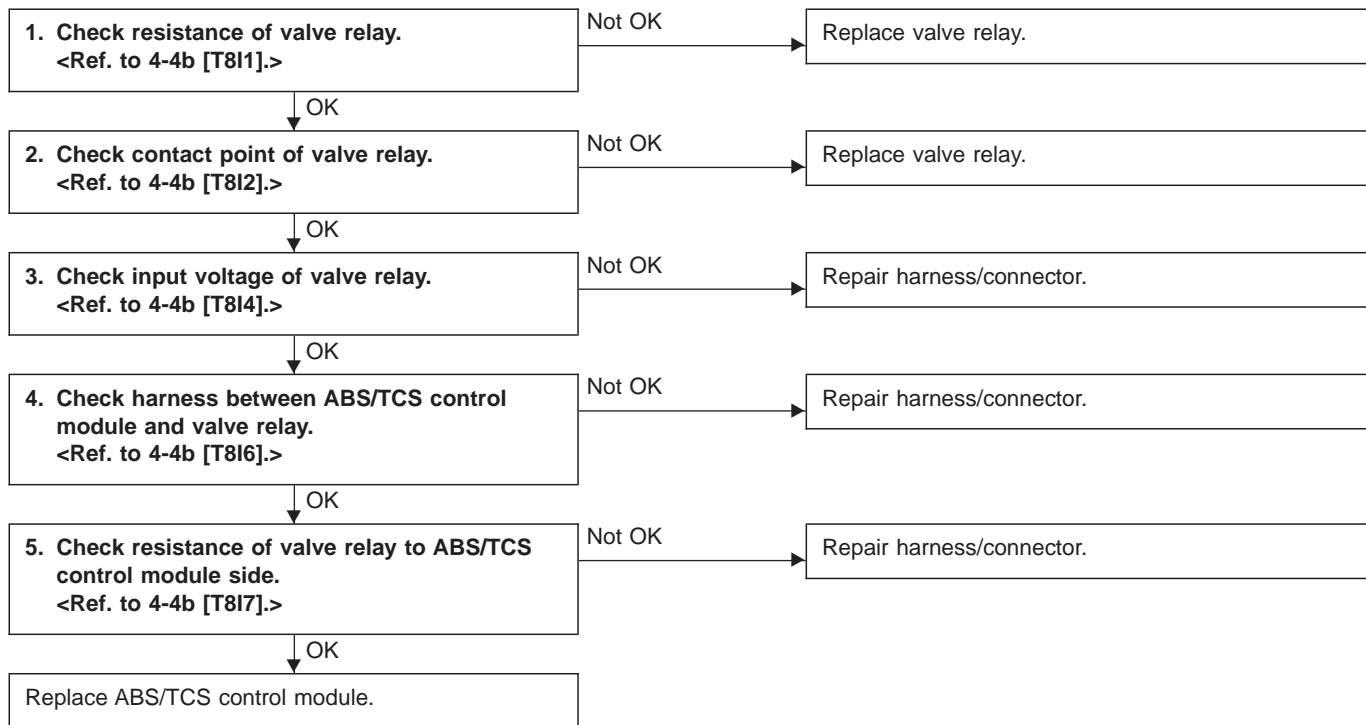
— Valve relay OFF malfunction —

**DIAGNOSIS:**

- Faulty valve relay
- Faulty harness/connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



D . ALL 52 ( FB1 )

MOTOR ON

B4M0524

**X: TROUBLE CODE 52**

**1. MOTOR ON**

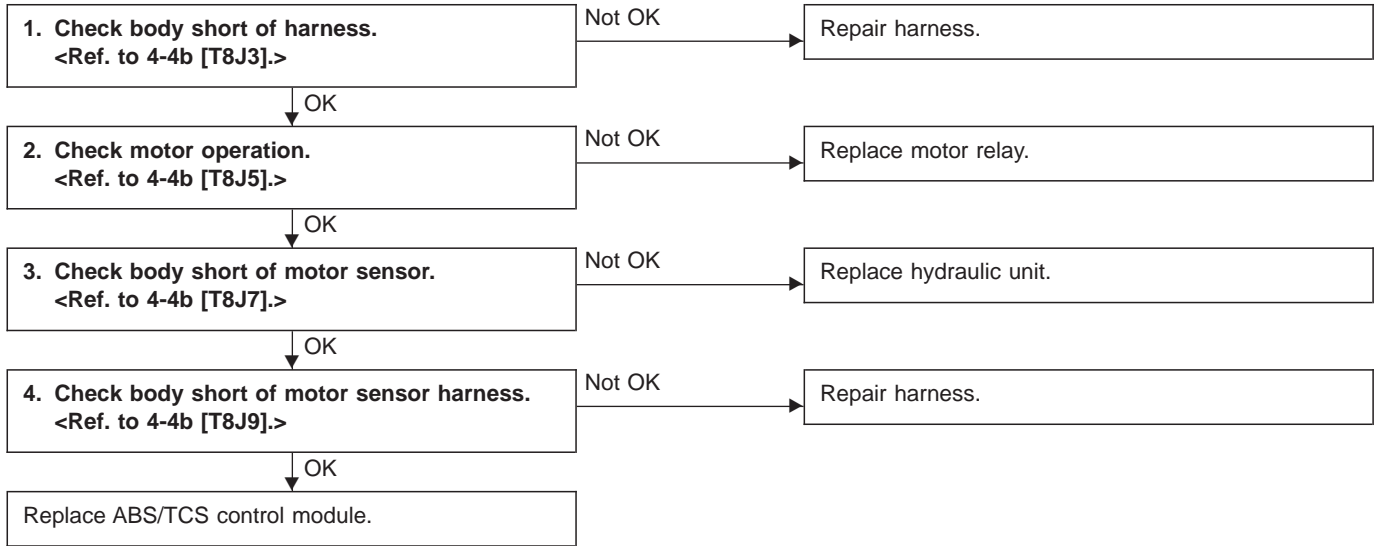
— Motor relay ON malfunction —

**DIAGNOSIS:**

- Faulty motor relay
- Faulty motor
- Faulty motor sensor
- Faulty harness
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS does not operate.
- TCS does not operate.



D . ALL 52 ( FB1 )

MOTOR OFF

B4M0525

**2. MOTOR OFF**

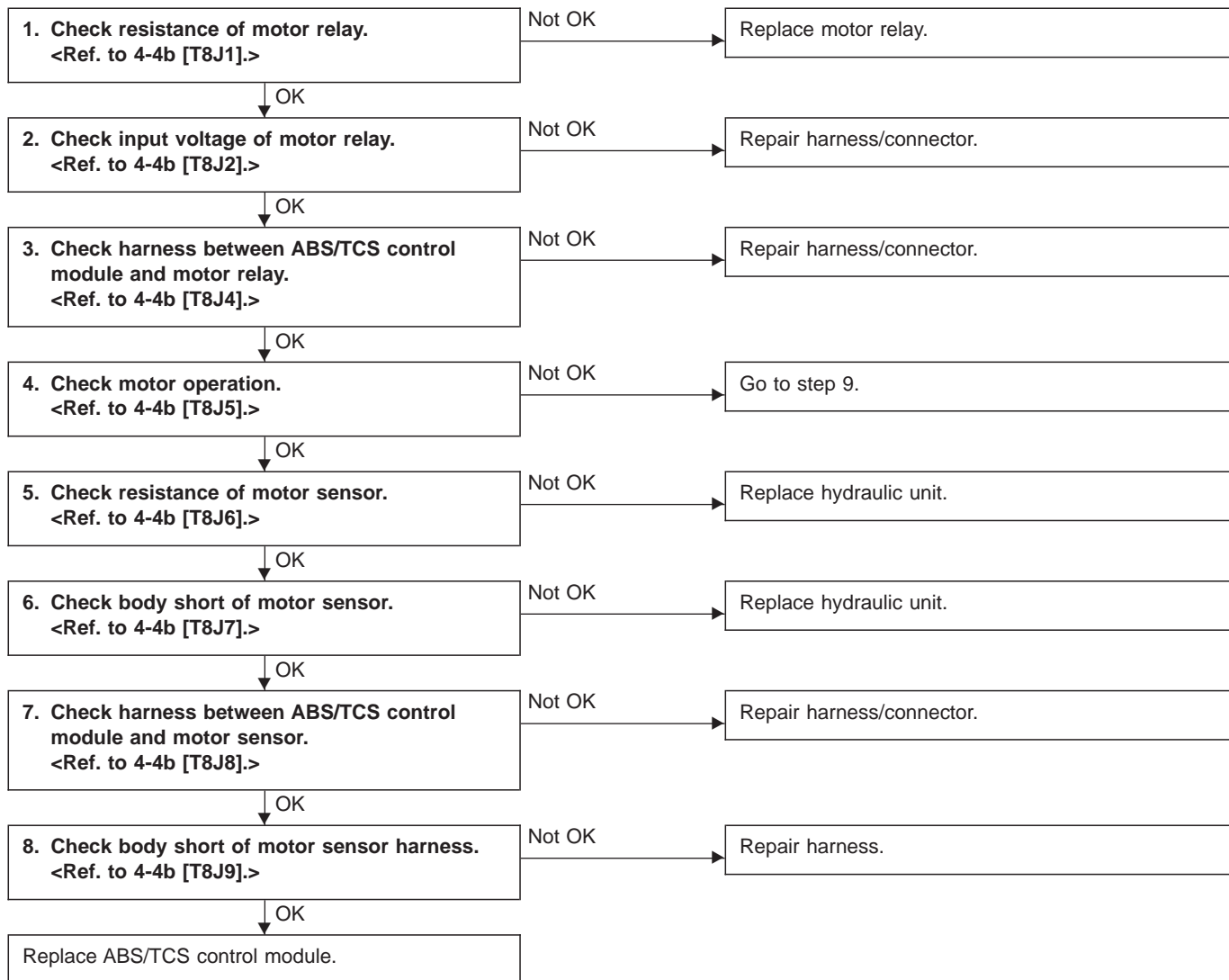
— Motor relay OFF malfunction —

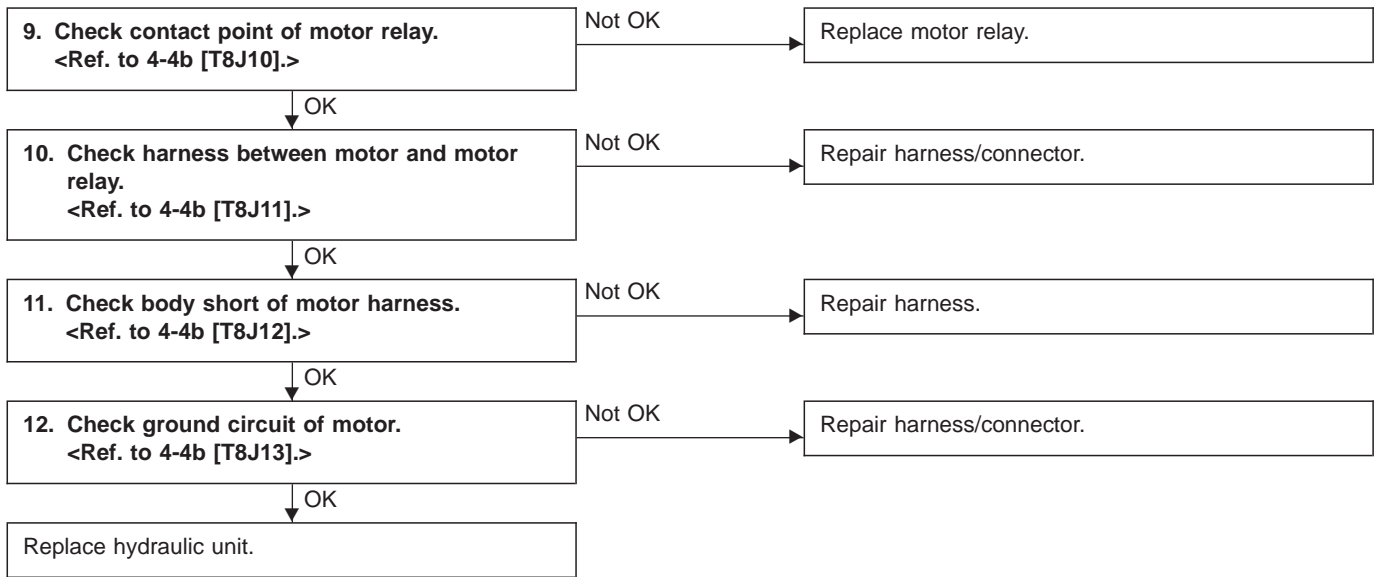
**DIAGNOSIS:**

- Faulty motor relay
- Faulty motor
- Faulty motor sensor
- Faulty harness/connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.



**NOTE:**

The check can also be made by analyzing the sensor output signal with oscilloscope during the TCS sequence control operation. If the ECM female connector end gives correct value, skip steps 5 through 8.

If not, operate the TCS sequence control again and measure the value at motor sensor male connector end, with the motor sensor connector disconnected. If the value is OK, proceed with steps 7 through 8 above.

D . ALL 54 ( FB1 )

B . SW HARD

B4M0526

**Y: TROUBLE CODE 54**

**1. B.SW HARD**

— Break and short circuit at stroke sensor or its wiring —

**DIAGNOSIS:**

- Faulty stroke sensor
- Faulty harness/connector
- Faulty stop light switch
- Faulty ABS/TCS control module

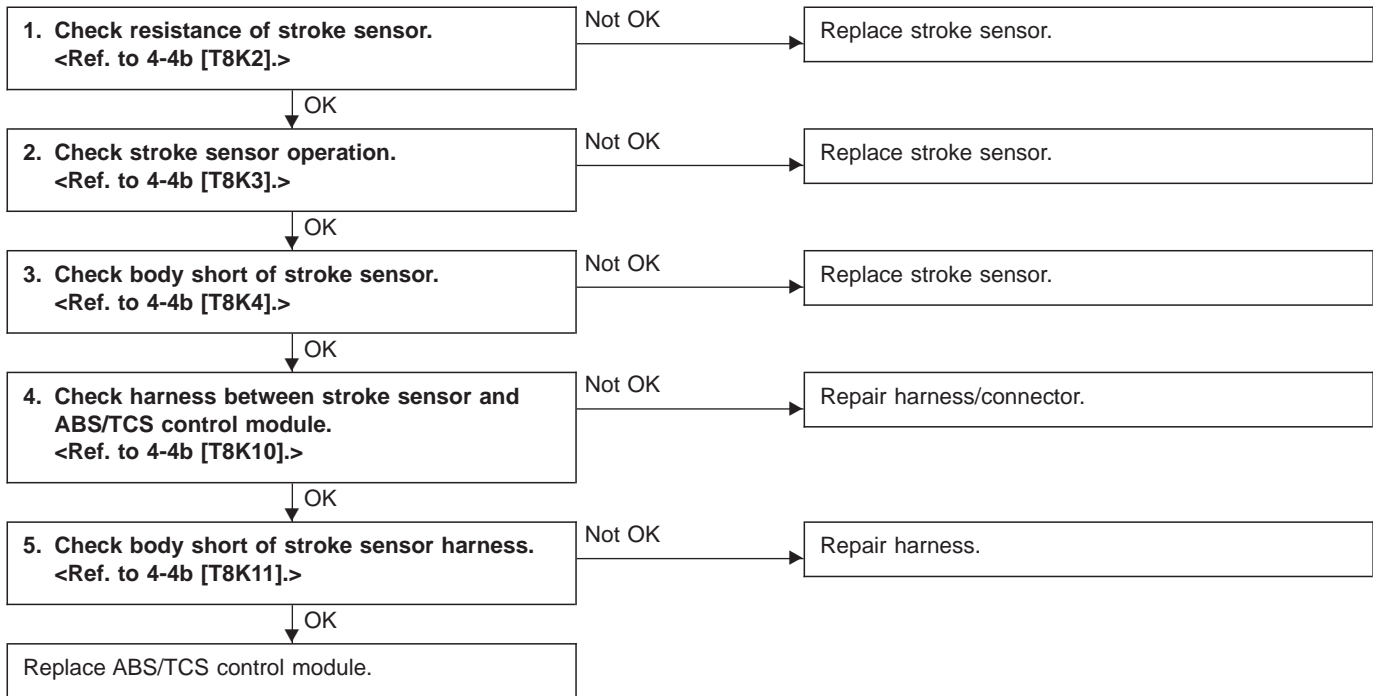
**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.

**NOTE:**

Operate the function F09 in select monitor TCS mode, and read the sensor output step.

If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 1 through 5.



D . ALL 54 ( FB1 )  
 B . SW SOFT ( G )  
 B4M0527

**2. B.SW SOFT (G)**

— Irregular value in comparison stroke sensor and vehicle acceleration comparison —

**DIAGNOSIS:**

- Faulty stroke sensor
- Faulty harness/connector
- Faulty stop light switch
- Faulty ABS/TCS control module

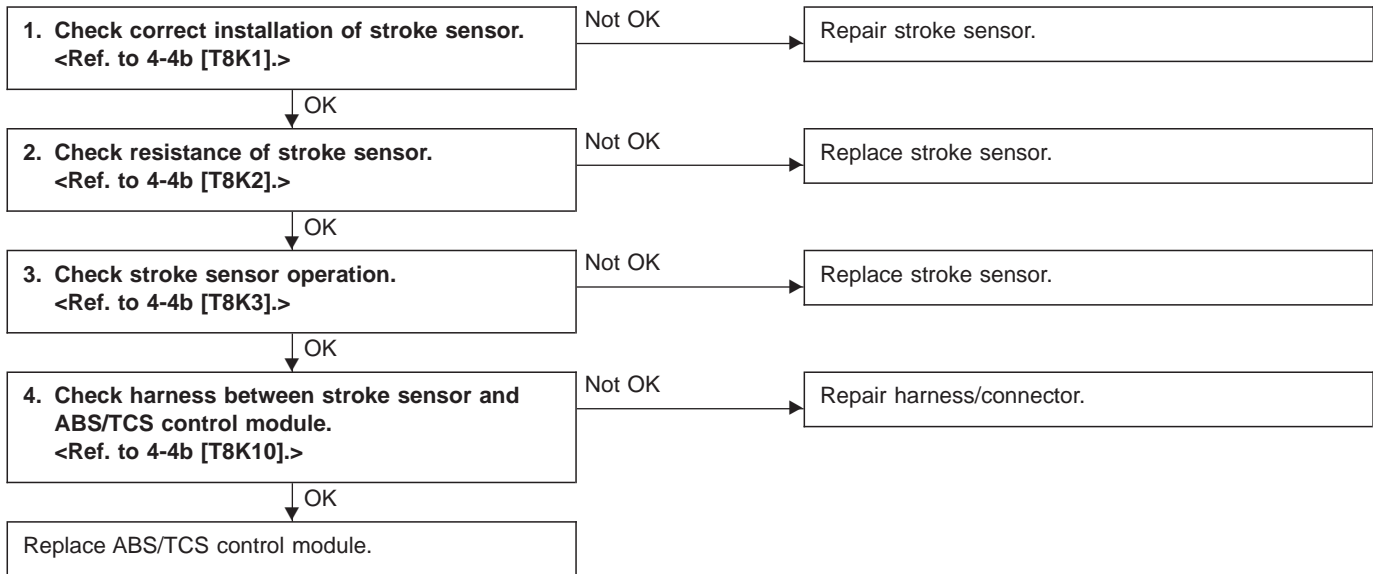
**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.

**NOTE:**

Operate the function F09 in select monitor TCS mode, and read the sensor output step.

If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 2 through 4.



D . ALL 54 (FB1)

B . SW SOFT (B)

B4M0528

**3. B.SW SOFT (B)**

— Irregular value in stroke sensor and brake light switch comparison —

**DIAGNOSIS:**

- Faulty stroke sensor
- Faulty stop light switch
- Faulty harness/connector
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

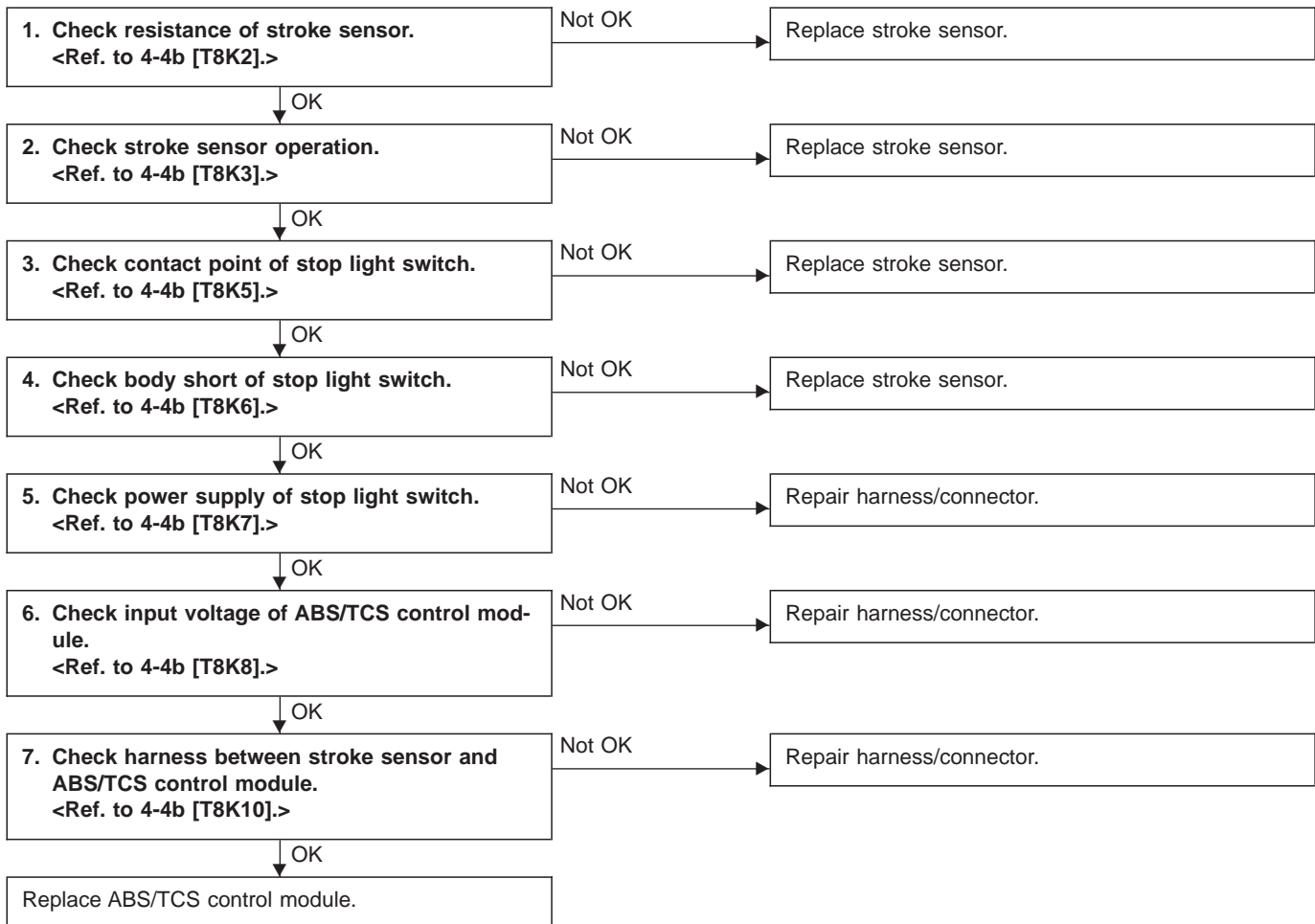
- ABS and TCS do not operate.

**NOTE:**

Operate the function F09 in select monitor TCS mode, and read the sensor output step.

If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 1 and 2 through 7.

Then, operate the function FA0 and check the stop and brake switches by B1 LED ON/OFF. If system is normal, LED comes on when depressing brake pedal, and goes off when not depressing. If so, skip check steps 3 through 6.



D . ALL 54 ( FB1 )

B . SW SOFT ( P )

B4M0529

**4. B.SW SOFT (P)**

— Comparison between stroke sensor and pump output —

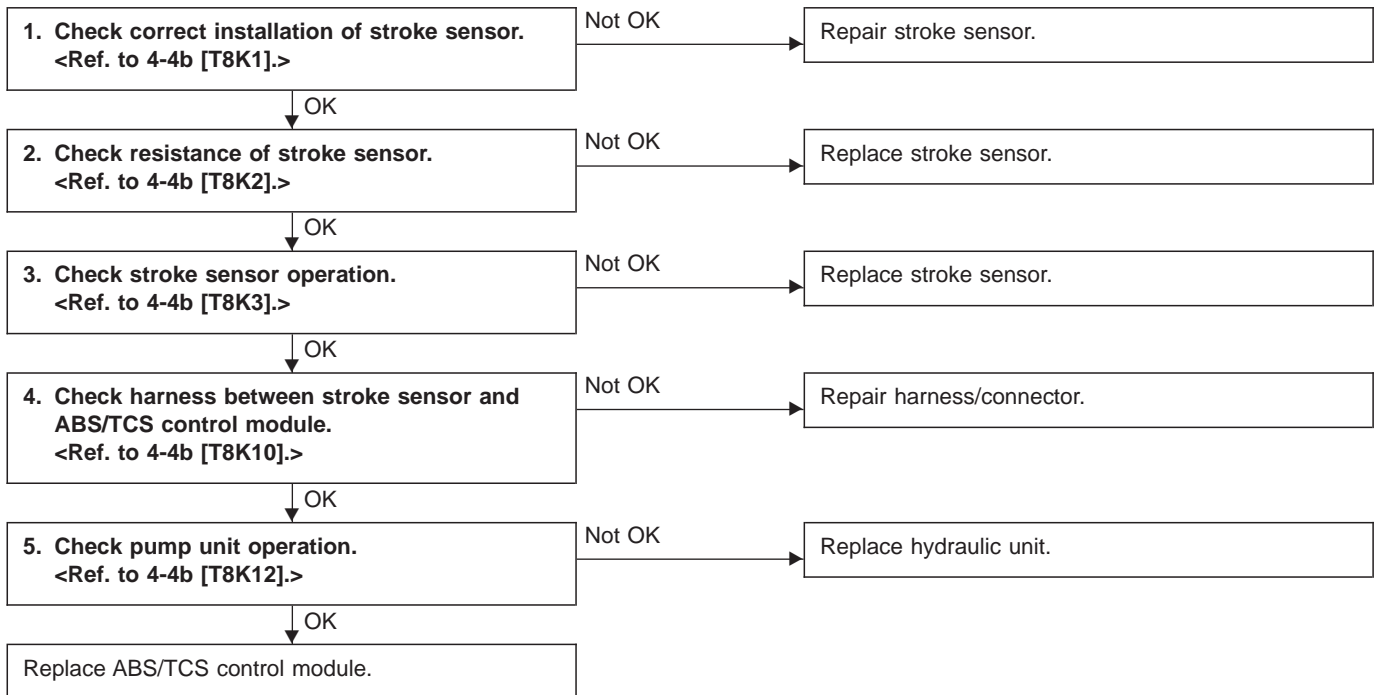
**DIAGNOSIS:**

- Faulty stroke sensor
- Faulty harness/connector
- Faulty pump unit in hydraulic unit
- Faulty stop light switch
- Faulty ABS/TCS control module

**NOTE:**

Operate the function F09 in select monitor TCS mode, and read the sensor output step.

If system is normal, the output reading is 1 when brake pedal is not depressed, and it changes from 2 to 3, 4 and 5 in accordance with the brake pedal depressing. If so, skip check steps 2 through 4.





D . ALL 54 ( FB1 )

B . SW SOFT ( O )

B4M0530

**5. B.SW SOFT (O)**

— Broken brake light switch —

**DIAGNOSIS:**

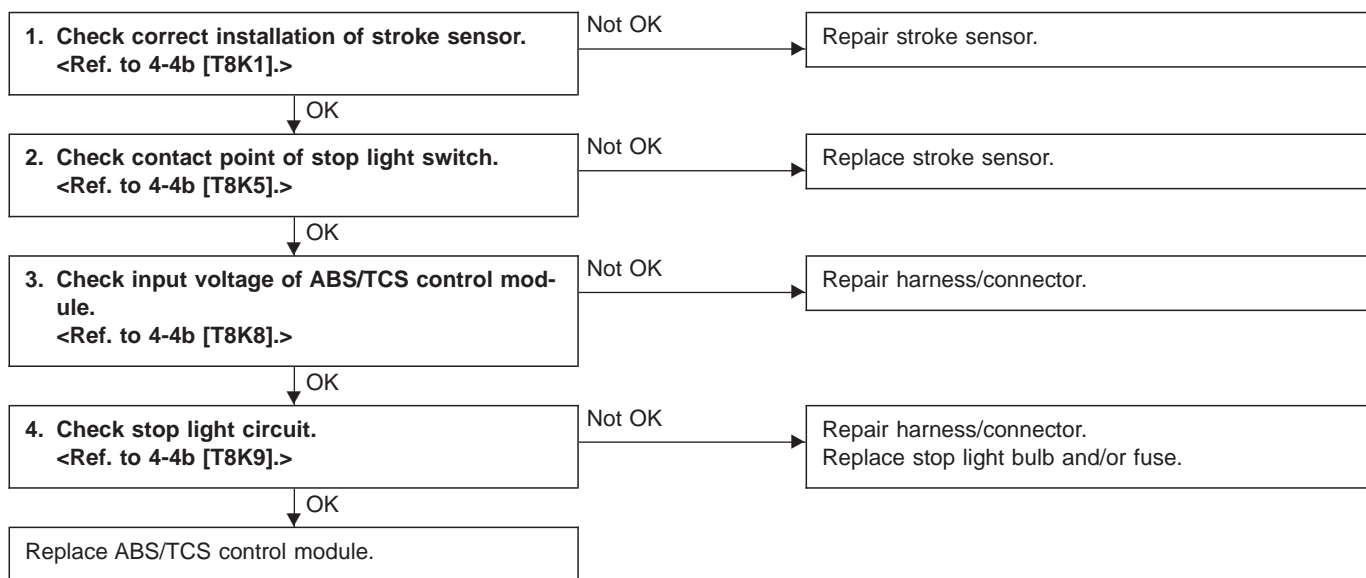
- Faulty stop light switch
- Faulty harness/connector
- Faulty stroke sensor
- Faulty ABS/TCS control module

**TROUBLE SYMPTOM:**

- TCS does not operate.

**NOTE:**

Operate the function FA0 in select monitor TCS mode, and check the stop and brake switches by B1 LED ON/OFF. If system is normal, LED comes on when depressing brake pedal, and goes off when not depressing. If so, skip check steps 2 through 4.



D . ALL 57 ( FB1 )

FLUID LEVEL SS

B4M0531

**Z: TROUBLE CODE 57**

**FLUID LEVEL SS**

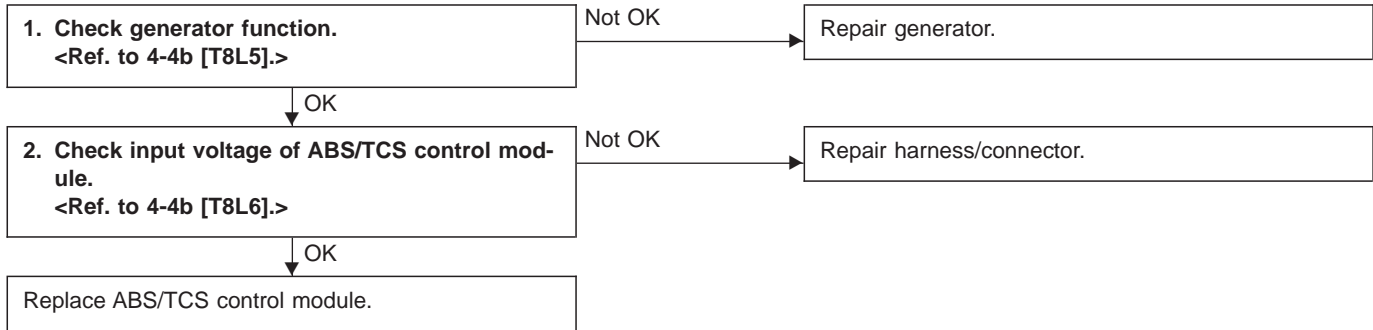
— Irregular signal from fluid level sensor —

**DIAGNOSIS:**

- Faulty fluid level sensor circuit
- Faulty harness/connector
- Faulty ABS/TCS control module
- Faulty generator

**TROUBLE SYMPTOM:**

- ABS and TCS do not operate.



D . ALL 58 ( FB1 )

PRESSURE SW

B4M0532

**AA: TROUBLE CODE 58**

**PRESSURE SW**

— Faulty pressure switch —

**DIAGNOSIS:**

- Faulty pressure
- Faulty stop light switch
- Faulty ABS/TCS control module
- Faulty harness/connector

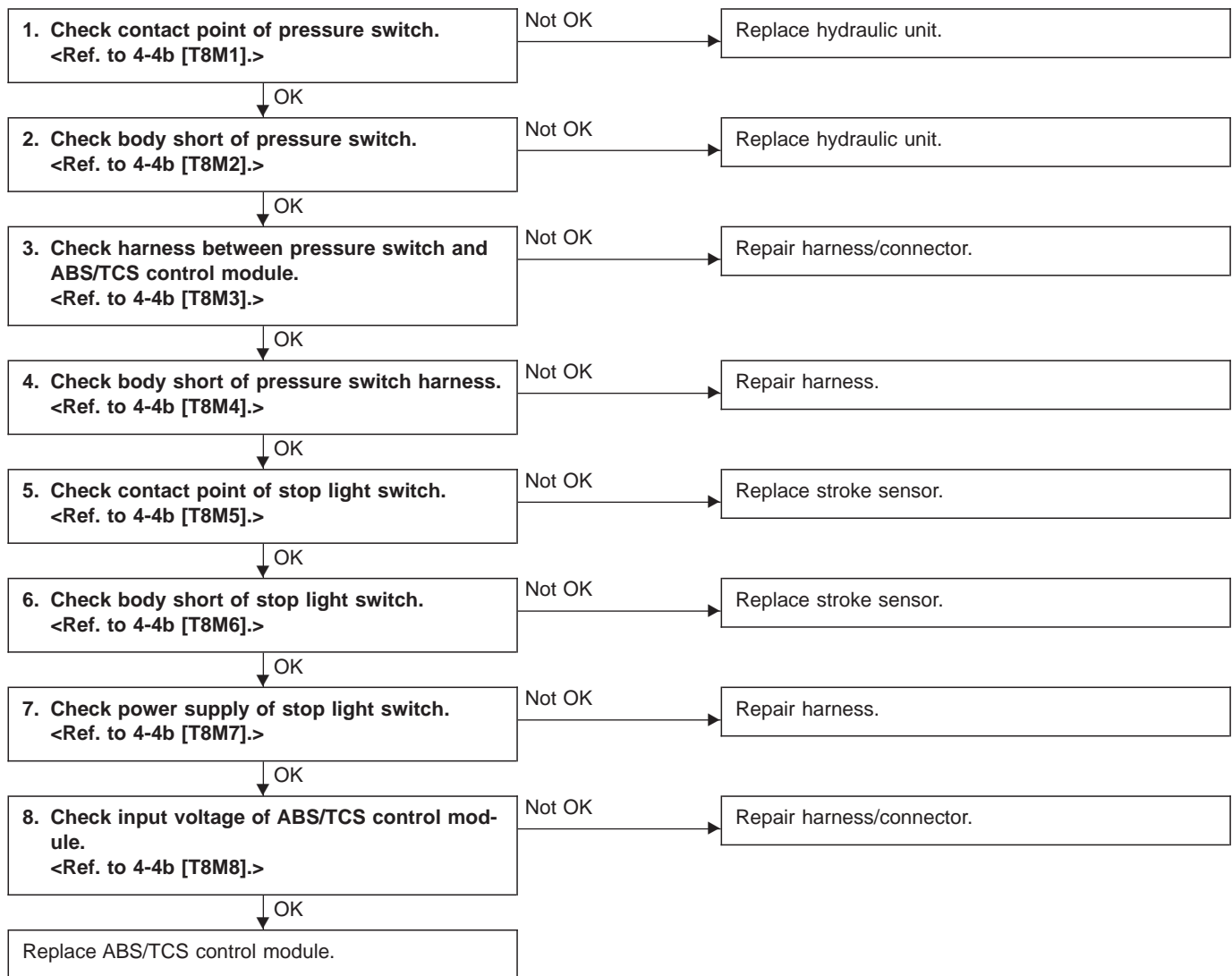
**TROUBLE SYMPTOM:**

- TCS does not operate.

**NOTE:**

Check using the select monitor.

Operate the function FA0 in select monitor TCS mode. The stop and brake switches can be checked by B1 LED ON/OFF. If system is normal, LED comes on when depressing brake pedal, and goes off when not depressing. If so, skip check steps 5 through 8.



D. ALL 61 (FB1)

TCS1 VALVE

B4M0533

### AB: TROUBLE CODE 61

#### TCS 1 VALVE

— Faulty TCS 1 solenoid valve —

#### DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

#### NOTE:

The procedures used are the same as those for FR.IN VALVE.

<Ref. to 4-4b [T10L0].>

D. ALL 62 (FB1)

TCS2 VALVE

B4M0534

### AC: TROUBLE CODE 62

#### TCS 2 VALVE

— Faulty TCS 2 solenoid valve —

#### DIAGNOSIS:

- Faulty harness/connector
- Faulty solenoid valve in hydraulic unit
- Faulty ABS/TCS control module

#### TROUBLE SYMPTOM:

- ABS and TCS do not operate.
- ABS sequence control does not operate.
- TCS sequence control does not operate.
- Air bleeding mode does not operate.

#### NOTE:

The procedures used are the same as those for FR.OUT VALVE.

<Ref. to 4-4b [T10M0].>

# 11. General Diagnostics Table

⊙: Primary expected causes ○: Secondary expected causes

Symptoms	Trouble conditions	Hydraulic unit				P valve	Master cylinder	Calipers and piston	Pad	Rotor	Hand brake	Piping	Mixture of air	Brake booster and check valve	Axle and wheel	Alignment	Play of pedal	Rough road surface	Semicylindrical road surface	Loose or worn suspension	Tire	Wrong connection and wiring	Stroke sensor	
		Solenoid valve	Motor	Mount bush	Speed sensor																			
ABS function	Directional stability cannot be obtained when braking.	Vehicle turns to right or left.	⊙			⊙	○		⊙	⊙	○			○	⊙						⊙	⊙		
		Vehicle spins.	⊙			⊙	○		○	⊙												⊙	⊙	
	Out-of-order brakes	Long braking distance	⊙	○		○	○	○	○	⊙	○		○	⊙	○							⊙	⊙	
		Brakes lock.	⊙	○		⊙	○		○			○											⊙	
		Brakes drag.	⊙			⊙	○	⊙	⊙	○		⊙	○		⊙		⊙							
		Long pedal stroke	○				○	○	○			○	⊙	○			○							
		Abnormal vehicle pitching	○			○												⊙		⊙			⊙	
Unstable braking force. One-side brake refuses to work.	⊙			⊙		○	⊙	⊙	○		○			○	○		⊙	○	○	⊙	⊙			
TCS function	When accelerating abruptly, directional stability cannot be obtained when traveling on a slippery road surface.	Vehicle moves unsteadily.	⊙			⊙		⊙	⊙			○			⊙		⊙		○	⊙	⊙	⊙		
		Handle refuses to work.	⊙			⊙		⊙	⊙			○									⊙	⊙		
		Handle loses control.	⊙			⊙		⊙	⊙	○		○				○		⊙	○	○	⊙	⊙		
	Bad acceleration, engine stalling (In addition to the causes listed here, check the ECM specifications.)	Engine stalls. Engine speed fails to increase.	⊙			⊙		⊙	⊙			○											⊙	
		Engine speed increases suddenly.	⊙			⊙		⊙	⊙	○	⊙	○	⊙										⊙	⊙
Vibration occurs and abnormal noise is produced. ● When applying brakes abruptly. ● When accelerating abruptly. ● When driving on a slippery road surface.	Brake pedal heavily vibrates when applying brakes.	○	○			○							○				⊙		○		⊙	⊙		
	Loud hydraulic unit operating noise	○	○	⊙	⊙						⊙													
	Noise is produced from front of vehicle.	○		⊙	⊙		⊙	⊙	⊙	⊙		⊙		⊙	○				⊙	○				
	Noise is produced from rear of vehicle.				⊙		⊙	⊙	⊙	⊙	⊙			○					⊙	○				

**NOTE:**  
This list includes no engine failure and transmission failure.

## **12. Phenomena Peculiar to the System**

### **1. WHEN TRAVELING WITH EXTREMELY UNDER INFLATED TIRES**

The TCS is apt to operate (particularly when turning) and, when it operates, acceleration can become slow\*. This state is not abnormal. Immediately restore the tires to normal by traveling after releasing the TCS with the TCS OFF switch.

\* Poor acceleration is sometimes caused by the engine itself. Check whether or not the TCS operating indicator light (green) comes on to determine that the failure is caused by the TCS control.

### **2. WHEN THE T TIRES ARE FITTED**

The TCS is apt to operate (particularly when turning) and, when it operates, acceleration can become slow. This state is not abnormal. Immediately restore the tires to normal by traveling after releasing the TCS with the TCS OFF switch.

### **3. WHEN OPERATING THE TCS CONTINUOUSLY ON A SLOPE IMPOSSIBLE TO CLIMB OR IN STACK STATE**

When operating the TCS for a long time, it can be automatically turned off (the OFF indicator light will come on), stopping braking. This state is not abnormal. It automatically resets by stopping and leaving the vehicle.

### **4. WHEN HEAVY LOAD IS PLACED ON THE BRAKES**

If service brakes are used too often when descending a long slope, heavy load can be placed on the brakes. To prevent this problem, the TCS is automatically turned off (the OFF indicator light will come on). This state is not abnormal. Stop the vehicle and leave it in the same way as step 3, it automatically resets.

### **5. KICKBACK TO THE BRAKE PEDAL WHEN THE ABS IS OPERATING**

Compared with ABS of the AWD model system, pedal kick-back with large amplitude of vibration and long cycle can be felt. This is caused by the difference in system configuration and, therefore, not abnormal. If you receive an inquiry from your clients, fully explain this point.

**6. INSPECTOR**

Before advancing the vehicle after the engine starts, drive the pump motor and valve for a very short time to functionally check the ABS/TCS brakes. It is not abnormal if, at this time, operating noises of the valve and motor are produced or kickback of the brake pedal is felt when stepping on the pedal.

**7. WHEN ATTACHING CHAINS**

It is sometimes a good idea to turn off the TCS for better advancing and accelerating the vehicle.

**8. WHEN A DRUM TESTER IS USED (SPEEDOMETER TEST, EXHAUST GAS TEST, BRAKE TEST, ETC.)**

Before performing tests, turn the TCS off by operating the TCS OFF switch or disconnect the fuse of ECM input power source to put the machine out of operation. If operating other parts to put the TCS in the fail state intentionally, trouble code will be recorded. Make sure to clear the memory. Also, in a 2-wheel tester, wheel speed sensor failure can be detected, making the TCS fail. This case is also not abnormal and clearing the memory is required.

## 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 [S1A2].>



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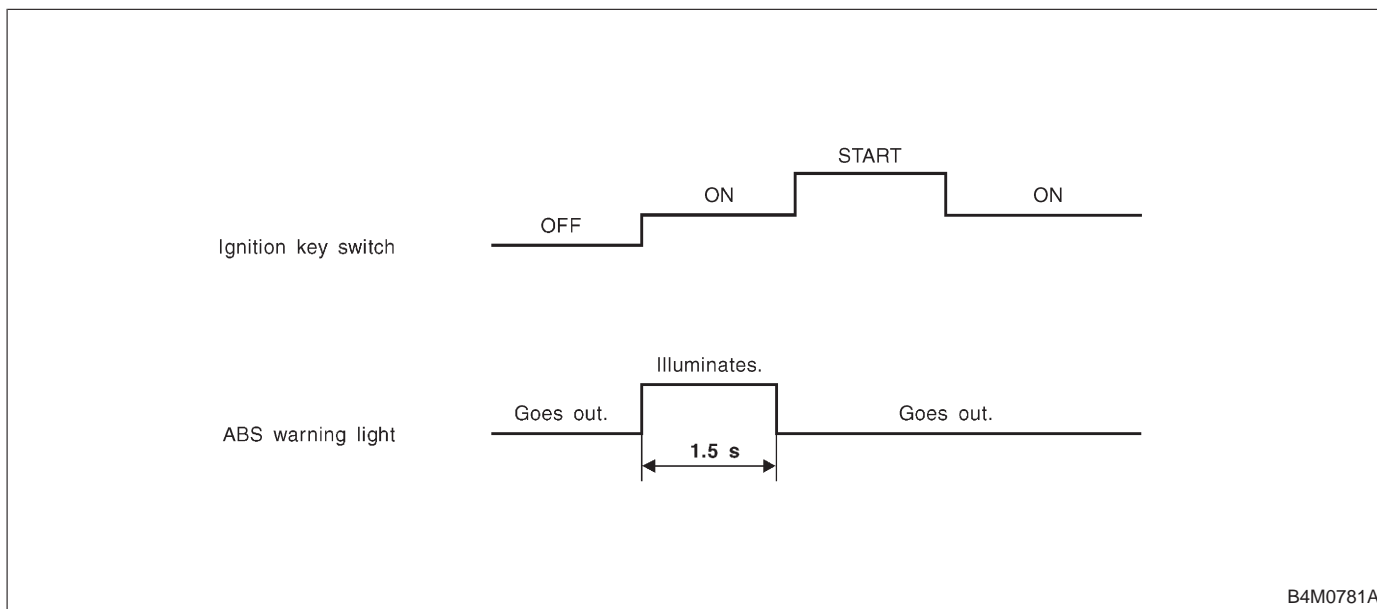
Check brake drag. <Ref. to 4-4 [K100].>

#### 4. BRAKE PAD AND ROTOR

Check brake pad and rotor. <Ref. to 4-4 [K100].>

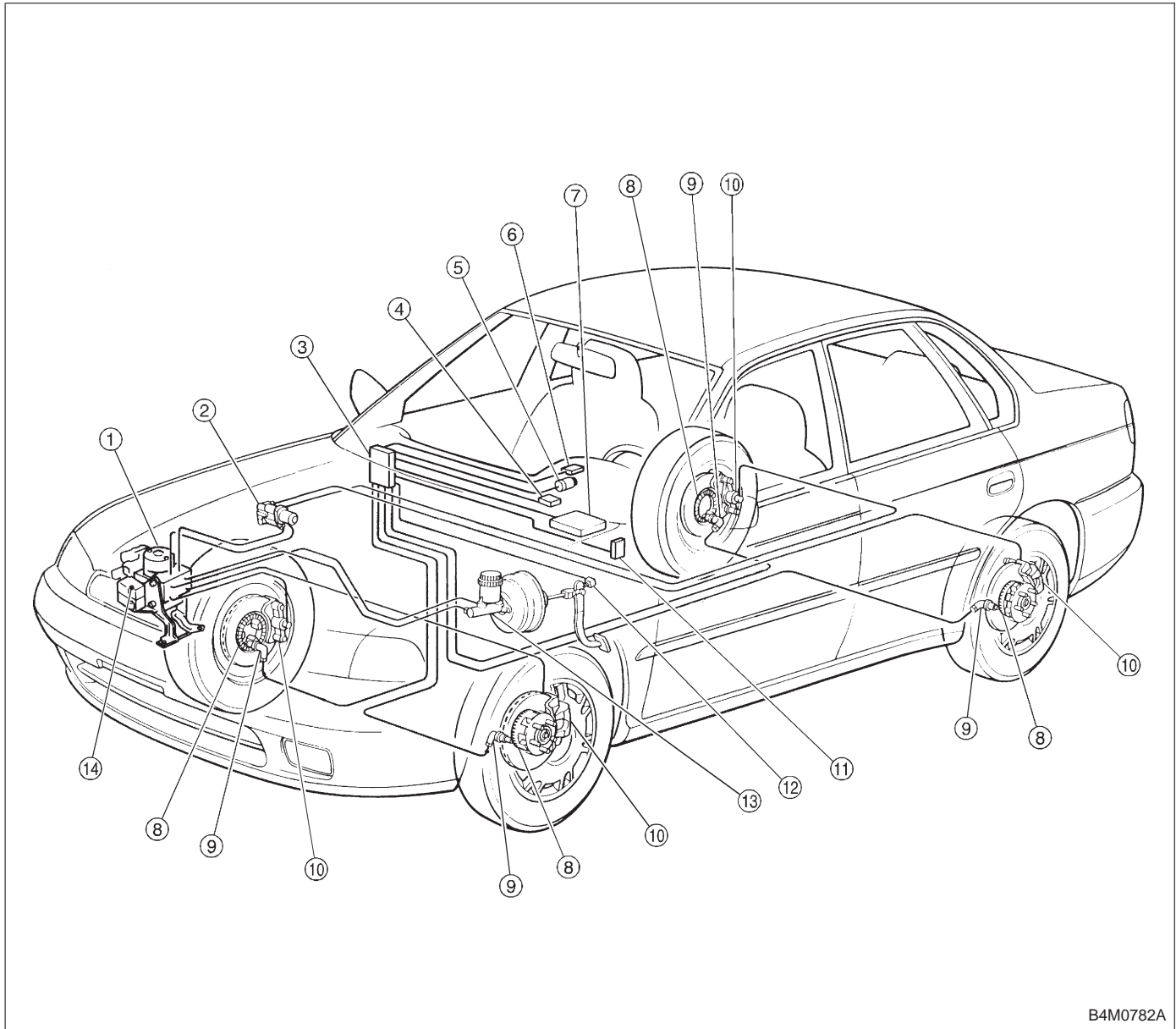
#### 5. TIRE SPECIFICATIONS, TIRE WEAR AND AIR PRESSURE

Check tire specifications, tire wear and air pressure. <Ref. to 4-2 [S1A2].>

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

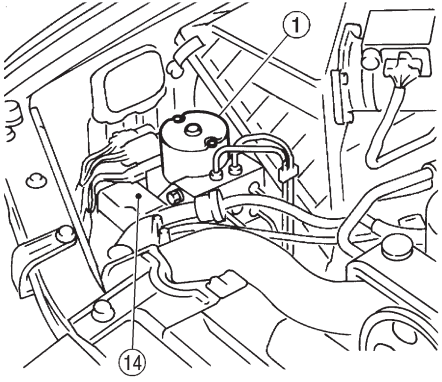
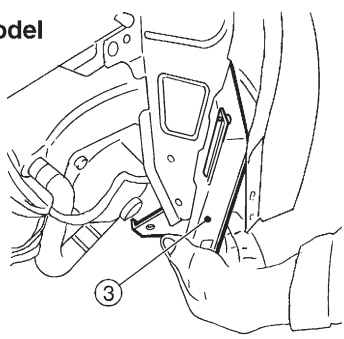
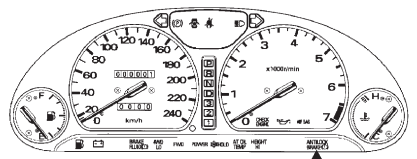
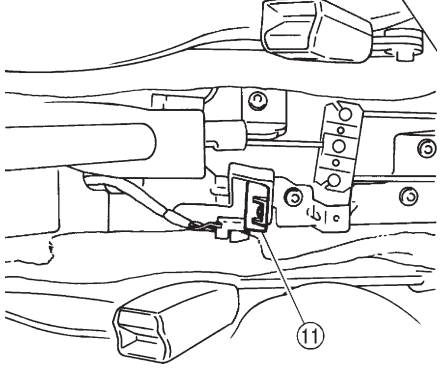
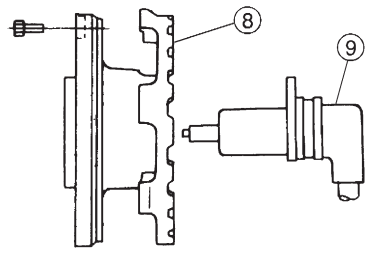
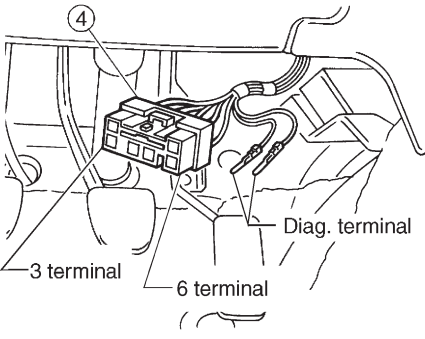
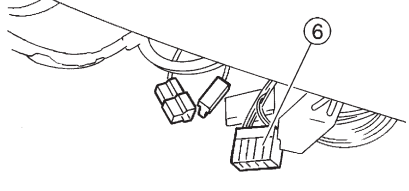
- 1) When the ABS warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
- 2) When the ABS warning light remains constantly OFF, refer to "7. Diagnostics Chart for ABS Warning Light Circuit and Diagnosis Circuit Failure" in this section, for repair. <Ref. to 4-4c [T7A0].>

3. Electrical Components Location

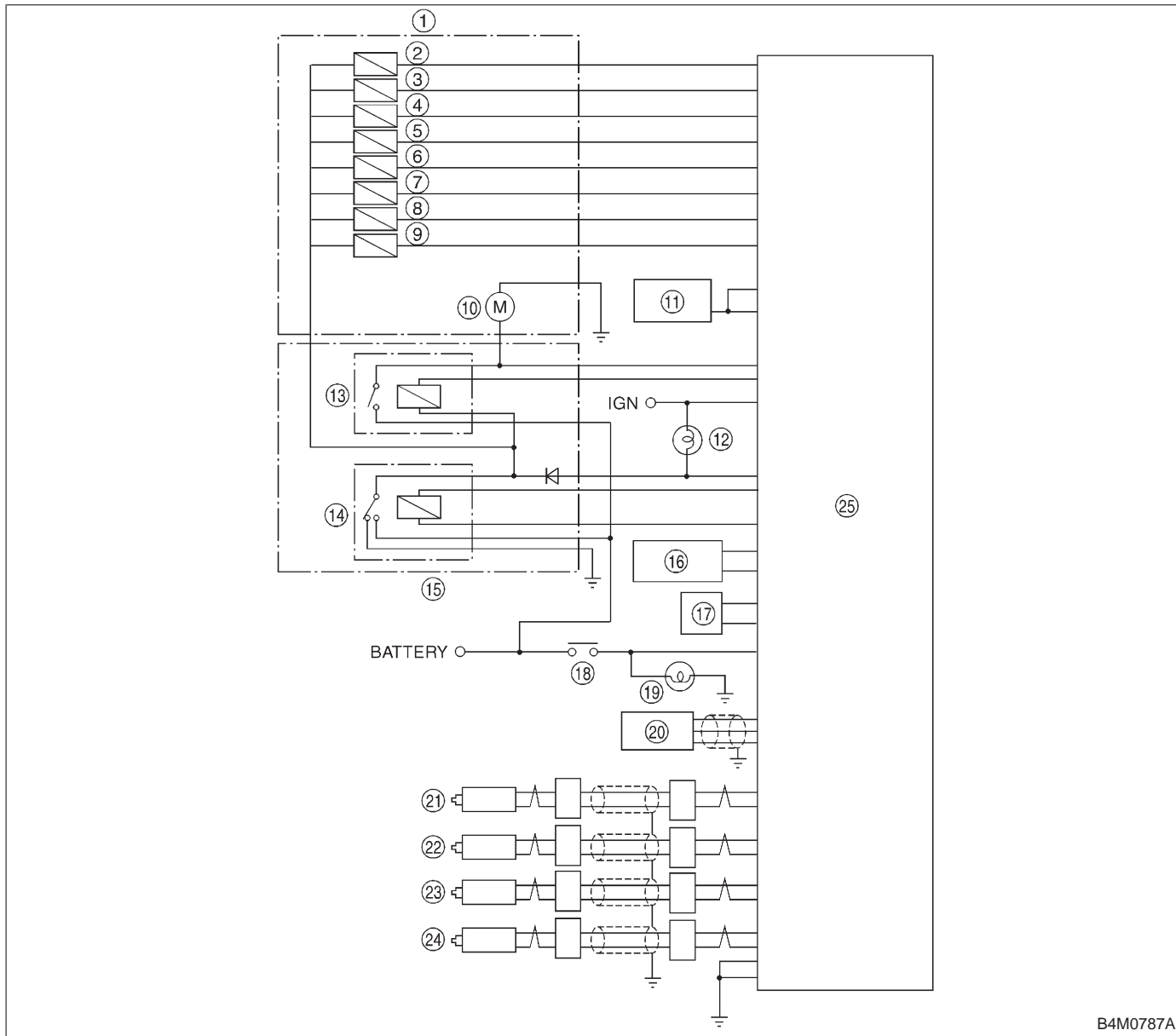


B4M0782A

- |   |                               |
|---|-------------------------------|
| ① Hydraulic control unit (H/U)                    | ⑧ Tone wheel                  |
| ② Proportioning valve                             | ⑨ ABS sensor                  |
| ③ ABS control module (ABSCM)                      | ⑩ Wheel cylinder              |
| ④ 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                   |

 <p>B4M0783A</p>	<p>LHD model</p>  <p>B4M0784A</p>	 <p>B4M0230B</p>
 <p>B4M0786A</p>	 <p>B4M0646B</p>	 <p>B4M0231B</p>
 <p>B4M0645B</p>	<p>SUBARU.</p>	

4. Schematic

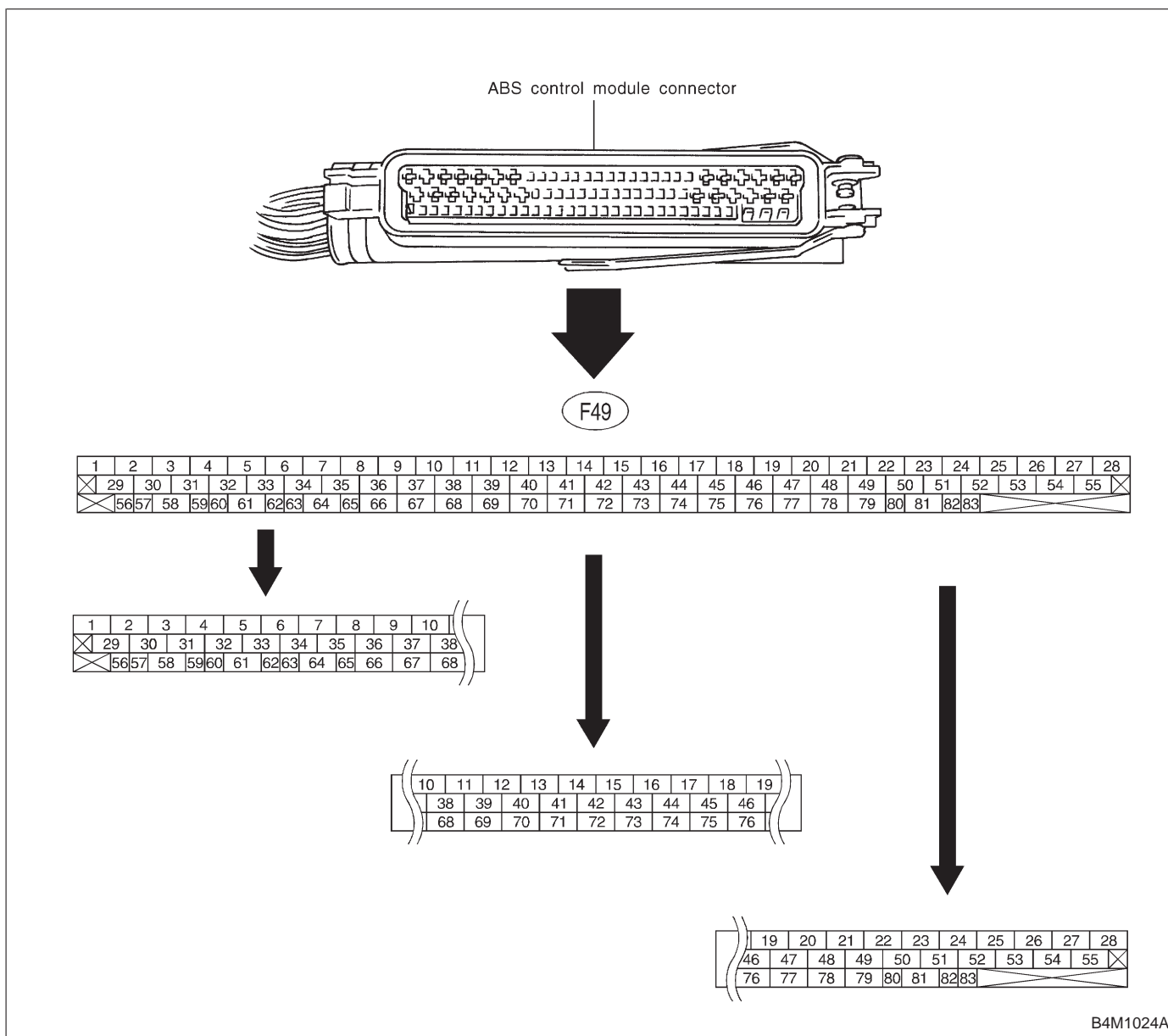


B4M0787A

- |   |                              |
|---|------------------------------|
| 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 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

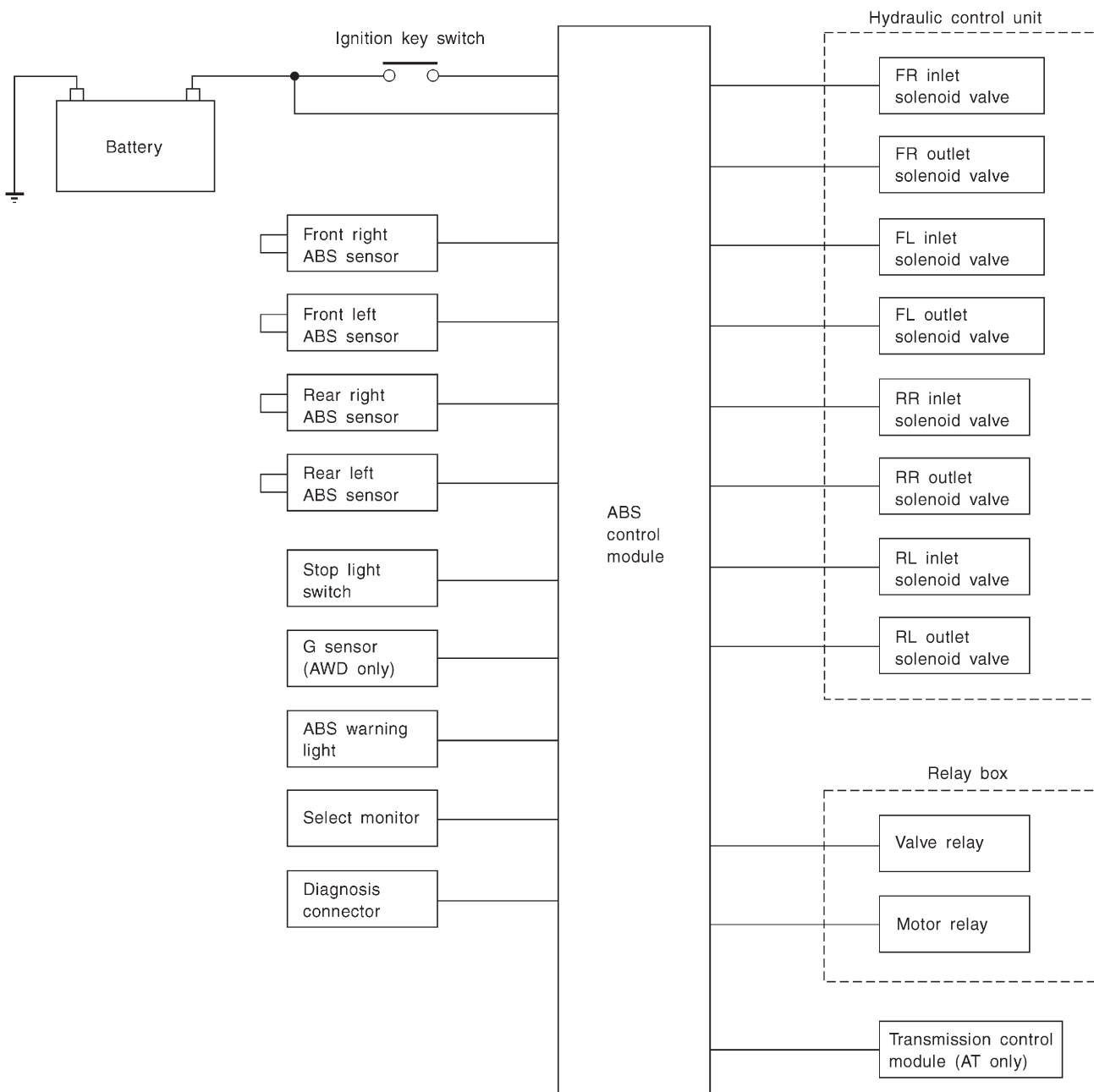


**NOTE:**

- The connector covers of LHD and RHD vehicles are in the reverse directions.
- 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	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.
Diagnosis connector	Terminal No. 3		5—1	10 — 14 V when ignition switch is ON.
	Terminal No. 6		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**

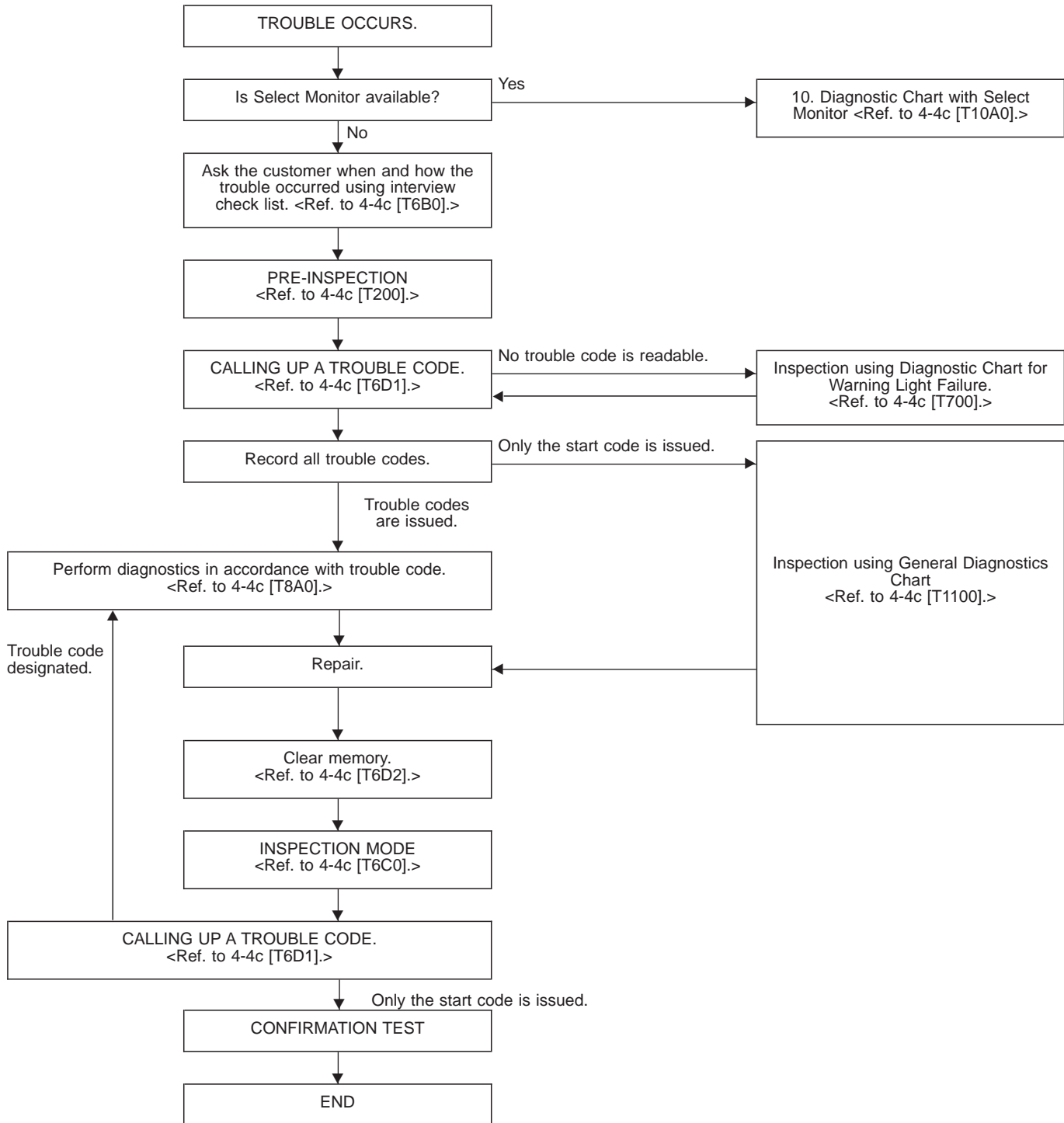


B4M0788A



## 6. Diagnostics Chart for On-board Diagnosis System

### A: BASIC DIAGNOSTICS PROCEDURE



**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 WARNING LIGHTS**

a. ABS warning light	
① Is always on. ② Sometimes comes on. ③ Comes on only once. ④ Does not come on.	
When/how long does it come on?	
Ignition key position	① Lock ② Acc ③ On (before starting engine) ④ Start ⑤ On after starting (Engine: run) ⑥ On after starting (Engine: stop)
Timing	① Immediately after ignition is on. ② Immediately after ignition starts. ③ When advancing (Speed__miles/h → __miles/h) ④ While traveling at a constant speed (Speed__miles/h) ⑤ When decelerating (Speed__miles/h → __miles/h) ⑥ When turning (To right, to left, steering angle__deg., steering time__sec) ⑦ When moving other electrical parts (Part name:____, Operating condition_____)

**2. SYMPTOMS**

ABS operating condition	① Performs no work. ② Operates only when abruptly applying brakes. (Conditions: vehicle speed__miles/h, how to step on brake pedal__) ③ Operating time (__sec., etc._____) ④ Operating noise (Produced/Not produced) ⑤ What kind of noise? (Knock, gong gong, bong, buzz, gong gong buzz, etc._____) ⑥ Reaction force of brake pedal (Stick, pressed down once with a clunk, pressed and released, etc._____)
Behavior of vehicle	① Directional stability cannot be obtained or steering arm refuses to work when applying brakes (vehicle turns to right, turns to left, spins, etc._____) . ② Directional stability cannot be obtained or steering arm refuses to work when accelerating (vehicle turns to right, turns to left, spins, etc._____) . ③ Brakes are out of order (braking distance is long, brakes lock or drag, pedal stroke is long, pedal sticks, etc. _____) . ④ Poor acceleration (fails to accelerate, engine stalls, etc._____) . ⑤ Vibration, abnormal noise (operating noise is loud, noise is produced during operation from the front of vehicle (right, left) (tones:____), noise is produced during operation from the rear of vehicle (tones:____, others _____) ) ⑥ Other phenomena (concrete symptoms_____)

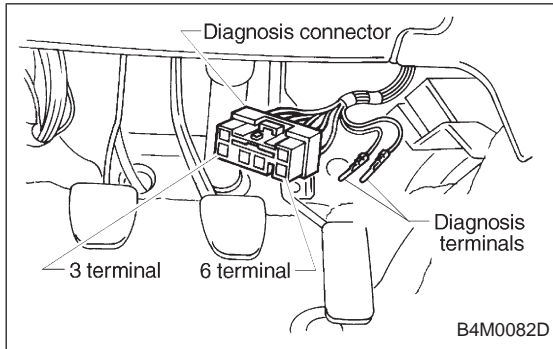
**3. CONDITIONS UNDER WHICH TROUBLE OCCURS**

Environment	① Weather (fine, cloudy, rain, snow, etc. ____) ② Ambient temperature (____°C/°F) ③ Road (urban area, suburbs, highway, general road, ascending slope, descending slope, paved road, gravel road, muddy road, sandy place, etc. ____) ④ Road surface (dry, wet, new-fallen snow, compressed snow, frozen slope, etc._____)
Conditions	① Brakes (deceleration__g, continuous/intermittent) ② Accelerator (acceleration__g, continuous/intermittent) ③ Travel speed (__miles, advancing, accelerating, reducing speed, low speed, turning, etc._____) ④ Condition of tire of each wheel (air pressure____, degree of wear____, whether or not genuine parts are used, whether or not chain is passed around tires, whether or not T tire is used.) others (_____) ⑤ Condition of suspension alignment (_____) ⑥ Loading state (_____)

**4. REPAIRED PARTS ARE USED OR NOT**

**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**

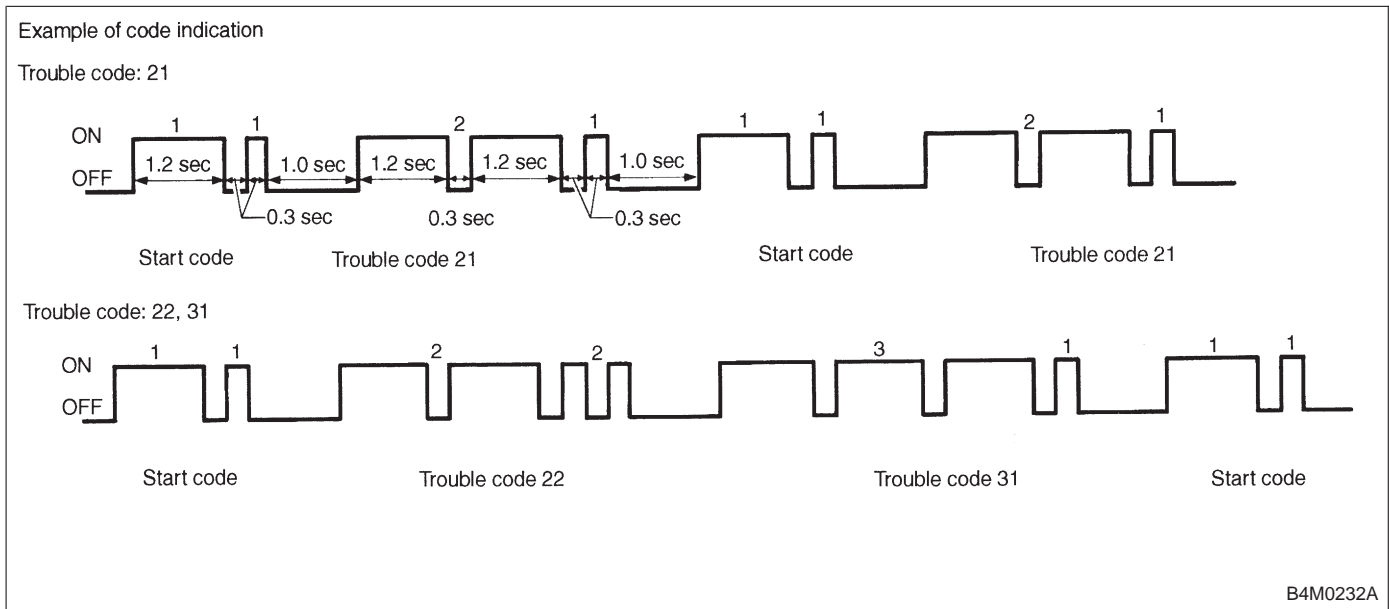
When on-board diagnosis of the ABS control module detects a problem, the information (up to a maximum of three) will be stored in the EEP ROM as a trouble code. When there are more than three, the most recent three will be stored. (Stored codes will stay in memory until they are cleared.)

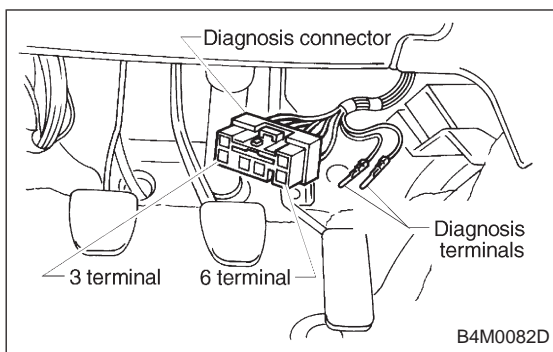
**1. CALLING UP A TROUBLE CODE**

- 1) Take out diagnosis connector from side of driver's seat heater unit.
- 2) Turn ignition switch OFF.
- 3) Connect diagnosis connector terminal 6 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:**

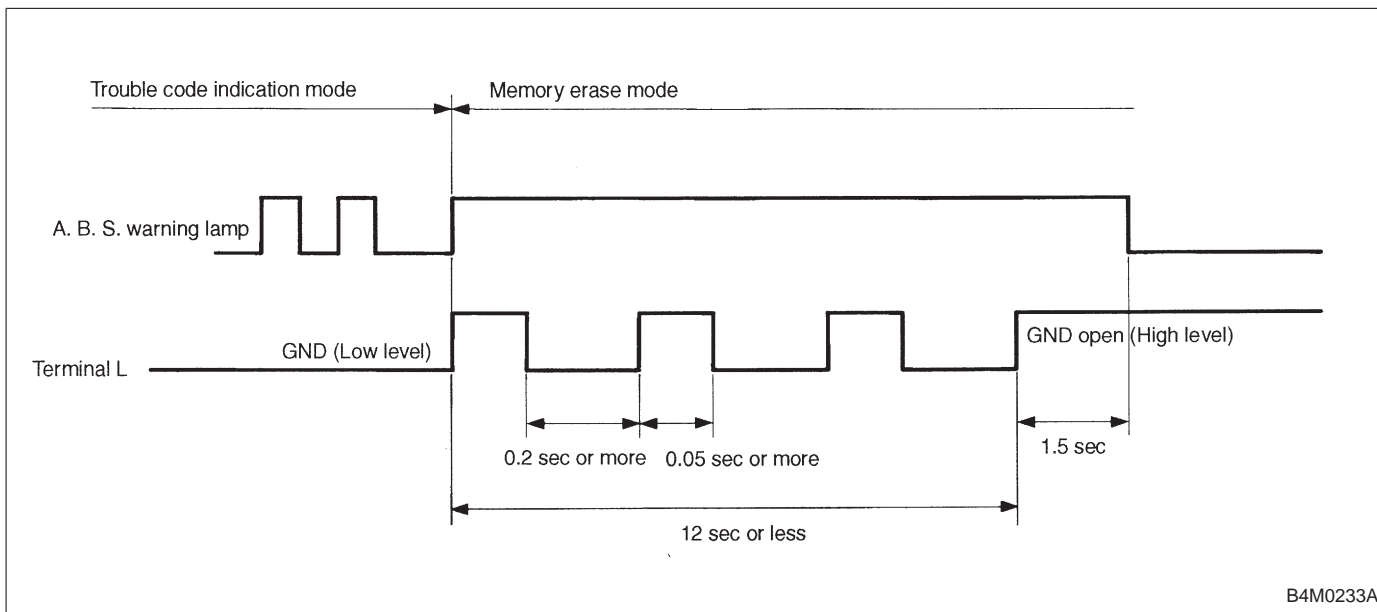
When there are no trouble codes in memory, only the start code (11) is shown.





**2. CLEARING MEMORY**

- 1) After calling up a trouble code, disconnect diagnosis connector terminal 6 from diagnosis terminal.
- 2) Repeat 3 times within approx. 12 seconds; connecting and disconnecting terminal 6 and diagnosis terminal for at least 0.05 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

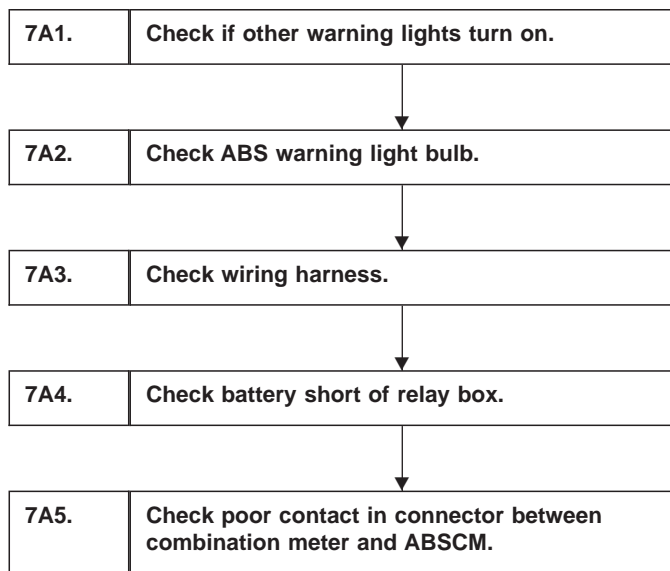
**A: ABS WARNING LIGHT DOES NOT COME ON.**

**DIAGNOSIS:**

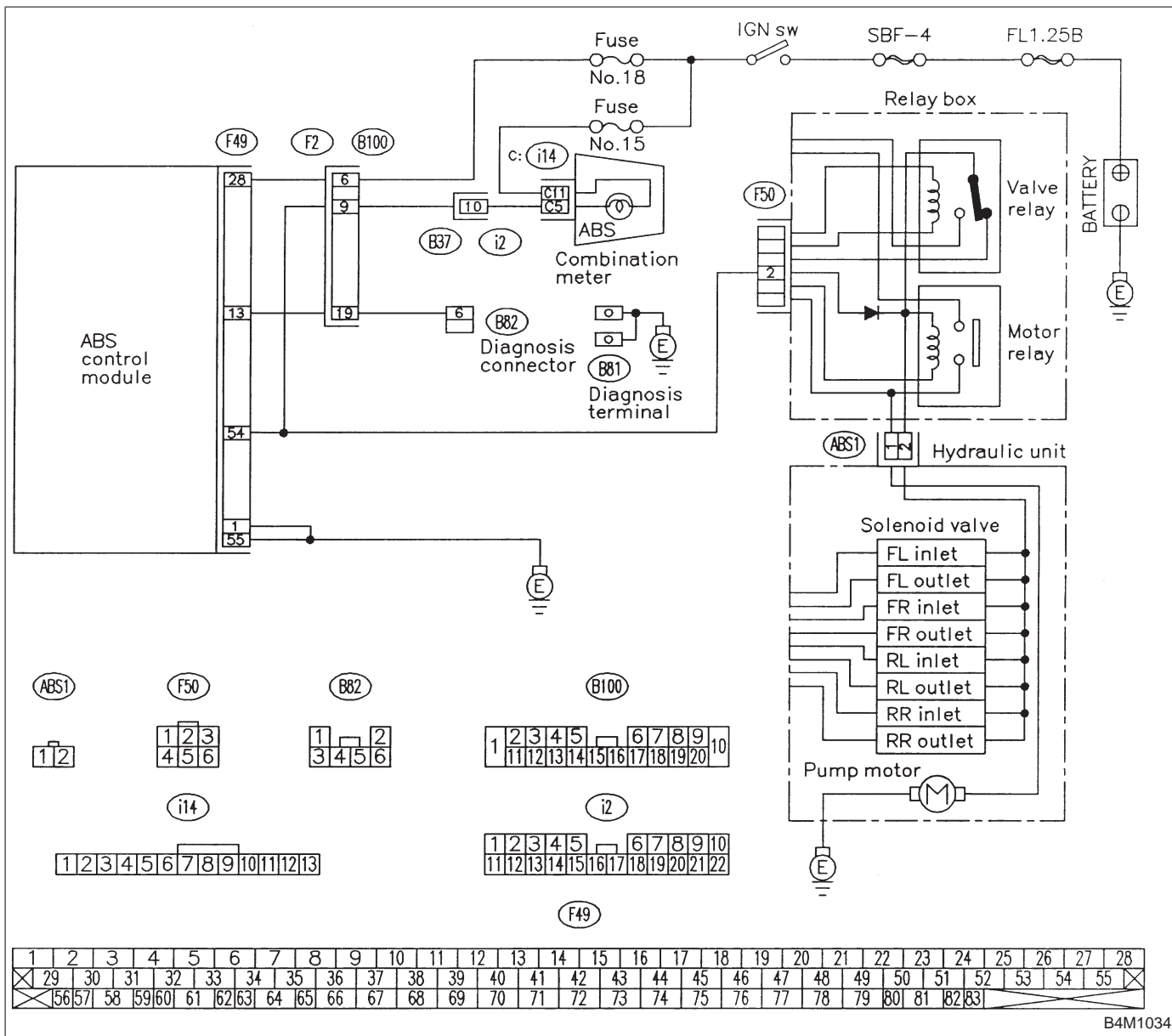
- ABS warning light circuit is open or shorted.

**TROUBLE SYMPTOM:**

- When ignition switch is turned ON (engine OFF), ABS warning light does not come on.



**WIRING DIAGRAM:**



B4M1034

**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.

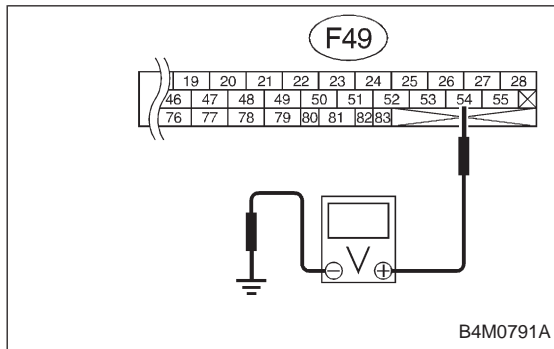
**7A2 CHECK ABS WARNING LIGHT BULB.**

- 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.

**CHECK** : **Connector & terminal (F49) No. 54 (+) — Chassis ground (-): Is voltage 12 V?**

**YES** : Go to next step.

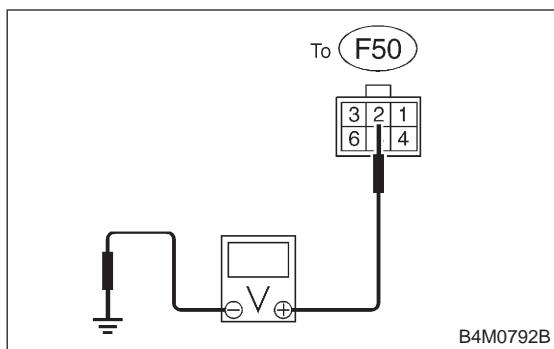
**NO** : Repair broken wire in harness or connector.

- 5) Turn ignition switch to OFF.
- 6) Measure voltage between ABSCM connector (F49) and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 54 (+) — Chassis ground (-): Is voltage less than 3 V?**

**YES** : Go to step **7A4**.

**NO** : Repair battery short of harness.

**7A4****CHECK BATTERY SHORT OF RELAY BOX.**

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

**CHECK** : **Connector & terminal**  
**To (F50) No. 2 (+) — Chassis ground (-):**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Replace relay box.

- 4) Turn ignition switch OFF.
- 5) Measure voltage between relay box and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F50) No. 2 (+) — Chassis ground (-):**  
**Is voltage 0 V?**

**YES** : Go to step **7A5**.

**NO** : Replace relay box.

**7A5****CHECK POOR CONTACT IN CONNECTOR BETWEEN COMBINATION METER AND ABSCM.**

**CHECK** : **Is there poor contact in connectors between combination meter and ABSCM?**

**YES** : Repair connector.

**NO** : Replace ABSCM.

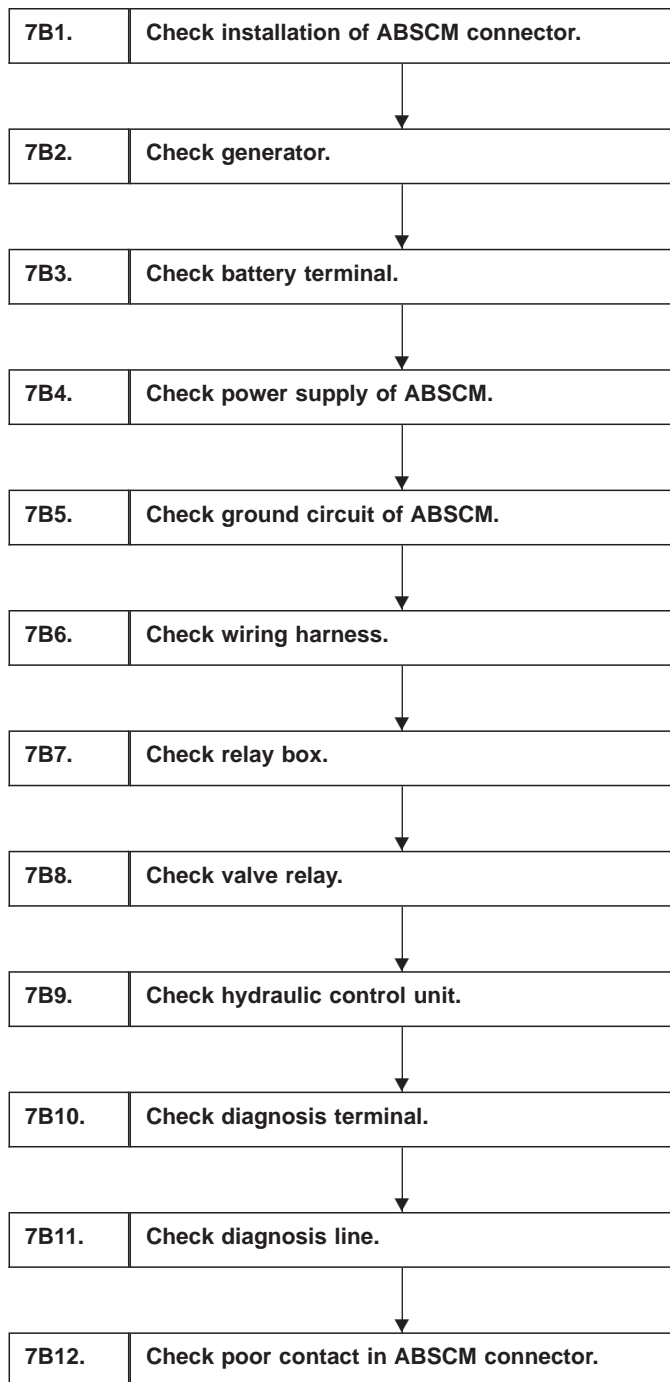


**B: ABS WARNING LIGHT DOES NOT GO OFF.****DIAGNOSIS:**

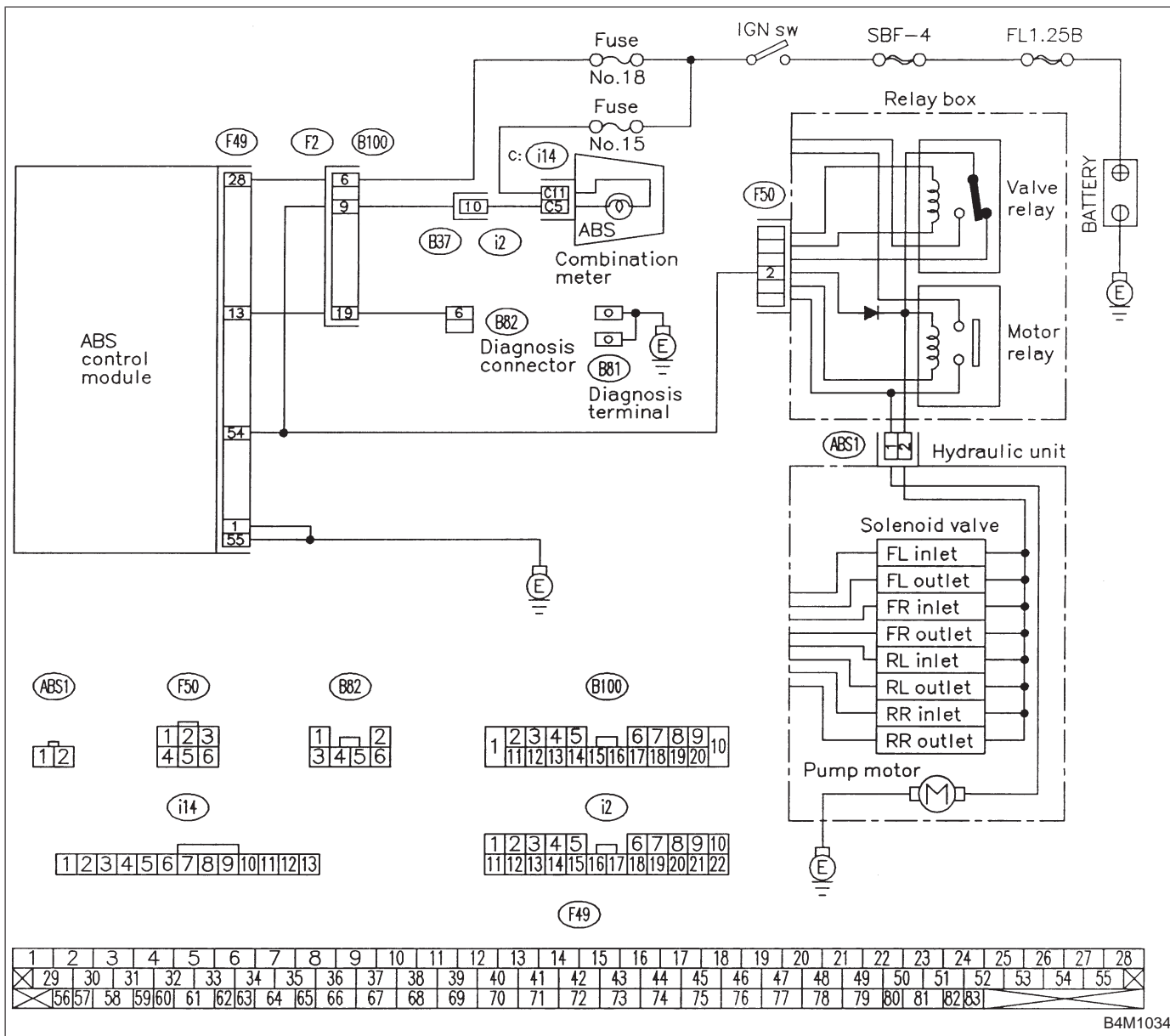
- ABS warning light circuit is open or shorted.

**TROUBLE SYMPTOM:**

- When starting the engine and while ABS warning light is kept ON.



**WIRING DIAGRAM:**



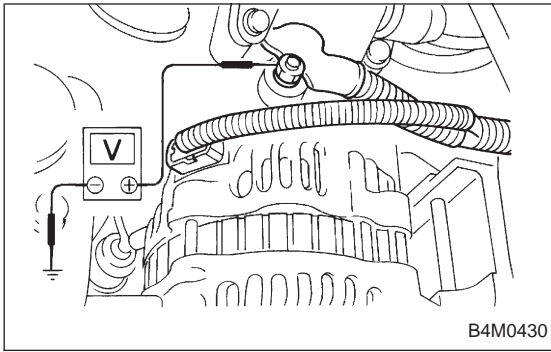
**7B1 CHECK INSTALLATION OF ABSCM CONNECTOR.**

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.

**CHECK** : *Terminal Generator B terminal (+) — Chassis ground (-): Is voltage 10 — 15 V?*

**YES** : Go to step 7B3.

**NO** : Repair generator.

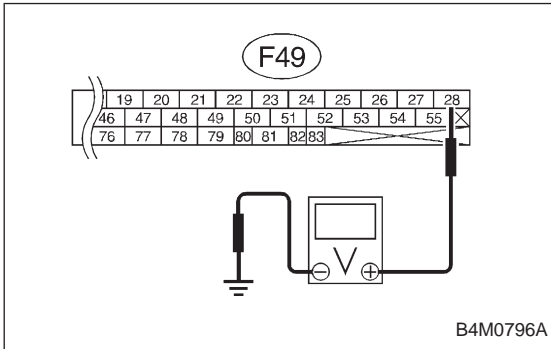
**7B3 CHECK BATTERY TERMINAL.**

Turn ignition switch to OFF.

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

**YES** : Repair battery terminal.

**NO** : Go to step 7B4.



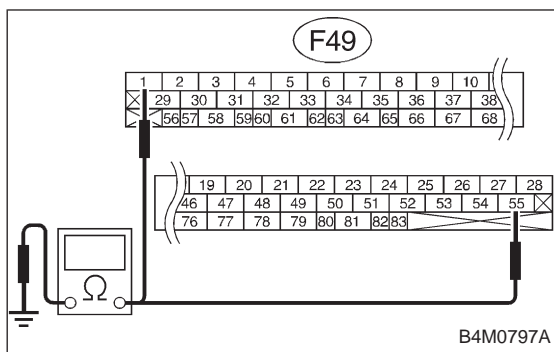
**7B4 CHECK POWER SUPPLY OF ABSCM.**

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

**CHECK** : *Connector & terminal (F49) No. 28 (+) — Chassis ground (-): Is voltage 10 — 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.

**CHECK** : **Connector & terminal**  
**(F49) No. 1 — Chassis ground:**  
**(F49) No. 55 — Chassis ground:**  
**Is resistance less than 0.5 Ω?**

- YES** : Go to step 7B6.  
**NO** : Repair ABSCm ground harness.

**7B6 CHECK WIRING HARNESS.**

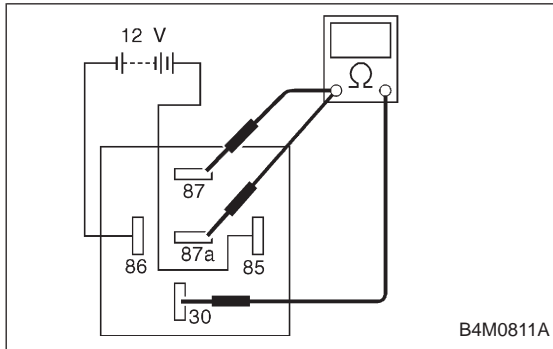
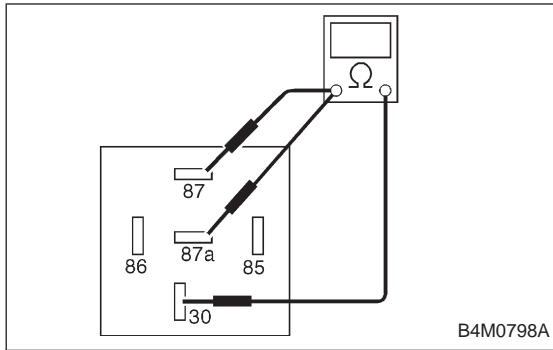
- 1) Disconnect connector (F50) from relay box.
- 2) Turn ignition switch to ON.

**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.



<b>7B8</b>	<b>CHECK VALVE RELAY.</b>
------------	---------------------------

1) Measure resistance between valve relay terminal and terminal.

**CHECK** : **Terminals**  
**No. 30 — No. 87:**  
*Is resistance more than 1 MΩ?*  
**No. 30 — No. 87a:**  
*Is resistance less than 0.5 Ω?*

**YES** : Go to next step.

**NO** : Replace valve relay.

2) Connect battery to valve relay terminal No. 85 and No. 86.

3) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 30 — No. 87:**  
*Is resistance less than 0.5 Ω?*  
**No. 30 — No. 87a:**  
*Is resistance more than 1 MΩ?*

**YES** : Go to step 7B9.

**NO** : Replace valve relay.

<b>7B9</b>	<b>CHECK HYDRAULIC CONTROL UNIT.</b>
------------	--------------------------------------

1) Turn ignition switch to OFF.

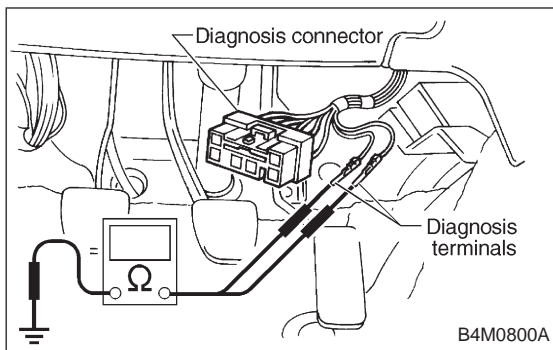
2) Connect connector (ABS1) to hydraulic control unit.

3) Turn ignition switch to ON.

**CHECK** : *Is the ABS warning light off?*

**YES** : Go to step 7B10.

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

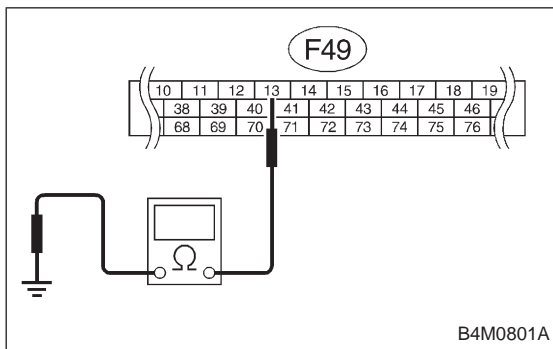


**7B10 CHECK DIAGNOSIS TERMINAL.**

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

**CHECK** : *Terminals*  
**Diagnosis terminal (A) — Chassis ground:**  
**Diagnosis terminal (B) — Chassis ground:**  
**Is the resistance less than 1 Ω?**

**YES** : Go to step 7B11.  
**NO** : Repair diagnosis terminal harness.



**7B11 CHECK DIAGNOSIS LINE.**

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Connector & terminal*  
**(F49) No. 13 — Chassis ground:**  
**Is the resistance less than 1 Ω?**

**YES** : Go to step 7B12.  
**NO** : Repair harness connector between ABSCM and diagnosis connector.

**7B12 CHECK POOR CONTACT IN ABSCM CONNECTOR.**

**CHECK** : *Is there poor contact in ABSCM connector?*

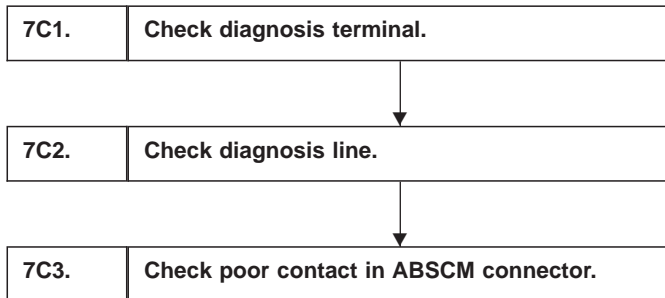
**YES** : Repair connector.  
**NO** : Replace ABSCM.

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

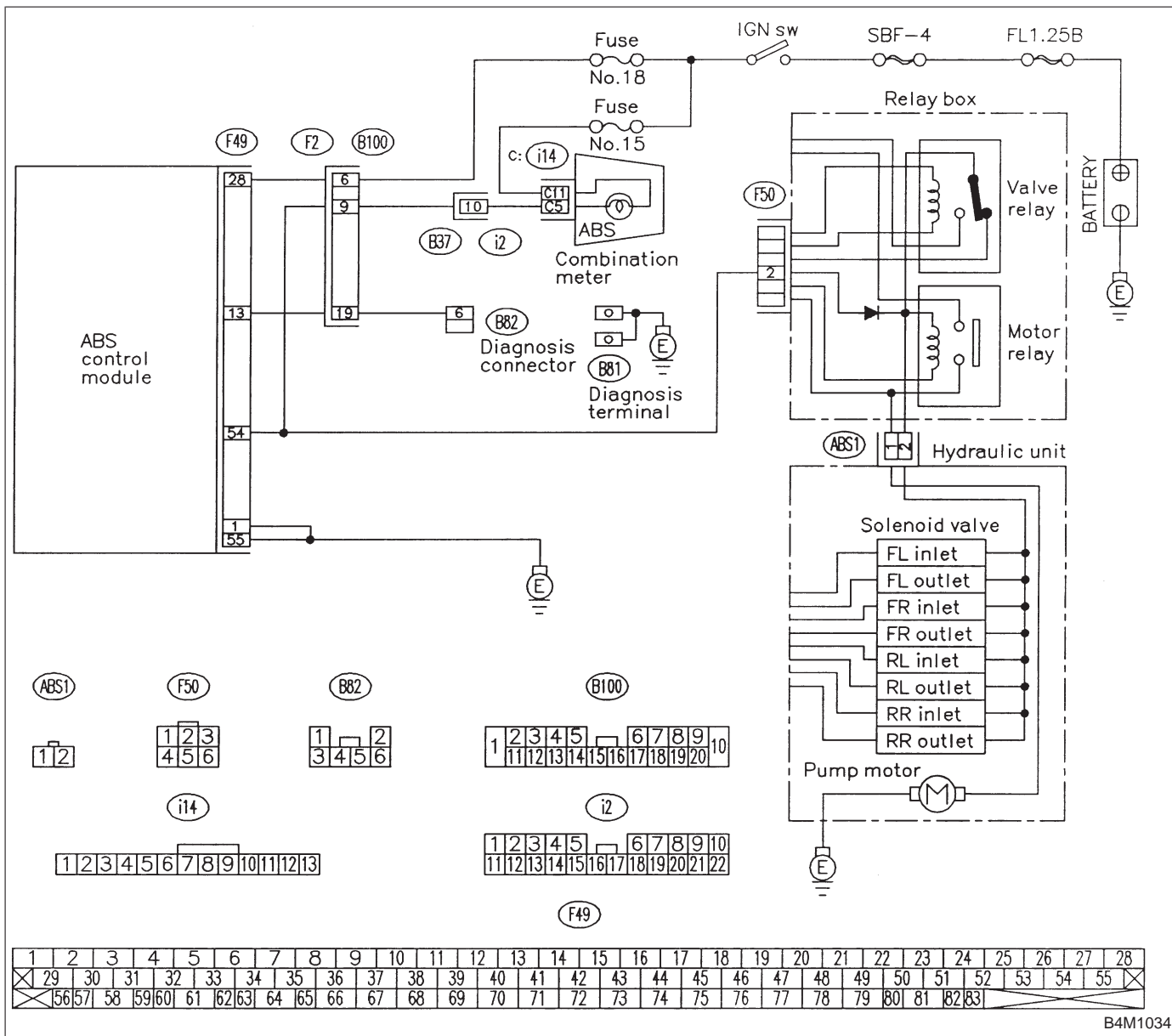
- Diagnosis circuit is open.

**TROUBLE SYMPTOM:**

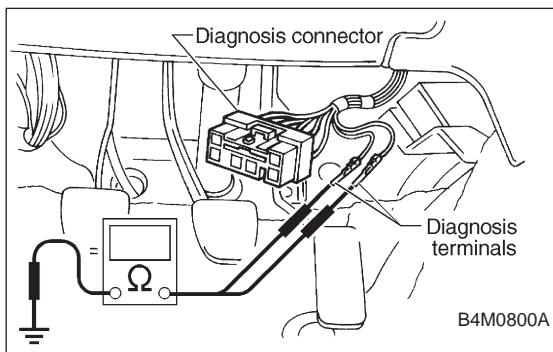
- The ABS warning light turns on or off normally but the start code cannot be read out in the diagnostic mode.



**WIRING DIAGRAM:**



B4M1034



**7C1 CHECK DIAGNOSIS TERMINAL.**

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

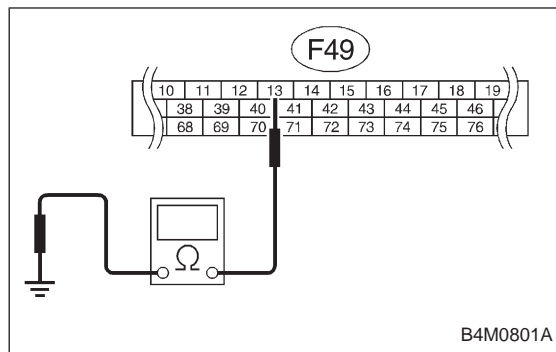
- CHECK** : **Terminals**  
**Diagnosis terminal (A) — Chassis ground:**  
**Diagnosis terminal (B) — Chassis ground:**  
**Is the resistance less than 0.5 Ω?**
- YES** : Go to step 7C2.  
**NO** : Repair diagnosis terminal harness.



## 4-4c

## BRAKES [ABS 5.3 TYPE]

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



**7C2**

**CHECK DIAGNOSIS LINE.**

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal to diagnosis connector (B82) No. 6.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 13 — Chassis ground:**  
**Is the resistance less than 0.5  $\Omega$ ?**

**YES** : Go to step 7C3.

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

**7C3**

**CHECK POOR CONTACT IN ABSCM CONNECTOR.**

**CHECK** : **Is there poor contact in ABSCM connector?**

**YES** : Repair connector.

**NO** : Replace ABSCM.

## 8. Diagnostics Chart with Trouble Code

## A: LIST OF TROUBLE CODE

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

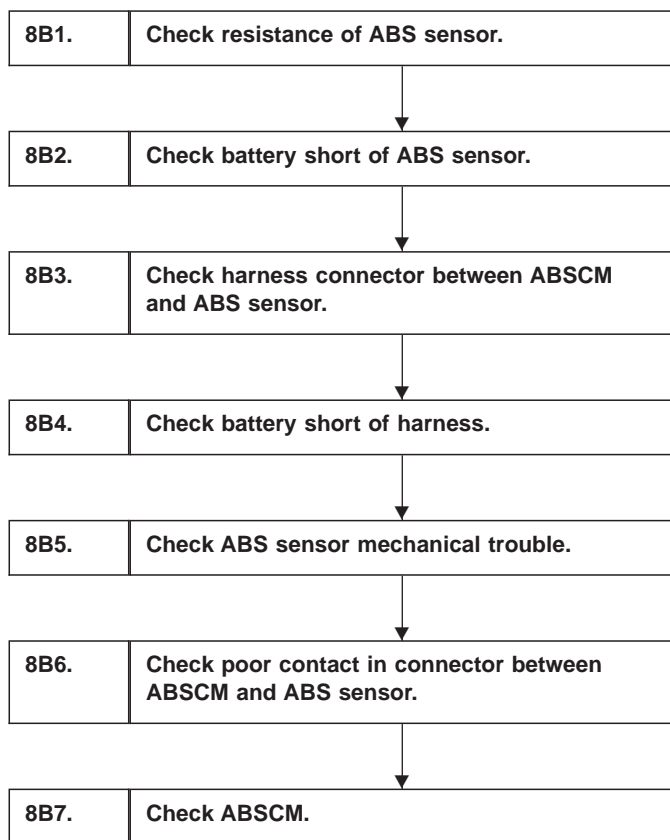
**B: TROUBLE CODE 21 (FRONT RH)  
TROUBLE CODE 23 (FRONT LH)  
TROUBLE CODE 25 (REAR RH)  
TROUBLE CODE 27 (REAR LH)  
— ABNORMAL ABS SENSOR (OPEN CIRCUIT  
OR INPUT VOLTAGE TOO HIGH) —**

**DIAGNOSIS:**

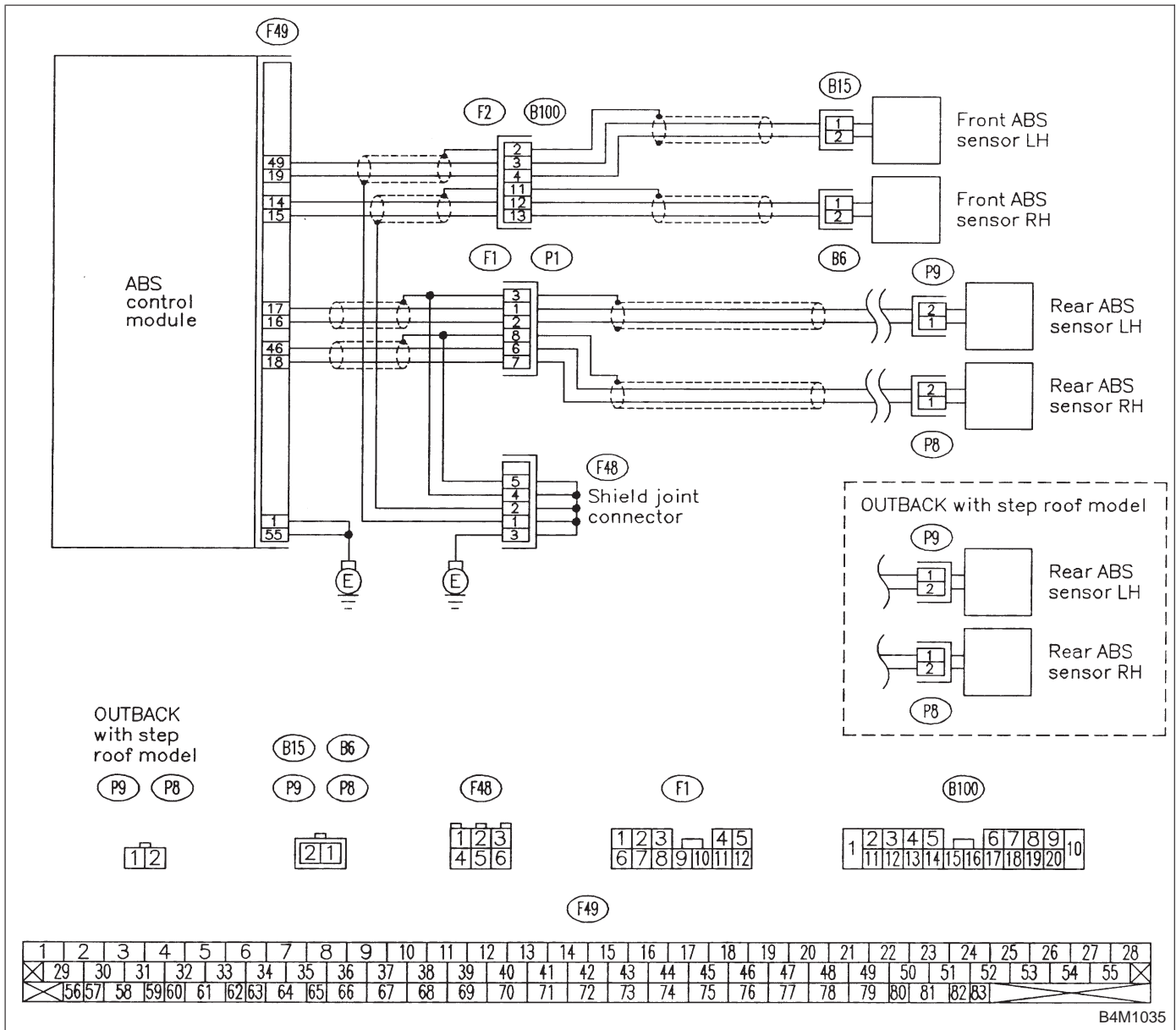
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

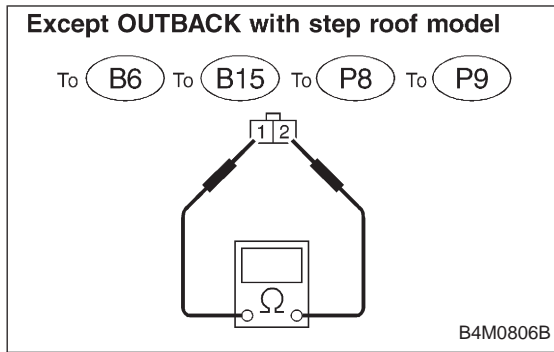
**TROUBLE SYMPTOM:**

- ABS does not operate.



**WIRING DIAGRAM:**





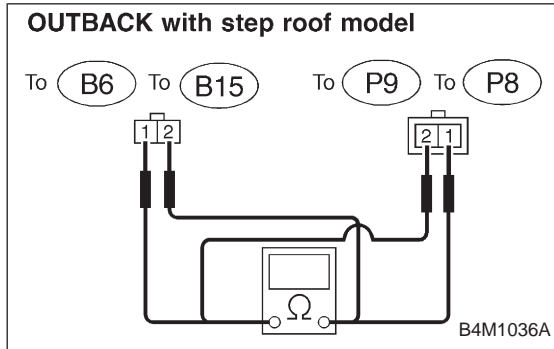
**8B1 CHECK RESISTANCE OF ABS SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance of ABS sensor connector terminals.

**CHECK** : *Trouble code/Connector & terminal*  
 21/to (B6) No. 1 — No. 2  
 23/to (B15) No. 1 — No. 2  
 25/to (P8) No. 1 — No. 2  
 27/to (P9) No. 1 — No. 2  
*Is resistance 0.8 — 1.2 kΩ?*

**YES** : Go to step 8B2.

**NO** : Replace ABS sensor.



**8B2 CHECK BATTERY SHORT OF ABS SENSOR.**

- 1) Disconnect connector from ABSCM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ABS sensor and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 21/to (B6) No. 1 (+) — Chassis ground (-)  
 23/to (B15) No. 1 (+) — Chassis ground (-)  
 25/to (P8) No. 1 (+) — Chassis ground (-)  
 27/to (P9) No. 1 (+) — Chassis ground (-)  
*Is voltage 0 V?*

**YES** : Go to next step.

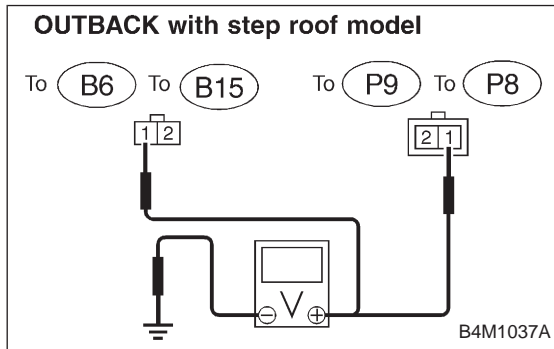
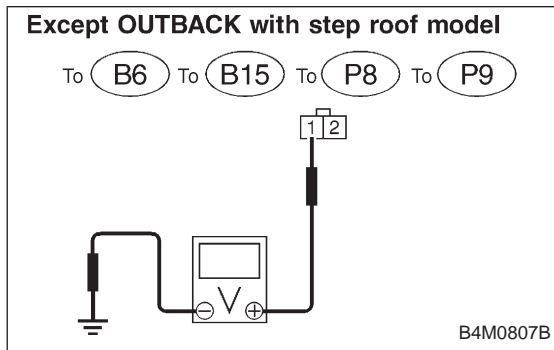
**NO** : Replace ABS sensor.

