

ON-BOARD DIAGNOSTICS II SYSTEM

2-7b

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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 injec-

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

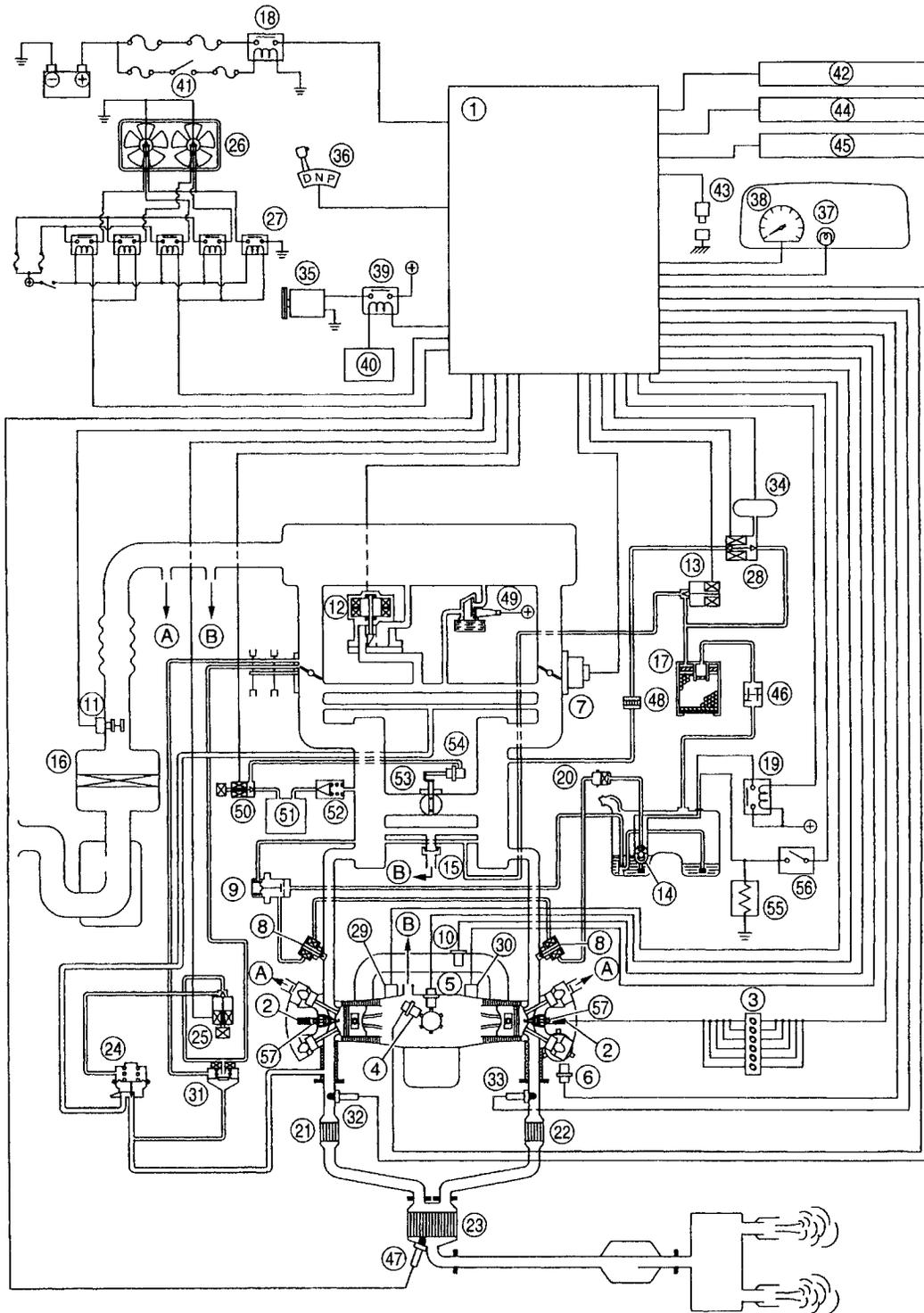
● Further, all the operating conditions of the engine are converted into electric signals, and this results in additional features of the system, such as large improved adaptability, easier addition of compensating element, etc.

The MFI system also has the following features:

- 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.

ON-BOARD DIAGNOSTICS II SYSTEM

2. SCHEMATIC

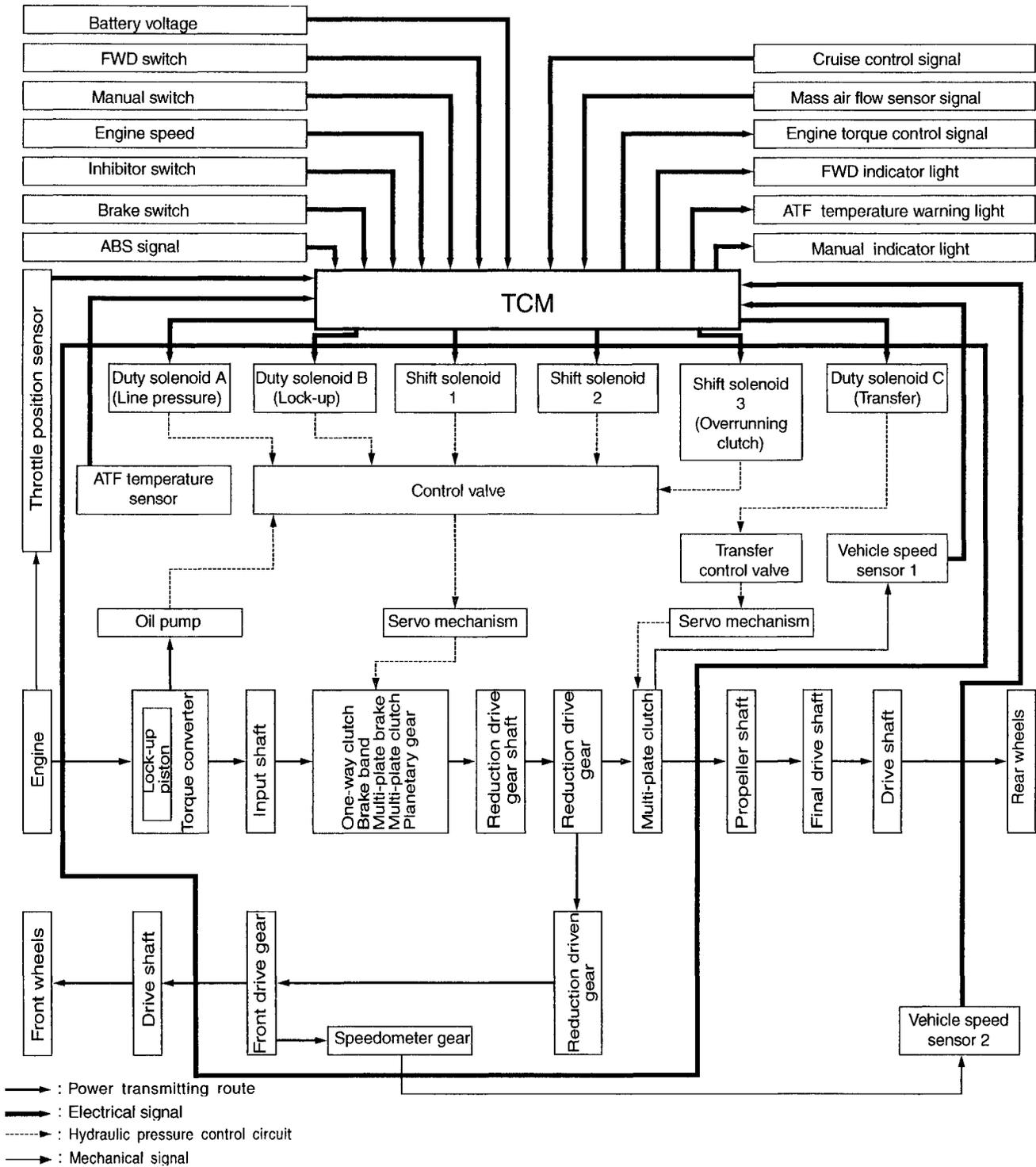


-
- ① Engine control module (ECM)
 - ② Ignition coil
 - ③ Ignitor
 - ④ Crankshaft position sensor 1
 - ⑤ Crankshaft position sensor 2
 - ⑥ Camshaft position sensor
 - ⑦ Throttle position sensor
 - ⑧ Fuel injectors
 - ⑨ Pressure regulator
 - ⑩ Engine coolant temperature sensor
 - ⑪ Mass air flow sensor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

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



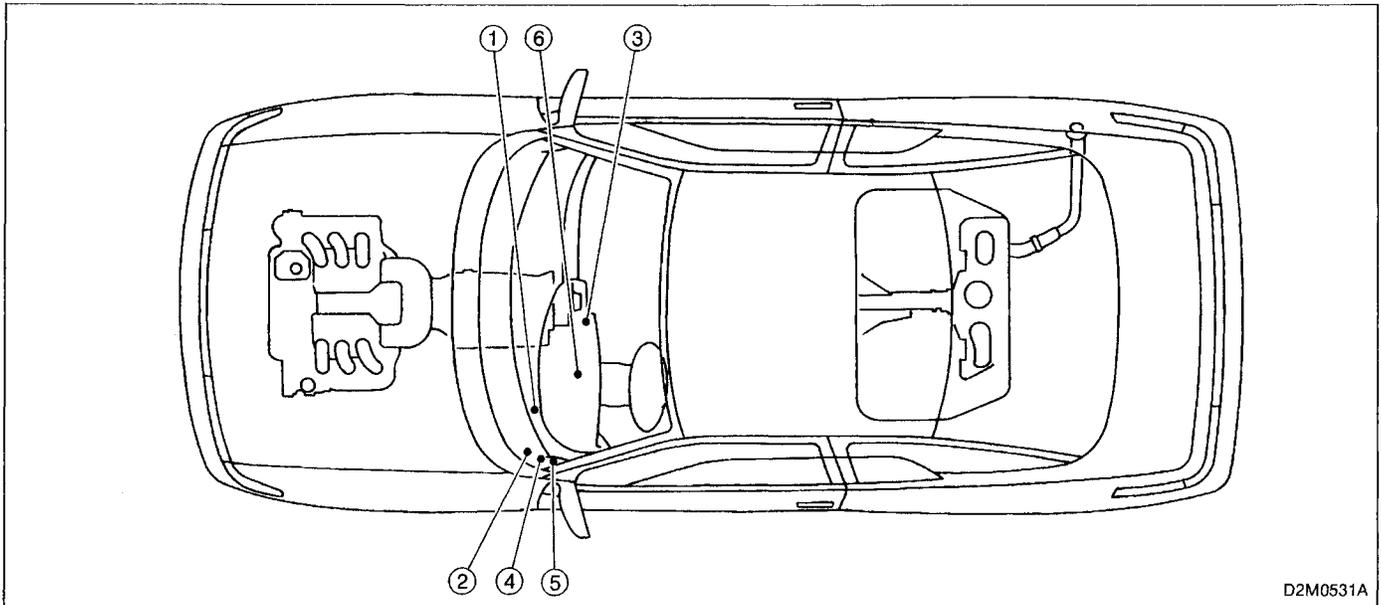
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MEMO:

2. Electrical Components Location

A: ENGINE

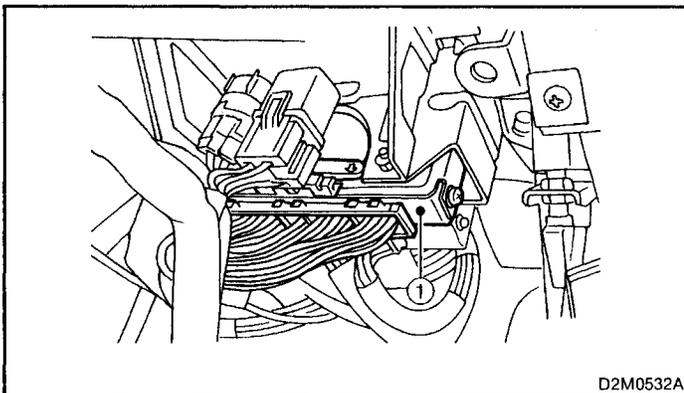
1. MODULE



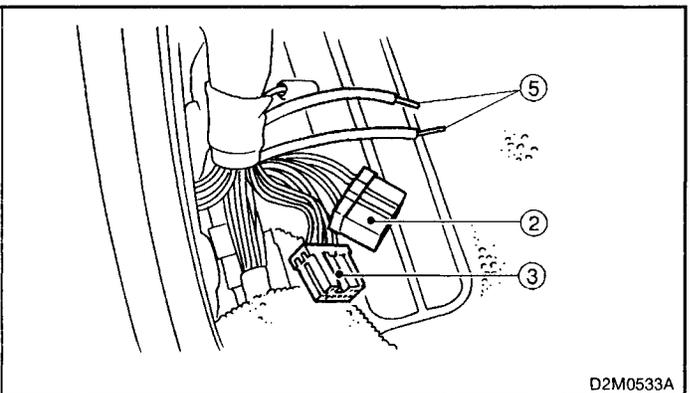
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- ① Engine control module (ECM)
- ② Data link connector (for Subaru select monitor only)
- ③ Data link connector (for Subaru select monitor and OBD-II general scan tool)

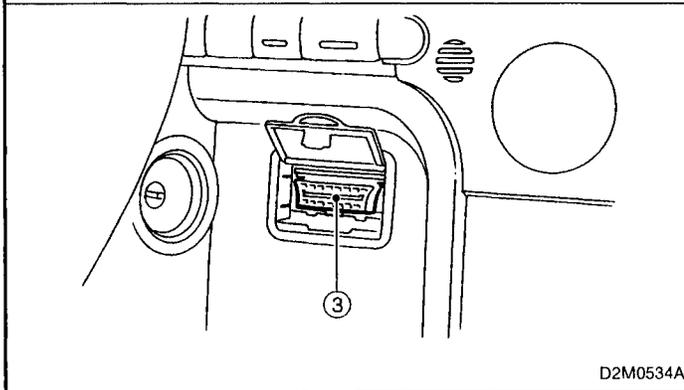
- ④ Diagnosis connector (Black)
- ⑤ Diagnosis terminal
- ⑥ CHECK ENGINE malfunction indicator lamp (MIL)



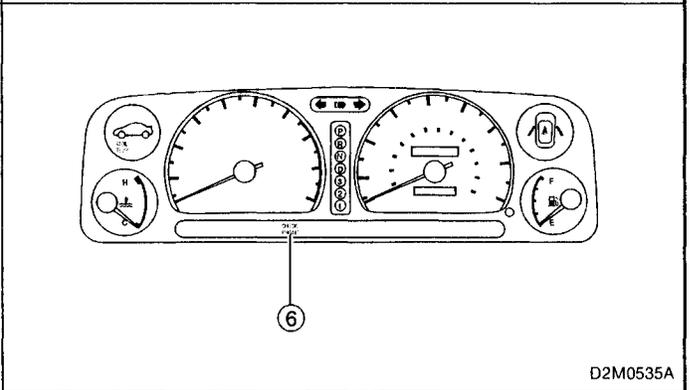
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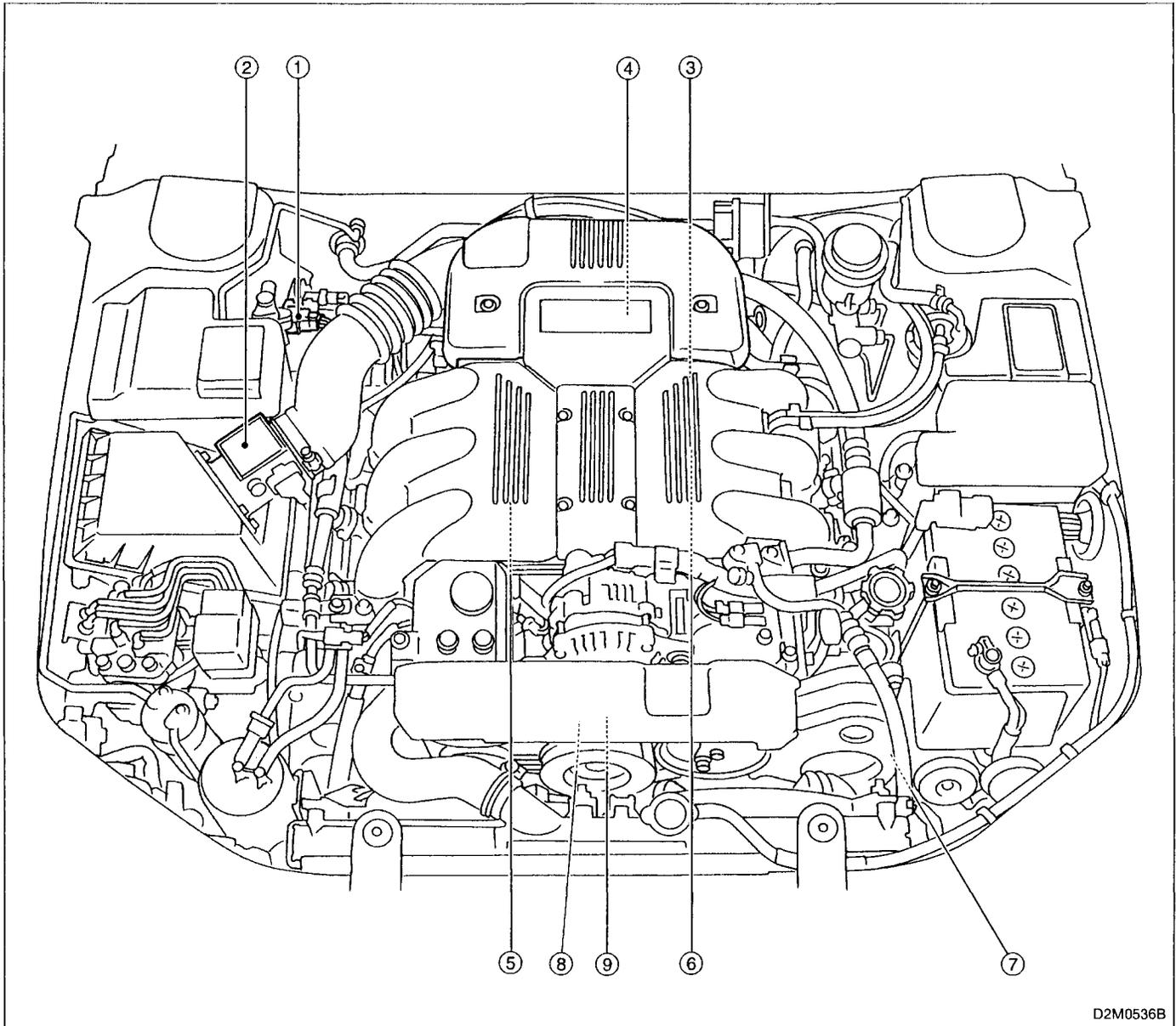


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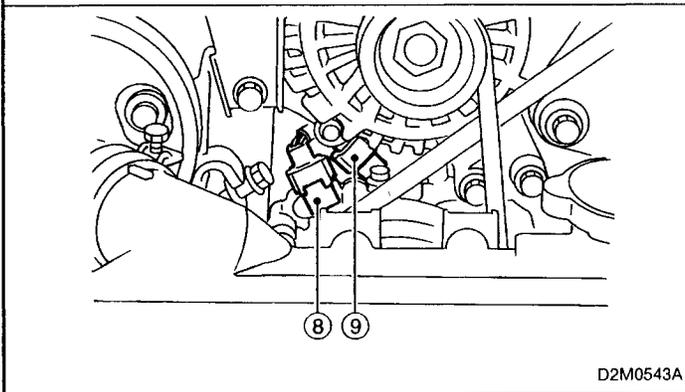
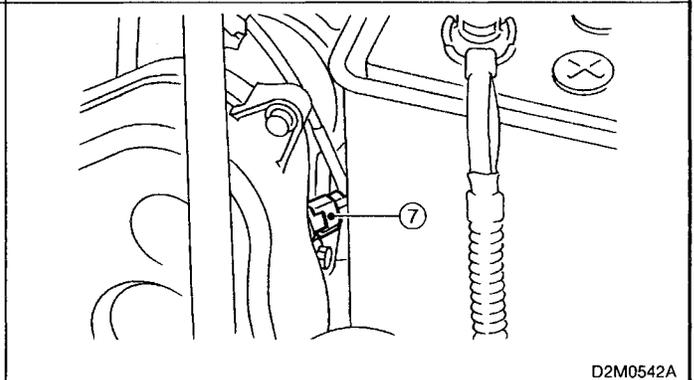
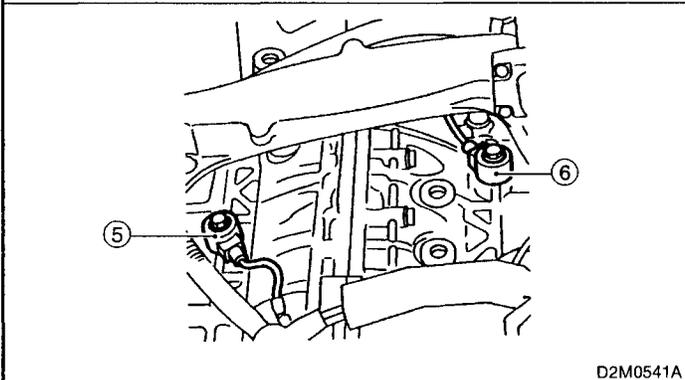
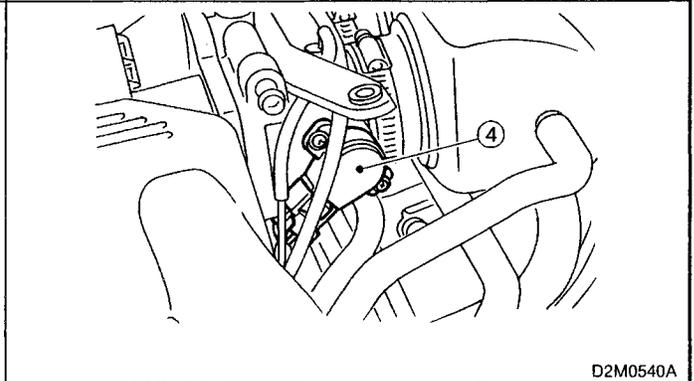
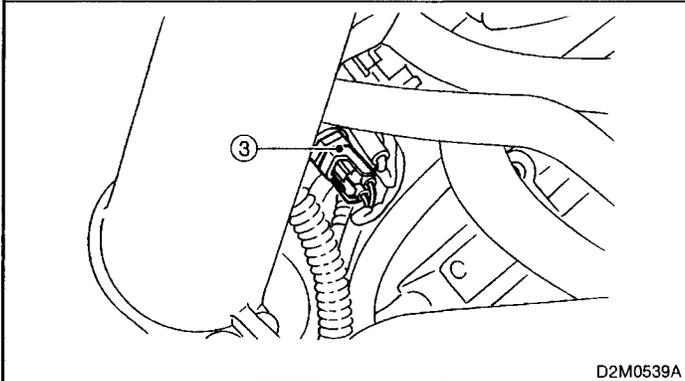
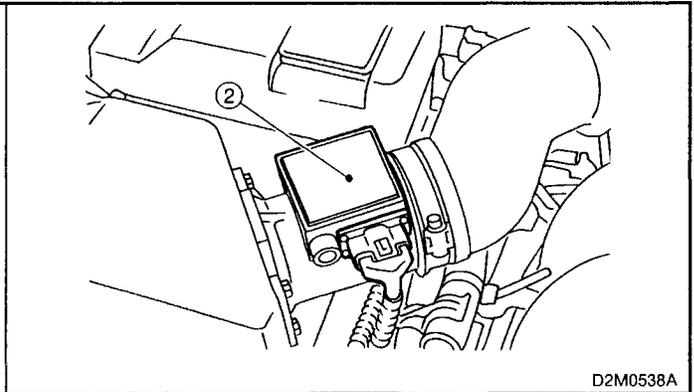
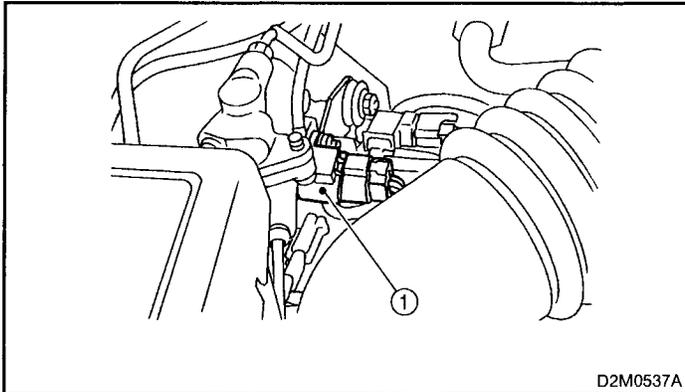
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2. SENSOR

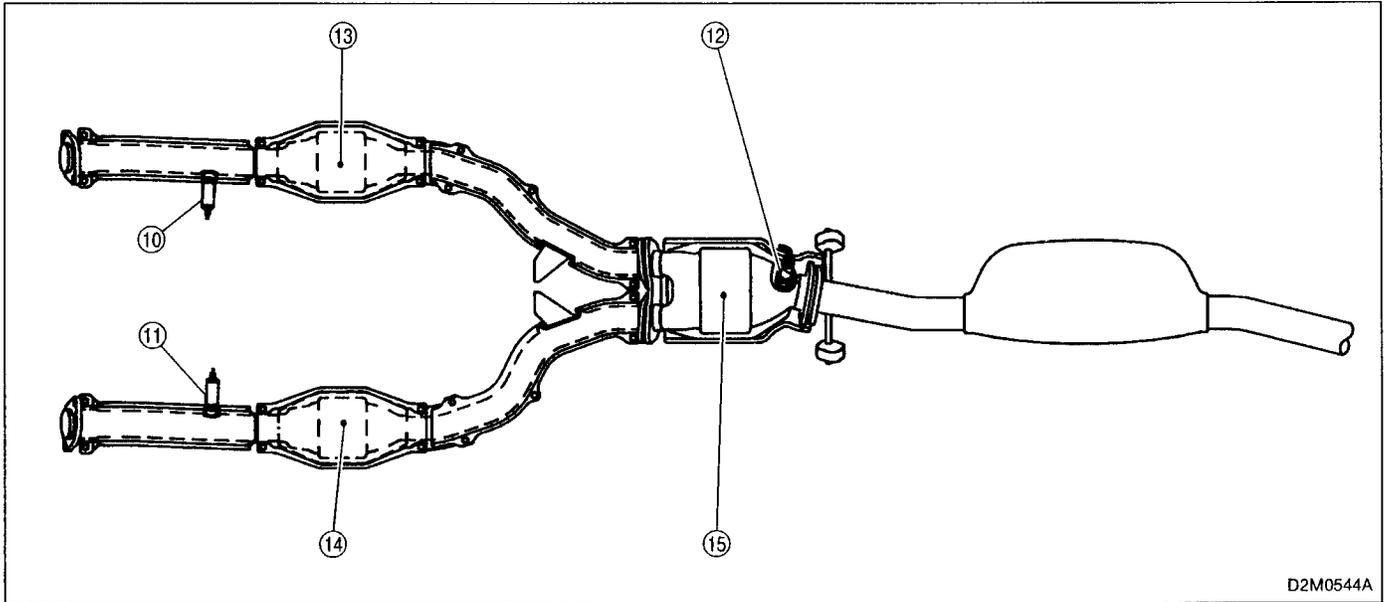


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- ① Pressure sensor
- ② Mass air flow sensor
- ③ Engine coolant temperature sensor
- ④ Throttle position sensor
- ⑤ Knock sensor 1
- ⑥ Knock sensor 2
- ⑦ Camshaft position sensor
- ⑧ Crankshaft position sensor 1
- ⑨ Crankshaft position sensor 2

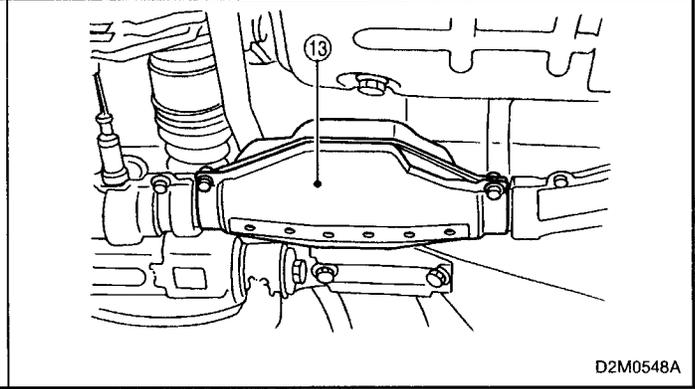
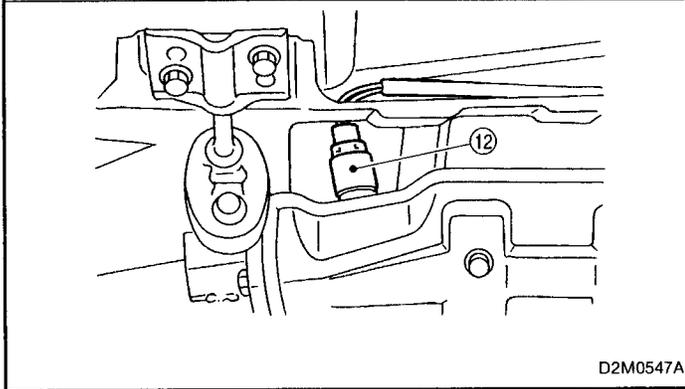
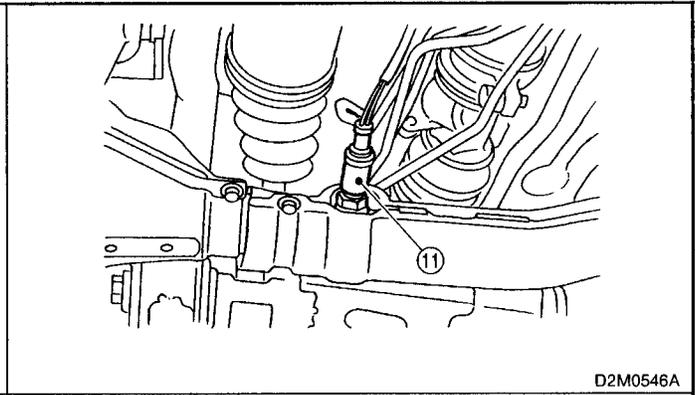
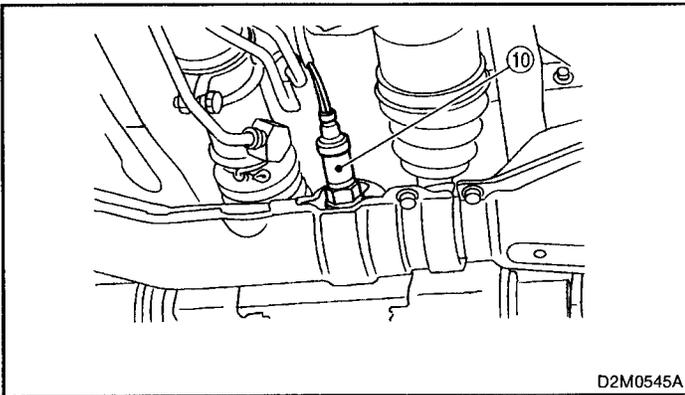


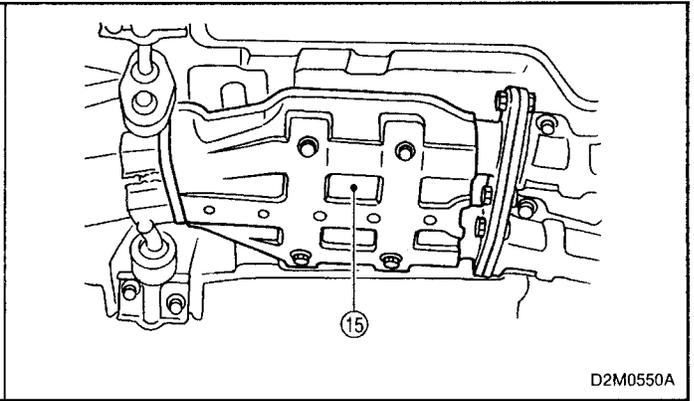
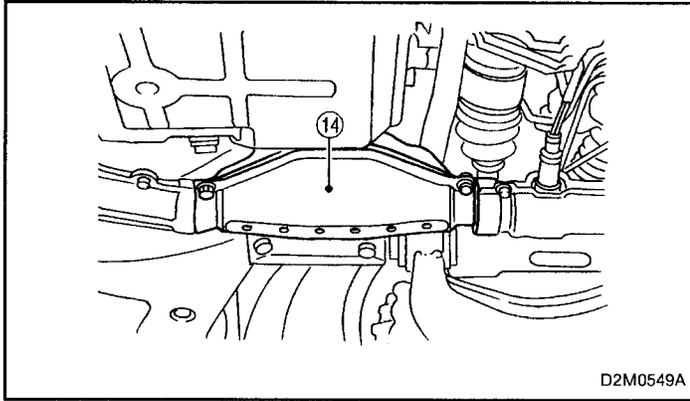
2. Electrical Components Location



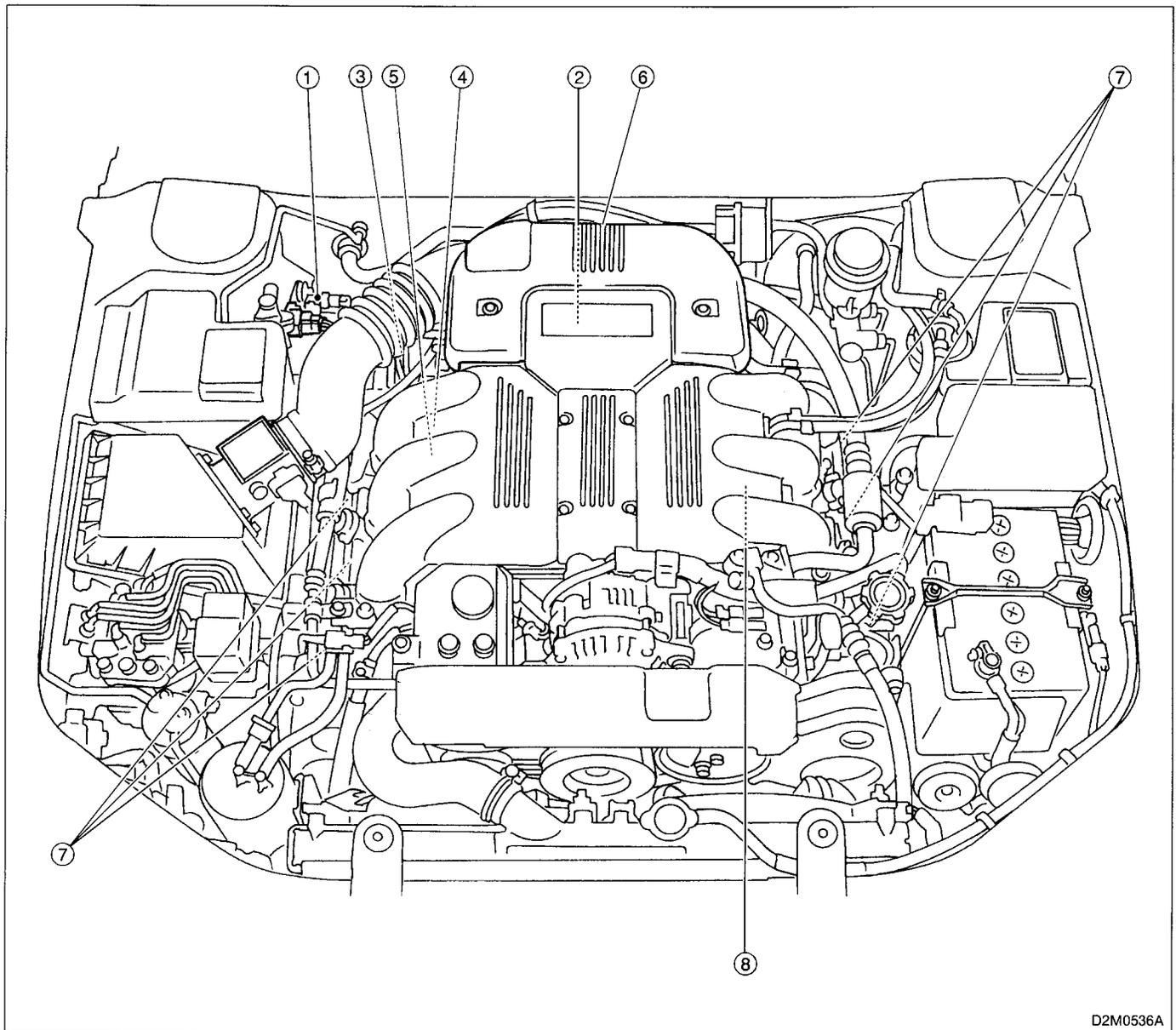
- ⑩ Front oxygen sensor 1 (RH)
- ⑪ Front oxygen sensor 2 (LH)
- ⑫ Rear oxygen sensor

- ⑬ Front catalytic converter (RH)
- ⑭ Front catalytic converter (LH)
- ⑮ Rear catalytic converter





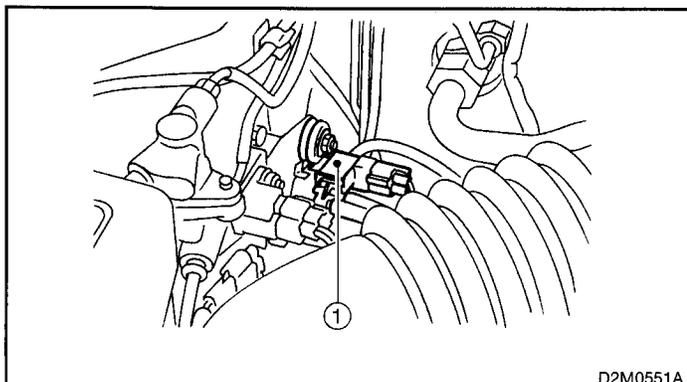
3. SOLENOID VALVE, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS



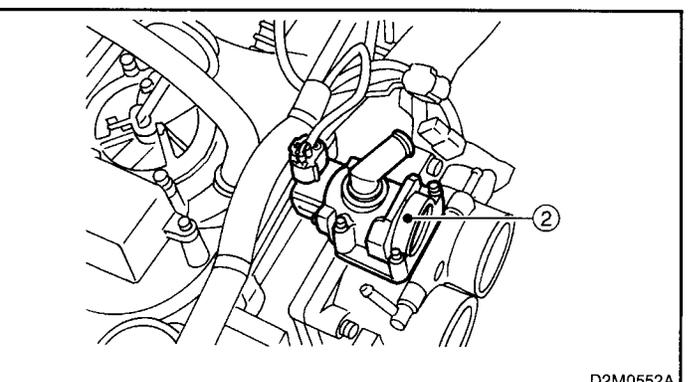
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- ① Pressure sources switching solenoid valve
- ② Idle air control solenoid valve
- ③ EGR valve
- ④ EGR control solenoid valve

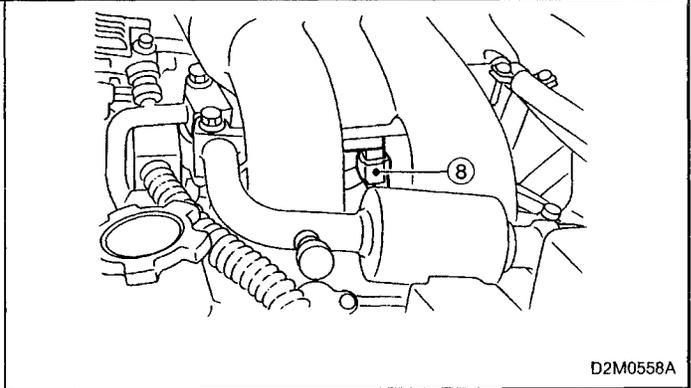
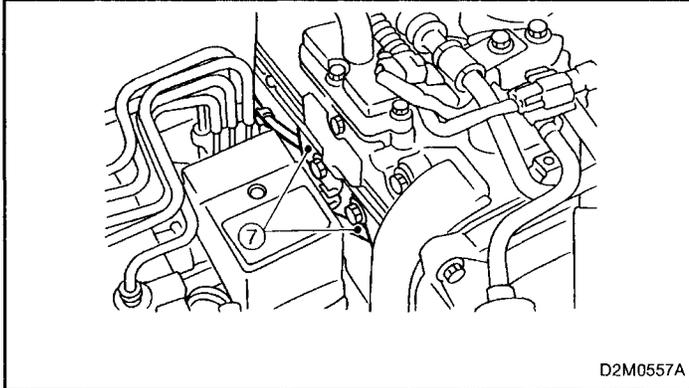
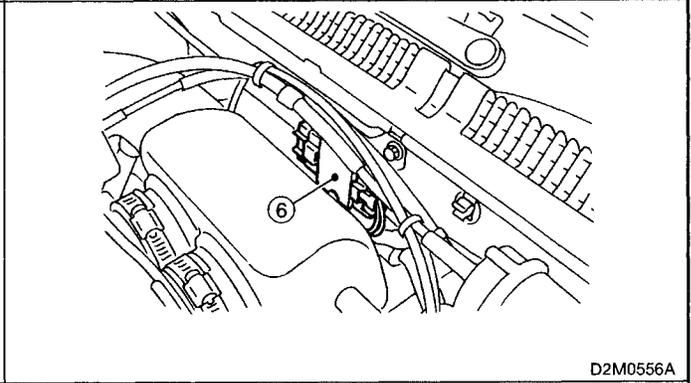
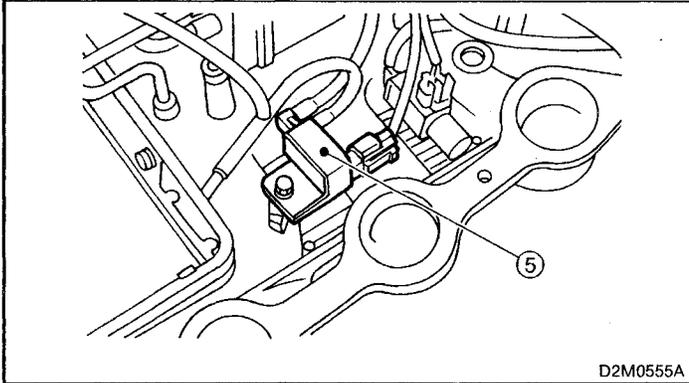
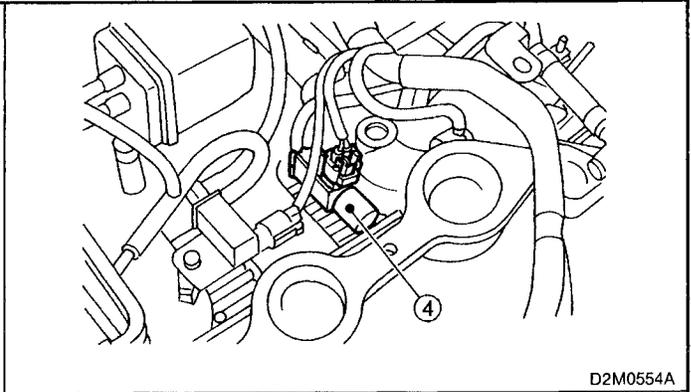
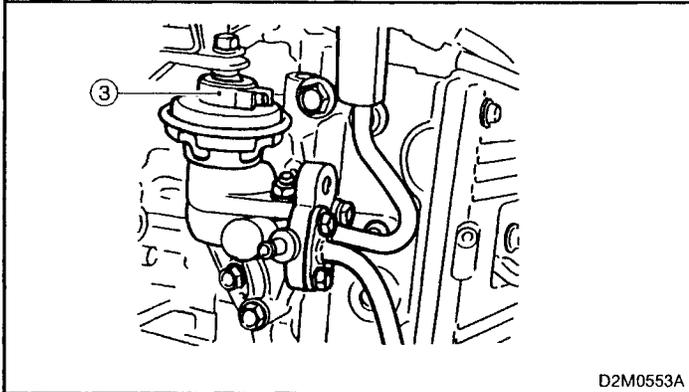
- ⑤ Purge control solenoid valve
- ⑥ Ignitor
- ⑦ Ignition coil
- ⑧ Induction control solenoid valve



D2M0551A



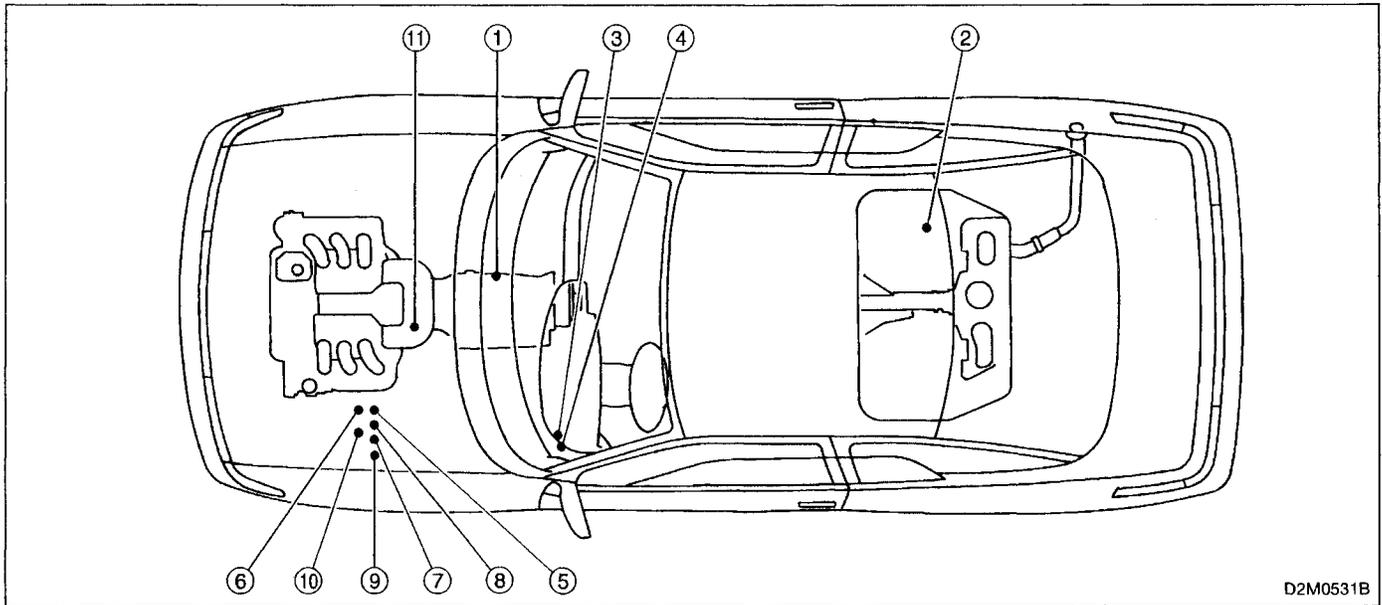
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2-7b [T2A3]

ON-BOARD DIAGNOSTICS II SYSTEM

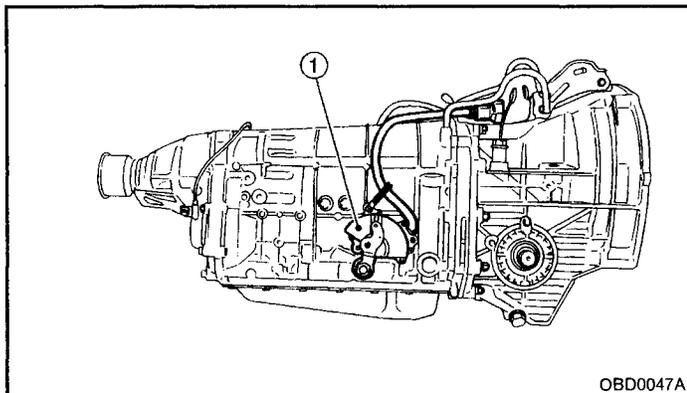
2. Electrical Components Location



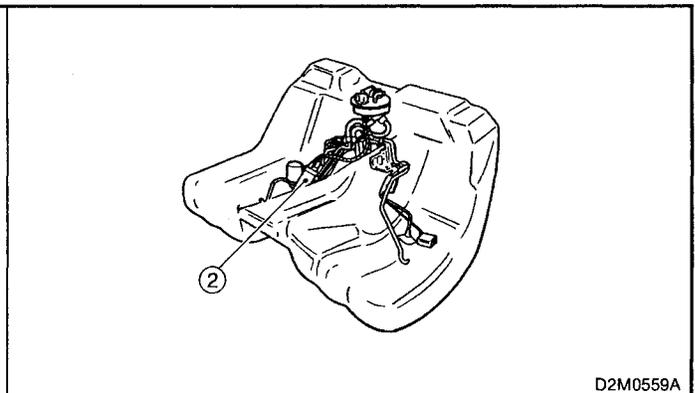
D2M0531B

- ① Inhibitor switch
- ② Fuel pump
- ③ Main relay
- ④ Fuel pump relay
- ⑤ Radiator main fan relay 1
- ⑥ Radiator main fan relay 2

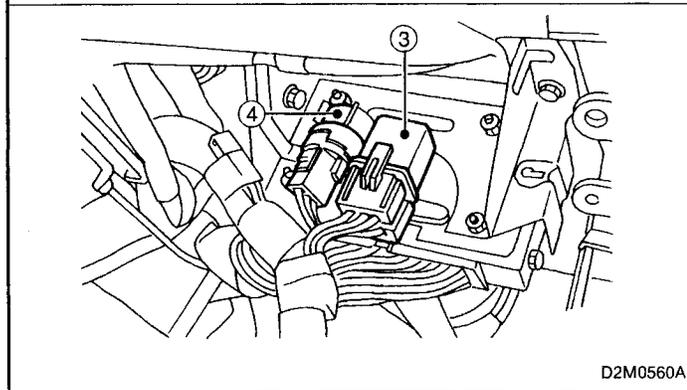
- ⑦ Radiator sub fan relay 1
- ⑧ Radiator sub fan relay 2
- ⑨ Radiator fan grounding relay
- ⑩ A/C relay
- ⑪ Starter



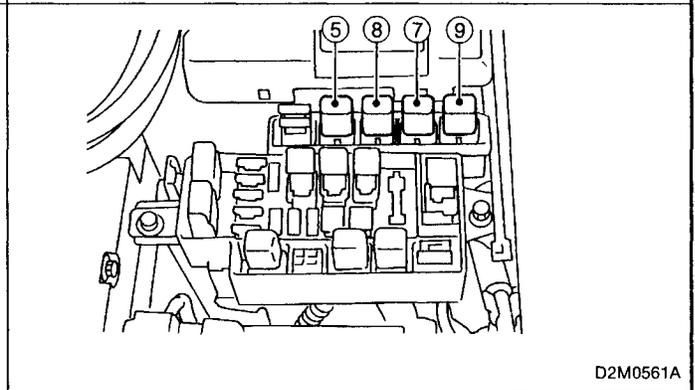
OBD0047A



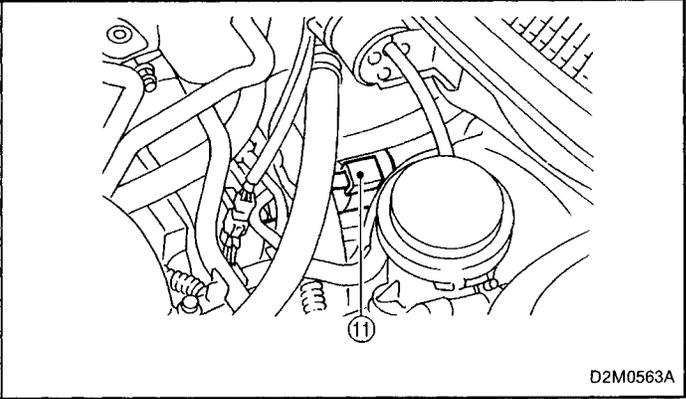
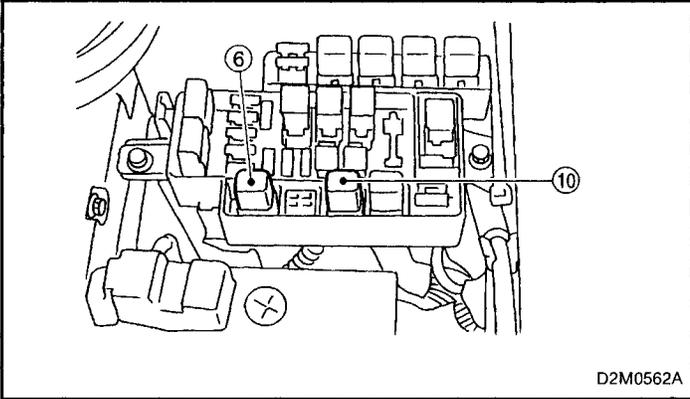
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D2M0560A

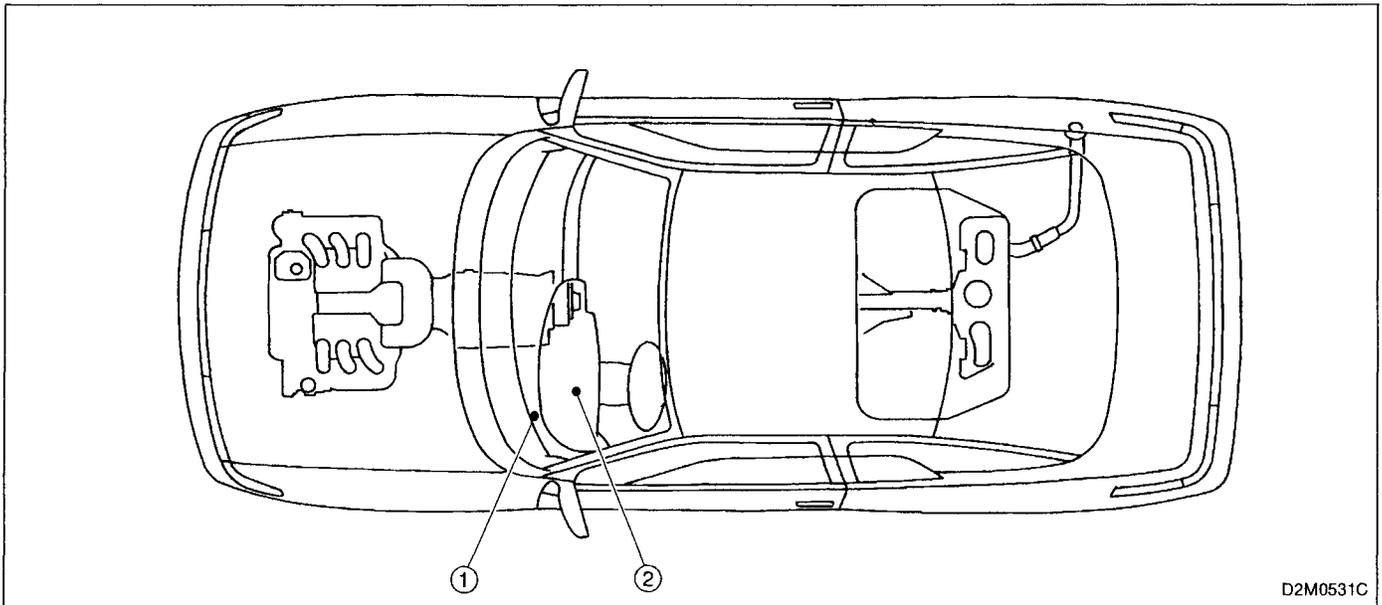


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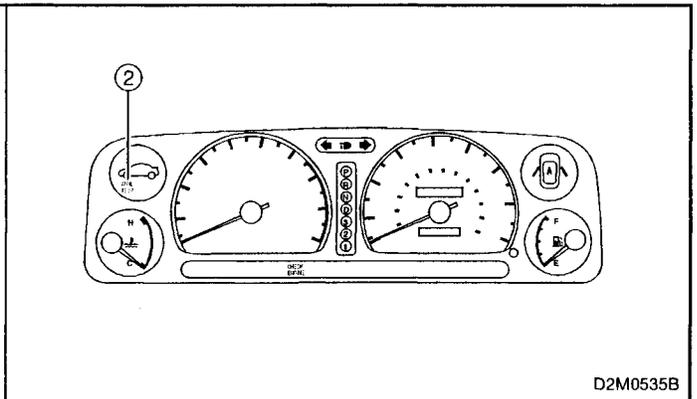
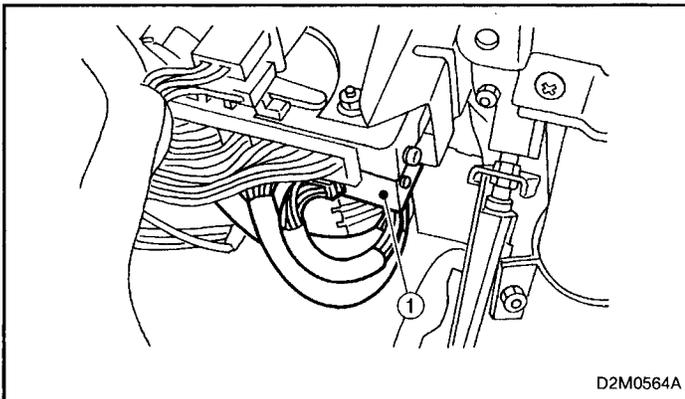
B: TRANSMISSION

1. MODULE

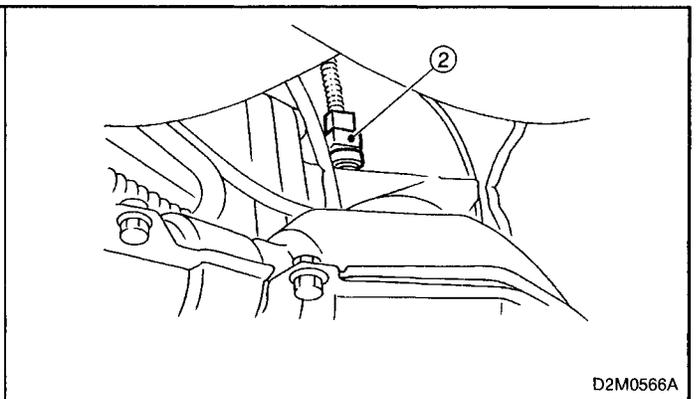
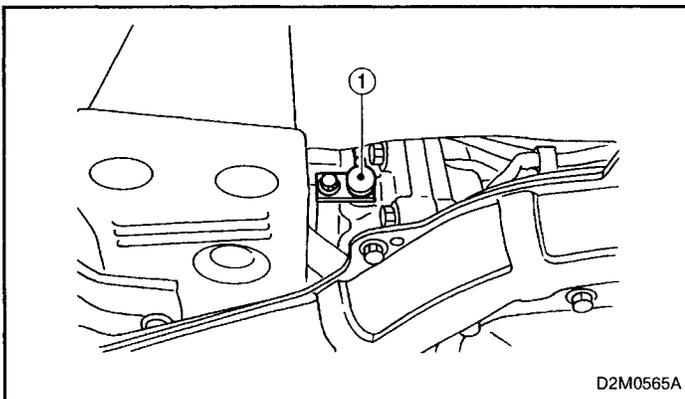


① Transmission Control Module (TCM)

② ATF temperature warning light

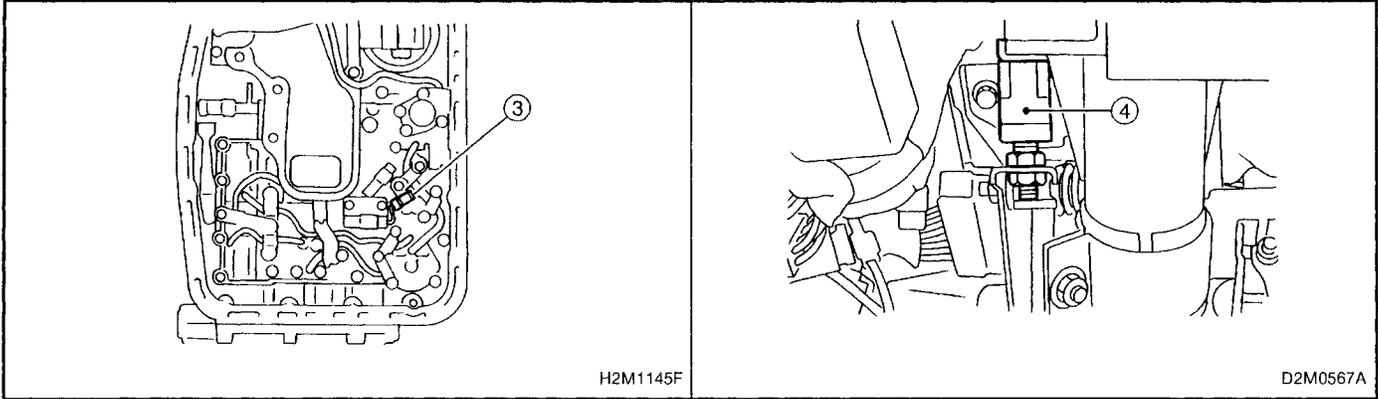


2. SENSOR



① Vehicle speed sensor 1

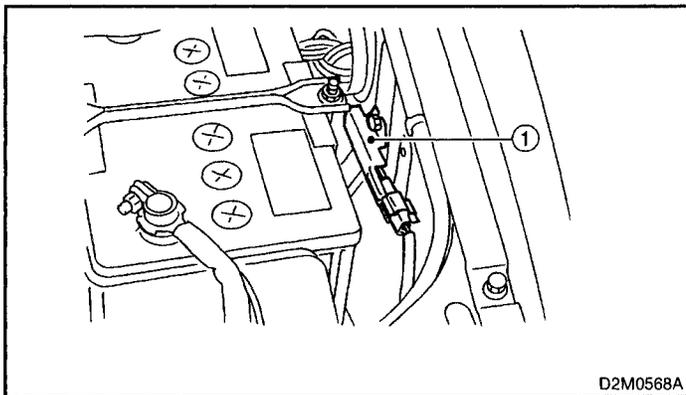
② Vehicle speed sensor 2



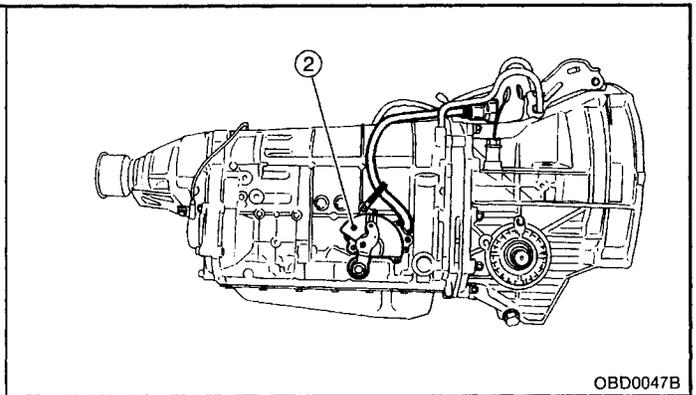
③ ATF temperature sensor

④ Brake light switch

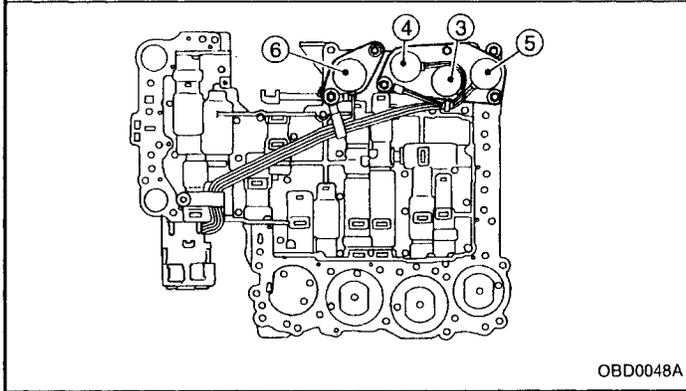
3. SOLENOID VALVE AND RELAY



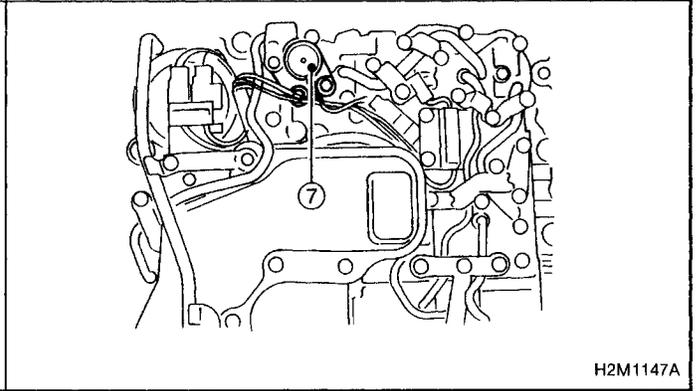
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OBD0047B



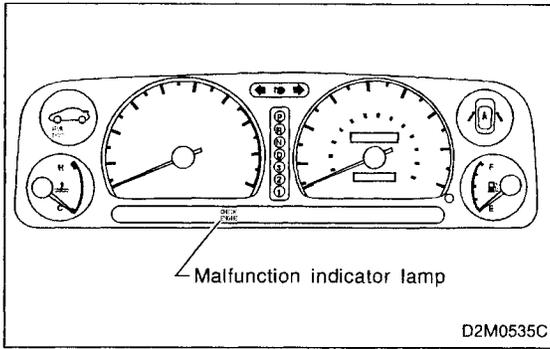
OBD0048A



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- 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



3. Diagnosis System

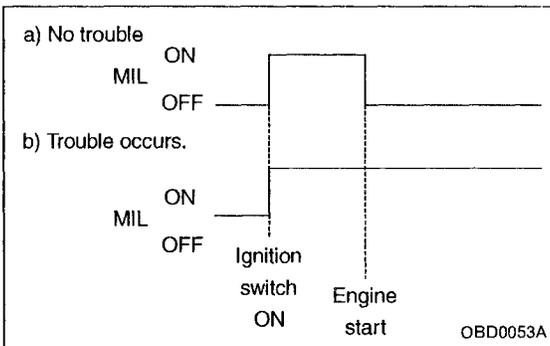
A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL)

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

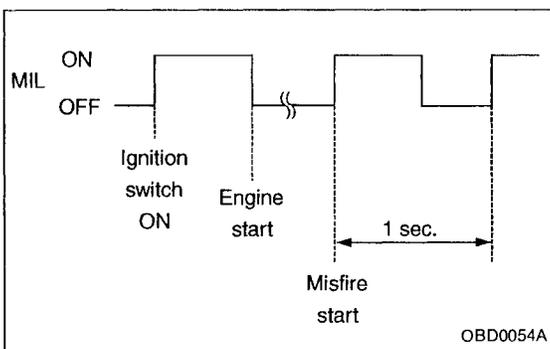
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter illuminates.

NOTE:

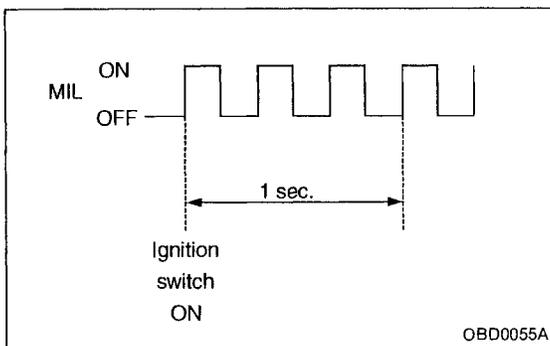
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Refer to "7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL), 2-7b [T700]".☆5>



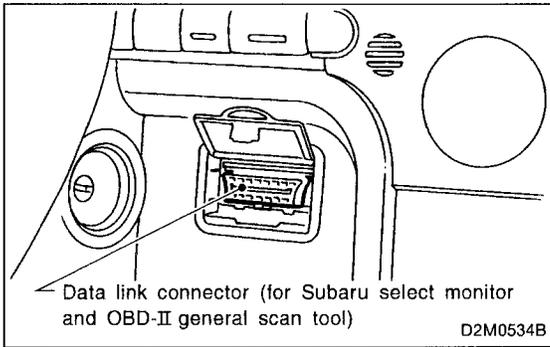
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.



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 diagnosis connector connected to diagnosis terminal, 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:

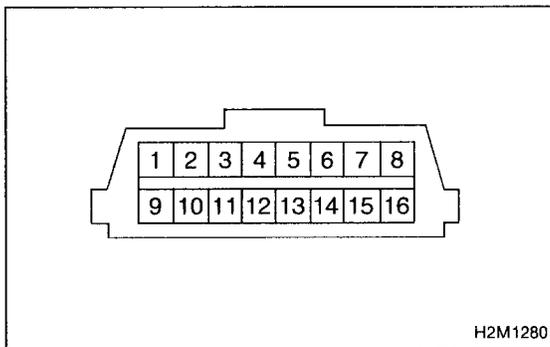
- (1) MODE \$01: Current powertrain diagnostic data
- (2) MODE \$02: Powertrain freeze frame data
- (3) MODE \$03: Emission-related powertrain diagnostic trouble codes
- (4) MODE \$04: Clear/Reset emission-related diagnostic information
- (5) MODE \$05: Oxygen sensor monitoring test results

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, 2-7b [T10A0]☆5.



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, 2-7b [T10A0]☆5.

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).

3. Diagnosis System

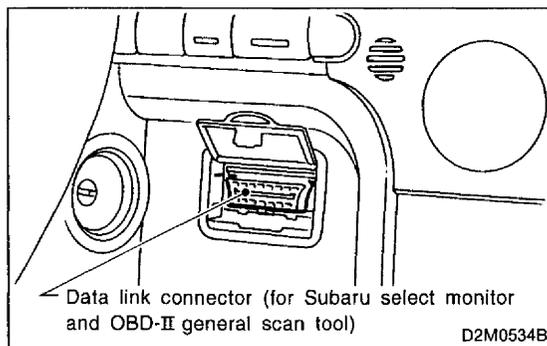
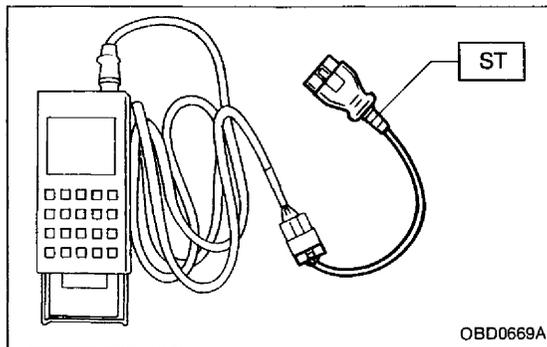
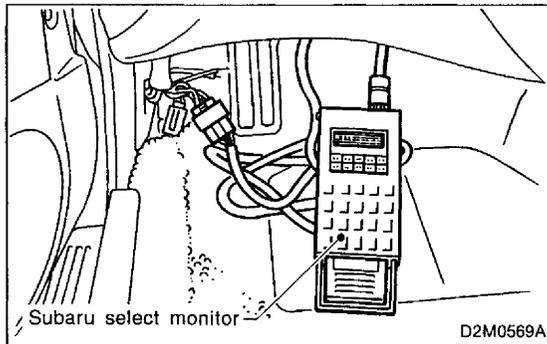
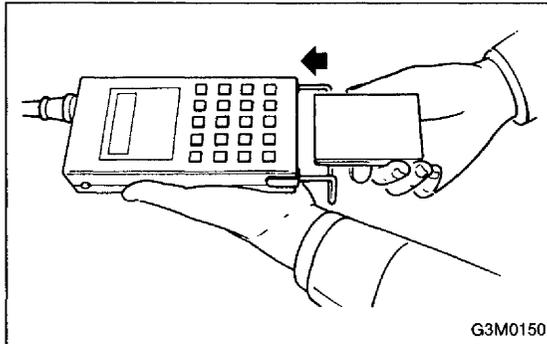
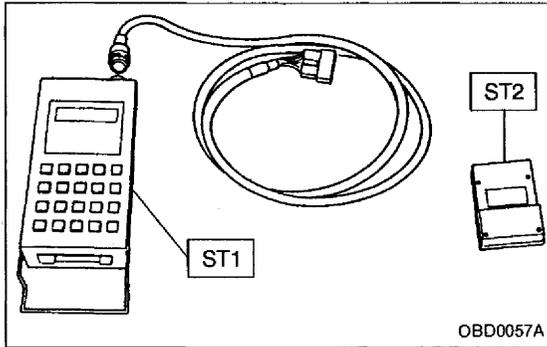
C: SUBARU SELECT MONITOR

1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.

ST1 498307500 SELECT MONITOR KIT

ST2 498346700 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;

(1) Remove the A pillar lower trim of driver side front pillar.

(2) Connect Subaru select monitor to data link connector.

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

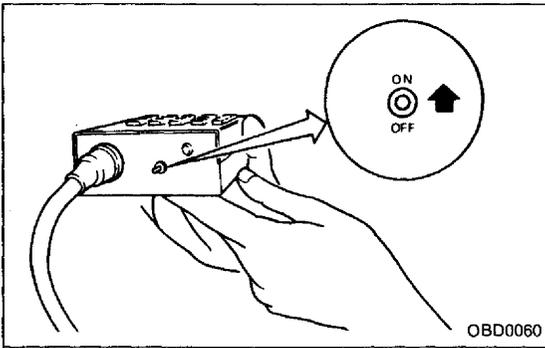
(1) Connect ST to Subaru select monitor cable.

ST 498357200 ADAPTER CABLE

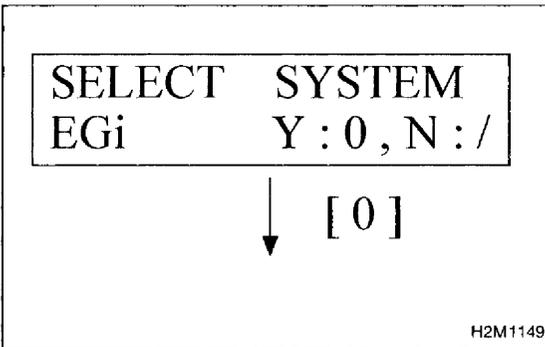
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

CAUTION:

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

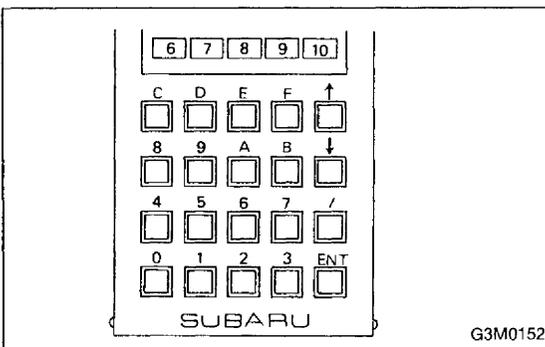


- 5) Turn ignition switch ON (engine OFF) and Subaru select monitor switch ON.
- 6) Using Subaru select monitor, call up diagnostic trouble code(s) and various data, then record them.

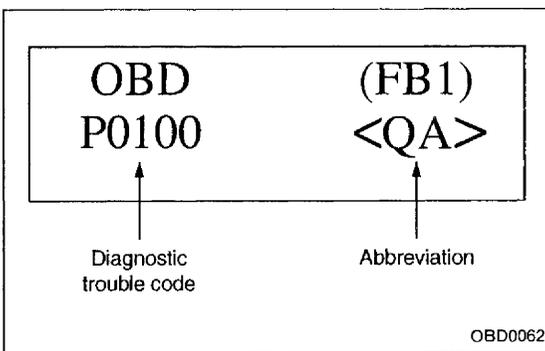


2. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB1)

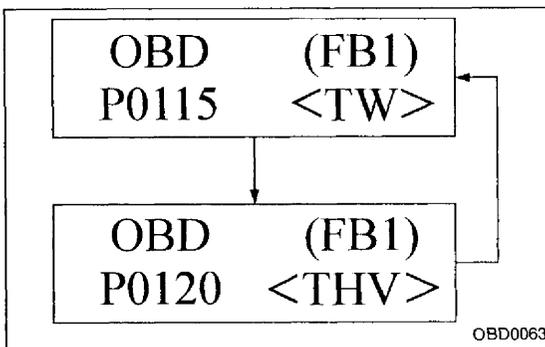
- 1) Select engine mode using function key. Press the function key [0].



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

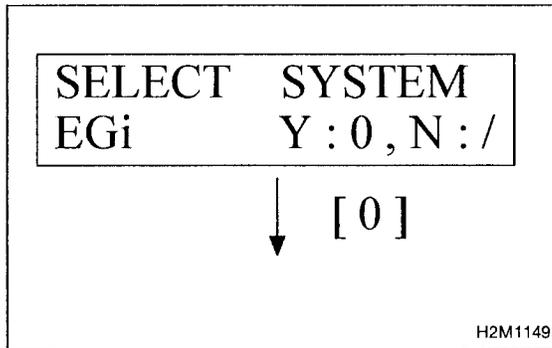


- 3) Ensure diagnostic trouble code(s) is shown.
 - (1) When there is only one diagnostic trouble code.



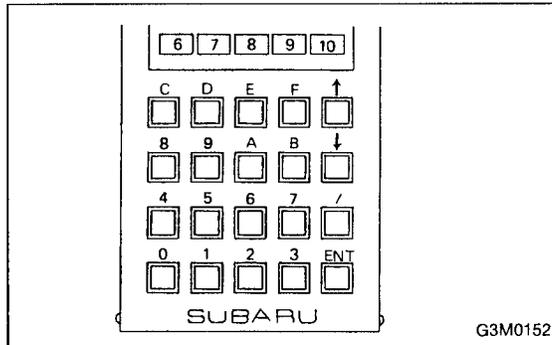
- (2) When there are multiple diagnostic trouble codes.

NOTE:
For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST, 2-7b [T10A0]☆5.



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

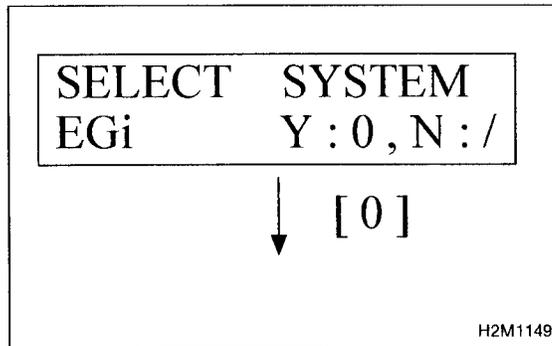
1) Select engine mode using function key.
Press the function key [0].



2) Designate mode using function key.
Refer to "6. READ DATA FUNCTION KEY LIST FOR ENGINE" 2-7b [T3C2]☆5.

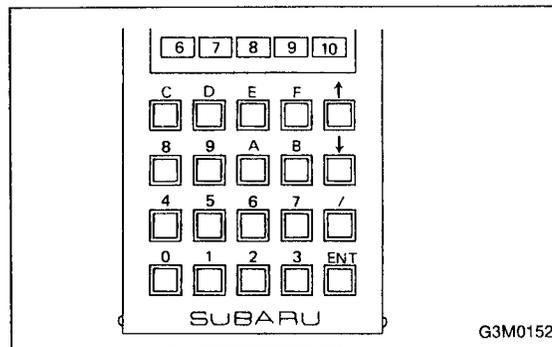
(Example: Press [F] [0] [1] [ENT] in that order.)

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



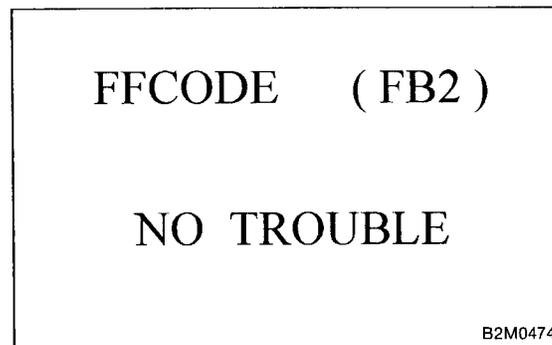
4. READ FREEZE FRAME DATA SHOWN ON DISPLAY. (MODE FB2)

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



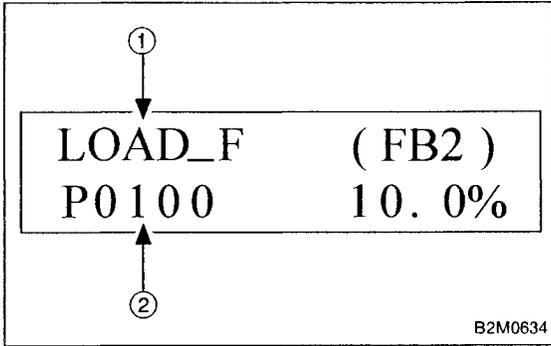
2) Designate mode using function key.

Press [F] [B] [2] [ENT] in that order.



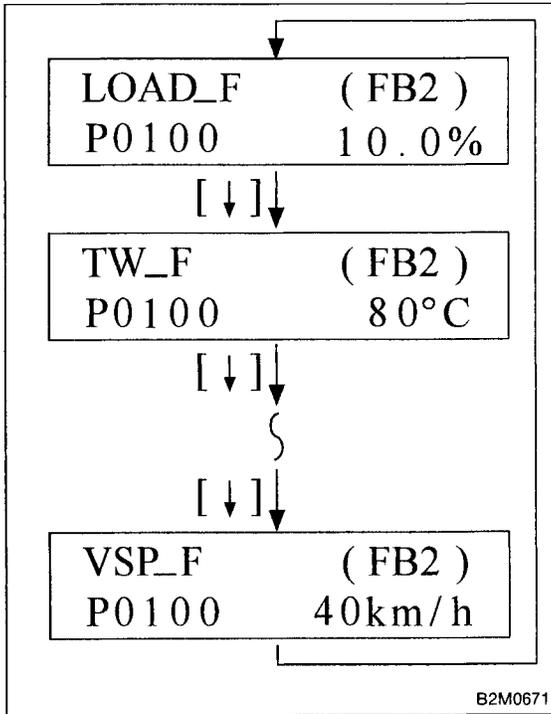
3) Ensure freeze frame data(s) is (are) shown.

(1) When no trouble is detected, or after memory is cleared.



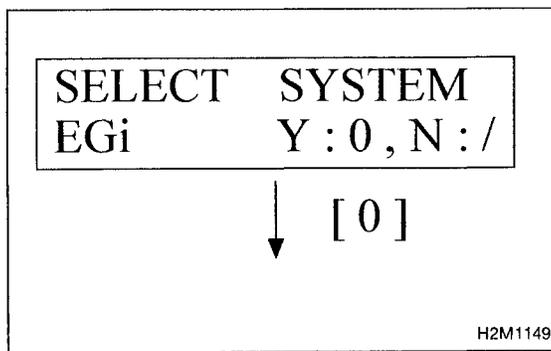
(2) When some trouble is detected.

- 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)

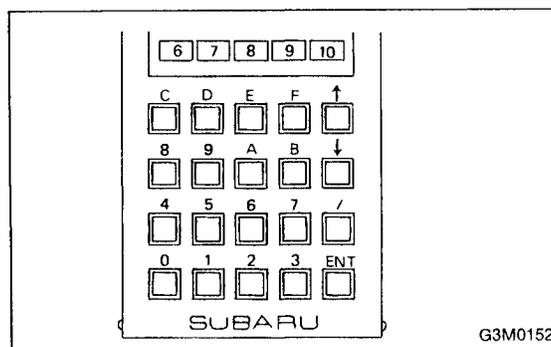
NOTE:

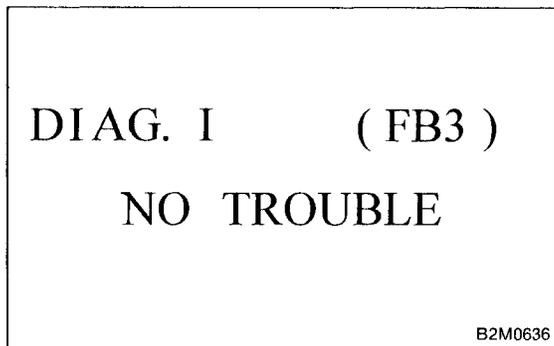
- For items and contents shown on display, refer to "6. READ DATA FUNCTION KEY LIST FOR ENGINE" 2-7b [T3C6]☆5.

- Freeze frame data will not erase without clearing memory.

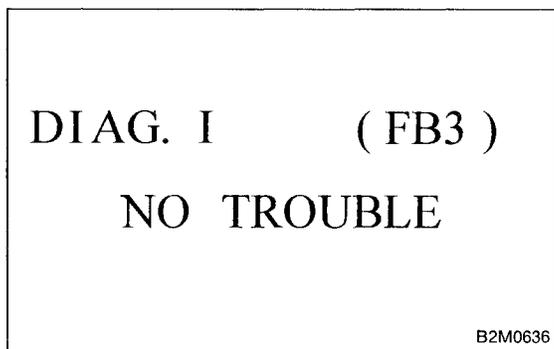
1) Select engine mode using function key. Press the function key [0].

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

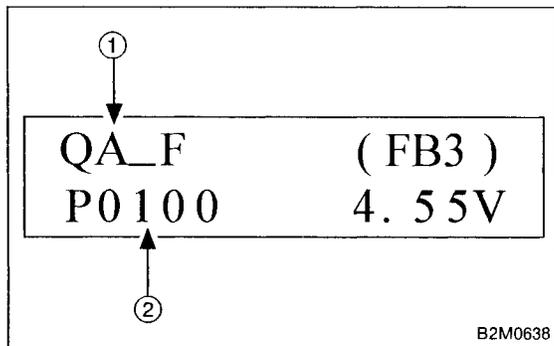




- 3) Ensure freeze frame data(s) is (are) shown.
(1) When no trouble is detected, or after memory is cleared.

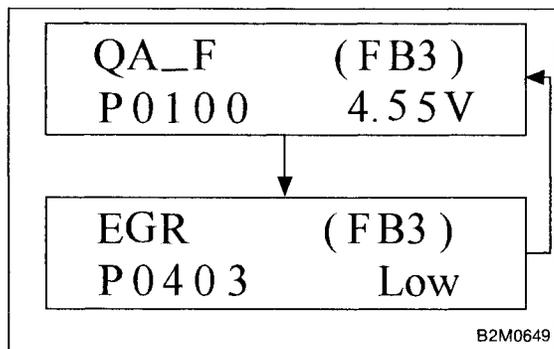


- (2) When a trouble occurs but the corresponding item is not displayed.



- (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 1 (RH) output signal	O2	V
F12	Front oxygen sensor 1 (RH) 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
F15	Front oxygen sensor 2 (LH) output signal	O23	V
F16	Front oxygen sensor 2 (LH) maximum and minimum output signal	O23max - min	V, V
F17	Short term fuel trim	ALPHA	%
F18	Short term fuel trim 2 (A/F correction coefficient 2)	ALPHA2	%
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 1 (RH) heater current	FO2H	A
F33	Rear oxygen sensor heater current	RO2H	A
F34	Front oxygen sensor 2 (LH) heater current	O23H	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	%
F40	Maximum value of cylinder #5 misfire times during 100 rotations	MF5	%

Function mode	Contents	Abbreviation	Unit of measure
F41	Maximum value of cylinder #6 misfire times during 100 rotations	MF6	%
F42	Maximum and minimum EGR system pressure value	EGRmax - min	kPa
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	—
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	—	—

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.

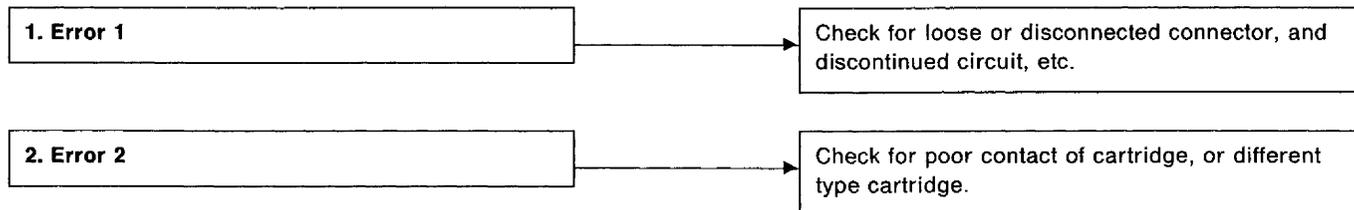
1997 (F00)
3.3 SOHC
D2M0930

7. FUNCTION MODE: F00
— ROM ID NUMBER (YEAR) —

CONDITION:
Ignition switch "ON"

SPECIFIED DATA:
Presentation display

● Probable cause (Item outside "specified data")



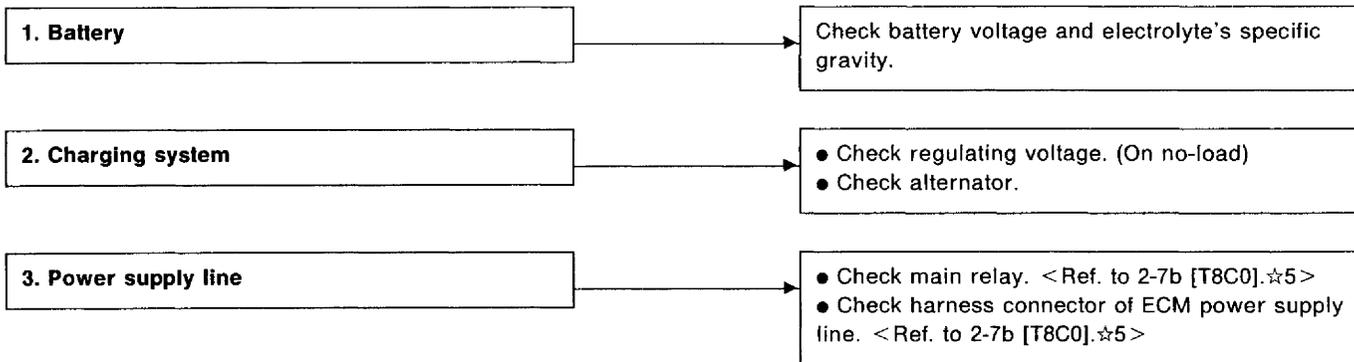
VB (F01)
12.4 V
B2M0270

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 AND 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: F05 AND 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)
2.82mS 2.82mS
D2M0577

15. FUNCTION MODE: F08
— INJECTOR PULSE WIDTH (TIM) —
● Injector pulse widths of #1, #3 and #5 cylinders are displayed on the left side, at the same time, those of #2, #4 and #6 cylinders on the right side.

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 1 (RH) OUTPUT SIGNAL (O2) —

O2max - min (F12)

0 . 80V 0 . 10V

B2M0487

19. FUNCTION MODE: F12**— FRONT OXYGEN SENSOR 1 (RH) MAXIMUM AND MINIMUM OUTPUT SIGNAL (FO2MAX - MIN) —**

- Front oxygen sensor 1 (RH) maximum and minimum output signals are indicated at the same time.

RO2 (F13)

0 . 60 V

B2M0488

20. FUNCTION MODE: F13**— REAR OXYGEN SENSOR OUTPUT SIGNAL (RO2) —**

RO2max - min (F14)

0 . 80V 0 . 10V

B2M0489

21. FUNCTION MODE: F14**— REAR OXYGEN SENSOR MAXIMUM AND MINIMUM OUTPUT SIGNAL (RO2MAX - MIN) —**

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

O23 (F15)

0 . 60 V

D2M0571

22. FUNCTION MODE: F15**— FRONT OXYGEN SENSOR 2 (LH) OUTPUT SIGNAL (O23) —**

O23max - min (F16)

0 . 80V 0 . 10V

D2M0572

23. FUNCTION MODE: F16**— FRONT OXYGEN SENSOR 2 (LH) MAXIMUM AND MINIMUM OUTPUT SIGNAL (O23MAX - MIN) —**

ALPHA (F17)

- 0.8 %

B2M0490

24. FUNCTION MODE: F17
— SHORT TERM FUEL TRIM [A/F CORRECTION COEFFICIENT] (ALPHA) —

ALPHA2 (F18)

- 0.8 %

D2M0573

25. FUNCTION MODE: F18
— SHORT TERM FUEL TRIM 2 [A/F CORRECTION COEFFICIENT 2] (ALPHA2) —

KNOCK (F19)

3.0 deg

B2M0491

26. FUNCTION MODE: F19
— KNOCK SENSOR SIGNAL [IGNITION TIMING CORRECTION COEFFICIENT] (KNOCK) —

BARO. P (F20)

100kPa752mmHg

B2M0755

27. FUNCTION MODE: F23
— ATMOSPHERIC ABSOLUTE PRESSURE SIGNAL (BARO. P) —

- Atmospheric absolute pressure is indicated in "kPa" and "mmHg" at the same time.

MANI. P (F21)

29kPa218mmHg

B2M0756

28. FUNCTION MODE: F24
— INTAKE MANIFOLD ABSOLUTE PRESSURE SIGNAL (MANI. P) —

- Intake manifold absolute pressure is indicated in "kPa" and "mmHg" at the same time.

PHOS (F29)

0.78 %

B2M0494

29. FUNCTION MODE: F29
— A/F CORRECTION COEFFICIENT [SHORT TERM TRIM] BY REAR OXYGEN SENSOR (PHOS) —

KBLRC (F30)

5.5 %

B2M0495

30. FUNCTION MODE: F30
— LONG TERM FUEL TRIM [A/F LEARNING CORRECTION COEFFICIENT] (KBLRC) —

K0 (F31)

0.0 %

B2M0496

31. FUNCTION MODE: F31
— LONG TERM FUEL TRIM WHOLE [A/F LEARNING CONTROL COEFFICIENT] (K0) —

FO2H (F32)

1.00 A

B2M0497

32. FUNCTION MODE: F32
— FRONT OXYGEN SENSOR 1 (RH) HEATER CURRENT (FO2H) —

RO2H (F33)

1.00 A

B2M0498

33. FUNCTION MODE: F33
— REAR OXYGEN SENSOR HEATER CURRENT (RO2H) —

O23H (F34)
1.00 A
D2M0574

34. FUNCTION MODE: F34
— FRONT OXYGEN SENSOR 2 (LH) HEATER
CURRENT (O23H) —

CPCD (F35)
0%
H2M1325

35. FUNCTION MODE: F35
— PURGE CONTROL SOLENOID VALVE DUTY RATIO
(CPCD) —

MF1 (F36)
0 %
B2M0499

36. FUNCTION MODE: F36
— MAXIMUM VALUE OF CYLINDER #1 MISFIRE
TIMES DURING 100 ROTATIONS (MF1) —

MF2 (F37)
0 %
B2M0500

37. FUNCTION MODE: F37
— MAXIMUM VALUE OF CYLINDER #2 MISFIRE
TIMES DURING 100 ROTATIONS (MF2) —

MF3 (F38)
0 %
B2M0501

38. FUNCTION MODE: F38
— MAXIMUM VALUE OF CYLINDER #3 MISFIRE
TIMES DURING 100 ROTATIONS (MF3) —

MF4 (F39)
0 %
B2M0502

39. FUNCTION MODE: F39
— MAXIMUM VALUE OF CYLINDER #4 MISFIRE
TIMES DURING 100 ROTATIONS (MF4) —

MF5 (F40)
0 %
D2M0575

40. FUNCTION MODE: F40
— MAXIMUM VALUE OF CYLINDER #5 MISFIRE
TIMES DURING 100 ROTATIONS (MF5) —

MF6 (F41)
0 %
D2M0576

41. FUNCTION MODE: F41
— MAXIMUM VALUE OF CYLINDER #6 MISFIRE
TIMES DURING 100 ROTATIONS (MF6) —

EGRmax-min (F42)
100kPa 4kPa
B2M0759

42. FUNCTION MODE: F42
— MAXIMUM AND MINIMUM EGR SYSTEM
PRESSURE VALUE (EGRMAX-MIN) —
● Maximum and minimum EGR system pressure value are
indicated at the same time.

