ON-BOARD DIAGNOSTICS II SYSTEM 2-7b

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 trips, MIL is turned off, but DTC remains at on-board computer.
● The OBD-II system is capable of communication with a general scan tool (OBD-II general scan tool) formed by ISO 9141 CARB.
● The OBD-II diagnostics procedure is different from the usual diagnostics procedure. When troubleshooting OBD-II vehicles, connect Subaru select monitor or the OBD-II general scan tool to the vehicle.

A: ENGINE

1. ENGINE AND EMISSION CONTROL SYSTEM

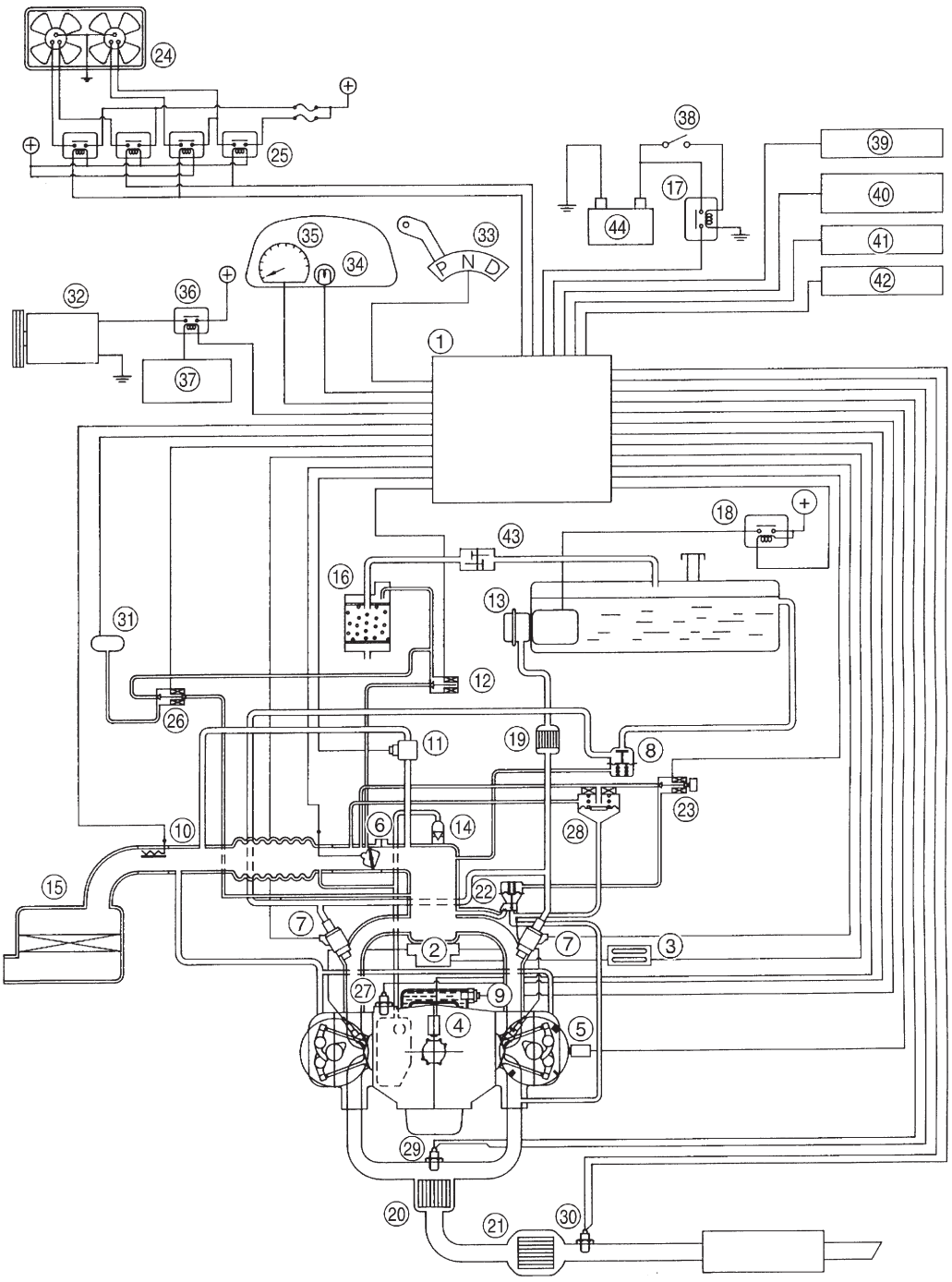
● The Multipoint Fuel Injection (MFI) system is a system that supplies the optimum air-fuel mixture to the engine for all the various operating conditions through the use of the latest electronic technology.
With this system fuel, which is pressurized at a constant pressure, is injected into the intake air passage of the cylinder head. The injection quantity of fuel is controlled by an intermittent injection system where the electro-magnetic injection valve (fuel injector) opens only for a short period of time, depending on the quantity of air required for one cycle of operation. In actual operation, the injection quan-

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

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

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

2. SCHEMATIC



H2M1130A

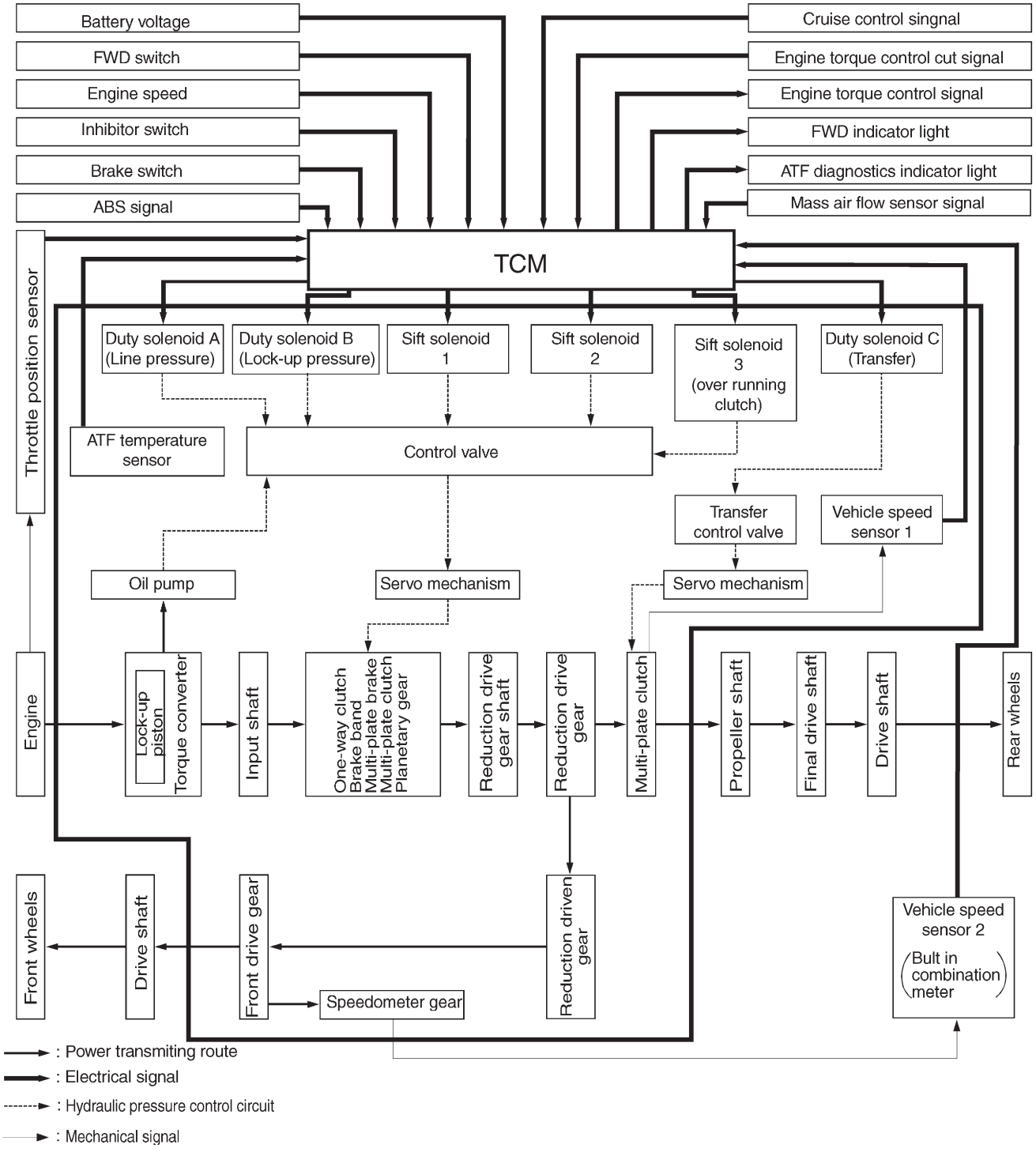
① Engine control module (ECM)
② Ignition coil
③ Ignitor
④ Crankshaft position sensor
⑤ Camshaft position sensor
⑥ Throttle position sensor
⑦ Fuel injectors
⑧ Pressure regulator
⑨ Engine coolant temperature sensor
⑩ Mass air flow sensor
⑪ Idle air control solenoid valve
⑫ Purge control solenoid valve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

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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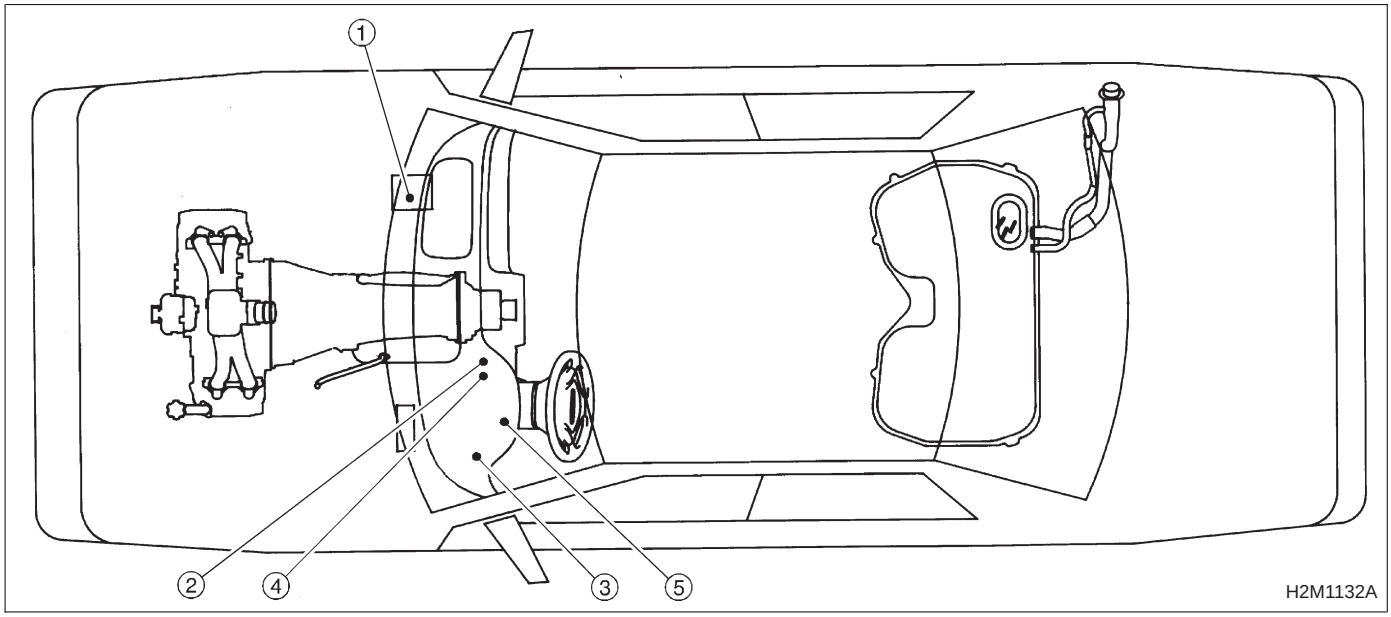
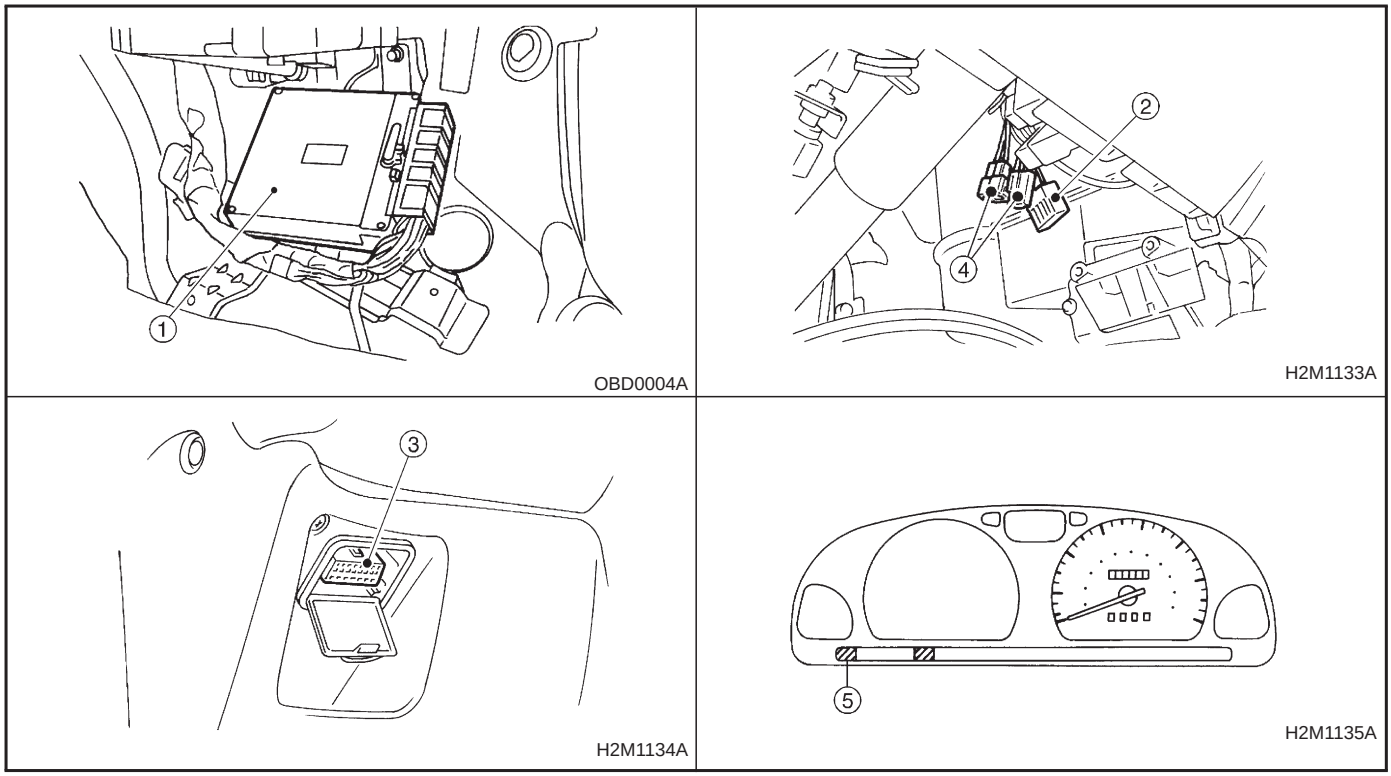
2. Electrical Components Location