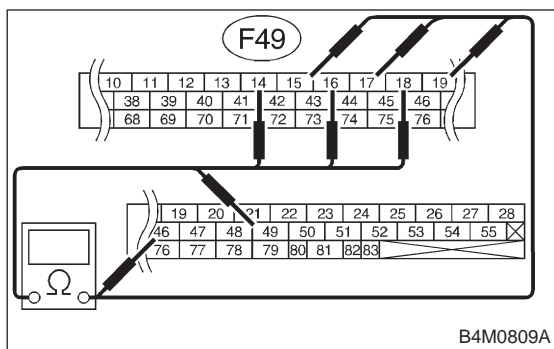
- 4) Turn ignition switch to OFF.
- 5) Measure voltage between ABS sensor and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 21/to (B6) No. 1 (+) — Chassis ground (-)  
 23/to (B15) No. 1 (+) — Chassis ground (-)  
 25/to (P8) No. 1 (+) — Chassis ground (-)  
 27/to (P9) No. 1 (+) — Chassis ground (-)  
*Is voltage 0 V?*

**YES** : Go to step 8B3.

**NO** : Replace ABS sensor.



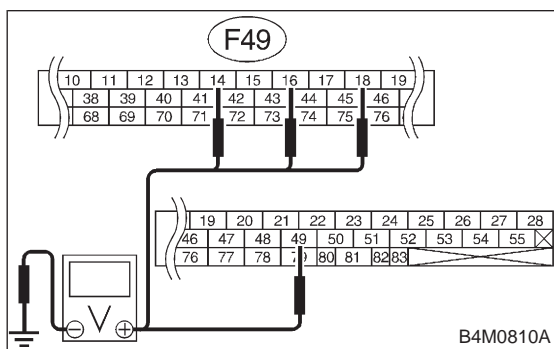
**8B3****CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

- 1) Connect connector to ABS sensor.
- 2) Measure resistance between ABSCM connector terminals.

**CHECK** : *Trouble code/Connector & terminal*  
**21/(F49) No. 14 — No. 15**  
**23/(F49) No. 49 — No. 19**  
**25/(F49) No. 18 — No. 46**  
**27/(F49) No. 16 — No. 17**  
*Is resistance 0.8 — 1.2 kΩ?*

**YES** : Go to step **8B4**.

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

**8B4****CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**21/(F49) No. 14 (+) — Chassis ground (-)**  
**23/(F49) No. 49 (+) — Chassis ground (-)**  
**25/(F49) No. 18 (+) — Chassis ground (-)**  
**27/(F49) No. 16 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to next step.

**NO** : Repair harness between ABSCM and ABS sensor.

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

**CHECK** : *Trouble code/Connector & terminal*  
**21/(F49) No. 14 (+) — Chassis ground (-)**  
**23/(F49) No. 49 (+) — Chassis ground (-)**  
**25/(F49) No. 18 (+) — Chassis ground (-)**  
**27/(F49) No. 16 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to step **8B5**.

**NO** : Repair harness between ABSCM and ABS sensor.

<b>8B5</b>	<b>CHECK ABS SENSOR MECHANICAL TROUBLE.</b>
------------	---

**CHECK** : **Tightening torque:**  
 **$32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )**  
**Are the ABS sensor installation bolts tightened securely?**

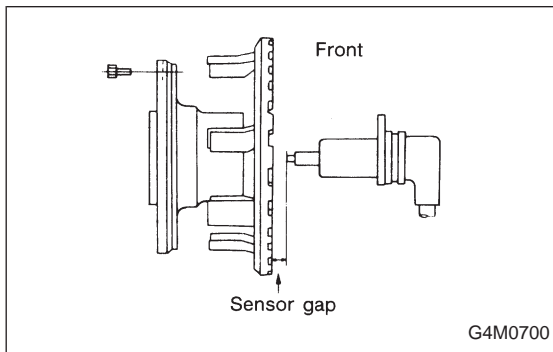
**YES** : Go to next **CHECK** .

**NO** : Tighten ABS sensor installation bolts securely.

**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 next step.

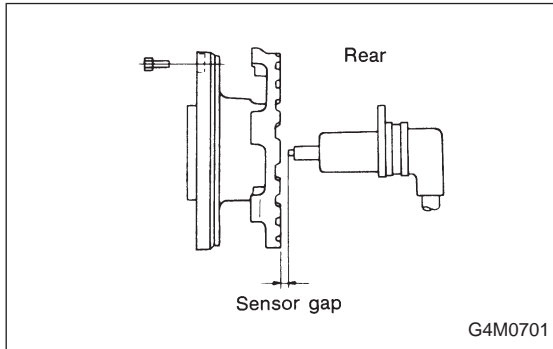
**NO** : Tighten tone wheel installation bolts securely.



1) 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?**

Specifications	Front wheel	Rear wheel
	0.9 — 1.4 mm (0.035 — 0.055 in)	0.7 — 1.2 mm (0.028 — 0.047 in)



**YES** : Go to next step.

**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.

2) Measure hub runout.

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

**YES** : Go to step **8B6**.

**NO** : Repair hub.

<b>8B6</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.</b>
------------	--

**CHECK** : *Is there poor contact in connectors between ABSCM and ABS sensor?*

**YES** : Repair connector.

**NO** : Go to step **8B7**.

<b>8B7</b>	<b>CHECK ABSCM.</b>
------------	---------------------

- 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 next **CHECK** .

**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.



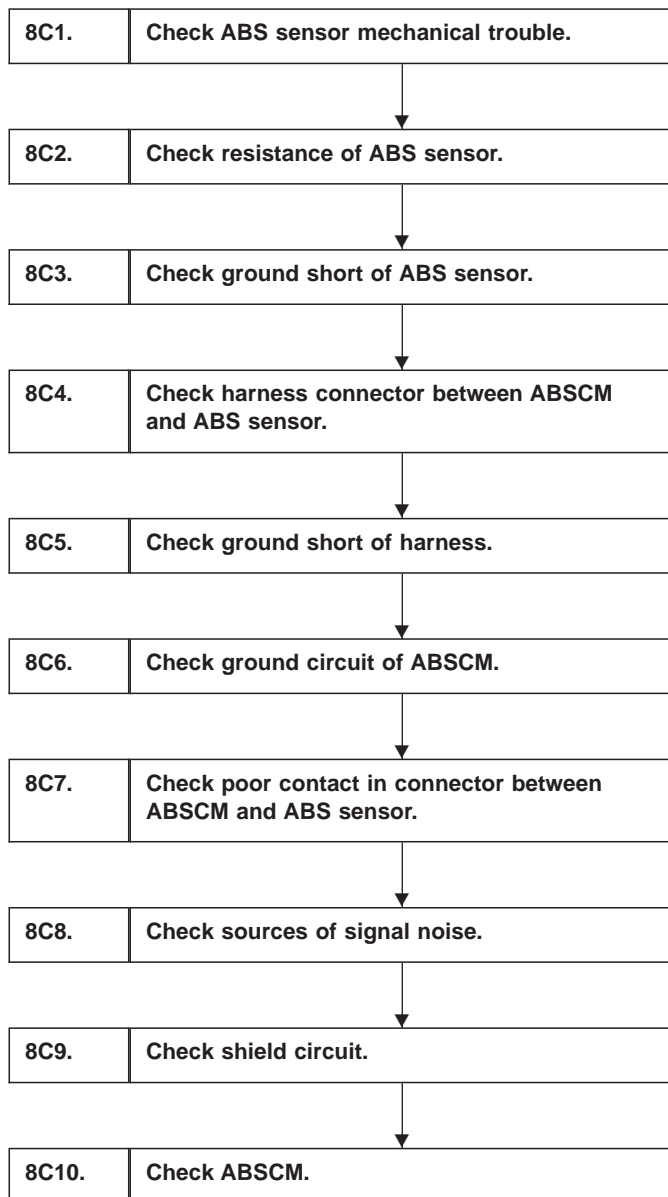
**C: TROUBLE CODE 22 (FRONT RH)  
TROUBLE CODE 24 (FRONT LH)  
TROUBLE CODE 26 (REAR RH)  
TROUBLE CODE 28 (REAR LH)  
— ABNORMAL ABS SENSOR (ABNORMAL  
ABS SENSOR SIGNAL) —**

**DIAGNOSIS:**

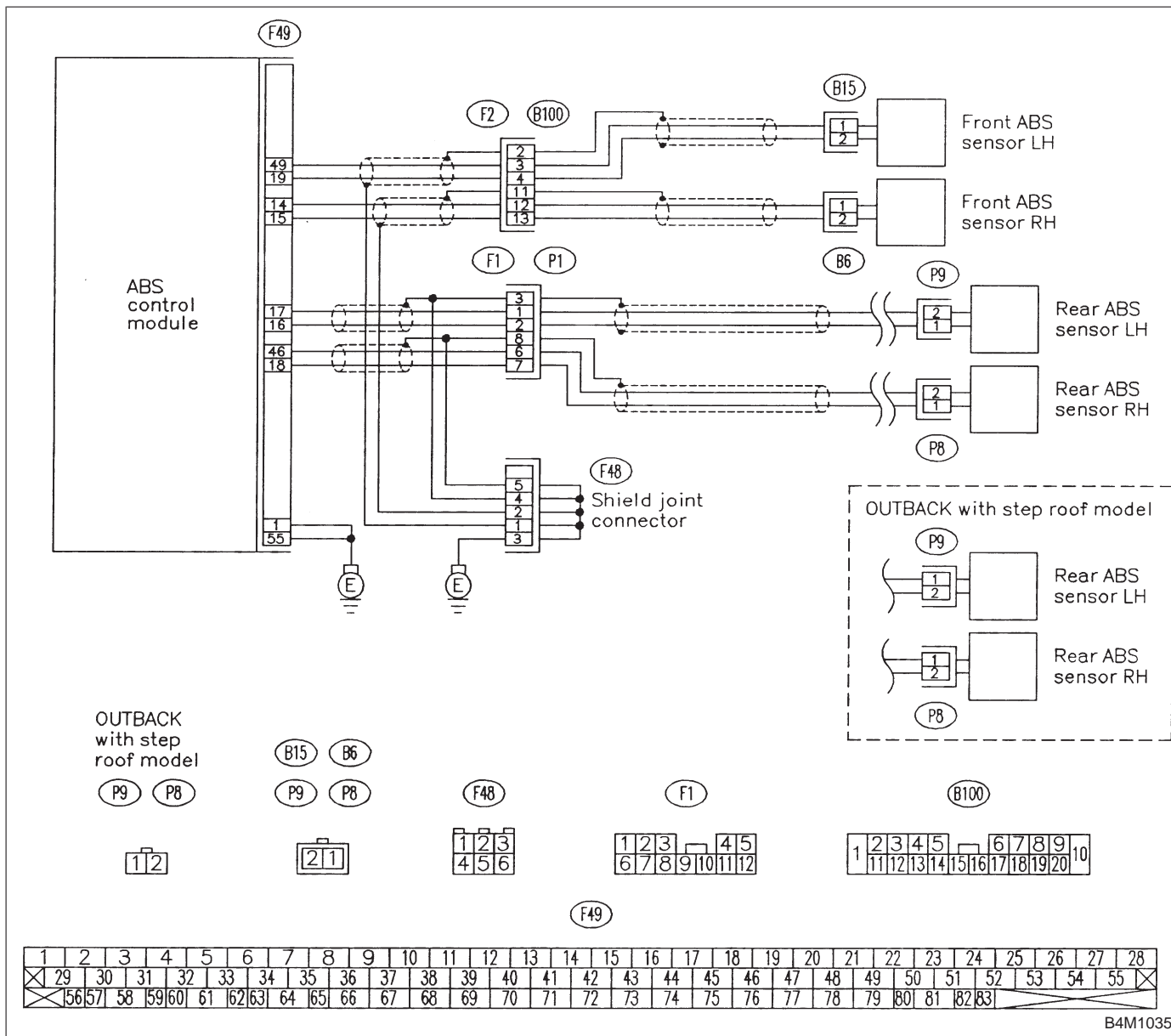
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS does not operate.

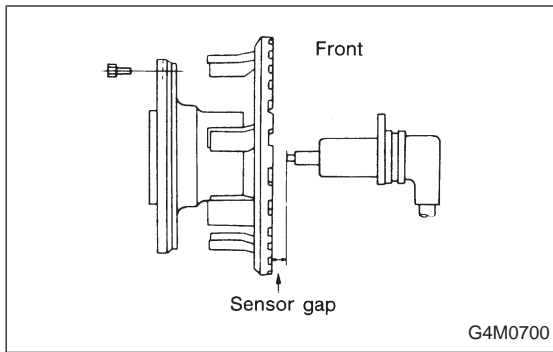


**WIRING DIAGRAM:**



**8C1 CHECK ABS SENSOR MECHANICAL TROUBLE.**

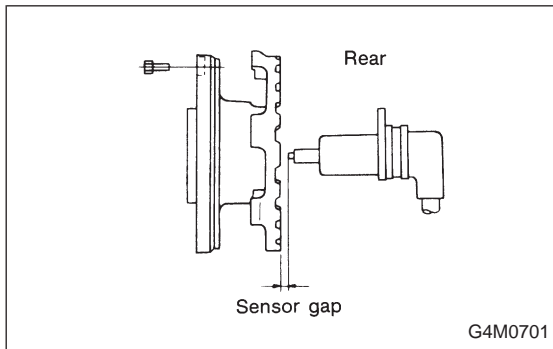
- CHECK** : **Tightening torque:**  
 $32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )  
**Are the ABS sensor installation bolts tightened securely?**
- YES** : Go to next **CHECK** .
- NO** : Tighten ABS sensor installation bolts securely.
- 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 next step.
- NO** : Tighten tone wheel installation bolts securely.



1) 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 next **CHECK** .

**NO** : Adjust the gap.

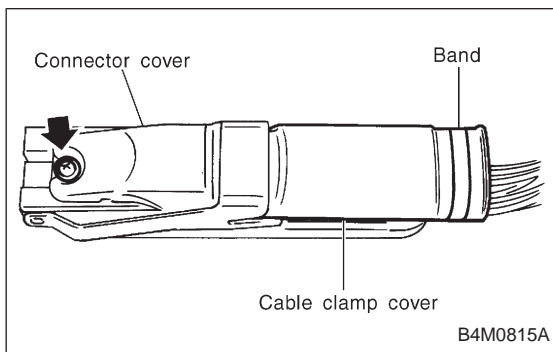
**NOTE:**

Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

**CHECK** : *Is an oscilloscope available?*

**YES** : Go to next step.

**NO** : Go to step 13).



2) Raise all four wheels of ground.

3) Turn ignition switch OFF.

4) Disconnect connector from ABS control module.

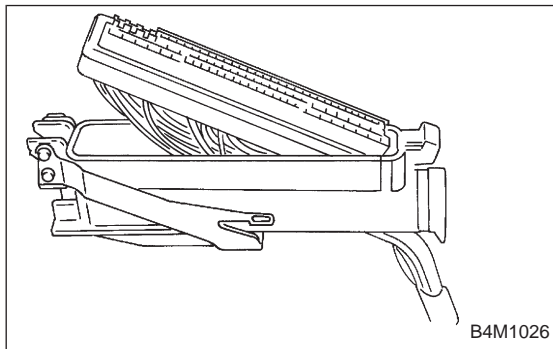
5) Remove band.

6) Remove cable clamp cover.

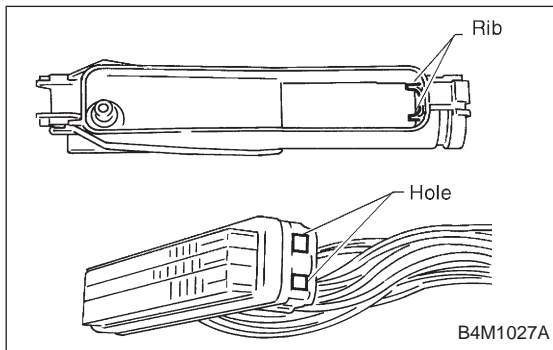
7) Remove screws securing connector cover.

**CAUTION:**

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



8) Remove connector cover.

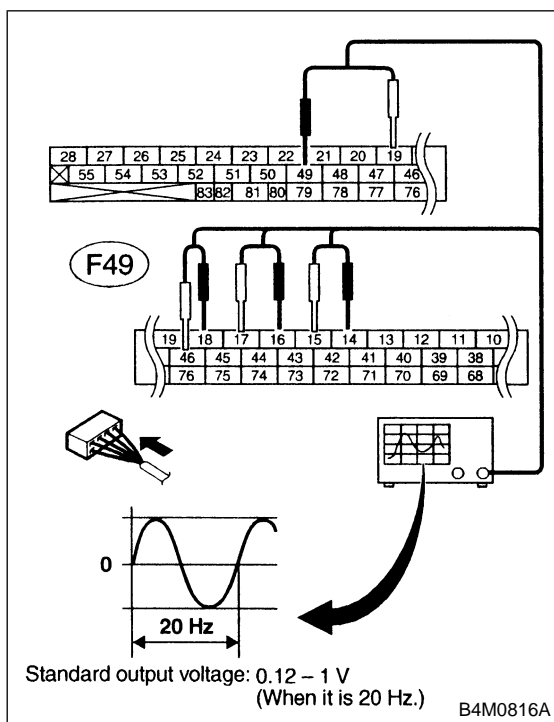


**NOTE:**

- To install, reverse above removal procedures.

- Align connector cover rib with connector hole before installation.

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



- 12) Rotate wheels and measure voltage at specified frequency.

NOTE:

When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

**TROUBLE CODE / Connector & terminal:**

**22 / (F49) No. 14 (+) — No. 15 (-)**

**24 / (F49) No. 49 (+) — No. 19 (-)**

**26 / (F49) No. 18 (+) — No. 46 (-)**

**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 8C2.

**NO** : Go to next step.

- 13) Remove disc rotor 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 next **CHECK** .

**CHECK** : Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?

**YES** : Replace ABS sensor or tone wheel.

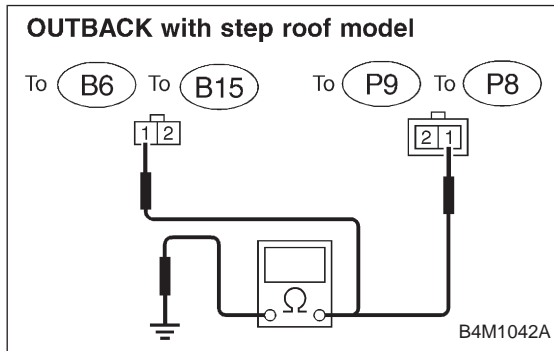
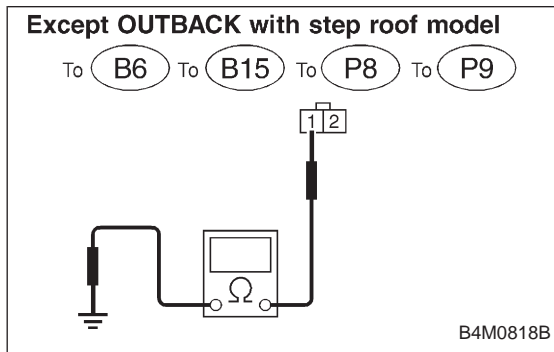
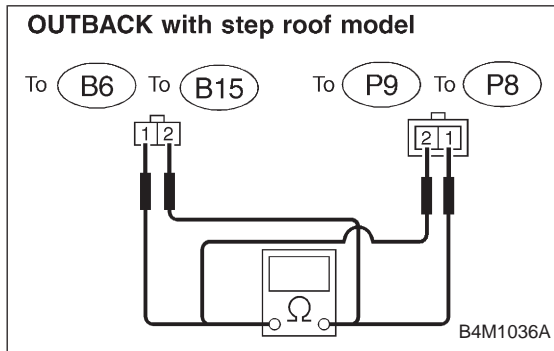
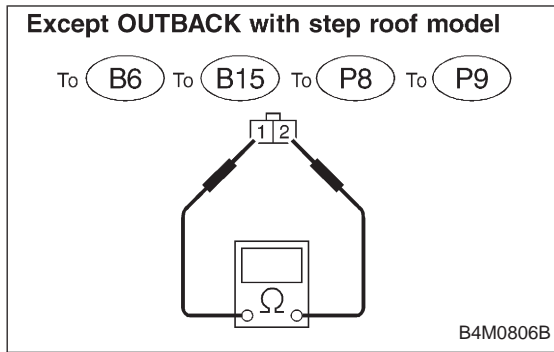
**NO** : Go to next step.

- 14) Measure hub runout.

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

**YES** : Go to step 8C2.

**NO** : Repair hub.



**8C2 CHECK RESISTANCE OF ABS SENSOR.**

- 1) Turn ignition switch OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance between ABS sensor connector terminals.

**CHECK** : *Trouble code/Connector & terminal*  
 22/to (B6) No. 1 — No. 2  
 24/to (B15) No. 1 — No. 2  
 26/to (P8) No. 1 — No. 2  
 28/to (P9) No. 1 — No. 2  
*Is resistance 0.8 — 1.2 kΩ?*

**YES** : Go to step 8C3.

**NO** : Replace ABS sensor.

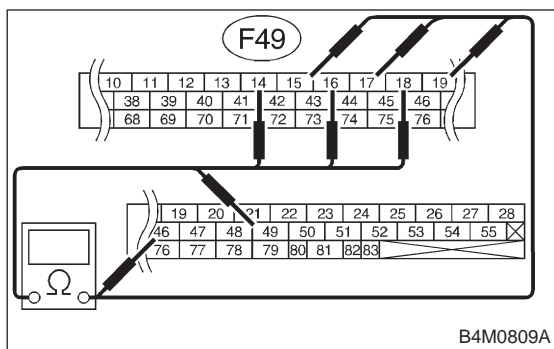
**8C3 CHECK GROUND SHORT OF ABS SENSOR.**

Measure resistance between ABS sensor and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 22/to (B6) No. 1 — Chassis ground  
 24/to (B15) No. 1 — Chassis ground  
 26/to (P8) No. 1 — Chassis ground  
 28/to (P9) No. 1 — Chassis ground  
*Is resistance more than 1 MΩ?*

**YES** : Go to step 8C4.

**NO** : Replace ABS sensor.

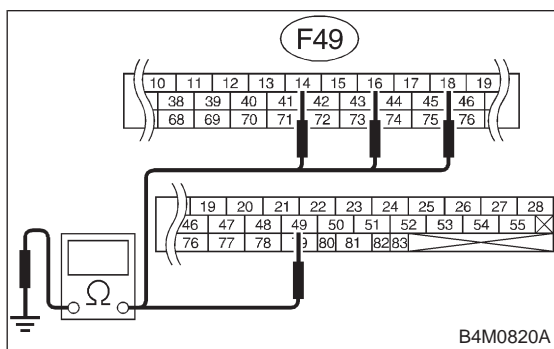
**8C4****CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**22/(F49) No. 14 — No. 15**  
**24/(F49) No. 49 — No. 19**  
**26/(F49) No. 18 — No. 46**  
**28/(F49) No. 16 — No. 17**  
*Is resistance 0.8 — 1.2 kΩ?*

**YES** : Go to step **8C5**.

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

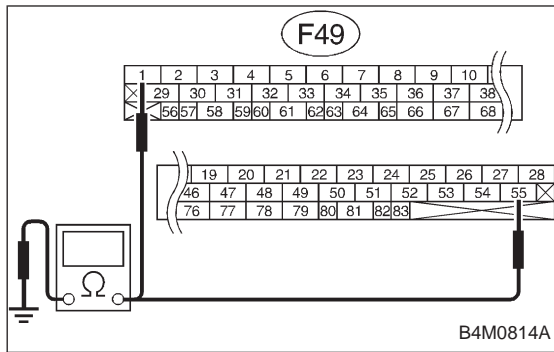
**8C5****CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**22/(F49) No. 14 — Chassis ground**  
**24/(F49) No. 49 — Chassis ground**  
**26/(F49) No. 18 — Chassis ground**  
**28/(F49) No. 16 — Chassis ground**  
*Is resistance more than 1 MΩ?*

**YES** : Go to step **8C6**.

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

**8C6 CHECK GROUND CIRCUIT OF ABSCM.**

Measure resistance between ABSCM and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 1 — GND (F49) No. 55 — GND**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8C7**.

**NO** : Repair ABSCM ground harness.

**8C7 CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

**CHECK** : **Is there poor contact in connectors between ABSCM and ABS sensor?**

**YES** : Repair connector.

**NO** : Go to step **8C8**.

**8C8 CHECK SOURCES OF SIGNAL NOISE.**

**CHECK** : **Is the car telephone or the wireless transmitter properly installed?**

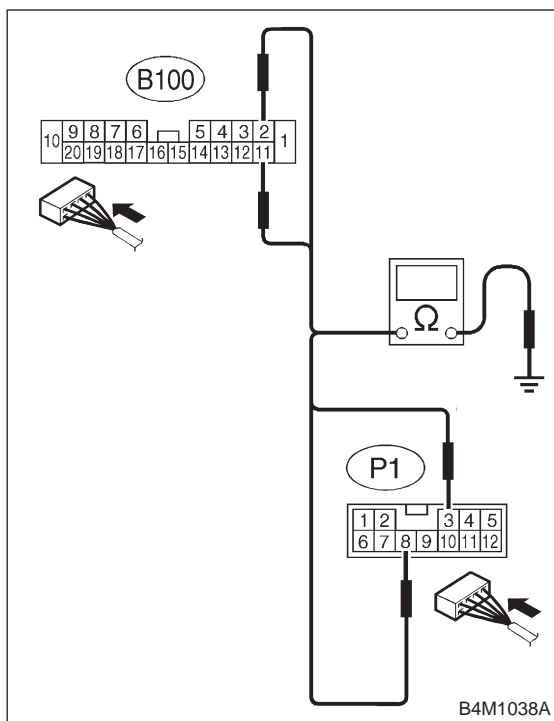
**YES** : Go to next **CHECK** .

**NO** : Properly install the car telephone or the wireless transmitter.

**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 **8C9**.

**8C9 CHECK SHIELD CIRCUIT.**

- 1) Connect all connectors.
- 2) Measure resistance between shield connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**22/(B100) No. 11 — Chassis ground**  
**24/(B100) No. 2 — Chassis ground**  
**26/(P1) No. 8 — Chassis ground**  
**28/(P1) No. 3 — Chassis ground**  
*Is resistance less than 0.5 Ω?*

**YES** : Go to step **8C10**.

**NO** : Repair shield harness.

**8C10 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary noise interference.

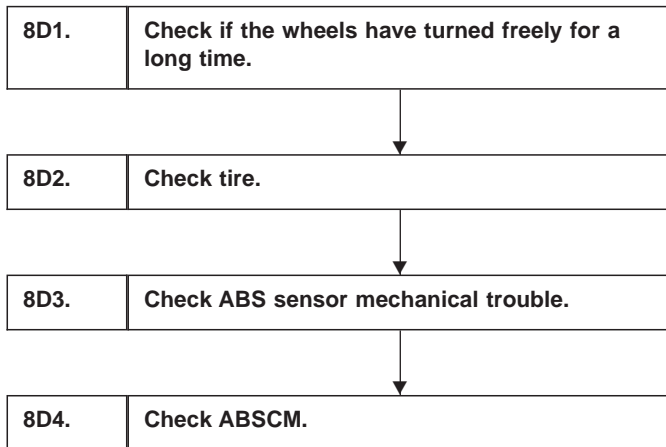


**D: TROUBLE CODE 29  
— ABNORMAL ABS SENSOR SIGNAL (ANY  
ONE OF FOUR) —****DIAGNOSIS:**

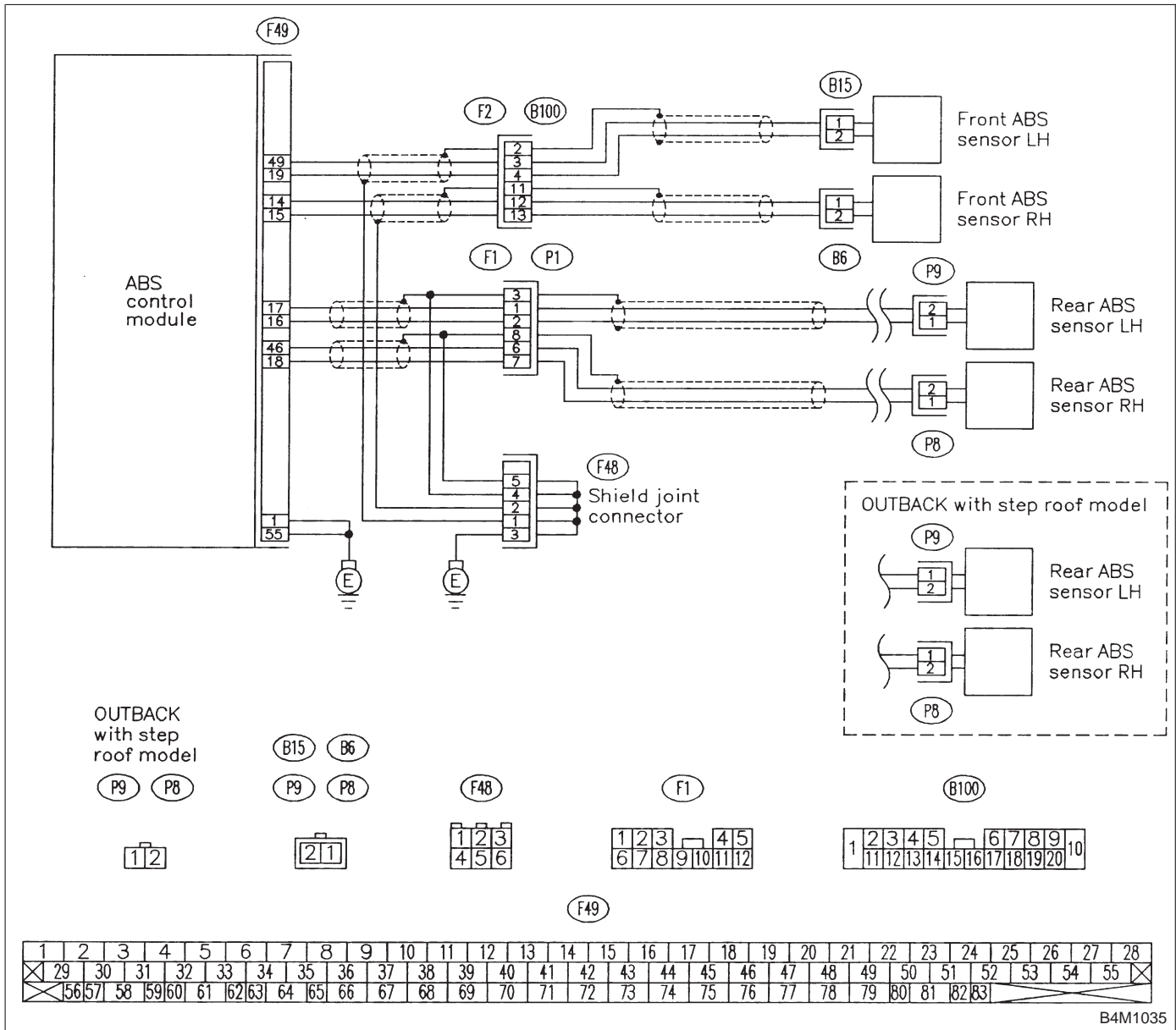
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

**TROUBLE SYMPTOM:**

- ABS does not operate.



**WIRING DIAGRAM:**



**8D1 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.

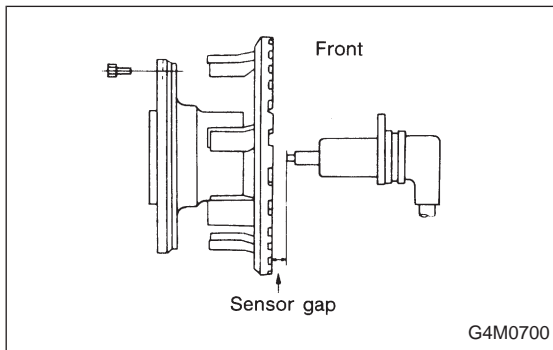
**NO** : Go to step **8D2**.

<b>8D2</b>	<b>CHECK TIRE.</b>
------------	--------------------

- CHECK** : *Are the tire specifications correct?*
- YES** : Go to next **CHECK** .
- NO** : Replace tire.
- CHECK** : *Is the tire worn excessively?*
- YES** : Replace tire.
- NO** : Go to next **CHECK** .
- CHECK** : *Is the tire pressure correct?*
- YES** : Go to step **8D3**.
- NO** : Adjust tire pressure.

<b>8D3</b>	<b>CHECK ABS SENSOR MECHANICAL TROUBLE.</b>
------------	---

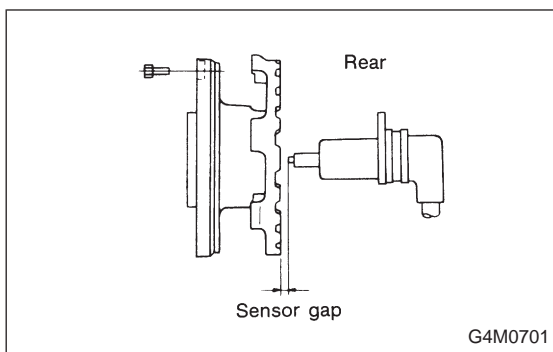
- CHECK** : *Tightening torque:*  
 **$32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )**  
*Are the ABS sensor installation bolts tightened securely?*
- YES** : Go to next **CHECK** .
- NO** : Tighten ABS sensor installation bolts securely.
- 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 next step.
- NO** : Tighten tone wheel installation bolts securely.



1) 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 next **CHECK** .

**NO** : Adjust the gap.

**NOTE:**

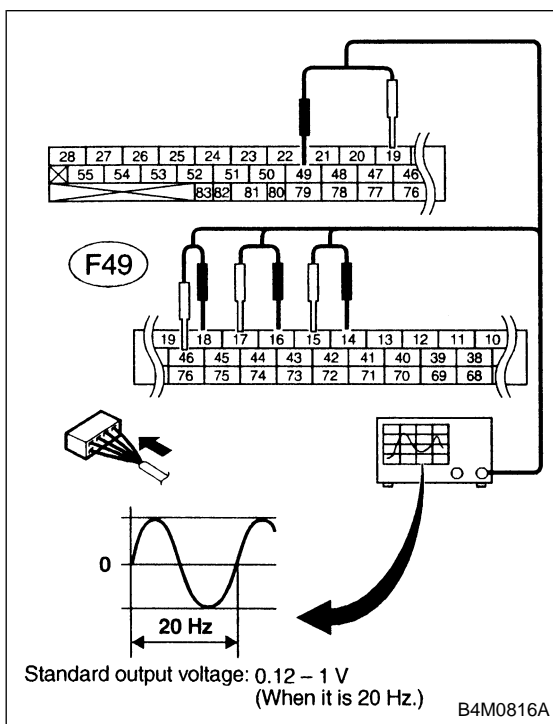
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

**CHECK** : *Is an oscilloscope available?*

**YES** : Go to next step.

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

- 2) Raise all four wheels of ground.
- 3) Turn ignition switch OFF.
- 4) Disconnect connector from ABS control module.
- 5) Disconnect connector cover from connector.  
<Ref. to 4-4c [T8C1] steps 5) to 8).>
- 6) Connect connector to ABS control module.
- 7) Connect the oscilloscope to the ABS control module connector.
- 8) Turn ignition switch ON.



- 9) Rotate wheels and measure voltage at specified frequency.

**NOTE:**

When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

**TROUBLE CODE / 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 8D4.

**NO** : Go to next step.

10) 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 next **CHECK** .

**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 next step.

11) Measure hub runout.

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

**YES** : Go to step **8D4**.

**NO** : Repair hub.

<b>8D4</b>	<b>CHECK ABSCM.</b>
------------	---------------------

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 next **CHECK** .

**CHECK** : ***Are other trouble codes being output?***

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

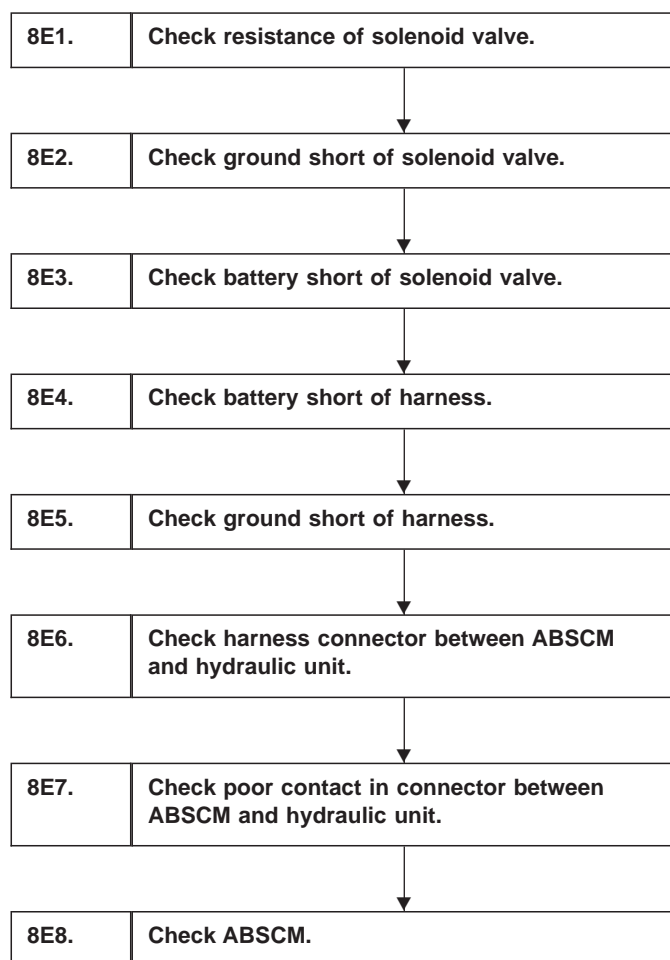
**E: TROUBLE CODE 31 (FRONT RH)  
TROUBLE CODE 33 (FRONT LH)  
TROUBLE CODE 35 (REAR RH)  
TROUBLE CODE 37 (REAR LH)  
— ABNORMAL INLET SOLENOID VALVE  
CIRCUIT(S) IN HYDRAULIC UNIT —**

**DIAGNOSIS:**

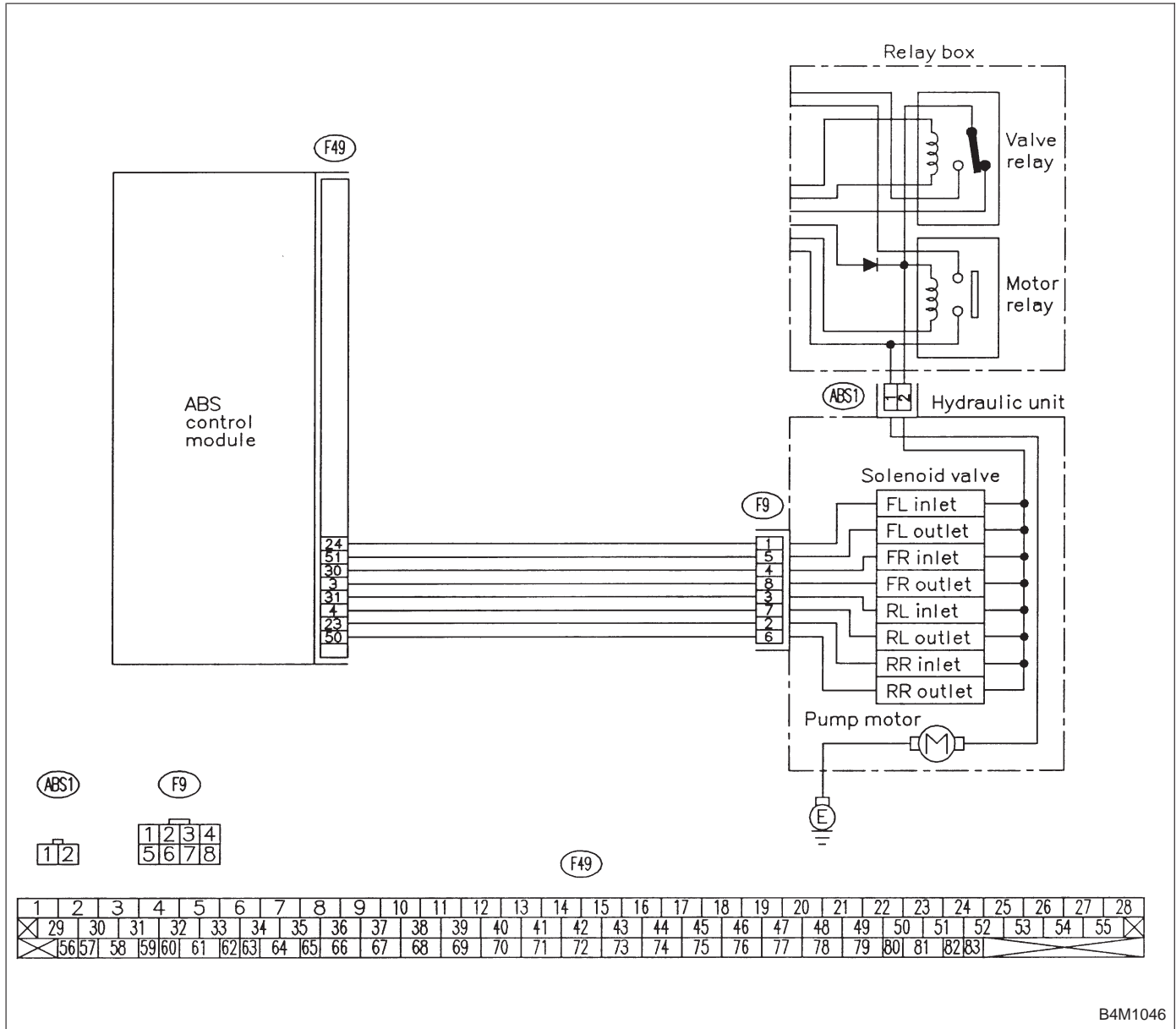
- Faulty harness/connector
- Faulty inlet solenoid valve in hydraulic unit

**TROUBLE SYMPTOM:**

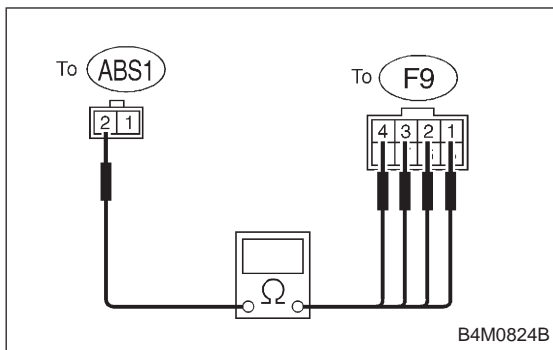
- ABS does not operate.



WIRING DIAGRAM:



B4M1046

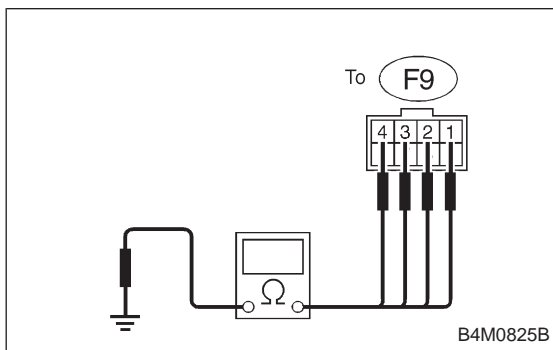


**8E1 CHECK RESISTANCE OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
 31/to (F9) No. 4 — to (ABS1) No. 2  
 33/to (F9) No. 1 — to (ABS1) No. 2  
 35/to (F9) No. 2 — to (ABS1) No. 2  
 37/to (F9) No. 3 — to (ABS1) No. 2  
*Is resistance 8.5±0.7 Ω?*

- YES** : Go to step 8E2.  
**NO** : Replace hydraulic unit.



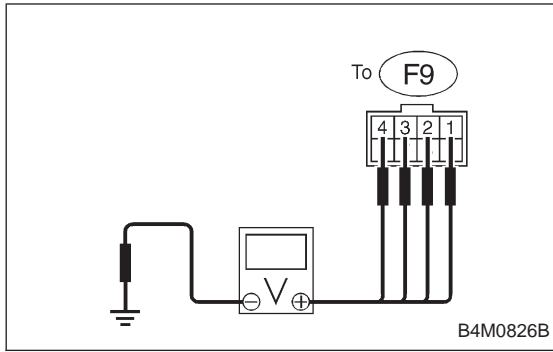
**8E2 CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 31/to (F9) No. 4 — Chassis ground  
 33/to (F9) No. 1 — Chassis ground  
 35/to (F9) No. 2 — Chassis ground  
 37/to (F9) No. 3 — Chassis ground  
*Is resistance more than 1 MΩ?*

- YES** : Go to step 8E3.  
**NO** : Replace hydraulic unit.





**8E3 CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 (+) — Chassis ground (-)**  
**33/to (F9) No. 1 (+) — Chassis ground (-)**  
**35/to (F9) No. 2 (+) — Chassis ground (-)**  
**37/to (F9) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

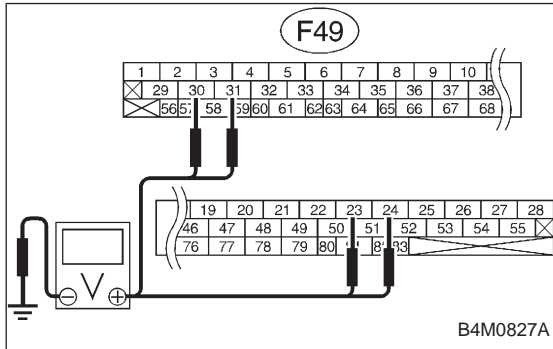
**NO** : Replace hydraulic unit.

- 4) Turn ignition switch to OFF.
- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 (+) — Chassis ground (-)**  
**33/to (F9) No. 1 (+) — Chassis ground (-)**  
**35/to (F9) No. 2 (+) — Chassis ground (-)**  
**37/to (F9) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **8E4**.

**NO** : Replace hydraulic unit.



**8E4 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 (+) — Chassis ground (-)**  
**33/(F49) No. 24 (+) — Chassis ground (-)**  
**35/(F49) No. 23 (+) — Chassis ground (-)**  
**37/(F49) No. 31 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

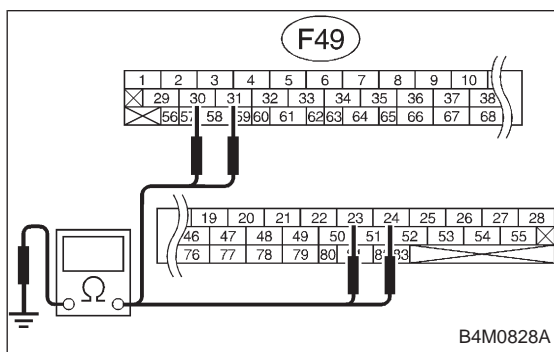
**NO** : Repair harness between ABSCM and hydraulic unit.

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 (+) — Chassis ground (-)**  
**33/(F49) No. 24 (+) — Chassis ground (-)**  
**35/(F49) No. 23 (+) — Chassis ground (-)**  
**37/(F49) No. 31 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to step **8E5**.

**NO** : Repair harness between ABSCM and hydraulic unit.



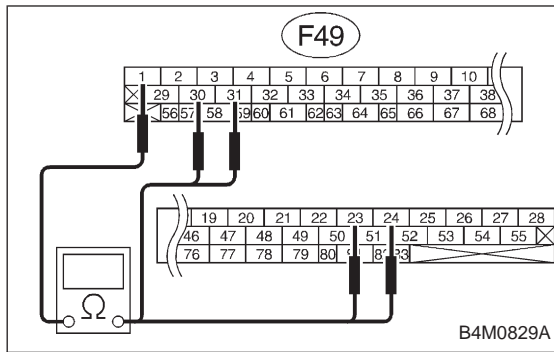
**8E5 CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 — Chassis ground**  
**33/(F49) No. 24 — Chassis ground**  
**35/(F49) No. 23 — Chassis ground**  
**37/(F49) No. 31 — Chassis ground**  
*Is resistance more than 1 MΩ?*

**YES** : Go to step **8E6**.

**NO** : Repair harness between ABSCM and hydraulic unit.

**8E6****CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 — No. 1**  
**33/(F49) No. 24 — No. 1**  
**35/(F49) No. 23 — No. 1**  
**37/(F49) No. 31 — No. 1**  
**Is resistance  $9.0 \pm 0.7 \Omega$ ?**

**YES** : Go to step **8E7**.

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

**8E7****CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

**CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **8E8**.

**8E8****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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

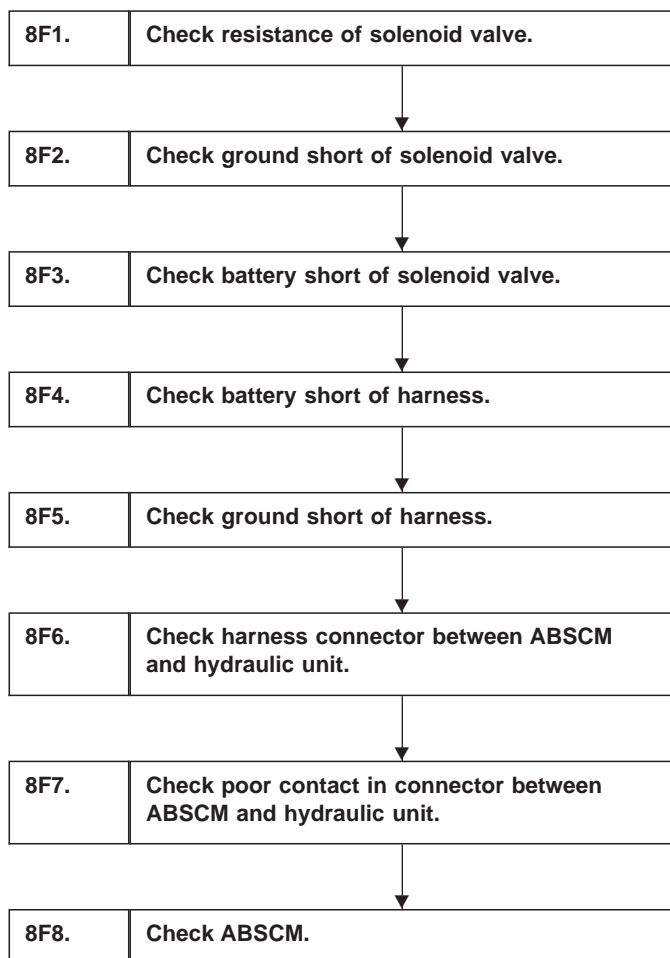
**F: TROUBLE CODE 32 (FRONT RH)  
 TROUBLE CODE 34 (FRONT LH)  
 TROUBLE CODE 36 (REAR RH)  
 TROUBLE CODE 38 (REAR LH)  
 — ABNORMAL OUTLET SOLENOID VALVE  
 CIRCUIT(S) IN HYDRAULIC UNIT —**

**DIAGNOSIS:**

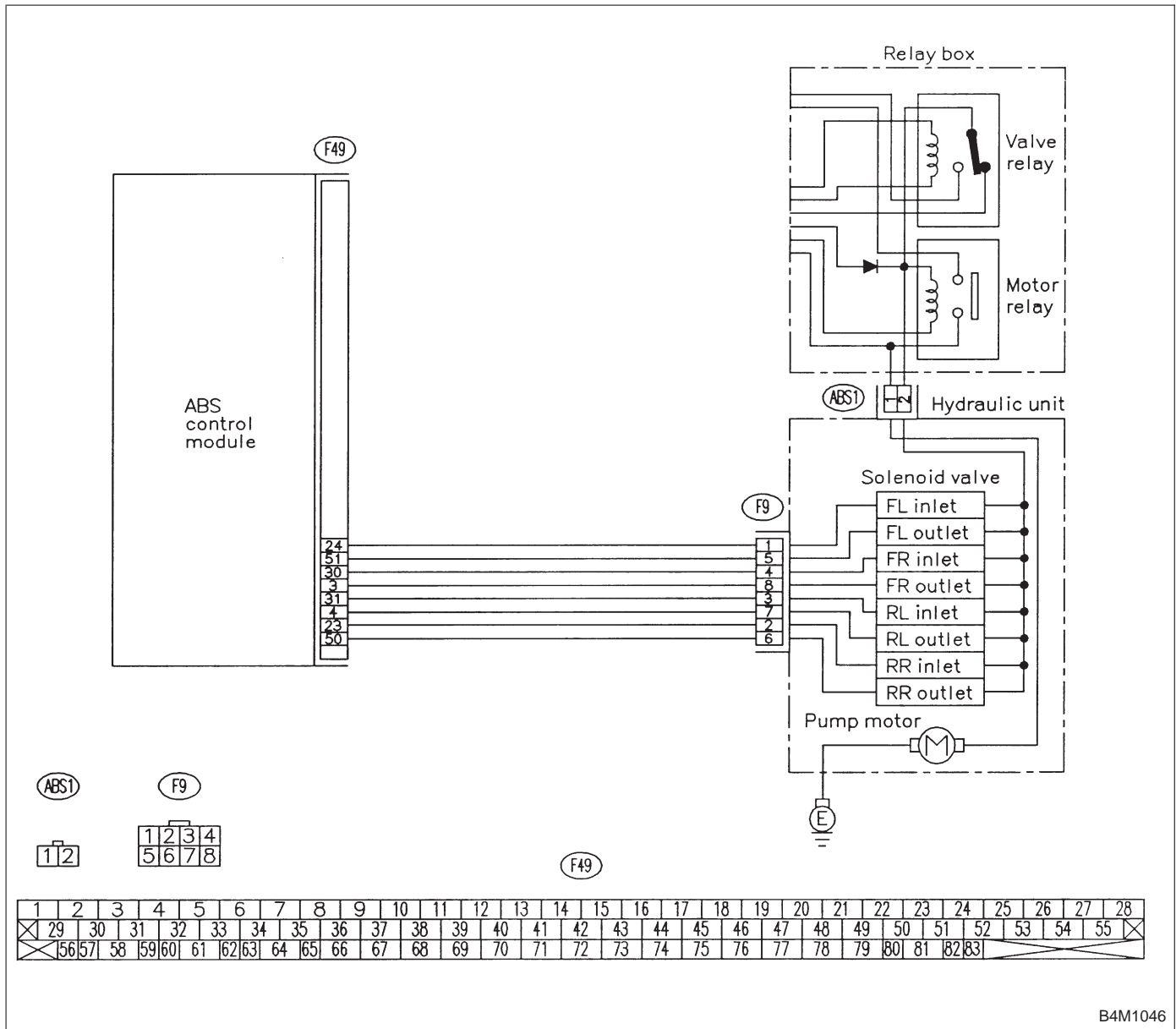
- Faulty harness/connector
- Faulty outlet solenoid valve in hydraulic unit

**TROUBLE SYMPTOM:**

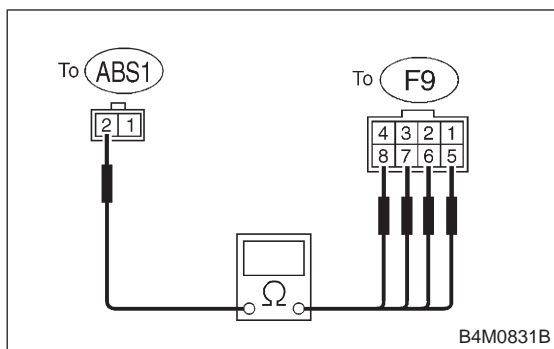
- ABS does not operate.



WIRING DIAGRAM:



B4M1046

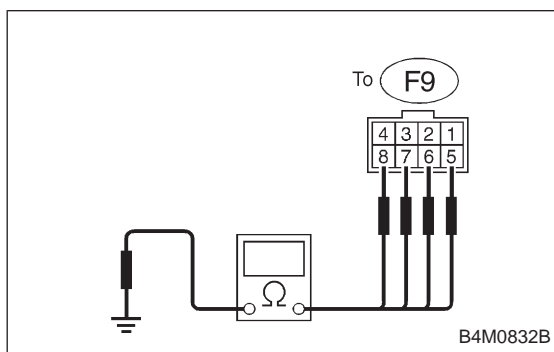
**8F1****CHECK RESISTANCE OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/to (F9) No. 8 — to (ABS1) No. 2**  
**34/to (F9) No. 5 — to (ABS1) No. 2**  
**36/to (F9) No. 6 — to (ABS1) No. 2**  
**38/to (F9) No. 7 — to (ABS1) No. 2**  
*Is resistance  $4.3 \pm 0.5 \Omega$ ?*

**YES** : Go to step **8F2**.

**NO** : Replace hydraulic unit.

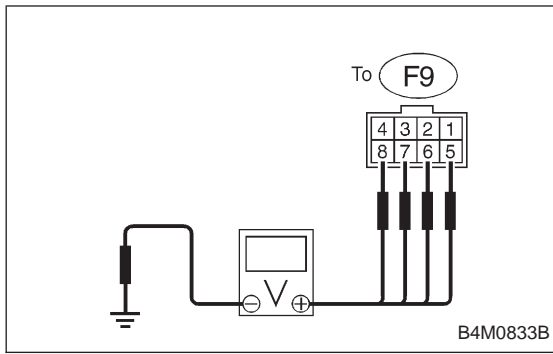
**8F2****CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**32/to (F9) No. 8 — Chassis ground**  
**34/to (F9) No. 5 — Chassis ground**  
**36/to (F9) No. 6 — Chassis ground**  
**38/to (F9) No. 7 — Chassis ground**  
*Is resistance more than  $1 M\Omega$ ?*

**YES** : Go to step **8F3**.

**NO** : Replace hydraulic unit.



**8F3 CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/to (F9) No. 8 (+) — Chassis ground (-)**  
**34/to (F9) No. 5 (+) — Chassis ground (-)**  
**36/to (F9) No. 6 (+) — Chassis ground (-)**  
**38/to (F9) No. 7 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to next step.

**NO** : Replace hydraulic unit.

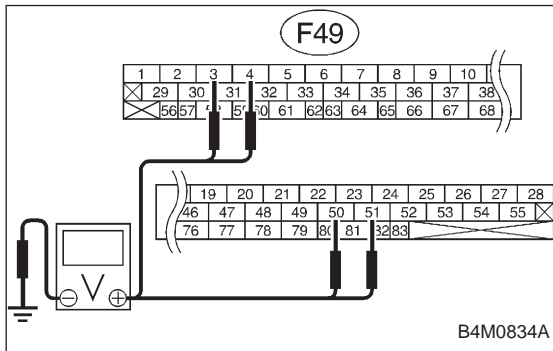
- 4) Turn ignition switch to OFF.

- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**32/to (F9) No. 8 (+) — Chassis ground (-)**  
**34/to (F9) No. 5 (+) — Chassis ground (-)**  
**36/to (F9) No. 6 (+) — Chassis ground (-)**  
**38/to (F9) No. 7 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to step **8F4**.

**NO** : Replace hydraulic unit.



**8F4 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/(F49) No. 3 (+) — Chassis ground (-)**  
**34/(F49) No. 51 (+) — Chassis ground (-)**  
**36/(F49) No. 50 (+) — Chassis ground (-)**  
**38/(F49) No. 4 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to next step.

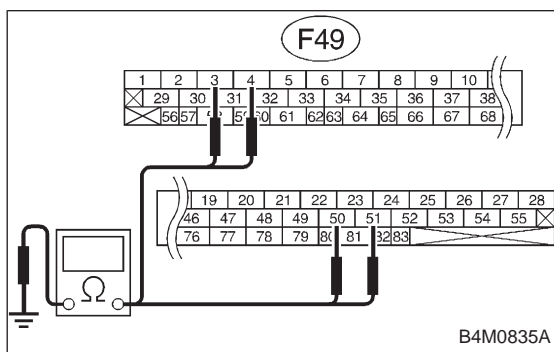
**NO** : Repair harness between ABSCM and hydraulic unit.

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/(F49) No. 3 (+) — Chassis ground (-)**  
**34/(F49) No. 51 (+) — Chassis ground (-)**  
**36/(F49) No. 50 (+) — Chassis ground (-)**  
**38/(F49) No. 4 (+) — Chassis ground (-)**  
*Is voltage 0 V?*

**YES** : Go to step **8F5**.

**NO** : Repair harness between ABSCM and hydraulic unit.



**8F5 CHECK GROUND SHORT OF HARNESS.**

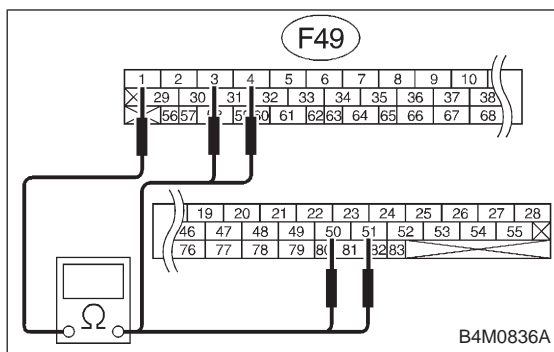
Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**32/(F49) No. 3 — Chassis ground**  
**34/(F49) No. 51 — Chassis ground**  
**36/(F49) No. 50 — Chassis ground**  
**38/(F49) No. 4 — Chassis ground**  
*Is resistance more than 1 MΩ?*

**YES** : Go to step **8F6**.

**NO** : Repair harness between ABSCM and hydraulic unit.



**8F6****CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/(F49) No. 3 — No. 1**  
**34/(F49) No. 51 — No. 1**  
**36/(F49) No. 50 — No. 1**  
**38/(F49) No. 4 — No. 1**  
*Is resistance  $4.8 \pm 0.5 \Omega$ ?*

**YES** : Go to step **8F7**.

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

**8F7****CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

**CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **8F8**.

**8F8****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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

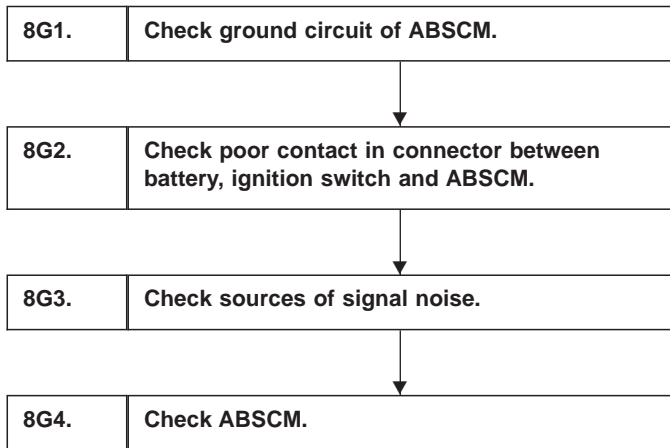
**G: TROUBLE CODE 41  
— ABNORMAL ABS CONTROL MODULE —**

**DIAGNOSIS:**

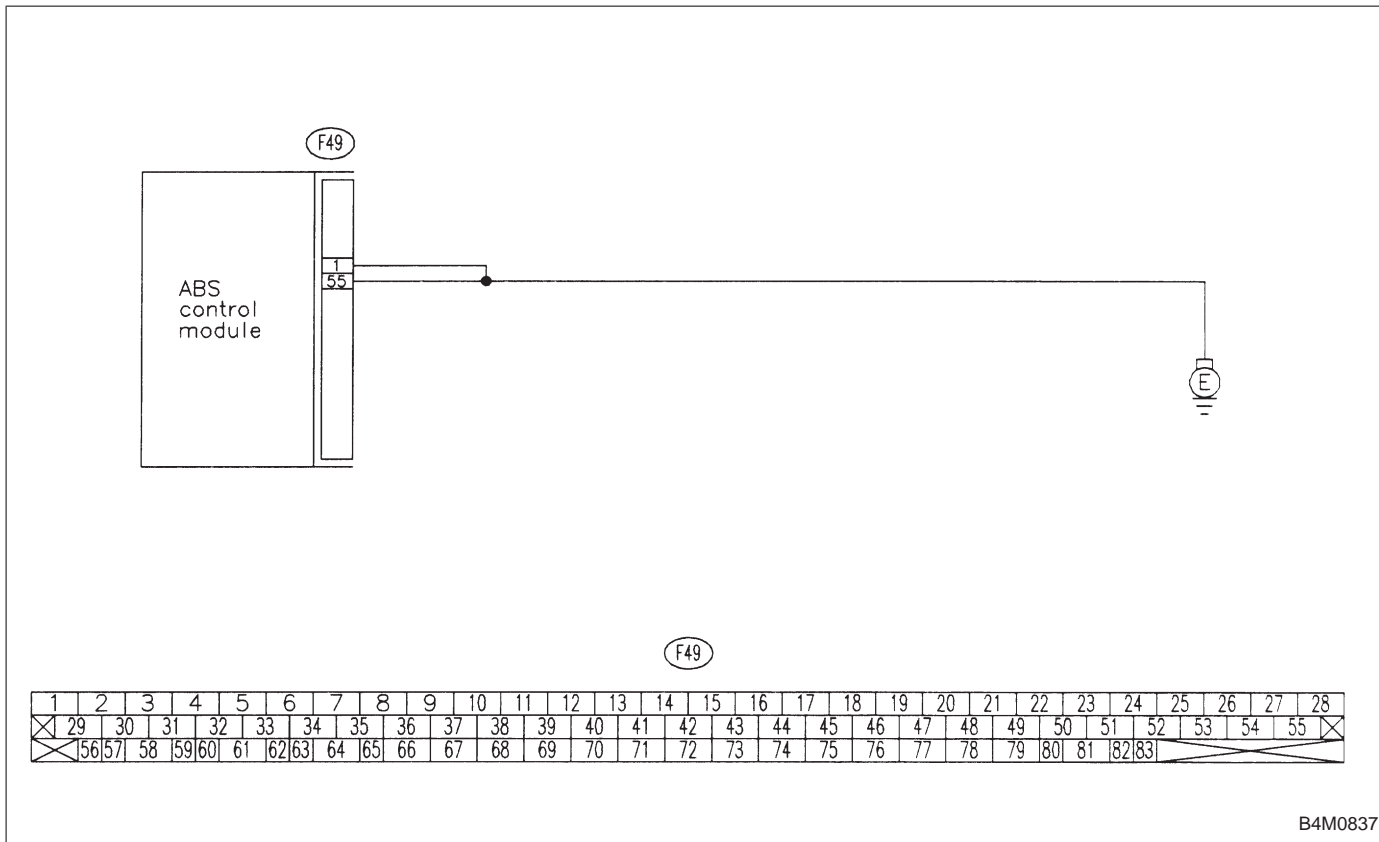
- Faulty ABSCM

**TROUBLE SYMPTOM:**

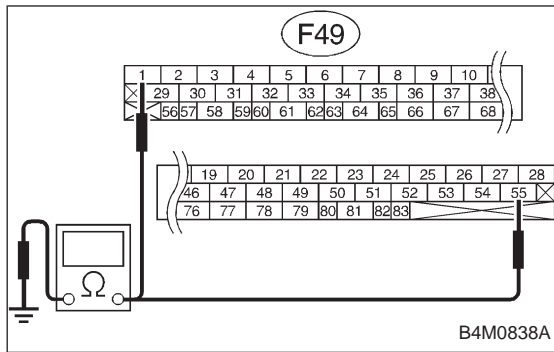
- ABS does not operate.



**WIRING DIAGRAM:**



B4M0837



<b>8G1</b>	<b>CHECK GROUND CIRCUIT OF ABSCM.</b>
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- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 1 — Chassis ground**  
**(F49) No. 55 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8G2**.

**NO** : Repair ABSCM ground harness.

<b>8G2</b>	<b>CHECK POOR CONTACT IN CONNECTORS BETWEEN BATTERY, IGNITION SWITCH AND ABSCM.</b>
------------	---

**CHECK** : **Is there poor contact in connectors between battery, ignition switch and ABSCM?**

**YES** : Repair connector.

**NO** : Go to step **8G3**.

<b>8G3</b>	<b>CHECK SOURCES OF SIGNAL NOISE.</b>
------------	---------------------------------------

**CHECK** : **Is the car telephone or the wireless transmitter properly installed?**

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

**NO** : Properly install the car telephone or the wireless transmitter.

**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 **8G4**.

<b>8G4</b>	<b>CHECK ABSCM.</b>
------------	---------------------

- 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

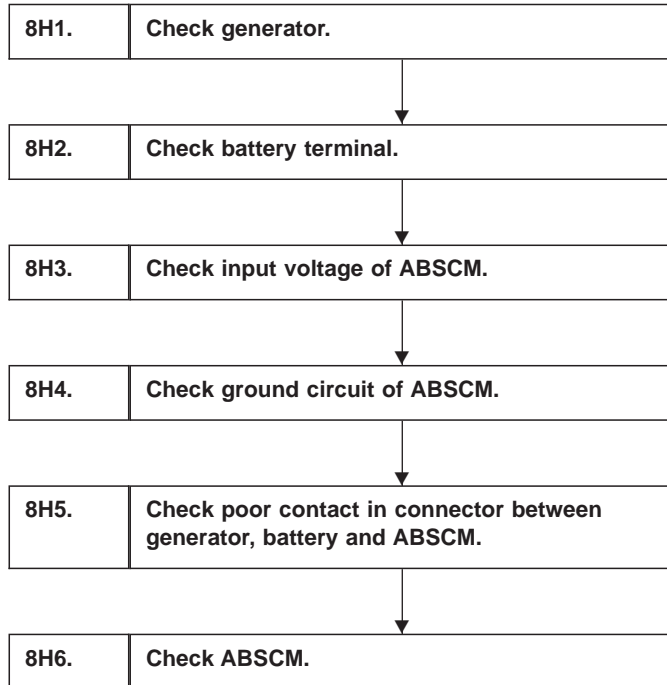
**NO** : A temporary poor contact.

**H: TROUBLE CODE 42  
— SOURCE VOLTAGE IS LOW. —****DIAGNOSIS:**

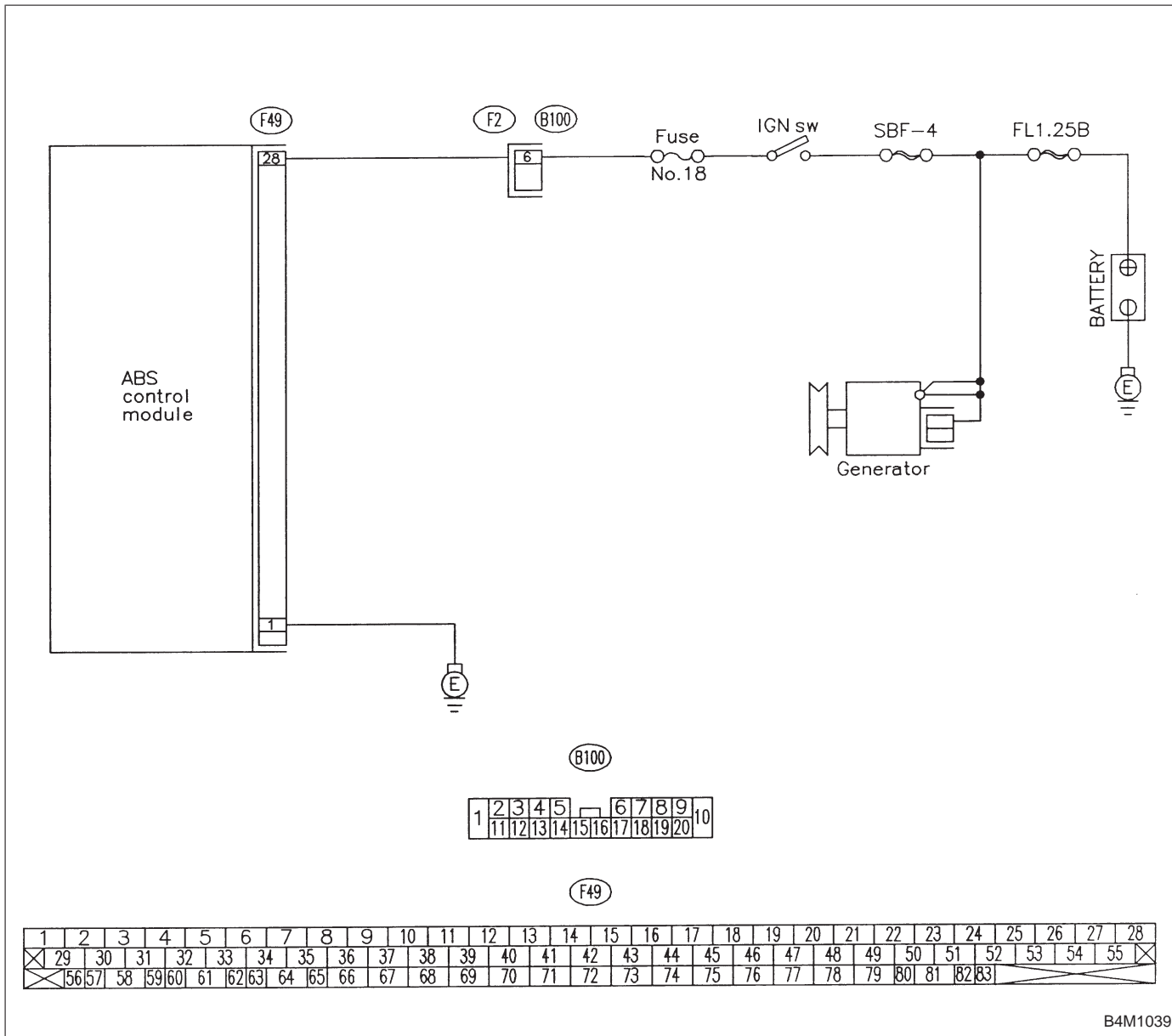
- Power source voltage of the ABSCM is low.

**TROUBLE SYMPTOM:**

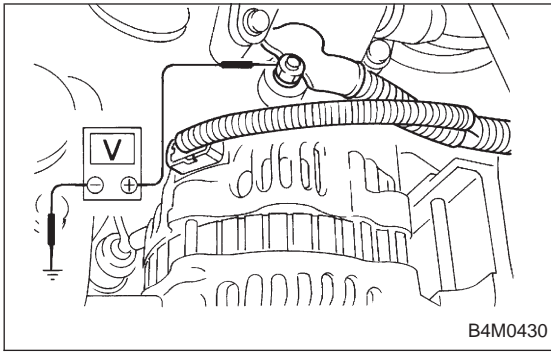
- ABS does not operate.



WIRING DIAGRAM:



B4M1039



**8H1 CHECK GENERATOR.**

- 1) Start engine.
- 2) Idling after warm-up.
- 3) Measure voltage between generator B terminal and chassis ground.

**CHECK** : *Terminal Generator B terminal — Chassis ground Is voltage 10 — 15 V?*

**YES** : Go to step 8H2.

**NO** : Repair generator.

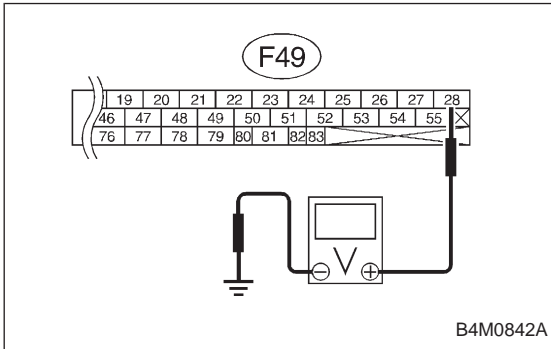
**8H2 CHECK BATTERY TERMINAL.**

Turn ignition switch to OFF.

**CHECK** : *Are the positive and negative battery terminals tightly clamped?*

**YES** : Go to step 8H3.

**NO** : Tighten the clamp of terminal.



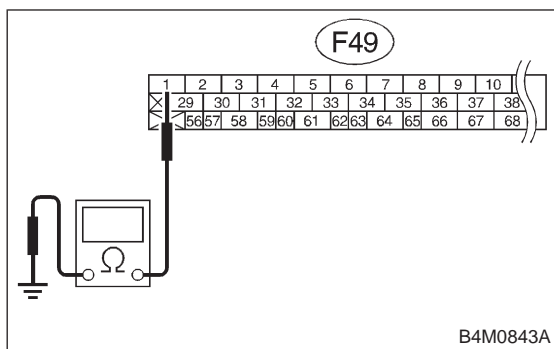
**8H3 CHECK INPUT VOLTAGE OF ABSCM.**

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

**CHECK** : *Connector & terminal (F49) No. 28 (+) — Chassis ground (-) Is voltage 10 — 15 V?*

**YES** : Go to step 8H4.

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

**8H4 CHECK GROUND CIRCUIT OF ABSCM.**

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

**CHECK** : **Connector & terminal (F49) No. 1 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 8H5.

**NO** : Repair ABSCM ground harness.

**8H5 CHECK POOR CONTACT IN CONNECTOR BETWEEN GENERATOR, BATTERY AND ABSCM.**

**CHECK** : **Is there poor contact in connectors between generator, battery and ABSCM?**

**YES** : Repair connector.

**NO** : Go to step 8H6.

**8H6 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 next **CHECK** .

**CHECK** : **Are other trouble codes being output?**

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

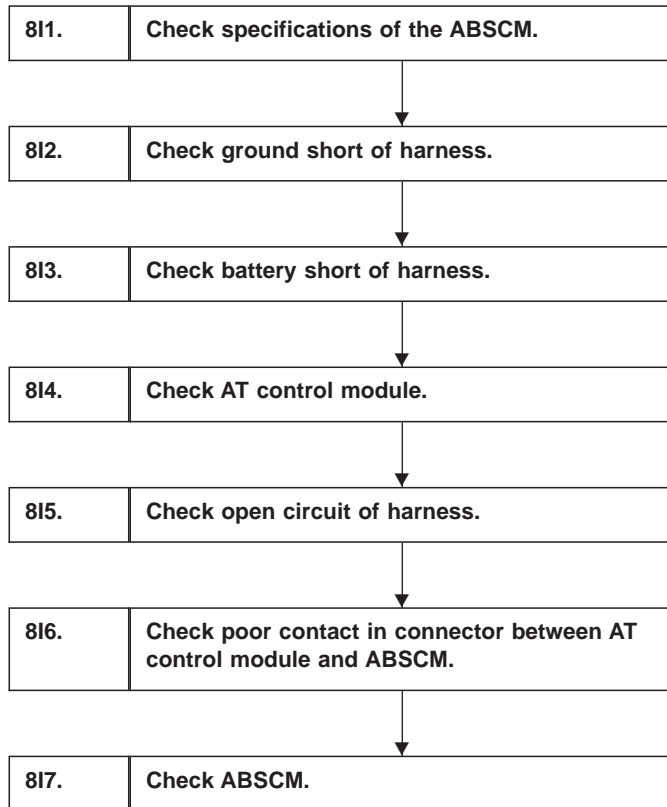


**I: TROUBLE CODE 44  
— A COMBINATION OF AT CONTROL  
ABNORMALS —****DIAGNOSIS:**

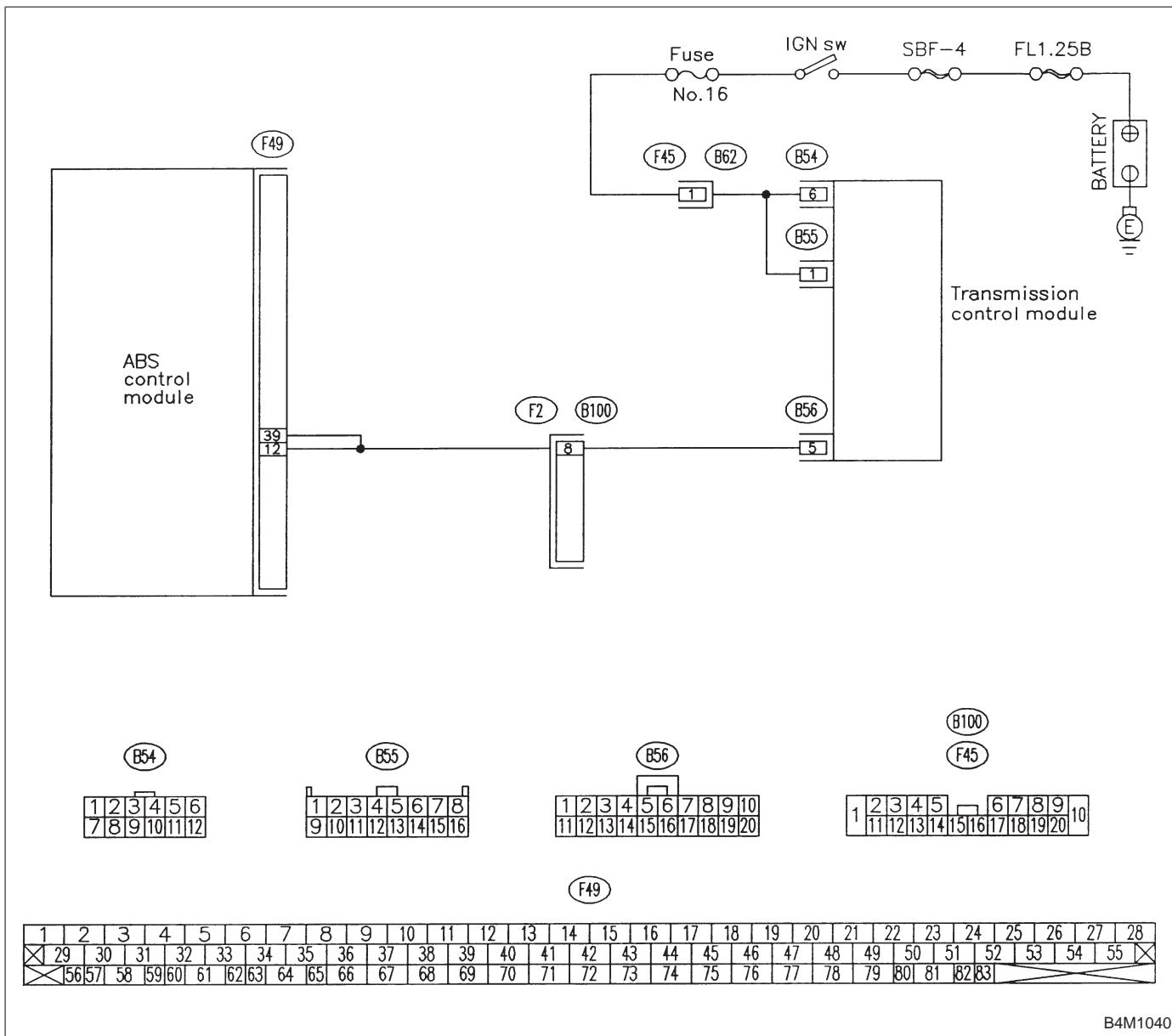
- Combination of AT control faults

**TROUBLE SYMPTOM:**

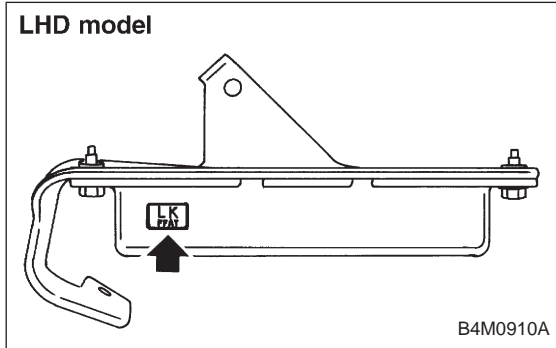
- ABS does not operate.



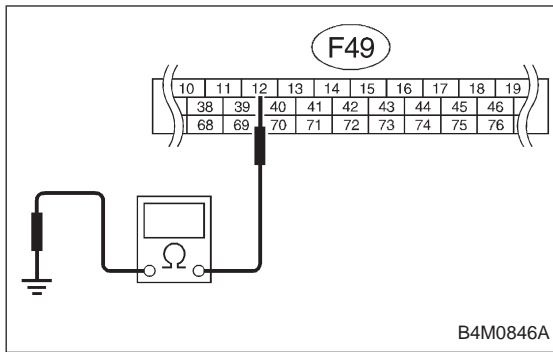
WIRING DIAGRAM:



B4M1040



<b>811</b>	<b>CHECK SPECIFICATIONS OF THE ABSCM.</b>
Check specifications of the plate attached to the ABSCM.	
<b>CHECK</b>	: <b>Is an ABSCM for AT model installed on a MT model?</b>
<b>YES</b>	: Replace ABSCM.
<b>NO</b>	: Go to step 812.



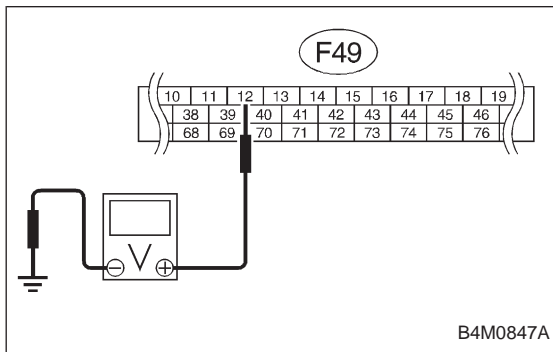
**8I2 CHECK GROUND SHORT OF HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from AT control module.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 12 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8I3.

**NO** : Repair harness between AT control module and ABSCM.



**8I3 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : **Connector & terminal (F49) No. 12 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

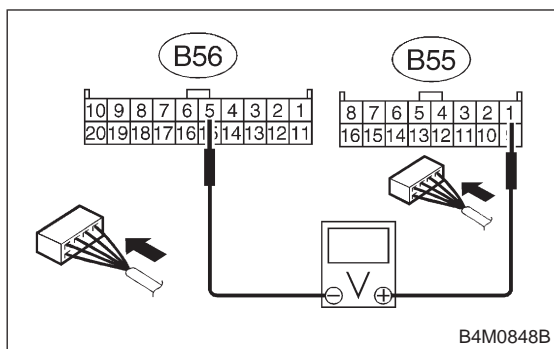
**NO** : Repair harness between AT control module and ABSCM.

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

**CHECK** : **Connector & terminal (F49) No. 12 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 8I4.

**NO** : Repair harness between AT control module and ABSCM.

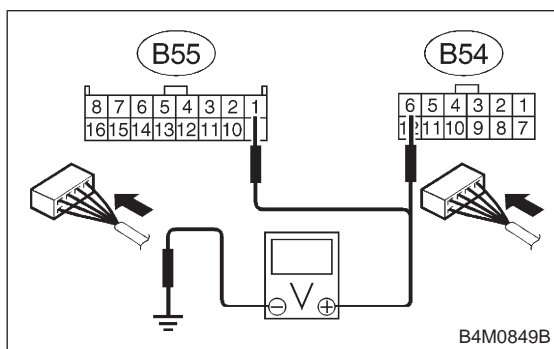
**814** CHECK AT CONTROL MODULE.

- 1) Connect all connectors to AT control module.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between AT control module connector terminals.

**CHECK** : **Connector & terminal**  
**(B55) No. 1 (+) — (B56) No. 5 (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step 815.

**NO** : Go to next step.

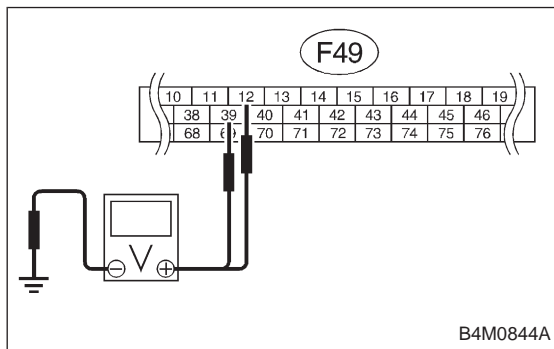


- 4) Measure voltage between AT control module connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(B54) No. 6 (+) — Chassis ground (-)**  
**(B55) No. 1 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Replace AT control module.

**NO** : Repair harness connector between battery, ignition switch and AT control module.

**815** CHECK OPEN CIRCUIT OF HARNESS.

Measure voltage between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 12 (+) — Chassis ground (-)**  
**(F49) No. 39 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step 816.

**NO** : Repair harness connector between AT control module and ABSCM.

<b>816</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN AT CONTROL MODULE AND ABSCM.</b>
------------	---

**CHECK** : *Is there poor contact in connectors between AT control module and ABSCM?*

**YES** : Repair connector.

**NO** : Go to step **817**.

<b>817</b>	<b>CHECK ABSCM.</b>
------------	---------------------

- 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

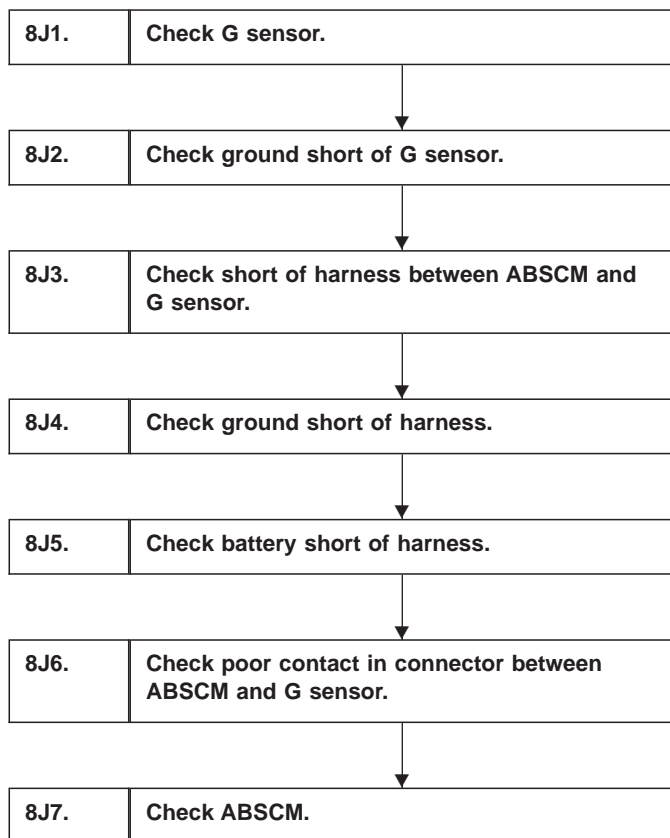
**NO** : A temporary poor contact.

**J: TROUBLE CODE 46  
— ABNORMAL G SENSOR POWER SUPPLY  
VOLTAGE —****DIAGNOSIS:**

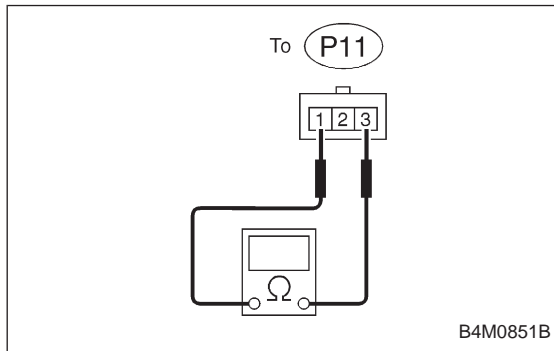
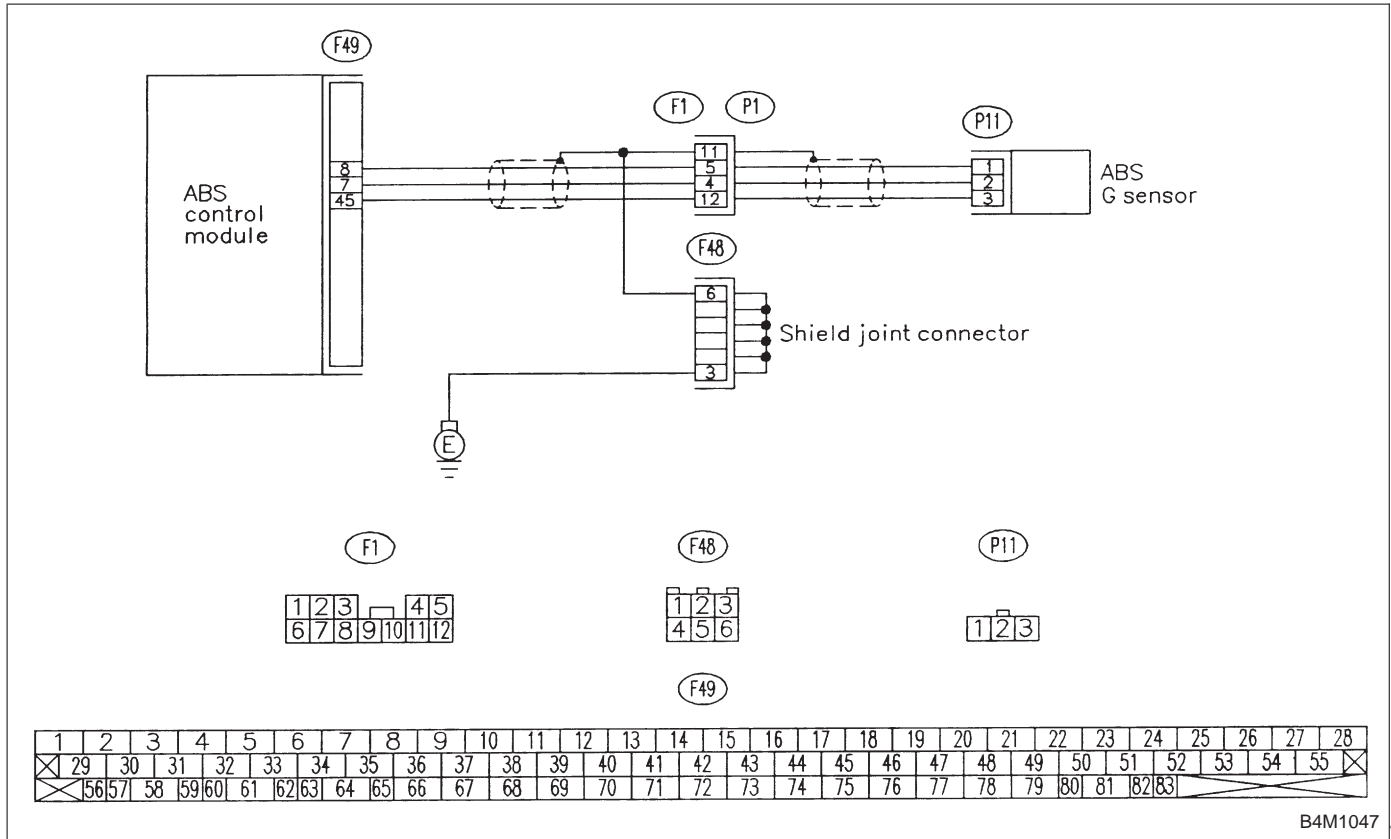
- Faulty G sensor power supply voltage

**TROUBLE SYMPTOM:**

- ABS does not operate.



**WIRING DIAGRAM:**



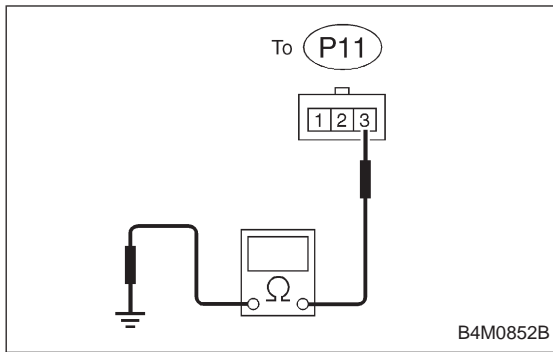
**8J1 CHECK G SENSOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove console box.
- 3) Disconnect connector from G sensor.
- 4) Measure resistance of G sensor.

**CHECK** : **Connector & terminal**  
**To (P11) No. 1 — No. 3**  
**Is resistance 50±8 kΩ?**

**YES** : Go to step 8J2.

**NO** : Replace G sensor.



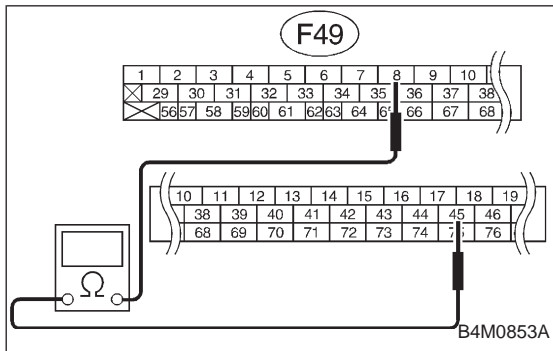
**8J2 CHECK GROUND SHORT OF G SENSOR.**

Measure resistance between G sensor and bracket.

**CHECK** : **Connector & terminal To (P11) No. 3 — Bracket**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8J3.

**NO** : Replace G sensor.



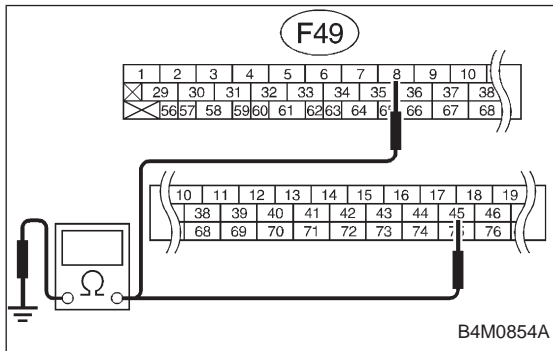
**8J3 CHECK SHORT OF HARNESS BETWEEN ABSCM AND G SENSOR.**

- 1) Disconnect connector from ABSCM.
- 2) Measure resistance between ABSCM connector terminals.

**CHECK** : **Connector & terminal (F49) No. 45 — No. 8**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8J4.

**NO** : Repair harness between ABSCM and G sensor.



**8J4 CHECK GROUND SHORT OF HARNESS.**

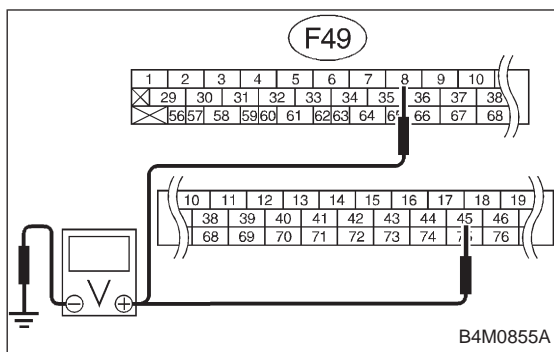
Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 8 — Chassis ground**  
**(F49) No. 45 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8J5.

**NO** : Repair harness between ABSCM and G sensor.



**8J5 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : **Connector & terminal**  
**(F49) No. 8 (+) — Chassis ground (-)**  
**(F49) No. 45 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Repair harness between ABSCM and G sensor.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between ABSCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 8 (+) — Chassis ground (-)**  
**(F49) No. 45 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **8J6**.

**NO** : Repair harness between ABSCM and chassis ground.

**8J6 CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.**

**CHECK** : **Is there poor contact in connectors between ABSCM and G sensor?**

**YES** : Repair connector.

**NO** : Go to step **8J7**.

**8J7 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 next **CHECK** .

**CHECK** : **Are other trouble codes being output?**

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

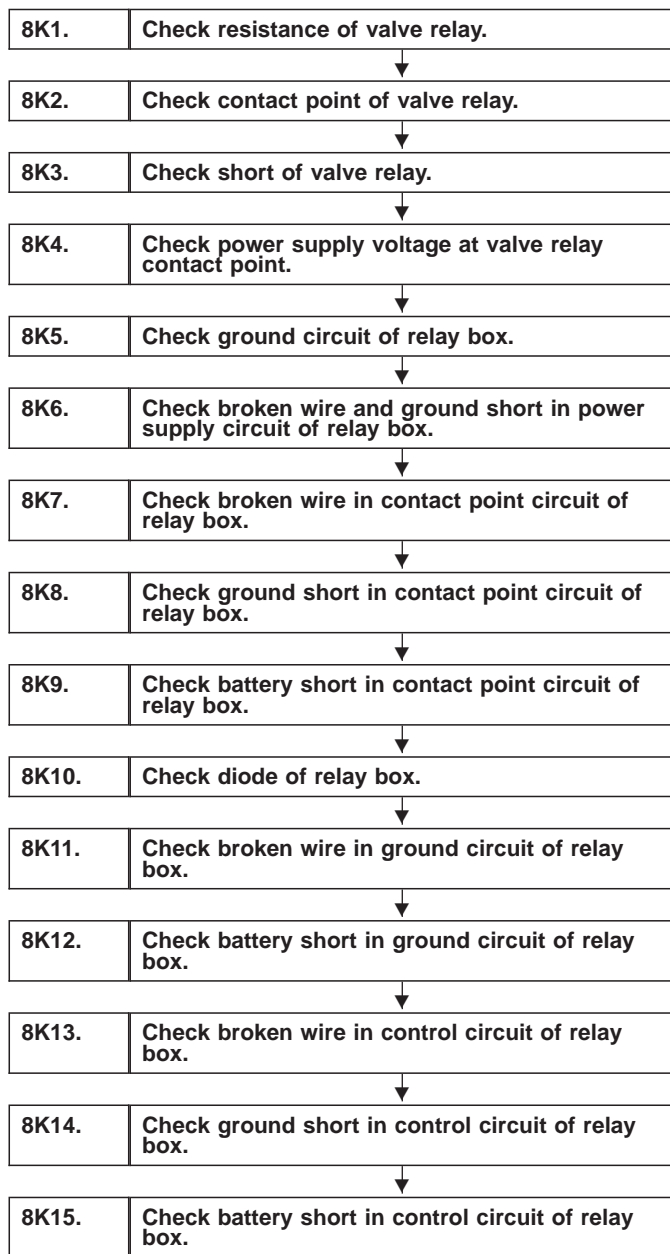
## K: TROUBLE CODE 51 — ABNORMAL VALVE RELAY —

### DIAGNOSIS:

- Faulty valve relay

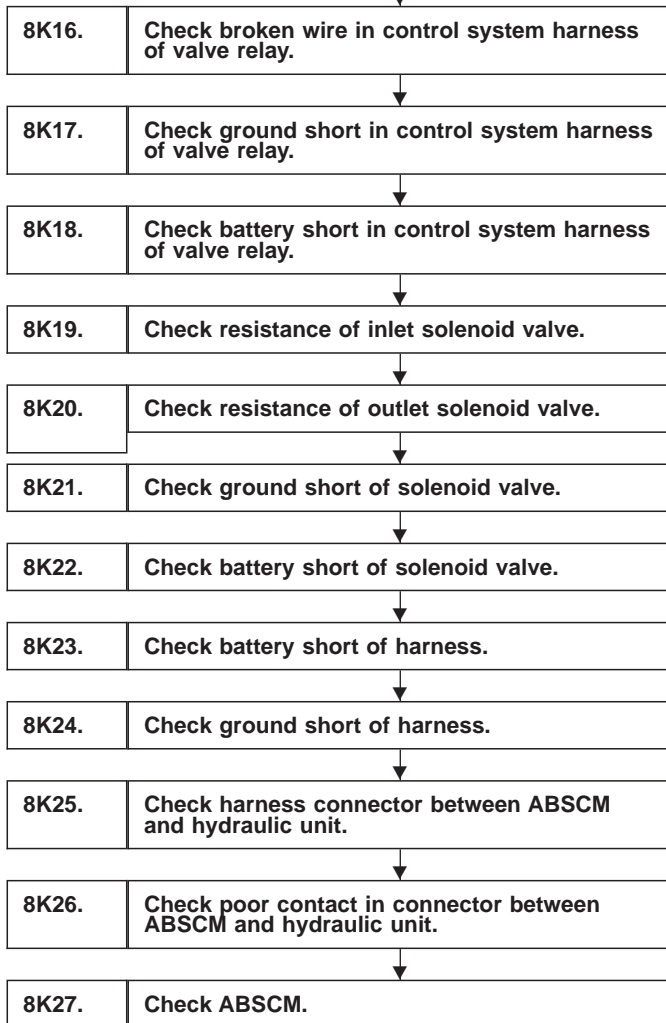
### TROUBLE SYMPTOM:

- ABS does not operate.

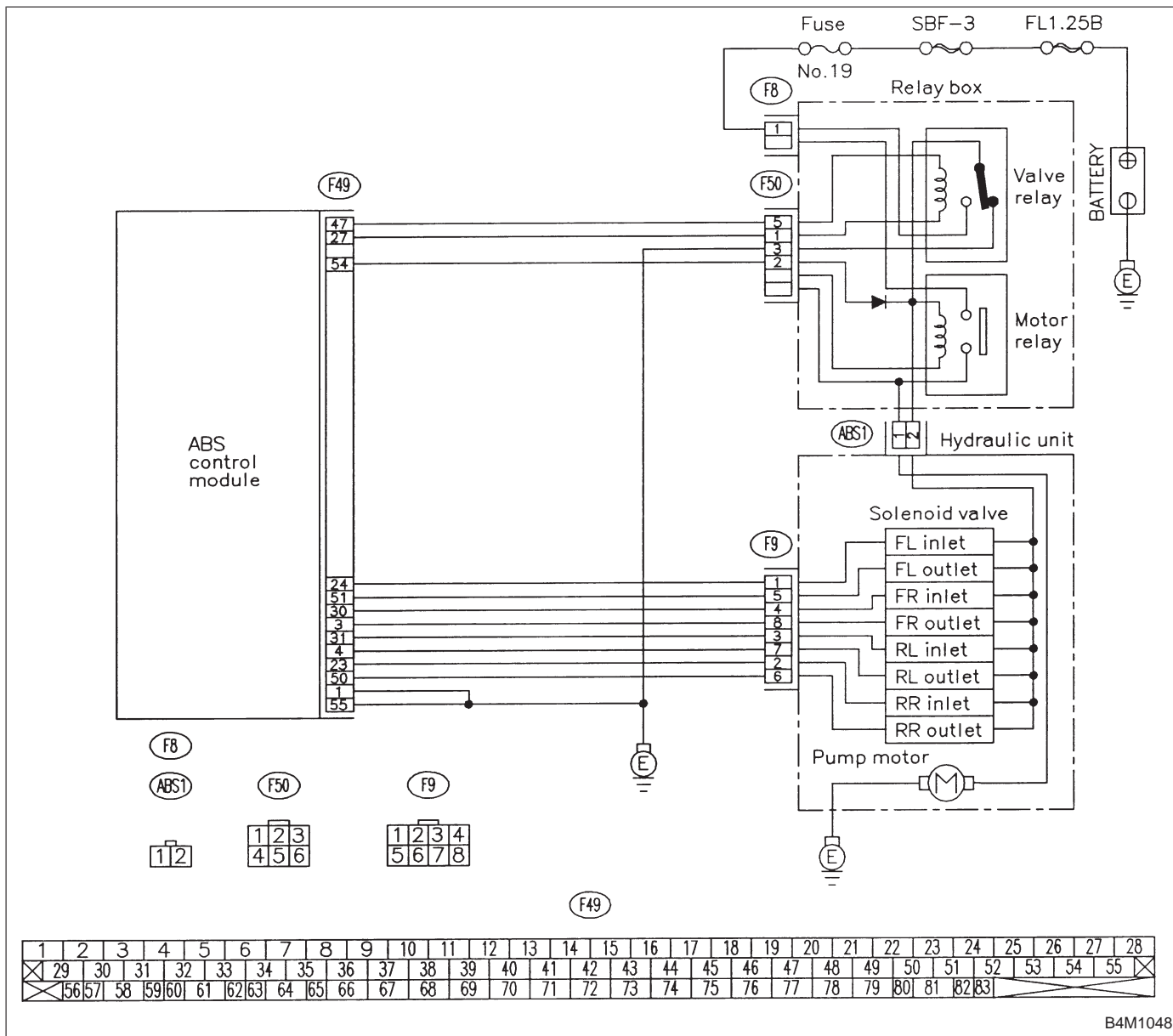


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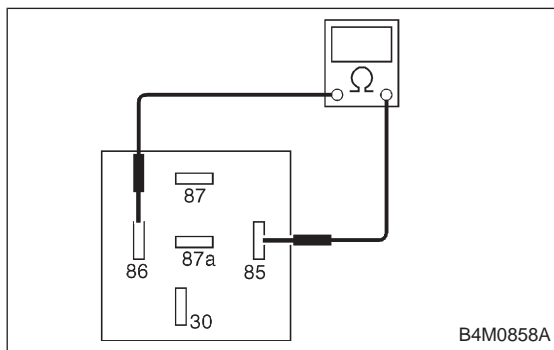
From the former page.



**WIRING DIAGRAM:**



B4M1048



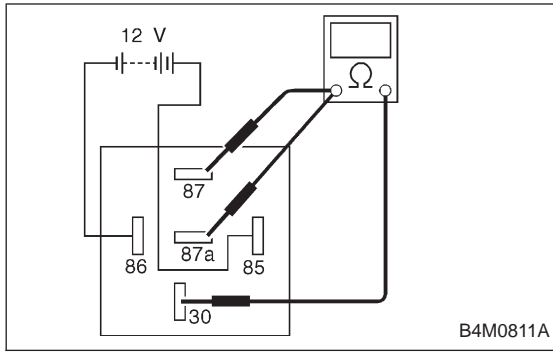
**8K1 CHECK RESISTANCE OF VALVE RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove valve relay from relay box.
- 3) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 86**  
**Is resistance 103±10 Ω?**

**YES** : Go to step **8K2**.

**NO** : Replace valve relay.



**8K2**

**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.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance less than 0.5 Ω?**

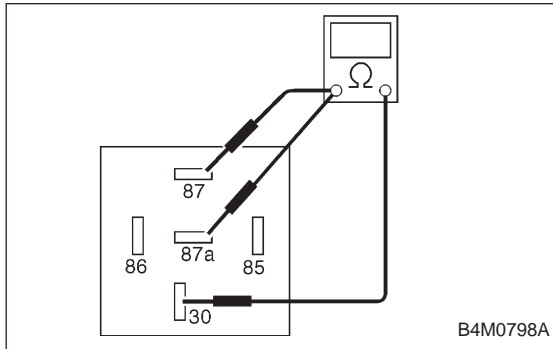
**YES** : Go to next **CHECK** .

**NO** : Replace valve relay.

**CHECK** : **Terminals**  
**No. 30 — No. 87a**  
**Is resistance more than 1 MΩ?**

**YES** : Go to next step.

**NO** : Replace valve relay.



- 3) Disconnect battery from valve relay terminals.
- 4) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance more than 1 MΩ?**

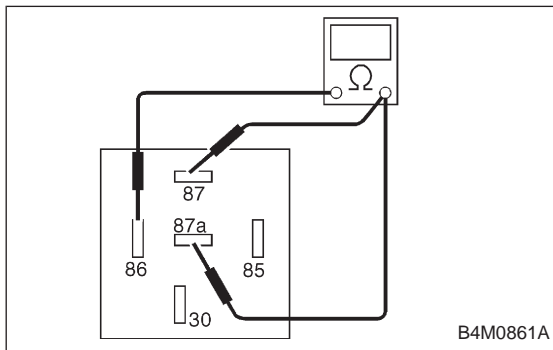
**YES** : Go to next **CHECK** .

**NO** : Replace valve relay.

**CHECK** : **Terminals**  
**No. 30 — No. 87a**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 8K3.

**NO** : Replace valve relay.



**8K3**

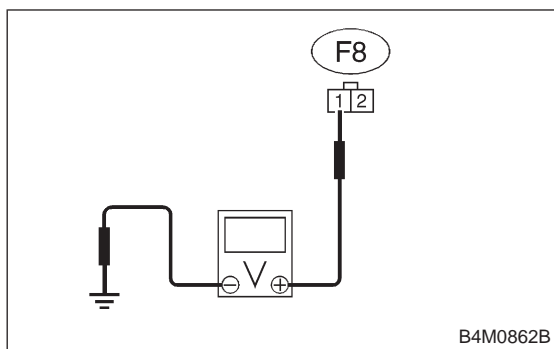
**CHECK SHORT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 86 — No. 87**  
**No. 86 — No. 87a**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8K4.

**NO** : Replace valve relay.

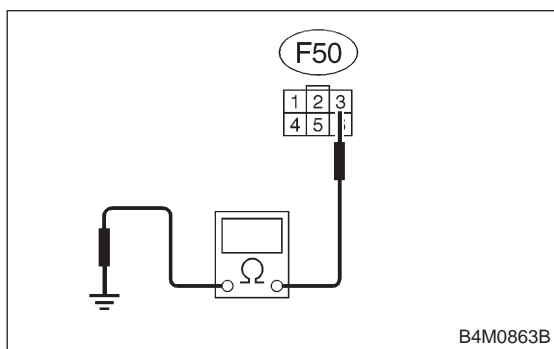
**8K4****CHECK POWER SUPPLY VOLTAGE AT VALVE RELAY CONTACT POINT.**

- 1) Disconnect connector (F8) from relay box.
- 2) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal (F8) No. 1 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step **8K5**.

**NO** : Repair harness connector between battery and relay box. Check fuse No. 19.

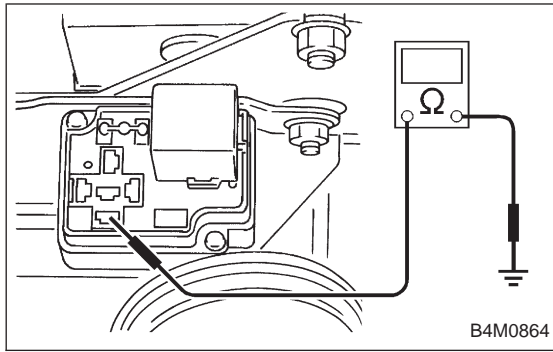
**8K5****CHECK GROUND CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal (F50) No. 3 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8K6**.

**NO** : Repair relay box ground harness.



**8K6**

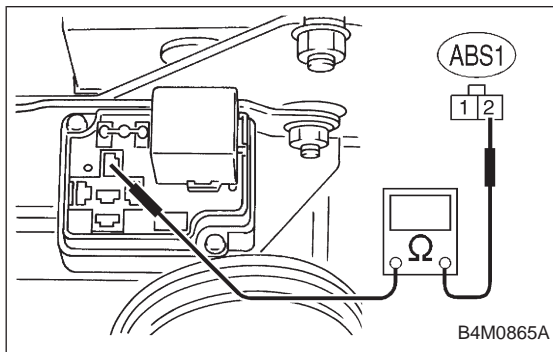
**CHECK BROKEN WIRE AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (ABS1) from hydraulic unit.
- 2) Connect connector (F8) to relay box.
- 3) Measure voltage of relay box.

**CHECK** : **Connector & terminal Valve relay installing point No. 87 — Chassis ground**  
**Is voltage 10 — 13 V?**

**YES** : Go to step **8K7**.

**NO** : Replace relay box. Check fuse No. 19.



**8K7**

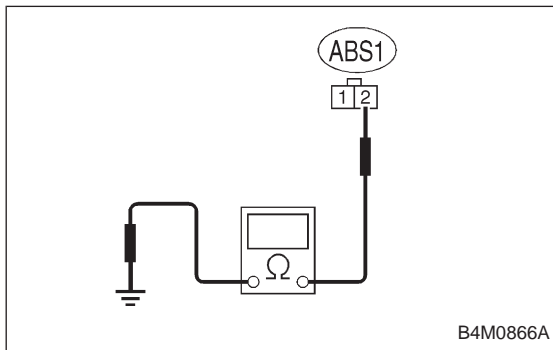
**CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between hydraulic unit connector and valve relay installing point.

**CHECK** : **Connector & terminal (ABS1) No. 2 — Valve relay installing point No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8K8**.

**NO** : Replace relay box.



**8K8**

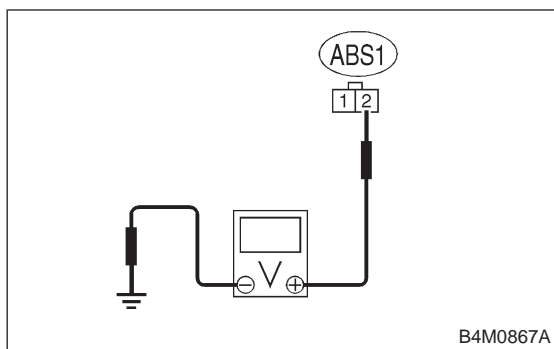
**CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 2 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step **8K9**.

**NO** : Replace relay box. Check fuse SBF6.

**8K9****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

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

**CHECK** : **Connector & terminal (ABS1) No. 2 (+) — Chassis ground (-)**  
Is voltage 0 V?

**YES** : Go to next step.

**NO** : Replace relay box. Check fuse No. 19 and SBF6.

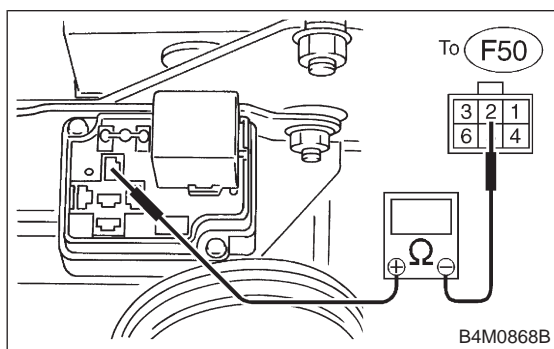
- 4) Turn ignition switch to OFF.

- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 2 (+) — Chassis ground (-)**  
Is voltage 0 V?

**YES** : Go to step **8K10**.

**NO** : Replace relay box. Check fuse No. 19 and SBF6.

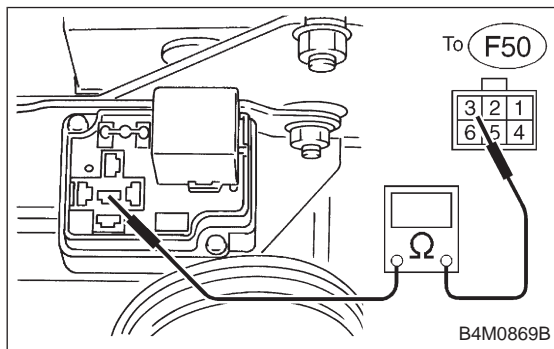
**8K10****CHECK DIODE OF RELAY BOX.**

Measure resistance between relay box connector and valve relay installing point.

**CHECK** : **Connector & terminal Valve relay installing point No. 30 (+) — To (F50) No. 2 (-)**  
Is resistance more than 1 MΩ?

**YES** : Go to step **8K11**.

**NO** : Replace relay box.

**8K11****CHECK BROKEN WIRE IN GROUND CIRCUIT OF RELAY BOX.**

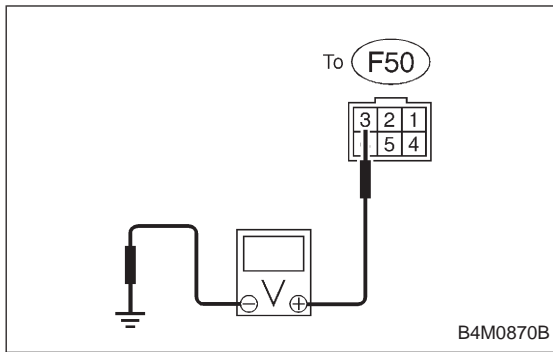
Measure resistance between relay box connector and valve relay installing point.