43. FA MODE FOR ENGINE

Function mode	LED No.	Contents	Display	LED "ON" requirements
FA0	1	Power steering pressure switch	SS	When power steering pressure switch is turned ON.
	2	Parking switch	PK	When parking position signal is entered.
	3	Neutral switch	NT	When neutral position signal is entered.
	7	Diagnosis connector	UD	When diagnosis connector and terminal are connected.
	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.
	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	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.
	8	Induction control solenoid valve	IH	When induction control solenoid valve is in function.
	9	Fuel pump discharge flow control signal	FP	When fuel pump discharge flow control signal value is other than 0%.
FA4	1	Catalyst	CA	When diagnosis of catalyzer is finished.
	2	EGR system	E1	When diagnosis of EGR system is finished.
	6	A/C pressure switch	AP	When A/C pressure switch is turned ON.
	7	Front oxygen sensor 2 (LH) signal	O3	When front oxygen sensor 2 (LH) mixture ratio is rich.
	8	Rear oxygen sensor signal	OR	When rear oxygen sensor mixture ratio is rich.
	9	Front oxygen sensor 1 (RH) signal	O2	When front oxygen sensor 1 (RH) mixture ratio is rich.
FA5	2	Knock signal 2	K2	When knock signal 2 is entered.
	7	EGR solenoid valve	ER	When EGR solenoid valve is in function.

LED No.	Signal name	Display
1	Power steering pressure switch	SS
2	Parking switch	PK
3	Neutral switch	NT
4	—	—
5	—	—
6	—	—
7	Diagnosis connector	UD
8	—	—
9	Ignition switch	IG
0	—	—

SS	PK	NT	—	—
—	UD	—	IG	—

1	2	3	4	5
6	7	8	9	0

44. FUNCTION MODE: FA0

— ON ↔ OFF SIGNAL —

Requirement for LED "ON".

- LED No. 1 Power steering pressure switch is turned ON.
- LED No. 2 Shift position is in "P".
- LED No. 3 Shift position is in "N".
- LED No. 7 Diagnosis connector and terminal are connected.
- LED No. 9 Ignition switch is turned ON.

LED No.	Signal name	Display
1	Radiator fan relay 2	R2
2	Knock signal	KS
3	—	—
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	—	FP	—
R1	AR	AC	—	—

1	2	3	4	5
6	7	8	9	0

45. FUNCTION MODE: FA1

— ON ↔ OFF SIGNAL —

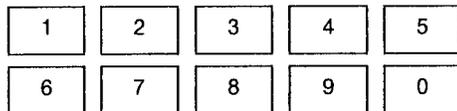
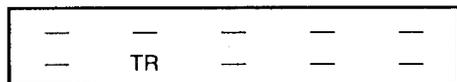
Requirement for LED "ON".

- LED No. 1 Radiator fan relay 2 is turned ON.
- LED No. 2 Engine is knocking.
- LED No. 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, 4, 6 and 7 blink 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	—	—
3	—	—
4	—	—
5	—	—
6	—	—
7	Engine torque control signal	TR
8	—	—
9	—	—
0	—	—



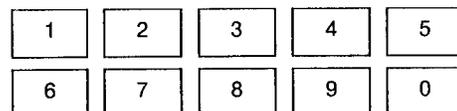
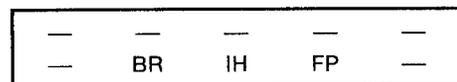
46. FUNCTION MODE: FA2

— ON ↔ OFF SIGNAL —

Requirement for LED "ON".

LED No. 7 ECM entered the torque control signal emitted from TCM.

LED No.	Signal name	Display
1	—	—
2	—	—
3	—	—
4	—	—
5	—	—
6	—	—
7	Pressure sources switching solenoid valve	BR
8	Induction control solenoid valve	IH
9	Fuel pump discharge flow control signal	FP
0	—	—



47. FUNCTION MODE: FA3

— ON ↔ OFF SIGNAL —

Requirement for LED "ON".

LED No. 7 Pressure sources switching solenoid valve is in function.

LED No. 8 Induction control solenoid valve is in function.

LED No. 9 ECM controls fuel pump supply voltage.

NOTE:

When LED No. 7 and 8 blink 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	—	—
4	—	—
5	—	—
6	A/C pressure switch	AP
7	Front oxygen sensor 2 (LH) signal	O3
8	Rear oxygen sensor signal	OR
9	Front oxygen sensor 1 (RH) signal	O2
0	—	—

CA	E1	—	—	—
AP	O3	OR	O2	—

1	2	3	4	5
6	7	8	9	0

48. 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. 6 A/C pressure switch is turned ON.
- LED No. 7 Front oxygen sensor 2 (LH) mixture ratio is rich.
- LED No. 8 Rear oxygen sensor mixture ratio is rich.
- LED No. 9 Front oxygen sensor 1 (RH) mixture ratio is rich.

LED No.	Signal name	Display
1	—	—
2	Knock signal 2	K2
3	—	—
4	—	—
5	—	—
6	—	—
7	EGR solenoid valve	ER
8	—	—
9	—	—
0	—	—

—	K2	—	—	—
—	ER	—	—	—

1	2	3	4	5
6	7	8	9	0

49. FUNCTION MODE: FA5

— ON ↔ OFF SIGNAL —

Requirement for LED "ON".

- LED No. 2 Engine is knocking.
- LED No. 7 EGR solenoid valve is in function.

NOTE:

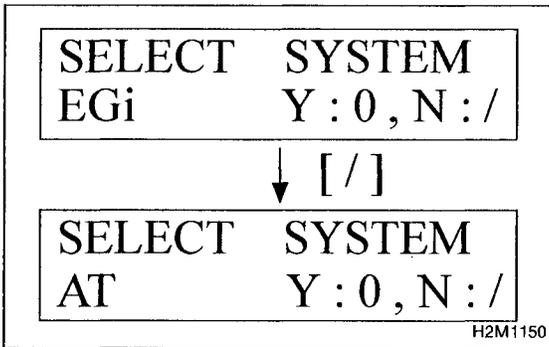
When LED No. 7 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

50. 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.	54
FB1	OBD	On-board diagnostics (Read data)	Current trouble code indicated by on-board diagnostics.	27
FB2	LOAD-F	Load data	<ul style="list-style-type: none"> ● Freeze frame data ● Data stored at the time of trouble occurrence, is shown on display. 	28
	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"> ● Freeze frame data ● Data stored at the time of trouble occurrence, is shown on display. 	29
	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		

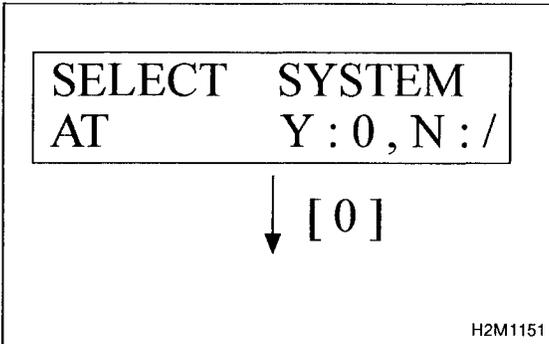
51. FC MODE FOR ENGINE

Function mode	Abbreviation	Contents	Contents of display	Page
FC0	MEMORY CLR	Back-up memory clear	Function of clearing trouble code stored in memory.	53

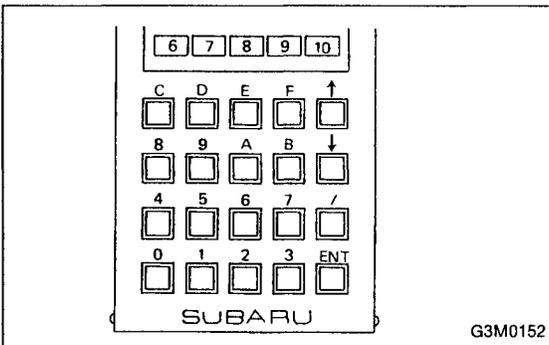


52. READ CURRENT DATA SHOWN ON DISPLAY FOR AT. (FUNCTION MODE)

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 "READ DATA FUNCTION KEY LIST FOR AT" 3-2 [T3C6]☆5.

(Example: Press [F] [0] [2] [ENT] in that order.)

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

53. 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

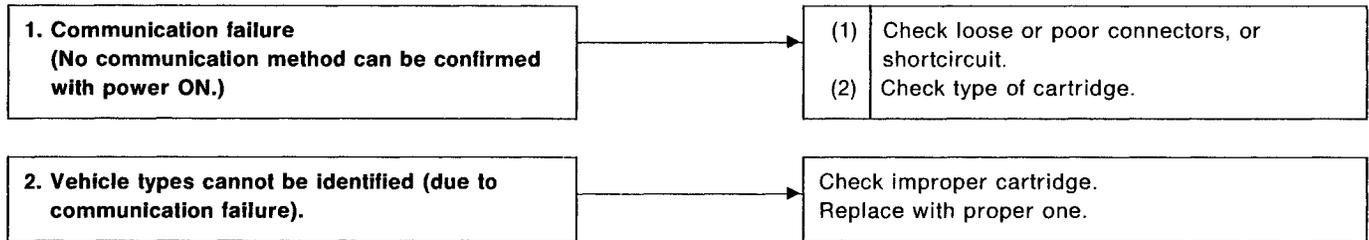
<p>E - 4AT (F00)</p> <p>4WD 1996</p> <p style="text-align: right; font-size: small;">D2M0581</p>
--

54. FUNCTION MODE: F00
— MODE DISPLAY —

SPECIFIED DATA:

Data at the left should be indicated.

Probable cause (if outside "specified data")



<p>VB (F01)</p> <p>12.7 V</p> <p style="text-align: right; font-size: small;">OBD0673</p>
--

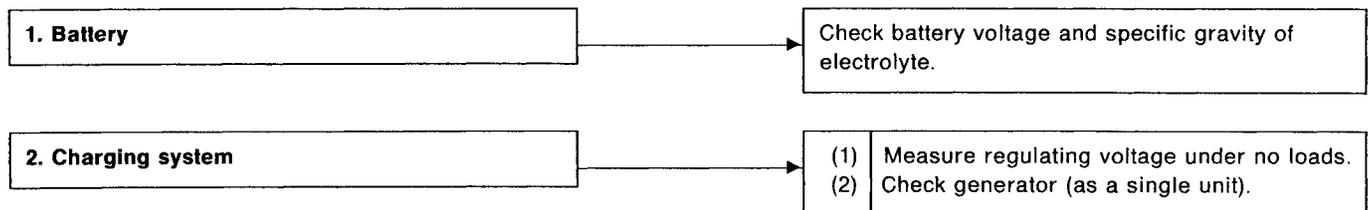
55. FUNCTION MODE: F01
— BATTERY VOLTAGE (VB) —

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

56. 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

57. 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

58. FUNCTION MODE: F06

— ENGINE SPEED (EREV) —

ATFT deg F (F07)

176 deg F

G3M0728

59. 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

60. FUNCTION MODE: F09

— THROTTLE POSITION SENSOR (THV) —

GEAR (F10)

1st

G3M0730

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

PLDTY (F11)

50%

G3M0731

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

LUPTY (F12)

5%

G3M0732

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

4WDTY (F13)

95%

G3M0733

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

THVCC (F14)

5.2 V

B3M0259

65. 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

66. 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	—	—	—

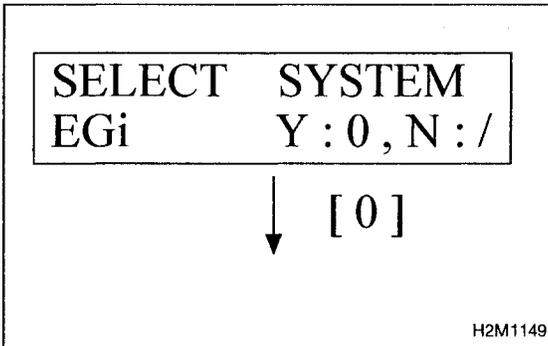
1	2	3	4	5
6	7	8	9	10

67. 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

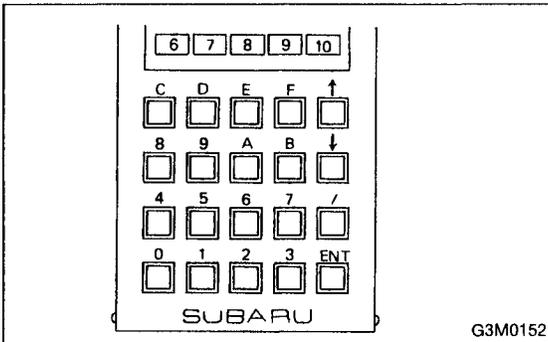
1) Select engine mode or AT mode using function key.

● Engine mode:

Press the function key [0].

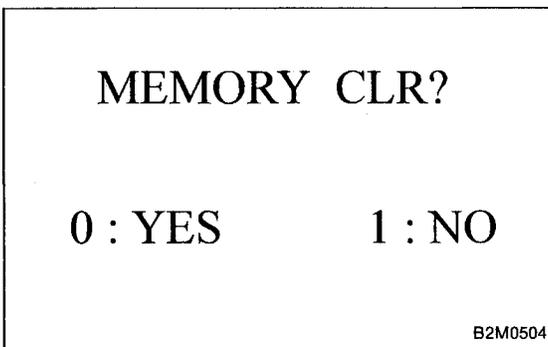
● AT mode:

Press the function key [/] [0] in that order.

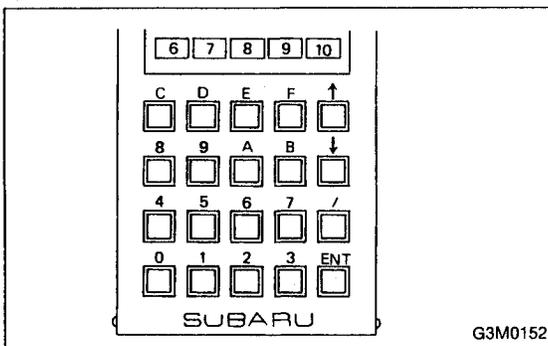


2) Designate mode using function key.

Press [F] [C] [0] [ENT] in that order.



3) Ensure displayed message.



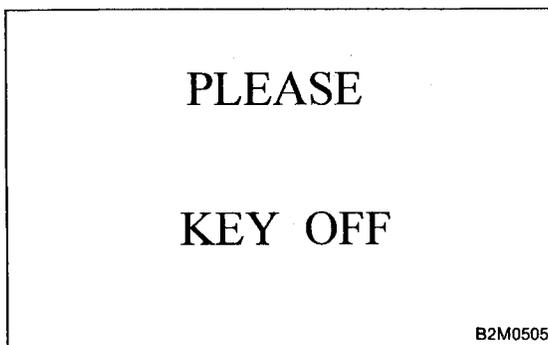
4) Press function key.

● When executing, (YES)

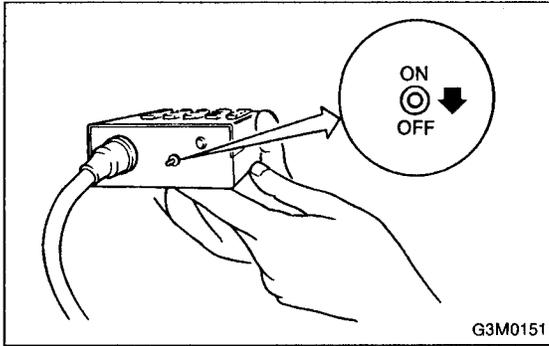
Press [0] [ENT] in that order.

● 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.



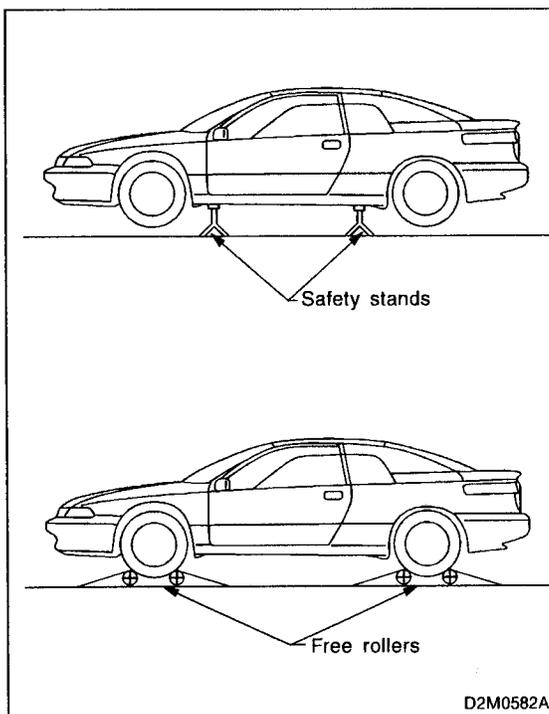
6) After the display is gone, turn Subaru select monitor switch and ignition switch to OFF.

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

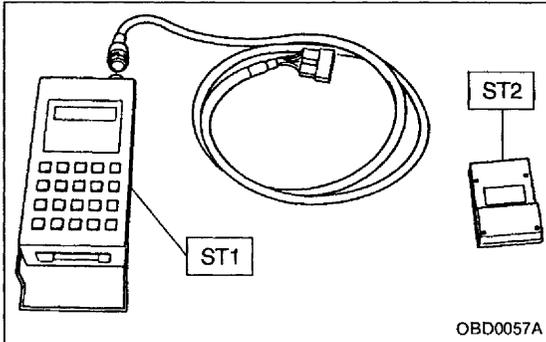
Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

● **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.



E: INSPECTION MODE

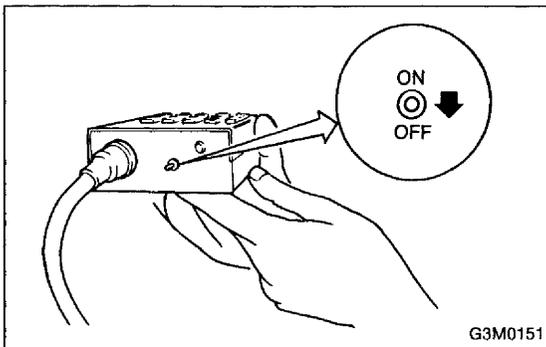
2. SUBARU SELECT MONITOR

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

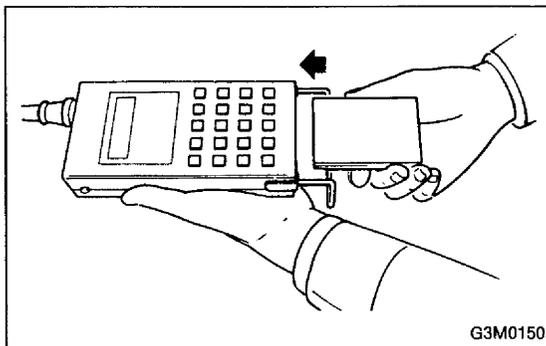
1) Prepare Subaru select monitor and cartridge.

ST1 498307500 SELECT MONITOR KIT

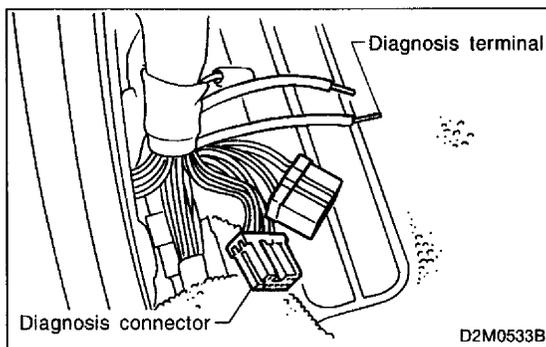
ST2 498346700 CARTRIDGE



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

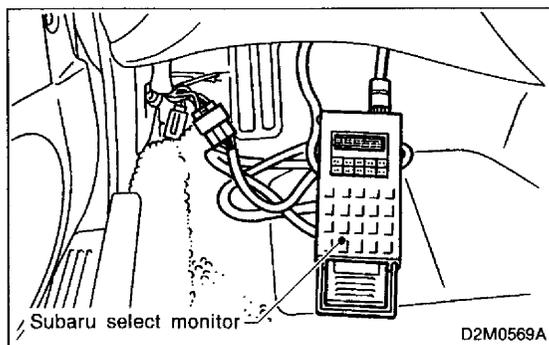


3) Insert cartridge into Subaru select monitor.

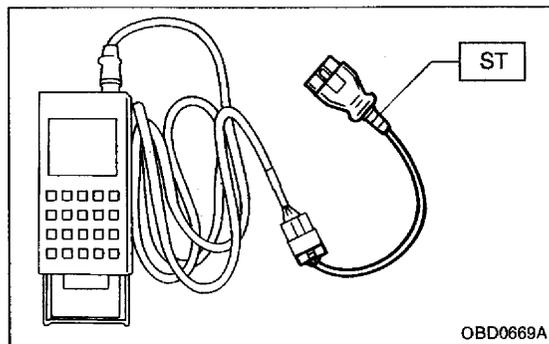


4) Remove the A pillar lower trim of driver side front pillar.

5) Connect diagnosis terminal into diagnosis connector (terminal No. 1).



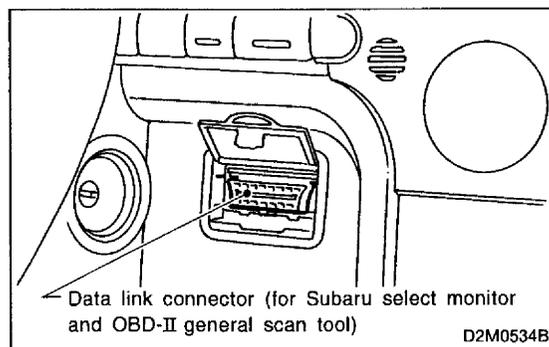
- 6) Connect Subaru select monitor to data link connector.
- Using data link connector for Subaru select monitor only:
Connect Subaru select monitor to its data link connector located in the A pillar lower trim of driver side front pillar.



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

(1) Connect ST to Subaru select monitor cable.

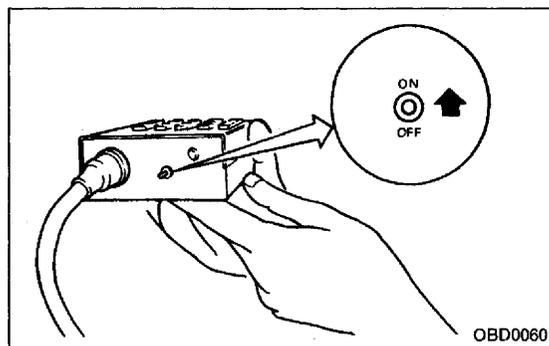
ST 498357200 ADAPTER CABLE



- (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.



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

- 8) Start the engine.

NOTE:

Ensure the selector lever is placed in the "P" position before starting.

- 9) Using the selector lever, turn the "P" position switch and the "N" position switch to ON.

- 10) Depress the brake pedal to turn the brake switch ON.

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

NOTE:

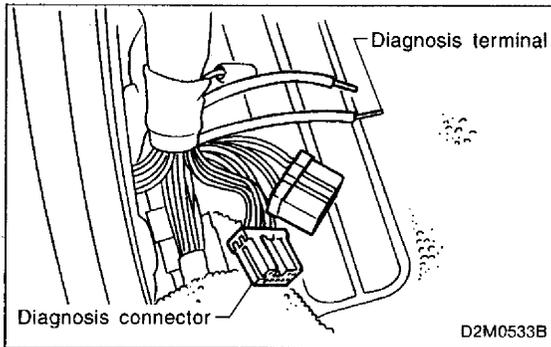
On models without tachometer, use the Subaru select monitor or tachometer (Secondary pickup type).

- 12) Place the selector lever in the "D" position and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

NOTE:

- Release the parking brake.

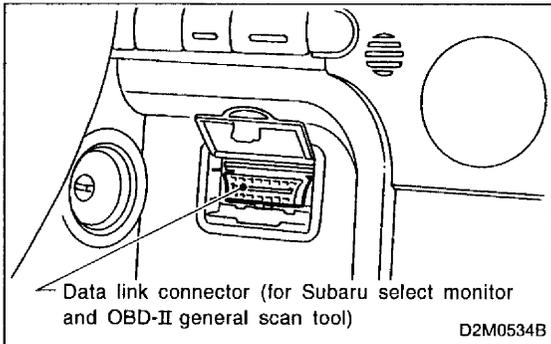
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. Turn ignition switch "OFF" to clear the memory.



3. OBD-II GENERAL SCAN TOOL

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

- 1) Remove the A pillar lower trim of driver side front pillar.
- 2) Connect diagnosis terminal into diagnosis connector (terminal No. 1).



- 3) 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.

- 4) Start the engine.

NOTE:

Ensure the selector lever is placed in the "P" position before starting.

- 5) Using the selector lever, turn the "P" position switch and the "N" position switch to ON.

- 6) Depress the brake pedal to turn the brake switch ON.

- 7) 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).

- 8) Place the selector lever in the "D" position and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).

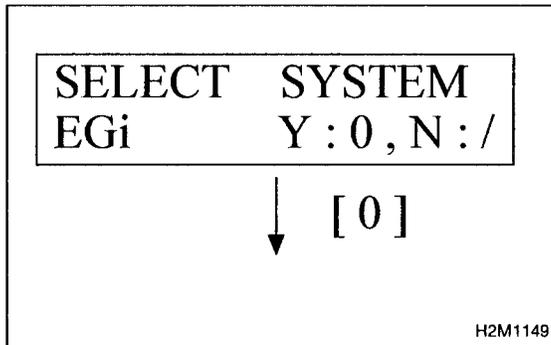
NOTE:

- Release the parking brake.
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. Turn ignition switch "OFF" to clear the memory.

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

NOTE:

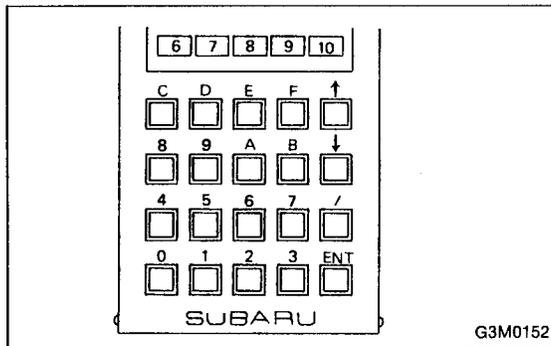
- For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.
- For details concerning diagnostic trouble codes, refer to the DIAGNOSTIC TROUBLE CODE (DTC) LIST 2-7b [T10A0]☆5.



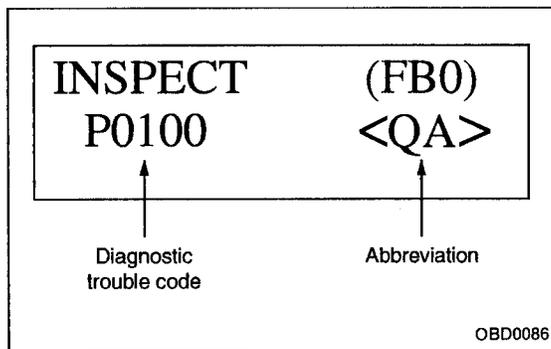
4. READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB0 <INSPECTION MODE>)

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

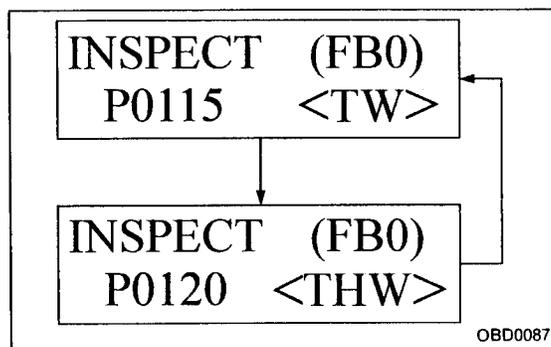
1) Select engine mode using function key. Press the function key [0].



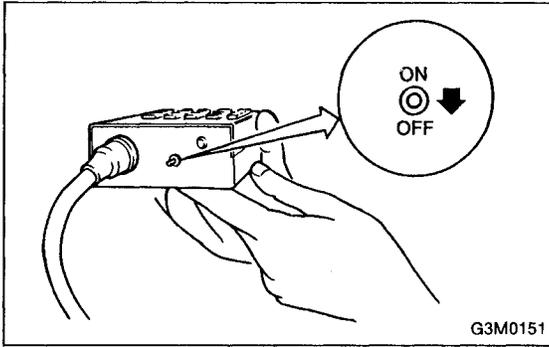
2) Designate mode using function key. Press [F] [B] [0] [ENT] in that order.



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, 2-7b [T10A0]☆5.

**F: 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”

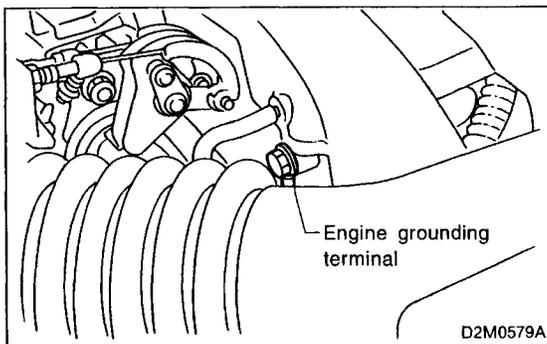
Airbag system wiring harness is routed near the engine control module (ECM), main relay and fuel pump relay.

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



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

8) 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.**

9) 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.

10) 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.

11) 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.

12) Do not continue the stall for more than five seconds at a time (from closed throttle, fully open throttle to stall engine speed).

13) On ABS vehicle, when performing driving test in jacked-up or lifted-up position, sometimes the warning light may be lit, but this is not a malfunction of the system. The reason for this is the speed difference between the front and rear wheels. Turn ignition switch "OFF" to clear the memory.

C: PRE-INSPECTION

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

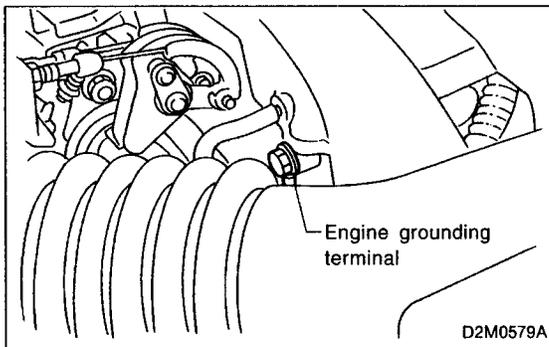
1. POWER SUPPLY

1) Measure battery voltage and specific gravity of electrolyte.

Standard voltage: 12 V

Specific gravity: Above 1.260

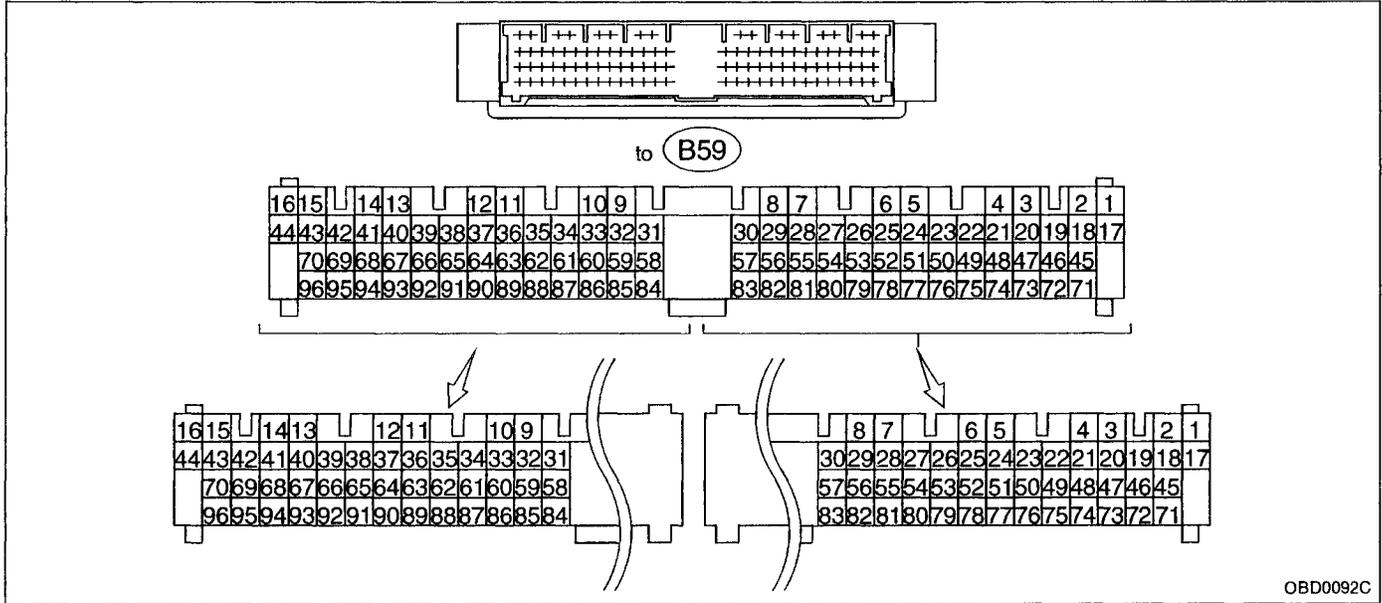
2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

**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



OBD0092C

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor 1	Signal (+)	B59	8	0	-7 — +7	Sensor output waveform
	Signal (-)	B59	29	0	0	—
	Shield	B59	57	0	0	—
Crankshaft position sensor 2	Signal (+)	B59	7	0	-7 — +7	Sensor output waveform
	Signal (-)	B59	28	0	0	—
	Shield	B59	54	0	0	—
Camshaft position sensor	Signal (+)	B59	30	0	-7 — +7	Sensor output waveform
	Signal (-)	B59	28	0	0	—
	Shield	B59	54	0	0	—
Mass air flow sensor	Signal	B59	5	0 — 0.3	0.8 — 1.2	—
	Shield	B59	57	0	0	—
	GND	B59	20	0	0	—
Throttle position sensor	Signal	B59	6	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	B59	21	5	5	—
	GND	B59	20	0	0	—
Front oxygen sensor 1 (RH)	Signal	B59	23	0	0 — 0.9	—
	Shield	B59	55	0	0	—

ON-BOARD DIAGNOSTICS II SYSTEM

[T501] 2-7b
5. Specified Data

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Front oxygen sensor 2 (LH)	Signal	B59	25	0	0 — 0.9	—
	Shield	B59	55	0	0	—
Rear oxygen sensor	Signal	B59	24	0	0 — 0.9	—
	Shield	B59	55	0	0	—
Engine coolant temperature sensor		B59	22	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		B59	83	0 or 5	0 or 5	"5" and "0" are repeatedly displayed when vehicle is driven.
Starter switch		B59	86	0	0	Cranking: 8 to 14
A/C switch		B59	60	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		B59	85	10 — 13	13 — 14	—
Neutral position switch		B59	82	ON: 0 OFF: 5.0 ± 0.5		Switch is ON when shift is in "N" position.
Parking switch		B59	76	ON: 0 OFF: 5.0 ± 0.5		Switch is ON when shift is in "P" position.
Diagnosis connector		B59	84	5	5	When connected: 0
Knock sensor 1	Signal	B59	3	2.8	2.8	—
	Shield	B59	56	0	0	—
Knock sensor 2	Signal	B59	4	2.8	2.8	—
	Shield	B59	56	0	0	—
Back-up power supply		B59	39	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control unit power supply		B59	1	10 — 13	13 — 14	—
			2			
Ignition control	#1	B59	41	0	1 — 3.4	—
	#2	B59	68	0	1 — 3.4	—
	#3	B59	67	0	1 — 3.4	—
	#4	B59	66	0	1 — 3.4	—
	#5	B59	65	0	1 — 3.4	—
	#6	B59	40	0	1 — 3.4	—
Fuel injector	#1	B59	96	10 — 13	1 — 14	Waveform
	#2	B59	70	10 — 13	1 — 14	Waveform
	#3	B59	44	10 — 13	1 — 14	Waveform
	#4	B59	16	10 — 13	1 — 14	Waveform
	#5	B59	43	10 — 13	1 — 14	Waveform
	#6	B59	15	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	B59	14	—	1 — 13	Waveform
	CLOSE end	B59	13	—	13 — 1	Waveform
Fuel pump relay control		B59	32	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		B59	31	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—

ON-BOARD DIAGNOSTICS II SYSTEM

Content	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Radiator fan relay 1 control	B59	74	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 2 control	B59	73	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Self-shutoff control	B59	63	10 — 13	13 — 14	—
Malfunction indicator lamp	B59	58	—	—	Light "ON": 1, or less Light "OFF": 10 — 14
Engine speed output	B59	64	—	0 — 13, or more	Waveform
Torque control signal	B59	79	5	5	—
Mass air flow signal for AT	B59	47	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve	B59	72	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor	B59	26	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve	B59	34	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve	B59	71	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor 1 (RH) heater signal	B59	38	0 — 1.0	0 — 1.0	—
Front oxygen sensor 2 (LH) heater signal	B59	12	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal	B59	37	0 — 1.0	0 — 1.0	—
AT diagnosis input signal	B59	80	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
Power steering pressure switch	B59	77	5	5	—
Induction control solenoid valve	B59	10	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Fuel pump discharge flow control	B59	33	—	High flow: 0 Low flow: 4 — 7	—
A/C pressure switch	B59	78	ON: 0 OFF: 5.0±0.5	ON: 0 OFF: 5.0±0.5	—
GND (sensors)	B59	20	0	0	—
GND (injectors)	B59	69	0	0	—
		95			
GND (ignition system)	B59	94	0	0	—
GND (power supply)	B59	19	0	0	—
		46			
GND (control systems)	B59	17	0	0	—
		18			
GND (oxygen sensor heater)	B59	11	0	0	—
		42			

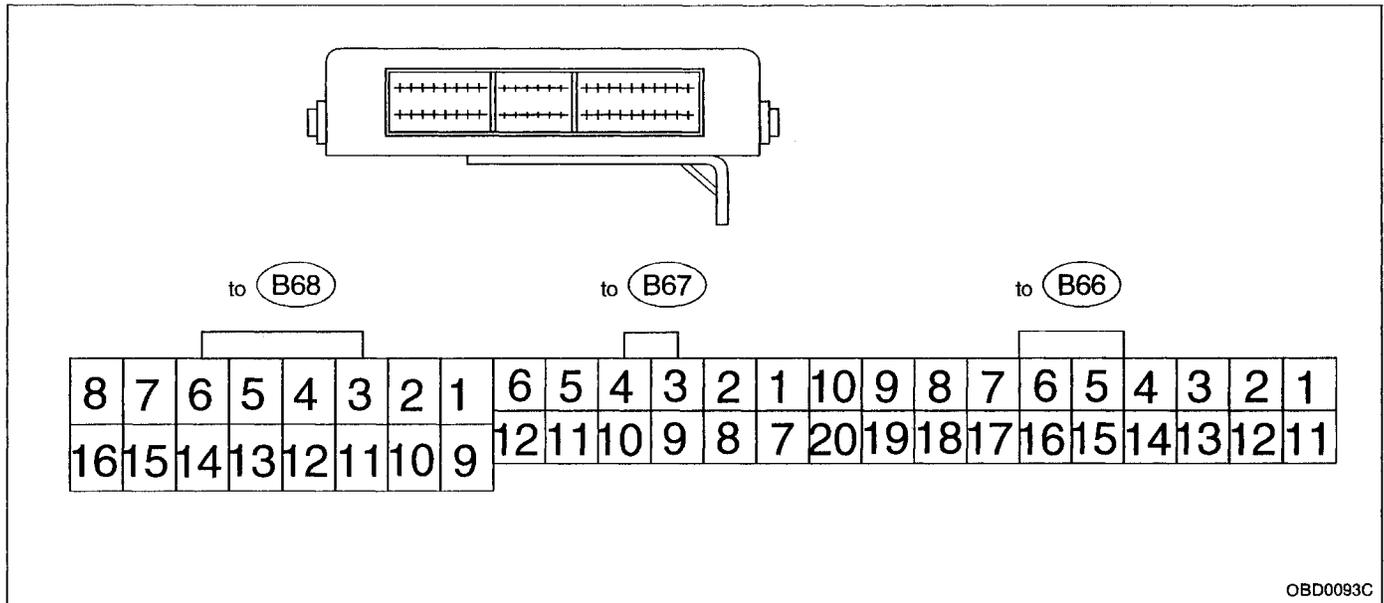
2. ENGINE CONDITION DATA

Content	Specified data
Mass air flow	2.3 — 4.7 (g/sec): Idling
	11.7 — 18.0 (g/sec): 2,500 rpm racing
Engine load	1.2 — 2.9 (%): Idling
	6.6 — 11.0 (%): 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



OBD0093C

Check with ignition switch ON.

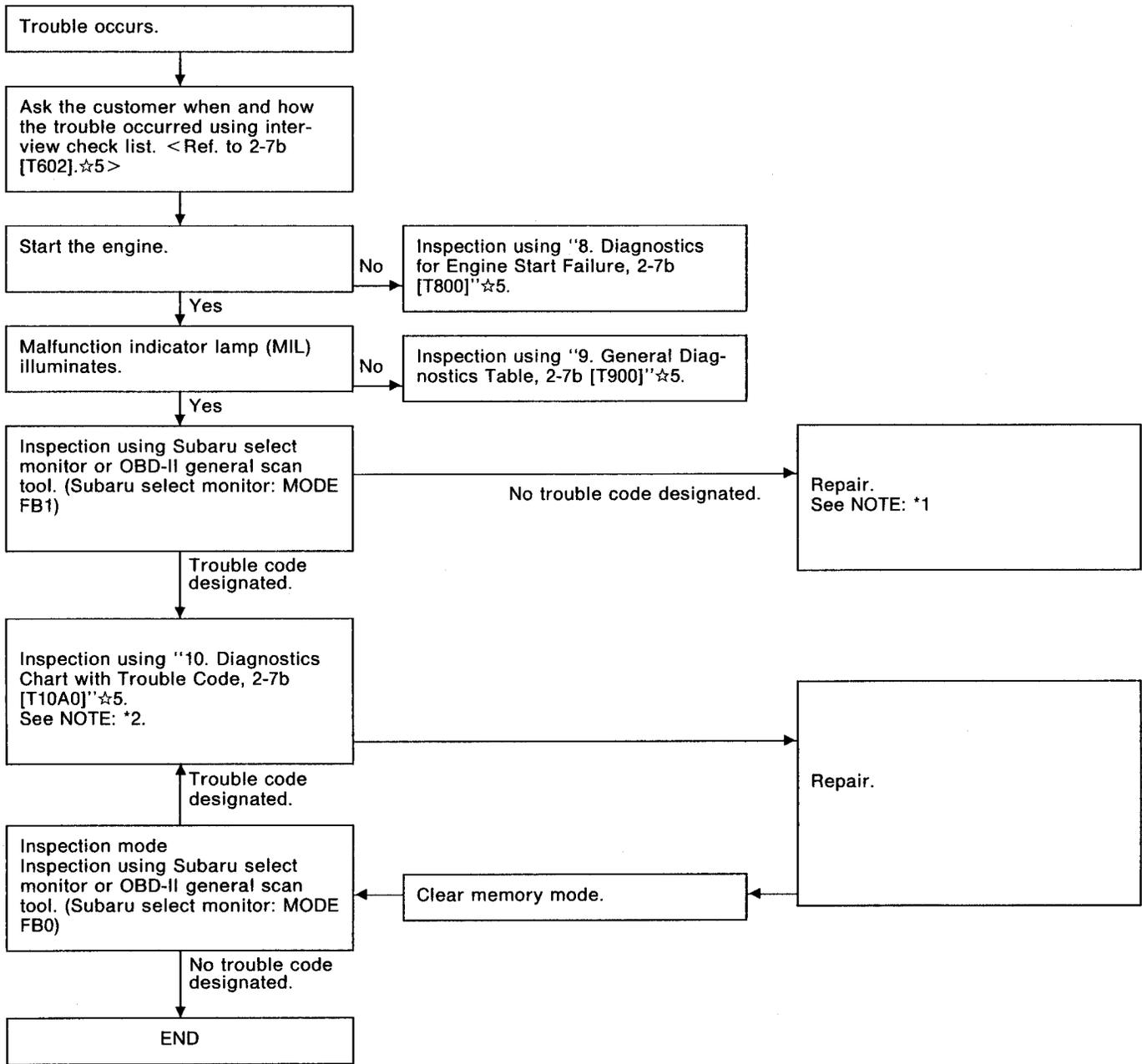
Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B66	14	Ignition switch OFF	10 — 16
Ignition power supply		B67	6	Ignition switch ON (with engine OFF)	10 — 16
		B68	1		
Inhibitor switch	"P" range switch	B66	9	Selector lever in "P" range	Less than 1
				Selector lever in any other than "P" range	More than 8
	"N" range switch	B66	8	Selector lever in "N" range	Less than 1
				Selector lever in any other than "N" range	More than 8
	"R" range switch	B66	10	Selector lever in "R" range	Less than 1
				Selector lever in any other than "R" range	More than 6
	"D" range switch	B67	1	Selector lever in "D" range	Less than 1
				Selector lever in any other than "D" range	More than 6
"3" range switch	B67	2	Selector lever in "3" range	Less than 1	
			Selector lever in any other than "3" range	More than 6	
"2" range switch	B67	3	Selector lever in "2" range	Less than 1	
			Selector lever in any other than "2" range	More than 6	
"1" range switch	B67	4	Selector lever in "1" range	Less than 1	
			Selector lever in any other than "1" range	More than 6	
Brake switch	B66	7	Brake pedal depressed	More than 10.5	
			Brake pedal released	Less than 1	
ABS signal	B66	5	ABS switch ON	Less than 1	
			ABS switch OFF	More than 6.5	
AT diagnostics signal	B68	12	Ignition switch ON (with engine OFF)	Less than 1	
			Ignition switch ON (with engine ON)	More than 10	
Manual switch	B66	6	Manual switch ON.	Less than 1	
			Manual switch OFF.	More than 6	

ON-BOARD DIAGNOSTICS II SYSTEM

[T503] 2-7b
5. Specified Data

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B67	8	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
Throttle position sensor power supply	B66	19	Ignition switch ON (with engine OFF)	5.12±0.1	—
ATF temperature sensor	B67	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	B67	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B66	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1↔More than 9	—
Engine speed signal	B67	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B66	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	B68	16	Ignition switch ON	4 — 6	—
Mass air flow signal	B67	9	Engine idling after warm-up	0.5 — 1.22	—
Shift solenoid 1	B68	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B68	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B68	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	B68	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	B68	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 0.5	
Duty solenoid B	B68	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C	B68	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	B67	7	—	0	Less than 1
Sensor ground line 2	B66	20	—	0	Less than 1
System ground line	B66	1	—	0	Less than 1
Power system ground line	B68	10	—	0	Less than 1
FWD switch	B66	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal (Subaru select monitor)	B66	12	—	—	—
		13	—	—	
AT diagnosis signal	B68	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), 2-7b [T700]." ☆5>

*2: Carry out the basic check, only when trouble code about automatic transmission is shown on display. <Ref. to 2-7b [T601].☆5>

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 [W2A1]☆1.

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 ATF temperature warning light
<input type="checkbox"/> ④ ABS warning light
<input type="checkbox"/> ⑤ 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)

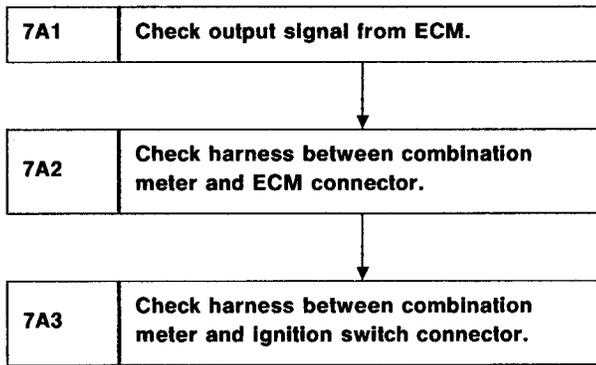
A: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT COME ON.

DIAGNOSIS:

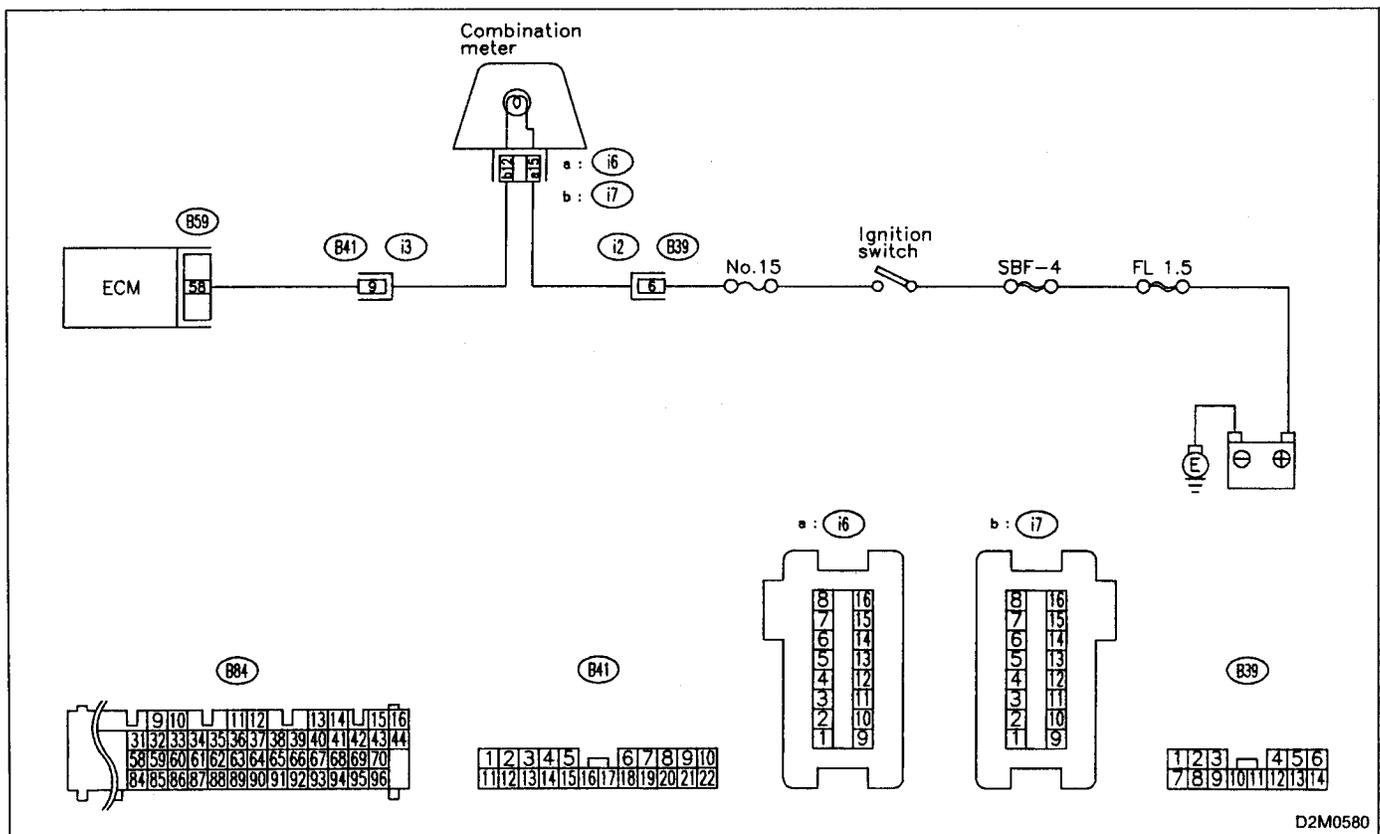
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.

TROUBLE SYMPTOM:

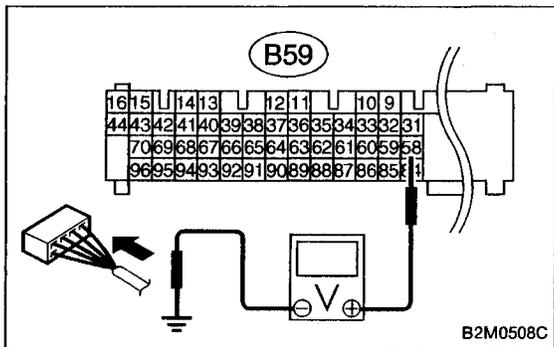
- When ignition switch is turned ON (engine OFF), MIL does not come on.



WIRING DIAGRAM:



D2M0580



7A1 CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK : Connector & terminal (B59) 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?

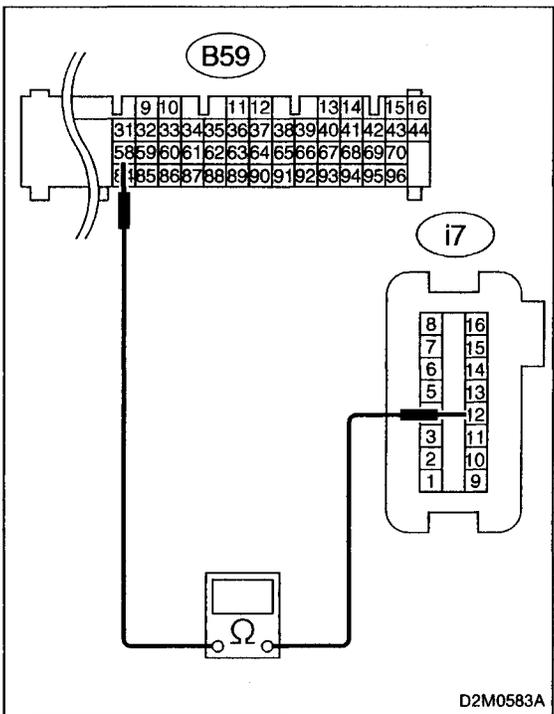
YES : Repair poor contact in ECM connector.

NO : Go to next **CHECK** .

CHECK : Is ECM connector correctly connected?

YES : Replace ECM.

NO : Repair connection of ECM connector.



7A2 CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove combination meter. <Ref. to 6-2 [W2A0].☆1>
- 3) Disconnect connector from ECM and combination meter.
- 4) Measure resistance of harness between ECM and combination meter connector.

CHECK : Connector & terminal (B59) No. 58 — (i7) No. 12: Is resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

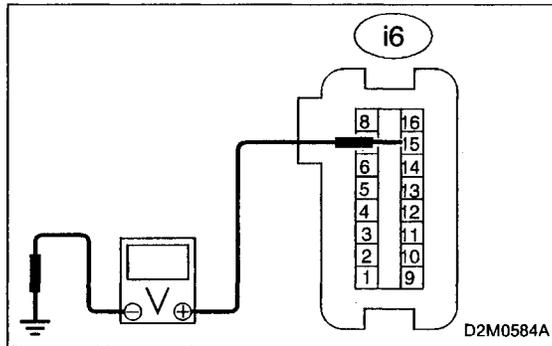
In this case, repair the following:

- Open circuit in harness between ECM and combination meter connector
- Poor contact in coupling connector (B41)

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 (i6) No. 15 (+) — 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) holder and combination meter connector.

- Open or short circuit in harness between coupling connector (B39) and combination meter connector
- Open or short circuit in harness between coupling connector (B39) and fuse (No. 15) holder
- Open or short circuit in harness between fuse (No. 15) holder and ignition switch connector
- Poor contact in coupling connector (B39)
- 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.

MEMO:

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

DIAGNOSIS:

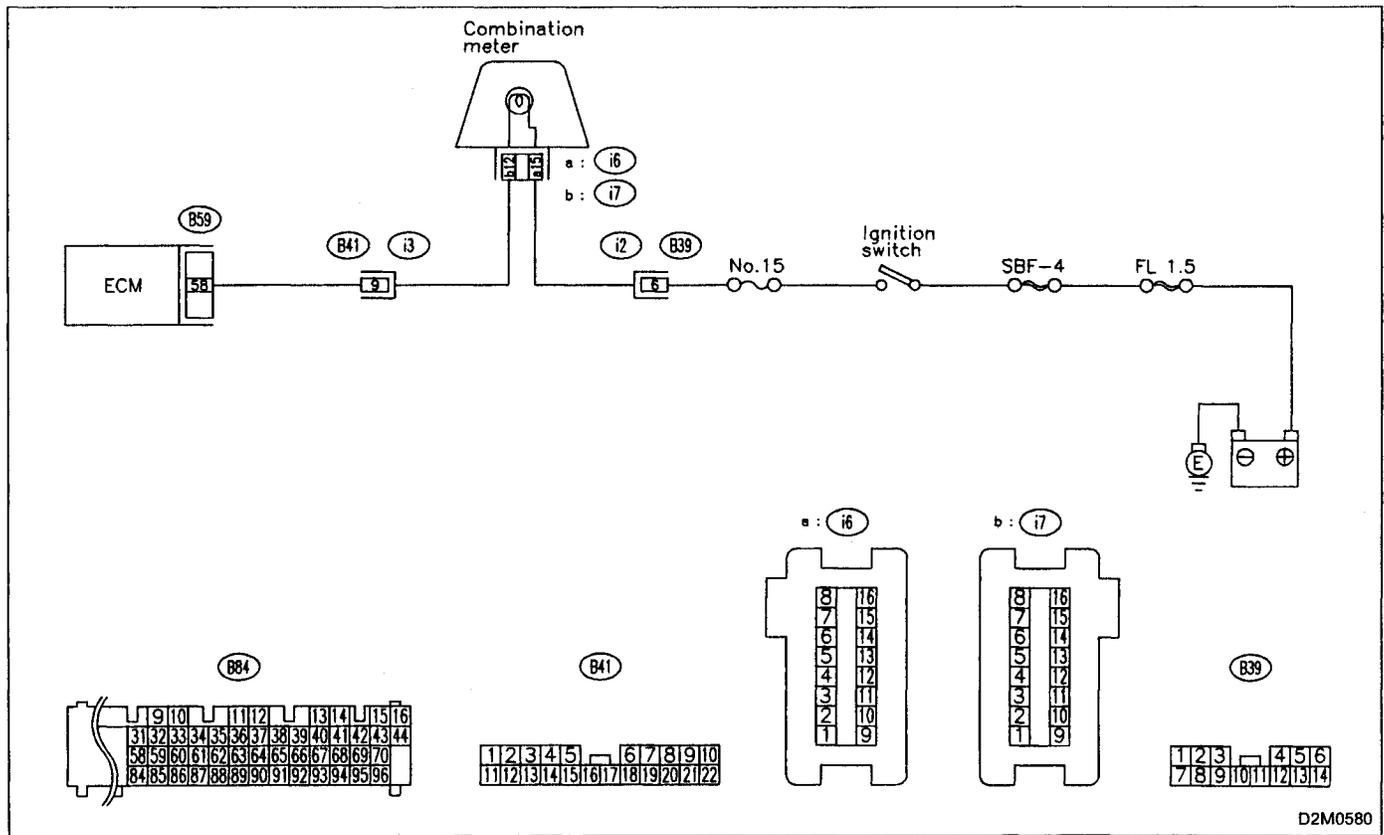
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is shorted.

TROUBLE SYMPTOM:

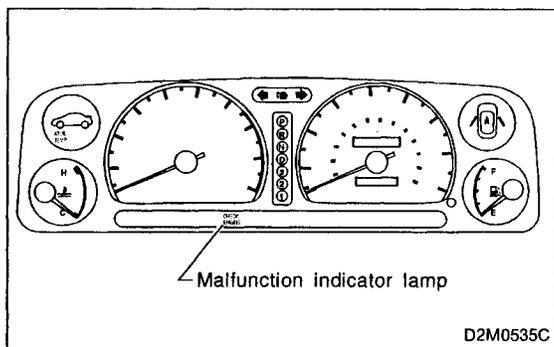
- Although MIL comes on when engine runs, trouble code is not shown on Subaru select monitor or OBD-II general scan tool display.

7B1	Check harness between combination meter and ECM connector.
-----	--

WIRING DIAGRAM:



D2M0580



7B1

CHECK HARNESS BETWEEN COMBINATION METER AND ECM CONNECTOR.

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

CHECK : **Does the MIL come on?**

YES : Repair short circuit in harness between combination meter and ECM connector.

NO : Replace ECM.

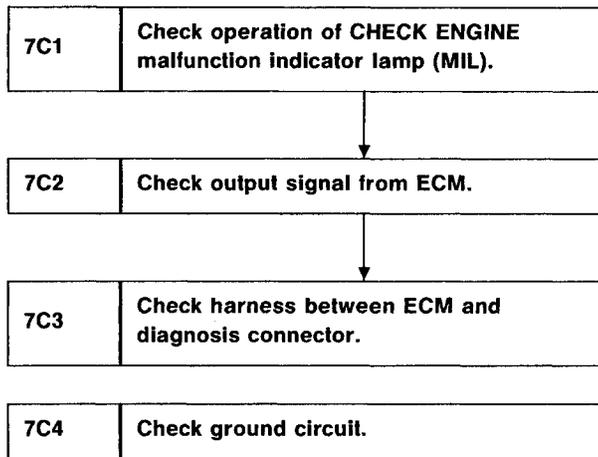
C: CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL) DOES NOT BLINK AT A CYCLE OF 3 HZ.

DIAGNOSIS:

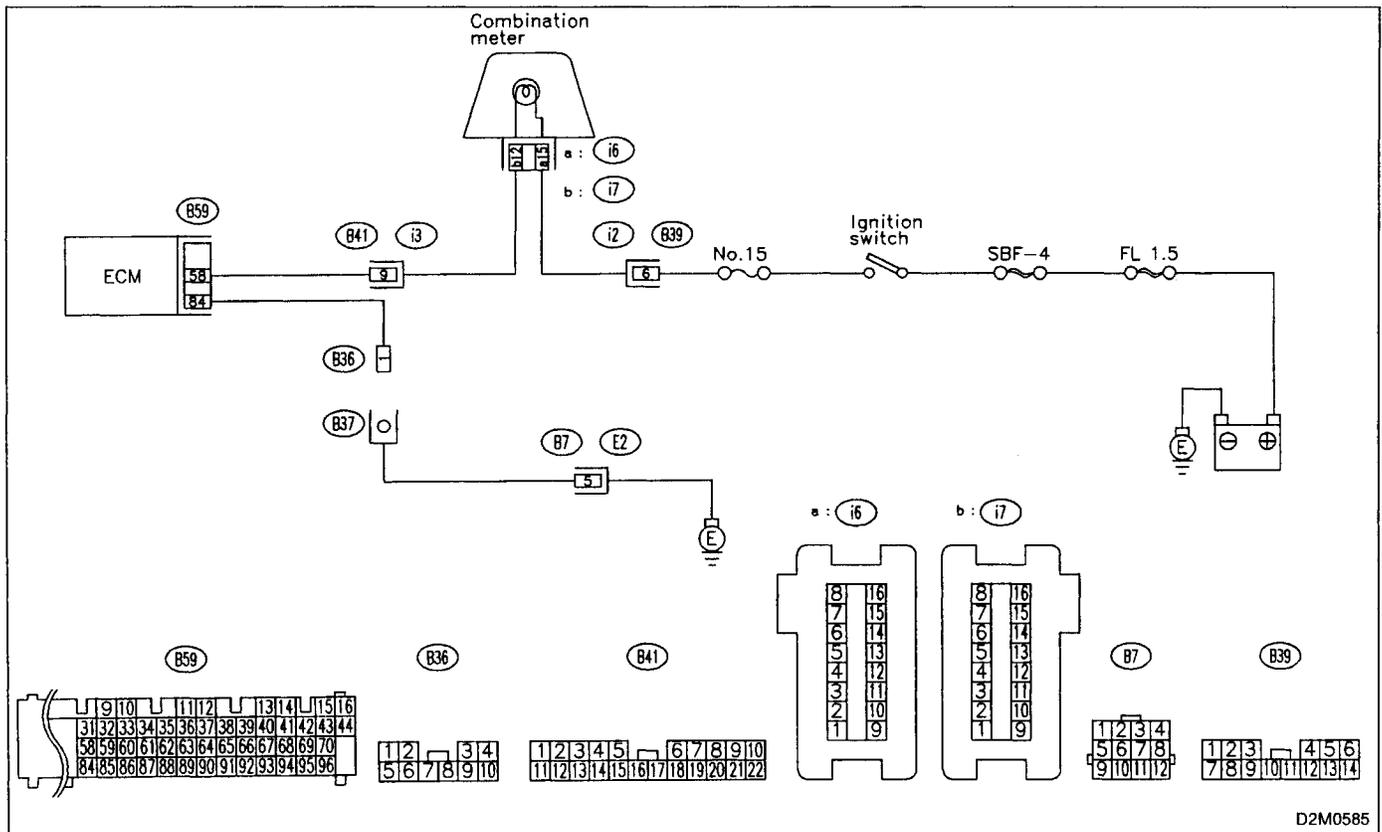
- The CHECK ENGINE malfunction indicator lamp (MIL) circuit is open or shorted.
- Diagnosis connector circuit is in open.

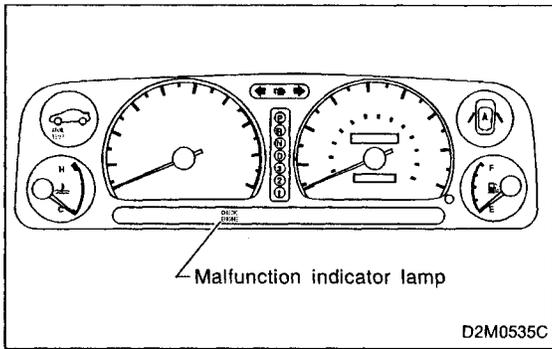
TROUBLE SYMPTOM:

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



WIRING DIAGRAM:





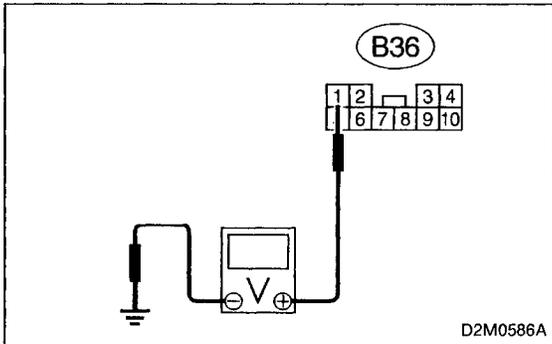
7C1 CHECK OPERATION OF CHECK ENGINE MALFUNCTION INDICATOR LAMP (MIL).

- 1) Turn ignition switch to OFF.
- 2) Disconnect diagnosis terminal from diagnosis 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 2-7b [T7A0].☆5>



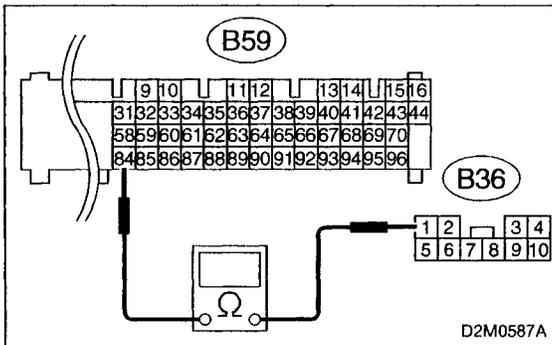
7C2 CHECK OUTPUT SIGNAL FROM ECM.

Measure voltage between diagnosis connector and chassis ground.

CHECK : Connector & terminal (B36) 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 DIAGNOSIS CONNECTOR.

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

CHECK : Connector & terminal (B59) No.84 — (B36) No.1: Is resistance less than 1 Ω?

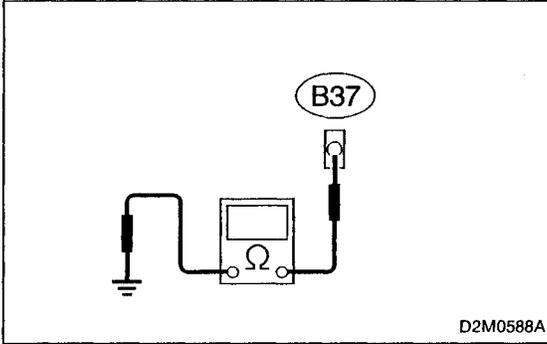
YES : Go to next **CHECK** .

NO : Repair open circuit in harness between ECM and diagnosis 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 diagnosis terminal and chassis ground.

CHECK : **Connector & terminal (B37) No.1 — Chassis ground:**
Is resistance less than 5 Ω?

YES : Repair poor contact in diagnosis connector.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between diagnosis terminal and coupling connector (B7)
- Open circuit in harness between coupling connector (B7) and engine grounding terminal
- Poor contact in coupling connector (B7)

MEMO:

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

DIAGNOSIS:

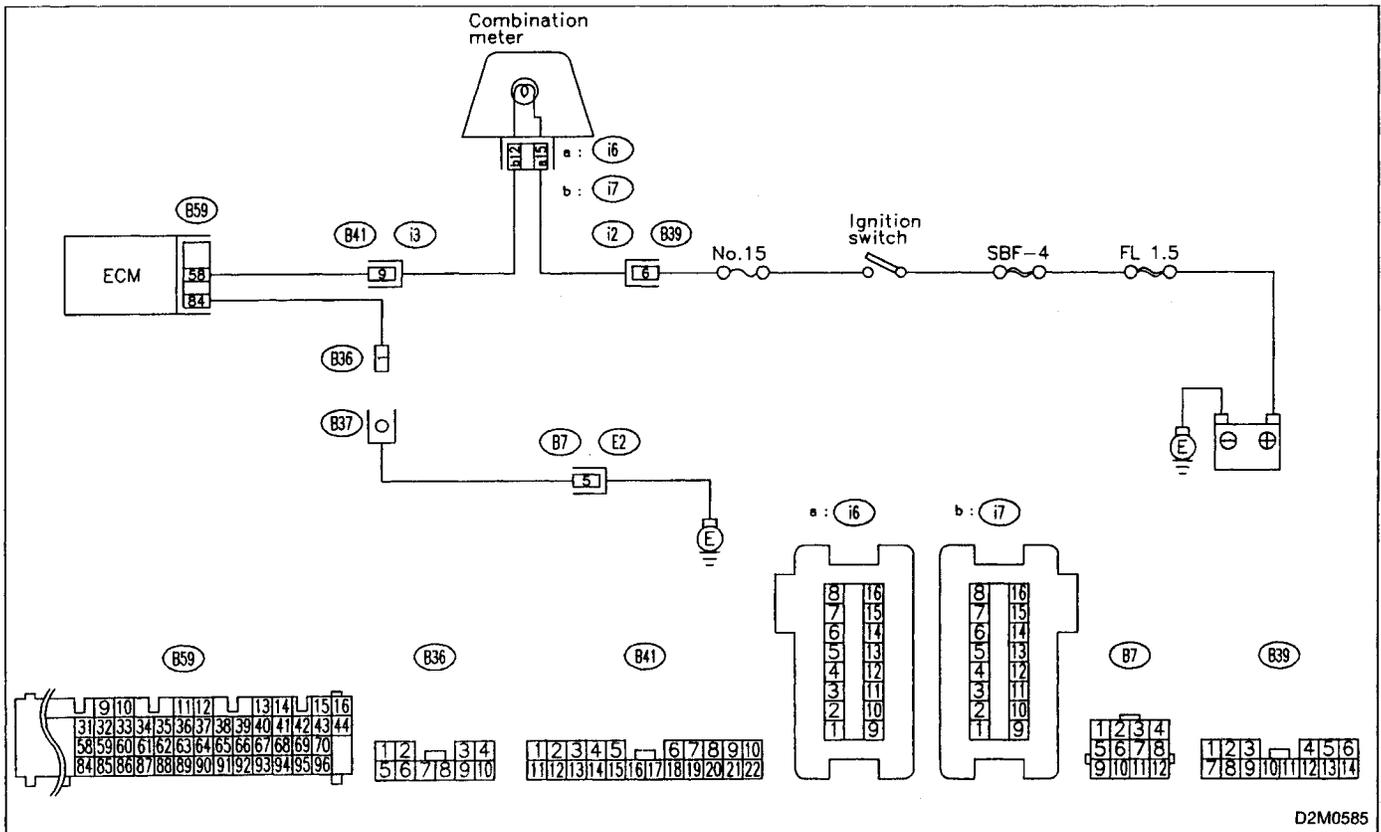
- Diagnosis connector circuit is shorted.

TROUBLE SYMPTOM:

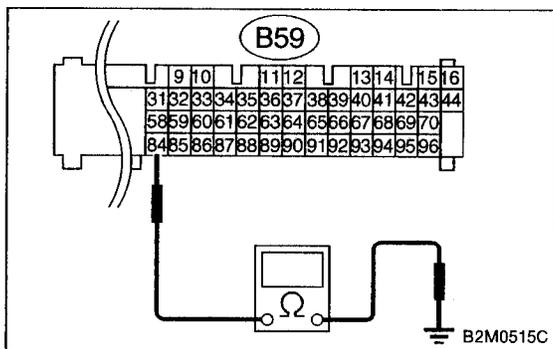
- Even though diagnosis connector is disconnected, MIL blinks at a cycle of 3 Hz when ignition switch is turned to ON.

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

WIRING DIAGRAM:



D2M0585



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

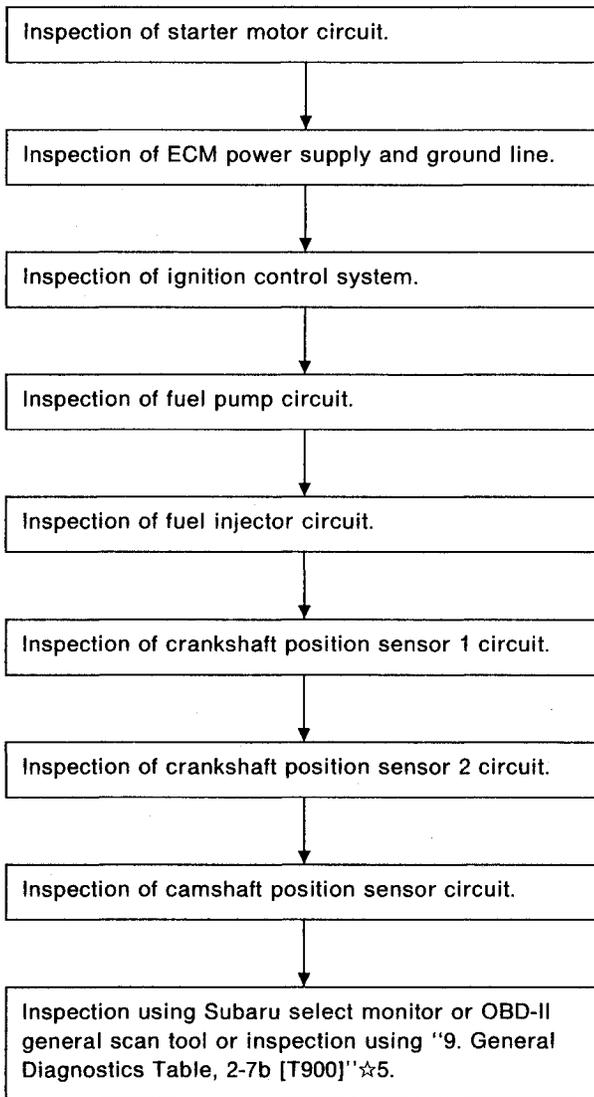
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

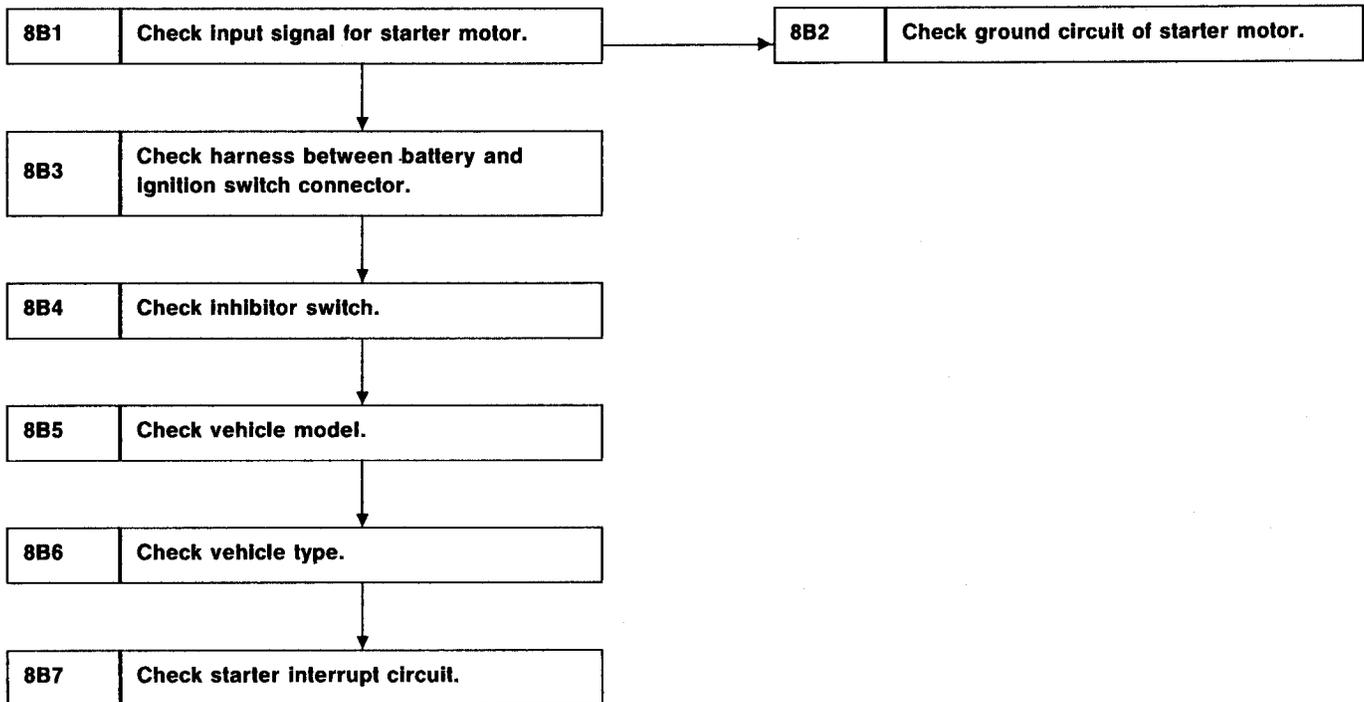
- CHECK** : **Connector & terminal (B59) No.84 — Chassis ground: Is resistance less than 5 Ω?**
- YES** : Repair short circuit in harness between ECM and diagnosis connector.
- NO** : Replace ECM.

MEMO:

8. Diagnostics for Engine Starting Failure

A: BASIC DIAGNOSTICS CHART

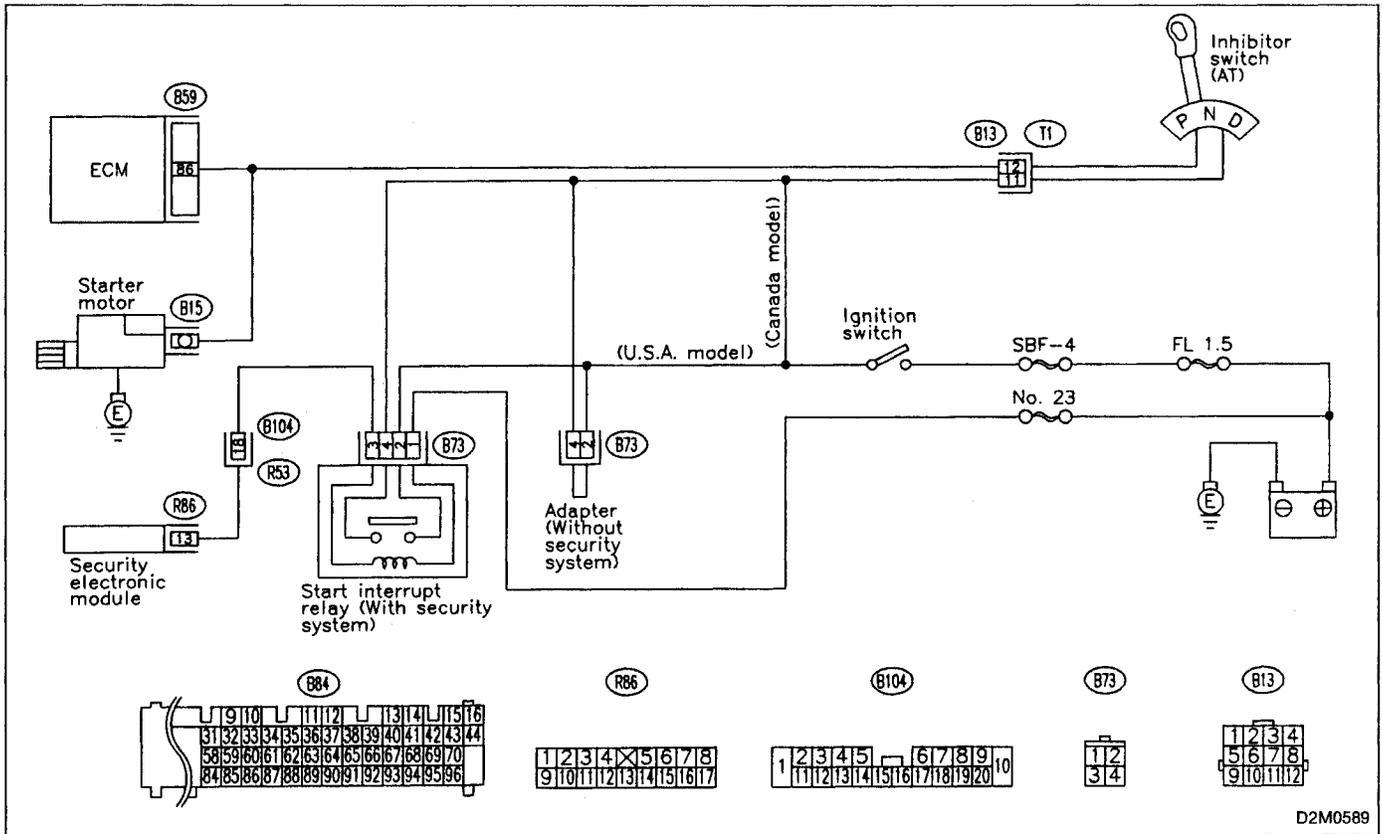


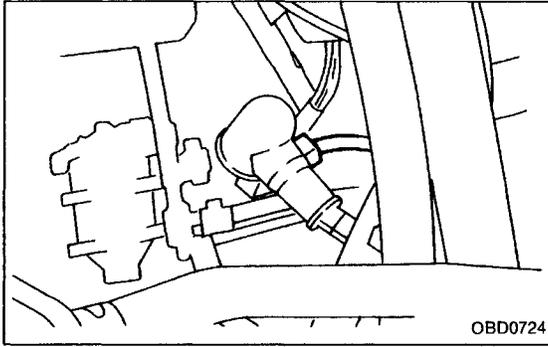
B: STARTER MOTOR CIRCUIT**CAUTION:**

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

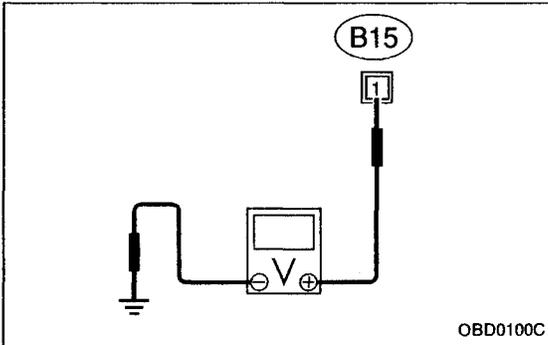
< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



**8B1****CHECK INPUT SIGNAL FOR STARTER MOTOR.**

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



- 4) Measure power supply voltage between starter motor connector terminal and engine ground.

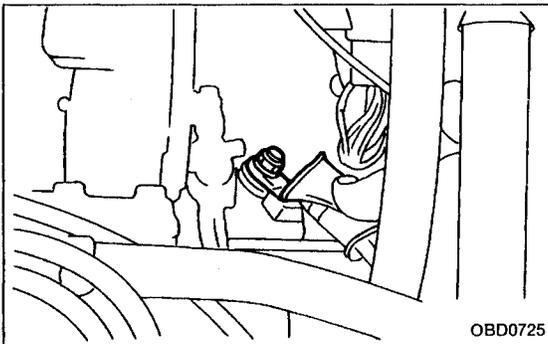
CHECK : **Connector & terminal (B15) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

NOTE:

Place the selector lever in the "P" or "N" position.

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 [W1A1].☆1>

NO : Repair open circuit of ground cable.

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

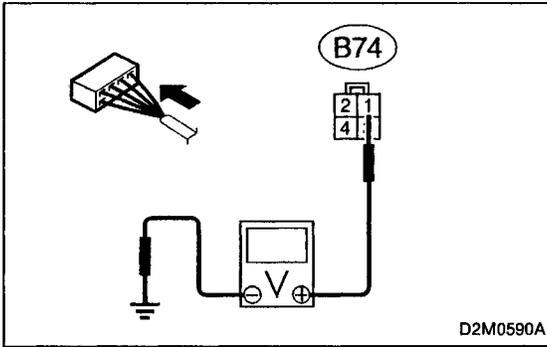
- 1) Turn ignition switch to OFF.
- 2) Remove SBF No. 4 from main fuse box.
- 3) Measure resistance of fuse.

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

YES : Go to next step 4).

NO : Replace SBF No. 4.

- 4) Install SBF No. 4 to main fuse box.
- 5) Turn ignition switch to ON.

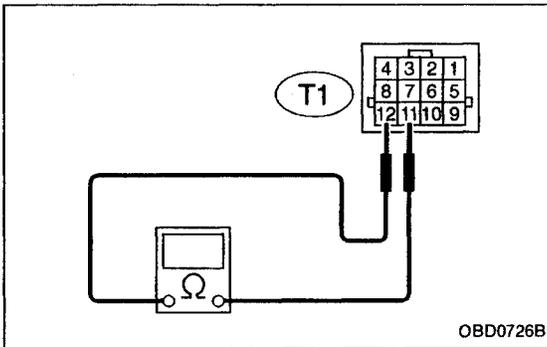


6) Measure power supply voltage between ignition switch connector and chassis ground.

CHECK : **Connector & terminal (B74) 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.
------------	--------------------------------

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

CHECK : **Connector & terminal (T1) No. 11 — No. 12: Is the resistance less than 10 Ω?**

YES : Go to step **8B5**.

NO : Repair or replace inhibitor switch.

8B5	CHECK VEHICLE MODEL.
------------	-----------------------------

CHECK : **Is vehicle model USA?**

YES : Go to step **8B6**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

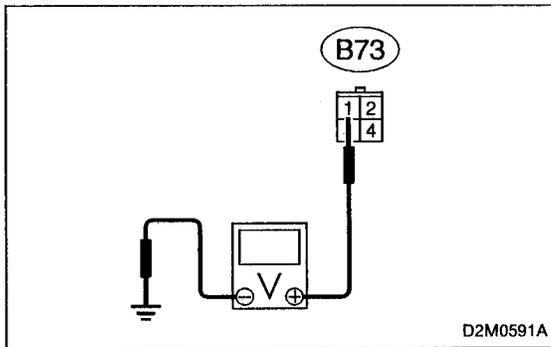
- Open or short circuit in harness between ignition switch and transmission harness connector
- Open or short circuit in harness between transmission harness and starter motor connector
- Poor contact in transmission harness connector

8B6**CHECK VEHICLE TYPE.****CHECK** : *Is the vehicle equipped with security system?***YES** : Go to step **8B7**.**NO** : Repair harness and connector.

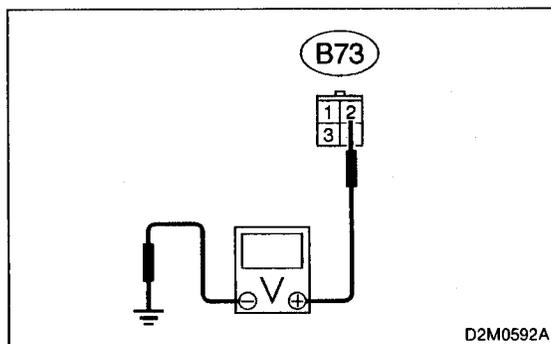
NOTE:

In this case, repair the following:

- Open or short circuit in harness between ignition switch and transmission harness connector
- Open or short circuit in harness between transmission harness and starter motor connector
- Poor contact in adapter connector (B73)
- Poor contact in transmission harness connector

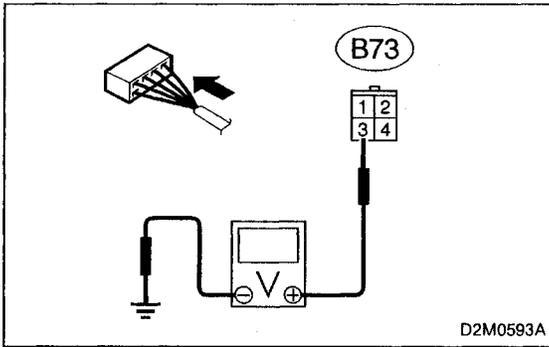
**8B7****CHECK STARTER INTERRUPT CIRCUIT.**

- 1) Disconnect connector from starter interrupt relay.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between starter interrupt relay connector and chassis ground.

CHECK : **Connector & terminal (B73) No. 1 (+) — Chassis ground (-):**
*Is the voltage more than 10 V?***YES** : Go to next step 4).**NO** : Repair open or short circuit in harness between starter interrupt relay connector and battery terminal.

- 4) Measure voltage between starter interrupt relay connector and chassis ground.

CHECK : **Connector & terminal (B73) No. 2 (+) — Chassis ground (-):**
*Is the voltage more than 10 V?***YES** : Go to next step 5).**NO** : Repair open or short circuit in harness between starter interrupt relay and ignition switch connector.

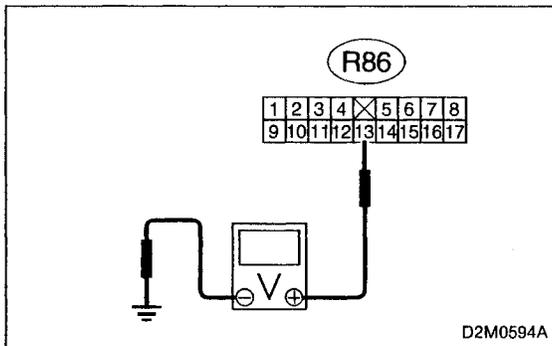


- 5) Turn ignition switch to OFF.
- 6) Connect connector to starter interrupt relay.
- 7) Disconnect connector from security electronic module.
- 8) Turn ignition switch to ON.
- 9) Measure voltage between starter interrupt relay connector and chassis ground.

CHECK : **Connector & terminal (B73) No. 3 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Go to next step 10).

NO : Replace starter interrupt relay.



- 10) Measure voltage between security electronic module connector and chassis ground.

CHECK : **Connector & terminal (R86) No. 13 (+) — Chassis ground (-): Is the voltage more than 10 V?**

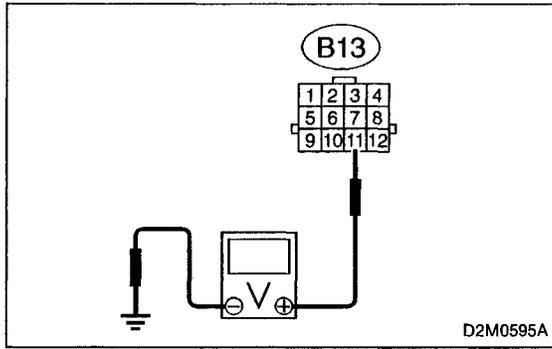
YES : Go to step 11).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open or short circuit in harness between starter interrupt relay and security electronic module connector
- Poor contact in coupling connector (B104)



11) Measure voltage between transmission harness connector and transmission ground.

CHECK : **Connector & terminal (B13) No. 11 (+) — Transmission ground (-): Is the voltage more than 10 V?**

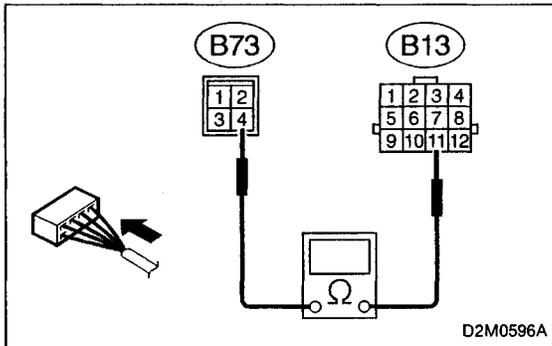
YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open or short circuit in harness between transmission harness and starter motor connector
- Poor contact in transmission harness connector

NO : Go to next step 12).



12) Turn ignition switch to OFF.

13) Measure resistance of harness between transmission harness and starter interrupt relay connector.

CHECK : **Connector & terminal (B13) No. 11 — (B73) No. 4: Is the resistance less than 1 Ω?**

YES : Go to next **CHECK** .

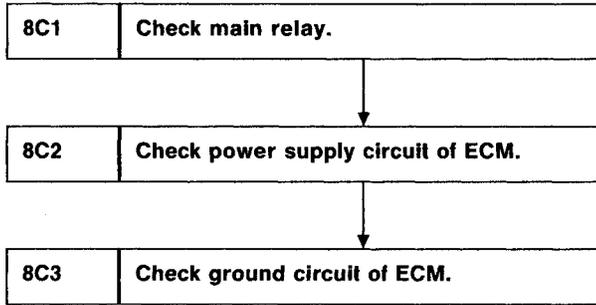
NO : Repair open circuit in harness between transmission harness and starter interrupt relay connector.