A: ENGINE

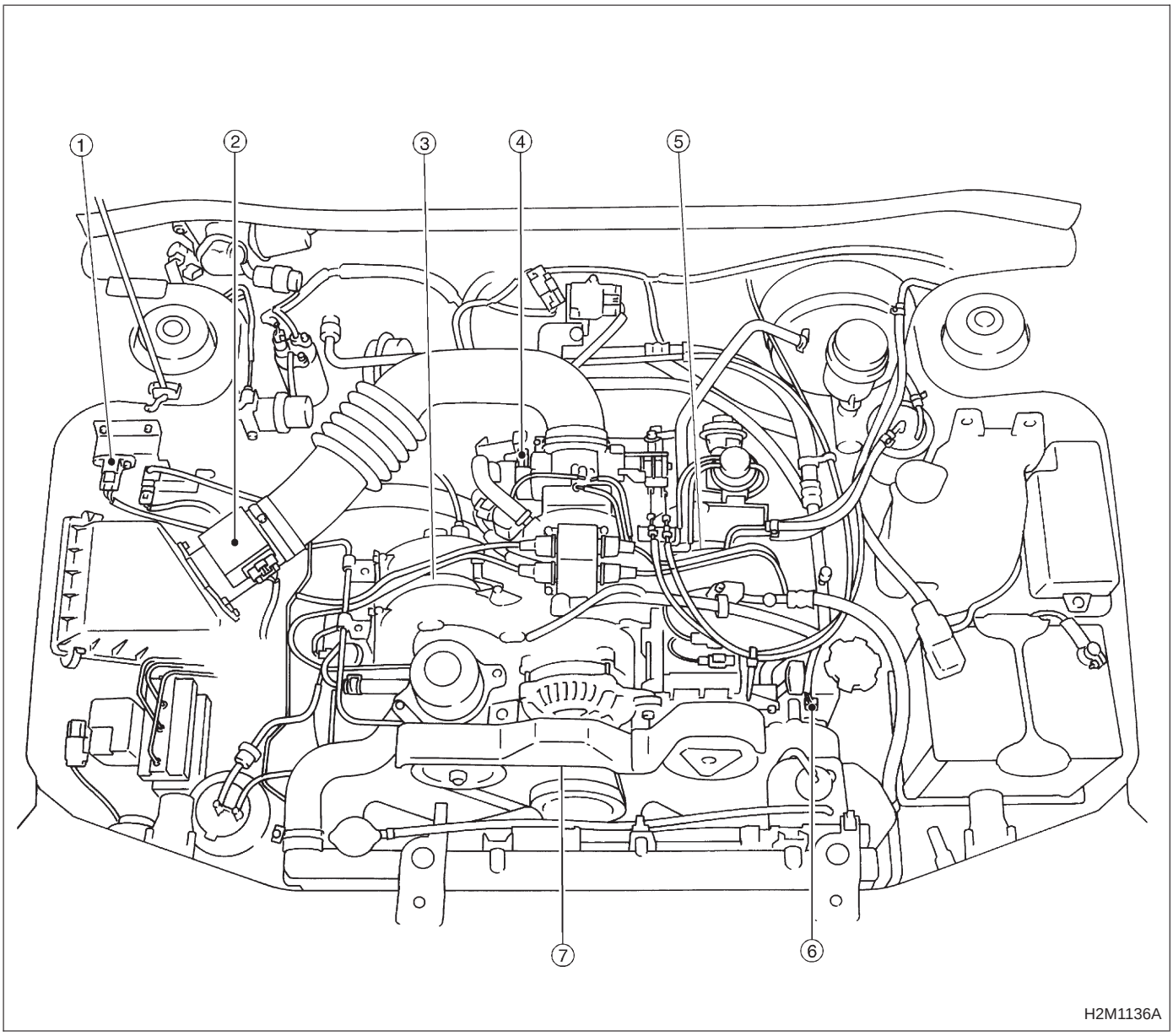
1. MODULE



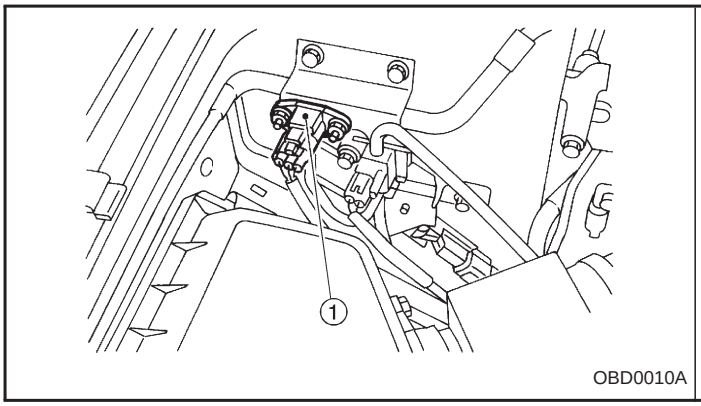
① Engine control module (ECM)
② Data link connector (for Subaru select monitor only)
③ Data link connector (for Subaru select monitor and OBD-II general scan tool)
④ Test mode connector
⑤ CHECK ENGINE malfunction indicator lamp (MIL)

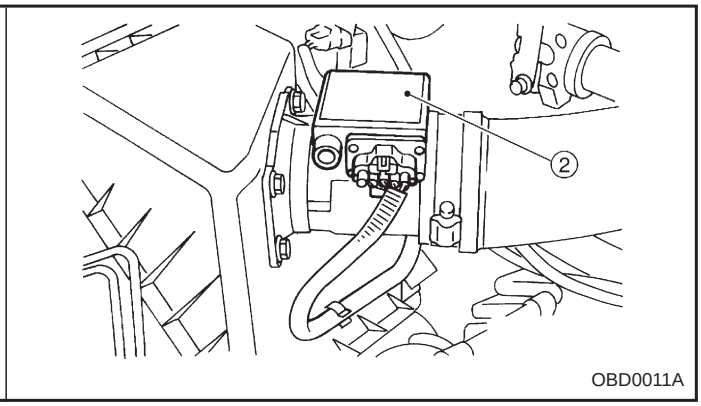


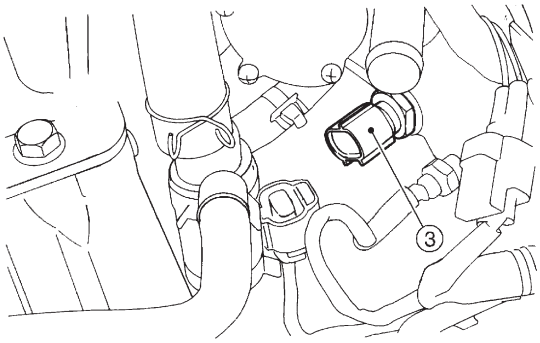
2. SENSOR



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







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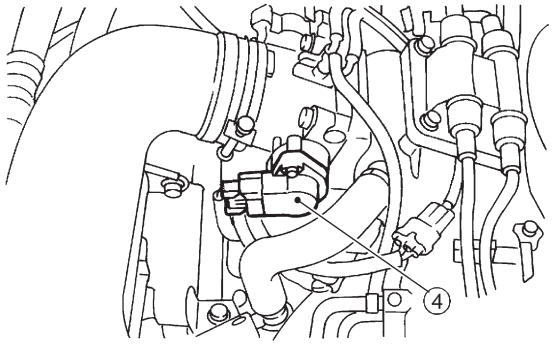

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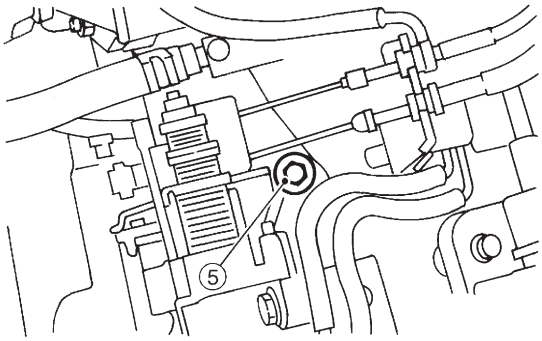

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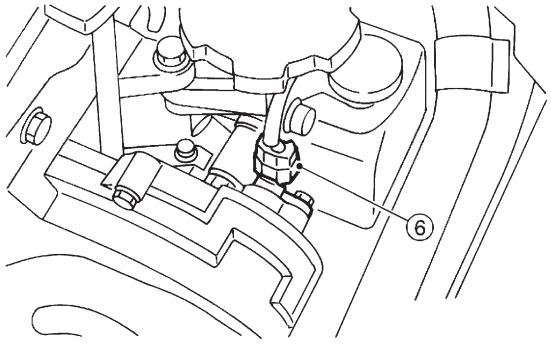

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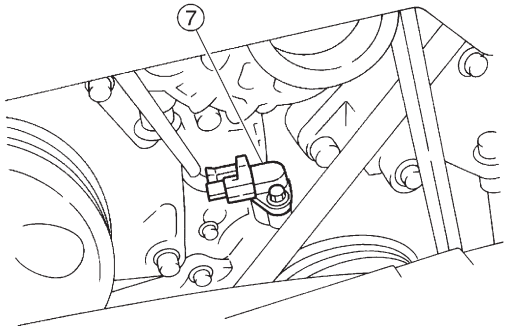

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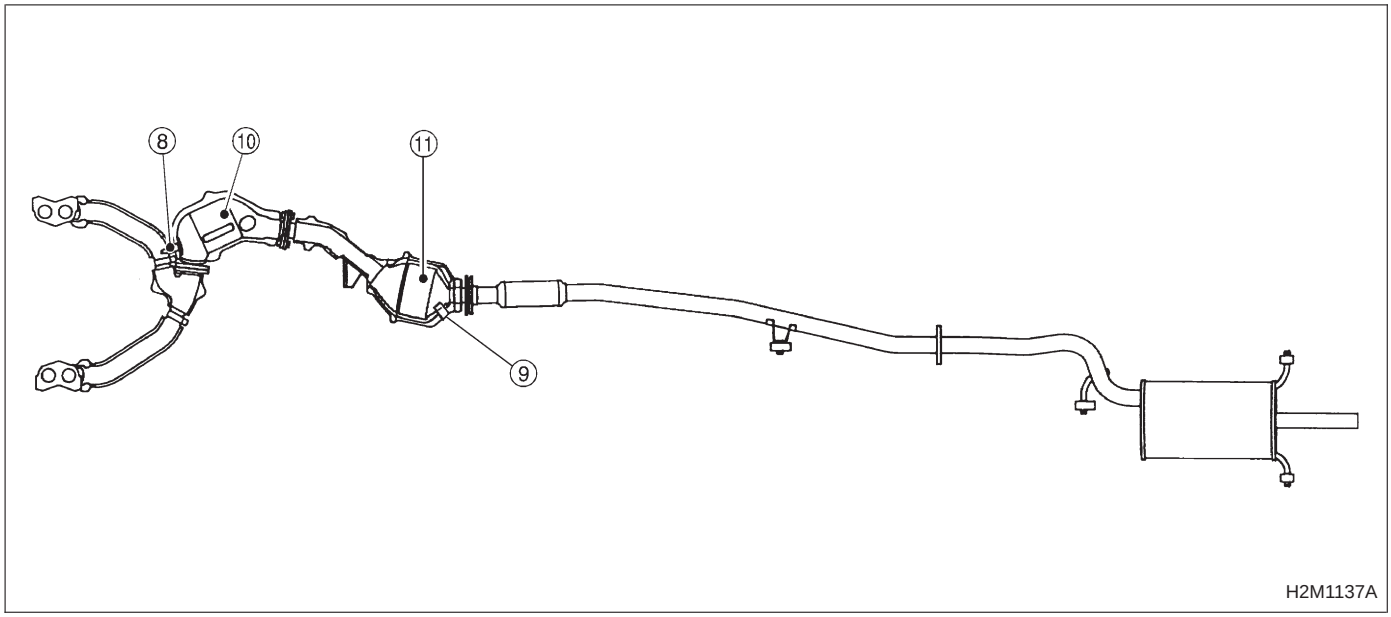
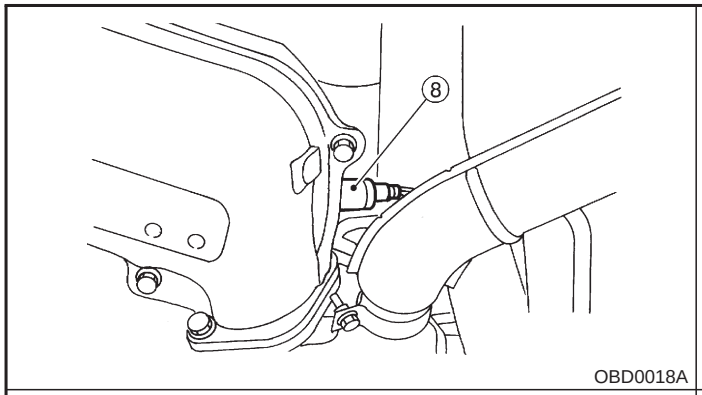
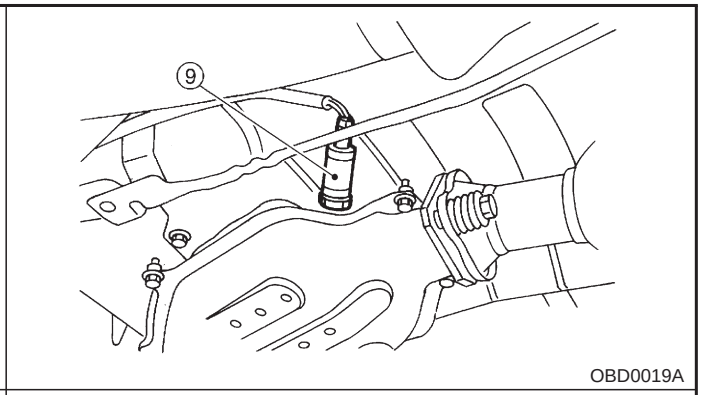
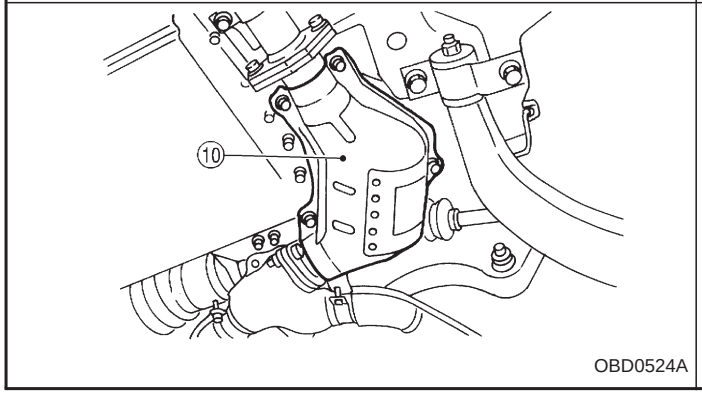
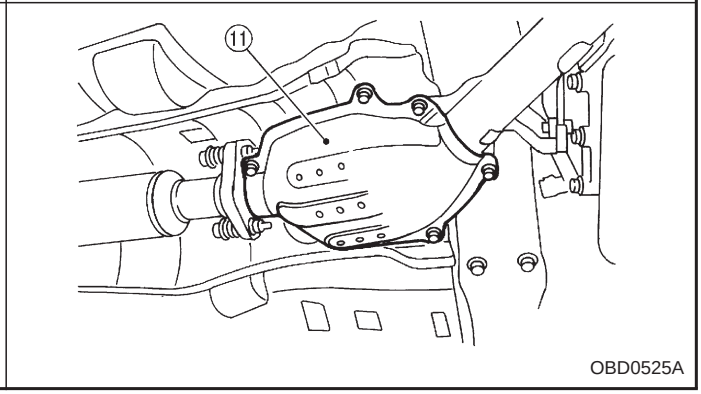