**CHECK** : **Connector & terminal To (F50) No. 3 — Valve relay installing point No. 87a**  
Is resistance less than 0.5 Ω?

**YES** : Go to step **8K12**.

**NO** : Replace relay box.





**8K12**

**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.

**CHECK** : **Connector & terminal**  
**To (F50) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

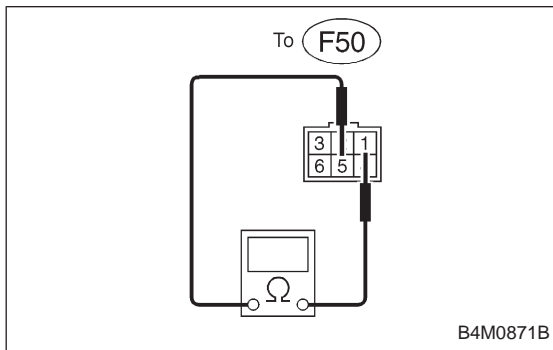
**NO** : Replace relay box and check all fuses.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F50) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 8K13.

**NO** : Replace relay box and check all fuses.



**8K13**

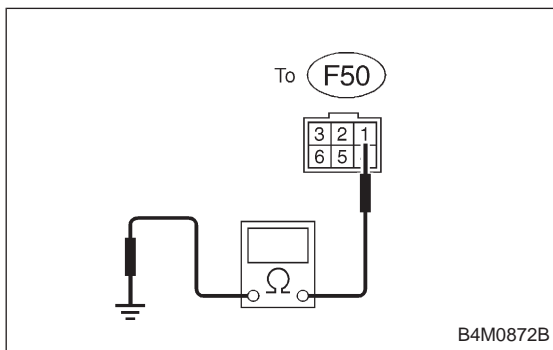
**CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.**

- 1) Install valve relay to relay box.
- 2) Measure resistance between relay box connector terminals.

**CHECK** : **Connector & terminal**  
**To (F50) No. 1 — No. 5**  
**Is resistance 103±10 Ω?**

**YES** : Go to step 8K14.

**NO** : Replace relay box.



**8K14**

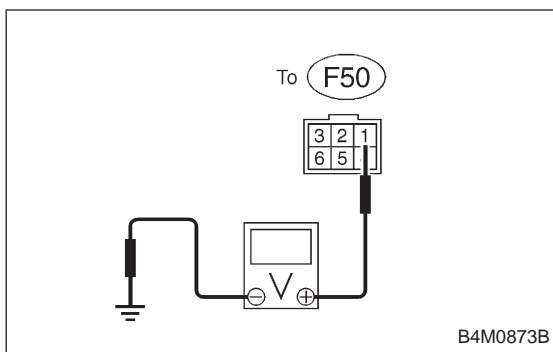
**CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F50) No. 1 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8K15.

**NO** : Replace relay box and check all fuses.



**8K15 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.

**CHECK** : *Connector & terminal To (F50) No. 1 (+) — Chassis ground (-) Is voltage 0 V?*

**YES** : Go to next step.

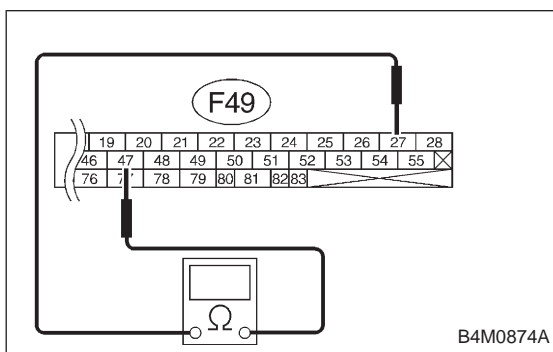
**NO** : Replace relay box. Check fuse No. 19 and SBF45A.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between relay box connector and chassis ground.

**CHECK** : *Connector & terminal To (F50) No. 1 (+) — Chassis ground (-) Is voltage 0 V?*

**YES** : Go to step 8K16.

**NO** : Replace relay box. Check fuse No. 19 and SBF45A.



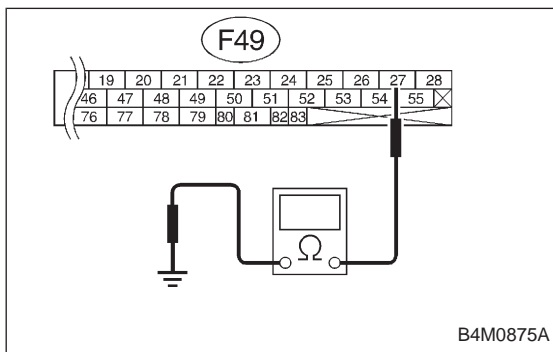
**8K16 CHECK BROKEN WIRE IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

- 1) Connect connector (F50) to relay box.
- 2) Measure resistance between ABSCM connector terminals.

**CHECK** : *Connector & terminal (F49) No. 27 — No. 47 Is resistance 103±10 Ω?*

**YES** : Go to step 8K17.

**NO** : Repair harness between ABSCM and relay box. Check fuse No. 18.



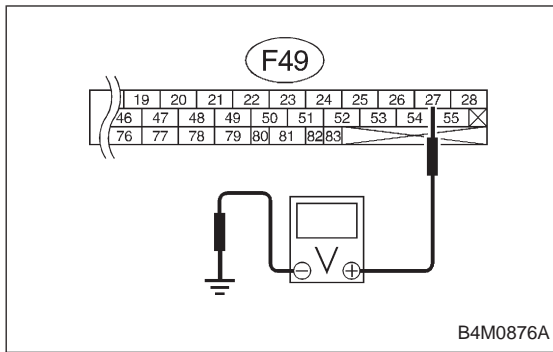
**8K17 CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Connector & terminal (F49) No. 27 — Chassis ground Is resistance more than 1 MΩ?*

**YES** : Go to step 8K18.

**NO** : Repair harness between ABSCM and relay box. Check fuse No. 18.



**8K18**

**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.

**CHECK** : **Connector & terminal (F49) No. 27 (+) — Chassis ground (-)**  
Is voltage 0 V?

**YES** : Go to next step.

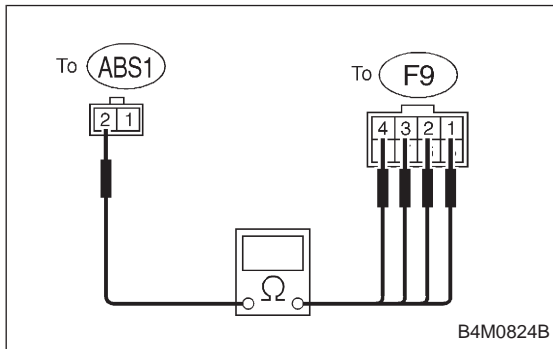
**NO** : Repair harness between ABSCM and relay box and check all fuses.

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

**CHECK** : **Connector & terminal (F49) No. 27 (+) — Chassis ground (-)**  
Is voltage 0 V?

**YES** : Go to step 8K19.

**NO** : Repair harness between ABSCM and relay box and check all fuses.



**8K19**

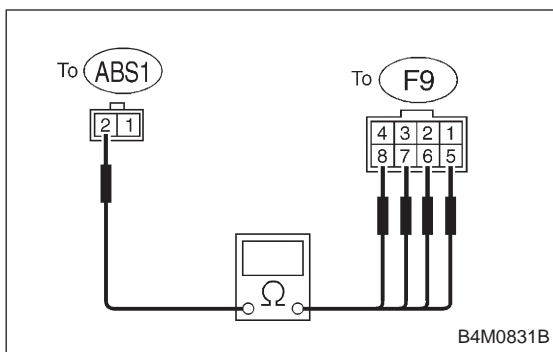
**CHECK RESISTANCE OF INLET SOLENOID VALVE.**

- 1) Disconnect connector from hydraulic unit.
- 2) Measure resistance between hydraulic unit connector terminals.

**CHECK** : **Connector & terminal**  
To (F9) No. 4 — to (ABS1) No. 2  
To (F9) No. 1 — to (ABS1) No. 2  
To (F9) No. 2 — to (ABS1) No. 2  
To (F9) No. 3 — to (ABS1) No. 2  
Is resistance 8.5±0.7 Ω?

**YES** : Go to step 8K20.

**NO** : Replace hydraulic unit.

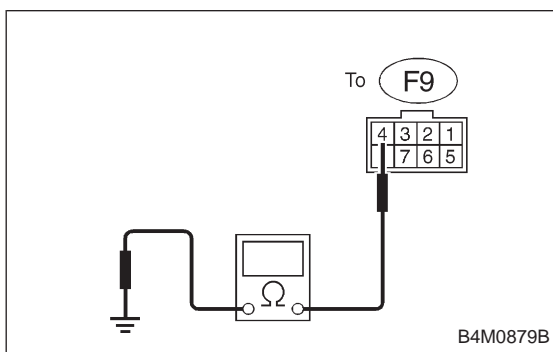


**8K20 CHECK RESISTANCE OF OUTLET SOLENOID VALVE.**

Measure resistance between hydraulic unit connector terminals.

- CHECK** : **Connector & terminal**  
**To (F9) No. 8 — to (ABS1) No. 2**  
**To (F9) No. 5 — to (ABS1) No. 2**  
**To (F9) No. 6 — to (ABS1) No. 2**  
**To (F9) No. 7 — to (ABS1) No. 2**  
**Is resistance  $4.3 \pm 0.5 \Omega$ ?**

- YES** : Go to step **8K21**.  
**NO** : Replace hydraulic unit.

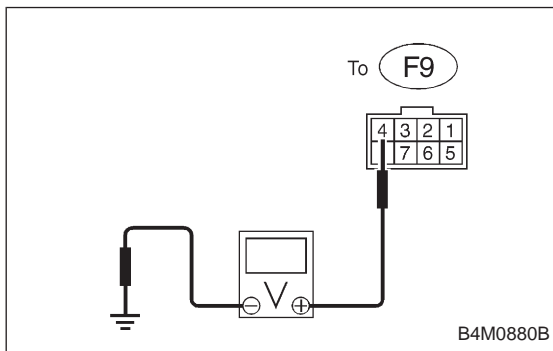


**8K21 CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

- CHECK** : **Connector & terminal**  
**To (F9) No. 4 — Chassis ground**  
**Is resistance more than  $1 M\Omega$ ?**

- YES** : Go to step **8K22**.  
**NO** : Replace hydraulic unit and check all fuses.



**8K22 CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

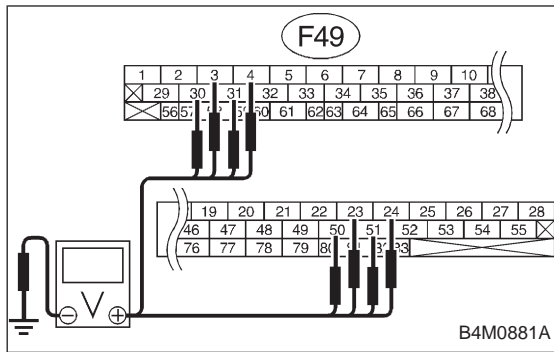
- CHECK** : **Connector & terminal**  
**To (F9) No. 4 (+) — Chassis ground (-)**  
**Is voltage  $0 V$ ?**

- YES** : Go to next step.  
**NO** : Replace hydraulic unit and check all fuses.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between hydraulic unit connector and chassis ground.

- CHECK** : **Connector & terminal**  
**To (F9) No. 4 (+) — Chassis ground (-)**  
**Is voltage  $0 V$ ?**

- YES** : Go to step **8K23**.  
**NO** : Replace hydraulic unit and check all fuses.

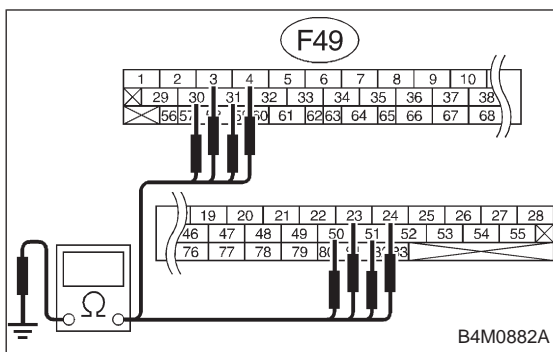
**8K23****CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : **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 (-)****Is voltage 0 V?****YES** : Go to next step.**NO** : Repair harness between hydraulic unit and ABSCM and check all fuses.

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

**CHECK** : **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 (-)****Is voltage 0 V?****YES** : Go to step **8K24**.**NO** : Repair harness between hydraulic unit and ABSCM and check all fuses.

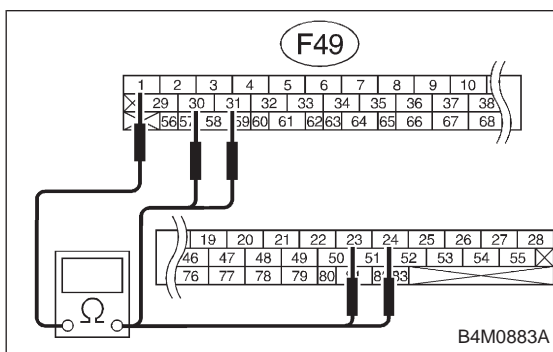


**8K24 CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

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

- YES** : Go to step 8K25.  
**NO** : Repair harness between hydraulic unit and ABSCM.

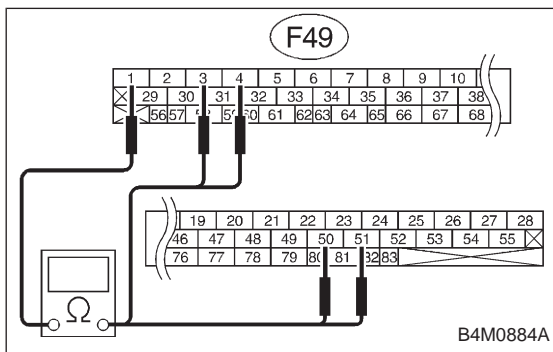


**8K25 CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

- CHECK** : *Connector & terminal*  
 (F49) No. 30 — No. 1  
 (F49) No. 24 — No. 1  
 (F49) No. 23 — No. 1  
 (F49) No. 31 — No. 1  
 Is resistance 9.0±0.7 Ω?

- YES** : Go to next **CHECK** .  
**NO** : Repair harness connector between hydraulic unit and ABSCM.



- CHECK** : *Connector & terminal*  
 (F49) No. 3 — No. 1  
 (F49) No. 51 — No. 1  
 (F49) No. 50 — No. 1  
 (F49) No. 4 — No. 1  
 Is resistance 4.8±0.5 Ω?

- YES** : Go to step 8K26.  
**NO** : Repair harness connector between hydraulic unit and ABSCM.

<b>8K26</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.</b>
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**CHECK** : *Is there poor contact in connector between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **8K27**.

<b>8K27</b>	<b>CHECK ABSCM.</b>
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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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

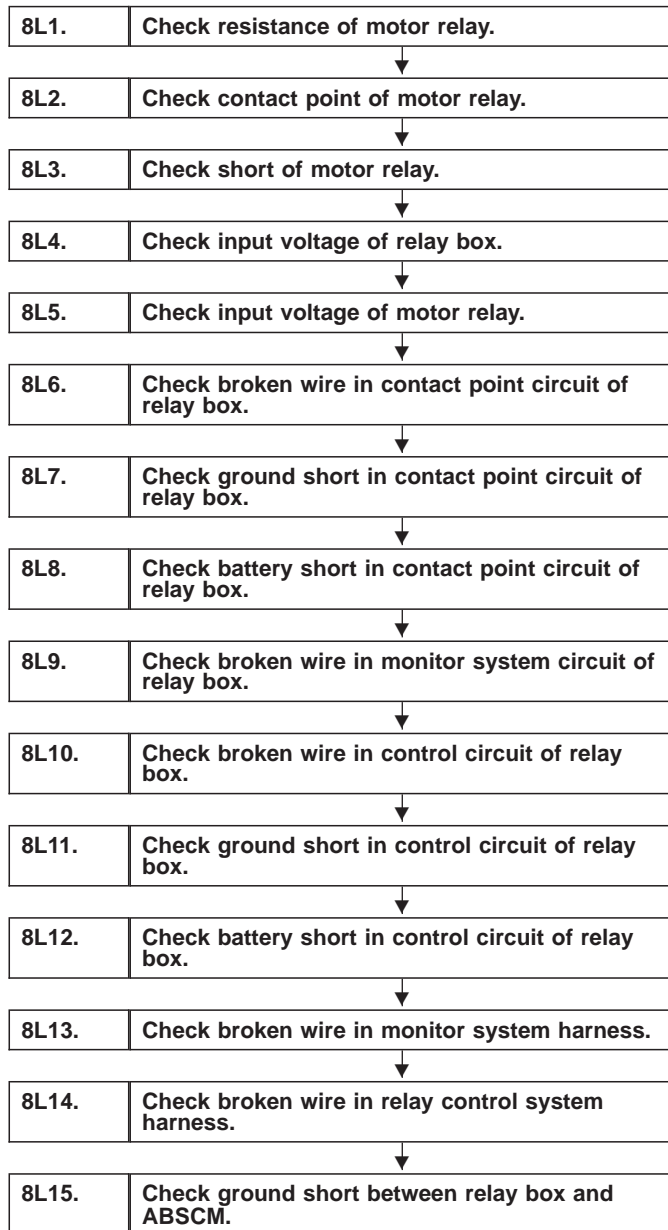
**L: TROUBLE CODE 52  
— ABNORMAL MOTOR AND/OR MOTOR  
RELAY —**

**DIAGNOSIS:**

- Faulty motor
- Faulty motor relay
- Faulty harness connector

**TROUBLE SYMPTOM:**

- ABS does not operate.



Continues to next page.



From the former page.

8L16.	Check battery short between relay box and ABSCM.
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8L17.	Check ground short at ABSCM monitor terminal.
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8L18.	Check battery short at ABSCM monitor terminal.
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8L19.	Check motor ground.
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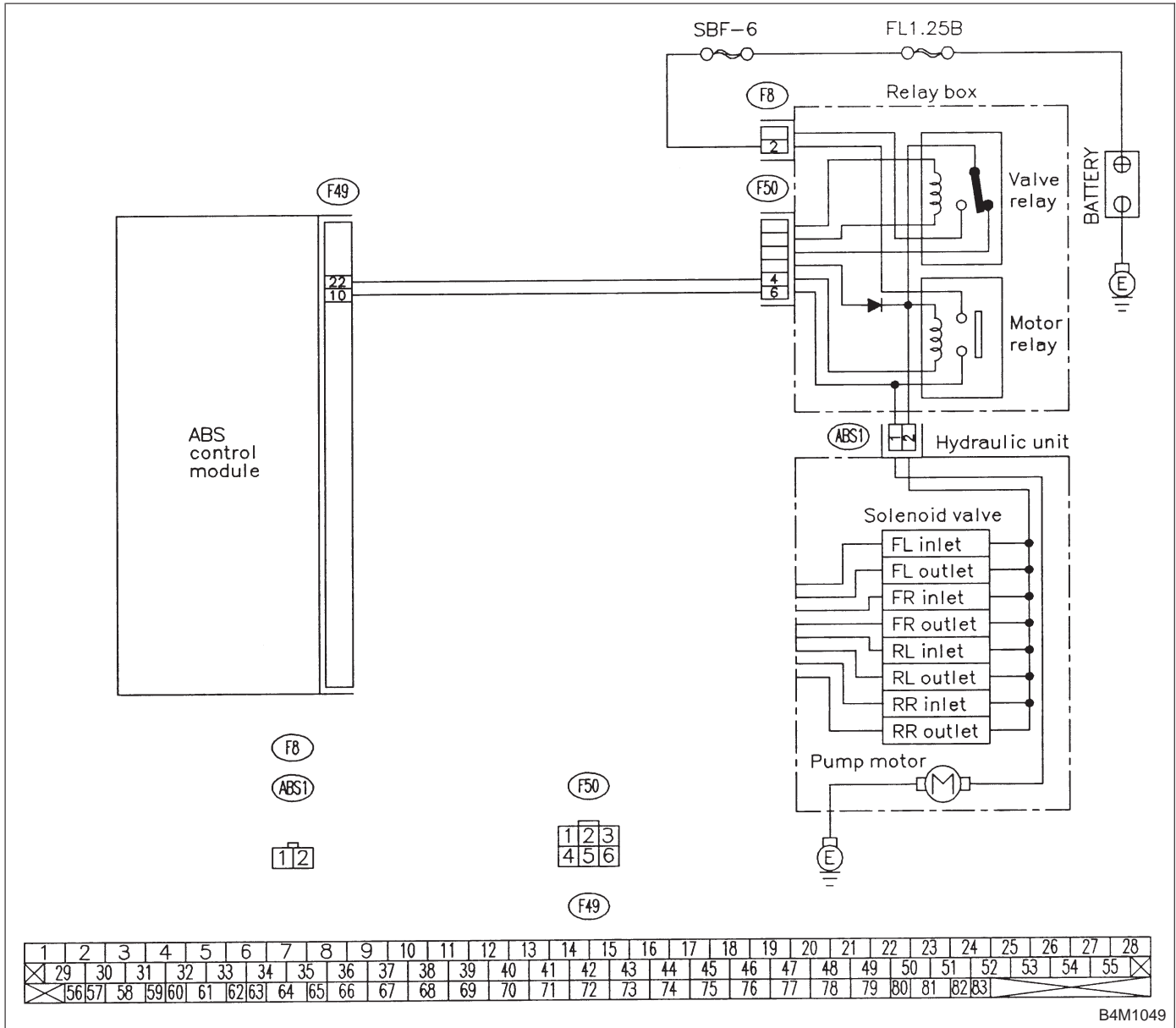
8L20.	Check ABSCM motor drive terminal.
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8L21.	Check motor operation.
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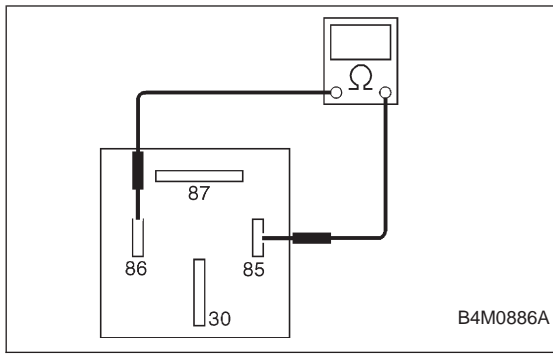
8L22.	Check poor contact in connector between hydraulic unit, relay box and ABSCM.
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8L23.	Check ABSCM.
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WIRING DIAGRAM:



B4M1049



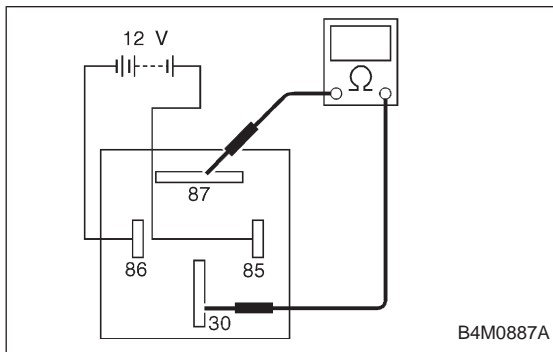
**8L1 CHECK RESISTANCE OF MOTOR RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Measure resistance between motor relay terminals.

**CHECK** : *Terminals*  
**No. 85 — No. 86**  
*Is resistance  $80 \pm 10 \Omega$ ?*

**YES** : Go to step **8L2**.

**NO** : Replace motor relay.



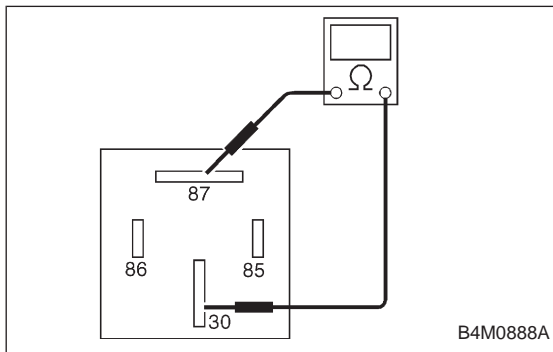
**8L2 CHECK CONTACT POINT OF MOTOR RELAY.**

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

**CHECK** : *Terminals*  
**No. 30 — No. 87**  
*Is resistance less than  $0.5 \Omega$ ?*

**YES** : Go to next step.

**NO** : Replace motor relay.

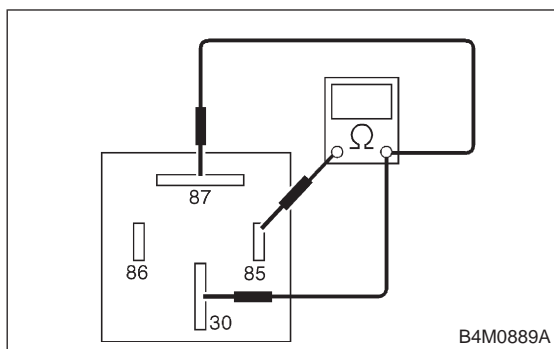


- 3) Disconnect battery from motor relay terminals.
- 4) Measure resistance between motor relay terminals.

**CHECK** : *Terminals*  
**No. 30 — No. 87**  
*Is resistance more than  $1 M\Omega$ ?*

**YES** : Go to step **8L3**.

**NO** : Replace motor relay.

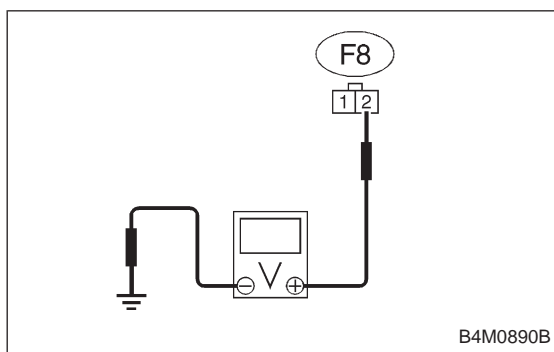
**8L3 CHECK SHORT OF MOTOR RELAY.**

Measure resistance between motor relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 30**  
**No. 85 — No. 87**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step **8L4**.

**NO** : Replace motor relay.

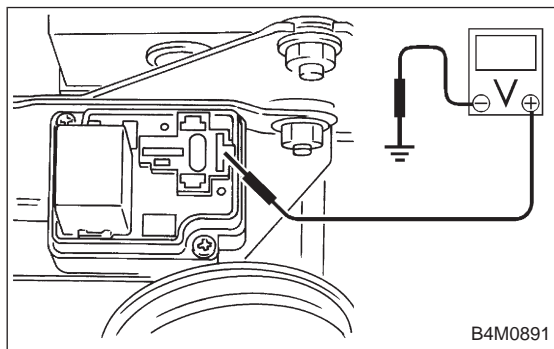
**8L4 CHECK INPUT VOLTAGE OF RELAY BOX.**

1) Disconnect connector (F8) from relay box.  
 2) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F8) No. 2 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step **8L5**.

**NO** : Repair harness connector between battery and relay box. Check fuse SBF6.

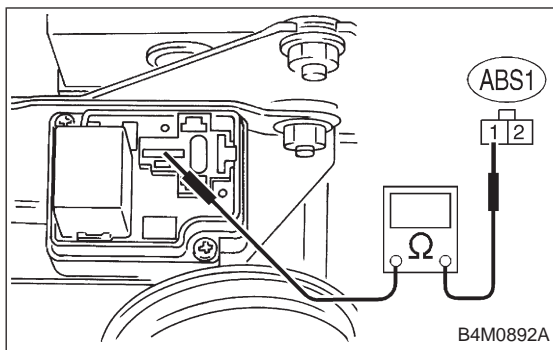
**8L5 CHECK INPUT VOLTAGE OF MOTOR RELAY.**

1) Connect connector (F8) to relay box.  
 2) Measure voltage between relay box and chassis ground.

**CHECK** : **Connector & terminal**  
**Relay installing point No. 87 (+) — Chassis ground (-)**  
**Is voltage more than 10 V?**

**YES** : Go to step **8L6**.

**NO** : Replace relay box. Check fuse SBF6.

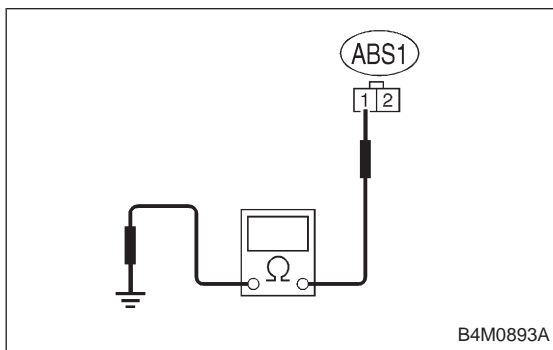
**8L6****CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (ABS1) from hydraulic unit.
- 2) Measure resistance between hydraulic unit and motor relay installing portion.

**CHECK** : **Connector & terminal (ABS1) No. 1 — Motor relay installing portion No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8L7**.

**NO** : Replace relay box.

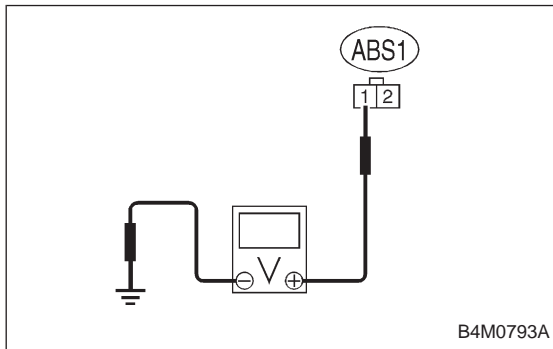
**8L7****CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between hydraulic unit and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 1 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step **8L8**.

**NO** : Replace relay box. Check fuse No. 19.

**8L8****CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

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

**CHECK** : **Connector & terminal (ABS1) No. 1 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Replace relay box.

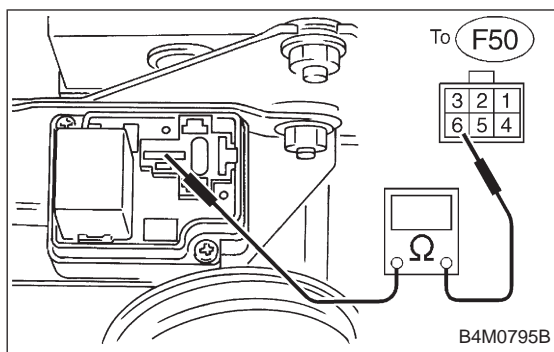
- 4) Turn ignition switch to OFF.

- 5) Measure voltage between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 1 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **8L9**.

**NO** : Replace relay box.

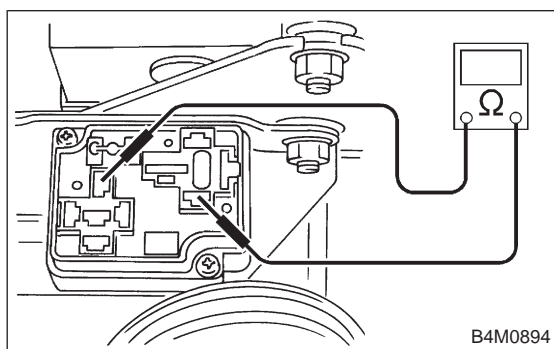
**8L9****CHECK BROKEN WIRE IN MONITOR SYSTEM CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box connector and motor relay installing point.

**CHECK** : **Connector & terminal**  
**To (F50) No. 6 — Motor relay installing point**  
**No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8L10**.

**NO** : Replace relay box.

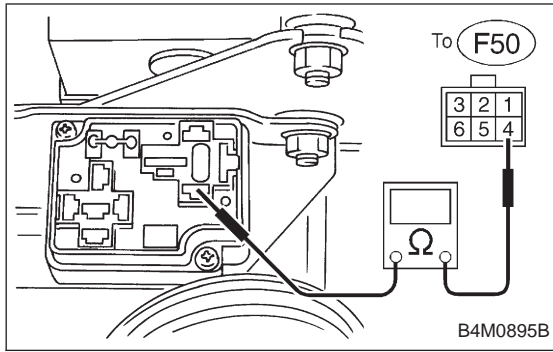
**8L10****CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.**

- 1) Remove valve relay from relay box.
- 2) Measure resistance between motor relay installing point and valve relay installing point.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 86 — Valve**  
**relay installing point No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to next step.

**NO** : Replace relay box.

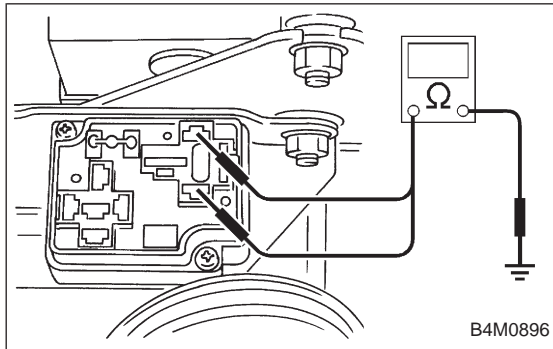


3) Measure resistance between motor relay installing point and relay box connector.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 86 — To (F50) No. 4**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 8L11.

**NO** : Replace relay box.



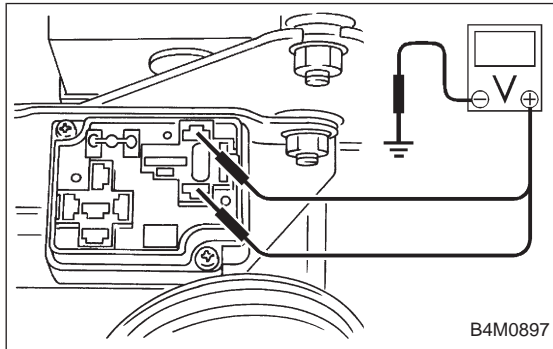
<b>8L11</b>	<b>CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.</b>
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Measure resistance between relay box and chassis ground.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 86 — Chassis ground**  
**Motor relay installing point No. 85 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 8L12.

**NO** : Replace relay box. Check fuse No. 19.



<b>8L12</b>	<b>CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.</b>
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1) Turn ignition switch to ON.  
 2) Measure voltage between motor relay installing point and chassis ground.

**CHECK** : **Connector & terminal**  
**Motor relay installing point (+) No. 86 — Chassis ground (-)**  
**Motor relay installing point (+) No. 85 — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

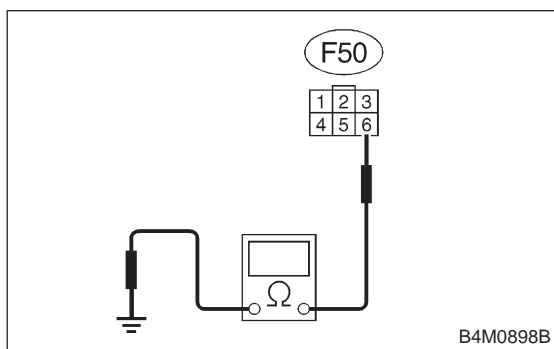
**NO** : Replace relay box and check all fuses.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between motor relay installing point and chassis ground.

**CHECK** : **Connector & terminal**  
**Motor relay installing point (+) No. 86 —**  
**Chassis ground**  
**Motor relay installing point (+) No. 85 —**  
**Chassis ground**  
**Is voltage 0 V?**

**YES** : Go to step **8L13**.

**NO** : Replace relay box and check all fuses.

**8L13**
**CHECK BROKEN WIRE IN MONITOR SYSTEM HARNESS.**

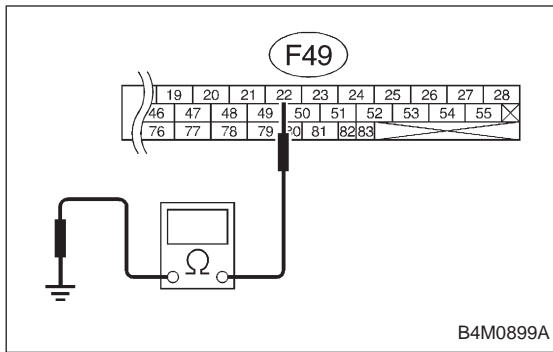
- 1) Connect between terminals No. 10 and No. 1 of ABSCM connector (F49) with a lead wire.
- 2) Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F50) No. 6 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **8L14**.

**NO** : Repair harness connector between ABSCM and relay box.





**8L14**

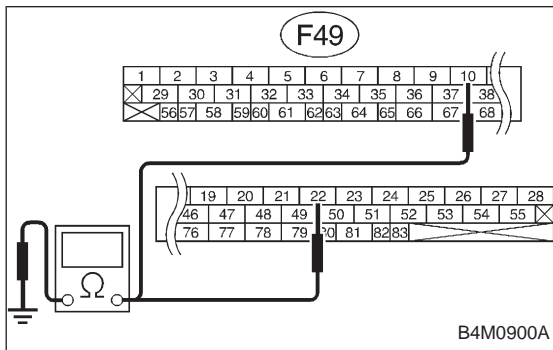
**CHECK BROKEN WIRE IN RELAY CONTROL SYSTEM HARNESS.**

- 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.

**CHECK** : **Connector & terminal (F49) No. 22 — Chassis ground**  
Is resistance  $80 \pm 10 \Omega$ ?

**YES** : Go to step **8L15**.

**NO** : Repair harness connector between ABSCM and relay box.



**8L15**

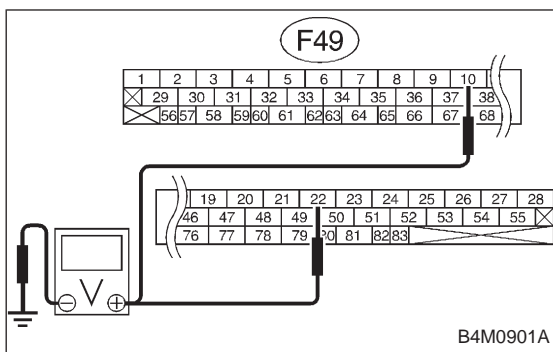
**CHECK GROUND SHORT BETWEEN RELAY BOX AND ABSCM.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 22 — Chassis ground**  
**(F49) No. 10 — Chassis ground**  
Is resistance more than  $1 M\Omega$ ?

**YES** : Go to step **8L16**.

**NO** : Repair harness between ABSCM and relay box. Check fuse No. 19 and SBF6.



**8L16 CHECK BATTERY SHORT BETWEEN RELAY BOX AND ABSCM.**

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

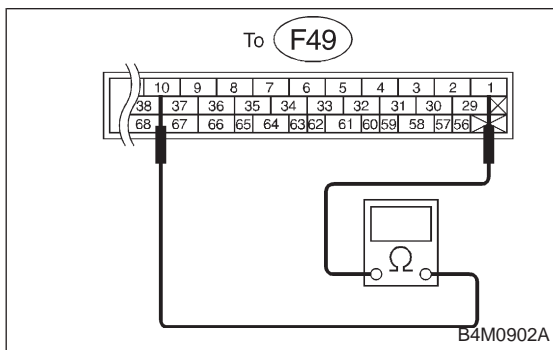
**CHECK** : **Connector & terminal**  
**(F49) No. 22 (+) — Chassis ground (-)**  
**(F49) No. 10 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

- YES** : Go to next step.  
**NO** : Repair harness between relay box and ABSCM.  
 Check fuse SBF6.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between ABSCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 22 (+) — Chassis ground (-)**  
**(F49) No. 10 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

- YES** : Go to step 8L17.  
**NO** : Repair harness between relay box and ABSCM.  
 Check fuse SBF6.

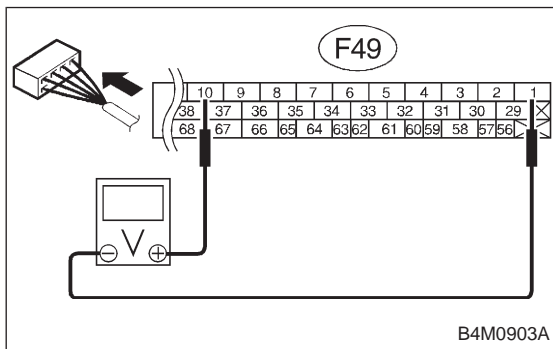


**8L17 CHECK GROUND SHORT AT ABSCM MONITOR TERMINAL.**

Measure resistance between ABSCM terminals.

**CHECK** : **Connector & terminal**  
**To (F49) No. 10 — No. 1**  
**Is resistance less than 0.5 Ω?**

- YES** : Go to step 8L18.  
**NO** : Replace ABSCM.



**8L18 CHECK BATTERY SHORT AT ABSCM MONITOR TERMINAL.**

- 1) Disconnect connector cover from ABSCM connector.  
 <Ref. to 4-4c [T8C1] steps 5) to 8).>
- 2) Connect all connectors.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM connector terminals.

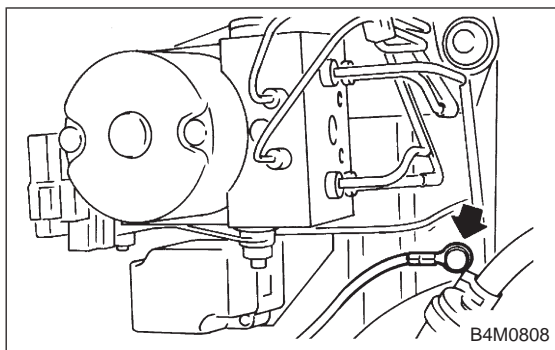
**CHECK** : **Connector & terminal**  
**(F49) No. 10 (+) — No. 1 (-)**  
**Is voltage less than 2 V?**

- YES** : Go to next step.  
**NO** : Replace ABSCM.

- 5) Turn ignition switch to OFF.
- 6) Measure voltage between ABSCM connector terminals.

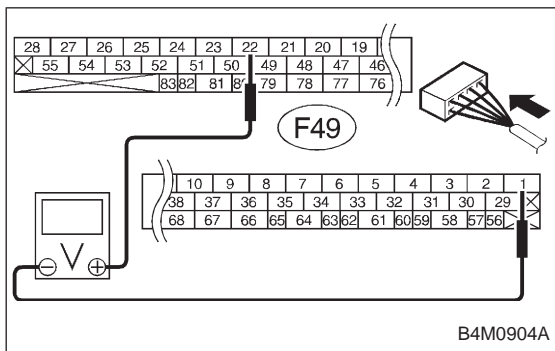
**CHECK** : **Connector & terminal**  
**(F49) No. 10 (+) — No. 1 (-)**  
**Is voltage less than 2 V?**

- YES** : Go to step 8L19.  
**NO** : Replace ABSCM.



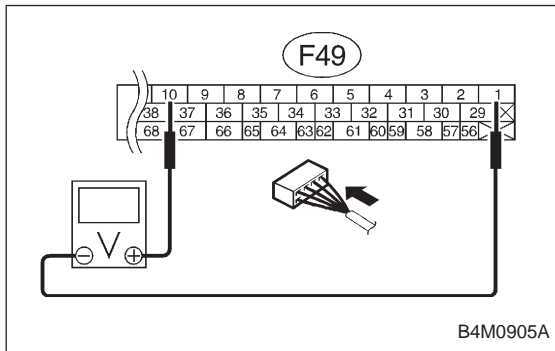
**8L19 CHECK MOTOR GROUND.**

- 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 **8L20**.
- NO** : Tighten the clamp of motor ground terminal.



**8L20 CHECK ABSCM MOTOR DRIVE TERMINAL.**

- 1) Measure voltage between ABSCM connector terminals.
  - 2) Operate the check sequence. <Ref. to 4-4 [W22D1].>
- CHECK** : *Connector & terminal*  
**(F49) No. 22 (+) — No. 1 (-)**  
*Does the voltage drop from 10 — 13 V to less than 1.5 V, and rise to 10 — 13 V again when carrying out the check sequence?*
- YES** : Go to step **8L21**.
- NO** : Replace ABSCM.



**8L21 CHECK MOTOR OPERATION.**

- 1) Measure voltage between ABSCM connector terminals.
  - 2) Operate the check sequence. <Ref. to 4-4 [W22D1].>
- CHECK** : *Connector & terminal*  
**(F49) No. 10 (+) — No. 1 (-)**  
*Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence?*  
*Can motor revolution noise (buzz) be heard when carrying out the check sequence?*
- YES** : Go to step **8L22**.
- NO** : Replace hydraulic unit.

<b>8L22</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.</b>
-------------	---

**CHECK** : *Is there poor contact in connector between hydraulic unit, relay box and ABSCM?*

**YES** : Repair connector.

**NO** : Go to step **8L23**.

<b>8L23</b>	<b>CHECK ABSCM.</b>
-------------	---------------------

- 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

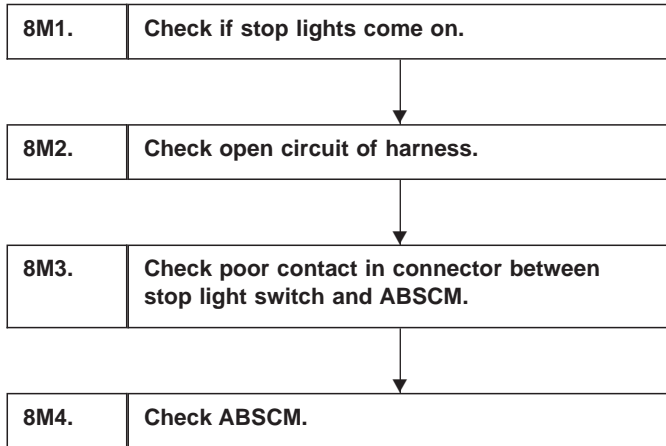
**NO** : A temporary poor contact.

**M: TROUBLE CODE 54  
— ABNORMAL STOP LIGHT SWITCH —****DIAGNOSIS:**

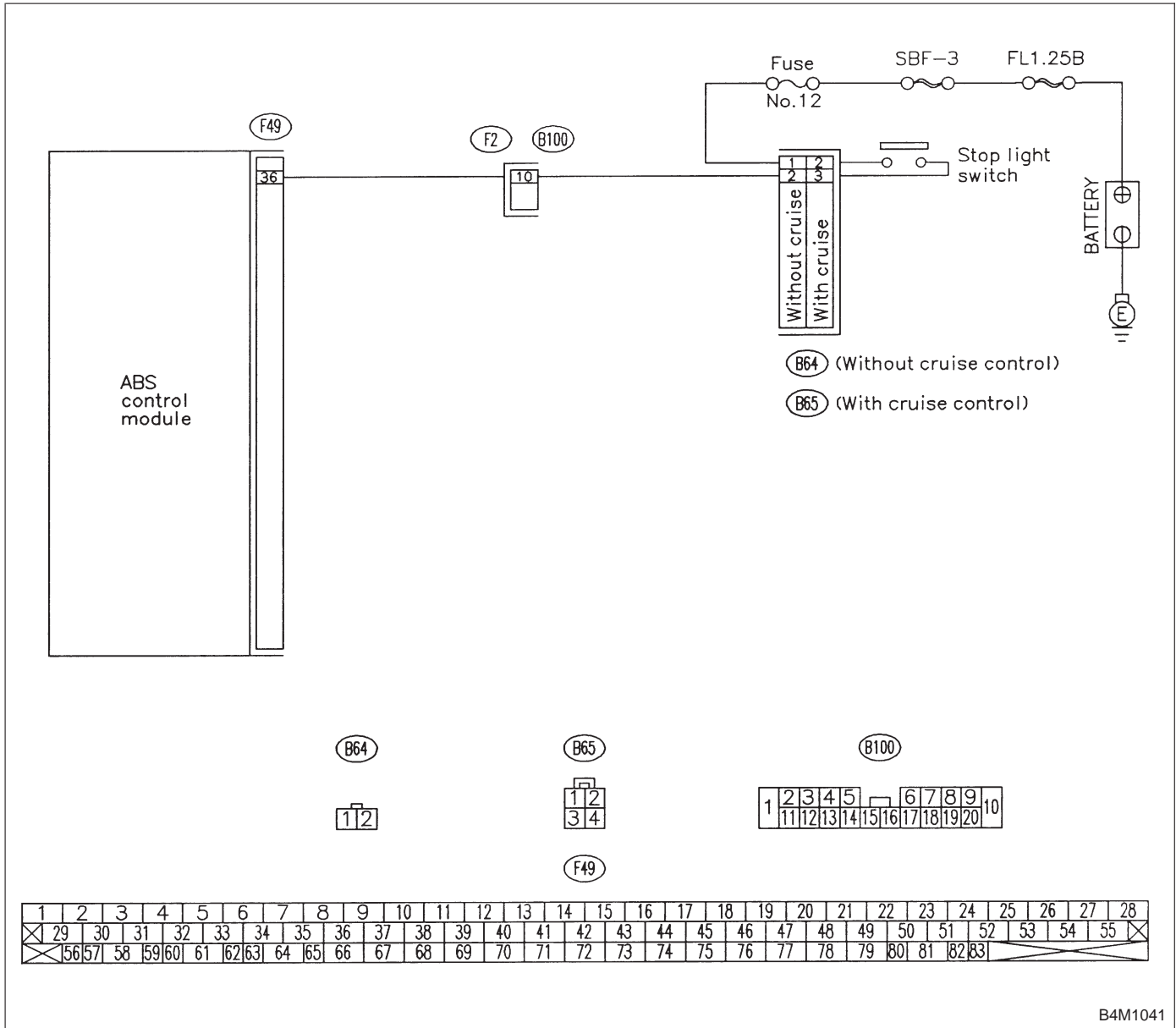
- Faulty stop light switch

**TROUBLE SYMPTOM:**

- ABS does not operate.



**WIRING DIAGRAM:**



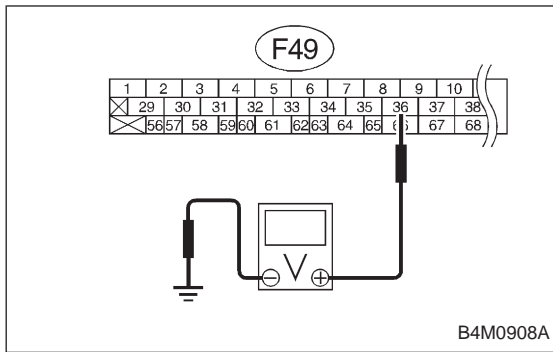
**8M1      CHECK IF STOP LIGHTS COME ON.**

Depress the brake pedal.

**CHECK** : *Do stop lights turn on?*

**YES** : Go to step **8M2**.

**NO** : Repair stop lights circuit.



**8M2 CHECK OPEN CIRCUIT OF 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.

**CHECK** : *Connector & terminal (F49) No. 36 — Chassis ground  
Is voltage 10 — 13 V?*

**YES** : Go to step **8M3**.

**NO** : Repair harness between stop light switch and ABSCM.

**8M3 CHECK POOR CONTACT IN CONNECTOR BETWEEN STOP LIGHT SWITCH AND ABSCM.**

**CHECK** : *Is there poor contact in connector between stop light switch and ABSCM?*

**YES** : Repair connector.

**NO** : Go to step **8M4**.

**8M4 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

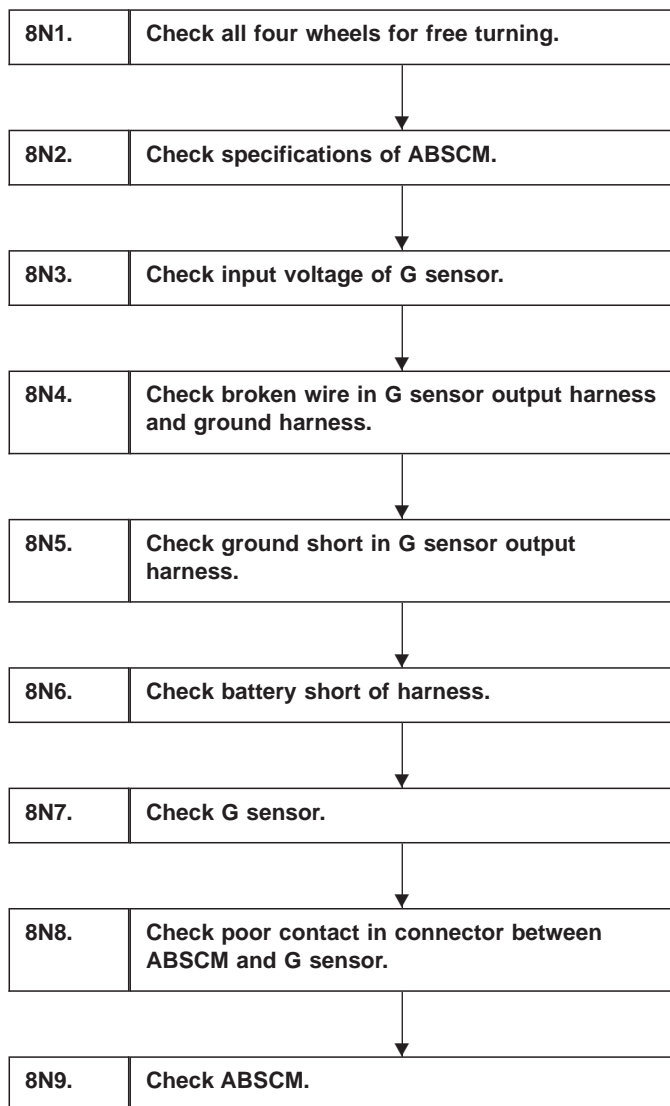
**NO** : A temporary poor contact.

**N: TROUBLE CODE 56  
— ABNORMAL G SENSOR OUTPUT  
VOLTAGE —****DIAGNOSIS:**

- Faulty G sensor output voltage

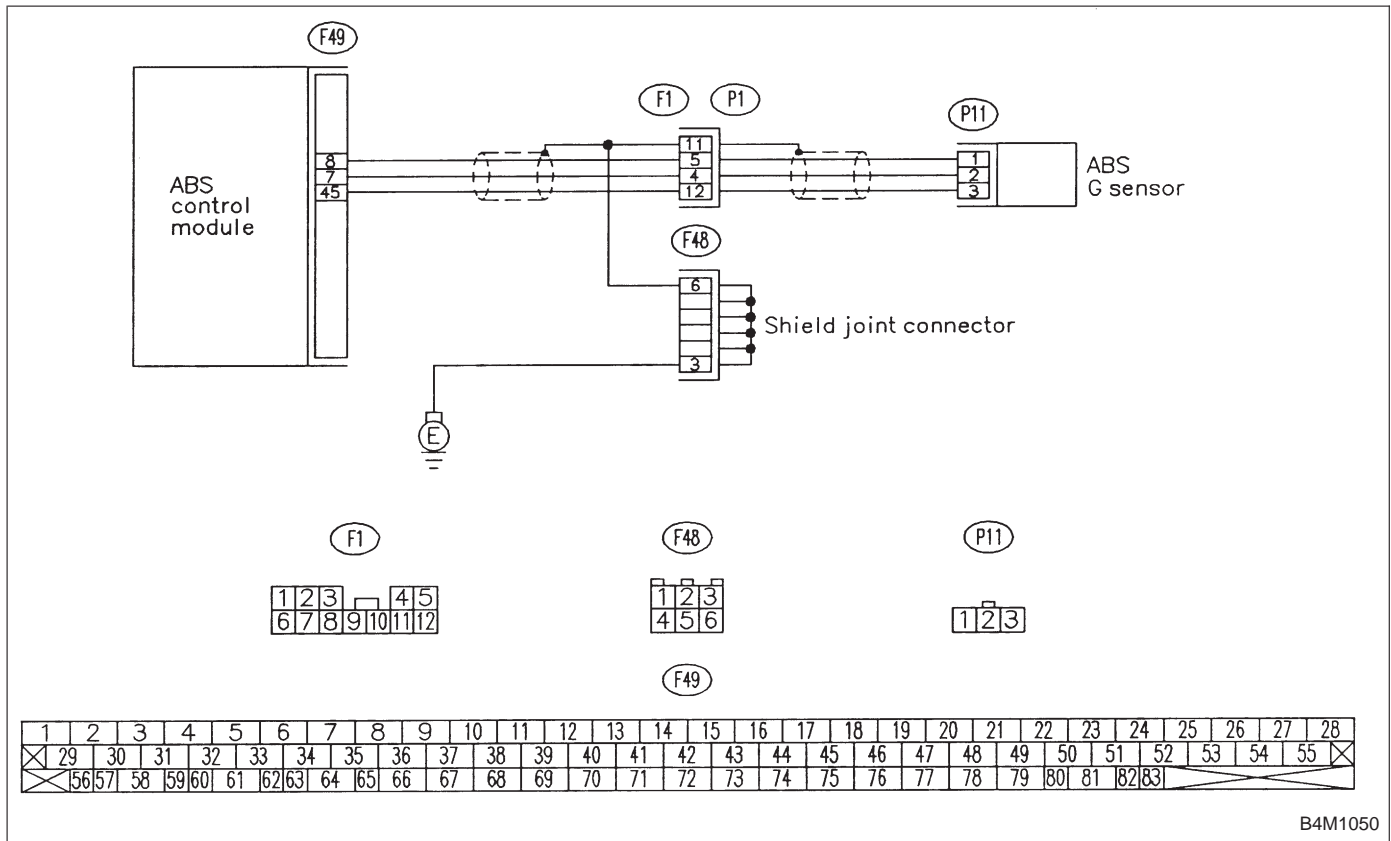
**TROUBLE SYMPTOM:**

- ABS does not operate.





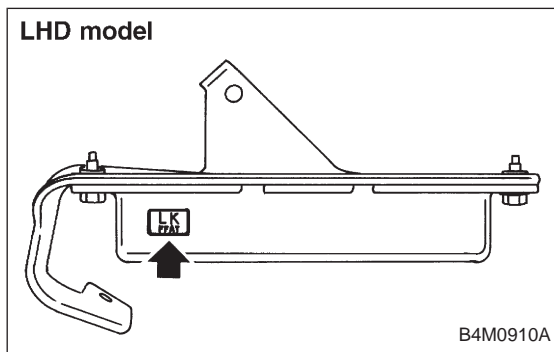
WIRING DIAGRAM:



B4M1050

**8N1** 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 8N2.



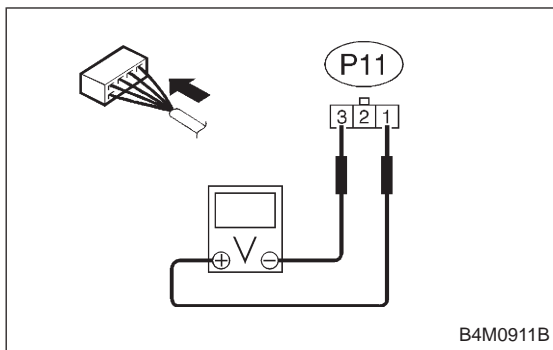
B4M0910A

**8N2** 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 8N3.

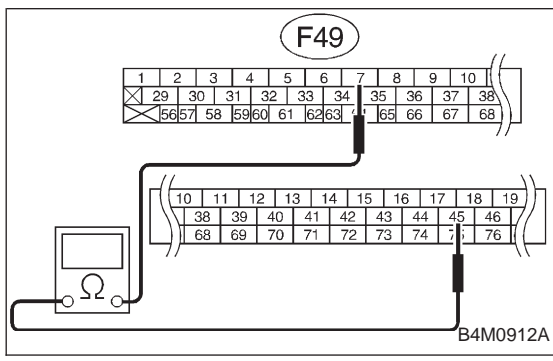


**8N3 CHECK INPUT VOLTAGE OF G SENSOR.**

- 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.

**CHECK** : **Connector & terminal (P11) No. 1 (+) — No. 3 (-)**  
**Is voltage  $5\pm 0.25$  V?**

- YES** : Go to step 8N4.
- NO** : Repair harness connector between G sensor and ABSCM.

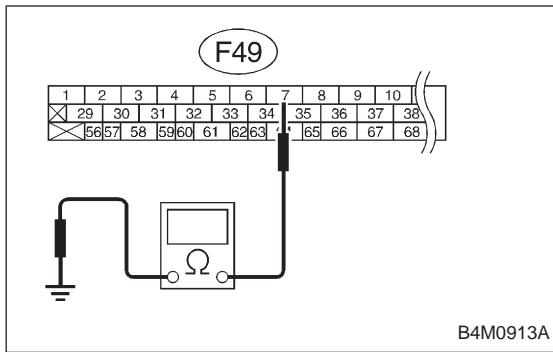


**8N4 CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

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

**CHECK** : **Connector & terminal (F49) No. 7 — No. 45**  
**Is resistance  $4.6\pm 0.3$  k $\Omega$ ?**

- YES** : Go to step 8N5.
- NO** : Repair harness between G sensor and ABSCM.



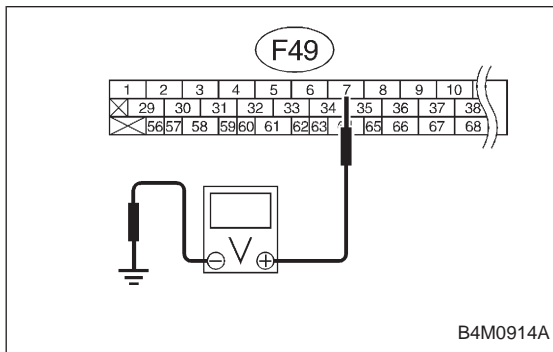
**8N5**      **CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.**

- 1) Disconnect connector from G sensor.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 7 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step **8N6**.

**NO** : Repair harness between G sensor and ABSCM.



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

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

**CHECK** : **Connector & terminal (F49) No. 7 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

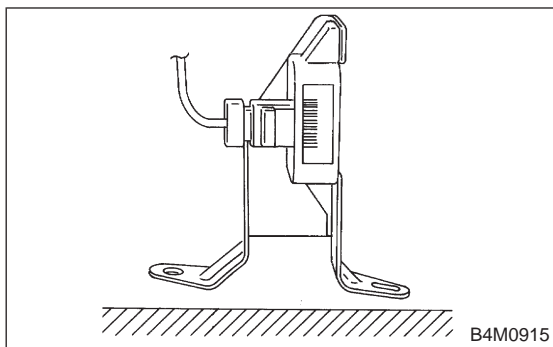
**NO** : Repair harness between G sensor and ABSCM.

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

**CHECK** : **Connector & terminal (F49) No. 7 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **8N7**.

**NO** : Repair harness between G sensor and ABSCM.

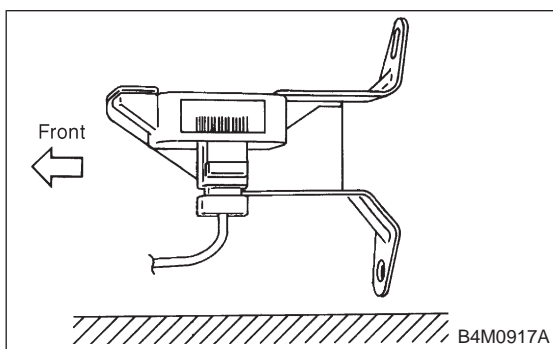
**8N7** CHECK G SENSOR.

- 1) Remove G sensor from vehicle.
- 2) Connect connector to G sensor.
- 3) Connect connector to ABSCM.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between G sensor connector terminals.

**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $2.3 \pm 0.2$  V when G sensor is horizontal?**

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

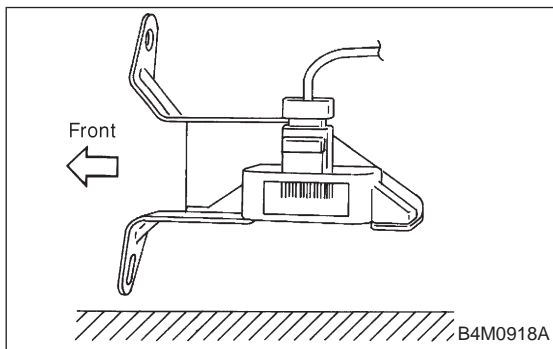
**NO** : Replace G sensor.



**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $3.9 \pm 0.2$  V when G sensor is inclined forwards to 90°?**

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

**NO** : Replace G sensor.



**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $0.7 \pm 0.2$  V when G sensor is inclined backwards to 90°?**

**YES** : Go to step **8N8**.

**NO** : Replace G sensor.

**8N8** CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.

**CHECK** : **Is there poor contact in connector between ABSCM and G sensor?**

**YES** : Repair connector.

**NO** : Go to step **8N9**.

<b>8N9</b>	<b>CHECK ABSCM.</b>
------------	---------------------

- 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?*

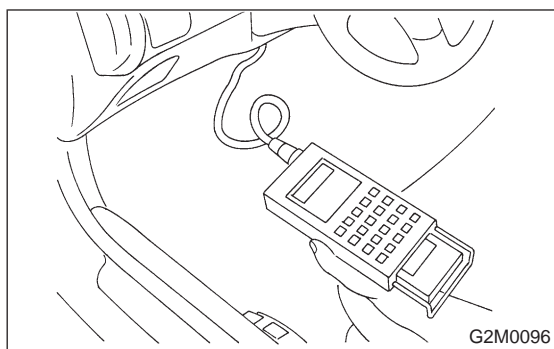
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**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. 498345700

### A: LIST OF FUNCTION MODE

#### 1. F MODE (ROM ID, ANALOG DATA ARE DISPLAYED.)

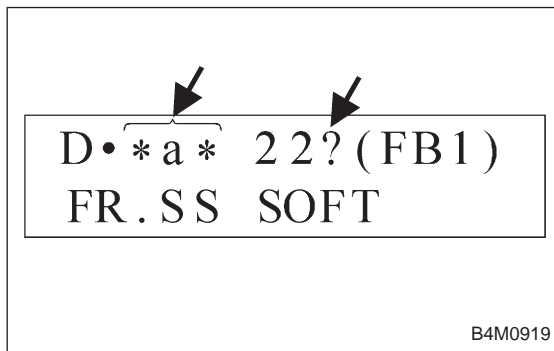
Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
F00	ROM ID	ECM identification	ROM ID number of ECM is read and enabled communication state is displayed.	Possible	4-4c [T9B0]
F01	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	4-4c [T9C0]
F02	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	4-4c [T9D0]
F03	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	4-4c [T9E0]
F04	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	4-4c [T9F0]
F05	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	4-4c [T9C0]
F06	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	4-4c [T9D0]
F07	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	4-4c [T9E0]
F08	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	4-4c [T9F0]
F09	BLS	Stop light switch monitor	Stop light switch monitor voltage is displayed.	Possible	4-4c [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	4-4c [T9H0]

**2. FA MODE (ON/OFF DATA ARE DISPLAYED.)**

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FA0	B1	Stop light switch	LED 1 comes on with the switch on (with the brake pedal down).	Possible	4-4c [T910]
	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
Code	Abbreviation				
FB1	D-ALL	History of trouble codes is displayed.	A maximum of 3 trouble codes are displayed in order of occurrence.	Possible	4-4c [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).

B4M0919

#### 4. FC MODE (TROUBLE CODES AND FREEZE FRAME DATA ARE ERASED.)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FC0	D-CLR	History of trouble codes and freeze frame data is erased.	Function of clearing trouble code and freeze frame data stored in memory.	Possible	4-4c [T9J0]

#### 5. FD MODE (ABS SEQUENCE CHECK MODE)

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FD1	A-CHK	ABS sequence control	Perform ABS sequence control by operating valve and pump motor sequentially.	Impossible	4-4 [W19D1]

#### 6. FE MODE (FREEZE FRAME DATA)

##### NOTE:

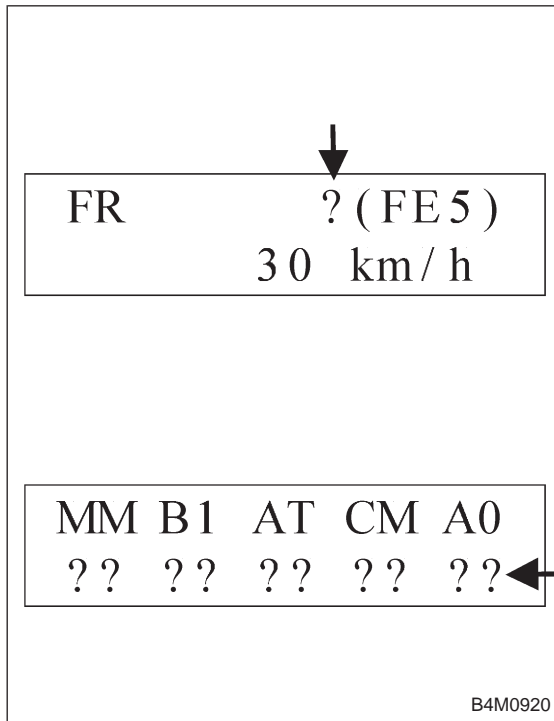
Data stored at the time of trouble occurrence is shown on display.

Function code		Measuring items	Contents to be monitored	Scroll	Ref. to
Code	Abbreviation				
FE1	FR	FR wheel speed (mile/h)	Wheel speed detected by the FR ABS sensor is displayed in mile/h.	Possible	4-4c [T9K0]
FE2	FL	FL wheel speed (mile/h)	Wheel speed detected by the FL ABS sensor is displayed in mile/h.	Possible	4-4c [T9L0]
FE3	RR	RR wheel speed (mile/h)	Wheel speed detected by the RR ABS sensor is displayed in mile/h.	Possible	4-4c [T9M0]
FE4	RL	RL wheel speed (mile/h)	Wheel speed detected by the RL ABS sensor is displayed in mile/h.	Possible	4-4c [T9N0]
FE5	FR	FR wheel speed (km/h)	Wheel speed detected by the FR ABS sensor is displayed in km/h.	Possible	4-4c [T9K0]
FE6	FL	FL wheel speed (km/h)	Wheel speed detected by the FL ABS sensor is displayed in km/h.	Possible	4-4c [T9L0]
FE7	RR	RR wheel speed (km/h)	Wheel speed detected by the RR ABS sensor is displayed in km/h.	Possible	4-4c [T9M0]
FE8	RL	RL wheel speed (km/h)	Wheel speed detected by the RL ABS sensor is displayed in km/h.	Possible	4-4c [T9N0]
FE13	POWER	ABSCM power supply voltage (V)	Power (in volts) supplied to ABSCM appears on the select monitor display.	Possible	4-4c [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	4-4c [T9P0]
FE15	MM	Motor relay monitor	LED 1 comes on when motor relay is on.	Possible	4-4c [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.		



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.

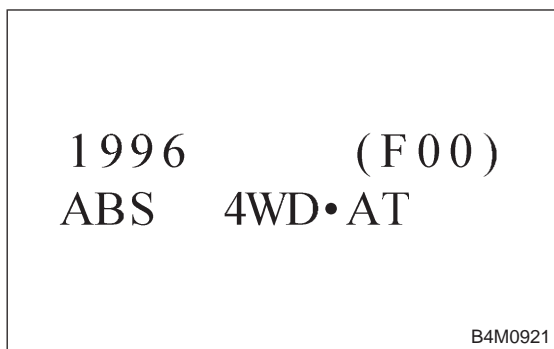


2) If freeze frame data is not properly stored in memory (due to a drop in ABSCM power supply, etc.), a trouble code, preceded by a question mark “?”, appears on the select monitor display. This shows it may be an unreliable reading.

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.

4) Freeze frame data and trouble code, stored in memory, are cleared simultaneously in the FC mode.

<Ref. to 4-4c [T9J0].>



**B: MODE F00**  
— ROM ID NUMBER (ROM) —

**CONDITION:**

Ignition switch ON

**SPECIFIED DATA:**

Presentation display

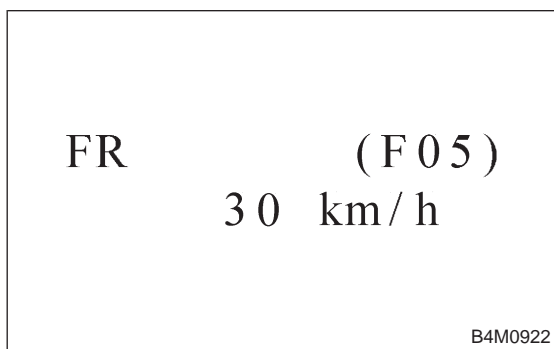
- Probable cause (Item outside “specified data”)

**1. Error 1**

Check for loose or disconnected connector, and discontinued circuit, etc.

**2. Error 2**

Check for poor contact of cartridge, or different type cartridge.

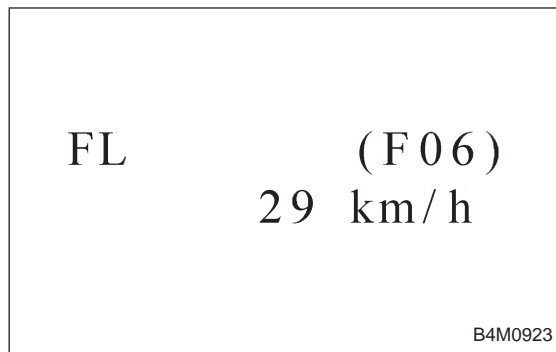


**C: MODE F01 AND F05**  
— FRONT RIGHT WHEEL SPEED SIGNAL (FR) —

- 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.

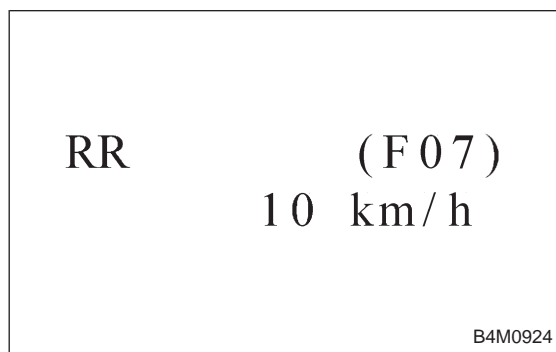


**D: MODE F02 AND F06**  
**— FRONT LEFT WHEEL SPEED SIGNAL (FL) —**

- 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.

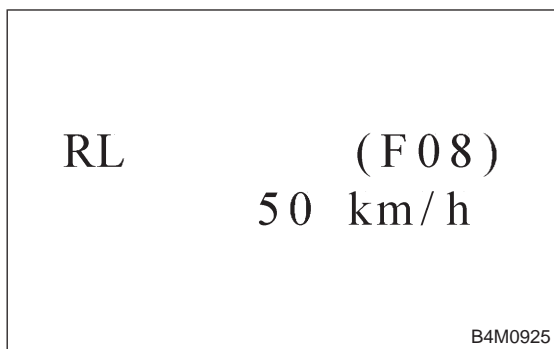


**E: MODE F03 AND F07**  
**— REAR RIGHT WHEEL SPEED SIGNAL (RR) —**

- 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.

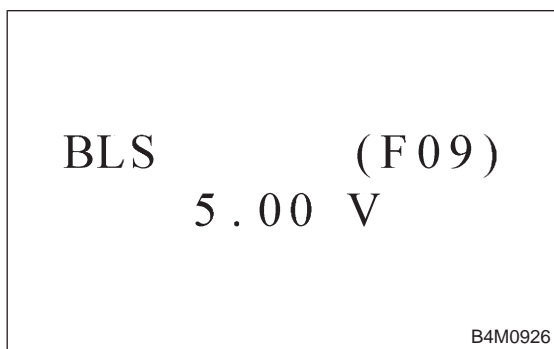
**F: MODE F04 AND F08****— REAR LEFT WHEEL SPEED SIGNAL (RL)**

—

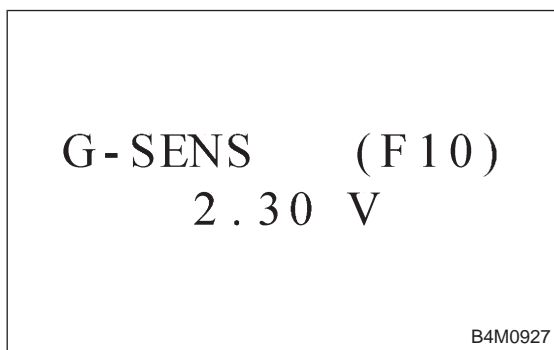
- Compare speedometer with monitor indications.
- F04: RL wheel speed is indicated in mile per hour (mile/h).
- F08: RL wheel speed is indicated in kilometer per hour (km/h).

**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 AND FREEZE FRAME DATA IS ERASED (D-CLR) —**

- Deletes the recorded trouble codes and freeze frame data in ABS control module.

F C O ENT

B4M0931

- 1) Use function keys to put in F C O ENT.

MEMORY CLR ?  
0 : YES    1 : NO

B4M0930

- 2) System indicates as shown.

MEMORY CLR ?  
\* 0 : YES    1 : NO

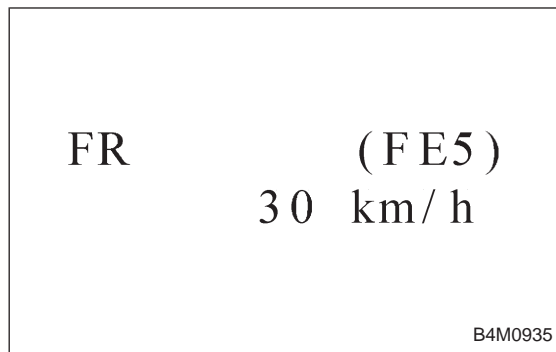
B4M0933

- 3) Key in 0, to clear memories. The indication of ✖ is added to screen.

PLEASE  
KEY OFF

B4M0934

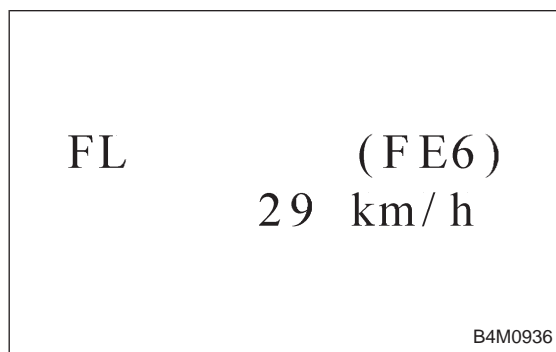
- 4) Key in ENT. System indicates as shown.
- 5) Turn the key OFF.

**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:**

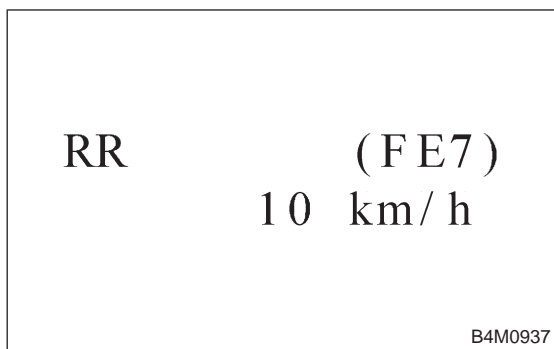
The monitor as shown, indicates that FR wheel speed is 30 km/h.

**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.

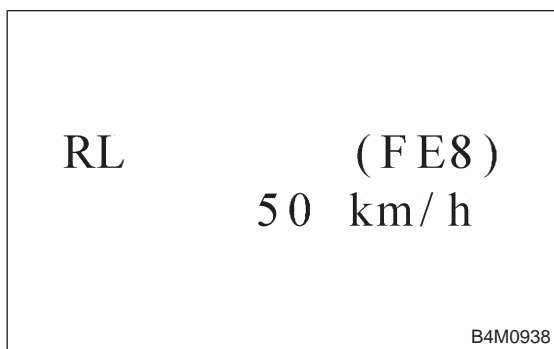


**M: MODE FE3 AND FE7**  
**— REAR RIGHT WHEEL SPEED SIGNAL (RR) —**

- 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.

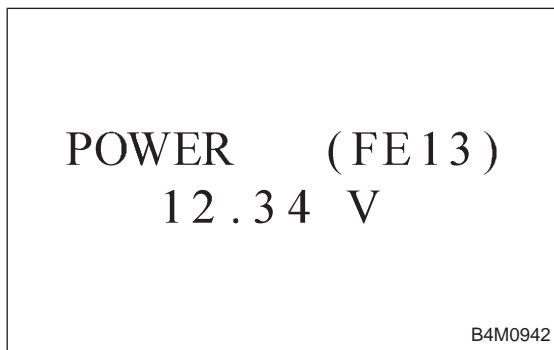


**N: MODE FE4 AND FE8**  
**— REAR LEFT WHEEL SPEED SIGNAL (RL) —**

- 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:**

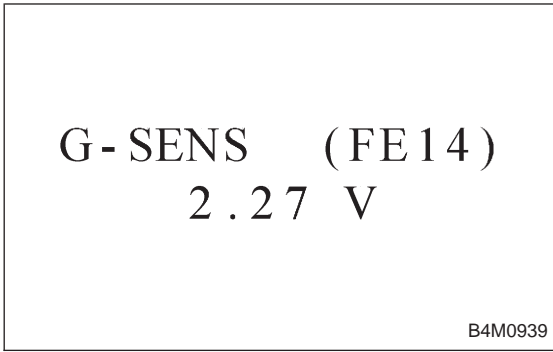
The monitor as shown, indicates that RL wheel speed is 50 km/h.



**O: MODE FE13**  
**— ABSCM POWER SUPPLY VOLTAGE (POWER) —**

- ABSCM power supply voltage is indicated at the time of malfunction.





**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

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	—	—

**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.

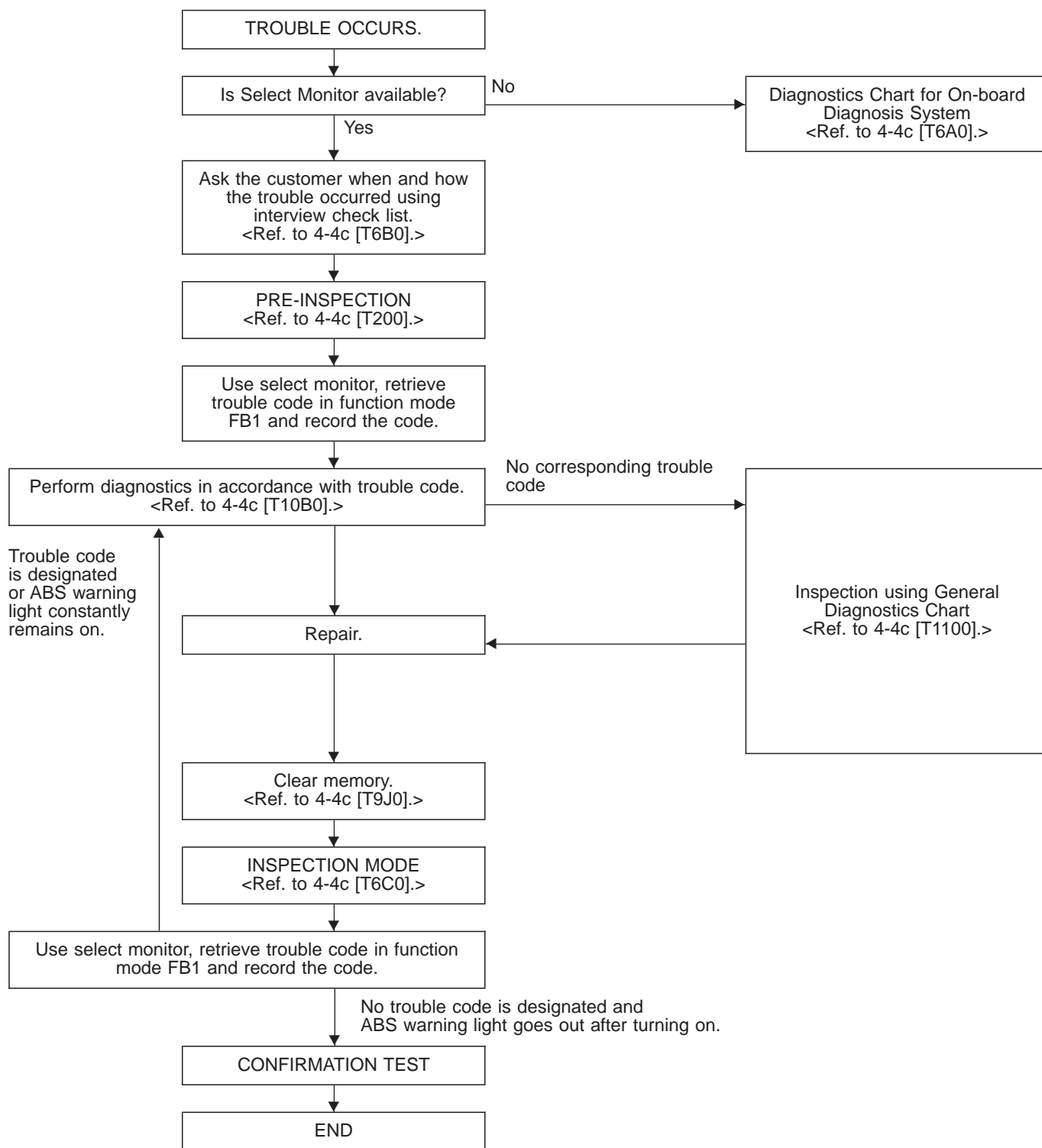
MM	B1	AT	CM	AO
—	—	—	—	—

1	2	3	4	5
---	---	---	---	---

6	7	8	9	10
---	---	---	---	----

# 10. Diagnostics Chart with Select Monitor

## A: BASIC DIAGNOSTIC CHART



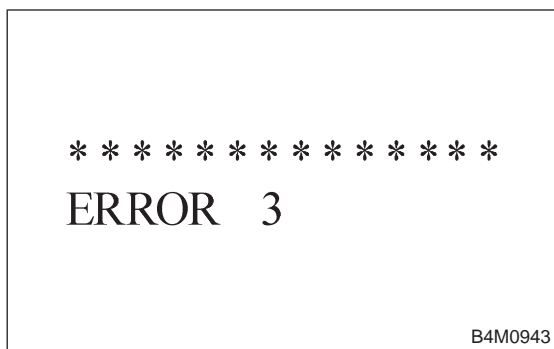
**NOTE:**  
To check harness for broken wires or short circuits, shake it while holding it or the connector.

## B: LIST OF TROUBLE CODE

Code	Display screen (FB1)	Contents of diagnosis	Ref. to
—	ERROR 3 (1)	Select monitor communication failure	4-4c [T10C0]
11	NO TROUBLE	Although no trouble appears on the select monitor display, the ABS warning light remains on.	4-4c [T10D0]
21	FR. SS HARD	Open circuit or input voltage too high of FR sensor	4-4c [T10E0]
22	FR. SS SOFT	Abnormal ABS sensor signal of FR sensor	4-4c [T10I0]
23	FL. SS HARD	Open circuit or input voltage too high of FL sensor	4-4c [T10F0]
24	FL. SS SOFT	Abnormal ABS sensor signal of FL sensor	4-4c [T10J0]
25	RR. SS HARD	Open circuit or input voltage too high of RR sensor	4-4c [T10G0]
26	RR. SS SOFT	Abnormal ABS sensor signal of RR sensor	4-4c [T10K0]
27	RL. SS HARD	Open circuit or input voltage too high of RL sensor	4-4c [T10H0]
28	RL. SS SOFT	Abnormal ABS sensor signal of RL sensor	4-4c [T10L0]
29	EITHER. SS SOFT	Abnormal ABS sensor signal (any one of four)	4-4c [T10M0]
31	FR. EV VALVE	Abnormal FR inlet valve	4-4c [T10N0]
32	FR. AV VALVE	Abnormal FR outlet valve	4-4c [T10R0]
33	FL. EV VALVE	Abnormal FL inlet valve	4-4c [T10O0]
34	FL. AV VALVE	Abnormal FL outlet valve	4-4c [T10S0]
35	RR. EV VALVE	Abnormal RR inlet valve	4-4c [T10P0]
36	RR. AV VALVE	Abnormal RR outlet valve	4-4c [T10T0]
37	RL. EV VALVE	Abnormal RL inlet valve	4-4c [T10Q0]
38	RL. AV VALVE	Abnormal RL outlet valve	4-4c [T10U0]
41	ECU	Abnormal ABSCM	4-4c [T10V0]
42	LOW VOLTAGE	Source voltage is low.	4-4c [T10W0]
44	CCM LINE	A combination of AT control abnormalities (ABS not in control)	4-4c [T10X0]
	CCM OPEN	A combination of AT control abnormalities (ABS in control)	4-4c [T10Y0]
46	GS POWER OVER	G sensor line voltage too high	4-4c [T10Z0]
	GS POWER LOW	G sensor line voltage too low	4-4c [T10AA0]
51	V. RELAY	Abnormal valve relay	4-4c [T10AB0]
	V. RELAY ON	Valve relay ON failure	4-4c [T10AC0]
52	M. RELAY OPEN	Open circuit of motor relay	4-4c [T10AD0]
	M. RELAY ON	Motor relay ON failure	4-4c [T10AE0]
	MOTOR	Abnormal motor	4-4c [T10AF0]
54	BLS	Abnormal stop light switch	4-4c [T10AG0]
56	G SENSOR LINE	Open or short circuit of G sensor	4-4c [T10AH0]
	G SENSOR +B	Battery short of G sensor	4-4c [T10AI0]
	G SENSOR H $\mu$	Abnormal G sensor high $\mu$ output	4-4c [T10AJ0]
	G SENSOR STICK	G sensor output is stuck.	4-4c [T10AK0]

## NOTE:

High  $\mu$  means high friction coefficient against road surface.



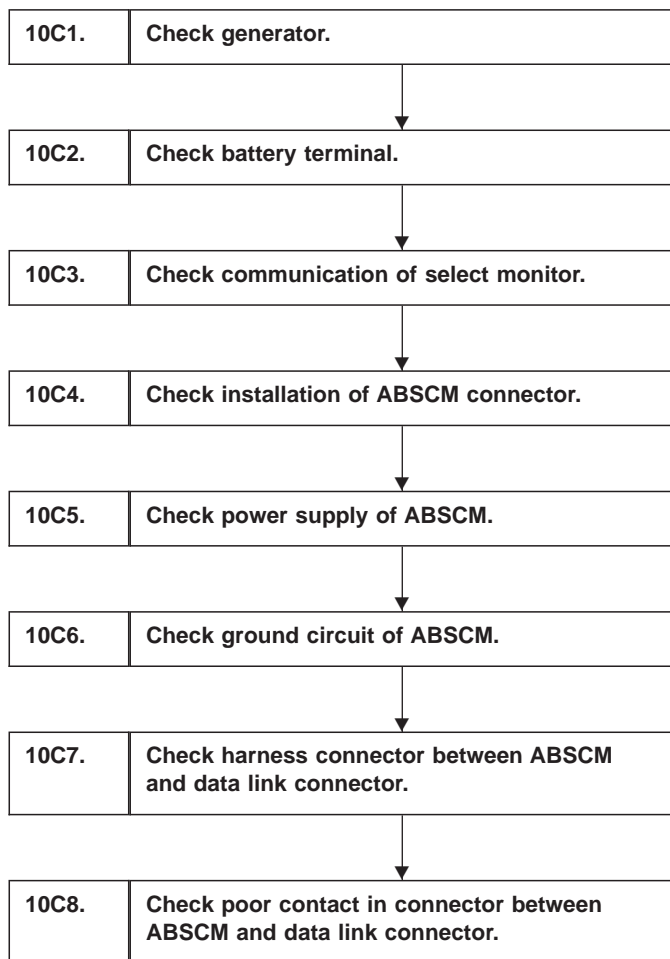
**C: ERROR 3 (1)**  
**— SELECT MONITOR COMMUNICATION FAILURE —**

**DIAGNOSIS:**

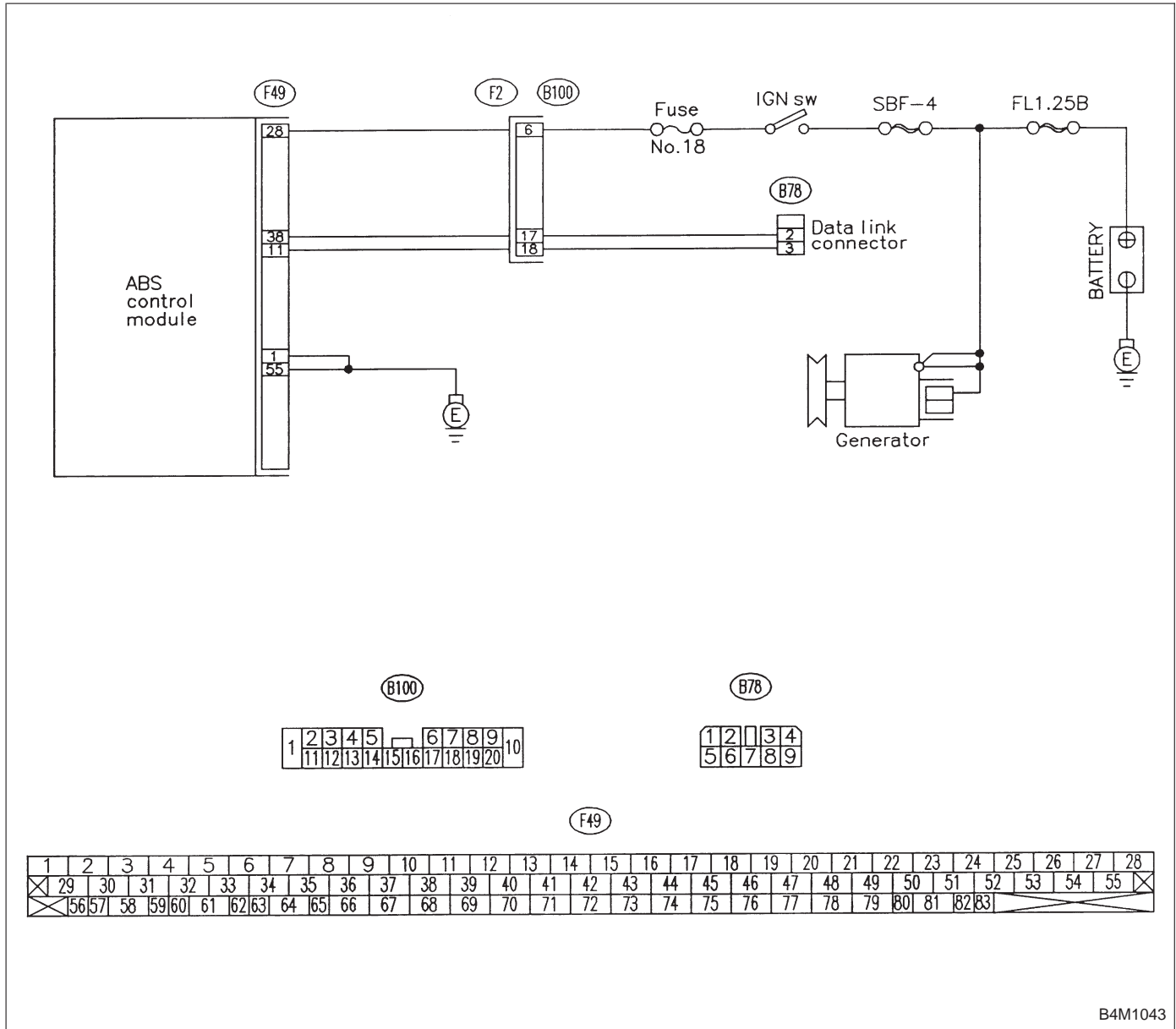
- Faulty harness connector

**TROUBLE SYMPTOM:**

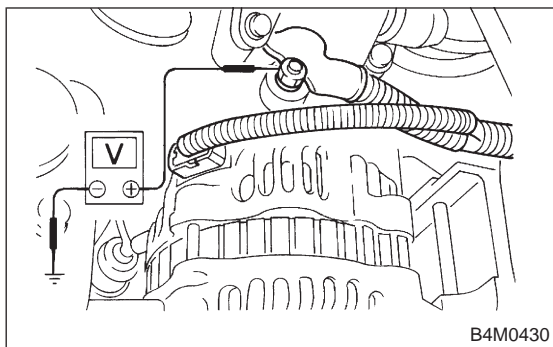
- ABS warning light remains on.
- ERROR 3 or 1 appears on the select monitor display.



**WIRING DIAGRAM:**



B4M1043



<b>10C1</b>	<b>CHECK GENERATOR.</b>
-------------	-------------------------

- 1) Start the engine.
- 2) Idle the engine.
- 3) Measure voltage between generator and chassis ground.

**CHECK** : **Terminal Generator B terminal (+) — Chassis ground (-):**  
**Is voltage 10 — 15 V?**

**YES** : Go to step **10C2**.

**NO** : Repair generator.

<b>10C2</b>	<b>CHECK BATTERY TERMINAL.</b>
-------------	--------------------------------

Turn ignition switch to OFF.

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

**YES** : Repair battery terminal.

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

<b>10C3</b>	<b>CHECK COMMUNICATION OF SELECT MONITOR.</b>
-------------	---

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.

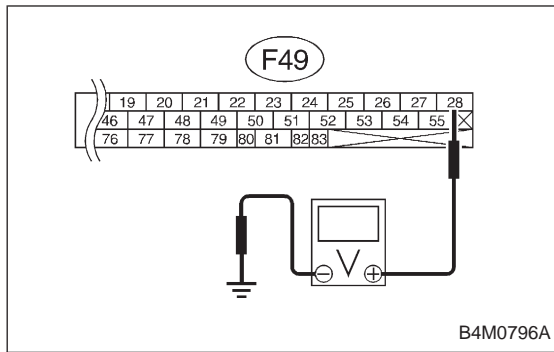
<b>10C4</b>	<b>CHECK INSTALLATION OF ABSCM CONNECTOR.</b>
-------------	---

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.



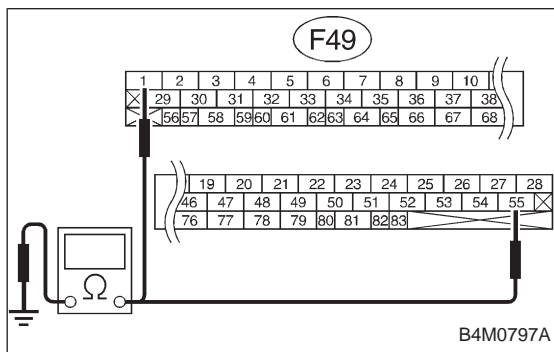
**10C5 CHECK POWER SUPPLY OF ABSCM.**

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

**CHECK** : **Connector & terminal (F49) No. 28 (+) — Chassis ground (-): Is voltage 10 — 15 V?**

**YES** : Go to step **10C6**.

**NO** : Repair ABSCM power supply circuit.



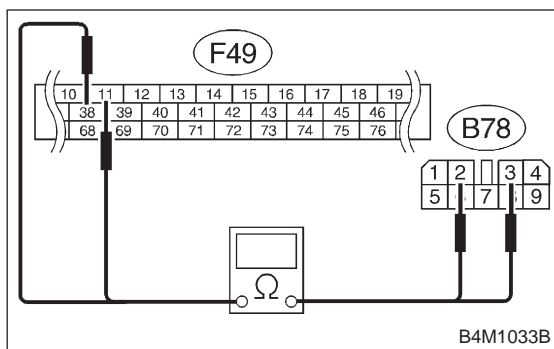
**10C6 CHECK GROUND CIRCUIT OF ABSCM.**

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

**CHECK** : **Connector & terminal (F49) No. 1 — Chassis ground: (F49) No. 55 — Chassis ground: Is 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 CONNECTOR.**

- 1) Turn ignition switch OFF.
- 2) Measure resistance between ABSCM connector and data link connector.

**CHECK** : **Connector & terminal**  
**(F49) No. 11 — (B78) No. 3**  
**(F49) No. 38 — (B78) No. 2**  
**Is resistance less than 0.5 Ω?**

**YES** : Repair harness and connector between ABSCM and data link connector.

**NO** : Go to step **10C8**.

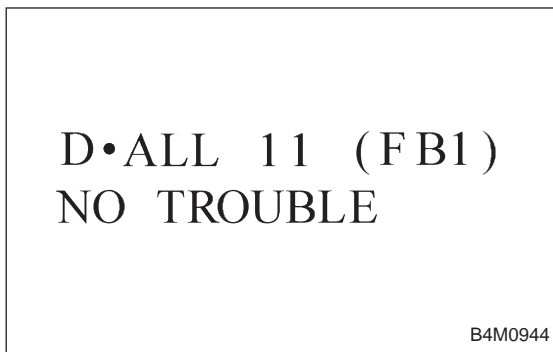
**10C8**
**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND DATA LINK CONNECTOR.**

**CHECK** : **Is there poor contact in connectors between ABSCM and data link connector?**

**YES** : Repair connector.

**NO** : Replace ABSCM.





**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:**

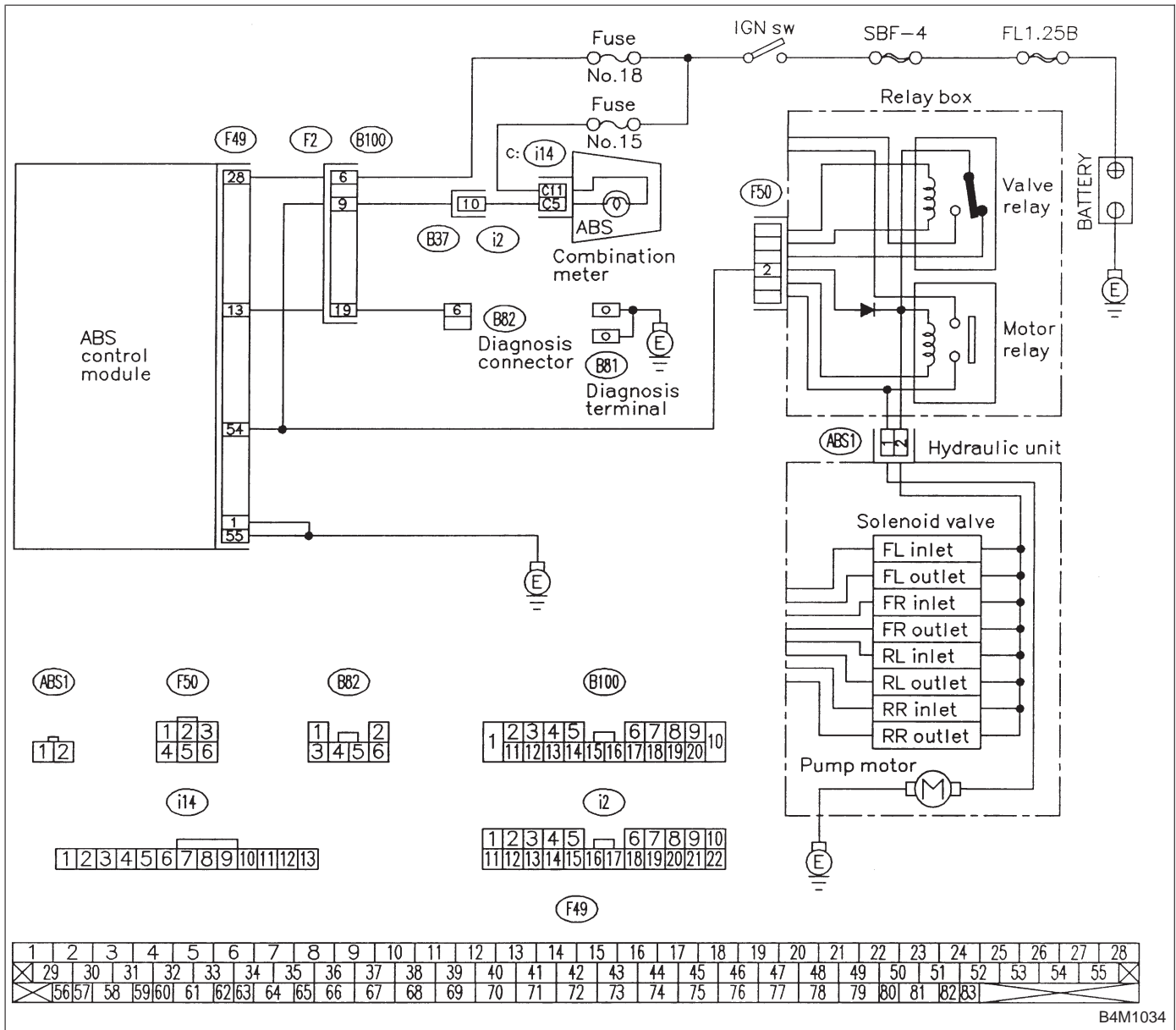
When the ABS warning light is OFF and “NO TROUBLE” is displayed on the select monitor, the system is in normal condition.

10D1.	Check ground short of harness.
-------	--------------------------------



10D2.	Check ground short of relay box.
-------	----------------------------------

**WIRING DIAGRAM:**



B4M1034

<b>10D1</b>	<b>CHECK GROUND SHORT OF HARNESS.</b>
-------------	---------------------------------------

- 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.

<b>10D2</b>	<b>CHECK GROUND SHORT OF RELAY BOX.</b>
-------------	---

- 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 (FB1)  
FR. SS HARD

B4M0945

**E: 21 FR. SS HARD**  
— ABNORMAL FRONT RH ABS SENSOR  
(OPEN CIRCUIT OR INPUT VOLTAGE TOO  
HIGH) —

D•NEW 23 (FB1)  
FL. SS HARD

B4M0946

**F: 23 FL. SS HARD**  
— ABNORMAL FRONT LH ABS SENSOR  
(OPEN CIRCUIT OR INPUT VOLTAGE TOO  
HIGH) —

D•NEW 25 (FB1)  
RR. SS HARD

B4M0947

**G: 25 RR. SS HARD**  
— ABNORMAL REAR RH ABS SENSOR  
(OPEN CIRCUIT OR INPUT VOLTAGE TOO  
HIGH) —

D•NEW 27 (FB1)  
RL. SS HARD

B4M0948

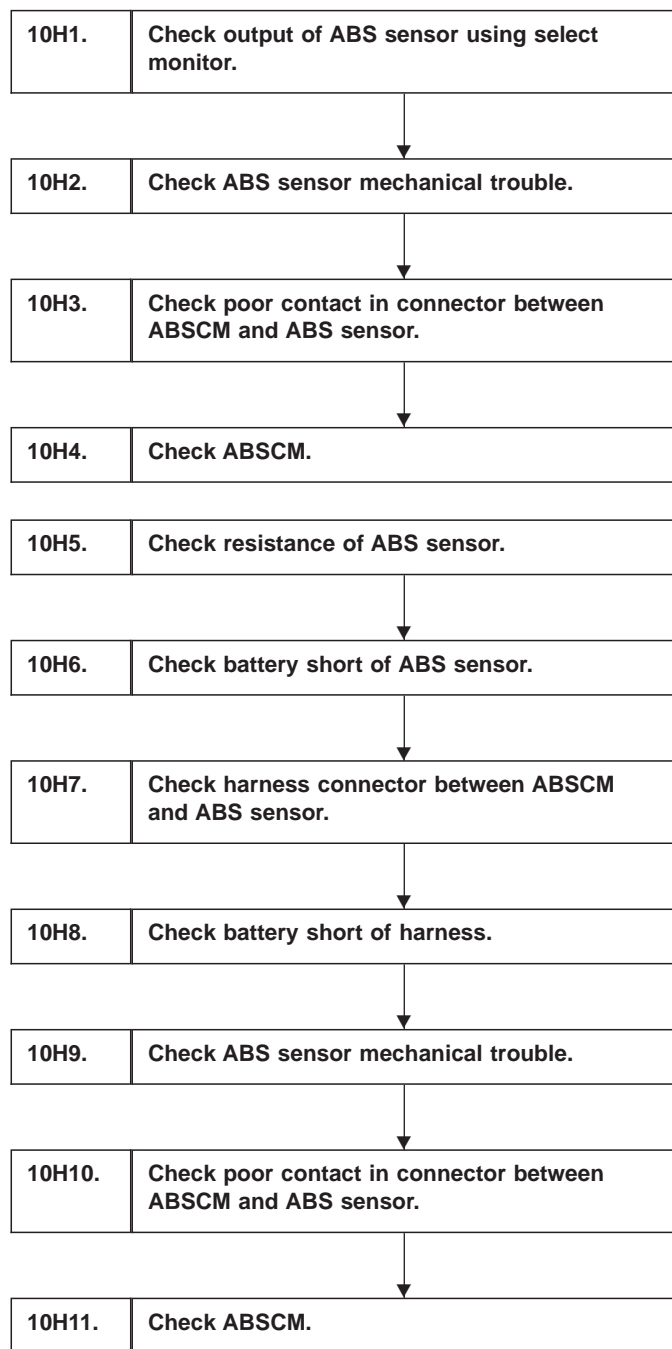
**H: 27 RL. SS HARD**  
— ABNORMAL REAR LH ABS SENSOR  
(OPEN CIRCUIT OR INPUT VOLTAGE TOO  
HIGH) —

**DIAGNOSIS:**

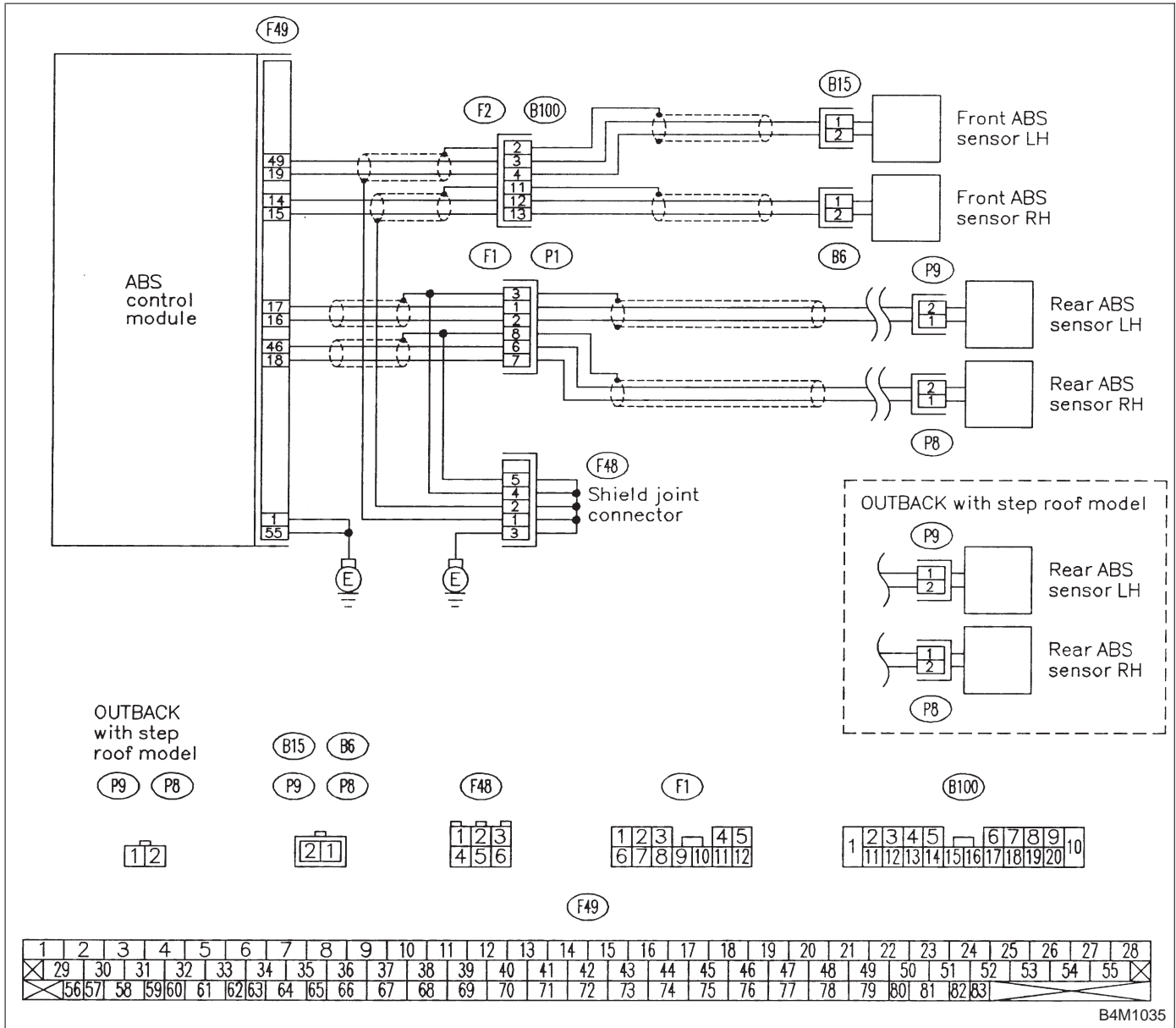
- Faulty ABS sensor (Broken wire, input voltage too high)
- Faulty harness connector

**TROUBLE SYMPTOM:**

- ABS does not operate.



**WIRING DIAGRAM:**



B4M1035

FR (F05)

30 km/h

B4M0922

<b>10H1</b>	<b>CHECK OUTPUT OF ABS SENSOR USING SELECT MONITOR.</b>
-------------	---

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 10H2.

**NO** : Go to step 10H5.

<b>10H2</b>	<b>CHECK ABS SENSOR MECHANICAL TROUBLE.</b>
-------------	---

**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?*

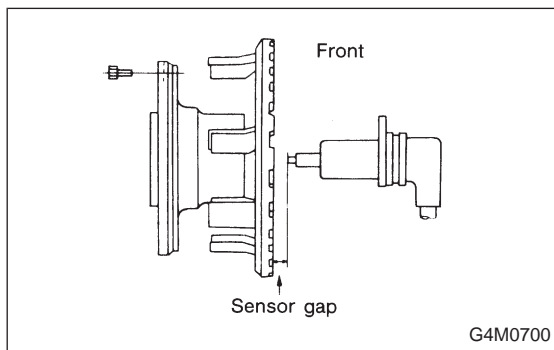
**YES** : Go to next **CHECK** .

**NO** : Tighten ABS sensor installation bolts securely.

**CHECK** : *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?*

**YES** : Go to next step.

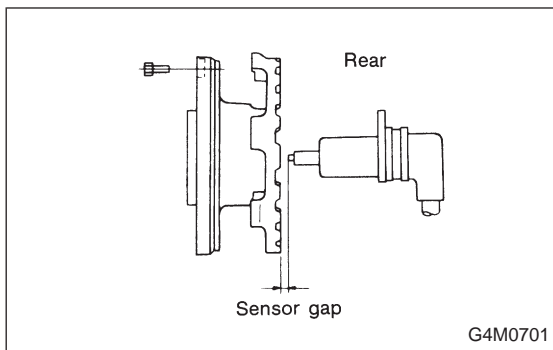
**NO** : Tighten tone wheel installation bolts securely.



1) 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 next step.

**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.

2) Measure hub runout.

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

**YES** : Go to step **10H3**.

**NO** : Repair hub.

<b>10H3</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.</b>
-------------	--

**CHECK** : *Is there poor contact in connectors between ABSCM and ABS sensor?*

**YES** : Repair connector.

**NO** : Go to step **10H4**.

<b>10H4</b>	<b>CHECK ABSCM.</b>
-------------	---------------------

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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

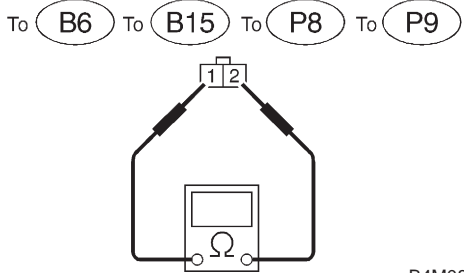
**NO** : A temporary poor contact.

**NOTE:**

Check harness and connectors between ABSCM and ABS sensor.



## Except OUTBACK with step roof model



10H5

## CHECK RESISTANCE OF ABS SENSOR.

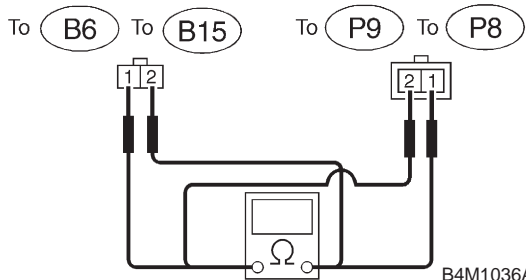
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABS sensor.
- 3) Measure resistance of ABS sensor connector terminals.

**CHECK** : *Trouble code/Connector & terminal*  
 21/to (B6) No. 1 — No. 2  
 23/to (B15) No. 1 — No. 2  
 25/to (P8) No. 1 — No. 2  
 27/to (P9) No. 1 — No. 2  
 Is resistance 0.8 — 1.2 kΩ?

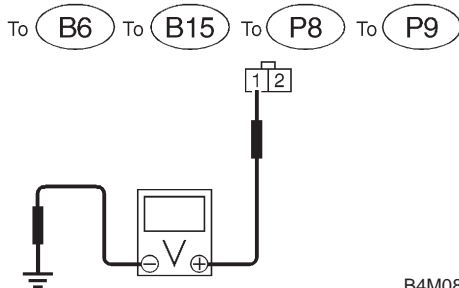
**YES** : Go to step 10H6.

**NO** : Replace ABS sensor.

## OUTBACK with step roof model



## Except OUTBACK with step roof model



10H6

## CHECK BATTERY SHORT OF ABS SENSOR.

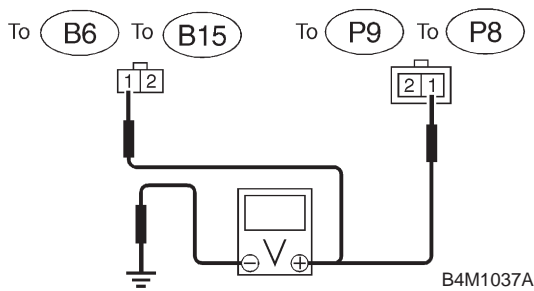
- 1) Disconnect connector from ABSCM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ABS sensor and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 21/to (B6) No. 1 (+) — Chassis ground (-)  
 23/to (B15) No. 1 (+) — Chassis ground (-)  
 25/to (P8) No. 1 (+) — Chassis ground (-)  
 27/to (P9) No. 1 (+) — Chassis ground (-)  
 Is voltage 0 V?