CHECK : **Are there poor contact in starter interrupt relay and security electronic module connector?**

YES : Repair poor contact in starter interrupt relay and security electronic module connector.

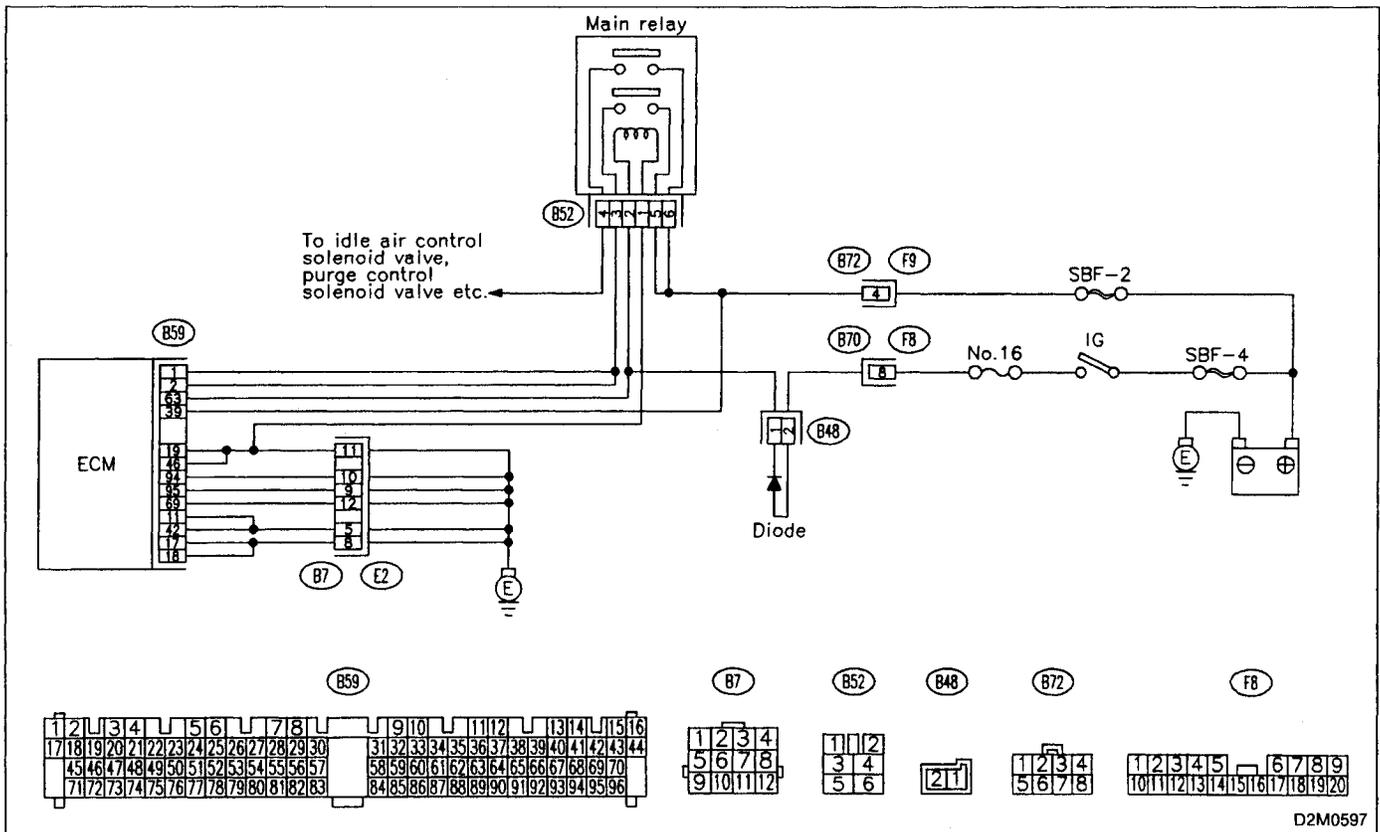
NO : Replace starter interrupt relay or security electronic module.

C: CONTROL MODULE POWER SUPPLY AND GROUND LINE

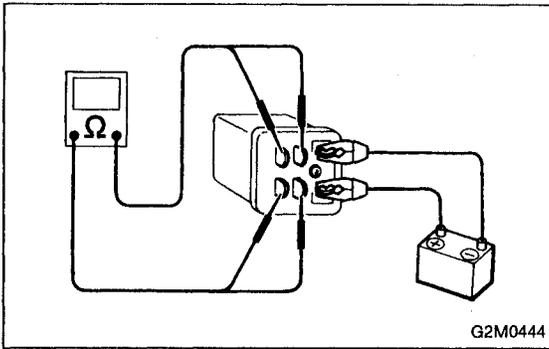


CAUTION:
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 < Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0597



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?

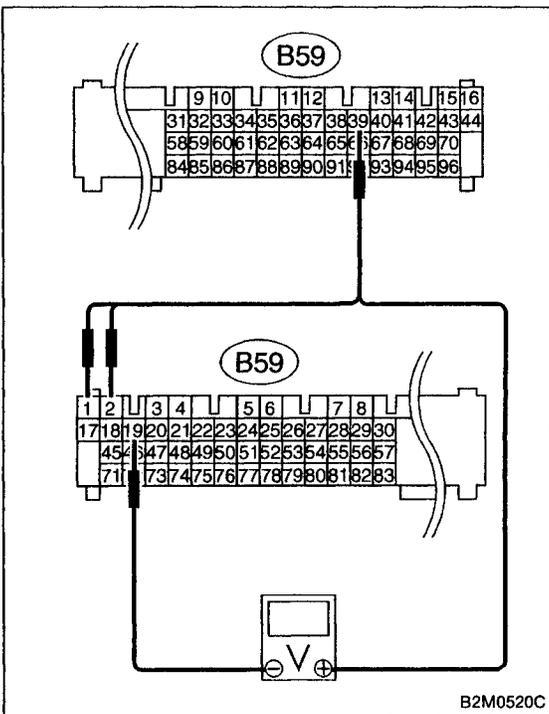
YES : Go to next **CHECK** .

NO : 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 (B59) 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 (B59) No. 2 (+) — No. 19 (-):**
Is the voltage more than 10 V?

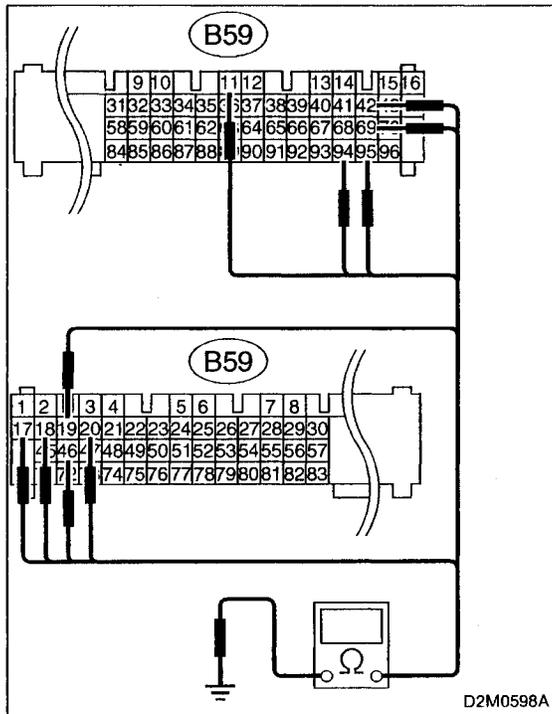
YES : Go to next **CHECK** .

NO : Repair harness of power supply circuit.

CHECK : **Connector & terminal (B59) No. 39 (+) — No. 19 (-):**
Is the voltage more than 10 V?

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

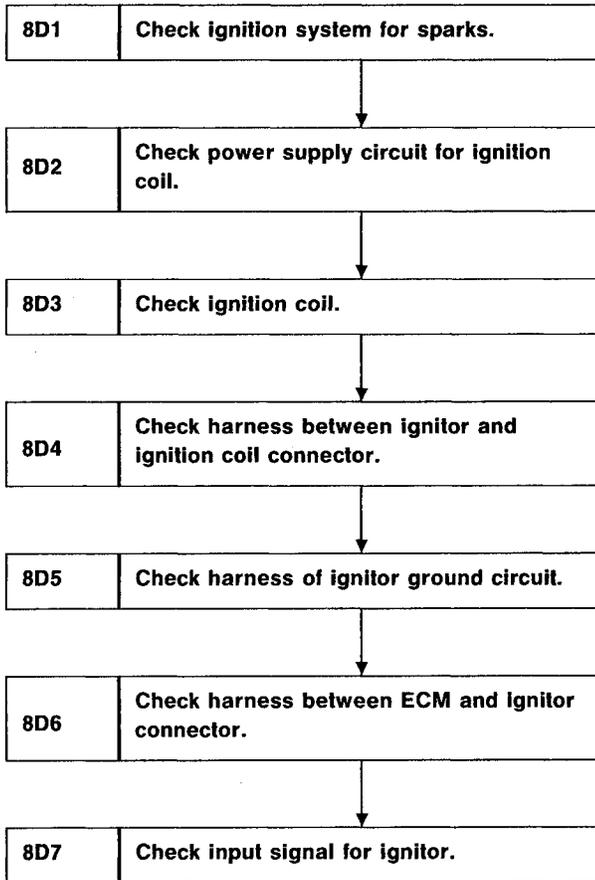
NO : Repair harness of power supply circuit.

**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 (B59) No. 11 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal (B59) No. 17 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal (B59) No. 18 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal (B59) No. 19 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal (B59) No. 20 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal (B59) No. 42 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal (B59) No. 46 — Chassis ground: Is the resistance less than 5 Ω?**
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.

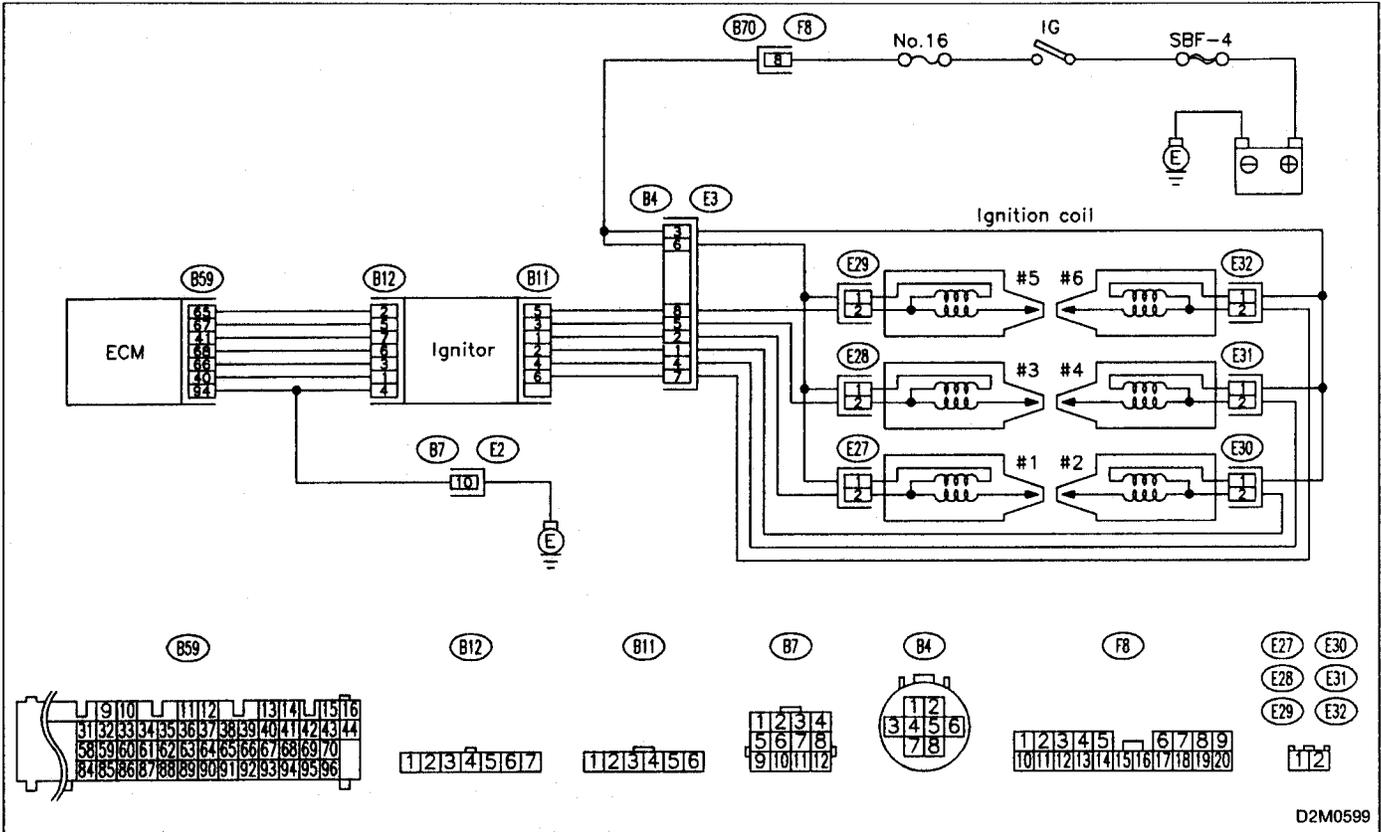
- CHECK** : **Connector & terminal**
(B59) No. 69 — Chassis ground:
Is the resistance less than 5 Ω?
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal**
(B59) No. 94 — Chassis ground:
Is the resistance less than 5 Ω?
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.
- CHECK** : **Connector & terminal**
(B59) No. 95 — Chassis ground:
Is the resistance less than 5 Ω?
- YES** : Check ignition control system. <Ref. to 2-7b [T8D0].☆5>
- NO** : Repair open circuit in harness between ECM connector and engine grounding terminal.

D: IGNITION CONTROL SYSTEM**CAUTION:**

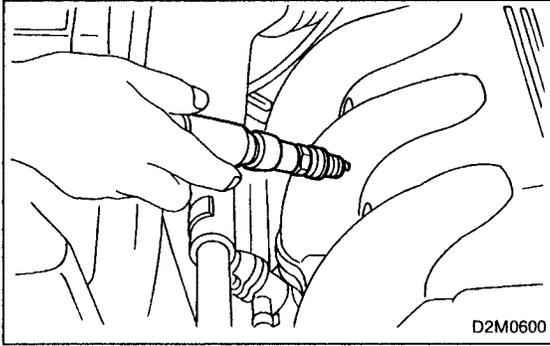
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0599



8D1	CHECK IGNITION SYSTEM FOR SPARKS.
------------	--

- 1) Remove each ignition coil from cylinder head. <Ref. to 6-1 [W3A0].☆1 >
- 2) Install new spark plug on ignition coil.

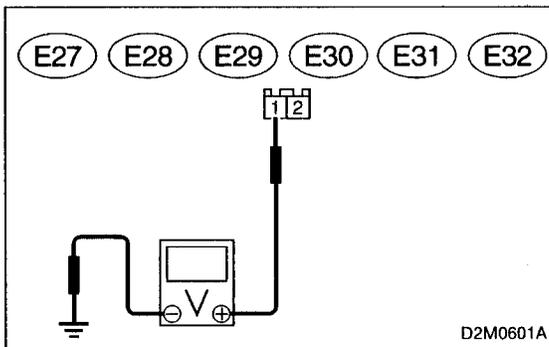
CAUTION:**Do not remove spark plug from engine.**

- 3) Disconnect connector from fuel pump relay.
- 4) Contact spark plug's thread portion on engine.
- 5) Start engine and stall it.
- 6) Crank engine to check that spark occurs at each cylinder.

CHECK : **Does spark occur at each cylinder?**

YES : Check fuel pump system. <Ref. to 2-7b [T8E0].☆5 >

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 on faulty cylinders.
- 3) Turn ignition switch to ON.
- 4) Measure power supply voltage between each ignition coil connector and engine ground.

CHECK : **Connector & terminal**

#1 (E27) No. 1 (+) — Engine ground (-):

#2 (E30) No. 1 (+) — Engine ground (-):

#3 (E28) No. 1 (+) — Engine ground (-):

#4 (E31) No. 1 (+) — Engine ground (-):

#5 (E29) No. 1 (+) — Engine ground (-):

#1 (E32) No. 1 (+) — Engine ground (-):

Is the voltage more than 10 V?

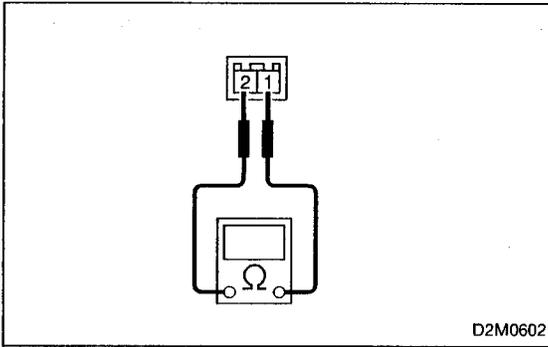
YES : Go to step **8D3**.

NO : Repair harness and connector.

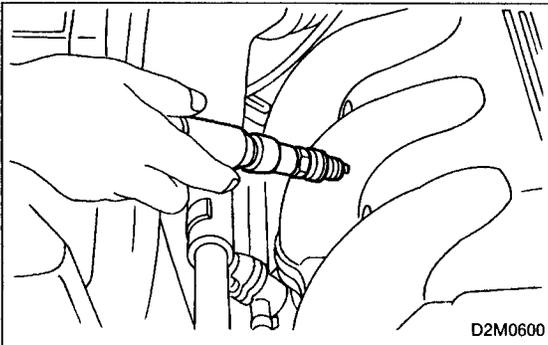
NOTE:

In this case, repair the following:

- Open circuit in harness between ignition coil and ignition switch connector
- Poor contact in coupling connector (B4)

**8D3****CHECK IGNITION COIL.**

- 1) Turn ignition switch to OFF.
- 2) Measure resistance between each ignition coil connector terminals to check primary coil.

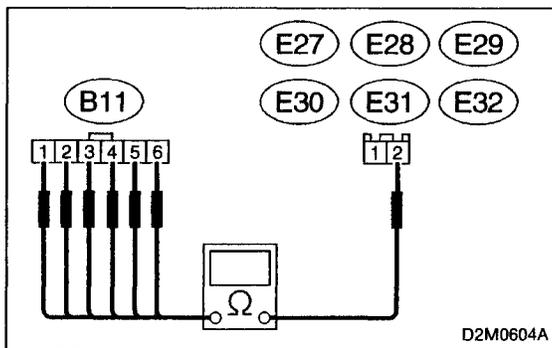
CHECK : **Terminals****No. 1 — No. 2:****Is the resistance between 0.45 and 1.05 Ω?****YES** : Go to next **CHECK** .**NO** : Replace faulty ignition coil.**CHECK** : **Is there poor contact in ignition coil connector or spark plug contact portion?****YES** : Repair poor contact in ignition coil connector or spark plug contact portion.**NO** : Go to next step 3).

- 3) Disconnect connector from ignition coil on normal cylinder and remove normal ignition coil.
- 4) Connect normal ignition coil connector to engine harness ignition coil connector for faulty cylinder.
- 5) Install new spark plug on ignition coil.

CAUTION:**Do not remove spark plug from engine.**

- 6) Contact spark plug's thread portion on engine.
- 7) Crank engine to check that spark occurs at faulty cylinder.

CHECK : **Does spark occur at faulty cylinder?****YES** : Replace faulty ignition coil.**NO** : Go to step **8D4**.

**8D4****CHECK HARNESS BETWEEN IGNITOR AND IGNITION COIL CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (B11) from ignitor.
- 3) Measure resistance of harness between each ignition coil and ignitor connector.

CHECK : **Connector & terminal**

#1 (B11) No. 1 — (E27) No. 2:

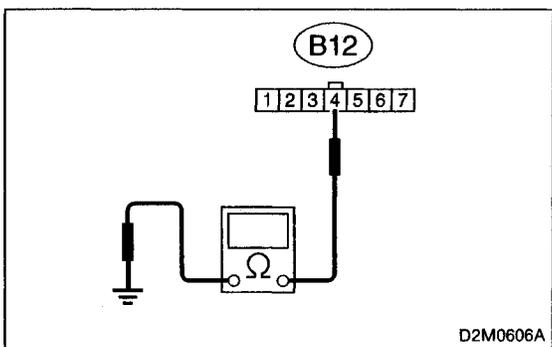
#2 (B11) No. 2 — (E30) No. 2:

#3 (B11) No. 3 — (E28) No. 2:

#4 (B11) No. 4 — (E31) No. 2:

#5 (B11) No. 5 — (E29) No. 2:

#6 (B11) No. 6 — (E32) No. 2:

Is the resistance less than 1 Ω ?**YES** : Go to step **8D5**.**NO** : Go to next **CHECK** .**CHECK** : **Is there poor contact in coupling connector (B4) or spark plug contact portion?****YES** : Repair poor contact in coupling connector (B4) or spark plug contact portion.**NO** : Repair open circuit in harness between ignition coil and ignitor connector.**8D5****CHECK HARNESS OF IGNITOR GROUND CIRCUIT.**

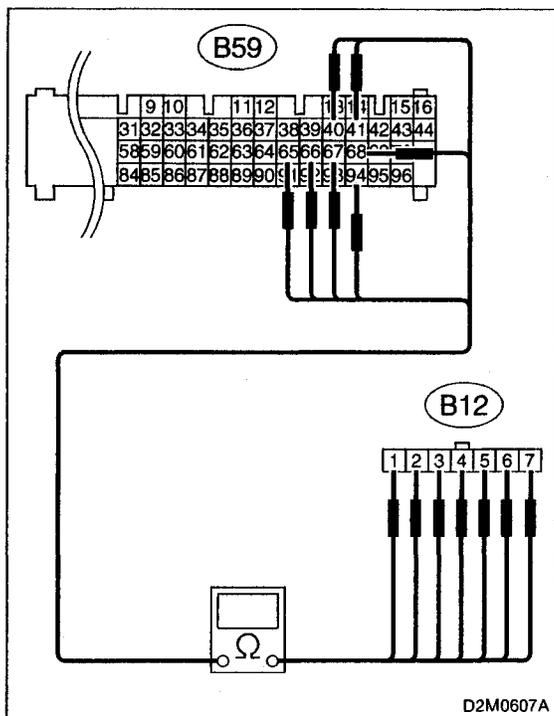
- 1) Disconnect connector (B12) from ignitor.
- 2) Measure resistance between ignitor connector and engine ground.

CHECK : **Connector & terminal****(B12) No. 4 — Engine ground:****Is the resistance less than 5 Ω?****YES** : Go to step **8D6**.**NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

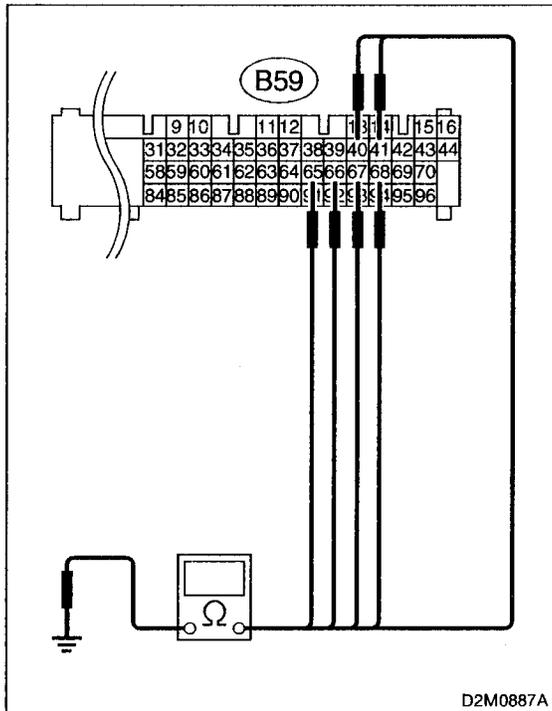
- Open circuit in harness between ignitor connector and engine grounding terminal
- Poor contact in coupling connector (B7)



8D6 CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

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

- CHECK** : Connector & terminal (B59) No. 41 — (B12) No. 7:
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 (B59) No. 68 — (B12) No. 6:
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 (B59) No. 67 — (B12) No. 5:
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 (B59) No. 66 — (B12) No. 3:
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 (B59) No. 65 — (B12) 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 (B59) No. 40 — (B12) 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 (B59) No. 94 — (B12) No. 4:
Is the resistance less than 1 Ω?
YES : Go to next step 3).
NO : Repair open circuit in harness between ECM and ignitor connector.



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

CHECK : **Connector & terminal (B59) 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 (B59) No. 68 — 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 (B59) No. 67 — 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 (B59) No. 66 — 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 (B59) No. 65 — 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 (B59) No. 40 — Chassis ground:**
Is the resistance more than 1 MΩ?

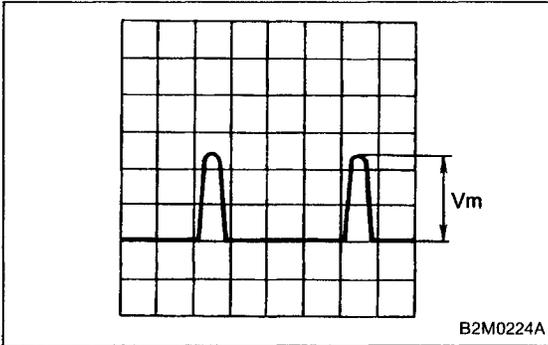
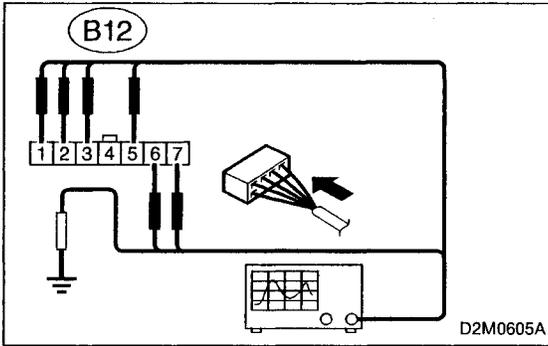
YES : Go to next **CHECK** .

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 : Go to step **8D7**.



8D7 **CHECK INPUT SIGNAL FOR IGNITOR.**

- 1) Connect connectors (B11) and (B12) to ignitor.
- 2) Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignitor connector and engine ground.

CHECK : **Connector & terminal:**

#1 (B12) No. 7 (+) — Engine ground (-):

#2 (B12) No. 6 (+) — Engine ground (-):

#3 (B12) No. 5 (+) — Engine ground (-):

#4 (B12) No. 3 (+) — Engine ground (-):

#5 (B12) No. 2 (+) — Engine ground (-):

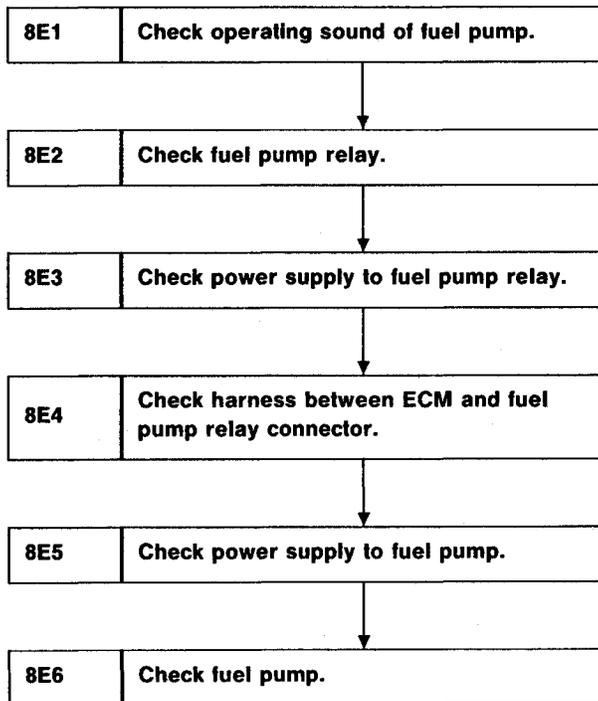
#6 (B12) No. 1 (+) — Engine ground (-):

Is the voltage more than 10 V?

YES : Check fuel pump circuit. <Ref. to 2-7b [T8E0].☆5>

NO : Replace ignitor.

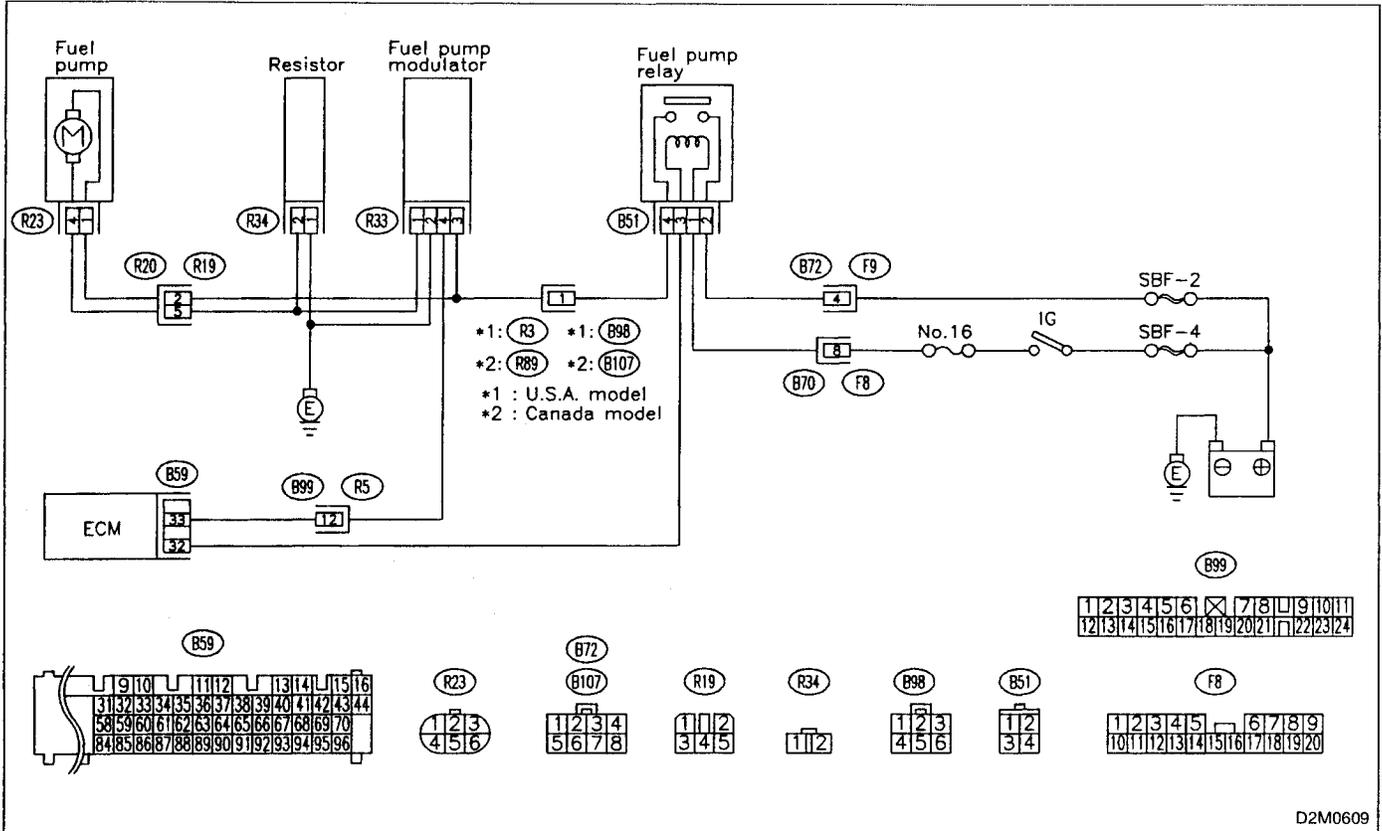
E: FUEL PUMP CIRCUIT

**CAUTION:**

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

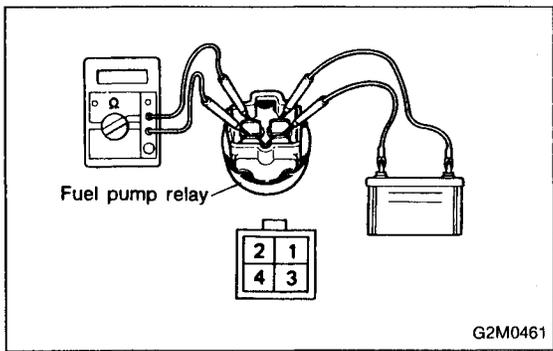
WIRING DIAGRAM:



8E1 CHECK OPERATING SOUND OF FUEL PUMP.

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

- CHECK** : Does fuel pump produce operating sound?
- YES** : Check fuel injector circuit. <Ref. to 2-7b [T10T0].☆5>
- NO** : Go to step **8E2**.



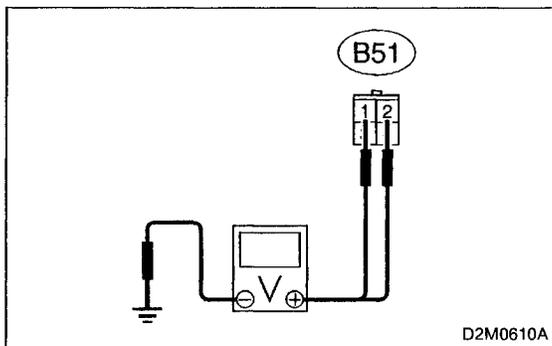
8E2 CHECK FUEL PUMP RELAY.

- 1) Turn ignition switch to OFF.
- 2) Remove fuel pump relay from bracket.
- 3) Disconnect connector from fuel pump relay.
- 4) Connect battery to fuel pump relay connector terminals No. 1 and No. 3.
- 5) 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 **8E3**.

NO : Replace fuel pump relay.

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

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

CHECK : **Connector & terminal**
(B51) No. 1 (+) — Chassis ground (-):
Is the voltage more than 10 V?

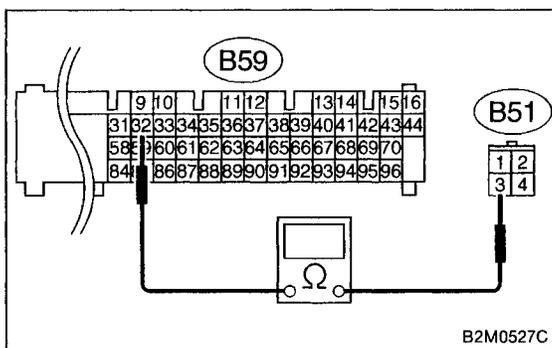
YES : Go to next **CHECK** .

NO : Repair power supply circuit.

CHECK : **Connector & terminal**
(B51) No. 2 (+) — Chassis ground (-):
Is the voltage more than 10 V?

YES : Go to next **8E4**.

NO : Repair power supply circuit.

**8E4**
CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.

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

CHECK : **Connector & terminal**
(B59) No. 32 — (B51) No. 3:
Is the resistance less than 1 Ω ?

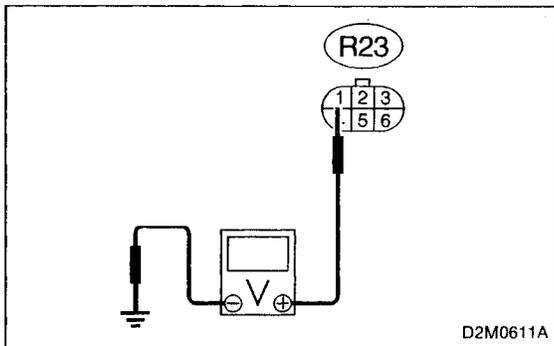
YES : Go to next **CHECK** .

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

CHECK : **Is there poor contact in ECM or fuel pump relay connector?**

YES : Repair poor contact in ECM or fuel pump relay connector.

NO : Go to step **8E5**.



8E5 CHECK POWER SUPPLY TO FUEL PUMP.

- 1) Connect connectors to ECM and fuel pump relay.
- 2) Disconnect connector from fuel pump.
- 3) Turn ignition switch to ON.
- 4) Measure voltage of power supply circuit between fuel pump connector and chassis ground.

CHECK : **Connector & terminal (R23) No. 1 (+) — Chassis ground (-): Is the voltage more than 10 V?**

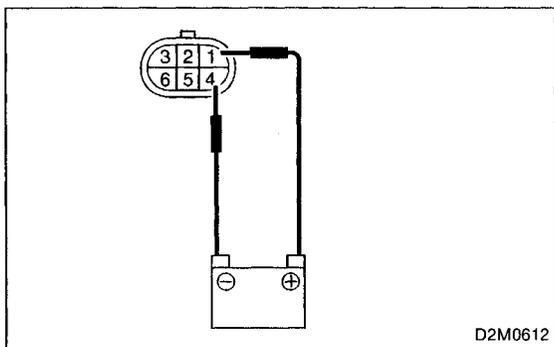
YES : Go to step **8E6**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open or short circuit in harness between fuel pump relay and fuel pump connector
- Poor contact in coupling connectors (B98, B107 and R19)
- Poor contact in fuel pump relay connector



8E6 CHECK FUEL PUMP.

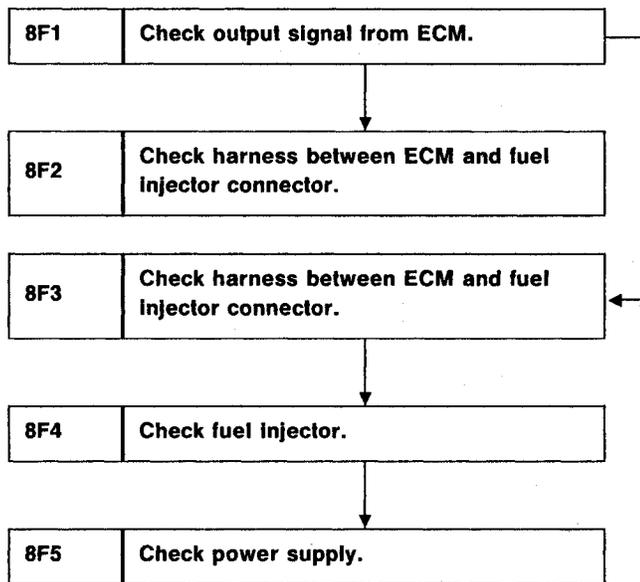
- 1) Turn ignition switch to OFF.
- 2) Contact battery to fuel pump connector terminals No. 1 (+) and No. 4 (-).
- 3) Make sure that fuel pump for proper operation.

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

YES : Repair fuel pump ground circuit.

NO : Replace fuel pump.

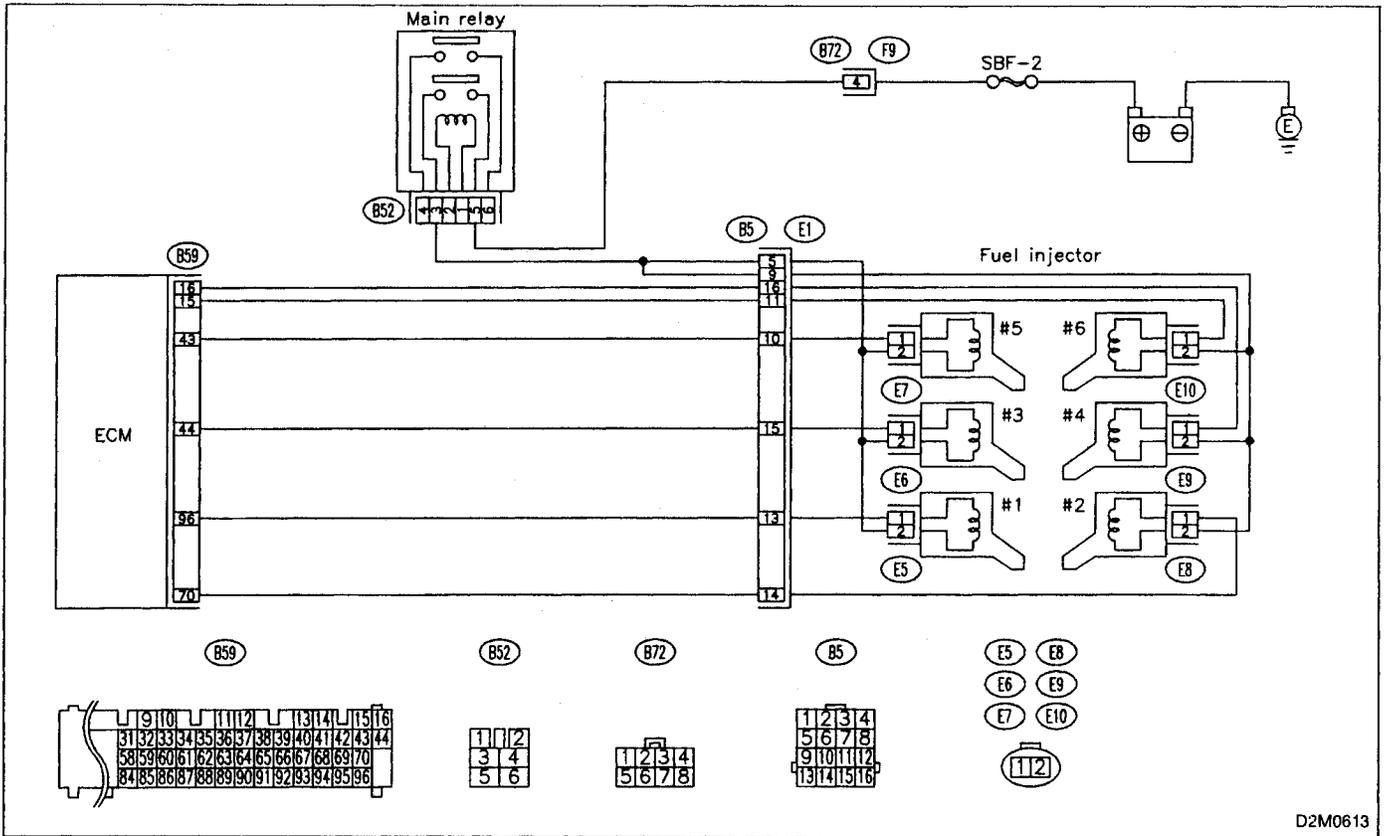
F: FUEL INJECTOR CIRCUIT

**CAUTION:**

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

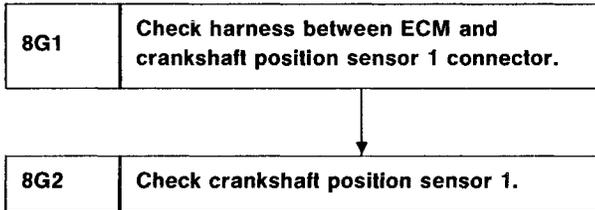
WIRING DIAGRAM:



D2M0613

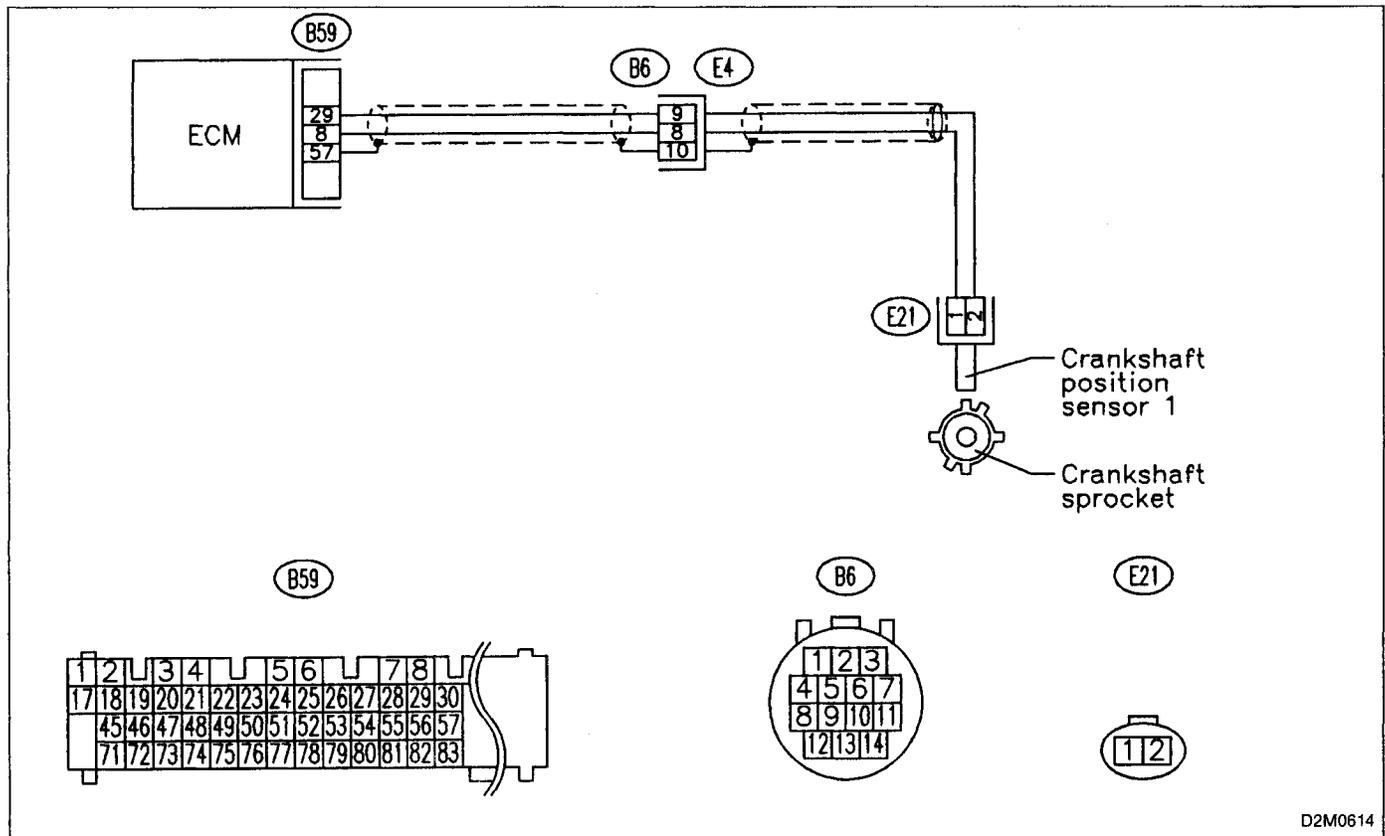
NOTE:
For the diagnostic procedure on fuel injector circuit, refer to 2-7b [T10T0]☆5.

**G: CRANKSHAFT POSITION SENSOR 1
CIRCUIT**



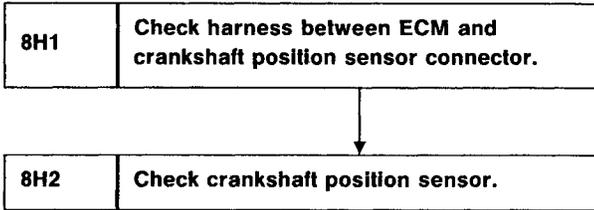
CAUTION:
 After repair or replacement of faulty parts, conduct
CLEAR MEMORY and INSPECTION MODES.
 < Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



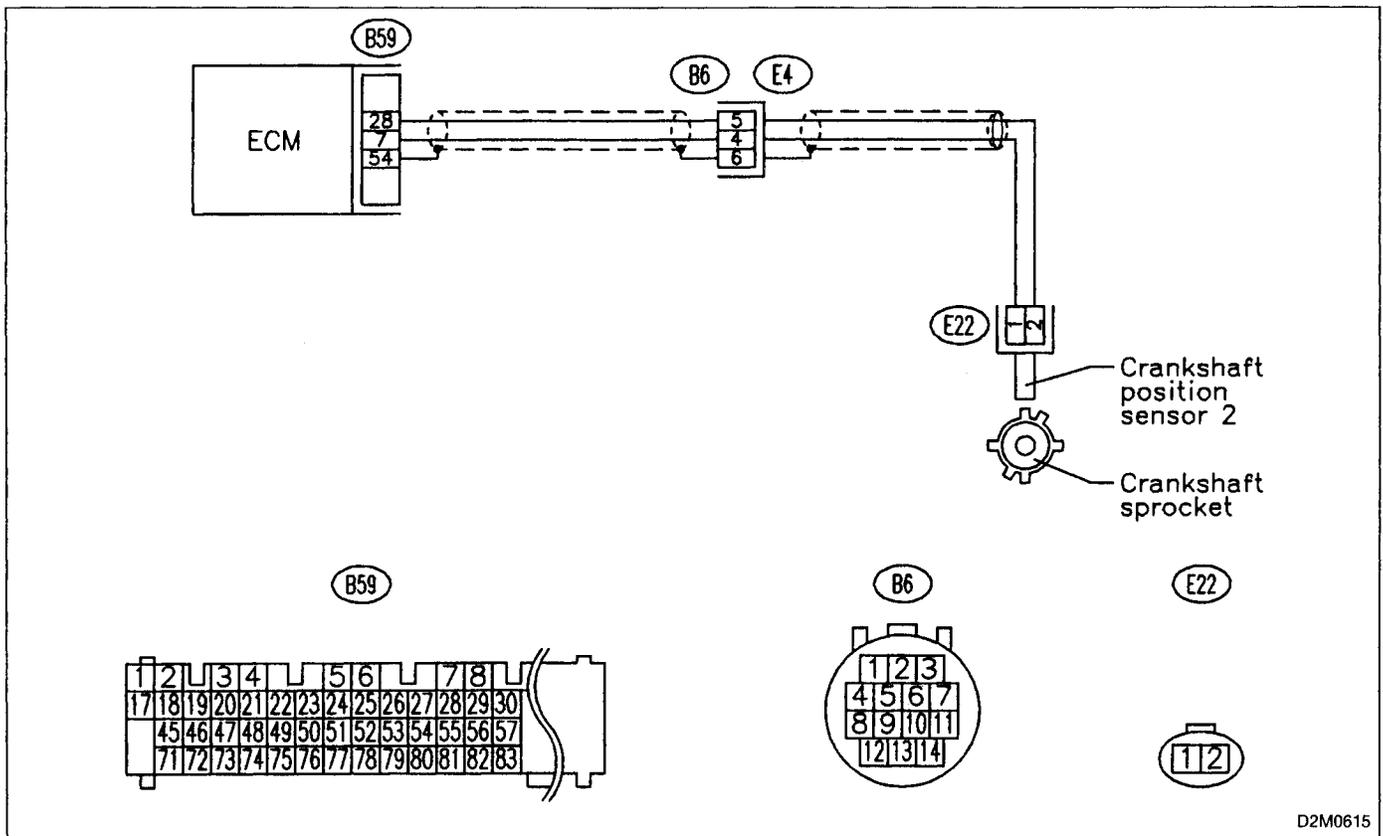
NOTE:
 For the diagnostic procedure on crankshaft position sensor 1 circuit, refer to 2-7b [T10AH0]☆5.

H: CRANKSHAFT POSITION SENSOR 2 CIRCUIT



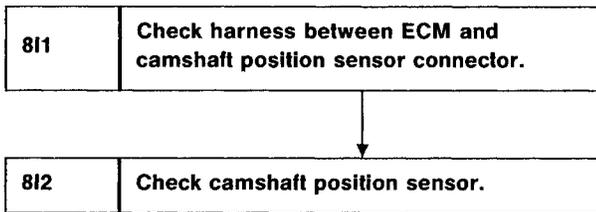
CAUTION:
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 < Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



NOTE:
 For the diagnostic procedure on crankshaft position sensor 2 circuit, refer to 2-7b [T10BQ0]☆5.

I: CAMSHAFT POSITION SENSOR CIRCUIT

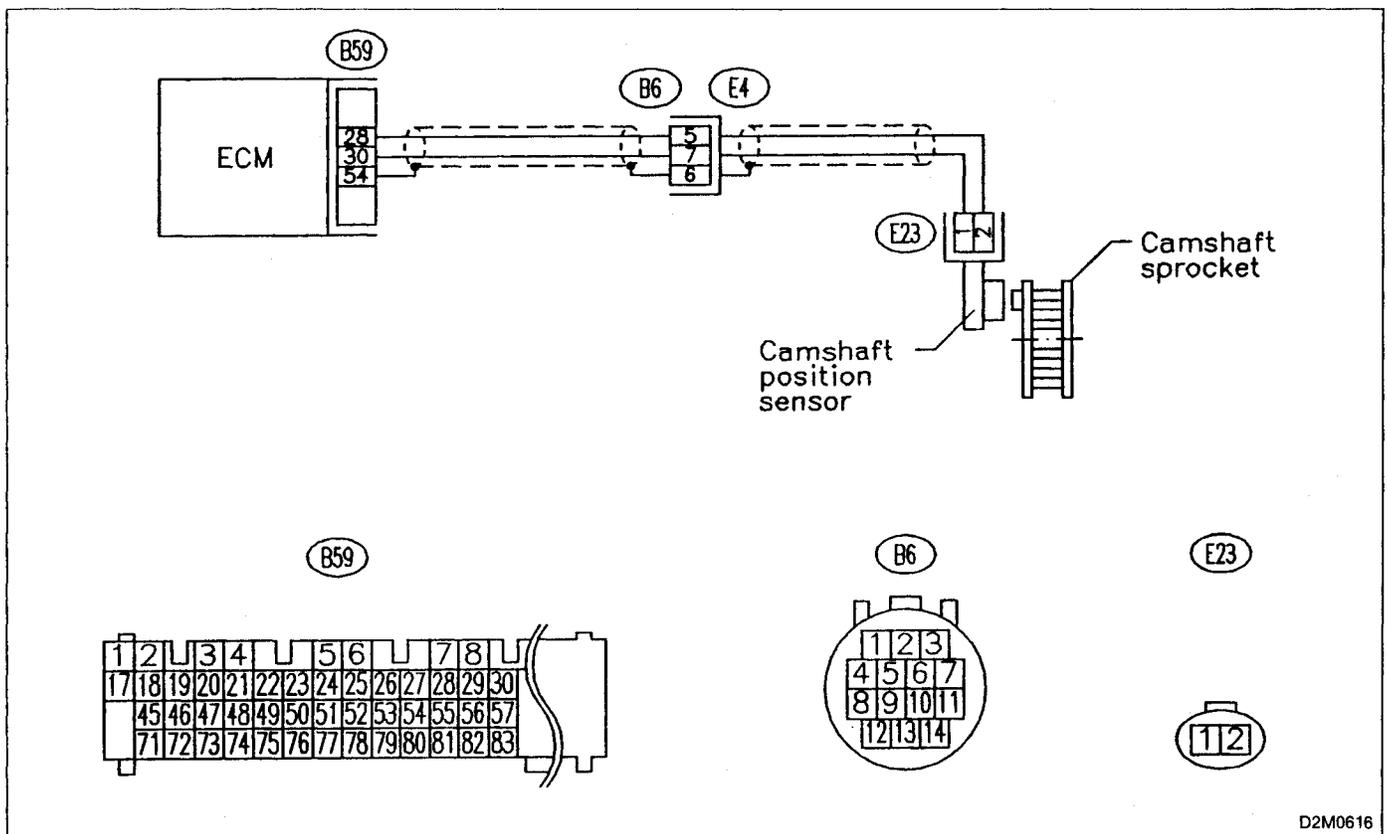


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0616

NOTE:

For the diagnostic procedure on crankshaft position sensor circuit, refer to 2-7b [T10A10]☆5.

9. General Diagnostics Table

1. FOR ENGINE

Symptom		Problem parts													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Mass air flow sensor	Engine coolant temperature sensor (*1)	Throttle position sensor	Crankshaft position sensor 1 & 2 and Camshaft position sensor (*2)	Idle air control solenoid valve	Knock sensor 1 & 2	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	Induction control solenoid valve
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 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		
Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>																							
Abnormal noise when select lever is in "P" or "N."																<input type="checkbox"/>													<input type="checkbox"/>		
Hissing noise occurs during standing starts.																<input type="checkbox"/>															
Noise occurs while driving in "D ₁ " range.																															
Noise occurs while driving in "D ₂ " range.																															
Noise occurs while driving in "D ₃ " range.																															
Noise occurs while driving in "D ₄ " range.																															
Engine stalls while shifting from one range to another.																							<input type="checkbox"/>								
Vehicle moves when select lever is in "N."																													<input type="checkbox"/>		
Shock occurs when select lever is moved from "N" to "D."		<input type="checkbox"/>									<input type="checkbox"/>												<input type="checkbox"/>								
Excessive time lag occurs when select lever is moved from "N" to "D."																							<input type="checkbox"/>							<input type="checkbox"/>	
Shock occurs when select lever is moved from "N" to "R."		<input type="checkbox"/>											<input type="checkbox"/>										<input type="checkbox"/>								
Excessive time lag occurs when select lever is moved from "N" to "R."																							<input type="checkbox"/>								
Vehicle does not start in any shift range (engine revving up).																<input type="checkbox"/>							<input type="checkbox"/>								
Vehicle does not start in any shift range (engine stall).																															
Vehicle does not start in "R" range only (engine revving up).					<input type="checkbox"/>	<input type="checkbox"/>																	<input type="checkbox"/>								
Vehicle does not start in "R" range only (engine stall).																													<input type="checkbox"/>		
Vehicle does not start in "D" or "3" range (engine revving up).																													<input type="checkbox"/>		
Vehicle does not start in "D", "3" or "2" range (engine revving up).																													<input type="checkbox"/>		
Vehicle does not start in "D", "3" or "2" range (engine stall).																													<input type="checkbox"/>		
Vehicle starts in "R" range only (engine revving up).																							<input type="checkbox"/>								
Acceleration during standing starts is poor (high stall rpm).																							<input type="checkbox"/>							<input type="checkbox"/>	
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).		<input type="checkbox"/>																					<input type="checkbox"/>								
Acceleration is poor when select lever is in "R" (normal stall rpm).																								<input type="checkbox"/>							
No shift occurs from 1st to 2nd gear.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>															<input type="checkbox"/>	<input type="checkbox"/>						
No shift occurs from 2nd to 3rd gear.		<input type="checkbox"/>																													
No shift occurs from 3rd to 4th gear.		<input type="checkbox"/>												<input type="checkbox"/>	<input type="checkbox"/>													<input type="checkbox"/>	<input type="checkbox"/>		
No "kick-down" shifts occur.		<input type="checkbox"/>							<input type="checkbox"/>																						
Engine brake is not effected when select lever is in "3" range.	<input type="checkbox"/>	<input type="checkbox"/>							<input type="checkbox"/>															<input type="checkbox"/>							

9. General Diagnostics 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	Hold switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (9R)	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		
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.		○							○																		○	○		○	

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.	

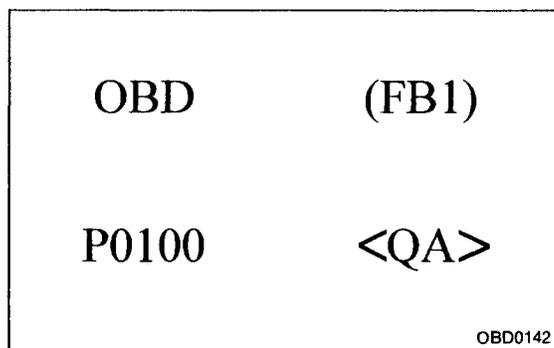
10. Diagnostics Chart with Trouble Code

A: DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC No.	Abbreviation (Subaru select monitor)	Item	Page
P0100	QA	Mass air flow sensor circuit malfunction	124 < Ref. to 2-7b [T10B0].☆5 >
P0101	QA — R	Mass air flow sensor circuit range/performance problem	130 < Ref. to 2-7b [T10C0].☆5 >
P0105	P — S	Pressure sensor circuit malfunction	132 < Ref. to 2-7b [T10D0].☆5 >
P0106	PS — R	Pressure sensor circuit range/performance problem	140 < Ref. to 2-7b [T10E0].☆5 >
P0115	TW	Engine coolant temperature sensor circuit malfunction	144 < Ref. to 2-7b [T10F0].☆5 >
P0120	THV	Throttle position sensor circuit malfunction	150 < Ref. to 2-7b [T10G0].☆5 >
P0121	TH — R	Throttle position sensor circuit range/performance problem	158 < Ref. to 2-7b [T10H0].☆5 >
P0125	TW — CL	Insufficient coolant temperature for closed loop fuel control	160 < Ref. to 2-7b [T10I0].☆5 >
P0130	FO2 — V	Front oxygen sensor 1 (RH) circuit malfunction	162 < Ref. to 2-7b [T10J0].☆5 >
P0133	FO2 — R	Front oxygen sensor 1 (RH) circuit slow response	166 < Ref. to 2-7b [T10K0].☆5 >
P0135	FO2H	Front oxygen sensor 1 (RH) heater circuit malfunction	168 < Ref. to 2-7b [T10L0].☆5 >
P0136	RO2 — V	Rear oxygen sensor circuit malfunction	174 < Ref. to 2-7b [T10M0].☆5 >
P0139	RO2 — R	Rear oxygen sensor circuit slow response	178 < Ref. to 2-7b [T10N0].☆5 >
P0141	RO2H	Rear oxygen sensor heater circuit malfunction	180 < Ref. to 2-7b [T10O0].☆5 >
P0142	O23 — V	Front oxygen sensor 2 (LH) circuit malfunction	186 < Ref. to 2-7b [T10P0].☆5 >
P0145	O23 — R	Front oxygen sensor 2 (LH) circuit slow response	190 < Ref. to 2-7b [T10Q0].☆5 >
P0147	O23H	Front oxygen sensor 2 (LH) heater circuit malfunction	192 < Ref. to 2-7b [T10R0].☆5 >
P0170	FUEL	Fuel trim malfunction	198 < Ref. to 2-7b [T10S0].☆5 >
P0201	INJ1	Fuel injector circuit malfunction - #1	204 < Ref. to 2-7b [T10T0].☆5 >
P0202	INJ2	Fuel injector circuit malfunction - #2	
P0203	INJ3	Fuel injector circuit malfunction - #3	
P0204	INJ4	Fuel injector circuit malfunction - #4	
P0205	INJ5	Fuel injector circuit malfunction - #5	
P0206	INJ6	Fuel injector circuit malfunction - #6	

DTC No.	Abbreviation (Subaru select monitor)	Item	Page
P0301	MIS — 1	Cylinder 1 misfire detected	210 < Ref. to 2-7b [T10Z0].☆5 >
P0302	MIS — 2	Cylinder 2 misfire detected	
P0303	MIS — 3	Cylinder 3 misfire detected	
P0304	MIS — 4	Cylinder 4 misfire detected	
P0305	MIS — 5	Cylinder 5 misfire detected	
P0306	MIS — 6	Cylinder 6 misfire detected	
P0325	KNOCK	Knock sensor 1 circuit malfunction	220 < Ref. to 2-7b [T10AF0].☆5 >
P0330	KNOCK2	Knock sensor 2 circuit malfunction	224 < Ref. to 2-7b [T10AG0].☆5 >
P0335	CRANK	Crankshaft position sensor 1 circuit malfunction	228 < Ref. to 2-7b [T10AH0].☆5 >
P0340	CAM	Camshaft position sensor circuit malfunction	232 < Ref. to 2-7b [T10AI0].☆5 >
P0385	CRANK 2	Crankshaft position sensor 2 circuit malfunction	9
P0400	EGR	Exhaust gas recirculation flow malfunction	236 < Ref. to 2-7b [T10AJ0].☆5 >
P0403	EGRSOL	Exhaust gas recirculation circuit malfunction	242 < Ref. to 2-7b [T10AK0].☆5 >
P0420	CAT	Catalyst system efficiency below threshold	248 < Ref. to 2-7b [T10AL0].☆5 >
P0441	CPC — F	Evaporative emission control system incorrect purge flow	250 < Ref. to 2-7b [T10AM0].☆5 >
P0443	CPC	Evaporative emission control system purge control valve circuit malfunction	252 < Ref. to 2-7b [T10AN0].☆5 >
P0500	VSP	Vehicle speed sensor malfunction	258 < Ref. to 2-7b [T10AO0].☆5 >
P0505	ISC	Idle control system malfunction	264 < Ref. to 2-7b [T10AP0].☆5 >
P0506	ISC — LOW	Idle control system RPM lower than expected	270 < Ref. to 2-7b [T10AQ0].☆5 >
P0507	ISC — HI	Idle control system RPM higher than expected	272 < Ref. to 2-7b [T10AR0].☆5 >
P0600	—	Serial communication link malfunction	276 < Ref. to 2-7b [T10AS0].☆5 >
P0601	RAM	Internal control module memory check sum error	278 < Ref. to 2-7b [T10AT0].☆5 >
P0703	ATBRK	Brake switch input malfunction	280 < Ref. to 2-7b [T10AU0].☆5 >
P0705	ATRNG	Transmission range sensor circuit malfunction	284 < Ref. to 2-7b [T10AV0].☆5 >
P0710	ATF	Transmission fluid temperature sensor circuit malfunction	292 < Ref. to 2-7b [T10AW0].☆5 >
P0720	ATVSP	Output speed sensor (vehicle speed sensor 1) circuit malfunction	293 < Ref. to 2-7b [T10AX0].☆5 >

DTC No.	Abbreviation (Subaru select monitor)	Item	Page
P0725	ATNE	Engine speed input circuit malfunction	294 < Ref. to 2-7b [T10AY0].☆5 >
P0731	ATGR1	Gear 1 incorrect ratio	296 < Ref. to 2-7b [T10AZ0].☆5 >
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 < Ref. to 2-7b [T10BD0].☆5 >
P0743	ATLU	Torque converter clutch system electrical	304 < Ref. to 2-7b [T10BE0].☆5 >
P0748	ATPL	Pressure control solenoid electrical	305 < Ref. to 2-7b [T10BF0].☆5 >
P0753	ATSFT1	Shift solenoid A electrical	306 < Ref. to 2-7b [T10BG0].☆5 >
P0758	ATSFT2	Shift solenoid B electrical	307 < Ref. to 2-7b [T10BH0].☆5 >
P0760	ATOVR — F	Shift solenoid C malfunction	308 < Ref. to 2-7b [T10BI0].☆5 >
P0763	ATOVR	Shift solenoid C electrical	312 < Ref. to 2-7b [T10BJ0].☆5 >
P1100	ST — SW	Starter switch circuit malfunction	314 < Ref. to 2-7b [T10BK0].☆5 >
P1101	N/P — SW	Neutral position switch circuit malfunction	316 < Ref. to 2-7b [T10BL0].☆5 >
P1102	BR	Pressure sources switching solenoid valve circuit malfunction	322 < Ref. to 2-7b [T10BM0].☆5 >
P1103	TRQ	Engine torque control signal circuit malfunction	328 < Ref. to 2-7b [T10BN0].☆5 >
P1108	IH SOL	Induction control solenoid valve circuit malfunction	332 < Ref. to 2-7b [T10BO0].☆5 >
P1500	FAN — 1	Radiator fan relay 1 circuit malfunction	342 < Ref. to 2-7b [T10BQ0].☆5 >
P1501	FAN — 2	Radiator fan relay 2 circuit malfunction	348 < Ref. to 2-7b [T10BR0].☆5 >
P1502	FAN — F	Radiator fan function problem	354 < Ref. to 2-7b [T10BS0].☆5 >
P1700	ATTH	Throttle position sensor circuit malfunction for automatic transmission	356 < Ref. to 2-7b [T10BT0].☆5 >
P1701	ATCRS	Cruise control set signal circuit malfunction for automatic transmission	358 < Ref. to 2-7b [T10BU0].☆5 >
P1702	ATDIAG	Automatic transmission diagnosis input signal circuit malfunction	362 < Ref. to 2-7b [T10BV0].☆5 >
P0336	CRANK-R	Crankshaft position sensor circuit range/performance problem	12



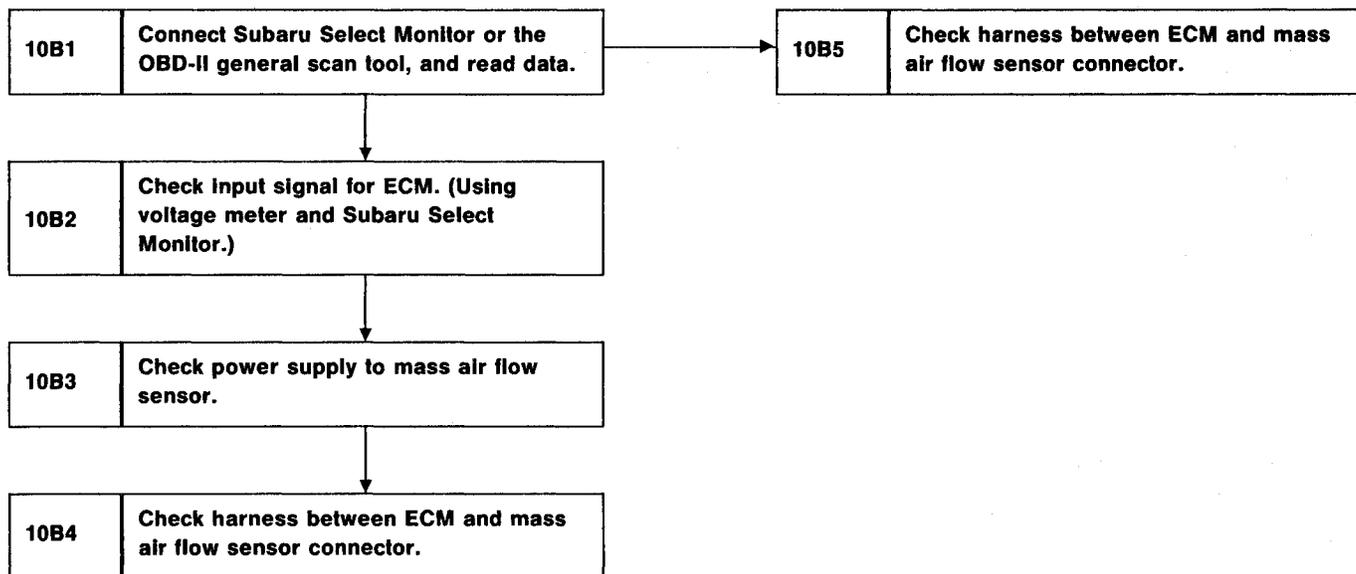
B: DTC P0100
— MASS AIR FLOW SENSOR CIRCUIT MALFUNCTION (QA) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

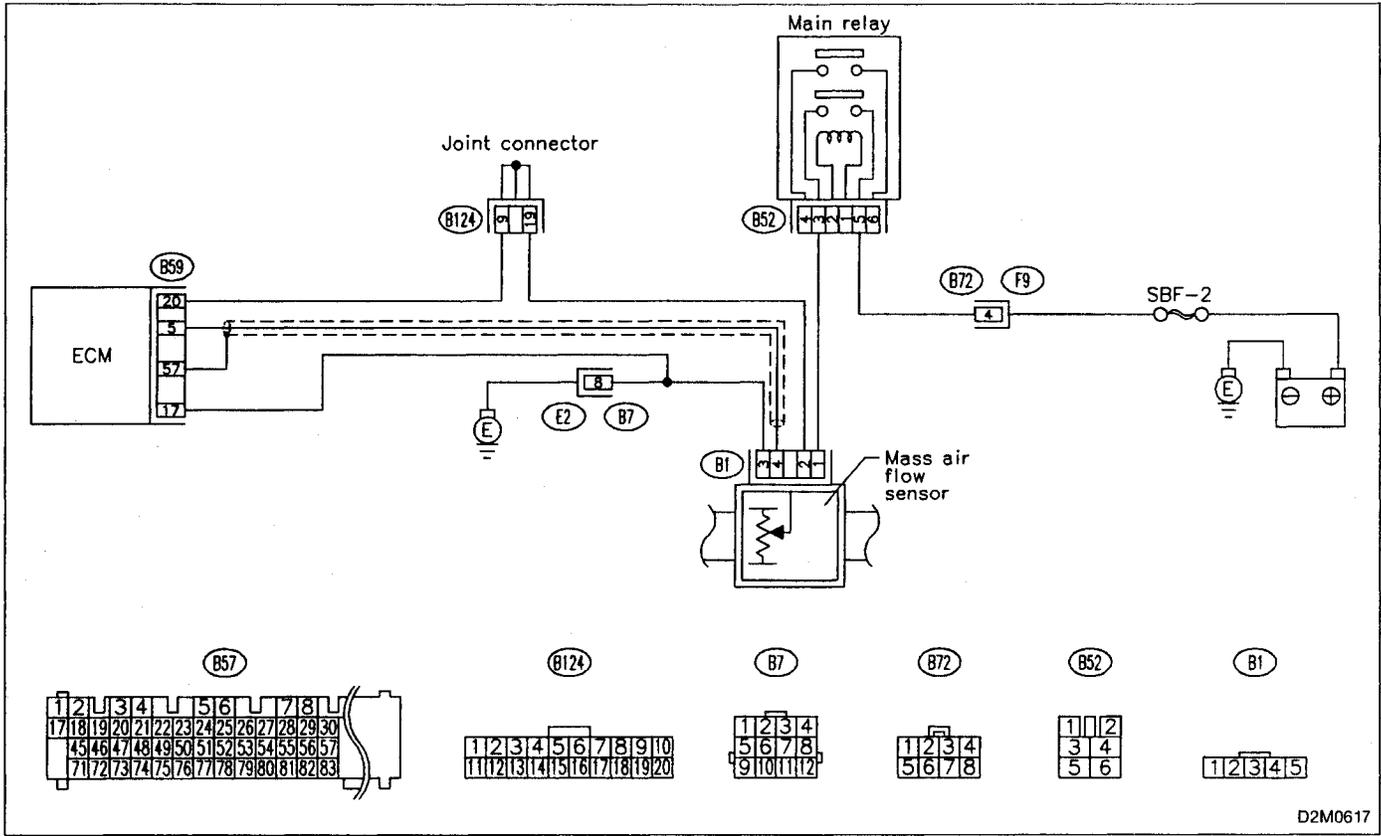


CAUTION:

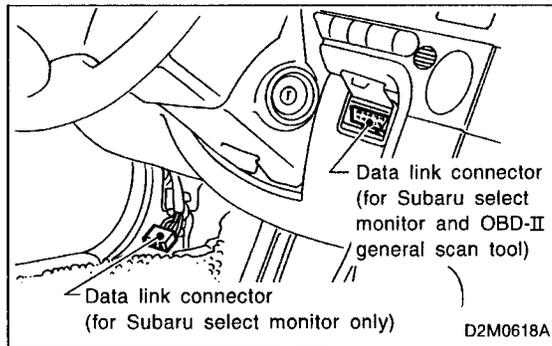
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



D2M0617



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.

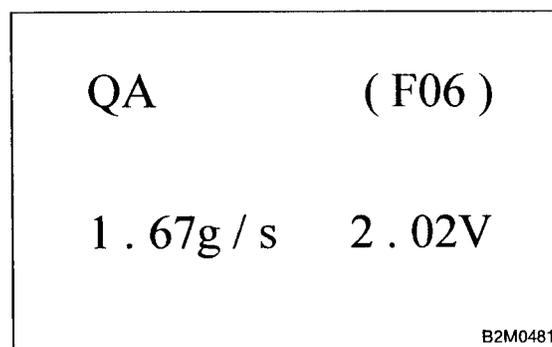
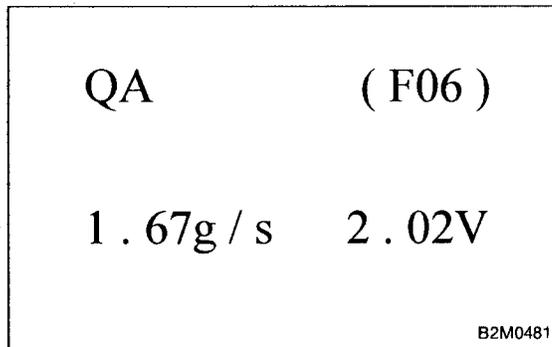
(YES) : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the mass air flow sensor.

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)** .



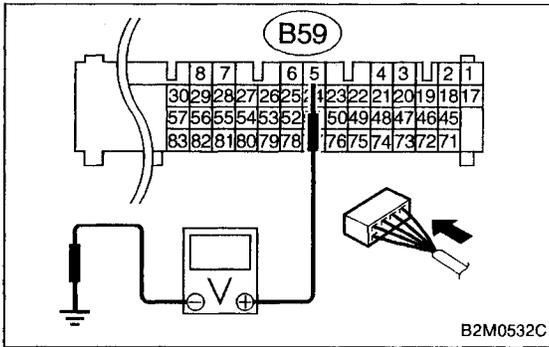
(CHECK) : *Is the value less than 1.3 g/sec or 0.3 V in function mode F06?*

(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 (B59) No. 5 (+) — Chassis ground (-): Is the voltage less than 0.3 V?**

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

NO : Go to next **CHECK**.

QA (F06)

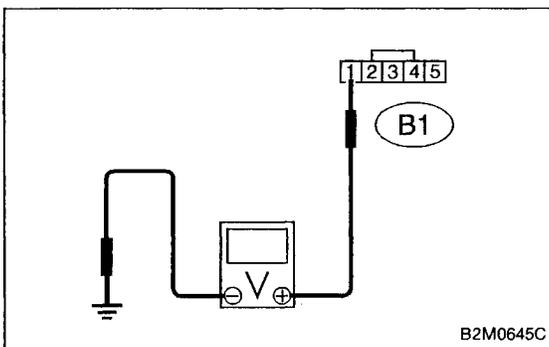
1 . 67g / s 2 . 02V

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.



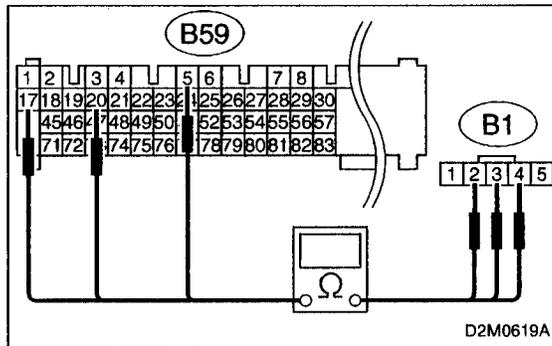
10B3 **CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.**

- 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 (B1) 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 (B59) No. 5 — (B1) 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 (B59) No. 17 — (B1) 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 (B59) No. 20 — (B1) 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 joint connector (B124)
- 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

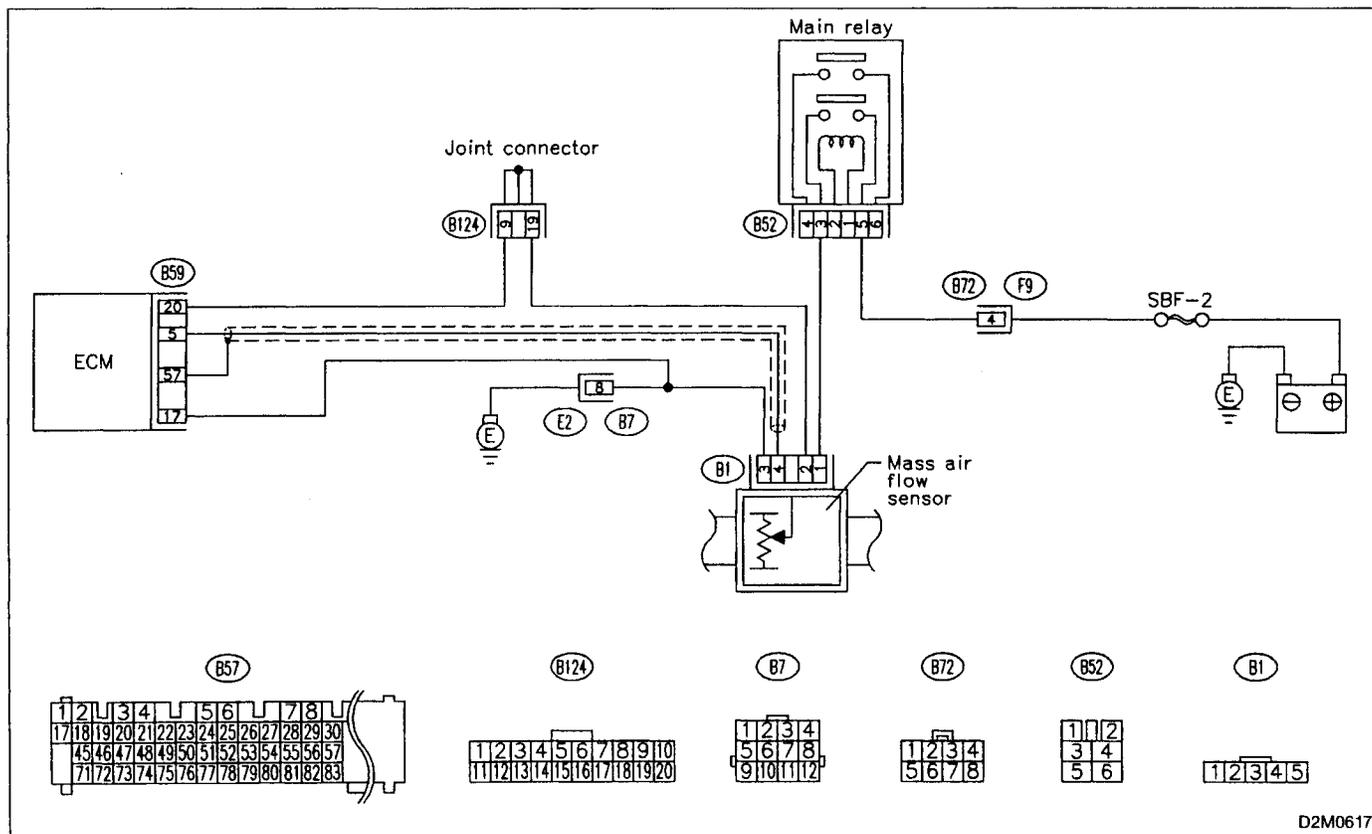
10C1	Check DTC P0100 on display.
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CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0]. ☆5 >

WIRING DIAGRAM:



D2M0617

10C1	CHECK DTC P0100 ON DISPLAY.
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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 2-7b [T1000]"☆5.

NOTE:

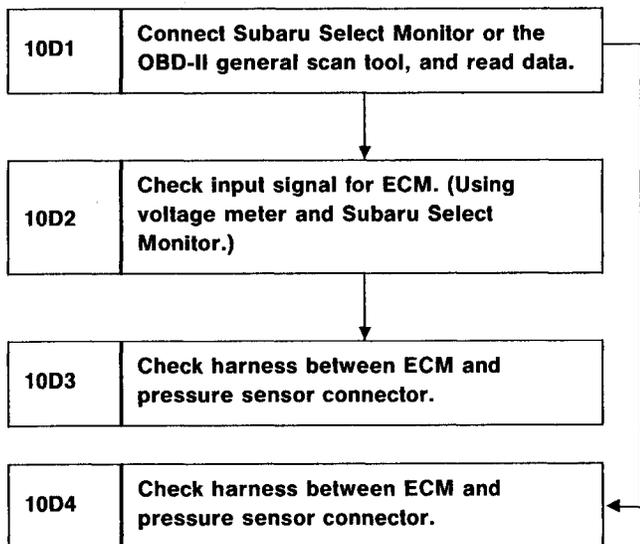
In this case, it is not necessary to inspect DTC P0101.

NO : Replace mass air flow sensor.

OBD	(FB1)
P0105	<P_S>
OBD0154	

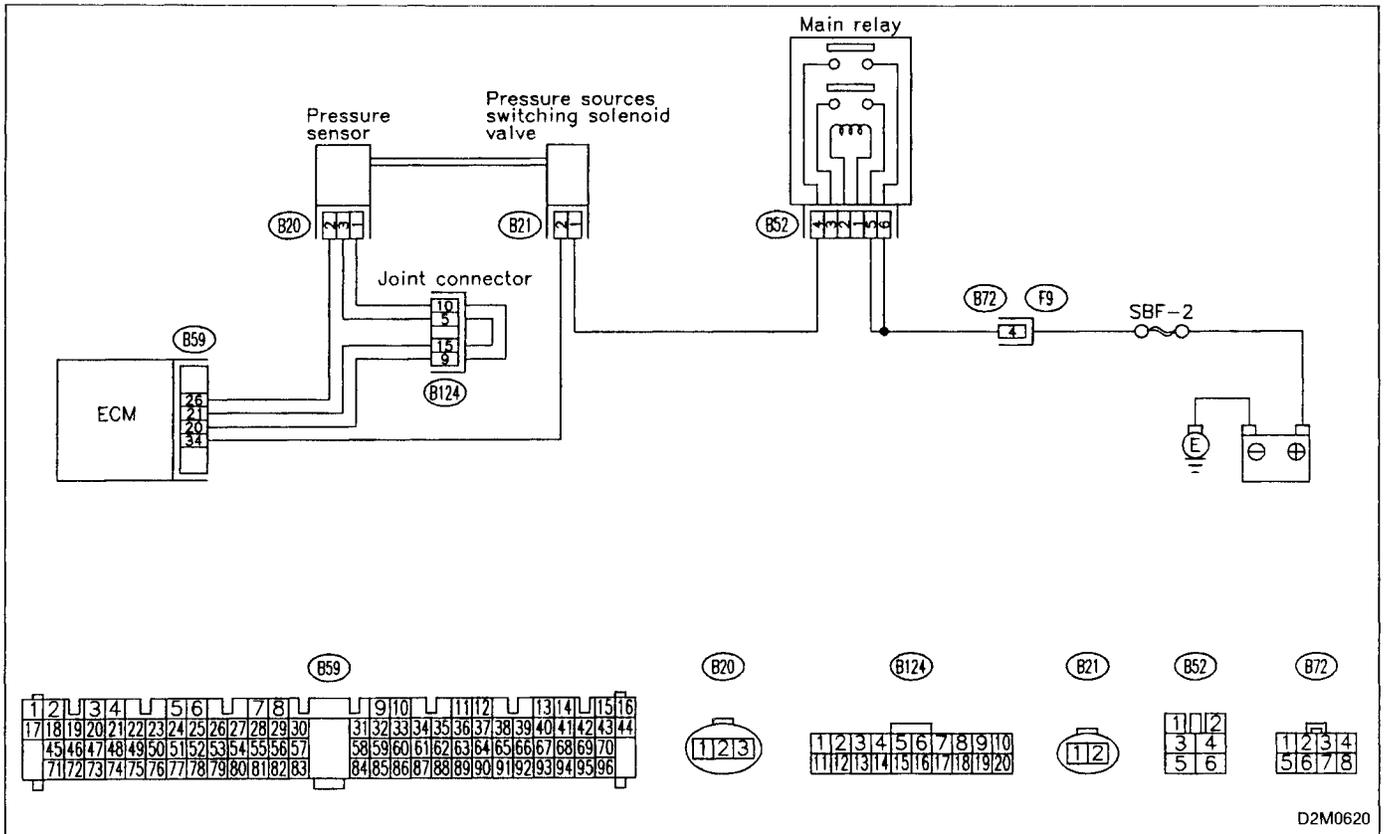
D: DTC P0105
— PRESSURE SENSOR CIRCUIT
MALFUNCTION (P – S) —

DTC DETECTING CONDITION:
 ● Immediately at fault recognition

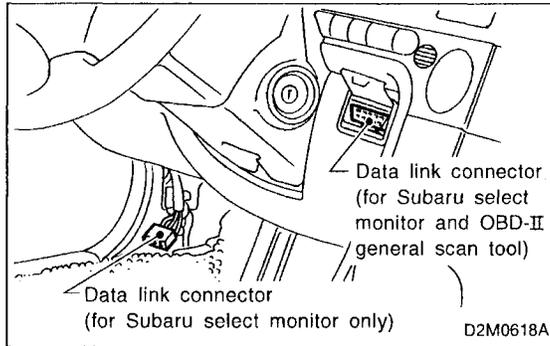


CAUTION:
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 < Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0620

**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**.

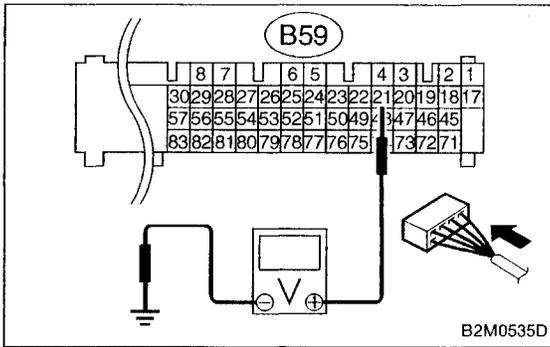
NO : Repair harness and connector.

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.



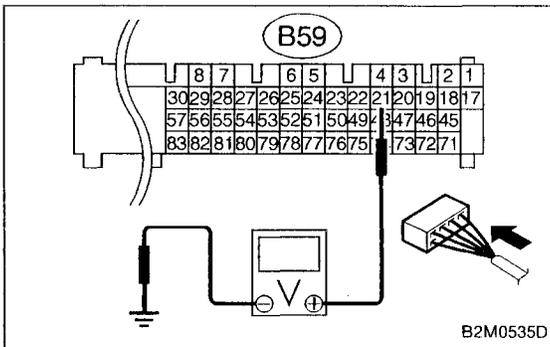
10D2 **CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)**

1) Measure voltage between ECM connector and chassis ground.

CHECK : **Connector & terminal (B59) No. 21 (+) — Chassis ground (-): Is the voltage more than 4.5 V?**

YES : Go to next step 2).

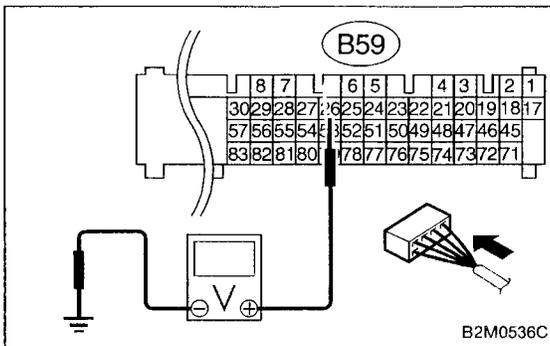
NO : Go to next **CHECK** .



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.

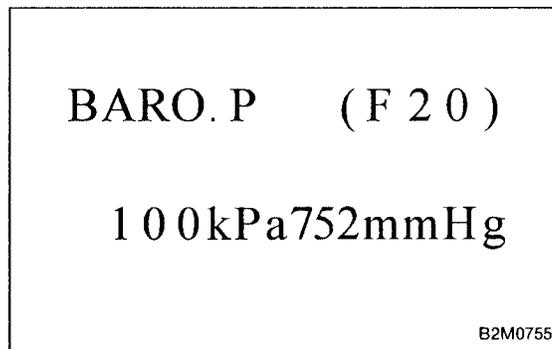


2) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 26 (+) — Chassis ground (-): Is the voltage less than 0.2 V?**

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

NO : Go to next step 3).



3) Read data on Subaru Select Monitor.

- Subaru Select Monitor

Designate mode using function key.

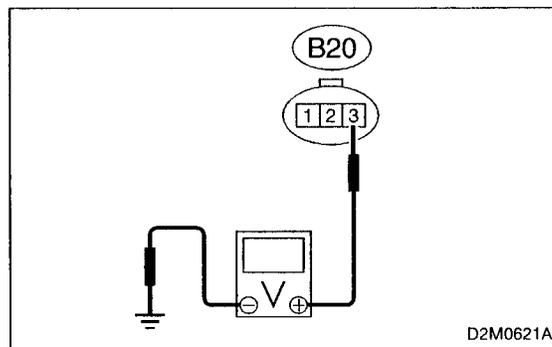
Function mode: F20

- F20: Display shows pressure signal value sent from pressure sensor.

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

YES : Repair poor contact in ECM connector.

NO : Go to step **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 (B20) No. 3 (+) — Engine ground (-): Is the voltage more than 4.5 V?**

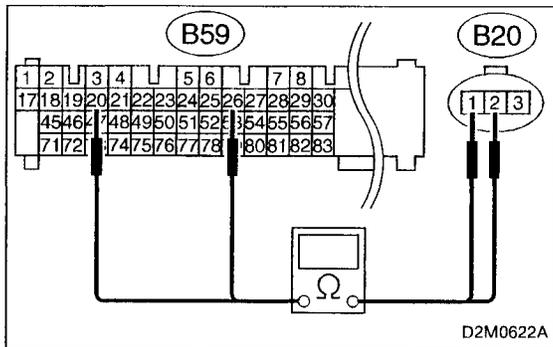
YES : Go to next step 5).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and pressure sensor connector
- Poor contact in joint connector (B124)



- 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 (B59) No. 26 — (B20) 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 (B59) No. 20 — (B20) No. 1:**
Is the resistance less than 1 Ω?

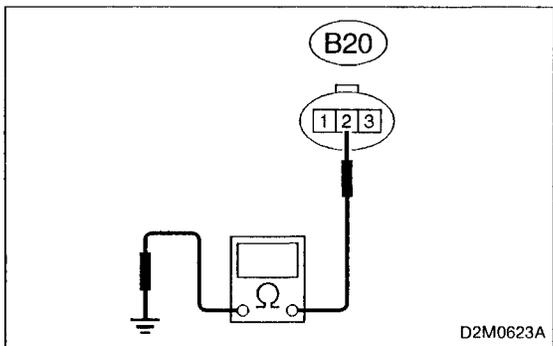
YES : Go to next step 8).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and pressure sensor connector
- Poor contact in joint connector (B124)



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

CHECK : **Connector & terminal (B20) 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

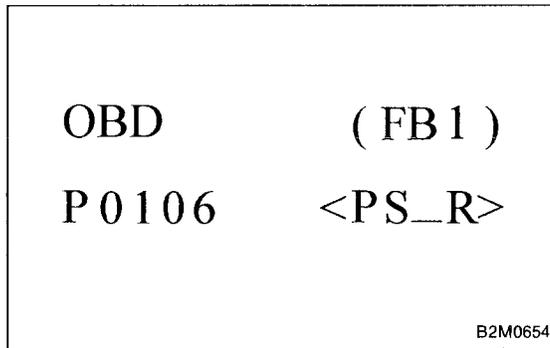
CHECK : **Is the value more than 140 kPa in function mode F21?**

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.