⑧ Front oxygen sensor
⑨ Rear oxygen sensor
⑩ Front catalytic converter
⑪ Rear catalytic converter

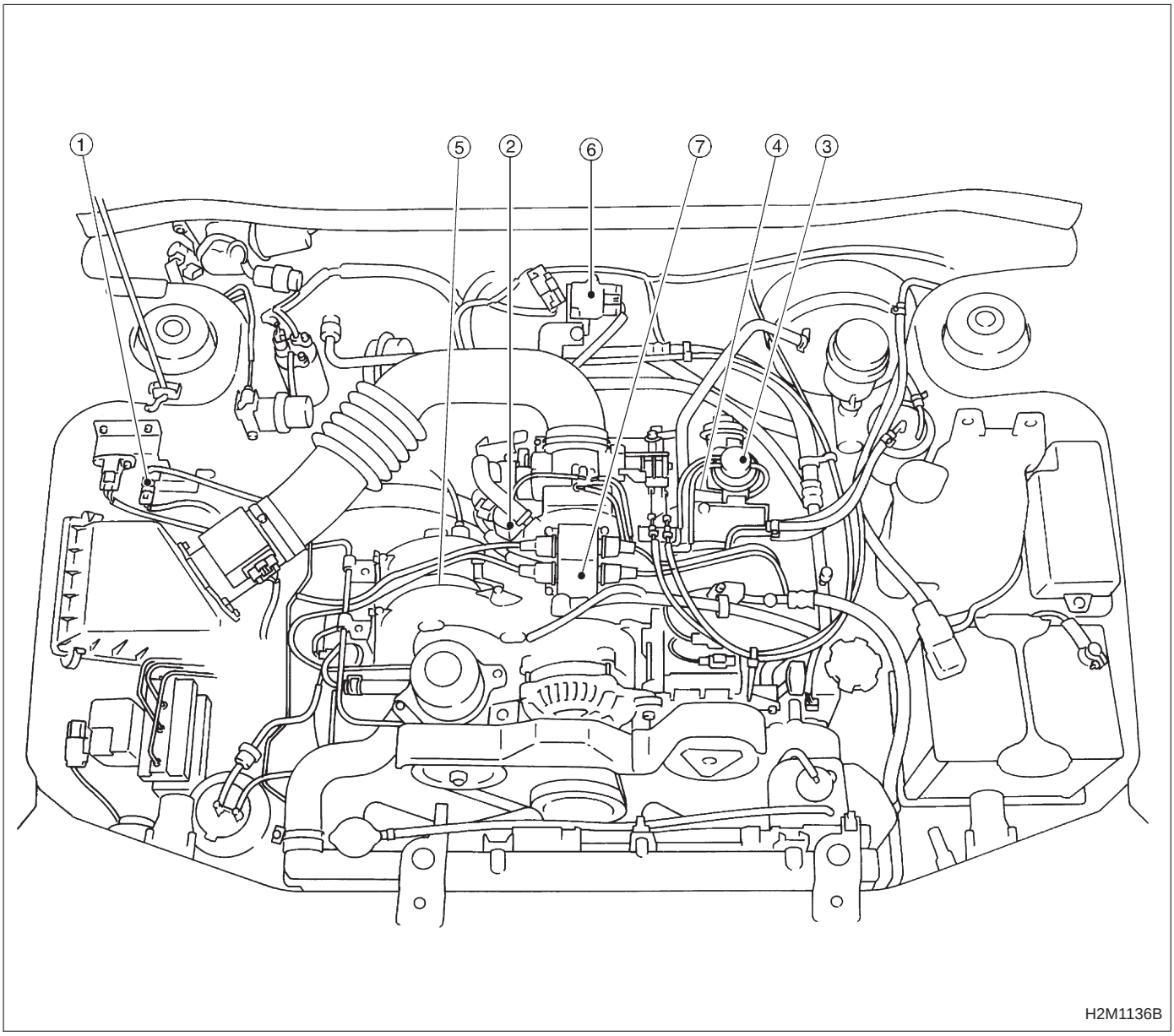




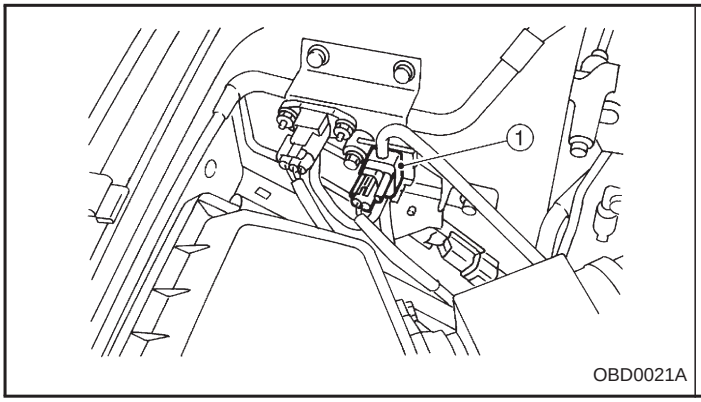


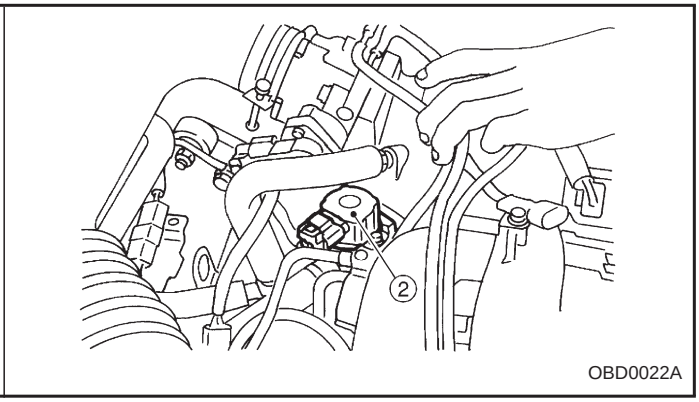


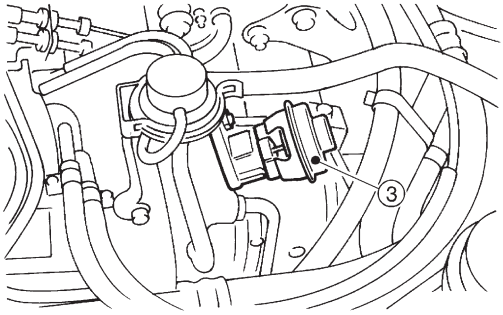
3. SOLENOID VALVE, EMISSION CONTROL SYSTEM PARTS AND IGNITION SYSTEM PARTS



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







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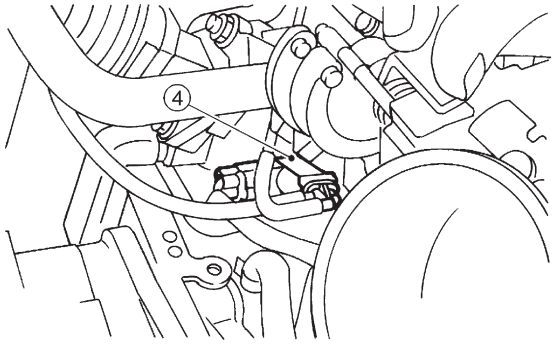

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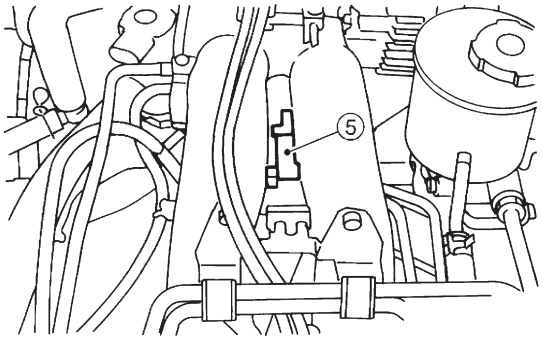
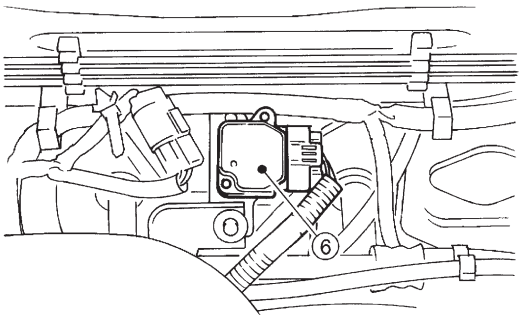


OBD0025A



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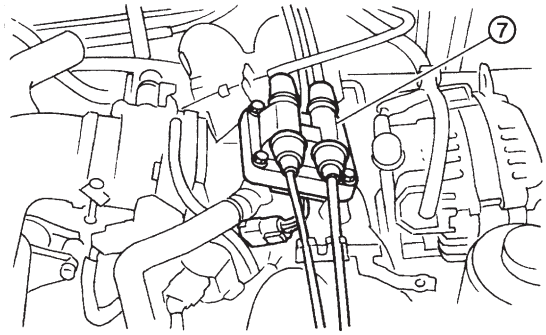

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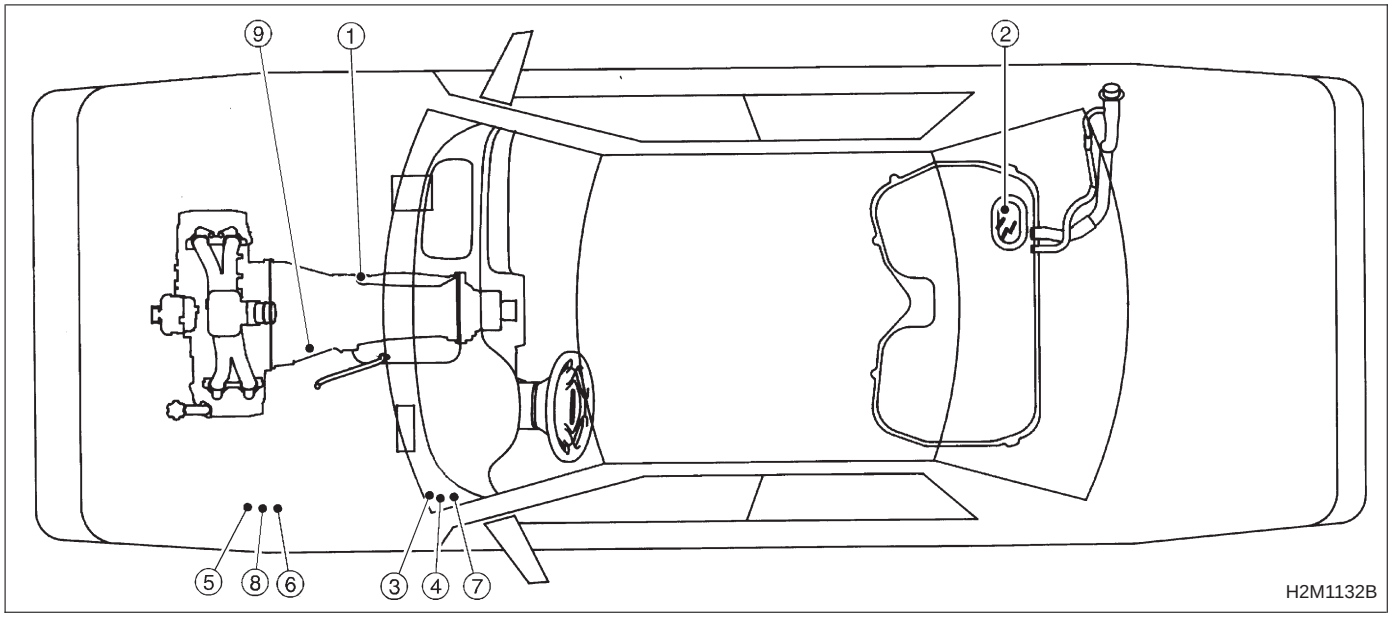
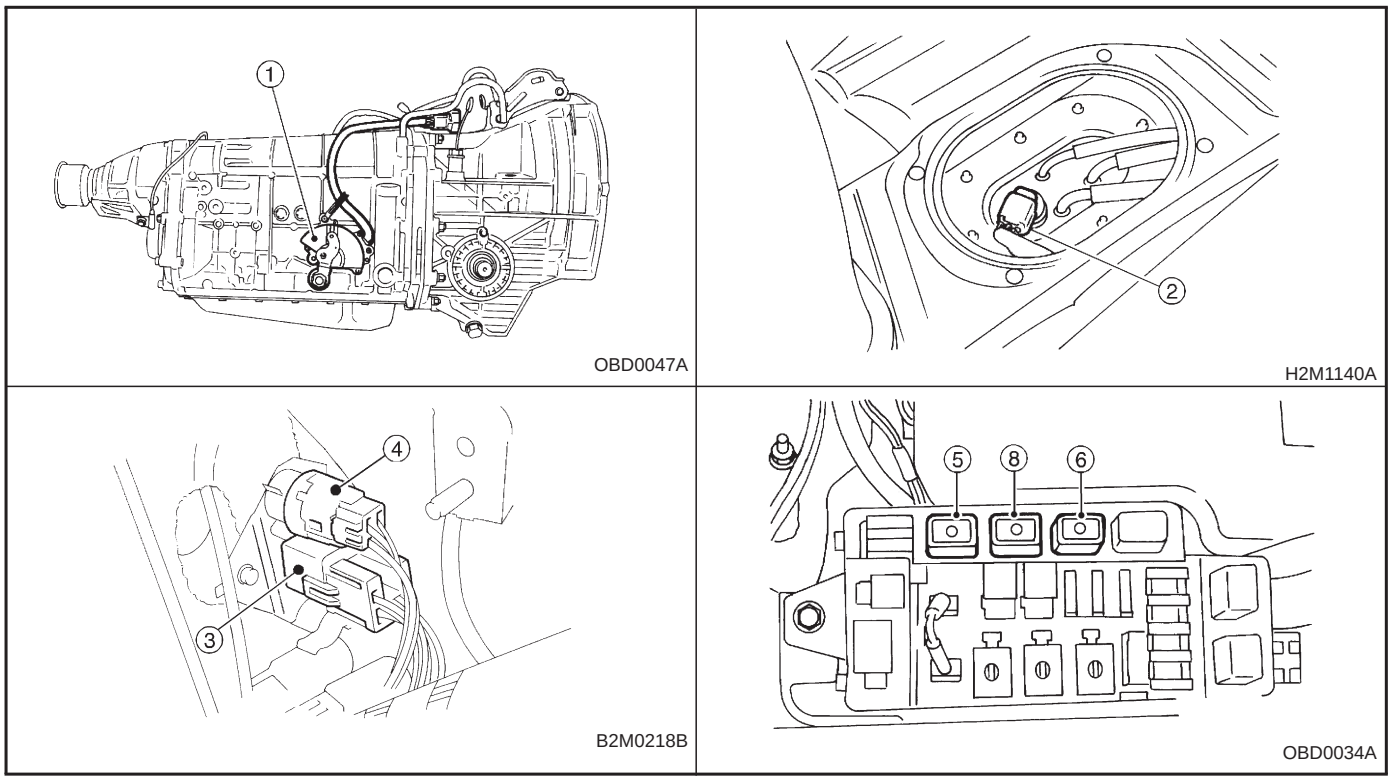
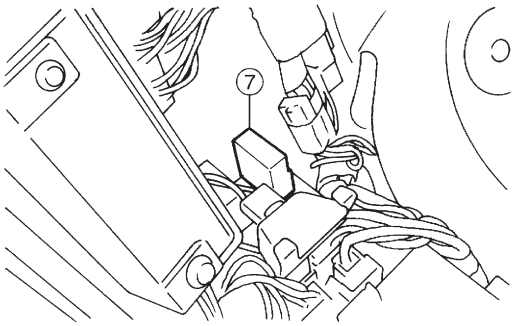