**YES** : Go to next step.

**NO** : Replace ABS sensor.

## OUTBACK with step roof model

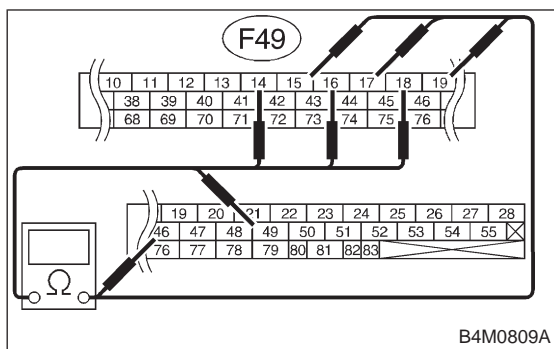


- 4) Turn ignition switch to OFF.
- 5) Measure voltage between ABS sensor and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 21/to (B6) No. 1 (+) — Chassis ground (-)  
 23/to (B15) No. 1 (+) — Chassis ground (-)  
 25/to (P8) No. 1 (+) — Chassis ground (-)  
 27/to (P9) No. 1 (+) — Chassis ground (-)  
 Is voltage 0 V?

**YES** : Go to step 10H7.

**NO** : Replace ABS sensor.



10H7

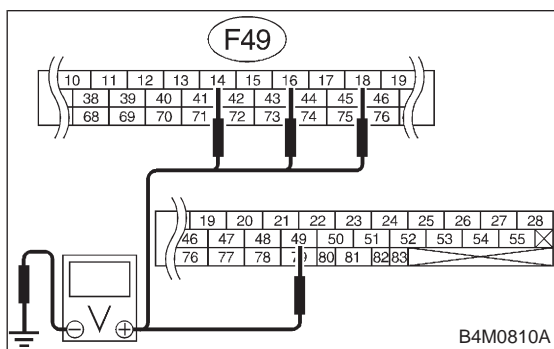
**CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

- 1) Connect connector to ABS sensor.
- 2) Measure resistance between ABSCM connector terminals.

**CHECK** : *Trouble code/Connector & terminal*  
 21/(F49) No. 14 — No. 15  
 23/(F49) No. 49 — No. 19  
 25/(F49) No. 18 — No. 46  
 27/(F49) No. 16 — No. 17  
*Is resistance 0.8 — 1.2 kΩ?*

**YES** : Go to step 10H8.

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



10H8

**CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *Trouble code/Connector & terminal*  
 21/(F49) No. 14 — Chassis ground  
 23/(F49) No. 49 — Chassis ground  
 25/(F49) No. 18 — Chassis ground  
 27/(F49) No. 16 — Chassis ground  
*Is voltage 0 V?*

**YES** : Go to next step.

**NO** : Repair harness between ABSCM and ABS sensor.

- 3) Turn ignition switch to OFF.

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

**CHECK** : *Trouble code/Connector & terminal*  
 21/(F49) No. 14 — Chassis ground  
 23/(F49) No. 49 — Chassis ground  
 25/(F49) No. 18 — Chassis ground  
 27/(F49) No. 16 — Chassis ground  
*Is voltage 0 V?*

**YES** : Go to step 10H9.

**NO** : Repair harness between ABSCM and ABS sensor.

<b>10H9</b>	<b>CHECK ABS SENSOR MECHANICAL TROUBLE.</b>
-------------	---

**CHECK** : **Tightening torque:**  
 $32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )  
**Are the ABS sensor installation bolts tightened securely?**

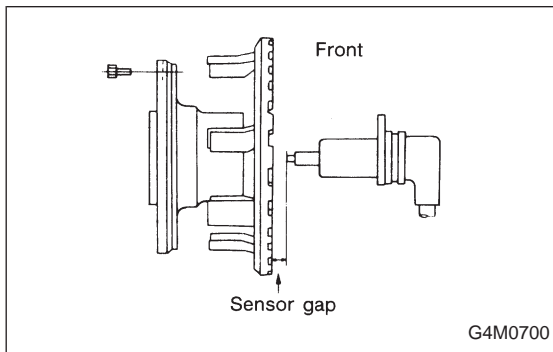
**YES** : Go to next **CHECK** .

**NO** : Tighten ABS sensor installation bolts securely.

**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 next step.

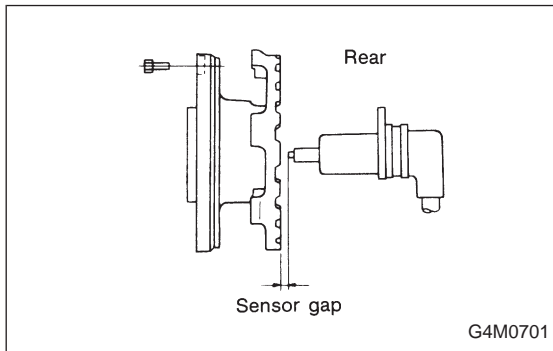
**NO** : Tighten tone wheel installation bolts securely.



1) 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 next step.

**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.

2) Measure hub runout.

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

**YES** : Go to step 10H10.

**NO** : Repair hub.

<b>10H10</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.</b>
--------------	--

**CHECK** : *Is there poor contact in connectors between ABSCM and ABS sensor?*

**YES** : Repair connector.

**NO** : Go to step **10H11**.

<b>10H11</b>	<b>CHECK ABSCM.</b>
--------------	---------------------

- 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 next **CHECK** .

**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 (FB1)  
FR. SS SOFT

B4M0812

I: 22 FR. SS SOFT  
— ABNORMAL FRONT RH ABS SENSOR  
(ABNORMAL ABS SENSOR SIGNAL) —

D•NEW 24 (FB1)  
FL. SS SOFT

B4M0949

J: 24 FL. SS SOFT  
— ABNORMAL FRONT LH ABS SENSOR  
(ABNORMAL ABS SENSOR SIGNAL) —

D•NEW 26 (FB1)  
RR. SS SOFT

B4M0950

K: 26 RR. SS SOFT  
— ABNORMAL REAR RH ABS SENSOR  
(ABNORMAL ABS SENSOR SIGNAL) —

D•NEW 28 (FB1)  
RL. SS SOFT

B4M0951

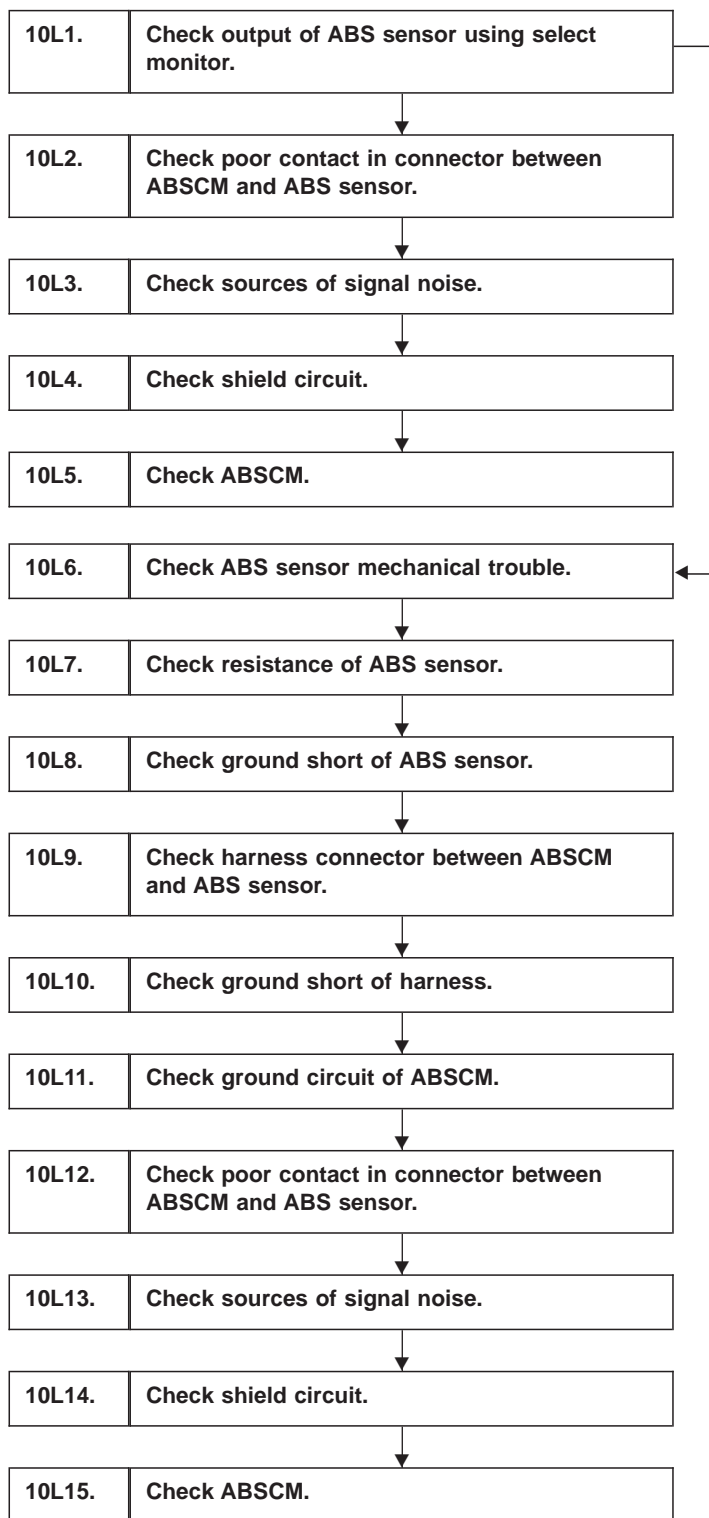
L: 28 RL. SS SOFT  
— ABNORMAL REAR LH ABS SENSOR  
(ABNORMAL ABS SENSOR SIGNAL) —

**DIAGNOSIS:**

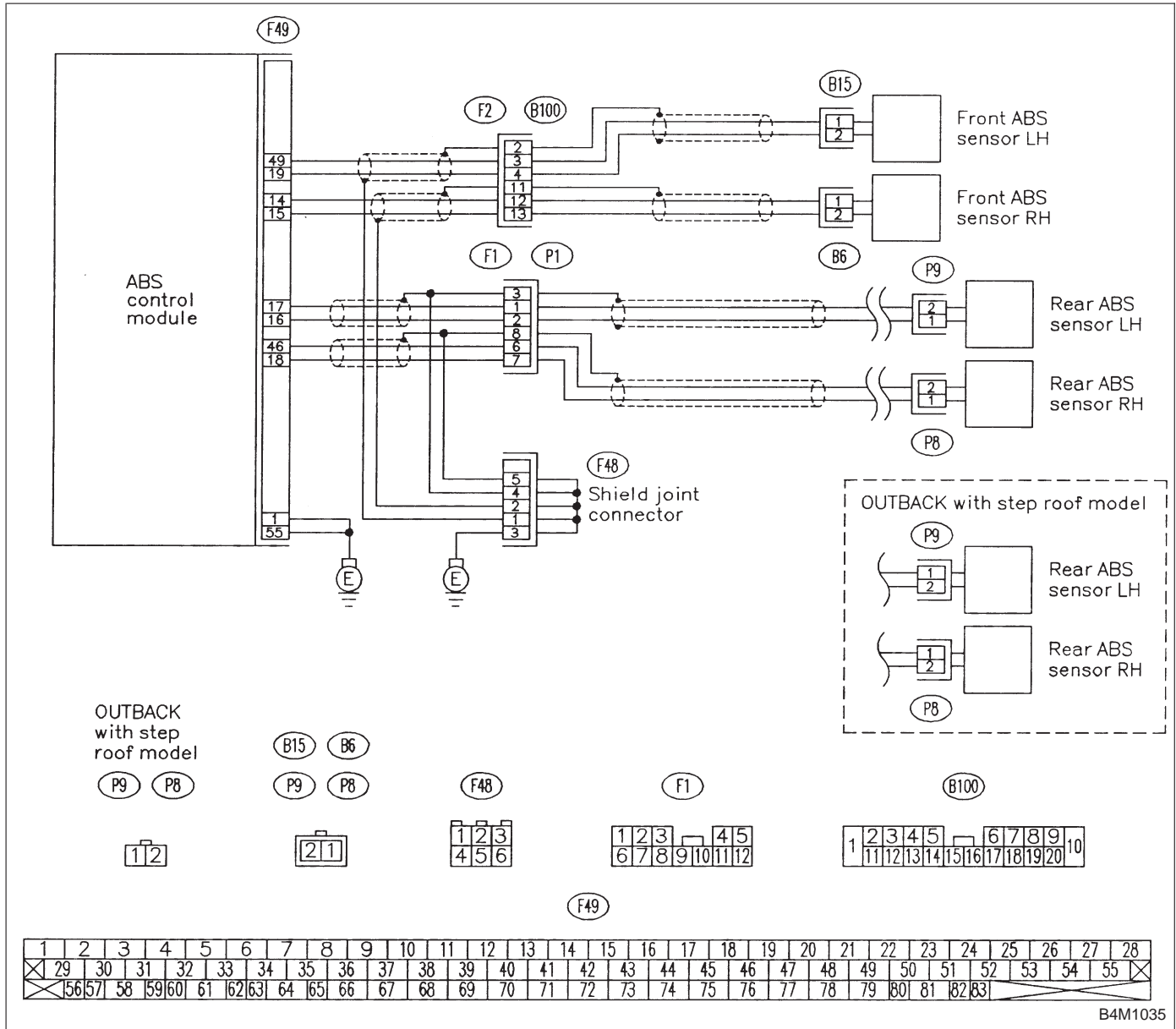
- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty harness/connector

**TROUBLE SYMPTOM:**

- ABS does not operate.



WIRING DIAGRAM:



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 10L3.

10L2

**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

**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 next **CHECK** .

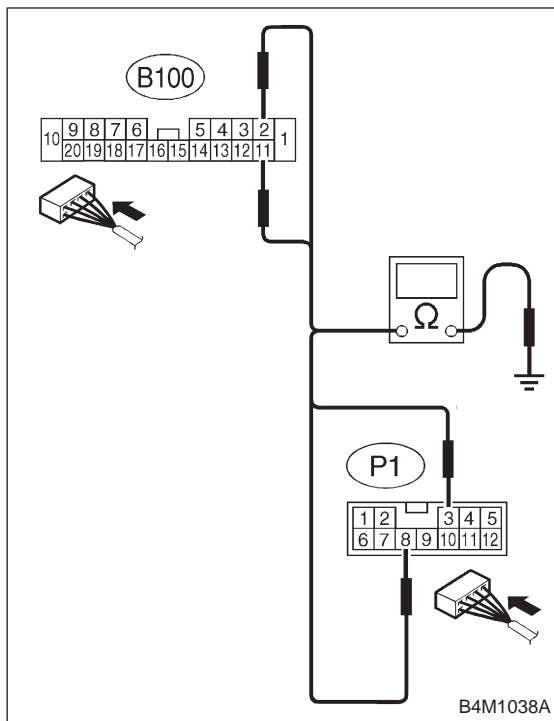
**NO** : Properly install the car telephone or the wireless transmitter.

**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 10L4.





<b>10L4</b>	<b>CHECK SHIELD CIRCUIT.</b>
-------------	------------------------------

- 1) Connect all connectors.
- 2) Measure resistance between shield connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**22/(B100) No. 11 — Chassis ground**  
**24/(B100) No. 2 — Chassis ground**  
**26/(P1) No. 8 — Chassis ground**  
**28/(P1) No. 3 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10L5.

**NO** : Repair shield harness.

<b>10L5</b>	<b>CHECK ABSCM.</b>
-------------	---------------------

- 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary noise interference.

**10L6 CHECK ABS SENSOR MECHANICAL TROUBLE.**

**CHECK** : **Tightening torque:**  
 **$32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )**  
**Are the ABS sensor installation bolts tightened securely?**

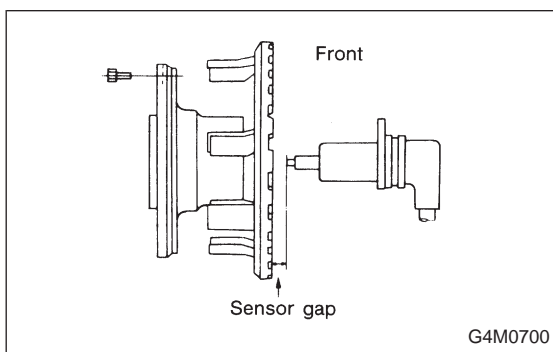
**YES** : Go to next **CHECK** .

**NO** : Tighten ABS sensor installation bolts securely.

**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 next step.

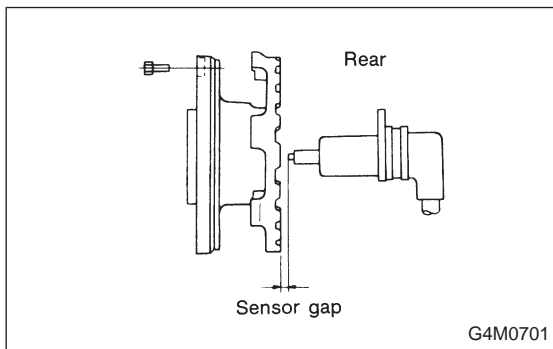
**NO** : Tighten tone wheel installation bolts securely.



1) 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 next **CHECK** .

**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.

**CHECK** : **Is an oscilloscope available?**

**YES** : Go to next step.

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

2) Raise all four wheels of ground.

3) Turn ignition switch OFF.

4) Disconnect connector from ABS control module.

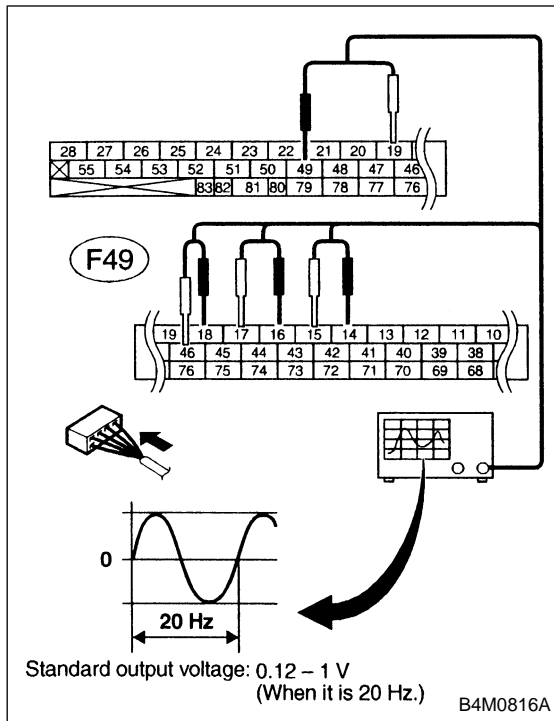
5) Disconnect connector cover from connector.

<Ref. to 4-4c [T8C1] steps 5) to 8).>

6) Connect connector to ABS control module.

7) Connect the oscilloscope to the ABS control module connector in accordance with trouble code.

8) Turn ignition switch ON.



9) Rotate wheels and measure voltage at specified frequency.

NOTE:

When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

**TROUBLE CODE / Connector & terminal:**

**22 / (F49) No. 14 (+) — No. 15 (-)**

**24 / (F49) No. 49 (+) — No. 19 (-)**

**26 / (F49) No. 18 (+) — No. 46 (-)**

**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 10L7.

**NO** : Go to next step.

10) Remove disc rotor 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 next **CHECK** .

**CHECK** : *Are there broken or damaged teeth in the ABS sensor pole piece or the tone wheel?*

**YES** : Replace ABS sensor or tone wheel.

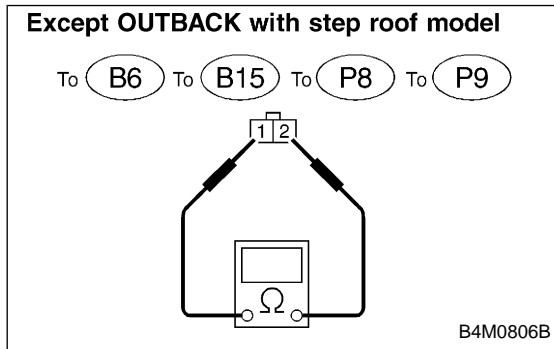
**NO** : Go to next step.

11) Measure hub runout.

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

**YES** : Go to step 10L7.

**NO** : Repair hub.



**10L7 CHECK RESISTANCE OF ABS SENSOR.**

1) Turn ignition switch OFF.

2) Disconnect connector from ABS sensor.

3) Measure resistance between ABS sensor connector terminals.

**CHECK** : *Trouble code/Connector & terminal*

**22/to (B6) No. 1 — No. 2**

**24/to (B15) No. 1 — No. 2**

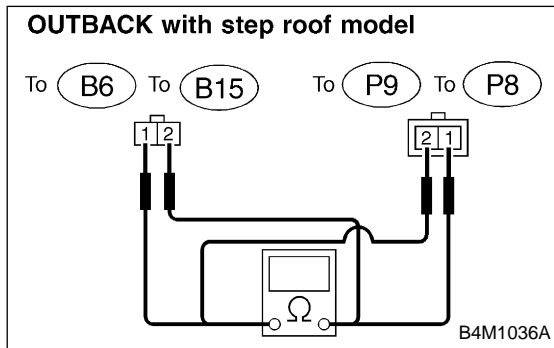
**26/to (P8) No. 1 — No. 2**

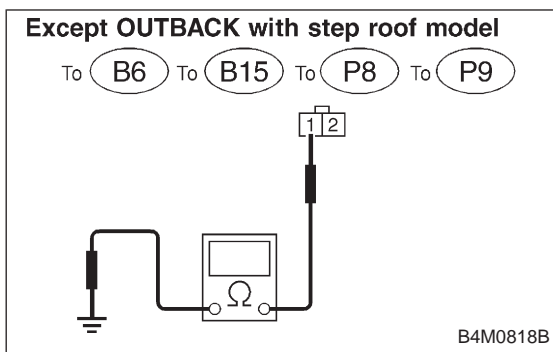
**28/to (P9) No. 1 — No. 2**

**Is resistance 0.8 — 1.2 kΩ?**

**YES** : Go to step 10L8.

**NO** : Replace ABS sensor.





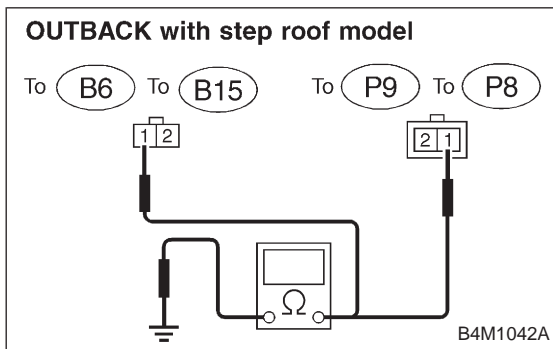
**10L8 CHECK GROUND SHORT OF ABS SENSOR.**

Measure resistance between ABS sensor and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 22/to (B6) No. 1 — Chassis ground  
 24/to (B15) No. 1 — Chassis ground  
 26/to (P8) No. 1 — Chassis ground  
 28/to (P9) No. 1 — Chassis ground  
*Is resistance more than 1 MΩ?*

**YES** : Go to step 10L9.

**NO** : Replace ABS sensor.



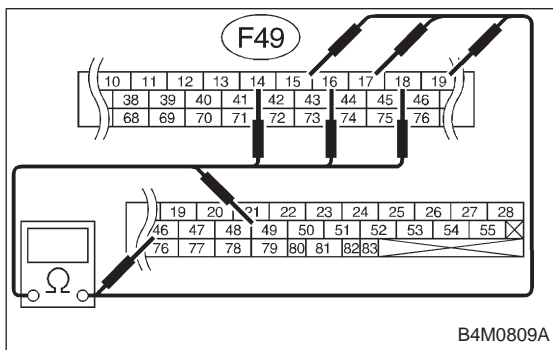
**10L9 CHECK HARNESS CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

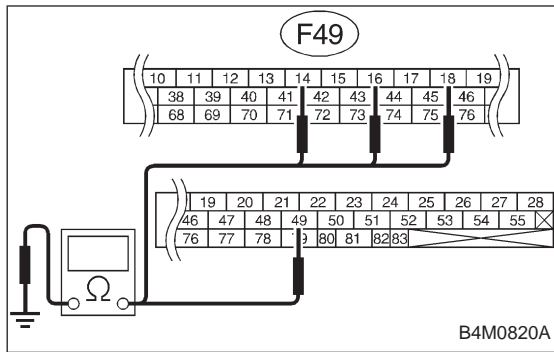
- 1) Connect connector to ABS sensor.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance at ABSCM connector terminals.

**CHECK** : *Trouble code/Connector & terminal*  
 22/(F49) No. 14 — No. 15  
 24/(F49) No. 49 — No. 69  
 26/(F49) No. 18 — No. 46  
 28/(F49) No. 16 — No. 17  
*Is resistance 0.8 — 1.2 kΩ?*

**YES** : Go to step 10L10.

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





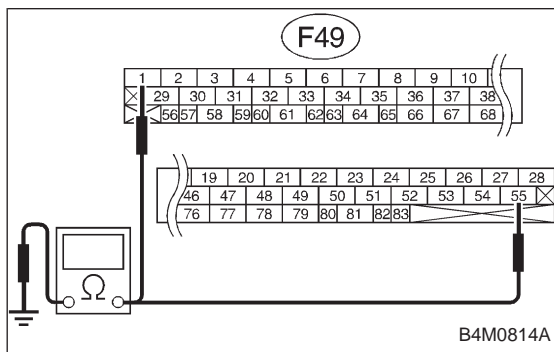
**10L10 CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal 22/(F49) No. 14 — Chassis ground 24/(F49) No. 49 — Chassis ground 26/(F49) No. 18 — Chassis ground 28/(F49) No. 16 — Chassis ground Is resistance more than 1 MΩ?*

**YES** : Go to step 10L11.

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



**10L11 CHECK GROUND CIRCUIT OF ABSCM.**

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

**CHECK** : *Connector & terminal (F49) No. 1 — GND (F49) No. 55 — GND Is resistance less than 0.5 Ω?*

**YES** : Go to step 10L12.

**NO** : Repair ABSCM ground harness.

**10L12 CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND ABS SENSOR.**

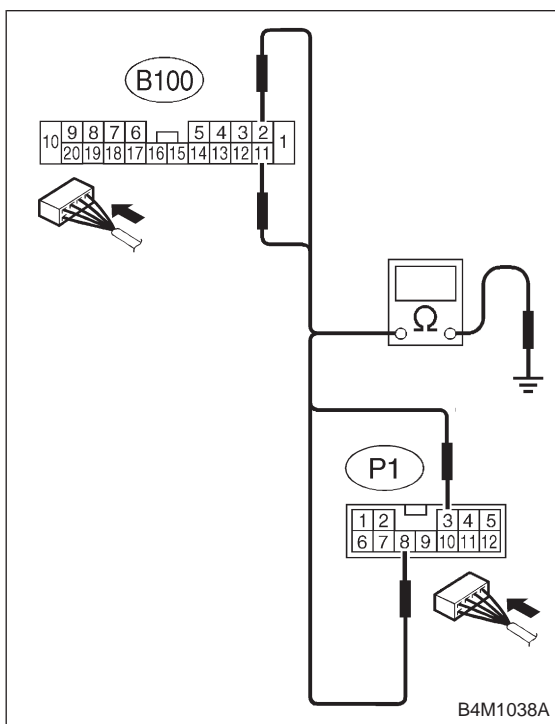
**CHECK** : *Is there poor contact in connectors between ABSCM and ABS sensor?*

**YES** : Repair connector.

**NO** : Go to step 10L13.

**10L13 CHECK SOURCES OF SIGNAL NOISE.**

- CHECK** : *Is the car telephone or the wireless transmitter properly installed?*
- YES** : Go to next **CHECK** .
- NO** : Properly install the car telephone or the wireless transmitter.
- 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 **10L14**.



**10L14 CHECK SHIELD CIRCUIT.**

- 1) Connect all connectors.
  - 2) Measure resistance between shield connector and chassis ground.
- CHECK** : *Trouble code/Connector & terminal*  
*22/(B100) No. 11 — Chassis ground*  
*24/(B100) No. 2 — Chassis ground*  
*26/(P1) No. 8 — Chassis ground*  
*28/(P1) No. 3 — Chassis ground*  
*Is resistance less than 0.5 Ω?*
  - YES** : Go to step **10L15**.
  - NO** : Repair shield harness.

10L15	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 next **CHECK** .

**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

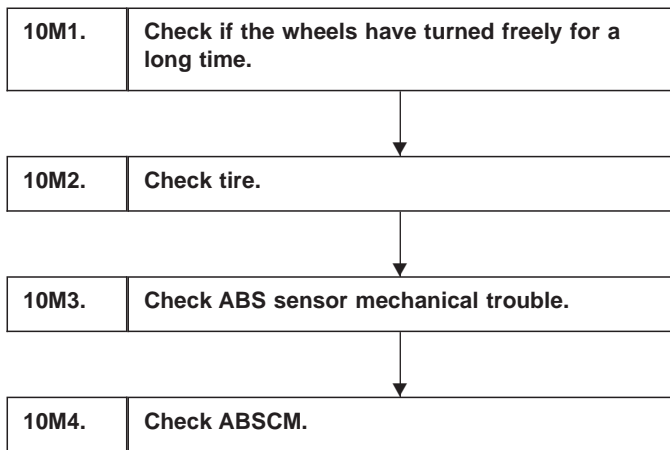
**M: 29 EITHER. SS SOFT  
— ABNORMAL ABS SENSOR SIGNAL (ANY ONE OF FOUR) —**

**DIAGNOSIS:**

- Faulty ABS sensor signal (noise, irregular signal, etc.)
- Faulty tone wheel
- Wheels turning freely for a long time

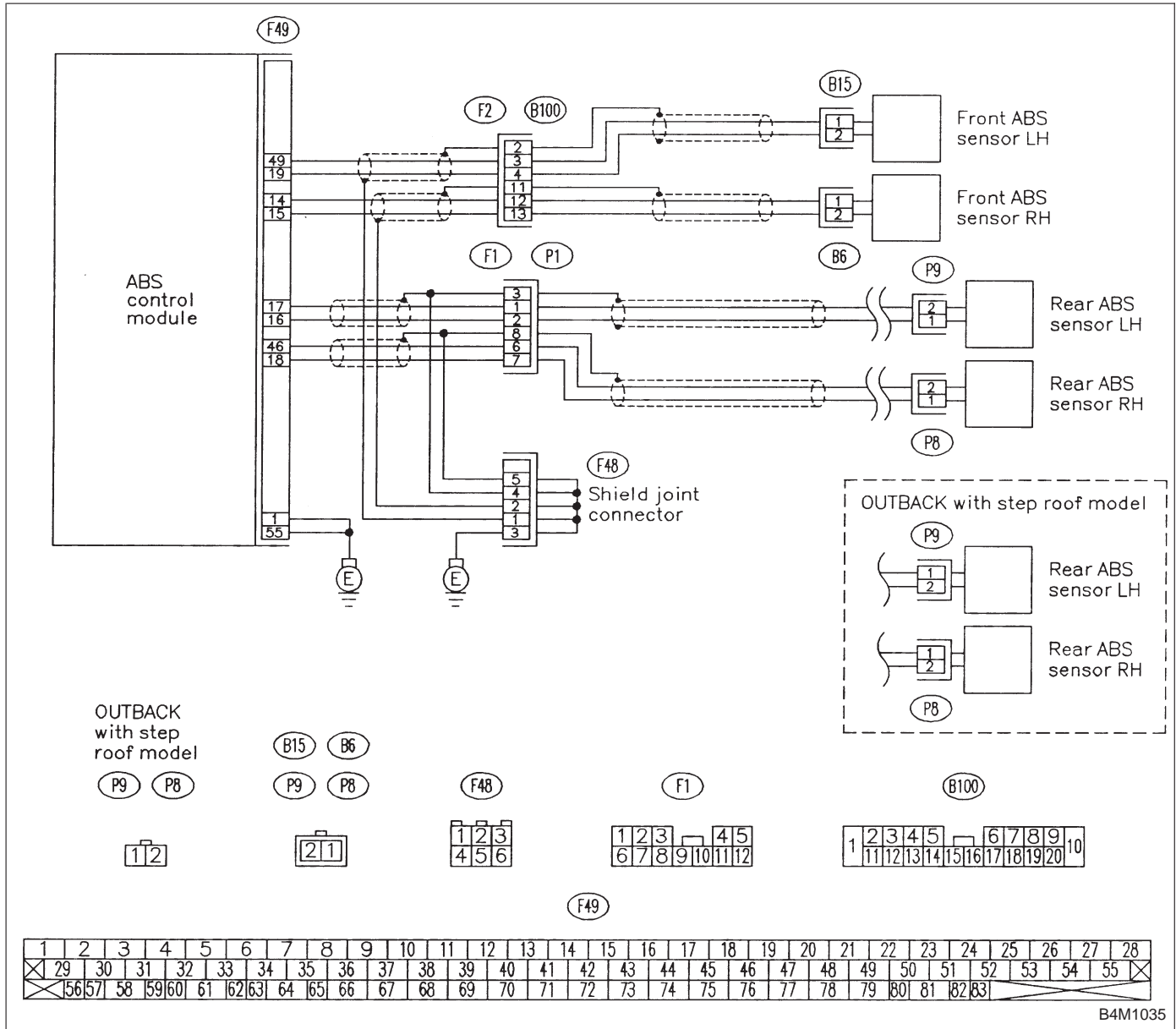
**TROUBLE SYMPTOM:**

- ABS does not operate.





**WIRING DIAGRAM:**



B4M1035

**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**

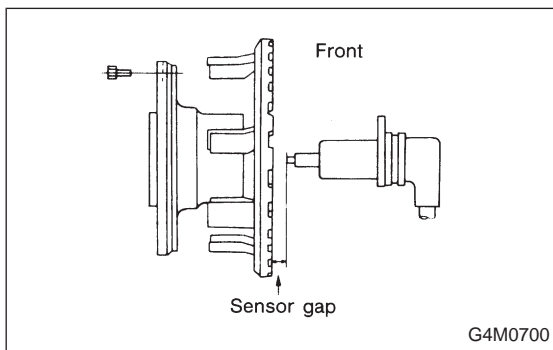
: Go to step **10M2**.

<b>10M2</b>	<b>CHECK TIRE.</b>
-------------	--------------------

- CHECK** : *Are the tire specifications correct?*
- YES** : Go to next **CHECK** .
- NO** : Replace tire.
- CHECK** : *Is the tire worn excessively?*
- YES** : Replace tire.
- NO** : Go to next **CHECK** .
- CHECK** : *Is the tire pressure correct?*
- YES** : Go to step **10M3**.
- NO** : Adjust tire pressure.

<b>10M3</b>	<b>CHECK ABS SENSOR MECHANICAL TROUBLE.</b>
-------------	---

- CHECK** : *Tightening torque:*  
 **$32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )**  
*Are the ABS sensor installation bolts tightened securely?*
- YES** : Go to next **CHECK** .
- NO** : Tighten ABS sensor installation bolts securely.
- 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 ABS sensor installation bolts tightened securely?*
- YES** : Go to next step.
- NO** : Tighten ABS sensor installation bolts securely.



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

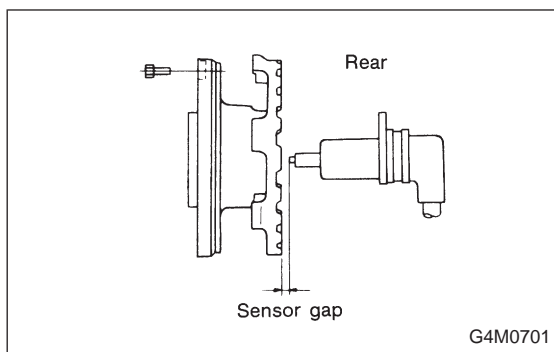
- CHECK** : *Is the gap within the specifications shown in the following table?*

	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)

# 4-4c

# BRAKES [ABS 5.3 TYPE]

## 10. Diagnostics Chart with Select Monitor



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

**NO** : Adjust the gap.

**NOTE:**

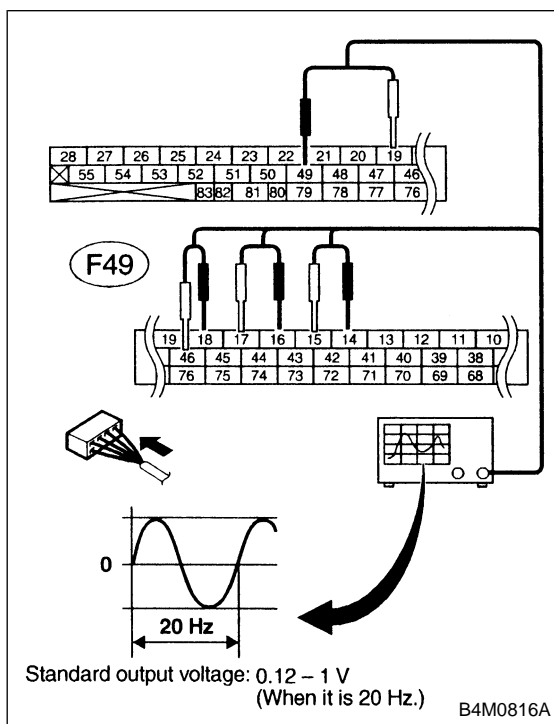
Adjust the gap using spacer (Part No. 26755AA000). If spacers cannot correct the gap, replace worn sensor or worn tone wheel.

**CHECK** : *Is an oscilloscope available?*

**YES** : Go to next step.

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

- 2) Raise all four wheels of ground.
- 3) Turn ignition switch OFF.
- 4) Disconnect connector from ABS control module.
- 5) Disconnect connector cover from connector.  
<Ref. to 4-4c [T8C1] steps 5) to 8).>
- 6) Connect connector to ABS control module.
- 7) Connect the oscilloscope to the ABS control module connector.
- 8) Turn ignition switch ON.



- 9) Rotate wheels and measure voltage at specified frequency.

**NOTE:**

When this inspection is completed, the ABS control module sometimes stores the trouble code 29.

**TROUBLE CODE / 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 10M4.

**NO** : Go to next step.

- 10) 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 next **CHECK** .

**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 next step.

11) Measure hub runout.

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

**YES** : Go to step 10M4.

**NO** : Repair hub.

<b>10M4</b>	<b>CHECK ABSCM.</b>
-------------	---------------------

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 next **CHECK** .

**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 (FB1)  
FR. EV VALVE

B4M0953

**N: 31 FR. EV VALVE**  
**— ABNORMAL FRONT RH INLET SOLENOID VALVE —**

D•NEW 33 (FB1)  
FL. EV VALVE

B4M0954

**O: 33 FL. EV VALVE**  
**— ABNORMAL FRONT LH INLET SOLENOID VALVE —**

D•NEW 35 (FB1)  
RR. EV VALVE

B4M0955

**P: 35 RR. EV VALVE**  
**— ABNORMAL REAR RH INLET SOLENOID VALVE —**

D•NEW 37 (FB1)  
RL. EV VALVE

B4M0956

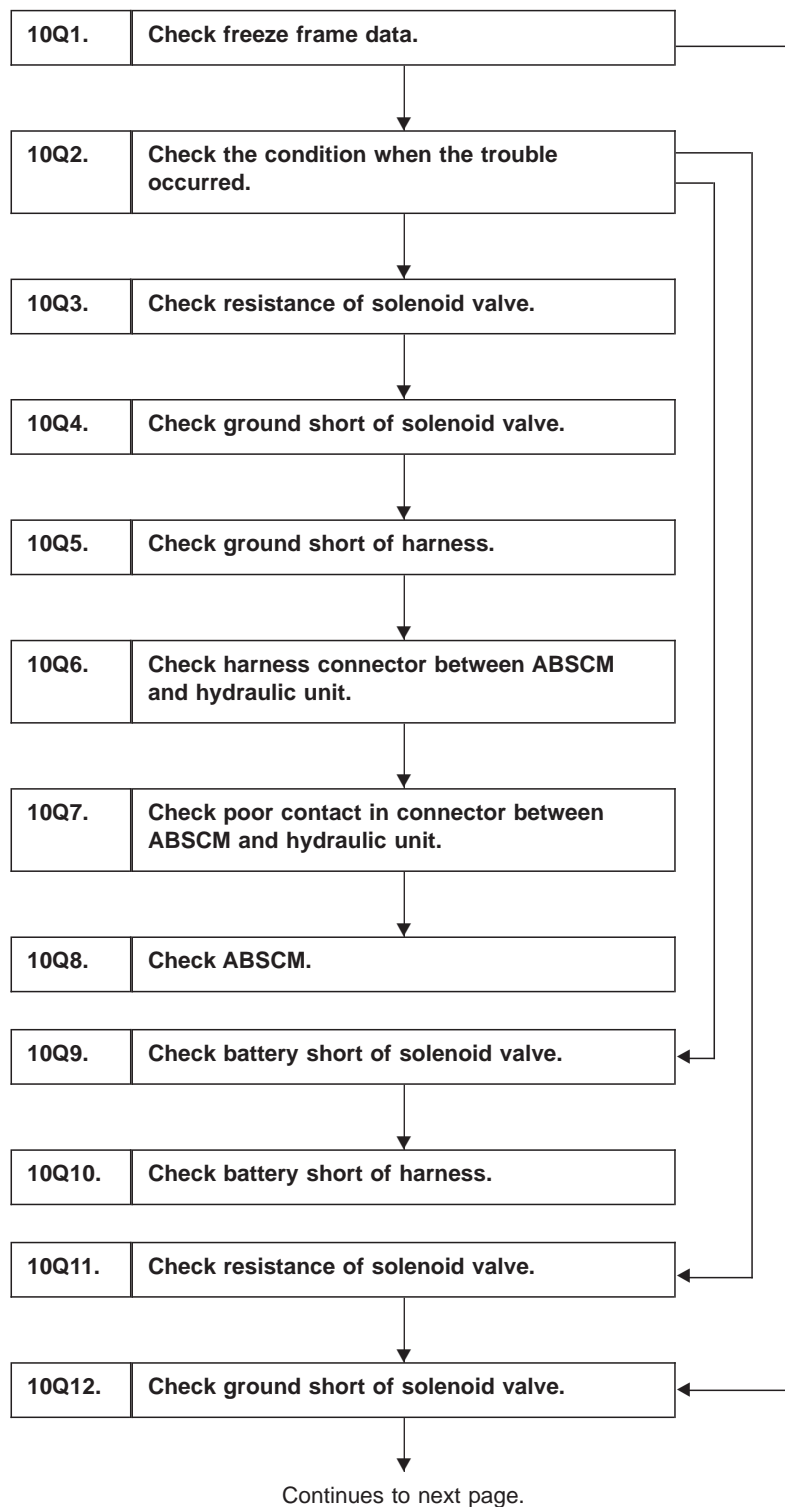
**Q: 37 RL. EV VALVE**  
**— ABNORMAL REAR LH INLET SOLENOID VALVE —**

**DIAGNOSIS:**

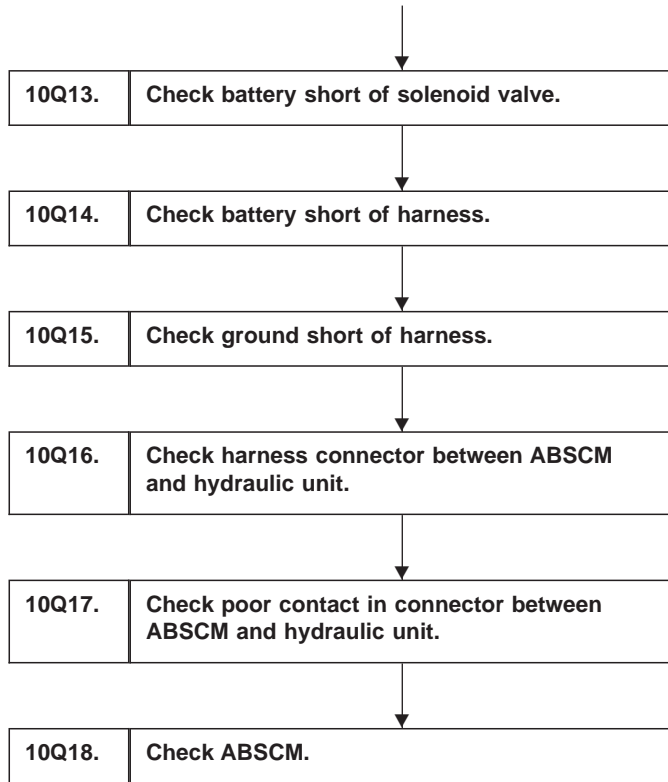
- Faulty harness/connector
- Faulty inlet solenoid valve in hydraulic unit

**TROUBLE SYMPTOM:**

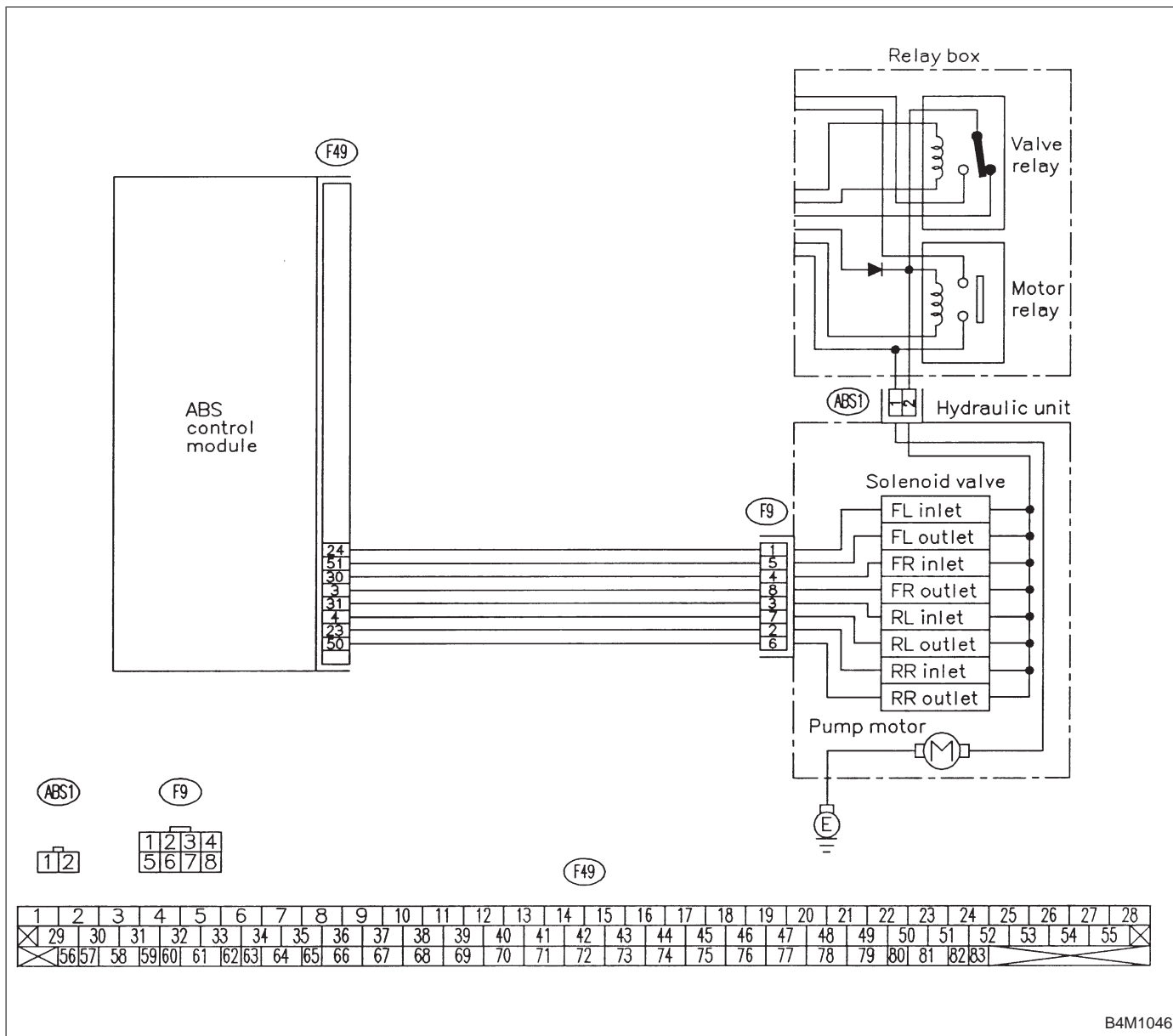
- ABS does not operate.



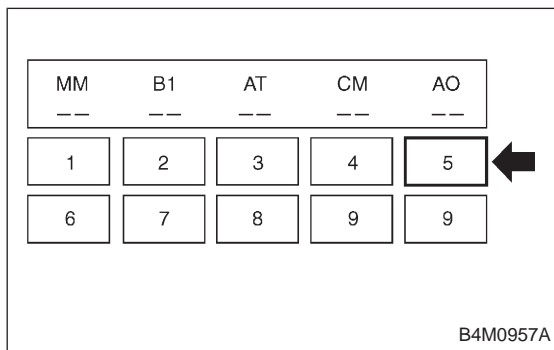
From the former page.



WIRING DIAGRAM:



B4M1046



B4M0957A

**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 10Q11.



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?*

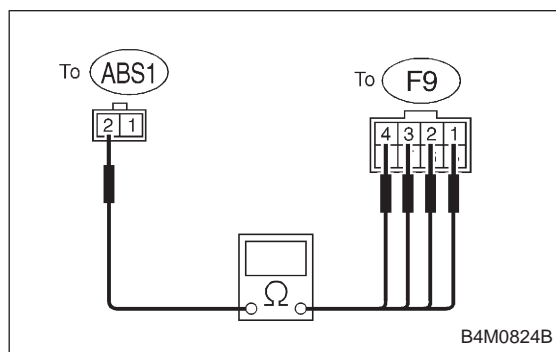
**YES** : Go to next **CHECK** .

**NO** : Go to step 11.

**CHECK** : *Did the trouble occur immediately after engine starting or during standing starts?*

**YES** : Go to step 10Q9.

**NO** : Go to step 10Q3.



10Q3

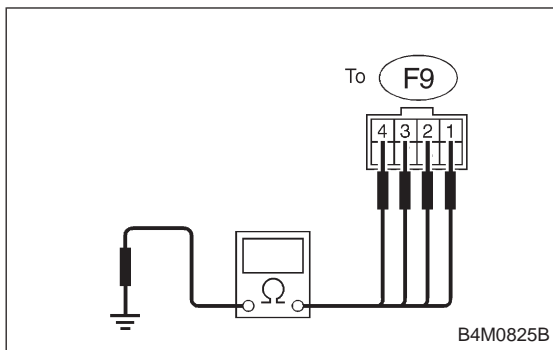
**CHECK RESISTANCE OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 — to (ABS1) No. 2**  
**33/to (F9) No. 1 — to (ABS1) No. 2**  
**35/to (F9) No. 2 — to (ABS1) No. 2**  
**37/to (F9) No. 3 — to (ABS1) No. 2**  
*Is resistance  $8.5 \pm 0.7 \Omega$ ?*

**YES** : Go to step 10Q4.

**NO** : Replace hydraulic unit.



**10Q4**

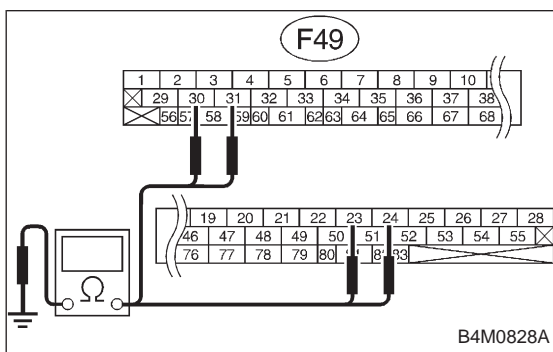
**CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 — Chassis ground**  
**33/to (F9) No. 1 — Chassis ground**  
**35/to (F9) No. 2 — Chassis ground**  
**37/to (F9) No. 3 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10Q5.

**NO** : Replace hydraulic unit.



**10Q5**

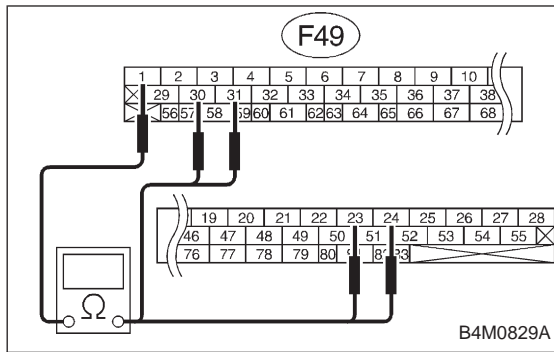
**CHECK GROUND SHORT OF HARNESS.**

- 1) Disconnect connector from ABSCM.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 — Chassis ground**  
**33/(F49) No. 24 — Chassis ground**  
**35/(F49) No. 23 — Chassis ground**  
**37/(F49) No. 31 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10Q6.

**NO** : Repair harness between ABSCM and hydraulic unit.

**10Q6****CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 — No. 1**  
**33/(F49) No. 24 — No. 1**  
**35/(F49) No. 23 — No. 1**  
**37/(F49) No. 31 — No. 1**  
**Is resistance  $9.0 \pm 0.7 \Omega$ ?**

**YES** : Go to step **10Q7**.

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

**10Q7****CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

**CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **10Q8**.

**10Q8****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?*

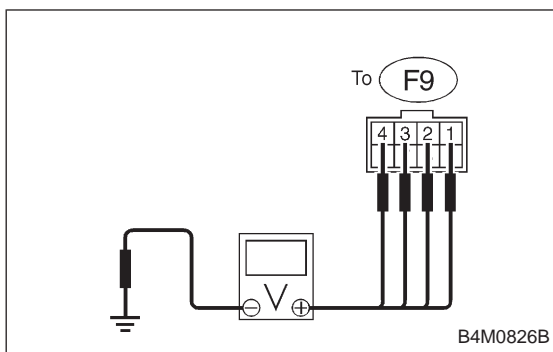
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.



**10Q9 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) Turn ignition switch to ON.
- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 (+) — Chassis ground (-)**  
**33/to (F9) No. 1 (+) — Chassis ground (-)**  
**35/to (F9) No. 2 (+) — Chassis ground (-)**  
**37/to (F9) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

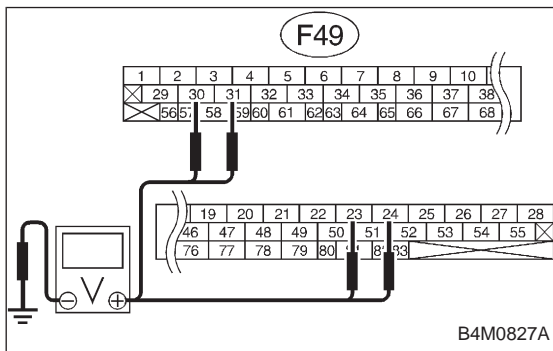
**NO** : Replace hydraulic unit.

- 6) Turn ignition switch to OFF.
- 7) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 (+) — Chassis ground (-)**  
**33/to (F9) No. 1 (+) — Chassis ground (-)**  
**35/to (F9) No. 2 (+) — Chassis ground (-)**  
**37/to (F9) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10Q10.

**NO** : Replace hydraulic unit.



**10Q10 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 (+) — Chassis ground (-)**  
**33/(F49) No. 24 (+) — Chassis ground (-)**  
**35/(F49) No. 23 (+) — Chassis ground (-)**  
**37/(F49) No. 31 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

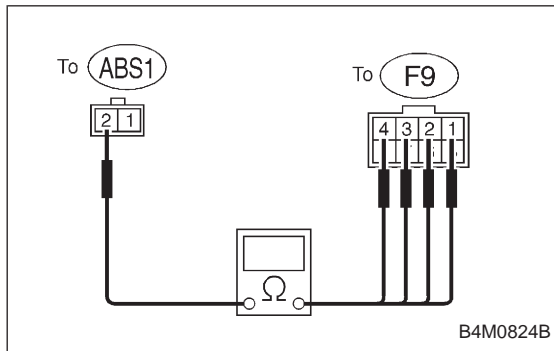
**NO** : Repair harness between ABSCM and hydraulic unit.

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

**CHECK** : *Trouble code/Connector & terminal*  
 31/(F49) No. 30 (+) — Chassis ground (-)  
 33/(F49) No. 24 (+) — Chassis ground (-)  
 35/(F49) No. 23 (+) — Chassis ground (-)  
 37/(F49) No. 31 (+) — Chassis ground (-)  
 Is voltage 0 V?

**YES** : Replace ABSCM.

**NO** : Repair harness between ABSCM and hydraulic unit.



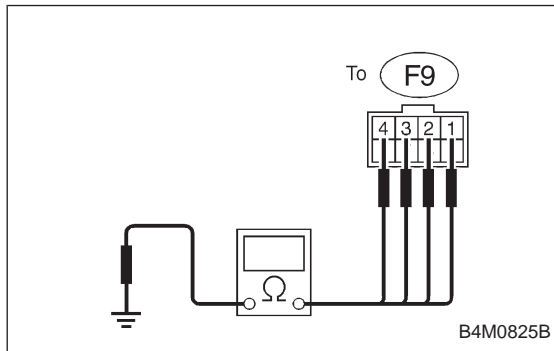
**10Q11 CHECK RESISTANCE OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
 31/to (F9) No. 4 — to (ABS1) No. 2  
 33/to (F9) No. 1 — to (ABS1) No. 2  
 35/to (F9) No. 2 — to (ABS1) No. 2  
 37/to (F9) No. 3 — to (ABS1) No. 2  
 Is resistance  $8.5 \pm 0.7 \Omega$ ?

**YES** : Go to step 10Q12.

**NO** : Replace hydraulic unit.



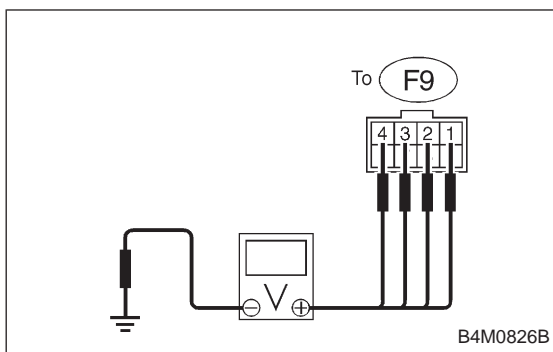
**10Q12 CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 31/to (F9) No. 4 — Chassis ground  
 33/to (F9) No. 1 — Chassis ground  
 35/to (F9) No. 2 — Chassis ground  
 37/to (F9) No. 3 — Chassis ground  
 Is resistance more than 1 MΩ?

**YES** : Go to step 10Q13.

**NO** : Replace hydraulic unit.



**10Q13 CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 (+) — Chassis ground (-)**  
**33/to (F9) No. 1 (+) — Chassis ground (-)**  
**35/to (F9) No. 2 (+) — Chassis ground (-)**  
**37/to (F9) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

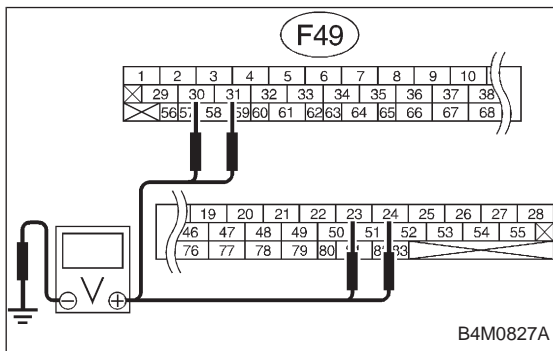
**NO** : Replace hydraulic unit.

- 4) Turn ignition switch to OFF.
- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**31/to (F9) No. 4 (+) — Chassis ground (-)**  
**33/to (F9) No. 1 (+) — Chassis ground (-)**  
**35/to (F9) No. 2 (+) — Chassis ground (-)**  
**37/to (F9) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10Q14.

**NO** : Replace hydraulic unit.



**10Q14 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**31/(F49) No. 30 (+) — Chassis ground (-)**  
**33/(F49) No. 24 (+) — Chassis ground (-)**  
**35/(F49) No. 23 (+) — Chassis ground (-)**  
**37/(F49) No. 31 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

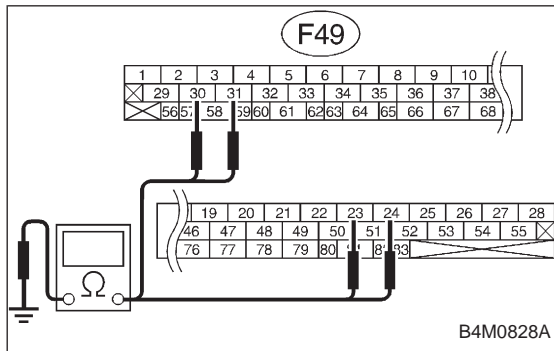
**NO** : Repair harness between ABSCM and hydraulic unit.

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

- CHECK** : *Trouble code/Connector & terminal*  
 31/(F49) No. 30 (+) — Chassis ground (-)  
 33/(F49) No. 24 (+) — Chassis ground (-)  
 35/(F49) No. 23 (+) — Chassis ground (-)  
 37/(F49) No. 31 (+) — Chassis ground (-)  
*Is voltage 0 V?*

**YES** : Go to step 10Q15.

**NO** : Repair harness between ABSCM and hydraulic unit.



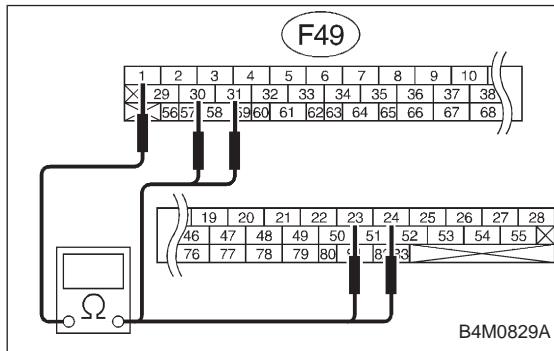
**10Q15 CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

- CHECK** : *Trouble code/Connector & terminal*  
 31/(F49) No. 30 — Chassis ground  
 33/(F49) No. 24 — Chassis ground  
 35/(F49) No. 23 — Chassis ground  
 37/(F49) No. 31 — Chassis ground  
*Is resistance more than 1 MΩ?*

**YES** : Go to step 10Q16.

**NO** : Repair harness between ABSCM and hydraulic unit.



**10Q16 CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

- CHECK** : *Trouble code/Connector & terminal*  
 31/(F49) No. 30 — No. 1  
 33/(F49) No. 24 — No. 1  
 35/(F49) No. 23 — No. 1  
 37/(F49) No. 31 — No. 1  
*Is resistance 9.0±0.7 Ω?*

**YES** : Go to step 10Q17.

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

<b>10Q17</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.</b>
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**CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **10Q18**.

<b>10Q18</b>	<b>CHECK ABSCM.</b>
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- 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 next **CHECK** .

**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 (FB1)  
FR. AV VALVE

B4M0958

**R: 32 FR. AV VALVE**  
**— ABNORMAL FRONT RH OUTLET**  
**SOLENOID VALVE —**

D•NEW 34 (FB1)  
FL. AV VALVE

B4M0959

**S: 34 FL. AV VALVE**  
**— ABNORMAL FRONT LH OUTLET**  
**SOLENOID VALVE —**

D•NEW 36 (FB1)  
RR. AV VALVE

B4M0960

**T: 36 RR. AV VALVE**  
**— ABNORMAL REAR RH OUTLET SOLENOID**  
**VALVE —**

D•NEW 38 (FB1)  
RL. AV VALVE

B4M0961

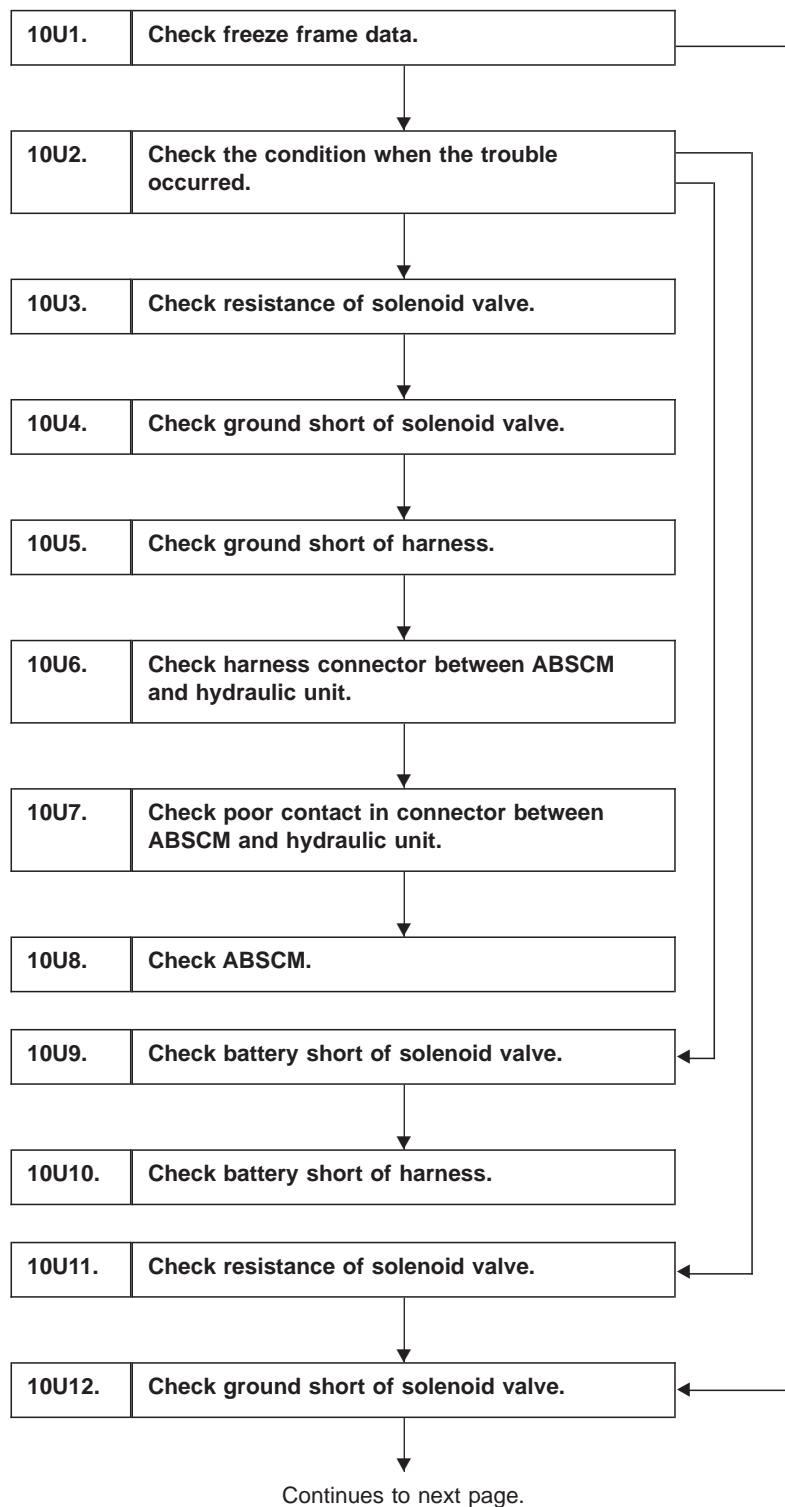
**U: 38 RL. AV VALVE**  
**— ABNORMAL REAR LH OUTLET SOLENOID**  
**VALVE —**

**DIAGNOSIS:**

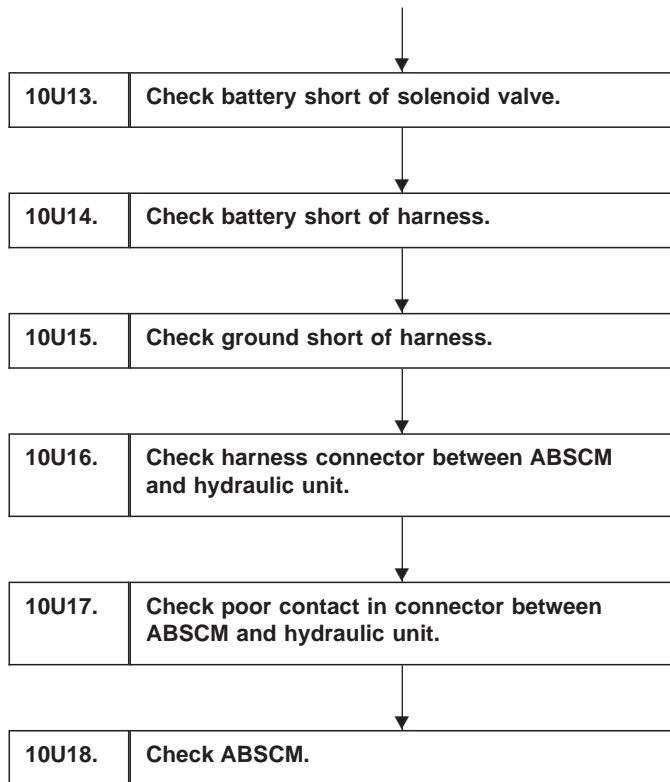
- Faulty harness/connector
- Faulty outlet solenoid valve in hydraulic unit

**TROUBLE SYMPTOM:**

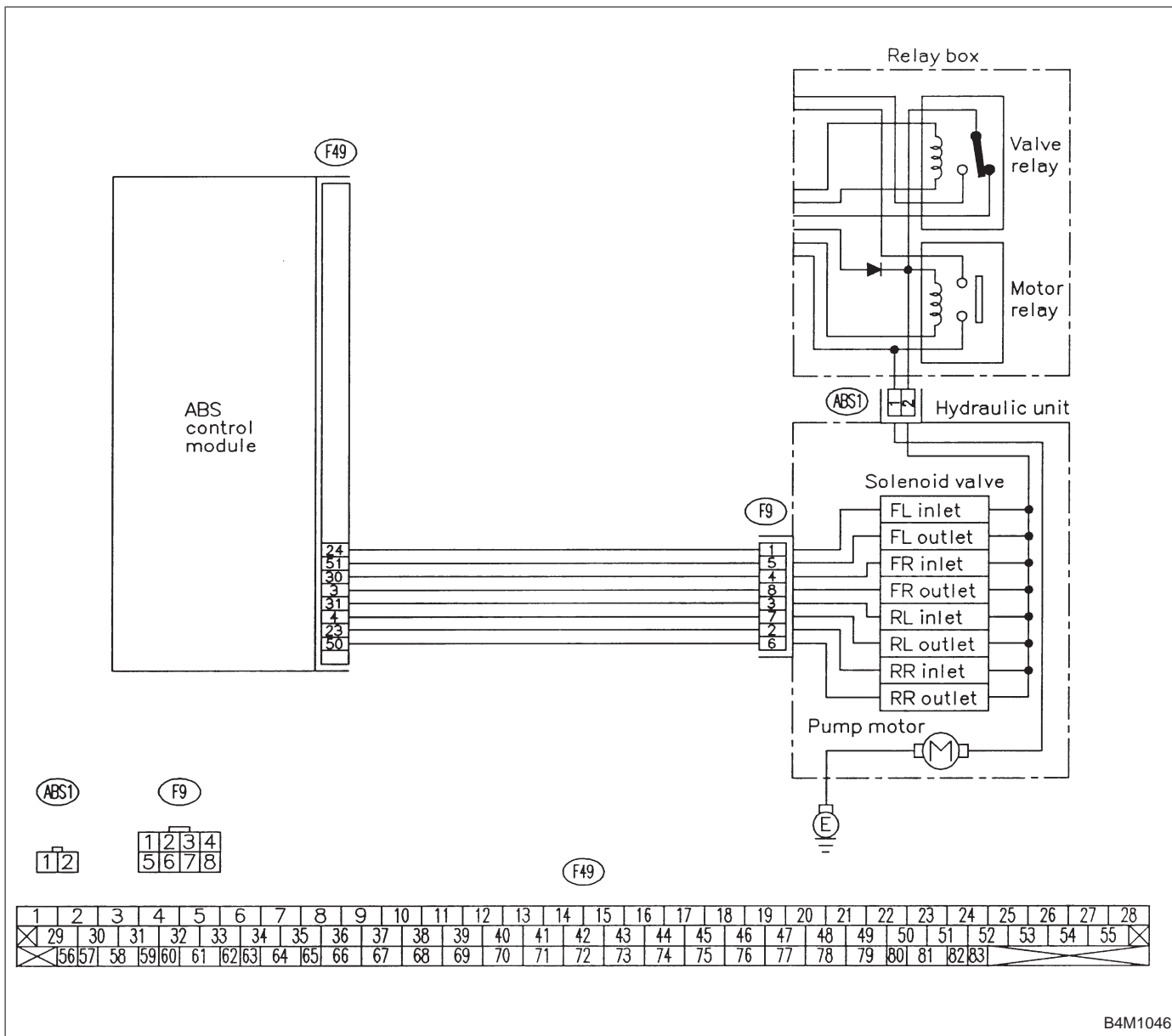
- ABS does not operate.



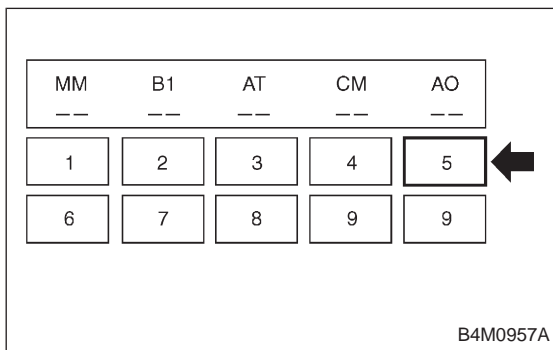
From the former page.



WIRING DIAGRAM:



B4M1046



B4M0957A

**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 10U11.

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?*

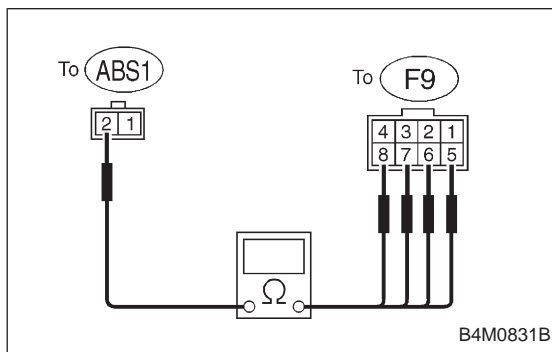
**YES** : Go to next **CHECK** .

**NO** : Go to step 10U11.

**CHECK** : *Did the trouble occur immediately after engine starting or during standing starts?*

**YES** : Go to step 10U9.

**NO** : Go to step 10U3.



10U3

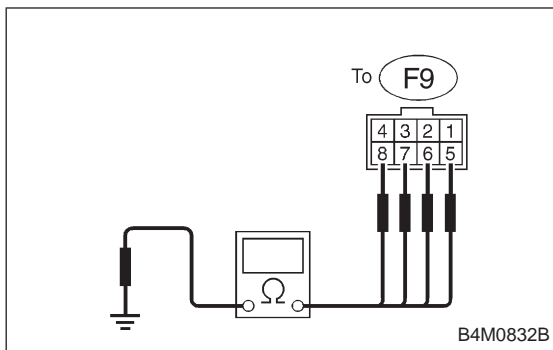
**CHECK RESISTANCE OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/to (F9) No. 8 — to (ABS1) No. 2**  
**34/to (F9) No. 5 — to (ABS1) No. 2**  
**36/to (F9) No. 6 — to (ABS1) No. 2**  
**38/to (F9) No. 7 — to (ABS1) No. 2**  
*Is resistance  $4.3 \pm 0.5 \Omega$ ?*

**YES** : Go to step 10U4.

**NO** : Replace hydraulic unit.

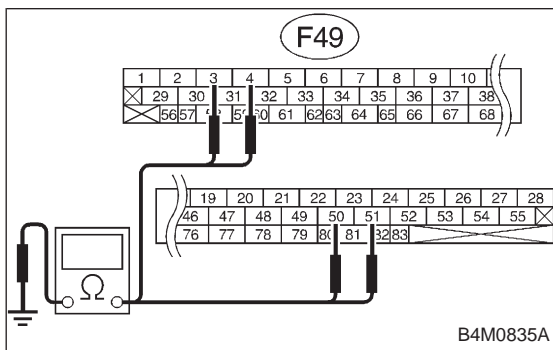


**10U4 CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**32/to (F9) No. 8 — Chassis ground**  
**34/to (F9) No. 5 — Chassis ground**  
**36/to (F9) No. 6 — Chassis ground**  
**38/to (F9) No. 7 — Chassis ground**  
**Is resistance more than 1 MΩ?**

- YES** : Go to step 10U5.
- NO** : Replace hydraulic unit.

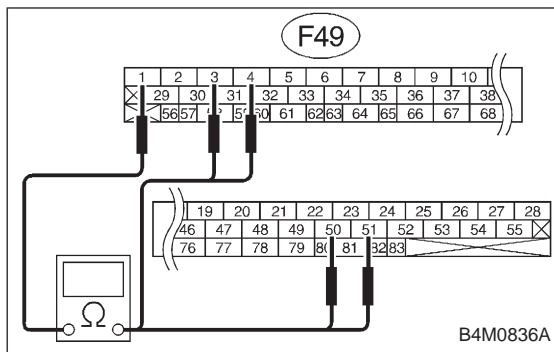


**10U5 CHECK GROUND SHORT OF HARNESS.**

- 1) Disconnect connector from ABSCM.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
**32/(F49) No. 3 — Chassis ground**  
**34/(F49) No. 51 — Chassis ground**  
**36/(F49) No. 50 — Chassis ground**  
**38/(F49) No. 4 — Chassis ground**  
**Is resistance more than 1 MΩ?**

- YES** : Go to step 10U6.
- NO** : Repair harness between ABSCM and hydraulic unit.

**10U6****CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

**CHECK** : *Trouble code/Connector & terminal*  
**32/(F49) No. 3 — No. 1**  
**34/(F49) No. 51 — No. 1**  
**36/(F49) No. 50 — No. 1**  
**38/(F49) No. 4 — No. 1**  
**Is resistance  $4.8 \pm 0.5 \Omega$ ?**

**YES** : Go to step **10U7**.

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

**10U7****CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

**CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **10U8**.

**10U8****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?*

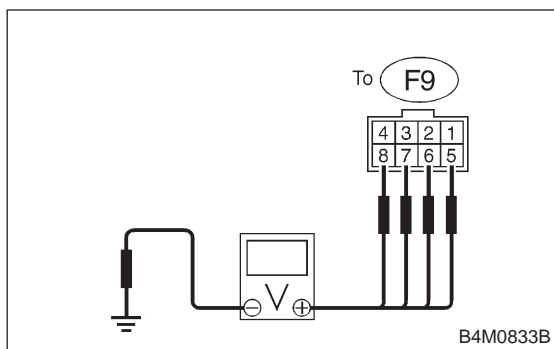
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

**10U9****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) Turn ignition switch to ON.
- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Trouble code/Connector & terminal**  
**32/to (F9) No. 8 (+) — Chassis ground (-)**  
**34/to (F9) No. 5 (+) — Chassis ground (-)**  
**36/to (F9) No. 6 (+) — Chassis ground (-)**  
**38/to (F9) No. 7 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

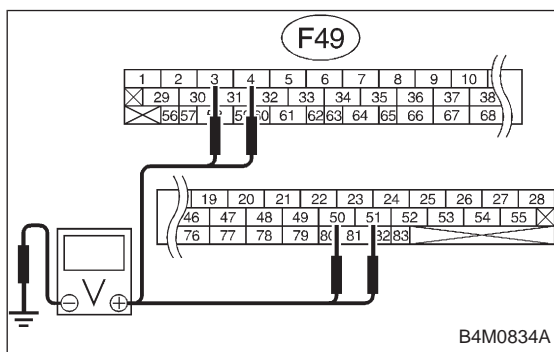
**NO** : Replace hydraulic unit.

- 6) Turn ignition switch to OFF.
- 7) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Trouble code/Connector & terminal**  
**32/to (F9) No. 8 (+) — Chassis ground (-)**  
**34/to (F9) No. 5 (+) — Chassis ground (-)**  
**36/to (F9) No. 6 (+) — Chassis ground (-)**  
**38/to (F9) No. 7 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **10U10**.

**NO** : Replace hydraulic unit.

**10U10****CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : **Trouble code/Connector & terminal**  
**32/(F49) No. 3 (+) — Chassis ground (-)**  
**34/(F49) No. 51 (+) — Chassis ground (-)**  
**36/(F49) No. 50 (+) — Chassis ground (-)**  
**38/(F49) No. 4 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Repair harness between ABSCM and hydraulic unit.

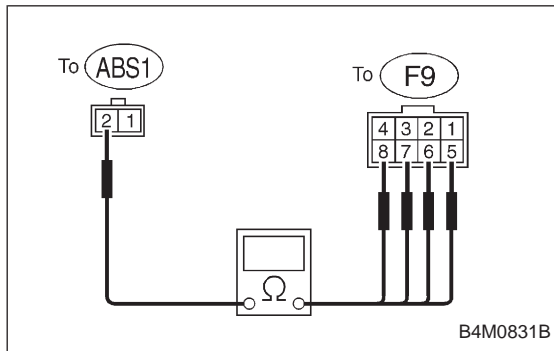
- 3) Turn ignition switch to OFF.
- 4) Measure voltage between ABSCM connector and chassis ground.



**CHECK** : *Trouble code/Connector & terminal*  
 32/(F49) No. 3 (+) — Chassis ground (-)  
 34/(F49) No. 51 (+) — Chassis ground (-)  
 36/(F49) No. 50 (+) — Chassis ground (-)  
 38/(F49) No. 4 (+) — Chassis ground (-)  
 Is voltage 0 V?

**YES** : Replace ABSCM.

**NO** : Repair harness between ABSCM and hydraulic unit.



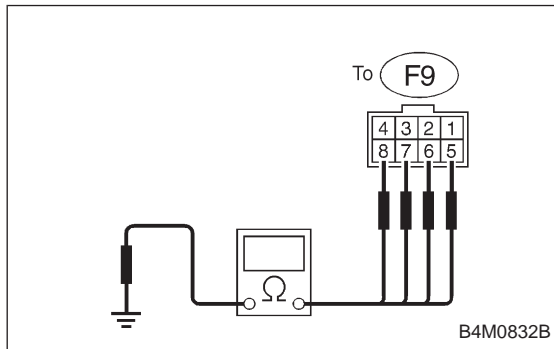
**10U11 CHECK RESISTANCE OF SOLENOID VALVE.**

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

**CHECK** : *Trouble code/Connector & terminal*  
 32/to (F9) No. 8 — to (ABS1) No. 2  
 34/to (F9) No. 5 — to (ABS1) No. 2  
 36/to (F9) No. 6 — to (ABS1) No. 2  
 38/to (F9) No. 7 — to (ABS1) No. 2  
 Is resistance  $4.3 \pm 0.5 \Omega$ ?

**YES** : Go to step 10U12.

**NO** : Replace hydraulic unit.



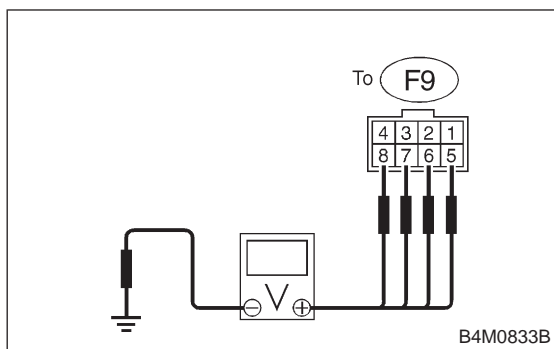
**10U12 CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Trouble code/Connector & terminal*  
 32/to (F9) No. 8 — Chassis ground  
 34/to (F9) No. 5 — Chassis ground  
 36/to (F9) No. 6 — Chassis ground  
 38/to (F9) No. 7 — Chassis ground  
 Is resistance more than 1 MΩ?

**YES** : Go to step 10U13.

**NO** : Replace hydraulic unit.

**10U13****CHECK BATTERY SHORT OF SOLENOID VALVE.**

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

**CHECK** : **Trouble code/Connector & terminal**  
**32/to (F9) No. 8 (+) — Chassis ground (-)**  
**34/to (F9) No. 5 (+) — Chassis ground (-)**  
**36/to (F9) No. 6 (+) — Chassis ground (-)**  
**38/to (F9) No. 7 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

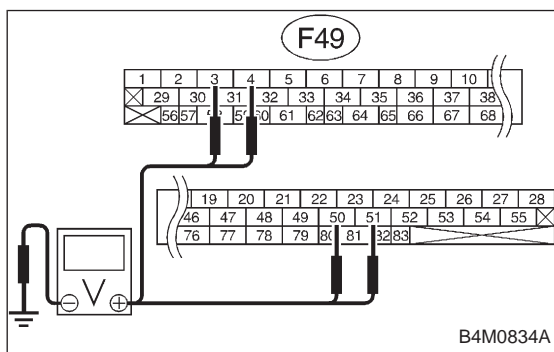
**NO** : Replace hydraulic unit.

- 4) Turn ignition switch to OFF.
- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Trouble code/Connector & terminal**  
**32/to (F9) No. 8 (+) — Chassis ground (-)**  
**34/to (F9) No. 5 (+) — Chassis ground (-)**  
**36/to (F9) No. 6 (+) — Chassis ground (-)**  
**38/to (F9) No. 7 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **10U14**.

**NO** : Replace hydraulic unit.

**10U14****CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : **Trouble code/Connector & terminal**  
**32/(F49) No. 3 (+) — Chassis ground (-)**  
**34/(F49) No. 51 (+) — Chassis ground (-)**  
**36/(F49) No. 50 (+) — Chassis ground (-)**  
**38/(F49) No. 4 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

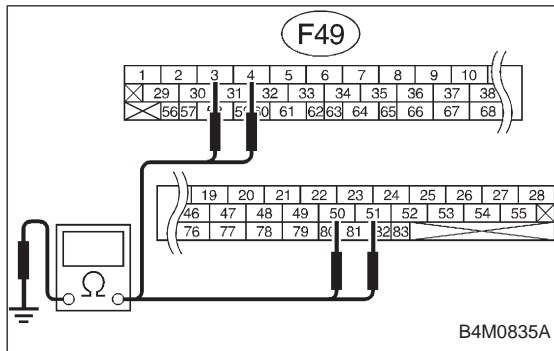
**YES** : Go to next step.

**NO** : Repair harness between ABSCM and hydraulic unit.

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

- CHECK** : *Trouble code/Connector & terminal*  
 32/(F49) No. 3 (+) — Chassis ground (-)  
 34/(F49) No. 51 (+) — Chassis ground (-)  
 36/(F49) No. 50 (+) — Chassis ground (-)  
 38/(F49) No. 4 (+) — Chassis ground (-)  
*Is voltage 0 V?*

- YES** : Go to step 10U15.  
**NO** : Repair harness between ABSCM and hydraulic unit.

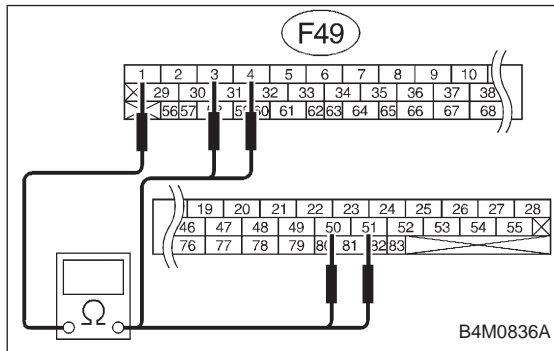


**10U15 CHECK GROUND SHORT OF HARNESS.**

Measure resistance between ABSCM connector and chassis ground.

- CHECK** : *Trouble code/Connector & terminal*  
 32/(F49) No. 3 — Chassis ground  
 34/(F49) No. 51 — Chassis ground  
 36/(F49) No. 50 — Chassis ground  
 38/(F49) No. 4 — Chassis ground  
*Is resistance more than 1 MΩ?*

- YES** : Go to step 10U16.  
**NO** : Repair harness between ABSCM and hydraulic unit.



**10U16 CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

- CHECK** : *Trouble code/Connector & terminal*  
 32/(F49) No. 3 — No. 1  
 34/(F49) No. 51 — No. 1  
 36/(F49) No. 50 — No. 1  
 38/(F49) No. 4 — No. 1  
*Is resistance 4.8±0.5 Ω?*

- YES** : Go to step 10U17.  
**NO** : Repair harness connector between ABSCM and hydraulic unit.

10U17	CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.
-------	---

**CHECK** : *Is there poor contact in connectors between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step 10U18.

10U18	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 next **CHECK** .

**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: 41 ECU**

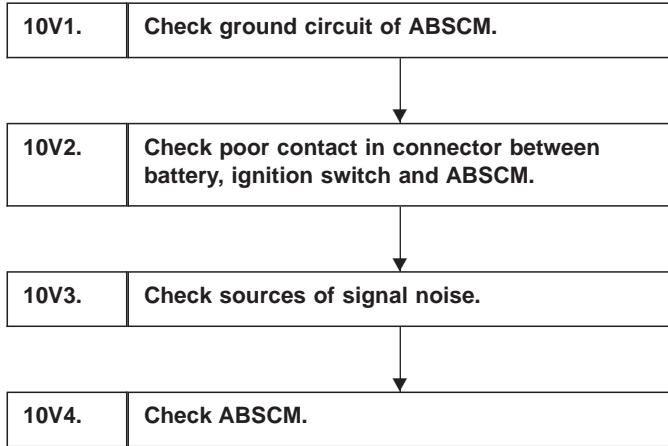
**— ABNORMAL ABS CONTROL MODULE —**

**DIAGNOSIS:**

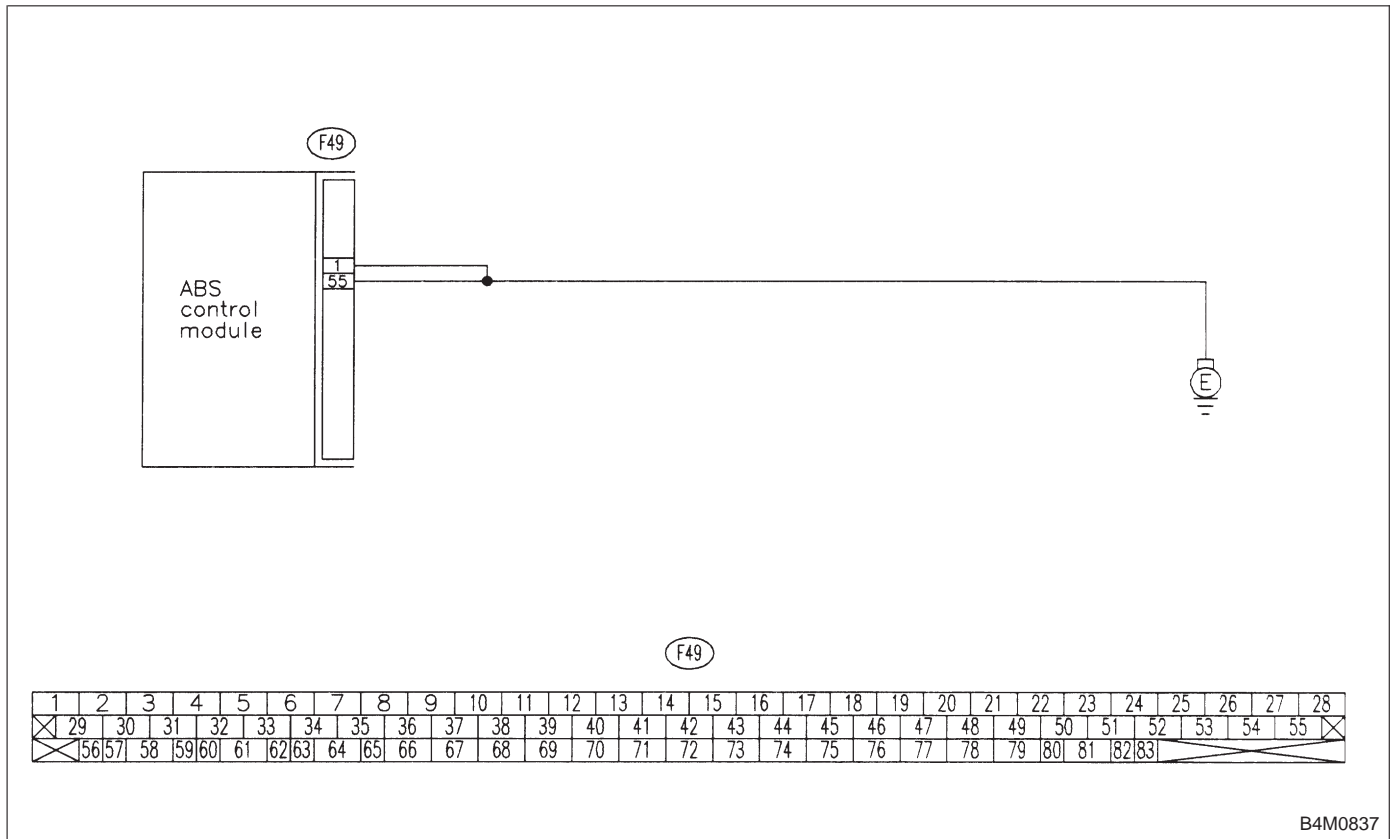
- Faulty ABSCM

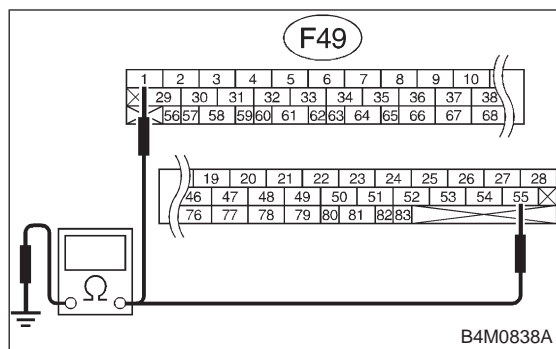
**TROUBLE SYMPTOM:**

- 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.

**CHECK** : **Connector & terminal**  
**(F49) No. 1 — Chassis ground**  
**(F49) No. 55 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10V2.

**NO** : Repair ABSCM ground harness.

**10V2 CHECK POOR CONTACT IN CONNECTORS BETWEEN BATTERY, IGNITION SWITCH AND ABSCM.**

**CHECK** : **Is there poor contact in connectors between battery, ignition switch and ABSCM?**

**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 next **CHECK** .

**NO** : Properly install the car telephone or the wireless transmitter.

**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 10V4.

<b>10V4</b>	<b>CHECK ABSCM.</b>
-------------	---------------------

- 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 next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

D•NEW 42 (FB1)  
LOW VOLTAGE

B4M0963

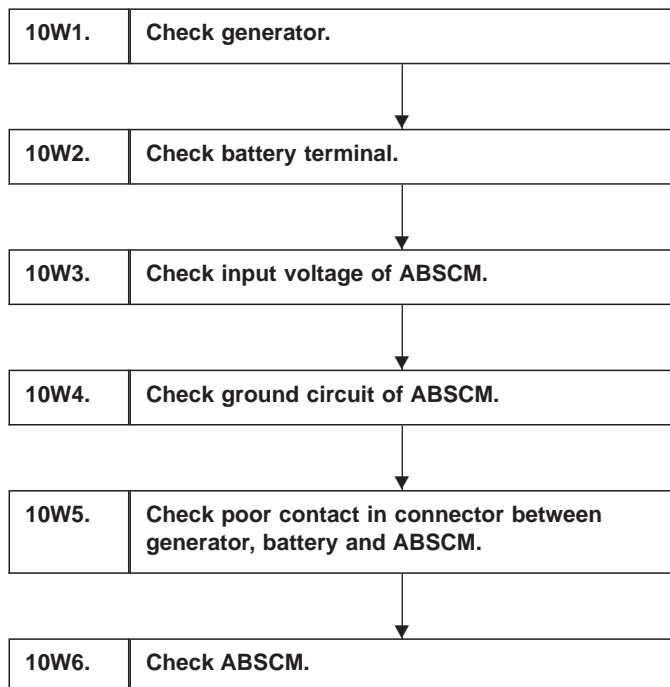
**W: 42 LOW VOLTAGE**  
**— SOURCE VOLTAGE IS LOW. —**

**DIAGNOSIS:**

- Power source voltage of the ABSCM is low.

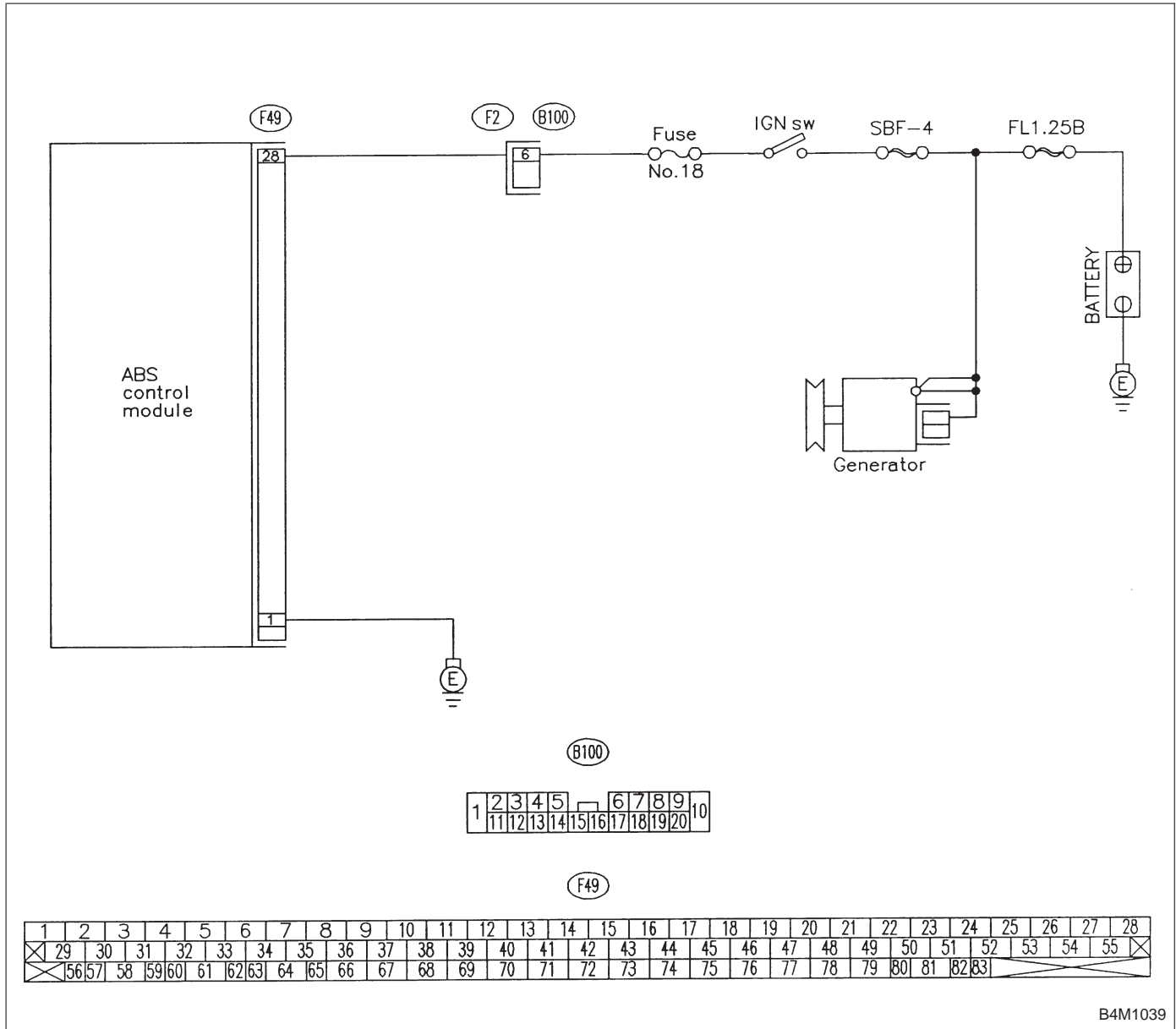
**TROUBLE SYMPTOM:**

- ABS does not operate.

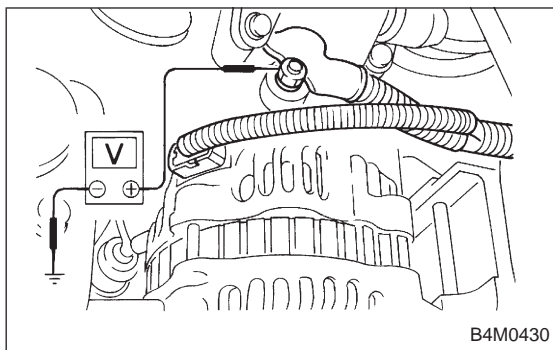




WIRING DIAGRAM:



B4M1039



B4M0430

**10W1 CHECK GENERATOR.**

- 1) Start engine.
- 2) Idling after warm-up.
- 3) Measure voltage between generator B terminal and chassis ground.

**CHECK** : **Terminal**  
**Generator B terminal — Chassis ground**  
**Is voltage 10 — 15 V?**

**YES** : Go to step **10W2**.

**NO** : Repair generator.

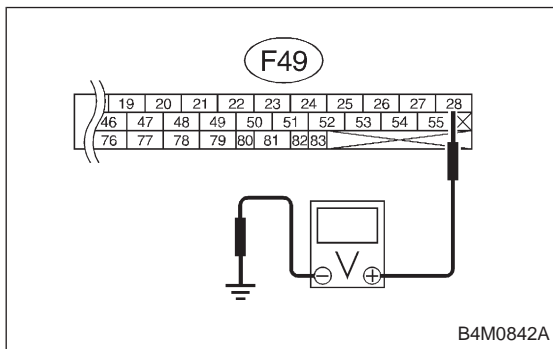
**10W2 CHECK BATTERY TERMINAL.**

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.



B4M0842A

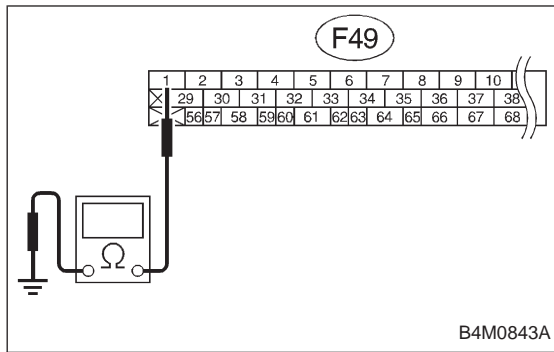
**10W3 CHECK INPUT VOLTAGE OF ABSCM.**

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

**CHECK** : **Connector & terminal**  
**(F49) No. 28 (+) — Chassis ground (-)**  
**Is voltage 10 — 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.

**CHECK** : **Connector & terminal (F49) No. 1 — Chassis ground**  
*Is resistance less than 0.5 Ω?*

**YES** : Go to step **10W5**.

**NO** : Repair ABSCM ground harness.

**10W5 CHECK POOR CONTACT IN CONNECTOR BETWEEN GENERATOR, BATTERY AND ABSCM.**

**CHECK** : *Is there poor contact in connectors between generator, battery and ABSCM?*

**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 next **CHECK** .

**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

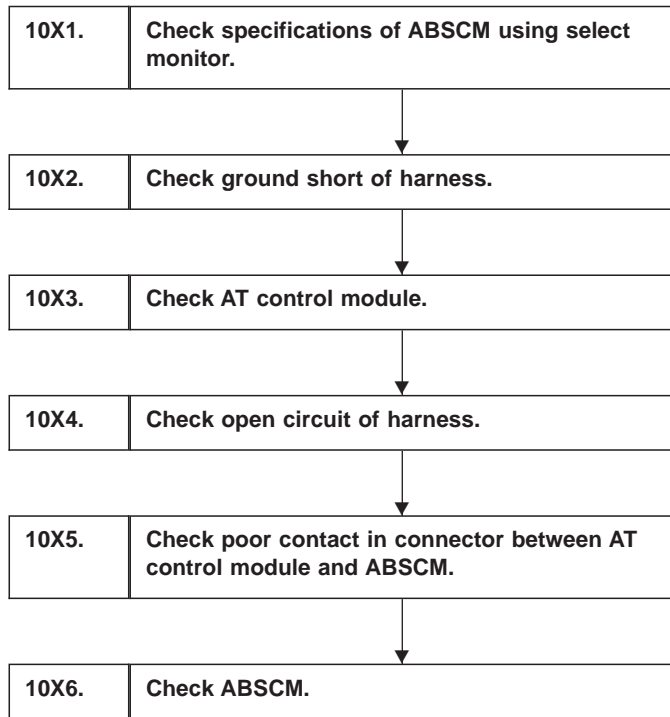
**X: 44 CCM LINE  
— A COMBINATION OF AT CONTROL  
ABNORMALS —**

**DIAGNOSIS:**

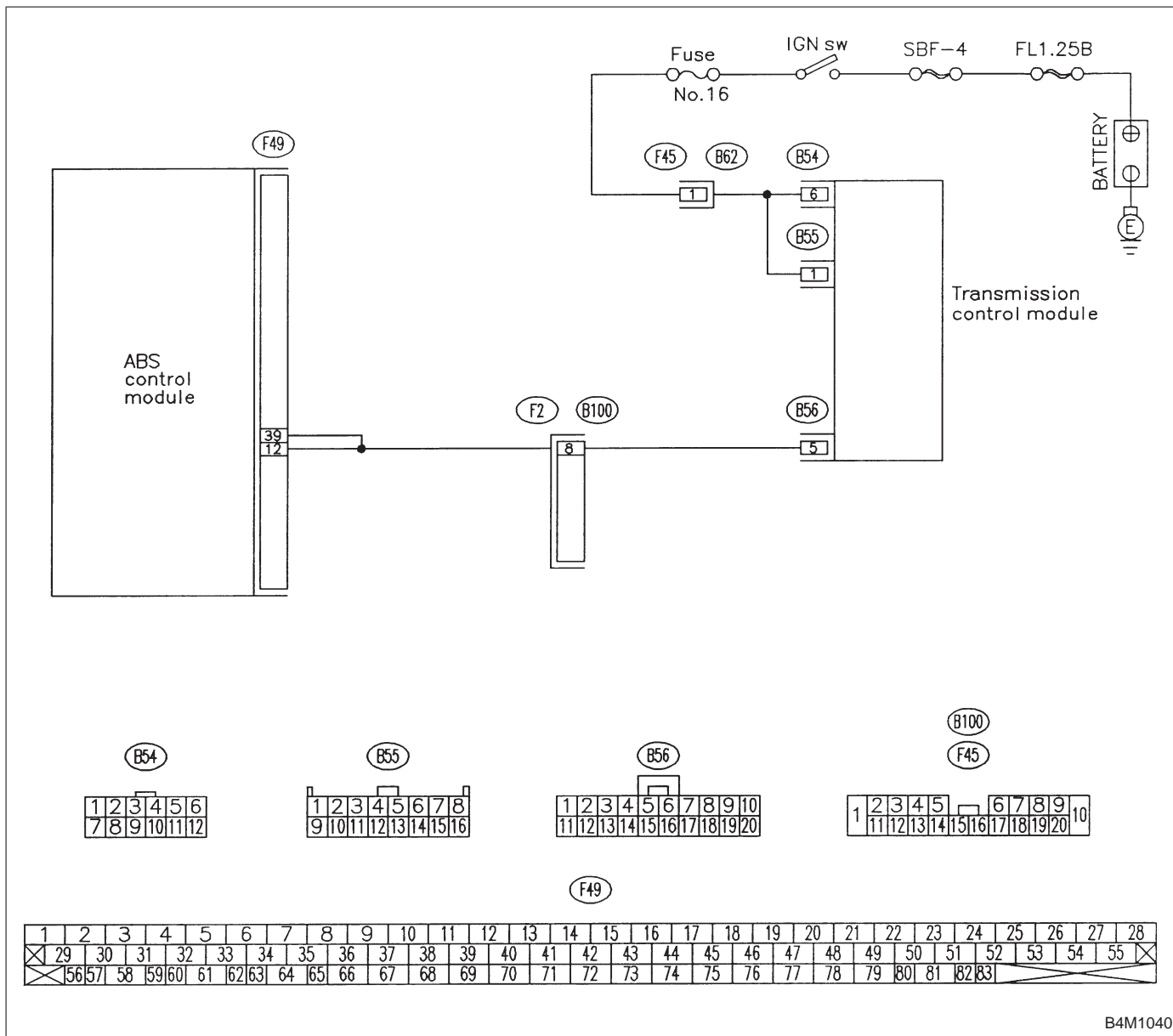
- Combination of AT control faults

**TROUBLE SYMPTOM:**

- ABS does not operate.



WIRING DIAGRAM:



B4M1040

1996 (F00)  
 ABS 4WD•AT

B4M0921

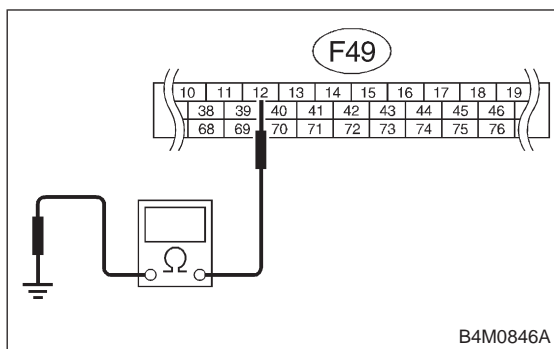
**10X1 CHECK SPECIFICATIONS OF ABSCM USING SELECT MONITOR.**

- 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.

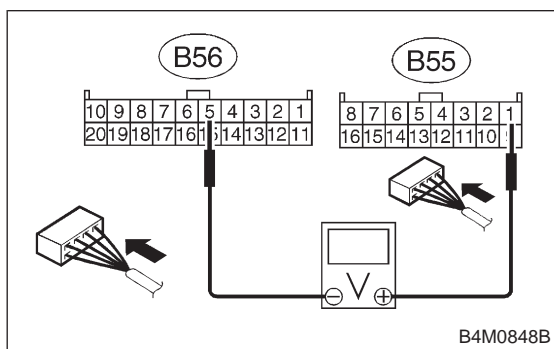
**10X2 CHECK GROUND SHORT OF HARNESS.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect two connectors from AT control module.
- 3) Disconnect connector from ABSCM.
- 4) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 12 — Chassis ground**  
Is resistance more than 1 MΩ?

**YES** : Go to step 10X3.

**NO** : Repair harness between AT control module and ABSCM.

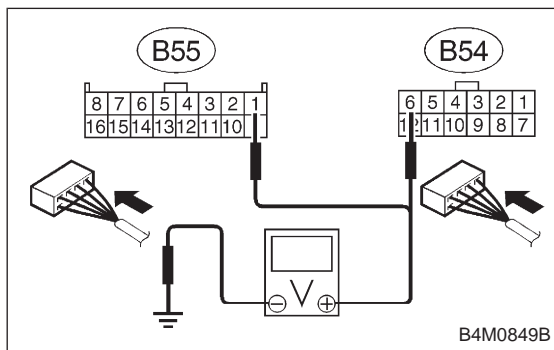
**10X3 CHECK AT CONTROL MODULE.**

- 1) Connect all connectors to AT control module.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between AT control module connector terminals.

**CHECK** : **Connector & terminal (B55) No. 1 (+) — (B56) No. 5 (-)**  
Is voltage 10 — 13 V?

**YES** : Go to step 10X4.

**NO** : Go to next step.

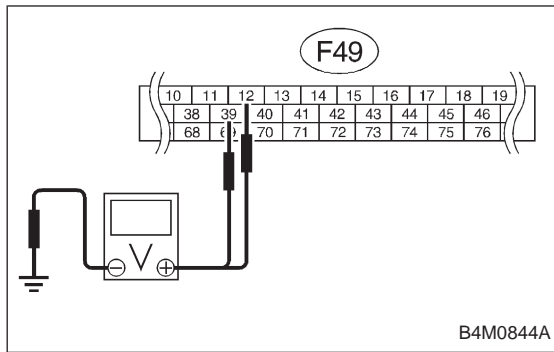


- 4) Measure voltage between AT control module connector and chassis ground.

**CHECK** : **Connector & terminal (B54) No. 6 (+) — Chassis ground (-)**  
**(B55) No. 1 (+) — Chassis ground (-)**  
Is voltage 10 — 13 V?

**YES** : Replace AT control module.

**NO** : Repair harness connector between battery, ignition switch and AT control module.

**10X4 CHECK OPEN CIRCUIT OF HARNESS.**

Measure voltage between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 12 (+) — Chassis ground (-)**  
**(F49) No. 39 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step **10X5**.

**NO** : Repair harness connector between AT control module and ABSCM.

**10X5 CHECK POOR CONTACT IN CONNECTOR BETWEEN AT CONTROL MODULE AND ABSCM.**

**CHECK** : **Is there poor contact in connectors between AT control module and ABSCM?**

**YES** : Repair connector.

**NO** : Go to step **10X6**.

**10X6 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 next **CHECK** .

**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

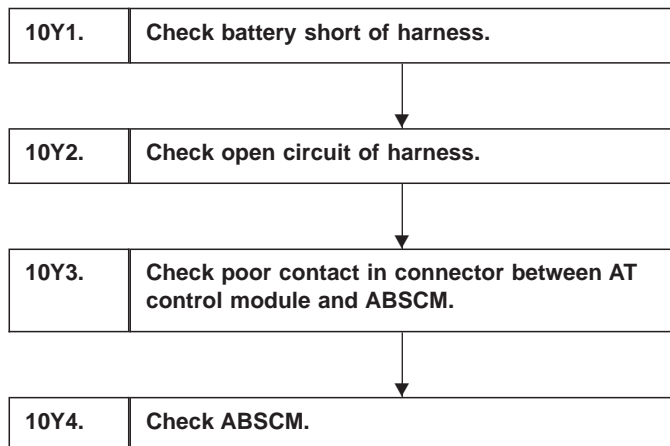
**Y: 44 CCM OPEN**  
**— A COMBINATION OF AT CONTROL**  
**ABNORMALS —**

**DIAGNOSIS:**

- Combination of AT control faults

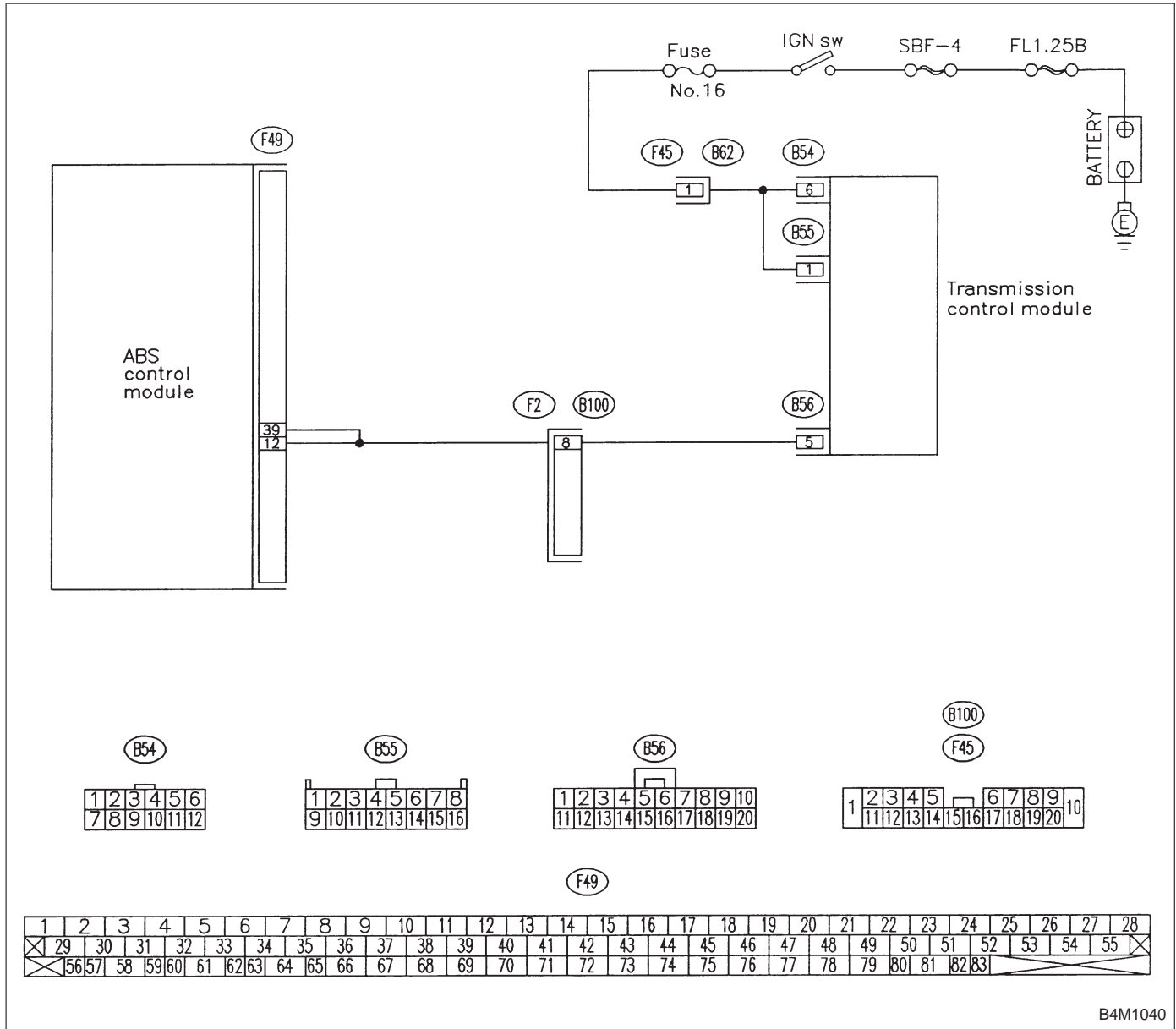
**TROUBLE SYMPTOM:**

- ABS does not operate.