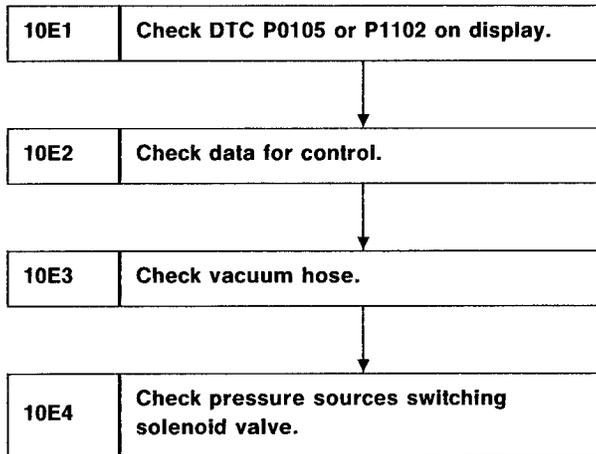


E: DTC P0106

— PRESSURE SENSOR CIRCUIT
RANGE/PERFORMANCE PROBLEM (PS — R) —

DTC DETECTING CONDITION:

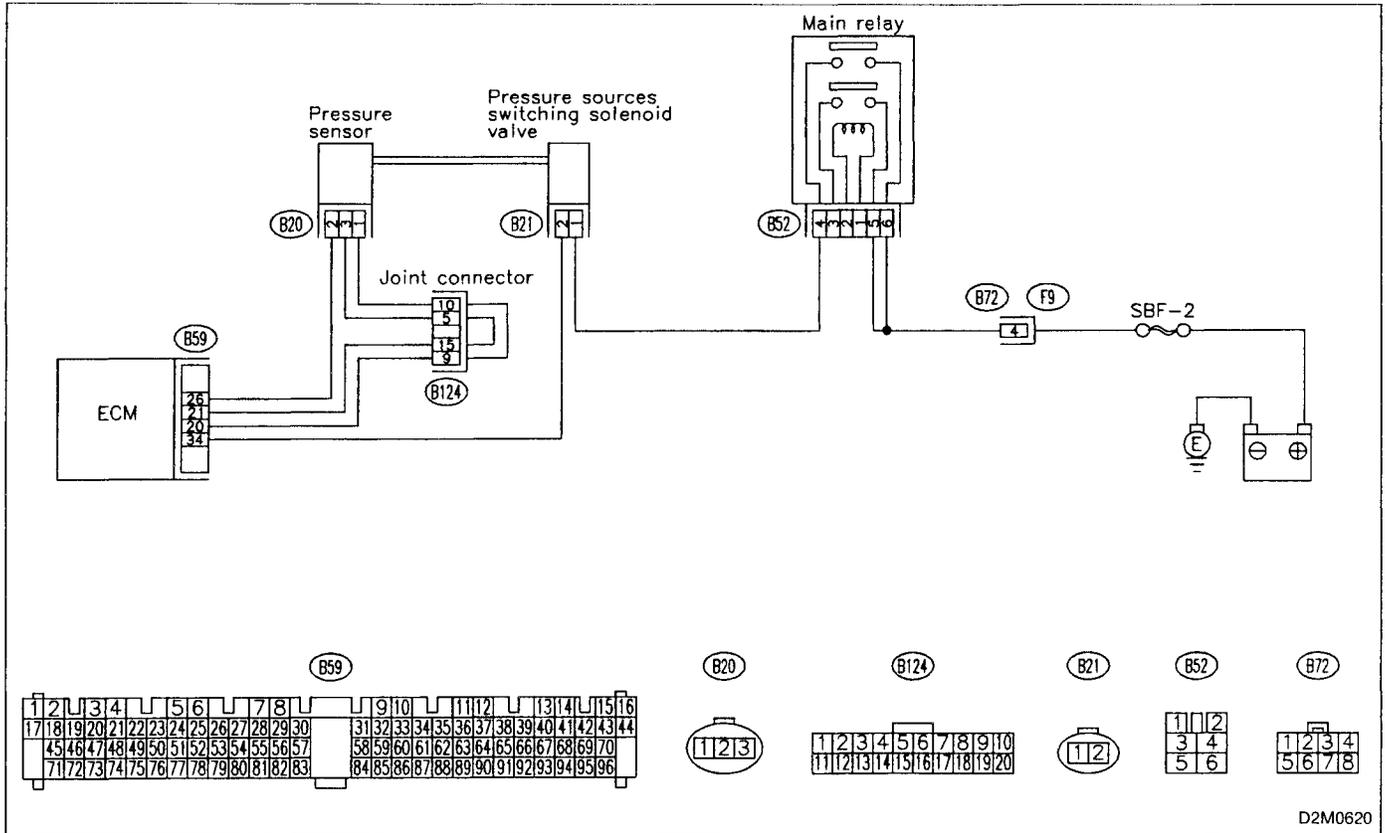
- Two consecutive trips with fault

**CAUTION:**

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

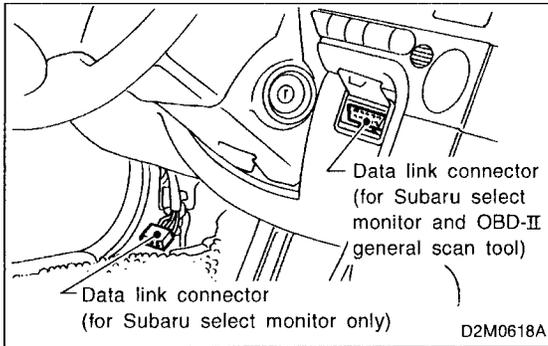
< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



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 2-7b [T1000]"☆5.
- 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)

1 0 0 kPa752mmHg

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)

1 0 0 kPa752mmHg

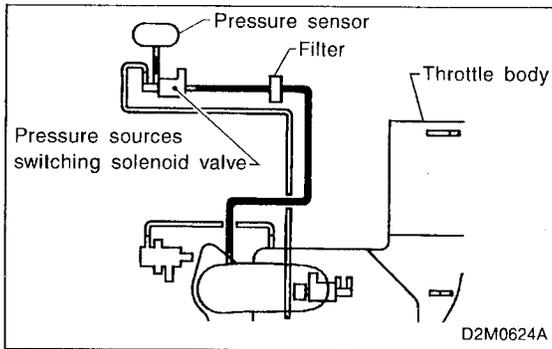
B2M0755

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?*

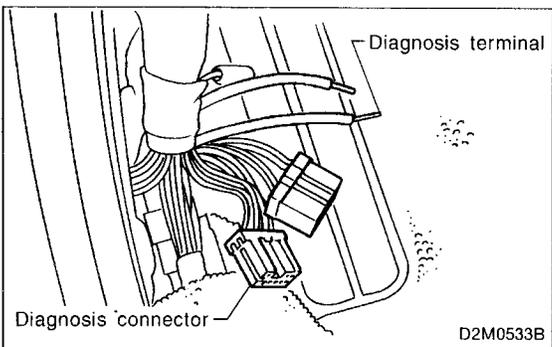
NOTE:

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 diagnosis terminal into diagnosis connector (terminal No. 1).
- 3) Turn ignition switch to ON.

CHECK : *Does pressure sources switching solenoid valve produce operating sound? (ON ↔ OFF each 1.5 sec.)*

YES : Replace pressure sensor.

NO : Replace pressure sources switching solenoid valve.



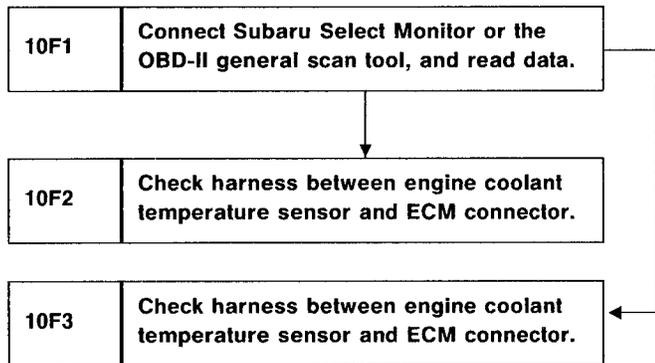
F: DTC P0115
— ENGINE COOLANT TEMPERATURE
SENSOR CIRCUIT MALFUNCTION (TW) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Hard to start
- Erroneous idling
- Poor driving performance

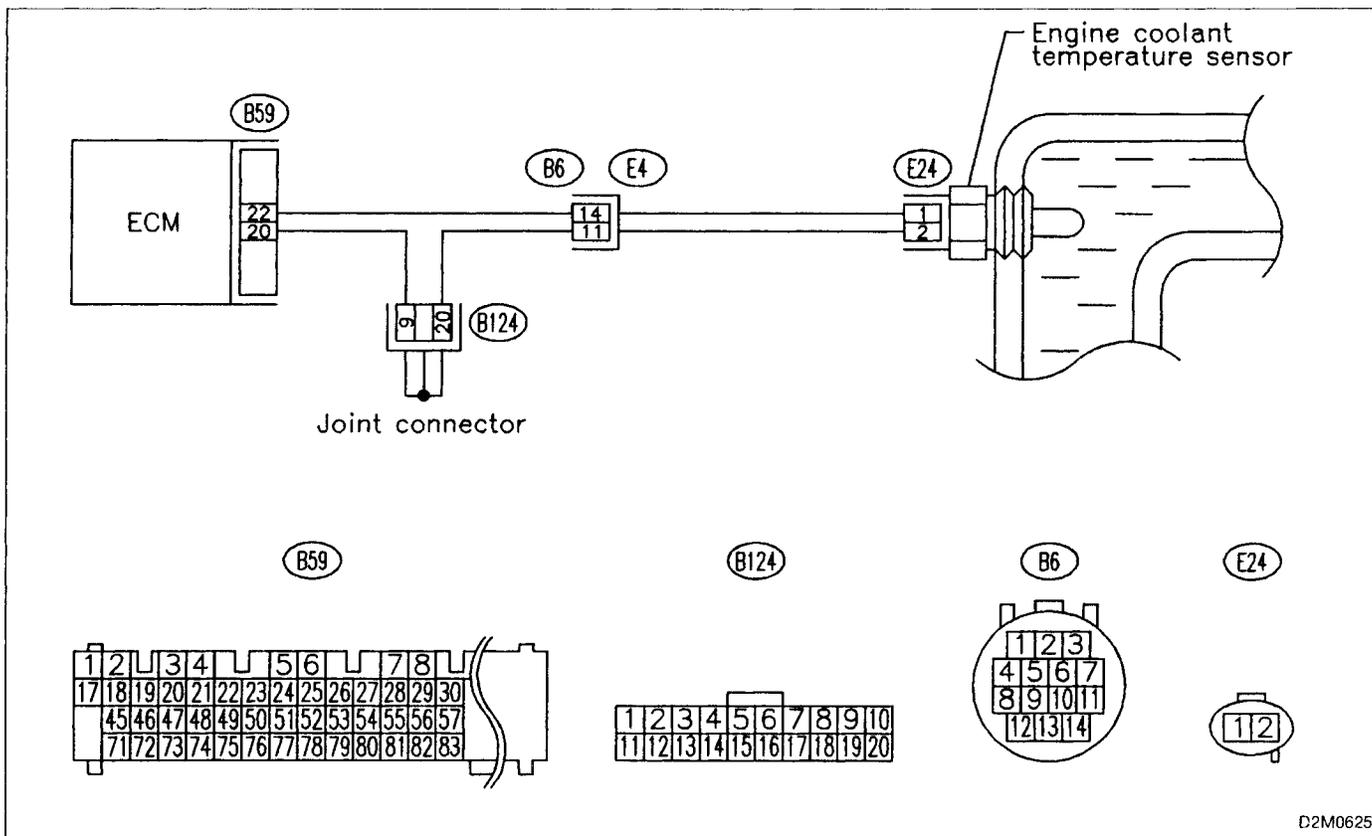


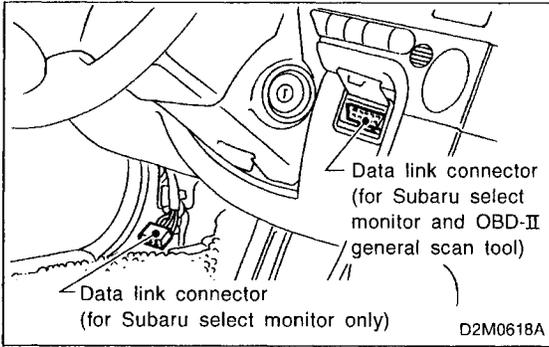
CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:





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.

TW	(F04)
80° C	176° F

B2M0479

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

- Subaru Select Monitor
Designate mode using function key.

Function mode: F04

- F04: Water temperature is indicated in "°C" and "°F".

CHECK : *Is the value greater than 150°C or 300°F in function mode F04?*

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

NO : Go to next **CHECK**.

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**.

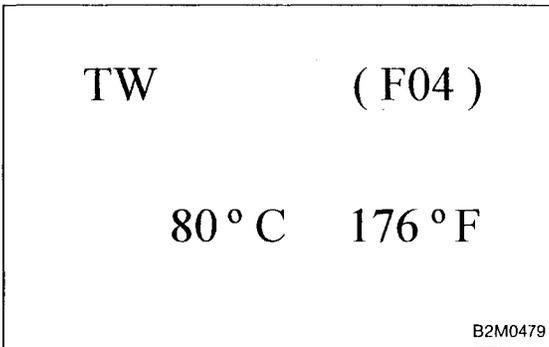
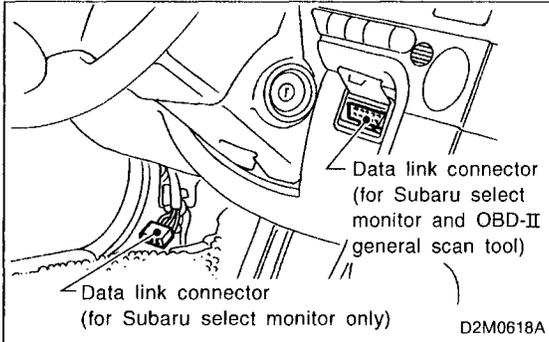
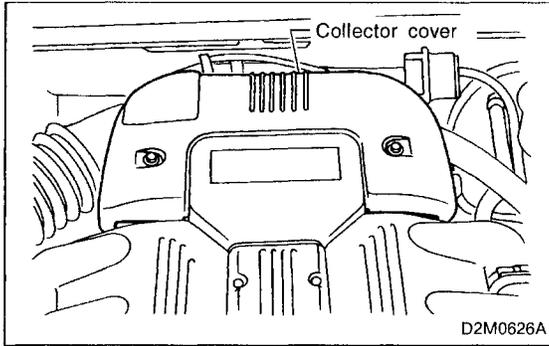
NO : Repair poor contact.

NOTE:

In this case, repair the following:

- Poor contact in engine coolant temperature sensor
- Poor contact in ECM
- Poor contact in coupling connector (B6)
- Poor contact in joint connector (B124)
- OBD-II general scan tool

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



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

- 1) Turn ignition switch to OFF.
- 2) Remove collector cover.
- 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".

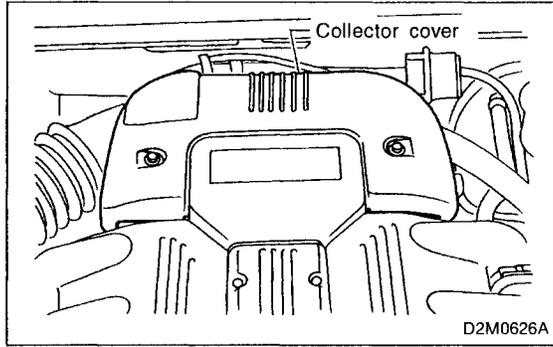
CHECK : Is the value less than -40°C or -40°F in function mode F04?

YES : Replace engine coolant temperature sensor.

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

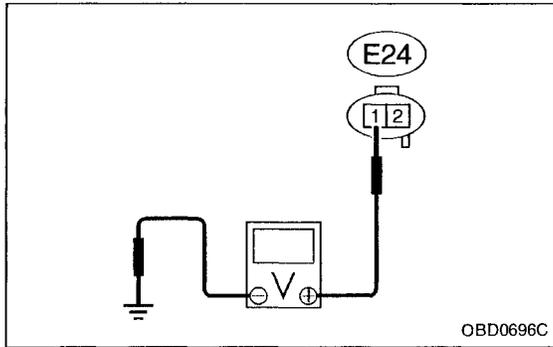
- OBD-II general scan tool

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 collector cover.
- 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.

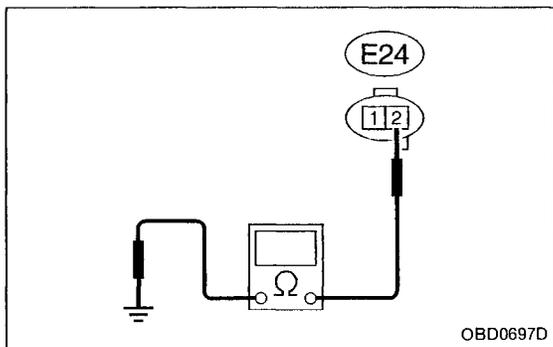
CHECK : **Connector & terminal (E24) No. 1 (+) — Engine ground (-): Is the voltage more than 4 V?**

- 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 (B6)



- 6) Turn ignition switch to OFF.
- 7) Measure resistance of harness between engine coolant temperature sensor connector and engine ground.

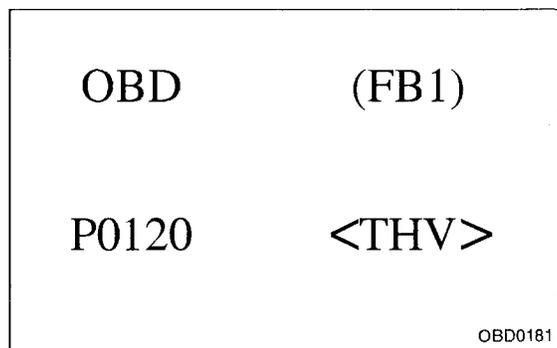
CHECK : **Connector & terminal (E24) No. 2 — Engine ground: Is the resistance less than 5 Ω?**

- 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 (B6)
- Poor contact in joint connector (B124)



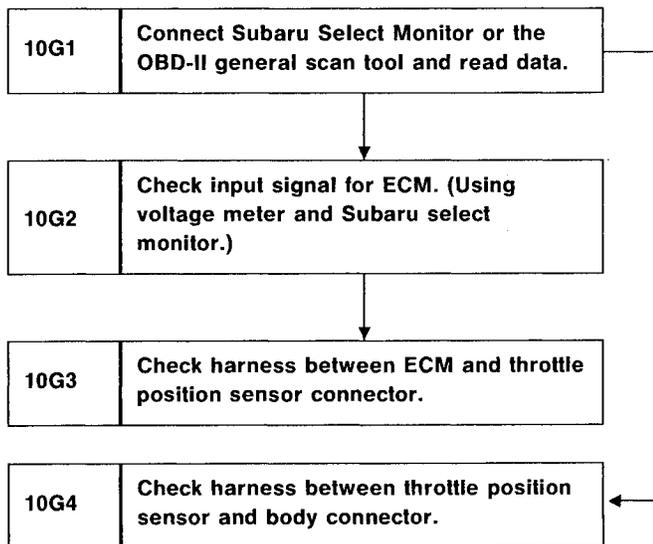
G: DTC P0120
— THROTTLE POSITION SENSOR CIRCUIT
MALFUNCTION (THV) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

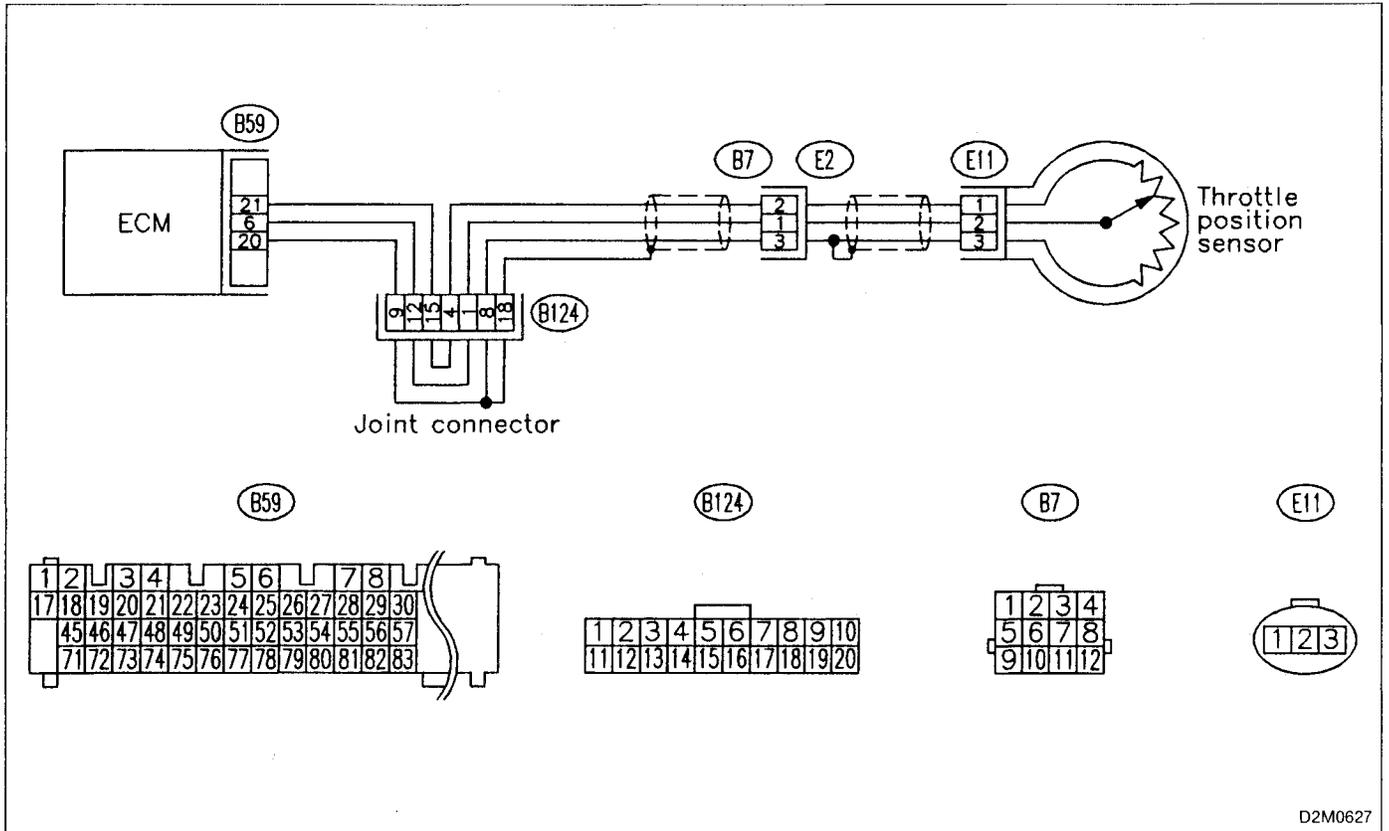


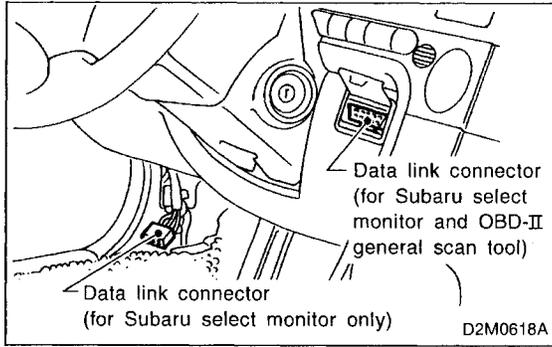
CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

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**.

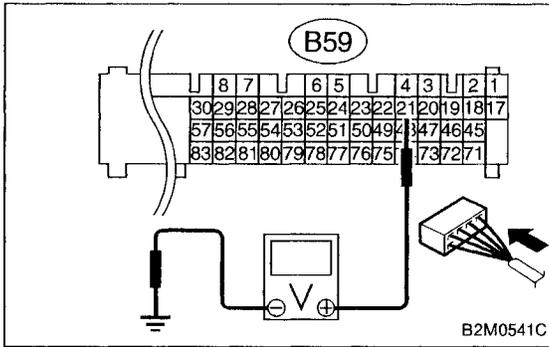
(NO) : Even if MIL lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector may be the cause.

NOTE:

In this case, repair the following:

- Poor contact in throttle position sensor connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B7)
- Poor contact in joint connector (B124)
- 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 (B59) No. 21 (+) — Chassis ground (-): Is the voltage more than 4.5 V?

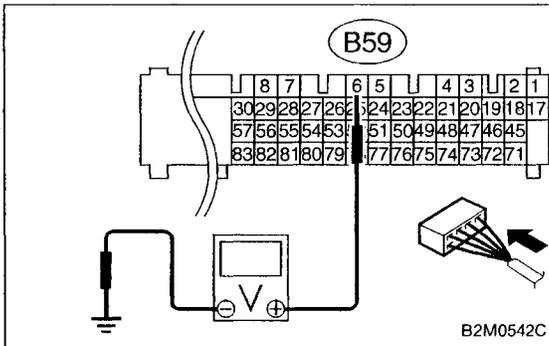
YES : Go to next step 2).

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 (B59) 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?

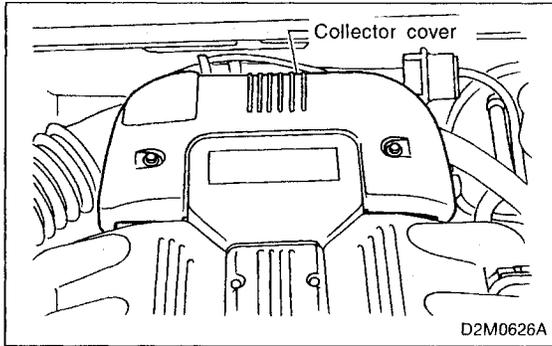
YES : Repair poor contact in ECM connector.

NO : Go to step 10G3.

THV (F07)

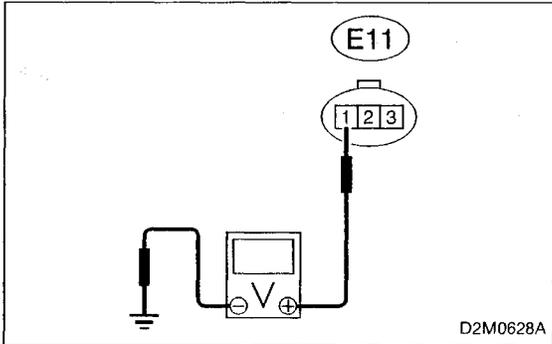
0% 0.21V

B2M0482



10G3 **CHECK HARNESS BETWEEN ECM AND THROTTLE POSITION SENSOR CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove collector cover.
- 3) Disconnect connectors from throttle position sensor.



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

CHECK : **Connector & terminal (E11) No. 1 (+) — Engine ground (-): Is the voltage more than 4.5 V?**

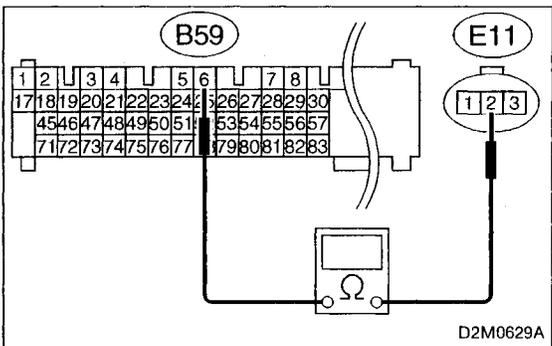
YES : Go to next step 6).

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 (B7)
- Poor contact in joint connector (B124)



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

CHECK : **Connector & terminal (B59) No. 6 — (E11) No. 2: Is the resistance less than 1 Ω?**

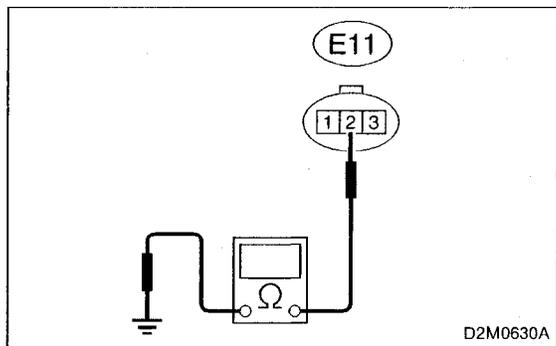
YES : Go to next step 8).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between throttle position sensor and ECM connector
- Poor contact in ECM connector
- Poor contact in throttle position sensor connector
- Poor contact in coupling connector (B7)
- Poor contact in joint connector (B124)



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

CHECK : **Connector & terminal (E11) No. 2 — Engine ground:**
Is the resistance less than 10 Ω?

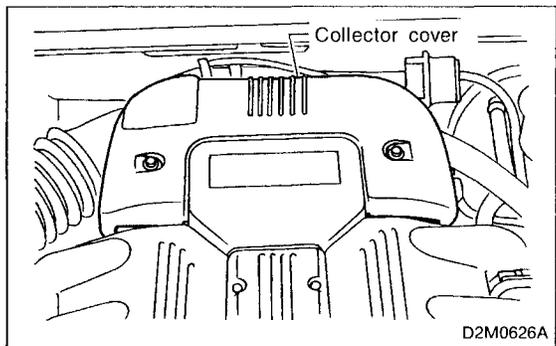
YES : Repair short circuit in harness between throttle position sensor and ECM connector.

NO : Go to next **CHECK** .

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

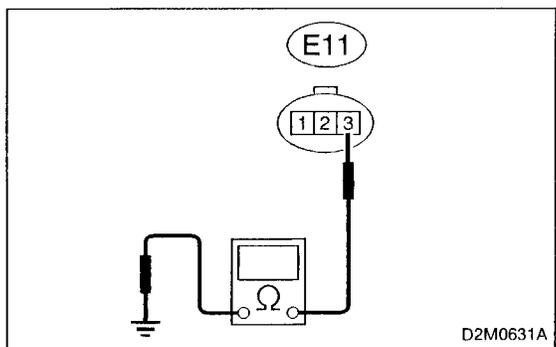
YES : Repair poor contact in throttle position sensor connector.

NO : Replace throttle position sensor.



10G4 CHECK HARNESS BETWEEN THROTTLE POSITION SENSOR AND BODY CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove collector cover.
- 3) Disconnect connector from throttle position sensor.



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

CHECK : **Connector & terminal (E11) No. 3 — Engine ground:**
Is the resistance less than 5 Ω?

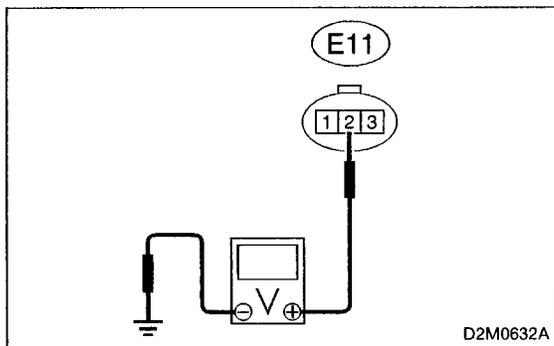
YES : Go to next step 5).

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 coupling connector (B7)
- Poor contact in joint connector (B124)



5) Turn ignition switch to ON.

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

CHECK : **Connector & terminal (E11) 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

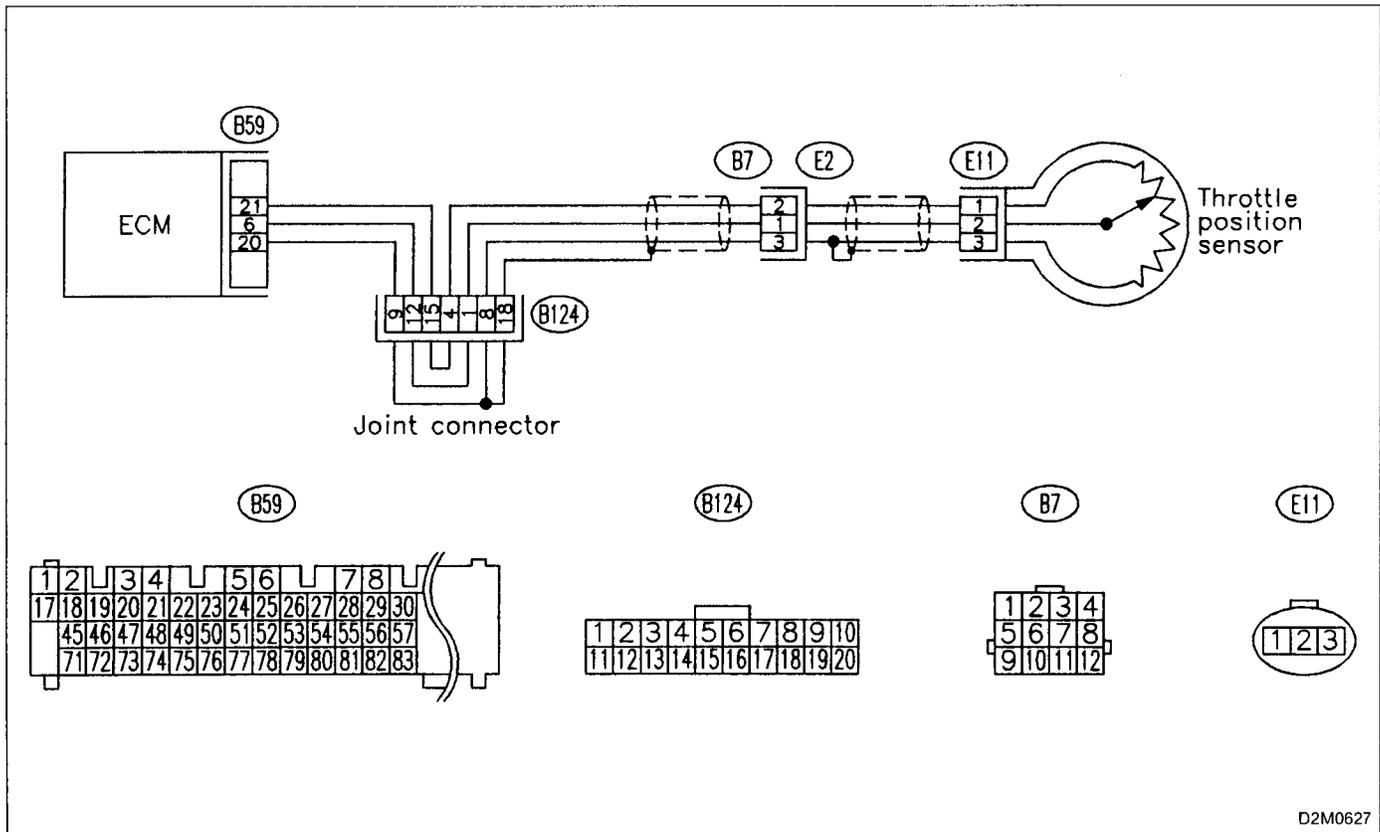
10H1	Check DTC P0120 on display.
------	-----------------------------

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0627

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 2-7b [T1000]"☆5.

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.

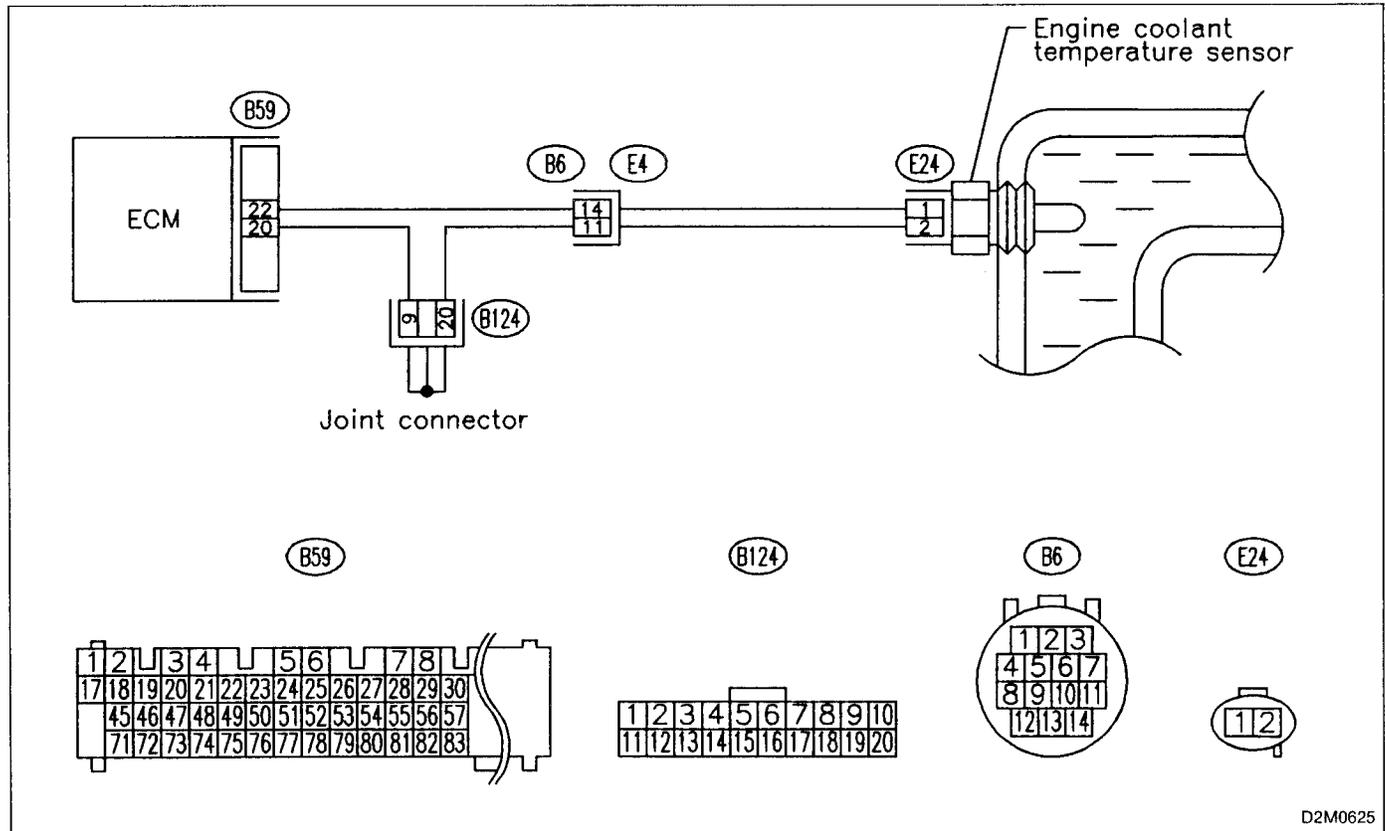
1011	Check DTC P0115 on display.
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CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0625

1011	CHECK DTC P0115 ON DISPLAY.
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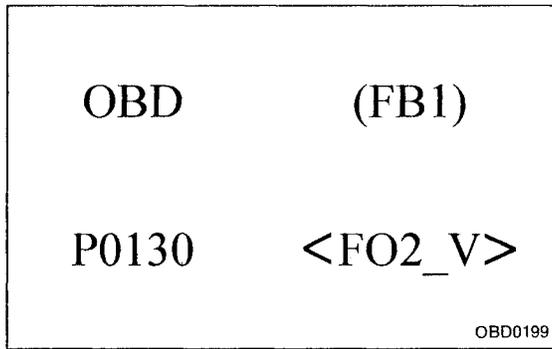
CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0115?*

YES : Inspect DTC P0115 using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

NOTE:

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

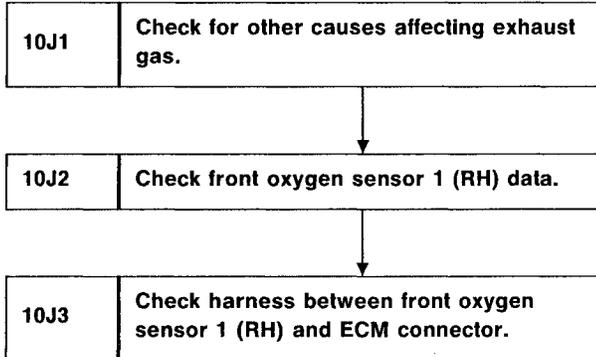
NO : Replace engine coolant temperature sensor.



J: DTC P0130
— FRONT OXYGEN SENSOR 1 (RH) CIRCUIT MALFUNCTION (FO2 — V) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

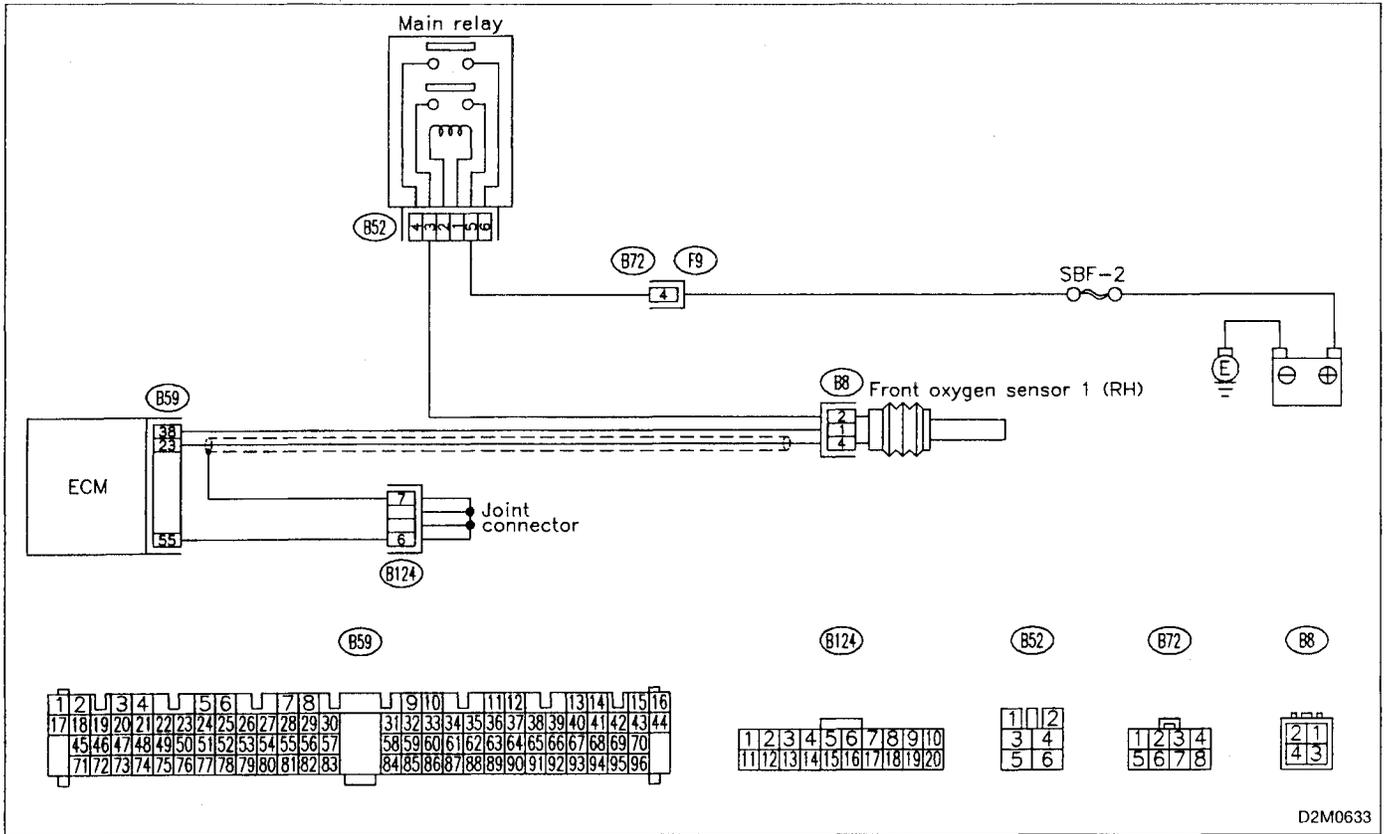


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



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 1 (RH) DATA.**

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- 3) Start engine and Turn the Subaru Select Monitor and the OBD-II general scan tool switch to ON.
- 4) Warm-up the engine until coolant temperature is above 70°C (160°F) and keep the engine speed at 2,000 rpm to 3,000 rpm for one minute.
- 5) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F12

- F12: Front oxygen sensor 1 (RH) max. and min. output signals are indicated at the same time.

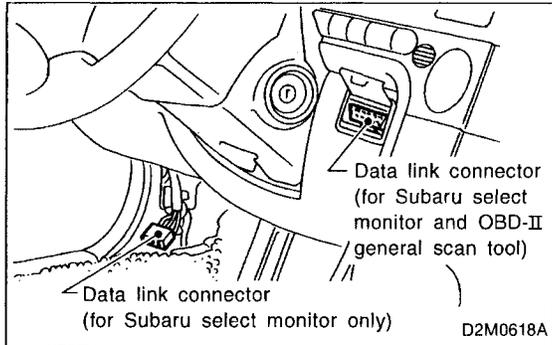
CHECK : *Is the difference of voltage less than 0.1 V between the value of max. output and min. output with function mode F12?*

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

NO : Replace front oxygen sensor 1 (RH).

- OBD-II general scan tool

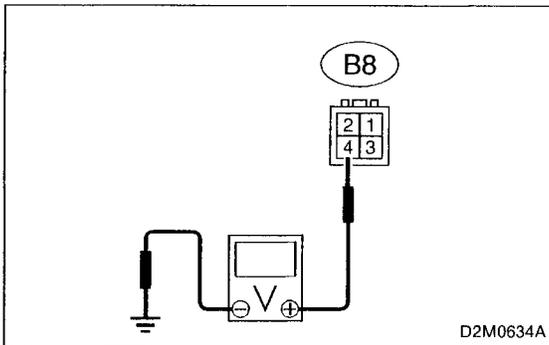
For detailed operation procedures, refer to the OBD-II General Scan Tool Instruction Manual.



O2max - min (F12)

0 . 80V 0 . 10V

B2M0487

**10J3****CHECK HARNESS BETWEEN FRONT OXYGEN SENSOR 1 (RH) AND ECM CONNECTOR.**

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

CHECK : **Connector & terminal (B8) No. 4 (+) — Engine ground (-): Is the voltage more than 0.2 V?**

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

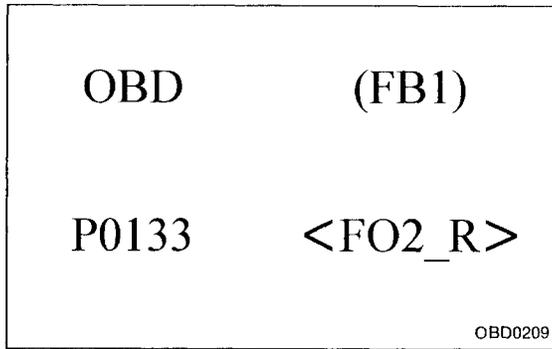
In this case, repair the following:

- Open circuit in harness between ECM and front oxygen sensor 1 (RH) connector
- Poor contact in the ECM connector

CHECK : **Is there poor contact in front oxygen sensor 1 (RH) connector?**

YES : Repair poor contact in front oxygen sensor 1 (RH) connector.

NO : Replace front oxygen sensor 1 (RH).

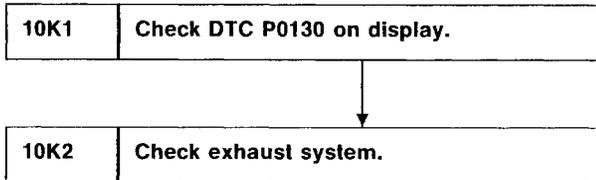


K: DTC P0133

— FRONT OXYGEN SENSOR 1 (RH) CIRCUIT SLOW RESPONSE (FO2 — R) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

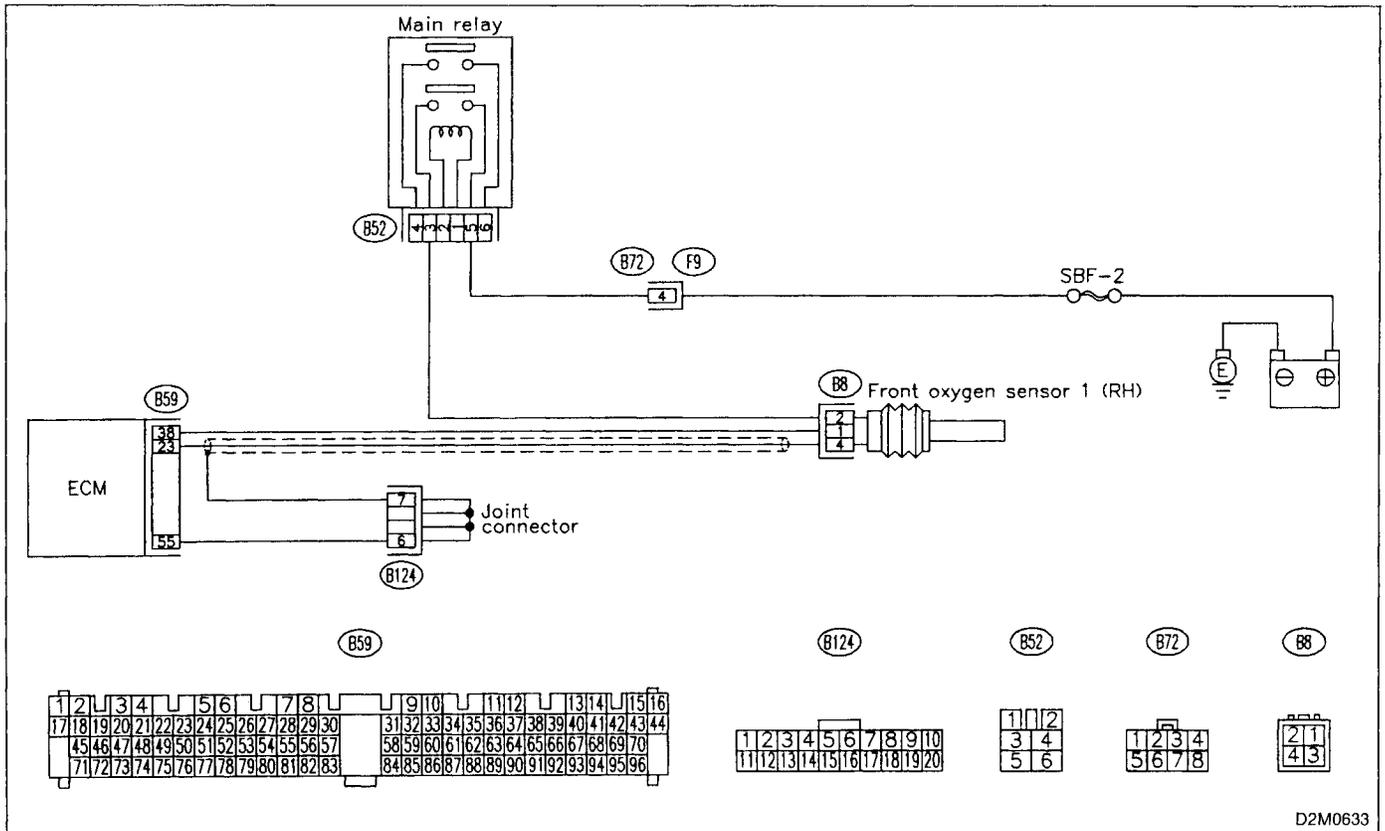


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0]. ☆5 >

WIRING DIAGRAM:



D2M0633

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 2-7b [T1000]"☆5.

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?*

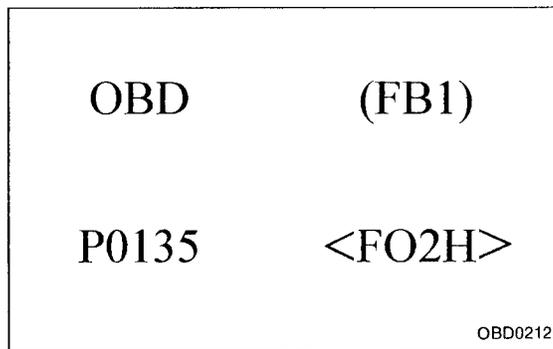
NOTE:

Check the following items.

- Loose installation of front portion of exhaust manifold (RH) onto cylinder head (RH)
- Loose connection between exhaust manifold (RH) and front exhaust pipe (RH)
- Damage of exhaust manifold and exhaust pipe resulting in a hole

YES : Repair exhaust system.

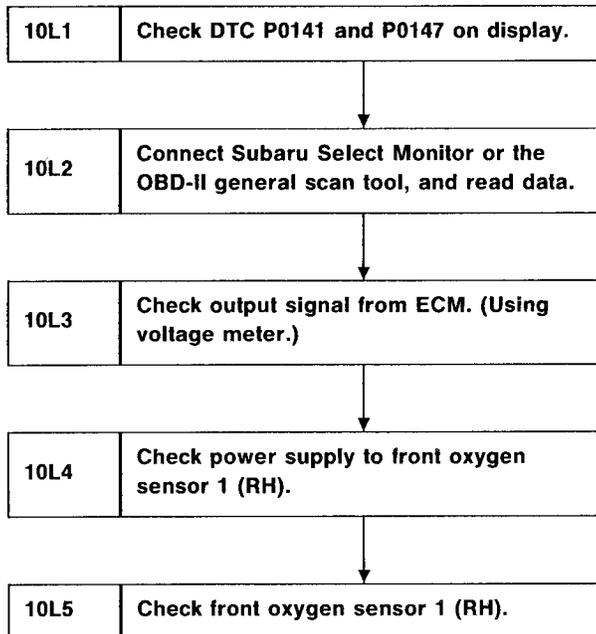
NO : Replace front oxygen sensor 1 (RH).

**L: DTC P0135**

— FRONT OXYGEN SENSOR 1 (RH) HEATER
CIRCUIT MALFUNCTION (FO2H) —

DTC DETECTING CONDITION:

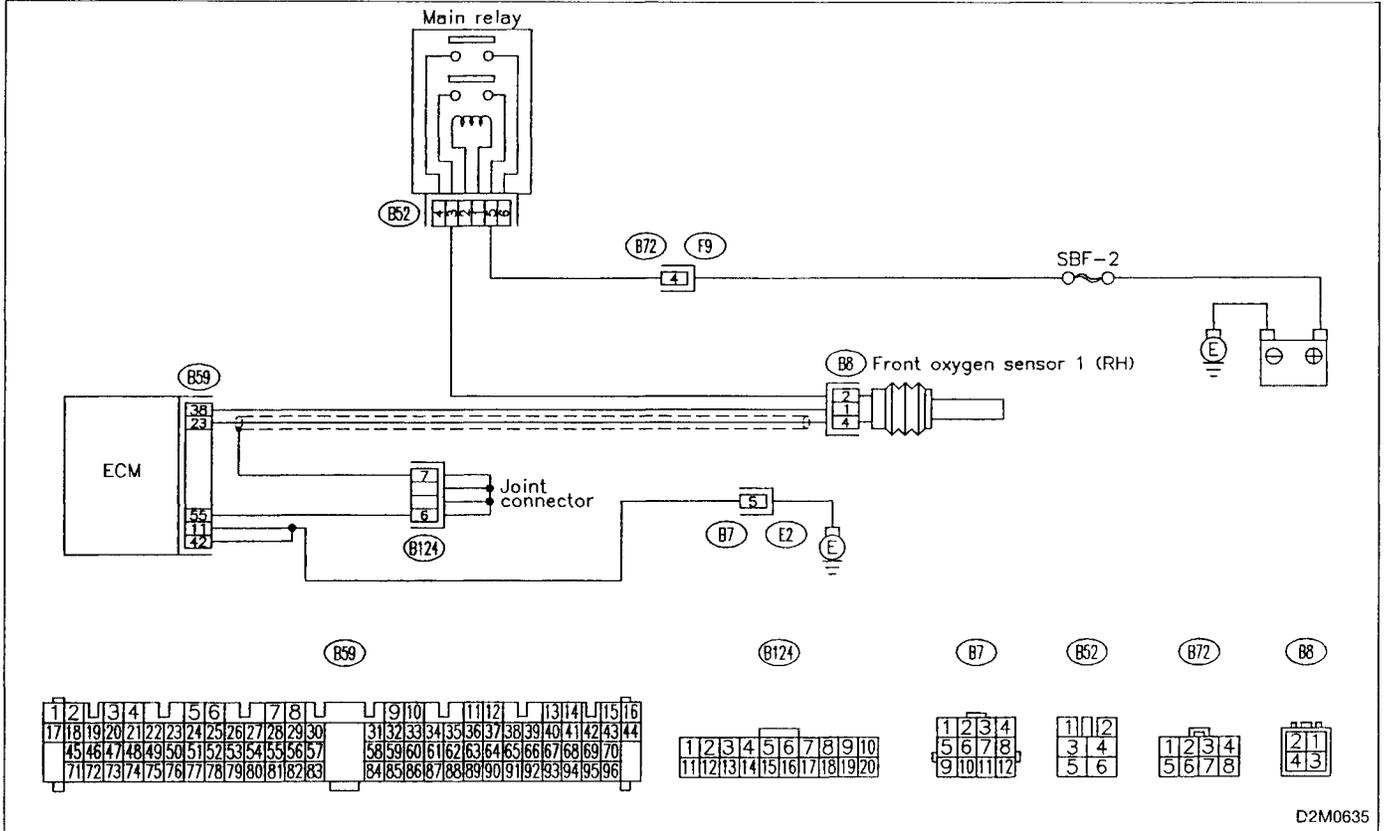
- Two consecutive trips with fault

**CAUTION:**

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



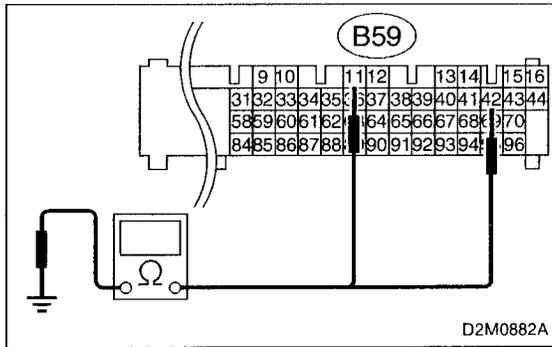
D2M0635

10L1	CHECK DTC P0141 AND P0147 ON DISPLAY.
-------------	--

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0135, P0141 and P0147 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 (B59) No. 11 and No. 42 — Chassis ground: Is the resistance less than 5 Ω?**

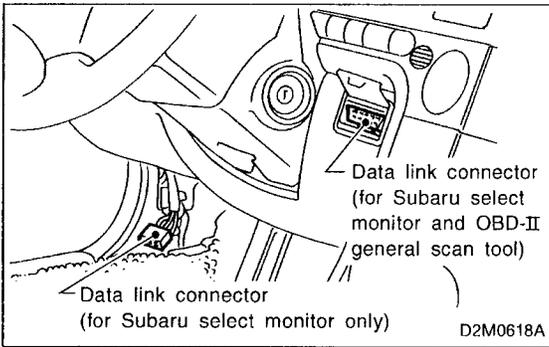
YES : Repair poor contact in ECM connector.

NO : Repair harness and connector.

NOTE:

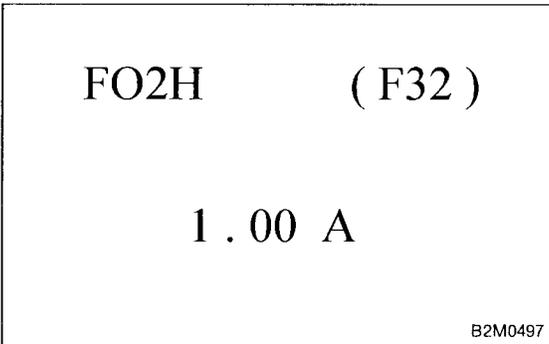
In this case, repair the following:

- Open circuit in harness between ECM and coupling connector (B7)
- Open circuit in harness between coupling connector (B7) and engine grounding terminal
- Poor contact in engine grounding terminal
- Poor contact in coupling connector (B7)



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 1 (RH) heater current is indicated.

CHECK : Is the value more than 0.2 A in function mode F32?

YES : Repair connector.

NOTE:

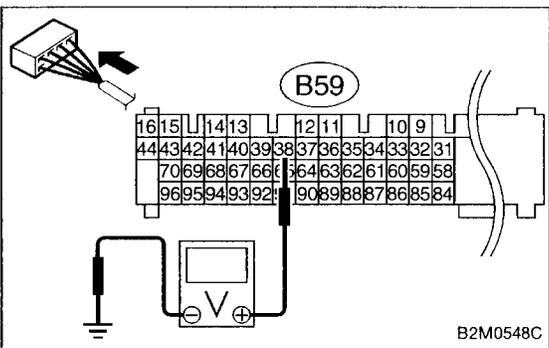
In this case, repair the following:

- Poor contact in front oxygen sensor 1 (RH) 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 (B59) No. 38 (+) — Chassis ground (-): Is the voltage less than 1.0 V?

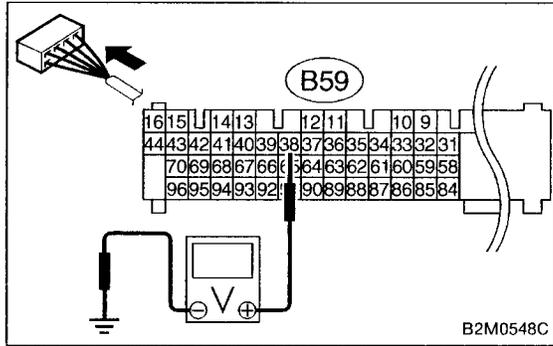
YES : Go to step 10L4.

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).

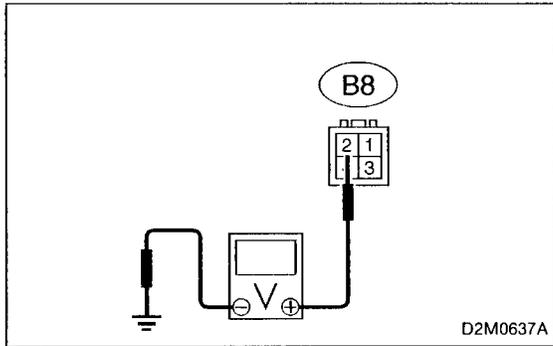


- 3) Disconnect connector from front oxygen sensor.
- 4) Measure voltage between ECM connector and chassis ground.

CHECK : **Connector & terminal (B59) 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 1 (RH) connector. After repair short circuit of harness, replace ECM.



10L4	CHECK POWER SUPPLY TO FRONT OXYGEN SENSOR 1 (RH).
-------------	--

- 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 1 (RH) connector and engine ground.

CHECK : **Connector & terminal (B8) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

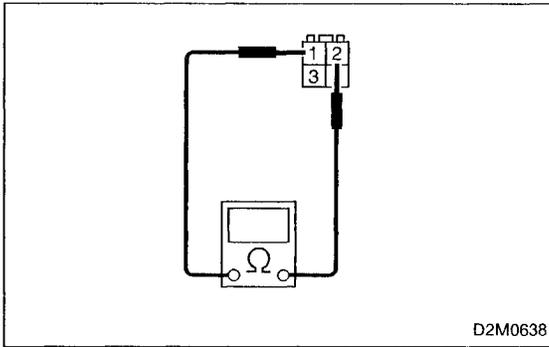
YES : Go to step **10L5**.

NO : Repair power supply line.

NOTE:

In this case, repair the following:

- Open circuit in harness between main relay and front oxygen sensor 1 (RH) connector
- Poor contact in front oxygen sensor 1 (RH) connector
- Poor contact in main relay connector

**10L5 CHECK FRONT OXYGEN SENSOR 1 (RH).**

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

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

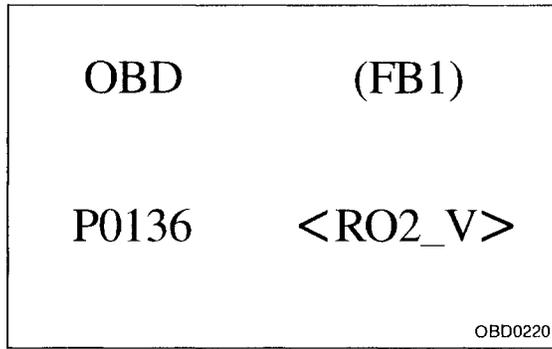
YES : Repair harness and connector.

NOTE:

In this case, repair the following:

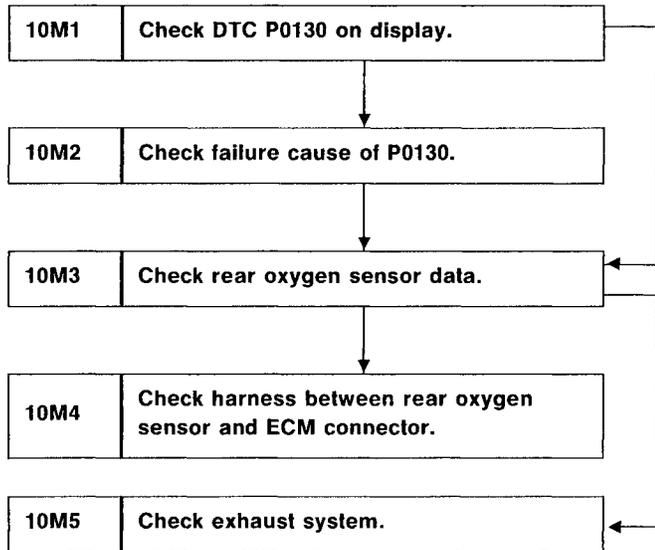
- Open circuit in harness between front oxygen sensor 1 (RH) and ECM connector
- Poor contact in front oxygen sensor 1 (RH) connector
- Poor contact in ECM connector

NO : Replace front oxygen sensor 1 (RH).



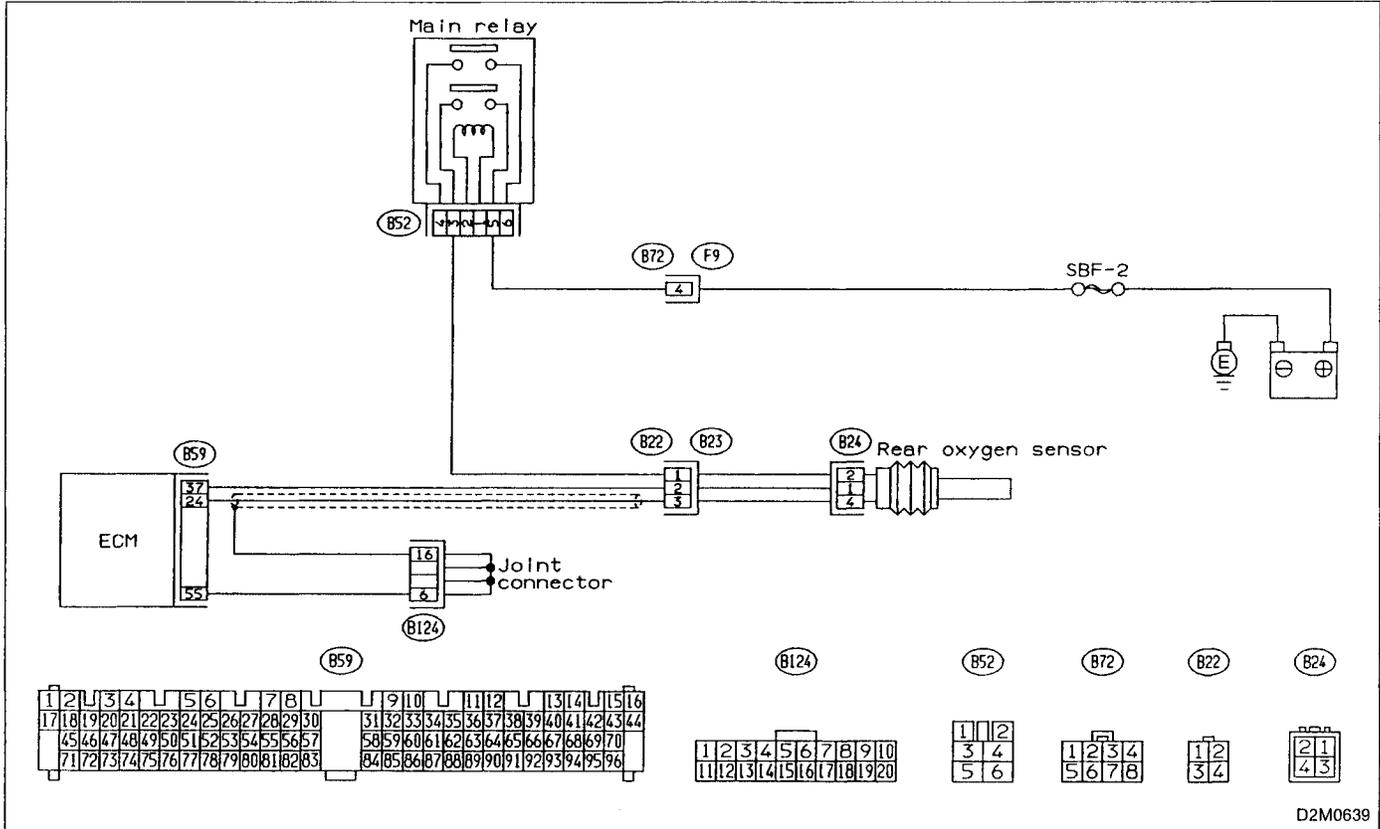
M: DTC P0136
— REAR OXYGEN SENSOR CIRCUIT MALFUNCTION (RO2 — V) —

DTC DETECTING CONDITION:
● Two consecutive trips with fault



CAUTION:
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0639

10M1 CHECK DTC P0130 ON DISPLAY.

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.

10M2 CHECK FAILURE CAUSE OF P0130.

Perform the step 10M1 of DTC P0130.

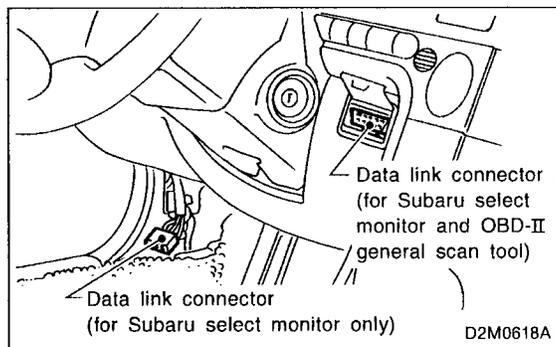
CHECK : Is the failure cause of P0130 in the fuel system?

YES : Check fuel system.

NOTE:

In this case, it is not necessary to inspect DTC P0136.

NO : Go to step 10M3.



10M3 CHECK REAR OXYGEN SENSOR DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor or OBD-II general scan tool to data link connector.
- 3) Start the engine, and turn Subaru Select Monitor or OBD-II general scan tool switch to ON.
- 4) Warm-up the engine until engine coolant temperature is above 70°C (160°F), and keep the engine speed at 2,000 rpm to 3,000 rpm for two minutes.

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

- Subaru Select Monitor Designate mode using function key.

Function mode: F13

- F13: Rear oxygen sensor output signal is indicated.

CHECK : Does the value fluctuate in function mode F13?

YES : Go to step 10M5.

NO : Go to next **CHECK** .

RO2 (F13)

0.60 V

B2M0488

RO2 (F13)

0.60 V

B2M0488

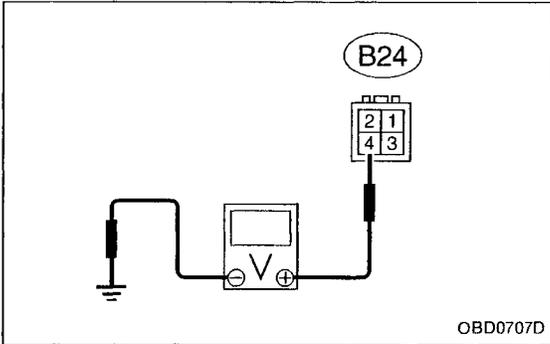
CHECK : Is the value fixed between 0.2 and 0.4 V in function mode F13?

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 (B24) No. 4 (+) — Engine 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 (B22)

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	

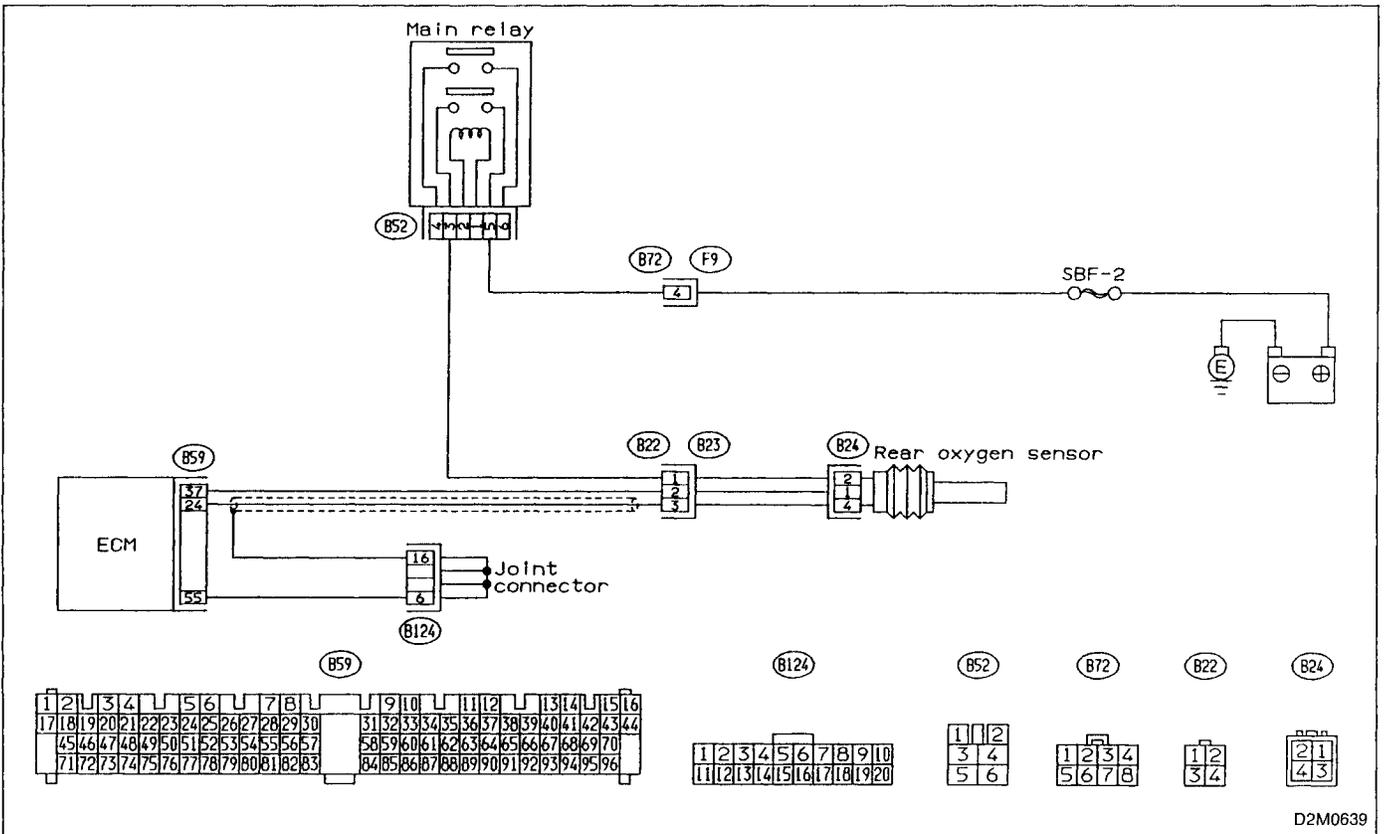
N: DTC P0139
— REAR OXYGEN SENSOR CIRCUIT SLOW RESPONSE (RO2 — R) —

- 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 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0639

10N1	CHECK DTC P0136 ON DISPLAY.
-------------	------------------------------------

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0136?*

YES : Inspect DTC P0136 using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

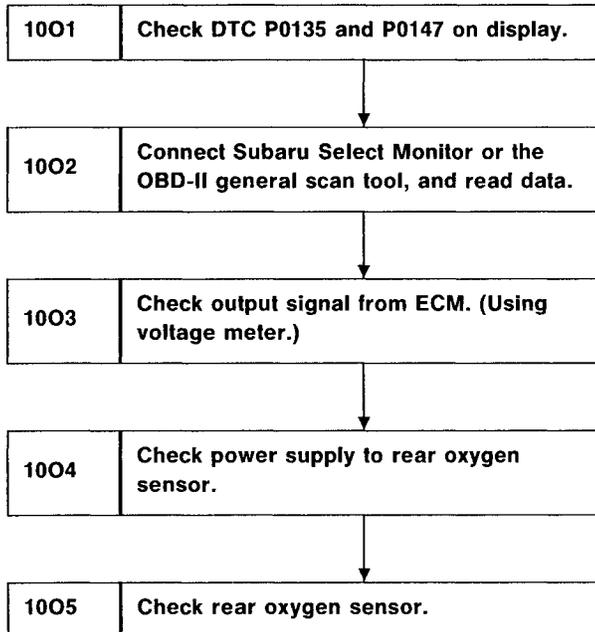
NOTE:

In this case, it is not necessary to inspect DTC P0139.

NO : Replace rear oxygen sensor.

**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.

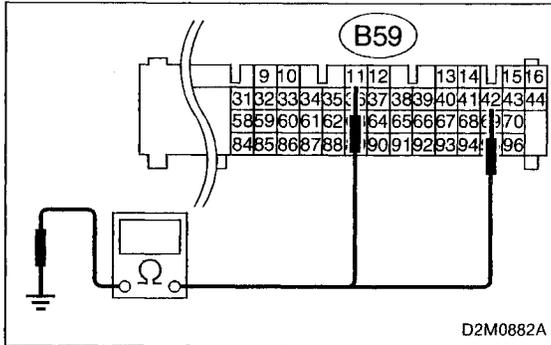
< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

1001	CHECK DTC P0135 AND P0147 ON DISPLAY.
-------------	--

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0141, P0135 and P0147 at the same time?

YES : Go to next step 1).

NO : Go to step **1002**.



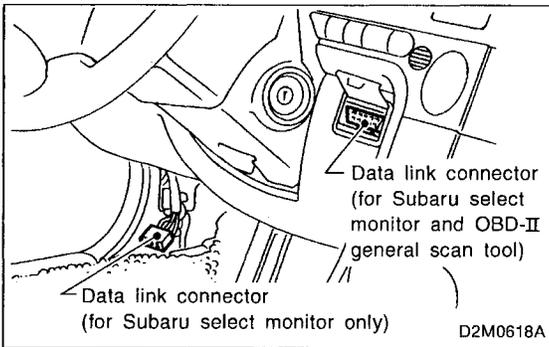
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from ECM.
- 3) Measure resistance of harness between ECM connector and chassis ground.

CHECK : **Connector & terminal (B59) No. 11 and No. 42 — Chassis ground: Is the resistance less than 5 Ω?**

YES : Repair poor contact in ECM connector.

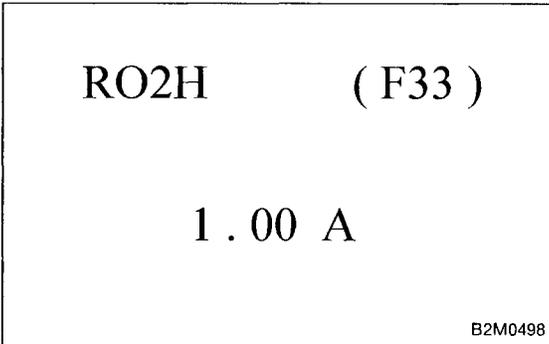
NO : Repair harness and connector.

- NOTE:
- In this case, repair the following:
- Open circuit in harness between ECM and coupling connector (B7)
 - Open circuit in harness between coupling connector (B7) and engine grounding terminal
 - Poor contact in engine grounding terminal
 - Poor contact in coupling connector (B7)



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.



- 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:

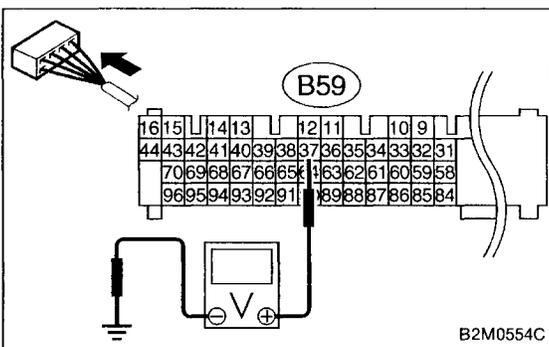
In this case, repair the following:

- Poor contact in rear oxygen sensor connector
- Poor contact in rear oxygen sensor connecting harness connector (B22)
- 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 (B59) No. 37 (+) — Chassis ground (-): Is the voltage less than 1.0 V?

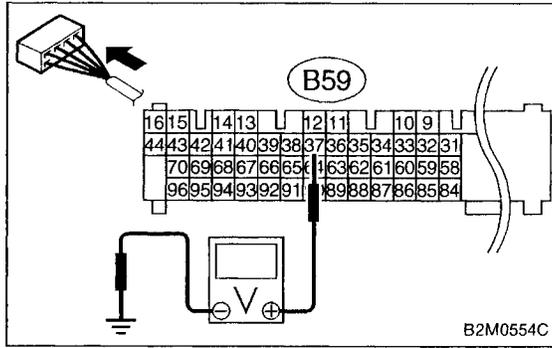
YES : Go to step **1004**.

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).

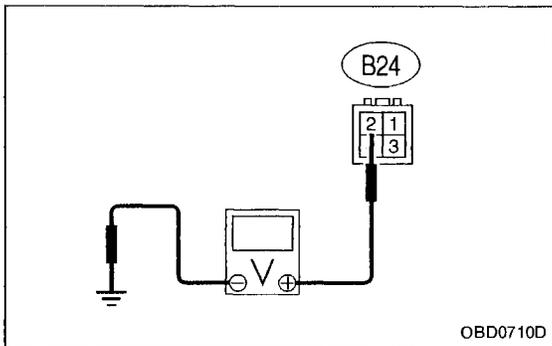


- 3) Disconnect connector from rear oxygen sensor.
- 4) Measure voltage between ECM connector and chassis ground.

CHECK : **Connector & terminal (B59) 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 (B24) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

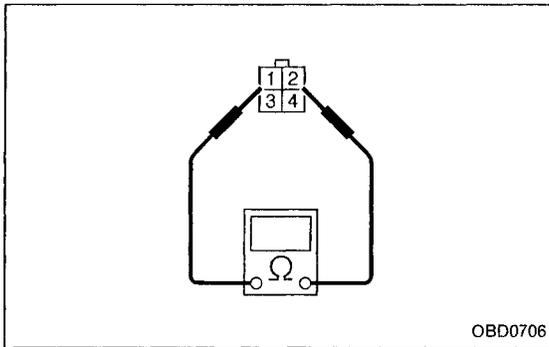
YES : Go to step **1005**.

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 (B22)

**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 (B22)

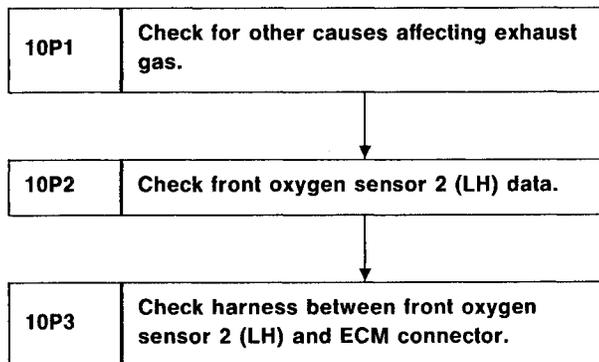
NO : Replace rear oxygen sensor.

OBD	(FB1)
P0142	<O23_V>
D2M0641	

P: DTC P0142
— FRONT OXYGEN SENSOR 2 (LH) CIRCUIT MALFUNCTION (O23 – V) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

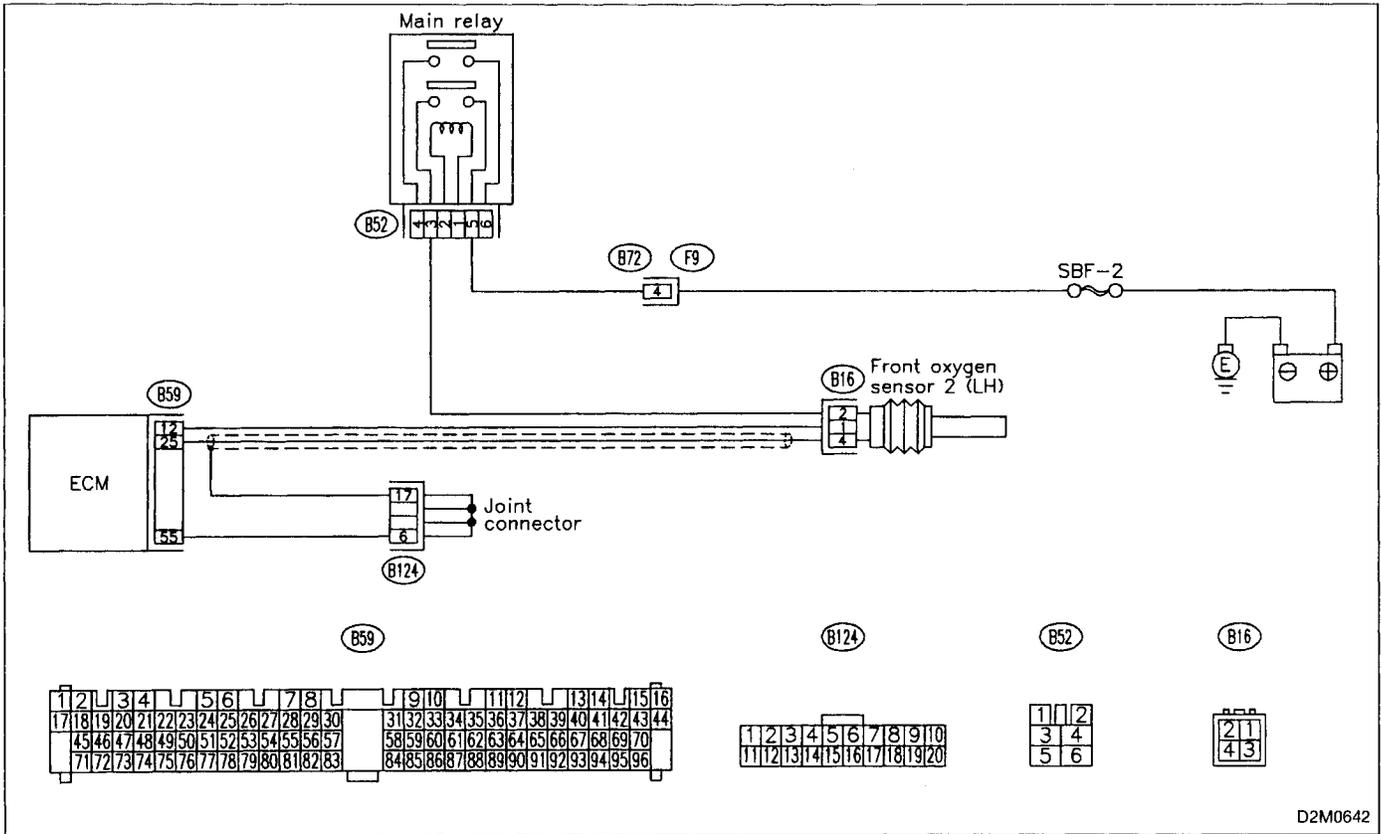


CAUTION:

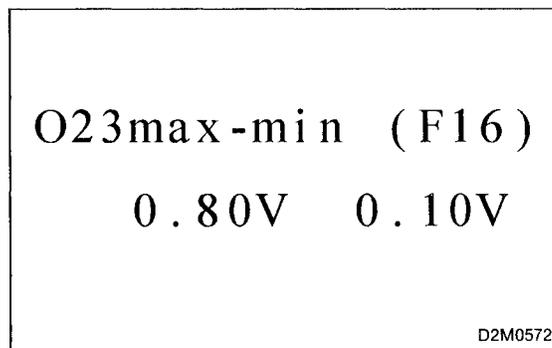
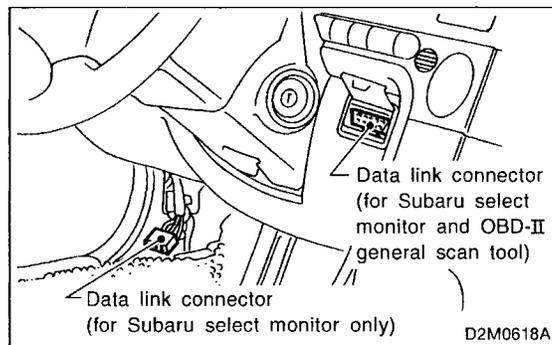
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0642



10P1	CHECK FOR OTHER CAUSES AFFECTING EXHAUST GAS.
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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 **10P2**.

10P2	CHECK FRONT OXYGEN SENSOR 2 (LH) DATA.
-------------	---

- 1) Turn ignition switch to OFF.
- 2) Connect the Subaru Select Monitor or the OBD-II general scan tool to data link connector.
- 3) Start engine and Turn the Subaru Select Monitor and the OBD-II general scan tool switch to ON.
- 4) Warm-up the engine until coolant temperature is above 70°C (160°F) and keep the engine speed at 2,000 rpm to 3,000 rpm for one minute.
- 5) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor
Designate mode using function key.

Function mode: F16

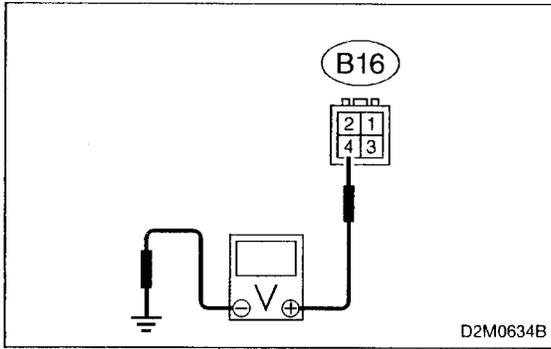
- F16: Front oxygen sensor 2 (LH) max. and min. output signals are indicated at the same time.

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 **10P3**.

NO : Replace front oxygen sensor 2 (LH).

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



10P3

CHECK HARNESS BETWEEN FRONT OXYGEN SENSOR 2 (LH) AND ECM CONNECTOR.

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

CHECK : **Connector & terminal (B16) No. 4 (+) — Engine ground (-): Is the voltage more than 0.2 V?**

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

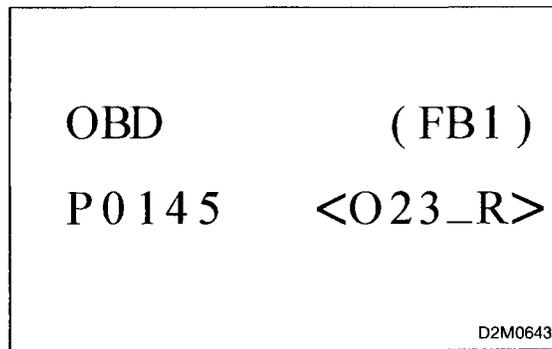
In this case, repair the following:

- Open circuit in harness between ECM and front oxygen sensor 2 (LH) 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 2 (LH) connector.

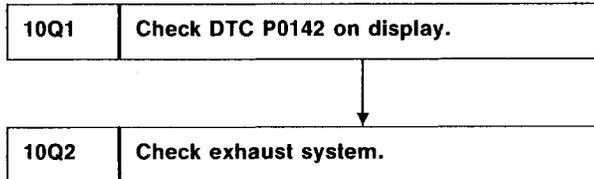
NO : Replace front oxygen sensor 2 (LH).



Q: DTC P0145
— FRONT OXYGEN SENSOR 2 (LH) CIRCUIT
SLOW RESPONSE (O23 — R) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

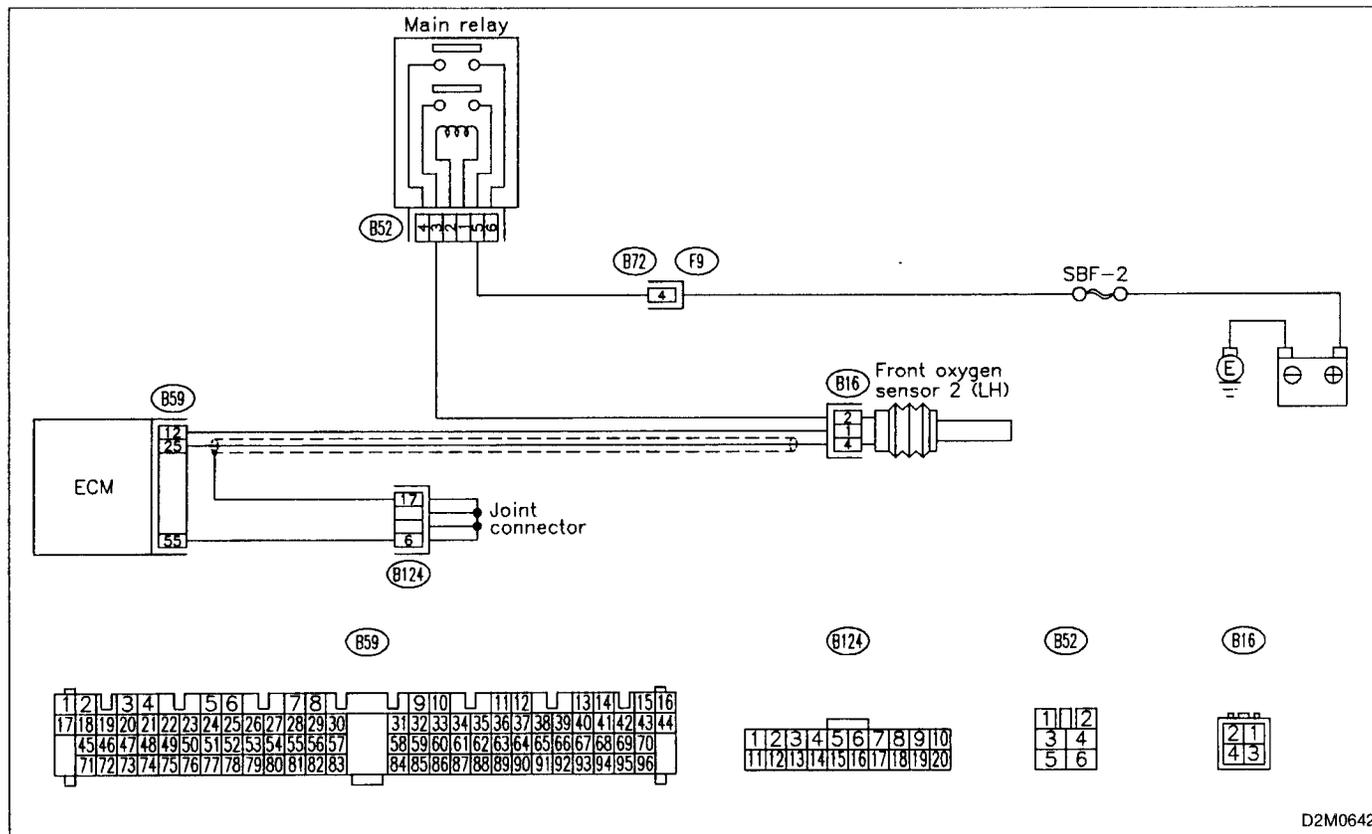


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0642

10Q1 CHECK DTC P0142 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0142?