① Inhibitor switch
② Fuel pump
③ Main relay
④ Fuel pump relay
⑤ Radiator sub fan relay 2 (With A/C models only)
⑥ Radiator sub fan relay 1 (With A/C models only)
⑦ Main fan relay
⑧ Radiator main fan relay 2 (With A/C models only)
⑨ Starter





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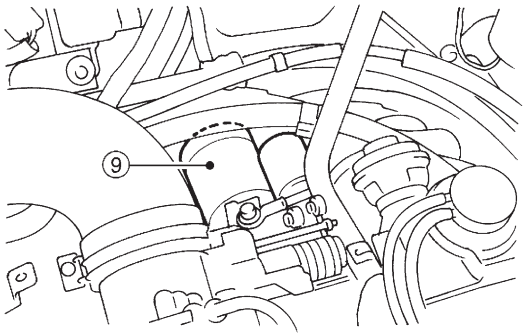
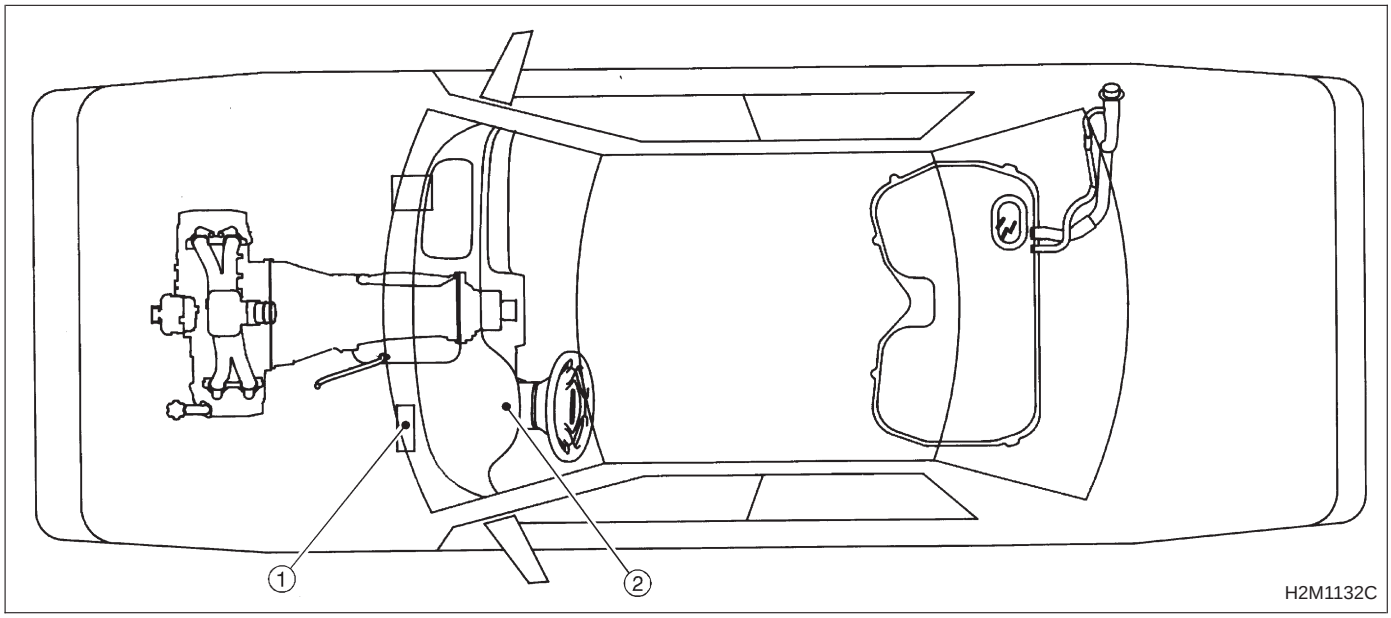


H2M1142A

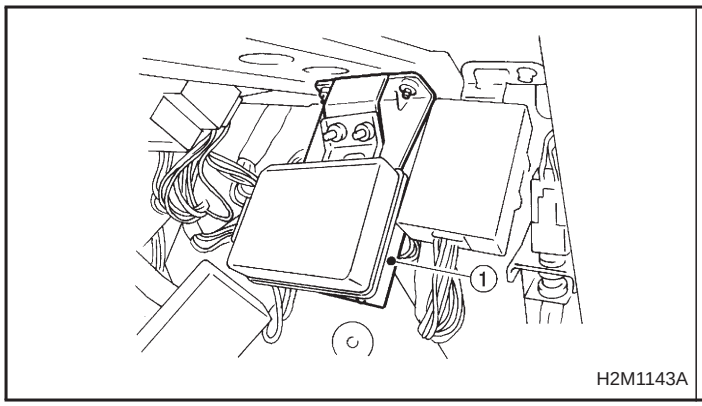
B: TRANSMISSION

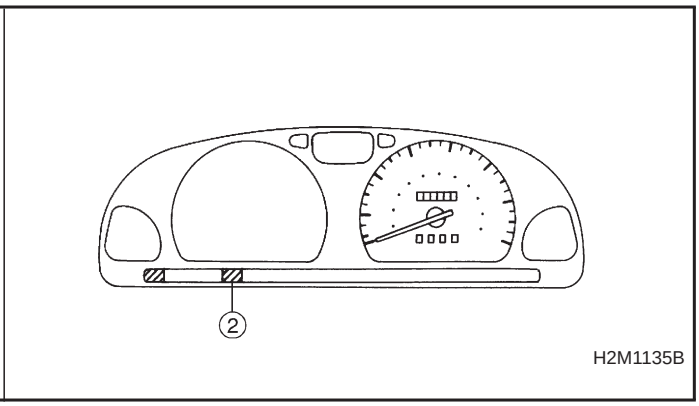
1. MODULE



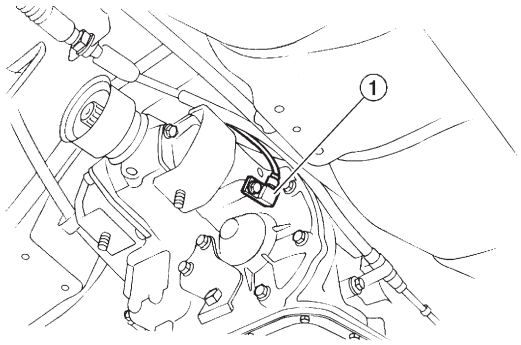
① Transmission Control Module (TCM)

② AT diagnostic indicator light

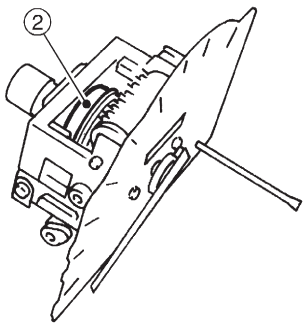




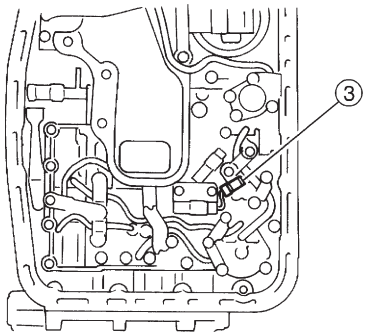
2. SENSOR



OBD0042B



H2M1144A



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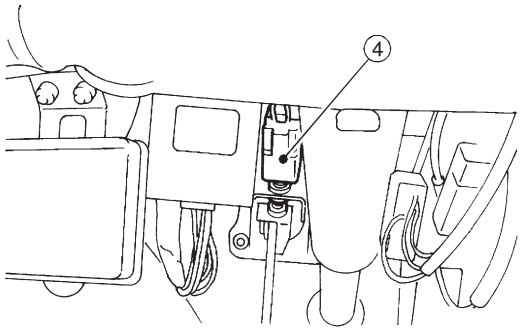
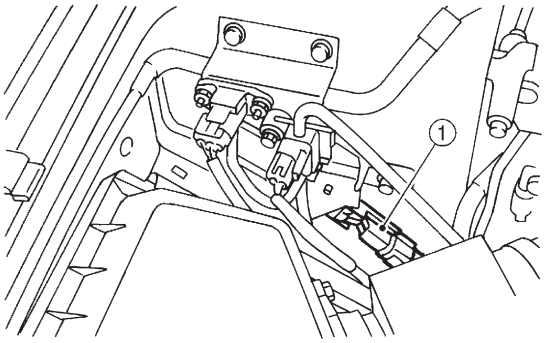


H2M1146A

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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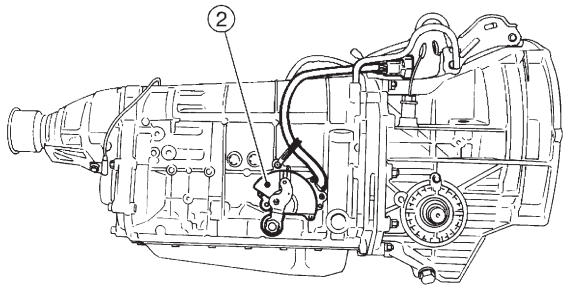
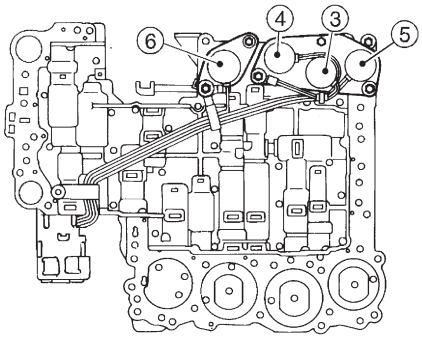
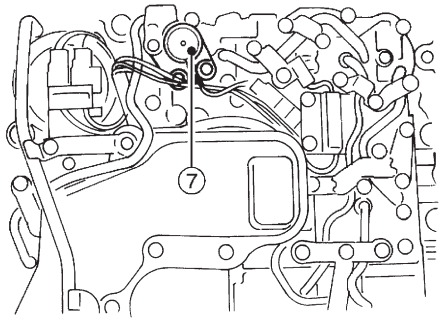


OBD0047B

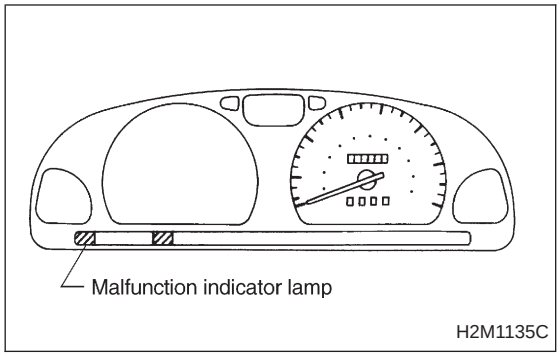


OBD0048A



H2M1147A

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

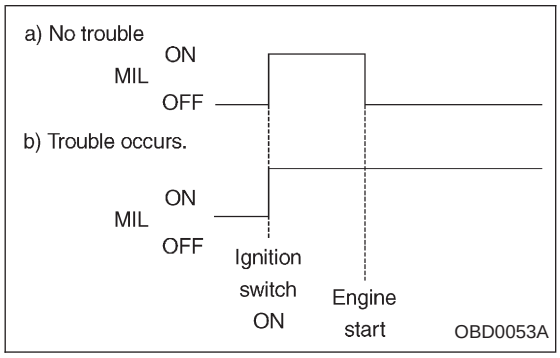


3. Diagnosis System

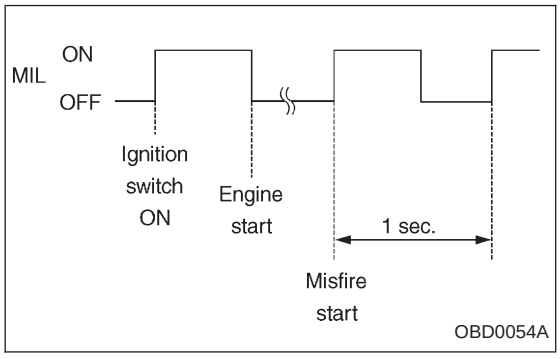
A: MALFUNCTION INDICATOR LAMP (MIL)

1. ACTIVATION OF MALFUNCTION INDICATOR LAMP (MIL)

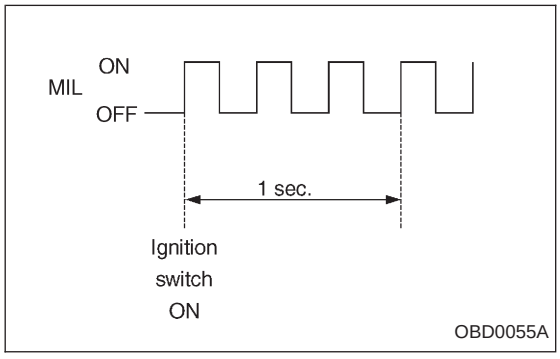
1) When ignition switch is turned to ON (engine off), the CHECK ENGINE malfunction indicator lamp (MIL) in the combination meter illuminates.
NOTE:
If the MIL does not illuminate, perform diagnostics of the CHECK ENGINE light circuit or the combination meter circuit. <Refer to "7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL), 2-7b [T700]".>



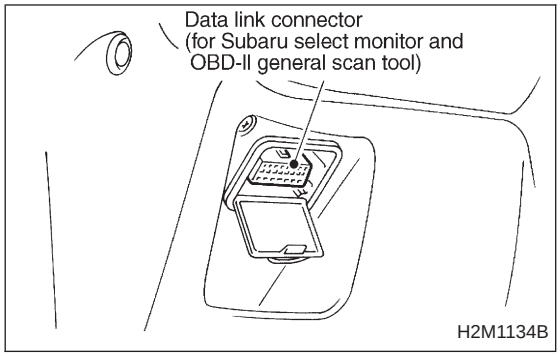
2) After starting the engine, the MIL goes out. If it does not, either the engine or the emission control system is malfunctioning.