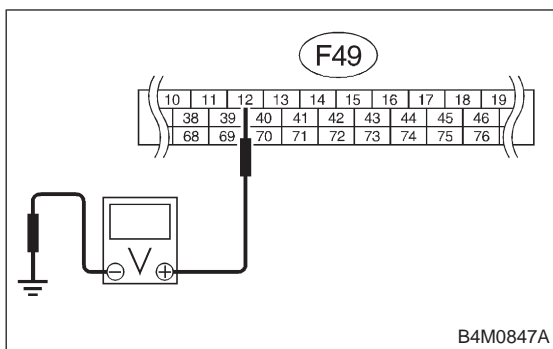




WIRING DIAGRAM:



B4M1040



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

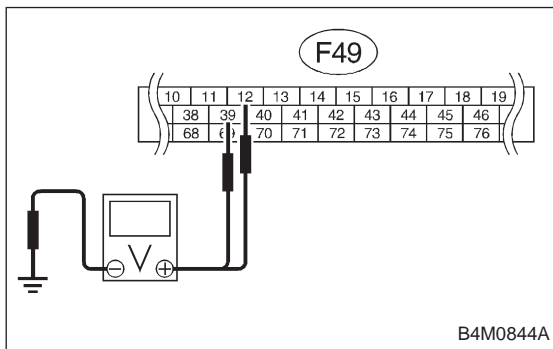
**CHECK** : **Connector & terminal (F49) No. 12 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

- YES** : Go to next step.
- NO** : Repair harness between AT control module and ABSCM.

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

**CHECK** : **Connector & terminal (F49) No. 12 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

- YES** : Go to step 10Y2.
- NO** : Repair harness between AT control module and ABSCM.



**10Y2 CHECK OPEN CIRCUIT OF HARNESS.**

- 1) Connect all connectors to AT control module.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 12 (+) — Chassis ground (-)**  
**(F49) No. 39 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

- YES** : Go to step 10Y3.
- NO** : Repair harness connector between AT control module and ABSCM.

10Y3	CHECK POOR CONTACT IN CONNECTOR BETWEEN AT CONTROL MODULE AND ABSCM.
------	--

**CHECK** : *Is there poor contact in connectors between AT control module and ABSCM?*

**YES** : Repair connector.

**NO** : Go to step 10Y4.

10Y4	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 next **CHECK** .

**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: 46 GS POWER OVER**  
**— G SENSOR LINE VOLTAGE TOO HIGH —**

**DIAGNOSIS:**

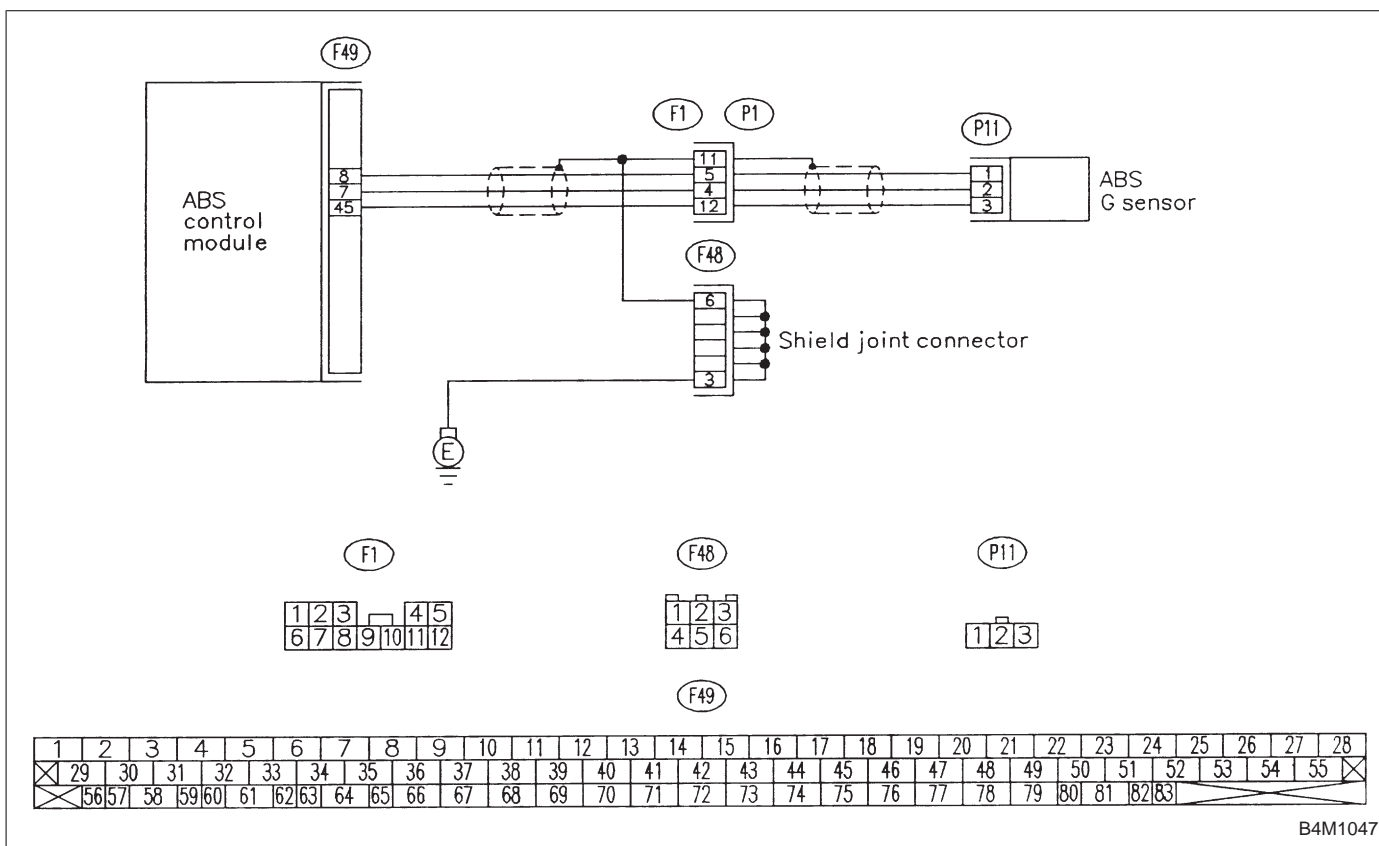
- Faulty G sensor power supply voltage

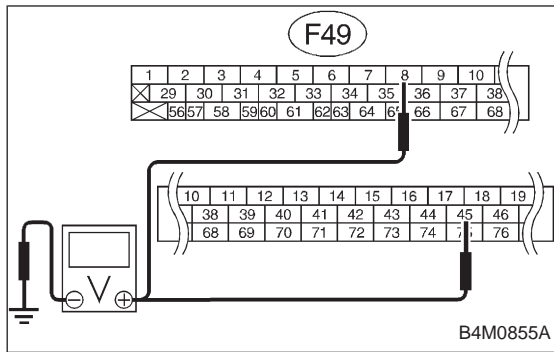
**TROUBLE SYMPTOM:**

- ABS does not operate.

**10Z1. Check battery short of harness.**

**WIRING DIAGRAM:**



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

**CHECK** : **Connector & terminal**  
**(F49) No. 8 (+) — Chassis ground (-)**  
**(F49) No. 45 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Repair harness between ABSCM and G sensor.

- 7) Turn ignition switch to OFF.
- 8) Measure voltage between ABSCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 8 (+) — Chassis ground (-)**  
**(F49) No. 45 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Replace ABSCM.

**NO** : Repair harness between ABSCM and chassis ground.

D•NEW 46 (FB1)  
GS POWER LOW

B4M0967

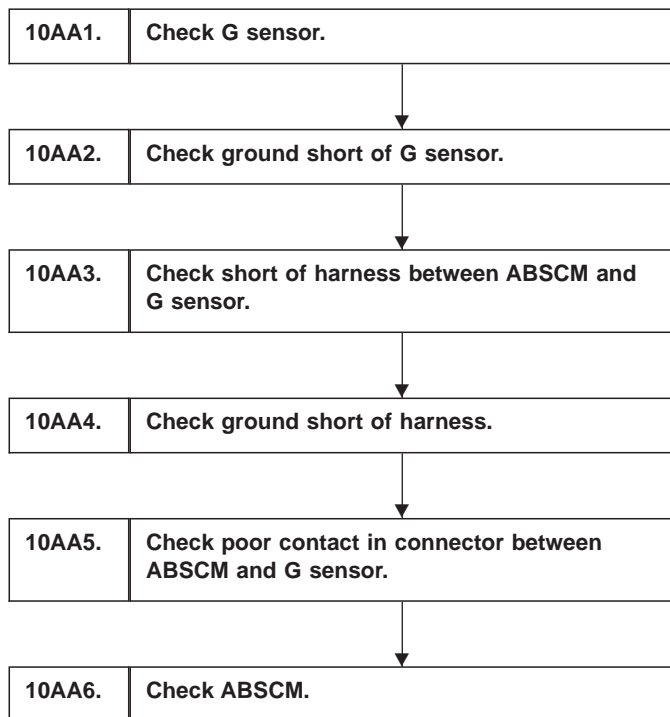
**AA: 46 GS POWER LOW**  
**— G SENSOR LINE VOLTAGE TOO LOW —**

**DIAGNOSIS:**

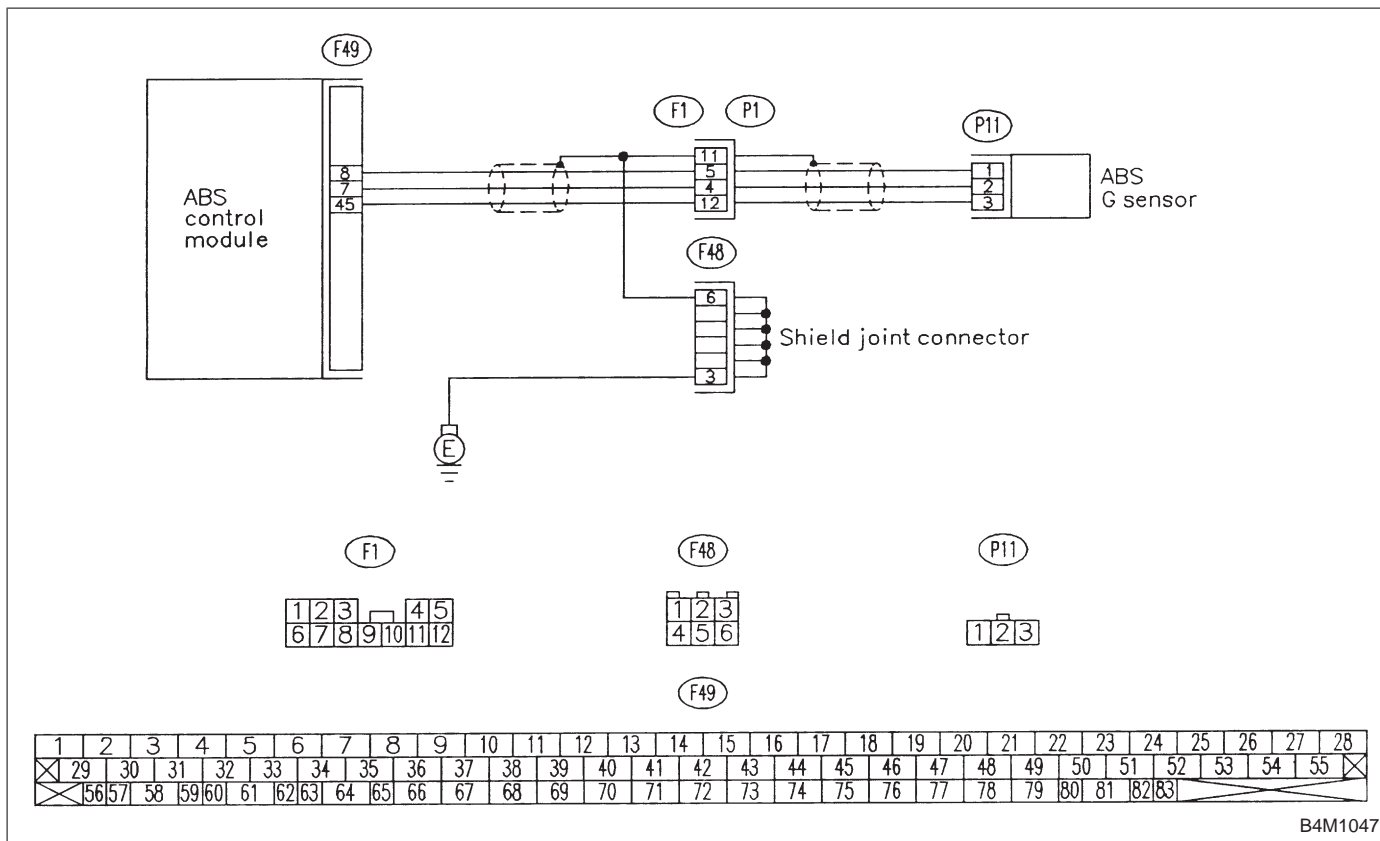
- Faulty G sensor power supply voltage

**TROUBLE SYMPTOM:**

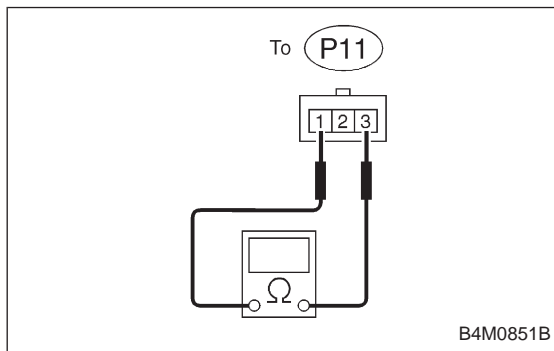
- ABS does not operate.



**WIRING DIAGRAM:**



B4M1047



B4M0851B

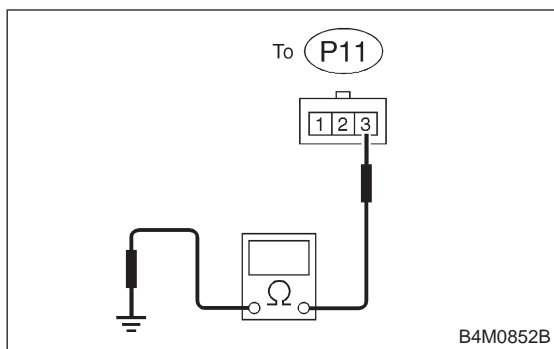
**10AA1 CHECK G SENSOR.**

- 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.

**CHECK** : **Connector & terminal**  
**To (P11) No. 1 — No. 3**  
**Is resistance 50±8 kΩ?**

**YES** : Go to step 10AA2.

**NO** : Replace G sensor.

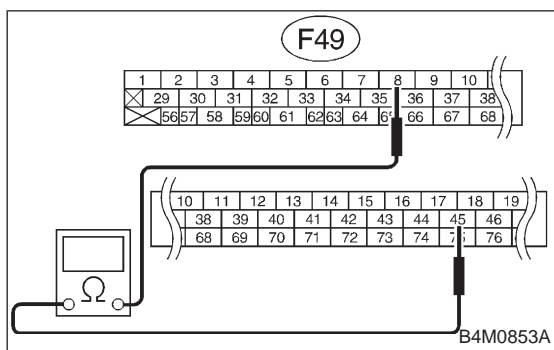
**10AA2 CHECK GROUND SHORT OF G SENSOR.**

Measure resistance between G sensor and bracket.

**CHECK** : **Connector & terminal**  
**To (P11) No. 3 — Bracket**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AA3.

**NO** : Replace G sensor.

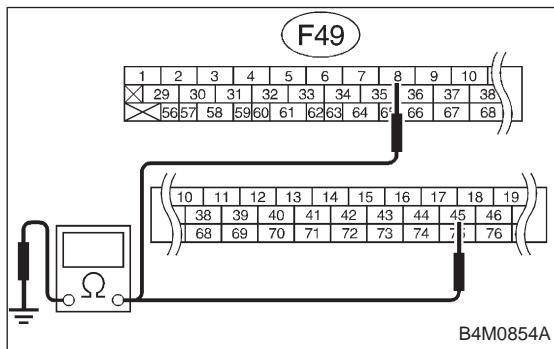
**10AA3 CHECK SHORT OF HARNESS BETWEEN ABSCM AND G SENSOR.**

- 1) Disconnect connector from ABSCM.
- 2) Measure resistance between ABSCM connector terminals.

**CHECK** : **Connector & terminal**  
**(F49) No. 45 — No. 8**  
**Is 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.

**CHECK** : **Connector & terminal**  
**(F49) No. 8 — Chassis ground**  
**(F49) No. 45 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AA5.

**NO** : Repair harness between ABSCM and G sensor.

**10AA5 CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.**

**CHECK** : **Is there poor contact in connectors between ABSCM and G sensor?**

**YES** : Repair connector.

**NO** : Go to step 10AA6.



<b>10AA6</b>	<b>CHECK ABSCM.</b>
--------------	---------------------

- 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 next **CHECK** .

**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

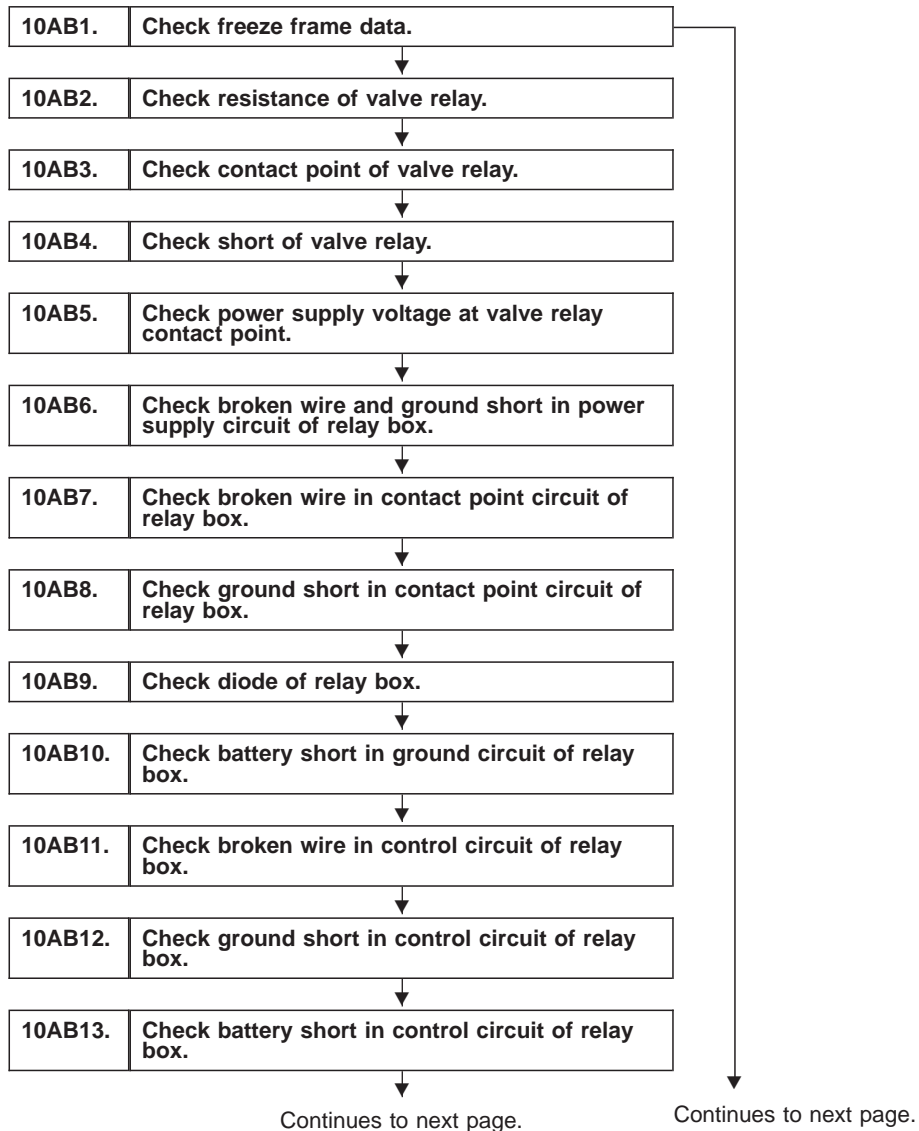
**AB: 51 V. RELAY**  
**— ABNORMAL VALVE RELAY —**

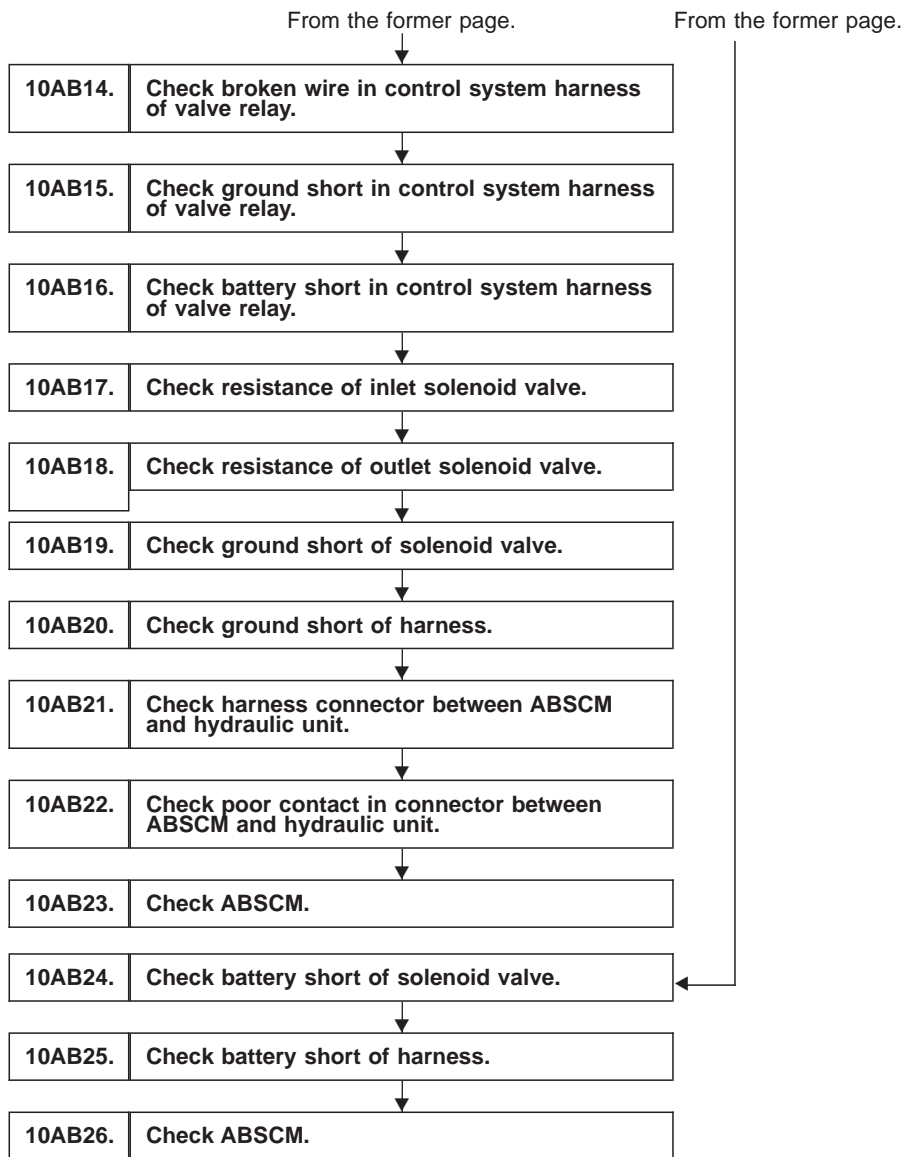
**DIAGNOSIS:**

- Faulty valve relay

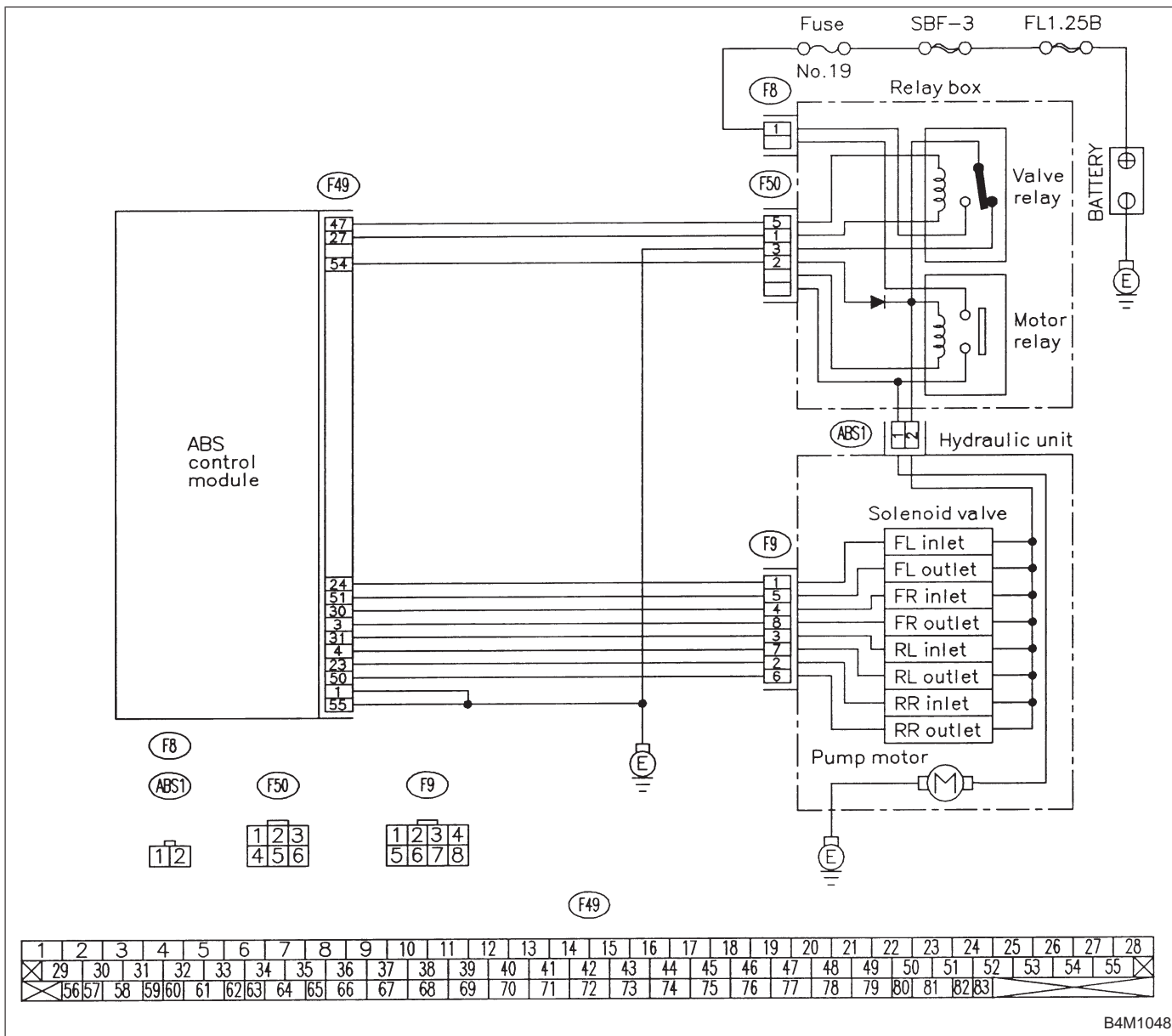
**TROUBLE SYMPTOM:**

- ABS does not operate.

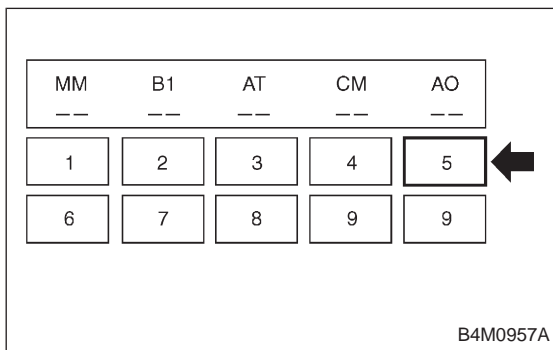




**WIRING DIAGRAM:**



B4M1048



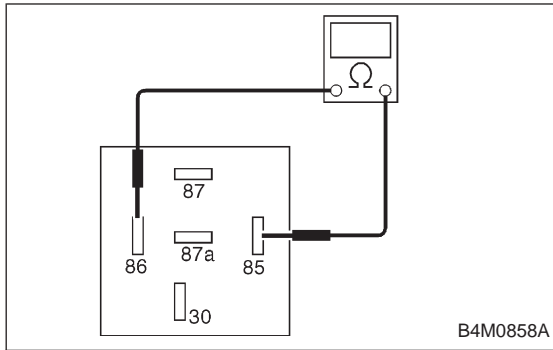
**10AB1 CHECK FREEZE FRAME DATA.**

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 10AB24.

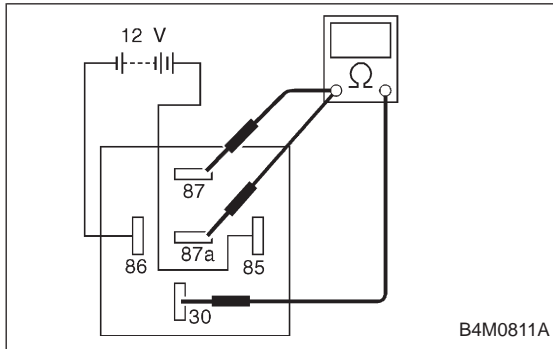


**10AB2 CHECK RESISTANCE OF VALVE RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove valve relay from relay box.
- 3) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 86**  
**Is resistance  $103 \pm 10 \Omega$ ?**

- YES** : Go to step **10AB3**.  
**NO** : Replace valve relay.



**10AB3 CHECK CONTACT POINT OF VALVE RELAY.**

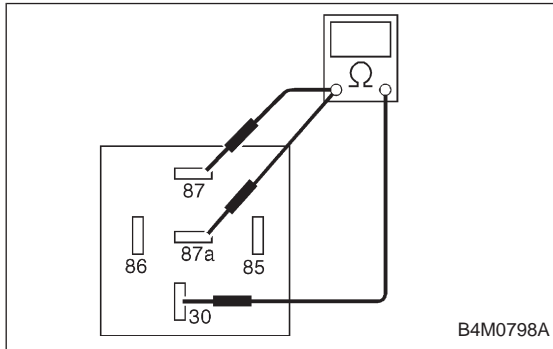
- 1) Connect battery to valve relay terminals No. 85 and No. 86.
- 2) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance less than  $0.5 \Omega$ ?**

- YES** : Go to next **CHECK** .  
**NO** : Replace valve relay.

**CHECK** : **Terminals**  
**No. 30 — No. 87a**  
**Is resistance more than  $1 M\Omega$ ?**

- YES** : Go to next step.  
**NO** : Replace valve relay.



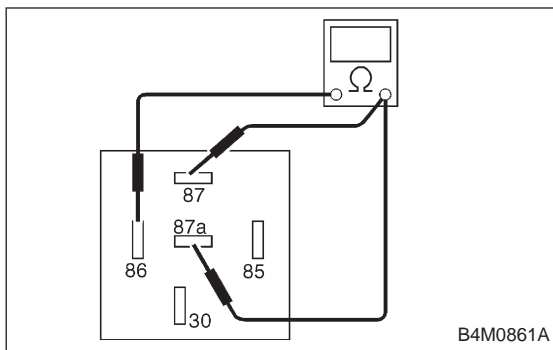
- 3) Disconnect battery from valve relay terminals.
- 4) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance more than  $1 M\Omega$ ?**

- YES** : Go to next **CHECK** .  
**NO** : Replace valve relay.

**CHECK** : **Terminals**  
**No. 30 — No. 87a**  
**Is resistance less than  $0.5 \Omega$ ?**

- YES** : Go to step **10AB4**.  
**NO** : Replace valve relay.

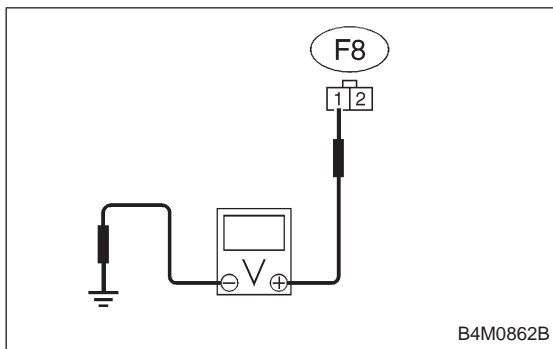


**10AB4 CHECK SHORT OF VALVE RELAY.**

Measure resistance between valve relay terminals.

**CHECK** : *Terminals*  
**No. 86 — No. 87**  
**No. 86 — No. 87a**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step **10AB5**.  
**NO** : Replace valve relay.

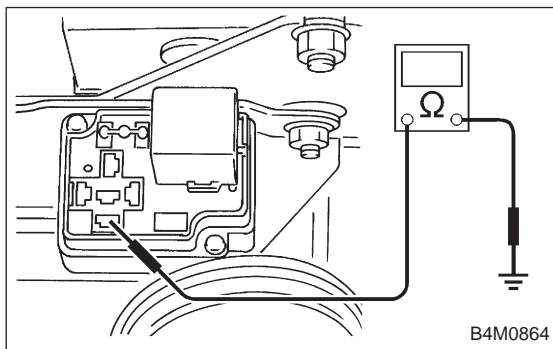


**10AB5 CHECK POWER SUPPLY VOLTAGE AT VALVE RELAY CONTACT POINT.**

1) Disconnect connector (F8) from relay box.  
 2) Measure voltage between relay box connector and chassis ground.

**CHECK** : *Connector & terminal*  
**(F8) No. 1 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step **10AB6**.  
**NO** : Repair harness connector between battery and relay box. Check fuse No. 19.

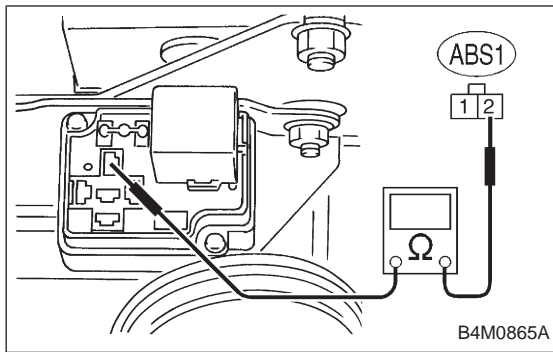


**10AB6 CHECK BROKEN WIRE AND GROUND SHORT IN POWER SUPPLY CIRCUIT OF RELAY BOX.**

1) Disconnect connector (ABS1) from hydraulic unit.  
 2) Connect connector (F8) to relay box.  
 3) Disconnect connector (F50) from relay box.  
 4) Measure voltage of relay box.

**CHECK** : *Connector & terminal*  
**Valve relay installing point No. 87 — Chassis ground**  
**Is voltage 10 — 13 V?**

**YES** : Go to step **10AB7**.  
**NO** : Replace relay box. Check fuse No. 19.



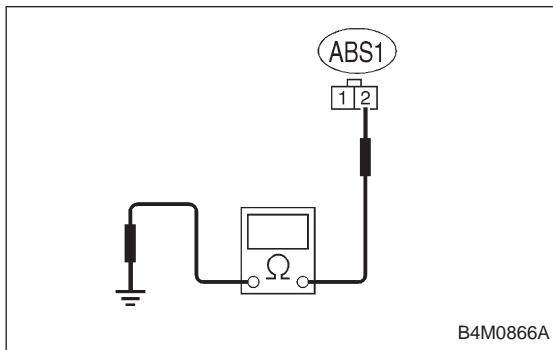
**10AB7 CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between hydraulic unit connector and valve relay installing point.

**CHECK** : **Connector & terminal (ABS1) No. 2 — Valve relay installing point No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10AB8.

**NO** : Replace relay box.



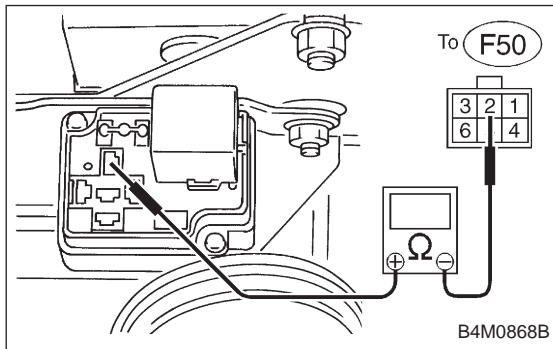
**10AB8 CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 2 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AB9.

**NO** : Replace relay box. Check fuse SBF6.



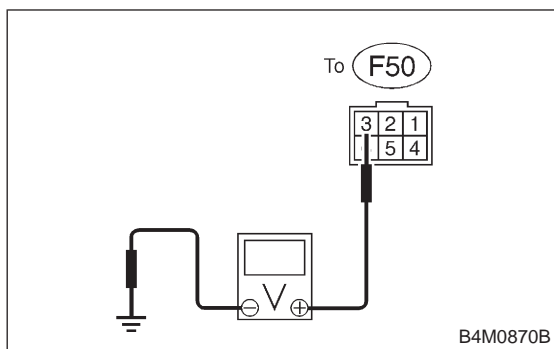
**10AB9 CHECK DIODE OF RELAY BOX.**

Measure resistance between relay box connector and valve relay installing point.

**CHECK** : **Connector & terminal Valve relay installing point No. 30 (+) — To (F50) No. 2 (-)**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AB10.

**NO** : Replace relay box.


**10AB10 CHECK BATTERY SHORT IN GROUND CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector from ABSCM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F50) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Replace relay box and check all fuses.

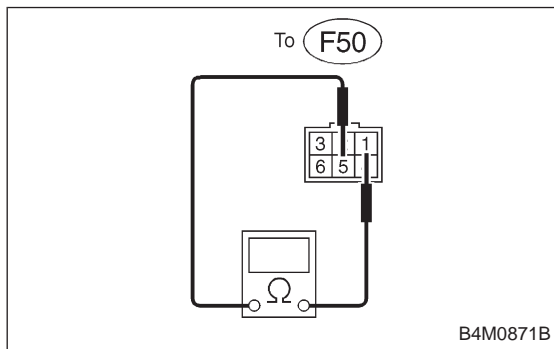
- 4) Turn ignition switch to OFF.

- 5) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F50) No. 3 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10AB11.

**NO** : Replace relay box and check all fuses.


**10AB11 CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.**

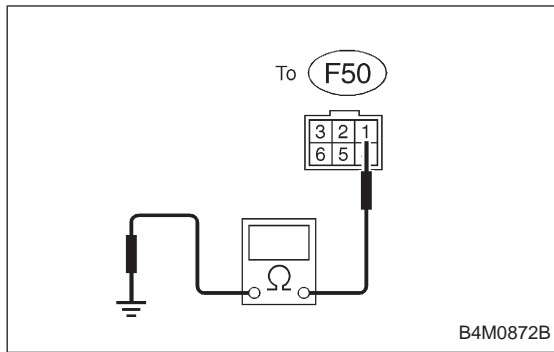
- 1) Install valve relay to relay box.
- 2) Measure resistance between relay box connector terminals.

**CHECK** : **Connector & terminal**  
**To (F50) No. 1 — No. 5**  
**Is resistance  $103 \pm 10 \Omega$ ?**

**YES** : Go to step 10AB12.

**NO** : Replace relay box.

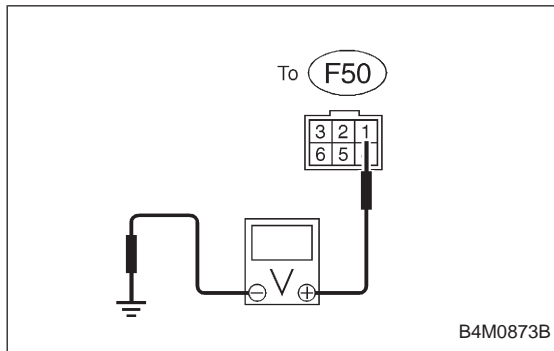




**10AB12 CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

Measure resistance between relay box connector and chassis ground.

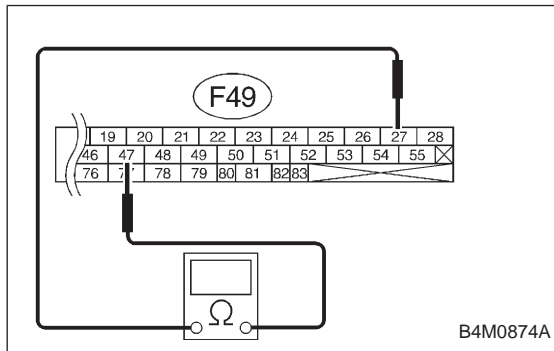
- CHECK** : *Connector & terminal To (F50) No. 1 — Chassis ground Is resistance more than 1 MΩ?*
- YES** : Go to step 10AB13.
- NO** : Replace relay box and check all fuses.



**10AB13 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.

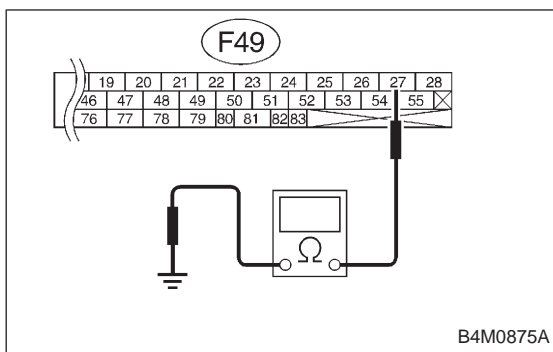
- CHECK** : *Connector & terminal To (F50) No. 1 (+) — Chassis ground (-) Is voltage 0 V?*
  - YES** : Go to next step.
  - NO** : Replace relay box. Check fuse No. 19 and SBF6.
- 3) Turn ignition switch to OFF.
  - 4) Measure voltage between relay box connector and chassis ground.
- CHECK** : *Connector & terminal To (F50) No. 1 (+) — Chassis ground (-) Is voltage 0 V?*
  - YES** : Go to step 10AB14.
  - NO** : Replace relay box. Check fuse No. 19 and SBF6.



**10AB14 CHECK BROKEN WIRE IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

- 1) Connect connector (F50) to relay box.
- 2) Measure resistance between ABSCM connector terminals.

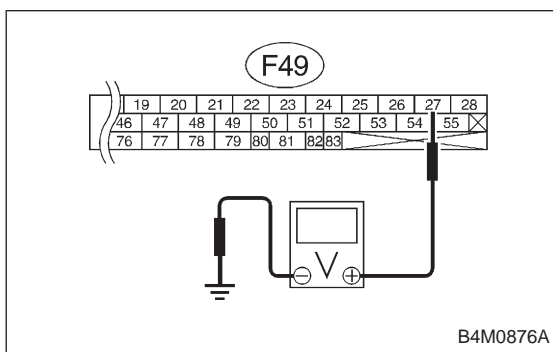
- CHECK** : *Connector & terminal (F49) No. 27 — No. 47 Is resistance 103±10 Ω?*
- YES** : Go to step 10AB15.
- NO** : Repair harness between ABSCM and relay box. Check fuse No. 18.



**10AB15 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.

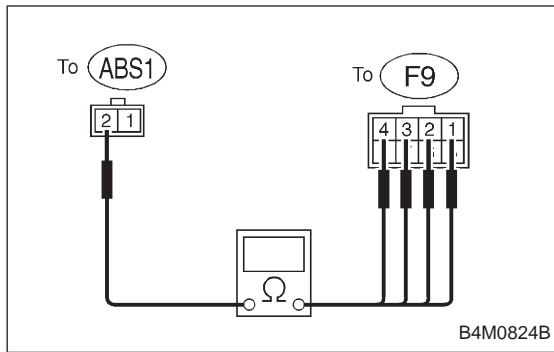
- CHECK** : **Connector & terminal (F49) No. 27 — Chassis ground**  
**Is resistance more than 1 MΩ?**
- YES** : Go to step **10AB16**.
- NO** : Repair harness between ABSCM and relay box. Check fuse No. 18.



**10AB16 CHECK BATTERY SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

- 1) Connect connector (F50) to relay box.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ABSCM connector and chassis ground.

- CHECK** : **Connector & terminal (F49) No. 27 (+) — Chassis ground (-)**  
**Is voltage 0 V?**
- YES** : Go to next step.
- NO** : Repair harness between ABSCM and relay box and check all fuses.
- 4) Turn ignition switch to OFF.
  - 5) Measure voltage between ABSCM connector and chassis ground.
- CHECK** : **Connector & terminal (F49) No. 27 (+) — Chassis ground (-)**  
**Is voltage 0 V?**
- YES** : Go to step **10AB17**.
- NO** : Repair harness between ABSCM and relay box and check all fuses.

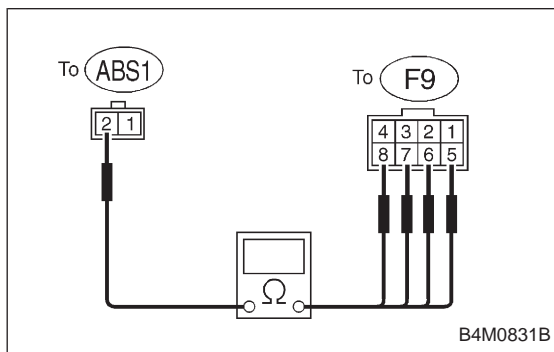


**10AB17 CHECK RESISTANCE OF INLET SOLENOID VALVE.**

- 1) Disconnect connector from hydraulic unit.
- 2) Measure resistance between hydraulic unit connector terminals.

**CHECK** : *Connector & terminal*  
 To (F9) No. 4 — to (ABS1) No. 2  
 To (F9) No. 1 — to (ABS1) No. 2  
 To (F9) No. 2 — to (ABS1) No. 2  
 To (F9) No. 3 — to (ABS1) No. 2  
 Is resistance  $8.5 \pm 0.7 \Omega$ ?

- YES** : Go to step 10AB18.  
**NO** : Replace hydraulic unit.

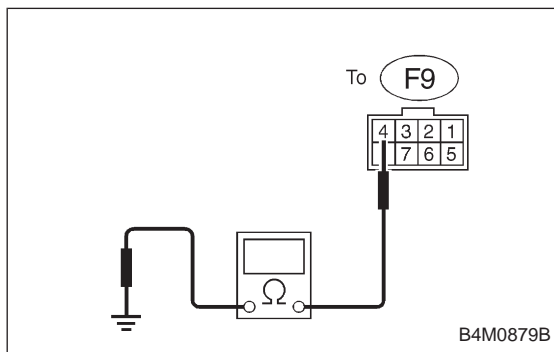


**10AB18 CHECK RESISTANCE OF OUTLET SOLENOID VALVE.**

Measure resistance between hydraulic unit connector terminals.

**CHECK** : *Connector & terminal*  
 To (F9) No. 8 — to (ABS1) No. 2  
 To (F9) No. 5 — to (ABS1) No. 2  
 To (F9) No. 6 — to (ABS1) No. 2  
 To (F9) No. 7 — to (ABS1) No. 2  
 Is resistance  $4.3 \pm 0.5 \Omega$ ?

- YES** : Go to step 10AB19.  
**NO** : Replace hydraulic unit.

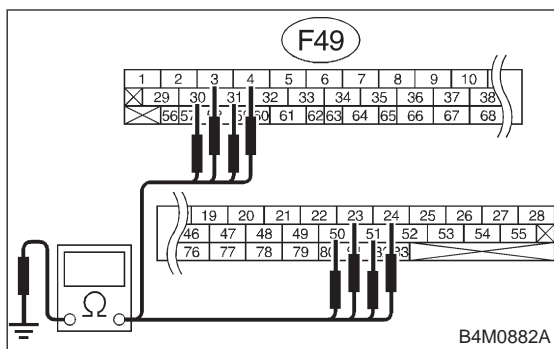


**10AB19 CHECK GROUND SHORT OF SOLENOID VALVE.**

Measure resistance between hydraulic unit connector and chassis ground.

**CHECK** : *Connector & terminal*  
 To (F9) No. 4 — Chassis ground  
 Is resistance more than  $1 M\Omega$ ?

- YES** : Go to step 10AB20.  
**NO** : Replace hydraulic unit and check all fuses.

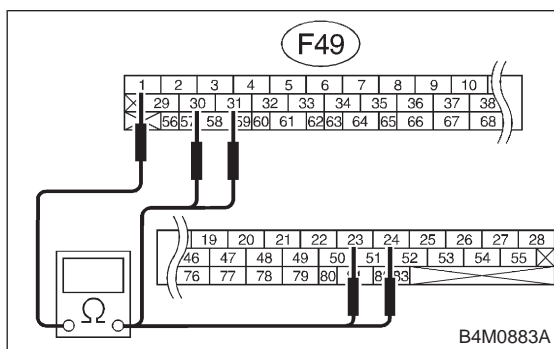
**10AB20 CHECK GROUND SHORT OF HARNESS.**

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

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

**YES** : Go to step 10AB21.

**NO** : Repair harness between hydraulic unit and ABSCM.

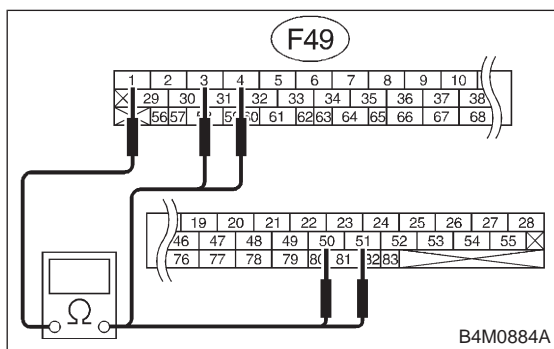
**10AB21 CHECK HARNESS CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.**

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

**CHECK** : **Connector & terminal**  
 (F49) No. 30 — No. 1  
 (F49) No. 24 — No. 1  
 (F49) No. 23 — No. 1  
 (F49) No. 31 — No. 1  
 Is resistance  $9.0 \pm 0.7 \Omega$ ?

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

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



**CHECK** : **Connector & terminal**  
 (F49) No. 3 — No. 1  
 (F49) No. 51 — No. 1  
 (F49) No. 50 — No. 1  
 (F49) No. 4 — No. 1  
 Is resistance  $4.8 \pm 0.5 \Omega$ ?

**YES** : Go to step 10AB22.

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

<b>10AB22</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.</b>
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**CHECK** : *Is there poor contact in connector between ABSCM and hydraulic unit?*

**YES** : Repair connector.

**NO** : Go to step **10AB23**.

<b>10AB23</b>	<b>CHECK ABSCM.</b>
---------------	---------------------

- 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?*

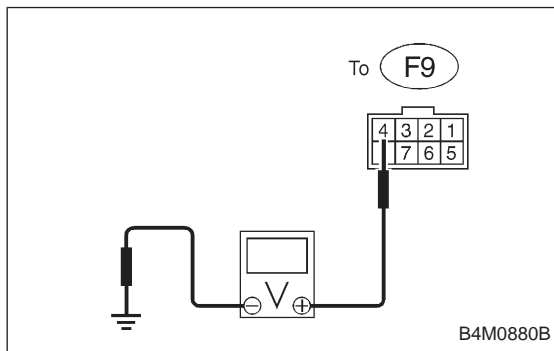
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.



<b>10AB24</b>	<b>CHECK BATTERY SHORT OF SOLENOID VALVE.</b>
---------------	---

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors (ABS1, F9) from hydraulic unit.
- 3) Disconnect connector from ABSCM.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Connector & terminal To (F9) No. 4 (+) — Chassis ground (-) Is voltage 0 V?*

**YES** : Go to next step.

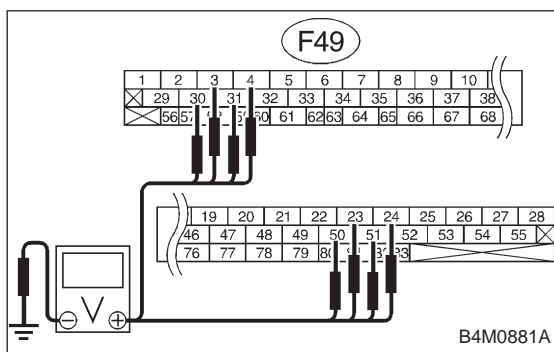
**NO** : Replace hydraulic unit and check all fuses.

- 6) Turn ignition switch to OFF.
- 7) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F63) No. 4 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **10AB25**.

**NO** : Replace hydraulic unit and check all fuses.



### 10AB25 CHECK BATTERY SHORT OF HARNESS.

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

**CHECK** : **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 (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Repair harness between hydraulic unit and ABSCM and check all fuses.

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

**CHECK** : **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 (-)**  
**Is voltage 0 V?**

**YES** : Go to step **10AB26**.

**NO** : Repair harness between hydraulic unit and ABSCM and check all fuses.

<b>10AB26</b>	<b>CHECK ABSCM.</b>
---------------	---------------------

- 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 next **CHECK** .

**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

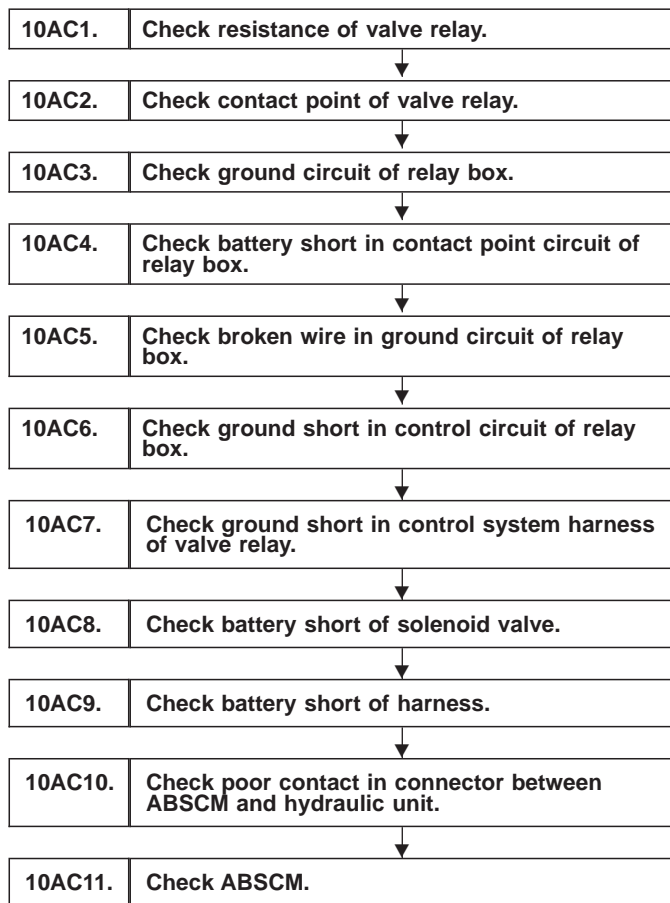
## AC: 51 V. RELAY ON — VALVE RELAY ON FAILURE —

### DIAGNOSIS:

- Faulty valve relay

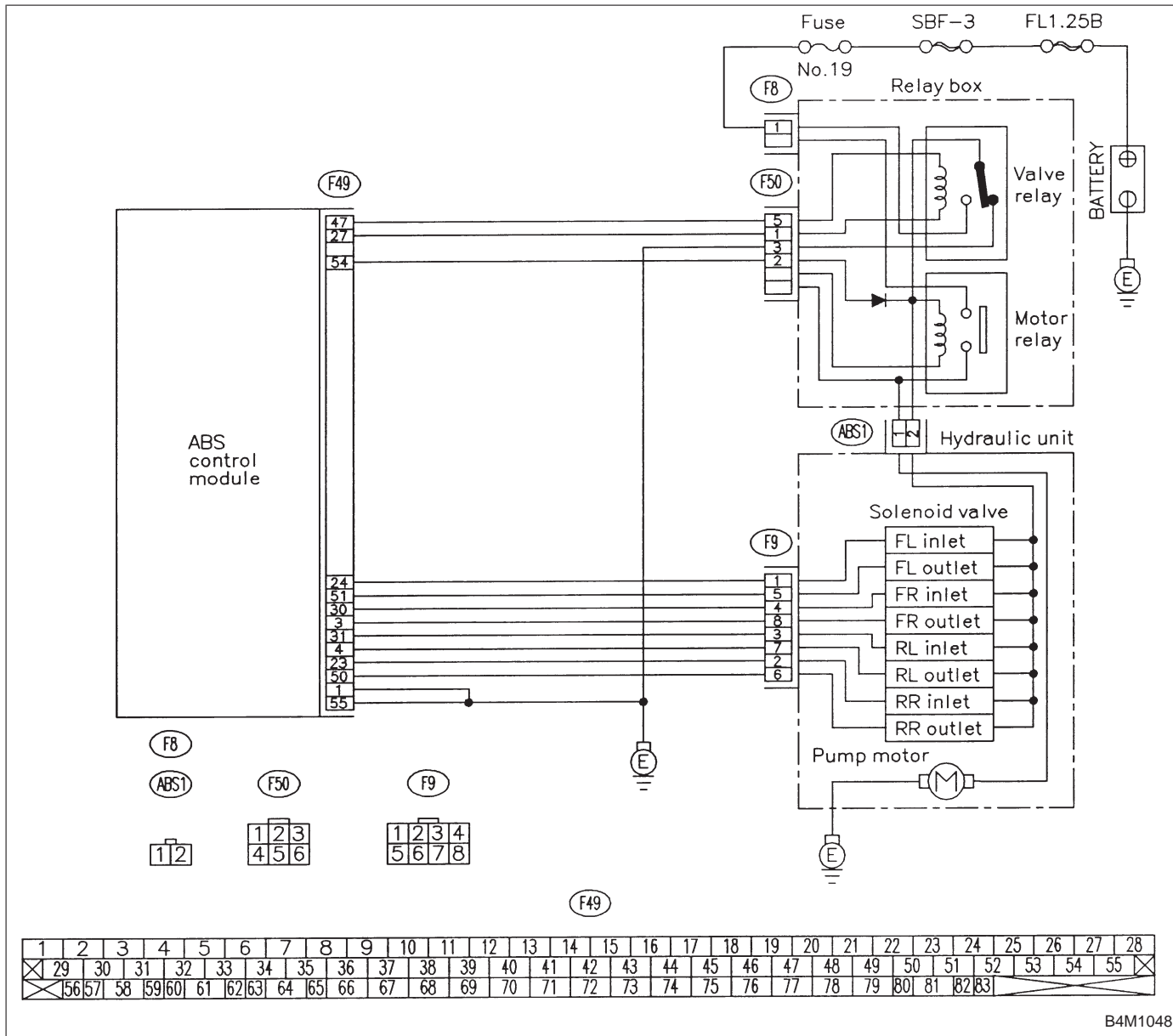
### TROUBLE SYMPTOM:

- ABS does not operate.

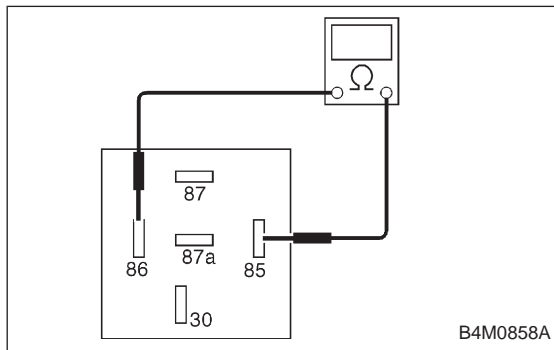




**WIRING DIAGRAM:**



B4M1048



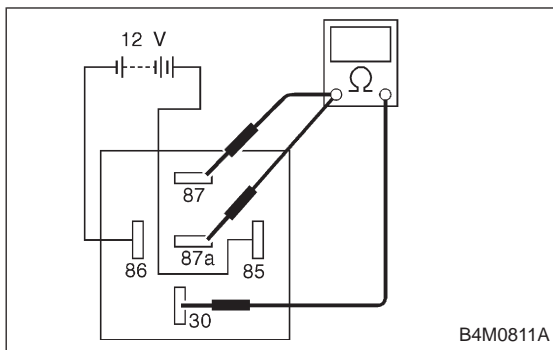
**10AC1 CHECK RESISTANCE OF VALVE RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove valve relay from relay box.
- 3) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 86**  
**Is resistance 103±10 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.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance less than 0.5 Ω?**

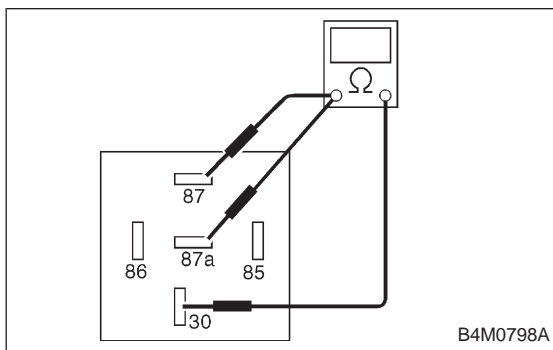
**YES** : Go to next **CHECK** .

**NO** : Replace valve relay.

**CHECK** : **Terminals**  
**No. 30 — No. 87a**  
**Is resistance more than 1 MΩ?**

**YES** : Go to next step.

**NO** : Replace valve relay.



- 3) Disconnect battery from valve relay terminals.
- 4) Measure resistance between valve relay terminals.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance more than 1 MΩ?**

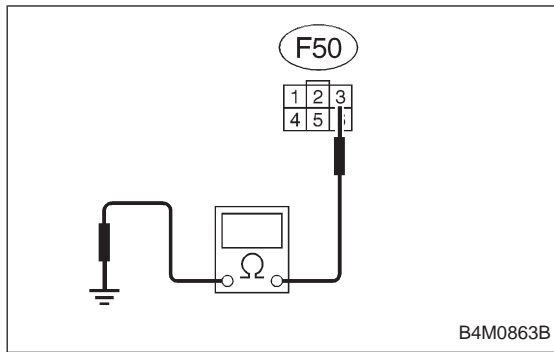
**YES** : Go to next **CHECK** .

**NO** : Replace valve relay.

**CHECK** : **Terminals**  
**No. 30 — No. 87a**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **10AC3**.

**NO** : Replace valve relay.

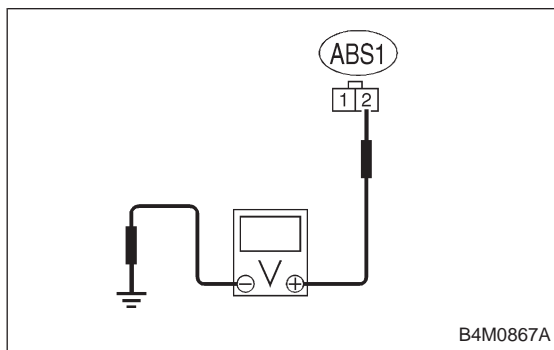

**10AC3 CHECK GROUND CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal (F50) No. 3 — Chassis ground**  
Is resistance less than 0.5 Ω?

**YES** : Go to step 10AC4.

**NO** : Repair relay box ground harness.


**10AC4 CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector from ABSCM.
- 2) Disconnect connector (ABS1) from hydraulic unit.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 2 (+) — Chassis ground (-)**  
Is voltage 0 V?

**YES** : Go to next step.

**NO** : Replace relay box. Check fuse No. 19 and SBF6.

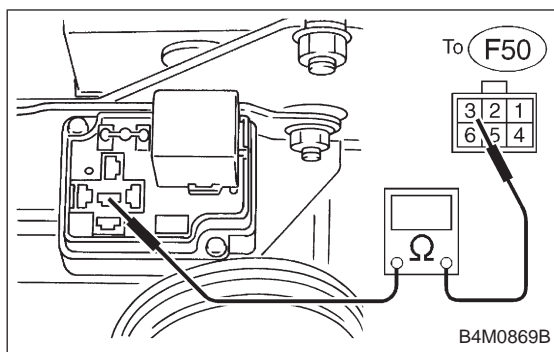
5) Turn ignition switch to OFF.

- 6) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 2 (+) — Chassis ground (-)**  
Is voltage 0 V?

**YES** : Go to step 10AC5.

**NO** : Replace relay box. Check fuse No. 9 and SBF6.

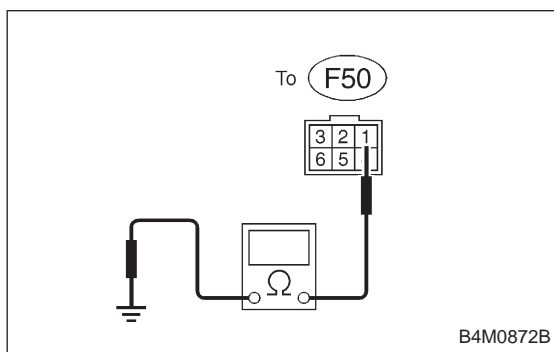
**10AC5 CHECK BROKEN WIRE IN GROUND CIRCUIT OF RELAY BOX.**

Measure resistance between relay box connector and valve relay installing point.

**CHECK** : **Connector & terminal**  
**To (F50) No. 3 — Valve relay installing point**  
**No. 87a**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10AC6.

**NO** : Replace relay box.

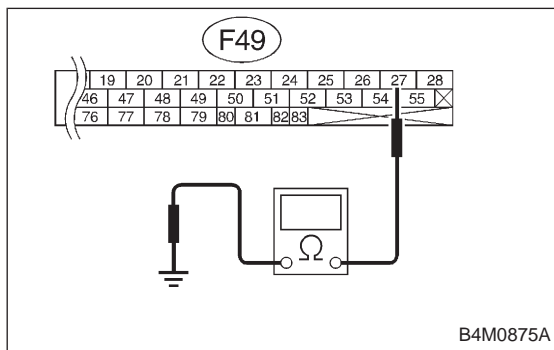
**10AC6 CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

1) Install valve relay to relay box.  
 2) Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**To (F50) No. 1 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AC7.

**NO** : Replace relay box and check all fuses.

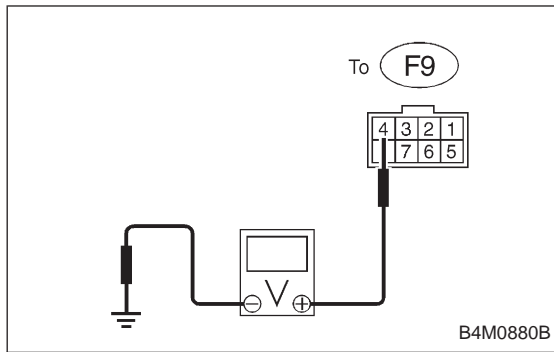
**10AC7 CHECK GROUND SHORT IN CONTROL SYSTEM HARNESS OF VALVE RELAY.**

Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 27 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AC8.

**NO** : Repair harness between ABSCM and relay box.  
 Check fuse No. 18.



**10AC8 CHECK BATTERY SHORT OF SOLENOID VALVE.**

- 1) Disconnect connector (ABS1, F9) from hydraulic unit.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Connector & terminal*  
**To (F63) No. 4 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Replace hydraulic unit and check all fuses.

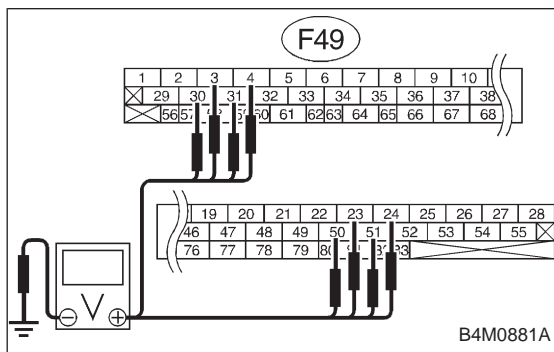
- 4) Turn ignition switch to OFF.

- 5) Measure voltage between hydraulic unit connector and chassis ground.

**CHECK** : *Connector & terminal*  
**To (F63) No. 4 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10AC9.

**NO** : Replace hydraulic unit and check all fuses.



**10AC9 CHECK BATTERY SHORT OF HARNESS.**

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

**CHECK** : *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 (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Repair harness between hydraulic unit and ABSCM and check all fuses.

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

**CHECK** : **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 (-)  
**Is voltage 0 V?**

**YES** : Go to step **10AC10**.

**NO** : Repair harness between hydraulic unit and ABSCM and check all fuses.

<b>10AC10</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND HYDRAULIC UNIT.</b>
---------------	--

**CHECK** : **Is there poor contact in connector between ABSCM and hydraulic unit?**

**YES** : Repair connector.

**NO** : Go to step **10AC11**.

<b>10AC11</b>	<b>CHECK ABSCM.</b>
---------------	---------------------

- 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 next **CHECK** .

**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

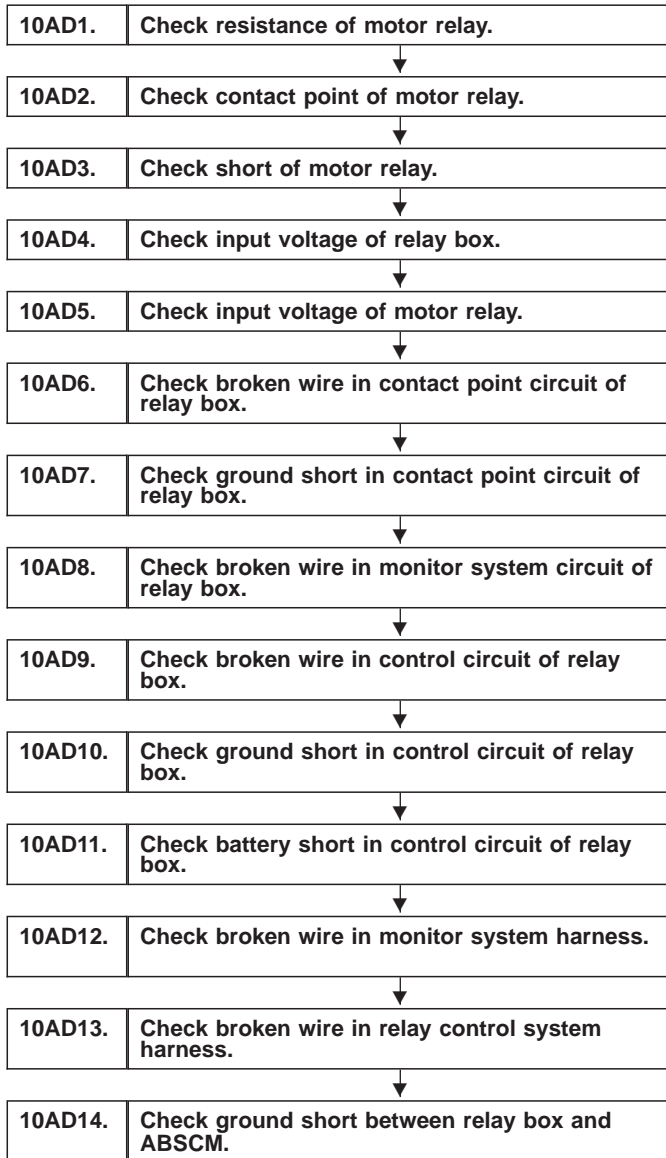
**AD: 52 M. RELAY OPEN**  
**— OPEN CIRCUIT OF MOTOR RELAY —**

**DIAGNOSIS:**

- Faulty motor
- Faulty motor relay
- Faulty harness connector

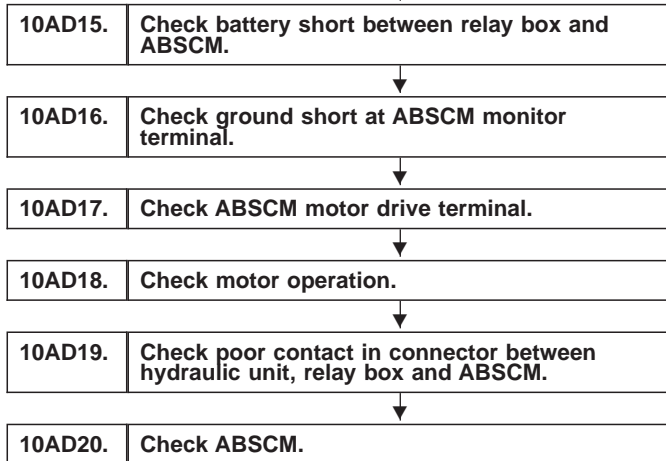
**TROUBLE SYMPTOM:**

- ABS does not operate.



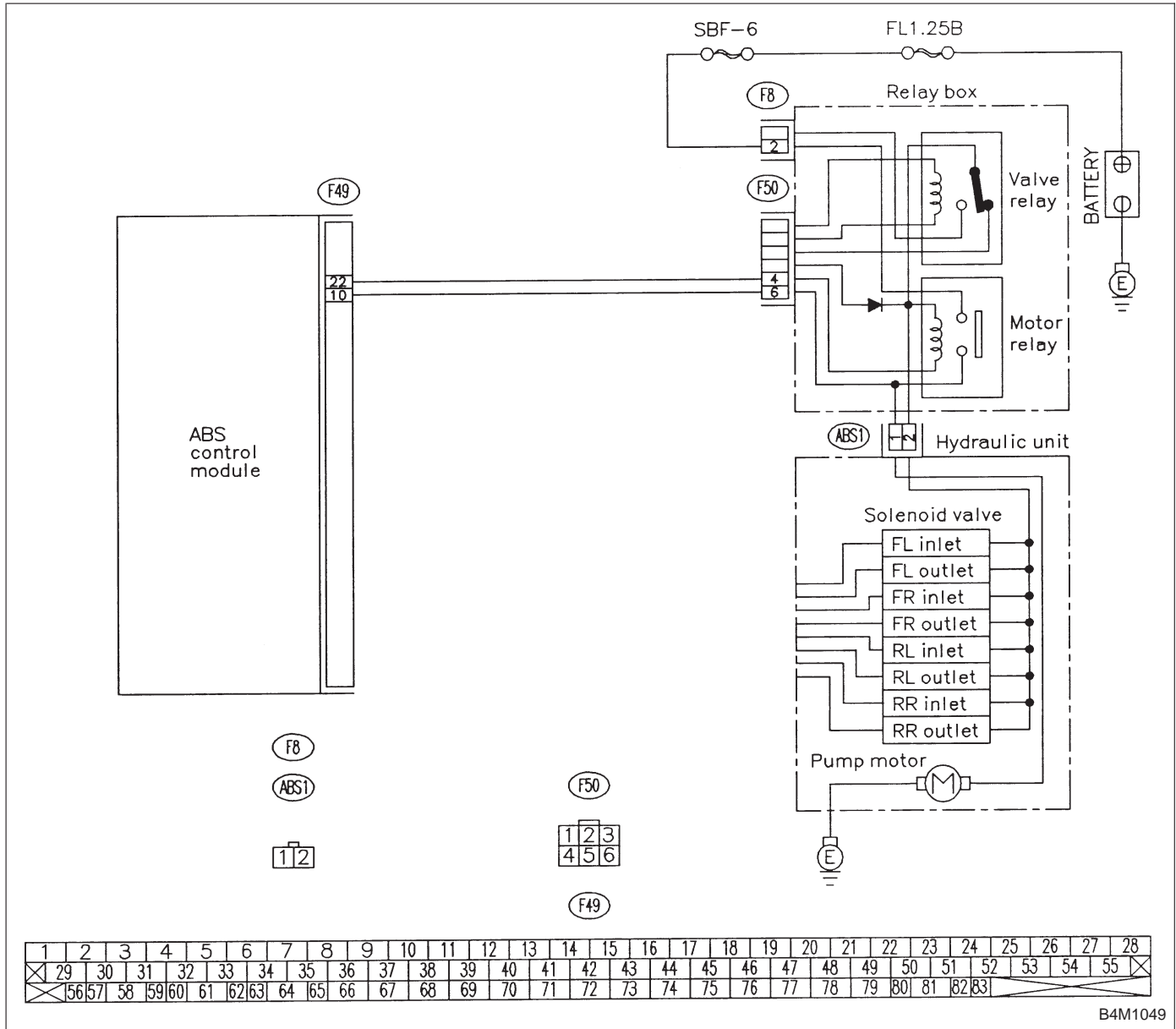
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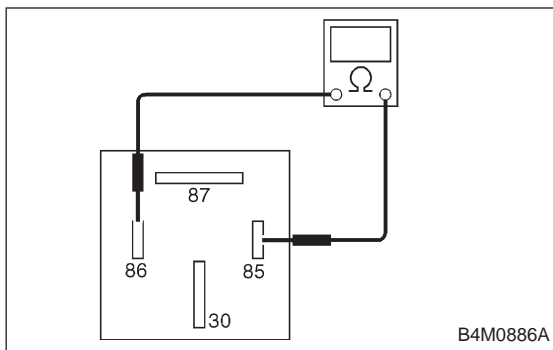
From the former page.





WIRING DIAGRAM:



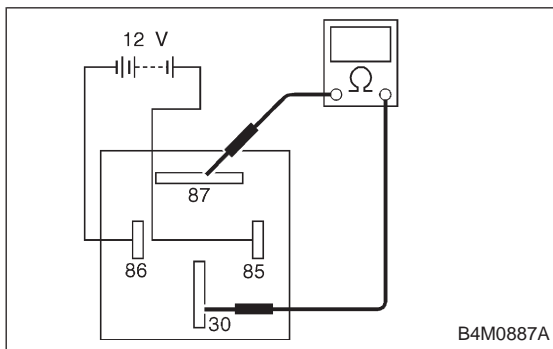


**10AD1 CHECK RESISTANCE OF MOTOR RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Measure resistance between motor relay terminals.

**CHECK** : *Terminals*  
**No. 85 — No. 86**  
*Is resistance  $80 \pm 10 \Omega$ ?*

- YES** : Go to step **10AD2**.  
**NO** : Replace motor relay.

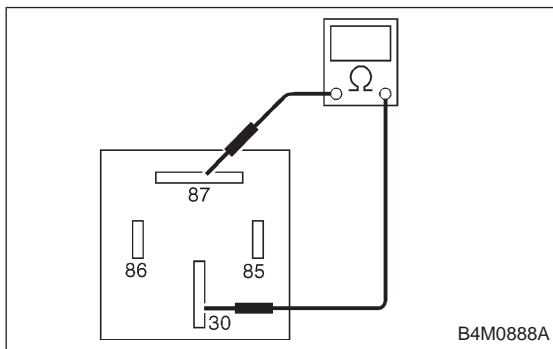


**10AD2 CHECK CONTACT POINT OF MOTOR RELAY.**

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

**CHECK** : *Terminals*  
**No. 30 — No. 87**  
*Is resistance less than  $0.5 \Omega$ ?*

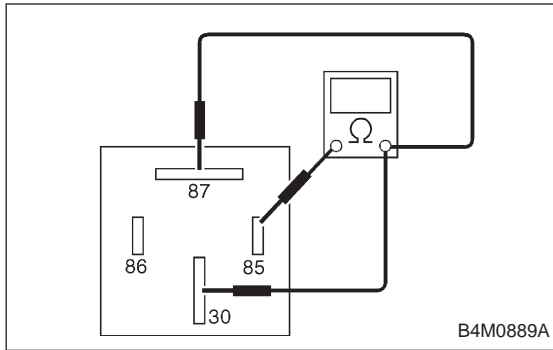
- YES** : Go to next step.  
**NO** : Replace motor relay.



- 3) Disconnect battery from motor relay terminals.
- 4) Measure resistance between motor relay terminals.

**CHECK** : *Terminals*  
**No. 30 — No. 87**  
*Is resistance more than  $1 M\Omega$ ?*

- YES** : Go to step **10AD3**.  
**NO** : Replace motor relay.

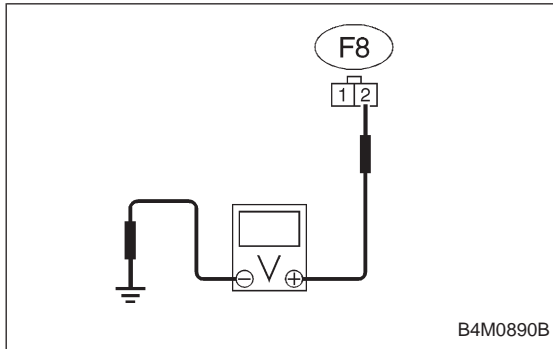
**10AD3 CHECK SHORT OF MOTOR RELAY.**

Measure resistance between motor relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 30**  
**No. 85 — No. 87**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AD4.

**NO** : Replace motor relay.

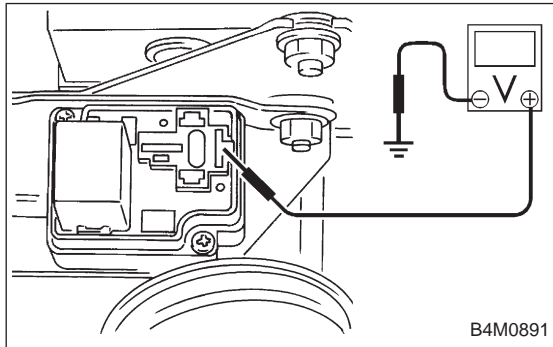
**10AD4 CHECK INPUT VOLTAGE OF RELAY BOX.**

1) Disconnect connector (F8) from relay box.  
 2) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F8) No. 2 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step 10AD5.

**NO** : Repair harness connector between battery and relay box. Check fuse SBF6.

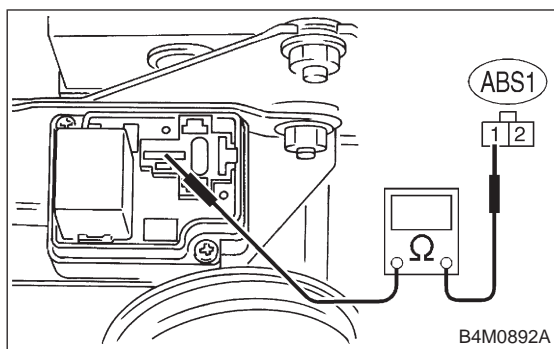
**10AD5 CHECK INPUT VOLTAGE OF MOTOR RELAY.**

1) Connect connector (F8) to relay box.  
 2) Measure voltage between relay box and chassis ground.

**CHECK** : **Connector & terminal**  
**Relay installing point No. 87 (+) — Chassis ground (-)**  
**Is voltage 10 — 13 V?**

**YES** : Go to step 10AD6.

**NO** : Replace relay box and fuse SBF6.

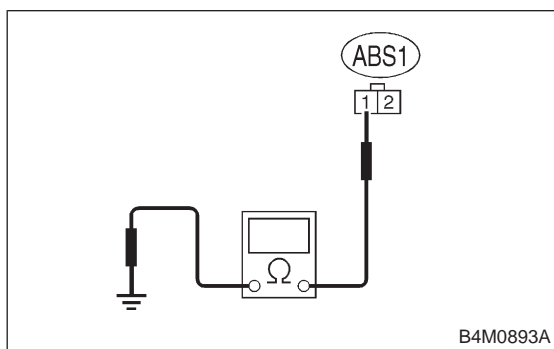

**10AD6 CHECK BROKEN WIRE IN CONTACT POINT CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (ABS1) from hydraulic unit.
- 2) Measure resistance between hydraulic unit and motor relay installing portion.

**CHECK** : **Connector & terminal (ABS1) No. 1 — Motor relay installing portion No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10AD7.

**NO** : Replace relay box.

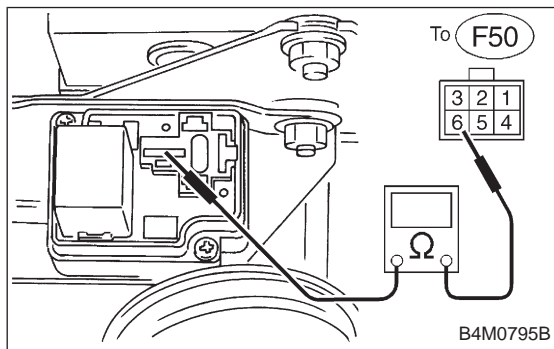

**10AD7 CHECK GROUND SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.**

Measure resistance between hydraulic unit and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 1 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AD8.

**NO** : Replace relay box. Check fuse No. 19.

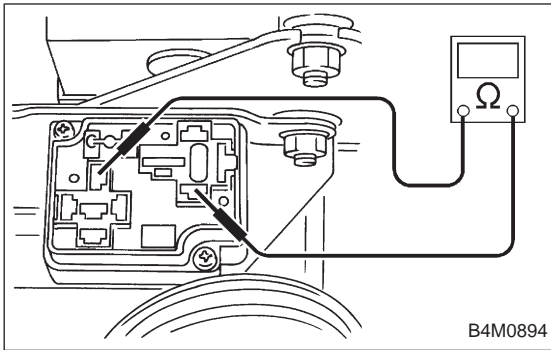

**10AD8 CHECK BROKEN WIRE IN MONITOR SYSTEM CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box connector and motor relay installing point.

**CHECK** : **Connector & terminal To (F50) No. 6 — Motor relay installing point No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10AD9.

**NO** : Replace relay box.

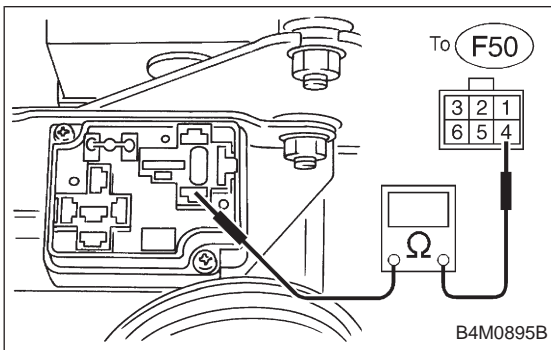

**10AD9 CHECK BROKEN WIRE IN CONTROL CIRCUIT OF RELAY BOX.**

- 1) Remove valve relay from relay box.
- 2) Measure resistance between motor relay installing point and valve relay installing point.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 86 — Valve relay installing point No. 30**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to next step.

**NO** : Replace relay box.

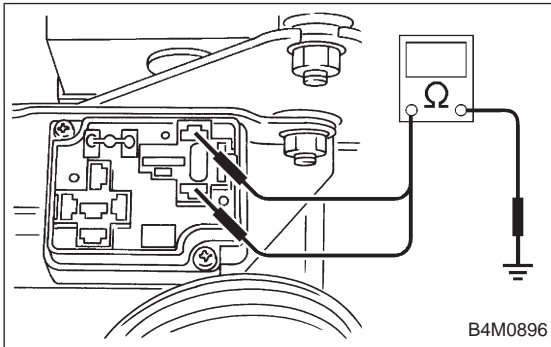


- 3) Measure resistance between motor relay installing point and relay box connector.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 86 — To (F50) No. 4**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step 10AD10.

**NO** : Replace relay box.

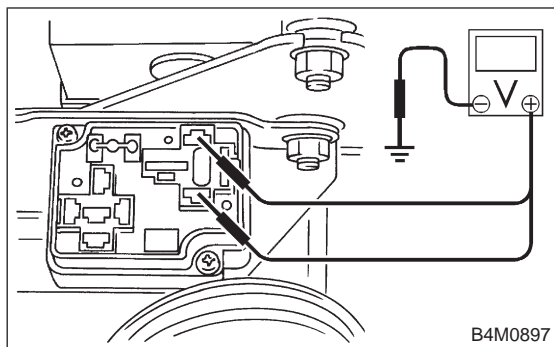

**10AD10 CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

Measure resistance between relay box and chassis ground.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 86 — Chassis ground**  
**Motor relay installing point No. 85 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AD11.

**NO** : Replace relay box. Check fuse No. 19.

**10AD11 CHECK BATTERY SHORT IN CONTROL CIRCUIT OF RELAY BOX.**

- 1) Disconnect connector from ABSCM.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between motor relay installing point and chassis ground.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 85 (+) —**  
**Chassis ground (-)**  
**Motor relay installing point No. 86 (+) —**  
**Chassis ground (-).**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Replace relay box and check all fuses.

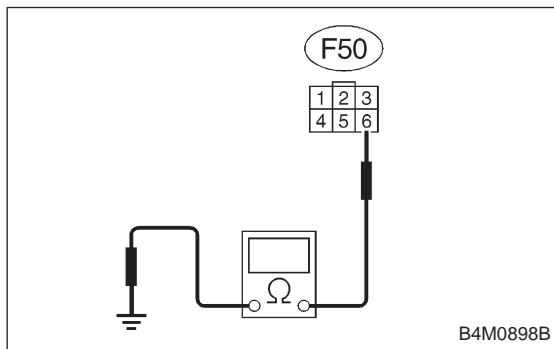
- 4) Turn ignition switch to OFF.

- 5) Measure voltage between motor relay installing point and chassis ground.

**CHECK** : **Connector & terminal**  
**Motor relay installing point No. 85 (+) —**  
**Chassis ground**  
**Motor relay installing point No. 86 (+) —**  
**Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step **10AD12**.

**NO** : Replace relay box and check all fuses.

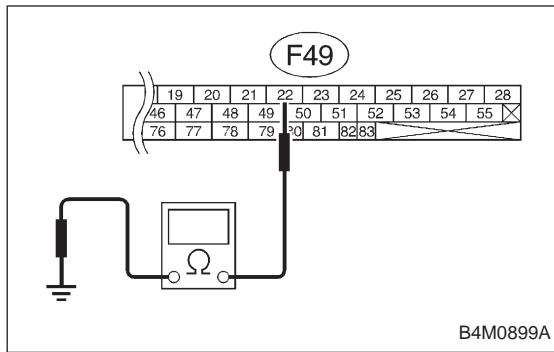
**10AD12 CHECK BROKEN WIRE IN MONITOR SYSTEM HARNESS.**

- 1) Connect between terminals No. 10 and No. 1 of ABSCM connector (F49) with a lead wire.
- 2) Measure resistance between relay box connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F50) No. 6 — Chassis ground**  
**Is resistance less than 0.5 Ω?**

**YES** : Go to step **10AD13**.

**NO** : Repair harness connector between ABSCM and relay box.



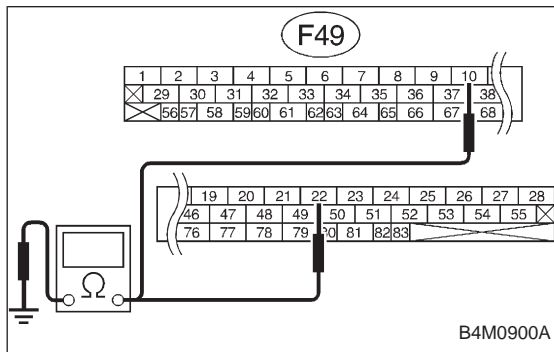
**10AD13 CHECK BROKEN WIRE IN RELAY CONTROL SYSTEM HARNESS.**

- 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.

**CHECK** : **Connector & terminal (F49) No. 22 — Chassis ground**  
Is resistance  $80 \pm 10 \Omega$ ?

**YES** : Go to step 10AD14.

**NO** : Repair harness connector between ABSCM and relay box.



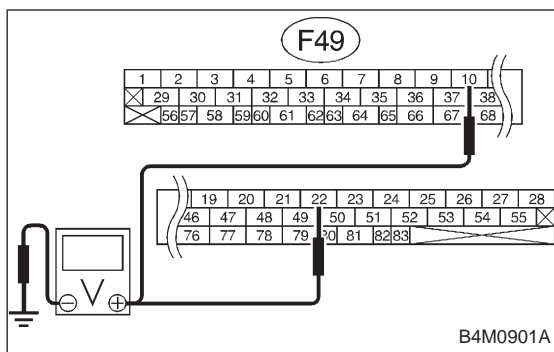
**10AD14 CHECK GROUND SHORT BETWEEN RELAY BOX AND ABSCM.**

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal (F49) No. 22 — Chassis ground**  
**(F49) No. 10 — Chassis ground**  
Is resistance more than  $1 M\Omega$ ?

**YES** : Go to step 10AD15.

**NO** : Repair harness between ABSCM and relay box. Check fuse No. 19 and SBF6.

**10AD15 CHECK BATTERY SHORT BETWEEN RELAY BOX AND ABSCM.**

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

**CHECK** : **Connector & terminal**  
**(F49) No. 22 (+) — Chassis ground (-)**  
**(F49) No. 10 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

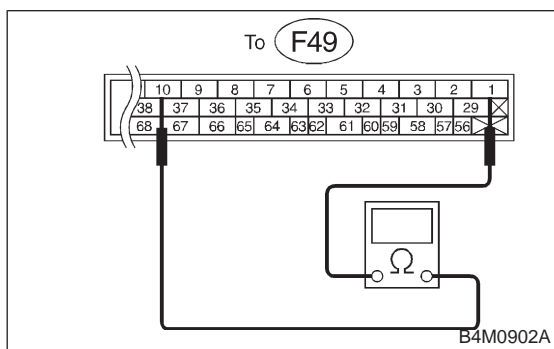
**NO** : Repair harness between relay box and ABSCM.  
 Check fuse SBF6.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between ABSCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 22 (+) — Chassis ground (-)**  
**(F49) No. 10 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10AD16.

**NO** : Repair harness between relay box and ABSCM.  
 Check fuse SBF6.

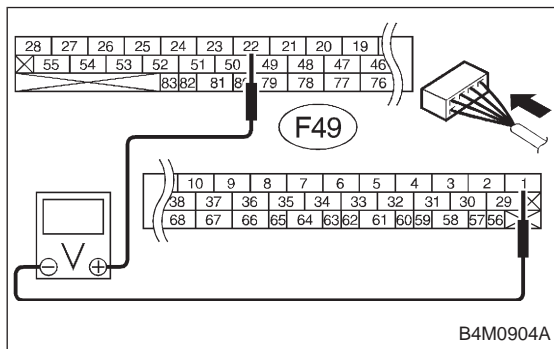
**10AD16 CHECK GROUND SHORT AT ABSCM MONITOR TERMINAL.**

Measure resistance between ABSCM terminals.

**CHECK** : **Connector & terminal**  
**To (F49) No. 10 — No. 1**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AD17.

**NO** : Replace ABSCM.

**10AD17 CHECK ABSCM MOTOR DRIVE TERMINAL.**

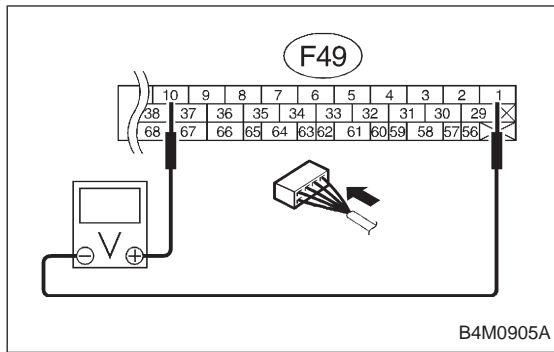
- 1) Disconnect connector cover from ABSCM connector.  
 <Ref. to 4-4c [T8C1] steps 5) to 8).>
- 2) Connect all connectors.
- 3) Measure voltage between ABSCM connector terminals.
- 4) Operate the check sequence. <Ref. to 4-4 [W22D1].>

**CHECK** : **Connector & terminals**  
**(F49) No. 22 (+) — No. 1 (-)**  
**Does the voltage drop from 10 — 13 V to less than 1.5 V, and rise to 10 — 13 V again when carrying out the check sequence?**

**YES** : Go to step 10AD18.

**NO** : Replace ABSCM.



**10AD18 CHECK MOTOR OPERATION.**

- 1) Measure voltage between ABSCM connector terminal.
- 2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

**CHECK** : **Connector & terminals (F49) No. 10 (+) — No. 1 (-)**  
**Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence?**  
**Can motor revolution noise (buzz) be heard when carrying out the check sequence?**

- YES** : Go to step **10AD19**.  
**NO** : Replace hydraulic unit.

**10AD19 CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.**

**CHECK** : **Is there poor contact in connector between hydraulic unit, relay box and ABSCM?**

- YES** : Repair connector.  
**NO** : Go to step **10AD20**.

**10AD20 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 next **CHECK** .

**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

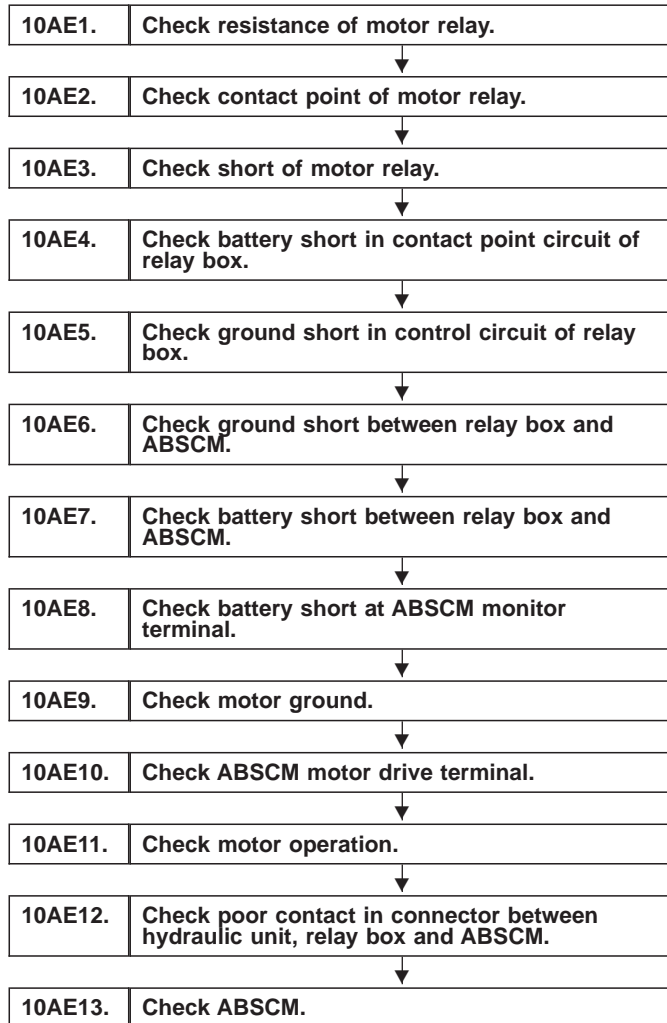
**AE: 52 M. RELAY ON**  
**— MOTOR RELAY ON FAILURE —**

**DIAGNOSIS:**

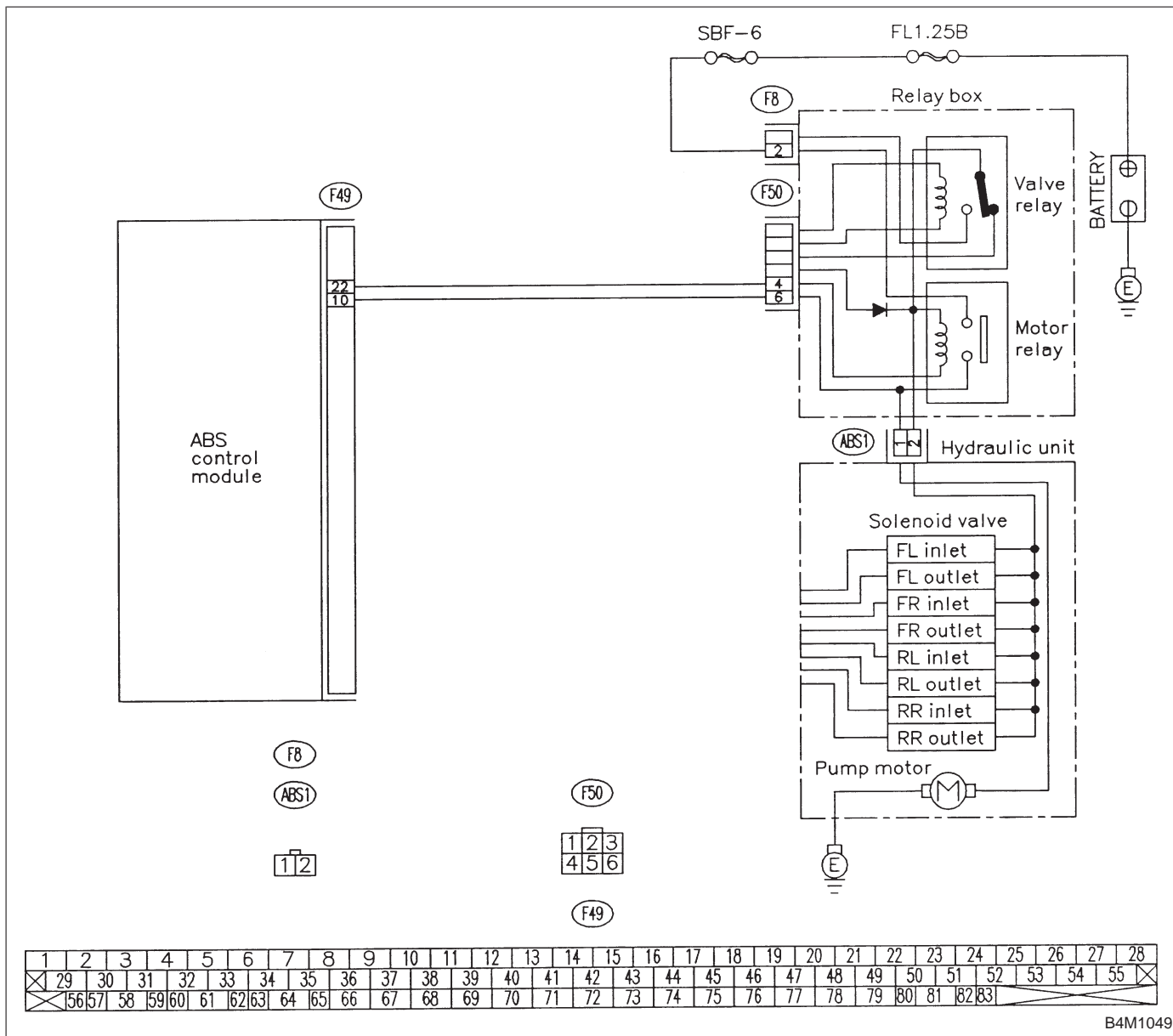
- Faulty motor
- Faulty motor relay
- Faulty harness connector

**TROUBLE SYMPTOM:**

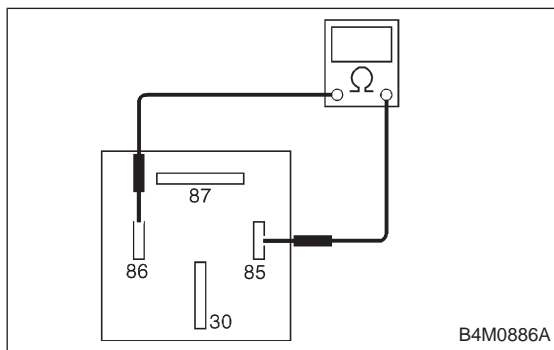
- ABS does not operate.



WIRING DIAGRAM:



B4M1049



B4M0886A

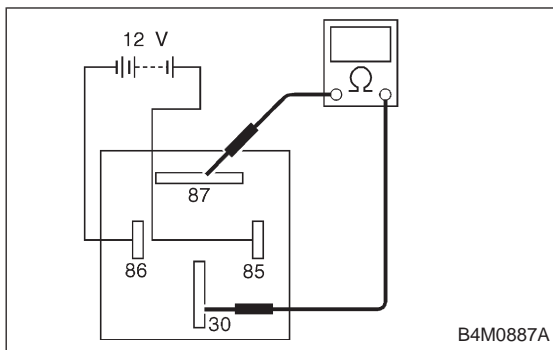
**10AE1 CHECK RESISTANCE OF MOTOR RELAY.**

- 1) Turn ignition switch to OFF.
- 2) Remove motor relay from relay box.
- 3) Measure resistance between motor relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 86**  
**Is resistance  $80 \pm 10 \Omega$ ?**

**YES** : Go to step **10AE2**.

**NO** : Replace motor relay.

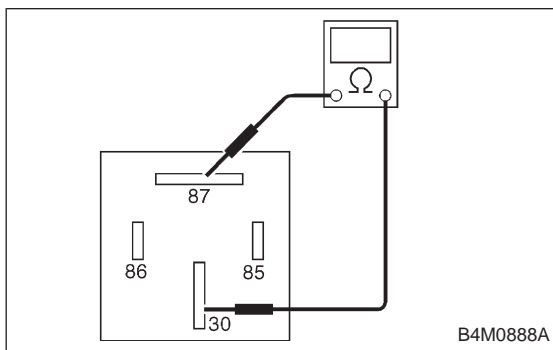


**10AE2 CHECK CONTACT POINT OF MOTOR RELAY.**

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

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance less than 0.5 Ω?**

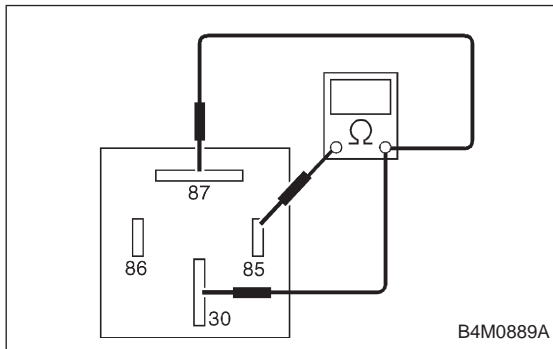
- YES** : Go to next step.  
**NO** : Replace motor relay.



- 3) Disconnect battery from motor relay terminals.
- 4) Measure resistance between motor relay terminals.

**CHECK** : **Terminals**  
**No. 30 — No. 87**  
**Is resistance more than 1 MΩ?**

- YES** : Go to step 10AE3.  
**NO** : Replace motor relay.

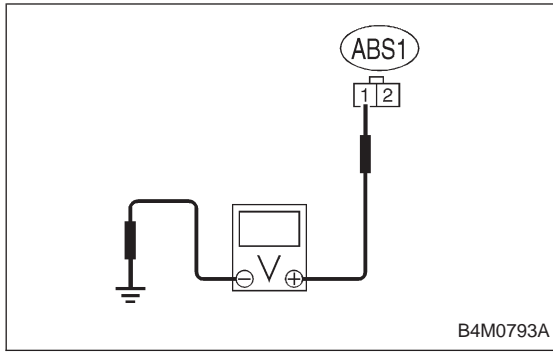


**10AE3 CHECK SHORT OF MOTOR RELAY.**

Measure resistance between motor relay terminals.

**CHECK** : **Terminals**  
**No. 85 — No. 30**  
**No. 85 — No. 87**  
**Is resistance more than 1 MΩ?**

- YES** : Go to step 10AE4.  
**NO** : Replace motor relay.



#### 10AE4 CHECK BATTERY SHORT IN CONTACT POINT CIRCUIT OF RELAY BOX.

- 1) Disconnect connector from ABSCM.
- 2) Disconnect connector (ABS1) from hydraulic unit.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 1 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

**NO** : Replace relay box.

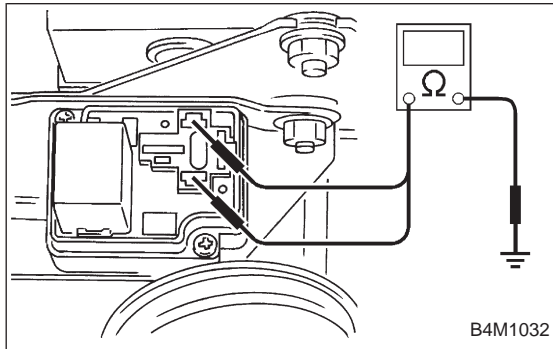
- 5) Turn ignition switch to OFF.

- 6) Measure voltage between relay box connector and chassis ground.

**CHECK** : **Connector & terminal (ABS1) No. 1 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10AE5.

**NO** : Replace relay box.



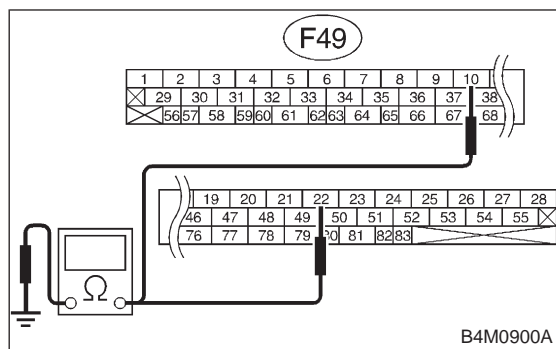
#### 10AE5 CHECK GROUND SHORT IN CONTROL CIRCUIT OF RELAY BOX.

- 1) Disconnect connector (F50) from relay box.
- 2) Measure resistance between relay box and chassis ground.

**CHECK** : **Connector & terminal Motor relay installing point No. 85 — Chassis ground**  
**Motor relay installing point No. 86 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AE6.

**NO** : Replace relay box. Check fuse No. 19.

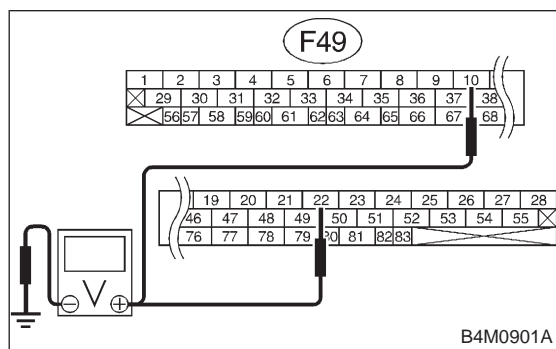
**10AE6 CHECK GROUND SHORT BETWEEN RELAY BOX AND ABSCM.**

- 1) Disconnect connector (F49) from ABSCM.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 22 — Chassis ground**  
**(F49) No. 10 — Chassis ground**  
**Is resistance more than 1 MΩ?**

**YES** : Go to step 10AE7.

**NO** : Repair harness between ABSCM and relay box.  
 Check fuse No. 19 and SBF6.

**10AE7 CHECK BATTERY SHORT BETWEEN RELAY BOX AND ABSCM.**

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

**CHECK** : **Connector & terminal**  
**(F49) No. 22 (+) — Chassis ground (-)**  
**(F49) No. 10 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to next step.

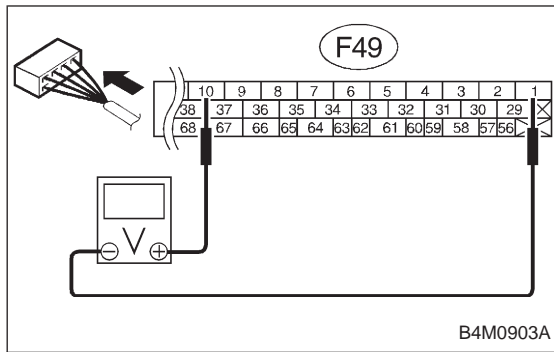
**NO** : Repair harness between relay box and ABSCM.  
 Check fuse SBF6.

- 3) Turn ignition switch to OFF.
- 4) Measure voltage between ABSCM and chassis ground.

**CHECK** : **Connector & terminal**  
**(F49) No. 22 (+) — Chassis ground (-)**  
**(F49) No. 10 (+) — Chassis ground (-)**  
**Is voltage 0 V?**

**YES** : Go to step 10AE8.

**NO** : Repair harness between relay box and ABSCM.  
 Check fuse SBF6.



**10AE8 CHECK BATTERY SHORT AT ABSCM MONITOR TERMINAL.**

- 1) Disconnect connector cover from ABSCM connector.  
<Ref. to 4-4c [T8C1] steps 5) to 8).>
- 2) Connect all connectors.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ABSCM connector terminals.

**CHECK** : **Connector & terminal (F49) No. 10 (+) — No. 1 (-)**  
**Is voltage less than 2 V?**

**YES** : Go to next step.

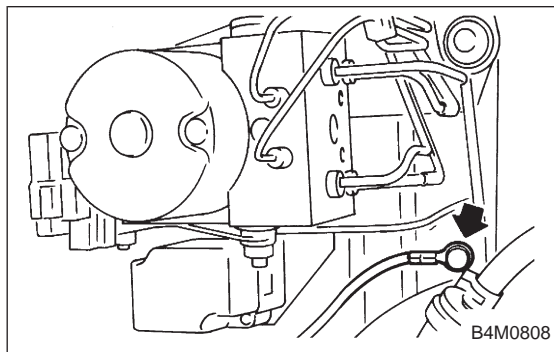
**NO** : Replace ABSCM.

- 5) Turn ignition switch to OFF.
- 6) Measure voltage between ABSCM connector terminals.

**CHECK** : **Connector & terminals (F49) No. 10 (+) — No. 1 (-)**  
**Is voltage less than 2 V?**

**YES** : Go to step 10AE9.

**NO** : Replace ABSCM.

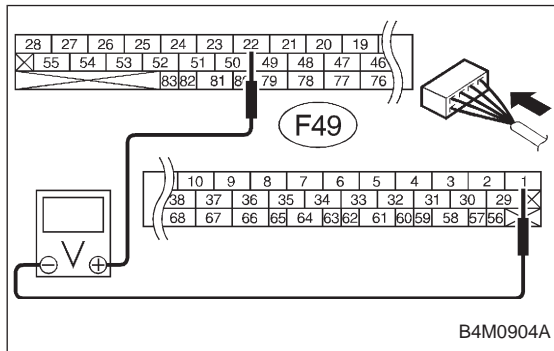


**10AE9 CHECK MOTOR GROUND.**

**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 10AE10.

**NO** : Tighten the clamp of motor ground terminal.



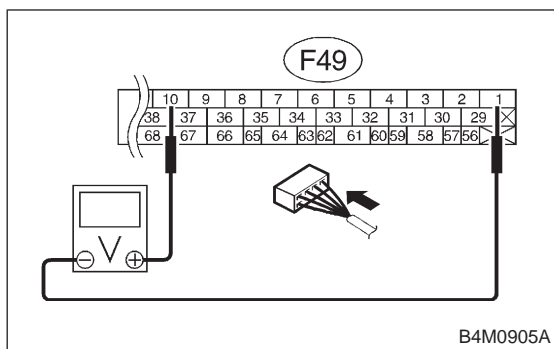
**10AE10 CHECK ABSCM MOTOR DRIVE TERMINAL.**

- 1) Measure voltage between ABSCM connector terminals.
- 2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

**CHECK** : **Connector & terminals (F49) No. 22 (+) — No. 1 (-)**  
**Does the voltage drop from 10 — 13 V to less than 1.5 V, and rise to 10 — 13 V again when carrying out the check sequence?**

**YES** : Go to step 10AE11.

**NO** : Replace ABSCM.

**10AE11 CHECK MOTOR OPERATION.**

- 1) Measure voltage between ABSCM connector terminal.
- 2) Operate the check sequence. <Ref. to 4-4 [W22D1].>

**CHECK** : **Connector & terminals (F49) No. 10 (+) — No. 1 (-)**  
**Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence?**  
**Can motor revolution noise (buzz) be heard when carrying out the check sequence?**

- YES** : Go to step **10AE12**.  
**NO** : Replace hydraulic unit.

**10AE12 CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.**

**CHECK** : **Is there poor contact in connector between hydraulic unit, relay box and ABSCM?**

- YES** : Repair connector.  
**NO** : Go to step **10AE13**.

**10AE13 CHECK ABSCM.**

- 1) Connect all connectors.
- 2) Erase the memory.
- 3) Perform inspection mode.
- 4) Read out the trouble code.

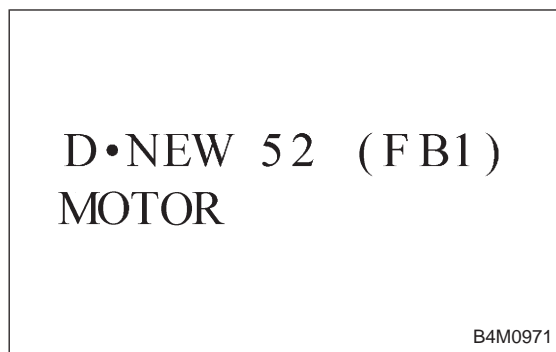
**CHECK** : **Is the same trouble code as in the current diagnosis still being output?**

- YES** : Replace ABSCM.  
**NO** : Go to next **CHECK** .

**CHECK** : **Are other trouble codes being output?**

- YES** : Proceed with the diagnosis corresponding to the trouble code.  
**NO** : A temporary poor contact.