YES : Inspect DTC P0142 using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

NOTE:

In this case, it is not necessary to inspect DTC P0145.

NO : Go to step **10Q2**.

10Q2 CHECK EXHAUST SYSTEM.

CHECK : Is there a fault in exhaust system?

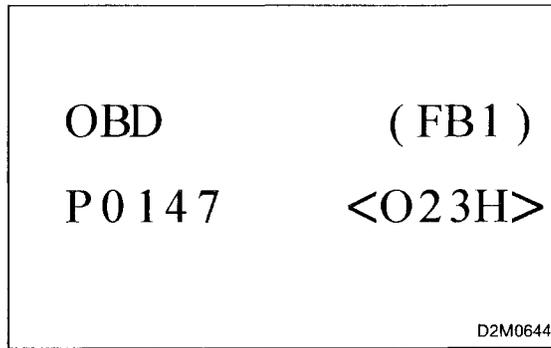
NOTE:

Check the following items.

- Loose installation of front portion of exhaust manifold (LH) onto cylinder head (LH)
- Loose connection between exhaust manifold (LH) and front exhaust pipe (LH)
- Damage of exhaust manifold and exhaust pipe resulting in a hole

YES : Repair exhaust system.

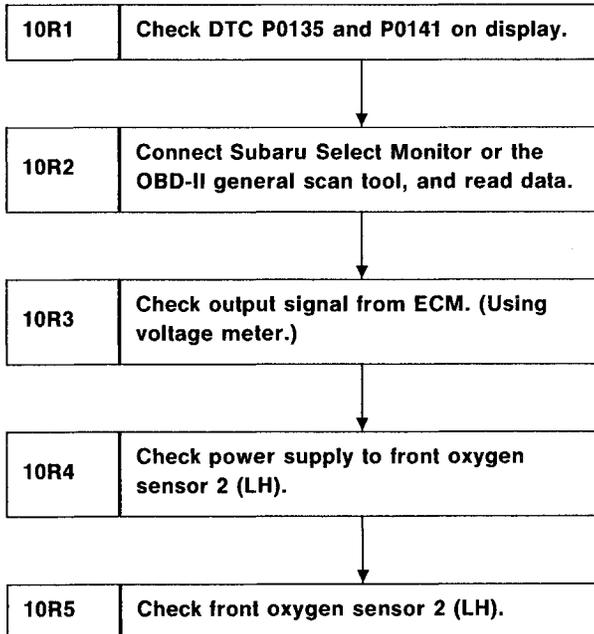
NO : Replace front oxygen sensor 2 (LH).



R: DTC P0147
— FRONT OXYGEN SENSOR 2 (LH) HEATER
CIRCUIT MALFUNCTION (O23H) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

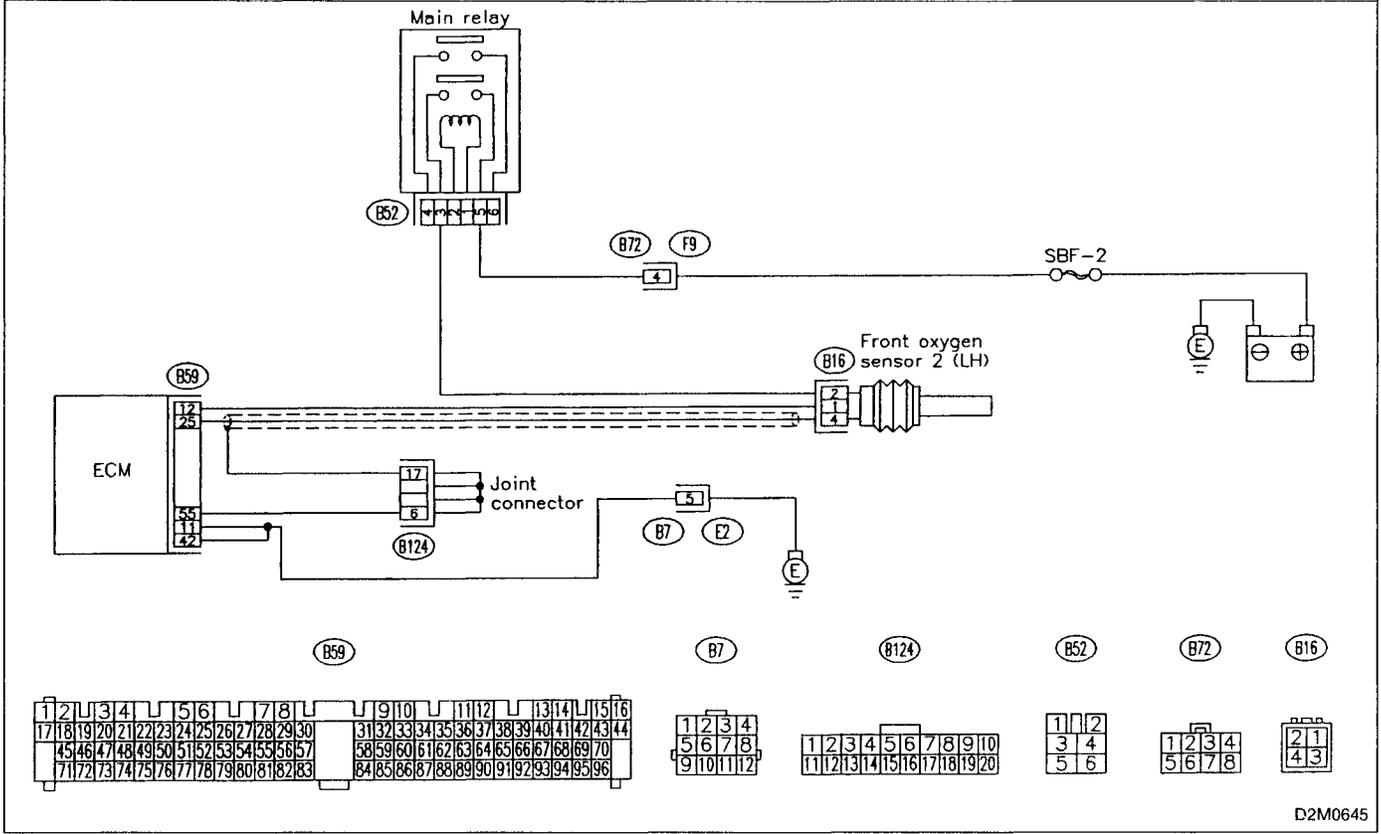


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



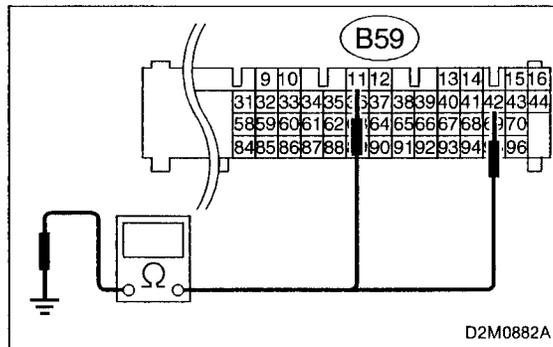
D2M0645

10R1	CHECK DTC P0135 AND P0141 ON DISPLAY.
-------------	--

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0147, P0135 and P0141 at the same time?

YES : Go to next step 1).

NO : Go to step **10R2**.



- 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 (B59) No. 11 and No. 42 — Chassis ground: Is the resistance less than 5 Ω?**

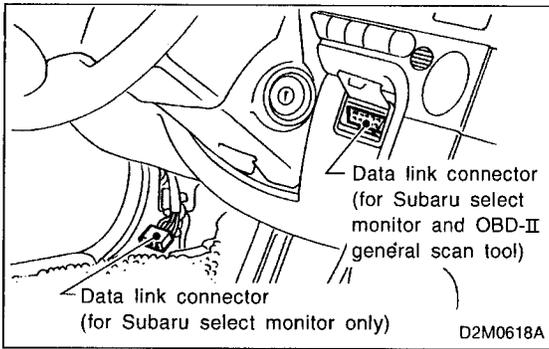
YES : Repair poor contact in ECM connector.

NO : Repair harness and connector.

NOTE:

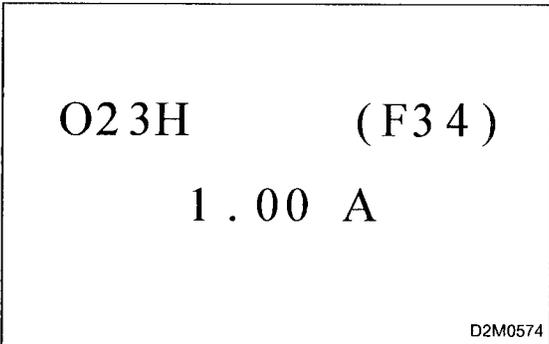
In this case, repair the following:

- Open circuit in harness between ECM and coupling connector (B7)
- Open circuit in harness between coupling connector (B7) and engine grounding terminal
- Poor contact in engine grounding terminal
- Poor contact in coupling connector (B7)



10R2 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: F34

- F34: Front oxygen sensor 2 (LH) heater current is indicated.

CHECK : Is the value more than 0.2 A in function mode F34?

YES : Repair connector.

NOTE:

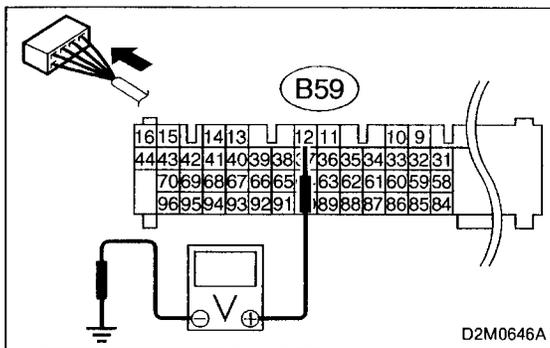
In this case, repair the following:

- Poor contact in front oxygen sensor 2 (LH) connector
- Poor contact in ECM connector

NO : Go to step **10R3**.

- OBD-II scan tool

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



10R3 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 (B59) No. 12 (+) — Chassis ground (-): Is the voltage less than 1.0 V?

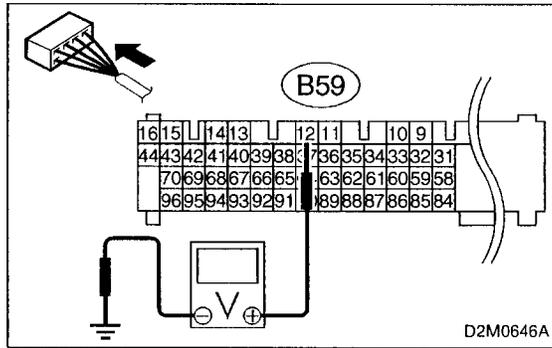
YES : Go to step **10R4**.

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).

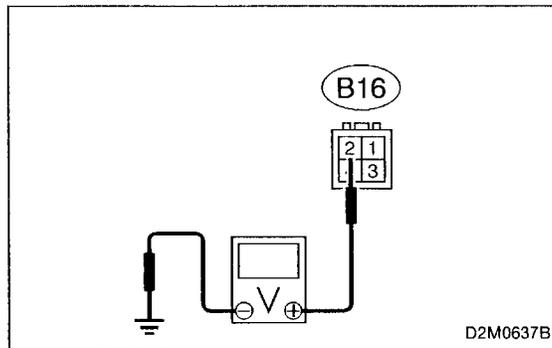


- 3) Disconnect connector from front oxygen sensor 2 (LH).
- 4) Measure voltage between ECM connector and chassis ground.

CHECK : **Connector & terminal (B59) No. 12 (+) — 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 2 (LH) connector. After repair short circuit of harness, replace ECM.



10R4	CHECK POWER SUPPLY TO FRONT OXY-GEN SENSOR 2 (LH).
-------------	---

- 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 (B16) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

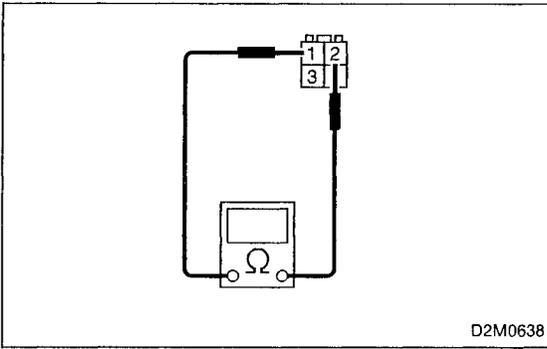
YES : Go to step **10R5**.

NO : Repair power supply line.

NOTE:

In this case, repair the following:

- Open circuit in harness between main relay and front oxygen sensor 2 (LH) connector
- Poor contact in front oxygen sensor 2 (LH) connector
- Poor contact in main relay connector

**10R5** **CHECK FRONT OXYGEN SENSOR 2 (LH).**

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

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

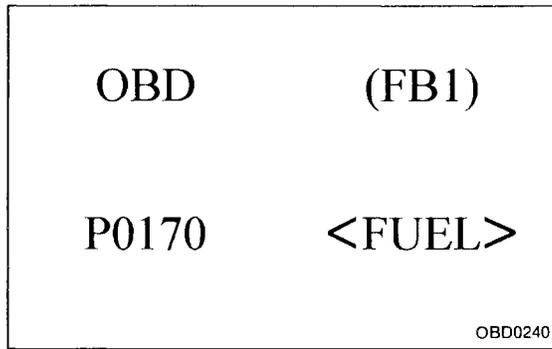
YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between front oxygen sensor 2 (LH) and ECM connector
- Poor contact in front oxygen sensor 2 (LH) connector
- Poor contact in ECM connector

NO : Replace front oxygen sensor 2 (LH).



S: DTC P0170

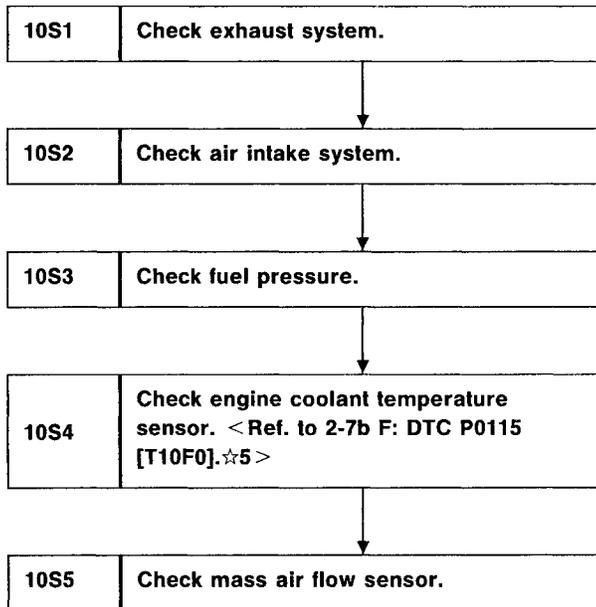
— FUEL TRIM MALFUNCTION (FUEL) —

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 2-7b [T3D0] and [T3E0].☆5 >

10S1	CHECK EXHAUST SYSTEM.
-------------	------------------------------

CHECK : *Are there holes or loose bolts on exhaust system?*

YES : Repair exhaust system.

NO : Go to step **10S2**.

10S2	CHECK AIR INTAKE SYSTEM.
-------------	---------------------------------

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

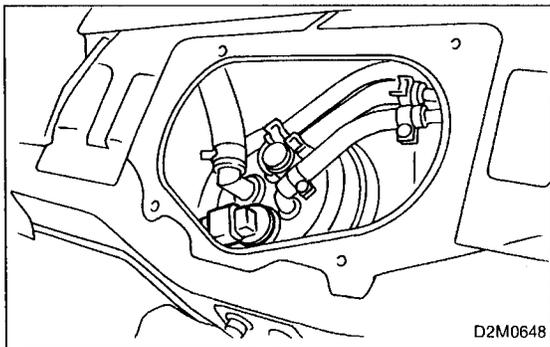
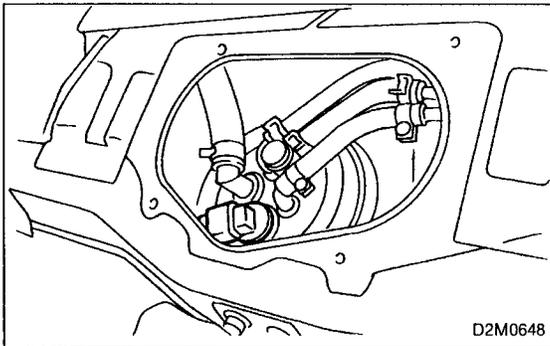
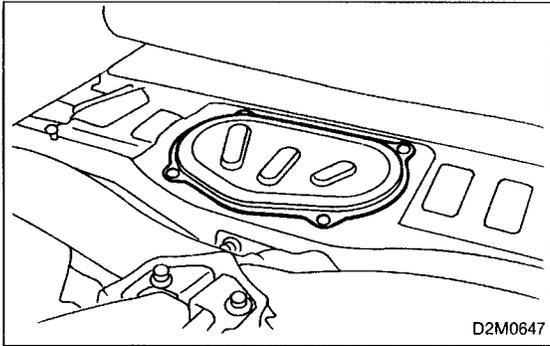
YES : Repair air intake system.

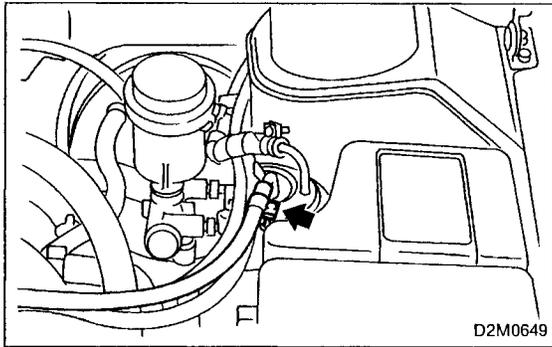
NO : Go to step **10S3**.

10S3	CHECK FUEL PRESSURE.
-------------	-----------------------------

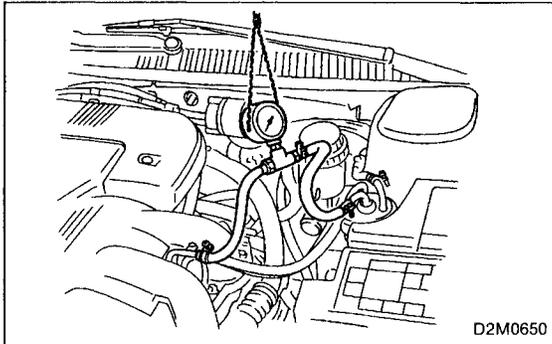
- 1) Release fuel pressure.
 - (1) Fold down the rear seat back, and turn up the trunk mat.
 - (2) Remove fuel pump access hole lid located on the trunk compartment floor.
 - (3) Disconnect connector from fuel tank.
 - (4) Start the engine, and run it until it stalls.
 - (5) After stopping the engine, crank the engine for 5 to 7 seconds to reduce fuel pressure.
 - (6) 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 235 and 265 kPa (2.4 — 2.7 kg/cm², 34 — 38 psi)?*

YES : Go to next step 6).

NO : Repair the following items.

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

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

CHECK : *Is fuel pressure between 177 and 206 kPa (1.8 — 2.1 kg/cm², 26 — 30 psi)?*

YES : Go to step 10S4.

NO : Repair the following items.

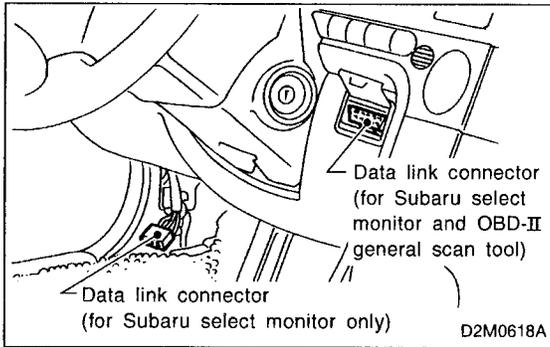
Fuel pressure too high	<ul style="list-style-type: none"> ● Faulty pressure regulator ● Clogged fuel return line or bent hose
Fuel pressure too low	<ul style="list-style-type: none"> ● Faulty pressure regulator ● Improper fuel pump discharge ● Clogged fuel supply line

WARNING:

Before removing fuel pressure gauge, release fuel pressure.

NOTE:

- If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.
- If out of specification as measured at step 6), check or replace pressure regulator and pressure regulator vacuum hose.

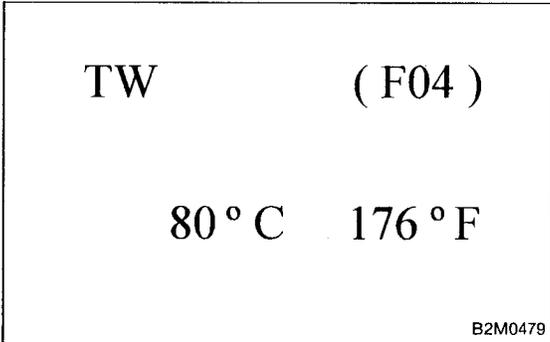


10S4

CHECK ENGINE COOLANT TEMPERATURE SENSOR.

< REF. TO 2-7b F: DTC P0115 [T10F0].☆5 >

- 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".

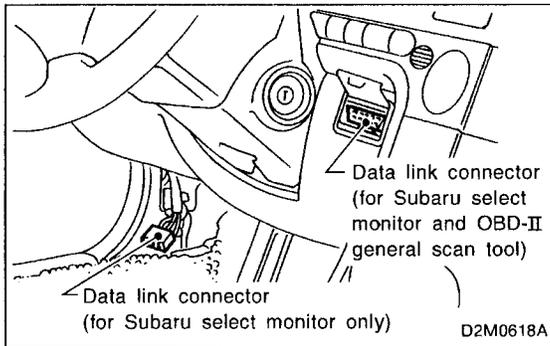
CHECK : *Is temperature greater than 60°C or 140°F in function mode F04?*

YES : Go to step 10S5.

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

10S5	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?*

Engine speed	Specified value
Idling	2.3 — 4.7 (g/sec)
2,500 rpm	11.7 — 18.0 (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)
P0201	<INJ1>
OBD0261	

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

OBD	(FB1)
P0202	<INJ2>
OBD0262	

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

OBD	(FB1)
P0203	<INJ3>
OBD0263	

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

OBD	(FB1)
P0204	<INJ4>
OBD0264	

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

OBD	(FB1)
P0205	<INJ5>
D2M0603	

X: DTC P0205
 — FUEL INJECTOR CIRCUIT MALFUNCTION -
 #5 (INJ5) —

OBD	(FB1)
P0206	<INJ6>
D2M0651	

Y: DTC P0206

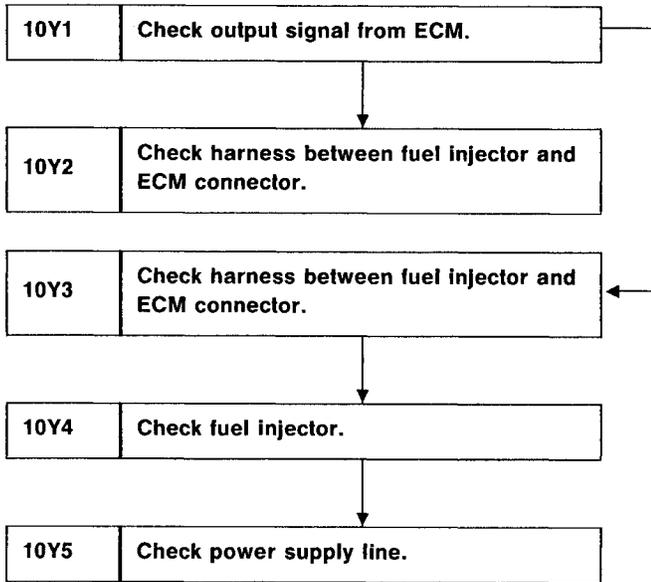
**— FUEL INJECTOR CIRCUIT MALFUNCTION -
#6 (INJ6) —**

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

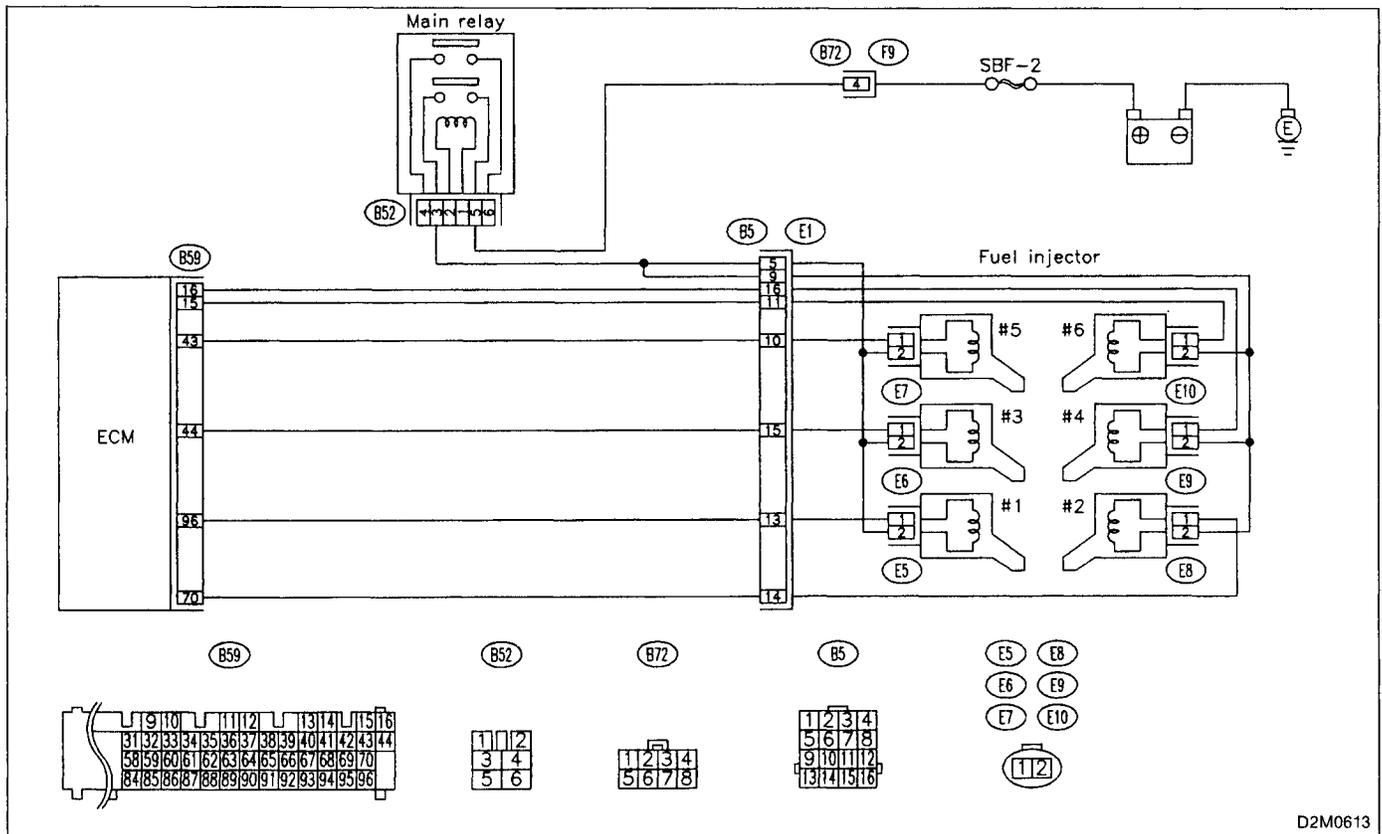
- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving



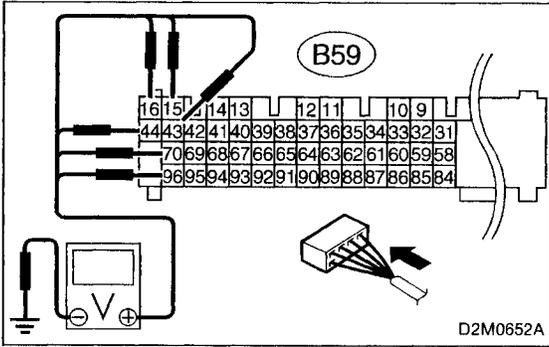
CAUTION:

- Check or repair only faulty cylinders.
 - After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
- < Ref. to 2-7b [T3D0] and [T3E0]. ☆5 >

WIRING DIAGRAM:



D2M0613

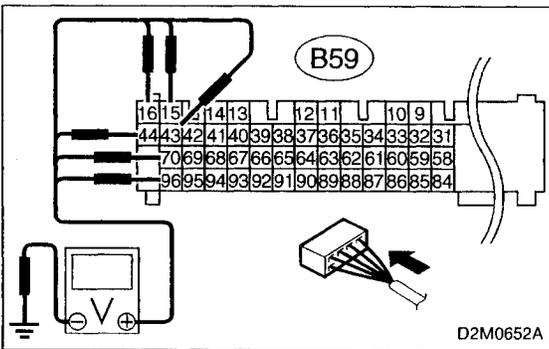


10Y1 CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK : **Connector & terminal**
#1 (B59) No. 96 (+) — Chassis ground (-):
#2 (B59) No. 70 (+) — Chassis ground (-):
#3 (B59) No. 44 (+) — Chassis ground (-):
#4 (B59) No. 16 (+) — Chassis ground (-):
#5 (B59) No. 43 (+) — Chassis ground (-):
#6 (B59) No. 15 (+) — Chassis ground (-):
Is the voltage more than 10 V?

- YES** : Go to step **10Y2**.
NO : Go to step **10Y3**.

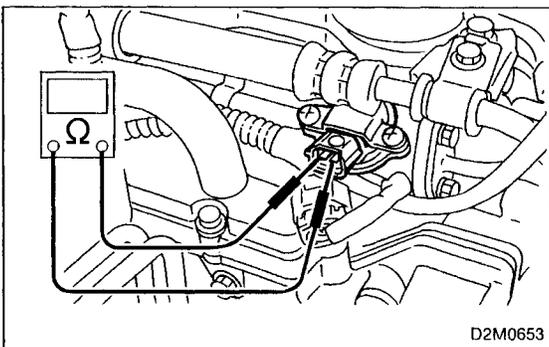


10Y2 CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

- 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 (B59) No. 96 (+) — Chassis ground (-):
#2 (B59) No. 70 (+) — Chassis ground (-):
#3 (B59) No. 44 (+) — Chassis ground (-):
#4 (B59) No. 16 (+) — Chassis ground (-):
#5 (B59) No. 43 (+) — Chassis ground (-):
#6 (B59) No. 15 (+) — 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.

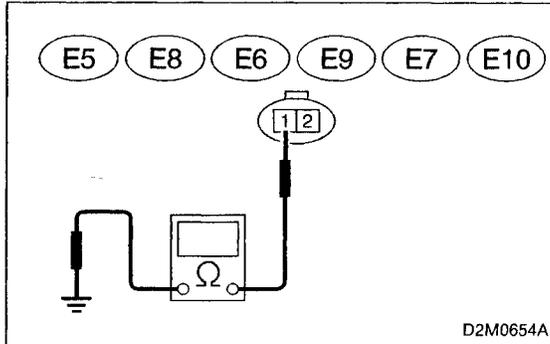
CHECK : **Terminals**
No. 1 — No. 2 :
Is the resistance less than 1 Ω?

- 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.



10Y3

CHECK HARNESS BETWEEN FUEL INJECTOR AND ECM CONNECTOR.

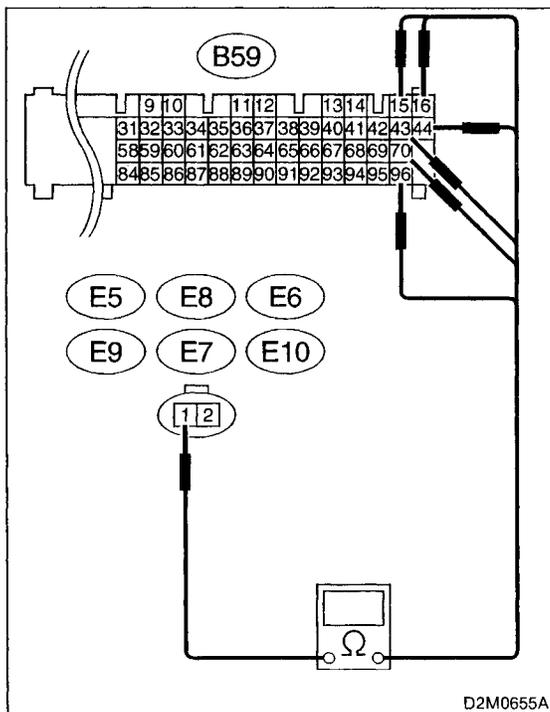
- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from fuel injector on faulty cylinders.
- 3) Measure voltage between ECM connector and engine ground on faulty cylinders.

CHECK : **Connector & terminal**

- #1 (E5) No. 1 — Engine ground:
 - #2 (E8) No. 1 — Engine ground:
 - #3 (E6) No. 1 — Engine ground:
 - #4 (E9) No. 1 — Engine ground:
 - #5 (E7) No. 1 — Engine ground:
 - #6 (E10) 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).



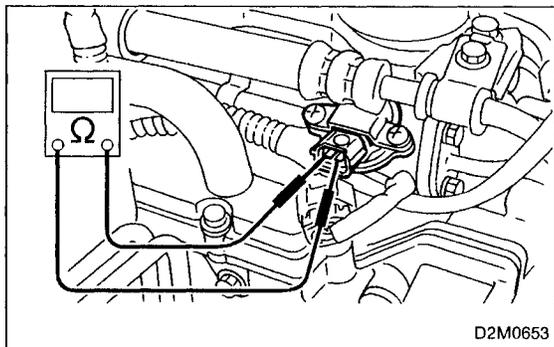
- 4) Measure resistance of harness connector between ECM connector and fuel injector on faulty cylinders.

CHECK : **Connector & terminal**

- #1 (B59) No. 96 — (E5) No. 1:
 - #2 (B59) No. 70 — (E8) No. 1:
 - #3 (B59) No. 44 — (E6) No. 1:
 - #4 (B59) No. 16 — (E9) No. 1:
 - #5 (B59) No. 43 — (E7) No. 1:
 - #6 (B59) No. 15 — (E10) No. 1:
- Is the resistance less than 1 Ω?**

YES : Go to step 10Y4.

NO : Repair open circuit in harness between ECM and fuel injector connector.



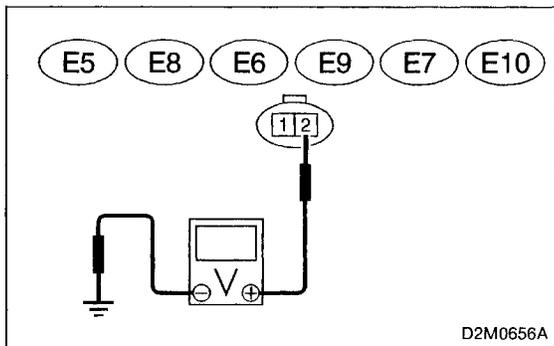
10Y4 CHECK FUEL INJECTOR.

Measure resistance between fuel injector terminals on faulty cylinder.

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

YES : Go to step **10Y5**.

NO : Replace faulty fuel injector.



10Y5 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 (E8) No. 2 (+) — Engine ground (-):
#3 (E6) No. 2 (+) — Engine ground (-):
#4 (E9) No. 2 (+) — Engine ground (-):
#5 (E7) No. 2 (+) — Engine ground (-):
#6 (E10) 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 coupling connector (B5)

OBD (FB1)

P0301 <MIS_1>

OBD0277

Z: DTC P0301
— CYLINDER 1 MISFIRE DETECTED
(MIS — 1) —

OBD (FB1)

P0302 <MIS_2>

OBD0278

AA: DTC P0302
— CYLINDER 2 MISFIRE DETECTED
(MIS — 2) —

OBD (FB1)

P0303 <MIS_3>

OBD0279

AB: DTC P0303
— CYLINDER 3 MISFIRE DETECTED
(MIS — 3) —

OBD (FB1)

P0304 <MIS_4>

OBD0280

AC: DTC P0304
— CYLINDER 4 MISFIRE DETECTED
(MIS — 4) —

OBD (FB1)

P0305 <MIS_5>

D2M0657

AD: DTC P0305
— CYLINDER 5 MISFIRE DETECTED
(MIS — 5) —

OBD (FB1)

P0306 <MIS_6>

D2M0658

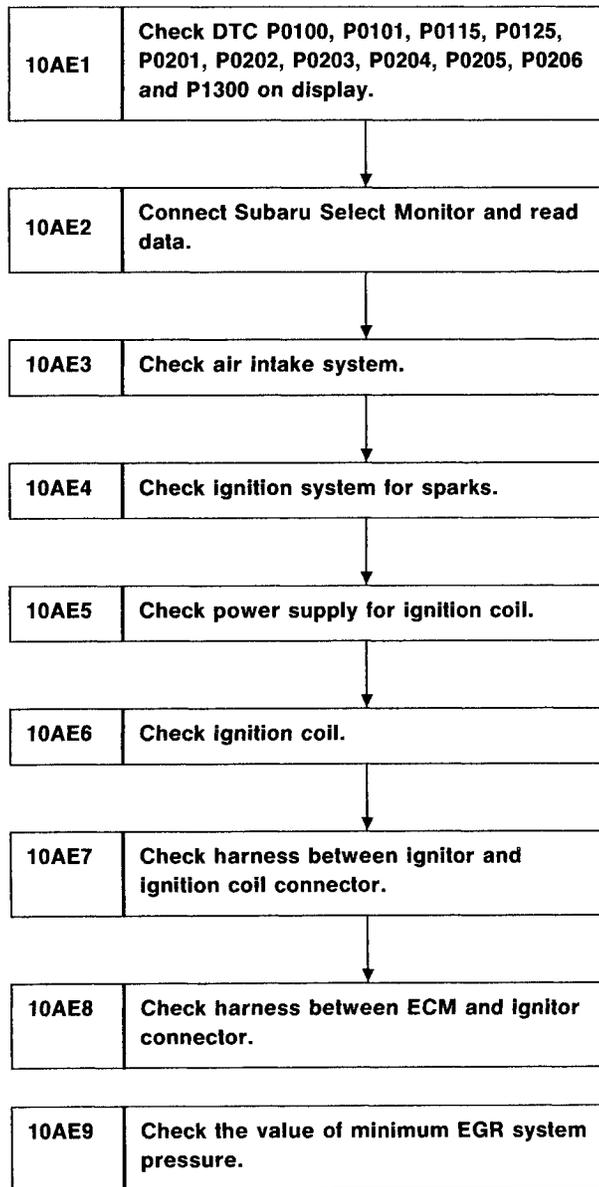
AE: DTC P0306
— CYLINDER 6 MISFIRE DETECTED
(MIS — 6) —

DTC DETECTING CONDITION:

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

TROUBLE SYMPTOM:

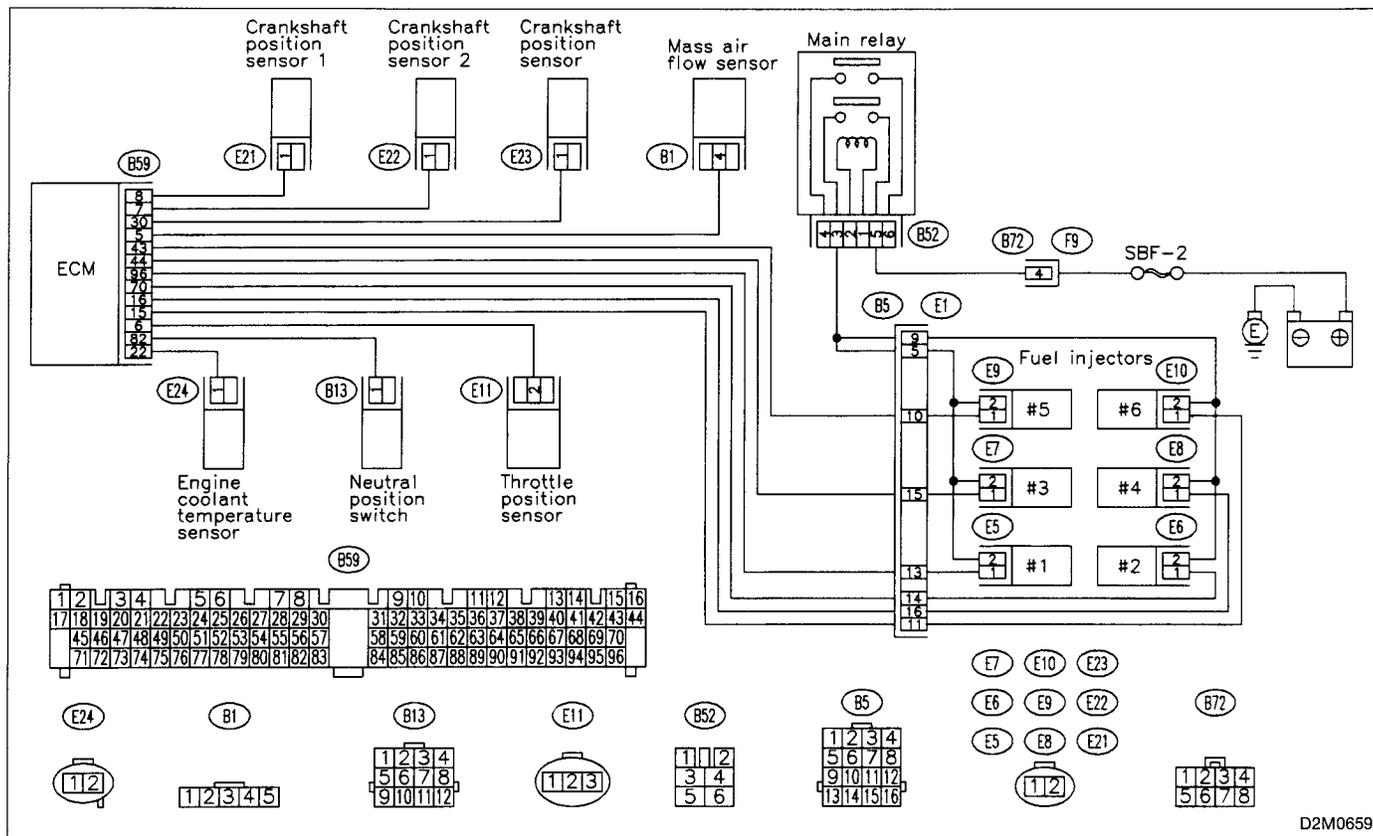
- Engine stalls.
- Erroneous idling
- Rough driving

**CAUTION:**

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0659

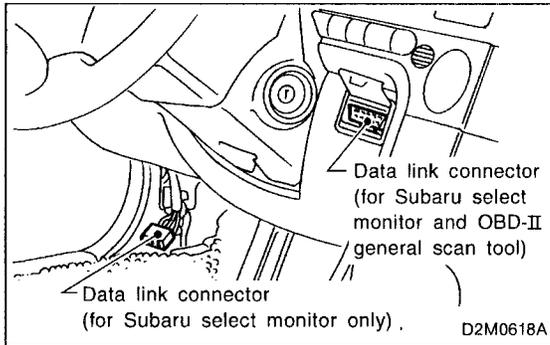
10AE1 CHECK DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203, P0204, P0205, P0206 AND P1300 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203, P0204, P0205, P0206 and P1300?

YES : Inspect DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203, P0204, P0205, P0206 and P1300 using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

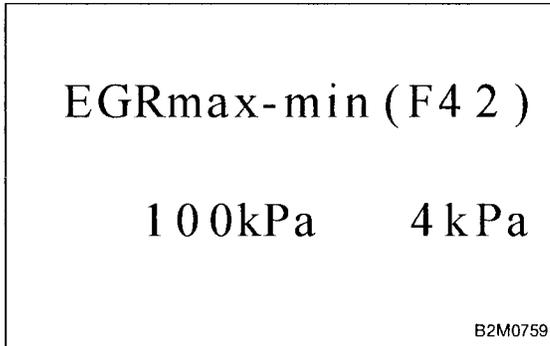
NOTE:
In this case, it is not necessary to inspect DTC P0301, P0302, P0303, P0304, P0305 and P0306.

NO : Go to step 10AE2.



10AE2 CONNECT SUBARU SELECT MONITOR AND READ DATA.

- 1) Turn ignition switch to OFF.
- 2) Connect Subaru Select Monitor to the data link connector.
- 3) Turn ignition switch to ON and turn Subaru Select Monitor switch to ON.



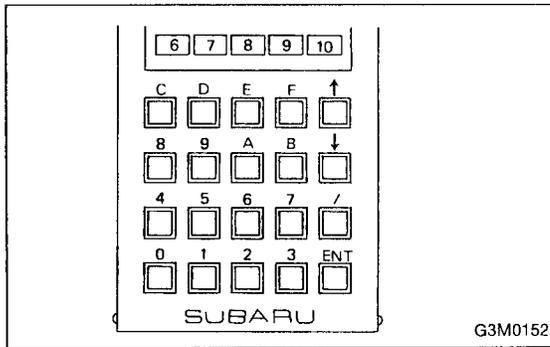
- 4) Read data on Subaru Select Monitor. Designate mode use function key.

Function mode: F42

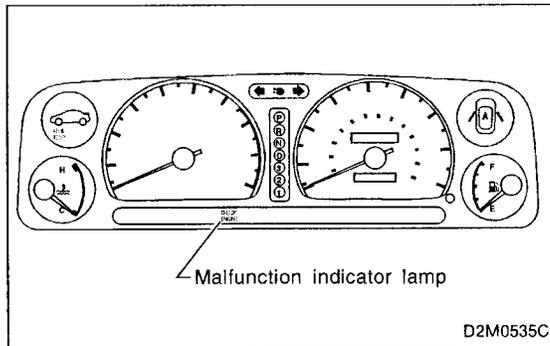
NOTE:

F42: Maximum and minimum EGR system pressure value are indicated at the same time.

- 5) Print out the displayed data on paper.



- 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 **10AE3**.

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 (B5)

10AE3	CHECK AIR INTAKE SYSTEM.
--------------	---------------------------------

CHECK : *Is there a fault in air intake system?*

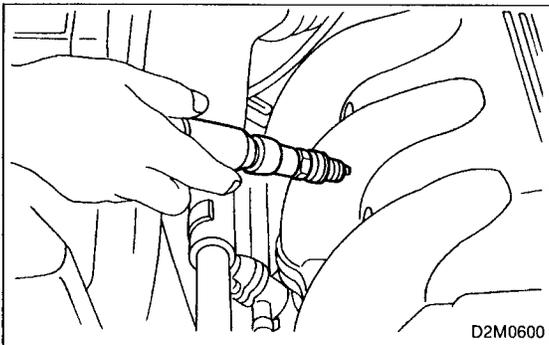
NOTE:

Check the following items:

- Are there air leaks or air suction caused by loose or dislocated nuts and bolts?
- Are there cracks or any disconnection of hoses?

YES : Repair air intake system.

NO : Go to step **10AE4**.



10AE4	CHECK IGNITION SYSTEM FOR SPARKS.
--------------	--

- 1) Turn ignition switch to OFF.
- 2) Remove ignition coil on faulty cylinders from cylinder head. < Ref. to 6-1 [W3A0].☆1 >
- 3) Install new spark plug on ignition coil.

CAUTION:

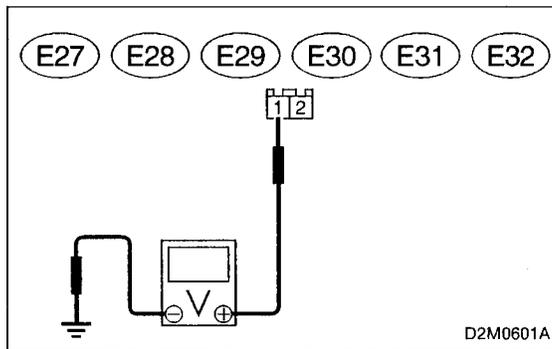
Do not remove spark plug from engine.

- 4) Disconnect connector from fuel pump relay.
- 5) Contact spark plug's thread portion on engine.
- 6) Start engine and stall it.
- 7) Crank engine to check that spark occurs at faulty cylinders.

CHECK : *Does spark occur at faulty cylinders?*

YES : Go to step **10AE9**.

NO : Go to step **10AE5**.



10AE5	CHECK POWER SUPPLY FOR IGNITION COIL.
--------------	--

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

CHECK : **Connector & terminal**

#1 (E27) No. 1 (+) — Engine ground (-):

#2 (E30) No. 1 (+) — Engine ground (-):

#3 (E28) No. 1 (+) — Engine ground (-):

#4 (E31) No. 1 (+) — Engine ground (-):

#5 (E29) No. 1 (+) — Engine ground (-):

#6 (E32) No. 1 (+) — Engine ground (-):

Is the voltage more than 10 V?

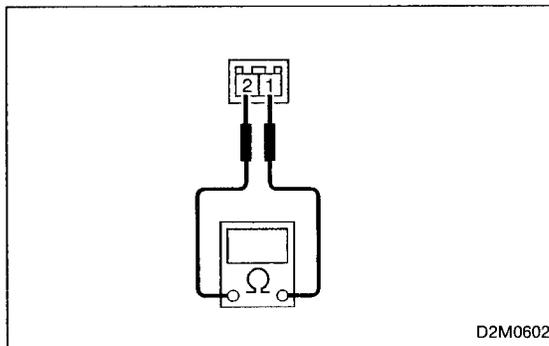
YES : Go to step **10AE6**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ignition coil and ignition switch connector
- Poor contact in coupling connector (B4)



10AE6	CHECK IGNITION COIL.
--------------	-----------------------------

- 1) Measure resistance between ignition coil connector terminals on faulty cylinders to check primary coil.

CHECK : **Terminals**

No. 1 — No. 2

Is the resistance between 0.45 and 1.05 Ω ?

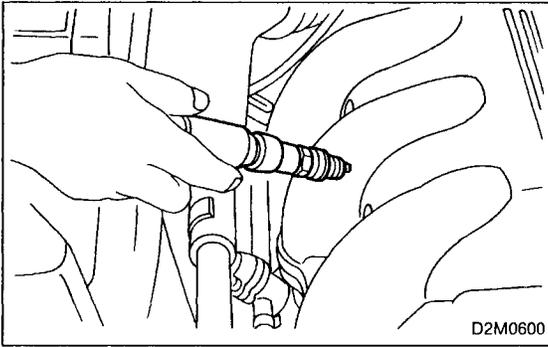
YES : Go to next **CHECK** .

NO : Replace faulty ignition coil.

CHECK : **Is there poor contact in ignition coil connector or spark plug contact portion?**

YES : Repair poor contact in ignition coil connector or spark plug contact portion.

NO : Go to next step 2).



- 2) Turn ignition switch to OFF.
- 3) Disconnect connector from ignition coil on normal cylinder.
- 4) Remove normal ignition coil from cylinder head.
<Ref. to 6-1 [W3A0].☆1 >
- 5) Connect normal ignition coil connector to engine harness ignition coil connector for faulty cylinder.
- 6) Install new spark plug on ignition coil.

CAUTION:

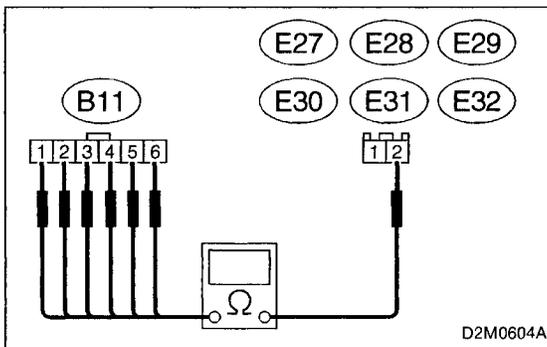
Do not remove spark plug from engine.

- 7) Contact spark plug's thread portion on engine.
- 8) Crank engine to check that spark occurs at faulty cylinder.

CHECK : Does spark occur at faulty cylinder?

YES : Replace faulty ignition coil.

NO : Go to step **10AE7**.



10AE7 CHECK HARNESS BETWEEN IGNITOR AND IGNITION COIL CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector (B11) from ignitor.
- 3) Measure resistance of harness between ignition coil and faulty cylinders and ignitor connector.

CHECK : Connector & terminal

#1 (B11) No. 1 — (E27) No. 2:

#2 (B11) No. 2 — (E30) No. 2:

#3 (B11) No. 3 — (E28) No. 2:

#4 (B11) No. 4 — (E31) No. 2:

#5 (B11) No. 5 — (E29) No. 2:

#6 (B11) No. 6 — (E32) No. 2:

Is the resistance less than 1 Ω?

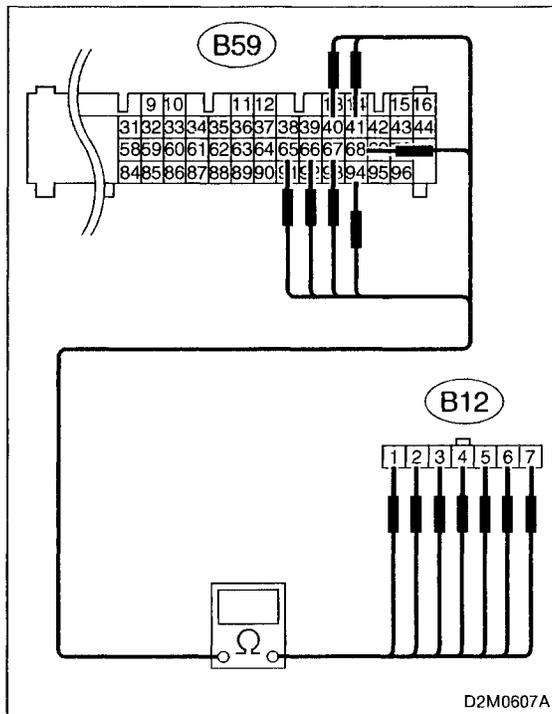
YES : Go to step **10AE8**.

NO : Go to next **CHECK** .

CHECK : Is there poor contact in coupling connector (B4) or spark plug contact portion?

YES : Repair poor contact in coupling connector (B4) or spark plug contact portion.

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


10AE8 CHECK HARNESS BETWEEN ECM AND IGNITOR CONNECTOR.

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

CHECK : **Connector & terminal**
#1 (B59) No. 41 — (B12) No. 7:
#2 (B59) No. 68 — (B12) No. 6:
#3 (B59) No. 67 — (B12) No. 5:
#4 (B59) No. 66 — (B12) No. 3:
#5 (B59) No. 65 — (B12) No. 2:
#6 (B59) No. 40 — (B12) No. 1:
Is the resistance less than 1 Ω?

YES : Go to next step 3).

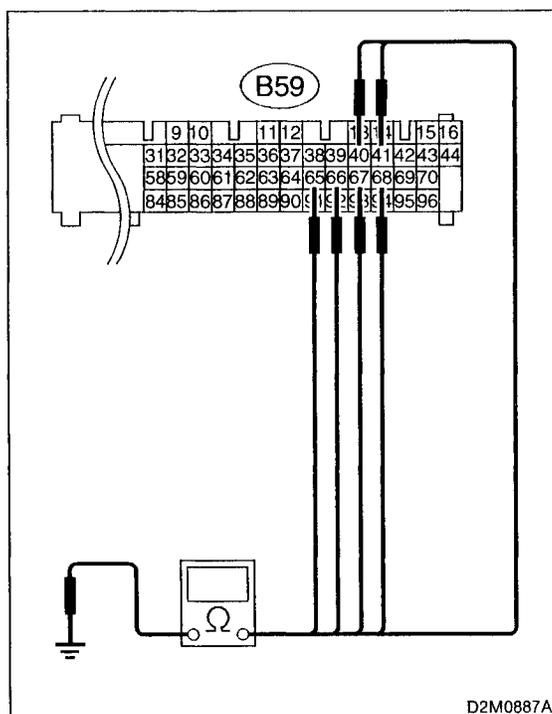
NO : Repair open circuit in harness between ECM and ignition coil connector.

- 3) Measure resistance of harness between ECM and ignition coil connector.

CHECK : **Connector & terminal**
(B59) No. 94 — (B12) No. 4:
Is the resistance less than 1 Ω?

YES : Go to next step 4).

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



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

CHECK : **Connector & terminal**
#1 (B59) No. 41 — Chassis ground:
#2 (B59) No. 68 — Chassis ground:
#3 (B59) No. 67 — Chassis ground:
#4 (B59) No. 66 — Chassis ground:
#5 (B59) No. 65 — Chassis ground:
#6 (B59) No. 40 — Chassis ground:
Is the resistance more than 1 MΩ?

YES : Repair short circuit in harness between ECM and ignitor connector.

NO : Replace ignitor.

EGRmax-min (F42)

100kPa 4kPa

B2M0759

10AE9**CHECK THE VALUE OF MINIMUM EGR SYSTEM PRESSURE.**

CHECK : *Is the minimum EGR system pressure value (value of function mode (F42)) less than 1 kPa?*

NOTE:

Use the value read in step **10AE2** 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, 2-7b [T10S3], [T10S4] and [T10S5]☆5.

OBD	(FB1)
P0325	<KNOCK>
<small>OBD0283</small>	

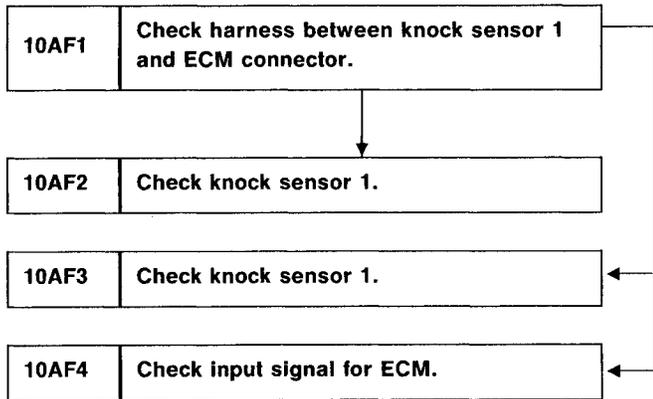
AF: DTC P0325
— KNOCK SENSOR 1 CIRCUIT MALFUNCTION (KNOCK) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

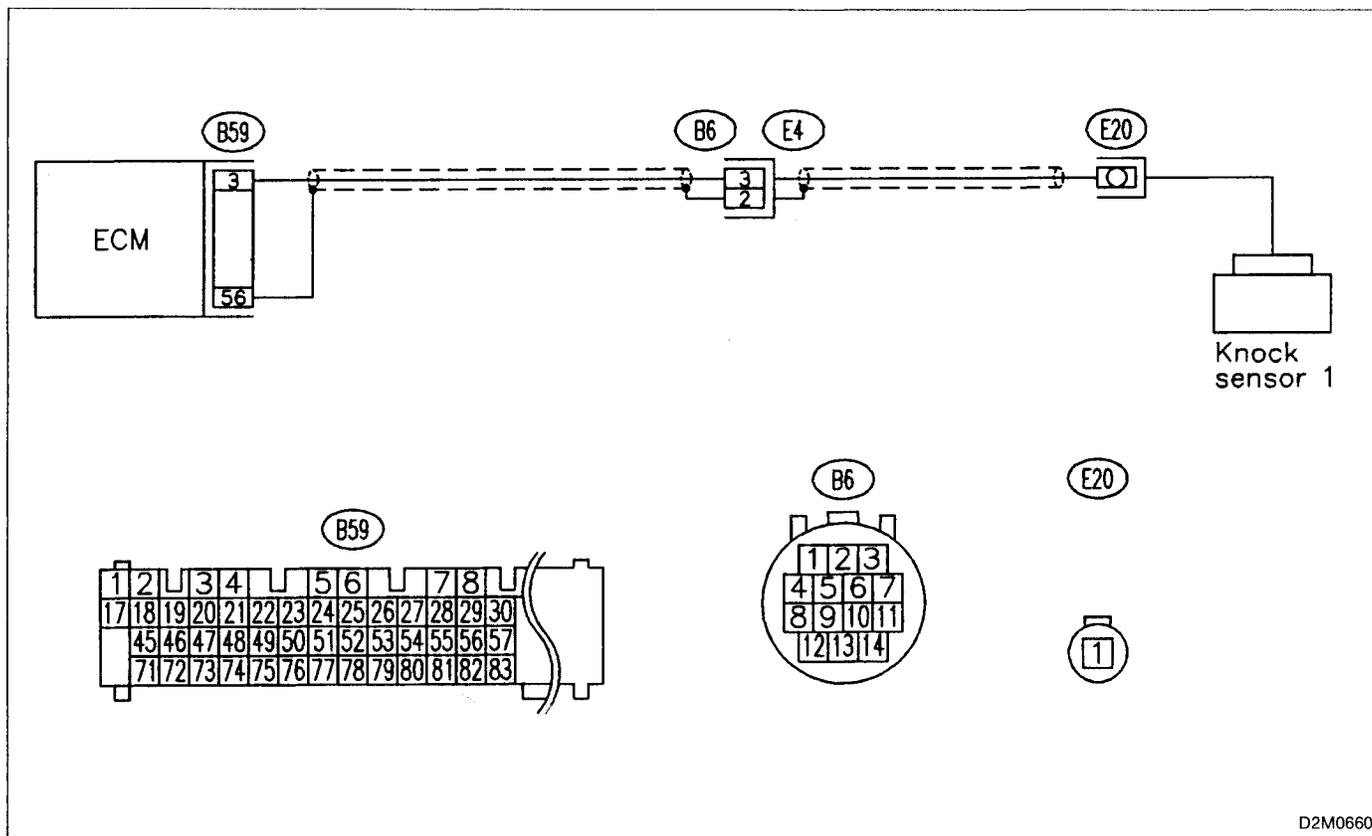


CAUTION:

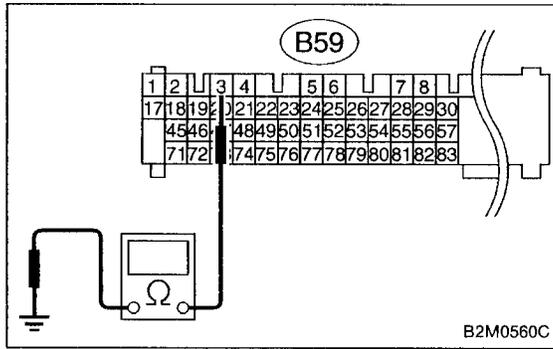
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0660



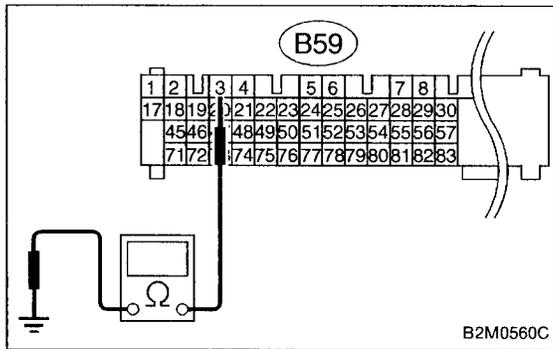
10AF1 CHECK HARNESS BETWEEN KNOCK SENSOR 1 AND ECM CONNECTOR.

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

CHECK : Connector & terminal (B59) No. 3 — Chassis ground:
Is the resistance more than 700 kΩ?

YES : Go to step 10AF2.

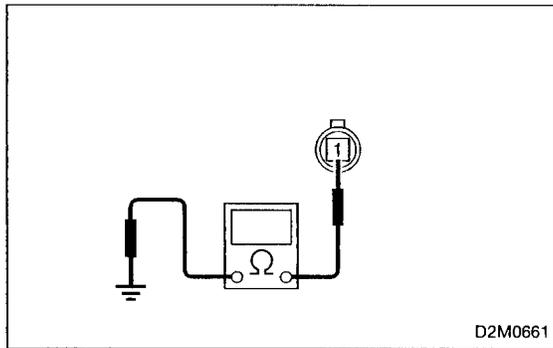
NO : Go to next **CHECK** .



CHECK : Connector & terminal (B59) No. 3 — Chassis ground:
Is the resistance less than 400 kΩ?

YES : Go to step 10AF3.

NO : Go to step 10AF4.



10AF2 CHECK KNOCK SENSOR 1.

- 1) Disconnect connector from knock sensor 1.
- 2) Measure resistance between knock sensor 1 connector terminal and engine ground.

CHECK : Terminals No. 1 — Engine ground:
Is the resistance more than 700 kΩ?

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

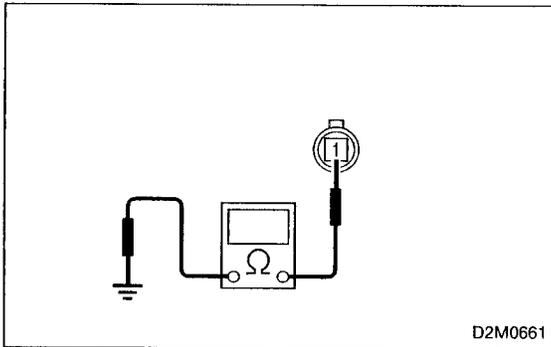
In this case, repair the following:

- Open circuit in harness between knock sensor 1 and ECM connector
- Poor contact in knock sensor 1 connector
- Poor contact in coupling connector (B6)

CHECK : Is the knock sensor 1 installation bolt tightened securely?

YES : Replace knock sensor 1.

NO : Tighten knock sensor 1 installation bolt securely.



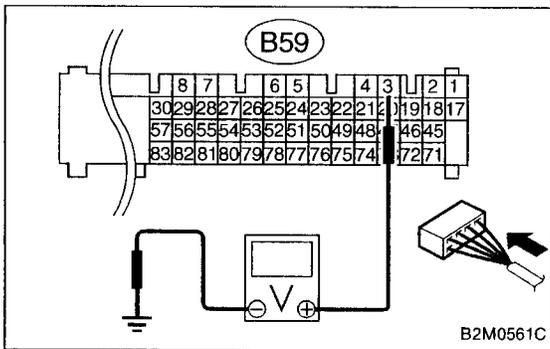
10AF3 CHECK KNOCK SENSOR 1.

- 1) Disconnect connector from knock sensor 1.
- 2) Measure resistance between knock sensor 1 connector terminal and engine ground.

CHECK : **Terminals**
No. 1 — Engine ground:
Is the resistance less than 400 kΩ?

- YES** : Replace knock sensor 1.
NO : Repair short circuit in harness between knock sensor 1 connector and ECM connector.

NOTE:
 The harness between both connectors is shielded. Repair short circuit of harness together with shield.



10AF4 CHECK INPUT SIGNAL FOR ECM.

- 1) Connect connectors to ECM and knock sensor 1.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ECM and chassis ground.

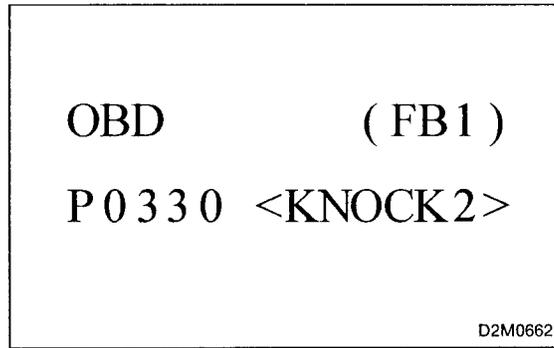
CHECK : **Connector & terminal**
(B59) No. 3 (+) — Chassis ground (-):
Is the voltage more than 2 V?

- 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 1 connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

NO : Repair poor contact in ECM connector.



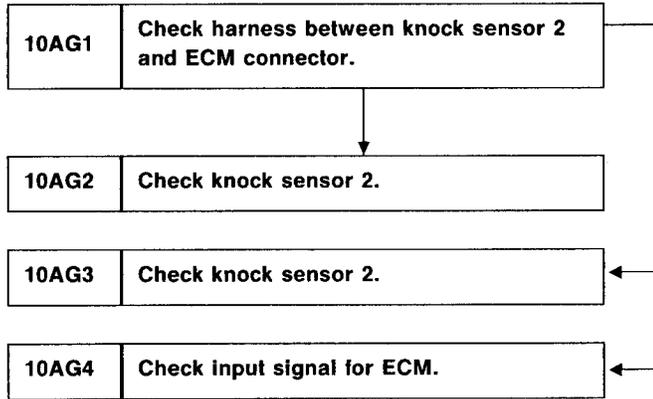
AG: DTC P0330
— KNOCK SENSOR 2 CIRCUIT MALFUNCTION (KNOCK2) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Poor driving performance
- Knocking occurs.

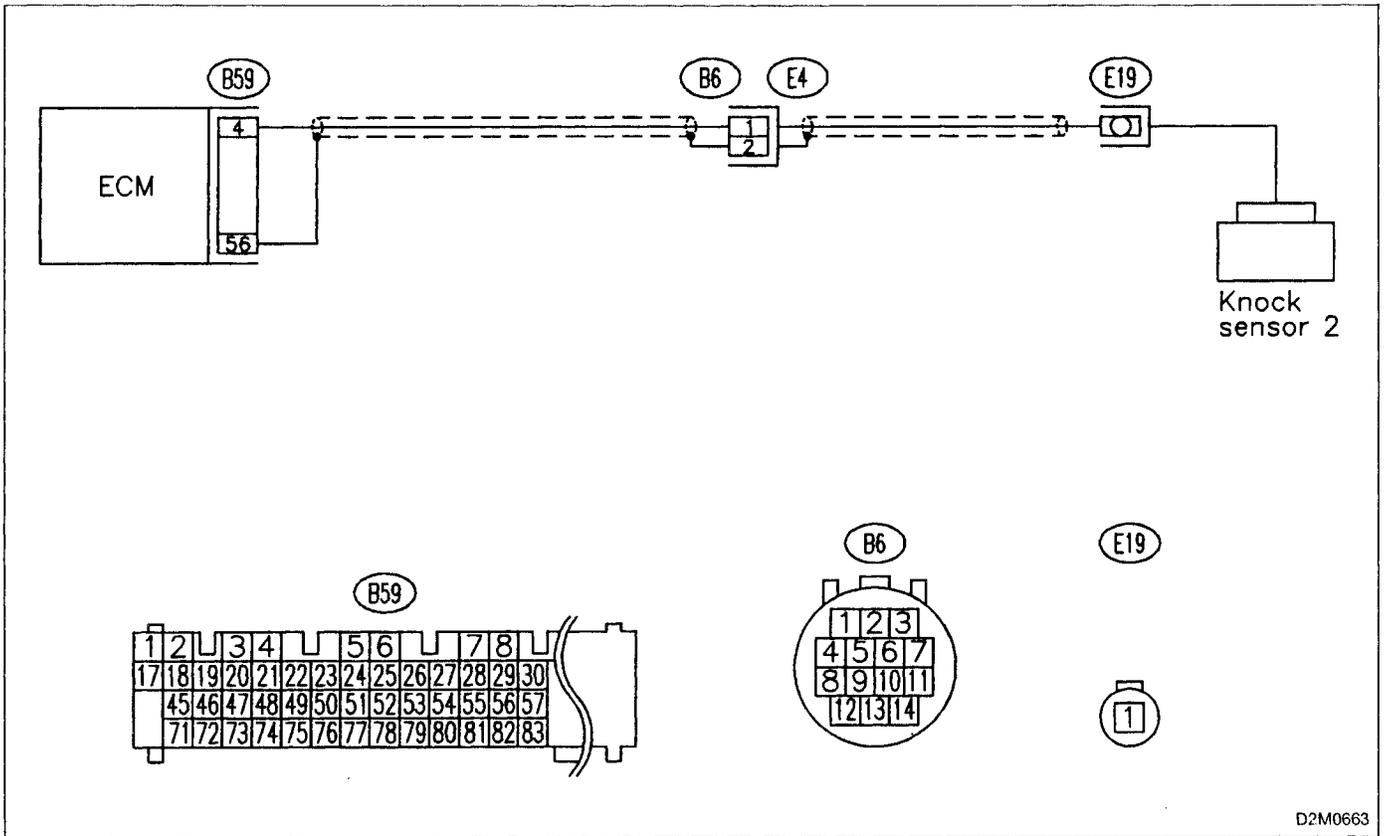


CAUTION:

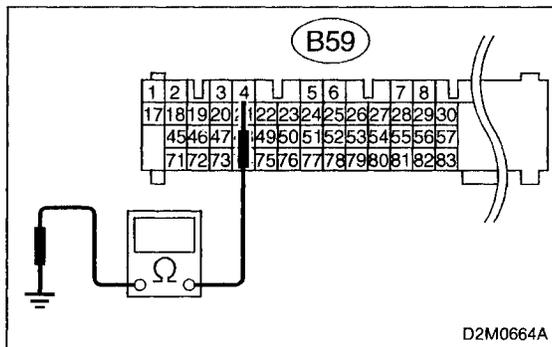
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0663



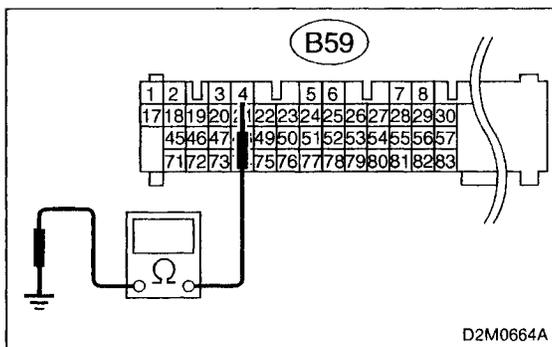
10AG1 CHECK HARNESS BETWEEN KNOCK SENSOR 2 AND ECM CONNECTOR.

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

CHECK : **Connector & terminal (B59) No. 4 — Chassis ground:**
Is the resistance more than 700 kΩ?

YES : Go to step **10AG2**.

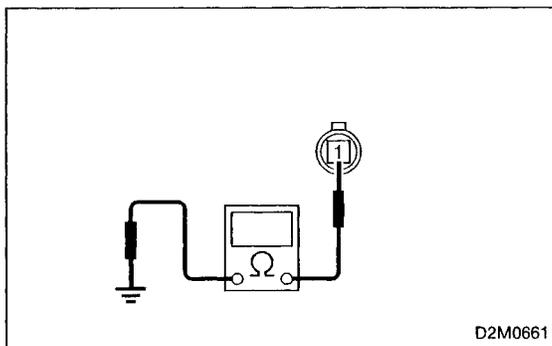
NO : Go to next **CHECK** .



CHECK : **Connector & terminal (B59) No. 4 — Chassis ground:**
Is the resistance less than 400 kΩ?

YES : Go to step **10AG3**.

NO : Go to step **10AG4**.



10AG2 CHECK KNOCK SENSOR 2.

- 1) Disconnect connector from knock sensor 2.
- 2) Measure resistance between knock sensor 2 connector terminal and engine ground.

CHECK : **Terminals No. 1 — Engine ground:**
Is the resistance more than 700 kΩ?

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

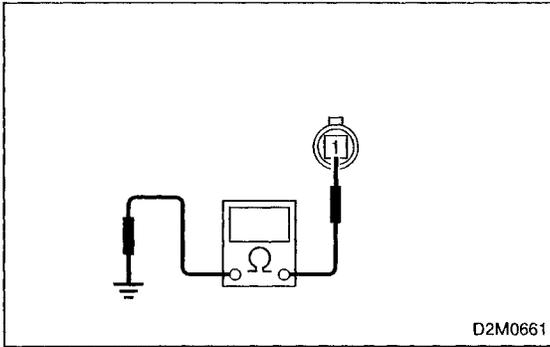
In this case, repair the following:

- Open circuit in harness between knock sensor 2 and ECM connector
- Poor contact in knock sensor 2 connector
- Poor contact in coupling connector (B6)

CHECK : **Is the knock sensor installation bolt tightened securely?**

YES : Replace knock sensor 2.

NO : Tighten knock sensor 2 installation bolt securely.



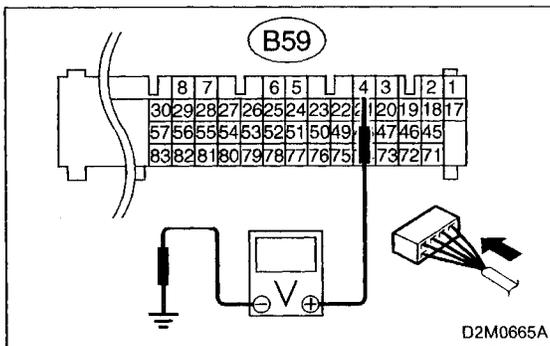
10AG3 CHECK KNOCK SENSOR 2.

- 1) Disconnect connector from knock sensor 2.
- 2) Measure resistance between knock sensor 2 connector terminal and engine ground.

CHECK : **Terminals**
No. 1 — Engine ground:
Is the resistance less than 400 kΩ?

- YES** : Replace knock sensor 2.
NO : Repair short circuit in harness between knock sensor 2 connector and ECM connector.

NOTE:
 The harness between both connectors is shielded. Repair short circuit of harness together with shield.



10AG4 CHECK INPUT SIGNAL FOR ECM.

- 1) Connect connectors to ECM and knock sensor 2.
- 2) Turn ignition switch to ON.
- 3) Measure voltage between ECM and chassis ground.

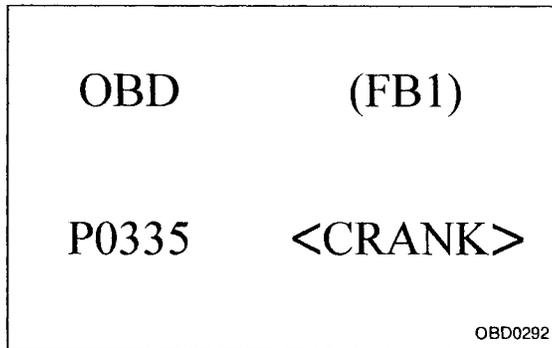
CHECK : **Connector & terminal**
(B59) No. 4 (+) — Chassis ground (-):
Is the voltage more than 2 V?

- 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 2 connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

NO : Repair poor contact in ECM connector.



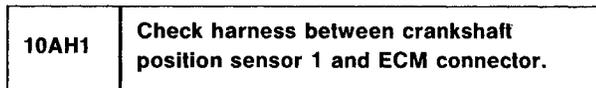
AH: DTC P0335
— CRANKSHAFT POSITION SENSOR 1
CIRCUIT MALFUNCTION (CRANK) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

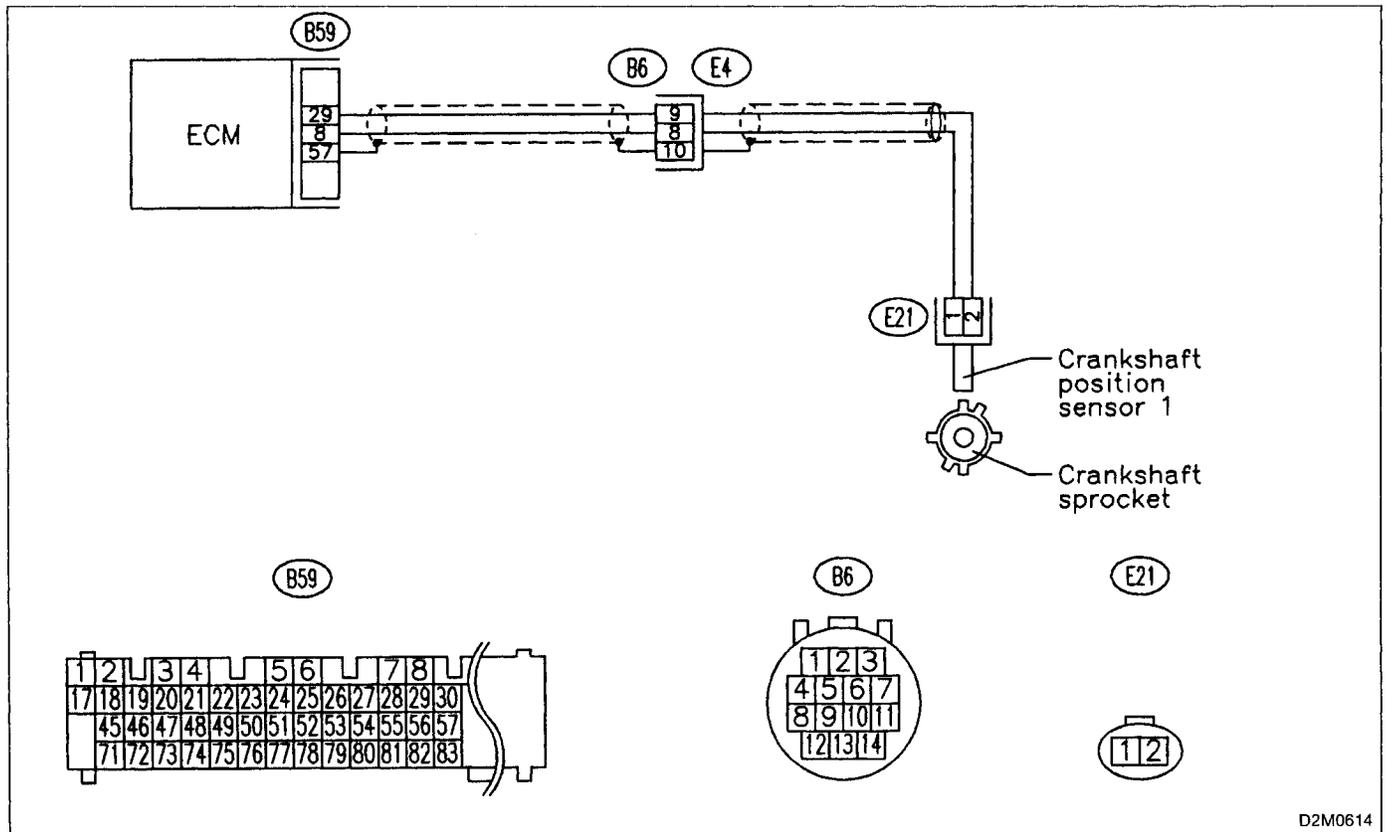


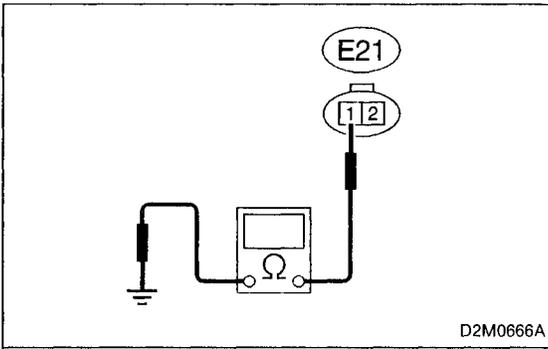
CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:





10AH1 CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR 1 AND ECM CONNECTOR.

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

CHECK : **Connector & terminal (E21) No. 1 — Engine ground:**
Is the resistance more than 100 kΩ?

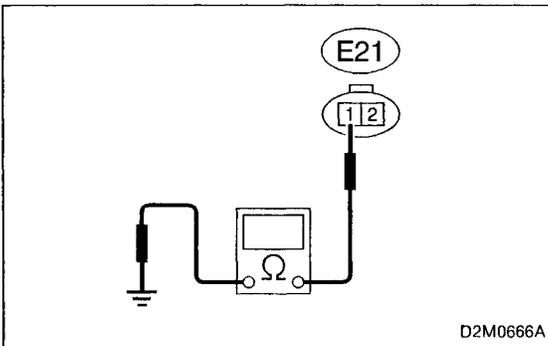
YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor 1 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

NO : Go to next **CHECK** .



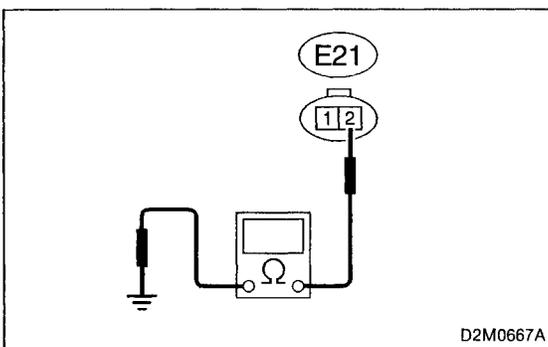
CHECK : **Connector & terminal (E21) No. 1 — Engine ground:**
Is the resistance less than 10 Ω?

YES : Repair short circuit in harness between crankshaft position sensor 1 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 (E21) No. 2 — Engine ground:**
Is the resistance less than 5 Ω?

YES : Go to step **10AH2**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

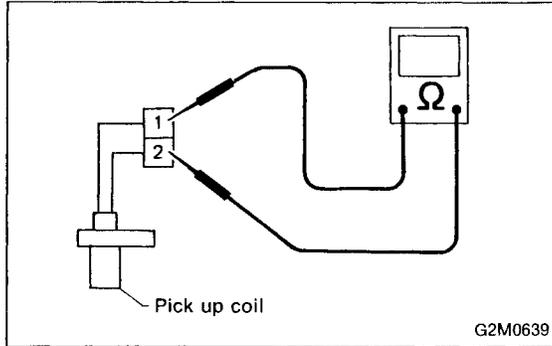
- Open circuit in harness between crankshaft position sensor 1 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

10AH2	CHECK CRANKSHAFT POSITION SENSOR 1.
--------------	--

CHECK : *Is the crankshaft position sensor 1 installation bolt tightened securely?*

YES : Go to next step 1).

NO : Tighten crankshaft position sensor 1 installation bolt securely.

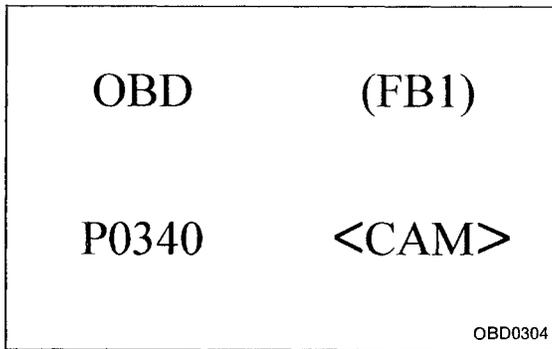


- 1) Remove crankshaft position sensor 1.
- 2) Measure resistance between connector terminals of crankshaft position sensor 1.

CHECK : **Terminals**
No. 1 — No. 2:
Is the resistance between 1 and 4 kΩ?

YES : Repair poor contact in crankshaft position sensor 1 connector.

NO : Replace crankshaft position sensor 1.



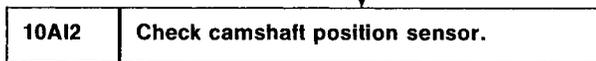
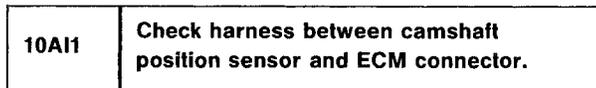
AI: DTC P0340
— CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION (CAM) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

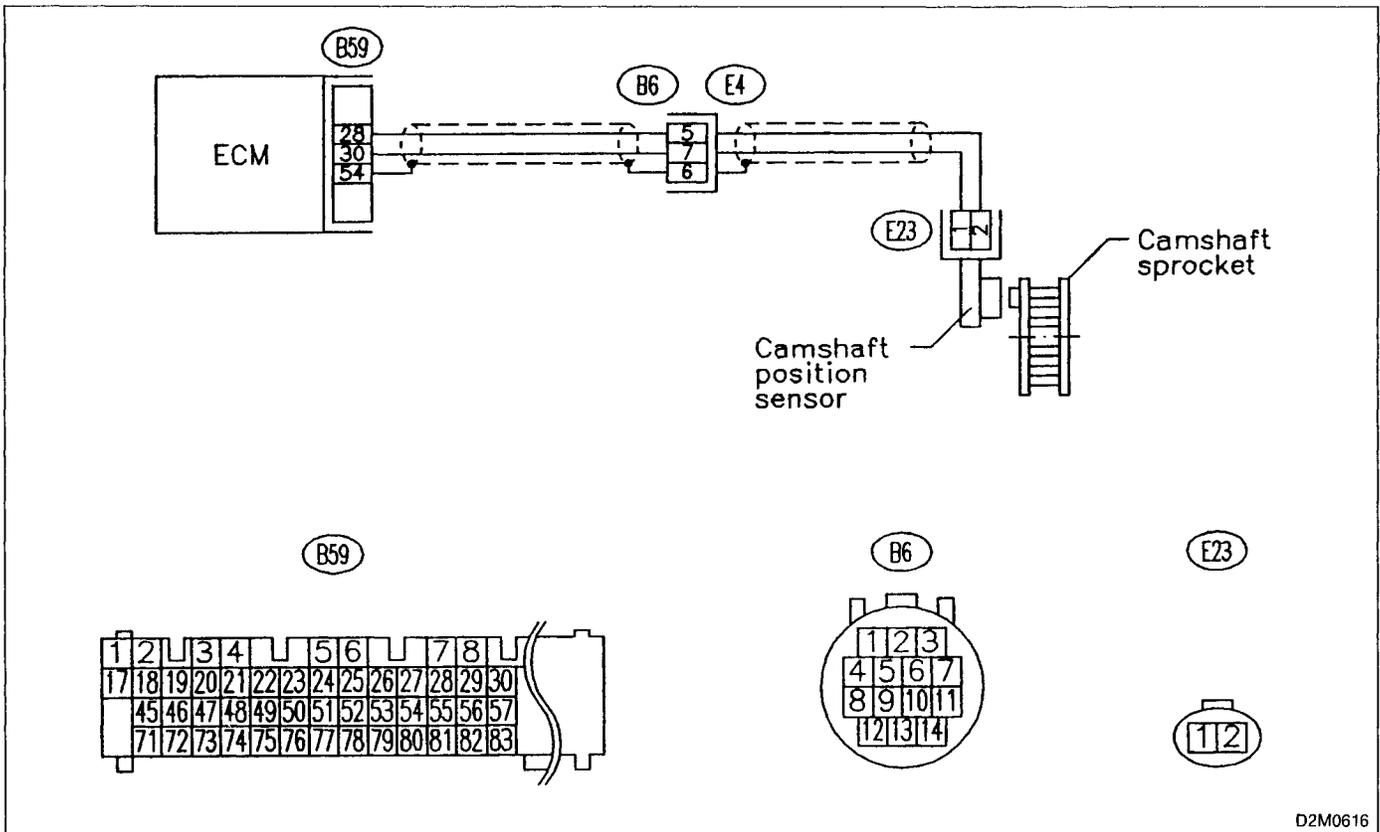


CAUTION:

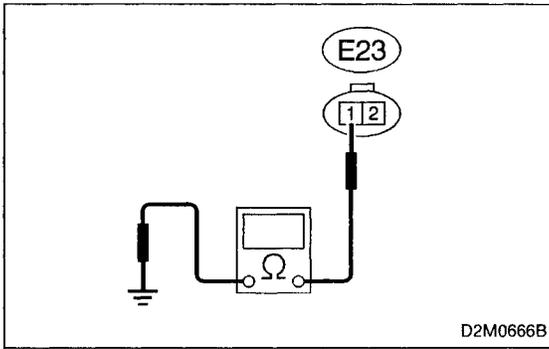
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0616



10A11 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.

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

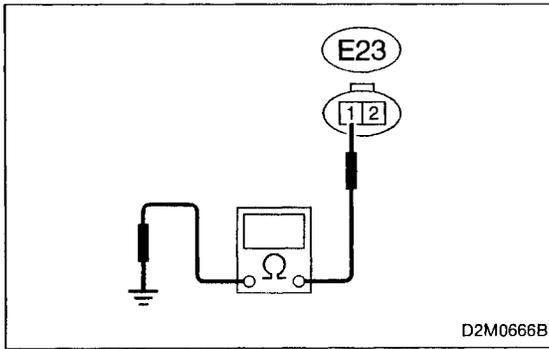
CHECK : **Connector & terminal (E23) No. 1 — Engine ground:**
Is the resistance more than 100 kΩ?

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 (B6)

NO : Go to next **CHECK** .

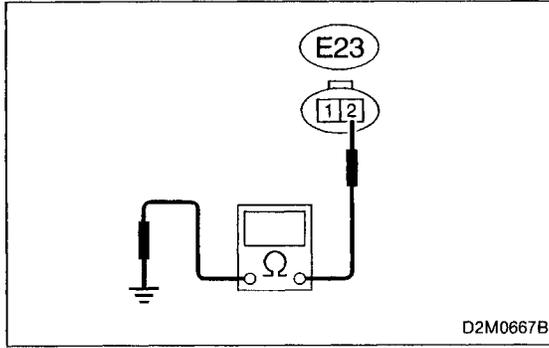


CHECK : **Connector & terminal (E23) No. 1 — Engine ground:**
Is the resistance less than 10 Ω?

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 (E23) No. 2 — Engine ground:**
Is the resistance less than 5 Ω?

YES : Go to step **10A12**.

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 (B6)

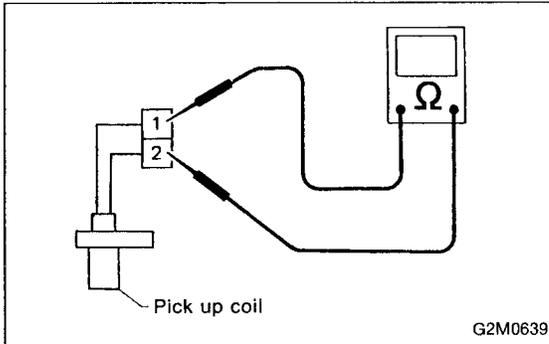
10AI2

CHECK CAMSHAFT POSITION SENSOR.

CHECK : *Is the camshaft position sensor installation bolt tightened securely?*

YES : Go to next step 1).

NO : Tighten camshaft position sensor installation bolt securely.



1) Remove camshaft position sensor.

2) Measure resistance between connector terminals of camshaft position sensor.