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



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



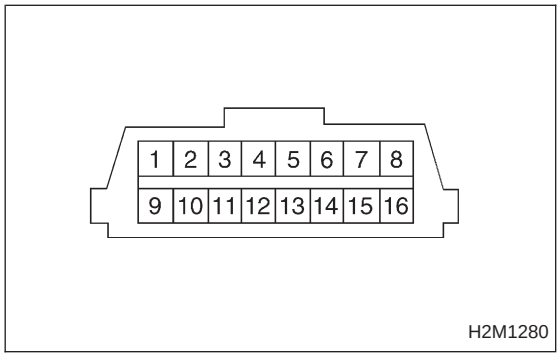
B: OBD-II GENERAL SCAN TOOL

1. HOW TO USE OBD-II GENERAL SCAN TOOL

1) Prepare a general scan tool (OBD-II general scan tool) required by SAE J1978.
2) Open the cover and connect the OBD-II general scan tool to the data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.
3) Using the OBD-II general scan tool, call up diagnostic trouble code(s) and freeze frame data.
OBD-II general scan tool functions consist of:

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

Read out data according to repair procedures.
(For detailed operation procedures, refer to the OBD-II General Scan Tool Operation Manual.)
NOTE:
For details concerning diagnostic trouble codes, refer to the "DIAGNOSTIC TROUBLE CODE (DTC) LIST", 2-7b [T10A0].



2. DATA LINK CONNECTOR (FOR OBD-II GENERAL SCAN TOOL AND SUBARU SELECT MONITOR)

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

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

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

*: Circuit only for Subaru Select Monitor

3. READ DATA LIST

- **MODE $01**

— Current powertrain diagnostic data —
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).

● **MODE $02**

— Powertrain freeze frame data —

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).

● **MODE $03**

— Emission-related powertrain diagnostic trouble codes —

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].

NOTE:

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

- **MODE $04**

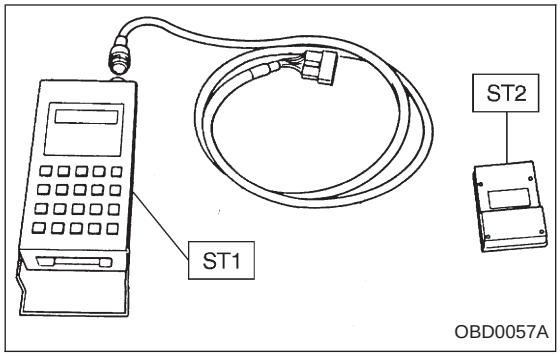
— Clear/Reset emission-related diagnostic information —
Refers to the mode used to clear or reset emission-related diagnostic information (OBD-II trouble diagnostic information).
NOTE:
Refer to OBD-II general scan tool manufacturer's instruction manual to clear or reset emission-related diagnostic information (MODE $04).

- **MODE $05**

— Oxygen sensor monitoring test results —
Refers to the mode using oxygen sensor output data while the on-board diagnosis system is performing diagnosis on the oxygen sensor.
A list of the support oxygen sensor output data and test ID (identification) are shown in the following table.

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

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

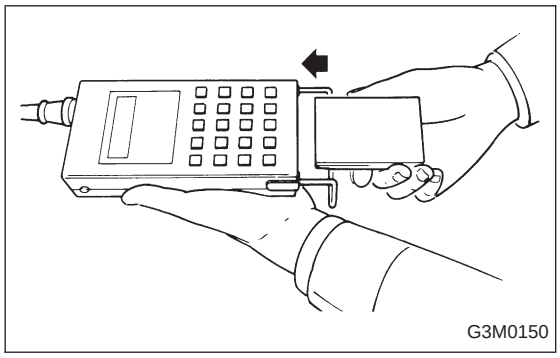


C: SUBARU SELECT MONITOR

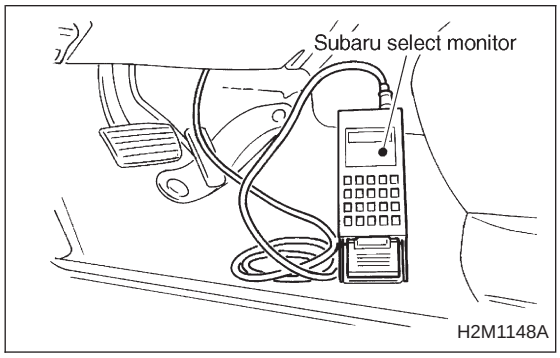
1. HOW TO USE SUBARU SELECT MONITOR

1) Prepare Subaru select monitor and cartridge.

ST1 498307500 SELECT MONITOR KIT
ST2 498345500 CARTRIDGE

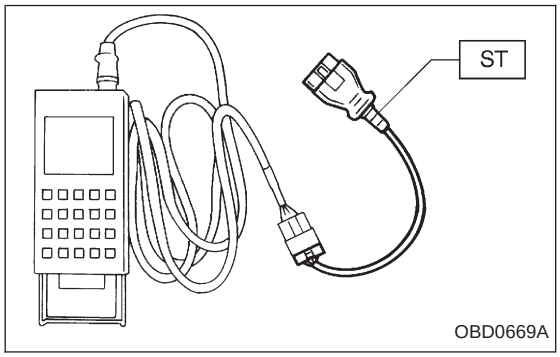


2) Turn ignition switch and Subaru select monitor switch to OFF.
3) Insert cartridge into Subaru select monitor.



4) Connect Subaru select monitor to data link connector.

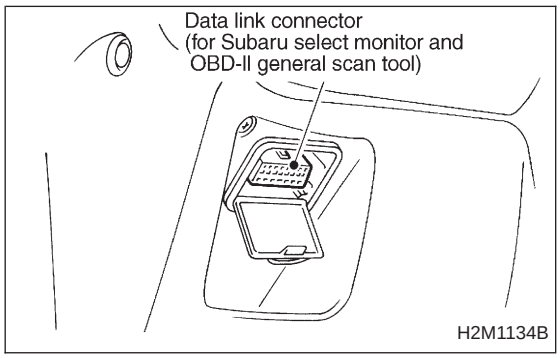
- Using data link connector for Subaru select monitor only, connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



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

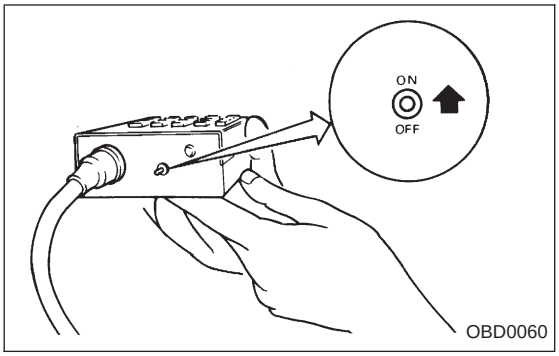
(1) Connect ST to Subaru select monitor cable.

ST 498357200 ADAPTER CABLE



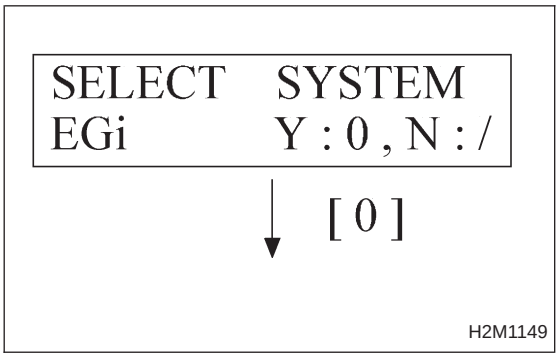
(2) Open the cover and connect Subaru select monitor to data link connector located in the lower portion of the instrument panel (on the driver's side), to the lower cover.

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



OBD0060

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

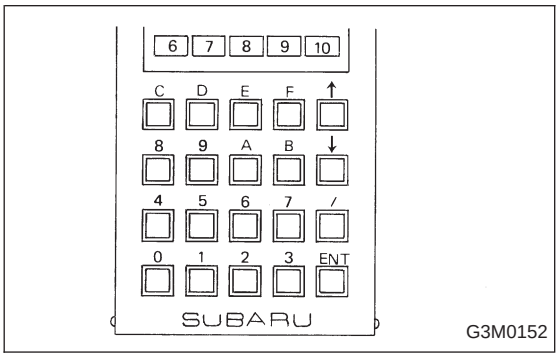


H2M1149

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

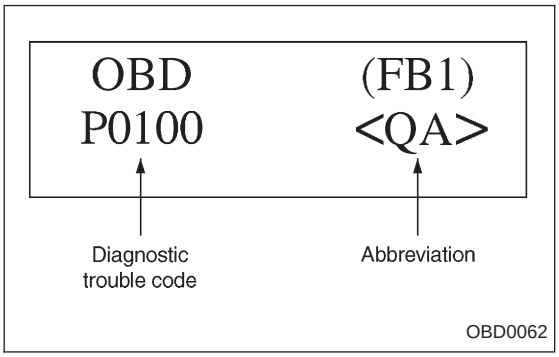
● **READ DIAGNOSTIC TROUBLE CODE (DTC) SHOWN ON DISPLAY. (MODE FB1)**

(1) Press the function key [0].



G3M0152

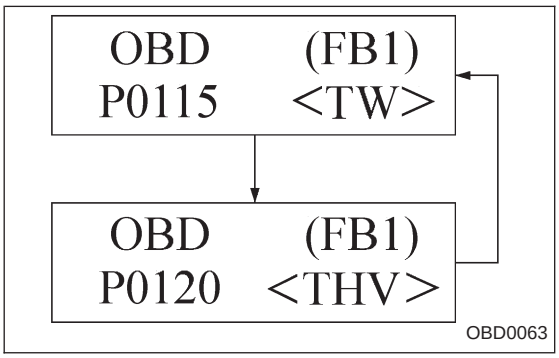
(2) Designate mode using function key.
Press [F] [B] [1] [ENT] in that order.



OBD0062

(3) Ensure diagnostic trouble code(s) is shown.

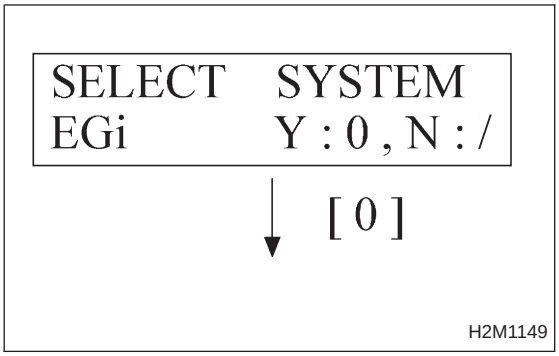
● When there is only one diagnostic trouble code.



OBD0063

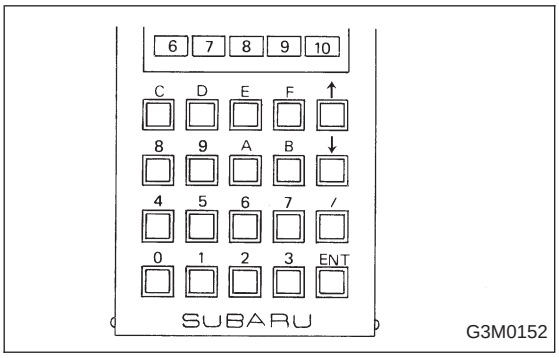
● When there are multiple diagnostic trouble codes.

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

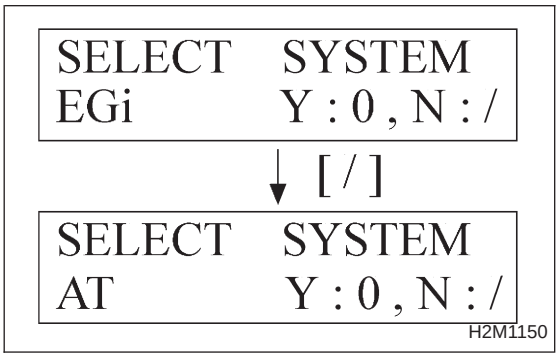


● READ CURRENT DATA AND FREEZE FRAME DATA SHOWN ON DISPLAY FOR ENGINE. (FUNCTION MODE)

(1) Press the function key [0].



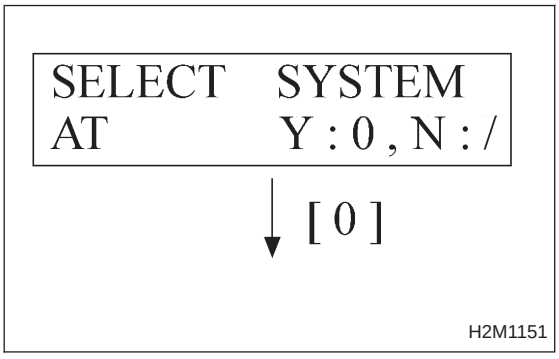
(2) Designate mode using function key.
Refer to “READ DATA FUNCTION KEY LIST FOR ENGINE”, 2-7b [T3C2].
(Example: Press [F] [0] [1] [ENT] in that order.)
(3) Ensure data of input or output signal is shown.