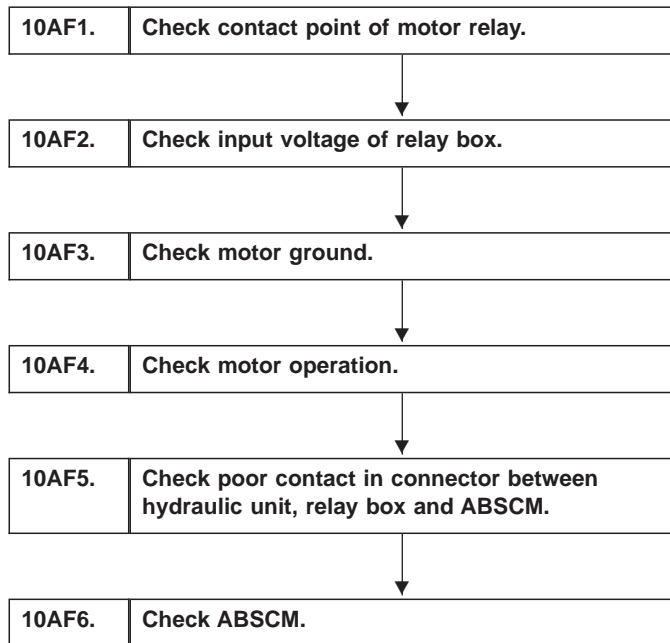
**AF: 52 MOTOR**  
**— ABNORMAL MOTOR —**

**DIAGNOSIS:**

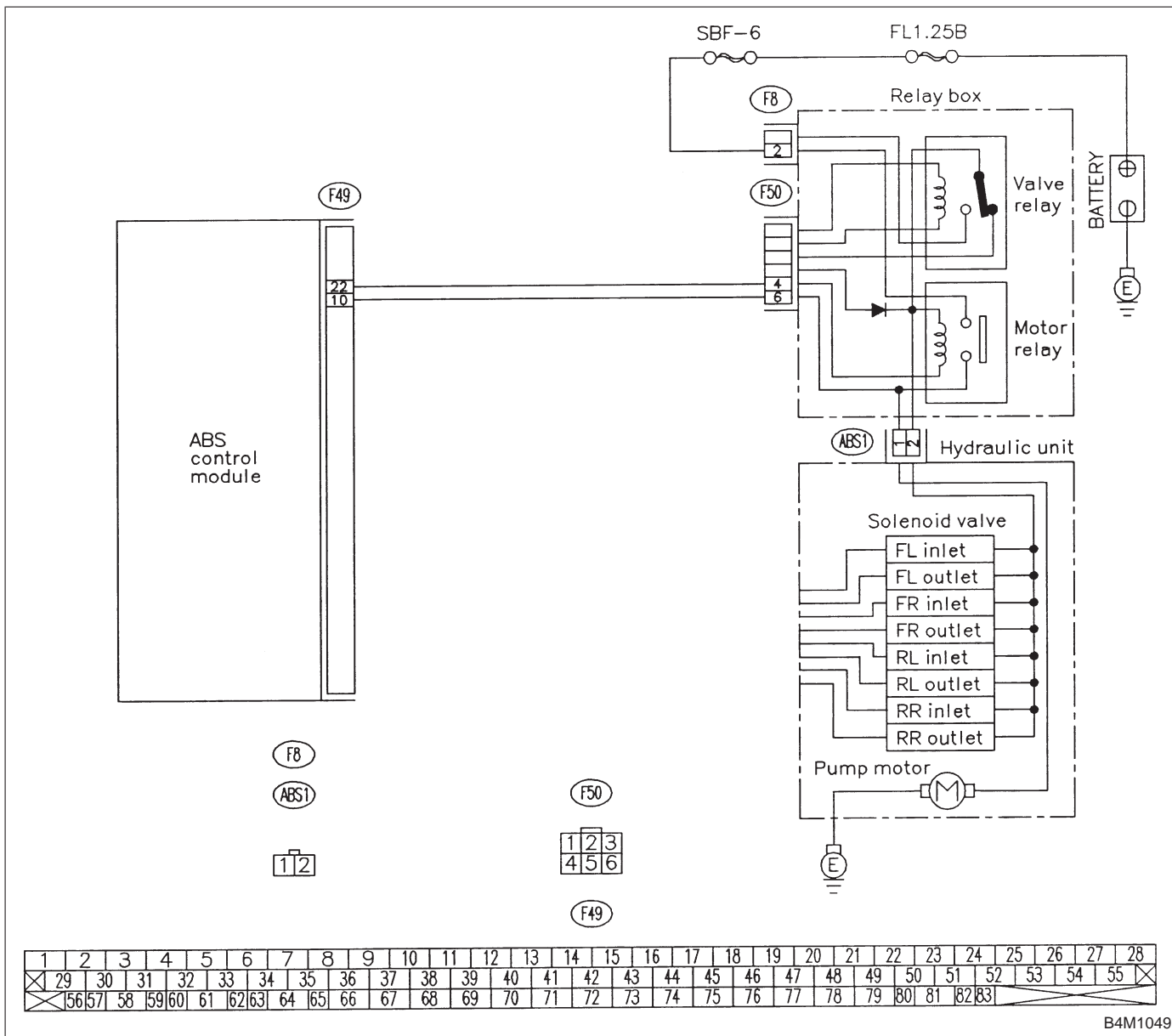
- Faulty motor
- Faulty motor relay
- Faulty harness connector

**TROUBLE SYMPTOM:**

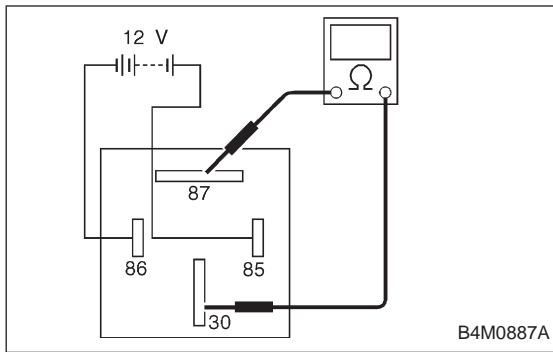
- ABS does not operate.



WIRING DIAGRAM:



B4M1049



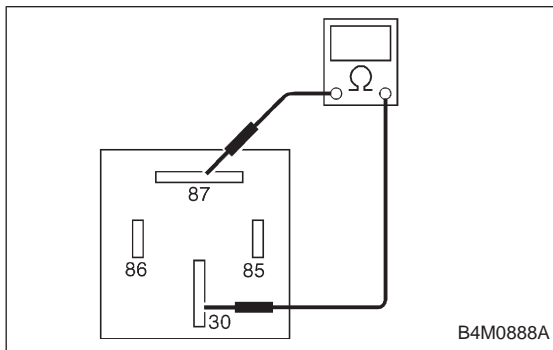
**10AF1 CHECK CONTACT POINT OF MOTOR RELAY.**

- 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.

**CHECK** : *Terminals No. 30 — No. 87*  
*Is resistance less than 0.5 Ω?*

**YES** : Go to next step.

**NO** : Replace motor relay.

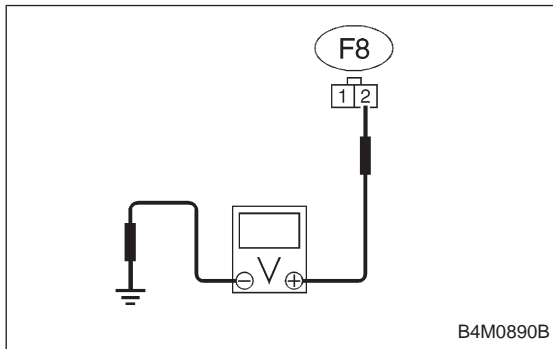


- 5) Disconnect battery from motor relay terminals.
- 6) Measure resistance between motor relay terminals.

**CHECK** : *Terminals No. 30 — No. 87*  
*Is resistance more than 1 MΩ?*

**YES** : Go to step 10AF2.

**NO** : Replace motor relay.



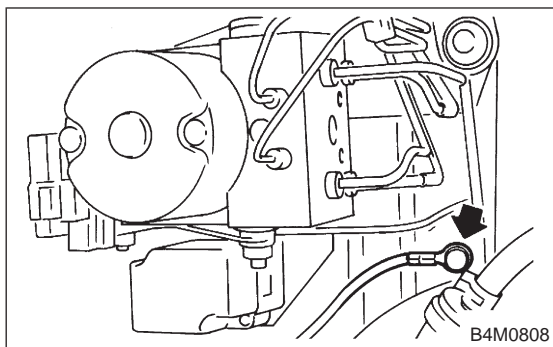
**10AF2 CHECK INPUT VOLTAGE OF RELAY BOX.**

- 1) Disconnect connector (F8) from relay box.
- 2) Measure voltage between relay box connector and chassis ground.

**CHECK** : *Connector & terminal (F8) No. 2 (+) — Chassis ground (-)*  
*Is voltage 10 — 13 V?*

**YES** : Go to step 10AF3.

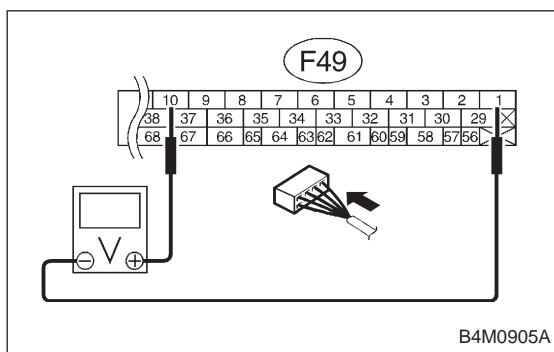
**NO** : Repair harness connector between battery and relay box. Check fuse SBF6.

**10AF3 CHECK MOTOR GROUND.**

**CHECK** : **Tightening torque:**  
 $32 \pm 10 \text{ N}\cdot\text{m}$  ( $3.3 \pm 1.0 \text{ kg}\cdot\text{m}$ ,  $24 \pm 7 \text{ ft}\cdot\text{lb}$ )  
**Is the motor ground terminal tightly clamped?**

**YES** : Go to step 10AF4.

**NO** : Tighten the clamp of motor ground terminal.

**10AF4 CHECK MOTOR OPERATION.**

- 1) Disconnect connector (F49) from ABSCM.
- 2) Disconnect connector cover from ABSCM connector (F49). <Ref. to 4-4c [T8C1] steps 5) to 8).>
- 3) Connect connector (F49) to ABSCM.
- 4) Connect motor relay to relay box.
- 5) Connect all connectors.
- 6) Measure voltage between ABSCM connector terminal.
- 7) Operate the check sequence. <Ref. to 4-4 [W22D1].>

**CHECK** : **Connector & terminals**  
**(F49) No. 10 (+) — No. 1 (-)**  
**Does the voltage raise from less than 1.5 V to 10 — 13 V, and return to less than 1.5 V again when carrying out the check sequence?**  
**Can motor revolution noise (buzz) be heard when carrying out the check sequence?**

**YES** : Go to step 10AF5.

**NO** : Replace hydraulic unit.

**10AF5 CHECK POOR CONTACT IN CONNECTOR BETWEEN HYDRAULIC UNIT, RELAY BOX AND ABSCM.**

**CHECK** : **Is there poor contact in connector between hydraulic unit, relay box and ABSCM?**

**YES** : Repair connector.

**NO** : Go to step 10AF6.

<b>10AF6</b>	<b>CHECK ABSCM.</b>
--------------	---------------------

- 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 next **CHECK** .

**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

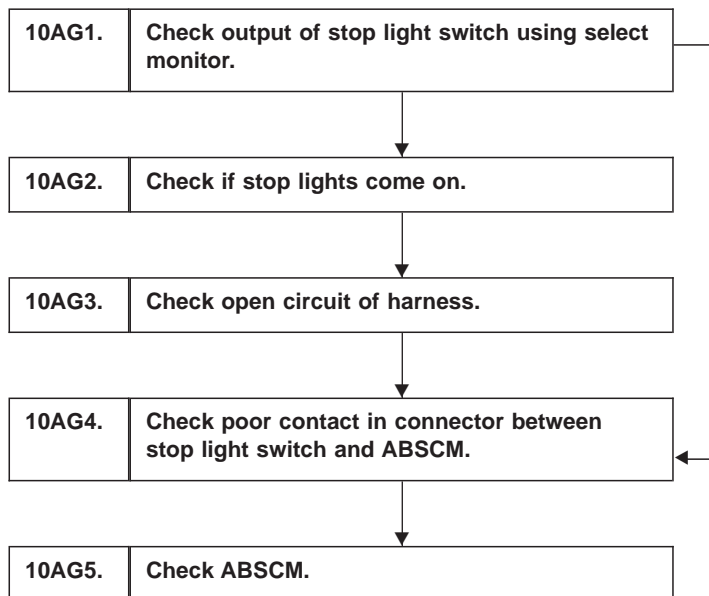
**AG: 54 BLS**  
**— ABNORMAL STOP LIGHT SWITCH —**

**DIAGNOSIS:**

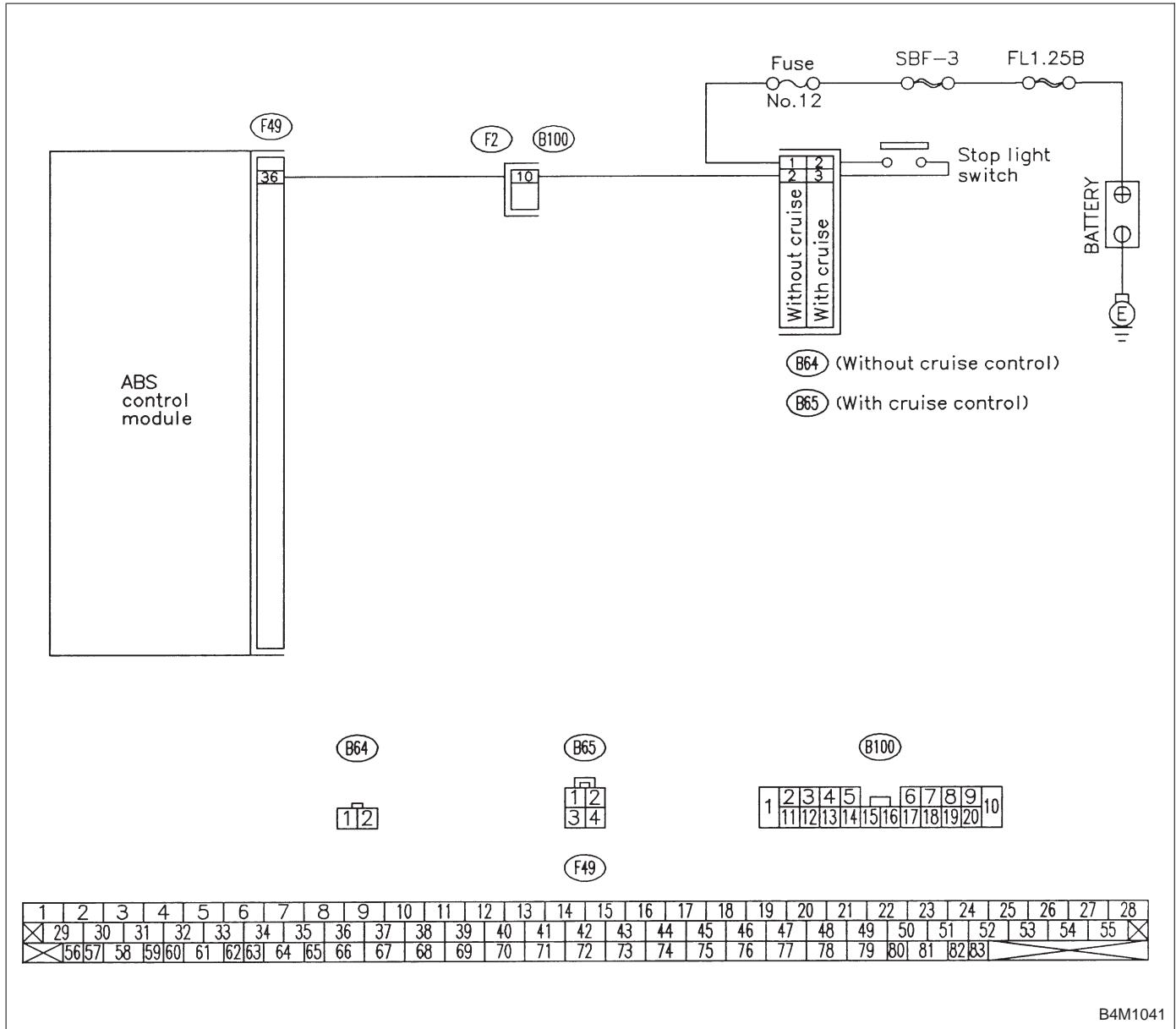
- Faulty stop light switch

**TROUBLE SYMPTOM:**

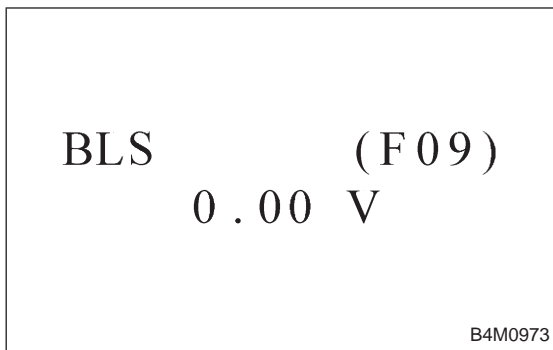
- ABS does not operate.



WIRING DIAGRAM:



B4M1041



**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 next step.

**NO** : Go to step **10AG1**.

- 4) Release the brake pedal.

- 5) 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 **10AG4**.

**NO** : Go to step **10AG2**.

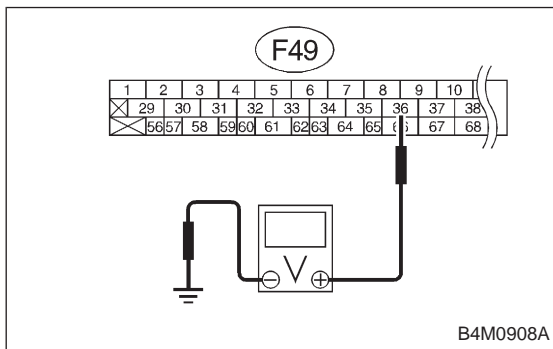
**10AG2 CHECK IF STOP LIGHTS COME ON.**

Depress the brake pedal.

**CHECK** : *Do stop lights turn on?*

**YES** : Go to step **10AG3**.

**NO** : Repair stop lights circuit.



**10AG3 CHECK OPEN CIRCUIT OF 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.

**CHECK** : *Connector & terminal (F49) No. 36 — Chassis ground Is voltage 10 — 13 V?*

**YES** : Go to step **10AG4**.

**NO** : Repair harness between stop light switch and ABSCM.



<b>10AG4</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN STOP LIGHT SWITCH AND ABSCM.</b>
--------------	---

**CHECK** : *Is there poor contact in connector between stop light switch and ABSCM?*

**YES** : Repair connector.

**NO** : Go to step **10AG5**.

<b>10AG5</b>	<b>CHECK ABSCM.</b>
--------------	---------------------

- 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 next **CHECK** .

**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

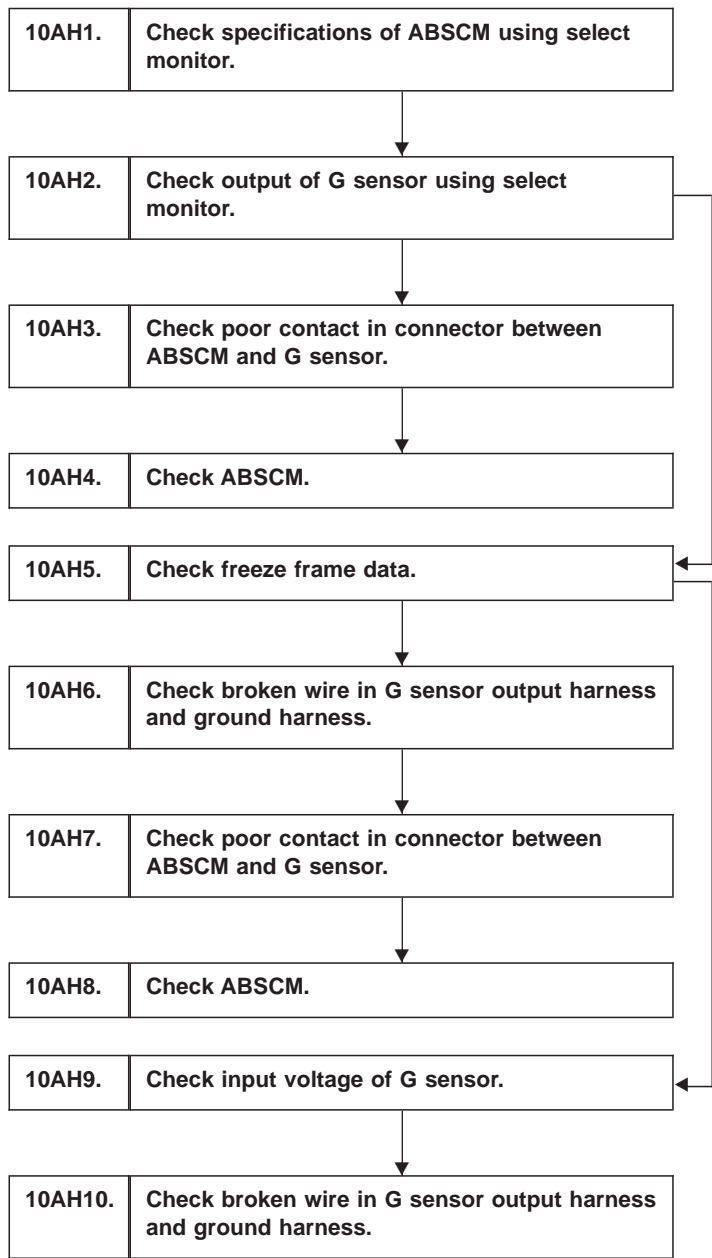
**AH: 56 G SENSOR LINE**  
**— OPEN OR SHORT CIRCUIT OF G SENSOR**  
**—**

**DIAGNOSIS:**

- Faulty G sensor output voltage

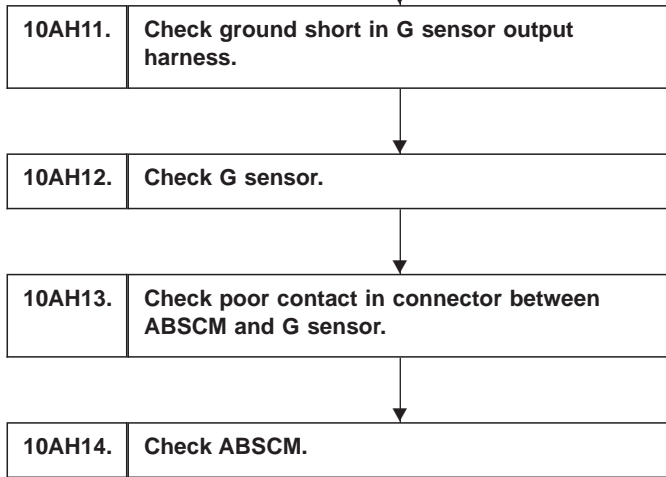
**TROUBLE SYMPTOM:**

- ABS does not operate.

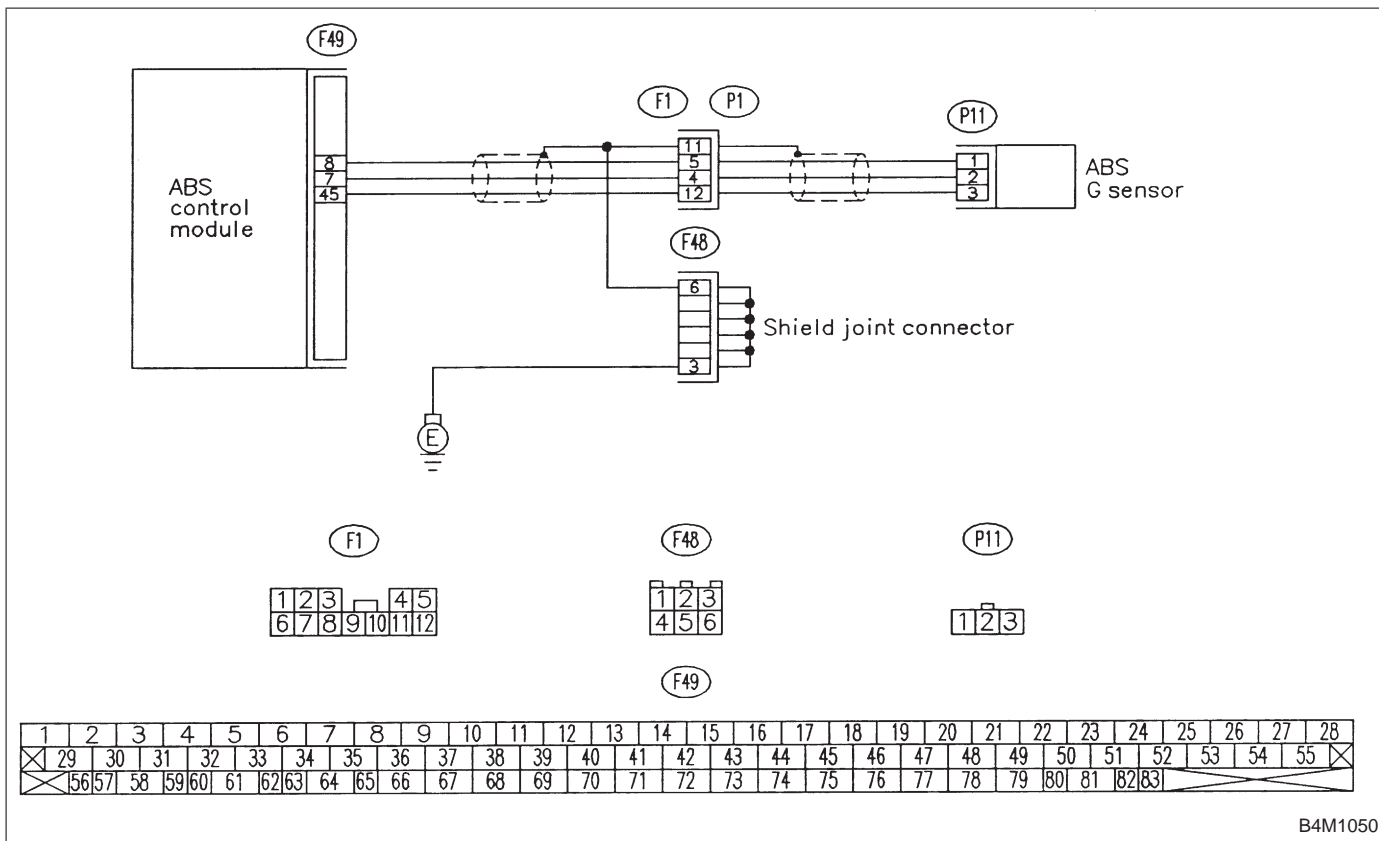


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From the former page.



WIRING DIAGRAM:



B4M1050

1996 (F00)  
ABS 4WD•AT

B4M0921

**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.

G - SENS (F10)  
2.30 V

B4M0927

<b>10AH2</b>	<b>CHECK OUTPUT OF G SENSOR USING SELECT MONITOR.</b>
--------------	---

- 1) Press **F**, **1** and **0** on the select monitor.
- 2) Read the select monitor display.

**CHECK** : *Is the indicated reading  $2.3 \pm 0.2$  V when the G sensor is in horizontal position?*

**YES** : Go to step 10AH3.

**NO** : Go to step 10AH5.

<b>10AH3</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.</b>
--------------	--

**CHECK** : *Is there poor contact in connector between ABSCM and G sensor?*

**YES** : Repair connector.

**NO** : Go to step 10AH4.

<b>10AH4</b>	<b>CHECK ABSCM.</b>
--------------	---------------------

- 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.

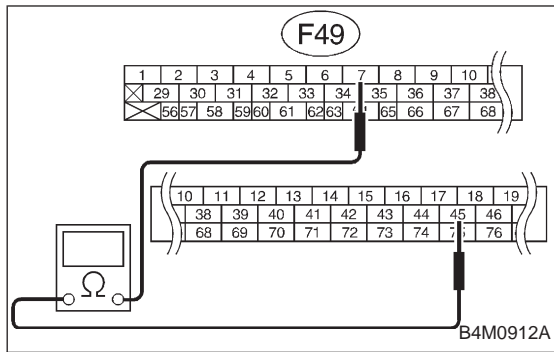
**NO** : Go to next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.



**10AH6**

**CHECK BROKEN WIRE 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.

**CHECK** : **Connector & terminal (P49) No. 7 — No. 45**  
**Is resistance  $4.6 \pm 0.3 \text{ k}\Omega$ ?**

**YES** : Go to step 10AH7.

**NO** : Repair harness between G sensor and ABSCM.

**10AH7**

**CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.**

**CHECK** : **Is there poor contact in connector between ABSCM and G sensor?**

**YES** : Repair connector.

**NO** : Go to step 10AH8.

**10AH8**

**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?**

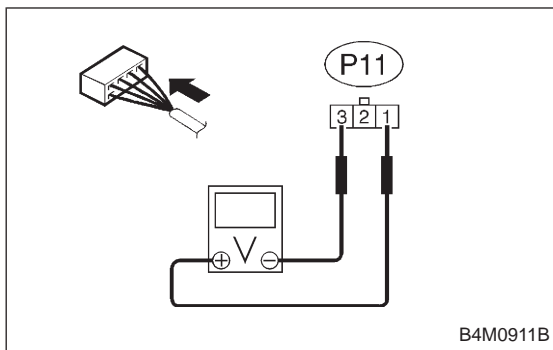
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**CHECK** : **Are other trouble codes being output?**

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.



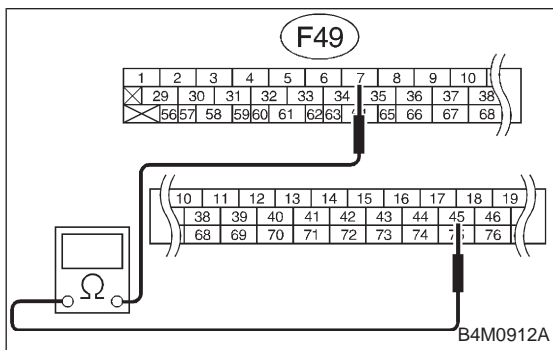
**10AH9 CHECK INPUT VOLTAGE OF G SENSOR.**

- 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.

**CHECK** : **Connector & terminal (P11) No. 1 (+) — No. 3 (-)**  
**Is voltage  $5\pm 0.25$  V?**

**YES** : Go to step **10AH10**.

**NO** : Repair harness connector between G sensor and ABSCM.



**10AH10 CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

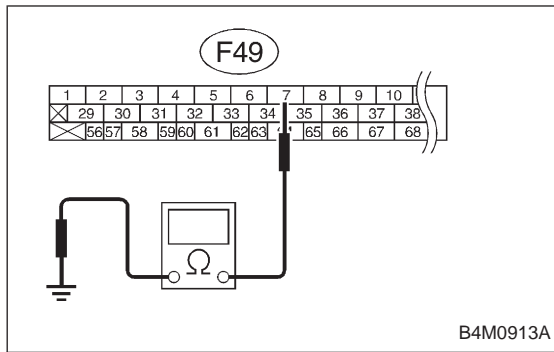
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ABSCM.
- 3) Measure resistance between ABSCM connector terminals.

**CHECK** : **Connector & terminal (P49) No. 7 — No. 45**  
**Is resistance  $4.6\pm 0.3$  k $\Omega$ ?**

**YES** : Go to step **10AH11**.

**NO** : Repair harness between G sensor and ABSCM.





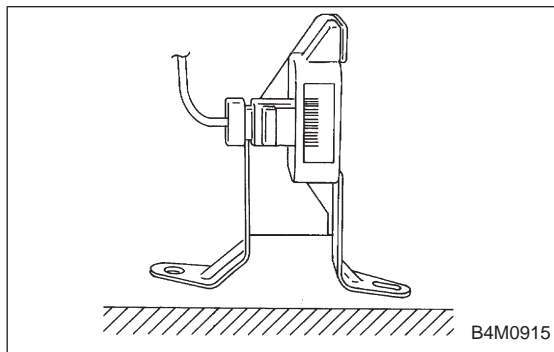
**10AH11 CHECK GROUND SHORT IN G SENSOR OUTPUT HARNESS.**

- 1) Disconnect connector from G sensor.
- 2) Measure resistance between ABSCM connector and chassis ground.

**CHECK** : Connector & terminal (F49) No. 7 — Chassis ground  
Is resistance more than 1 MΩ?

**YES** : Go to step 10AH12.

**NO** : Repair harness between G sensor and ABSCM.



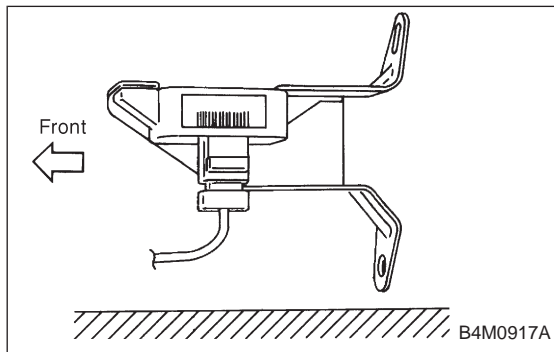
**10AH12 CHECK G SENSOR.**

- 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.

**CHECK** : Connector & terminal (P11) No. 2 (+) — No. 1 (-)  
Is voltage 2.3±0.2 V when G sensor is horizontal?

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

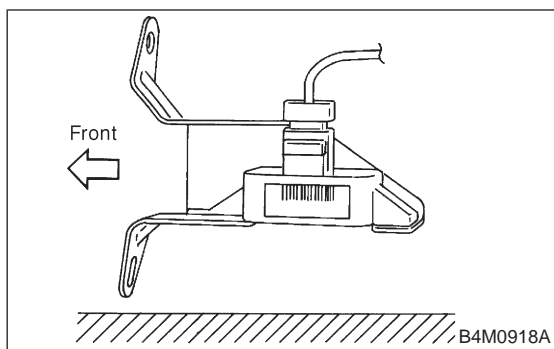
**NO** : Replace G sensor.



**CHECK** : Connector & terminal (P11) No. 2 (+) — No. 1 (-)  
Is voltage 3.9±0.2 V when G sensor is inclined forwards to 90°?

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

**NO** : Replace G sensor.



**CHECK** : **Connector & terminal**  
**(P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $0.7 \pm 0.2$  V when G sensor is**  
**inclined backwards to  $90^\circ$ ?**

**YES** : Go to step **10AH13**.

**NO** : Replace G sensor.

<b>10AH13</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.</b>
---------------	--

**CHECK** : **Is there poor contact in connector between**  
**ABSCM and G sensor?**

**YES** : Repair connector.

**NO** : Go to step **10AH14**.

<b>10AH14</b>	<b>CHECK ABSCM.</b>
---------------	---------------------

- 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 next **CHECK** .

**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

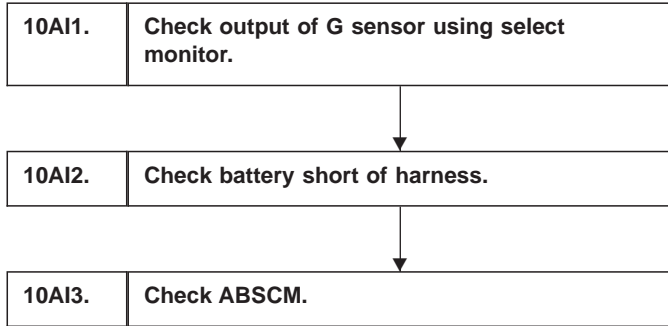
**AI: 56 G SENSOR +B**  
**— BATTERY SHORT OF G SENSOR —**

**DIAGNOSIS:**

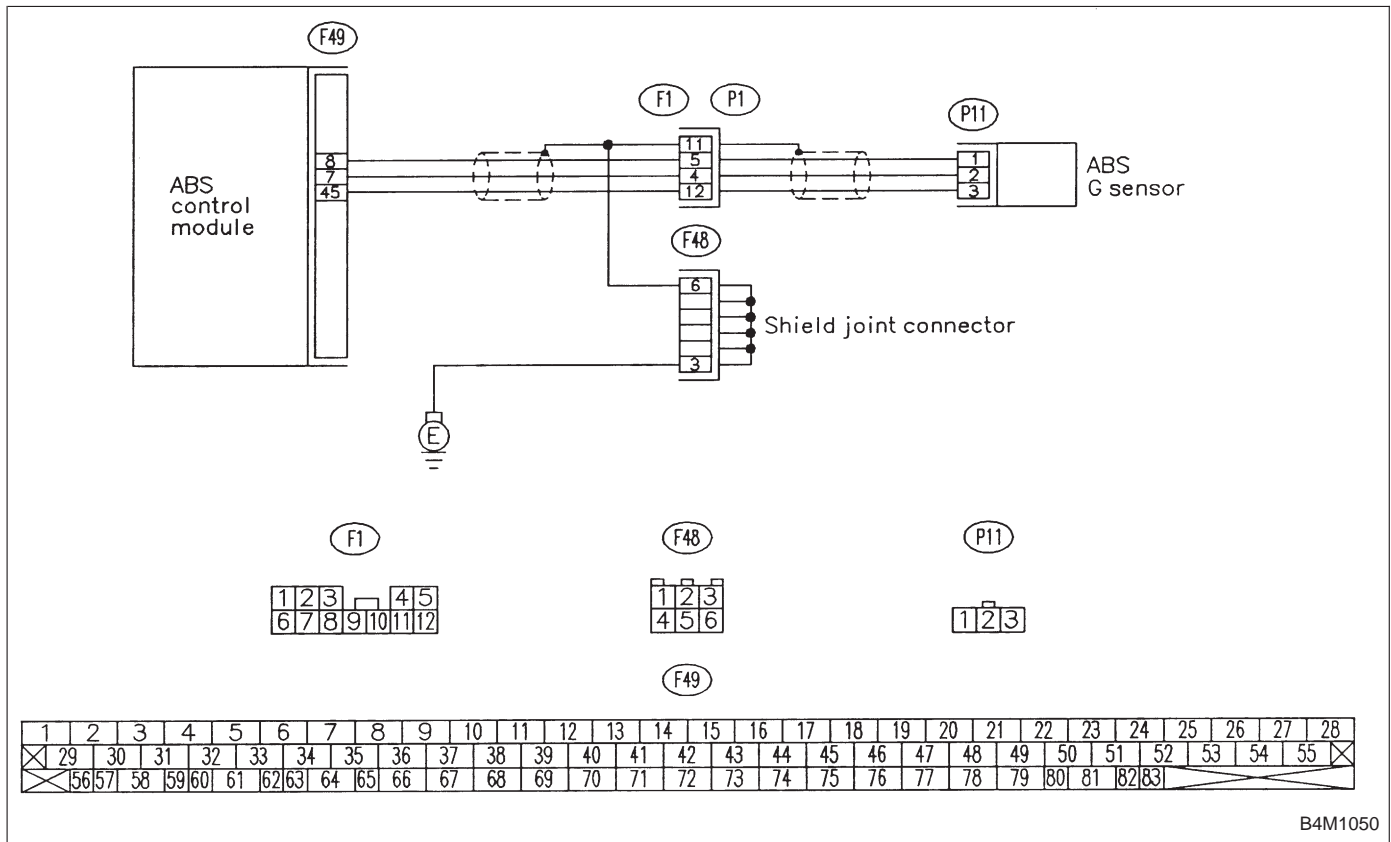
- Faulty G sensor output voltage

**TROUBLE SYMPTOM:**

- ABS does not operate.

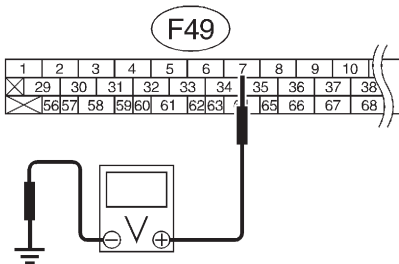


**WIRING DIAGRAM:**



G - SENS (F10)  
2.30 V

B4M0927



B4M0914A

### 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  $2.3 \pm 0.2$  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) Turn ignition switch to ON.
- 6) Measure voltage between ABSCM connector and chassis ground.

**CHECK** : *Connector & terminal (F49) No. 7 (+) — Chassis ground (-) Is voltage 0 V?*

**YES** : Go to next step.

**NO** : Repair harness between G sensor and ABSCM.

- 7) Turn ignition switch to OFF.

- 8) Measure voltage between ABSCM connector and chassis ground.

**CHECK** : *Connector & terminal (F49) No. 7 (+) — Chassis ground (-) Is voltage 0 V?*

**YES** : Go to step **10AI3**.

**NO** : Repair harness between G sensor and ABSCM.

### 10AI3 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 next **CHECK** .

**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 H $\mu$

B4M0984

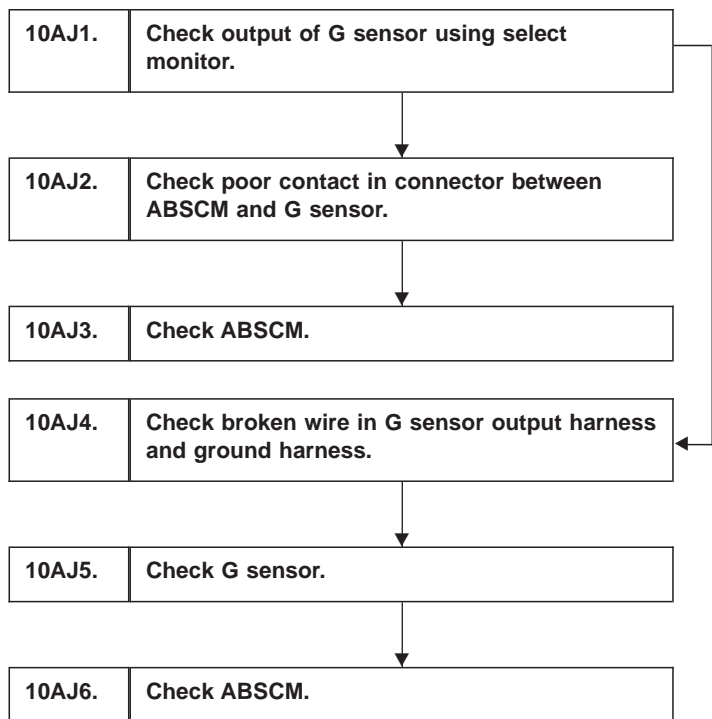
**AJ: 56 G SENSOR H $\mu$**   
**— ABNORMAL G SENSOR HIGH  $\mu$  OUTPUT**  
**—**

**DIAGNOSIS:**

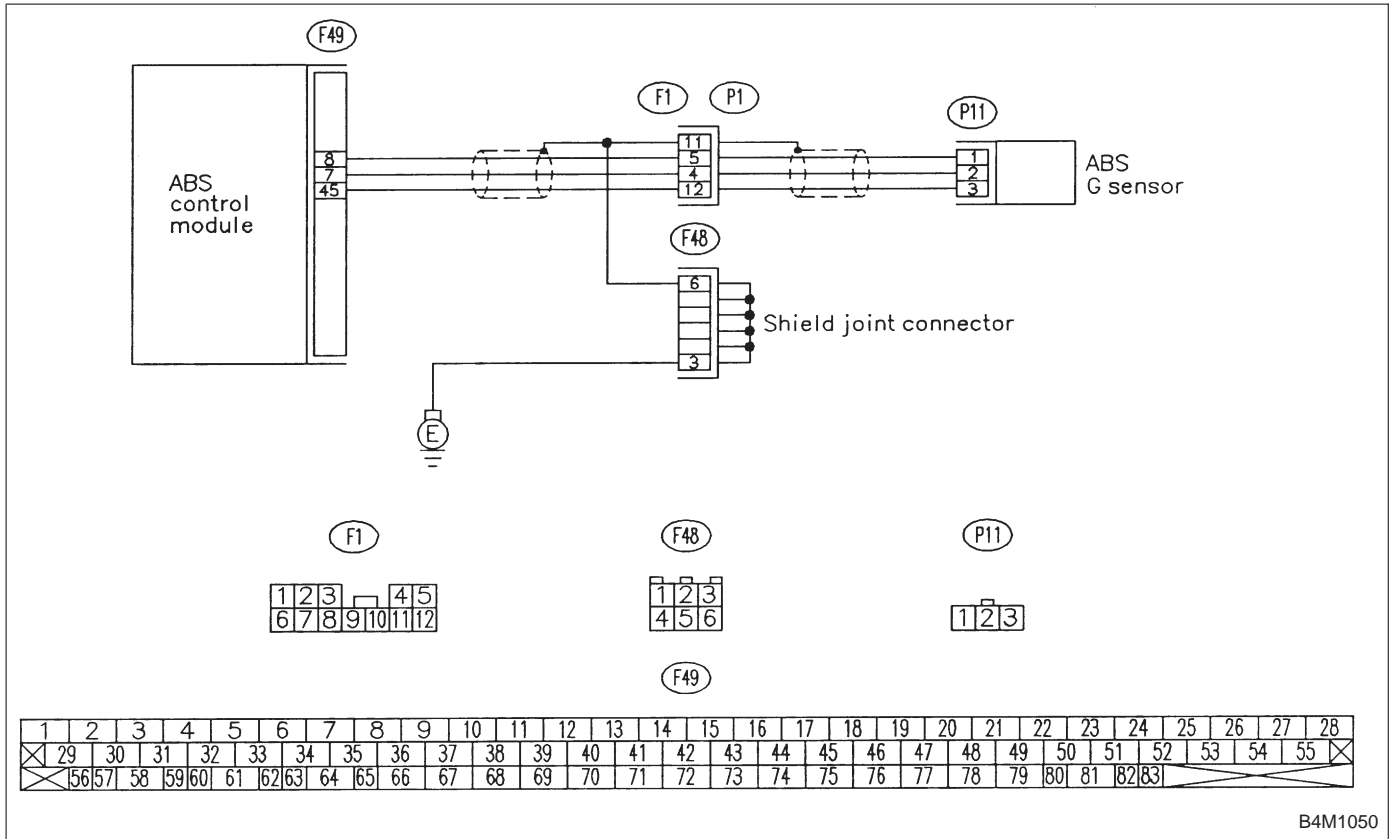
- Faulty G sensor output voltage

**TROUBLE SYMPTOM:**

- ABS does not operate.



WIRING DIAGRAM:



G - SENS (F 10)  
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 10AJ5.

**10AJ2 CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.**

**CHECK** : *Is there poor contact in connector between ABSCM and G sensor?*

**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?*

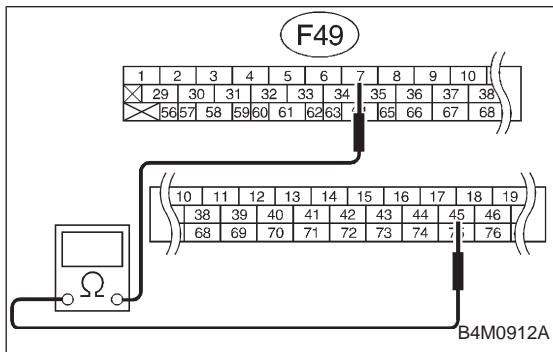
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.



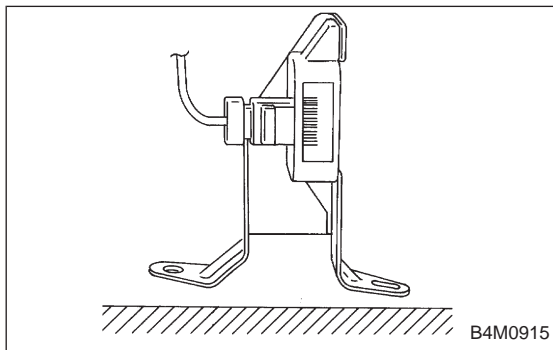
**10AJ4 CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

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

**CHECK** : *Connector & terminal (F49) No. 7 — No. 45 Is resistance  $4.6 \pm 0.3 \text{ k}\Omega$ ?*

**YES** : Go to step 10AJ5.

**NO** : Repair harness between G sensor and ABSCM.



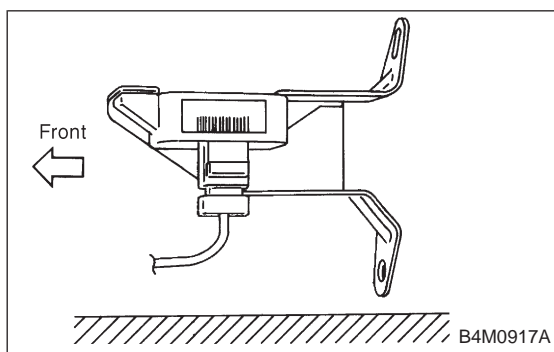
**10AJ5 CHECK G SENSOR.**

- 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.

**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $2.3 \pm 0.2$  V when G sensor is horizontal?**

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

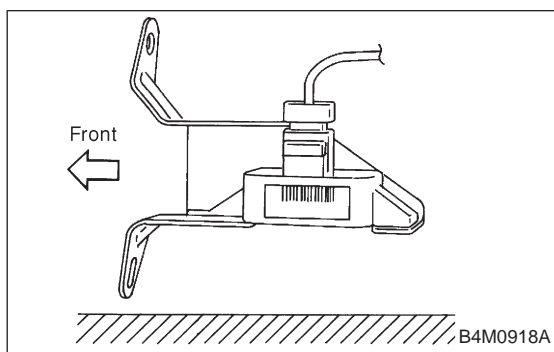
**NO** : Replace G sensor.



**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $3.9 \pm 0.2$  V when G sensor is inclined forwards to 90°?**

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

**NO** : Replace G sensor.



**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $0.7 \pm 0.2$  V when G sensor is inclined backwards to 90°?**

**YES** : Go to step **10AJ6**.

**NO** : Replace G sensor.

<b>10AJ6</b>	<b>CHECK ABSCM.</b>
--------------	---------------------

- 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 next **CHECK** .

**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

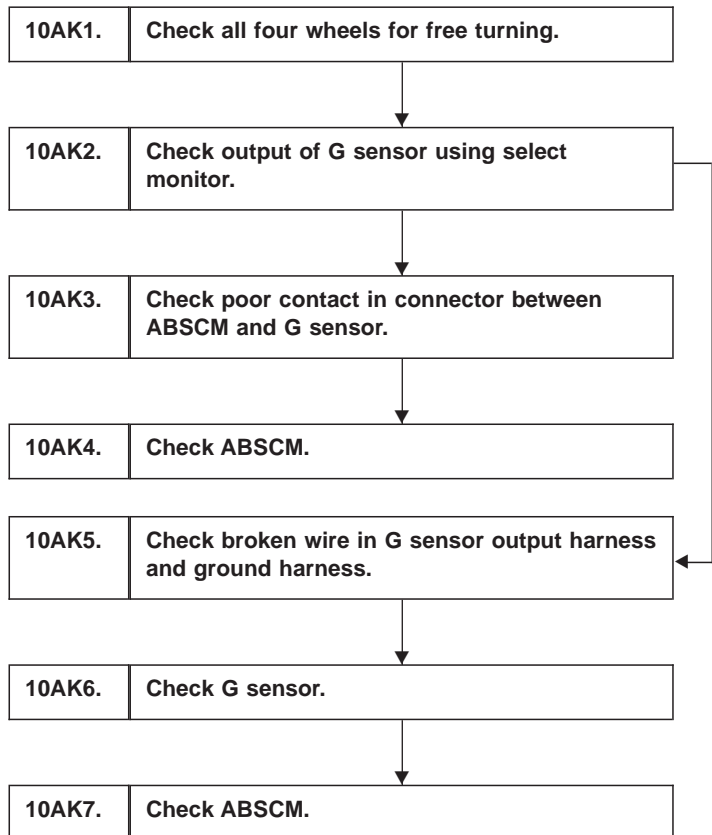
**AK: 56 G SENSOR STICK  
— G SENSOR OUTPUT IS STUCK. —**

**DIAGNOSIS:**

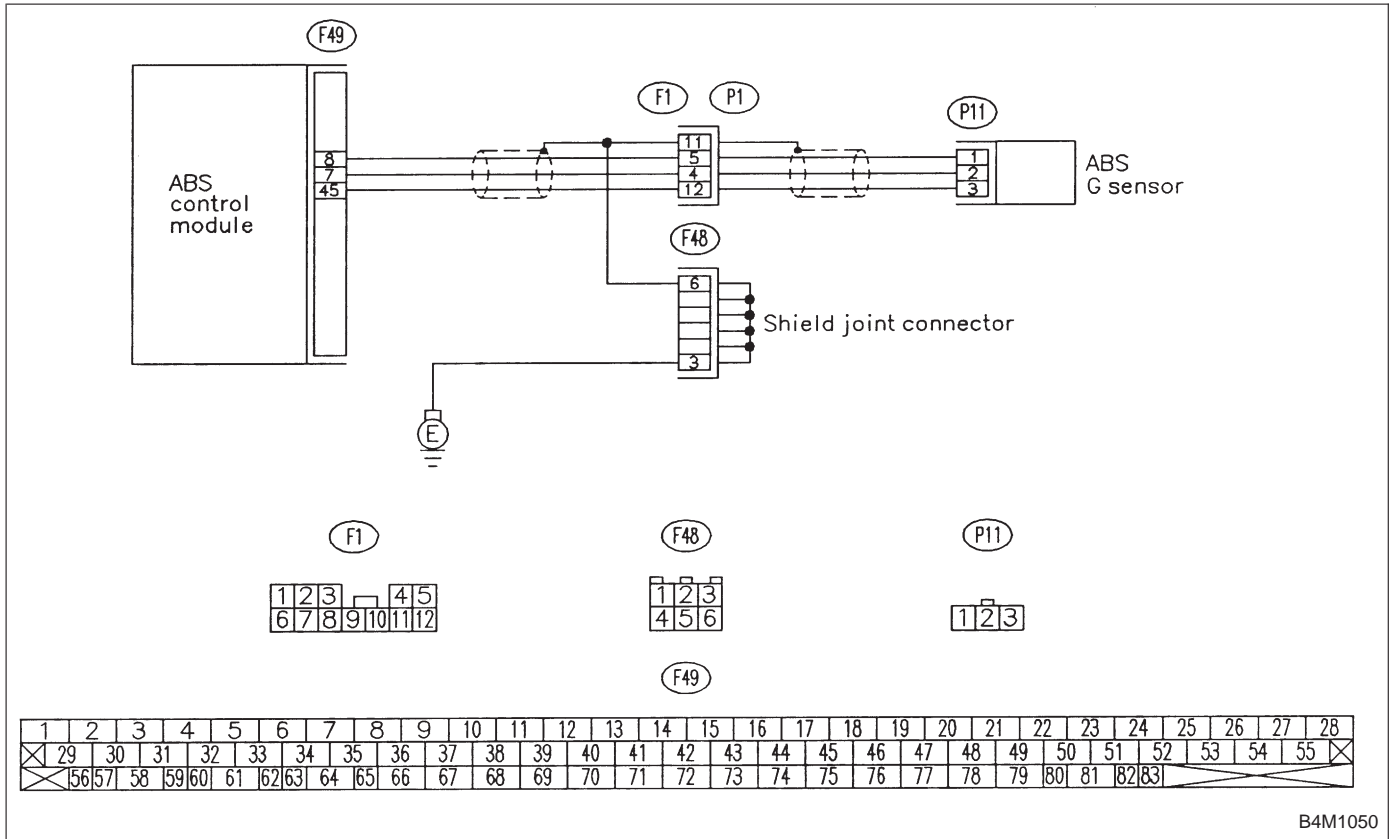
- Faulty G sensor output voltage

**TROUBLE SYMPTOM:**

- ABS does not operate.



**WIRING DIAGRAM:**



B4M1050

**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**.

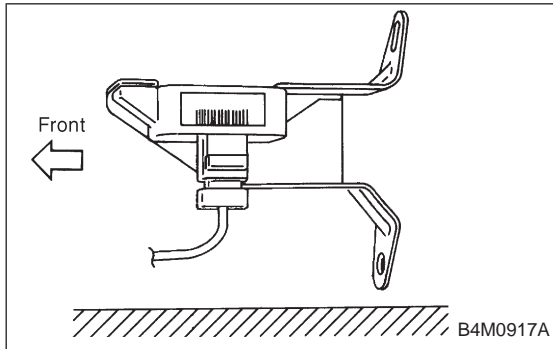
**G - SENS (F 10)**  
**2.30 V**

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 **2.3±0.2 V** when the vehicle is in horizontal position?
- YES** : Go to next step.
- NO** : Go to step **10AK5**.

- 3) Remove console box.
- 4) Remove G sensor from vehicle. (Do not disconnect connector.)

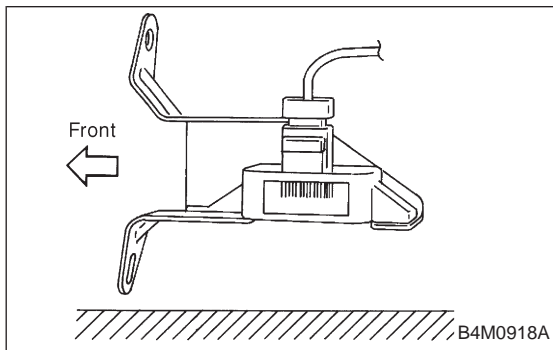


5) Read the select monitor display.

**CHECK** : *Is the indicated reading  $3.9 \pm 0.2$  V when G sensor is inclined forwards to  $90^\circ$ ?*

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

**NO** : Replace G sensor.



**CHECK** : *Is the indicated reading  $0.7 \pm 0.2$  V when G sensor is inclined backwards to  $90^\circ$ ?*

**YES** : Go to step **10AK3**.

**NO** : Replace G sensor.

<b>10AK3</b>	<b>CHECK POOR CONTACT IN CONNECTOR BETWEEN ABSCM AND G SENSOR.</b>
--------------	--

**CHECK** : *Is there poor contact in connector between ABSCM and G sensor?*

**YES** : Repair connector.

**NO** : Go to step **10AK4**.

**10AK4 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?*

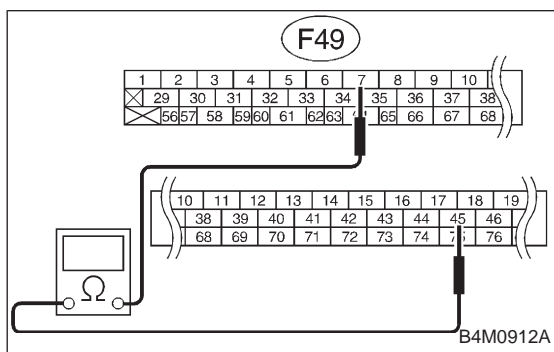
**YES** : Replace ABSCM.

**NO** : Go to next **CHECK** .

**CHECK** : *Are other trouble codes being output?*

**YES** : Proceed with the diagnosis corresponding to the trouble code.

**NO** : A temporary poor contact.

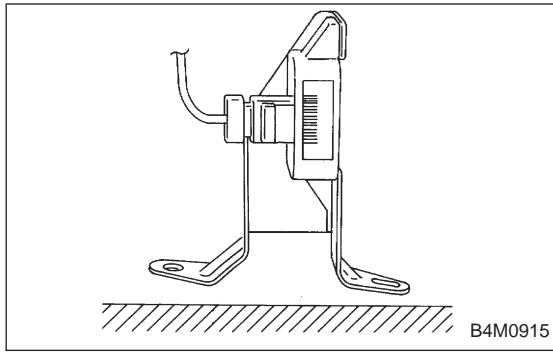
**10AK5 CHECK BROKEN WIRE IN G SENSOR OUTPUT HARNESS AND GROUND HARNESS.**

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

**CHECK** : *Connector & terminal (F49) No. 7 — No. 45  
Is resistance  $4.6 \pm 0.3 \text{ k}\Omega$ ?*

**YES** : Go to step **10AK6**.

**NO** : Repair harness between G sensor and ABSCM.



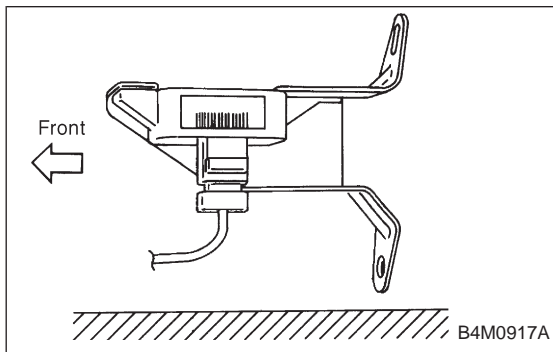
**10AK6 CHECK G SENSOR.**

- 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.

**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $2.3 \pm 0.2$  V when G sensor is horizontal?**

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

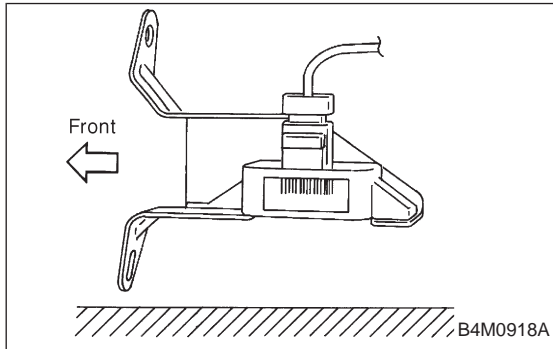
**NO** : Replace G sensor.



**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $3.9 \pm 0.2$  V when G sensor is inclined forwards to 90°?**

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

**NO** : Replace G sensor.



**CHECK** : **Connector & terminal (P11) No. 2 (+) — No. 1 (-)**  
**Is voltage  $0.7 \pm 0.2$  V when G sensor is inclined backwards to 90°?**

**YES** : Go to step **10AK7**.

**NO** : Replace G sensor.

10AK7	CHECK ABSCM.
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- 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 next **CHECK** .

**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.	<ul style="list-style-type: none"> <li>● Hydraulic unit (solenoid valve)</li> <li>● ABS sensor</li> <li>● Brake (caliper &amp; piston, pads)</li> <li>● Wheel alignment</li> <li>● Tire specifications, tire wear and air pressures</li> <li>● Incorrect wiring or piping connections</li> <li>● Road surface (uneven, camber)</li> </ul>
	Vehicle spins.	<ul style="list-style-type: none"> <li>● Hydraulic unit (solenoid valve)</li> <li>● ABS sensor</li> <li>● Brake (pads)</li> <li>● Tire specifications, tire wear and air pressures</li> <li>● Incorrect wiring or piping connections</li> </ul>
Poor braking	Long braking/stopping distance	<ul style="list-style-type: none"> <li>● Hydraulic unit (solenoid valve)</li> <li>● Brake (pads)</li> <li>● Air in brake line</li> <li>● Tire specifications, tire wear and air pressures</li> <li>● Incorrect wiring or piping connections</li> </ul>
	Wheel locks.	<ul style="list-style-type: none"> <li>● Hydraulic unit (solenoid valve, motor)</li> <li>● ABS sensor</li> <li>● Incorrect wiring or piping connections</li> </ul>
	Brake dragging	<ul style="list-style-type: none"> <li>● Hydraulic unit (solenoid valve)</li> <li>● ABS sensor</li> <li>● Master cylinder</li> <li>● Brake (caliper &amp; piston)</li> <li>● Parking brake</li> <li>● Axle &amp; wheels</li> <li>● Brake pedal play</li> </ul>
	Long brake pedal stroke	<ul style="list-style-type: none"> <li>● Air in brake line</li> <li>● Brake pedal play</li> </ul>
	Vehicle pitching	<ul style="list-style-type: none"> <li>● Suspension play or fatigue (reduced damping)</li> <li>● Incorrect wiring or piping connections</li> <li>● Road surface (uneven)</li> </ul>
	Unstable or uneven braking	<ul style="list-style-type: none"> <li>● Hydraulic unit (solenoid valve)</li> <li>● ABS sensor</li> <li>● Brake (caliper &amp; piston, pads)</li> <li>● Tire specifications, tire wear and air pressures</li> <li>● Incorrect wiring or piping connections</li> <li>● Road surface (uneven)</li> </ul>
	Excessive pedal vibration	<ul style="list-style-type: none"> <li>● Incorrect wiring or piping connections</li> <li>● Road surface (uneven)</li> </ul>
Vibration and/or noise (while driving on slippery roads)	Noise from hydraulic unit	<ul style="list-style-type: none"> <li>● Hydraulic unit (mount bushing)</li> <li>● ABS sensor</li> <li>● Brake piping</li> </ul>
	Noise from front of vehicle	<ul style="list-style-type: none"> <li>● Hydraulic unit (mount bushing)</li> <li>● ABS sensor</li> <li>● Master cylinder</li> <li>● Brake (caliper &amp; piston, pads, rotor)</li> <li>● Brake piping</li> <li>● Brake booster &amp; check valve</li> <li>● Suspension play or fatigue</li> </ul>
	Noise from rear of vehicle	<ul style="list-style-type: none"> <li>● ABS sensor</li> <li>● Brake (caliper &amp; piston, pads, rotor)</li> <li>● Parking brake</li> <li>● Brake piping</li> <li>● Suspension play or fatigue</li> </ul>

**B: CHECKING THE HYDRAULIC UNIT OPERATION**

<Ref. to 4-4 [W22C1] or [W22C2].>

1) Do ABS sequence control patterns take place in correct order?

If not, check wiring and piping for incorrect connections.

2) Are oil pressure or braking force variations within specifications?

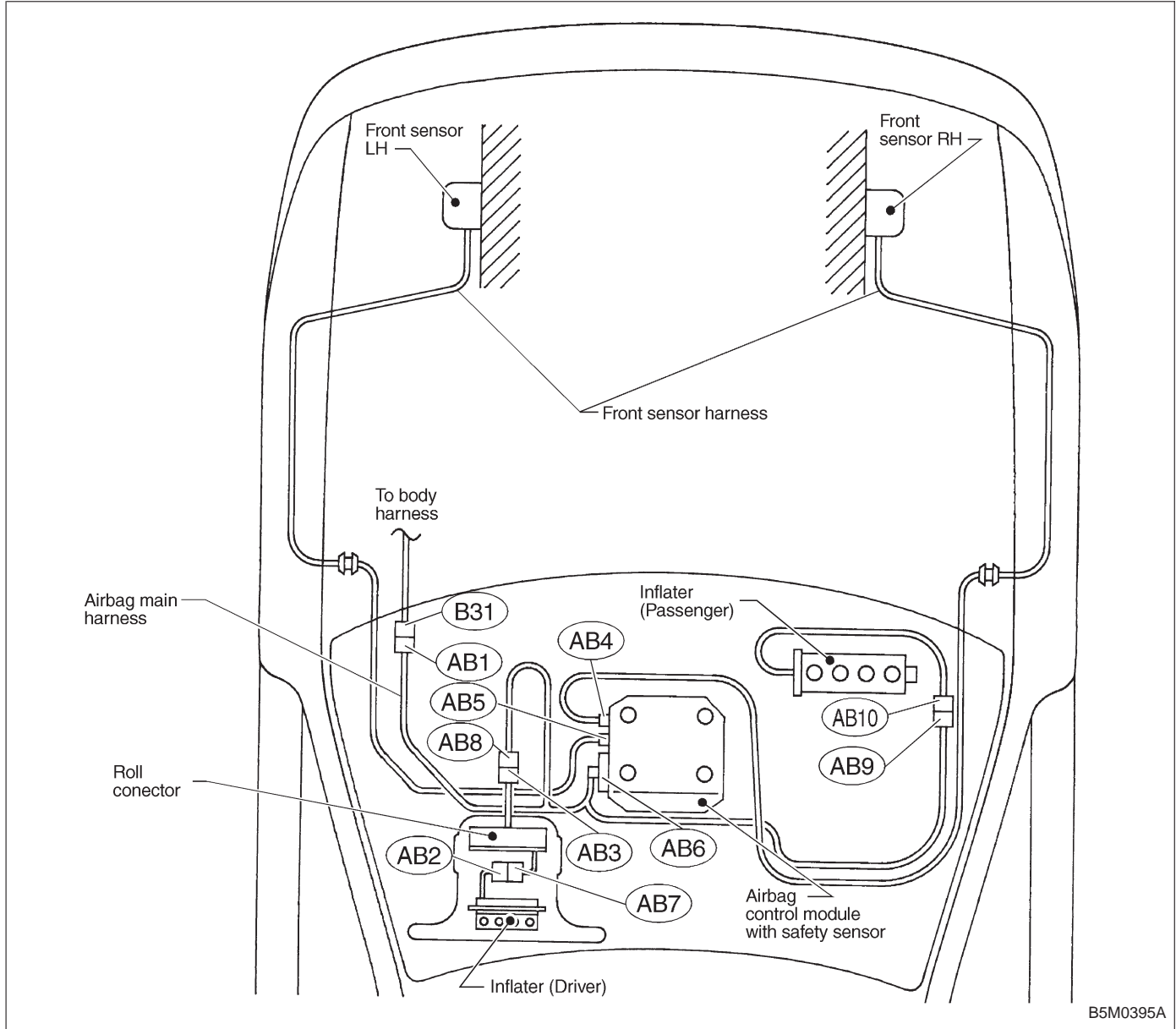
If not, check master cylinder, brake piping, hydraulic unit, proportioning valve and wheel cylinder for improper operation.

3) Does pedal hardness change before and after ABS sequence control?

If so, bleed air from brake line.

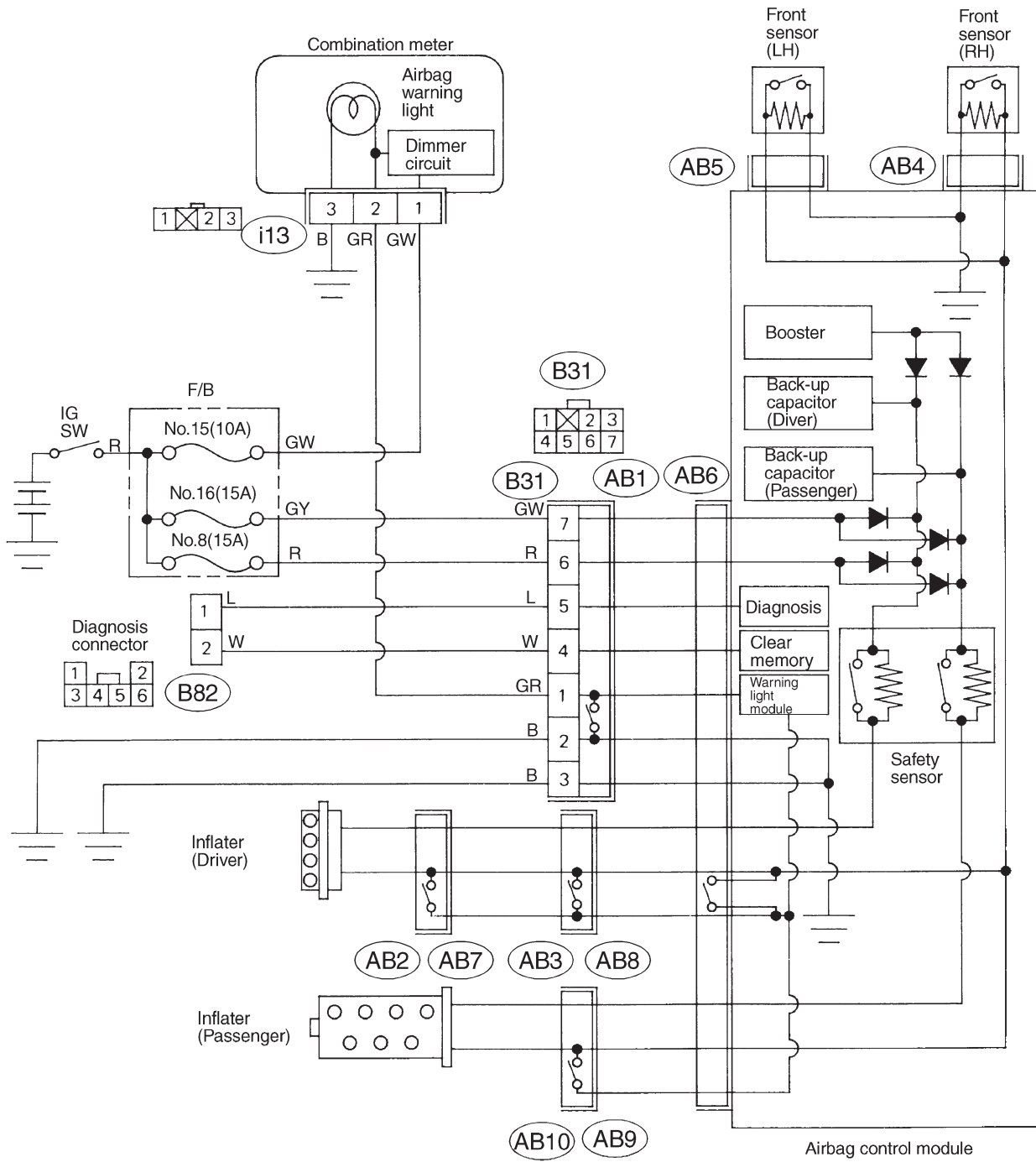


1. Electrical Components Location



Connector No.	(AB1)	(AB2)	(AB3)	(AB4)	(AB5)	(AB6)	(AB7)	(AB8)	(AB9)	(AB10)
Pole	7	3	3	2	2	12	3	3	3	3
Color	Yellow	Yellow	Yellow	Blue	Orange	Yellow	Yellow	Yellow	Yellow	Yellow
Male/Female	Male	Female	Female	Female	Female	Female	Male	Male	Male	Female

2. Schematic



B5M0111B

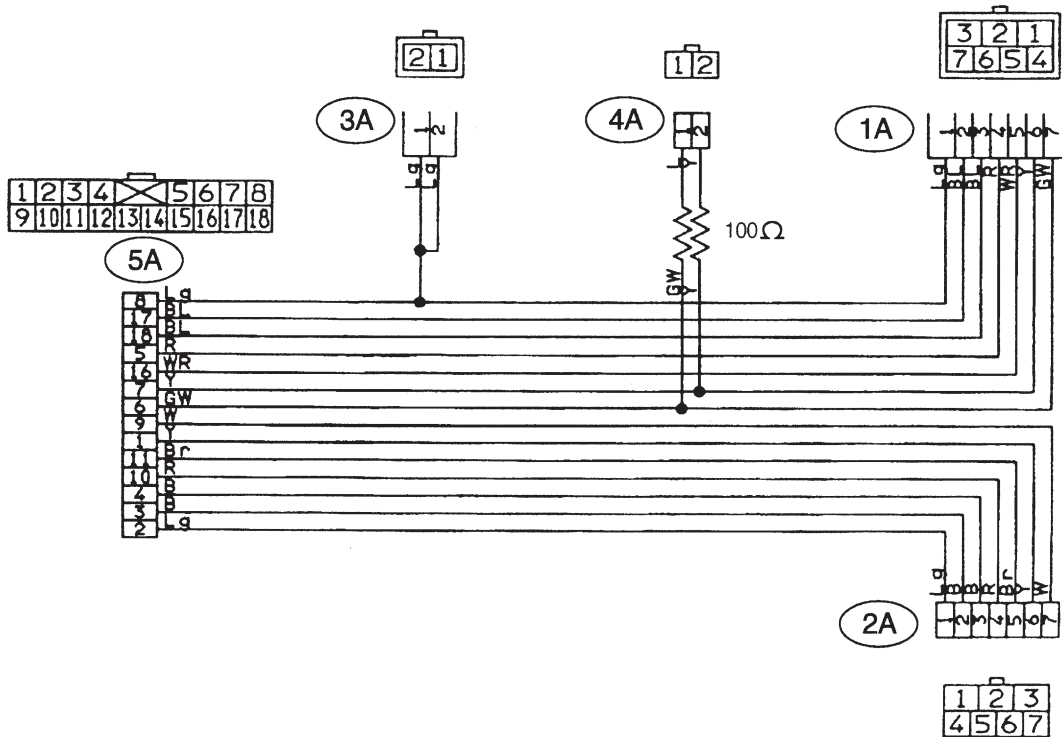
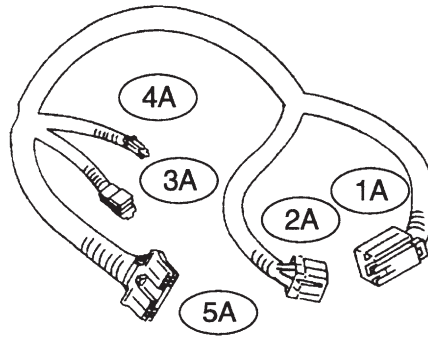
### 3. Tools for Diagnostics

**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**

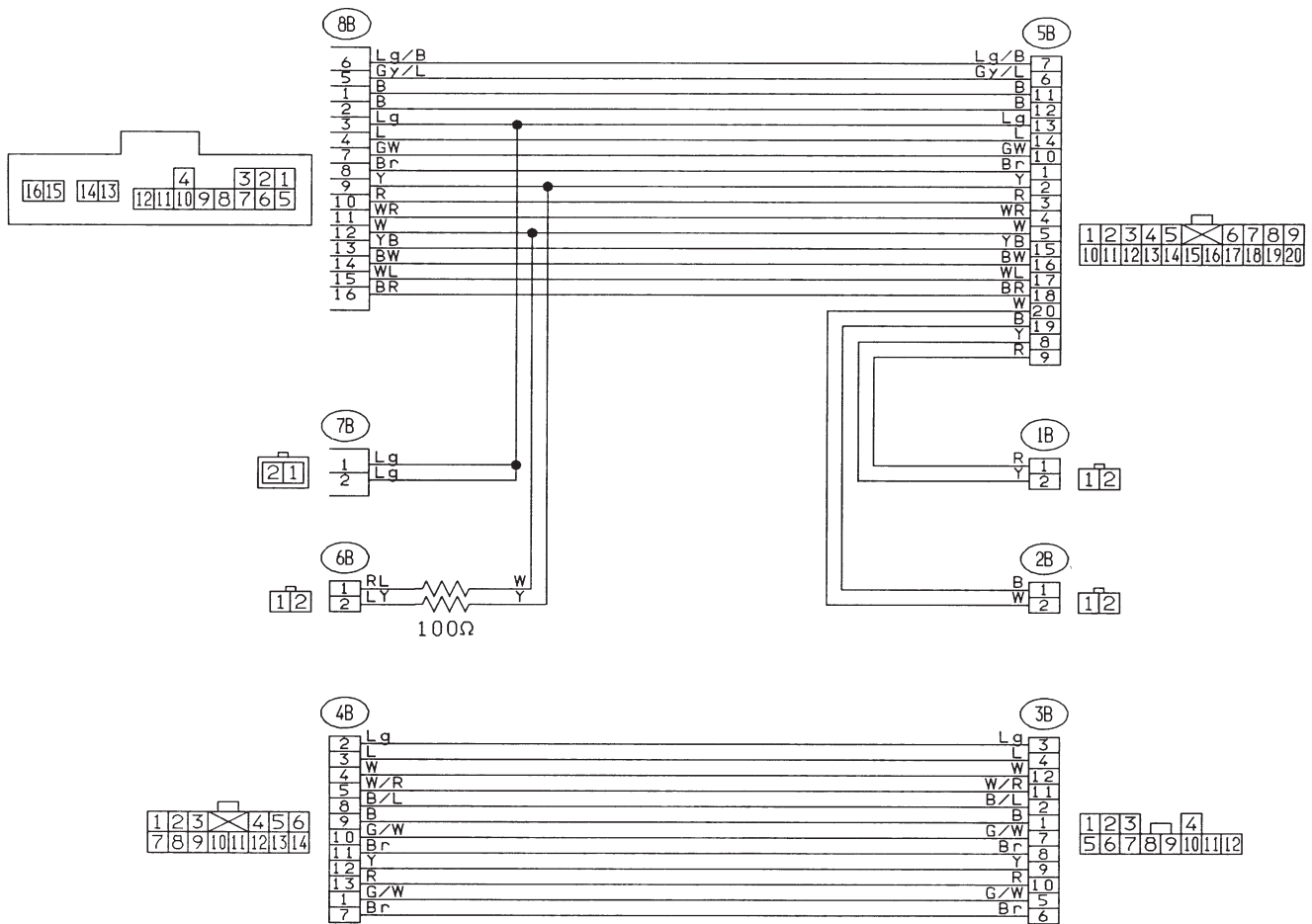
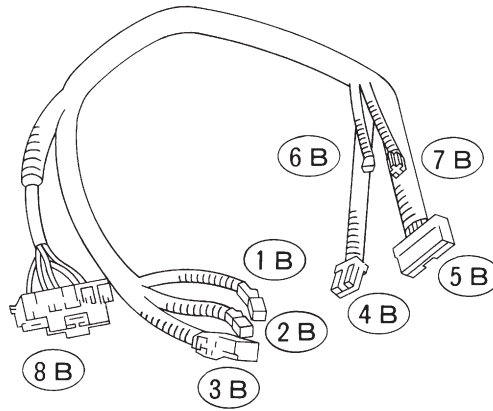
PN 98299PA000



B5M0112A

B: TEST HARNESS B2

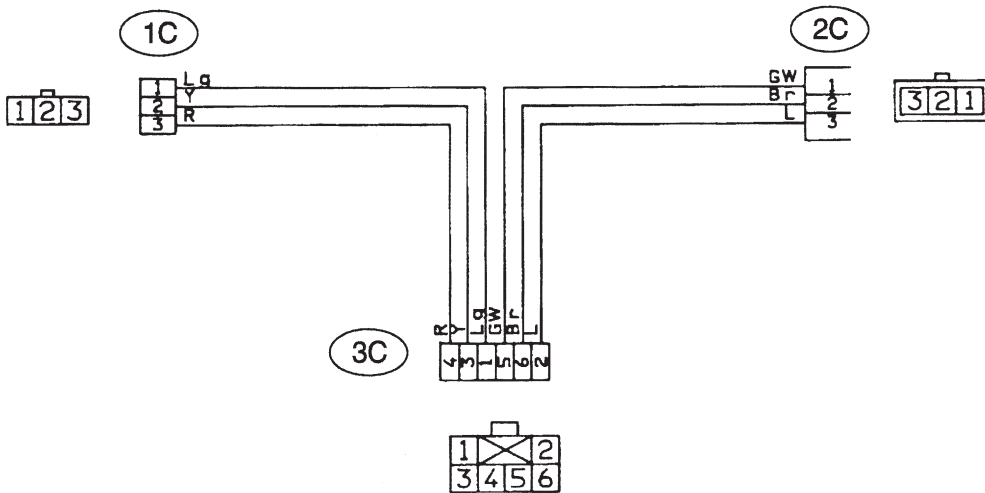
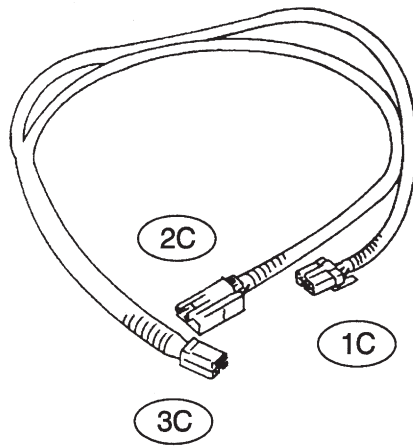
PN 98299PA011



G5M0593

C: TEST HARNESS C

PN 98299PA020

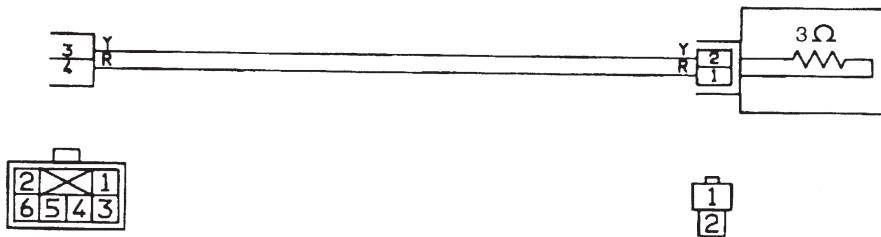
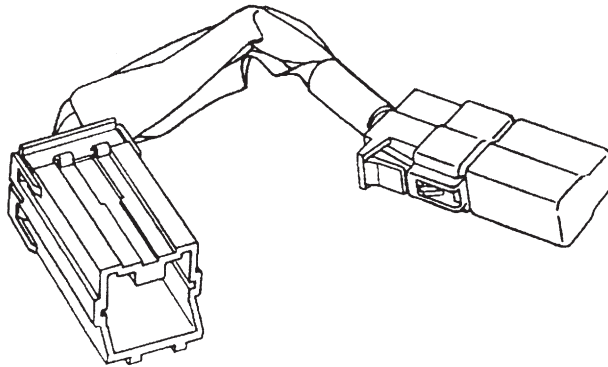


B5M0113A

**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.

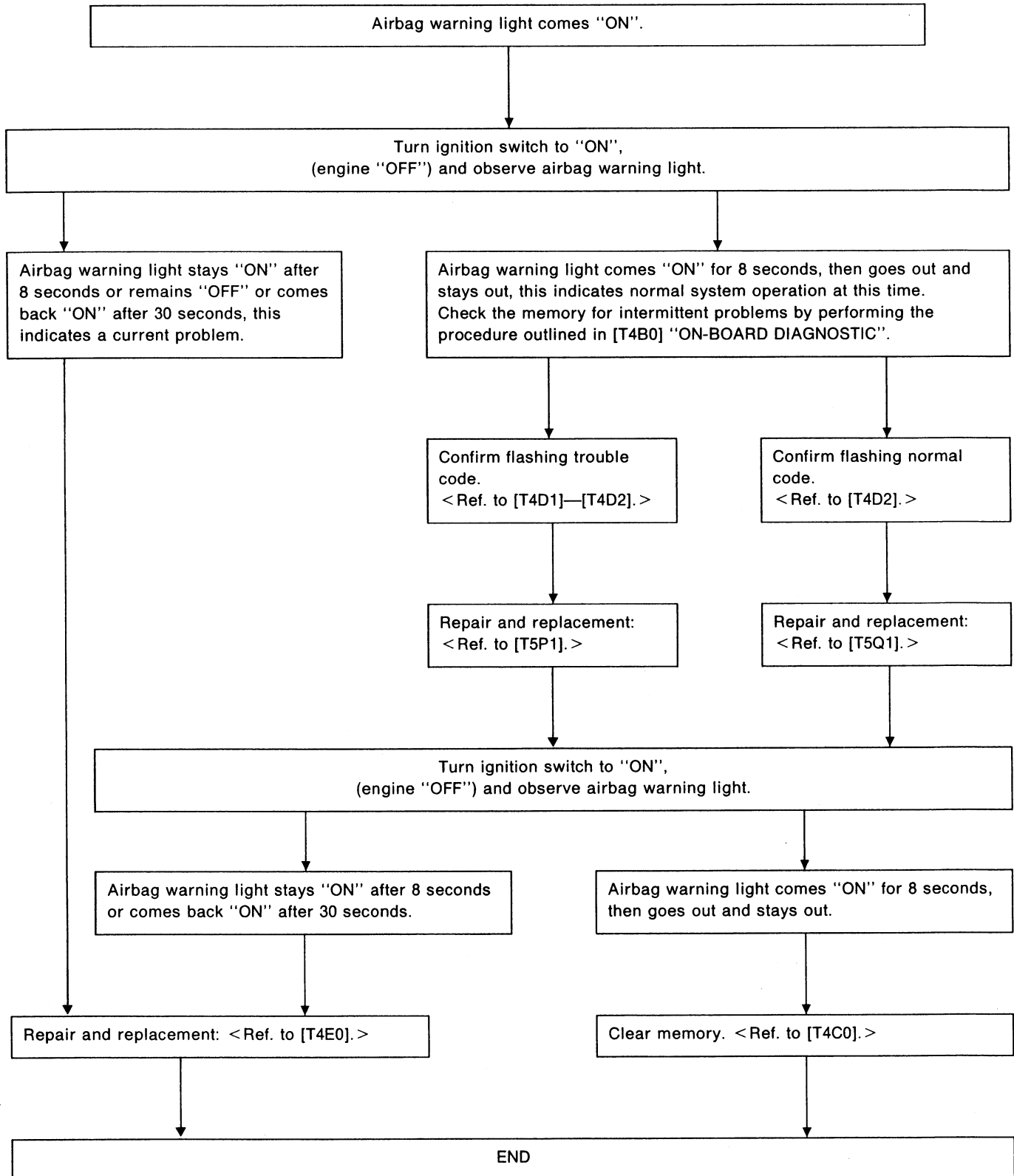
PN 98299PA040

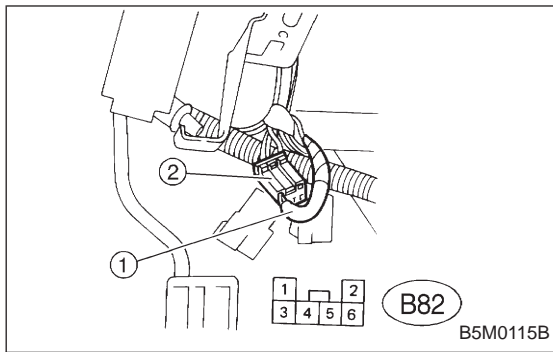


B5M0114A

### 4. Diagnostics Chart for On-board Diagnostic System

#### A: BASIC DIAGNOSTICS PROCEDURE



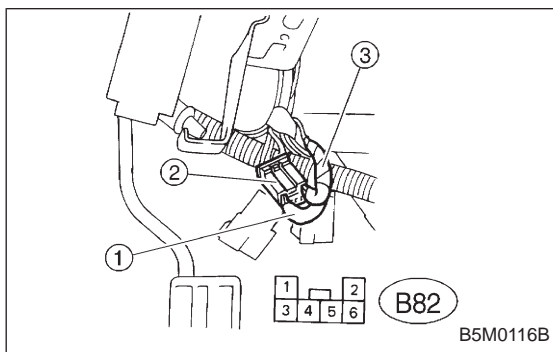


**B: ON-BOARD DIAGNOSTIC**

When the airbag system is in functioning condition, the airbag warning light will remain on for 8 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 ① to No. 1 terminal of diagnosis connector ② located below 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:

Make sure ignition switch is ON (and engine off). Connect one DIAG. terminal ① on diagnosis connector ② terminal No. 1.

While warning light is flashing, connect the other DIAG. terminal ③ on terminal No. 2 for at least three seconds.

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.

After clear memory and then DIAG. terminals ① and ③, extract from diagnosis connector ②.



**D: LIST OF TROUBLE CODES****1. TROUBLE CODES**

Trouble code/Contents of troubles	Memory function	Contents of diagnosis	Page
02	Provided.	1) Front sensor harness is shorted. 2) Airbag main harness is shorted. 3) Airbag module harness (Dr/Ps) is shorted. 4) Roll connector is shorted. 5) Airbag control module is faulty.	16
03	Provided.	1) Front sensor harness circuit is open. 2) Front sensor unit circuit is open.	18
04	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Ps) circuit is shorted. 3) Airbag control module is faulty.	19
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.	20
12	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Dr) circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty.	22
13	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Dr) is shorted. 3) Roll connector circuit is shorted. 4) Airbag control module is faulty.	23
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) (AB4), (AB5) and (AB6) are not connected properly to airbag control module.	24
21	Provided.	Airbag control module is faulty.	26
22	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Ps) circuit is open. 3) Airbag control module is faulty.	27
23	Provided.	1) Airbag main harness is shorted to power supply. 2) Front sensor harness is shorted to power supply. 3) Airbag module harness (Dr/Ps) is damaged. 4) Roll connector is shorted to power supply. 5) Airbag control module is faulty.	28
24	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Dr) circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty. 5) Above diagnosis plus other faulty of airbag modular parts.	30
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.	32
32	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Ps) circuit is open. 3) Airbag control module is faulty. 4) Above diagnosis plus other faulty of airbag modular parts.	34

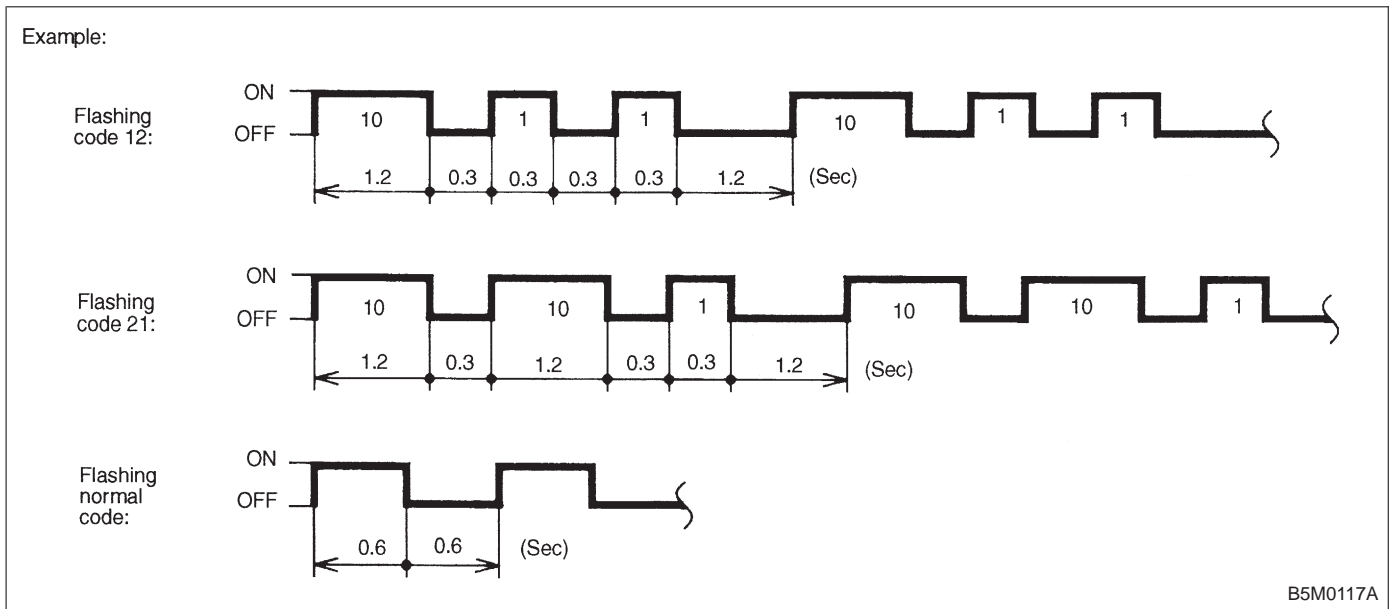
NOTE: Dr: Driver side Ps: Passenger side

Trouble code/Contents of troubles		Memory function	Contents of diagnosis	Page
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.	36
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.	40
Warning light indicates trouble code, then normal code.	Flashing trouble code.	Provided.	Airbag system component parts are faulty.	42
	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.	45

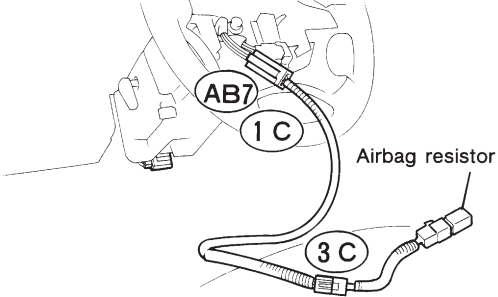
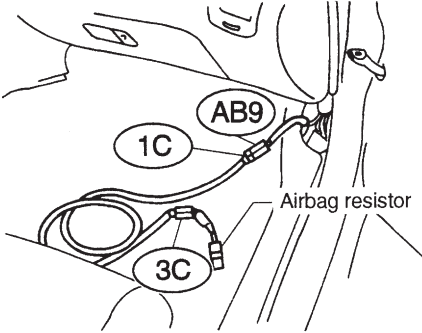
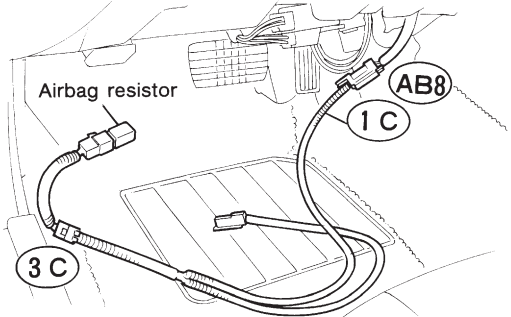
**2. HOW TO READ TROUBLE CODES**

The AIRBAG warning light flashes a code corresponding to the faulty parts.

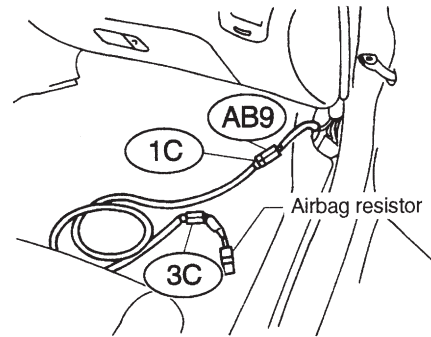
The long segment (1.2 sec on) indicates a “ten”, and the short segment (0.3 sec on) indicates a “one”.



## E: DIAGNOSTICS PROCEDURE

Airbag warning light stays on after 8 seconds.	
1) Perform on-board diagnostic. <Ref. to 5-5 [T4B0].>	
2) Are trouble codes 2, 4, 12, 13, 22, 23, 24 or 32 indicated? <Ref. to 5-5 [T4D1]—[T4D2].> Record trouble codes.	
3) If "NO", proceed with diagnostics and repair according to trouble code indicated then perform step 29).	
4) If "YES", proceed by turning ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. If codes 12 or 13 are indicated proceed to step 5). If codes 12 or 13 are not indicated proceed to step 6).	
5) Remove driver side airbag module and connect test harness C connector (1C) to (AB7). <Ref. to 5-5 [W3A1].> Connect airbag resistor to test harness C connector (3C). Proceed to step 19).	 <p style="text-align: right;">G5M0430</p>
6) If codes 4 or 22 are indicated, proceed to step 7). If codes 4 or 22 are not indicated proceed to step 11).	
7) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].> Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C).	 <p style="text-align: right;">B5M0118A</p>
8) Reconnect battery ground cable and turn ignition switch "ON", does airbag warning light go out after 8 seconds and remain "OFF" for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)	
9) If "YES", turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Install a new passenger side airbag module <Ref. to 5-5 [W3B0].> then proceed to step 29).	
10) If "NO" proceed to step 1).	
11) 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). Turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.) If "YES" proceed to step 5). If "NO" proceed to step 12).	 <p style="text-align: right;">G5M0429</p>

- 12) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Connect connector (AB3) to (AB8). Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5 [W3A2].>  
Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C).

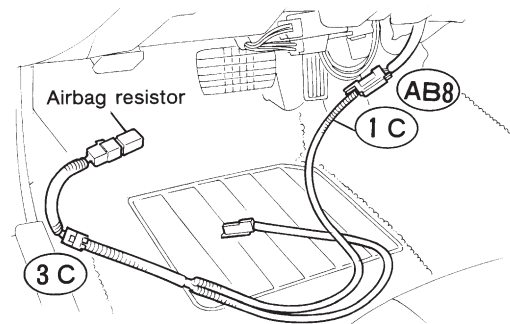


B5M0118A

- 13) Reconnect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)

- 14) If "YES", proceed to step 9).

- 15) If "NO", turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Disconnect connector (AB3) to (AB8). Connect test harness C connector (1C) to (AB8). Connect airbag resistor to test harness C connector (3C).



G5M0429

- 16) Reconnect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)

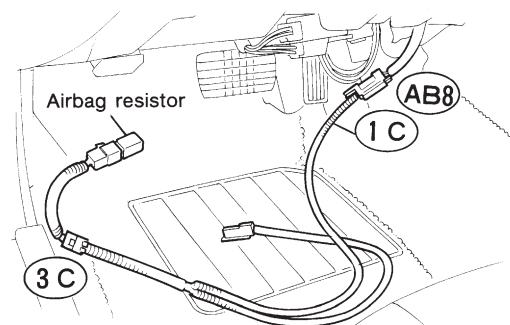
- 17) If "YES", turn ignition switch "OFF", disconnect battery ground cable and wait 20 seconds. Install a new passenger side airbag module <Ref. to 5-5 [W3B0].> then proceed to step 5).

- 18) If "NO", proceed with diagnostics according to trouble code indicated during on-board diagnostic. Proceed to step 29).

- 19) Reconnect battery ground cable and turn ignition switch "ON", does airbag warning light go out after 8 seconds and remain "OFF" for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)

- 20) If "YES", turn ignition switch "OFF", disconnect battery ground cable and wait 20 seconds. Install driver side airbag module <Ref. to 5-5 [W3B0].> and proceed to step 29).

- 21) If "NO", 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). Turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.)  
If "YES" proceed to step 22).  
If "NO" proceed to step 23).

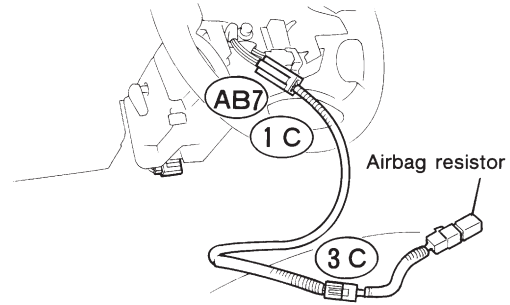


G5M0429

- 22) If "YES", replace combination switch, <Ref. to 5-5 [W7A0].> and proceed to step 26).

- 23) If "NO", proceed with diagnostics and repair according to trouble code indicated, then perform step 24).

24) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Remove driver side airbag module and connect test harness C connector (1C) to (AB7) <Ref. to 5-5 [W3A1].> with airbag resistor attached to test harness C connector (3C).



G5M0430

25) Reconnect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.) If "YES", proceed to step 26). If "NO", proceed to step 27).

26) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Install driver side airbag module <Ref. to 5-5 [W3B0].> and proceed to step 26).

27) Replace combination switch, <Ref. to 5-5 [W7A0].> and proceed to step 26).

28) Reconnect battery and turn ignition switch "ON". Does airbag warning light go off after 8 seconds and remain off for more than 30 seconds? See notes 1) and 2). (Refer to end of chart.) If "YES", proceed to step 29). If "NO", proceed to step 31).

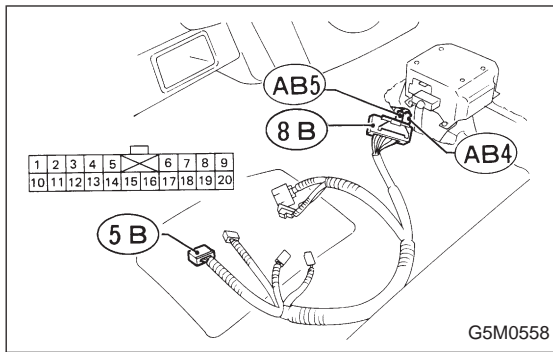
29) Perform clear memory procedure. <Ref. to 5-5 [T4C0].>

30) If memory cannot be cleared, another trouble code exists. Return to step 1).

31) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Replace driver side airbag module. <Ref. to 5-5 [W3A1].> Proceed to step 28).

**NOTES:**

- 1) Always remember to secure the green double locks before turning the ignition switch "ON".
- 2) In some cases the airbag warning light will go "OFF" after 8 seconds but will turn "ON" again within 30 seconds. In this case continue diagnostics with the basic diagnostics procedures or trouble code procedures.



### 1. FRONT SENSOR AND HARNESS INSPECTION

- 1) Disconnect connectors (AB4) and (AB5) from airbag control module. <Ref. to 5-5 [W6A0].>
- 2) Connect connectors (AB4) and (AB5) to connector (8B) of test harness B2.
- 3) Measure resistance between connector (5B) terminal indicated.

#### **(5B) Terminal / Specified resistance:**

**(RH: AB4): No. 17 — No. 18 / 1.4 — 1.6 k $\Omega$**

**(LH: AB5): No. 15 — No. 16 / 1.4 — 1.6 k $\Omega$**

- 4) Measure resistance between each connector (5B) terminal and body.

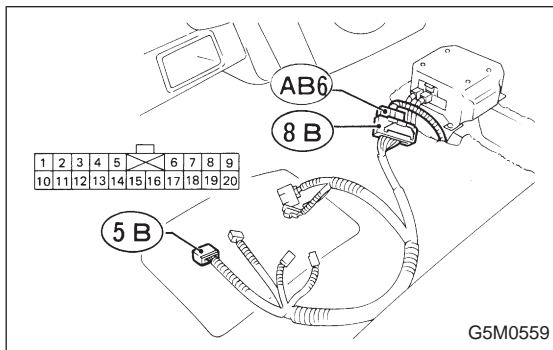
#### **(5B) Terminal / Specified resistance:**

**(RH: AB4): No. 17 — Body / 1 M $\Omega$ , or more**

**No. 18 — Body / 1 M $\Omega$ , or more**

**(LH: AB5): No. 15 — Body / 1 M $\Omega$ , or more**

**No. 16 — Body / 1 M $\Omega$ , or more**



### 2. AIRBAG MAIN HARNESS INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect (AB6) to test harness B2 connector (8B).
- 2) Measure resistance between each (5B) terminal and body.

#### **(5B) Terminal / Specified resistance:**

**No. 1 — Body / 1 M $\Omega$ , or more**

**No. 14 — Body / 1 M $\Omega$ , or more**

**B: TROUBLE CODE 03**

**DIAGNOSIS:**

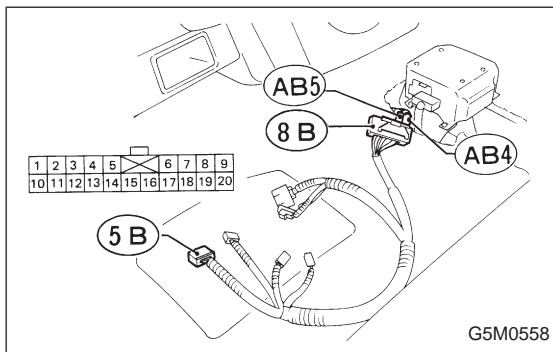
- Front sensor harness circuit is open.
- Front sensor unit circuit is open.

1. Front sensor (LH and RH) inspection

Identify faulty sensor and replace front sensor.

**CAUTION:**

Before performing the diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.



**1. FRONT SENSOR (LH AND RH) INSPECTION**

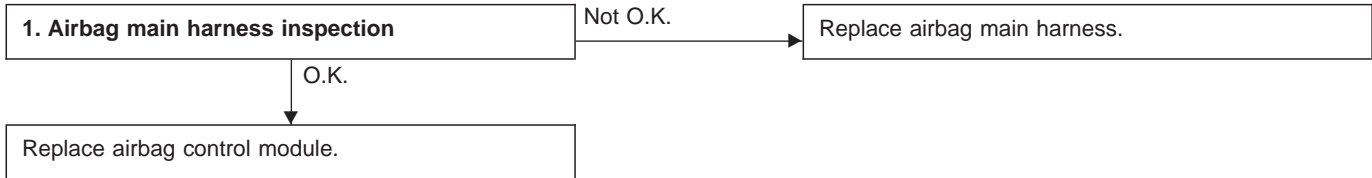
- 1) Disconnect connectors (AB4) and (AB5) from airbag control module. <Ref. to 5-5 [W6A0].>
- 2) Connect connectors (AB4) and (AB5) to test harness B2 connector (8B).
- 3) Measure resistance between connector (5B) terminal.

**(5B) Terminal / Specified resistance:**

- (RH: AB4): No. 17 — No. 18 / 1.4 — 1.6 kΩ
- (LH: AB5): No. 15 — No. 16 / 1.4 — 1.6 kΩ

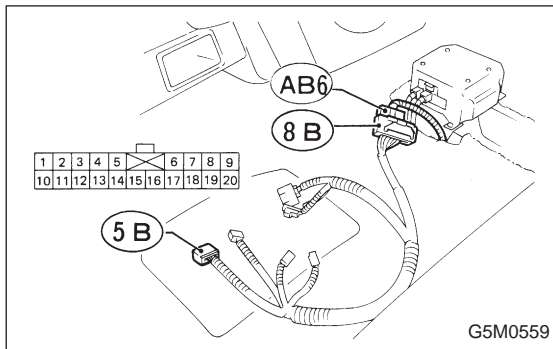
**C: TROUBLE CODE 04****DIAGNOSIS:**

- 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).

**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminal.

**(5B) Terminal / Specified resistance:**  
**No. 6 — No. 7 / 10 kΩ, or more**



**D: TROUBLE CODE 11**

**DIAGNOSIS:**

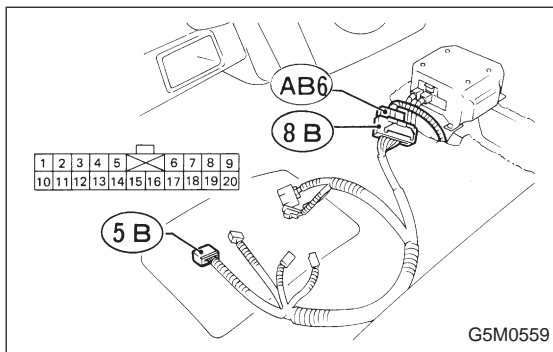
- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 8 is blown.
- Body harness circuit is open.



**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).



**1. AIRBAG CONTROL MODULE INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].> 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 body.

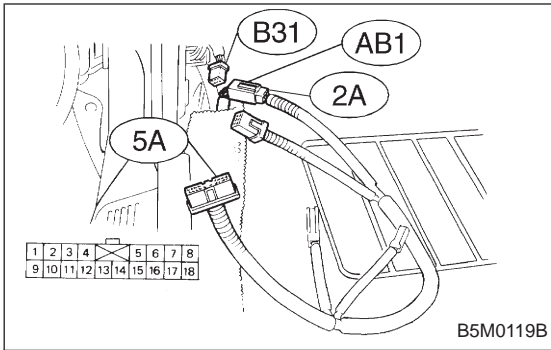
**(5B) Terminal / Specified voltage:**

**No. 2 — Body / 10 V, or more**

**2. AIRBAG MAIN HARNESS INSPECTION**

1) Go to step 2) below after performing diagnostics on airbag system as per flowchart under “**1. AIRBAG CONTROL MODULE INSPECTION**” previously outlined.

2) Turn ignition switch “OFF”, disconnect battery ground terminal and then wait at least 20 seconds.



3) Disconnect body harness connector (B31) from connector (AB1) at front lower pillar, and connect connector (AB1) to test harness A connector (2A).

4) Measure resistance between test harness A connector (5A) terminal and test harness B2 connector (5B) terminal.

**Connector & terminal / Specified resistance:**

**(5A) No. 1 — (5B) No. 2 / 10  $\Omega$ , or less**

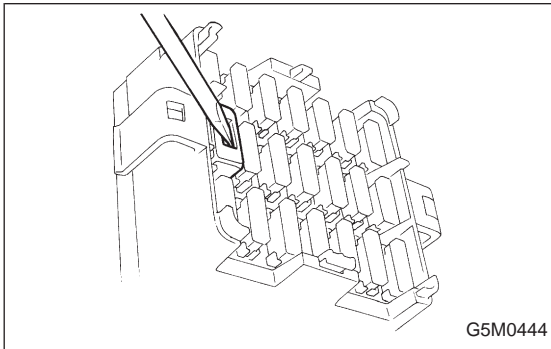
5) Measure resistance between terminals of connectors (5A) and (5B).

**(5A) Terminal / Specified resistance:**

**No. 1 — Body / 10  $k\Omega$ , or more**

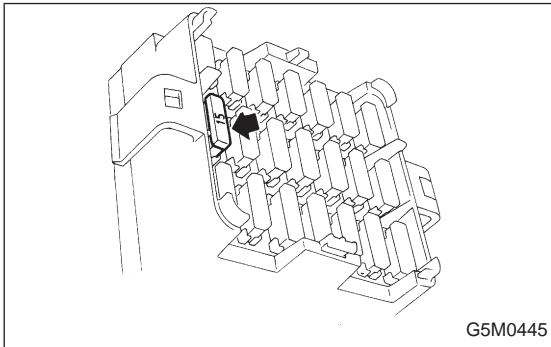
**(5B) Terminal / Specified resistance:**

**No. 2 — Body / 10  $k\Omega$ , or more**



### 3. FUSE No. 8 INSPECTION

1) Turn ignition switch "OFF", and remove airbag fuse protector.

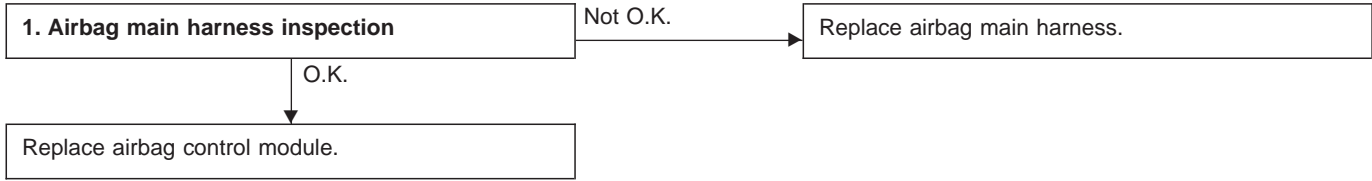


2) Remove and visually check fuse No. 8.

**E: TROUBLE CODE 12**

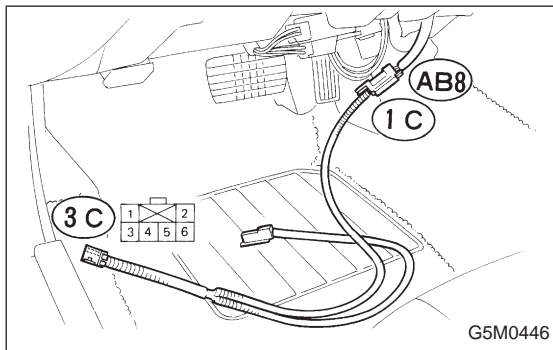
**DIAGNOSIS:**

- Airbag main harness circuit is open.
- Airbag module harness (Driver) circuit is open.
- Roll connector circuit is open.
- Airbag control module is faulty.



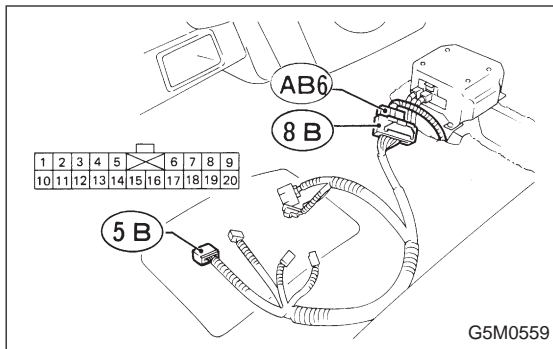
**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



**1. 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 [W6A0].> 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.

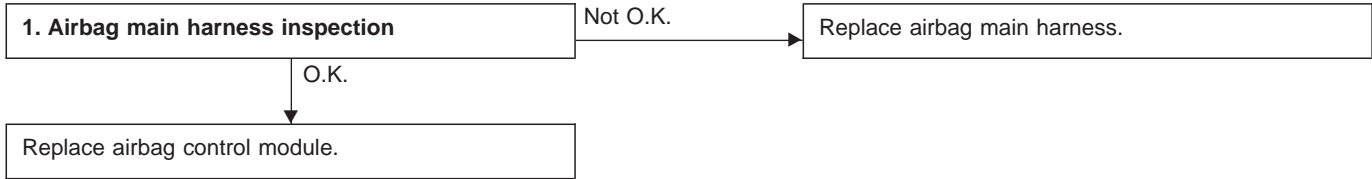
**Connector & terminal / Specified resistance:**

(5B) No. 14 — (3C) No. 4 / 10 Ω, or less

(5B) No. 1 — (3C) No. 3 / 10 Ω, or less

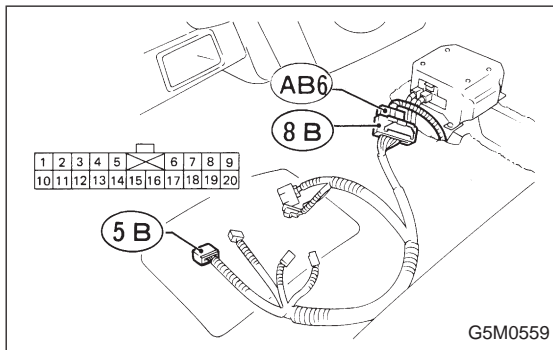
**F: TROUBLE CODE 13****DIAGNOSIS:**

- 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).

**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

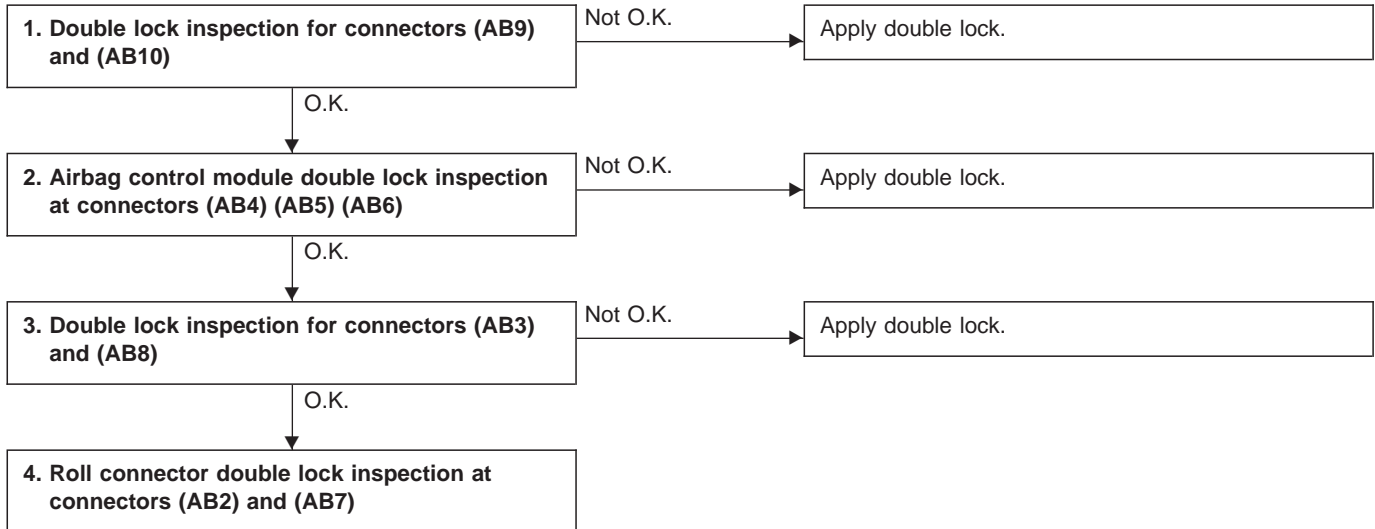
2) Measure resistance between test harness B2 connector (5B) terminal.

**(5B) Terminal / Specified resistance:**  
**No. 1 — No. 14 / 10 kΩ, or more**

**G: TROUBLE CODE 14**

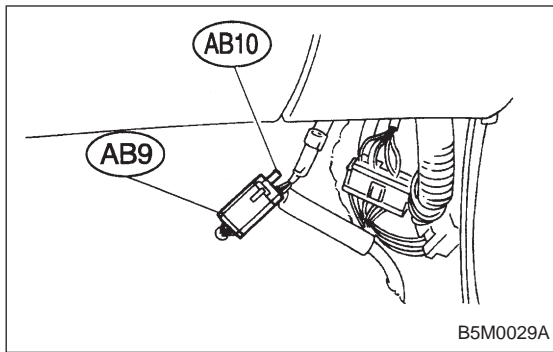
**DIAGNOSIS:**

- (AB9) and (AB10) are not connected properly.
- (AB2) and (AB7) are not connected properly.
- (AB3) and (AB8) are not connected properly.
- (AB4), (AB5) and (AB6) are not connected properly to airbag control module.



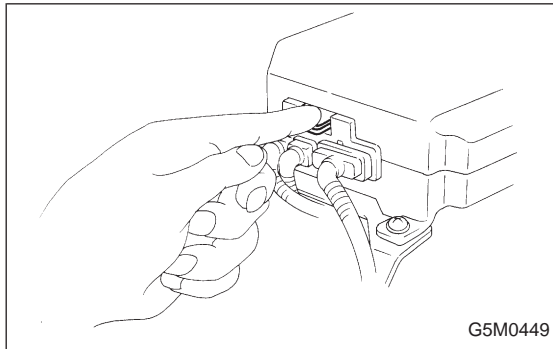
**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



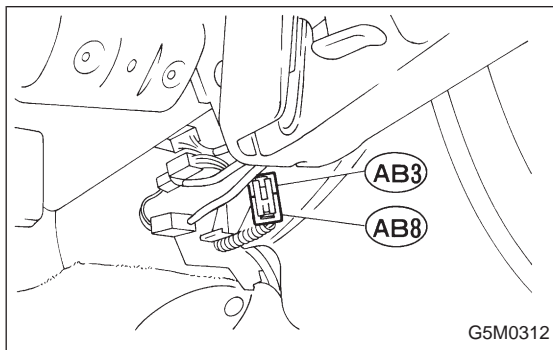
### 1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB9) AND (AB10)

- 1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>
- 2) Check double lock of connectors (AB9) and (AB10).