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>	

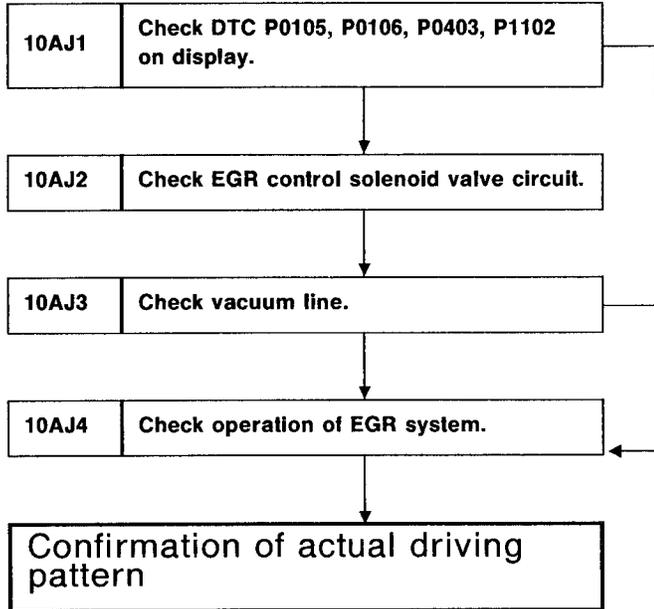
AJ: DTC P0400
— EXHAUST GAS RECIRCULATION FLOW MALFUNCTION (EGR) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Poor driving performance on low engine speed

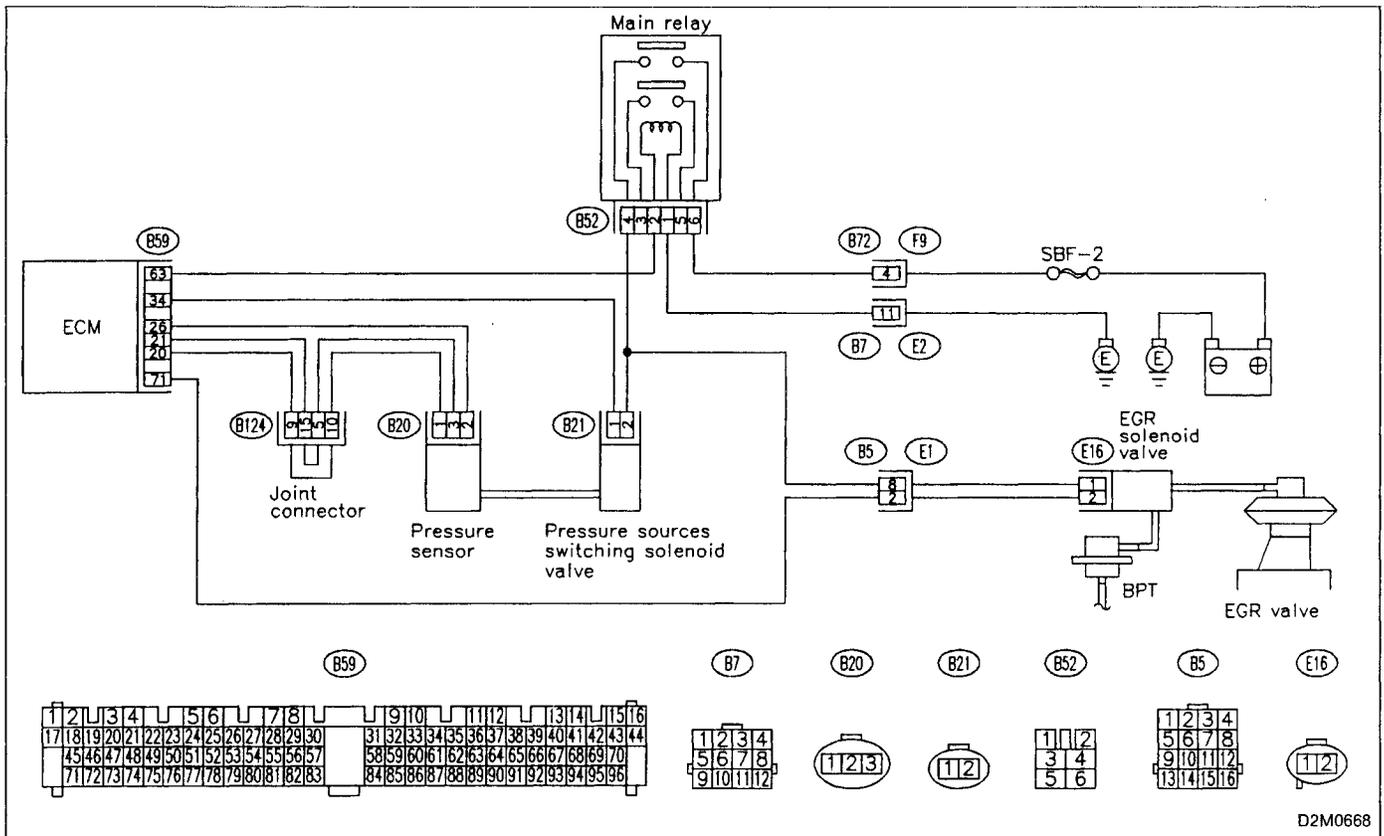


CAUTION:

Before confirmation of actual driving pattern, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0668

10AJ1 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 2-7b [T1000]"☆5.
● 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 **10AJ2.**

10AJ2	CHECK EGR CONTROL SOLENOID VALVE CIRCUIT.
--------------	--

1) Perform clear memory mode. <Ref. to 2-7b [T3D0].☆5>

2) Perform inspection mode. <Ref. to 2-7b [T3E0].☆5>

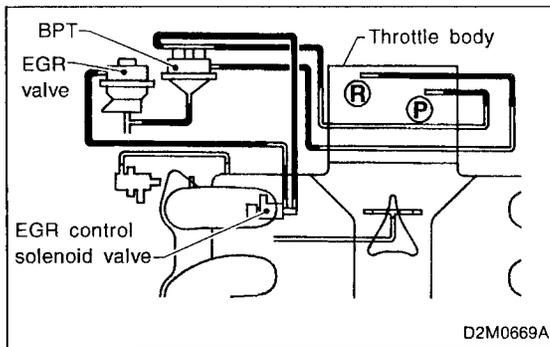
CHECK : **Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0403?**

YES : Check EGR control solenoid valve circuit. <Ref. to 2-7b [T10AK0].☆5>

NOTE:

In this case, it is not necessary to inspect DTC P0400.

NO : Go to step **10AJ3**.



10AJ3	CHECK VACUUM LINE.
--------------	---------------------------

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

NOTE:

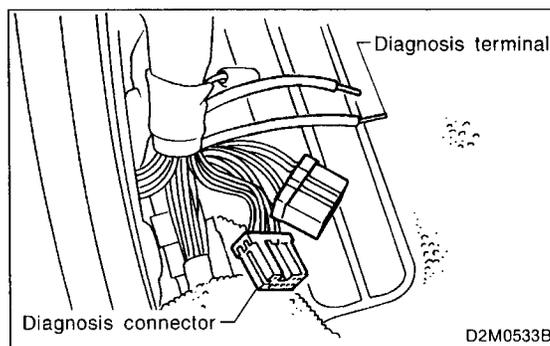
Check the following items.

- 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 control solenoid valve and BPT
- Disconnection, leakage and clogging of the vacuum hose between EGR control 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 **10AJ4**.



10AJ4	CHECK OPERATION OF EGR SYSTEM.
--------------	---------------------------------------

1) Turn ignition switch to OFF.

2) Connect diagnosis terminal into diagnosis connector (terminal No. 1).

3) Turn ignition switch to ON.

CHECK : **Does EGR control solenoid valve produce operating sound?**

YES : Go to next step 4).

NO : Replace EGR control solenoid valve.

- 4) Turn ignition switch to OFF.
- 5) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5>
- 6) Disconnect connector from EGR control solenoid valve.
- 7) Connect 12 V battery's ground \ominus terminal to one terminal of the EGR control 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.

- 8) Start the engine.

CHECK : **Does EGR valve operate at a throttle valve opening of 5 to 10 degrees with visually check?**

NOTE:

As it is impossible to see the EGR valve directly, use mirror to check visually.

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.**

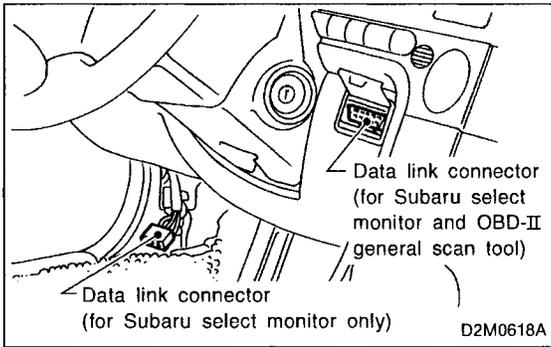
NO : Clean EGR valve. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

CAUTION:

Do not use solvent when cleaning EGR valve assembly, as it can damage diaphragm.

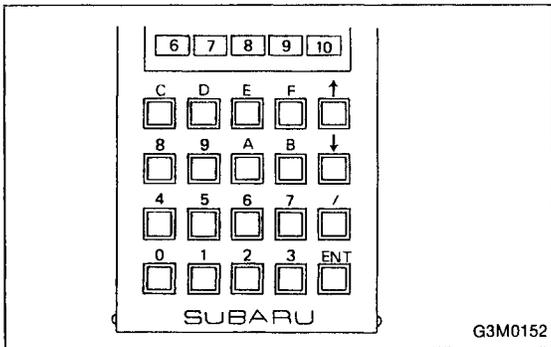
NOTE:

- 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.



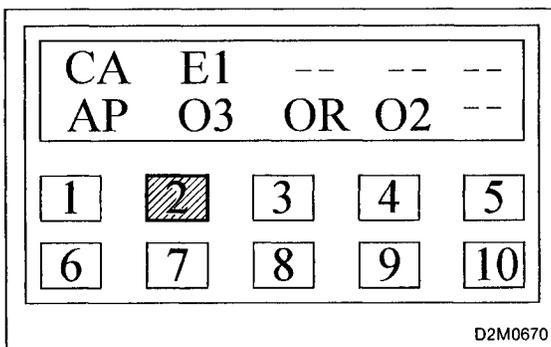
CONFIRMATION OF ACTUAL DRIVING PATTERN.

- 1) Conduct CLEAR MEMORY and INSPECTION MODES. <Ref. to 2-7b [T3D0] and [T3E0].☆5>
- 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

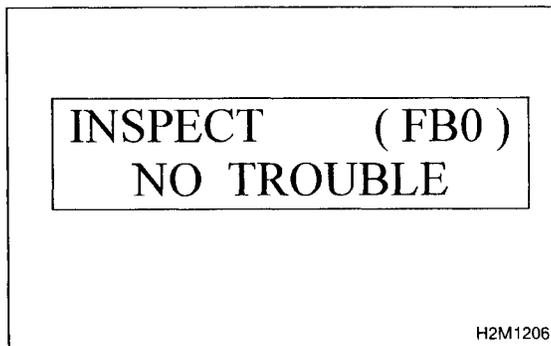


- 6) Drive at 88 ± 5 km/h (55 ± 3 MPH) until the LED No. 2 comes on.

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.

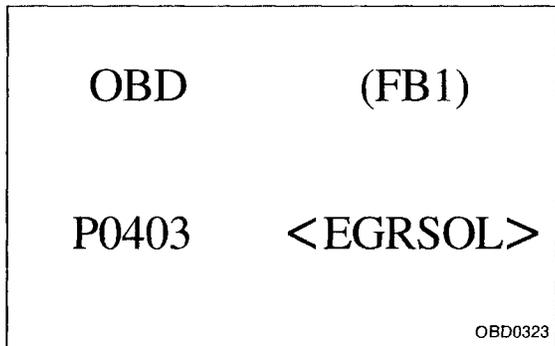
Put the gear to "D" range for the diagnosis.



- 7) Designate mode using function key.

Function mode: FB0

- 8) Confirm the "No trouble" indication on Subaru select monitor.



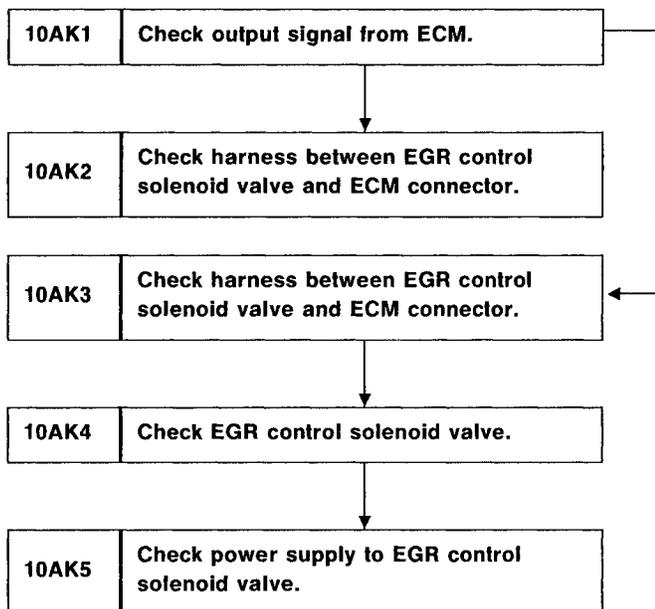
AK: DTC P0403
— EXHAUST GAS RECIRCULATION CIRCUIT MALFUNCTION (EGRSOL) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

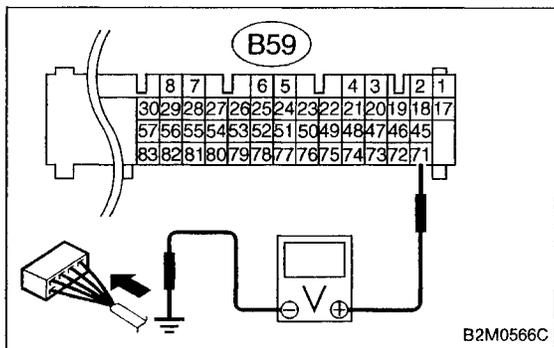
- Poor driving performance on low engine speed



CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >



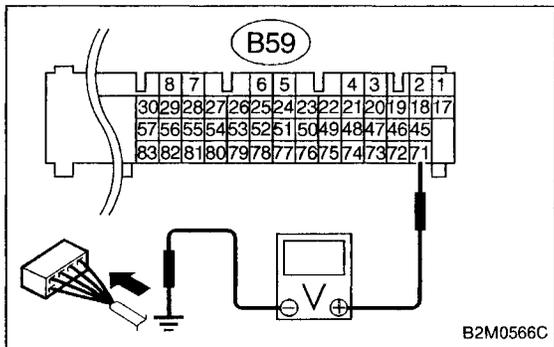
10AK1 CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK : **Connector & terminal (B59) No. 71 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Go to step 10AK2.

NO : Go to step 10AK3.



10AK2 CHECK HARNESS BETWEEN EGR CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5 >
- 3) Disconnect connector from EGR control solenoid valve.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between ECM and chassis ground.

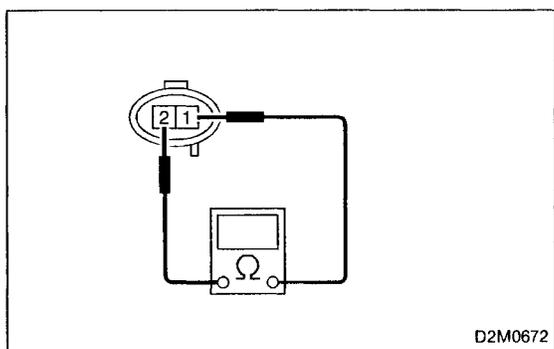
CHECK : **Connector & terminal (B59) No. 71 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Repair short circuit in harness and replace ECM.

NOTE:

The harness between ECM and EGR control solenoid valve is in short circuit.

NO : Go to next step 6).



- 6) Turn ignition switch to OFF.
- 7) Remove EGR control solenoid valve. <Ref. to 2-1 [W7A0].☆5 >
- 8) Measure resistance between EGR control solenoid valve terminals.

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

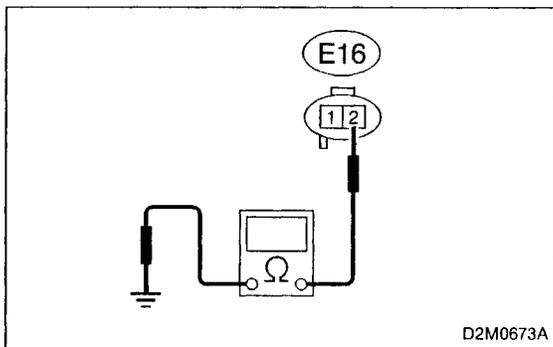
YES : Replace EGR control solenoid valve and ECM.

NO : Go to next **CHECK** .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



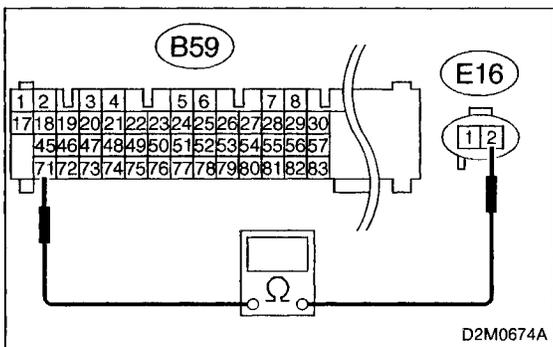
10AK3 **CHECK HARNESS BETWEEN EGR CONTROL SOLENOID VALVE AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5>
- 3) Disconnect connectors from EGR control solenoid valve and ECM.
- 4) Measure resistance of harness between EGR control solenoid valve connector and engine ground.

CHECK : **Connector & terminal (E16) No. 2 — Engine ground: Is the resistance less than 10 Ω?**

YES : Repair short circuit in harness between ECM and EGR control solenoid valve connector.

NO : Go to next step 5).



- 5) Measure resistance of harness between ECM and EGR control solenoid valve connector.

CHECK : **Connector & terminal (B59) No. 71 — (E16) No. 2: Is the voltage less than 1 Ω?**

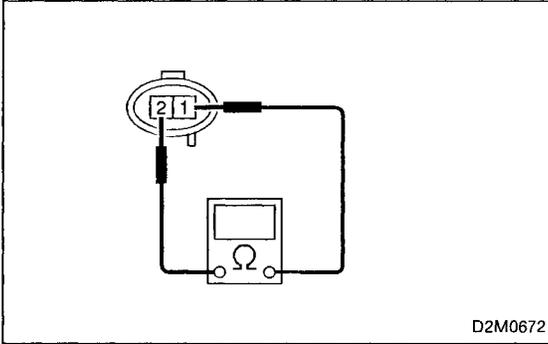
YES : Go to step **10AK4**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and EGR control solenoid valve connector
- Poor contact in coupling connector (B5)

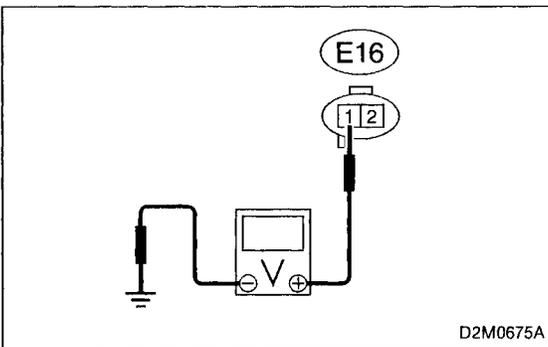
**10AK4 CHECK EGR CONTROL SOLENOID VALVE.**

- 1) Remove EGR control solenoid valve. <Ref. to 2-1 [W7A0].☆5>
- 2) Measure resistance between EGR control solenoid valve terminals.

CHECK : **Terminals**
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **10AK5**.

NO : Replace EGR control solenoid valve.

**10AK5 CHECK POWER SUPPLY TO EGR CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to ON.
- 2) Measure voltage between EGR control solenoid valve connector and engine ground.

CHECK : **Connector & terminal**
(E16) No. 1 (+) — Engine 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 EGR control solenoid valve
- Poor contact in coupling connector (B5)

CHECK : **Is there poor contact in EGR control solenoid valve connector?**

YES : Repair poor contact in EGR 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)
P0420	<CAT>
OBD0329	

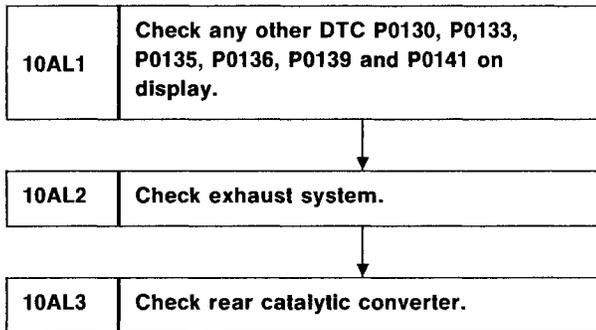
AL: DTC P0420
— CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD (CAT) —

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.

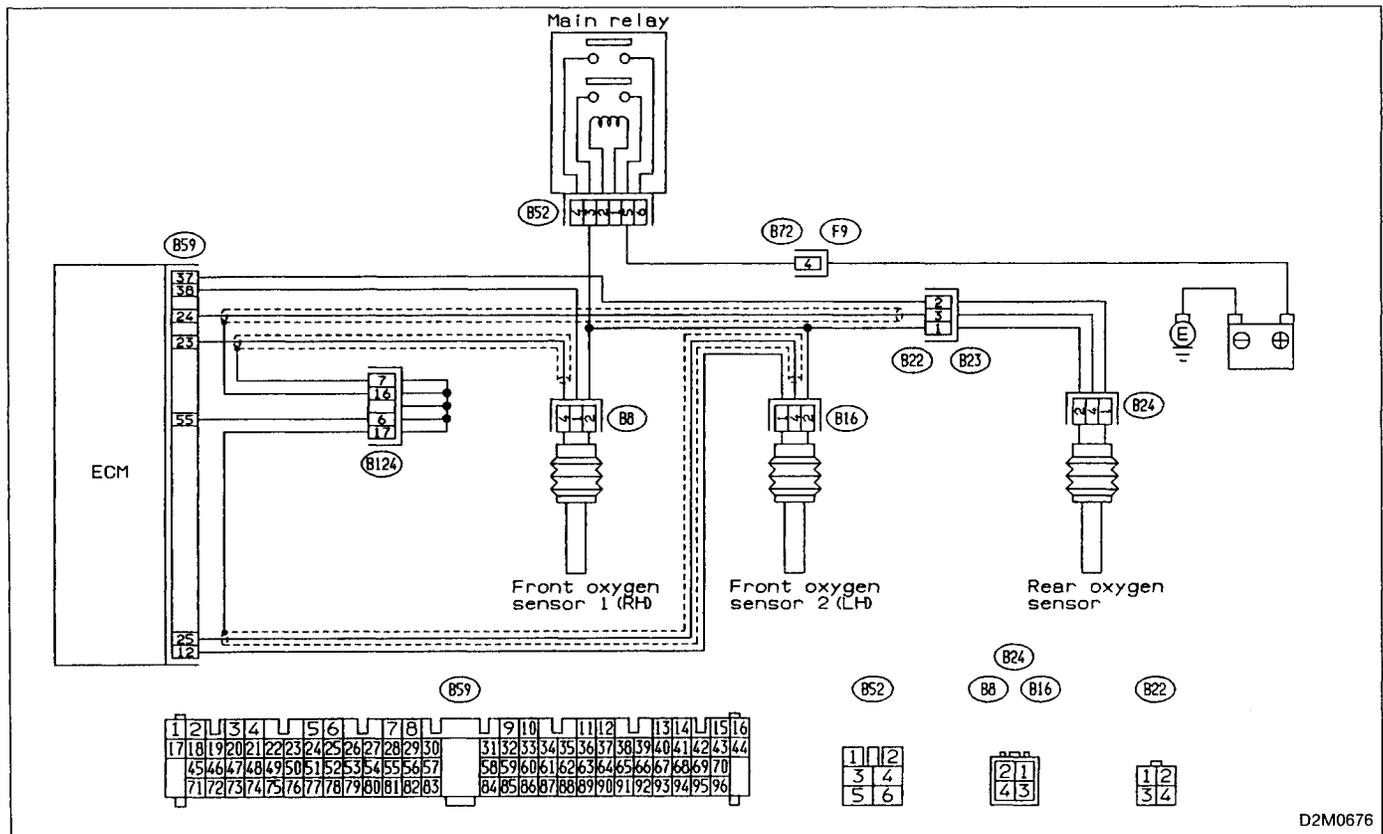


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



10AL1	CHECK ANY OTHER DTC P0130, P0133, P0135, P0136, P0139 AND P0141 ON DISPLAY.
--------------	--

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0130, P0133, P0135, P0136, P0139 and P0141?*

YES : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

NOTE:

In this case, it is not necessary to inspect DTC P0420.

NO : Go to step **10AL2**.

10AL2	CHECK EXHAUST SYSTEM.
--------------	------------------------------

Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.

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

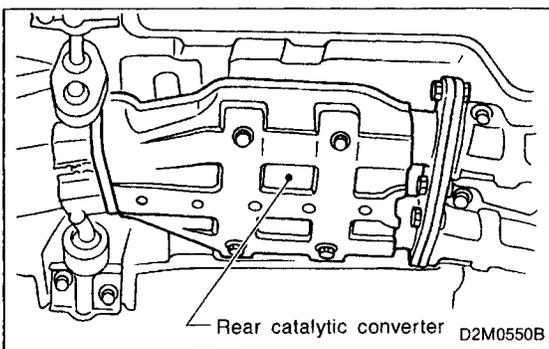
NOTE:

Check the following positions.

- Between cylinder heads and exhaust manifolds
- Between exhaust manifolds and front exhaust pipes
- Between front exhaust pipes and rear catalytic converter

YES : Repair or replace exhaust system.

NO : Go to step **10AL3**.



10AL3	CHECK REAR CATALYTIC CONVERTER.
--------------	--

Separate rear catalytic converter from front exhaust pipes.

CHECK : *Is there damage at front face of rear catalyst?*

YES : Replace front and rear catalytic converters.

NO : Replace front catalytic converters.

OBD	(FB1)
P0441	<CPC_F>
OBD0331	

AM: DTC P0441
— EVAPORATIVE EMISSION CONTROL SYSTEM INCORRECT PURGE FLOW (CPC — F) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

10AM1 Check any other DTC P0105, P0106, P0443 and P1102 on display.

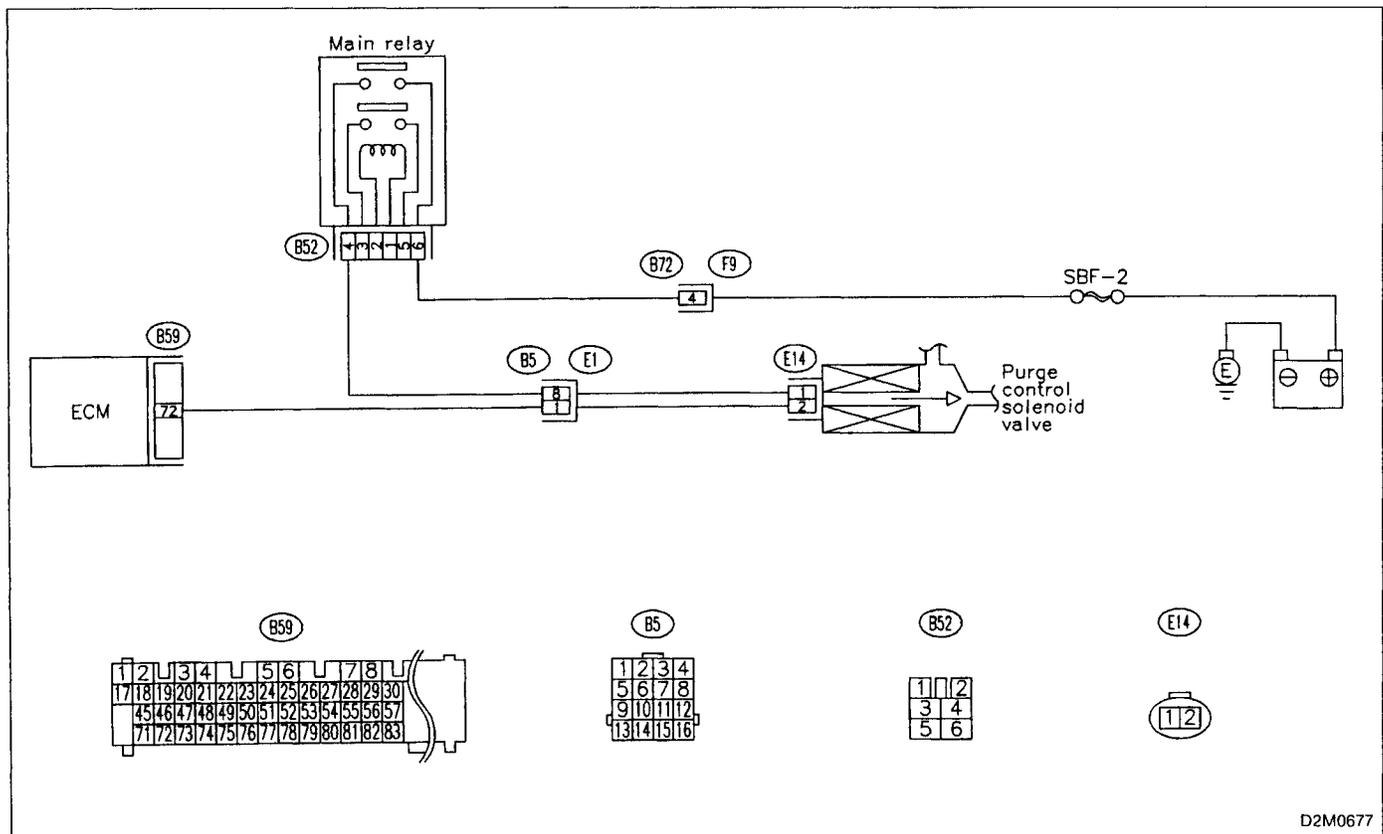
10AM2 Check purge control solenoid valve operation.

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0677

10AM1	CHECK ANY OTHER DTC P0105, P0106, P0443 AND P1102 ON DISPLAY.
--------------	--

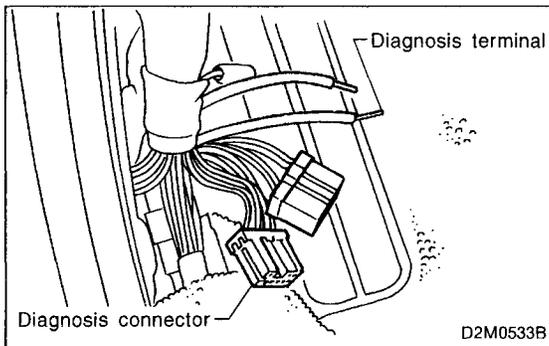
CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0105, P0106, P0443, and P1102?*

YES : Inspect the relevant DTC using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

NOTE:

In this case, it is not necessary to inspect DTC P0441.

NO : Go to step **10AM2**.



10AM2	CHECK PURGE CONTROL SOLENOID VALVE OPERATION.
--------------	--

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal into diagnosis connector (terminal No. 1).
- 3) Turn ignition switch to ON.

CHECK : *Does purge control solenoid valve produce operating sound at about 0.3 Hz?*

YES : Go to next step 4).

NO : Replace purge control solenoid valve.

- 4) Disconnect canister purge hose from canister.

CHECK : *Does pulsation occur by blowing through the canister purge hose?*

YES : Repair or replace evaporation line.

NOTE:

In this case, repair the following:

- Loose connections in evaporation line
- Cracks in evaporation line
- Clogging in evaporation line

NO : Replace purge control solenoid valve.

OBD	(FB1)
P0443	<CPC>
<small>OBD0335</small>	

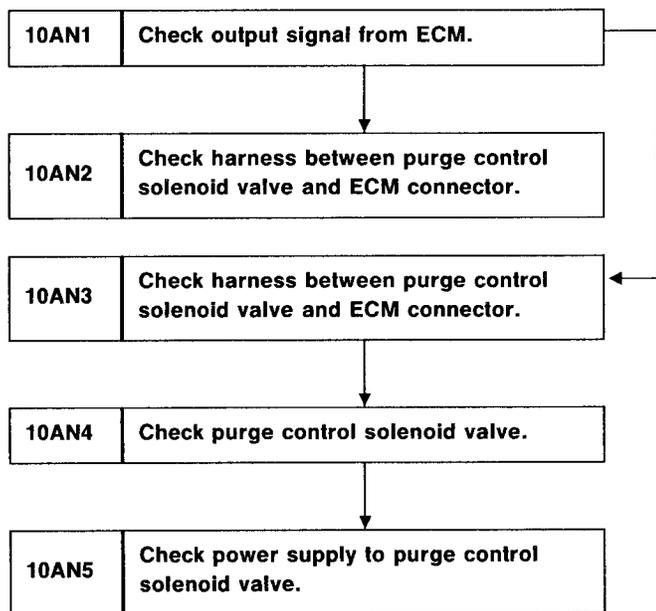
AN: DTC P0443
— EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT MALFUNCTION (CPC) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Erroneous idling

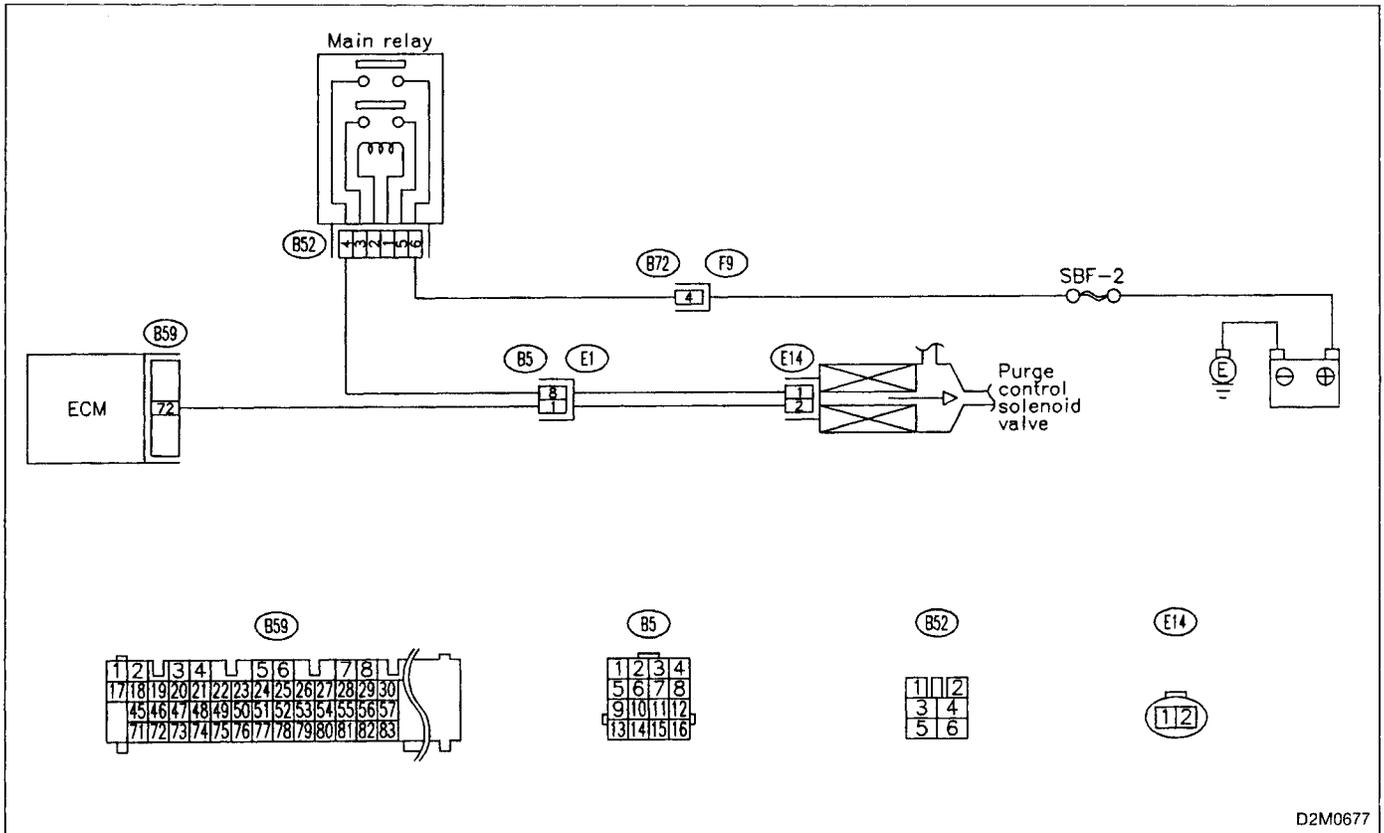


CAUTION:

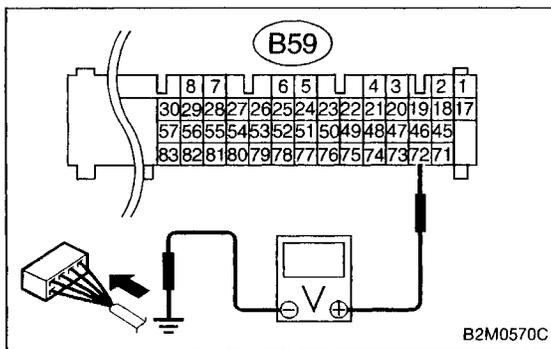
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0677



B2M0570C

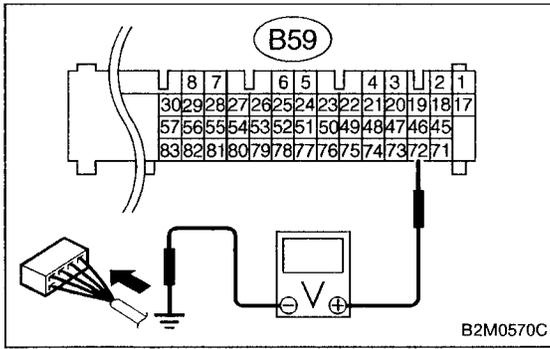
10AN1 CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK : Connector & terminal
(B59) No. 72 (+) — Chassis ground (—):
Is the voltage more than 10 V?

YES : Go to step 10AN2.

NO : Go to step 10AN3.



10AN2

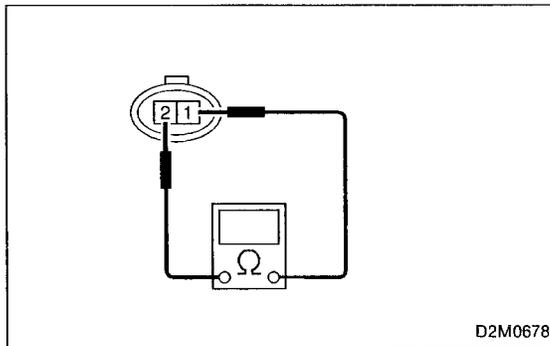
CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5>
- 3) Disconnect connector from purge control solenoid valve.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) 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 6).



- 6) Turn ignition switch to OFF.
- 7) Remove purge control solenoid valve. <Ref. to 2-1 [W4A0].☆5>
- 8) Measure resistance between purge control solenoid valve terminals.

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

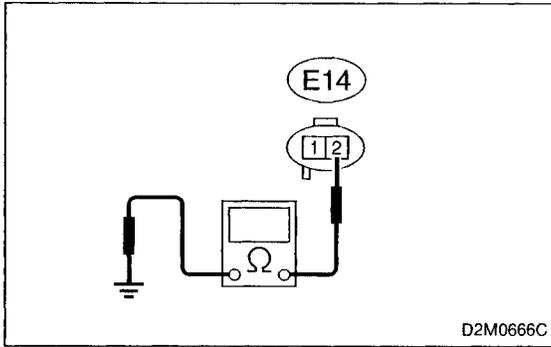
YES : Replace purge control solenoid valve and ECM.

NO : Go to next **CHECK** .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



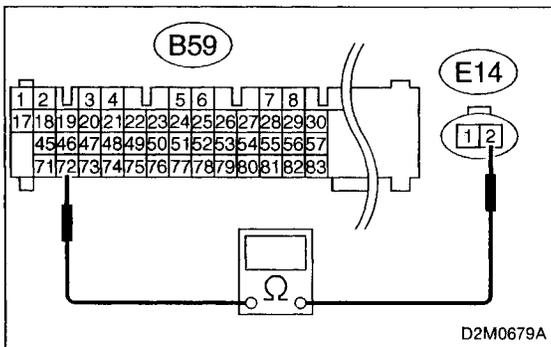
10AN3

CHECK HARNESS BETWEEN PURGE CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5>
- 3) Disconnect connectors from purge control solenoid valve and ECM.
- 4) Measure resistance of harness between purge control solenoid valve connector and engine ground.

CHECK : **Connector & terminal (E14) 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 5).



- 5) Measure resistance of harness between ECM and purge control solenoid valve of harness connector.

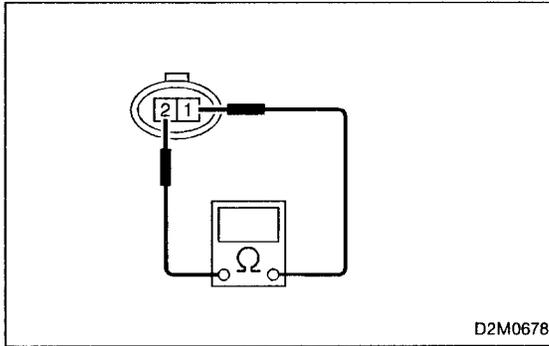
CHECK : **Connector & terminal (B59) No. 72 — (E14) No. 2: Is the resistance less than 1 Ω?**

- YES** : Go to step 10AN4.
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and purge control solenoid valve
- Poor contact in coupling connector (B5)



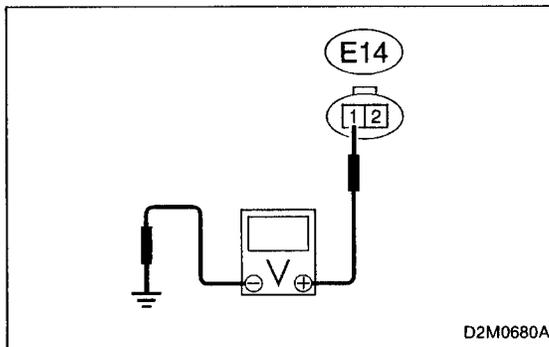
10AN4	CHECK PURGE CONTROL SOLENOID VALVE.
--------------	--

- 1) Remove purge control solenoid valve. <Ref. to 2-1 [W4A0].☆5>
- 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 **10AN5**.

NO : Replace purge control solenoid valve.



10AN5	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**
(E14) No. 1 (+) — Engine 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 purge control solenoid valve
- Poor contact in coupling connector

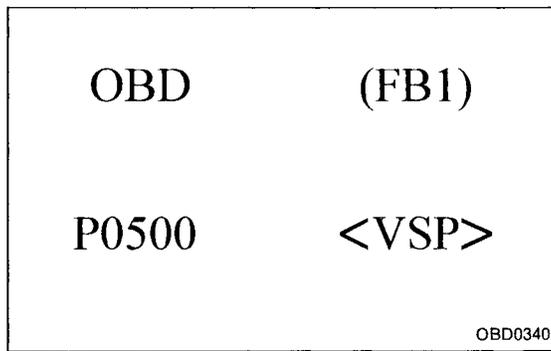
CHECK : **Is there poor contact in purge control solenoid valve connector?**

YES : Repair poor contact in purge control solenoid valve connector.

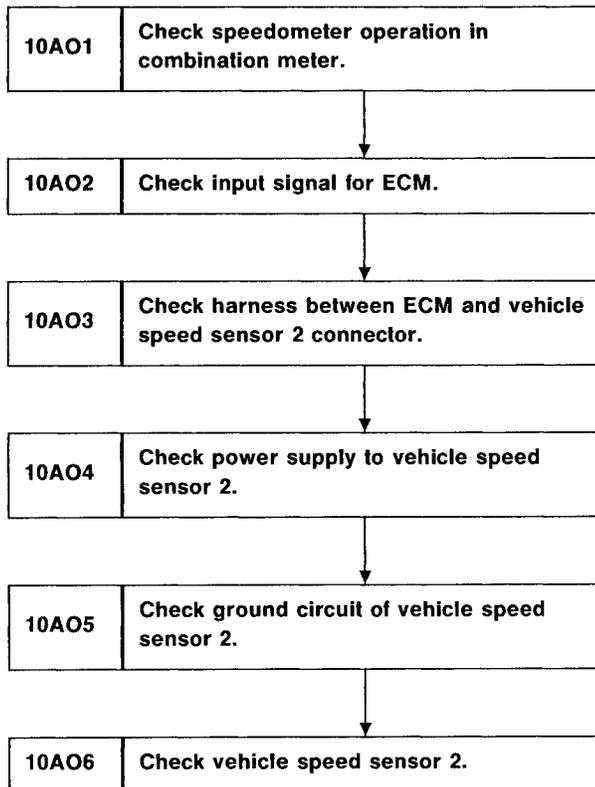
NO : Contact with SOA service.

NOTE:

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

**AO: DTC P0500****— VEHICLE SPEED SENSOR MALFUNCTION (VSP) —****DTC DETECTING CONDITION:**

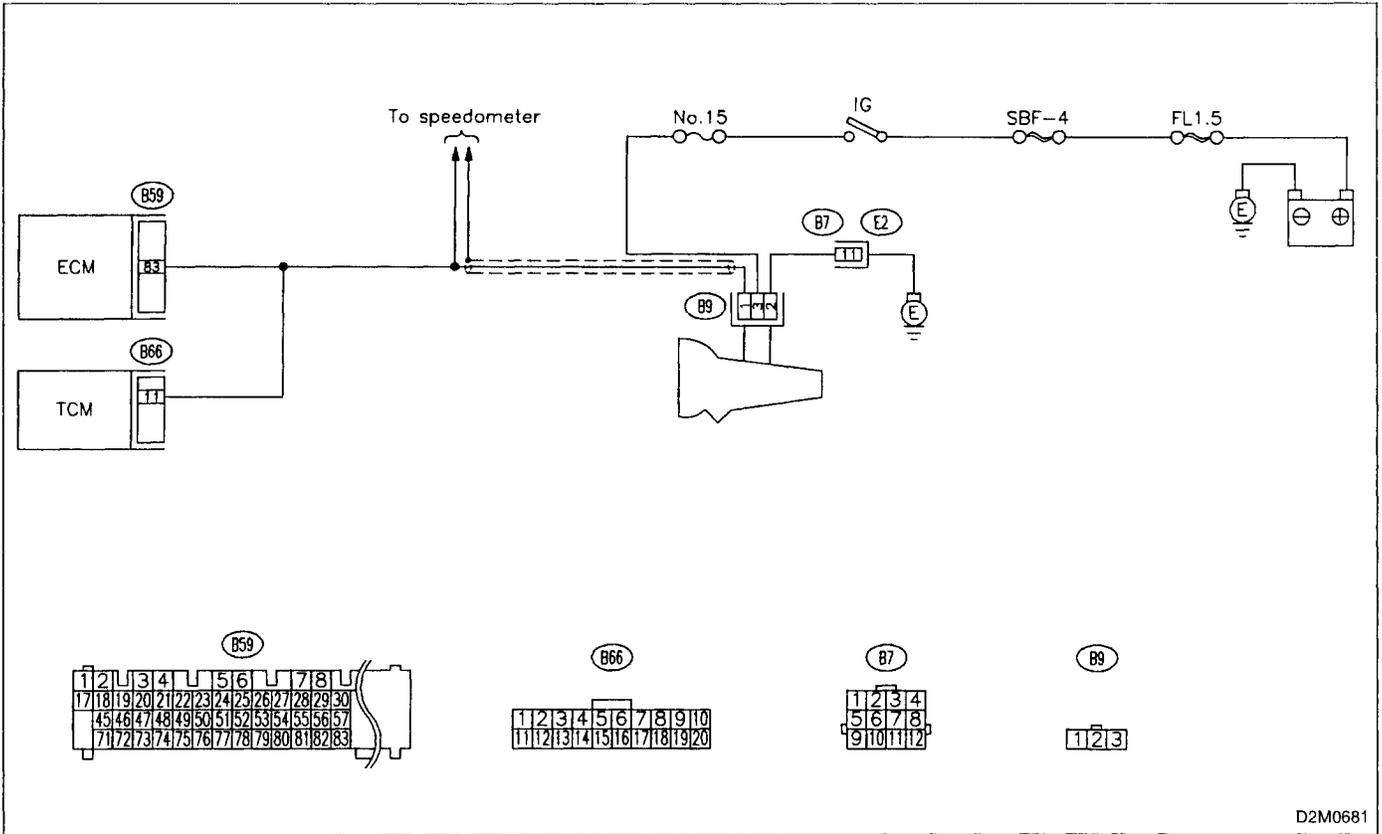
- Immediately at fault recognition

**CAUTION:**

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0681

10A01	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.
--------------	--

- 1) Lift-up the vehicle.
- 2) Start the engine, and drive the wheels.

CHECK : **Does speedometer operate normally?**

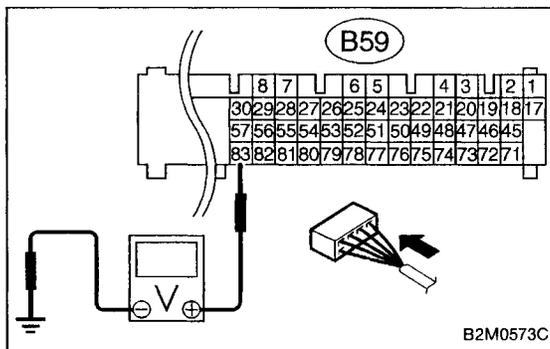
YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and vehicle speed sensor 2
- Poor contact in ECM connector

NO : Go to step **10A02**.



10A02	CHECK INPUT SIGNAL FOR ECM.
--------------	------------------------------------

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from TCM.
- 3) Start the engine, and drive the wheels.
- 4) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 83 (+) — Chassis ground (-): Does the voltage change from 0 to 5 V?**

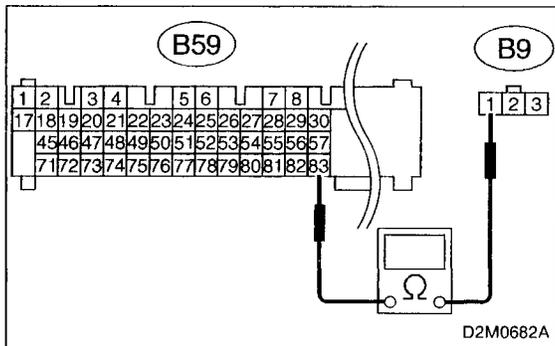
YES : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between vehicle speed sensor 2 and combination meter connector
- Poor contact in ECM connector
- Poor contact in combination meter connector

NO : Go to step **10A03**.

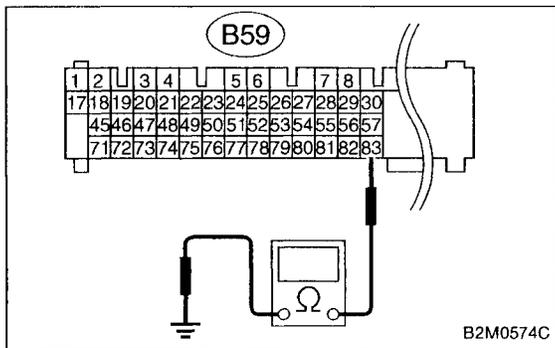


10A03 CHECK HARNESS BETWEEN ECM AND VEHICLE SPEED SENSOR 2 CONNECTOR.

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

CHECK : Connector & terminal
(B59) No. 83 — (B9) No. 1
Is the resistance less than 1 Ω?

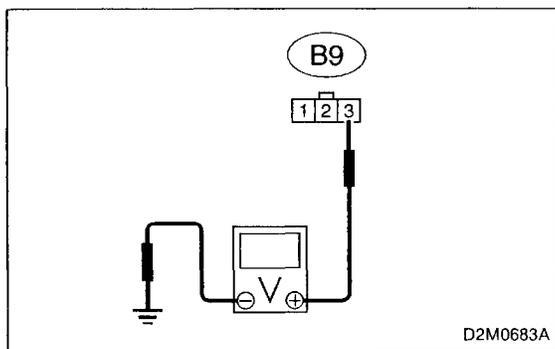
- YES** : Go to next step 4).
- NO** : Repair open circuit in harness between ECM and vehicle speed sensor 2.



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

CHECK : Connector & terminal
(B59) No. 83 — Chassis ground:
Is the resistance less than 10 Ω?

- YES** : Repair short circuit in harness between ECM and vehicle speed sensor 2 connector.
- NO** : Go to step **10A04**.

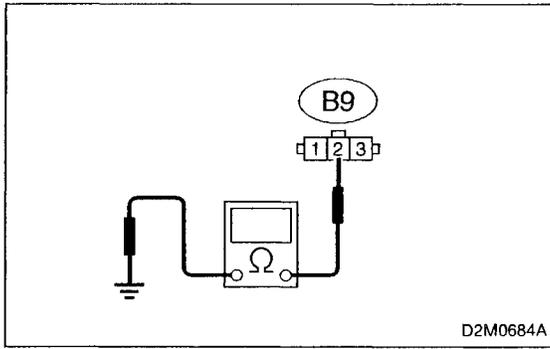


10A04 CHECK POWER SUPPLY TO VEHICLE SPEED SENSOR 2.

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

CHECK : Connector & terminal
(B9) No. 3 (+) — Engine ground (-):
Is the voltage more than 10 V?

- YES** : Go to step **10A05**.
- NO** : Repair power supply circuit of vehicle speed sensor 2.



10A05 CHECK GROUND CIRCUIT OF VEHICLE SPEED SENSOR 2.

- 1) Turn ignition switch to OFF.
- 2) Measure resistance of harness between vehicle speed sensor 2 connector and engine ground.

CHECK : **Connector & terminal (B9) No. 2 — Engine ground:**
Is the resistance less than 5 Ω?

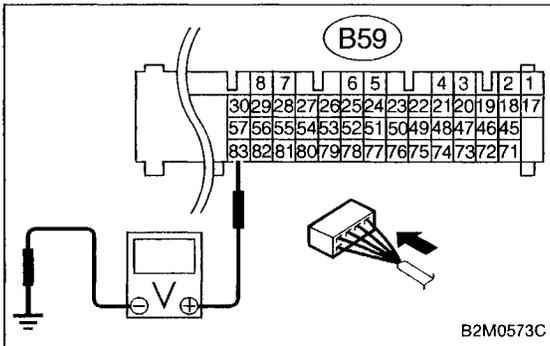
YES : Go to step **10A06**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between vehicle speed sensor 2 connector and engine ground
- Poor contact in coupling connector (B7)



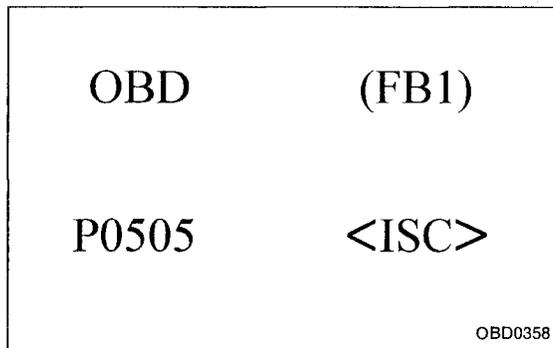
10A06 CHECK VEHICLE SPEED SENSOR 2.

- 1) Remove vehicle speed sensor 2 from transmission.
- 2) Connect connectors to ECM and vehicle speed sensor 2.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM connector and chassis ground, while rotating the key of vehicle speed sensor 2.

CHECK : **Connector & terminal (B59) No. 83 (+) — Chassis ground (-):**
Does the voltage change from 0 to 5 V?

YES : Repair mechanical trouble in transmission.

NO : Replace vehicle speed sensor 2.



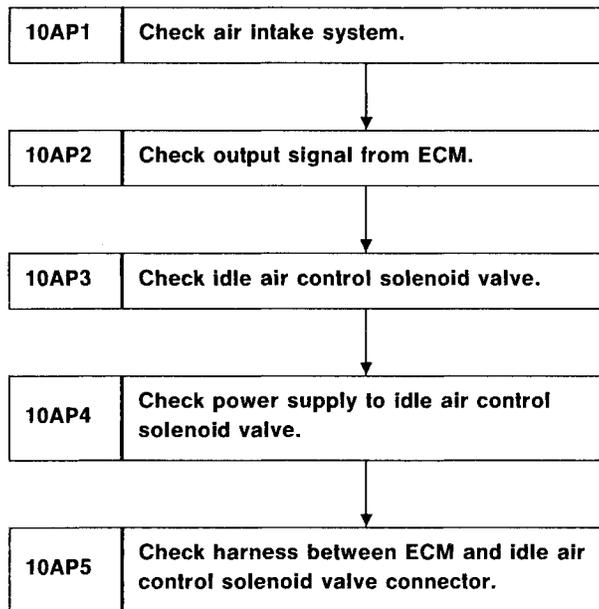
AP: DTC P0505
— IDLE CONTROL SYSTEM MALFUNCTION (ISC) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Engine breathing

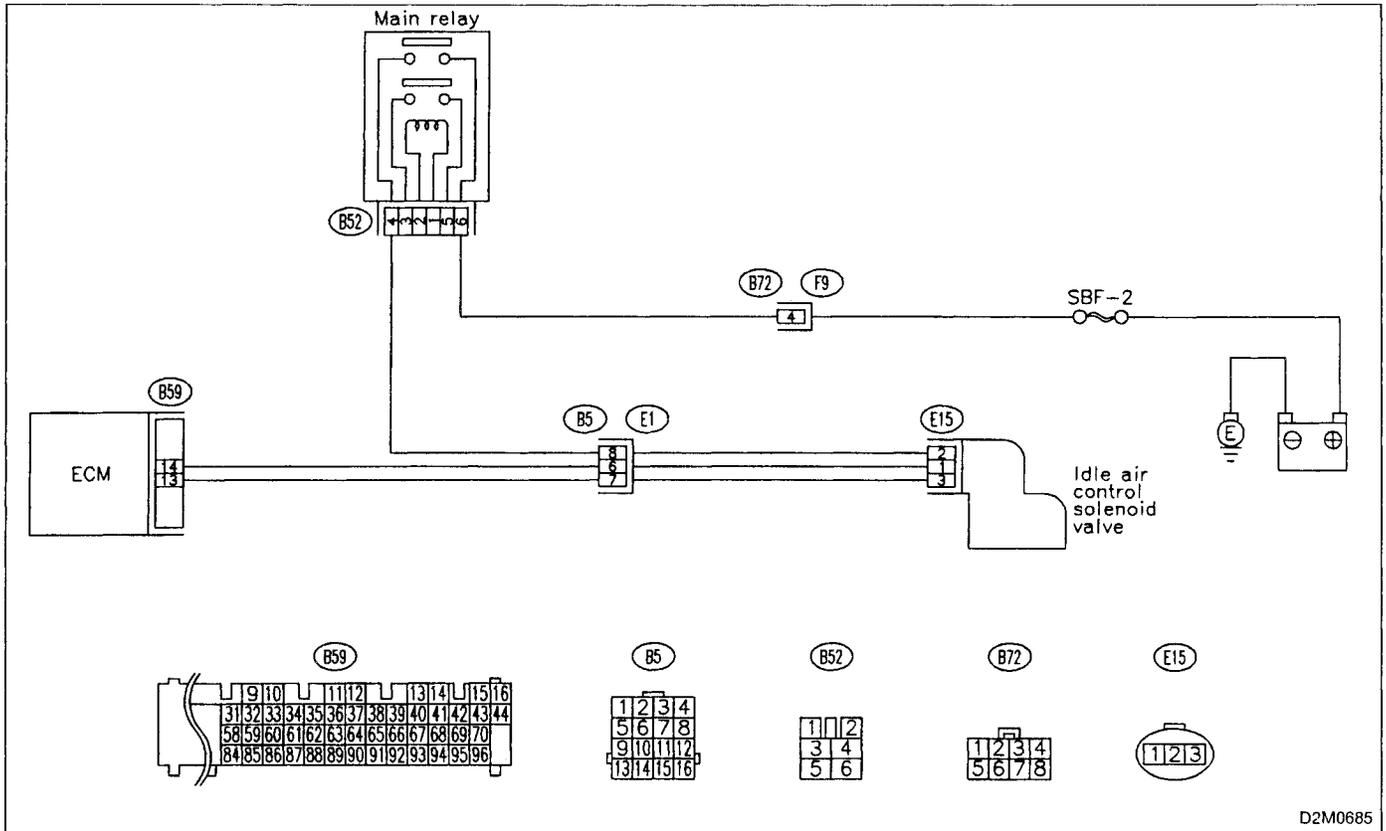


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0685

10AP1 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?*

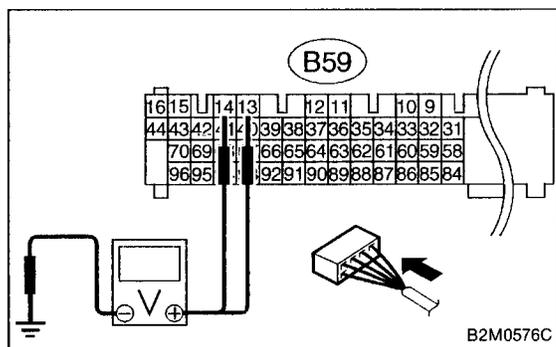
NOTE:

Check the following items.

- Loose installation of intake manifold, collector, idle air control solenoid valve and throttle body
- Cracks of intake manifold gaskets, 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 **10AP2**.

**10AP2 CHECK OUTPUT SIGNAL FROM ECM.**

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

CHECK : **Connector & terminal (B59) No. 13 (+) — Chassis ground (-): Is the voltage more than 3 V?**

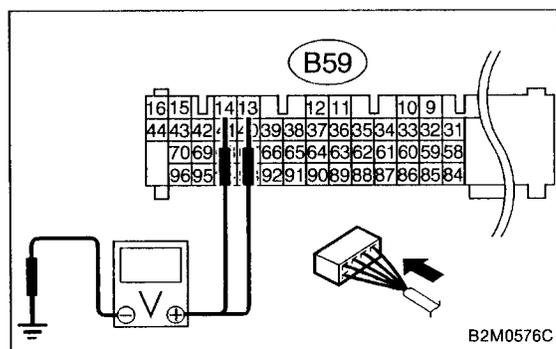
YES : Go to next **CHECK** .

NO : Go to step **10AP4**.

CHECK : **Connector & terminal (B59) No. 14 (+) — Chassis ground (-): Is the voltage more than 3 V?**

YES : Go to next step 3).

NO : Go to step **10AP4**.



- 3) Turn ignition switch to OFF.
- 4) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5>
- 5) Disconnect connector from idle air control solenoid valve.
- 6) Turn ignition switch to ON.
- 7) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) 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 (B59) No. 14 (+) — Chassis ground (-): Is the voltage more than 10 V?**

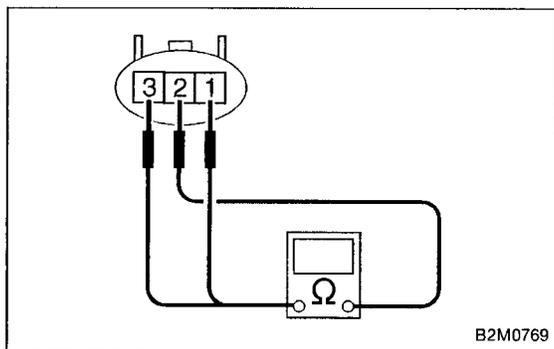
YES : Repair short circuit in harness between ECM and idle air control solenoid valve connector and replace ECM.

NO : Go to next **CHECK** .

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

YES : Repair poor contact in ECM connector.

NO : Go to step **10AP3**.



10AP3 CHECK IDLE AIR CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to OFF.
- 2) Remove idle air control solenoid valve. <Ref. to 2-7 [W15A0].☆5>
- 3) 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?

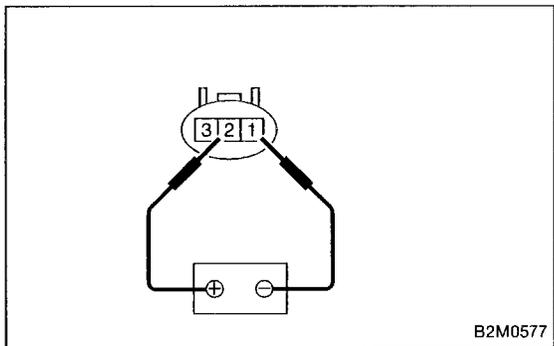
YES : Replace idle air control solenoid valve and ECM.

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 4).

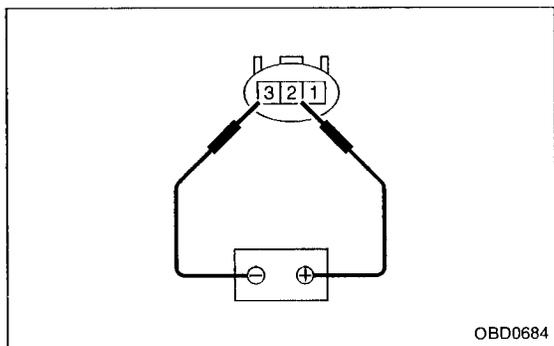


- 4) Check operation of idle air control solenoid valve.

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** .

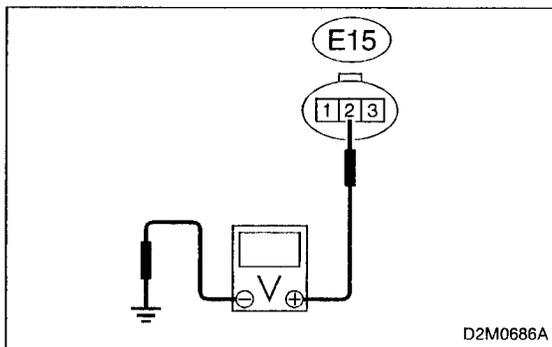
NO : Clean idle air control solenoid valve. <Ref. to 2-7 [W15B0].☆5>



CHECK : **Is idle air control solenoid valve fully closed when applying the battery to terminals No. 2 (+) and No. 3 (-)?**

YES : Go to step **10AP4**.

NO : Clean idle air control solenoid valve. <Ref. to 2-7 [W15B0].☆5>

**10AP4****CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.**

- 1) Turn ignition switch to OFF.
- 2) Remove air intake boot. <Ref. to 2-7 [W1A0].☆5>
- 3) Disconnect connector from idle air control solenoid valve.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between idle air control solenoid valve and engine ground.

CHECK : **Connector & terminal (E15) No. 2 (+) — Engine ground (-): Is the voltage more than 10 V?**

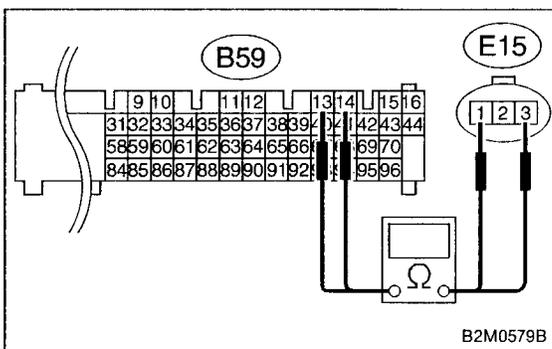
YES : Go to step **10AP5**.

NO : Repair harness connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between idle air control solenoid valve and main relay connector
- Poor contact in coupling connector (B5)

**10AP5****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 (B59) No. 13 — (E15) No. 1: 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 idle air control solenoid valve connector
- Poor contact in coupling connector (B5)

CHECK : **Connector & terminal (B59) No. 13 — (E15) No. 3: Is the resistance less than 1 Ω?**

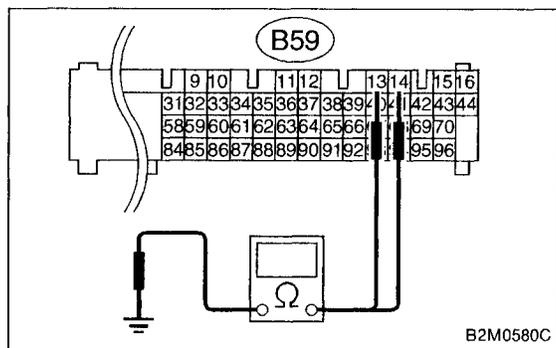
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and idle air control solenoid valve connector
- Poor contact in coupling connector (B5)



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

CHECK : **Connector & terminal (B59) 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 (B59) No. 14 — 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** .

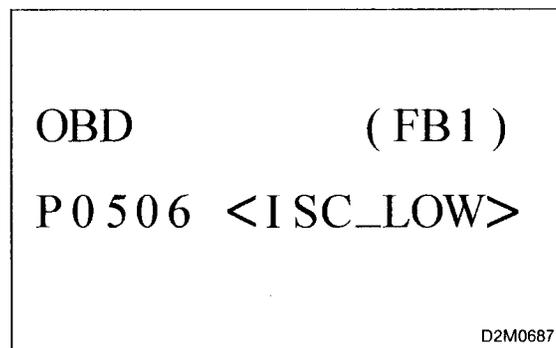
CHECK : **Is there poor contact in idle air control solenoid valve connector?**

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.



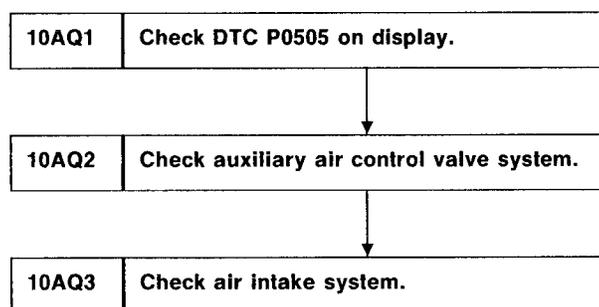
AQ: DTC P0506
— IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED (ISC — LOW) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Engine is difficult to start.
- Engine does not start.
- Erroneous idling
- Engine stalls.



CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

10AQ1	CHECK DTC P0505 ON DISPLAY.
--------------	------------------------------------

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?*

YES : Inspect DTC P0505 using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

NOTE:

In this case, it is not necessary to inspect DTC P0506.

NO : Go to step **10AQ2**.

10AQ2	CHECK AUXILIARY AIR CONTROL VALVE SYSTEM.
--------------	--

1) Inspect auxiliary air control valve hoses.

CHECK : *Is the auxiliary air control valve hose clogging between auxiliary air control valve and air intake boot?*

YES : Repair auxiliary air control valve hose.

NO : Go to next **CHECK**.

CHECK : *Is the auxiliary air control valve hose clogging between auxiliary air control valve and throttle body?*

YES : Repair auxiliary air control valve hose.

YES : Go to next step 2).

2) Inspect auxiliary air control valve. <Ref. to 2-7 [W17B0].☆5>

CHECK : *Is there a fault in auxiliary air control valve system?*

YES : Repair auxiliary air control valve system.

NO : Go to step **10AQ3**.

10AQ3	CHECK AIR INTAKE SYSTEM.
--------------	---------------------------------

1) Turn ignition switch to ON.

2) Start engine, and idle it.

CHECK : *Is clogging the by-pass hose between idle air control solenoid valve and air intake boot?*

YES : Repair the by-pass line.

NO : Replace idle air control solenoid valve.

<p>OBD (FB1)</p> <p>P0507 <ISC_HI></p> <p style="text-align: right; font-size: small;">D2M0688</p>
--

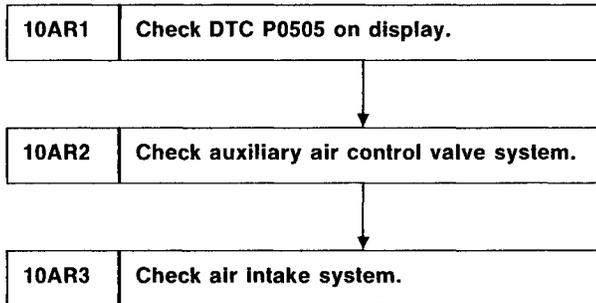
AR: DTC P0507
— IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED (ISC — HI) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.



CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

10AR1 CHECK DTC P0505 ON DISPLAY.

- CHECK** : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0505?
- YES** : Inspect DTC P0505 using "10. Diagnostics Chart with Trouble Code 2-7b [T1000]"☆5.

NOTE:

In this case, it is not necessary to inspect DTC P0507.

- NO** : Go to step **10AR2**.

10AR2 CHECK AUXILIARY AIR CONTROL VALVE SYSTEM.

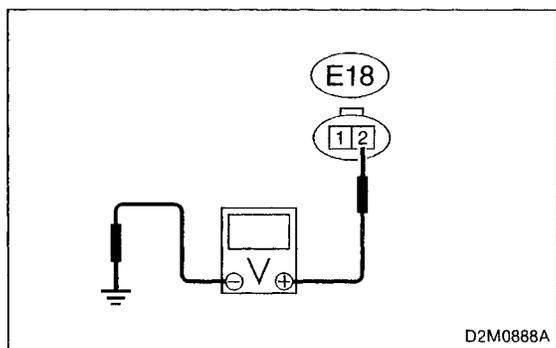
1) Inspect auxiliary air control valve hose.

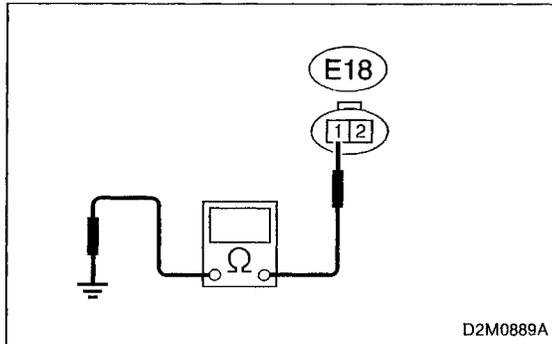
- CHECK** : Is there disconnection of leakage in the auxiliary air control valve hose between auxiliary air control valve and throttle body?
- YES** : Repair auxiliary air control valve hose.
- NO** : Go to next step 2).

- 2) Turn ignition switch OFF.
- 3) Disconnect connector from auxiliary air control valve.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between auxiliary air control valve connector and engine ground.

- CHECK** : Connector & terminal (E18) No. 2 (+) — Engine ground (—): Is the voltage more than 10 V?

- YES** : Go to next step 6).
- NO** : Repair power supply circuit in auxiliary air control valve.





6) Turn ignition switch to OFF.

7) Measure resistance of harness between auxiliary air control valve connector and engine ground.

CHECK : **Connector & terminal (E18) No. 1 — Engine ground:**
Is the resistance less than 5 Ω?

YES : Go to next **CHECK** .

NO : Repair open circuit in harness between auxiliary air control valve connector and engine ground.

CHECK : **Is there poor contact in auxiliary air control valve connector?**

YES : Repair poor contact in auxiliary air control valve connector.

NO : Go to next step 8).

8) Inspect auxiliary air control valve. <Ref. to 2-7 [W17B0].☆5 >

CHECK : **Is there a fault in auxiliary air control valve system?**

YES : Repair auxiliary air control valve system.

NO : Go to step **10AR3**.

10AR3	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, collector, idle air control solenoid valve and throttle body
- Cracks of intake manifold gaskets, 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.

AS: DTC P0600
— SERIAL COMMUNICATION LINK
MALFUNCTION —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

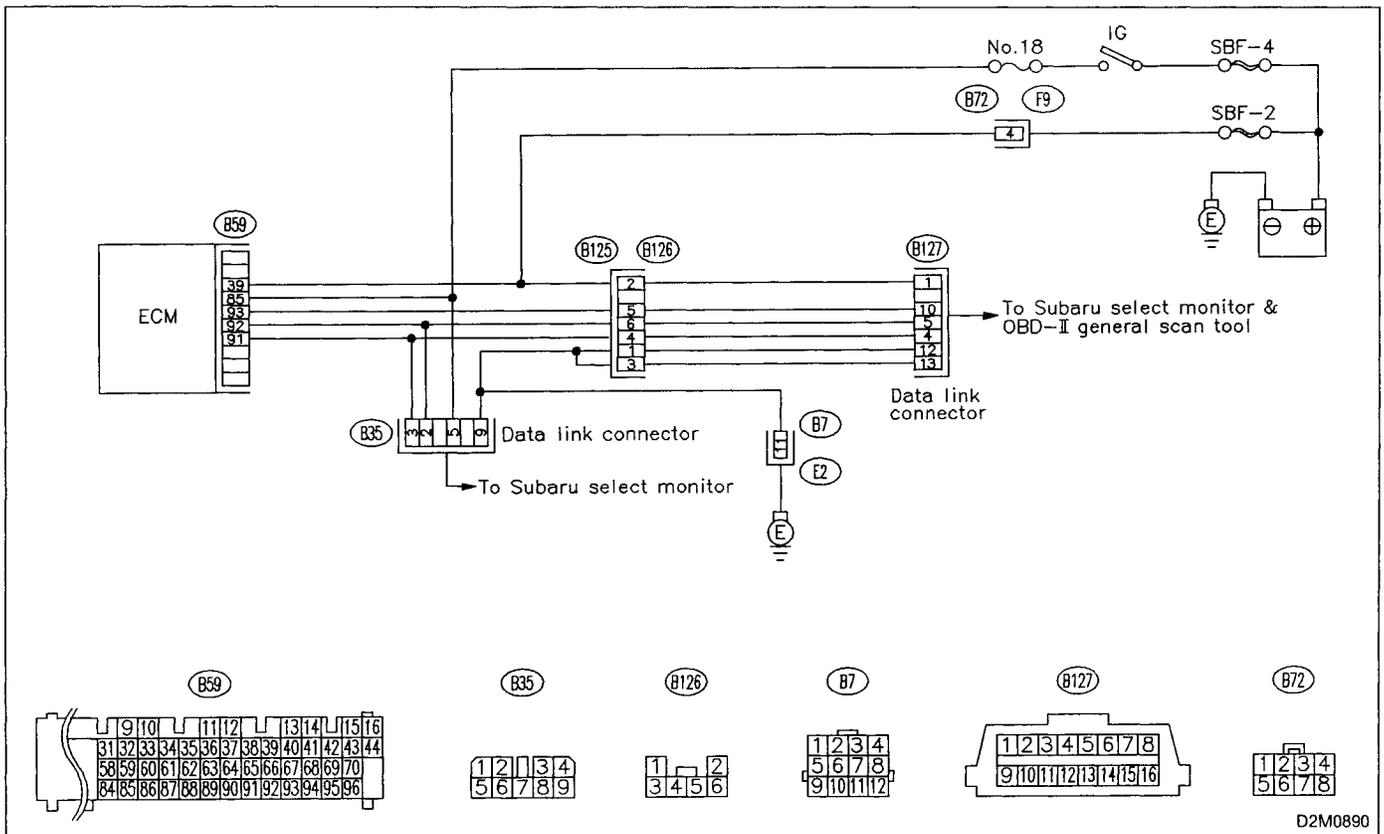
10AS1	Check harness between ECM and data link connector.
-------	--

CAUTION:

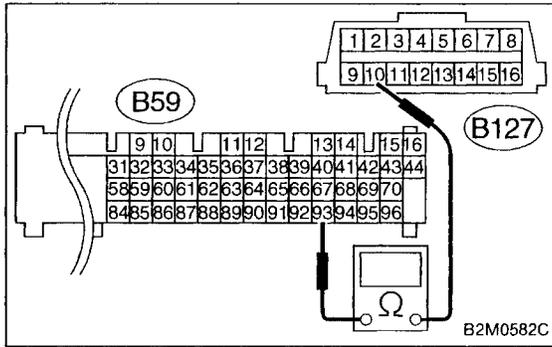
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

< Ref. to 2-7b [T3D0] and [T3E0]. ☆5 >

WIRING DIAGRAM:



D2M0890



10AS1 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 (B59) No. 93 — (B127) No. 10: Is the resistance less than 1 Ω?**

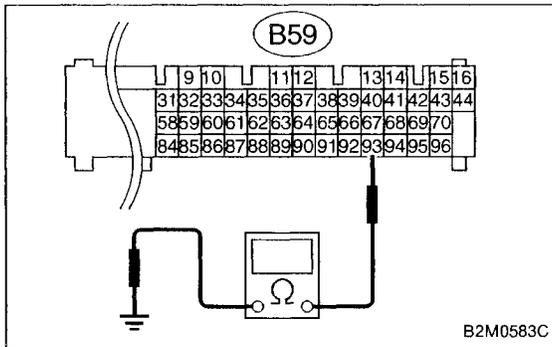
YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and data link connector
- Poor contact in coupling connector (B126)

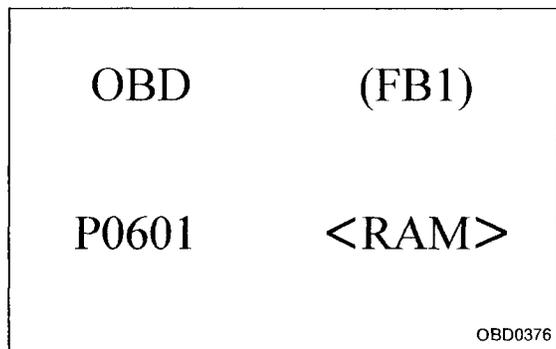


- 4) Measure resistance of harness between ECM and chassis ground.

CHECK : **Connector & terminal (B59) 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.



AT: 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.

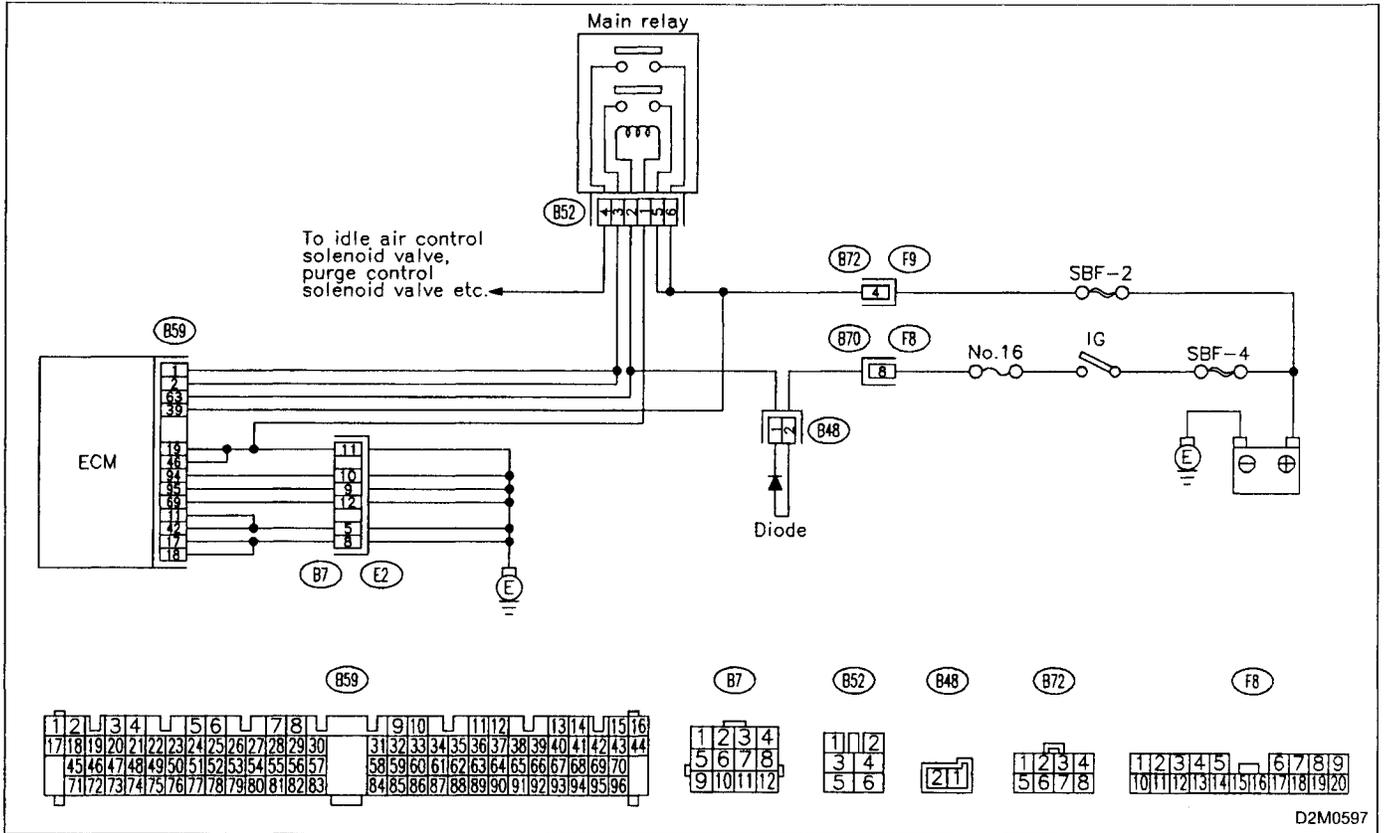
10AT1	Check DTC P0601 on display.
-------	-----------------------------

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0597

10AT1 | **CHECK DTC P0601 ON DISPLAY.**

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0601?

YES : Replace ECM.

OBD (FB1)

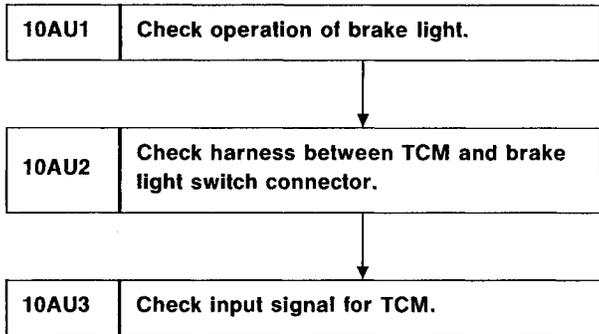
P0703 <ATBRK>

B2M0655

AU: DTC P0703
— BRAKE SWITCH INPUT MALFUNCTION (ATBRK) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

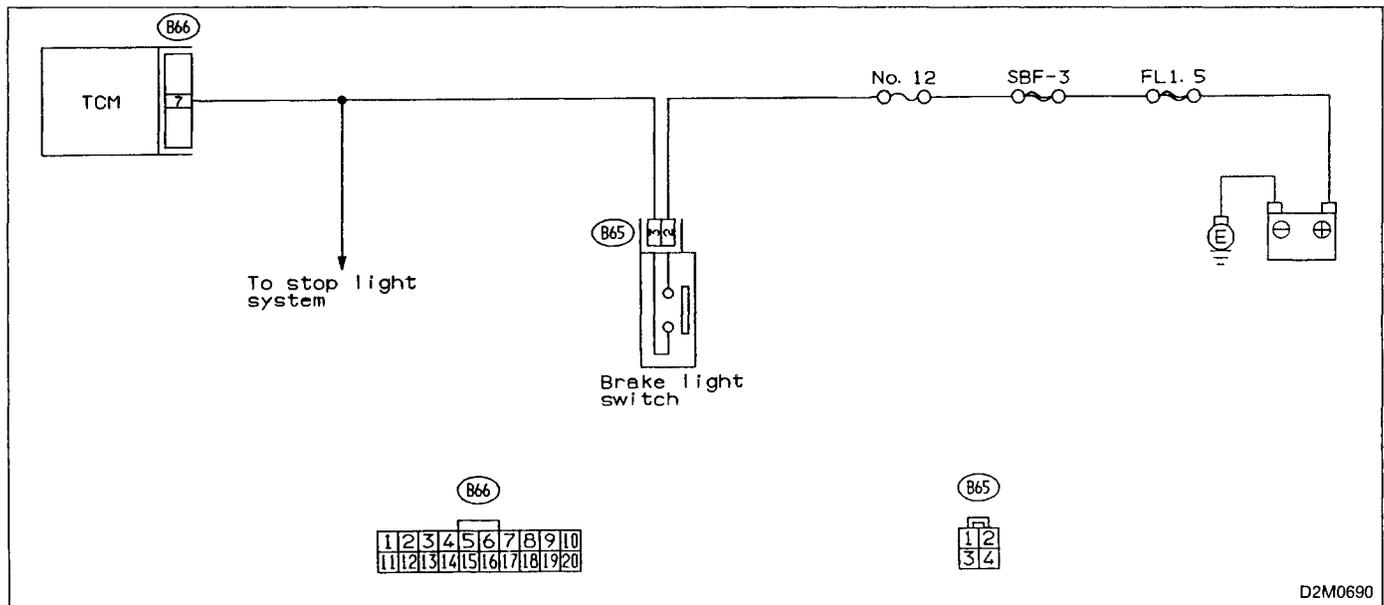


CAUTION:

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

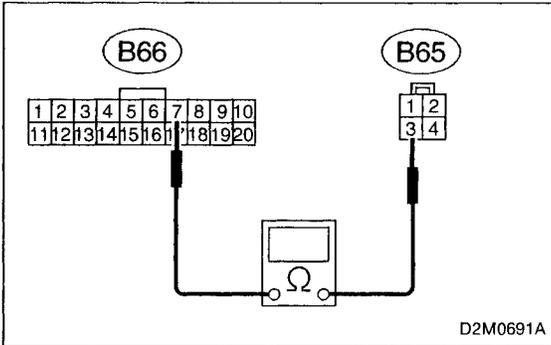
< Ref. to 2-7b [T3D0] and [T3E0]. ☆5 >

WIRING DIAGRAM:



10AU1 CHECK OPERATION OF BRAKE LIGHT.

- CHECK** : Does brake light come on when depressing the brake pedal?
- YES** : Go to step **10AU2**.
- NO** : Repair or replace brake light circuit.



10AU2 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.

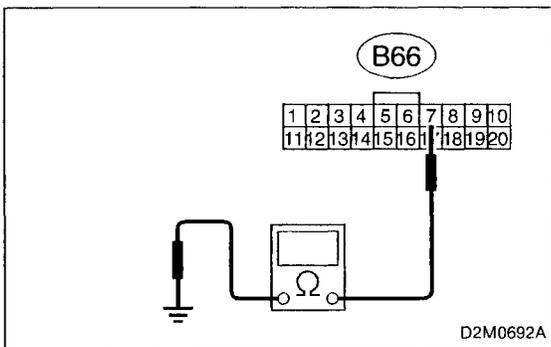
CHECK : **Connector & terminal (B66) No. 7 — (B65) No. 3:**
Is the resistance less than 1 Ω?

- YES** : Go to next step 3).
- NO** : Repair or replace harness and connector.

NOTE:

In this case, repair the following:

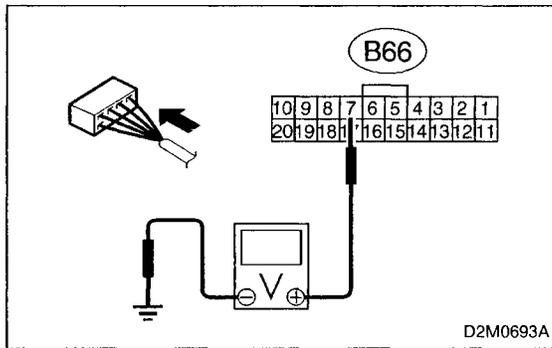
- Open circuit in harness between TCM and brake light switch connector
- Poor contact in TCM connector
- Poor contact in brake light switch connector



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

CHECK : **Connector & terminal (B66) No. 7 — Chassis ground:**
Is the resistance more than 1 MΩ?

- YES** : Go to step **10AU3**.
- NO** : Repair short circuit in harness between TCM and brake light switch connector.



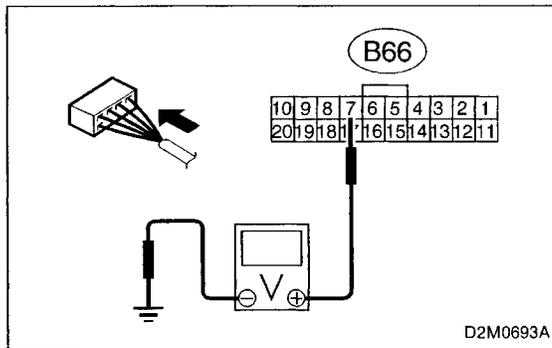
10AU3 CHECK INPUT SIGNAL FOR TCM.

- 1) Connect connectors to TCM and brake light switch.
- 2) Measure voltage between TCM and chassis ground.

CHECK : **Connector & terminal (B66) 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 (B66) No. 7 (+) — Chassis ground (-): Is the voltage more than 10 V when depressing the brake pedal?**

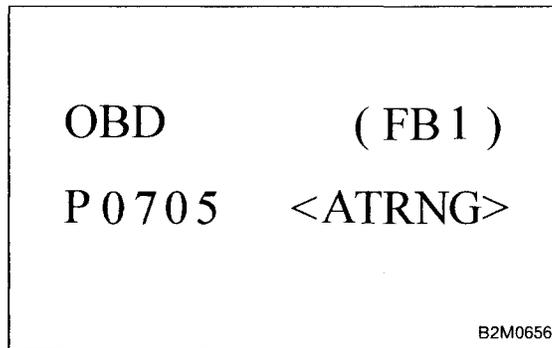
YES : Go to next **CHECK** .

NO : Adjust or replace brake light switch.

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

YES : Repair poor contact in TCM connector.

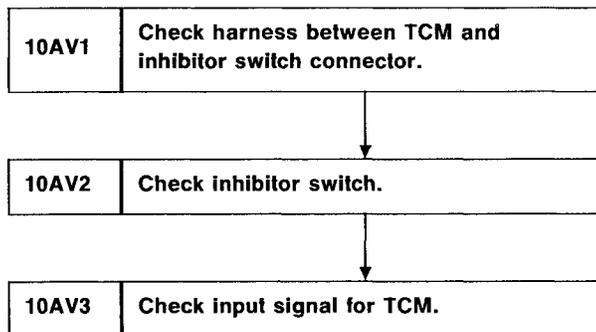
NO : Replace TCM.