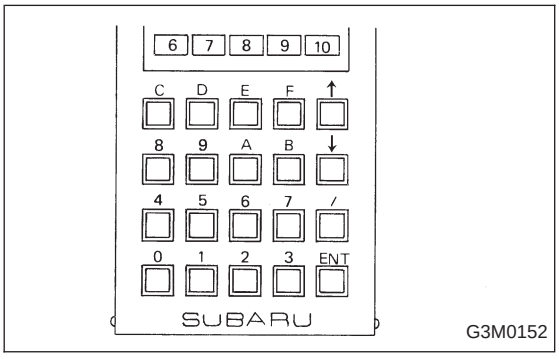


● READ CURRENT DATA SHOWN ON DISPLAY FOR AT. (FUNCTION MODE)

(1) 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”, 2-7b [T3C6].
(Example: Press [F] [0] [2] [ENT] in that order.)
(4) Ensure data of input or output signal is shown.

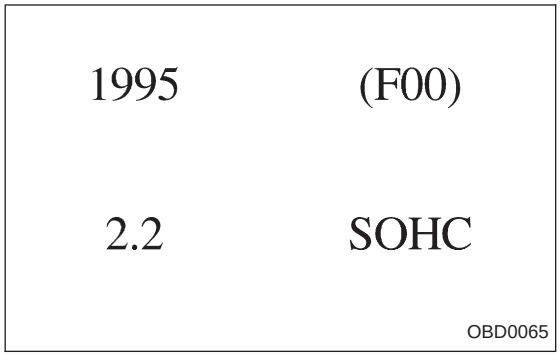
2. READ DATA FUNCTION KEY LIST FOR ENGINE

Function mode	Contents	Abbreviation	Unit of measure
F00	ROM ID number	YEAR	—
F01	Battery voltage	VB	V
F02	Vehicle speed signal	VSP	m/h
F03	Vehicle speed signal	VSP	km/h
F04	Engine speed signal	EREV	rpm
F05	Engine coolant temperature signal	TW	°F
F06	Engine coolant temperature signal	TW	°C
F07	Ignition signal	ADVS	deg
F08	Mass air flow signal	QA	V
F09	Load data	DATA	—
F10	Throttle position signal	THV	V
F11	Injector pulse width	TIM	mS
F12	Idle air control signal	ISC	%
F13	Front oxygen sensor output signal	FO2	V
F14	Front oxygen sensor maximum output signal	FO2max	V
F15	Front oxygen sensor minimum output signal	FO2min	V
F16	Rear oxygen sensor output signal	RO2	V
F17	Rear oxygen sensor maximum output signal	RO2max	V
F18	Rear oxygen sensor minimum output signal	RO2min	V
F19	Short term fuel trim	ALPHA	%
F20	Knock sensor signal	RTRD	deg
F21	A/F correction (short term trim) by rear oxygen sensor	PHOS	%
F23	Atmospheric absolute pressure signal	BARO. P	V
F24	Intake manifold absolute pressure signal	MANI. P	V
F25	Long term fuel trim	KBLRC	%
F28	Long term whole fuel trim	K0	%
F29	Front oxygen sensor heater current	FO2H	A
F30	Rear oxygen sensor heater current	RO2H	A
F38	Minimum EGR system pressure value	EGRmin	mmHg
F45	Load data	LOAD	%
F46	Throttle position signal	THV	%
F47	Mass air flow signal	QA	g/s
F48	Atmospheric absolute pressure signal	BARO. P	kPa
F49	Intake manifold absolute pressure signal	MANI. P	kPa
F50	Load data (Freeze frame data)	LOAD−F	%
F51	Engine coolant temperature signal (Freeze frame data)	TW−F	°C
F52	Throttle position signal (Freeze frame data)	ALPH−F	%
F53	Long term fuel trim (Freeze frame data)	KBLR−F	%
F54	Intake manifold absolute pressure signal (Freeze frame data)	MANI−F	kPa
F55	Engine speed signal (Freeze frame data)	EREV−F	rpm
F56	Vehicle speed signal (Freeze frame data)	VSP−F	km/h

Function mode	Contents	Abbreviation	Unit of measure
FA0	ON ↔ OFF signal	—	—
FA1	ON ↔ OFF signal	—	—
FA2	ON ↔ OFF signal	—	—
FA3	ON ↔ OFF signal	—	—
FA4	ON ↔ OFF signal	—	—
FB0	Diagnostic trouble code (DTC)	INSPECT	—
FB1	Diagnostic trouble code (DTC)	OBD	—
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) F38 (Minimum EGR system pressure value) will not read accurately until the EGR flow diagnosis terminates.

EGR flow diagnosis terminates when LED No.5 illuminates at function mode FA4.



● FUNCTION MODE: F00 — ROM ID NUMBER (YEAR) —

CONDITION:

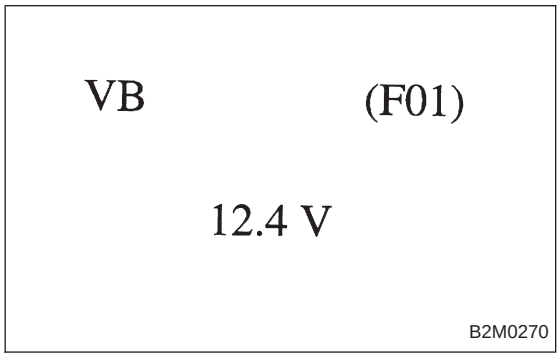
Ignition switch “ON”

SPECIFIED DATA:

Presentation display

● Probable cause (Item outside “specified data”)

1. Error 1	Check for loose or disconnected connector, and discontinued circuit, etc.
2. Error 2	Check for poor contact of cartridge, or different type cartridge.



● FUNCTION MODE: F01 — BATTERY VOLTAGE (VB) —

CONDITION:

(1) Ignition switch “ON”
(2) Idling after warm-up

SPECIFIED DATA:

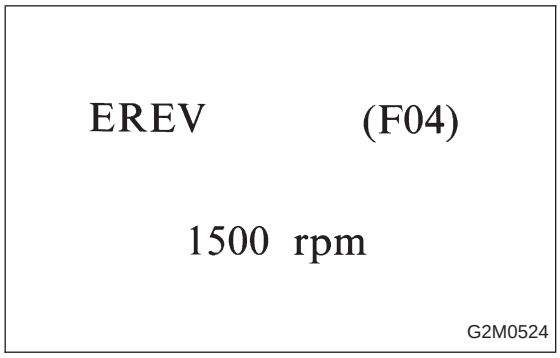
(1) 11±1 V
(2) 13±1 V

● Probable cause (Item outside “specified data”)

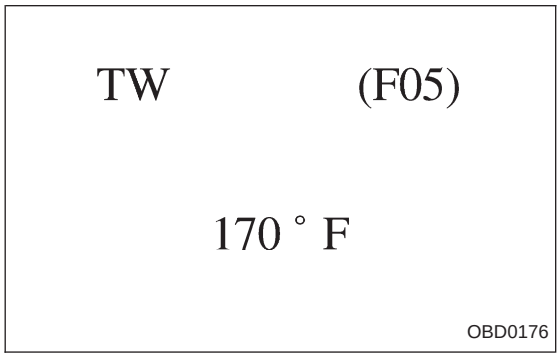
1. Battery	Check battery voltage and electrolyte’s specific gravity.
2. Charging system	● Check regulating voltage. (On no-load) ● Check alternator.
3. Power supply line	● Check main relay. <Ref. to 2-7b [T8C1].> ● Check harness connector of ECM power supply line. <Ref. to 2-7b [T8C2], [T8C3].>

● FUNCTION MODE: F02 AND F03 — VEHICLE SPEED SIGNAL (VSP) —

- F02: Vehicle speed is indicated in mile per hour (m/h).
- F03: Vehicle speed is indicated in kilometer per hour (km/h).

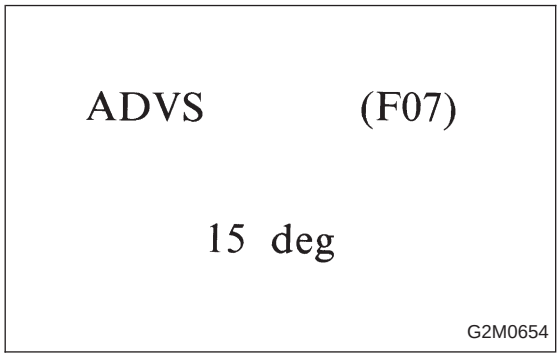


● FUNCTION MODE: F04 — ENGINE SPEED SIGNAL (EREV) —



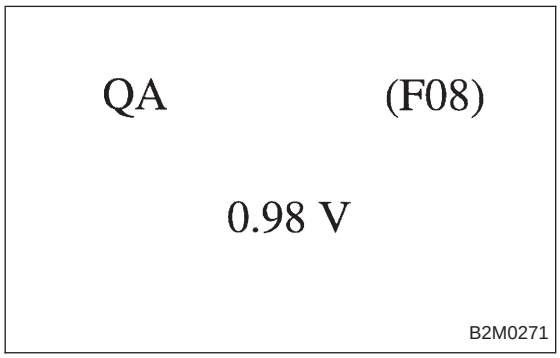
● FUNCTION MODE: F05 AND F06 — ENGINE COOLANT TEMPERATURE SIGNAL (TW) —

- F05: Engine coolant temperature is indicated in "°F".
- F06: Engine coolant temperature is indicated in "°C".

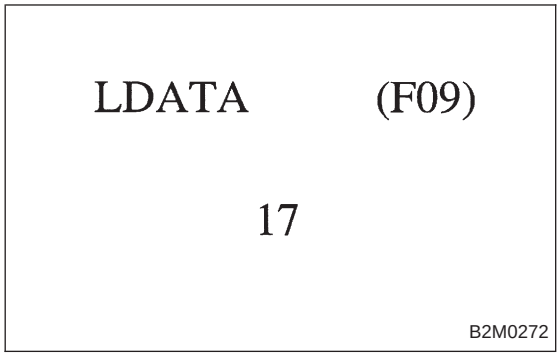


● FUNCTION MODE: F07 — IGNITION SIGNAL (ADVS) —

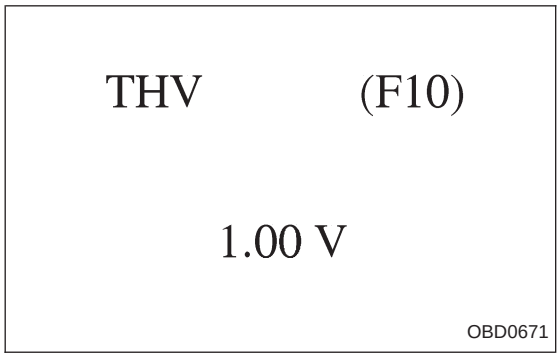
NOTE:
The ignition timing value displayed in mode F07 is a value computed by ECM and will not always correspond with the value measured with a timing light.



● FUNCTION MODE: F08 — MASS AIR FLOW SIGNAL (QA) —

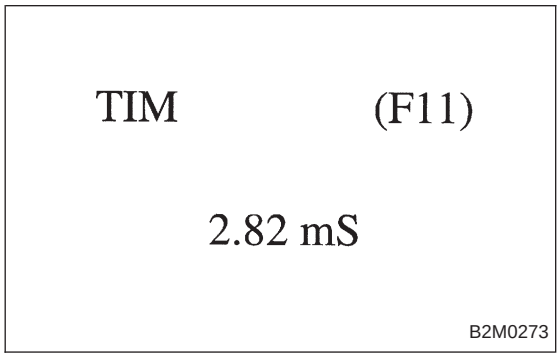


● **FUNCTION MODE: F09**
— LOAD DATA (LDATA) —

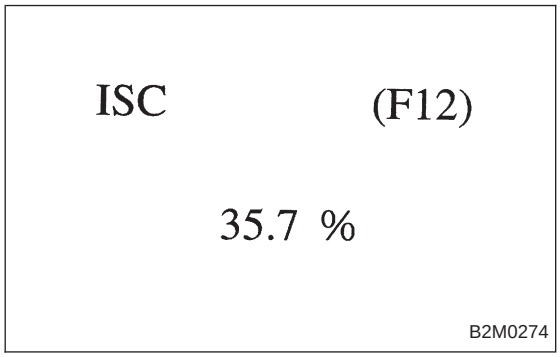


● **FUNCTION MODE: F10**
— THROTTLE POSITION SIGNAL (THV) —

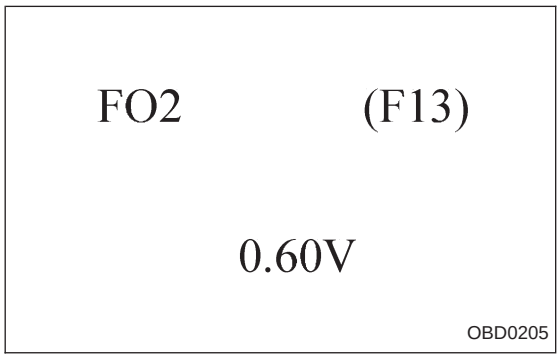
NOTE:
Be sure that the displayed value changes smoothly when changing throttle valve from fully closed to fully opened.