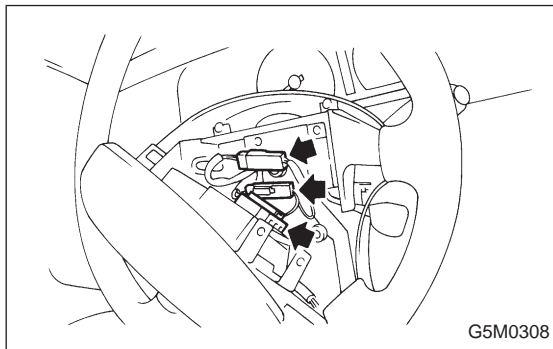
### 2. AIRBAG CONTROL MODULE DOUBLE LOCK INSPECTION AT CONNECTORS (AB4) (AB5) (AB6)

Check double lock of connectors (AB4) (AB5) (AB6) connected to airbag control module. <Ref. to 5-5 [W6A0].>



### 3. 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.



### 4. ROLL CONNECTOR DOUBLE LOCK INSPECTION AT CONNECTORS (AB2) AND (AB7)

Remove driver side airbag module <Ref. to 5-5 [W3A1].>, and check double lock of connectors (AB2) and (AB7) at roll connector.

**H: TROUBLE CODE 21****DIAGNOSIS:**

- Airbag control module is faulty.

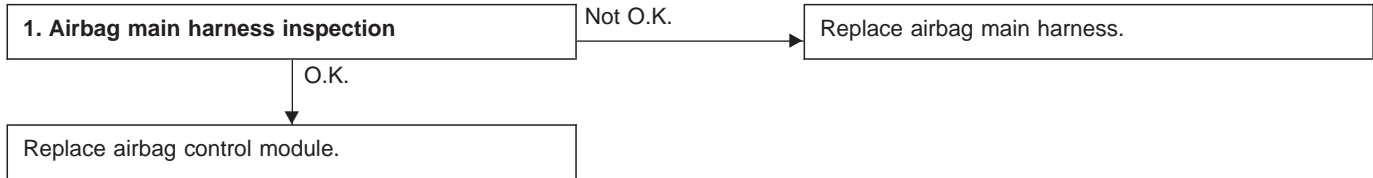
Replace airbag control module.
--------------------------------

**CAUTION:**

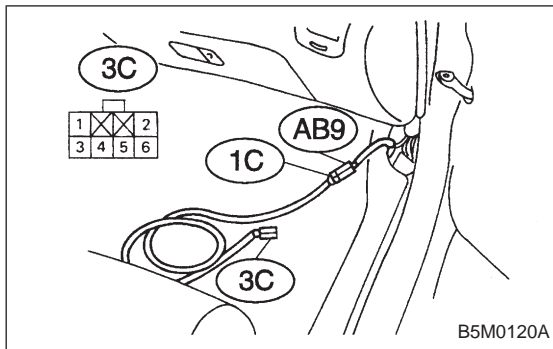
**Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5 [W6A0].>**

**I: TROUBLE CODE 22****DIAGNOSIS:**

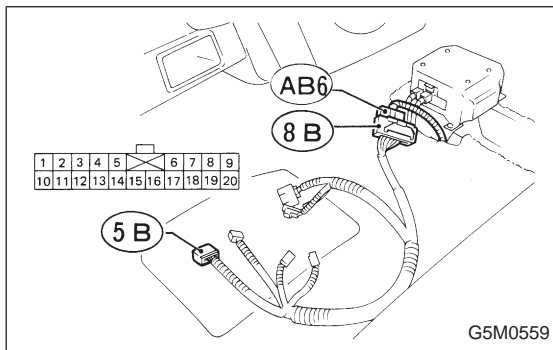
- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.

**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

**1. AIRBAG MAIN HARNESS INSPECTION**

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5 [W6A0].> 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 / Specified resistance:**

(5B) No. 6 — (3C) No. 4 / 10 Ω, or less

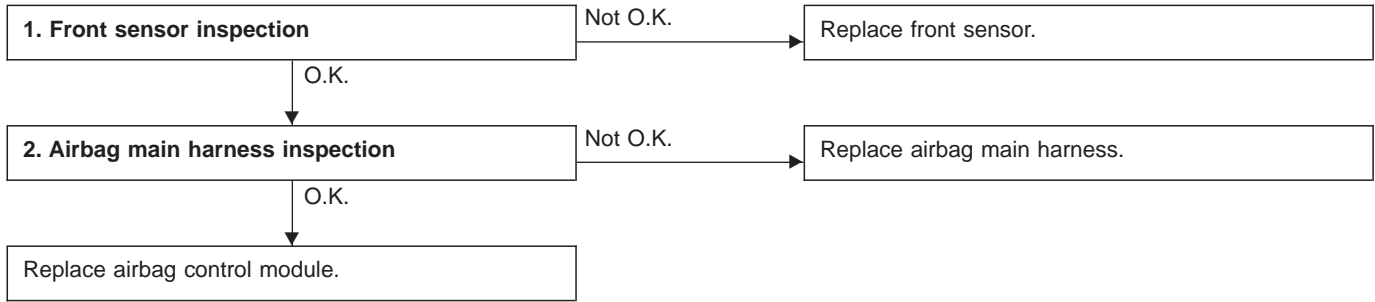
(5B) No. 7 — (3C) No. 3 / 10 Ω, or less



**J: TROUBLE CODE 23**

**DIAGNOSIS:**

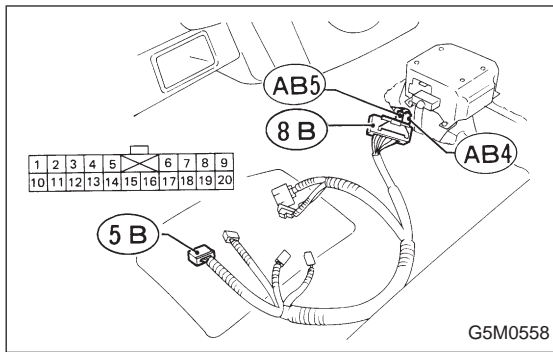
- Airbag main harness is shorted to power supply.
- Front sensor harness is shorted to power supply.
- Airbag module harness (Driver or passenger) is damaged.
- Roll connector is shorted to power supply.
- Airbag control module is faulty.



**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).



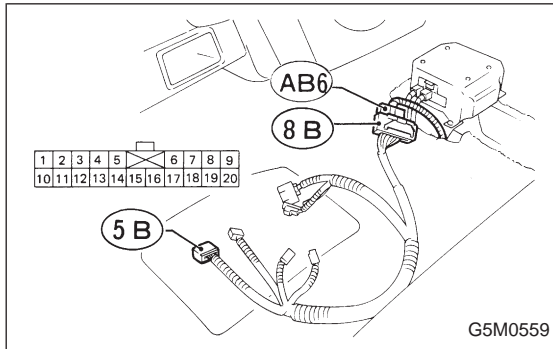
### 1. FRONT SENSOR INSPECTION

- 1) Disconnect connectors (AB4) and (AB5) from airbag control module. <Ref. to 5-5 [W6A0].>
- 2) Connect connectors (AB4) and (AB5) to test harness B2 connector (8B).
- 3) Measure resistance between test harness B2 connector (5B) terminal.

#### **(5B) Terminal / Specified resistance:**

**(RH: AB4): No. 17 — No. 18 / 1.4 — 1.6 k $\Omega$**

**(LH: AB5): No. 15 — No. 16 / 1.4 — 1.6 k $\Omega$**



### 2. AIRBAG MAIN HARNESS INSPECTION

- 1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, 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 body.

#### **(5B) Terminal / Specified voltage:**

**No. 1 — Body / 1 V, or less**

**No. 6 — Body / 1 V, or less**

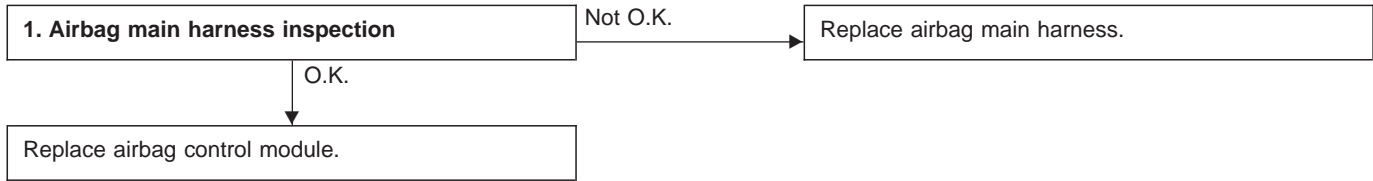
**No. 7 — Body / 1 V, or less**

**No. 14 — Body / 1 V, or less**

**K: TROUBLE CODE 24**

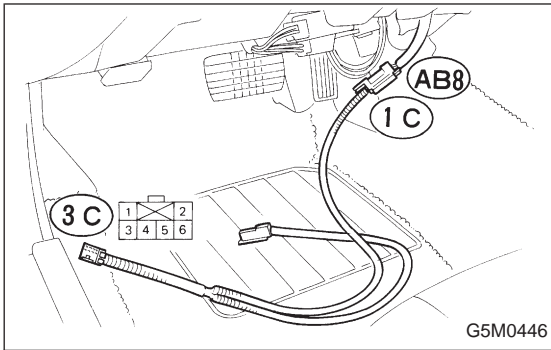
**DIAGNOSIS:**

- Airbag main harness circuit is open.
- Airbag module harness (Driver) circuit is open.
- Roll connector circuit is open.
- Airbag control module is faulty.
- Above diagnosis plus other faulty of airbag modular parts



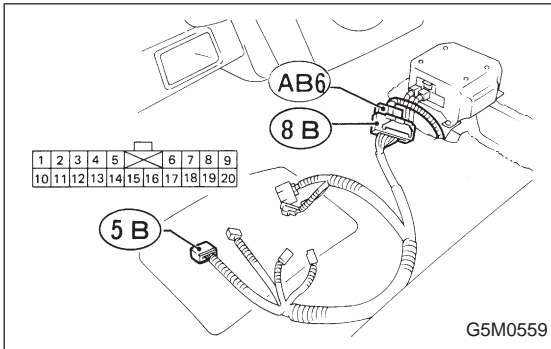
**CAUTION:**

**Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.**



### 1. 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 [W6A0].> 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 / Specified resistance:**

**(5B) No. 14 — (3C) No. 4 / 10 Ω, or less**

**(5B) No. 1 — (3C) No. 3 / 10 Ω, or less**

**L: TROUBLE CODE 31**

**DIAGNOSIS:**

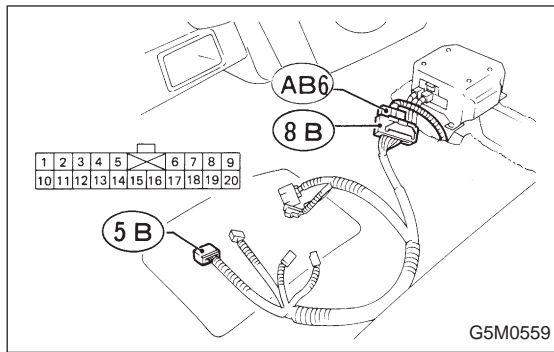
- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 16 is blown.
- Body harness circuit is open.



**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).



### 1. AIRBAG CONTROL MODULE INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

2) Connect battery ground cable and turn ignition switch "ON" (engine off).

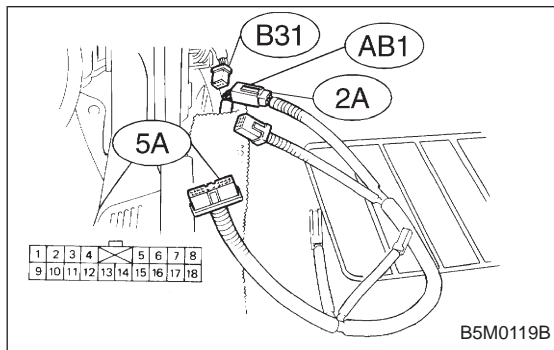
3) Measure voltage across connector (5B) terminal and body.

**(5B) Terminal / Specified voltage:**  
**No. 5 — Body / 10 V, or more**

### 2. AIRBAG MAIN HARNESS INSPECTION

1) Go to step 2) below after performing diagnostics on airbag system as per flowchart under "1. AIRBAG CONTROL MODULE INSPECTION" 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, and connect connector (AB1) to test harness A connector (2A).

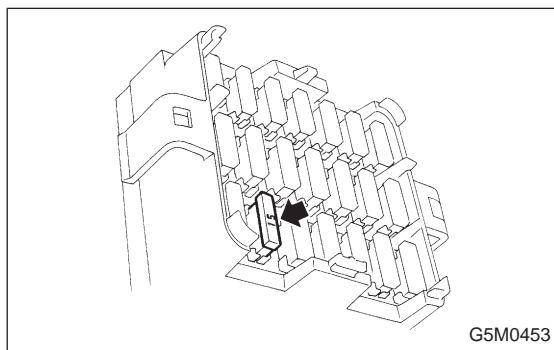
4) Measure resistance between test harness A connector (5A) and test harness B2 connector (5B) terminals.

**Connector & terminal / Specified resistance:**  
**(5A) No. 9 — (5B) No. 5 / 10 Ω, or less**

5) Measure resistance between each terminal of connectors (5A) and (5B) and body.

**(5A) Terminal / Specified resistance:**  
**No. 9 — Body / 10 kΩ, or more**

**(5B) Terminal / Specified resistance:**  
**No. 5 — Body / 10 kΩ, or more**



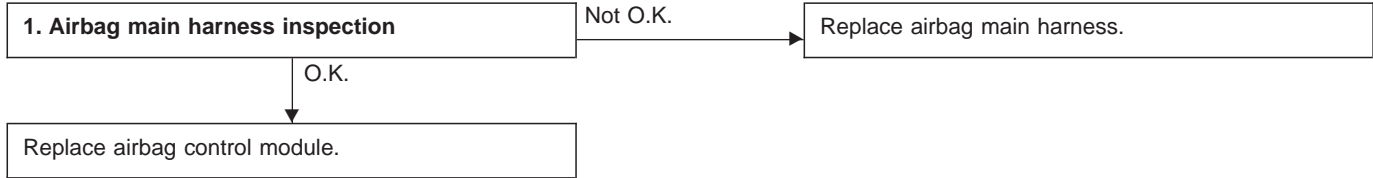
### 3. FUSE No. 16 INSPECTION

Make sure ignition switch is turned "OFF", then remove and visually check fuse No. 16.

**M: TROUBLE CODE 32**

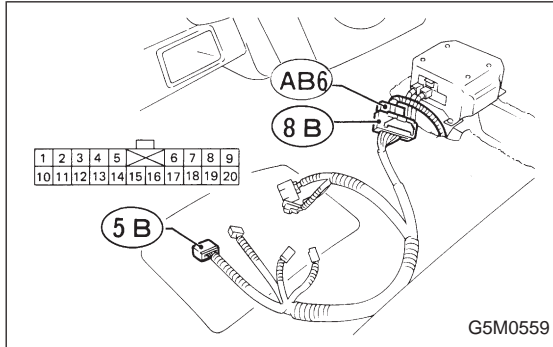
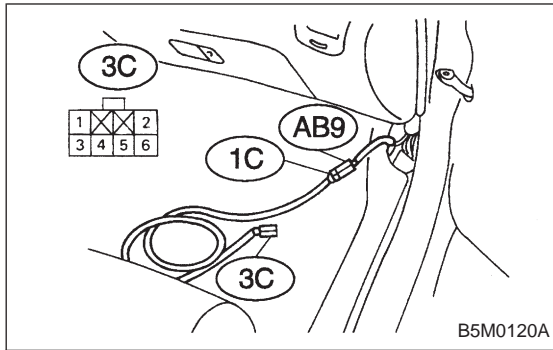
**DIAGNOSIS:**

- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.
- Above diagnosis plus other faulty of airbag modular parts



**CAUTION:**

**Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.**



### 1. AIRBAG MAIN HARNESS INSPECTION

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).

2) Disconnect connector (AB6) <Ref. to 5-5 [W6A0].> 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 / Specified resistance:**

**(5B) No. 6 — (3C) No. 4 / 10 Ω, or less**

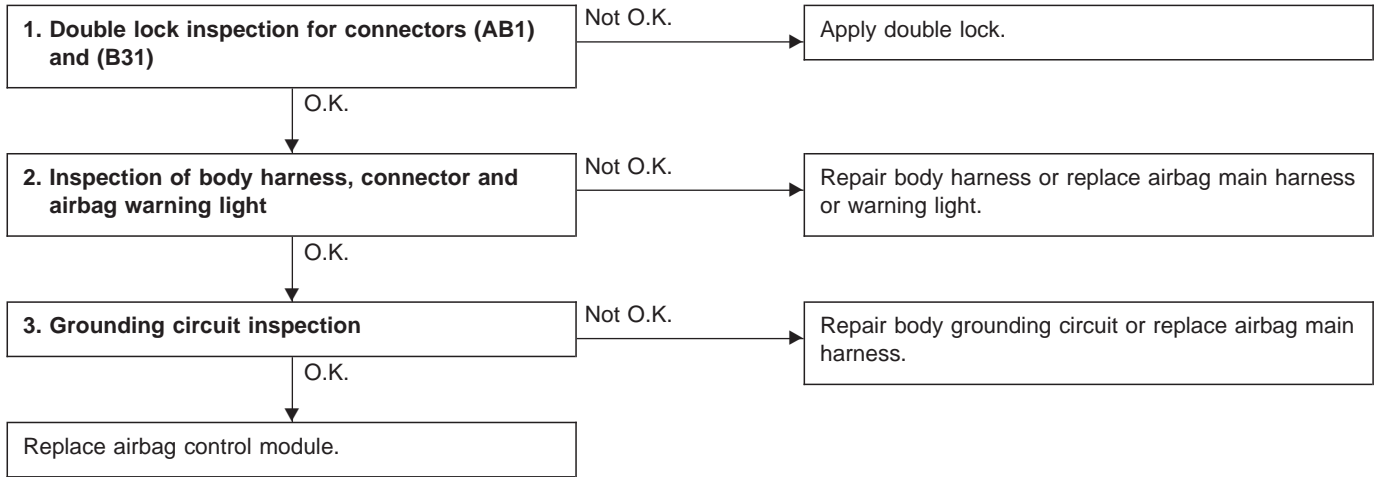
**(5B) No. 7 — (3C) No. 3 / 10 Ω, or less**



**N: AIRBAG WARNING LIGHT REMAINS ON.**

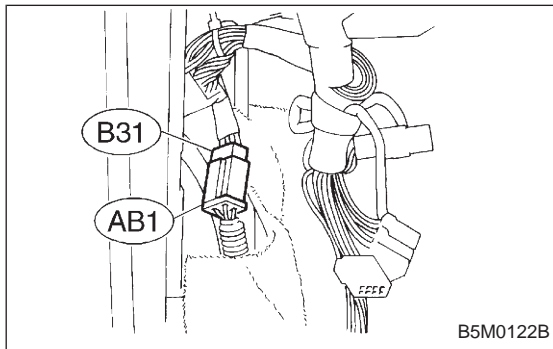
**DIAGNOSIS:**

- 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.



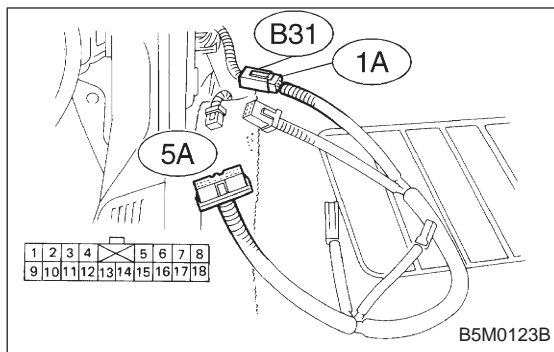
**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



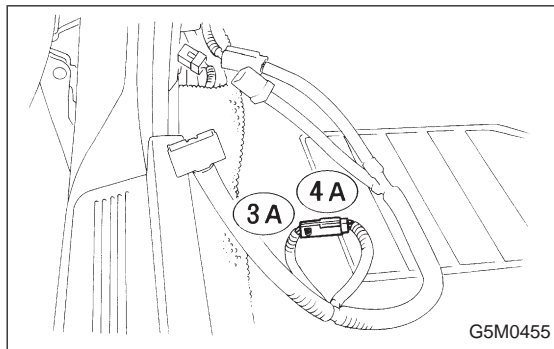
**1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB1) AND (B31)**

- 1) Remove front pillar lower trim (Driver side).
- 2) Check double lock of connectors (AB1) and (B31).

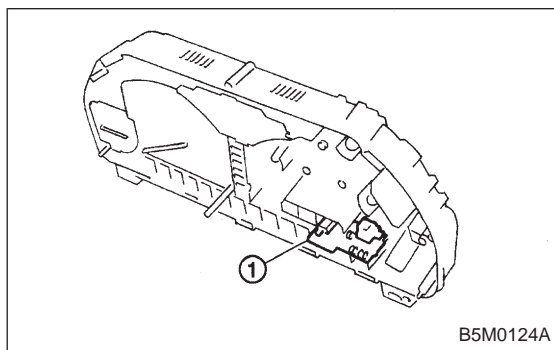


## 2. INSPECTION OF BODY HARNESS, CONNECTOR AND AIRBAG WARNING LIGHT

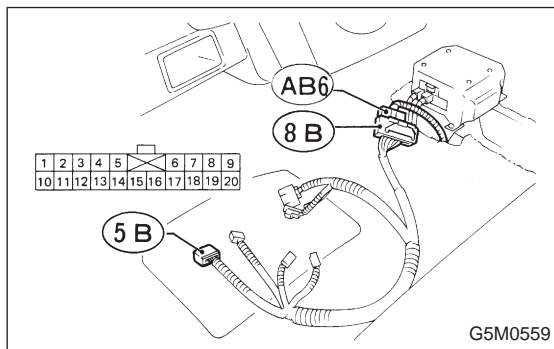
1) Turn ignition switch "OFF" and connect body harness connector (B31) to test connector (1A).



2) Connect battery ground cable and turn ignition switch "ON", (engine off) and connect connectors (3A) and (4A) to check if warning light goes out. If it does, go to step 4) below. If it remains on, check body harness and repair if necessary.

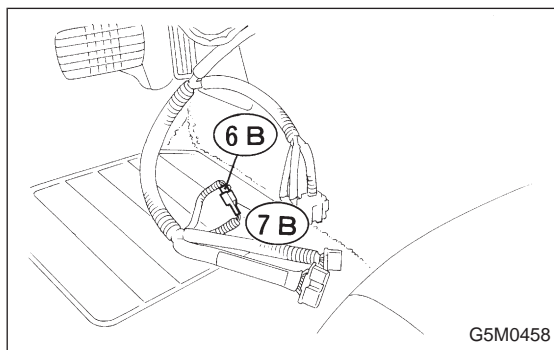


3) If body harness is satisfactory, replace airbag warning light module ①. After problem has been eliminated, disconnect connectors (3A) and (4A).

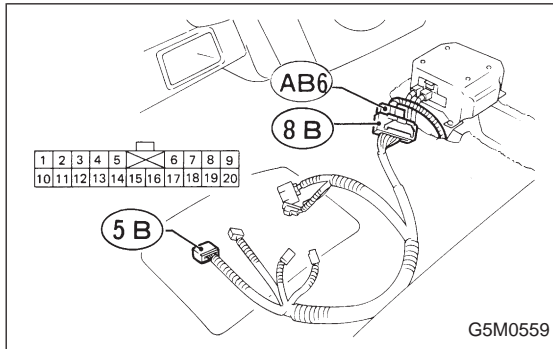
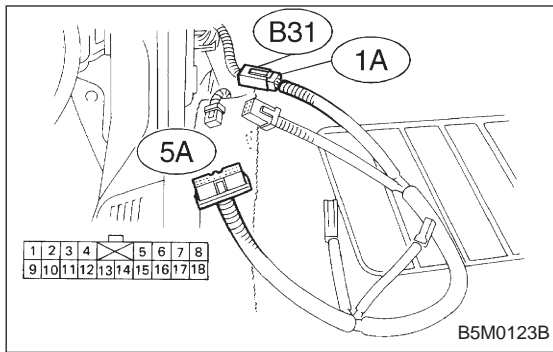


4) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds, and re-connect connectors (AB1) and (B31).

5) Remove instrument panel lower cover and disconnect (AB3) with (AB8), then disconnect connector (AB6) from airbag control module, <Ref. to 5-5 [W6A0].> and connect it to test harness B2 connector (8B).



6) Connect battery ground cable and turn ignition switch "ON," (engine off) and connect connectors (6B) and (7B) to check if warning light goes out. If it does, go to "3. GROUNDING CIRCUIT INSPECTION". If it remains on, replace airbag main harness. After problem has been eliminated, disconnect connectors (6B) and (7B).



**3. GROUNDING CIRCUIT INSPECTION**

1) Turn ignition switch “OFF”, disconnect battery ground cable and then wait at least 20 seconds. Disconnect connector (AB1) from body harness connector (B31), and connect connector (B31) to test harness A connector (1A). Measure resistance between connector (5A) terminal and body.

**(5A) Terminal / Specified resistance:**  
**No. 17 — Body / 10 Ω, or less**  
**No. 18 — Body / 10 Ω, or less**

If resistance is greater than 10 ohms, body grounding circuit is faulty and should be repaired. If resistance is less than 10 ohms, go to step 2) below.

2) Connect connectors (AB1) and (B31). Disconnect connector (AB6) from airbag control module <Ref. to 5-5 [W6A0].>, and connect it to test harness B2 connector (8B).

3) Measure resistance between each test harness B2 connector (5B) terminal and body.

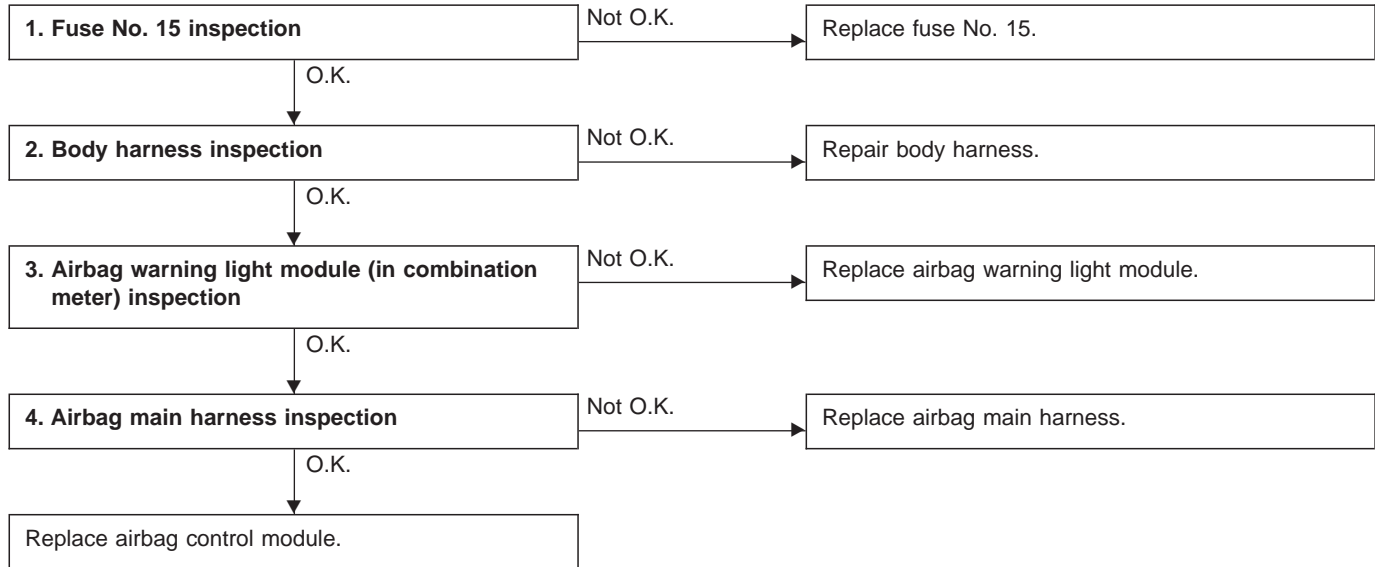
**(5B) Terminal / Specified resistance:**  
**No. 11 — Body / 10 Ω, or less**  
**No. 12 — Body / 10 Ω, or less**

If resistance is greater than 10 ohms, replace airbag main harness.

If resistance is less than 10 ohms, replace airbag control module.

**O: AIRBAG WARNING LIGHT REMAINS OFF.****DIAGNOSIS:**

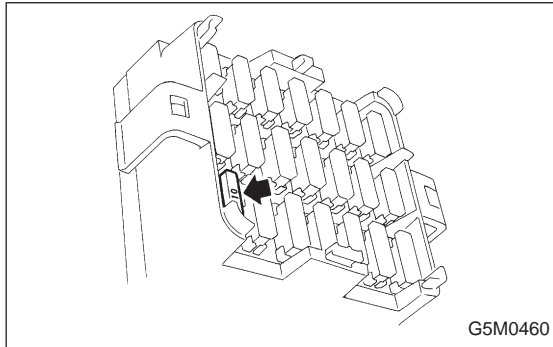
- Fuse No. 15 is blown.
- Body harness circuit is open.
- Airbag warning light is faulty.
- Airbag main harness is faulty.
- Airbag control module is faulty.

**CAUTION:**

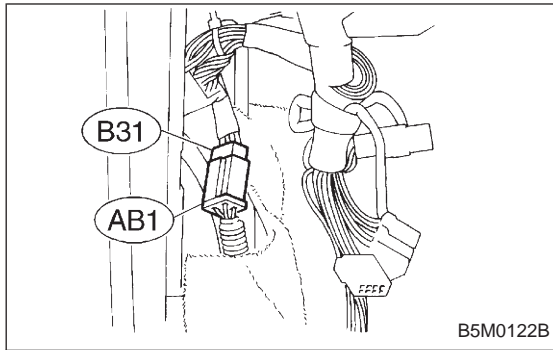
Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds.

**1. FUSE No. 15 INSPECTION**

- 1) Remove and visually check fuse No. 15.
- 2) If fuse is blown, replace it with a new one. After connecting battery cable and turning ignition switch "ON", if it blows again, proceed to "2. BODY HARNESS INSPECTION".

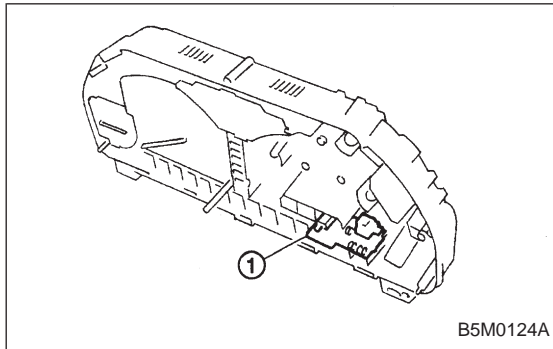
**2. BODY HARNESS INSPECTION**

Turn ignition switch "ON" (engine off) to make sure other warning lights (in combination meter) illuminate. If they do not, check body harness.

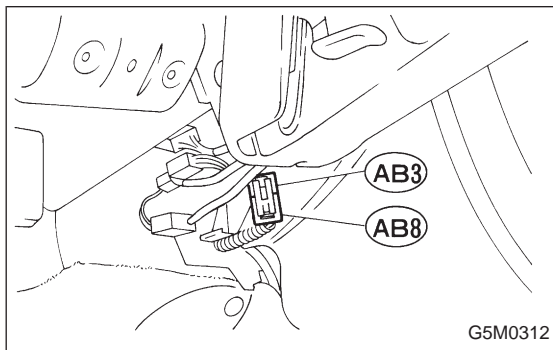


**3. AIRBAG WARNING LIGHT MODULE (IN COMBINATION METER) INSPECTION**

- 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).

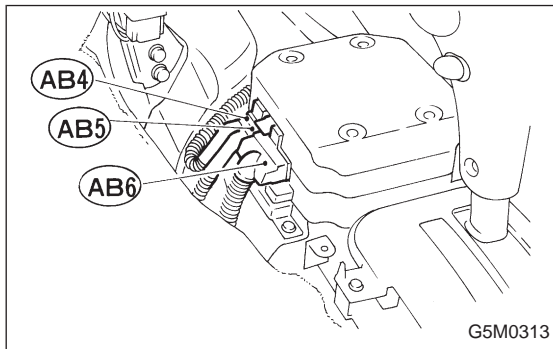


- 3) Connect battery ground cable and turn ignition switch "ON" (engine off) to make sure airbag warning light illuminates.
- If it does not, replace airbag warning light module ①.



**4. 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 [M2-6].>



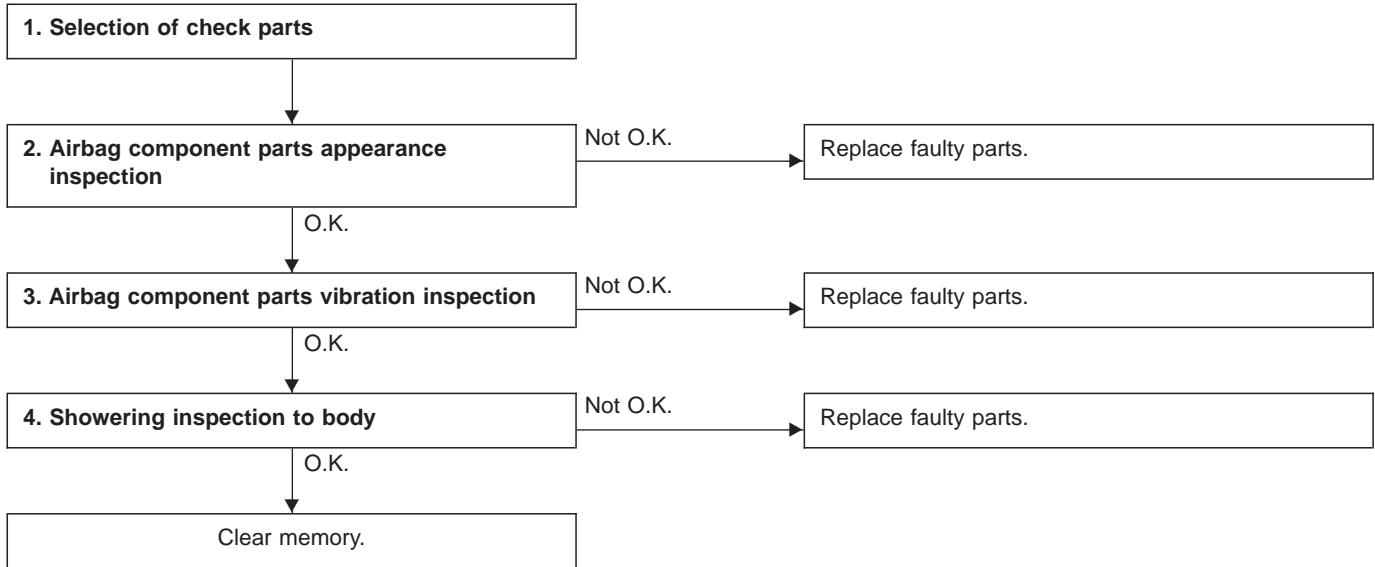
- 4) Disconnect connector (AB6) from airbag control module. <Ref. to 5-5 [W6A0].>
- 5) Connect battery ground cable and turn ignition switch "ON" to make sure airbag warning light illuminates.

**P: 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.**

**1. SELECTION OF CHECK PARTS**

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 5-5:
02	<ul style="list-style-type: none"> <li>● Front sensor (RH, LH)</li> <li>● Airbag main harness</li> <li>● Airbag module (Driver/Passenger)</li> <li>● Roll connector</li> <li>● Airbag control module</li> </ul>	W4A0 W5A0 W3A1—W3A2 W7A0 W6A0
03	<ul style="list-style-type: none"> <li>● Front sensor (RH, LH)</li> <li>● Airbag control module</li> </ul>	W4A0 W6A0
04	<ul style="list-style-type: none"> <li>● Airbag module (Passenger)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A2 W5A0 W6A0
11	<ul style="list-style-type: none"> <li>● Fuse No. 8</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> <li>● Body harness</li> </ul>	T5D3 W5A0 W6A0 —
12	<ul style="list-style-type: none"> <li>● Roll connector</li> <li>● Airbag module (Driver)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W7A0 W3A1 W5A0 W6A0
13	<ul style="list-style-type: none"> <li>● Airbag module (Driver)</li> <li>● Roll connector</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A1 W7A0 W5A0 W6A0
21	<ul style="list-style-type: none"> <li>● Airbag control module</li> </ul>	W6A0
22	<ul style="list-style-type: none"> <li>● Airbag module (Passenger)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A2 W5A0 W6A0
23	<ul style="list-style-type: none"> <li>● Airbag main harness</li> <li>● Roll connector</li> <li>● Airbag module (Driver/Passenger)</li> <li>● Front sensor (RH, LH)</li> <li>● Airbag control module</li> </ul>	W5A0 W7A0 W3A1—W3A2 W4A0 W6A0
24	<ul style="list-style-type: none"> <li>● Airbag module (Driver)</li> <li>● Roll connector</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A1 W7A0 W5A0 W6A0
32	<ul style="list-style-type: none"> <li>● Airbag module (Passenger)</li> <li>● Roll connector</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A2 W7A0 W5A0 W6A0

## 2. AIRBAG COMPONENT PARTS APPEARANCE INSPECTION

Conduct appearance inspection on parts selected.

### NOTE:

Also check connector terminals, wiring harness, case, etc. for damage.

## 3. 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 and front sensor at the same time as erroneous operation may result.**



## 4. SHOWERING INSPECTION TO BODY

- 1) Spray water on vehicle body.

### CAUTION:

**Do not directly spray water on airbag components.**

- 2) Check passenger compartment for traces of leaking.

### NOTE:

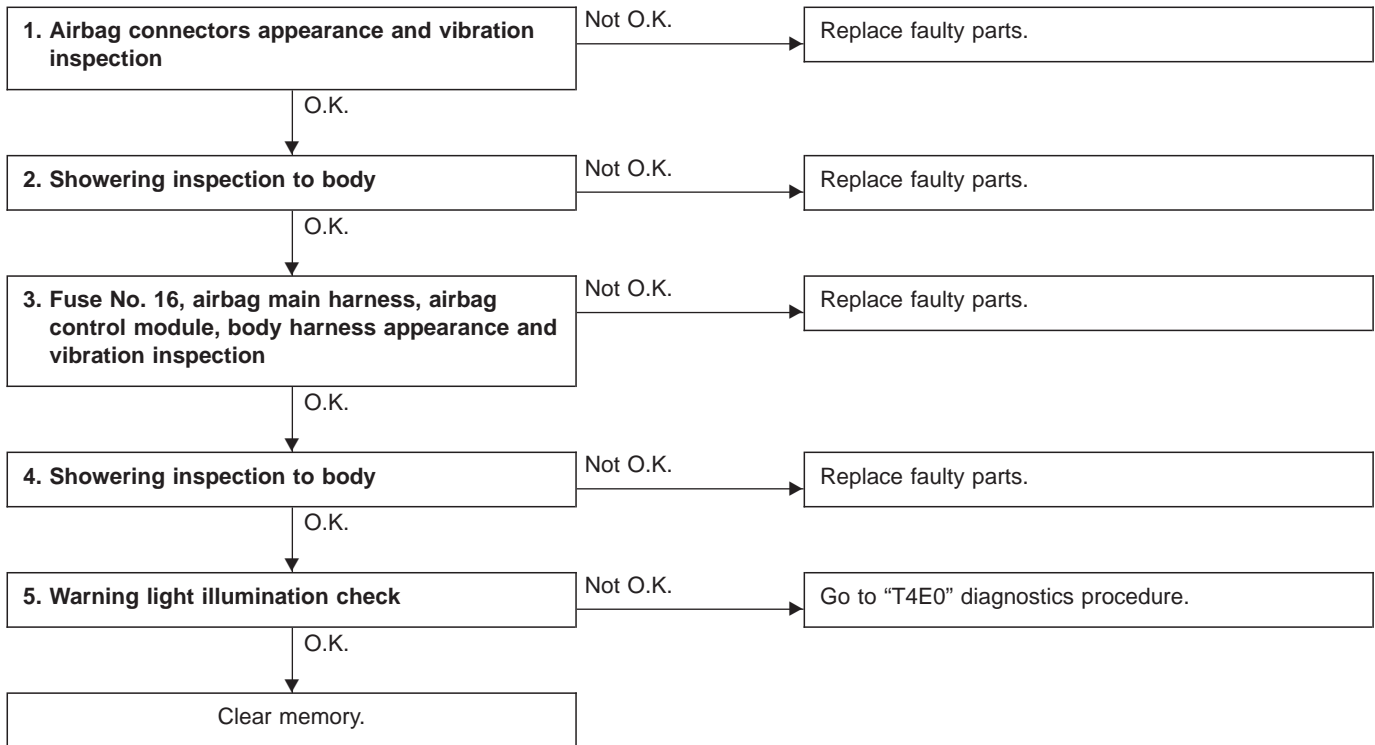
Also check wiring harnesses as water may leak along them and get airbag component parts wet.



**Q: 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.**

**1. AIRBAG CONNECTORS APPEARANCE AND VIBRATION INSPECTION**

1) Conduct appearance inspection on airbag connectors (AB2 through AB8). <Ref. to 5-5 [T100].>

**NOTE:**

Check terminals, case and wiring harnesses for damage.

2) Conduct vibration inspection on airbag connectors (AB2 through AB8). <Ref. to 5-5 [T100].>

**NOTE:**

Gently shake each airbag connector.



## 2. SHOWERING INSPECTION TO BODY

- 1) Spray water on vehicle body.

### CAUTION:

**Do not directly spray water on airbag components.**

- 2) Check passenger compartment for traces of leaking.

### NOTE:

If leaks are noted, also check wiring harnesses as water may leak along them and wet airbag connectors.

## 3. FUSE No. 16, AIRBAG MAIN HARNESS, AIRBAG CONTROL MODULE, BODY HARNESS APPEARANCE AND VIBRATION INSPECTION

- 1) Conduct appearance inspection on fuse No. 16 <Ref. to 5-5 [T5L3].>, airbag main harness <Ref. to 5-5 [W5A0].>, airbag control module <Ref. to 5-5 [W6A0].> and body harness.

### NOTE:

Also check connectors, terminals, wiring harness and case for damage.

- 2) Conduct vibration inspection on fuse No. 16, airbag main harness, airbag control module and body harness.

### NOTE:

Gently shake each part.



## 4. SHOWERING INSPECTION TO BODY

- 1) Spray water on vehicle body.

### CAUTION:

**Do not directly spray water on each part.**

- 2) Check passenger compartment for traces of leaking.

### NOTE:

If leaks are noted, check wiring harnesses as water may leak along them and get parts wet.

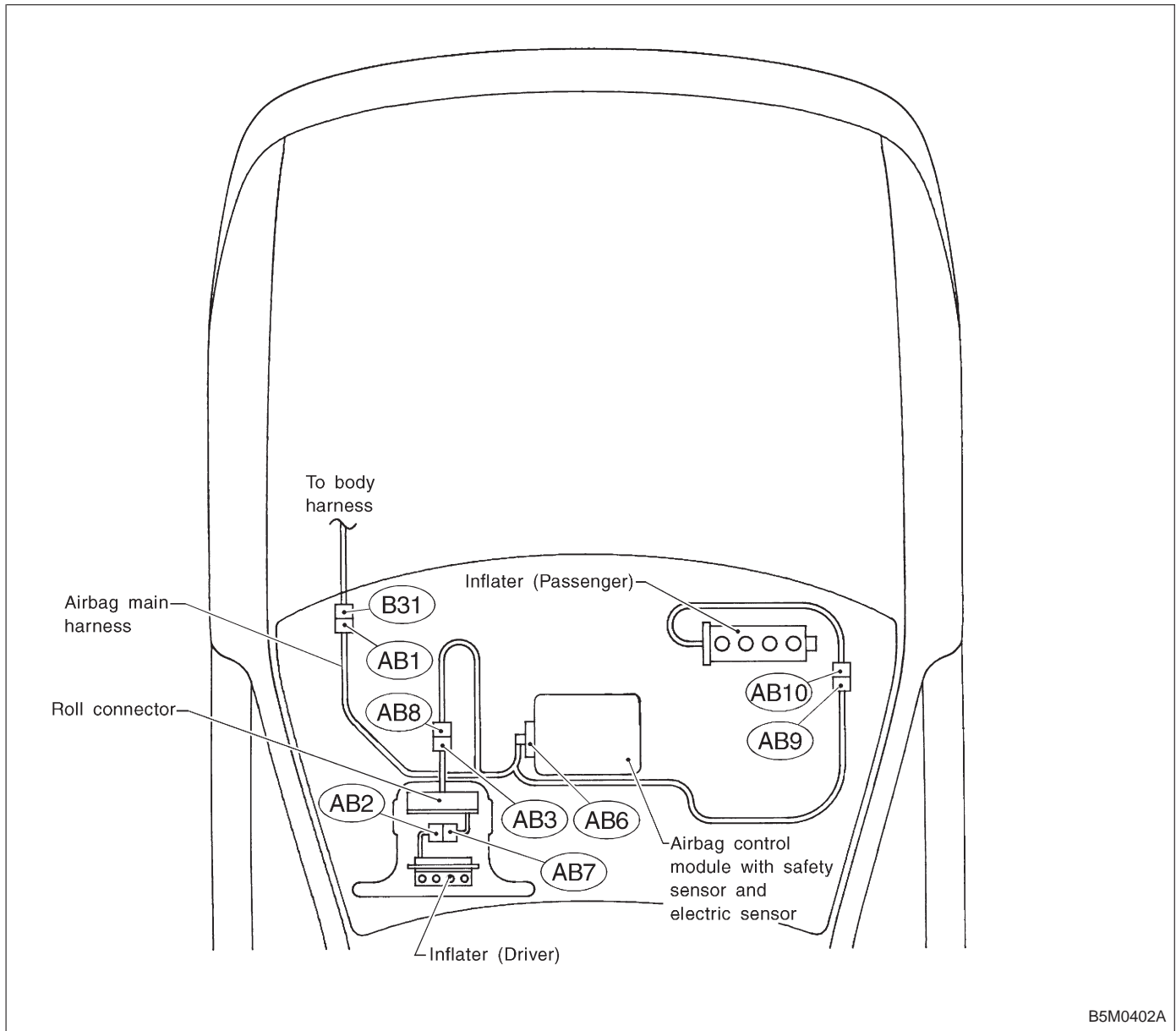
## 5. WARNING LIGHT ILLUMINATION CHECK

Turn ignition switch "ON" (engine off) and observe airbag warning light.

Airbag warning light comes "ON" for 8 seconds then goes out and stays out.

# 1. Electrical Components Location

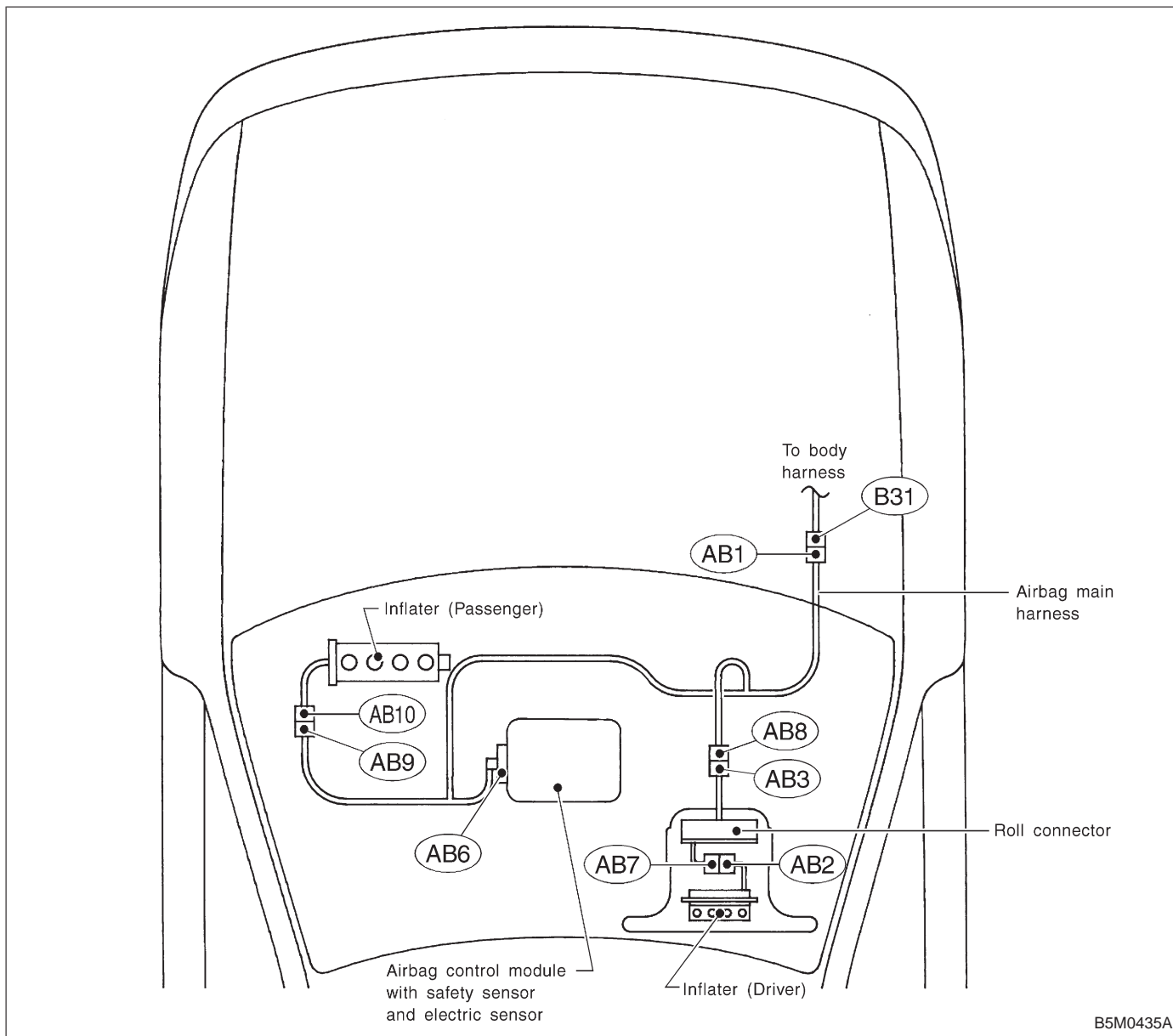
## 1. LHD MODEL



B5M0402A

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

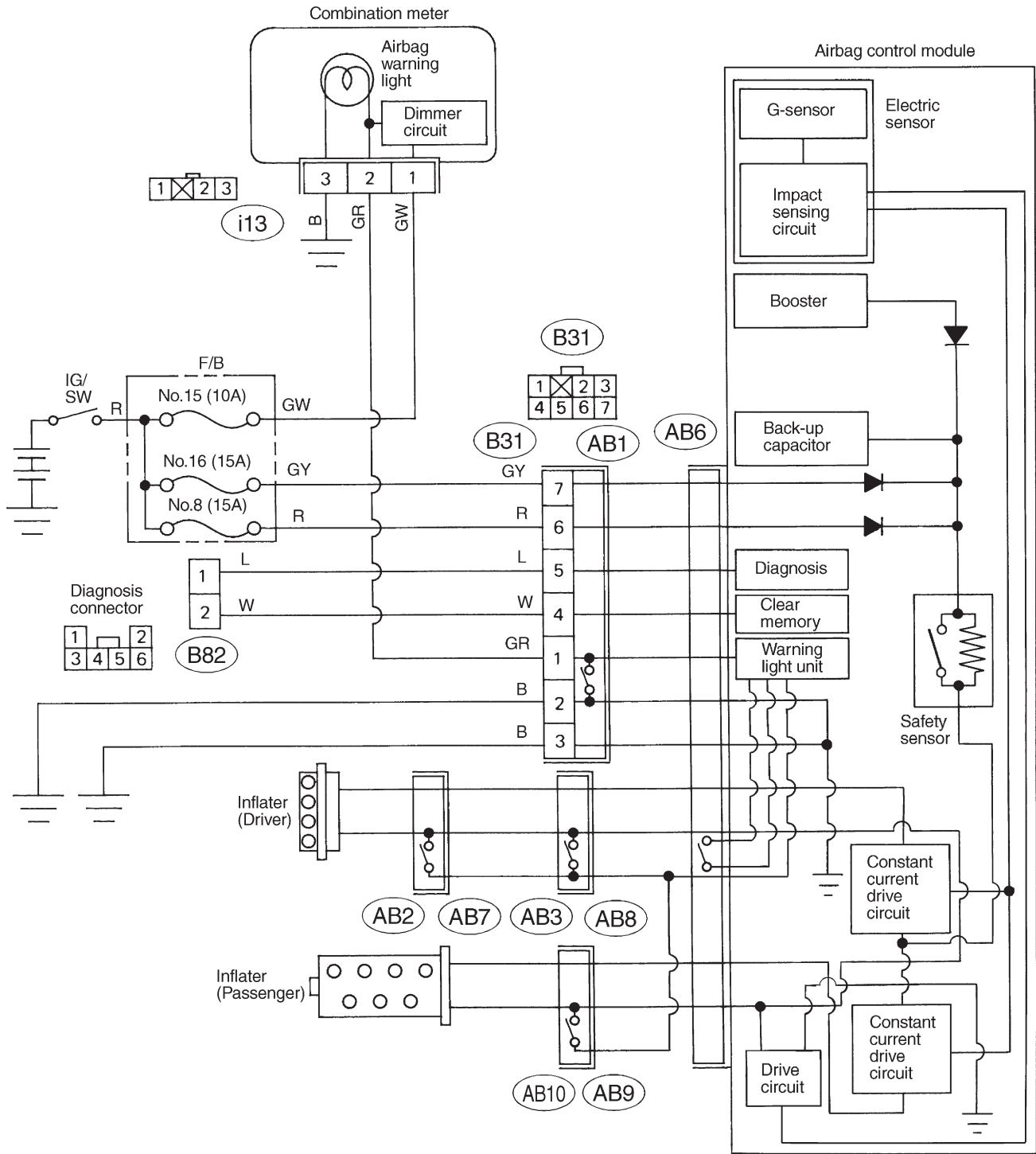
2. RHD MODEL



B5M0435A

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



B5M0403A

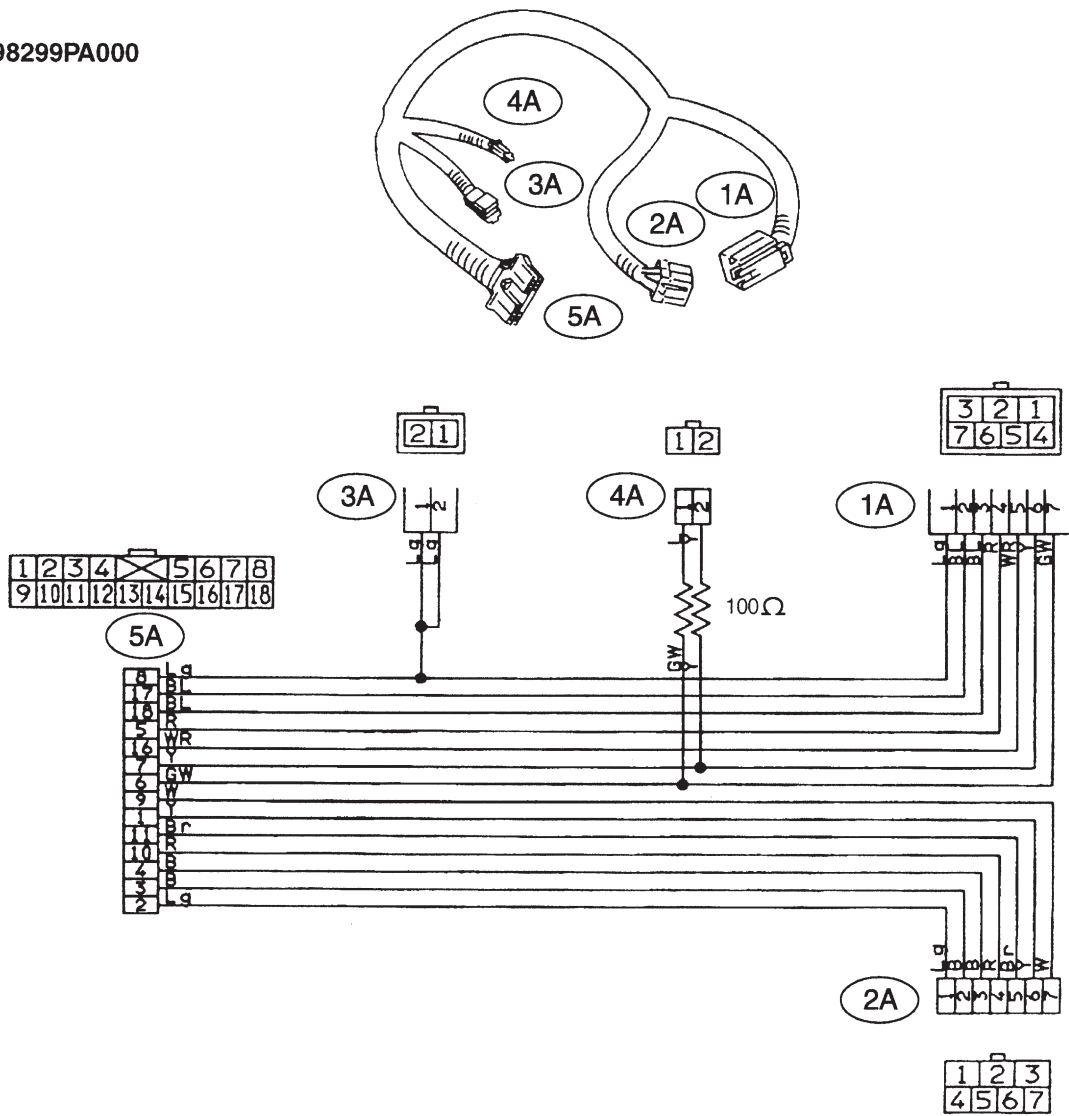
### 3. Tools for Diagnostics

**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**

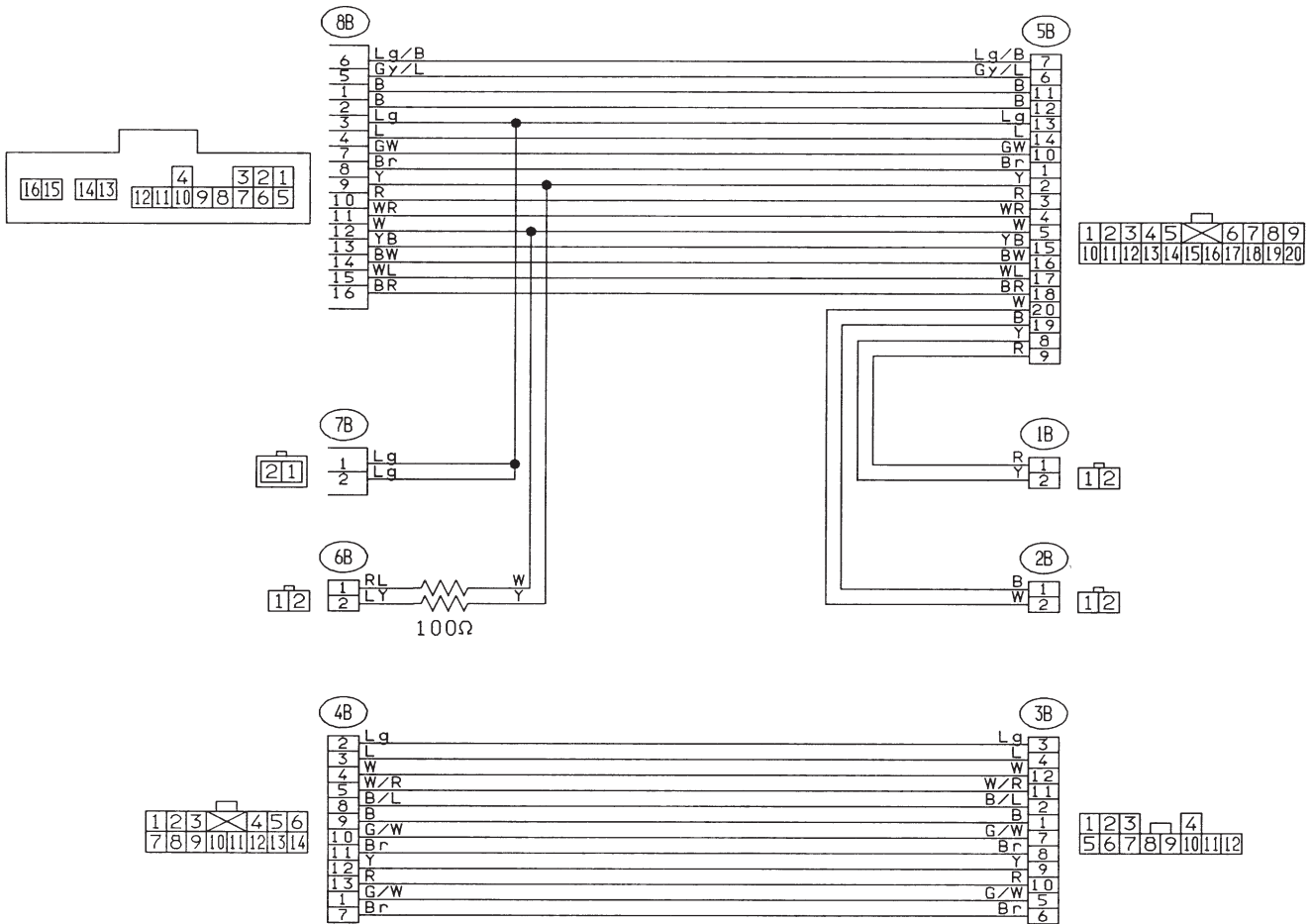
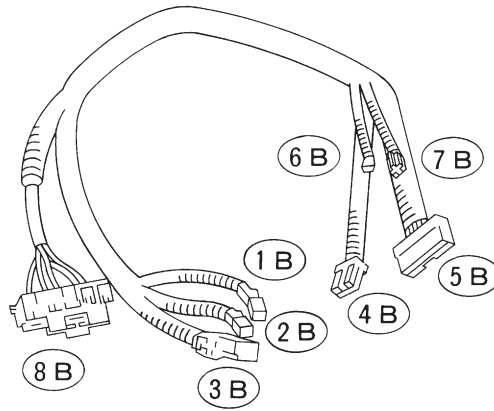
PN 98299PA000



B5M0112A

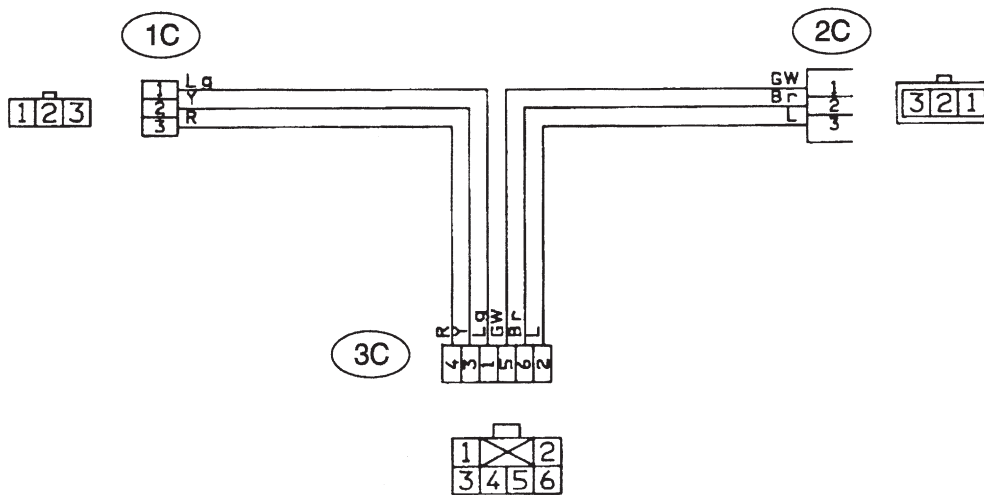
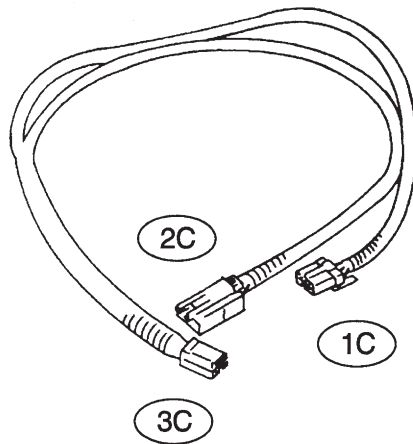
B: TEST HARNESS B2

PN 98299PA011



C: TEST HARNESS C

PN 98299PA020

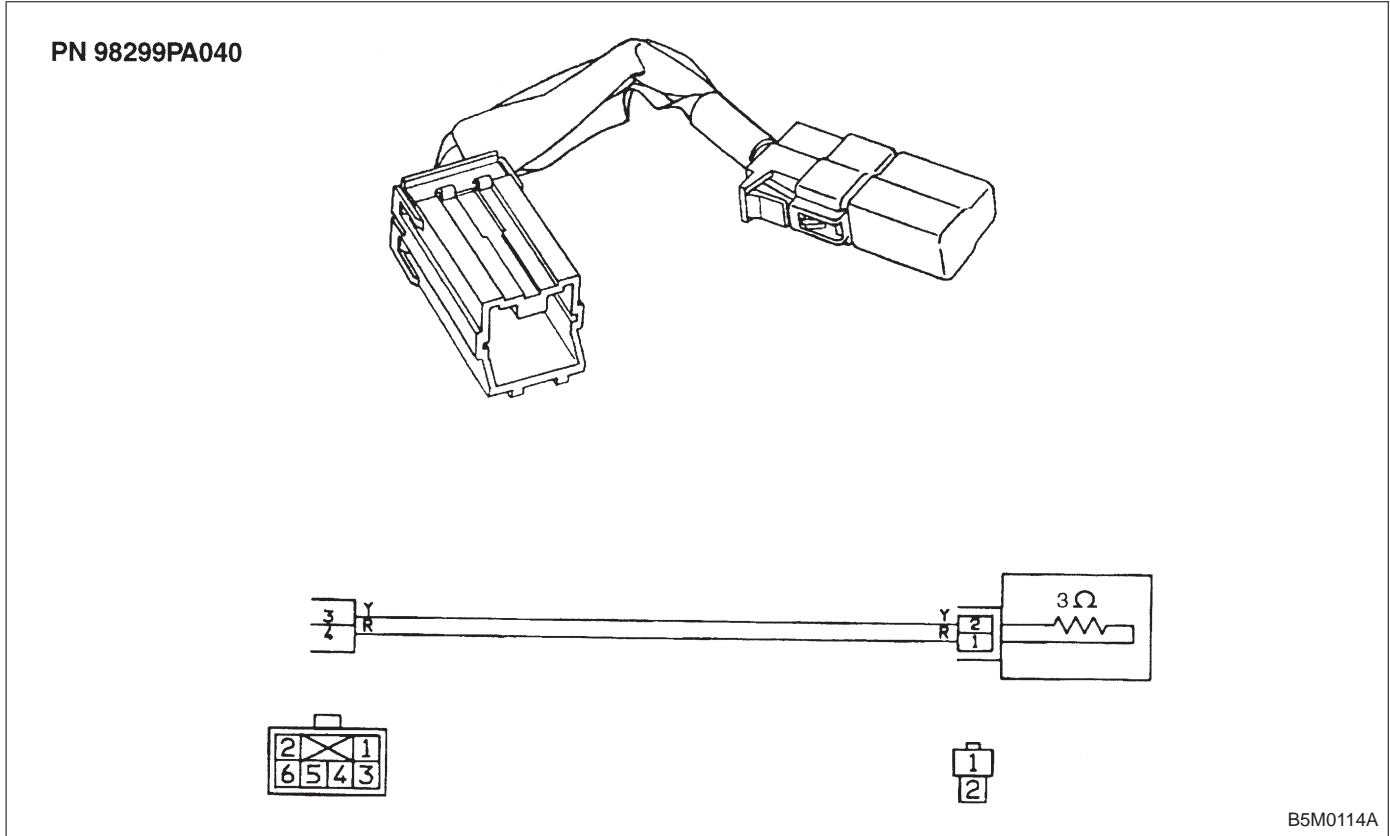


B5M0113A



### D: AIRBAG RESISTOR

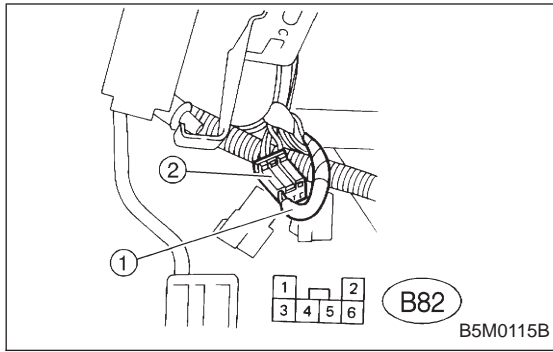
The airbag resistor is used during diagnostics. The airbag resistor has the same resistance as the airbag module and thus provides safety when used instead of the airbag module. It also makes it possible to finish, diagnostics in less time.



## 4. Diagnostics Chart for On-board Diagnostic System

### A: BASIC DIAGNOSTICS PROCEDURE

1) Airbag warning light comes "ON".
2) Turn ignition switch to "ON", (engine "OFF") and observe airbag warning light.
3) If airbag warning light stays "ON" after 8 seconds or remains "OFF", or comes back "ON" after 30 seconds, this indicates a current problem. Proceed to step 8). If airbag warning light comes "ON" for 8 seconds, then goes out and stays out, this indicates normal system operation at this time. Check the memory for intermittent problems by performing the procedure outlined in 5-5b [T4B0] "ON-BOARD DIAGNOSTICS". Proceed to step 4).
4) If trouble code indicated, <Ref. to 5-5b [T4D1] — [T4D2].> proceed to step 5). If normal code indicated, <Ref. to 5-5b [T4D2].> proceed to step 6).
5) Repair and replacement, <Ref. to 5-5b [T5P1].> proceed to step 7).
6) Repair and replacement, <Ref. to 5-5b [T5Q1].> proceed to step 7).
7) Turn ignition switch "ON", (engine "OFF") and observe airbag warning light. If airbag warning light stays "ON" after 8 seconds or comes back "ON" after 30 seconds, proceed to step 8). If airbag warning light comes "ON" for 8 seconds, then goes out and stays out, proceed to step 9).
8) Repair and replacement. <Ref. to 5-5b [T4E0].> Proceed to step 10).
9) Clear memory. <Ref. to 5-5b [T4C0].> Proceed to step 10).
10) END

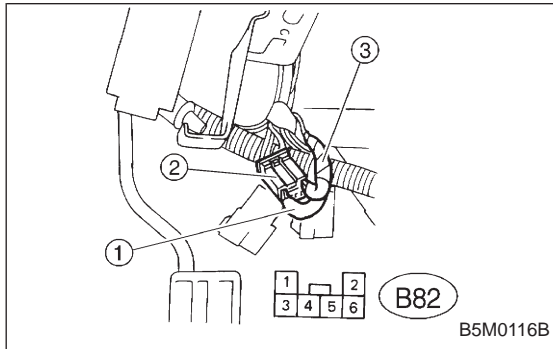


## B: ON-BOARD DIAGNOSTIC

When the airbag system is in functioning condition, the airbag warning light will remain on for 8 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 ① to No. 1 terminal of diagnosis connector ② located below 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:

Make sure ignition switch is ON (and engine off). Connect one DIAG. terminal ① on diagnosis connector ② terminal No. 1.

While warning light is flashing, connect the other DIAG. terminal ③ on terminal No. 2 for at least three seconds.

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.

After clear memory and then DIAG. terminals ① and ③, extract from diagnosis connector ②.

**D: LIST OF TROUBLE CODES**

**1. TROUBLE CODES**

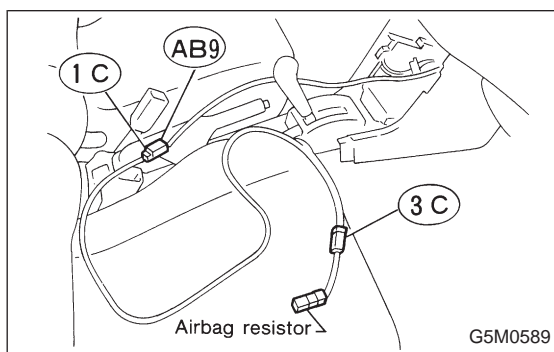
Trouble code/Contents of troubles	Memory function	Contents of diagnosis	Page
04	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Ps) circuit is shorted. 3) Airbag control module is faulty.	16
11	Provided.	1) Airbag control module is faulty. 2) Airbag main harness circuit is open. 3) Fuse No. 8 is blown. 4) Body harness circuit is open.	17
12	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Dr) circuit is open. 3) Roll connector circuit is open. 4) Airbag control module is faulty.	20
13	Provided.	1) Airbag main harness circuit is shorted. 2) Airbag module harness (Dr) is shorted. 3) Roll connector circuit is shorted. 4) Airbag control module is faulty.	21
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.	22
21	Provided.	Airbag control module is faulty.	24
22	Provided.	1) Airbag main harness circuit is open. 2) Airbag module harness (Ps) circuit is open. 3) Airbag control module is faulty.	25
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.	26
33	Provided.	Airbag module is inflated.	28
34	Provided.	1) Airbag main harness circuit (Ps) is shorted to power supply. 2) Airbag module harness (Ps) is shorted to power supply. 3) Airbag control module is faulty.	29
41	Provided.	1) Airbag main harness circuit (Dr) is shorted to ground. 2) Airbag module harness circuit (Dr) is shorted to ground. 3) Roll connector circuit is shorted to ground. 4) Airbag control module is faulty.	30
42	Provided.	1) Airbag main harness circuit (Ps) is shorted to ground. 2) Airbag module harness circuit (Ps) is shorted to ground. 3) Airbag control module is faulty.	31
43	Provided.	1) Airbag main harness circuit (Dr) is shorted to power supply. 2) Airbag module harness (Dr) is shorted to power supply. 3) Roll connector is shorted to power supply. 4) Airbag control module is faulty.	32



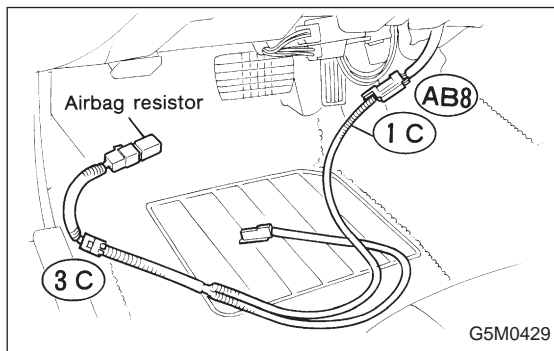
**E: DIAGNOSTICS PROCEDURE**

**1. AIRBAG WARNING LIGHT STAYS ON AFTER 8 SECONDS.**

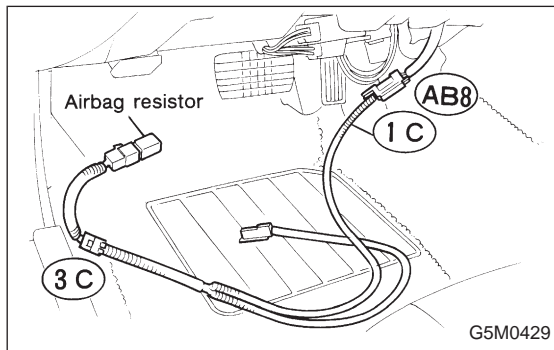
- 1) Perform on-board diagnostic. <Ref. to 5-5b [T4B0].>
- 2) Are trouble codes 4, 12, 13, 22, 34, 41, 42 or 43 indicated? <Ref. to 5-5b [T4D1]—[T4D2].>  
Record trouble codes. If “YES” proceed to step 4). If “NO” proceed to step 3).
- 3) Proceed with diagnostics and repair according to trouble code indicated then perform step 15).
- 4) If codes 4, 22, 34, 42 are indicated, proceed to step 5). If codes 4, 22, 34, 42 are not indicated, proceed to step 10).
- 5) If codes 12, 13, 41, 43 are indicated, proceed to step 6). If codes 12, 13, 41, 43 are not indicated, proceed to step 11).



6) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5b [W3A2].> Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C). 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). Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds?

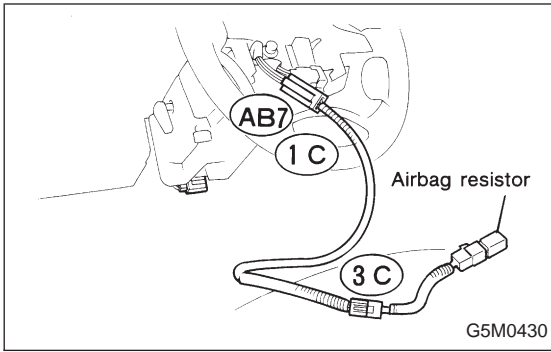


See “NOTE:”.  
If “YES” proceed to step 7).  
If “NO” proceed to step 3).



7) Turn ignition switch “OFF”, disconnect battery ground cable, and wait 20 seconds. Connect passenger side airbag module connector (AB9) to (AB10). Connect battery ground cable and turn ignition switch “ON”. Does airbag warning light go “OFF” after 8 seconds and remain off for more than 30 seconds?

See “NOTE:”.  
If “YES” proceed to step 8).  
If “NO” proceed to step 13).



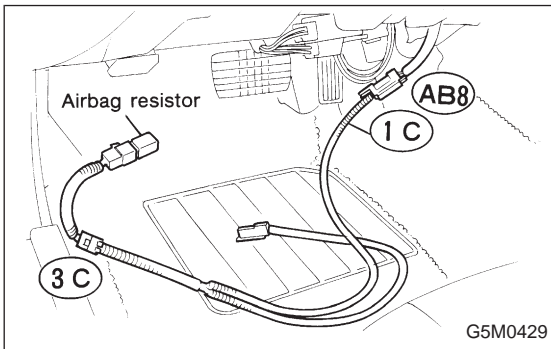
8) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Connect connector (AB8) to (AB3). Remove driver side airbag module and connect test harness C connector (1C) to (AB7). <Ref. to 5-5b [W3A1].> Connect airbag resistor to test harness C connector (3C). Connect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds?

See "NOTE:".

If "YES" proceed to step 9).

If "NO" proceed to step 14).

9) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Replace with a new driver side airbag module. <Ref. to 5-5b [W3A1].> Proceed to step 15).



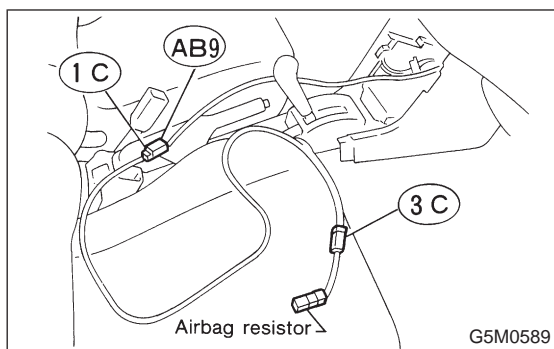
10) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Remove lower cover panel and connect test harness C connector (1C) to (AB8) <Ref. to 5-4 [W1A0].> with airbag resistor attached to test harness C connector (3C).

Connect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds?

See "NOTE:".

If "YES" proceed to step 8).

If "NO" proceed to step 3).



11) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Disconnect passenger side airbag module connector (AB9) to (AB10). <Ref. to 5-5b [W3A2].>

Connect test harness C connector (1C) to (AB9). Connect airbag resistor to test harness C connector (3C).

Connect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds?

See "NOTE:".

If "YES" proceed to step 12).

If "NO" proceed to step 3).

12) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Replace with a new passenger side airbag module <Ref. to 5-5b [W3A2].> then proceed to step 15).

13) Turn ignition switch "OFF", disconnect battery ground cable and wait 20 seconds. Replace with a new passenger side airbag module <Ref. to 5-5b [W3A2].> then proceed to step 7).

14) Turn ignition switch "OFF", disconnect battery ground cable, and wait 20 seconds. Replace with a new combination switch, <Ref. to 5-5b [W6A0].> and install driver side airbag module <Ref. to 5-5b [W3B0].>.

Connect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds?

See "NOTE:".

If "YES" proceed to step 16).

If "NO" proceed to step 9).

15) Connect battery ground cable and turn ignition switch "ON". Does airbag warning light go "OFF" after 8 seconds and remain off for more than 30 seconds? See "NOTE:".

If "YES" proceed to step 16).

If "NO" proceed to step 1).

16) Perform clear memory procedure. <Ref. to 5-5b [T4C0].>

If memory cannot be cleared, another trouble code exists. Return to step 1).

If memory can be cleared, proceed to step 17).

17) END

NOTE:

- Always remember to secure the green double locks before turning the ignition switch "ON".

- In some cases the airbag warning light will go "OFF" after 8 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

<Ref. to 5-5b [T4D1].>

### A: TROUBLE CODE 04

#### DIAGNOSIS:

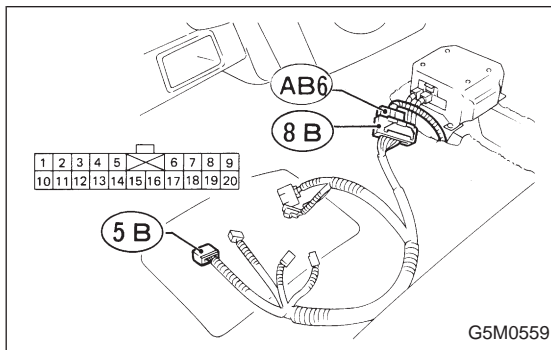
- Airbag main harness circuit is shorted.
- Airbag module harness (Passenger) circuit is shorted.
- Airbag control module is faulty.

#### 1. Airbag main harness inspection

#### 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).



#### 1. AIRBAG MAIN HARNESS INSPECTION

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminal.

**CHECK** : **Connector & terminal**  
**(5B) No. 6 — (5B) No. 7:**  
**Is resistance more than 10 kΩ?**

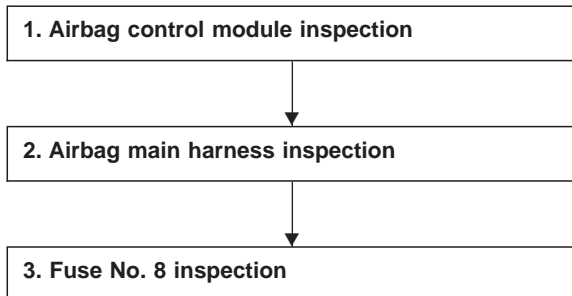
**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.

**B: TROUBLE CODE 11**

**DIAGNOSIS:**

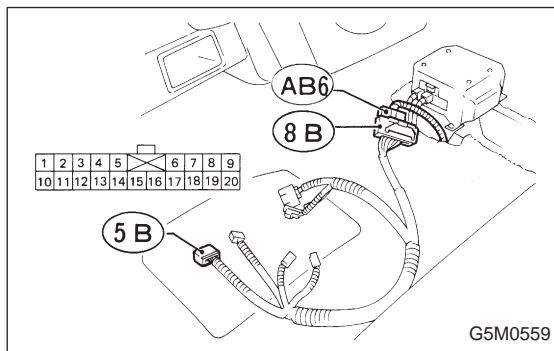
- Airbag control module is faulty.
- Airbag main harness circuit is open.
- Fuse No. 8 is blown.
- Body harness circuit is open.



**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).



**1. AIRBAG CONTROL MODULE INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [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.

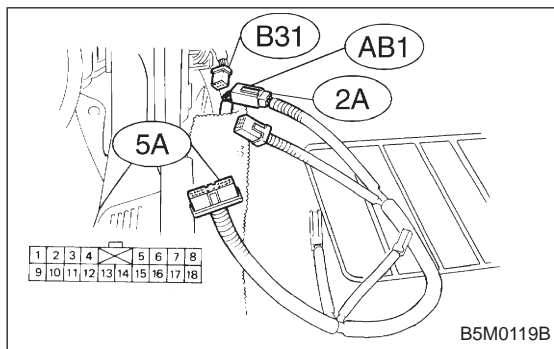
**CHECK** : **Connector & terminal (5B) No. 2 (+) — Chassis ground (-): Is voltage more than 10 V?**

**YES** : Replace airbag control module.

**NO** : Go to step 2.

## 2. AIRBAG MAIN HARNESS INSPECTION

- 1) Go to step 2) below after performing diagnostics on air-bag system as per diagnosis procedure under "1. AIR BAG CONTROL MODULE INSPECTION" previously outlined.
- 2) Turn ignition switch "OFF", disconnect battery ground terminal and then wait at least 20 seconds.



- 3) Disconnect body harness connector (B31) from connector (AB1) at front lower pillar, and connect connector (AB1) to test harness A connector (2A).

- 4) Measure resistance between test harness A connector (5A) terminal and test harness B2 connector (5B) terminal.

**CHECK** : **Connector & terminal**  
**(5A) No. 1 — (5B) No. 2:**  
**Is resistance less than 10 Ω?**

**YES** : Go to step 5).

**NO** : Replace airbag main harness.

- 5) Measure resistance between (5A) and (5B) connector terminals and chassis ground.

**CHECK** : **Connector & terminal**  
**(5A) No. 1 (+) — Chassis ground (-):**  
**Is resistance more than 10 kΩ?**

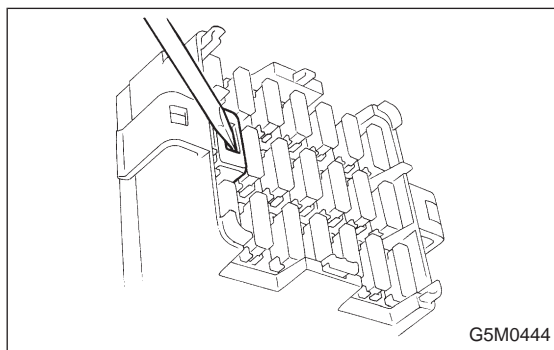
**YES** : Go to next **CHECK** .

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal**  
**(5B) No. 2 (+) — Chassis ground (-):**  
**Is resistance more than 10 kΩ?**

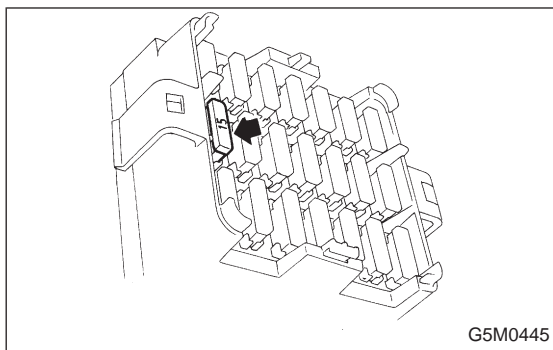
**YES** : Go to step 3.

**NO** : Replace airbag main harness.



## 3. 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.

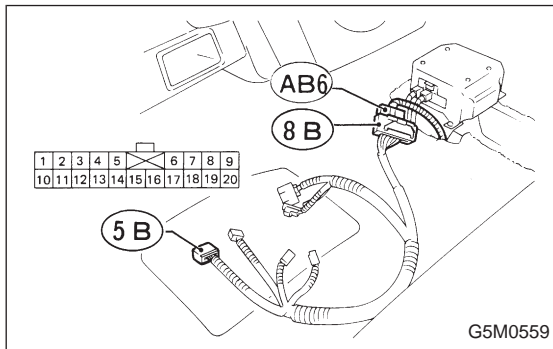
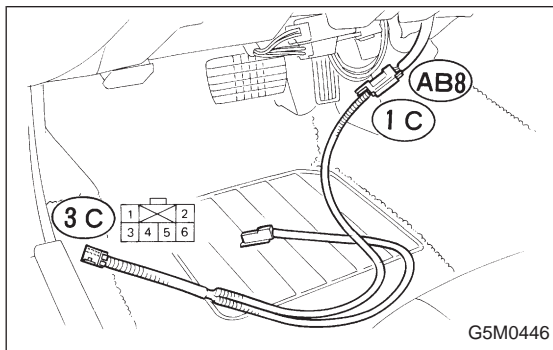
**NO** : Repair body harness.

**C: 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.

**1. Airbag main harness inspection****CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.

**1. 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 5-5b [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.

**CHECK** : **Connector & terminal**  
**(5B) No. 14 — (3C) No. 4:**  
**Is resistance less than 10 Ω?**

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

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal**  
**(5B) No. 1 — (3C) No. 3:**  
**Is resistance less than 10 Ω?**

**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.

**D: TROUBLE CODE 13**

**DIAGNOSIS:**

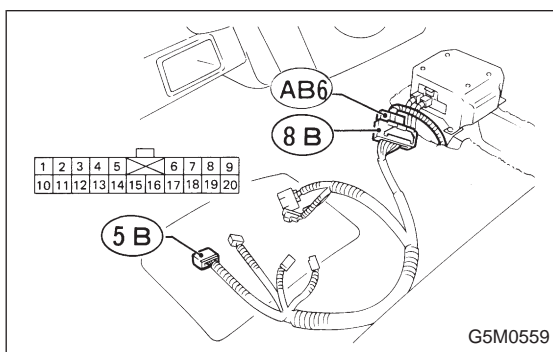
- Airbag main harness circuit is shorted.
- Airbag module harness (Driver) is shorted.
- Roll connector circuit is shorted.
- Airbag control module is faulty.

1. Airbag main harness inspection

**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).



**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminal.

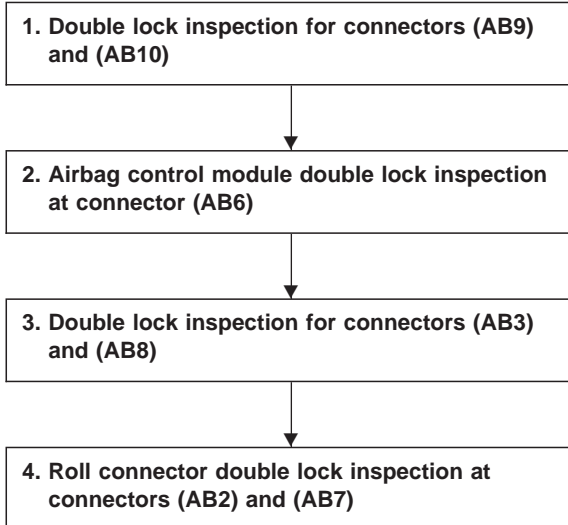
**CHECK** : *Connector & terminal (5B) No. 1 — (5B) No. 14: Is resistance more than 10 kΩ?*

**YES** : Replace airbag control module.

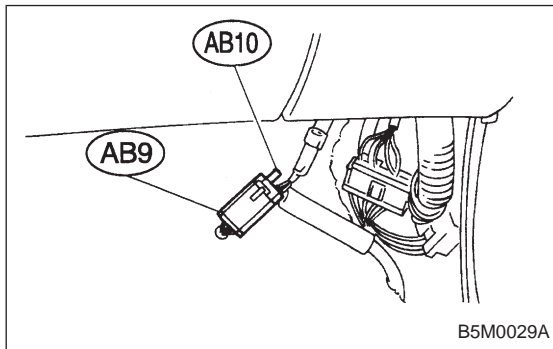
**NO** : Replace airbag main harness.

**E: 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.

**1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB9) AND (AB10)**

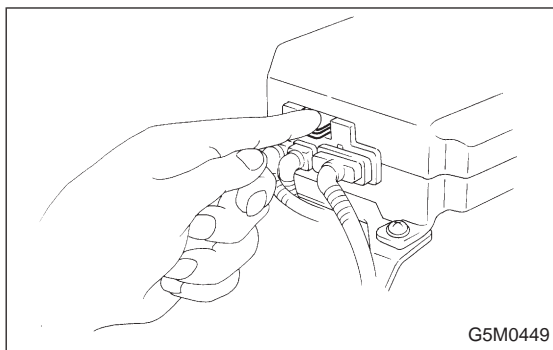
1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>

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 2.



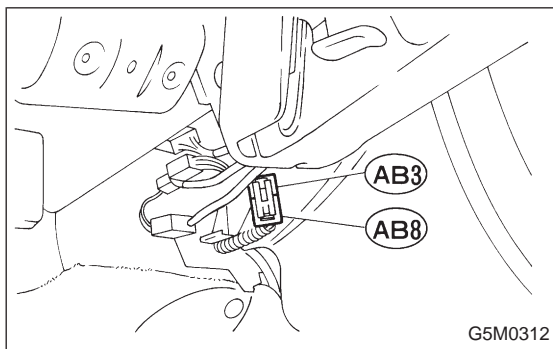
**2. AIRBAG CONTROL MODULE DOUBLE LOCK INSPECTION AT CONNECTOR (AB6)**

Check double lock of connector (AB6) connected to airbag control module. <Ref. to 5-5b [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 3.



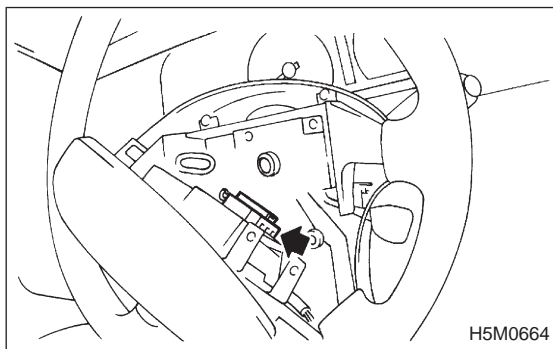
**3. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB3) AND (AB8)**

- 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 4.



**4. ROLL CONNECTOR DOUBLE LOCK INSPECTION AT CONNECTORS (AB2) AND (AB7)**

Remove driver side airbag module <Ref. to 5-5b [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.



**F: TROUBLE CODE 21****DIAGNOSIS:**

- Airbag control module is faulty.

1. Check if trouble code 21 is indicated.

**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5b [W5A0].>

**1. CHECK IF TROUBLE CODE 21 IS INDICATED.**

Confirm flashing trouble code according to 5-5b [T4A0] "BASIC DIAGNOSTICS PROCEDURE".

**CHECK** : *Is airbag warning light trouble code 21 indicated?*

**YES** : Replace airbag control module.

**NO** : Clear memory.

**G: TROUBLE CODE 22**

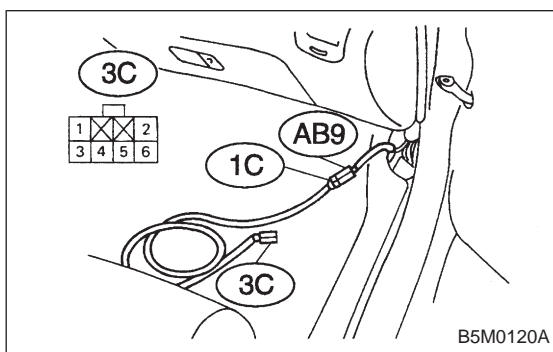
**DIAGNOSIS:**

- Airbag main harness circuit is open.
- Airbag module harness (Passenger) circuit is open.
- Airbag control module is faulty.

**1. Airbag main harness inspection**

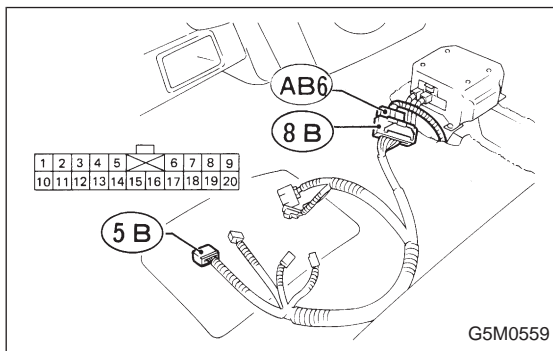
**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds.



**1. AIRBAG MAIN HARNESS INSPECTION**

1) Remove front pillar lower trim (Passenger side). <Ref. to 5-3 [W5A1].>, disconnect connector (AB9) and (AB10) and connect connector (AB9) to test harness C connector (1C).



2) Disconnect connector (AB6) <Ref. to 5-5b [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.

**CHECK** : **Connector & terminal (5B) No. 6 — (3C) No. 4: Is resistance less than 10 Ω?**

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

**NO** : Replace airbag main harness.

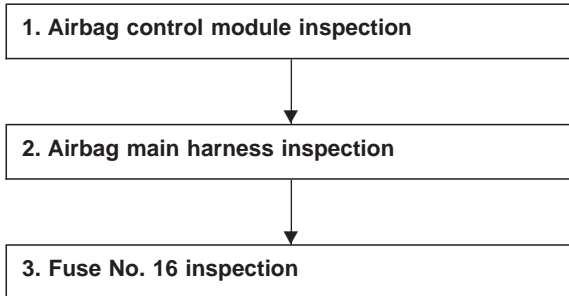
**CHECK** : **Connector & terminal (5B) No. 7 — (3C) No. 3: Is resistance less than 10 Ω?**

**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.

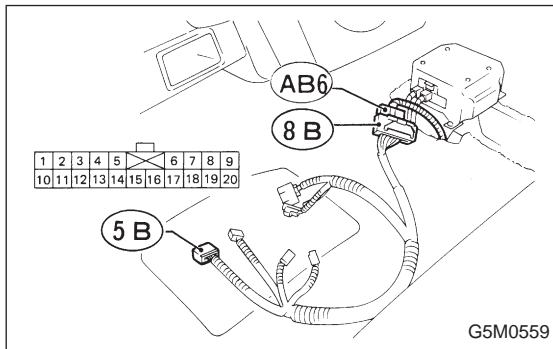
**H: TROUBLE CODE 31****DIAGNOSIS:**

- 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).

**1. AIRBAG CONTROL MODULE INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [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.

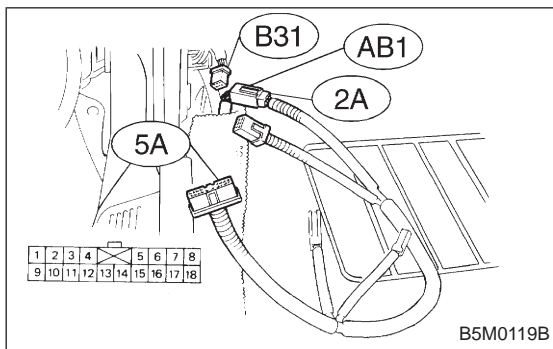
**CHECK** : **Connector & terminal (5B) No. 5 (+) — Chassis ground (-): Is voltage more than 10 V?**

**YES** : Replace airbag control module.

**NO** : Go to step 2.

**2. AIRBAG MAIN HARNESS INSPECTION**

- 1) Go to step 2) below after performing diagnostics on air-bag system as per diagnosis procedure under "1. AIRBAG CONTROL MODULE INSPECTION" 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.

**CHECK** : **Connector & terminal (5A) No. 9 — (5B) No. 5:**  
**Is resistance less than 10 Ω?**

**YES** : Go to step 5).

**NO** : Replace airbag main harness.

- 5) Measure resistance between each terminal of connectors (5A) and (5B) and chassis ground.

**CHECK** : **Connector & terminal (5A) No. 9 (+) — Chassis ground (-):**

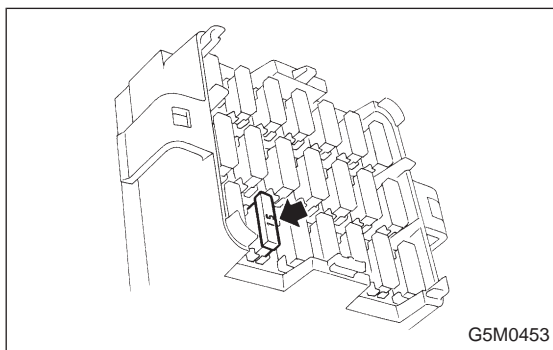
**YES** : Go to next **CHECK** .

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal (5B) No. 5 (+) — Chassis ground (-):**  
**Is resistance more than 10 kΩ?**

**YES** : Go to step 3.

**NO** : Replace airbag main harness.



**3. 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.

**I: TROUBLE CODE 33****DIAGNOSIS:**

- Airbag module is inflated.

1. Check if trouble code 33 is indicated.

**CAUTION:**

Before performing diagnostics on airbag system, turn ignition switch "OFF", disconnect battery ground terminal, and then wait at least 20 seconds. <Ref. to 5-5b [W5A0].>

**1. CHECK IF TROUBLE CODE 33 IS INDICATED.**

Confirm flashing trouble code according to 5-5b [T4A0] "BASIC DIAGNOSTICS PROCEDURE".

**CHECK** : *Is airbag warning light trouble code 33 indicated?*

**YES** : Replace airbag control module.

**NO** : Clear memory.

**J: TROUBLE CODE 34**

**DIAGNOSIS:**

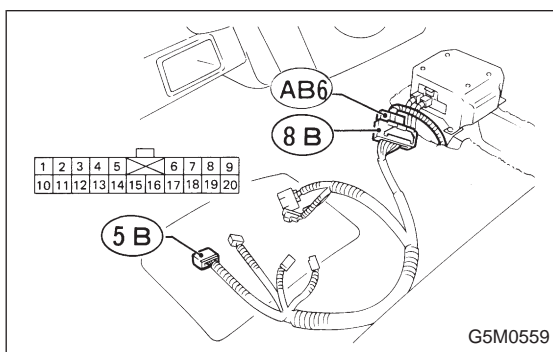
- Airbag main harness circuit (Passenger) is shorted to power supply.
- Airbag module harness (Passenger) is shorted to power supply.
- Airbag control module is faulty.

1. Airbag main harness inspection

**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).



**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [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.

**CHECK** : **Connector & terminal (5B) No. 6 (+) — Chassis ground (-): Is voltage less than 1 V?**

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

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal (5B) No. 7 (+) — Chassis ground (-): Is voltage less than 1 V?**

**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.

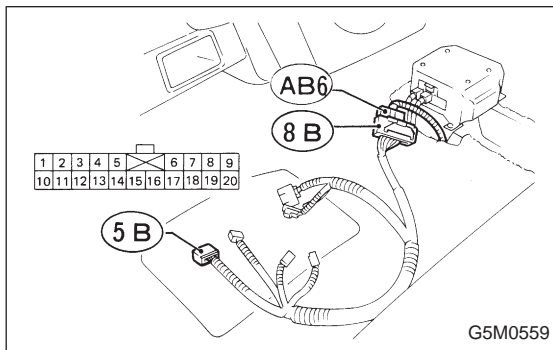
**K: TROUBLE CODE 41****DIAGNOSIS:**

- 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.

**1. Airbag main harness inspection****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).

**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

**CHECK** : **Connector & terminal (5B) No. 1 (+) — Chassis ground (-): Is resistance more than 200 Ω?**

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

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal (5B) No. 14 (+) — Chassis ground (-): Is resistance more than 200 Ω?**

**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.

**L: TROUBLE CODE 42**

**DIAGNOSIS:**

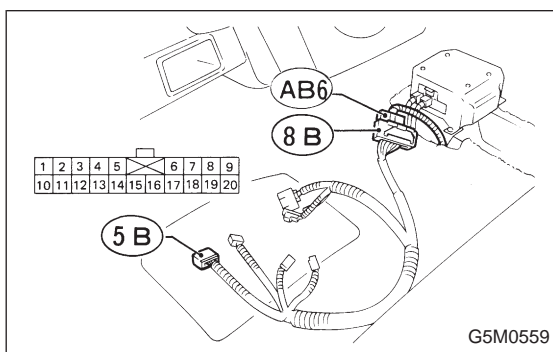
- Airbag main harness circuit (Passenger) is shorted to ground.
- Airbag module harness circuit (Passenger) is shorted to ground.
- Airbag control module is faulty.

**1. Airbag main harness inspection**

**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).



**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

2) Measure resistance between test harness B2 connector (5B) terminals and chassis ground.

**CHECK** : **Connector & terminal (5B) No. 6 (+) — Chassis ground (-): Is resistance more than 200 Ω?**

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

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal (5B) No. 7 (+) — Chassis ground (-): Is resistance more than 200 Ω?**

**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.



**M: TROUBLE CODE 43****DIAGNOSIS:**

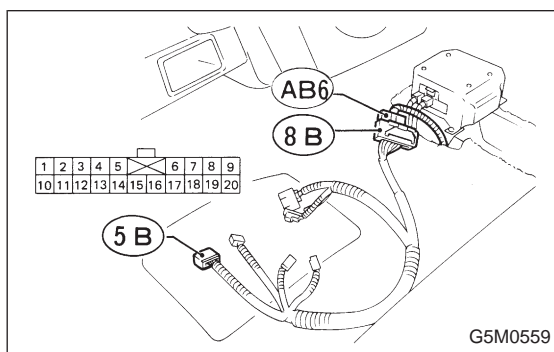
- Airbag main harness circuit (Driver) is shorted to power supply.
- Airbag module harness (Driver) is shorted to power supply.
- Roll connector is shorted to power supply.
- Airbag control module is faulty.

## 1. Airbag main harness inspection

**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).

**1. AIRBAG MAIN HARNESS INSPECTION**

1) Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [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.

**CHECK** : **Connector & terminal (5B) No. 1 (+) — Chassis ground (-): Is voltage less than 1 V?**

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

**NO** : Replace airbag main harness.

**CHECK** : **Connector & terminal (5B) No. 14 (+) — Chassis ground (-): Is voltage less than 1 V?**

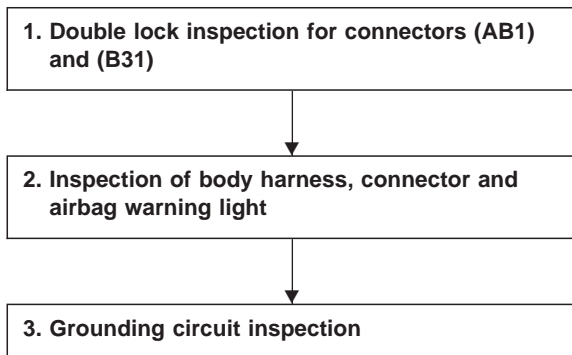
**YES** : Replace airbag control module.

**NO** : Replace airbag main harness.

**N: AIRBAG WARNING LIGHT REMAINS ON.**

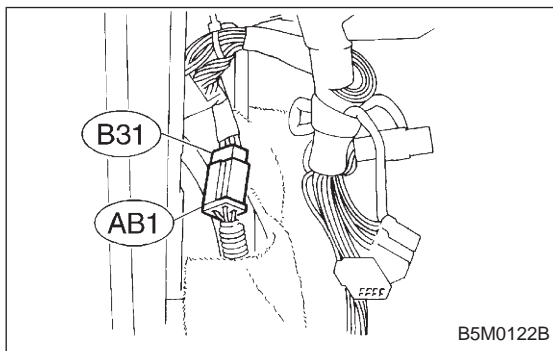
**DIAGNOSIS:**

- 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.



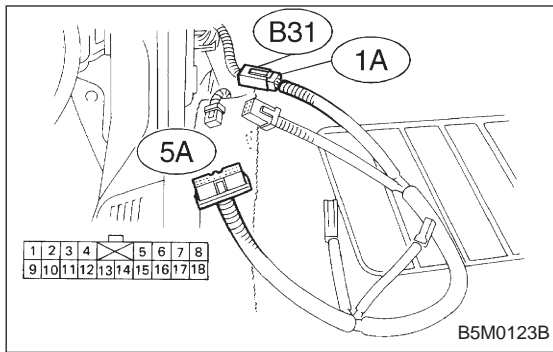
**1. DOUBLE LOCK INSPECTION FOR CONNECTORS (AB1) AND (B31)**

- 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)?*

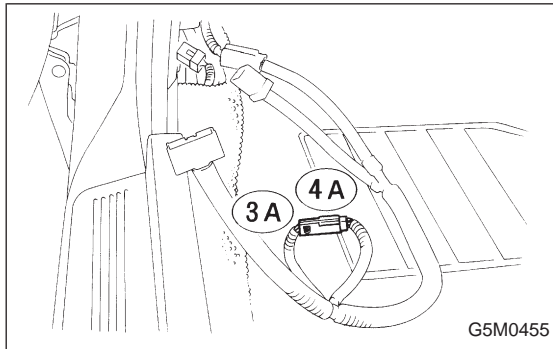
**YES** : Repair poor contact in double lock of connectors (AB1) and (B31).

**NO** : Go to step 2.



**2. INSPECTION OF BODY HARNESS, CONNECTOR AND AIRBAG WARNING LIGHT**

1) Turn ignition switch "OFF" and connect body harness connector (B31) to test connector A connector (1A).

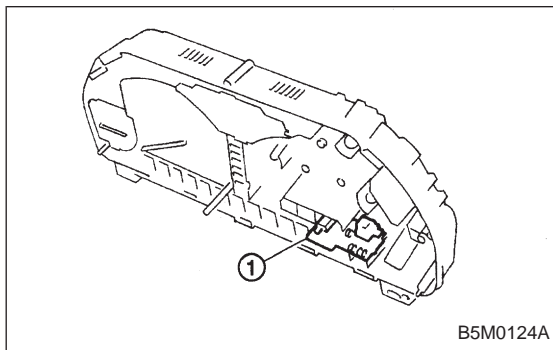


2) Connect battery ground cable and turn ignition switch "ON", (engine off) and connect connectors (3A) and (4A).

**CHECK** : Does the airbag warning light come off?

**YES** : Go to step 3).

**NO** : Go to next **CHECK** .



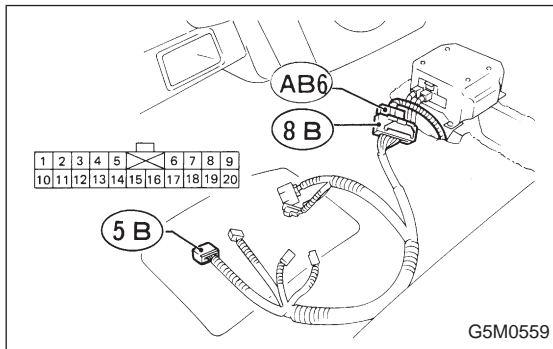
**CHECK** : Is there anything unusual to body harness?

**YES** : Repair body harness.

**NO** : Replace airbag warning light module ①.

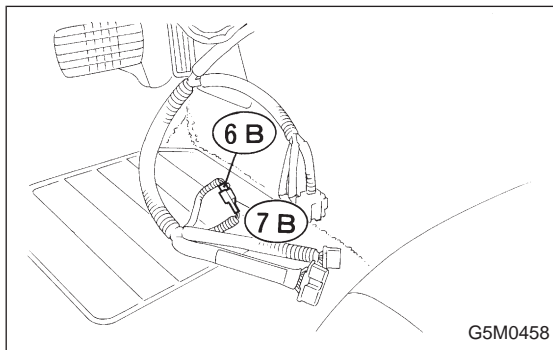
NOTE:

After problem has been eliminated, disconnect connectors (3A) and (4A).



3) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds, and re-connect connectors (AB1) and (B31).

4) Remove instrument panel lower cover and disconnect (AB3) with (AB8), then disconnect connector (AB6) from airbag control module, <Ref. to 5-5b [W5A0].> and connect it to test harness B2 connector (8B).



5) Connect battery ground cable and turn ignition switch "ON," (engine off) and connect connectors (6B) and (7B).

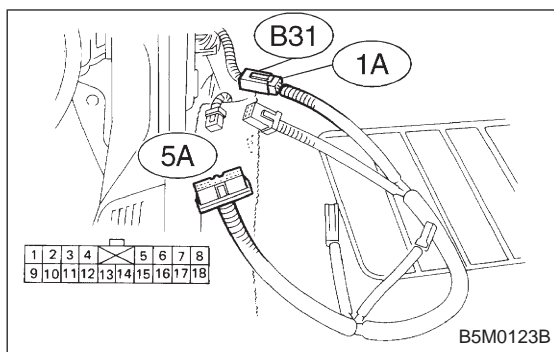
**CHECK** : Does the airbag warning light come on?

**YES** : Go to step 3.

**NO** : Replace airbag main harness.

NOTE:

After problem has been eliminated, disconnect connectors (6B) and (7B).



**3. GROUNDING CIRCUIT INSPECTION**

1) Turn ignition switch "OFF", disconnect battery ground cable and then wait at least 20 seconds. Disconnect connector (AB1) from body harness connector (B31), and connect connector (B31) to test harness A connector (1A). Measure resistance between connector (5A) terminal and chassis ground.

**CHECK** : **Connector & terminal (5A) No. 17 (+) — Chassis ground (-): Is resistance less than 10 Ω?**

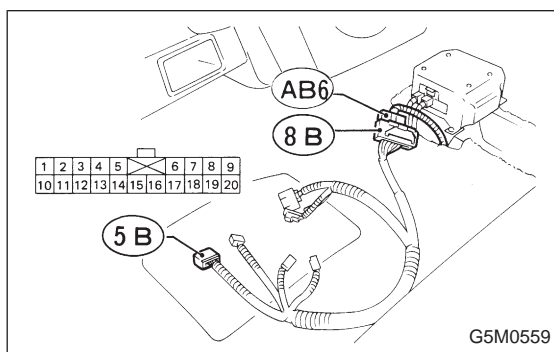
**YES** : Go to next **CHECK** .

**NO** : Repair body grounding circuit.

**CHECK** : **Connector & terminal (5A) No. 18 (+) — Chassis ground (-): Is resistance less than 10 Ω?**

**YES** : Go to step 2).

**NO** : Repair body grounding circuit.



2) Connect connectors (AB1) and (B31). Disconnect connector (AB6) from airbag control module <Ref. to 5-5b [W5A0].>, and connect it to test harness B2 connector (8B).

3) Measure resistance between each test harness B2 connector (5B) terminal and chassis ground.

**CHECK** : **Connector & terminal (5B) No. 11 (+) — Chassis ground (-): Is resistance less than 10 Ω?**

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

**NO** : Replace airbag main harness.

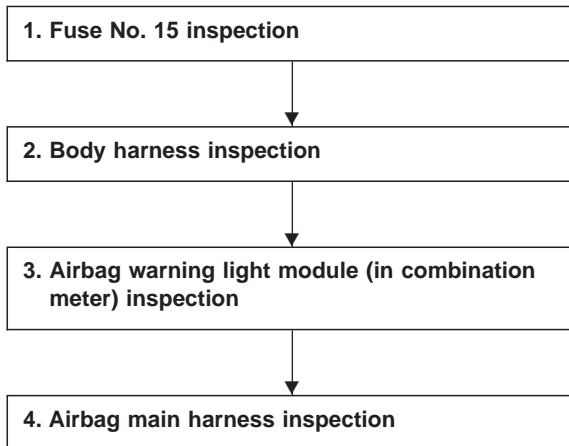
**CHECK** : **Connector & terminal (5B) No. 12 (+) — Chassis ground (-): Is resistance less than 10 Ω?**

**YES** : Replace airbag control module.

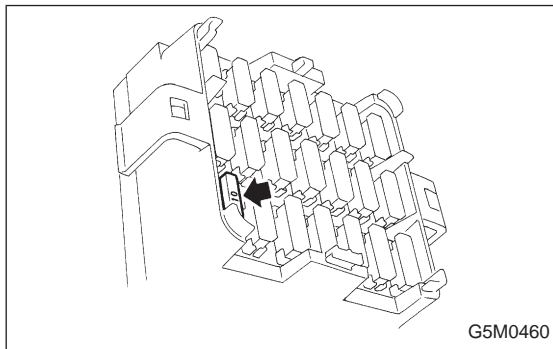
**NO** : Replace airbag main harness.

**O: 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.

**1. 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 2.

**NO** : Go to step 2.

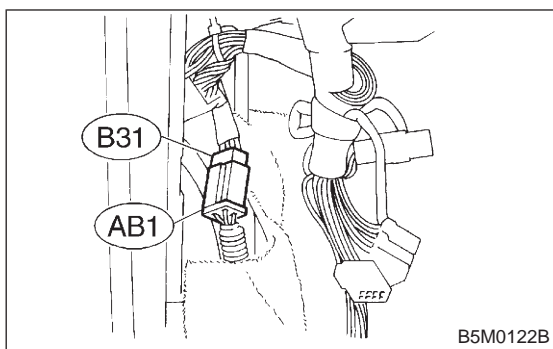
**2. BODY HARNESS INSPECTION**

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?*

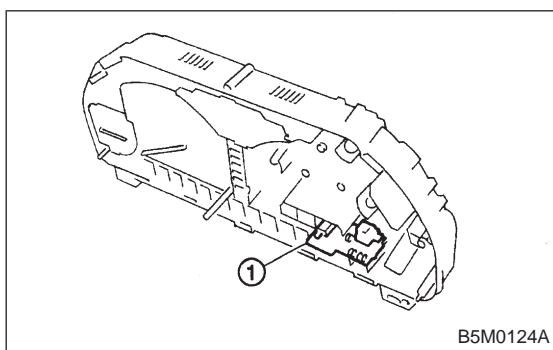
**YES** : Go to step 3.

**NO** : Repair body harness.



### 3. 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).

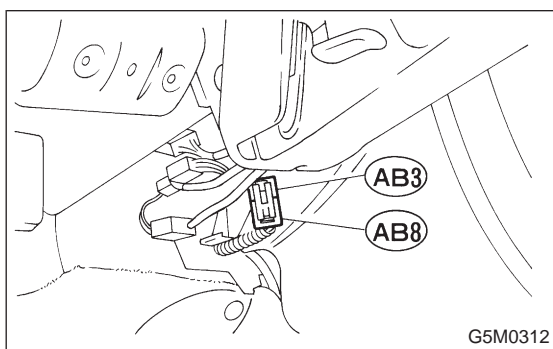


- 3) Connect battery ground cable and turn ignition switch "ON" (engine off) to make sure airbag warning light illuminates.