**AV: DTC P0705****— TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION (ATRNG) —****DTC DETECTING CONDITION:**

- Two consecutive trips with fault

TROUBLE SYMPTOM:

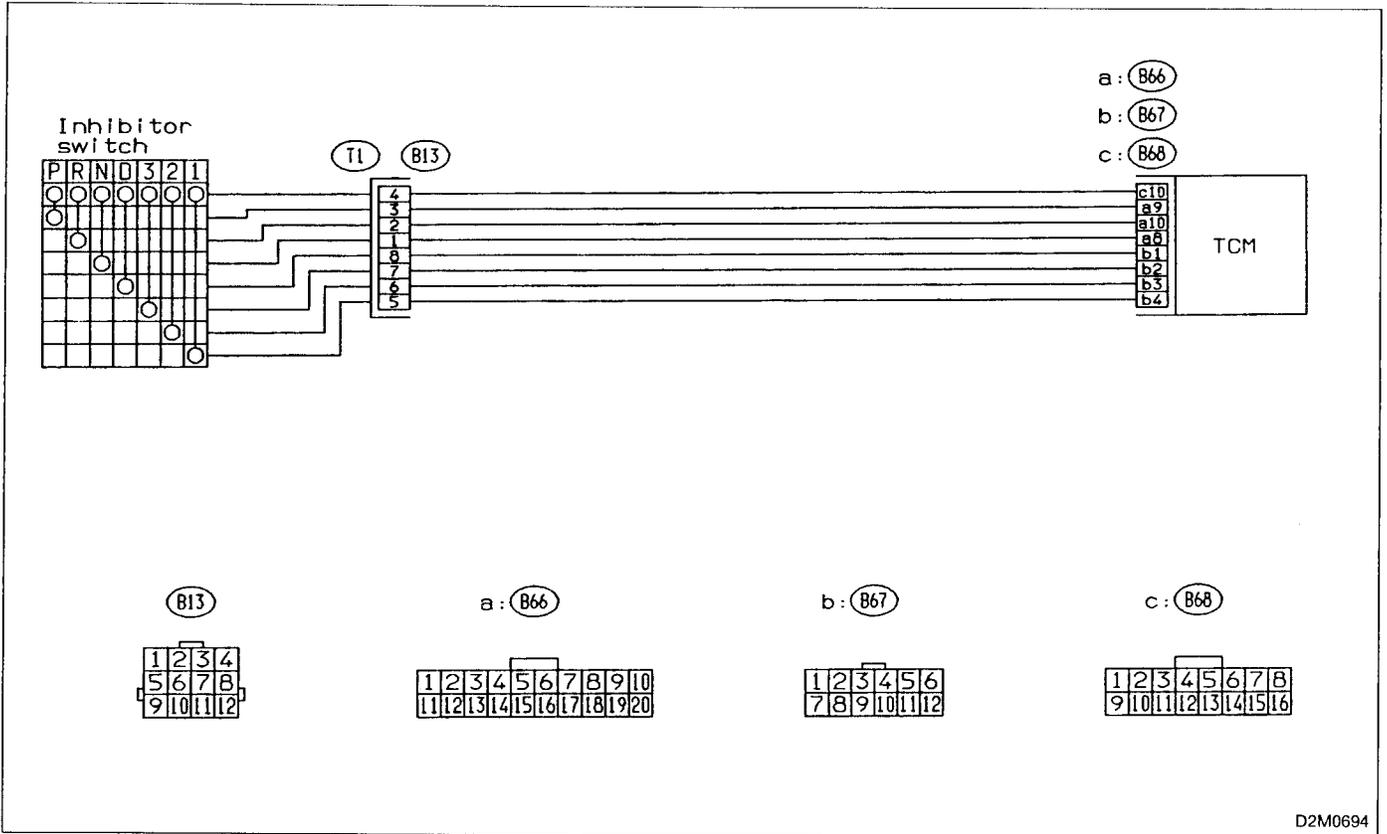
- Starter does not rotate when selector lever is in "P" or "N" range.
- Starter rotates when selector lever is in "R", "D", "3", "2" or "1" range.
- Engine brake is not effected when selector lever is in "3" range.
- Shift characteristics are erroneous.

**CAUTION:**

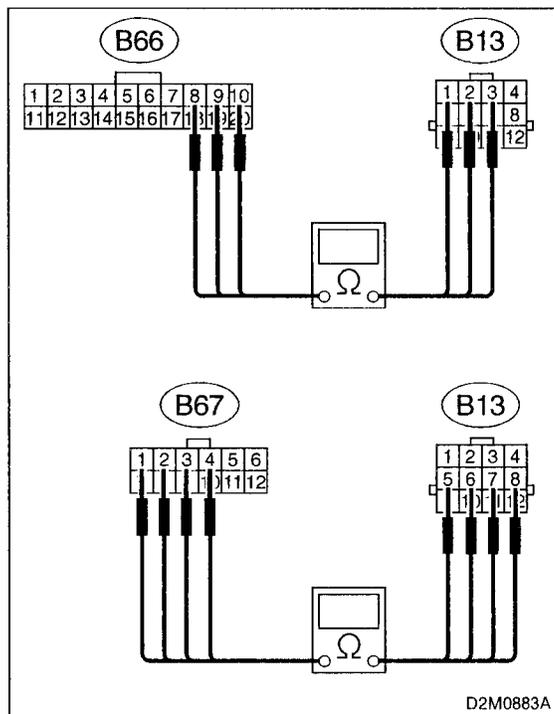
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0694



10AV1

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 (B66) No. 9 — (B13) 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 (B66) No. 10 — (B13) 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 (B66) No. 8 — (B13) 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 (B67) No. 1 — (B13) 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 (B67) No. 2 — (B13) 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 (B67) No. 3 — (B13) No. 6:**
Is the resistance less than 1 Ω?

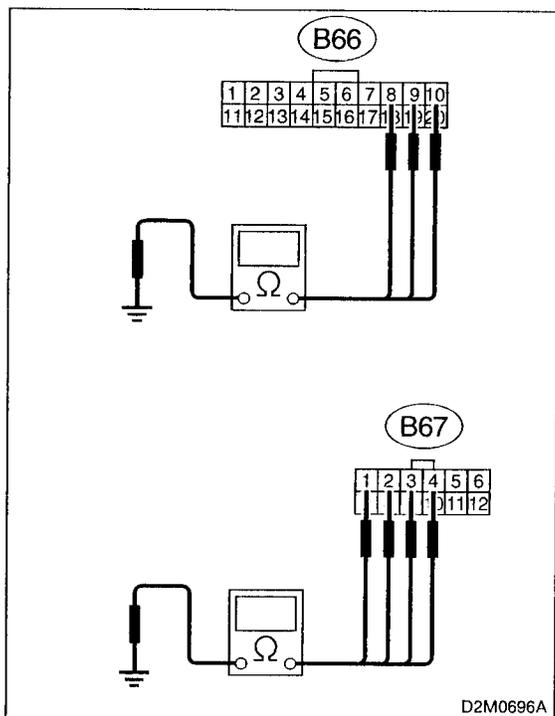
YES : Go to next **CHECK** .

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

CHECK : **Connector & terminal (B67) No. 4 — (B13) 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 (B66) 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 (B66) 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 (B66) 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 (B67) 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 (B67) 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 (B67) No. 3 — Chassis ground:**
Is the resistance more than 1 MΩ?

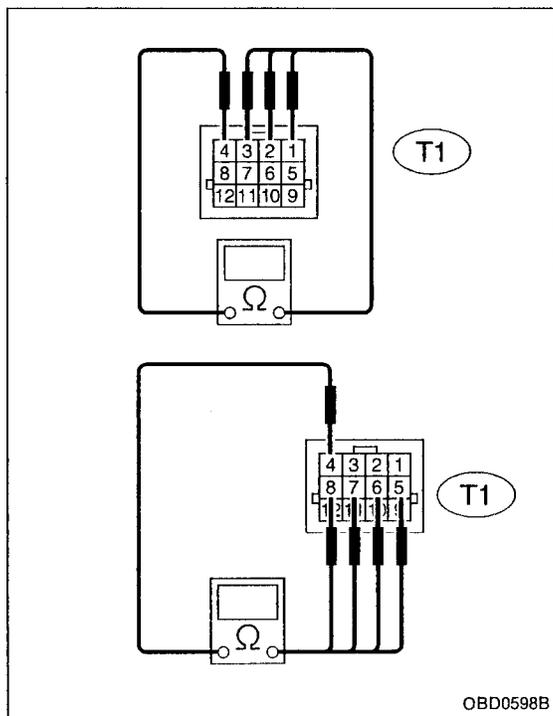
YES : Go to next **CHECK** .

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

CHECK : **Connector & terminal (B67) No. 4 — Chassis ground:**
Is the resistance more than 1 MΩ?

YES : Go to step **10AV2**.

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



OBD0598B

10AV2 CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

CHECK : **Connector & terminal (T1) No. 3 — No. 4**
 ● Is the resistance less than 1 Ω in "P" position?
 ● Is the resistance more than 1 MΩ in other positions?

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

CHECK : **Connector & terminal (T1) No. 2 — No. 4**
 ● Is the resistance less than 1 Ω in "R" position?
 ● Is the resistance more than 1 MΩ in other positions?

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

CHECK : **Connector & terminal (T1) No. 1 — No. 4**
 ● Is the resistance less than 1 Ω in "N" position?
 ● Is the resistance more than 1 MΩ in other positions?

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

CHECK : **Connector & terminal (T1) No. 8 — No. 4**
 ● Is the resistance less than 1 Ω in "D" position?
 ● Is the resistance more than 1 MΩ in other positions?

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

CHECK : **Connector & terminal (T1) No. 7 — No. 4**
 ● Is the resistance less than 1 Ω in "3" position?
 ● Is the resistance more than 1 MΩ in other positions?

YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

CHECK : Connector & terminal (T1) 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 (T1) No. 5 — No. 4

- Is the resistance less than 1 Ω in “1” position?
- Is the resistance more than 1 MΩ in other positions?

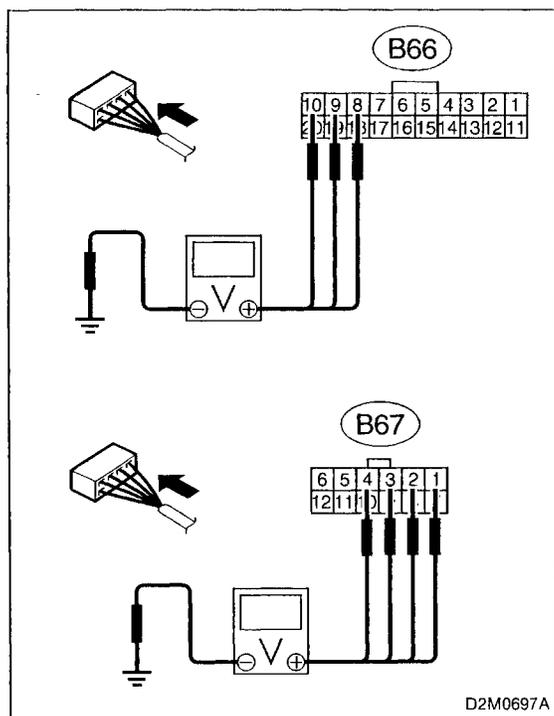
YES : Go to step 10AV3.

NO : Go to **CHECK1** .

CHECK1 : Is there faulty connection in the selector cable?

YES : Repair connection of selector cable.

NO : Replace inhibitor switch.



10AV3 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 (B66) 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?

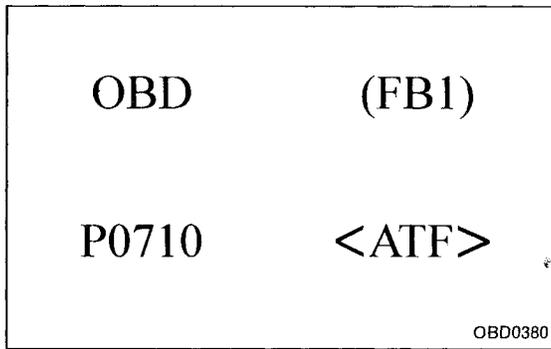
YES : Go to next **CHECK** .

NO : Go to **CHECK1** .

CHECK : Connector & terminal (B66) 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**
(B66) 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**
(B67) 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**
(B67) 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**
(B67) 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**
(B67) 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.



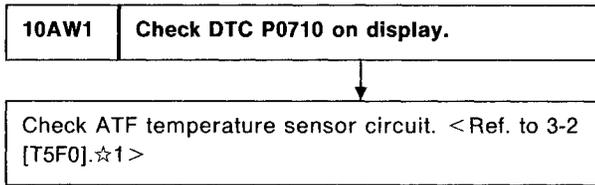
AW: DTC P0710
— TRANSMISSION FLUID TEMPERATURE
SENSOR CIRCUIT MALFUNCTION (ATF) —

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

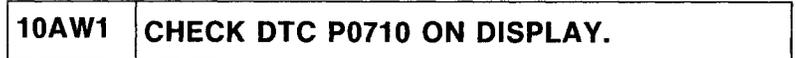
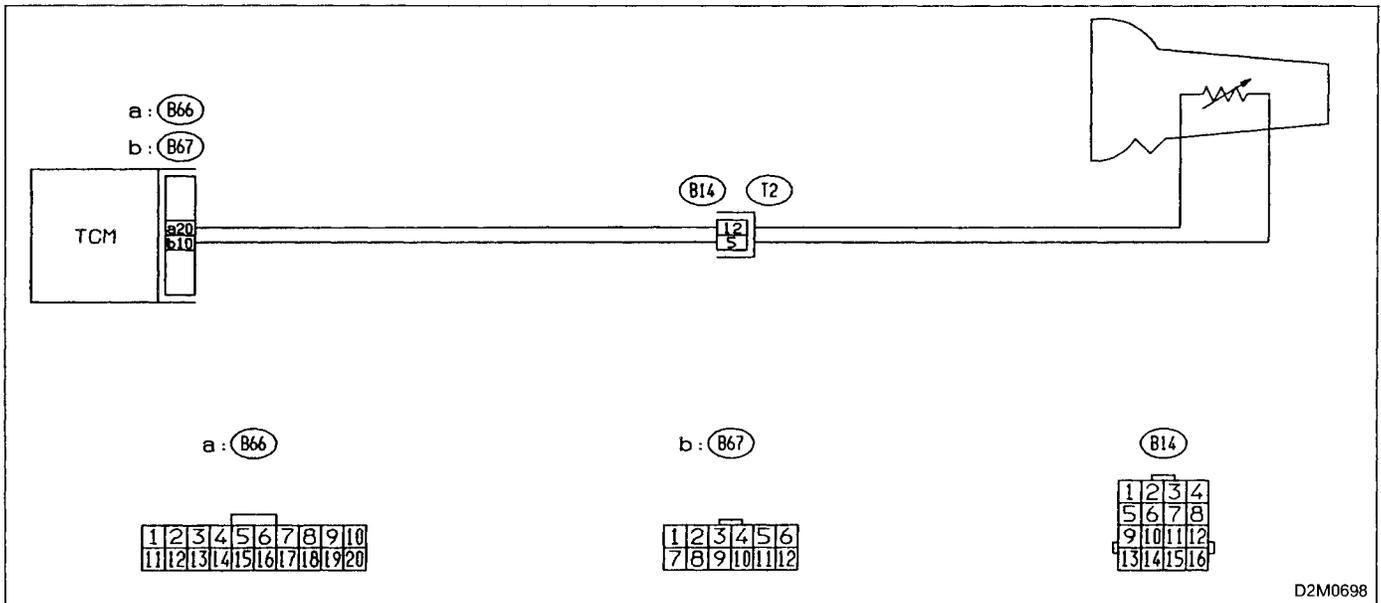


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



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 [T5F0]☆1.

OBD	(FB1)
P0720	<ATVSP>
OBD0392	

AX: 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"

10AX1	Check DTC P0720 on display.
--------------	------------------------------------

↓

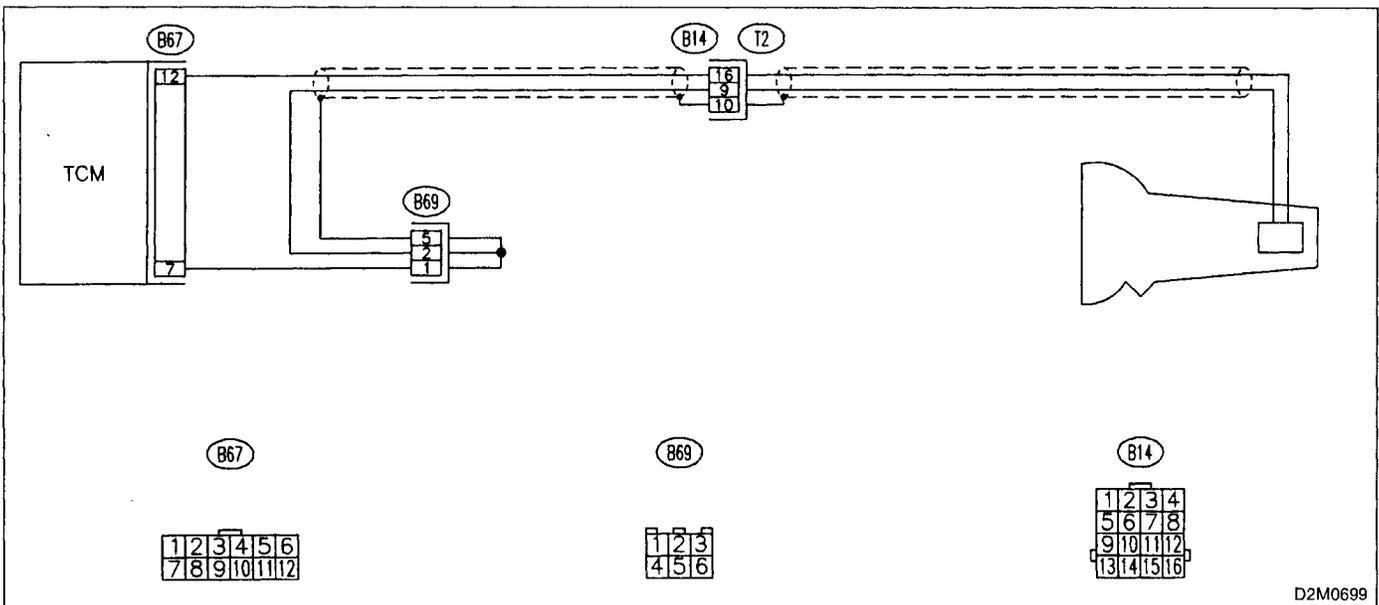
Check vehicle speed sensor 1 circuit. <Ref. to 3-2 [T5K0].☆1>

CAUTION:

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



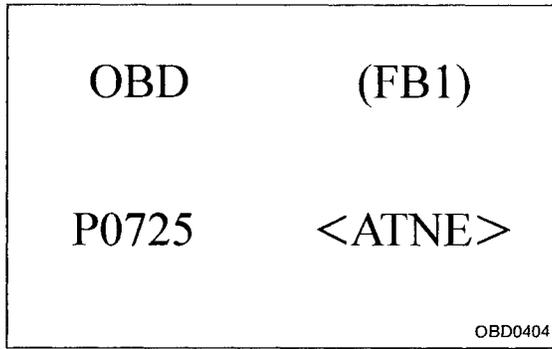
10AX1	CHECK DTC P0720 ON DISPLAY.
--------------	------------------------------------

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0720?

YES : Check vehicle speed sensor 1 circuit.

NOTE:

For the diagnostic procedure on vehicle speed sensor 1 circuit, refer to 3-2 [T5K0].☆1.



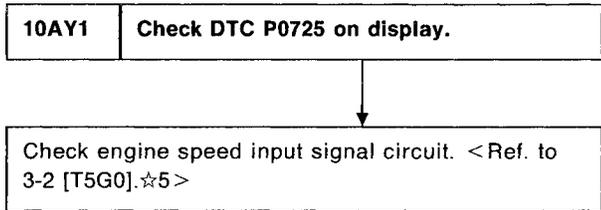
AY: DTC P0725
— ENGINE SPEED INPUT CIRCUIT
MALFUNCTION (ATNE) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

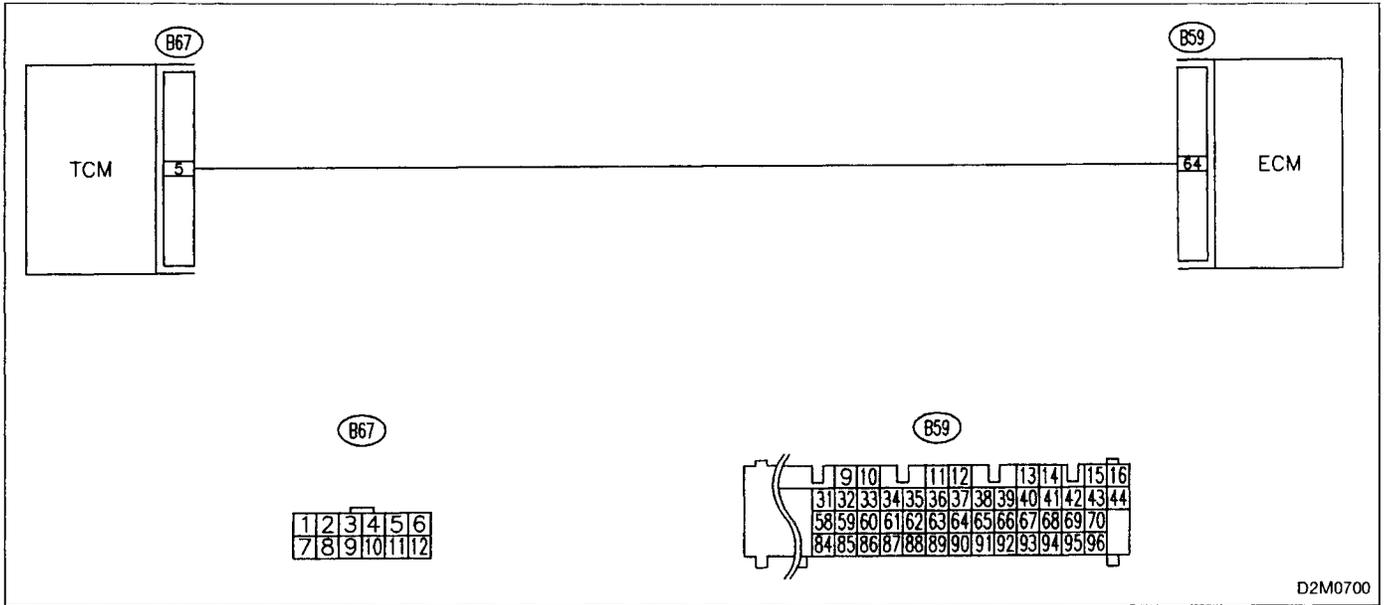
- No lock-up (after engine warm-up)
- AT diagnostic indicator light (AT OIL TEMP indicator light) remains on when vehicle speed is "0".



CAUTION:

After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



10AY1 | **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 [T5G0]☆5.

OBD	(FB 1)
P0731	<ATGR1>
B2M0657	

AZ: DTC P0731

— GEAR 1 INCORRECT RATIO (ATGR1) —

OBD	(FB 1)
P0732	<ATGR2>
B2M0658	

BA: DTC P0732

— GEAR 2 INCORRECT RATIO (ATGR2) —

OBD	(FB 1)
P0733	<ATGR3>
B2M0659	

BB: DTC P0733

— GEAR 3 INCORRECT RATIO (ATGR3) —

OBD	(FB 1)
P0734	<ATGR4>
B2M0660	

BC: DTC P0734

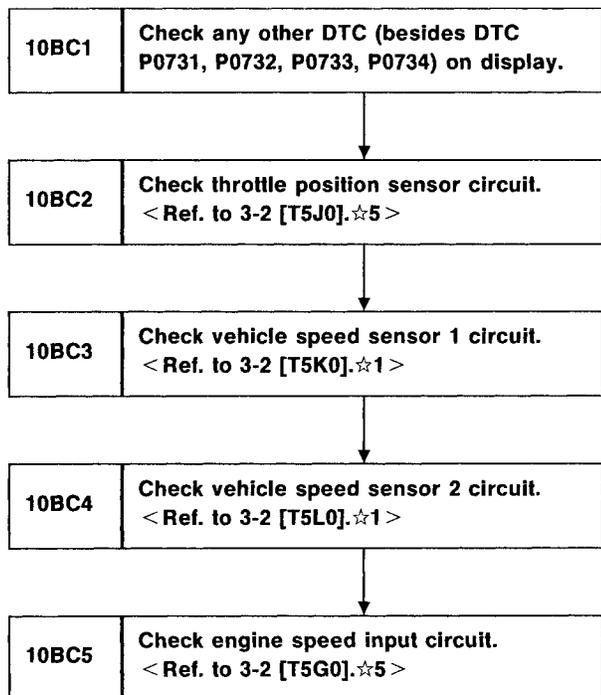
— GEAR 4 INCORRECT RATIO (ATGR4) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

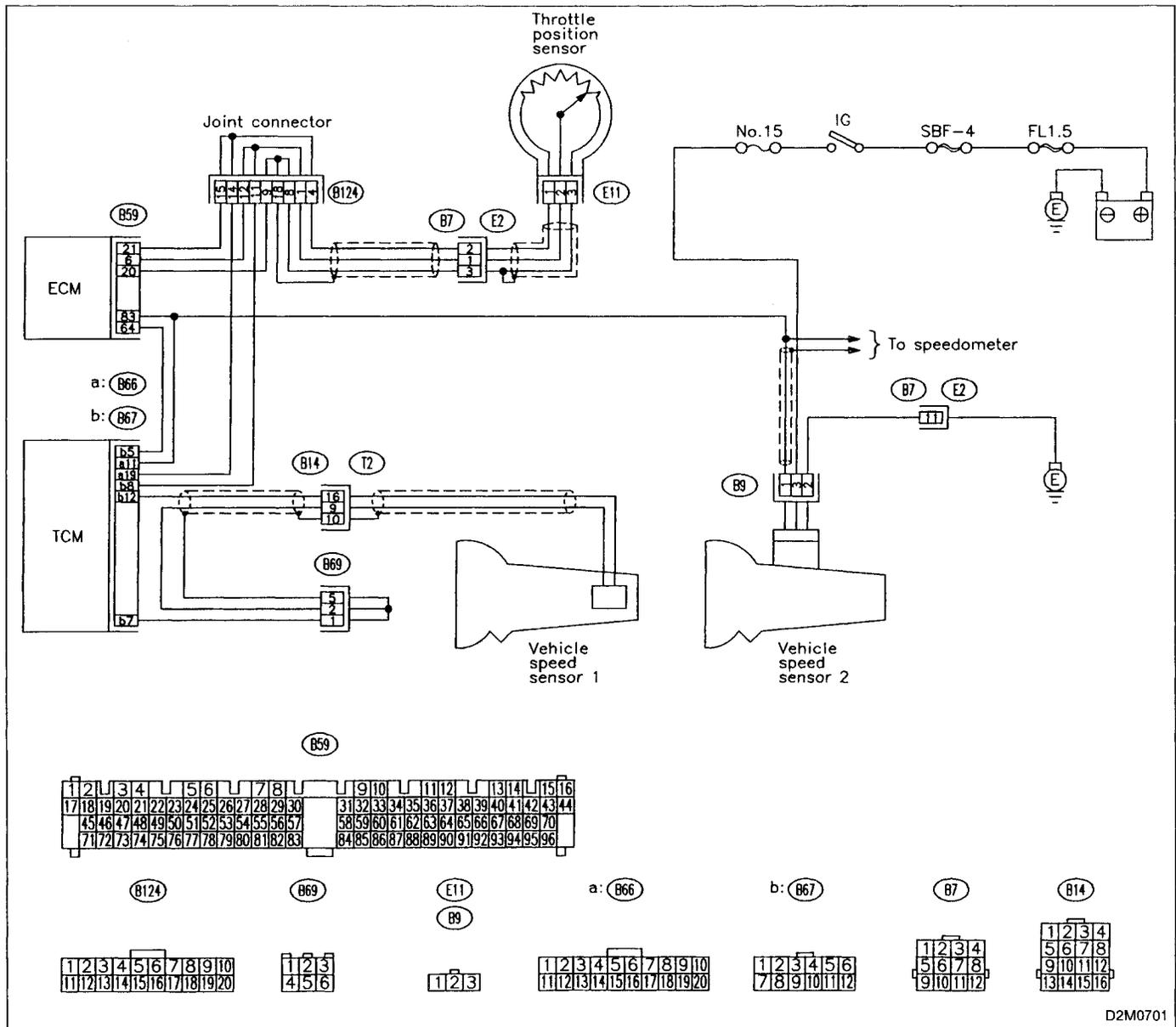
- Shift point too high or too low; engine brake not effected in "3" range; excessive shift shock; excessive tight corner "braking"

**CAUTION:**

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



D2M0701

10BC1 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, 2-7b [T1000]"☆5.
- NO** : Go to step **10BC2**.

10BC2	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 [T5J0]☆5.

YES : Repair or replace throttle position sensor circuit.

NO : Go to step **10BC3**.

10BC3	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 [T5K0]☆1.

YES : Repair or replace vehicle speed sensor 1 circuit.

NO : Go to step **10BC4**.

10BC4	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 [T5L0]☆1.

YES : Repair or replace vehicle speed sensor 2 circuit.

NO : Go to step **10BC5**.

10BC5	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 [T5G0]☆5.

YES : Repair or replace engine speed input circuit.

NO : Go to next **CHECK** .

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

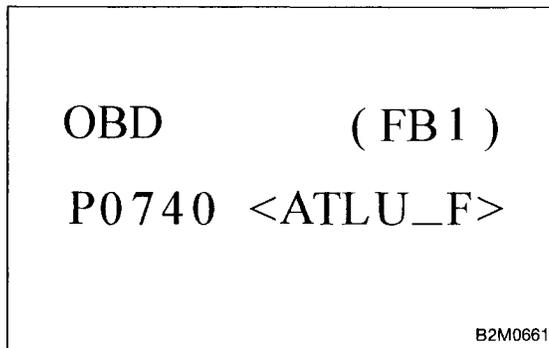
YES : Repair poor contact in TCM connector.

NO : Go to next **CHECK** .

CHECK : *Is there any mechanical trouble in automatic transmission?*

YES : Repair or replace automatic transmission.

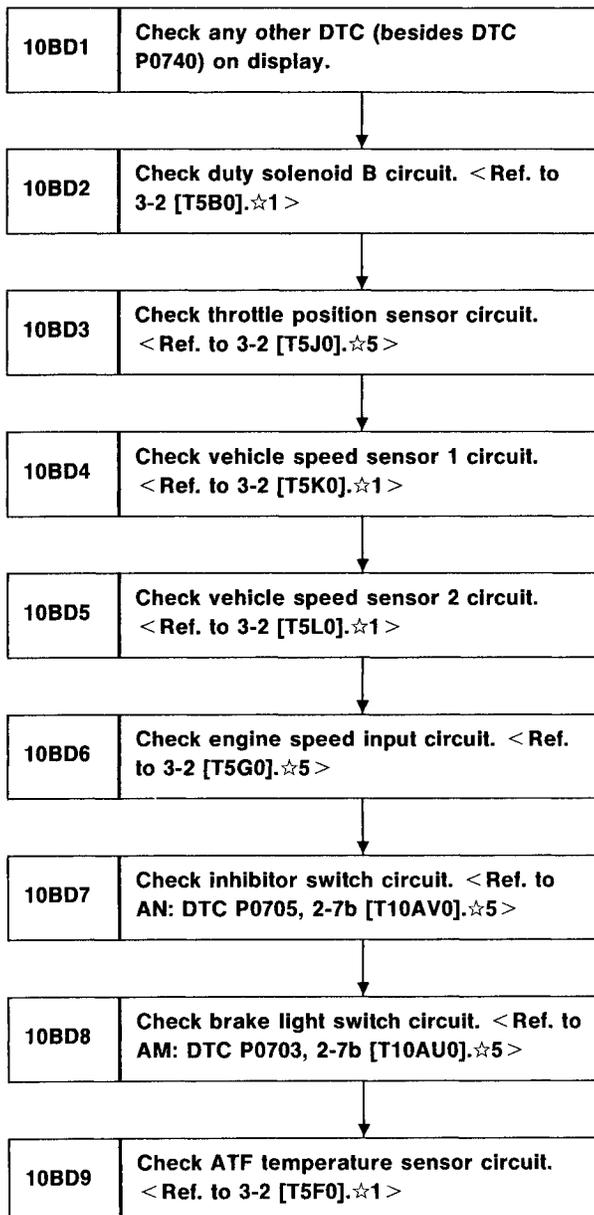
NO : Replace TCM.

**BD: DTC P0740****— TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION (ATLU — F) —****DTC DETECTING CONDITION:**

- Two consecutive trips with fault

TROUBLE SYMPTOM:

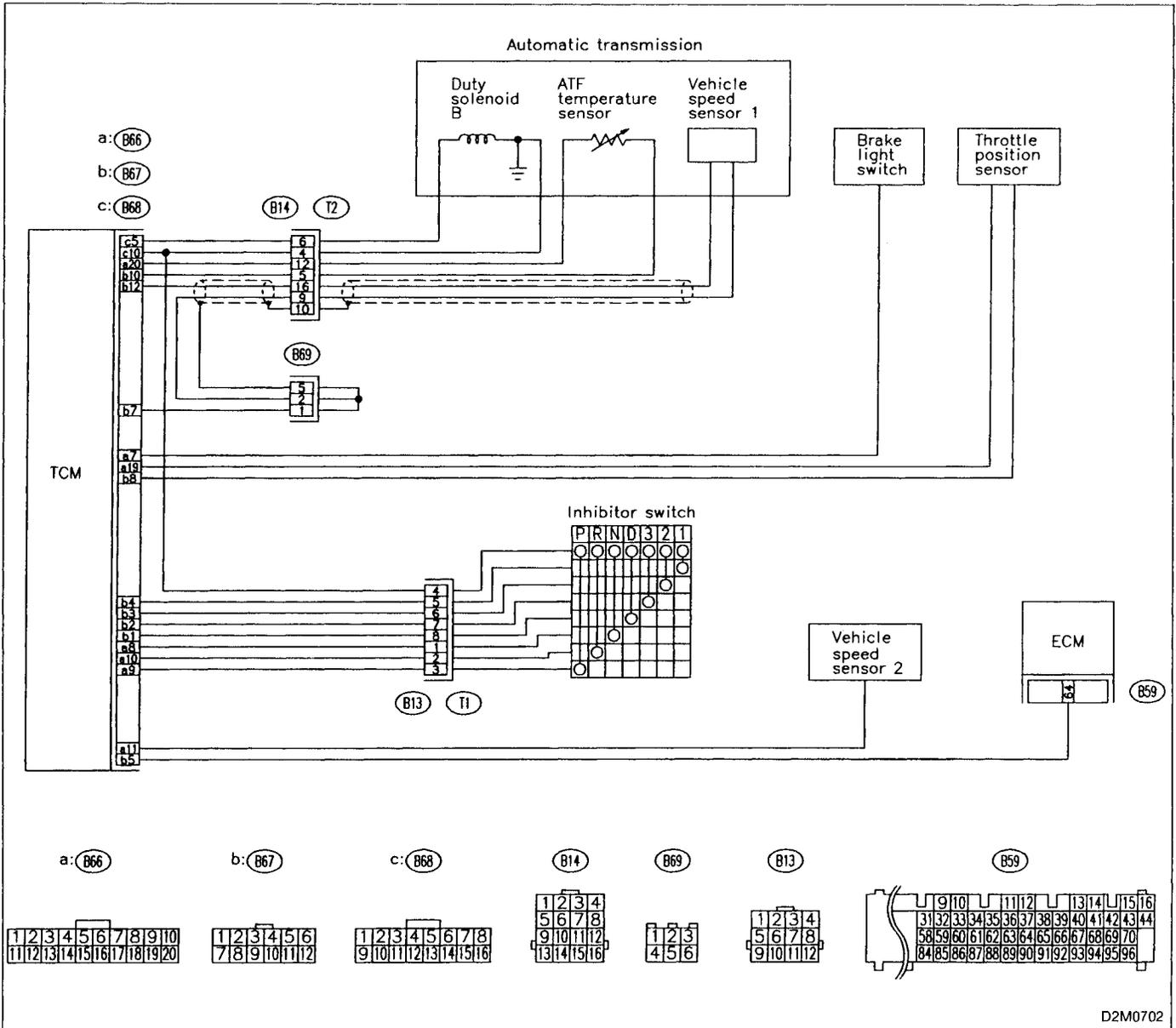
- No lock-up (after engine warm-up)
- No shift or excessive tight corner "braking"

**CAUTION:**

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



10BD1 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, 2-7b [T1000]"☆5.
- NO** : Go to step **10BD2**.

10BD2 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 [T5B0]☆1.

YES : Repair or replace duty solenoid B circuit.

NO : Go to step **10BD3**.

10BD3 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 [T5J0]☆5.

YES : Repair or replace throttle position sensor circuit.

NO : Go to step **10BD4**.

10BD4 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 [T5K0]☆1.

YES : Repair or replace vehicle speed sensor 1 circuit.

NO : Go to step **10BD5**.

10BD5 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 [T5L0]☆1.

YES : Repair or replace vehicle speed sensor 2 circuit.

NO : Go to step **10BD6**.

10BD6 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 [T5G0]☆5.

YES : Repair or replace engine speed input circuit.

NO : Go to step **10BD7**.

10BD7	CHECK INHIBITOR SWITCH CIRCUIT.
--------------	--

CHECK : *Is there any trouble in inhibitor switch circuit?*

NOTE:

For the diagnostic procedure on inhibitor switch circuit, refer to 2-7b [T10AV0]☆5.

YES : Repair or replace inhibitor switch circuit.

NO : Go to step **10BD8**.

10BD8	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 2-7b [T10AU0]☆5.

YES : Repair or replace brake light switch circuit.

NO : Go to step **10BD9**.

10BD9	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 [T5F0]☆1.

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.

OBD (FB1)

P0743 <ATLU>

B2M0662

BE: 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)

10BE1 Check DTC P0743 on display.



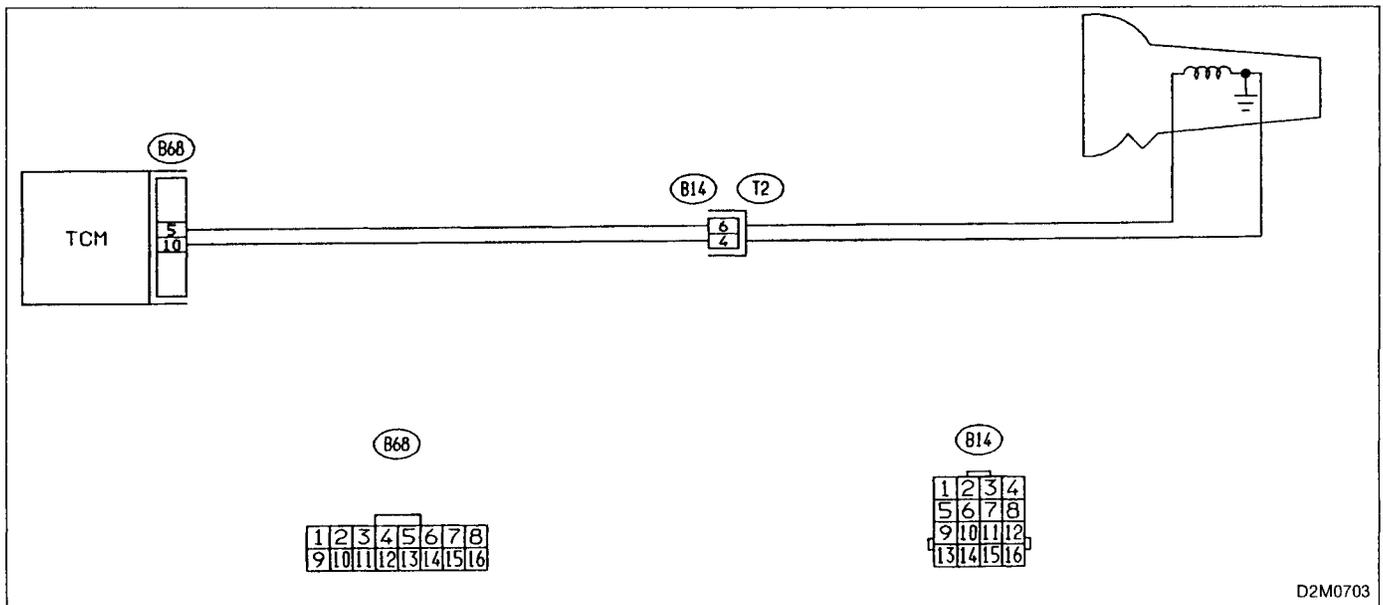
Check duty solenoid B circuit. < Ref. to 3-2 [T5B0].☆1 >

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



10BE1 CHECK DTC P0743 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0743?

YES : Check duty solenoid B circuit.

NOTE:

For the diagnostic procedure on duty solenoid B circuit, refer to 3-2 [T5B0]☆1.

OBD (FB1)
P0748 <ATPL>

B2M0663

BF: DTC P0748
— **PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL (ATPL)** —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Excessive shift shock

10BF1 Check DTC P0748 on display.

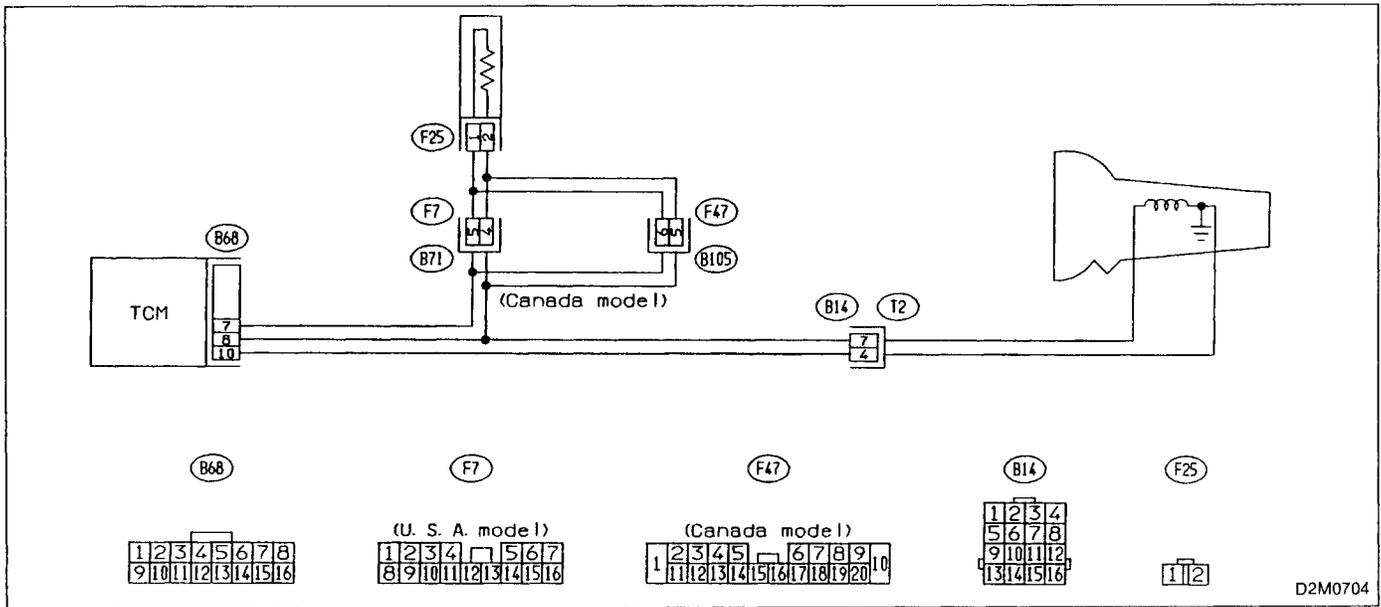
Check duty solenoid A circuit. <Ref. to 3-2 [T5A0].☆1>

CAUTION:

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



10BF1 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 [T5A0].☆1.

OBD (FB1)

P0753 <ATSFT1>

B2M0664

BG: DTC P0753
— SHIFT SOLENOID A (SHIFT SOLENOID 1) ELECTRICAL (ATSFT1) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- No shift

10BG1 Check DTC P0753 on display.



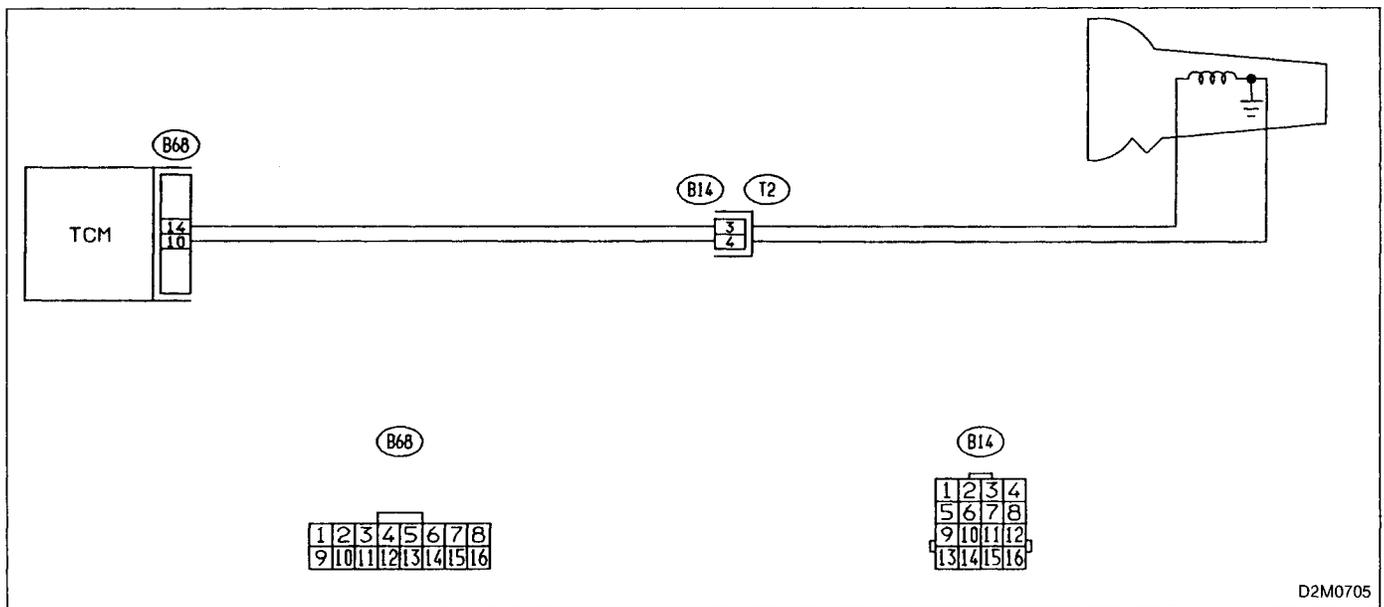
Check shift solenoid 1 circuit. <Ref. to 3-2 [T5E0].☆1>

CAUTION:

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



10BG1 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 [T5E0]☆1.

OBD (FB1)
P0758 <ATSFT2>

B2M0665

BH: DTC P0758
— SHIFT SOLENOID B (SHIFT SOLENOID 2)
ELECTRICAL (ATSFT2) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- No shift

10BH1 | Check DTC P0758 on display.

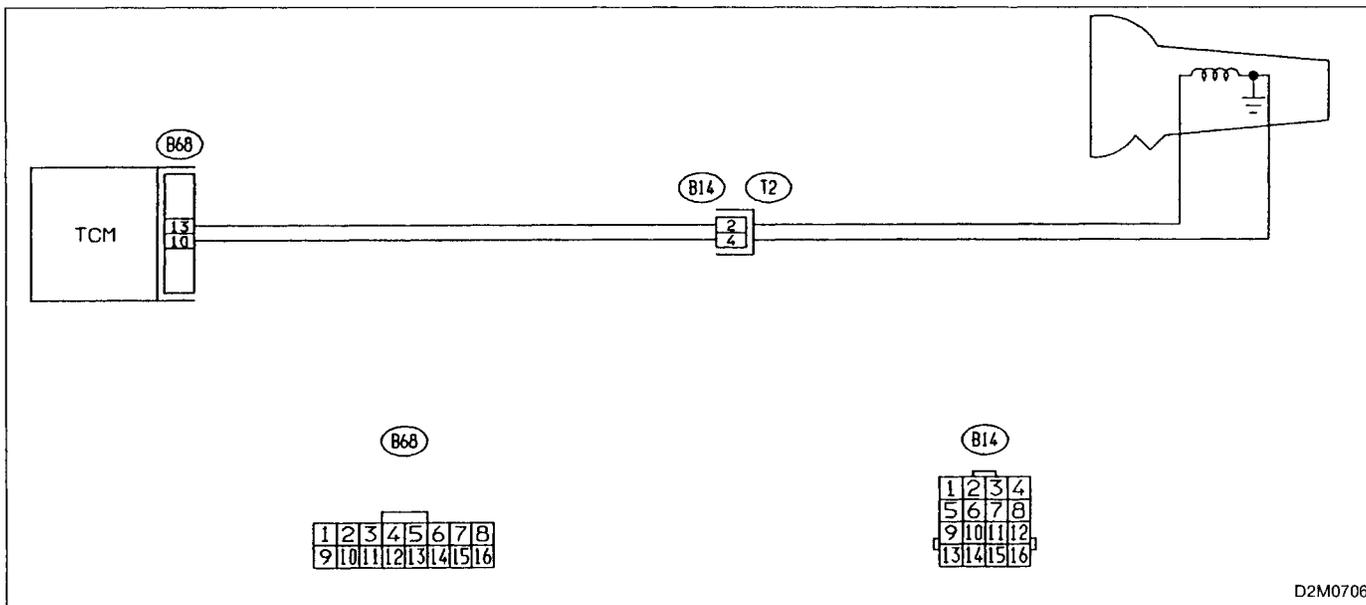
Check shift solenoid 2 circuit. < Ref. to 3-2 [T5D0].☆1 >

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



10BH1 | 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 [T5D0]☆1.

<p>OBD (FB1)</p> <p>P0760<ATOVR_F></p> <p style="text-align: right; font-size: small;">B2M0666</p>
--

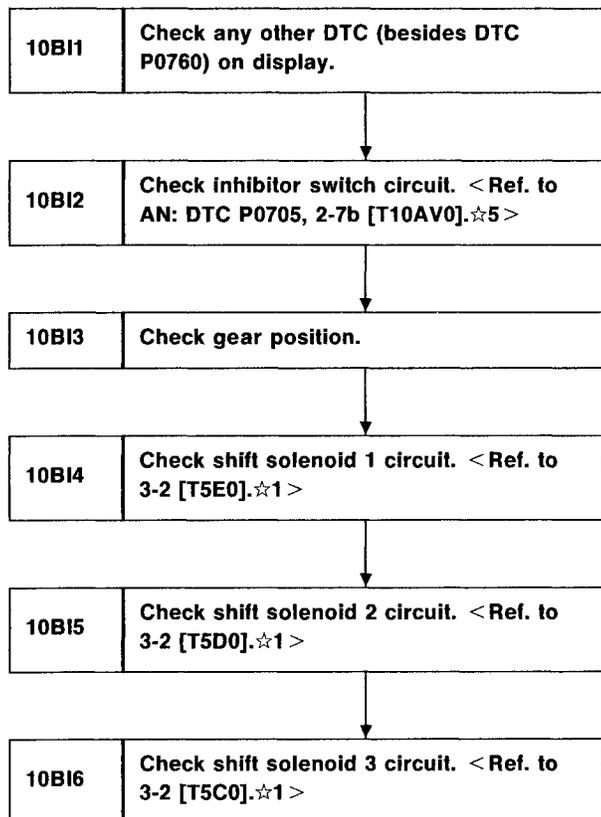
BI: DTC P0760
— SHIFT SOLENOID C (SHIFT SOLENOID 3) MALFUNCTION (ATOVR — F) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in "3"

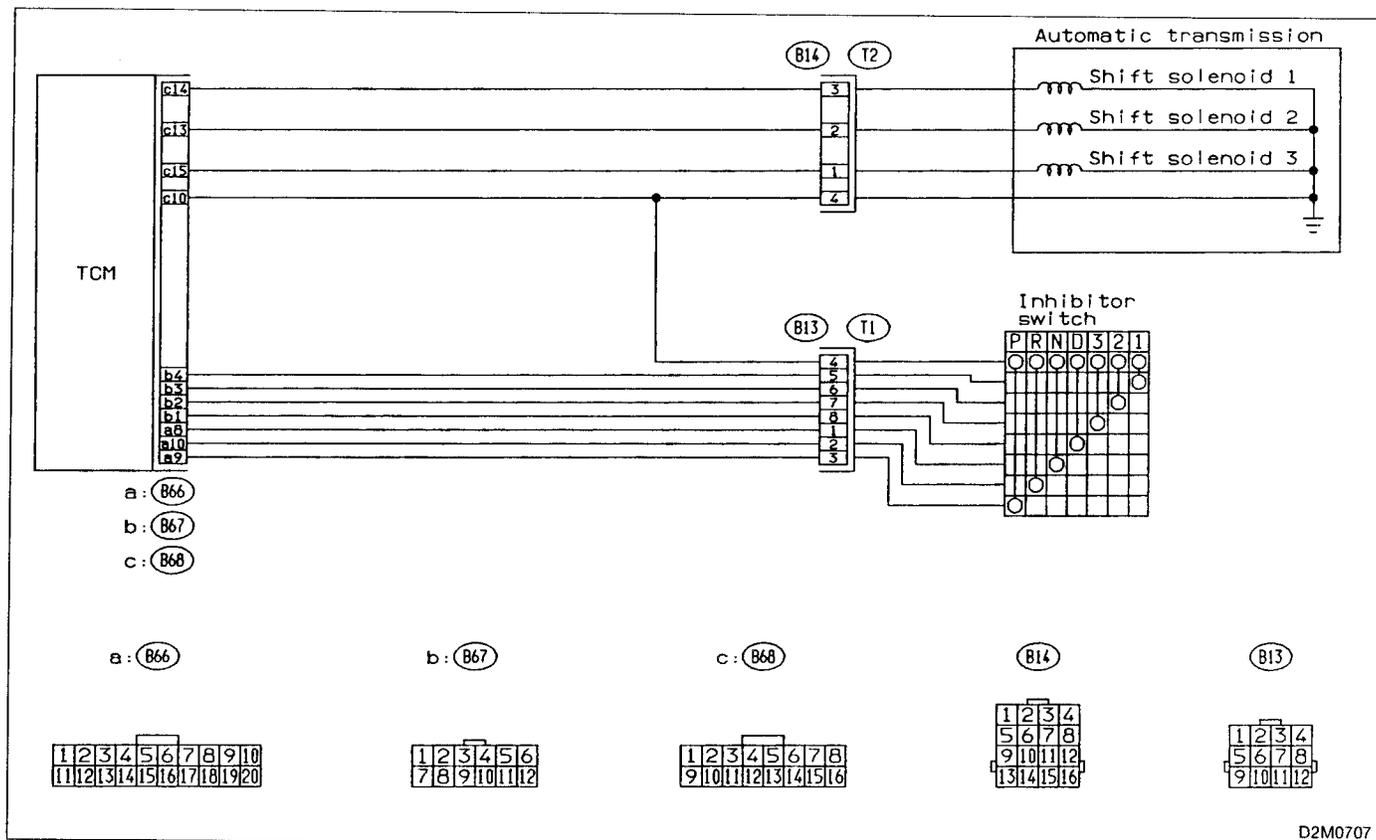


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



10B11 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, 2-7b [T1000]"☆5.
- NO** : Go to step **10B12**.

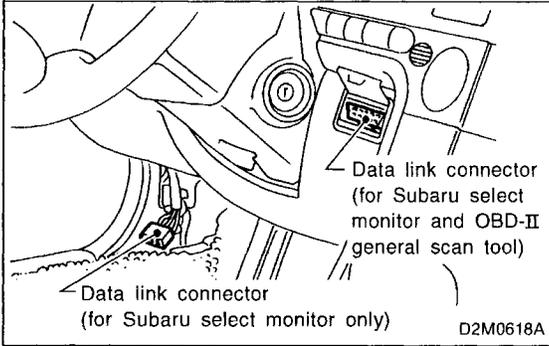
10B12 CHECK INHIBITOR SWITCH CIRCUIT.

- CHECK** : Is there any trouble in inhibitor switch circuit?

NOTE:

For the diagnostic procedure on inhibitor switch circuit, refer to 2-7b [T10AV0]☆5.

- YES** : Repair or replace inhibitor switch circuit.
- NO** : Go to step **10B13**.



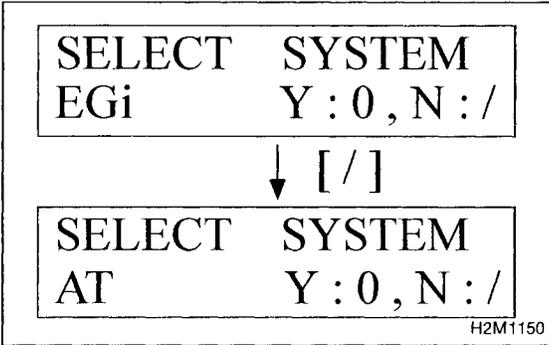
10B13 CHECK GEAR POSITION.

- 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:

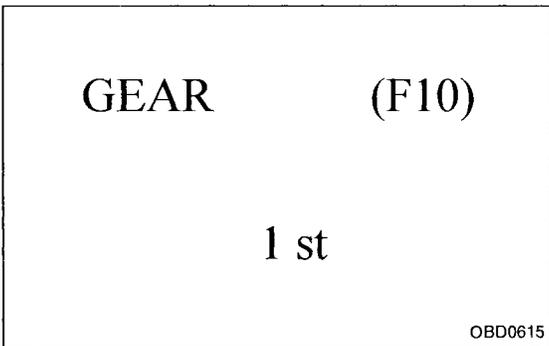
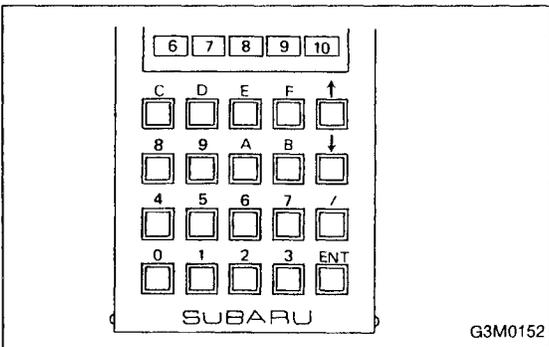
On AWD models, raise all wheels off ground.

- 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 **10B14**.

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.

10B14 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 [T5E0]☆1.

YES : Repair or replace shift solenoid 1 circuit.

NO : Go to step **10B15**.

10B15 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 [T5D0]☆1.

YES : Repair or replace shift solenoid 2 circuit.

NO : Go to step **10B16**.

10B16 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 [T5C0]☆1.

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

BJ: 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"

10BJ1 Check DTC P0763 on display.

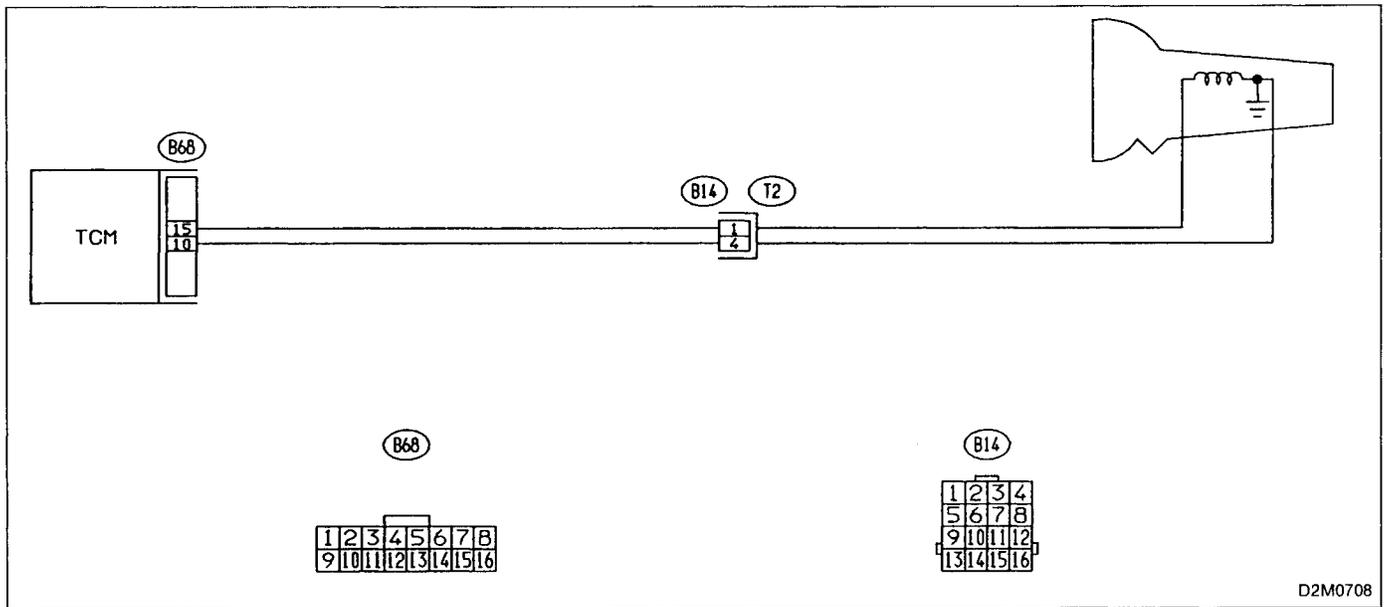
Check shift solenoid 3 circuit. <Ref. to 3-2 [T5C0].☆1>

CAUTION:

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



10BJ1 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 [T5C0].☆1.

OBD	(FB1)
P1100	<ST_SW>
OBD0458	

BK: DTC P1100
— STARTER SWITCH CIRCUIT MALFUNCTION (ST – SW) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Failure of engine to start

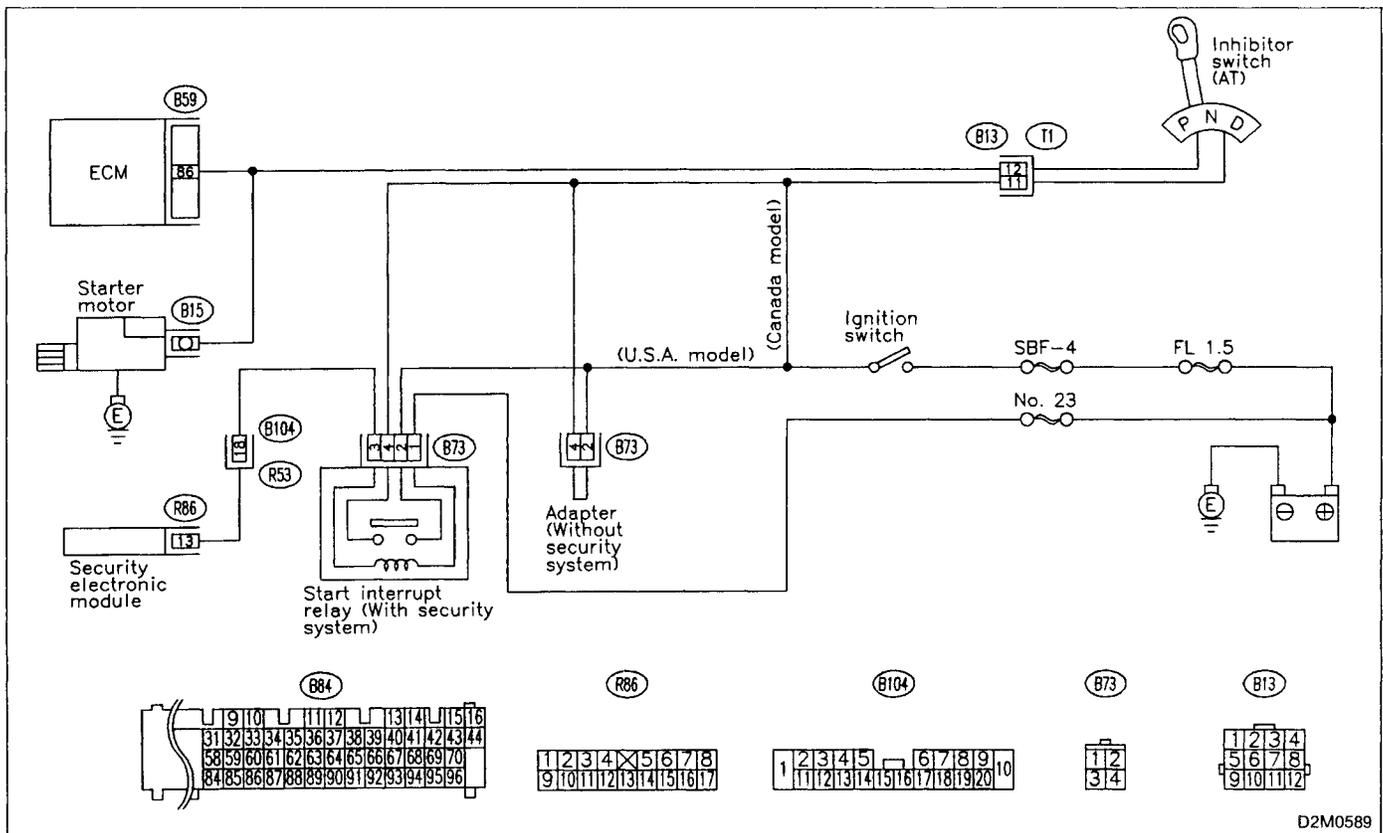
10BK1	Check operation of starter motor.
--------------	--

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0589

10BK1	CHECK OPERATION OF STARTER MOTOR.
--------------	--

CHECK : *Does starter motor operate when ignition switch to "ST"?*

NOTE:

Place the inhibitor switch in the "P" or "N" position.

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 2-7b [T8B0]☆5.

<p>OBD (FB1)</p> <p>P1101 <N/P_SW></p> <p style="text-align: right; font-size: small;">B2M0668</p>
--

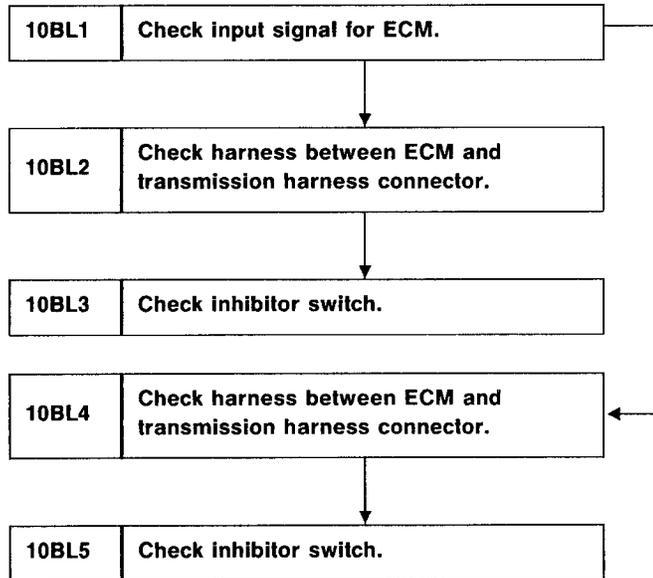
BL: DTC P1101
— NEUTRAL POSITION SWITCH CIRCUIT MALFUNCTION (N/P — SW) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Erroneous idling

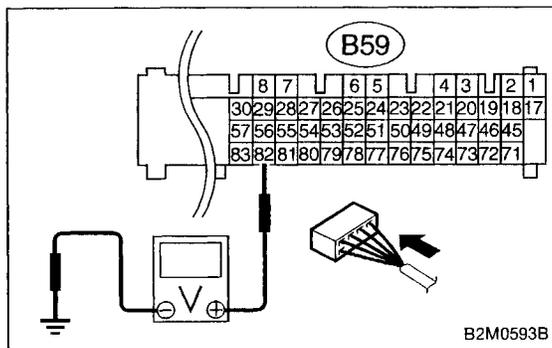
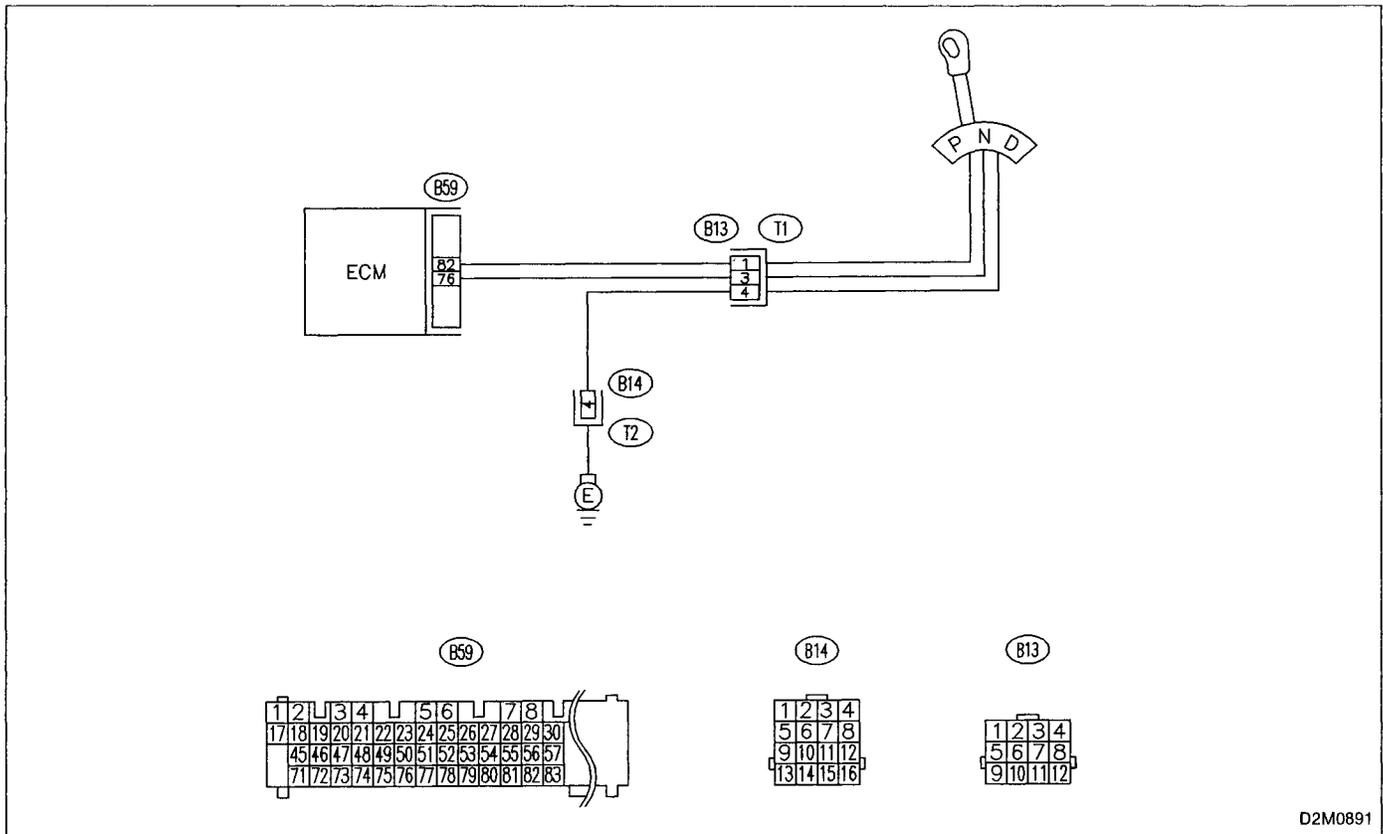


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



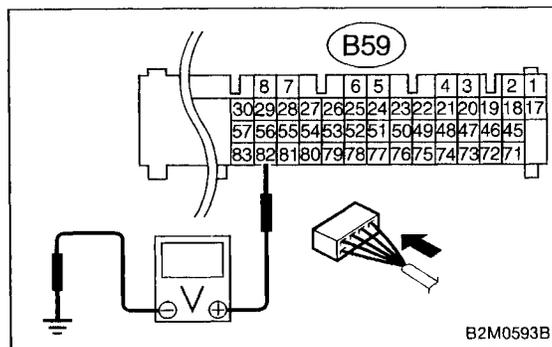
10BL1 CHECK INPUT SIGNAL FOR ECM.

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

CHECK : Connector & terminal (B59) No. 82 (+) — Chassis ground (-): Is the voltage less than 1 V in "N" position?

YES : Go to next **CHECK** .

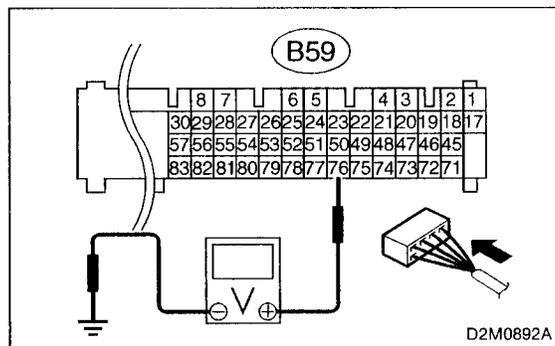
NO : Go to step 10BL2.



CHECK : Connector & terminal (B59) No. 82 (+) — Chassis ground (-): Is the voltage between 4.5 and 5.5 V in other positions?

YES : Go to next **CHECK** .

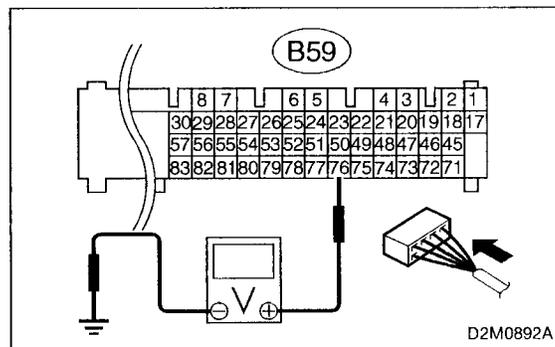
NO : Go to step 10BL2.



CHECK : Connector & terminal
(B59) No. 76 (+) — Chassis ground (-):
Is the voltage less than 1 V in "P" position?

YES : Go to next **CHECK** .

NO : Go to step 10BL4.



CHECK : Connector & terminal
(B59) No. 76 (+) — Chassis ground (-):
Is the voltage between 4.5 and 5.5 V in other positions?

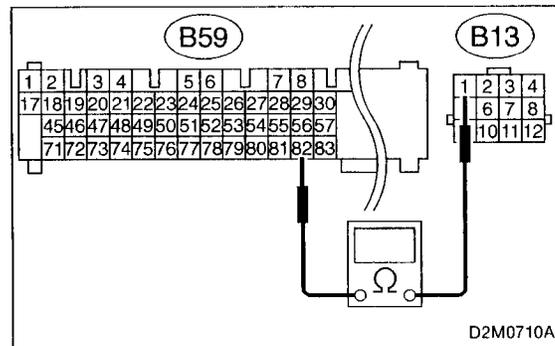
YES : Go to next **CHECK** .

NO : Go to step 10BL4.

CHECK : Is there poor contact in ECM connector?

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



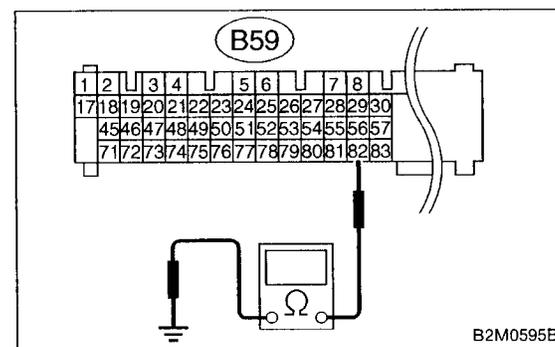
10BL2 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

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

CHECK : Connector & terminal
(B59) No. 82 — (B13) No. 1:
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.

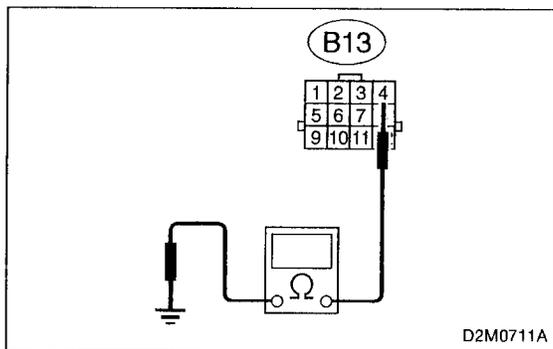


- 4) Measure resistance of harness between ECM and chassis ground.

CHECK : Connector & terminal
(B59) 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 transmission ground.

CHECK : **Connector & terminal (B13) No. 4 — Transmission ground: Is the resistance less than 5 Ω?**

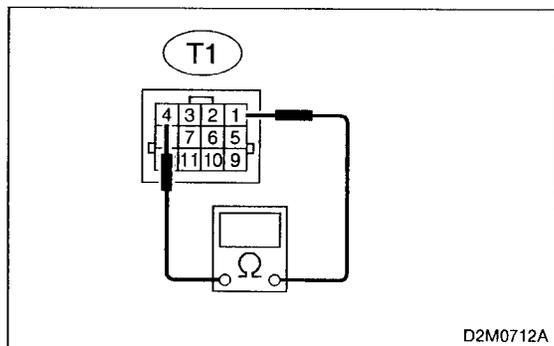
YES : Go to step **10BL3**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between transmission harness connector and transmission grounding point
- Poor contact in transmission harness connector (B14)
- Poor contact in transmission grounding point



10BL3	CHECK INHIBITOR SWITCH.
--------------	--------------------------------

Measure resistance between transmission harness connector receptacle's terminals.

CHECK : **Connector & terminal (T1) No. 1 — No. 4: Is the resistance less than 1 Ω in "N" position?**

YES : Go to next **CHECK** .

NO : Repair open circuit in transmission harness or replace inhibitor switch.

CHECK : **Connector & terminal (T1) No. 1 — No. 4: Is the resistance more than 1 MΩ in other positions?**

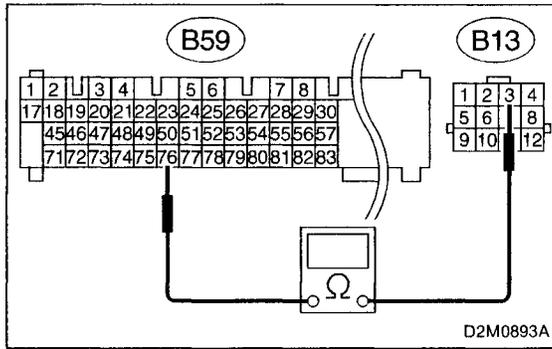
YES : Go to next **CHECK** .

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].☆1 >

NO : Replace ECM.



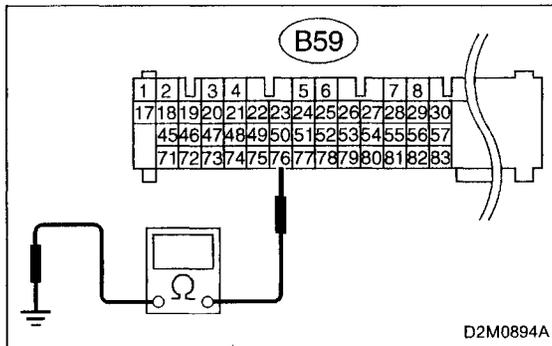
10BL4 CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR.

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

CHECK : **Connector & terminal (B59) No. 76 — (B13) No. 3:**
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.

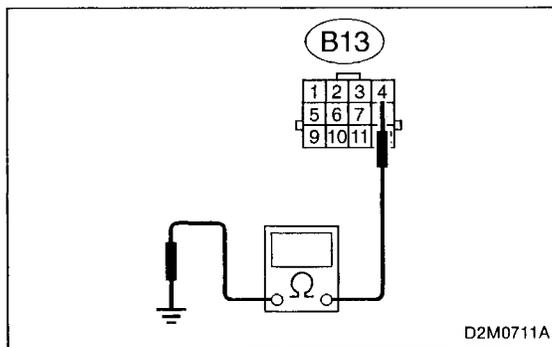


- 4) Measure resistance of harness between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 76 — 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 transmission ground.

CHECK : **Connector & terminal (B13) No. 4 — Transmission ground:**
Is the resistance less than 5 Ω?

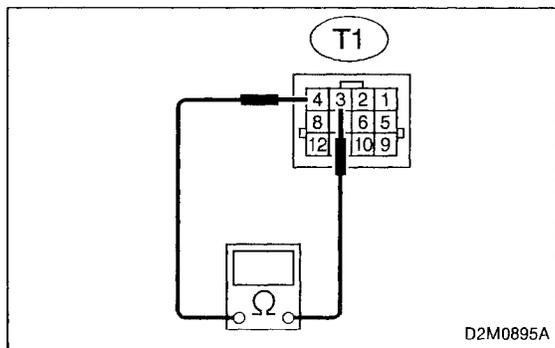
YES : Go to step 10BL5.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

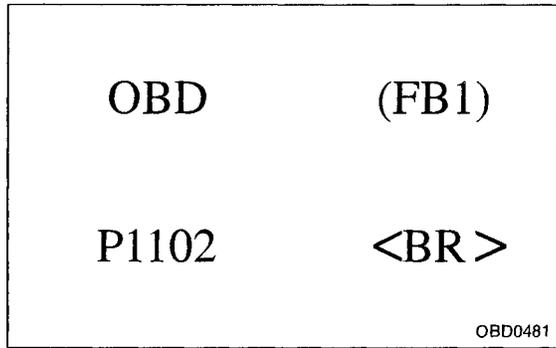
- Open circuit in harness between transmission harness connector and transmission grounding point
- Poor contact in transmission harness connector (B14)
- Poor contact in transmission grounding point



10BL5 CHECK INHIBITOR SWITCH.

Measure resistance between transmission harness connector receptacle's terminals.

- CHECK** : **Connector & terminal (T1) No. 3 — No. 4:**
Is the resistance less than 1 Ω in "P" position?
- YES** : Go to next **CHECK** .
- NO** : Repair open circuit in transmission harness or replace inhibitor switch.
- CHECK** : **Connector & terminal (T1) No. 3 — No. 4:**
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].☆1 >
- NO** : Replace ECM.



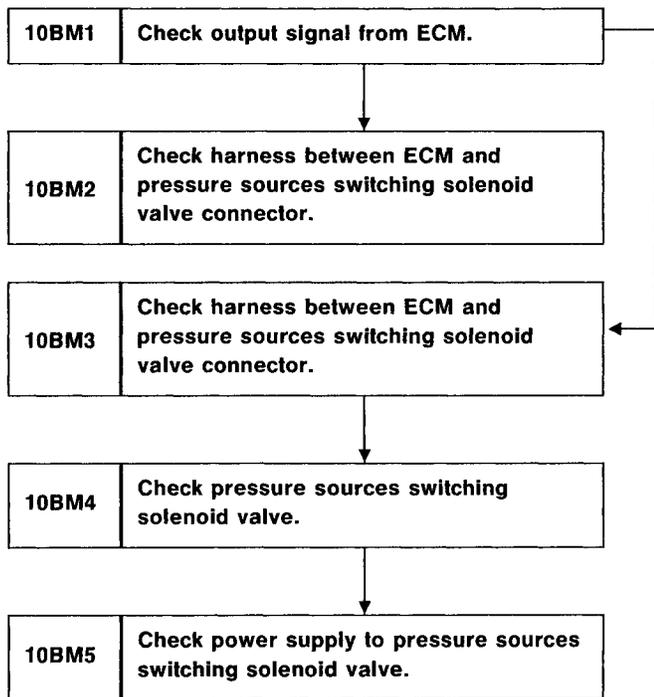
BM: DTC P1102
— PRESSURE SOURCES SWITCHING
SOLENOID VALVE CIRCUIT MALFUNCTION
(BR) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Failure of engine to start

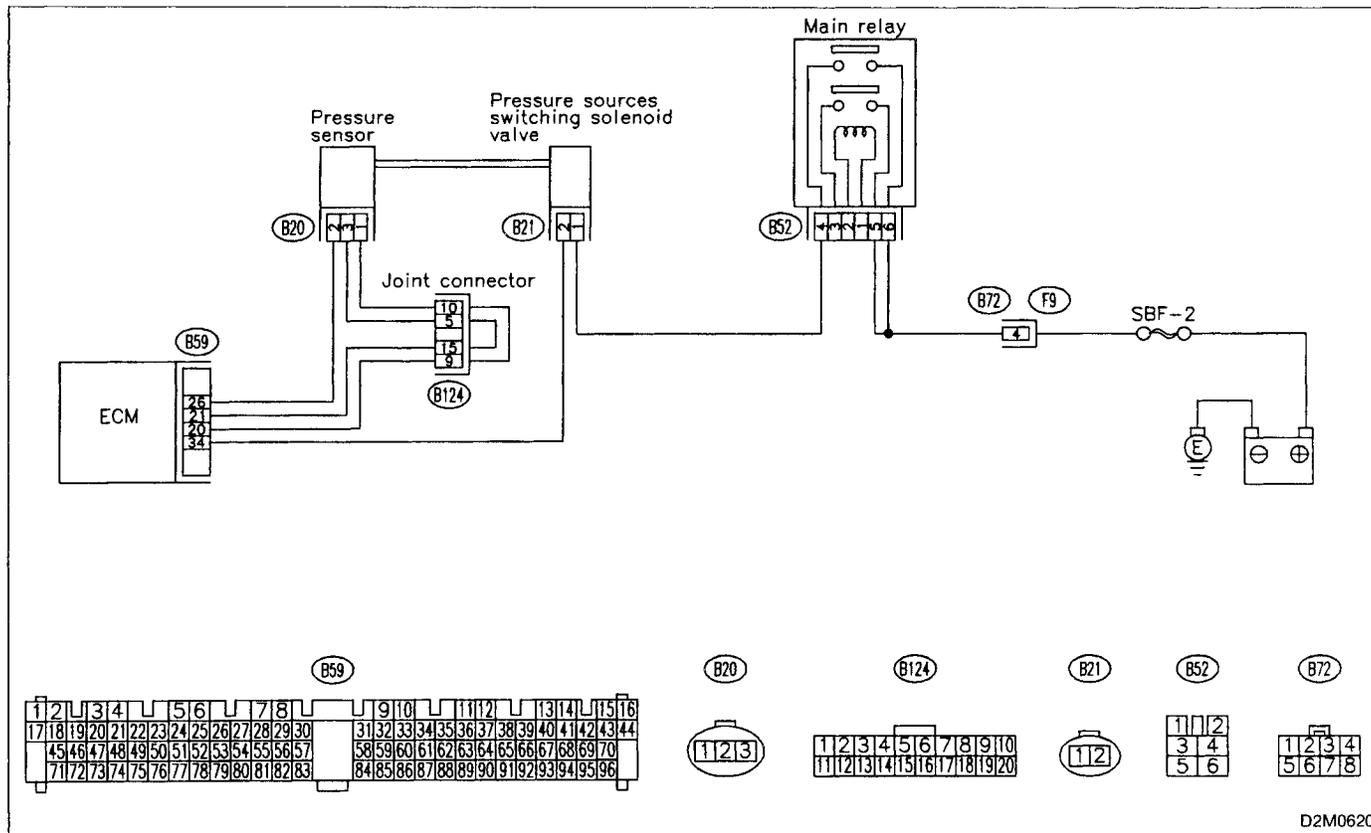


CAUTION:

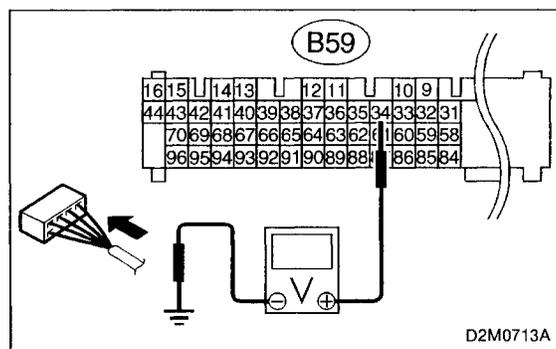
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODE**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0620



D2M0713A

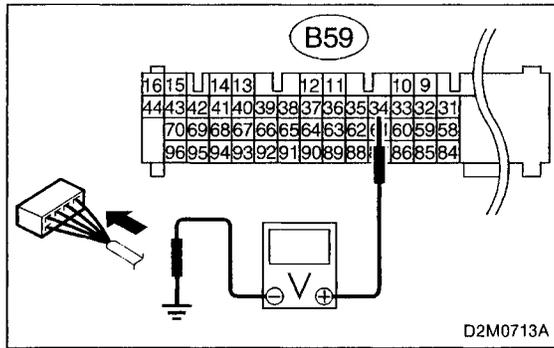
10BM1 CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK : **Connector & terminal (B59) No. 34 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Go to step **10BM2**.

NO : Go to step **10BM3**.



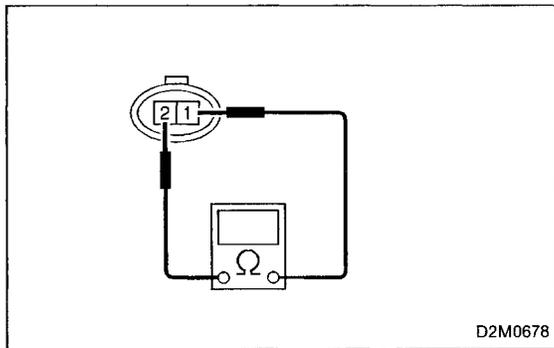
10BM2 **CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.**

- 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 (B59) No. 34 (+) — 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?**

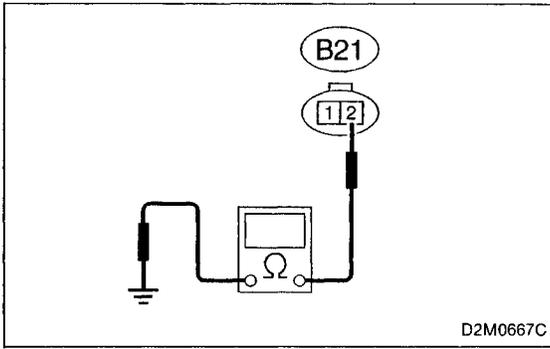
YES : Replace pressure sources switching solenoid valve and ECM.

NO : Go to next **CHECK** .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



10BM3

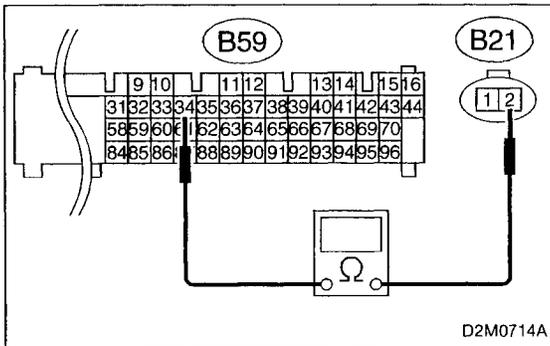
CHECK HARNESS BETWEEN ECM AND PRESSURE SOURCES SWITCHING SOLENOID VALVE CONNECTOR.

- 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 (B21) No. 2 — 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).

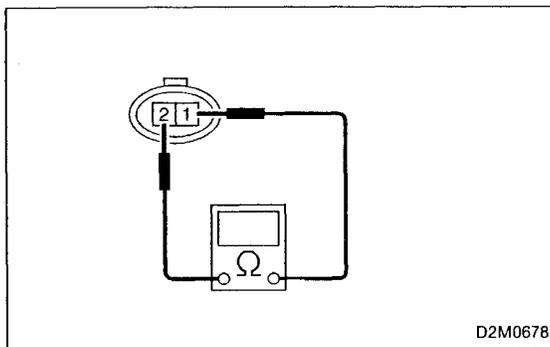


- 4) Measure resistance of harness between ECM and pressure sources switching solenoid valve connector.

CHECK : **Connector & terminal (B59) No. 34 — (B21) No. 2:**
Is the resistance less than 1 Ω?

YES : Go to step 10BM4.

NO : Repair open circuit in harness between ECM and pressure sources switching solenoid valve connector.



10BM4

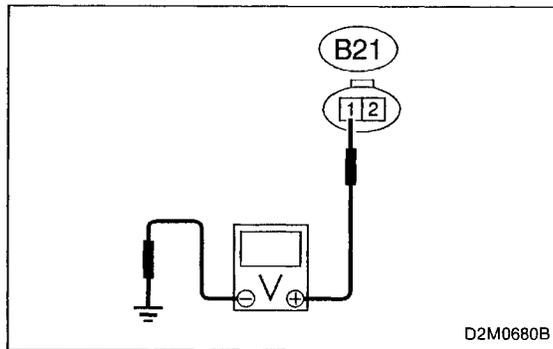
CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.

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 10BM5.

NO : Replace pressure sources switching solenoid valve.

**10BM5****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 (B21) 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 pressure sources switching solenoid valve connector.

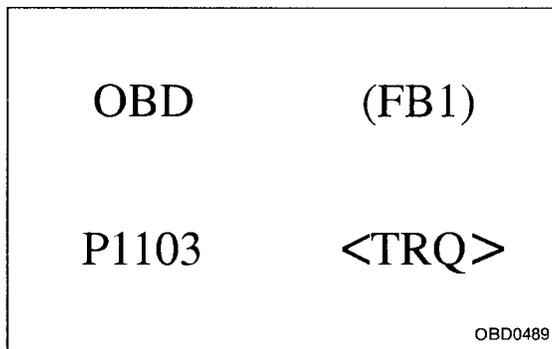
CHECK : **Is there poor contact in pressure sources switching solenoid valve connector?**

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.



BN: DTC P1103
— ENGINE TORQUE CONTROL SIGNAL
CIRCUIT MALFUNCTION (TRQ) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Excessive shift shock

10BN1	Check input signal for ECM.
--------------	------------------------------------



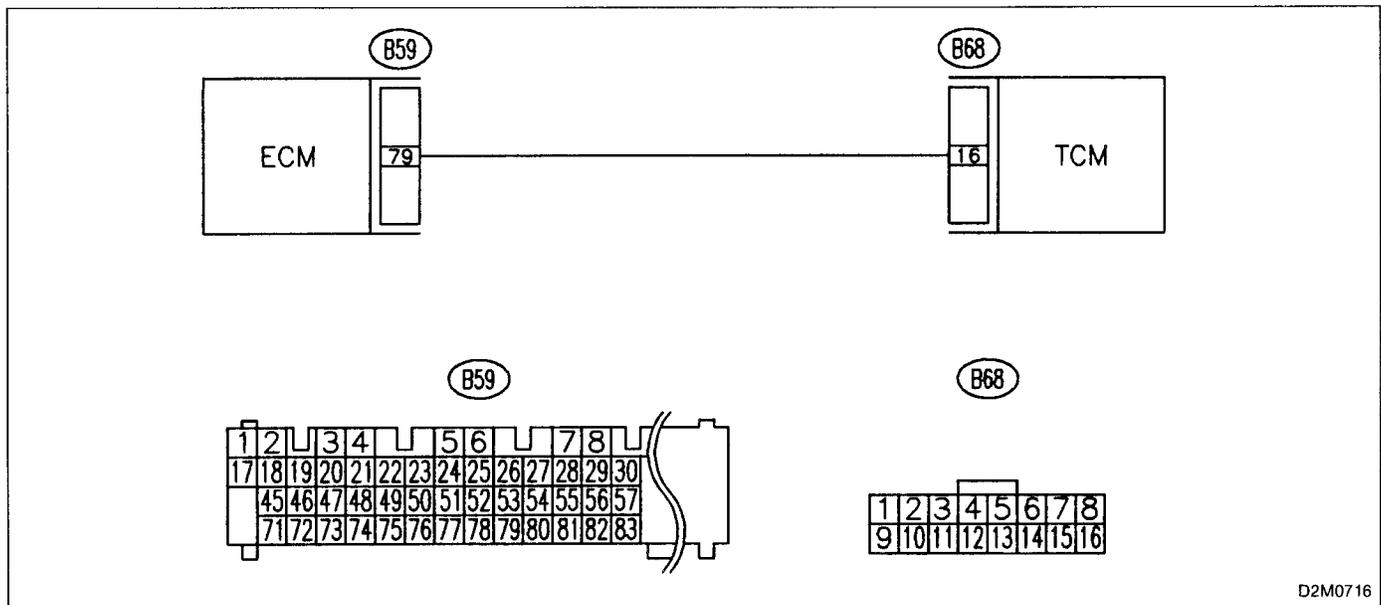
10BN2	Check harness between ECM and TCM connector.
--------------	---

CAUTION:

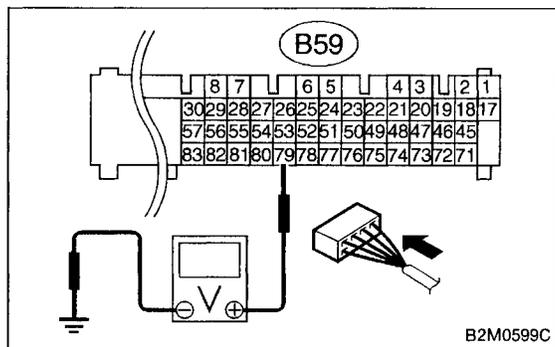
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0716



10BN1 CHECK INPUT SIGNAL FOR ECM.