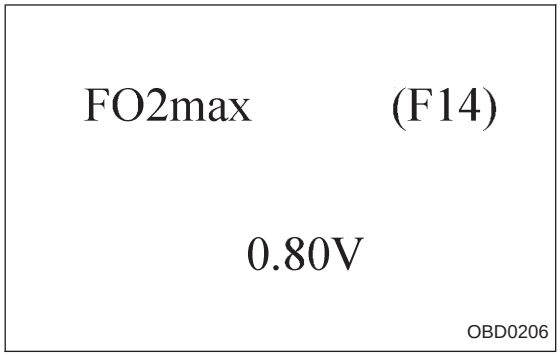
● **FUNCTION MODE: F11**
— INJECTOR PULSE WIDTH (TIM) —



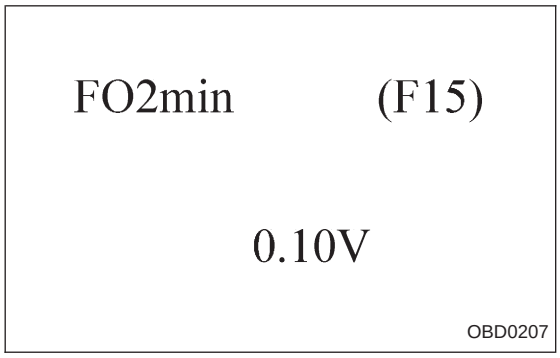
● **FUNCTION MODE: F12**
— IDLE AIR CONTROL SIGNAL (ISC) —



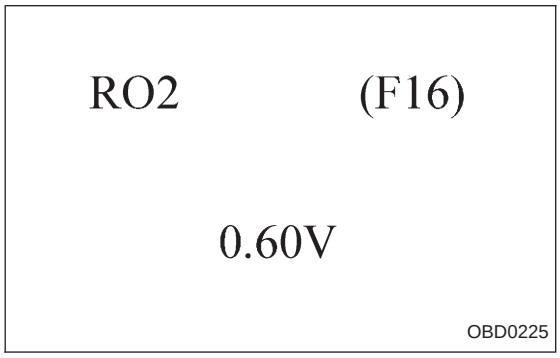
● **FUNCTION MODE: F13**
— FRONT OXYGEN SENSOR OUTPUT SIGNAL (FO2) —



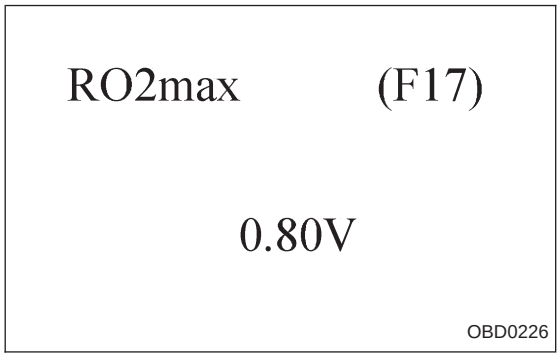
- **FUNCTION MODE: F14**
— FRONT OXYGEN SENSOR MAXIMUM OUTPUT SIGNAL (FO2MAX) —



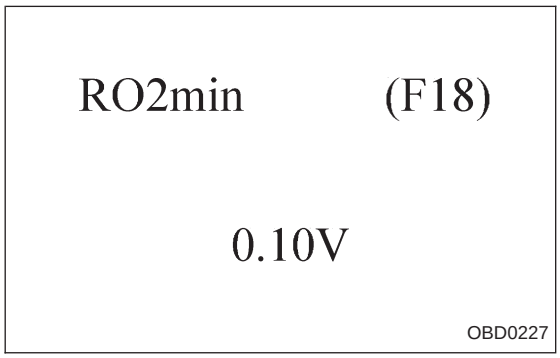
- **FUNCTION MODE: F15**
— FRONT OXYGEN SENSOR MINIMUM OUTPUT SIGNAL (FO2MIN) —



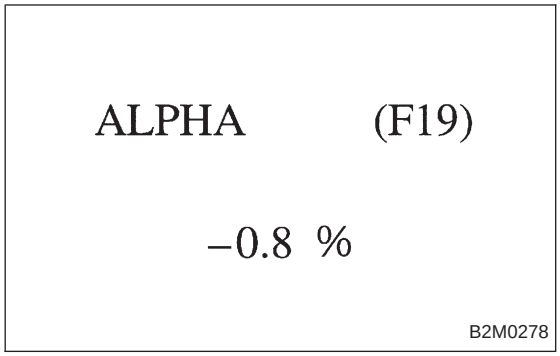
- **FUNCTION MODE: F16**
— REAR OXYGEN SENSOR OUTPUT SIGNAL (RO2) —



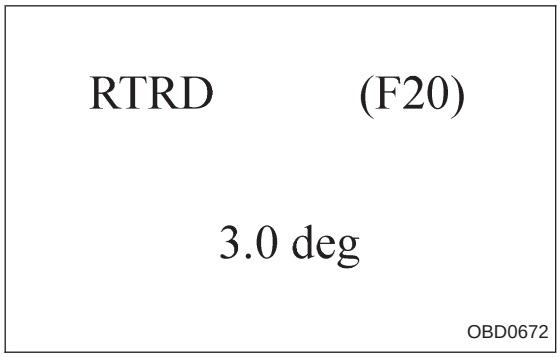
- **FUNCTION MODE: F17**
— REAR OXYGEN SENSOR MAXIMUM OUTPUT SIGNAL (RO2MAX) —



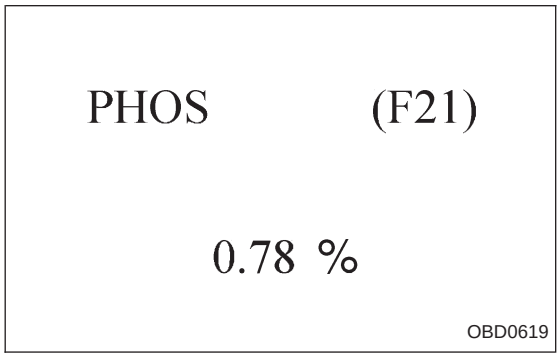
- **FUNCTION MODE: F18**
— REAR OXYGEN SENSOR MINIMUM OUTPUT SIGNAL (RO2MIN) —



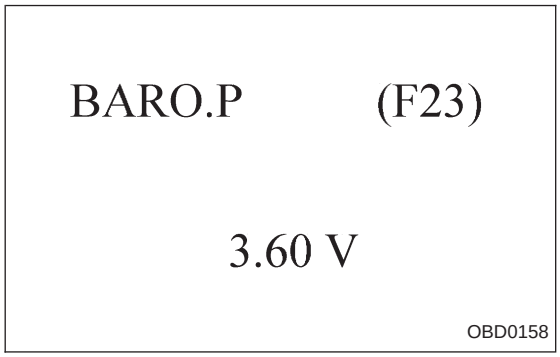
- **FUNCTION MODE: F19**
  — SHORT TERM FUEL TRIM [A/F CORRECTION COEFFICIENT] (ALPHA) —



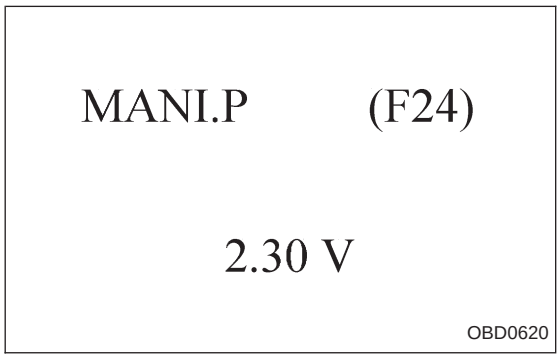
- **FUNCTION MODE: F20**
  — KNOCK SENSOR SIGNAL [IGNITION TIMING CORRECTION COEFFICIENT] (RTRD) —



- **FUNCTION MODE: F21**
  — A/F CORRECTION COEFFICIENT [SHORT TERM TRIM] BY REAR OXYGEN SENSOR (PHOS) —

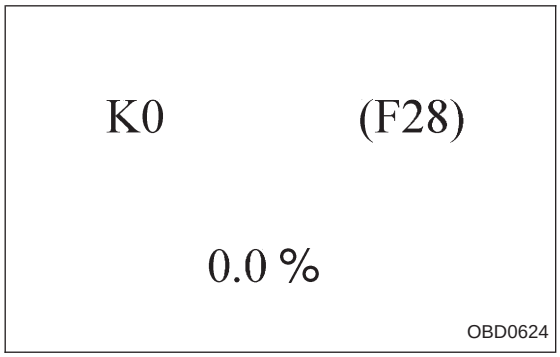


- **FUNCTION MODE: F23**
  — ATMOSPHERIC ABSOLUTE PRESSURE SIGNAL (BARO. P) —

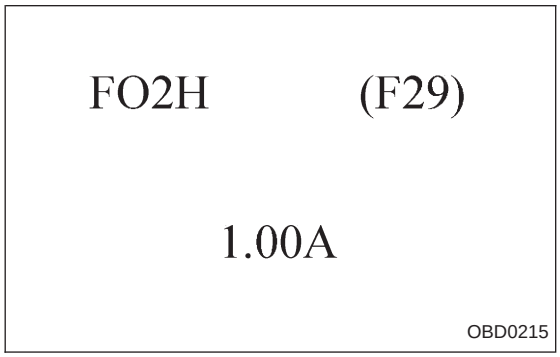


- **FUNCTION MODE: F24**
  — INTAKE MANIFOLD ABSOLUTE PRESSURE SIGNAL (MANI. P) —

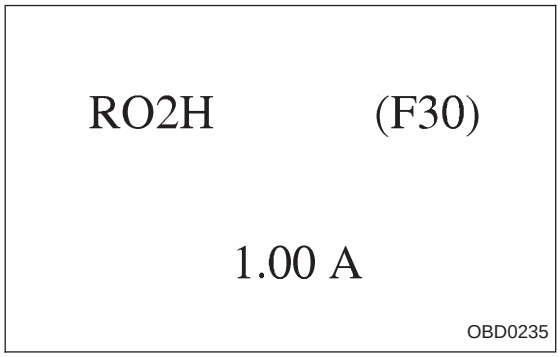
● **FUNCTION MODE: F25**
— LONG TERM FUEL TRIM [A/F LEARNING CORRECTION COEFFICIENT] (KBLRC) —



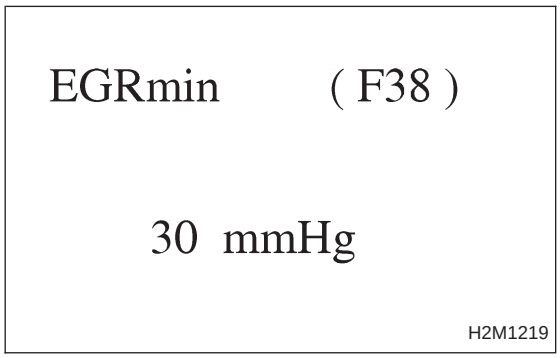
● **FUNCTION MODE: F28**
— LONG TERM FUEL TRIM WHOLE [A/F LEARNING CONTROL COEFFICIENT] (K0) —



● **FUNCTION MODE: F29**
— FRONT OXYGEN SENSOR HEATER CURRENT (FO2H) —



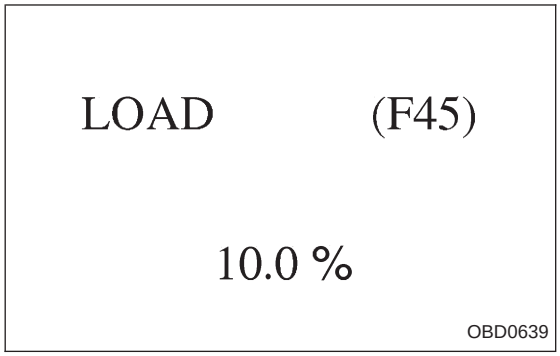
● **FUNCTION MODE: F30**
— REAR OXYGEN SENSOR HEATER CURRENT (RO2H) —



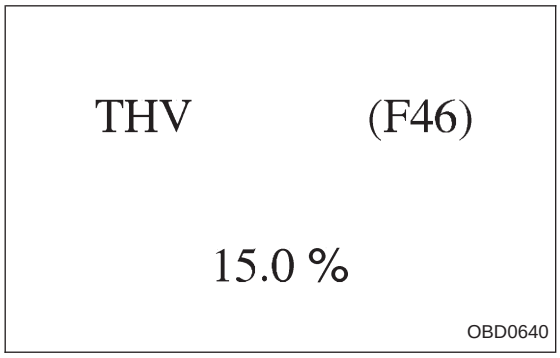
● **FUNCTION MODE: F38**
— MINIMUM EGR SYSTEM PRESSURE VALUE (EGRMIN) —

NOTE:
Minimum EGR system pressure value will not read accurately until the EGR flow diagnosis terminates.

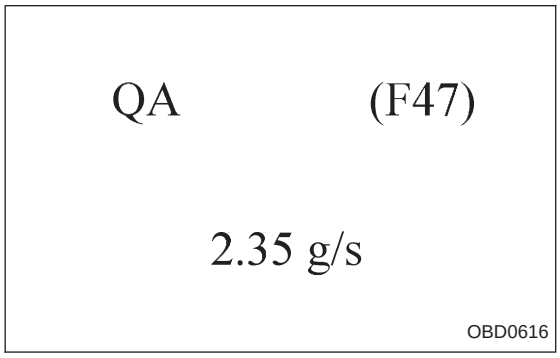
EGR flow diagnosis terminates when LED No.5 illuminates at function mode FA4.



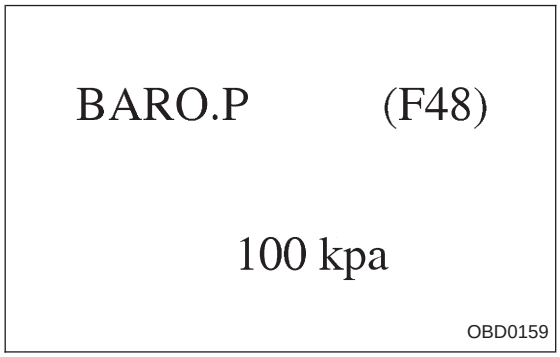
- **FUNCTION MODE: F45**
— LOAD DATA (LOAD) —



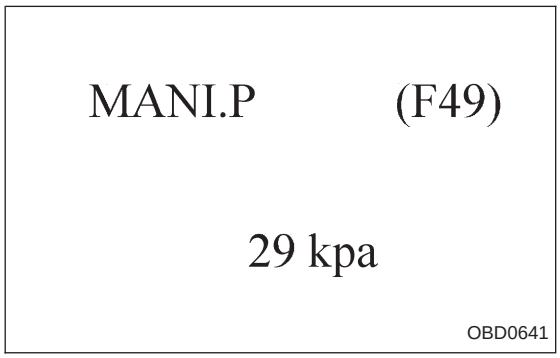
- **FUNCTION MODE: F46**
— THROTTLE POSITION SIGNAL (THV) —



- **FUNCTION MODE: F47**
— MASS AIR FLOW SIGNAL (QA) —

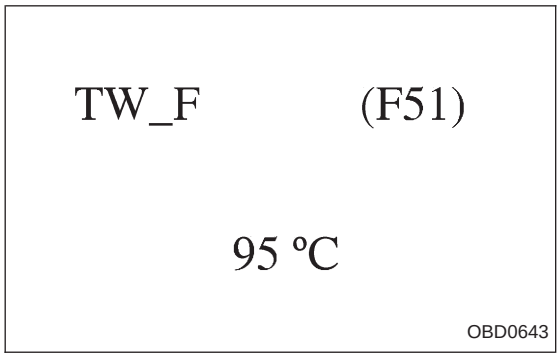


- **FUNCTION MODE: F48**
— ATMOSPHERIC ABSOLUTE PRESSURE SIGNAL (BARO. P) —

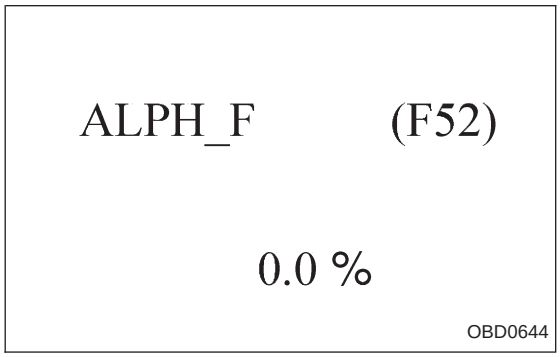


- **FUNCTION MODE: F49**
— INTAKE MANIFOLD ABSOLUTE PRESSURE SIGNAL (MANI. P) —

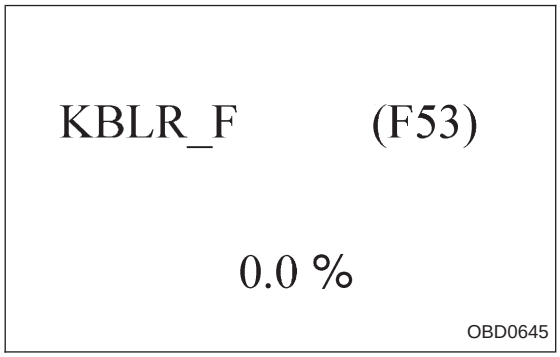
● **FUNCTION MODE: F50**
— LOAD DATA [FREEZE FRAME DATA) (LOAD – F) —



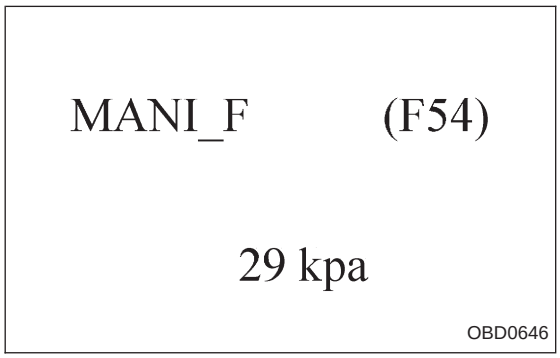
● **FUNCTION MODE: F51**
— ENGINE COOLANT TEMPERATURE SIGNAL [FREEZE FRAME DATA] (TW – F) —