**CHECK** : *Does the airbag warning light come on?*

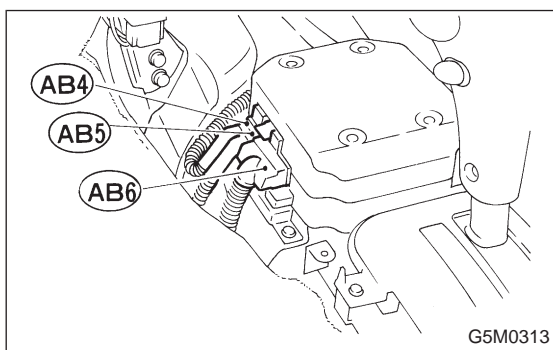
**YES** : Go to step 4.

**NO** : Replace airbag warning light module ①.



### 4. 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 [M2-6].>



- 4) Disconnect connector (AB6) from airbag control module. <Ref. to 5-5b [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.

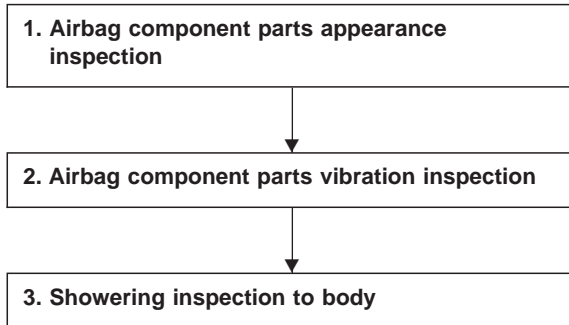
**NO** : Replace airbag main harness.

**P: 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.

**1. AIRBAG COMPONENT PARTS APPEARANCE INSPECTION**

1) Conduct on-board diagnostic and call up trouble codes stored in memory. <Ref. to 5-5b [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 5-5b:
04	<ul style="list-style-type: none"> <li>● Airbag module (Passenger)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A2 W4A0 W5A0
11	<ul style="list-style-type: none"> <li>● Fuse No. 8</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> <li>● Body harness</li> </ul>	T5D3 W4A0 W5A0 —
12	<ul style="list-style-type: none"> <li>● Roll connector</li> <li>● Airbag module (Driver)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W6A0 W3A1 W4A0 W5A0
13	<ul style="list-style-type: none"> <li>● Airbag module (Driver)</li> <li>● Roll connector</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A1 W6A0 W4A0 W5A0
21	<ul style="list-style-type: none"> <li>● Airbag control module</li> </ul>	W5A0
22	<ul style="list-style-type: none"> <li>● Airbag module (Passenger)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A2 W4A0 W5A0
33	<ul style="list-style-type: none"> <li>● Airbag control module</li> </ul>	W5A0
34	<ul style="list-style-type: none"> <li>● Airbag main harness</li> <li>● Airbag module (Passenger)</li> <li>● Airbag control module</li> </ul>	W4A0 W3A2 W5A0
41	<ul style="list-style-type: none"> <li>● Airbag module (Driver)</li> <li>● Roll connector</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A1 W6A0 W4A0 W5A0
42	<ul style="list-style-type: none"> <li>● Airbag module (Passenger)</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A2 W4A0 W5A0
43	<ul style="list-style-type: none"> <li>● Airbag module (Driver)</li> <li>● Roll connector</li> <li>● Airbag main harness</li> <li>● Airbag control module</li> </ul>	W3A1 W6A0 W4A0 W5A0



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 2.

NOTE:

Also check connector terminals, wiring harness, case, etc. for damage.

## 2. 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 3.



## 3. 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** : Clear memory.

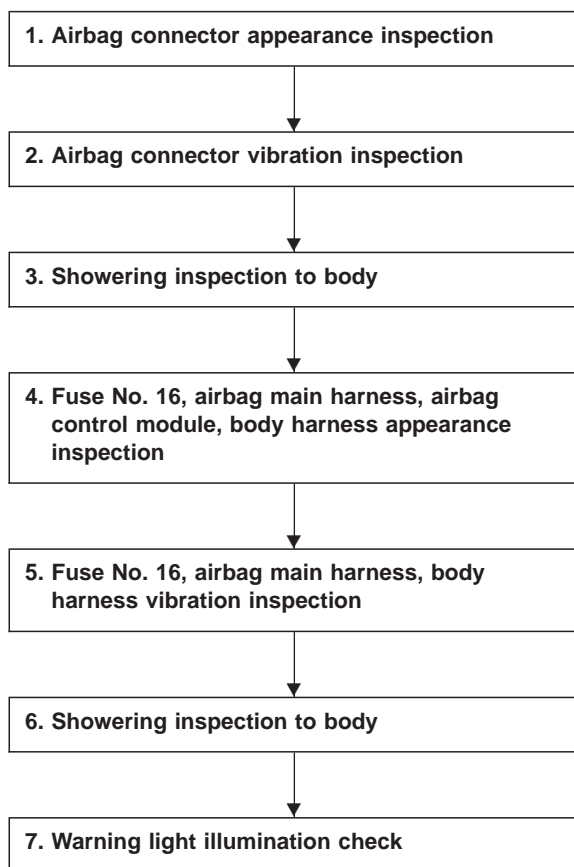
NOTE:

Also check wiring harnesses as water may leak along them and get airbag component parts wet.

**Q: 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.

**1. AIRBAG CONNECTOR APPEARANCE INSPECTION**

Conduct appearance inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5b [T100].>

**CHECK** : *Is there anything unusual about the appearance of connectors (AB2) through (AB8)?*

**YES** : Replace faulty airbag component parts.

**NO** : Go to step 2.

**NOTE:**

Check terminals, case and wiring harnesses for damage.

**2. AIRBAG CONNECTOR VIBRATION INSPECTION**

Conduct vibration inspection on airbag connectors (AB2) through (AB8). <Ref. to 5-5b [T100].>

**CHECK** : *Do the connectors (AB2) through (AB8) malfunction again when shaking?*

**YES** : Replace faulty airbag component parts.

**NO** : Go to step 3.

NOTE:

Gently shake each airbag connector.

**3. 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 4.

NOTE:

If leaks are noted, also check wiring harnesses as water may leak along them and wet airbag connectors.

**4. FUSE No. 16, AIRBAG MAIN HARNESS, AIRBAG CONTROL MODULE, BODY HARNESS APPEARANCE INSPECTION**

Conduct appearance inspection on fuse No. 16 <Ref. to 5-5b [T5H3].>, airbag main harness <Ref. to 5-5b [W4A0].>, airbag control module <Ref. to 5-5b [W5A0].> 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 5.

NOTE:

Also check connectors, terminals, wiring harness and case for damage.

**5. 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.**

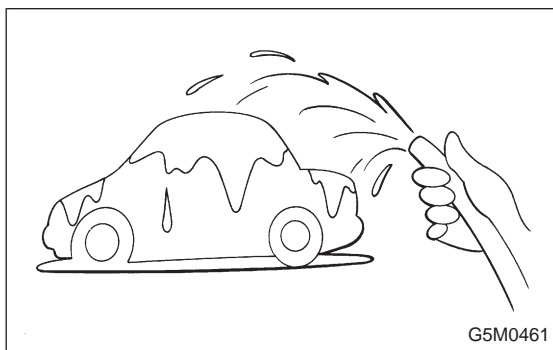
**CHECK** : *Do fuse No. 16, airbag main harness or body harness malfunction again when shaking?*

**YES** : Replace faulty airbag component parts.

**NO** : Go to step 6.

**NOTE:**

Gently shake each part.

**6. 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 7.

**NOTE:**

If leaks are noted, check wiring harnesses as water may leak along them and get parts wet.

**7. WARNING LIGHT ILLUMINATION CHECK**

Turn ignition switch "ON" (engine off) and observe airbag warning light.

**CHECK** : *Does the airbag warning light comes on for 8 seconds, then go out and stay out?*

**YES** : Clear memory.

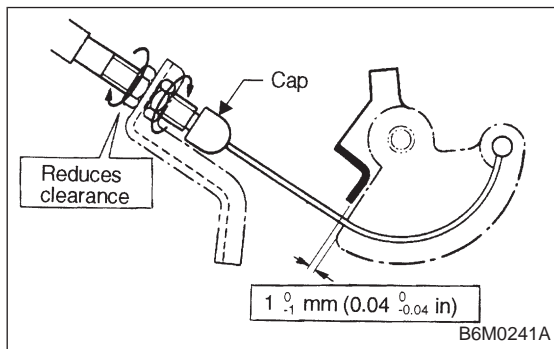
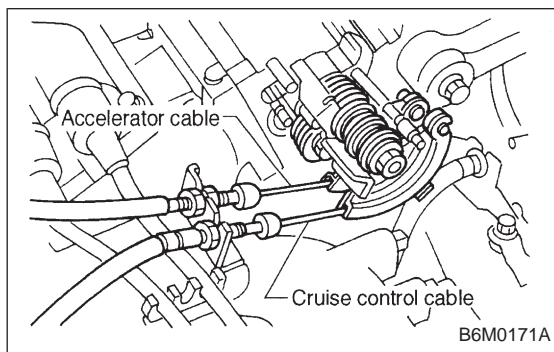
**NO** : Go to 5-5b [T4E0] "DIAGNOSTICS PROCEDURE".

## 1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the cruise control command switch.

### CAUTION:

- All Airbag system wiring harness and connectors are colored yellow. Do not use electrical test equipment on these circuits.
- Be careful not to damage Airbag system wiring harness when servicing the cruise control command switch.



## 2. Pre-inspection

### 1. CRUISE CONTROL CABLE

- 1) Cable installation
  - (1) Ensure that cruise control cable is attached to the left of accelerator cable (on accelerator pedal side).
  - (2) Ensure that accelerator cable throttle cam does not move when cruise control throttle cam is moved by hand.
  - (3) Ensure that throttle cam moves smoothly.
- 2) Cable free play
  - (1) Ensure that throttle cam-to-lever clearance is within specifications.

**Standard value:**  $1 \begin{smallmatrix} 0 \\ -1 \end{smallmatrix} \text{ mm } (0.04 \begin{smallmatrix} 0 \\ -0.04 \end{smallmatrix} \text{ in})$

### NOTE:

If clearance is not within specifications, adjust cable at its outer end.

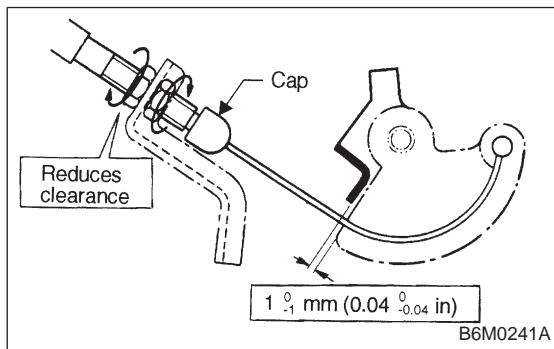
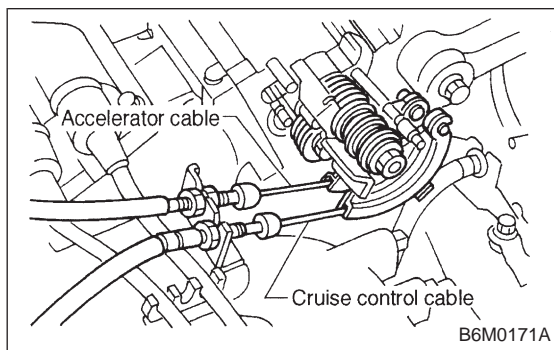
- (2) Ensure that cap is positioned in groove.

## 1. Supplemental Restraint System "Airbag"

Airbag system wiring harness is routed near the cruise control command switch.

### CAUTION:

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- Be careful not to damage Airbag system wiring harness when servicing the cruise control command switch.



## 2. Pre-inspection

### 1. CRUISE CONTROL CABLE

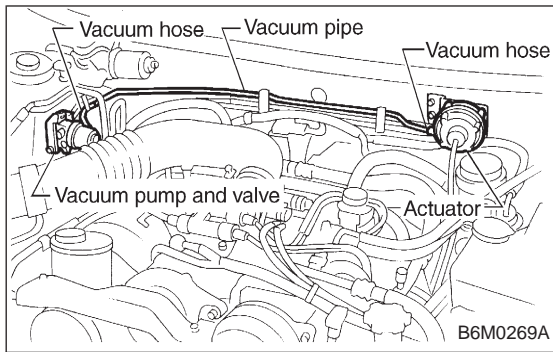
- 1) Cable installation
  - (1) Ensure that cruise control cable is attached to the left of accelerator cable (on accelerator pedal side).
  - (2) Ensure that accelerator cable throttle cam does not move when cruise control throttle cam is moved by hand.
  - (3) Ensure that throttle cam moves smoothly.
- 2) Cable free play
  - (1) Ensure that throttle cam-to-lever clearance is within specifications.

**Standard value:**  $1 \begin{smallmatrix} 0 \\ -1 \end{smallmatrix} \text{ mm (} 0.04 \begin{smallmatrix} 0 \\ -0.04 \end{smallmatrix} \text{ in)}$

### NOTE:

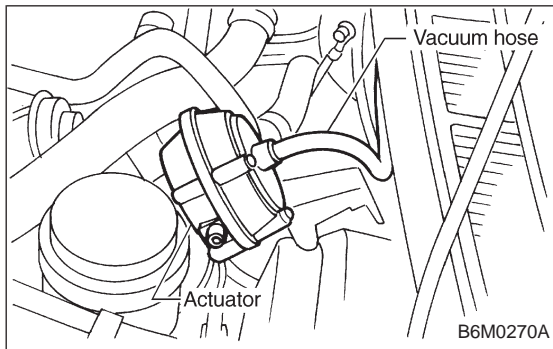
If clearance is not within specifications, adjust cable at its outer end.

- (2) Ensure that cap is positioned in groove.



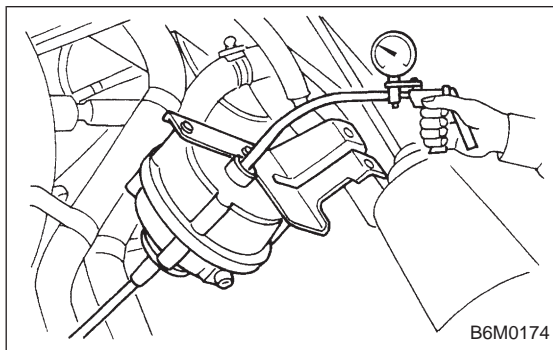
## 2. VACUUM HOSE AND PIPE

Check vacuum hose and pipe (which connects actuator and vacuum pump) for disconnection or cracks.



## 3. ACTUATOR

1) Disconnect vacuum hose from actuator.



2) Connect vacuum pump as shown in figure.

3) Make sure that cruise control cable moves smoothly and quickly when a vacuum pressure of 40.0 kPa (300 mmHg, 11.81 inHg) is applied to actuator.

**Stroke: 35 mm (1.38 in)**

4) When vacuum pressure is released from condition 3) above, make sure the cable returns to its original position smoothly and quickly.

5) After inspection, disconnect vacuum pump and connect vacuum hose.

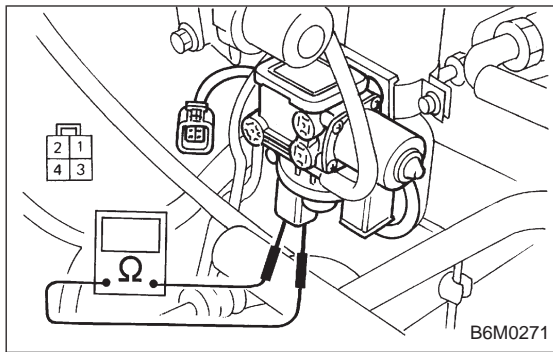
## 4. POWER SUPPLY

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.

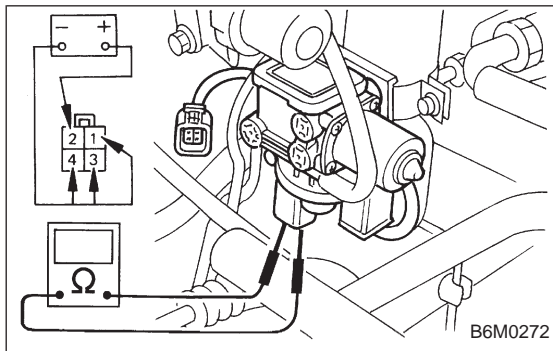


**5. VACUUM PUMP AND VALVE**

- 1) Measure resistance of vacuum pump and valve.
  - (1) Disconnect connector from vacuum pump and valve.
  - (2) Measure resistance between each terminal of vacuum pump and valve.

**Terminals / Specified resistance:**

- No. 2 — No. 3 / 100 Ω or less (Vacuum pump motor)**
- No. 2 — No. 1 / 69 Ω (Air valve)**
- No. 2 — No. 4 / 69 Ω (Release valve)**



- 2) Check for leakage and sticking of vacuum valve.
  - (1) Disconnect connector from vacuum pump and valve.
  - (2) Make sure that cruise control cable moves smoothly when connecting + (positive) battery cable to terminal No. 2 and – (negative) battery cable to terminals No. 1, 3 and 4 of vacuum pump and valve connector.

**Stroke: 35 mm (1.38 in)**

**Movement time: Within 3 seconds**

- (3) When the battery cable is disconnected from condition (2) above, make sure the cable returns to its original position smoothly.

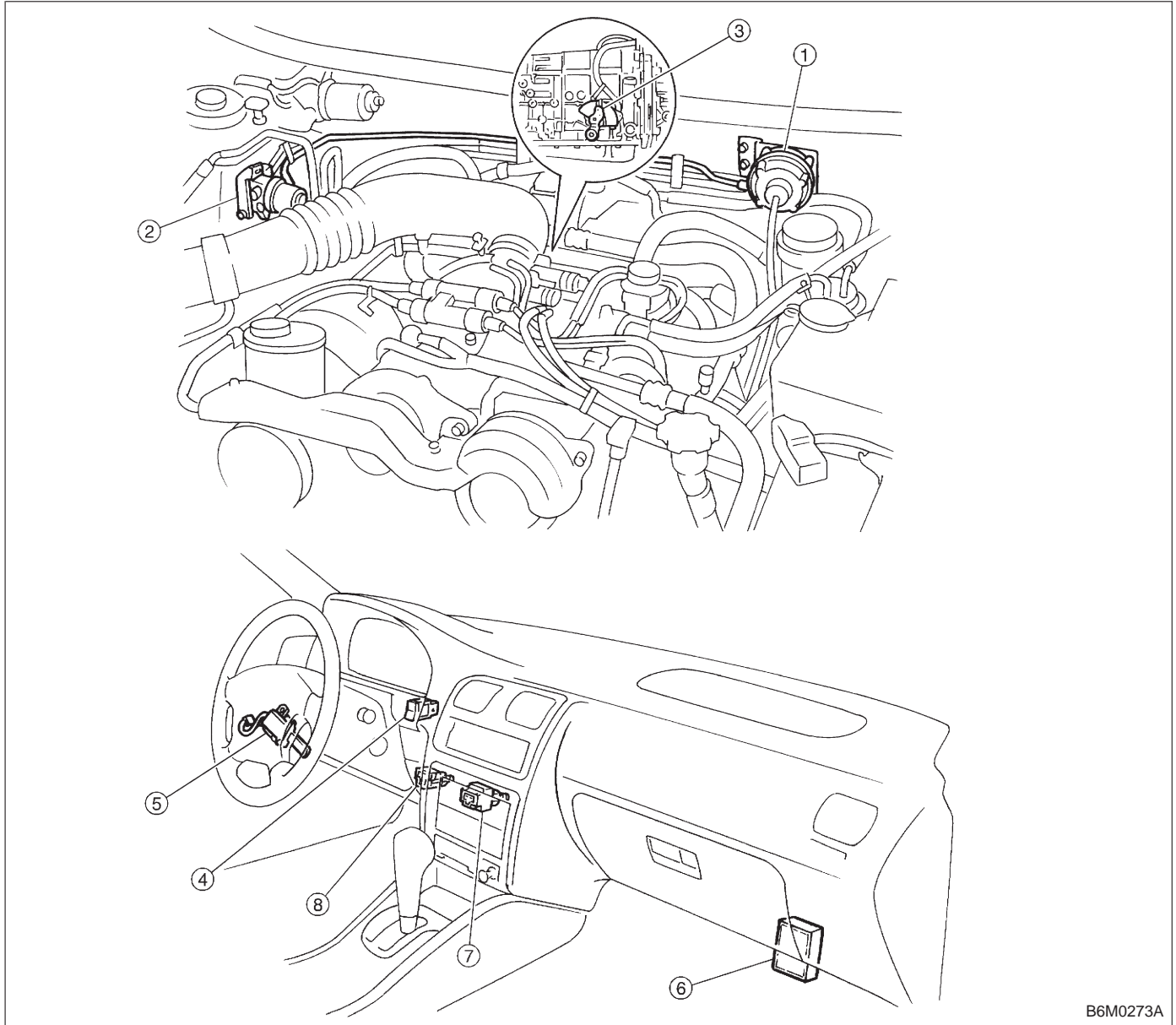
**Movement time: Within 1.5 seconds**

- (4) Connect battery to each terminal and check cable movement.

Terminal No.				Battery		Cruise control cable operation
1	2	3	4	⊕	⊖	
—	—	—	—	—	—	—
	○			○		Pull
		○			○	
○			○		○	
	○			○		Hold
○			○		○	
	○			○		Release
			○		○	



### 3. Electrical Components Location

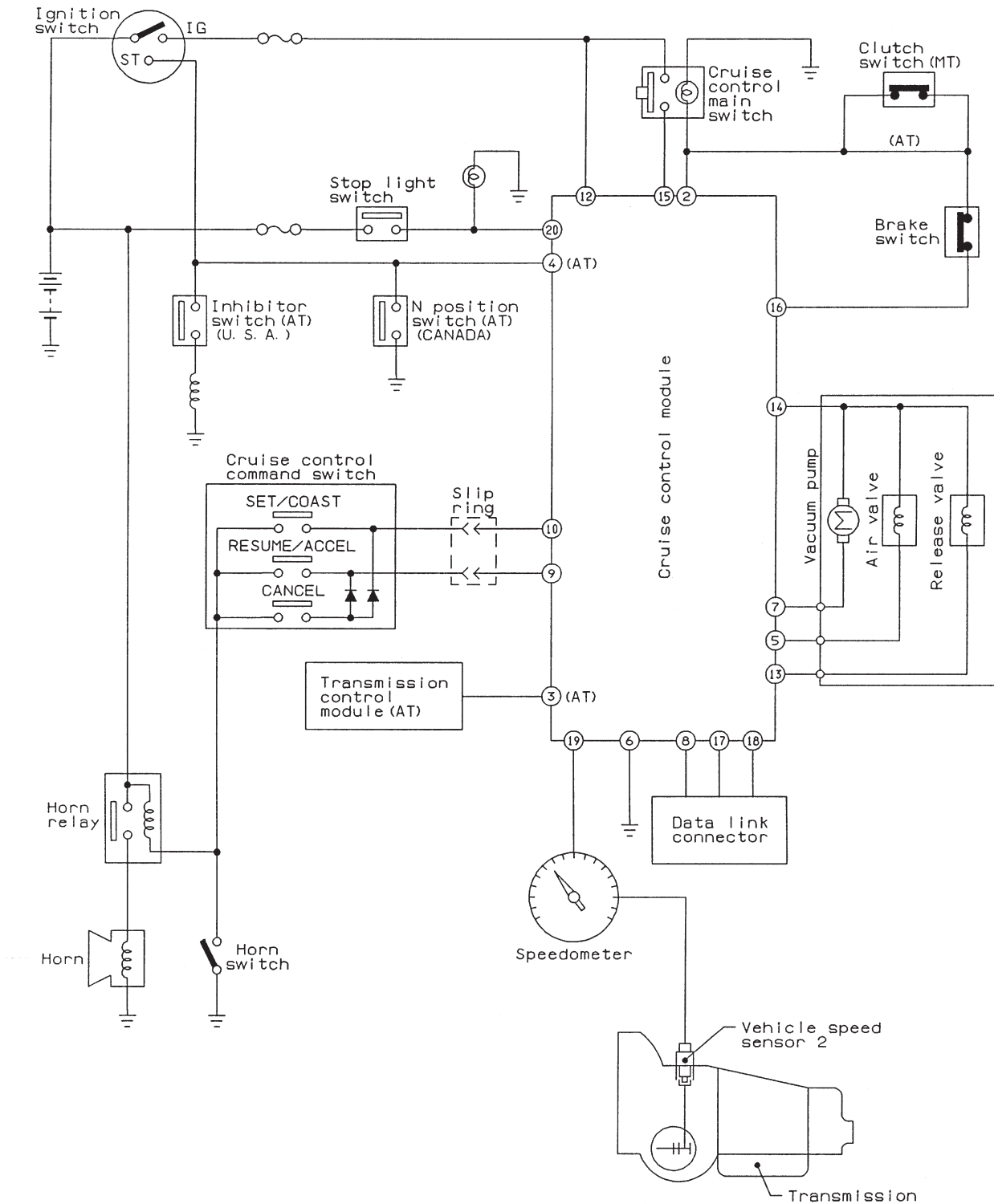


B6M0273A

- ① Actuator
- ② Vacuum pump and valve
- ③ Inhibitor switch (AT)
- ④ Cruise control main switch

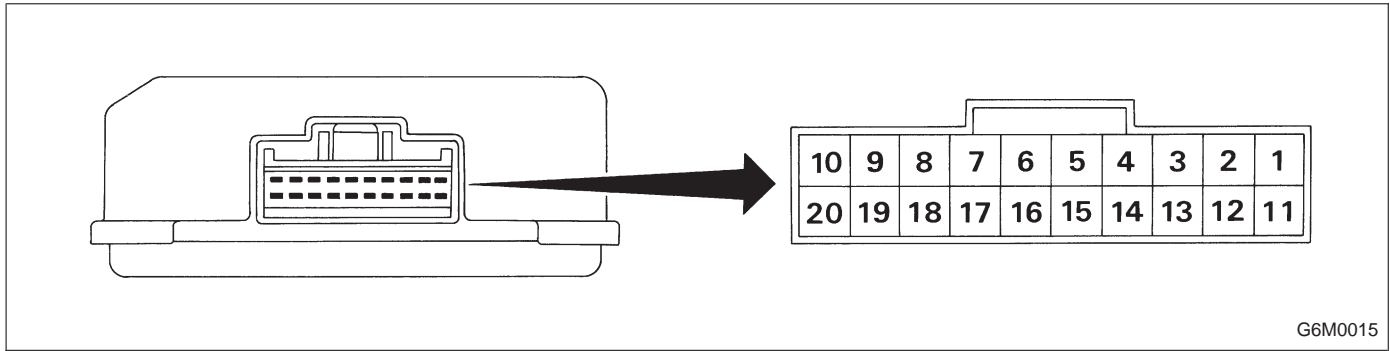
- ⑤ Cruise control command switch
- ⑥ Cruise control module
- ⑦ Stop and brake switch
- ⑧ Clutch switch (MT)

4. Schematic



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## 5. Control Module I/O Signal



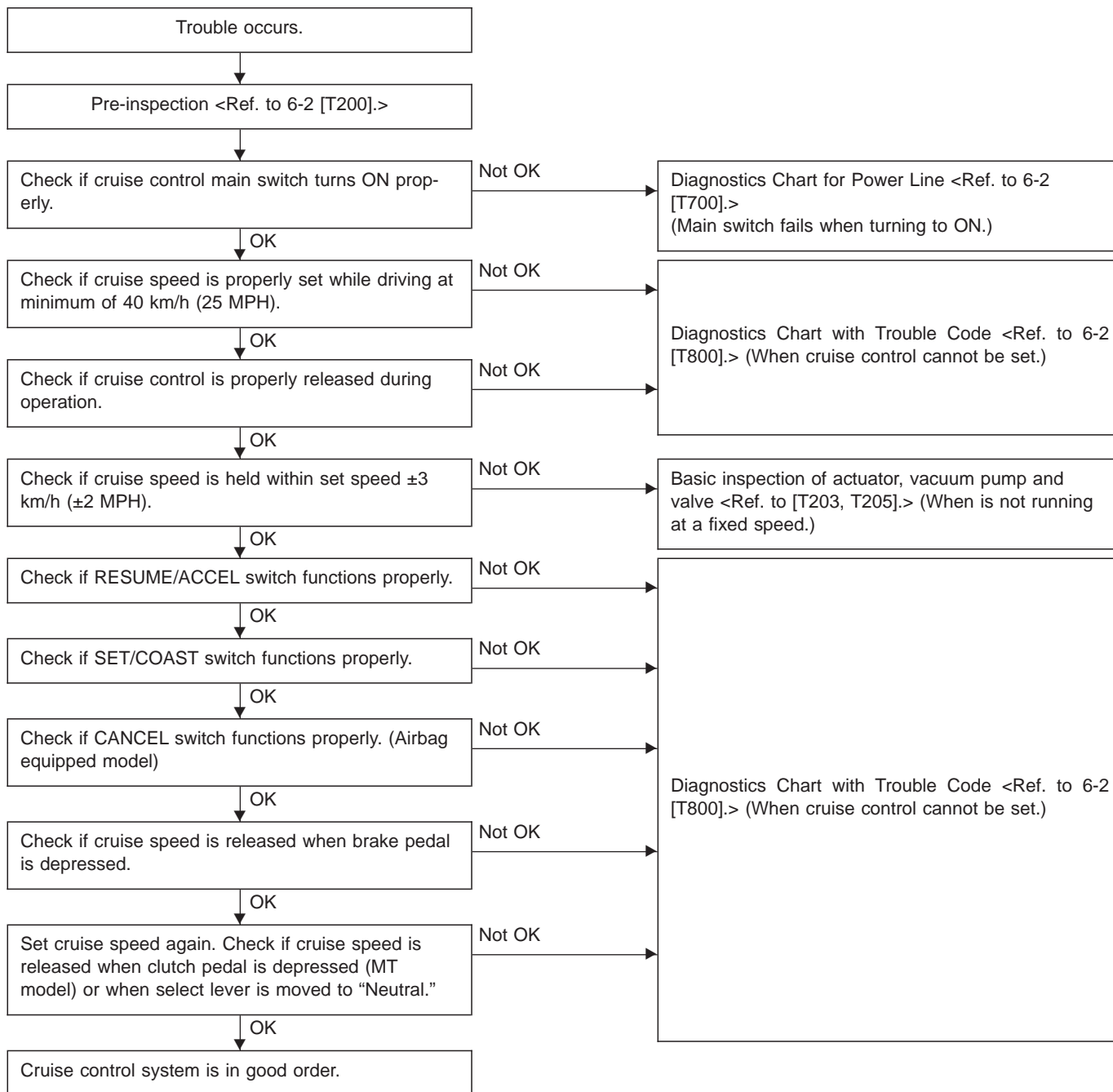
Content	Terminal No.	Measuring conditions and I/O signals (ignition switch ON and engine idling)
Main power supply	2	<ul style="list-style-type: none"> <li>Battery voltage is present when main power is turned ON.</li> <li>"0" volt is present when main power is turned OFF.</li> </ul>
Inhibitor switch (AT) (U.S.A.) N position switch (AT) (CANADA)	4	<ul style="list-style-type: none"> <li>"0" volt is present when selector lever is set to P or N position (CANADA: N position only).</li> <li>Battery voltage is present when selector lever is other than P or N position (CANADA: N position only).</li> </ul>
Air valve	5	<ul style="list-style-type: none"> <li>"0" volt is present when vehicle is stopped.</li> <li>ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating.</li> </ul>
GND	6	—
Vacuum pump motor	7	<ul style="list-style-type: none"> <li>"0" volt is present when vehicle is stopped.</li> <li>ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating.</li> </ul>
Data link connector	8	—
RESUME/ACCEL switch	9	<ul style="list-style-type: none"> <li>Battery voltage is present when switch is turned ON.</li> <li>"0" volt is present when switch is turned OFF.</li> </ul>
SET/COAST switch	10	<ul style="list-style-type: none"> <li>Battery voltage is present when switch is turned ON.</li> <li>"0" volt is present when switch is turned OFF.</li> </ul>
Ignition switch	12	<ul style="list-style-type: none"> <li>Battery voltage is present when ignition switch is turned ON.</li> <li>"0" volt is present when ignition switch is turned OFF.</li> </ul>
Release valve	13	<ul style="list-style-type: none"> <li>"0" volt is present when vehicle is stopped.</li> <li>ON-and-OFF ("0"-and-battery voltage) operation is alternately repeated while cruise control is operating.</li> </ul>
Power supply to vacuum pump motor, air valve, release valve	14	<ul style="list-style-type: none"> <li>"0" volt is present when vehicle is stopped.</li> <li>Battery voltage is present while cruise control is operating.</li> </ul>
Cruise main switch	15	<ul style="list-style-type: none"> <li>Battery voltage is present during pressing the main switch, and then approx. 12 V is present while switch is turned ON.</li> <li>"0" volt is present when switch is turned OFF.</li> </ul>
Brake switch	16	Turn the cruise main switch to ON and leave clutch pedal released (MT). Then check that; <ul style="list-style-type: none"> <li>"0" volt is present when brake pedal is depressed.</li> <li>Battery voltage is present when brake pedal is released.</li> </ul> Additionally only in MT vehicle, keep the cruise main switch to ON and leave brake pedal released. Then check that; <ul style="list-style-type: none"> <li>"0" volt is present when clutch pedal is depressed.</li> <li>Battery voltage is present when clutch pedal is released.</li> </ul>
Data link connector	17	—
Data link connector	18	—
Vehicle speed sensor 2	19	Lift-up the vehicle until all four wheels are raised off ground, and then rotate any wheel manually. Approx. 5 and 0 volt pulse signals are alternately input to cruise control module.
Stop light switch	20	Turn ignition switch to OFF. Then check that; <ul style="list-style-type: none"> <li>Battery voltage is present when brake pedal is depressed.</li> <li>"0" volt is present when brake pedal is released.</li> </ul>

**NOTE:**

Voltage at terminals 5, 7, 13 and 14 cannot be checked unless vehicle is driving by cruise control operation.

## 6. Diagnostics Chart for On-board Diagnosis System

### A: BASIC DIAGNOSTICS PROCEDURE



## B: ON-BOARD DIAGNOSIS WITH SELECT MONITOR

### 1. GENERAL

The on-board diagnosis function of the cruise control system uses an external select monitor.

The on-board diagnosis function operates in two categories, which are used depending on the type of problems;

- Cruise cancel conditions diagnosis
- Real-time diagnosis

**Applicable cartridge No.: 498349601**

- Cruise cancel conditions diagnosis

This category of diagnosis requires actual vehicle driving in order to determine the cause, (as when cruise speed is cancelled during driving although cruise cancel condition is not entered).



Cruise control module memory stores the cancel condition (Code No.) which occurred during driving. When there are plural cancel conditions (Code No.), they are shown in order, for 2 seconds per Code No., on the select monitor.

### CAUTION:

- The cruise control memory stores not only the cruise “cancel” which occurred (although “cancel” operation is not entered by the driver), but also the “cancel” condition input by the driver.
- The content of memory is cleared when ignition switch or cruise main switch is turned OFF.

- Real-time diagnosis

The real-time diagnosis function is used to determine whether or not the input of output signal system is in good order, according to signal emitted from switches, sensors, etc.

Vehicle cannot be driven at cruise speed because problems occurs in the cruise control system or its associated circuits.



Monitor the signal conditions from switches and sensors.

**2. CRUISE CANCEL CONDITIONS DIAGNOSIS**

- 1) Connect select monitor.
- 2) Start the engine and turn cruise control main switch to ON.
- 3) Set select monitor in "FB0" mode.
- 4) Drive vehicle at least 40 km/h (25 MPH) with cruise speed set.
- 5) If cruise speed is canceled itself (without doing any cancel operations), a trouble code will appear on select monitor display.

**CAUTION:**

- A trouble code will also appear when cruise cancel is effected by driver. Do not confuse.
- Have a co-worker ride in vehicle to assist in diagnosis during driving.

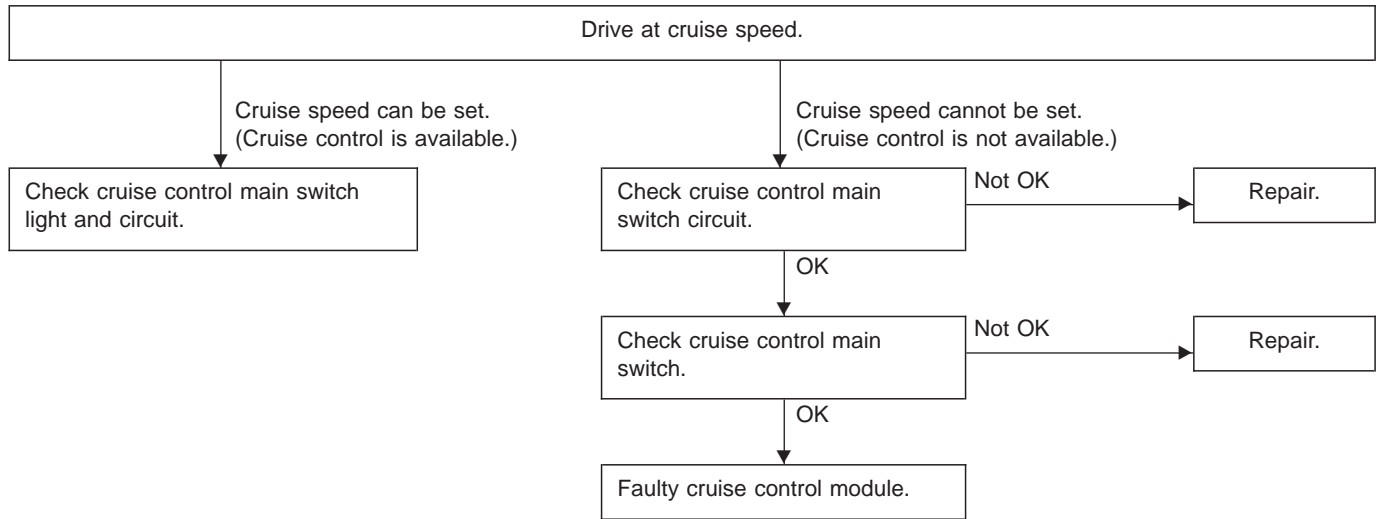
**NOTE:**

Trouble code will be cleared by turning ignition switch or cruise control main switch to OFF.

**3. REAL-TIME DIAGNOSIS**

- 1) Connect select monitor.
- 2) Turn ignition switch and cruise control main switch to ON.
- 3) Set select monitor in "FA0" mode.
- 4) Ensure that normal indication is displayed when controls are operated as indicated below:
  - When SET/COAST switch is pressed.
  - When RESUME/ACCEL switch is pressed.
  - When brake pedal is depressed. (Stop and brake switch turns ON.)
  - When clutch pedal is depressed. (MT model)
  - When select lever is set to N position. (AT model)

## 7. Diagnostics Chart for Power Line A: BASIC DIAGNOSTICS PROCEDURE



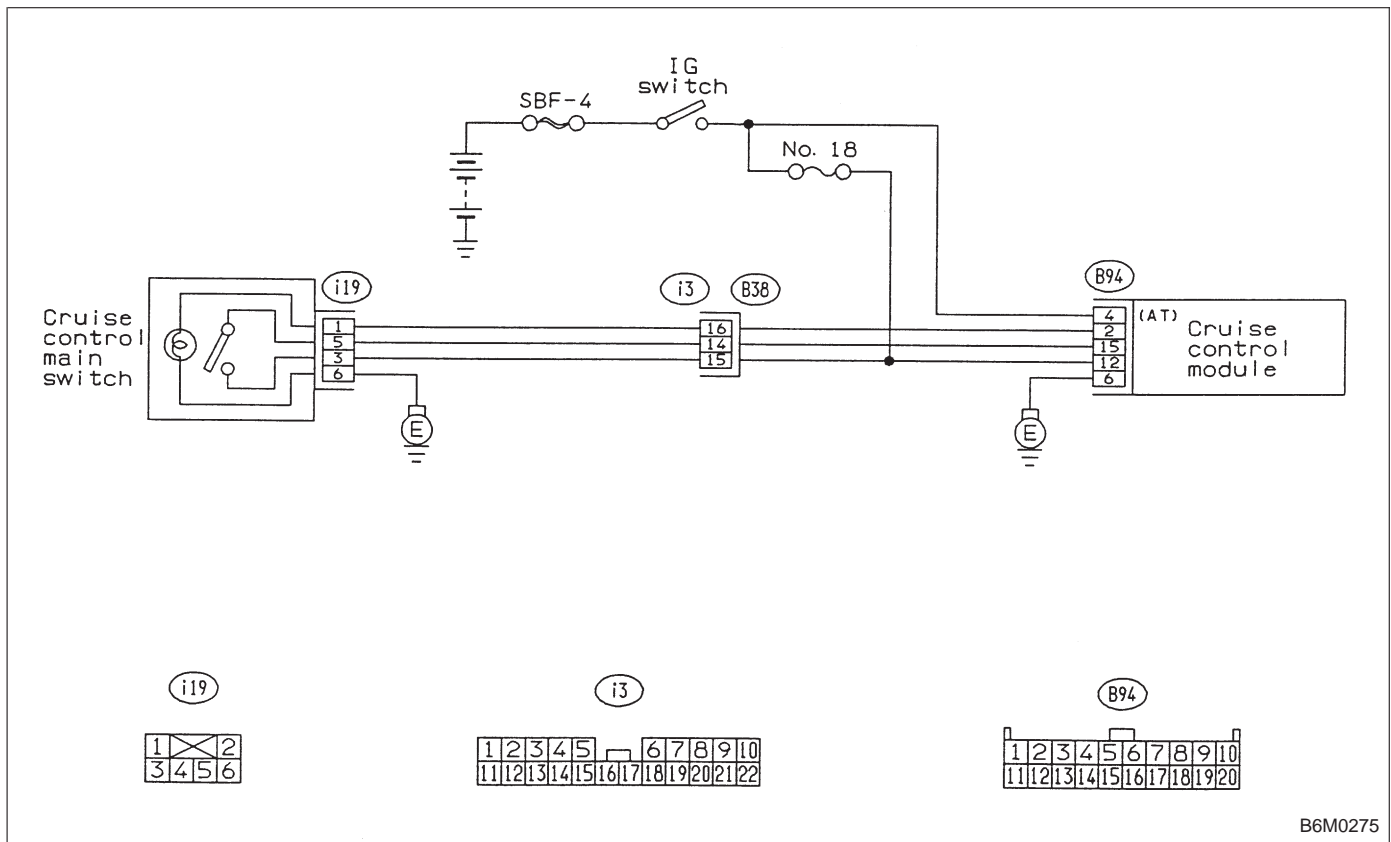
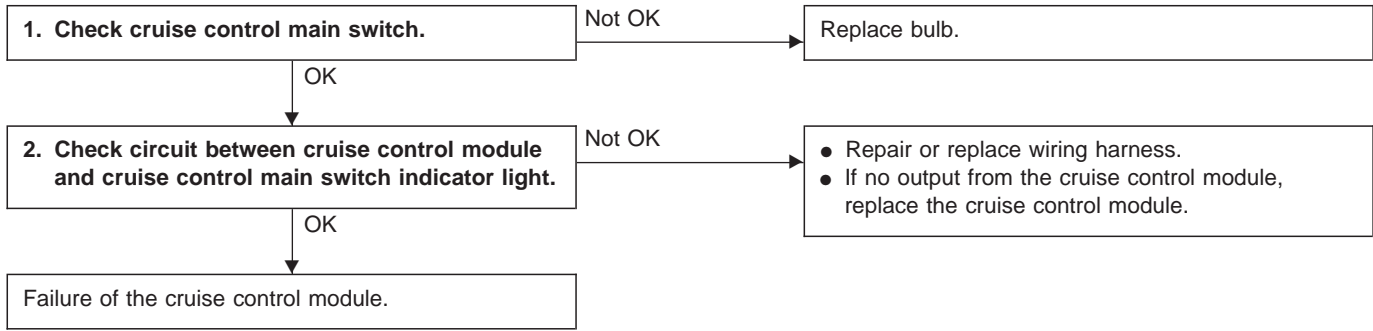
**B: CHECK INDICATOR AND CIRCUIT IN CRUISE CONTROL MAIN SWITCH**

**DIAGNOSIS:**

- Bulb failure or open harness of the indicator circuit in the cruise control main switch.

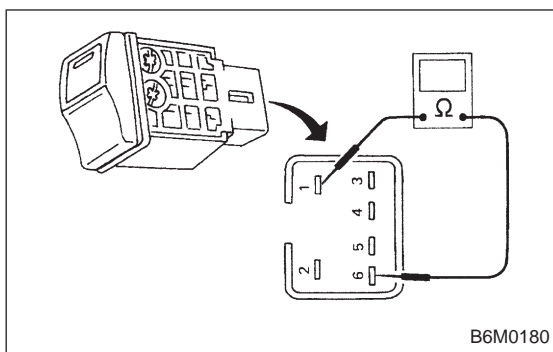
**TROUBLE SYMPTOM:**

- Cruise control can be set, normally indicator does not come on. (When main switch is pressed.)



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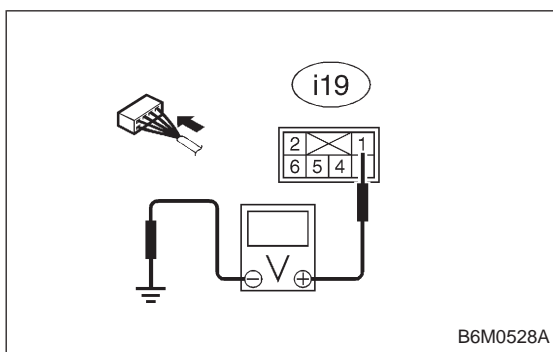




**1. CHECK CRUISE CONTROL MAIN SWITCH.**

- 1) Remove cruise control main switch.
- 2) Measure resistance between cruise control main switch terminals.

**Terminals / Specified resistance:**  
**No. 1 — No. 6 / Approx. 50 Ω**

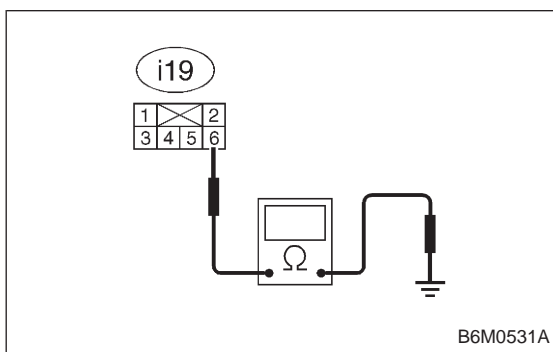


**2. CHECK CIRCUIT BETWEEN CRUISE CONTROL MODULE AND CRUISE CONTROL MAIN SWITCH INDICATOR LIGHT.**

- 1) Turn the ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Measure voltage between cruise control main switch connector and the body.

**Connector & terminal / Specified voltage:**  
**(i19) No. 1 — Body / 10 V, or more**

- 4) Turn the ignition switch and cruise control main switch to OFF.



- 5) Remove the connector from the cruise control main switch.

- 6) Measure resistance of ground circuit between the cruise control main switch connector and body.

**Connector & terminal / Specified resistance:**  
**(i19) No. 6 — Body / 10 Ω, max.**

**C: CHECK CRUISE CONTROL MAIN SWITCH**

**DIAGNOSIS:**

- Faulty cruise control main switch, or open harness.

**TROUBLE SYMPTOM:**

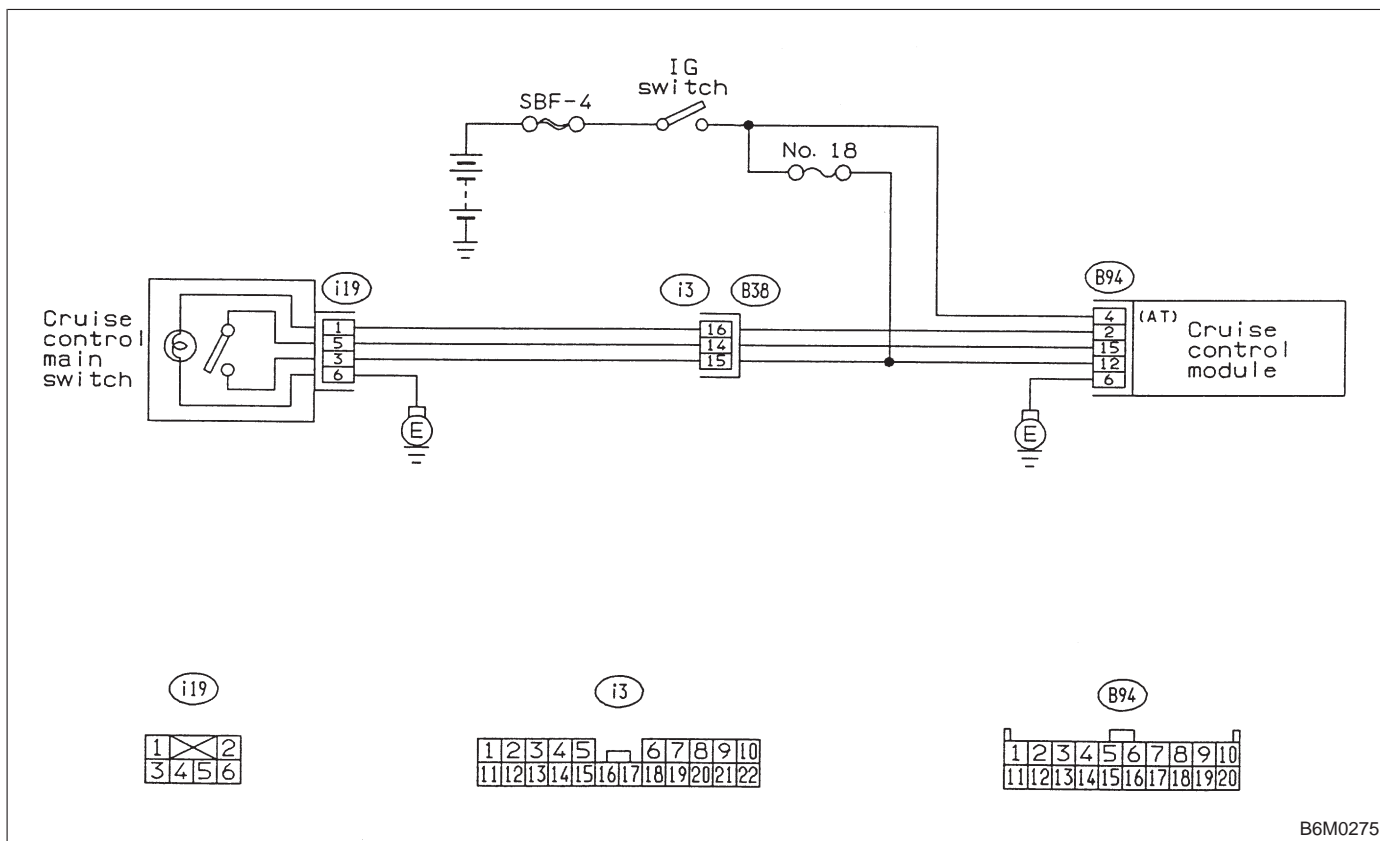
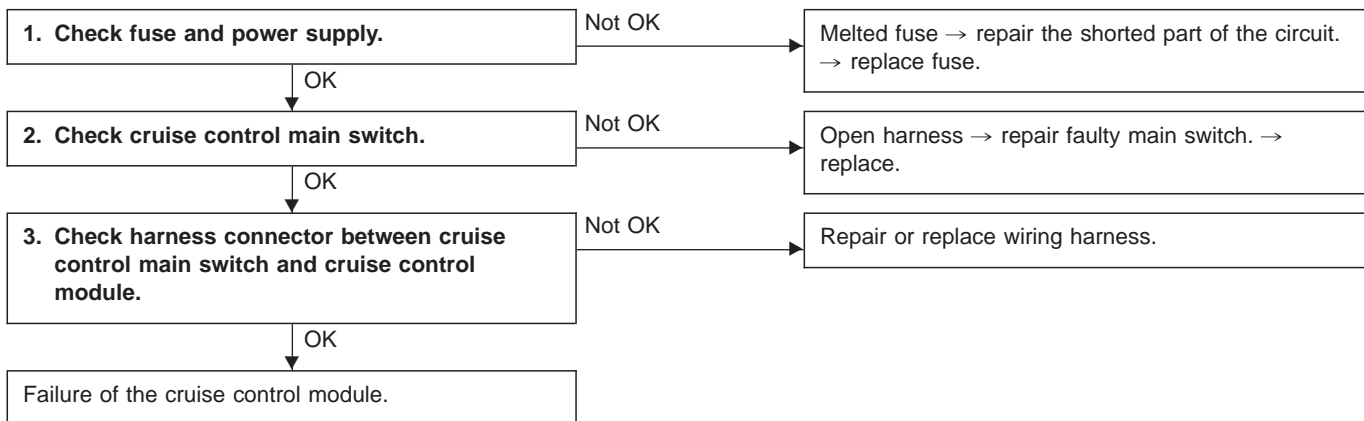
- Cruise control main switch is not turned ON and cruise control cannot be set.

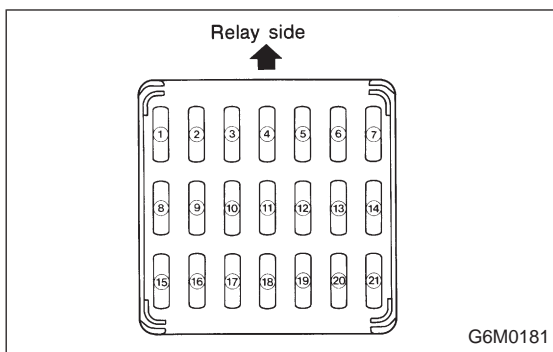
**NOTE:**

When the main relay (built-in cruise control module) operates, the main switch circuit is in normal condition.

The main relay operation can be checked by hearing the operation sounds.

This operation sounds will be heard when ignition switch and cruise control main switch is turned to ON.

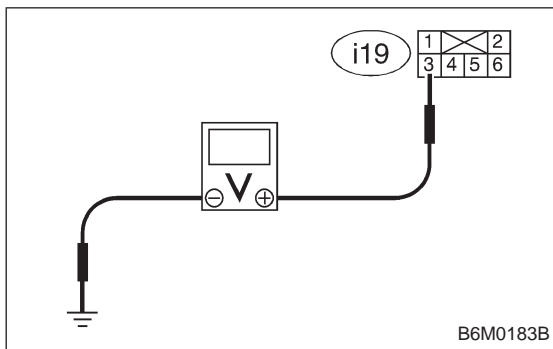




**1. CHECK FUSE AND POWER SUPPLY.**

- 1) Check fuse No. 18.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between fuse box connector and body.

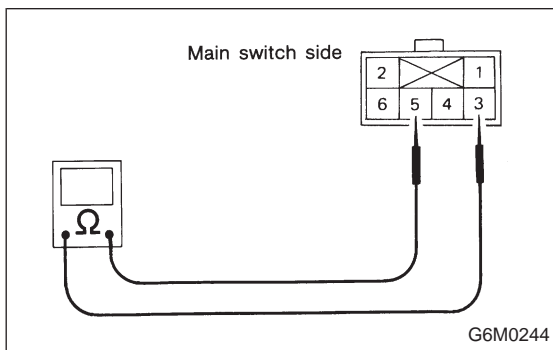
**Connector & terminal / Specified voltage:**  
**(B51) No. 4 — Body / 10 V, or more**



**2. CHECK CRUISE CONTROL MAIN SWITCH.**

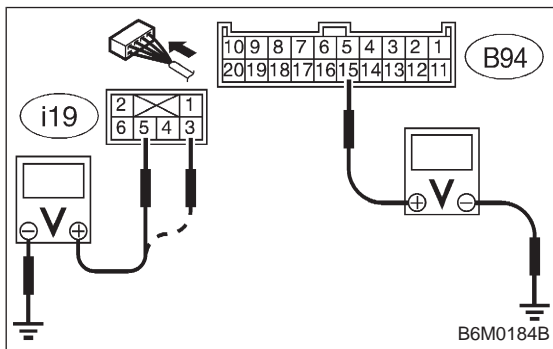
- 1) Turn ignition switch to OFF.
- 2) Remove cruise control main switch and disconnect connector.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between cruise control main switch connector and body.

**Connector & terminal / Specified voltage:**  
**(i19) No. 3 — Body / 10 V, or more**



- 5) Measure resistance between cruise control main switch terminals.

**Terminals / Specified resistance:**  
**No. 3 — No. 5 / 10 Ω, max. (ON)**  
**1 MΩ, min. (OFF)**



**3. CHECK HARNESS CONNECTOR BETWEEN CRUISE CONTROL MAIN SWITCH AND CRUISE CONTROL MODULE.**

- 1) Connect connector.
- 2) Turn ignition switch to ON.
- 3) Turn cruise control main switch to ON.
- 4) Measure voltage between each terminal of cruise control main switch or cruise control module and body.

**Connector & terminal / Specified voltage:**  
**(i19) No. 3 — Body / 10 V, or more**  
**(i19) No. 5 — Body / 10 V, or more**  
**(B94) No. 15 — Body / 10 V, or more**

**NOTE:**

Depress cruise control main switch with fingers while measuring (i19) No. 5 — Body.

## 8. Diagnostics Chart with Trouble Code

### A: TROUBLE CODE

Trouble code	Item	Contents of diagnosis	Page
10	OK	Normal	18
11	BRAKE/ST/CL or N	<ul style="list-style-type: none"> <li>● Input signals from brake switch "OFF", stop light switch "ON" (Brake pedal is in depressed condition.)</li> <li>● Input signals from clutch switch "OFF", or inhibitor switch is in "N" position. [Clutch pedal is depressed (MT), or select lever is set to N position (AT).]</li> </ul>	20
12	NOT SET SP	Out of cruise speed range	22
13	LOW SP LIM	Low-speed control limiter	22
14	CANCEL SW	Input signal from cancel switch	26
15	NO MEMORY	No memorized cruise speed	—
21	SP SENS NG	Faulty vehicle speed sensor 2	22
22	COM SW NG	Faulty SET/COAST switch or RESUME/ACCEL switch	26
23	RELAY NG	Faulty safety relay included in cruise control module	29
24	CPU RAM NG	Faulty CPU RAM included in cruise control module	29
31	MOTOR NG	Faulty vacuum motor or motor drive system	30
32	AIR VAL NG	Faulty air valve or valve drive system	30
33	REL VAL NG	Faulty release valve or valve drive system	30

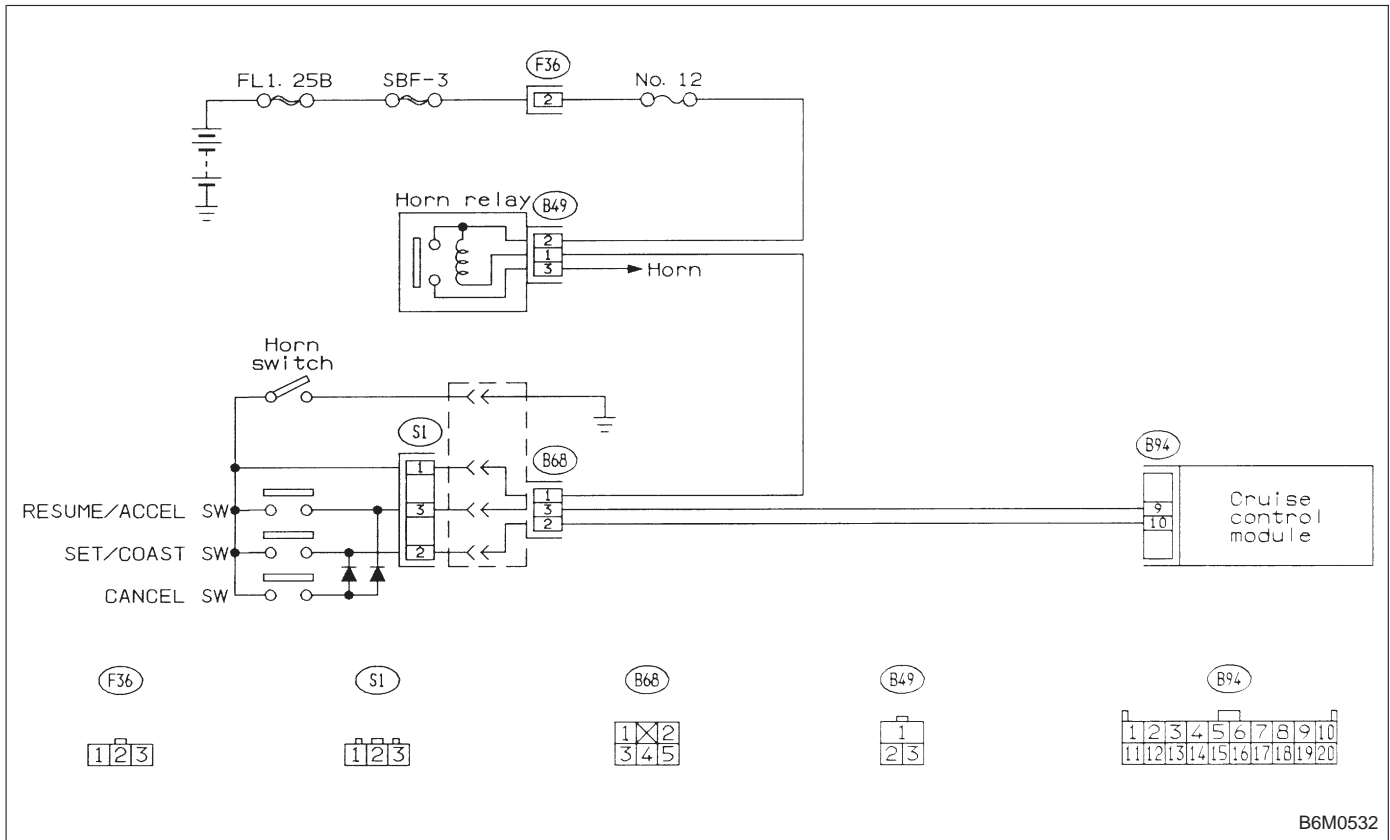
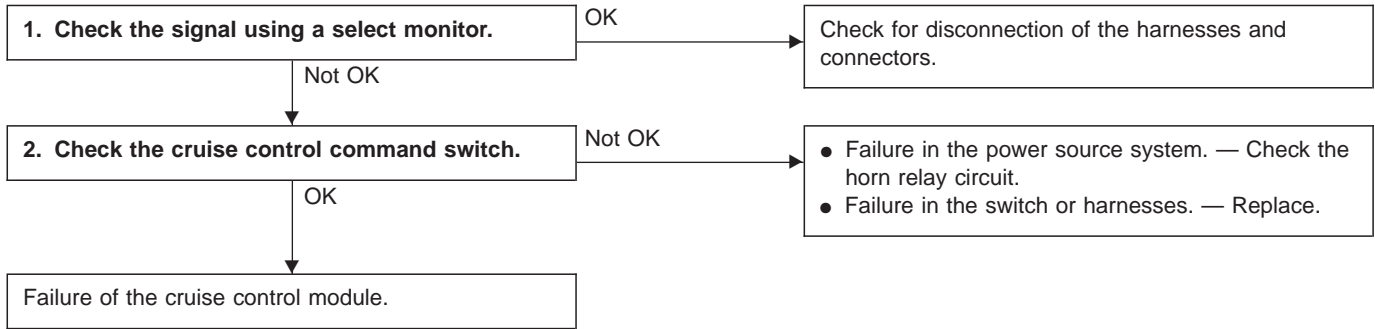
**B: TROUBLE CODE 10**  
**— NORMAL CONDITION —**

**DIAGNOSIS:**

- SET/COAST switch or disconnection of the wiring or short circuit.
- RESUME/ACCEL switch or disconnection of the wiring or short circuit.

**TROUBLE SYMPTOM:**

- Cruise control cannot be set, or it is cancelled immediately.
- RESUME/ACCEL cannot be operated.



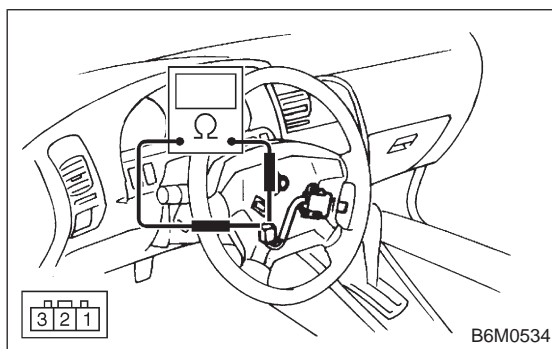
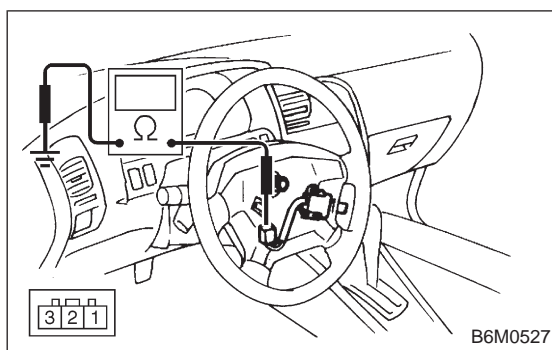
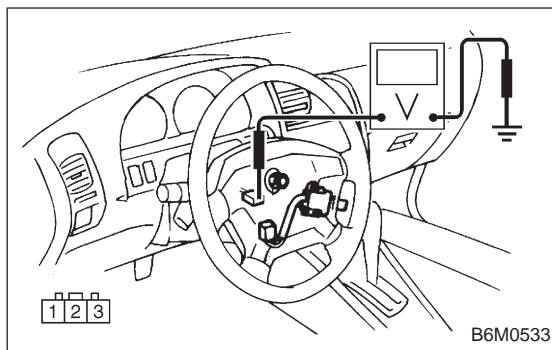
B6M0532

LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	● Brake switch ● Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
---	---	---	---	---

6	7	8	9	10
---	---	---	---	----



### 1. CHECK THE SIGNAL USING A SELECT MONITOR.

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Set select monitor in "FA0" mode.
- 4) Check signals for proper operation.
  - (1) When pushing the SET switch:  
LED No. 1 goes out — lights.
  - (2) When pushing the RESUME switch:  
LED No. 2 goes out — lights.

### 2. CHECK THE CRUISE CONTROL COMMAND SWITCH.

- 1) Disconnect connector from command switch.
- 2) Measure voltage between connector (S1) and body.

**Connector & terminal / Specified voltage:**  
(S1) No. 1 — Body / 10 V, or more

- 3) Check for harness short circuit between command switch and body.

**Terminals / Specified resistance:**  
No. 2 — Body / 1 M $\Omega$ , min.  
No. 3 — Body / 1 M $\Omega$ , min.

- 4) Measure resistance between each terminal of switch side connector to check the switch operation.

**Terminals:**  
No. 1 — No. 2 (SET/COAST SWITCH)  
No. 1 — No. 3 (RESUME/ACCEL SWITCH)

**Specified resistance:**  
10  $\Omega$ , max. (ON)  
1 M $\Omega$ , min. (OFF)

CANCEL (FB0)

11 BRAKE/ST/CL or N

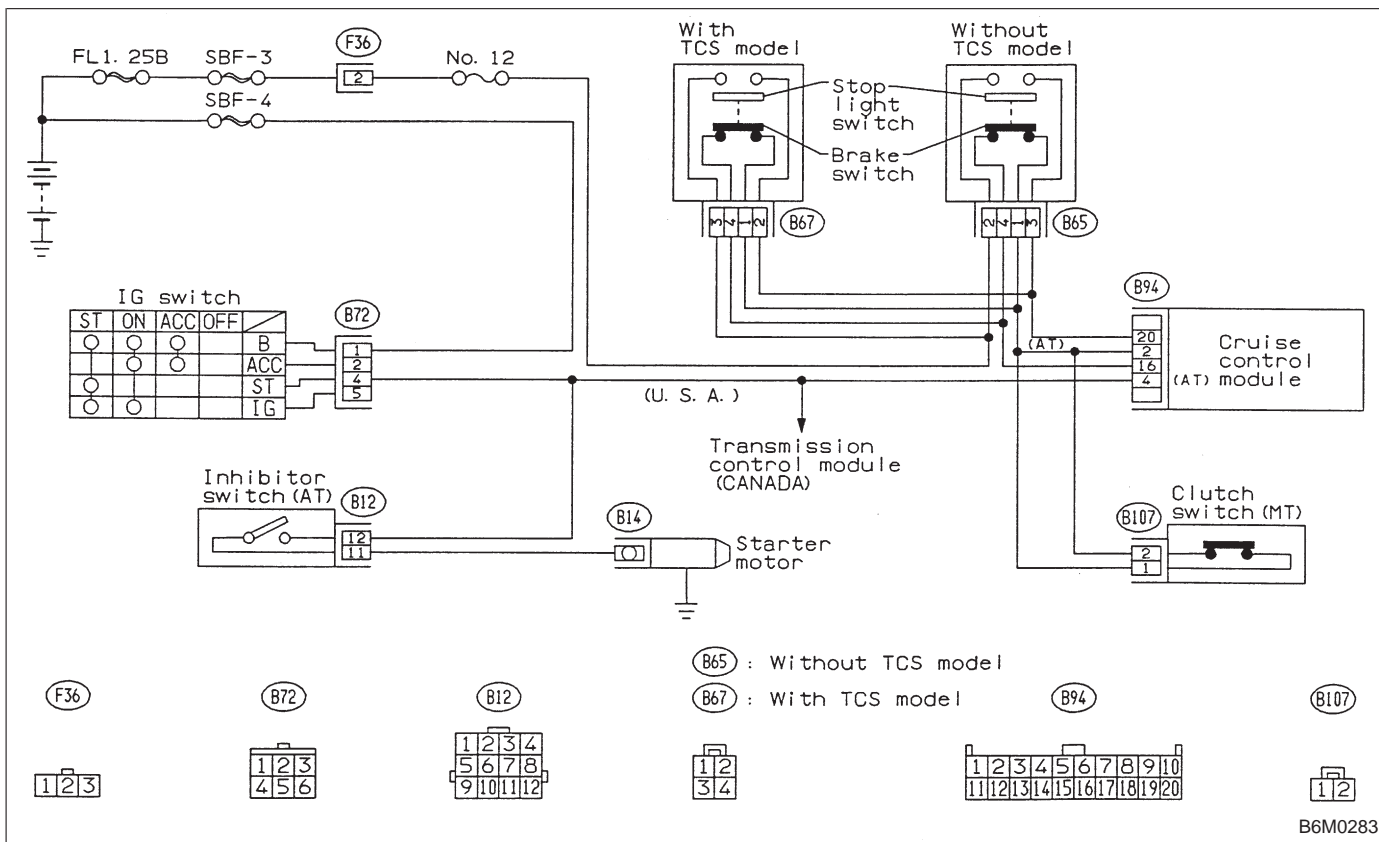
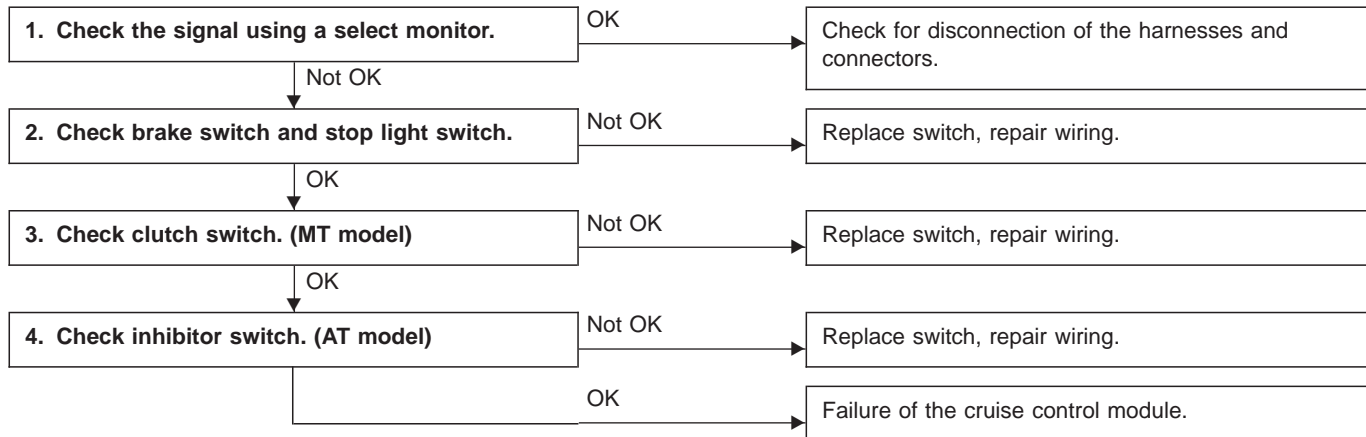
B6M0244

**C: TROUBLE CODE 11**  
**— BRAKE SWITCH, STOP LIGHT SWITCH, CLUTCH SWITCH, INHIBITOR SWITCH —**  
**DIAGNOSIS:**

- Failure or disconnection of the stop light switch and brake switch.
- Failure or disconnection of the inhibitor switch. (AT)
- Failure or disconnection of the clutch switch. (MT)

**TROUBLE SYMPTOM:**

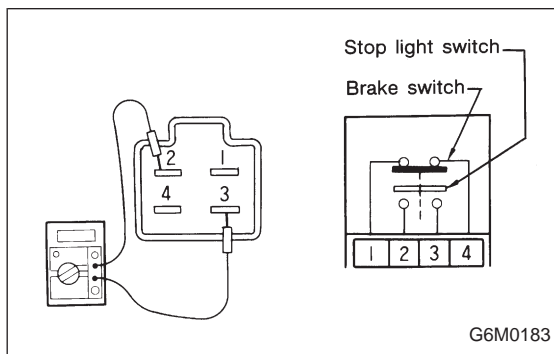
- Cruise control cannot be set.



LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	● Brake switch ● Clutch switch (MT)	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10



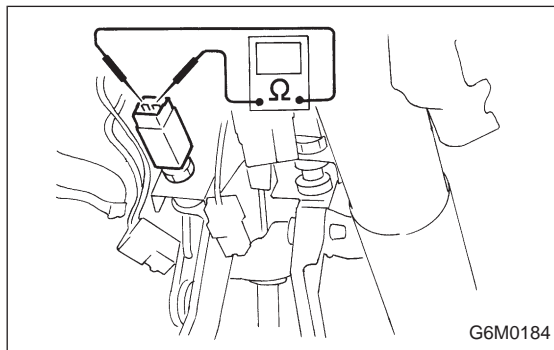
**1. CHECK THE SIGNAL USING A SELECT MONITOR.**

- 1) Turn ignition switch to ON.
- 2) Turn cruise control main switch to ON.
- 3) Apply parking brake securely.
- 4) Set select monitor in "FA0" mode.
- 5) Release the clutch pedal. (MT model)
- 6) Depress the brake pedal and check signals for proper operation.  
Stop light switch: LED No. 3 goes out — lights.  
Brake switch : LED No. 4 goes out — lights.
- 7) Release the brake pedal.
- 8) Depress the clutch pedal and check signal for proper operation. (MT model)  
Clutch switch: LED No. 4 goes out — lights.
- 9) Set the selector lever from D to N position and check signal for proper operation. (AT model)  
Inhibitor switch: LED No. 5 goes out — lights.

**2. CHECK BRAKE SWITCH AND STOP LIGHT SWITCH.**

- 1) Remove connector of stop and brake switch.
- 2) Check circuit between each terminal.

Pedal operation	Brake switch between No. 1 — No. 4	Stop light switch between No. 2 — No. 3
Depressing the brake pedal.	1 MΩ, or more	1 Ω, or less
Without depressing the brake pedal.	1 Ω, or less	1 MΩ, or more



**3. CHECK CLUTCH SWITCH. (MT MODEL)**

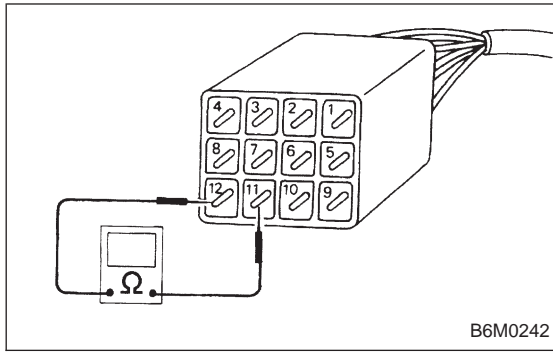
- 1) Disconnect connector from clutch switch.
- 2) Check continuity of the clutch switch.

**Terminals / Specified resistance:**

**No. 1 — No. 2 / 10 Ω, max. (Without pedal depressing.)**

**/ 1 MΩ, min. (Pedal depressing.)**





**4. CHECK INHIBITOR SWITCH. (AT MODEL)**

- 1) Set the selector lever to N position.
- 2) Disconnect connector of inhibitor switch.
- 3) Check continuity of the inhibitor switch.

**Terminals / Specified resistance:**

**No. 11 — No. 12 / 10 Ω, max.**

**(Selector lever is in P or N.)**

**/ 1 MΩ, min.**

**(Selector lever is not in P or N.)**

**CANCEL (FB0)**

**12 NOT SET SP**

B6M0191

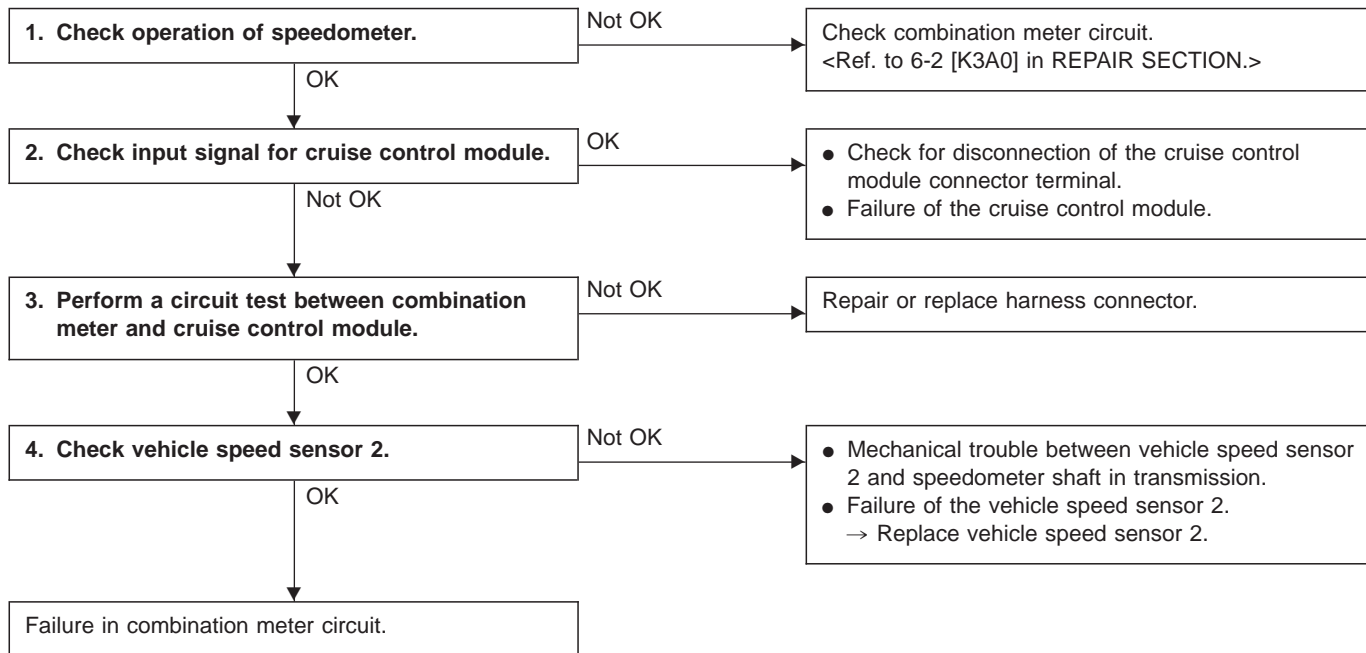
**D: TROUBLE CODE 12, 13 AND 21  
— VEHICLE SPEED SENSOR 2 SYSTEM —**

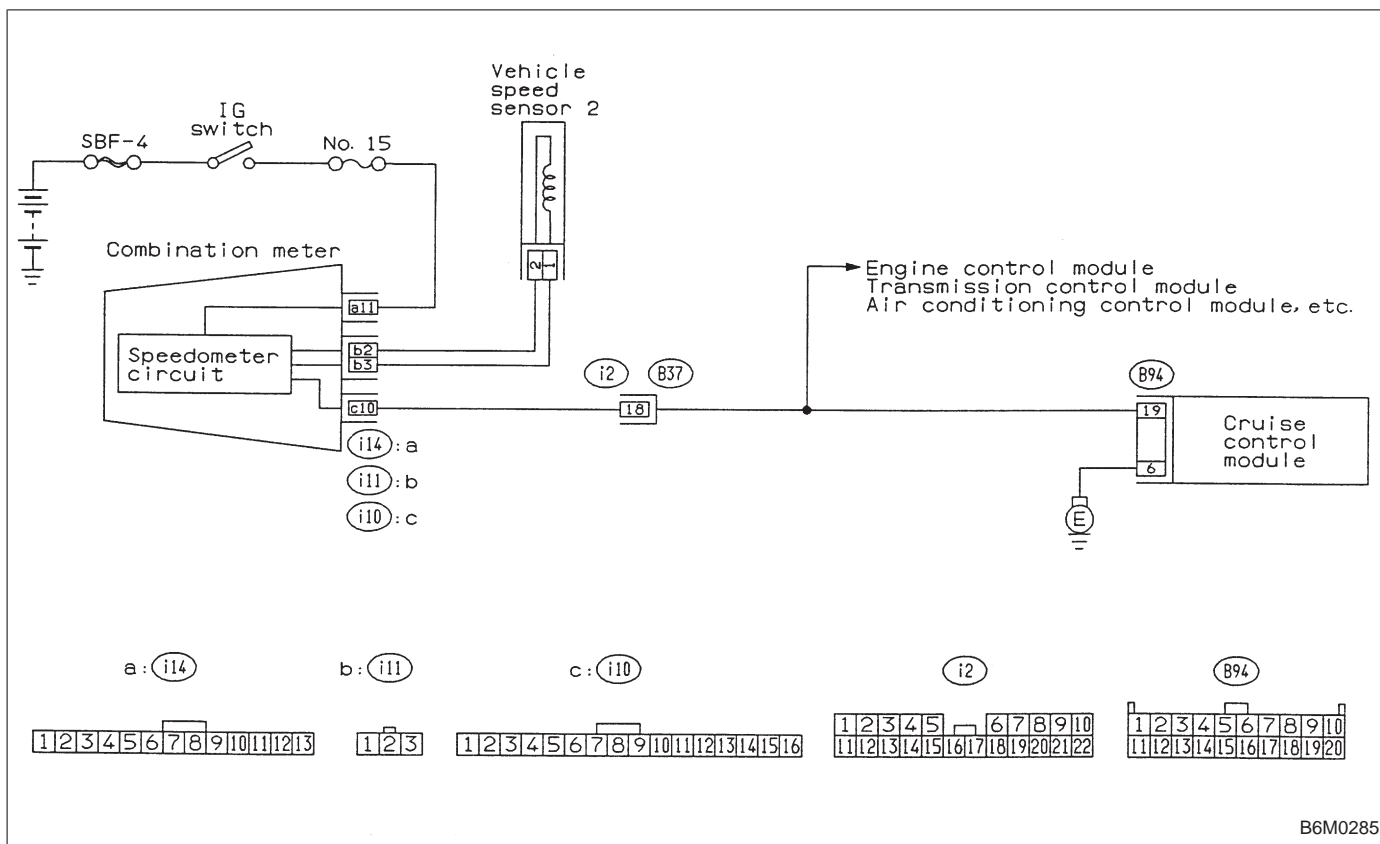
**DIAGNOSIS:**

- Disconnection or short circuit of vehicle speed sensor 2 system.

**TROUBLE SYMPTOM:**

- Cruise control cannot be set. (Cancelled immediately.)





**1. CHECK OPERATION OF SPEEDOMETER.**

Make sure that speedometer indicates the vehicle speed by driving the vehicle.

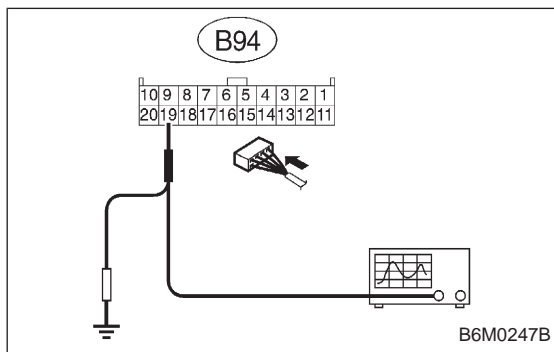
**2. CHECK INPUT SIGNAL FOR CRUISE CONTROL MODULE.**

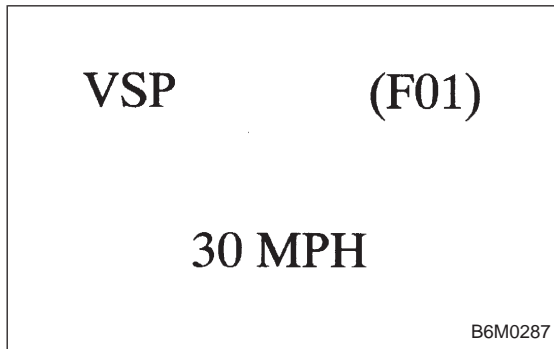
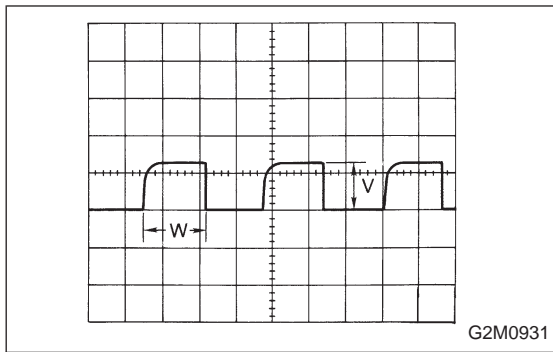
**WARNING:**

**Be careful not to be caught up by the running wheels.**

- 1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
- 2) Set oscilloscope to cruise control module connector terminals.

**Connector & terminal / (B94) No. 19 — Body**





- 3) Start the engine.
- 4) Shift on the gear position, and keep the vehicle speed at constant.
- 5) Measure signal voltage.

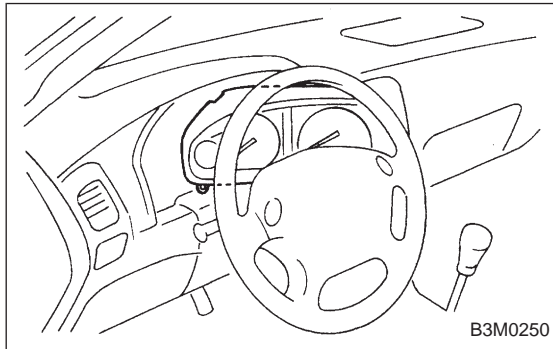
**Specified voltage (V): 2 V, or more**

NOTE:

- If the vehicle speed increases, the width of amplitude (W) decreases.
- If oscilloscope is not available, check input signal (vehicle speed signal) by using a select monitor. (Refer to the procedure as described below.)
- Using the select monitor:
  - (1) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
  - (2) Turn ignition switch to OFF and set select monitor.
  - (3) Turn ignition switch to ON.
  - (4) Turn cruise control main switch to ON.
  - (5) Set select monitor in "F01" or "F02" mode.
  - (6) Drive the vehicle at speed greater than 40 km/h (25 MPH).
  - (7) Check that vehicle speed indication on select monitor and speedometer are equal.

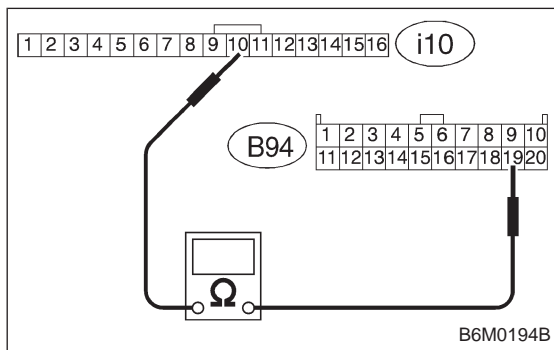
NOTE:

- When there is a disconnection or short circuit in the harness between the meter and the cruise control module, the indicated value will be 0 to 1.0 km/h (0 to 0.6 MPH).
- In "F01" mode, vehicle speed is indicated in mile per hour (MPH).  
In "F02" mode, vehicle speed is indicated in kilometer per hour (km/h).



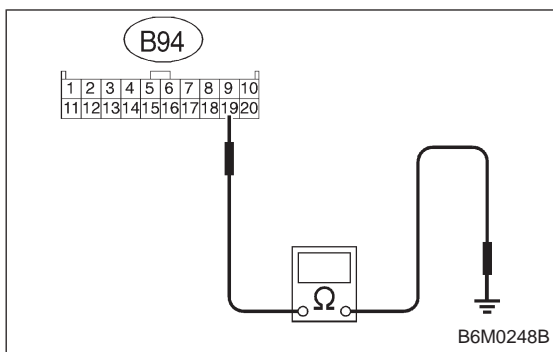
### 3. PERFORM A CIRCUIT TEST BETWEEN COMBINATION METER AND CRUISE CONTROL MODULE.

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



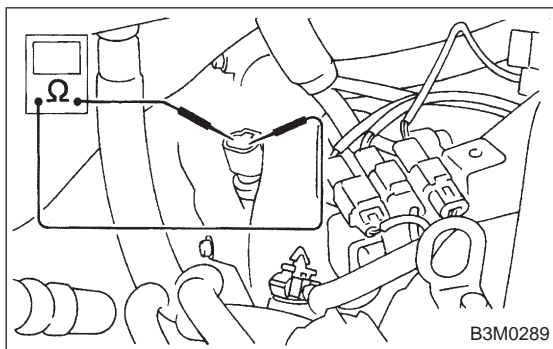
- 3) Disconnect connector from cruise control module.
- 4) Measure resistance of harness connector between combination meter and cruise control module.

**Connector & terminal / Specified resistance:**  
**(i10) No. 10 — (B94) No. 19 / 10 Ω, max.**



5) Measure resistance of harness connector between cruise control module and body to make sure that circuit does not short.

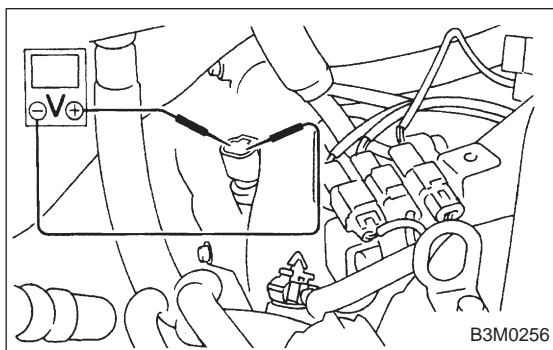
**Connector & terminal / Specified resistance:**  
**(B94) No. 19 — Body / 1 MΩ, min.**



**4. CHECK VEHICLE SPEED SENSOR 2.**

- 1) Disconnect connector from vehicle speed sensor 2.
- 2) Measure resistance between terminals of vehicle speed sensor 2.

**Terminals / Specified resistance:**  
**No. 1 — No. 2 / 350 — 450 Ω**

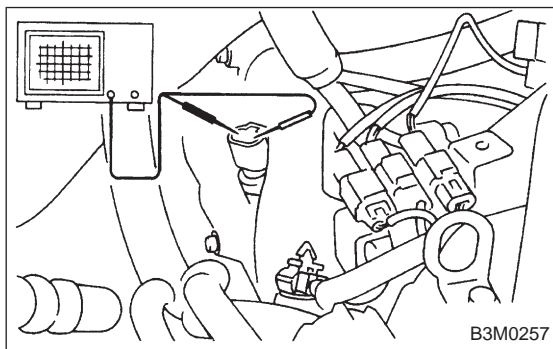


**WARNING:**

**Be careful not to be caught up by the running wheels.**

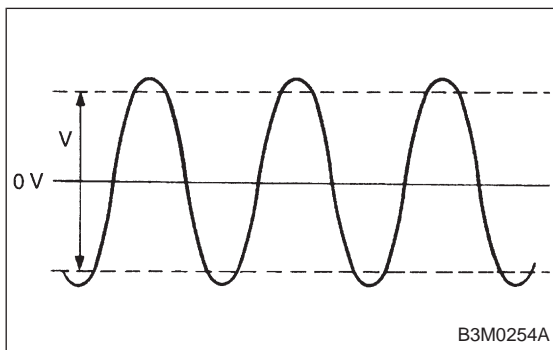
- 3) Set the vehicle on free roller, or lift-up the vehicle and support with safety stands.
- 4) Drive the vehicle at speed greater than 20 km/h (12 MPH).
- 5) Measure voltage between terminals of vehicle speed sensor 2.

**Terminals / Specified voltage:**  
**No. 1 — No. 2 / 2 V, or more (AC range)**



- Using an oscilloscope:
  - (1) Turn ignition switch to OFF.
  - (2) Set oscilloscope to vehicle speed sensor 2.
  - (3) Drive the vehicle at speed greater than 20 km/h (12 MPH).
  - (4) Measure signal voltage.

**Specified voltage (V): 5 V, min.**



CANCEL (FB0)

14 CANCEL SW

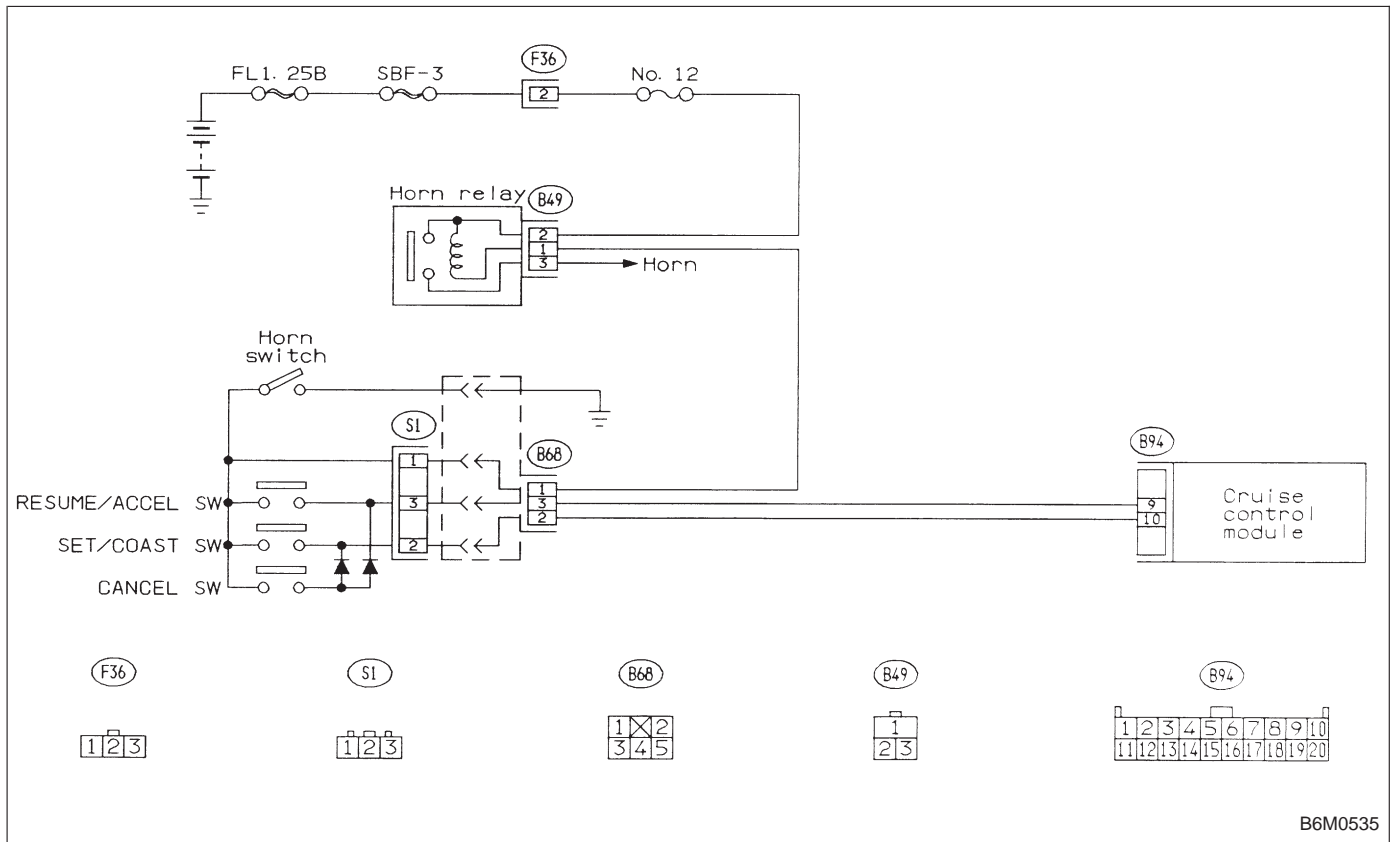
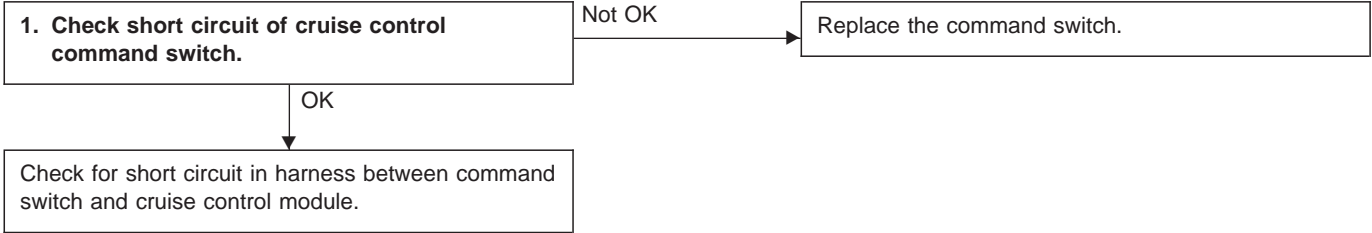
B6M0196

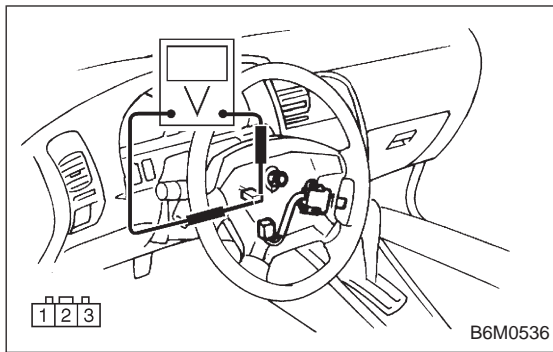
**E: TROUBLE CODE 14 AND 22**  
**— SET/COAST SWITCH, RESUME/ACCEL SWITCH, CANCEL SWITCH —**  
**DIAGNOSIS:**

- Short circuit inside the SET SW and RESUME SW.

**TROUBLE SYMPTOM:**

- Cruise control cannot be set. (Cancelled immediately.)





**1. CHECK SHORT CIRCUIT OF CRUISE CONTROL COMMAND SWITCH.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between each terminal of connector (S1).

**Terminals / Specified resistance:**

**SET switch ON**

(S1) No. 1 — (S1) No. 2 / 10 — 13 V

**RESUME switch ON**

(S1) No. 1 — (S1) No. 3 / 10 — 13 V

**CANCEL switch ON**

(S1) No. 1 — (S1) No. 2 / 10 — 13 V

(S1) No. 1 — (S1) No. 3 / 10 — 13 V

CANCEL (FB0)

23 RELAY NG

B6M0198

**F: TROUBLE CODE 23 AND 24  
— CRUISE CONTROL MODULE BUILT-IN  
RELAY, CPU RAM —**

**DIAGNOSIS:**

- Welding of built-in relay of cruise control module.
- Failure of built-in CPU RAM of cruise control module.

**TROUBLE SYMPTOM:**

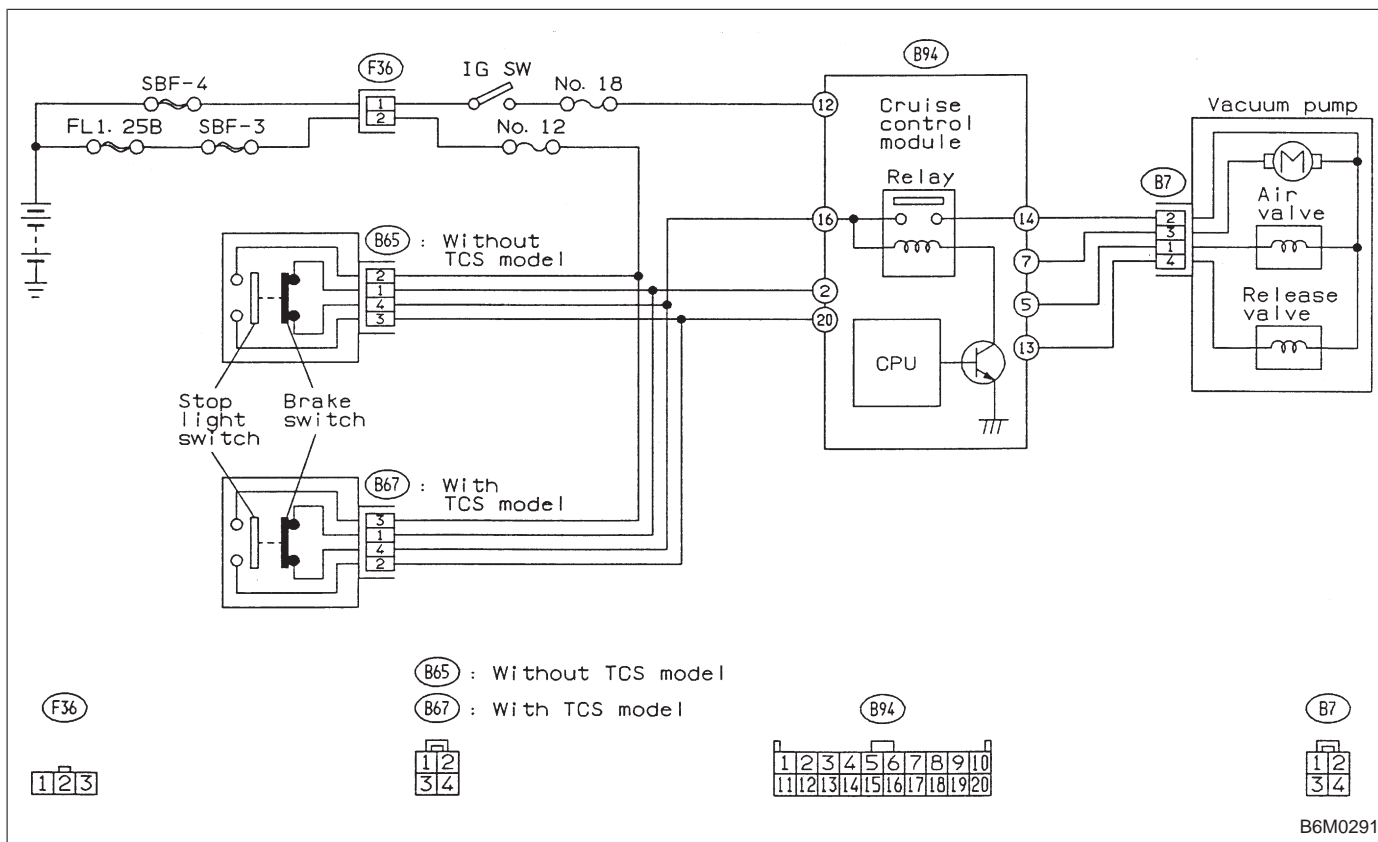
- Cruise control is cancelled and memorized cruise speed is also cancelled.
- Once cruise control is cancelled, cruise control cannot be set until the ignition switch and cruise main switch turns OFF, and then turns ON again.

**NOTE:**

Perform real-time diagnosis ("FA0" mode) and check vehicle speed signal with select monitor.

When input signals are in good condition, failure is in cruise control module.

(Check power supply and ground condition of cruise control module.)





CANCEL (FB0)  
31 MOTOR NG  
B6M0200

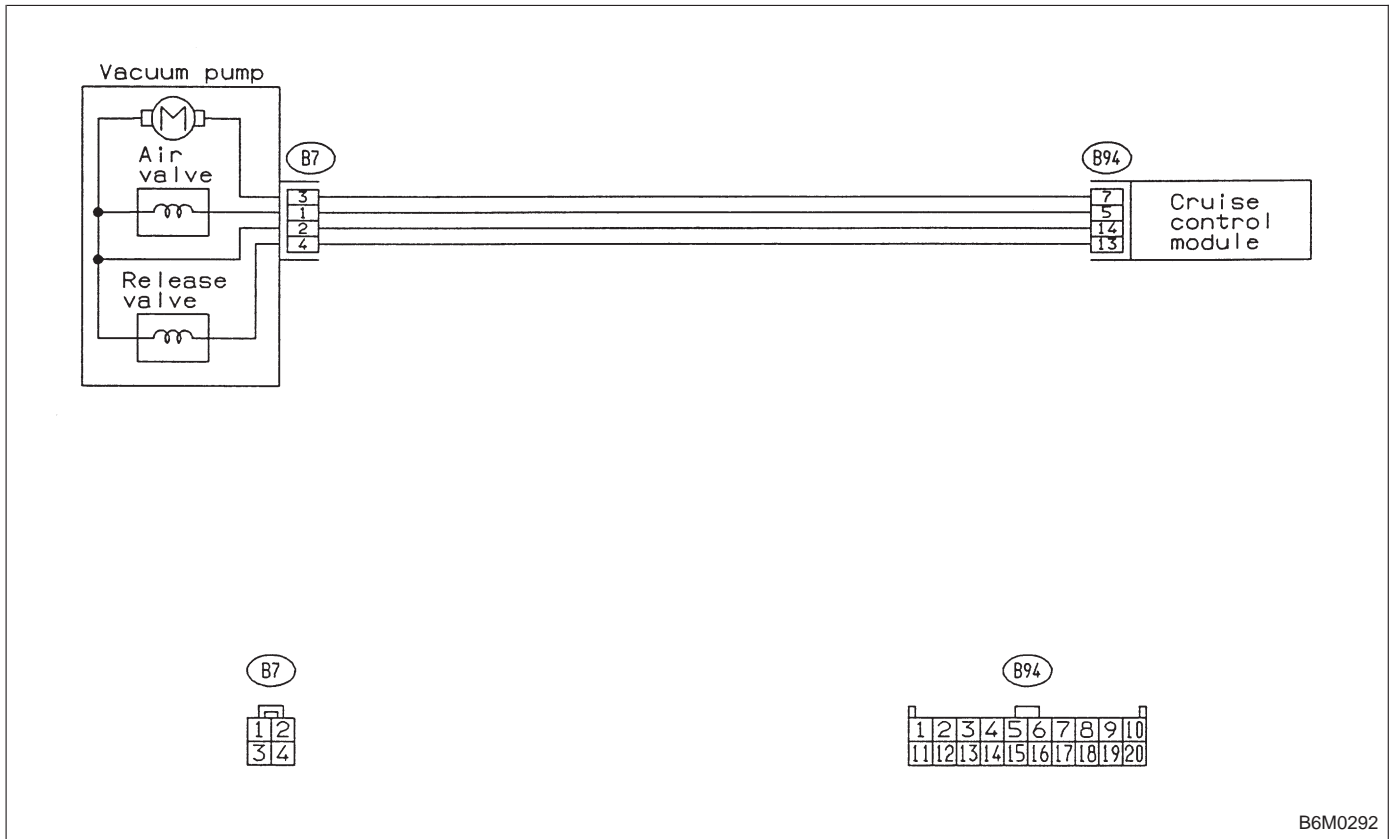
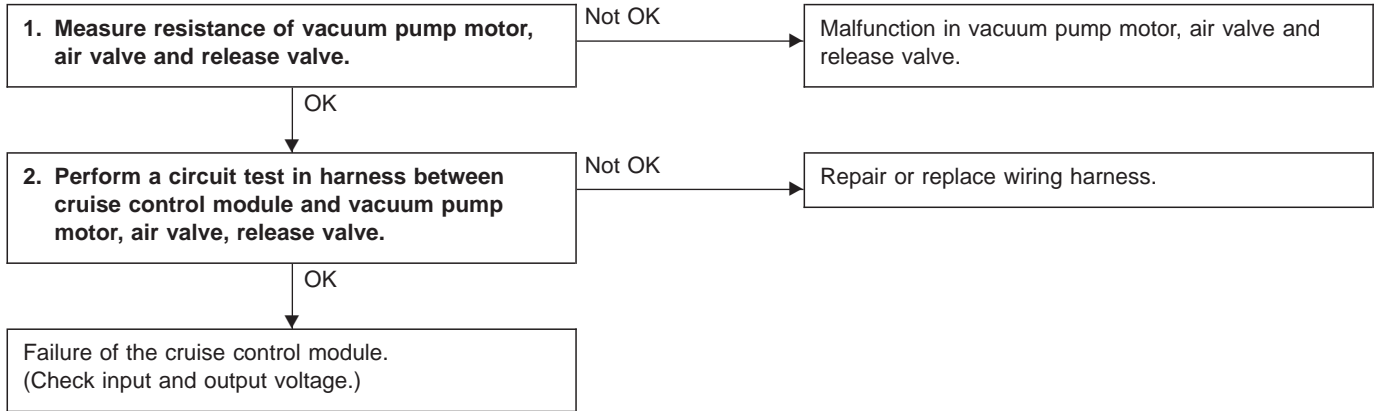
**G: TROUBLE CODE 31, 32 AND 33 — VACUUM PUMP, AIR VALVE, RELEASE VALVE —**

**DIAGNOSIS:**

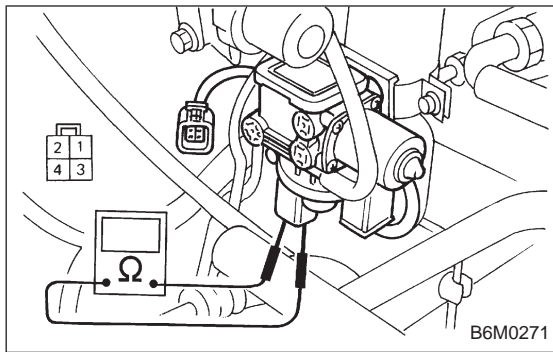
- Open or poor contact of vacuum pump motor, air valve and release valve.

**TROUBLE SYMPTOM:**

- Cruise control cannot be set. (Cancelled immediately.)



B6M0292



### 1. MEASURE RESISTANCE OF VACUUM PUMP MOTOR, AIR VALVE AND RELEASE VALVE.

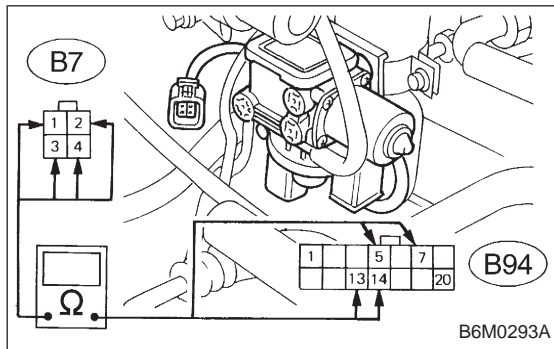
- 1) Disconnect connector of vacuum pump and valve.
- 2) Measure resistance of vacuum pump motor, air valve and release valve.

#### **Terminals / Specified resistance:**

**No. 2 — No. 3 / 46 Ω (Vacuum pump motor)**

**No. 2 — No. 1 / 69 Ω (Air valve)**

**No. 2 — No. 4 / 69 Ω (Release valve)**



### 2. PERFORM A CIRCUIT TEST IN HARNESS BETWEEN CRUISE CONTROL MODULE AND VACUUM PUMP MOTOR, AIR VALVE, RELEASE VALVE.

- 1) Disconnect connectors from cruise control module, vacuum pump and valve.
- 2) Measure resistance of harness connector between cruise control module, vacuum pump motor, air valve and release valve.

#### **Connector & terminal / Specified resistance:**

**(B7) No. 1 — (B94) No. 5 / 10 Ω, max.**

**(B7) No. 2 — (B94) No. 14 / 10 Ω, max.**

**(B7) No. 3 — (B94) No. 7 / 10 Ω, max.**

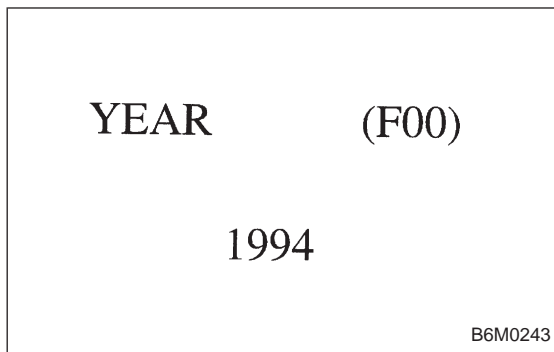
**(B7) No. 4 — (B94) No. 13 / 10 Ω, max.**

**9. Diagnostics Chart with Select Monitor**

**A: FUNCTION MODE**

Applicable cartridge of select monitor: No. 498349601

Function mode	Contents	Abbreviation	Unit of measure	Page
F00	ROM ID number	YEAR	—	33
F01	Vehicle speed signal	VSP	MPH	33
F02	Vehicle speed signal	VSP	km/h	33
F03	Memorized cruise set speed	MSP	MPH	34
F04	Memorized cruise set speed	MSP	km/h	34
FA0	ON ↔ OFF signal	—	—	35



**B: MODE F00**  
**— ROM ID NUMBER (YEAR) —**

**CONDITION:**  
 Ignition switch "ON"

**SPECIFIED DATA:**  
 Presentation display

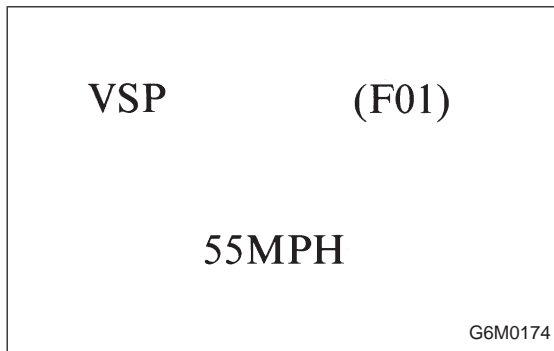
- Probable cause (Item outside "specified data")

1. Error 1

Check for loose or disconnected connector, and discontinued circuit, etc.

2. Error 2

Check for poor contact of cartridge, or different type cartridge.



**C: MODE F01 AND F02**  
**— VEHICLE SPEED SIGNAL (VSP) —**

**CONDITION:**  
 Driving at constant speed.

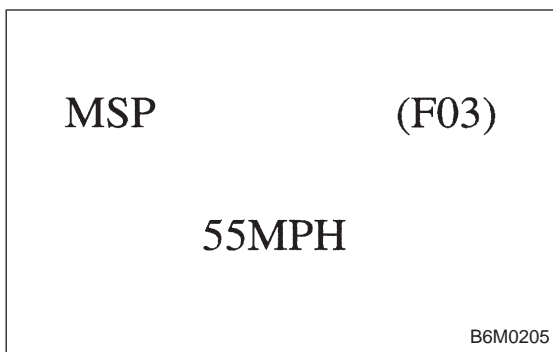
**SPECIFIED DATA:**  
 Compare speedometer with monitor indications.

- F01: Vehicle speed is indicated in mile per hour (MPH).
- F02: Vehicle speed is indicated in kilometer per hour (km/h).

- Probable cause (Item outside "specified data")

1. Vehicle speed sensor 2

Check vehicle speed sensor line.  
 <Ref. to 6-2 [T8D0].>



**D: MODE F03 AND F04**  
**— MEMORIZED CRUISE SET SPEED (MSP) —**

**CONDITION:**

Driving at minimum of 40 km/h (25 MPH) and set cruise control.

**SPECIFIED DATA:**

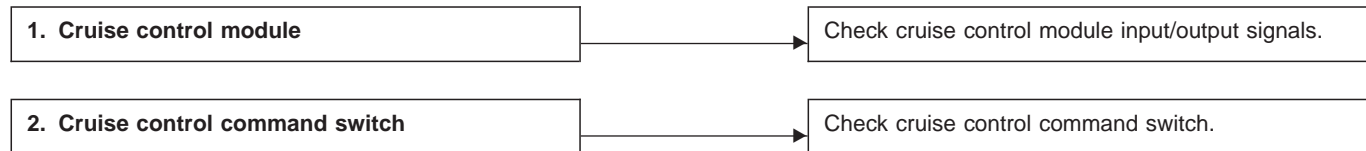
Compare displayed vehicle speed on select monitor in mode "F03" and "F04" with the speed in mode "F01" and "F02".

- F03: Memorized cruise set speed is indicated in mile per hour (MPH).
- F04: Memorized cruise set speed is indicated in kilometer per hour (km/h).

**NOTE:**

- F01: Actual vehicle speed is indicated in mile per hour (MPH).
- F02: Actual vehicle speed is indicated in kilometer per hour (km/h).

- Probable cause (Item outside "specified data")



LED No.	Signal name	Display
1	SET/COAST switch	SE
2	RESUME/ACCEL switch	RE
3	Stop light switch	ST
4	<ul style="list-style-type: none"> <li>● Brake switch</li> <li>● Clutch switch (MT)</li> </ul>	BR
5	Inhibitor switch (AT)	N
6	—	—
7	—	—
8	—	—
9	—	—
10	—	—

**E: MODE FA0**

**— ON ↔ OFF SIGNAL —**

Requirement for LED “ON”.

LED No. 1 SET/COAST switch is turned to ON.

LED No. 2 RESUME/ACCEL switch is turned to ON.

LED No. 3 Stop light switch is turned to ON.  
(Brake pedal is depressed.)

LED No. 4 ● Brake switch is turned to ON.  
● Clutch switch is turned to ON. (MT model)  
(Clutch pedal is depressed.)

LED No. 5 Select lever is set to “P” or “N” position. (AT model)

SE	RE	ST	BR	N
—	—	—	—	—

1	2	3	4	5
6	7	8	9	10