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

CHECK : Connector & terminal (B59) No. 79 (+) — Chassis ground (-): Is the voltage more than 4.5 V?

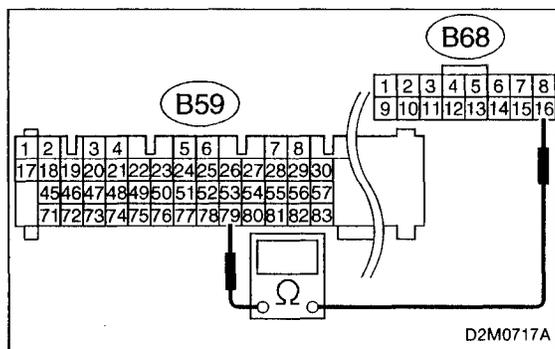
YES : Go to next **CHECK** .

NO : Go to step **10BN2**.

CHECK : Is there poor contact in ECM connector?

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



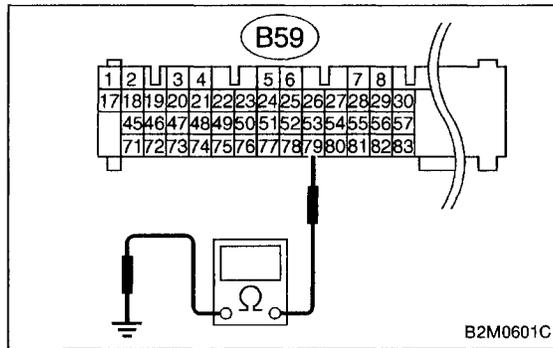
10BN2 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

- 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 (B59) No. 79 — (B68) 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 connector and chassis ground.

CHECK : **Connector & terminal (B59) 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.

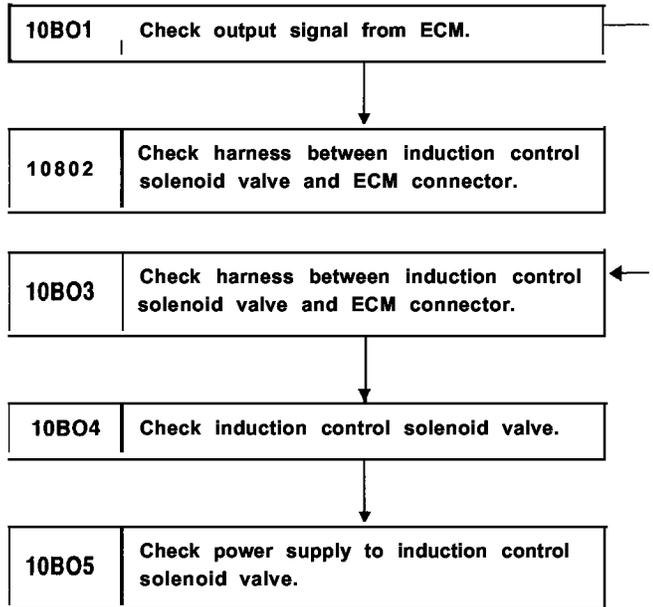
NO : Replace TCM.

<p>OBD (FB1)</p> <p>P1108 <IH SOL></p> <p style="text-align: right; font-size: small;">D2M0718</p>
--

BO: DTC P1108
— INDUCTION CONTROL SOLENOID VALVE
CIRCUIT MALFUNCTION (IH SOL) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

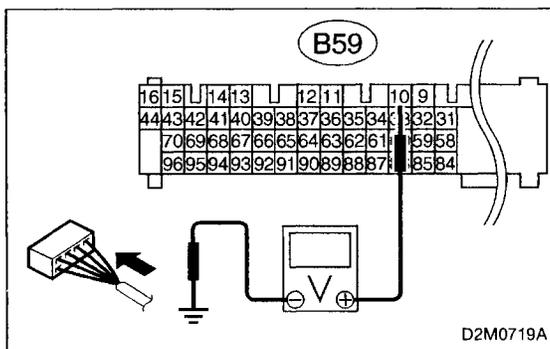
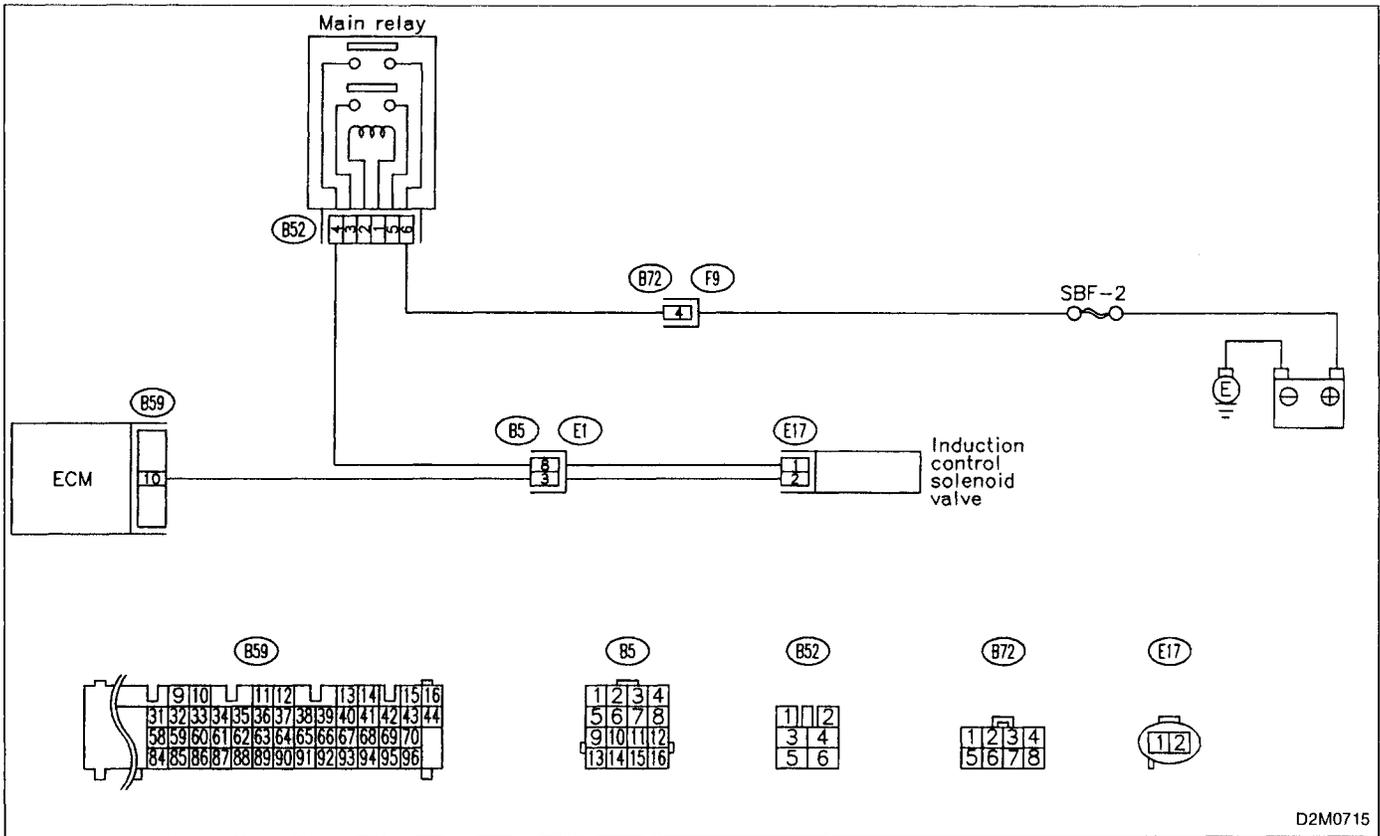


CAUTION:

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



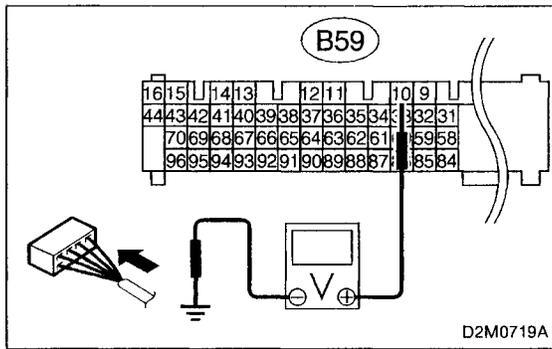
10B01 CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK : Connector & terminal
 (B59) No. 10 (+) — Chassis ground (-):
 Is the voltage more than 10 V?

YES : Go to step 10B02.

NO : Go to step 10B03.



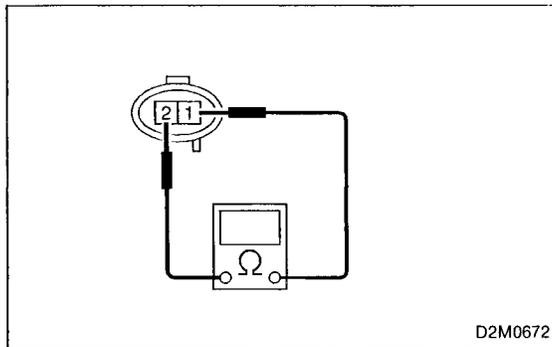
10B02 CHECK HARNESS BETWEEN INDUCTION CONTROL SOLENOID VALVE AND ECM CONNECTOR.

- 1) Turn ignition switch to OFF.
- 2) Disconnect connector from induction control solenoid valve.
- 3) Turn ignition switch to ON.
- 4) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 10 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Repair short circuit in harness between ECM and induction control solenoid valve connector.

NO : Go to next step 5).



- 5) Turn ignition switch to OFF.
- 6) Remove induction control solenoid valve. <Ref. to 2-7 [W18A0], ☆5 >
- 7) Measure resistance between induction control solenoid valve terminals.

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

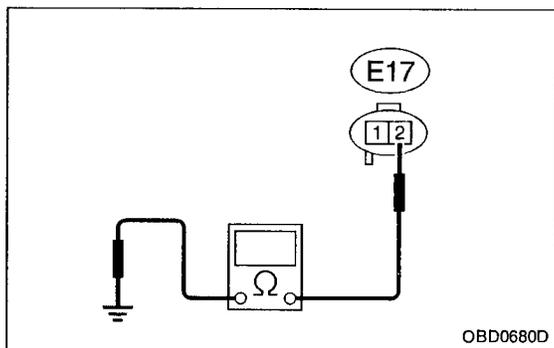
YES : Replace induction control solenoid valve and ECM.

NO : Go to next **CHECK** .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



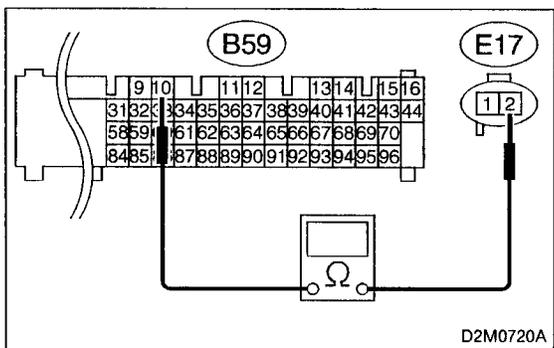
10B03 **CHECK HARNESS BETWEEN INDUCTION CONTROL SOLENOID VALVE AND ECM CONNECTOR.**

- 1) Turn ignition switch to OFF.
- 2) Disconnect connectors from induction control solenoid valve and ECM.
- 3) Measure resistance of harness between induction control solenoid valve connector and engine ground.

CHECK : **Connector & terminal (E17) No. 2 — Engine ground:**
Is the resistance less than 10 Ω?

YES : Repair short circuit in harness between ECM and induction 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 (B59) No. 10 — (E17) No. 2:**
Is the resistance less than 1 Ω?

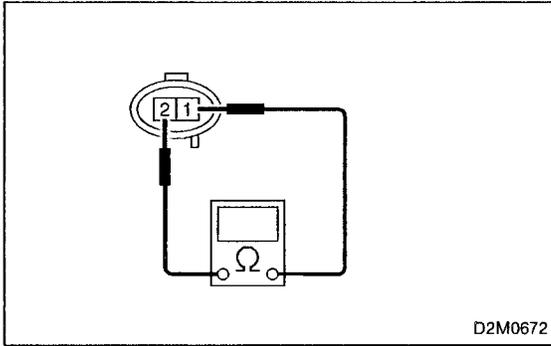
YES : Go to step **10B04**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between ECM and induction control solenoid valve connector
- Poor contact in coupling connector (B5)

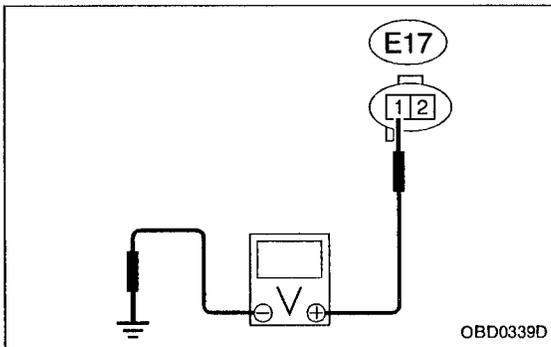

10B04 CHECK INDUCTION CONTROL SOLENOID VALVE.

- 1) Remove induction control solenoid valve. <Ref. to 2-7 [W18A0].☆5>
- 2) Measure resistance between induction control solenoid valve terminals.

CHECK : **Terminals**
No. 1 — No. 2:
Is the resistance between 10 and 100 Ω?

YES : Go to step **10B05**.

NO : Replace induction control solenoid valve.


10B05 CHECK POWER SUPPLY TO INDUCTION CONTROL SOLENOID VALVE.

- 1) Turn ignition switch to ON.
- 2) Measure voltage between induction control solenoid valve and engine ground.

CHECK : **Connector & terminal**
(E17) No. 1 (+) — Engine 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 induction control solenoid valve connector
- Poor contact in coupling connector (B5)

CHECK : **Is there poor contact in induction control solenoid valve connector?**

YES : Repair poor contact in induction 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)
 P0385<CRANK 2>
 D2M0931

BP: DTC P0385
— CRANKSHAFT POSITION SENSOR 2
CIRCUIT MALFUNCTION (CRANK 2) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

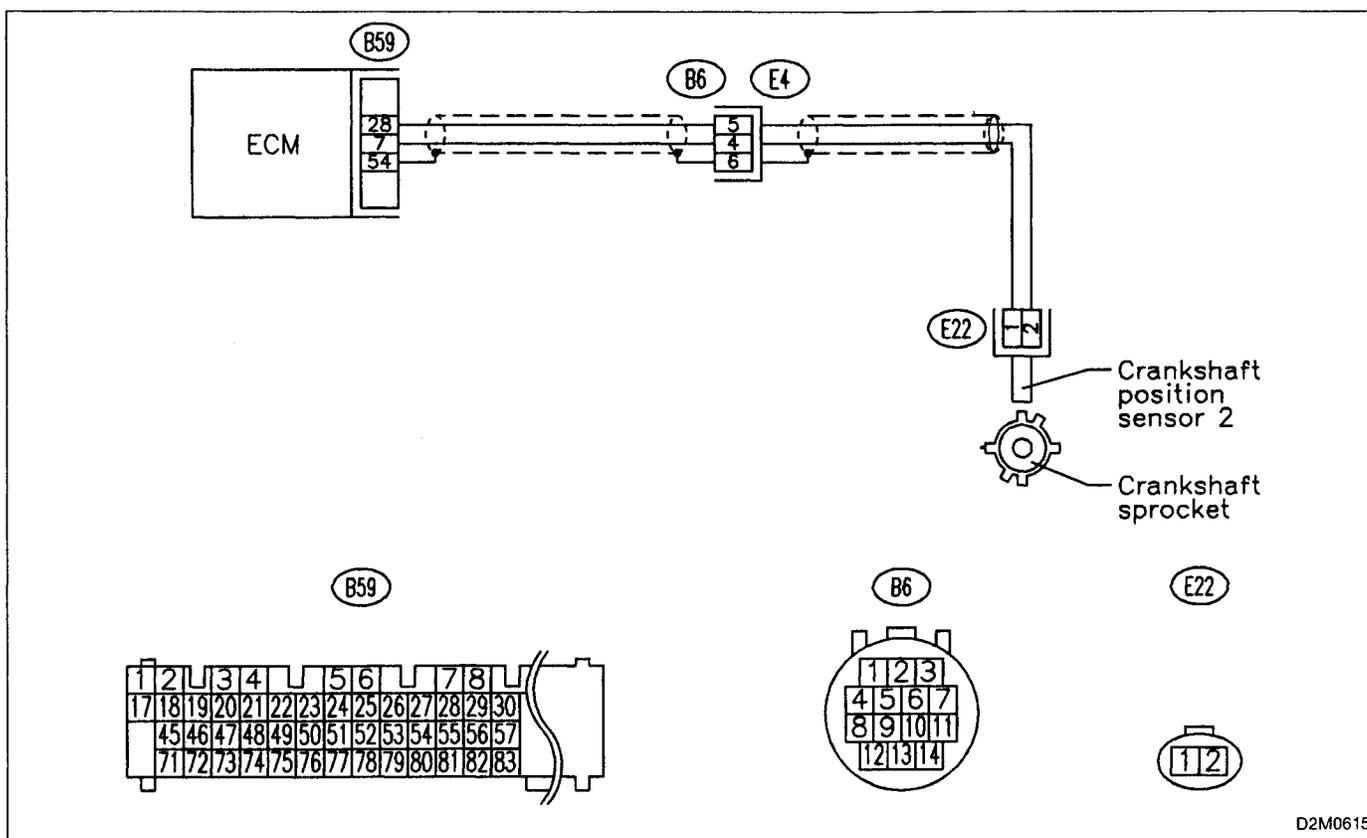
- Engine stalls.
- Failure of engine to start

CAUTION:

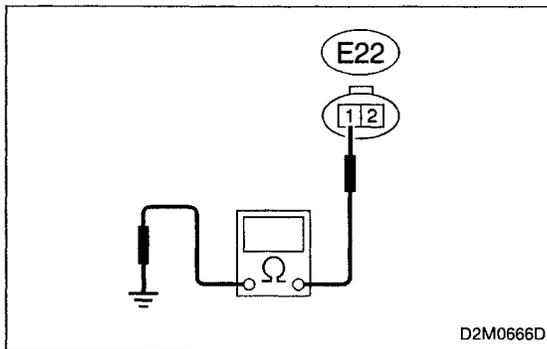
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



D2M0615



10BP1

CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR 2 AND ECM CONNECTOR.

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

CHECK : **Connector & terminal (E22) 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 2 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

NO : Go to next **CHECK** .

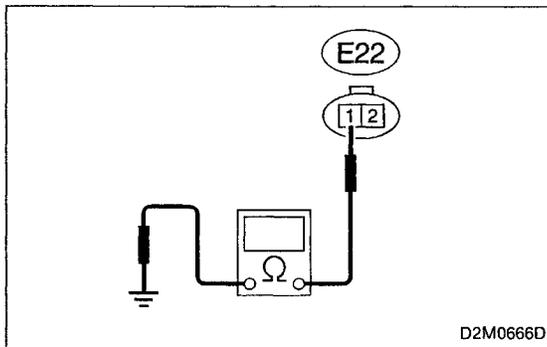
CHECK : **Connector & terminal (E22) No. 1 — Engine ground:**
Is the resistance less than 10 Ω?

YES : Repair short circuit in harness between crankshaft position sensor 2 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 (E22) No. 2 — Engine ground:**
Is the resistance less than 5 Ω?

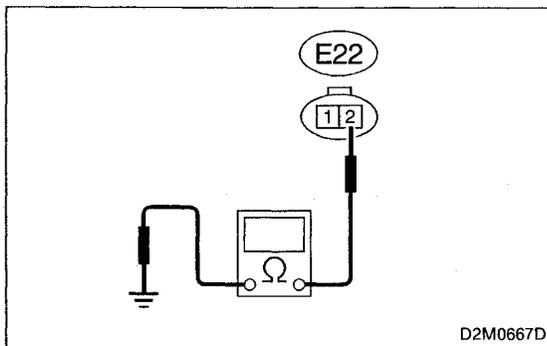
YES : Go to step 10BP2.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor 2 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

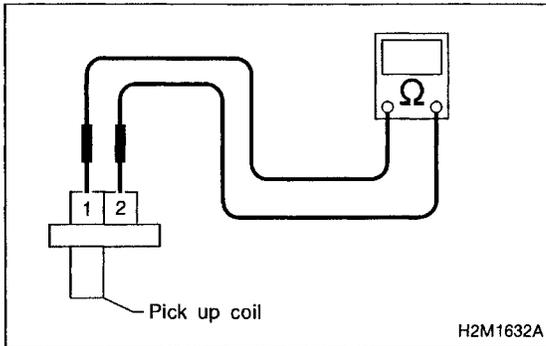


10BP2**CHECK CRANKSHAFT POSITION SENSOR 2.****CHECK****: Is the crankshaft position sensor 2 installation bolt tightened securely?****YES**

: Go to next step 1).

NO

: Tighten crankshaft position sensor 2 installation bolt securely.



1) Remove crankshaft position sensor 2.

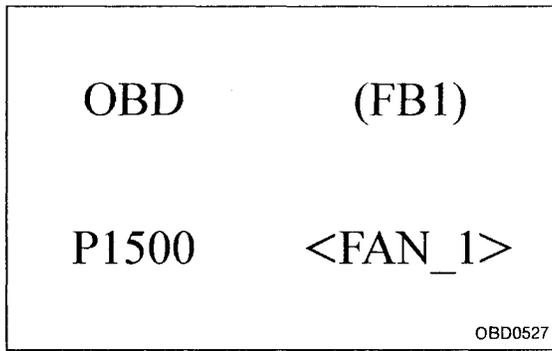
2) Measure resistance between connector terminals of crankshaft position sensor 2.

CHECK**: Terminals****No. 1 — No. 2:****Is the resistance between 1 and 4 kΩ?****YES**

: Repair poor contact in crankshaft position sensor 2 connector.

NO

: Replace crankshaft position sensor 2.



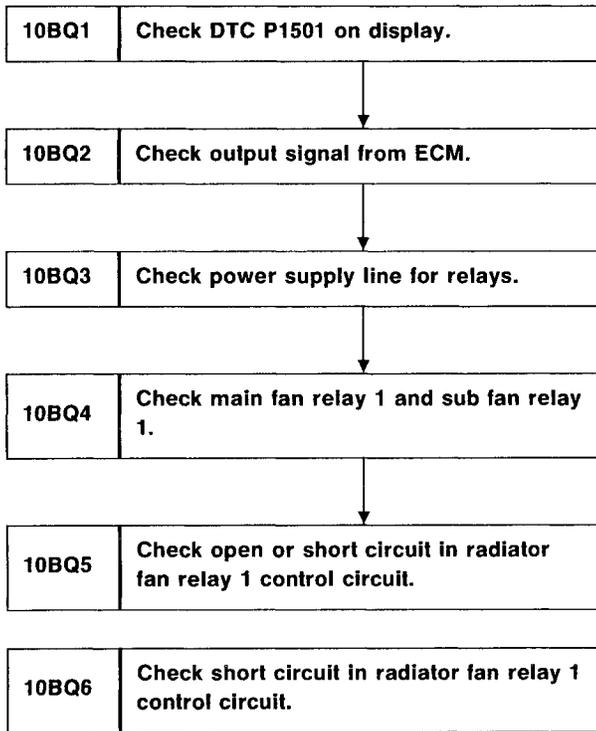
BQ: DTC P1500
— RADIATOR FAN RELAY 1 CIRCUIT
MALFUNCTION (FAN — 1) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

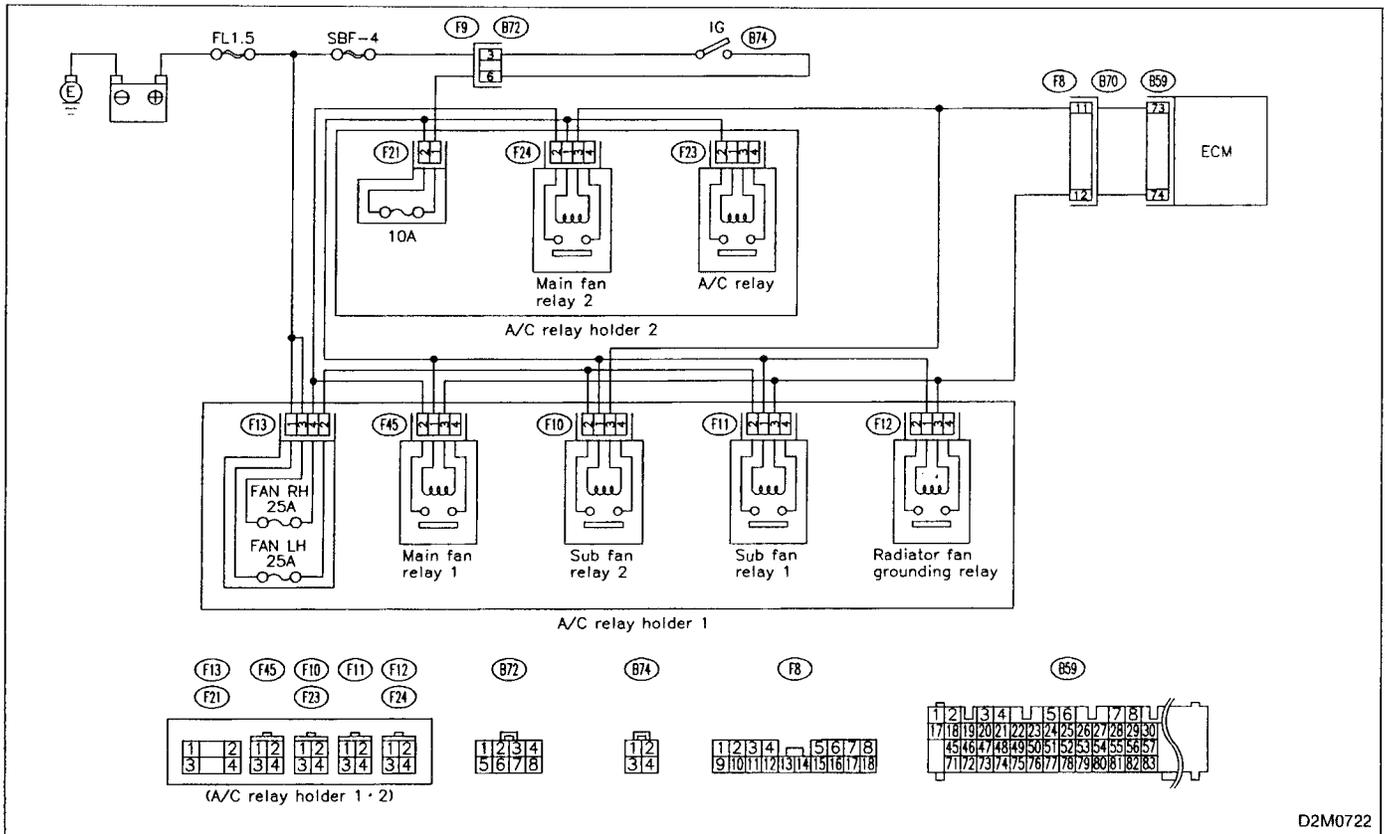


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



10BQ1 CHECK DTC P1501 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P1500 and P1501 at same time?

YES : Go to next step 1).

NO : Go to step **10BQ2**.

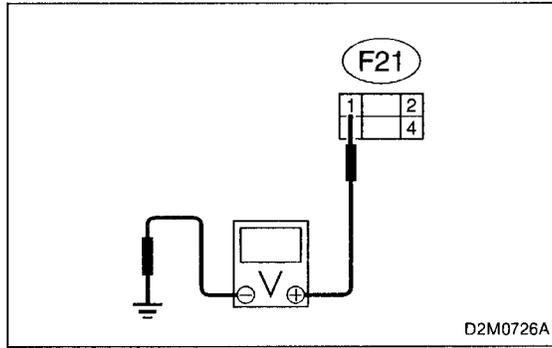
1) Turn ignition switch to OFF.

2) Remove the fuse (10A).

CHECK : Is the fuse in power supply circuit broken?

YES : Replace the fuse.

NO : Go to next step 3).



3) Measure voltage between fuse connector and engine ground.

CHECK : **Connector & terminal (F21) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

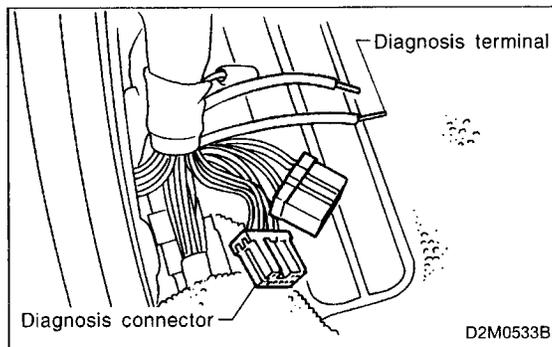
YES : Go to step **10BQ2**.

NO : Repair harness and connector.

NOTE:

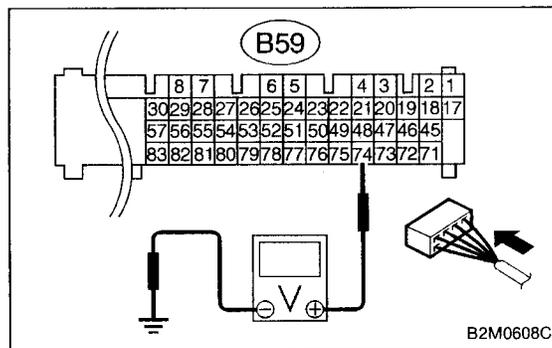
In this case, repair the following:

- Open or short circuit in harness between ignition switch and fuse connector
- Poor contact in coupling connector (B72)



10BQ2 CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal into diagnosis connector (terminal No. 1).
- 3) Turn ignition switch to ON.

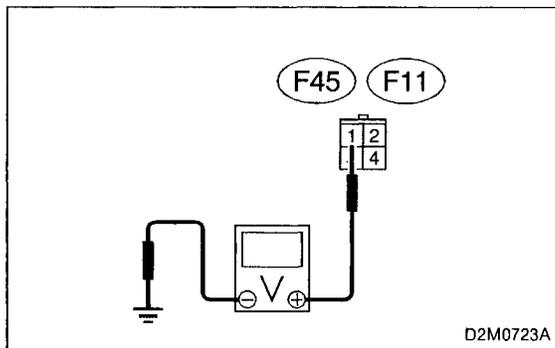


4) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 74 (+) — Chassis ground: Is the voltage more than 10 V?**

YES : Go to step **10BQ6**.

NO : Go to step **10BQ3**.



10BQ3 CHECK POWER SUPPLY LINE FOR RELAYS.

- 1) Turn ignition switch to OFF.
- 2) Install the fuse.
- 3) Remove main fan relay 1 and sub fan relay 1.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between main fan relay 1 connector and engine ground.

CHECK : **Connector & terminal**
(F45) No. 1 (+) — Engine ground (-):
Is the voltage more than 10 V?

- YES** : Go to next step 6).
- NO** : Repair harness between connector.

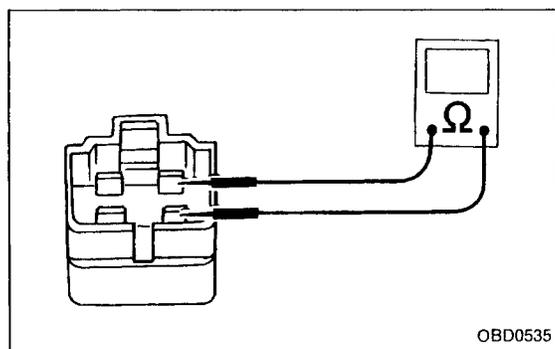
NOTE:

- Open or short circuit in harness between fuse and main fan relay 1 connector
- Poor contact in fuse connector (F21)

- 6) Measure voltage between sub fan relay 1 connector and engine ground.

CHECK : **Connector & terminal**
(F11) No. 1 (+) — Engine ground (-):
Is the voltage more than 10 V?

- YES** : Go to step **10BQ4**.
- NO** : Repair open or short circuit in harness between fuse and sub fan relay 1 connector.



10BQ4 CHECK MAIN FAN RELAY 1 AND SUB FAN RELAY 1.

- 1) Measure resistance between main fan relay 1 terminals.

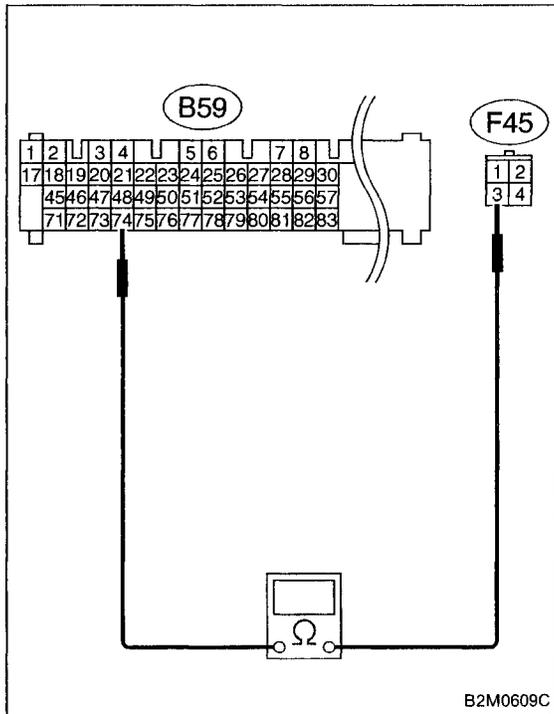
CHECK : **Terminals**
No. 1 — No. 3:
Is the resistance between 87 and 107 Ω?

- YES** : Go to next step 2).
- NO** : Replace main fan relay 1.

- 2) Measure resistance between sub fan relay 1 terminals.

CHECK : **Terminals**
No. 1 — No. 3:
Is the resistance between 87 and 107 Ω?

- YES** : Go to step **10BQ5**.
- NO** : Replace sub fan relay 1.



10BQ5 CHECK OPEN OR SHORT CIRCUIT IN RADIATOR FAN RELAY 1 CONTROL CIRCUIT.

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

CHECK : **Connector & terminal (B59) No. 74 — (F45) No. 3:**
Is the resistance less than 1 Ω?

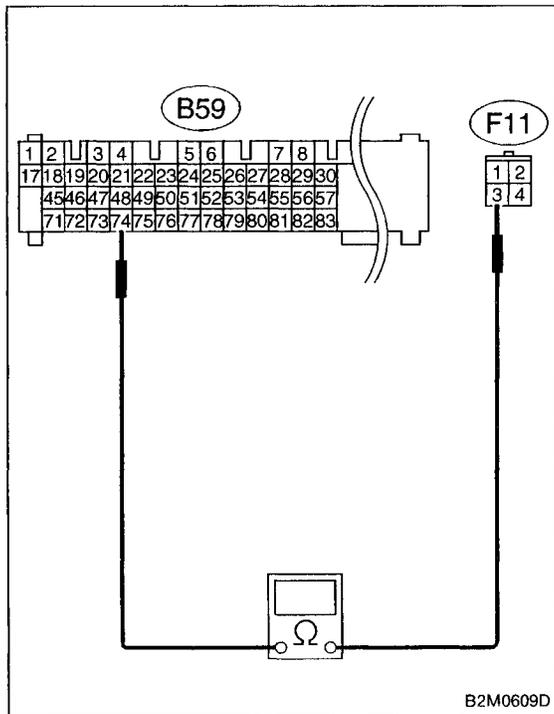
YES : Go to next **CHECK** .

NO : Go to next step 4).

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 5).



- 4) Measure resistance of harness between ECM and sub fan relay 1 connector.

CHECK : **Connector & terminal (B59) No. 74 — (F11) No. 3:**
Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

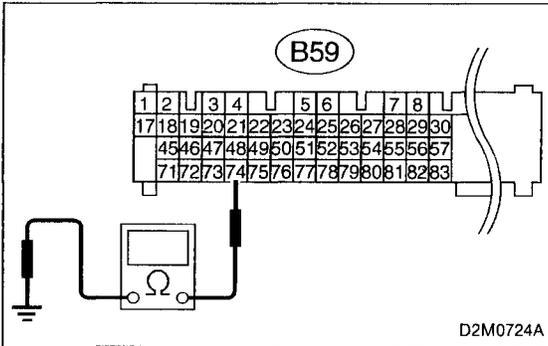
In this case, repair the following:

- Open circuit in harness between ECM and main fan relay 1 connector
- Open circuit in harness between ECM and sub fan relay 1 connector
- Poor contact in coupling connector (F8)

CHECK : **Is there poor contact in ECM or sub fan relay 1 connector?**

YES : Repair poor contact in ECM or sub fan relay 1 connector.

NO : Go to next step 5).

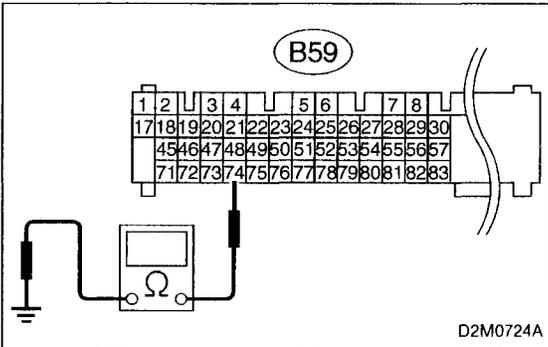


5) Measure resistance of harness between ECM connector and chassis ground.

CHECK : **Connector & terminal (B59) No. 74 — Chassis ground: Is the resistance less than 10 Ω?**

YES : Go to next step 6).

NO : Replace ECM.



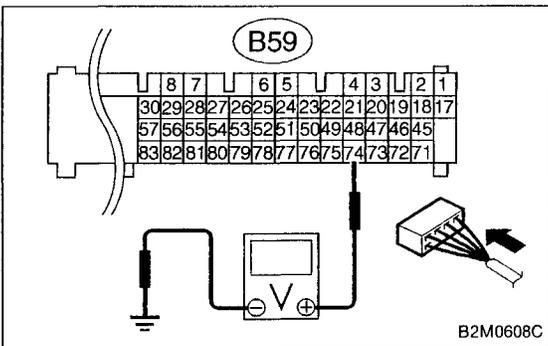
6) Disconnect coupling connector (F8).

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

CHECK : **Connector & terminal (B59) No. 74 — Chassis ground: Is the resistance less than 10 Ω?**

YES : Repair short circuit in harness between ECM and coupling connector (F8).

NO : Repair short circuit in harness between main fan relay 1 or sub fan relay 1 and coupling connector (F8).



10BQ6 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.
- 3) Disconnect test mode connector.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) 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.

<p>OBD (FB1)</p> <p>P1501 <FAN_2></p> <p style="text-align: right; font-size: small;">D2M0725</p>

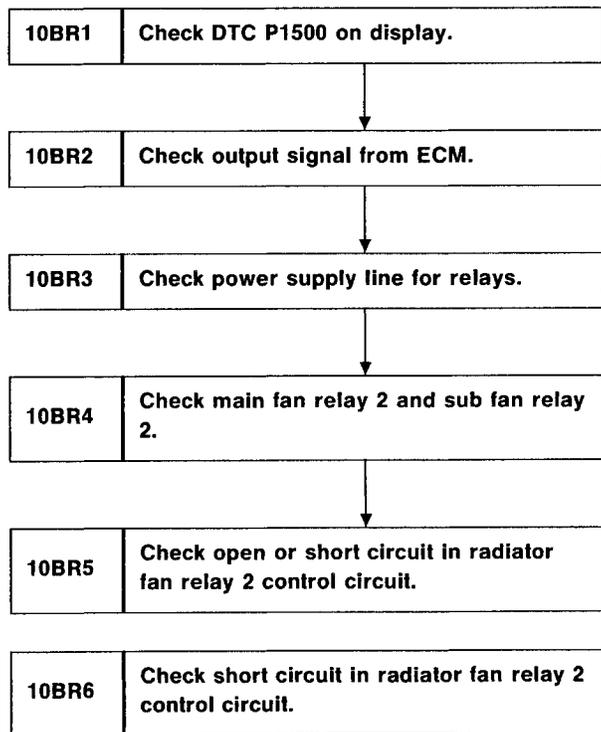
BR: DTC P1501
— RADIATOR FAN RELAY 2 CIRCUIT MALFUNCTION (FAN — 2) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Radiator fan does not operate properly.
- Overheating

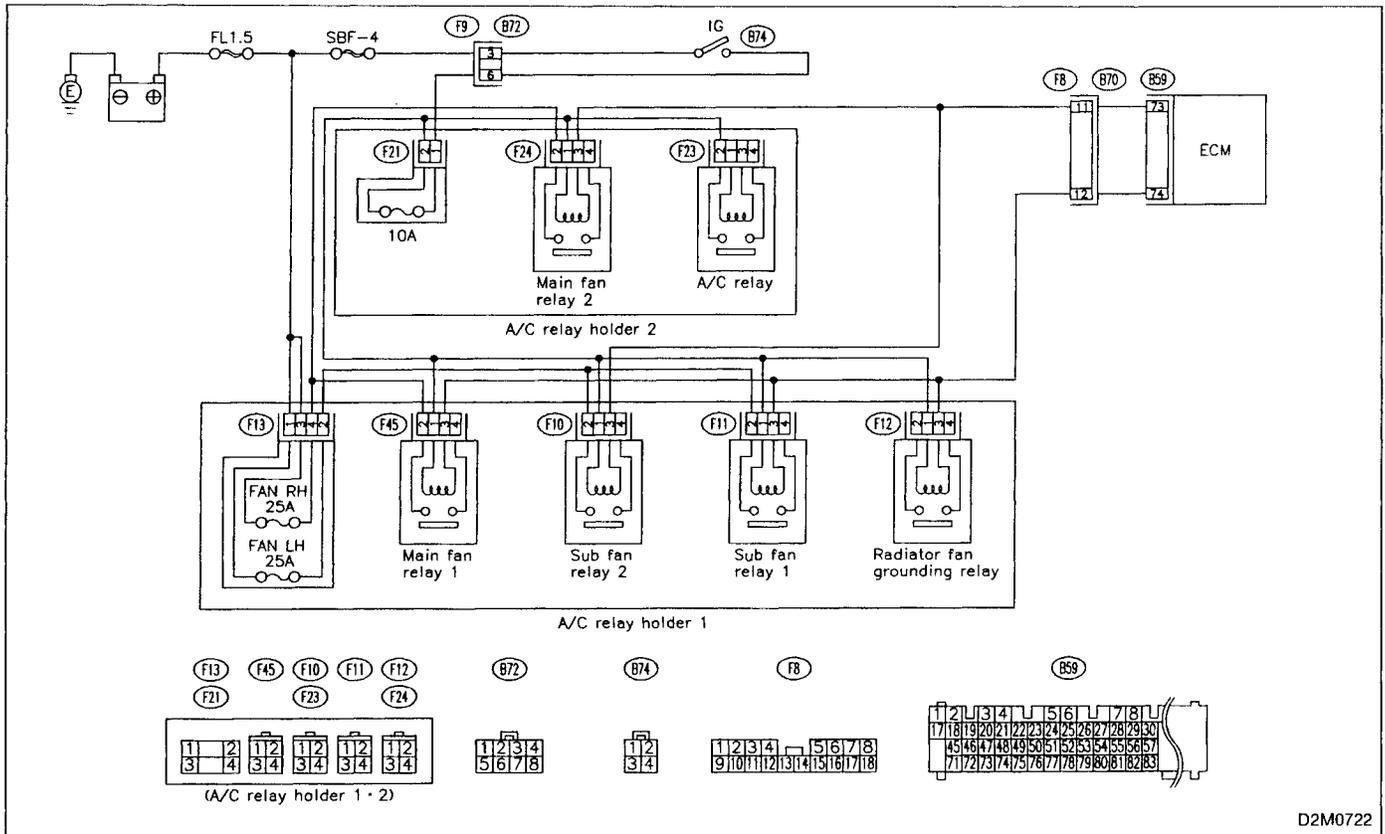


CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0722

10BR1 CHECK DTC P1500 ON DISPLAY.

CHECK : Does the Subaru select monitor or OBD-II general scan tool indicate DTC P1500 and P1501 at same time?

YES : Go to next step 1).

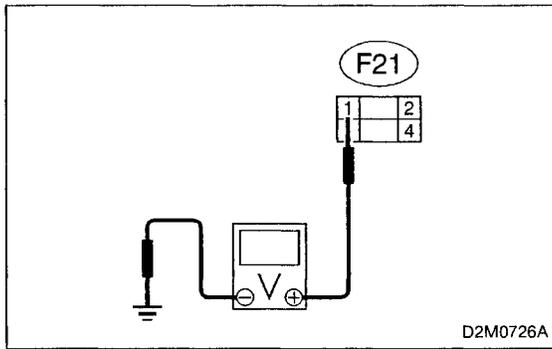
NO : Go to step 10BR2.

- 1) Turn ignition switch to OFF.
- 2) Remove the fuse (10A).

CHECK : Is the fuse in power supply circuit broken?

YES : Replace the fuse.

NO : Go to next step 3).



3) Measure voltage between fuse connector and engine ground.

CHECK : **Connector & terminal (F21) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

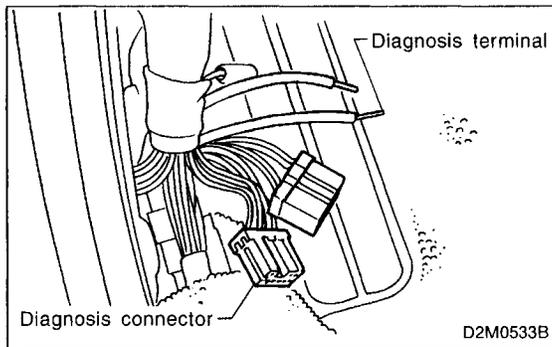
YES : Go to step 10BR2.

NO : Repair harness and connector.

NOTE:

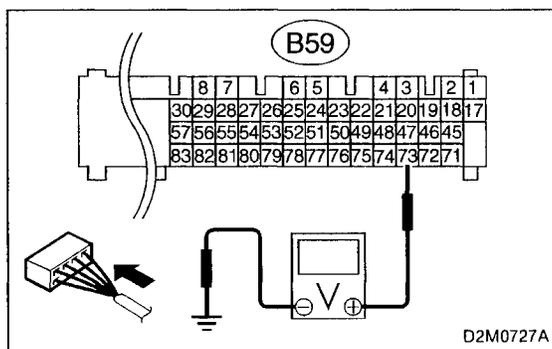
In this case, repair the following:

- Open or short circuit in harness between ignition switch and fuse connector
- Poor contact in coupling connector (B72)



10BR2 CHECK OUTPUT SIGNAL FROM ECM.

- 1) Turn ignition switch to OFF.
- 2) Connect diagnosis terminal into diagnosis connector (terminal No. 1).
- 3) Turn ignition switch to ON.

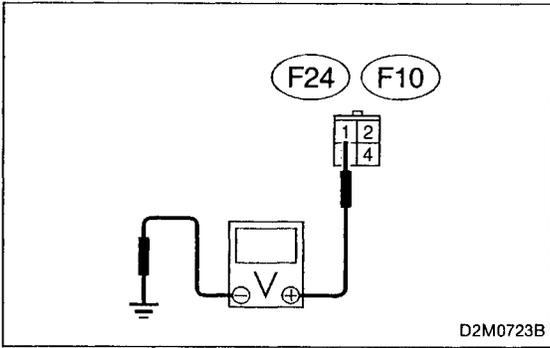


4) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 73 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Go to step 10BR6.

NO : Go to step 10BR3.



10BR3 CHECK POWER SUPPLY LINE FOR RELAYS.

- 1) Turn ignition switch to OFF.
- 2) Install the fuse.
- 3) Remove main fan relay 2 and sub fan relay 2.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between main fan relay 2 connector and engine ground.

CHECK : **Connector & terminal (F24) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

YES : Go to next step 6).

NO : Repair harness between connector.

NOTE:

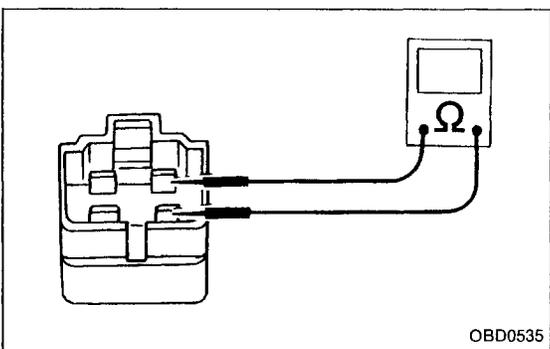
- Open or short circuit in harness between fuse and main fan relay 2 connector
- Poor contact in fuse connector (F21)

- 6) Measure voltage between sub fan relay 2 connector and engine ground.

CHECK : **Connector & terminal (F10) No. 1 (+) — Engine ground (-): Is the voltage more than 10 V?**

YES : Go to step **10BR4**.

NO : Repair open or short circuit in harness between fuse and sub fan relay 2 connector.



10BR4 CHECK MAIN FAN RELAY 2 AND SUB FAN RELAY 2.

- 1) Measure resistance between main fan relay 2 terminals.

CHECK : **Terminals No. 1 — No. 3: Is the resistance between 87 and 107 Ω?**

YES : Go to next step 2).

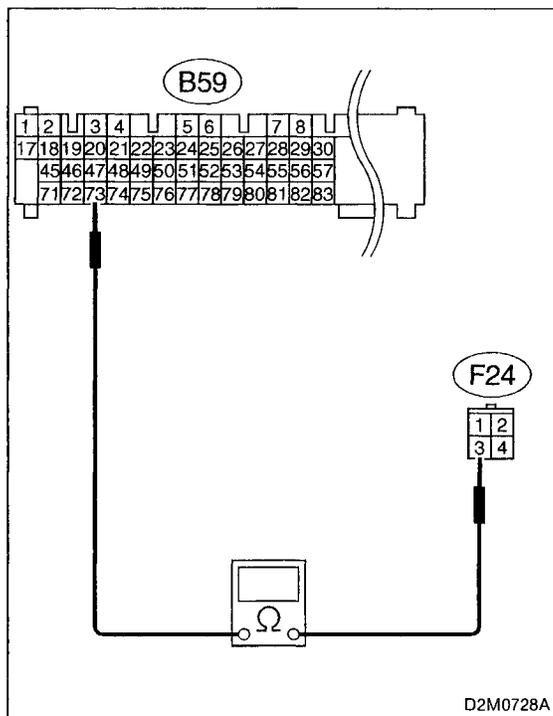
NO : Replace main fan relay 2.

- 2) Measure resistance between sub fan relay 2 terminals.

CHECK : **Terminals No. 1 — No. 3: Is the resistance between 87 and 107 Ω?**

YES : Go to step **10BR5**.

NO : Replace sub fan relay 2.



10BR5

CHECK OPEN OR SHORT CIRCUIT IN RADIATOR FAN RELAY 2 CONTROL CIRCUIT.

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

CHECK : **Connector & terminal (B59) No. 73 — (F24) No. 3:**
Is the resistance less than 1 Ω?

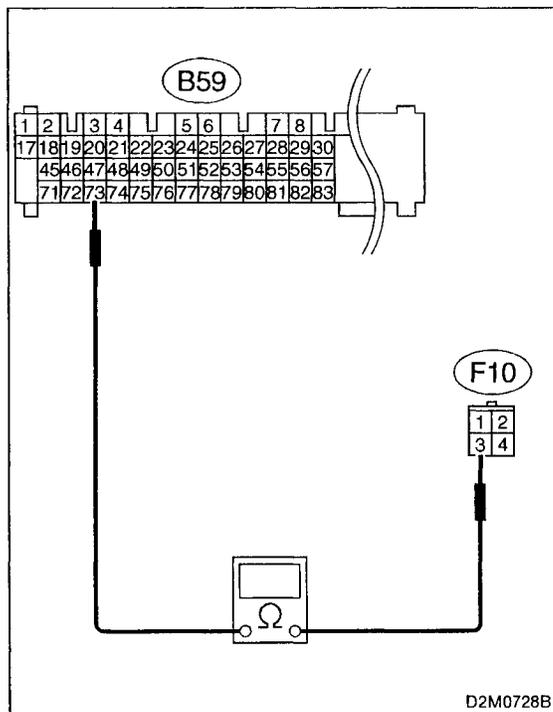
YES : Go to next **CHECK** .

NO : Go to next step 4).

CHECK : **Is there poor contact in ECM or main fan relay 2 connector?**

YES : Repair poor contact in ECM or main fan relay 2 connector.

NO : Go to next step 5).



- 4) Measure resistance of harness between ECM and sub fan relay 2 connector.

CHECK : **Connector & terminal (B59) No. 73 — (F10) No. 3:**
Is the resistance less than 1 Ω?

YES : Go to next **CHECK** .

NO : Repair harness and connector.

NOTE:

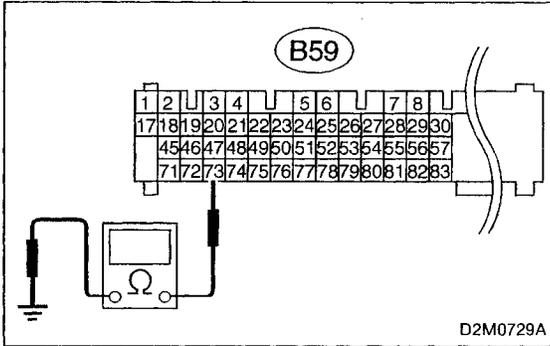
In this case, repair the following:

- Open circuit in harness between ECM and main fan relay 2 connector
- Open circuit in harness between ECM and sub fan relay 2 connector
- Poor contact in coupling connector (F8)

CHECK : **Is there poor contact in ECM or sub fan relay 2 connector?**

YES : Repair poor contact in ECM or sub fan relay 2 connector.

NO : Go to next step 5).

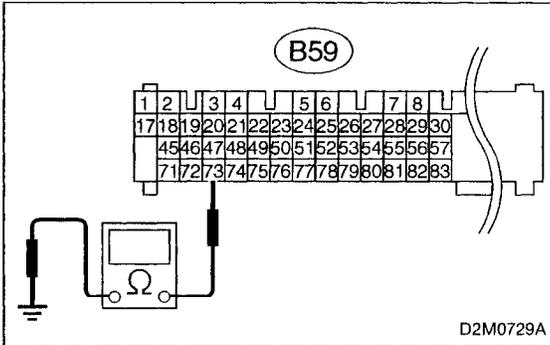


5) Measure resistance of harness between ECM and connector and chassis ground.

CHECK : **Connector & terminal (B59) No. 73 — Chassis ground: Is the resistance less than 10 Ω?**

YES : Go to next step 6).

NO : Replace ECM.



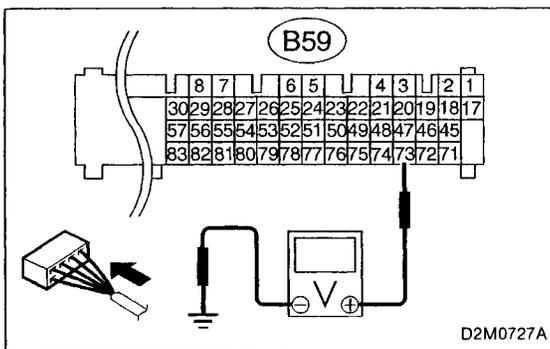
6) Disconnect coupling connector (F8).

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

CHECK : **Connector & terminal (B59) No. 73 — Chassis ground: Is the resistance less than 10 Ω?**

YES : Repair short circuit in harness between ECM and coupling connector (F8).

NO : Repair short circuit in harness between main fan relay 2 or sub fan relay 2 and coupling connector (F8).



10BR6 CHECK SHORT CIRCUIT IN RADIATOR FAN RELAY 2 CONTROL CIRCUIT.

- 1) Turn ignition switch to OFF.
- 2) Remove main fan relay 2 and sub fan relay 2.
- 3) Disconnect diagnosis terminal from diagnosis connector.
- 4) Turn ignition switch to ON.
- 5) Measure voltage between ECM and chassis ground.

CHECK : **Connector & terminal (B59) No. 73 (+) — Chassis ground (-): Is the voltage more than 10 V?**

YES : Repair short circuit in radiator fan relay 2 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	

BS: DTC P1502
— RADIATOR FAN FUNCTION PROBLEM (FAN – F) —

DTC DETECTING CONDITION:

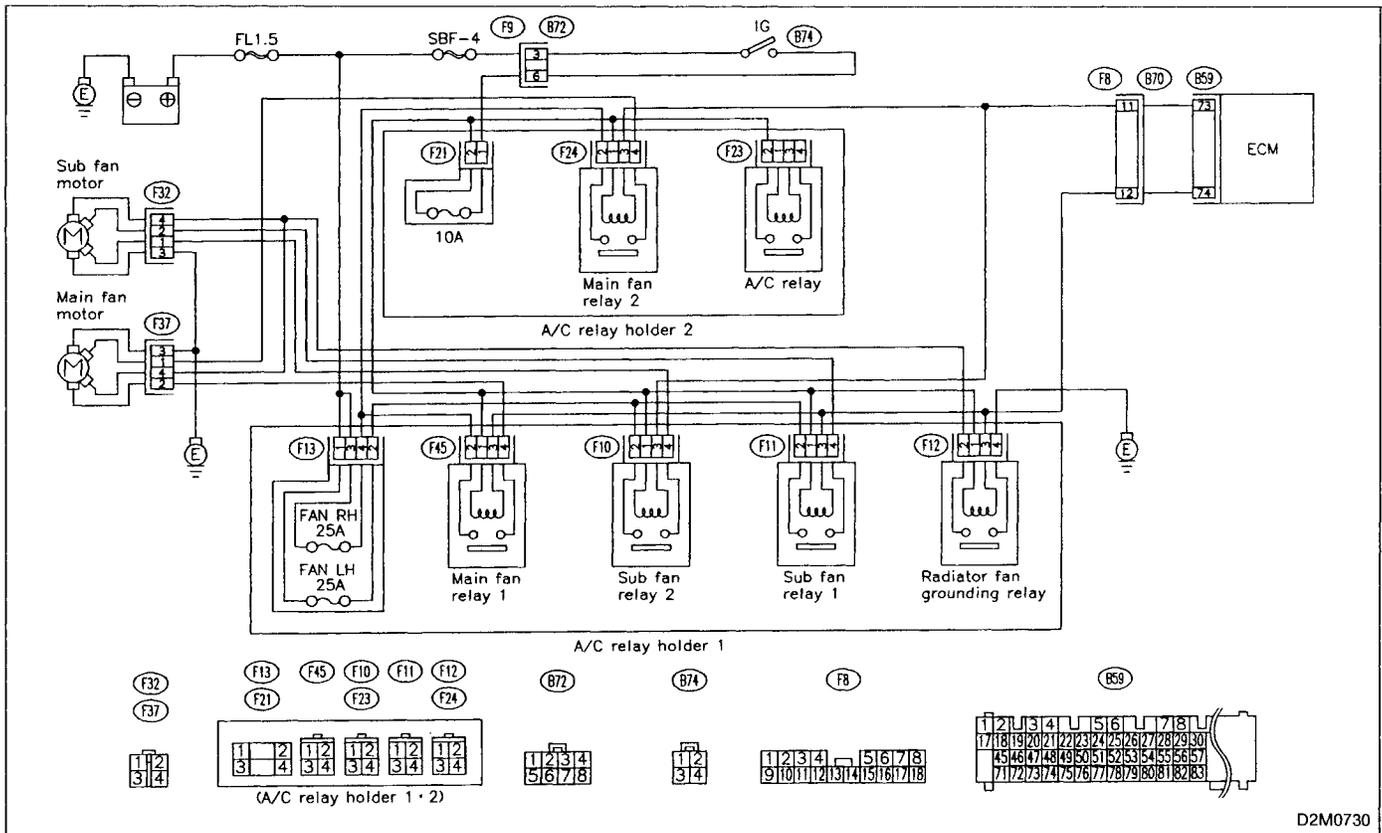
- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Occurrence of noise
- Overheating

10BS1	Check any other DTC (beside DTC P1502) on display.
--------------	---

WIRING DIAGRAM:



D2M0730

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0]. ☆5 >

NOTE:

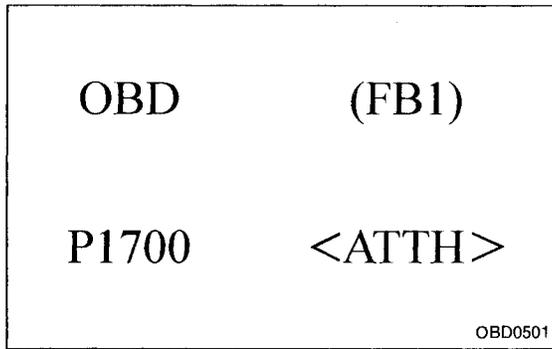
If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

10BS1	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, 2-7b [T1000]"☆5.

NO : Check engine cooling system. <Ref. to 2-5 [T2A0].☆5>



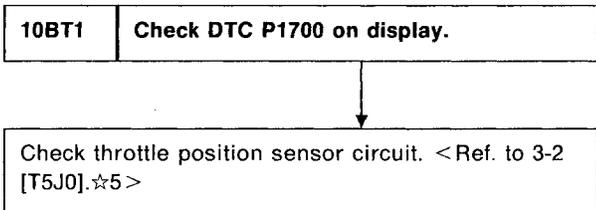
BT: DTC P1700
— THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION (ATTH) —

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"

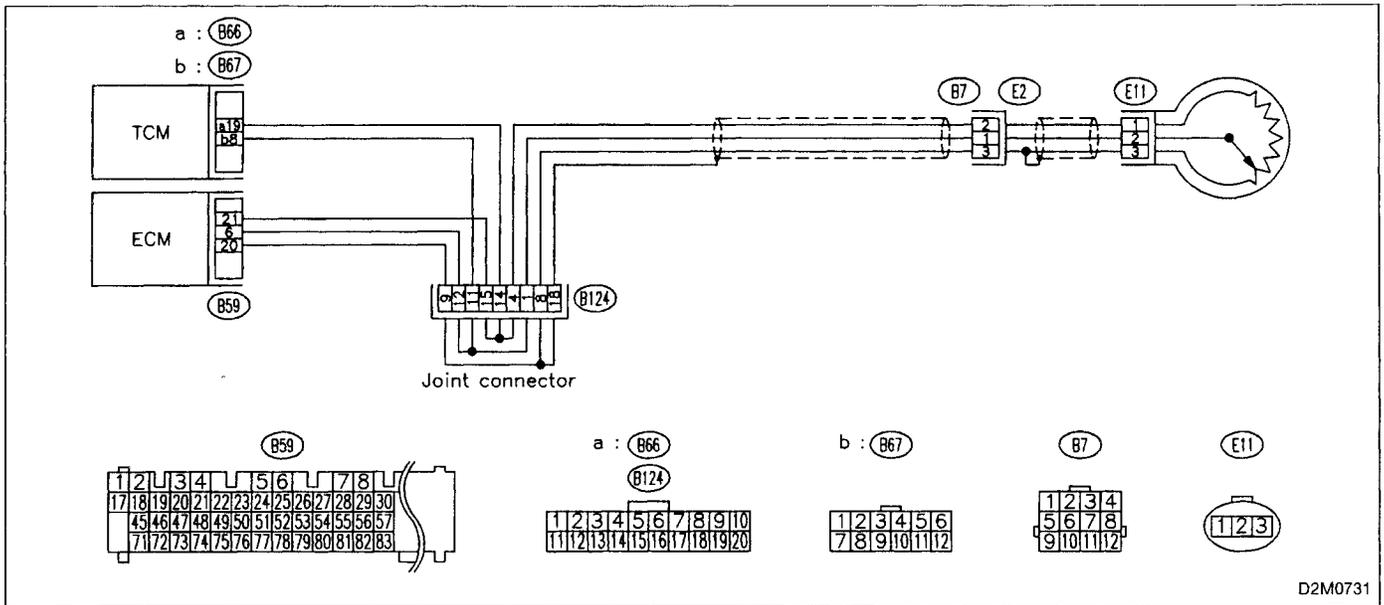


CAUTION:

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

<Ref. to 2-7b [T3D0] and [T3E0].☆5>

WIRING DIAGRAM:



D2M0731

10BT1 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:

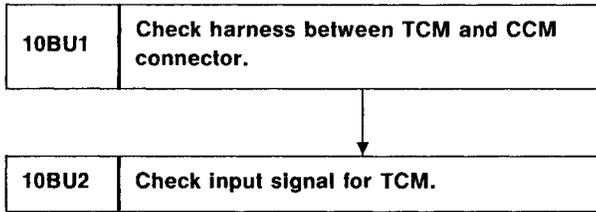
For the diagnostic procedure on throttle position sensor circuit, refer to 3-2 [T5J0]☆5.

OBD (FB1)
P1701 <ATCRS>

B2M0669

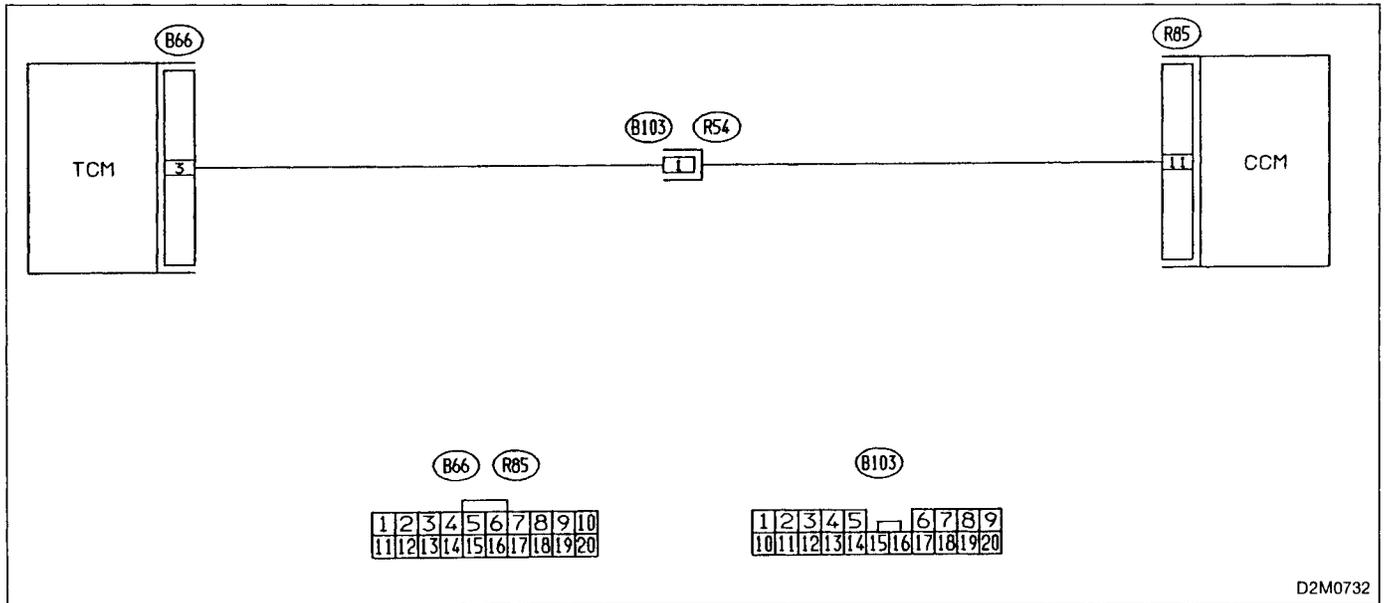
BU: DTC P1701
— CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION (ATCRS) —

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

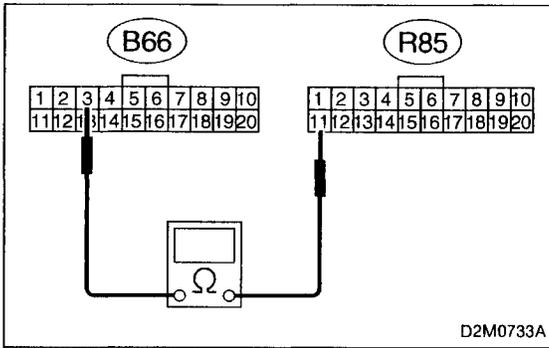


CAUTION:
 After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.
 < Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0732



10BU1 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.

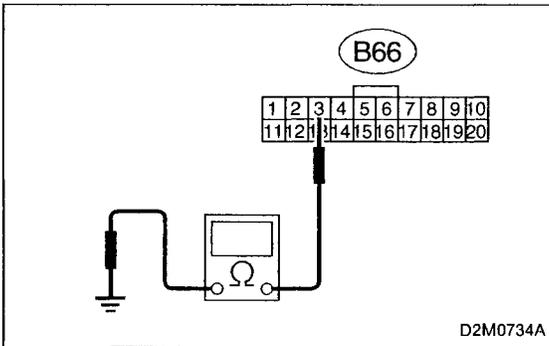
CHECK : **Connector & terminal (B66) No. 3 — (R85) No. 11:**
Is the resistance less than 1 Ω?

- YES** : Go to next step 4).
- NO** : Repair harness and connector.

NOTE:

In this case, repair the following:

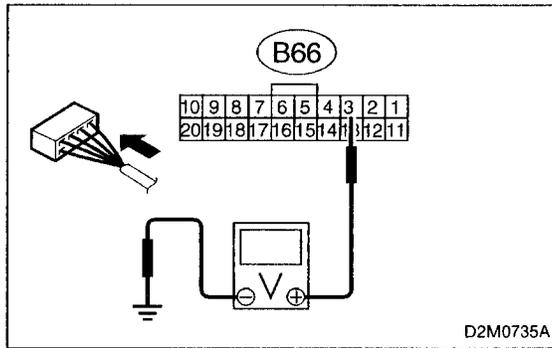
- Open circuit in harness between TCM and CCM connector
- Poor contact in coupling connector (B103)



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

CHECK : **Connector & terminal (B66) 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 **10BU2**.



10BU2	CHECK INPUT SIGNAL FOR TCM.
--------------	------------------------------------

- 1) Connect connector to TCM and CCM.
- 2) Lift-up the vehicle or set the vehicle on free rollers.

CAUTION:

On AWD models, raise all wheels off ground.

- 3) Start the engine.
- 4) Cruise control main switch to ON.
- 5) Move selector lever to "D" and slowly increase vehicle speed to 50 km/h (31 MPH).
- 6) Cruise control set switch to ON.
- 7) Measure voltage between TCM and chassis ground.

CHECK : **Connector & terminal (B66) No. 3 (+) — Chassis ground (-):**
Is the resistance less than 1 V?

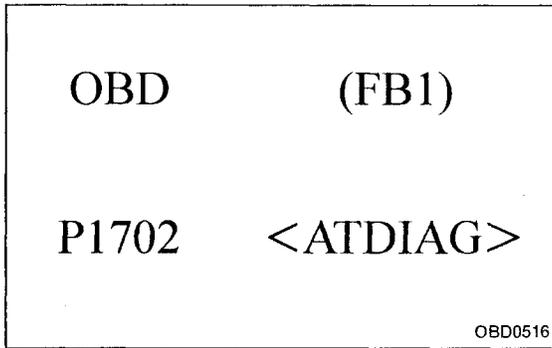
YES : Go to next **CHECK** .

NO : Check cruise control set circuit. <Ref. to 6-2 [T100].☆1 >

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM.



BV: DTC P1702
— AUTOMATIC TRANSMISSION DIAGNOSIS
INPUT SIGNAL CIRCUIT MALFUNCTION
(ATDIAG) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

10BV1 Check harness between ECM and TCM connector.

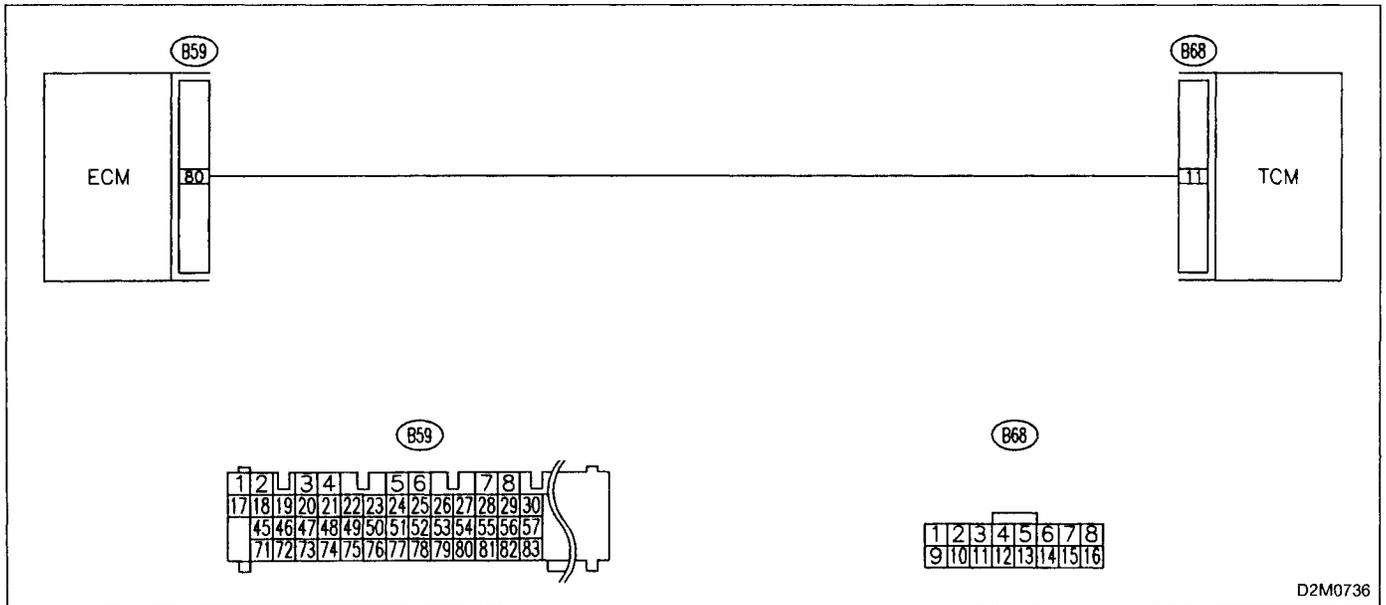
10BV2 Check harness between ECM and TCM connector.

CAUTION:

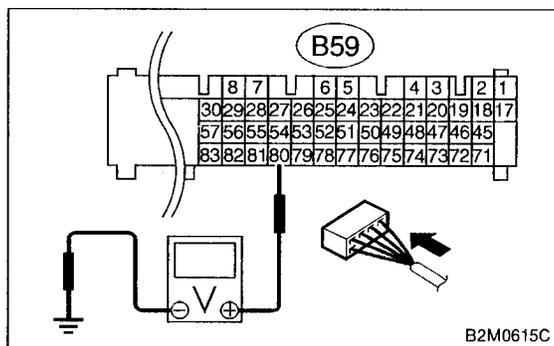
After repair or replacement of faulty parts, conduct **CLEAR MEMORY** and **INSPECTION MODES**.

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

WIRING DIAGRAM:



D2M0736



10BV1 CHECK HARNESS BETWEEN ECM AND TCM CONNECTOR.

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

CHECK : **Connector & terminal (B59) 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 (B59) No. 80 (+) — Chassis ground (-): Is the voltage less than 1 V?**

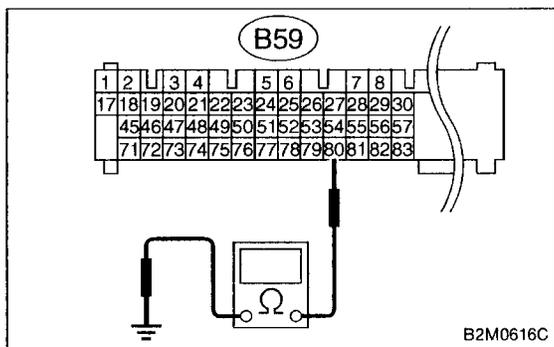
YES : Go to step **10BV2**.

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



10BV2 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 (B59) 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)
 P0336 <CRANK_R>
 B2M1091

BW: DTC P0336
— CRANKSHAFT POSITION SENSOR CIRCUIT
RANGE/PERFORMANCE PROBLEM
(CRANK-R) —

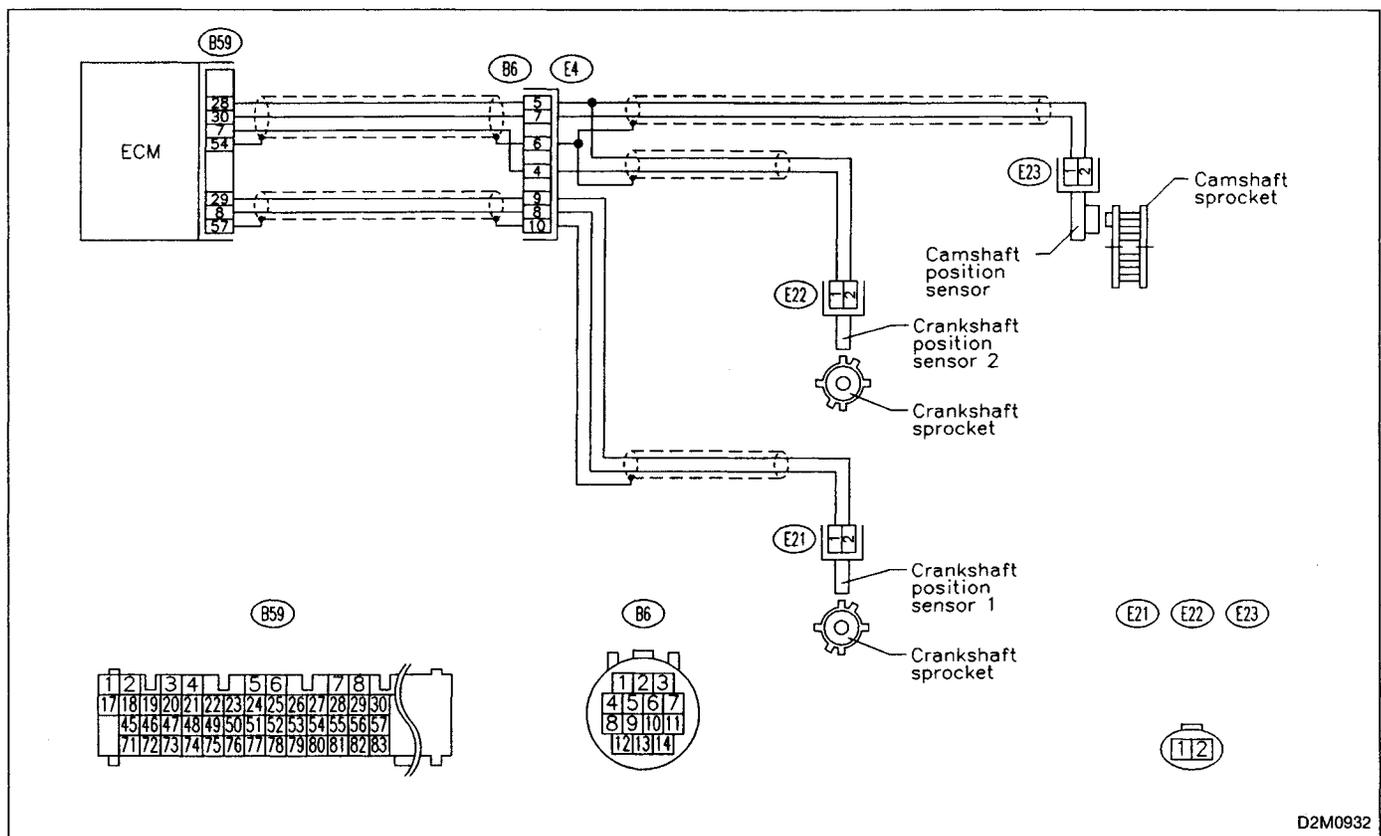
DTC DETECTING CONDITION:

- Immediately at fault recognition

TROUBLE SYMPTOM:

- Engine stalls.
- Failure of engine to start

WIRING DIAGRAM:



D2M0932

CAUTION:

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

< Ref. to 2-7b [T3D0] and [T3E0].☆5 >

10BW1	CHECK DTC P0335, P0340 OR P0385 ON DISPLAY.
--------------	--

CHECK : *Does the Subaru select monitor or OBD-II general scan tool indicate DTC P0335, P0340 or P0385?*

YES : Inspect DTC P0335, P0340 and P0385 using "10. Diagnostics Chart with Trouble Code".
<2-7b [T10A0].☆6>

NO : Go to step **10BW2**.

10BW2	CHECK INSTALLATION OF CRANKSHAFT POSITION SENSOR 1.
--------------	--

Turn ignition switch to OFF.

CHECK : *Is the crankshaft position sensor 1 installation bolt tightened securely?*

YES : Go to step **10BW3**.

NO : Tighten crankshaft position sensor 1 installation bolt securely.

10BW3	CHECK INSTALLATION OF CRANKSHAFT POSITION SENSOR 2.
--------------	--

CHECK : *Is the crankshaft position sensor 2 installation bolt tightened securely?*

YES : Go to step **10BW4**.

NO : Tighten crankshaft position sensor 2 installation bolt securely.

10BW4	CHECK INSTALLATION OF CAMSHAFT POSITION SENSOR.
--------------	--

CHECK : *Is the camshaft position sensor installation bolt tightened securely?*

YES : Go to step **10BW5**.

NO : Tighten camshaft position sensor installation bolt securely.

10BW5	CHECK INSTALLATION OF TIMING BELT.
--------------	---

1) Remove left-hand belt cover, right-hand belt cover and front belt cover. <Ref. to 2-3 [W2A2].☆1>

2) Check installation of timing belt.

CHECK : *Are there skipping timing belt teeth?*

YES : Replace installation of timing belt.

NO : Go to step **10BW6**.

10BW6 CHECK CRANKSHAFT SPROCKET.

Check damage of crankshaft sprocket.

CHECK : **Do protrusions of crankshaft sprocket break off?**

YES : Replace crankshaft sprocket.

NO : Go to step **10BW7**.

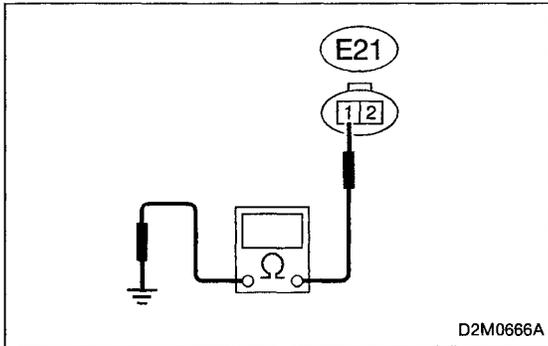
10BW7 CHECK LEFT-HAND CAMSHAFT SPROCKET.

Check damage of left-hand camshaft sprocket.

CHECK : **Does protrusion of camshaft sprocket break off?**

YES : Replace left-hand camshaft sprocket.

NO : Go to step **10BW8**.



10BW8 CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR 1 AND ECM CONNECTOR.

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

CHECK : **Connector & terminal (E21) 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 1 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

NO : Go to next **CHECK** .

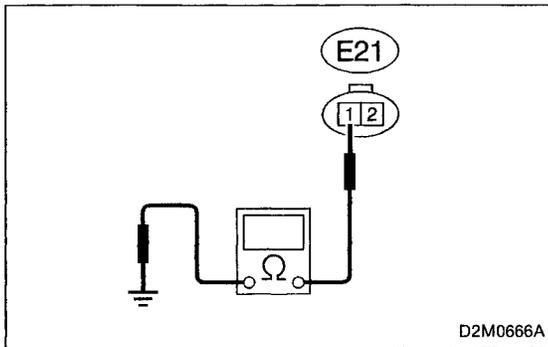
CHECK : **Connector & terminal (E21) No. 1 — Engine ground: Is the resistance less than 10 Ω?**

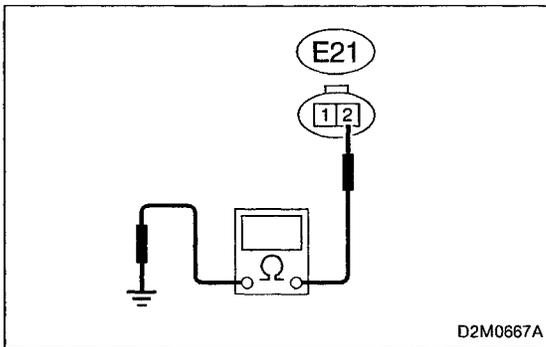
YES : Repair short circuit in harness between crankshaft position sensor 1 and ECM connector.

NOTE:

The harness between both connectors are shielded. Repair short circuit in harness together with shield.

NO : Go to next **CHECK** .





CHECK : **Connector & terminal (E21) No. 2 — Engine ground:**
Is the resistance less than 5 Ω?

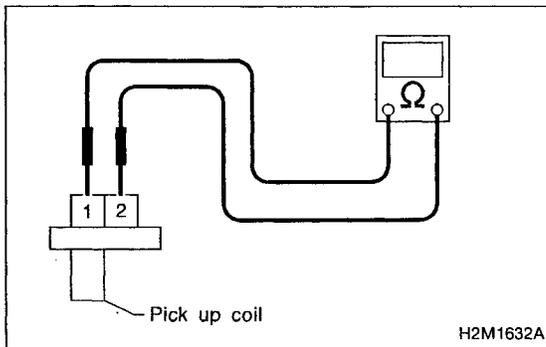
YES : Go to step **10BW9**.

NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor 1 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)



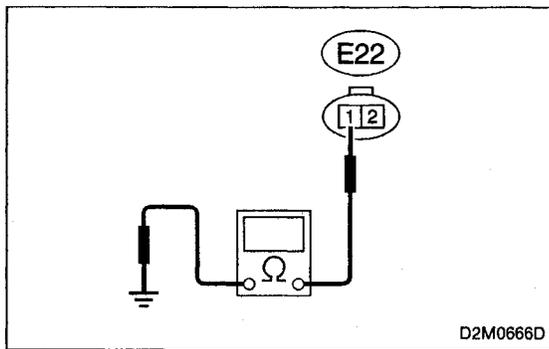
10BW9 CHECK CRANKSHAFT POSITION SENSOR 1.

- 1) Remove crankshaft position sensor 1.
- 2) Measure resistance between connector terminals of crankshaft position sensor 1.

CHECK : **Terminals No. 1 — No. 2:**
Is the resistance between 1 and 4 kΩ?

YES : Go to step **10BW10**.

NO : Replace crankshaft position sensor 1.



10BW10 CHECK HARNESS BETWEEN CRANKSHAFT POSITION SENSOR 2 AND ECM CONNECTOR.

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

CHECK : **Connector & terminal (E22) 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 2 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)

NO : Go to next **CHECK** .

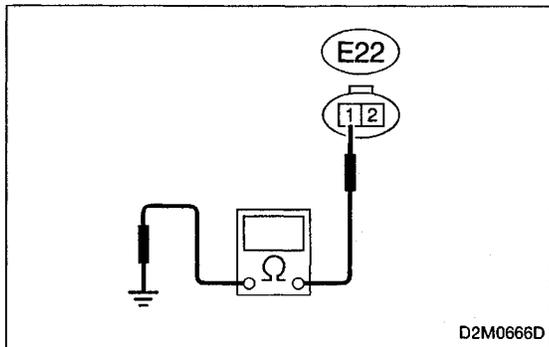
CHECK : **Connector & terminal (E22) No. 1 — Engine ground:**
Is the resistance less than 10 Ω?

YES : Repair short circuit in harness between crankshaft position sensor 2 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 (E22) No. 2 — Engine ground:**
Is the resistance less than 5 Ω?

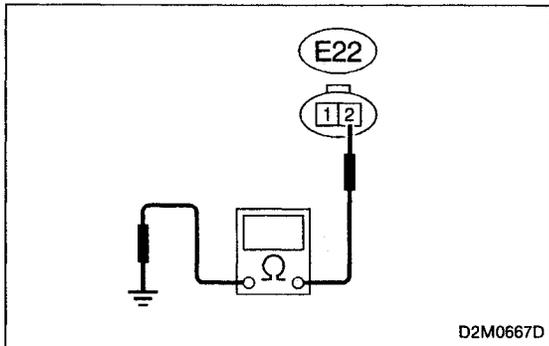
YES : Go to step **10BW11**.

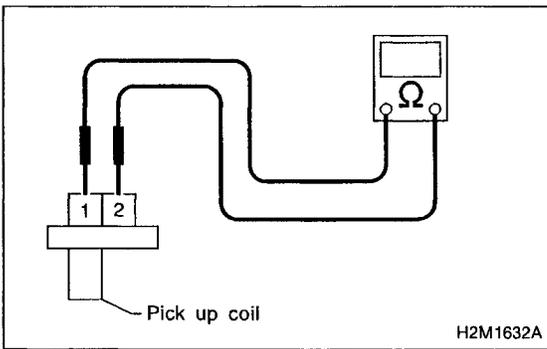
NO : Repair harness and connector.

NOTE:

In this case, repair the following:

- Open circuit in harness between crankshaft position sensor 2 and ECM connector
- Poor contact in ECM connector
- Poor contact in coupling connector (B6)





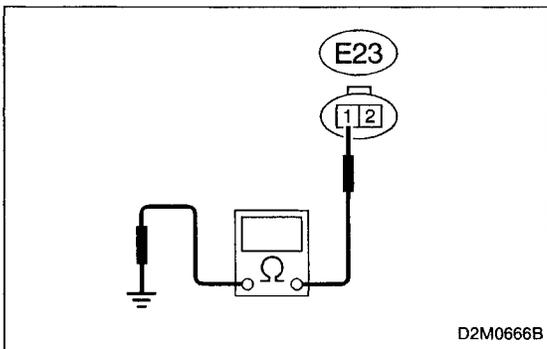
10BW11 CHECK CRANKSHAFT POSITION SENSOR 2.

- 1) Remove crankshaft position sensor 2.
- 2) Measure resistance between connector terminals of crankshaft position sensor 2.

CHECK : **Terminals**
No. 1 — No. 2:
Is the resistance between 1 and 4 kΩ?

YES : Go to step **10BW12**.

NO : Replace crankshaft position sensor 2.



10BW12 CHECK HARNESS BETWEEN CAMSHAFT POSITION SENSOR AND ECM CONNECTOR.

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

CHECK : **Connector & terminal**
(E23) No. 1 — Engine ground:
Is the resistance more than 100 kΩ?

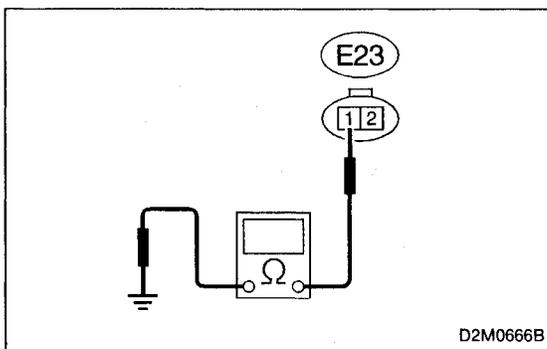
YES : Repair harness and connector.

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 (B6)

NO : Go to next **CHECK** .



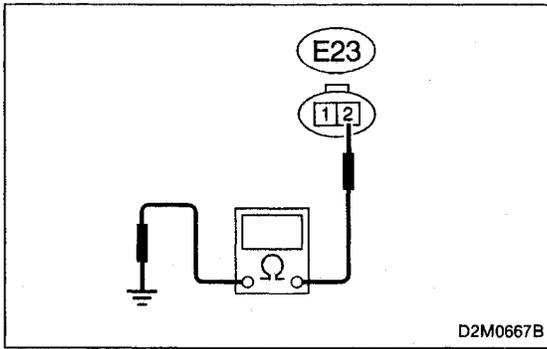
CHECK : **Connector & terminal**
(E23) No. 1 — Engine ground:
Is the resistance less than 10 Ω?

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 (E23) No. 2 — Engine ground: Is the resistance less than 5 Ω?**

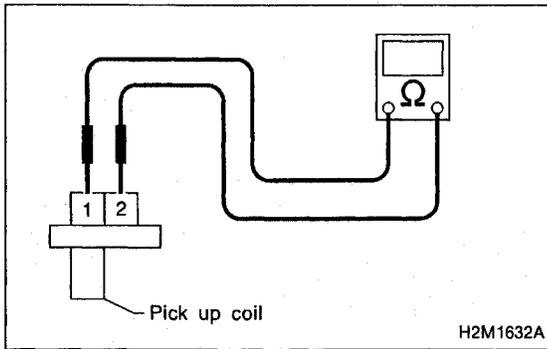
YES : Go to step **10BW13**.

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 (B6)



10BW13 CHECK CAMSHAFT POSITION SENSOR.

- 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 : Go to step **10BW14**.

NO : Replace camshaft position sensor.

10BW14 CHECK POOR CONTACT.

CHECK : **Are there poor contact in crankshaft position sensor 1, crankshaft position sensor 2 and camshaft position sensor circuit?**

YES : Repair poor contact.

NO : Contact with SOA service.

NOTE:

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