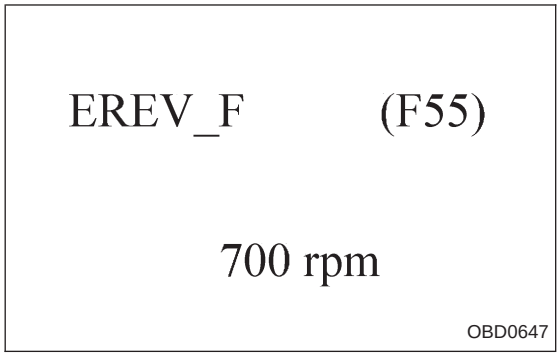
● **FUNCTION MODE: F52**
— THROTTLE POSITION SIGNAL [FREEZE FRAME DATA] (ALPH – F) —



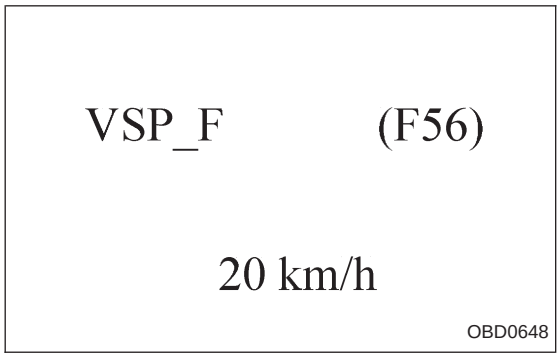
● **FUNCTION MODE: F53**
— LONG TERM FUEL TRIM <A/F LEARNING CONTROL COEFFICIENT> [FREEZE FRAME DATA] (KBLR – F) —



● **FUNCTION MODE: F54**
— INTAKE MANIFOLD ABSOLUTE PRESSURE SIGNAL [FREEZE FRAME DATA] (MANI – F) —



● **FUNCTION MODE: F55**
— ENGINE SPEED SIGNAL [FREEZE FRAME DATA] (EREV – F) —



● **FUNCTION MODE: F56**
— VEHICLE SPEED SIGNAL [FREEZE FRAME DATA] (VSP – F) —

3. FA MODE FOR ENGINE

Function mode	LED No.	Contents	Display	LED “ON” requirements
FA0	1	Ignition switch	IG	When ignition switch is turned ON.
	2	AT/MT identification signal	AT	When AT identification signal is entered.
	3	Test mode connector	UD	When test mode connector is connected.
	5	Idle speed control identification signal	IC	When engine rpm is less than the established value.
	7	Neutral switch	NT	When neutral position signal is entered.
FA1	2	Air conditioner switch	AC	When air conditioner switch is turned ON.
	3	Air conditioner relay	AR	When air conditioner relay is in function.
	4	Radiator fan relay 1	R1	When radiator fan relay 1 is in function.
	5	Radiator fan relay 2	R2	When radiator fan relay 2 is in function.
	6	Fuel pump relay	FP	When fuel pump relay is in function.
	7	Purge control solenoid valve	CP	When purge control solenoid valve is in function.
	8	Pressure sources switching solenoid valve	BR	When pressure sources switching solenoid valve is in function.
FA2	3	EGR solenoid valve	EG	When EGR solenoid valve is in function.
	4	Engine torque control signal	TR	When engine torque control signal is entered.
	5	Engine torque control cut signal	TC	When engine torque control cut signal is got out.
	9	Front oxygen sensor signal	FO	When front oxygen sensor mixture ratio is rich.
	10	Rear oxygen sensor signal	RO	When rear oxygen sensor mixture ratio is rich.

LED No.	Signal name	Display
1	Ignition switch	IG
2	Identification of AT model	AT
3	Test mode connector	UD
4	—	—
5	—	—
6	—	—
7	Park/Neutral position switch	NT
8	—	—
9	—	—
10	—	—

IG	AT	UD	ID	IC
—	NT	—	—	—

1	2	3	4	5
6	7	8	9	10

● FUNCTION MODE: FA0

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 1 Ignition switch is turned ON.
LED No. 2 Vehicle is AT model.
LED No. 3 Test mode connector is connected.
LED No. 7 Shift position is in “P” or “N”.

LED No.	Signal name	Display
1	—	—
2	A/C switch	AC
3	A/C relay	AR
4	Radiator fan relay 1	R1
5	Radiator fan relay 2	R2
6	Fuel pump relay	FP
7	Purge control solenoid valve	CP
8	—	—
9	Pressure sources switching solenoid valve	BR
10	—	—

—	AC	AR	R1	R2
FP	CP	—	BR	—

1	2	3	4	5
6	7	8	9	10

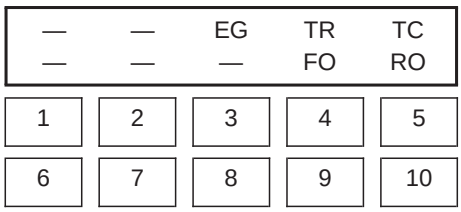
● FUNCTION MODE: FA1

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 2 A/C switch is turned ON.
LED No. 3 A/C relay is turned ON.
LED No. 4 Radiator fan relay 1 is turned ON.
LED No. 5 Radiator fan relay 2 is turned ON.
LED No. 6 Fuel pump relay is turned ON.
LED No. 7 Purge control solenoid valve is in function.
LED No. 9 Pressure sources switching solenoid valve is in function.

NOTE:
When LED No. 3, 4, 5, 6, 7 and 9 blinks with the test mode connector connected and the ignition switch turned to ON, the corresponding part is functioning properly.

LED No.	Signal name	Display
1	—	—
2	—	—
3	EGR solenoid valve	EG
4	Torque control signal	TR
5	Torque control cut signal	TC
6	—	—
7	—	—
8	—	—
9	Front oxygen sensor signal	FO
10	Rear oxygen sensor signal	RO



● FUNCTION MODE: FA2

— ON ↔ OFF SIGNAL —

Requirement for LED “ON”.
LED No. 3 EGR solenoid valve is in function.
LED No. 4 ECM entered the torque control signal emitted from TCM.
LED No. 5 Engine torque control cut signal goes out.
LED No. 9 Front oxygen sensor mixture ratio is rich.
LED No. 10 Rear oxygen sensor mixture ratio is rich.

4. FB MODE FOR ENGINE

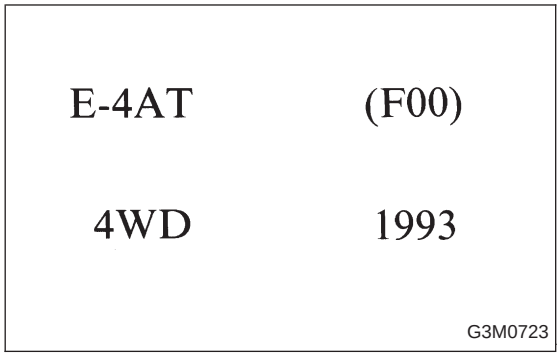
Function mode	Abbreviation	Contents	Contents of display	Page
FB0	INSPECT	On-board diagnostics (Inspection)	Current trouble code indicated by on-board diagnostics after clear memory.	49
FB1	OBD	On-board diagnostics (Read data)	Current trouble code indicated by on-board diagnostics.	24

5. 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.	48

6. 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	LUDTY	%
F13	AWD duty	4WDTY	%
F14	Throttle position sensor power supply	THVCC	V
F15	Mass air flow sensor	AFM	V



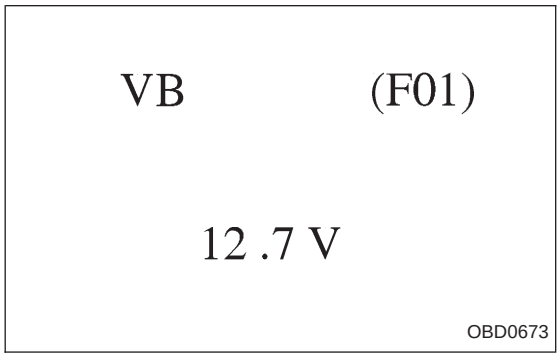
● FUNCTION MODE: F00 — MODE DISPLAY —

SPECIFIED DATA:

Data at the left should be indicated.

Probable cause (if outside “specified data”)

1. Communication failure (No communication method can be confirmed with power ON.)	(1) Check loose or poor connectors, or shortcircuit. (2) Check type of cartridge.
2. Vehicle types cannot be identified (due to communication failure).	Check improper cartridge. Replace with proper one.



● FUNCTION MODE: F01 — BATTERY VOLTAGE (VB) —

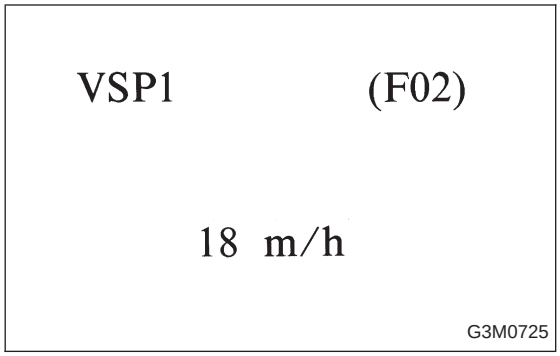
CONDITION:

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

SPECIFIED DATA:

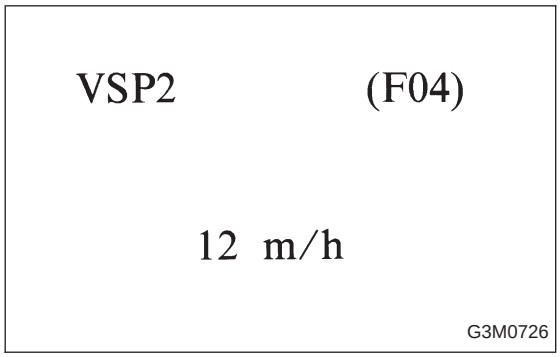
(1) 12±1 V
(2) 13±1 V

1. Battery	Check battery voltage and specific gravity of electrolyte.
2. Charging system	(1) Measure regulating voltage under no loads. (2) Check generator (as a single unit).



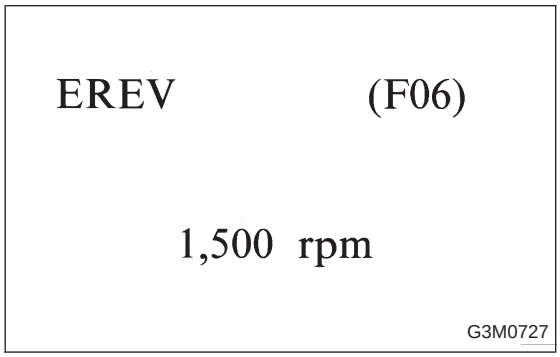
● FUNCTION MODE: F02 — VEHICLE SPEED SENSOR 1 (VSP1) —

● F02: Vehicle speed is indicated in mile per hour (m/h).
● F03: Vehicle speed is indicated in kilometer per hour (km/h).



● FUNCTION MODE: F04 — VEHICLE SPEED SENSOR 2 (VSP2) —

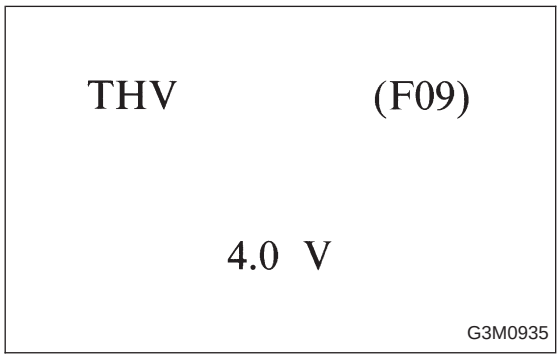
● F04: Vehicle speed is indicated in mile per hour (m/h).
● F05: Vehicle speed is indicated in kilometer per hour (km/h).



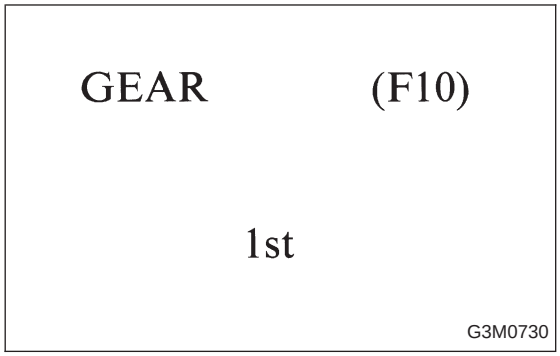
● FUNCTION MODE: F06 — ENGINE SPEED (EREV) —

● FUNCTION MODE: F07 — ATF TEMPERATURE SENSOR (ATFT) —

● F07: ATF temperature is indicated in “deg F”.
● F08: ATF temperature is indicated in “deg C”.

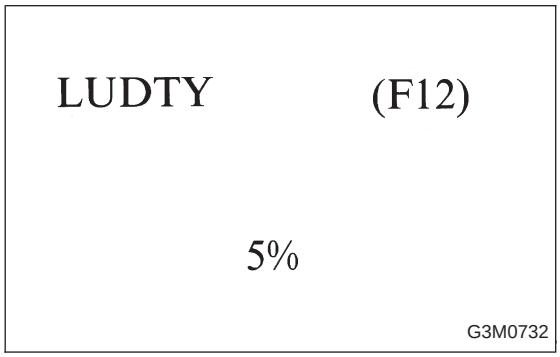


● FUNCTION MODE: F09 — THROTTLE POSITION SENSOR (THV) —

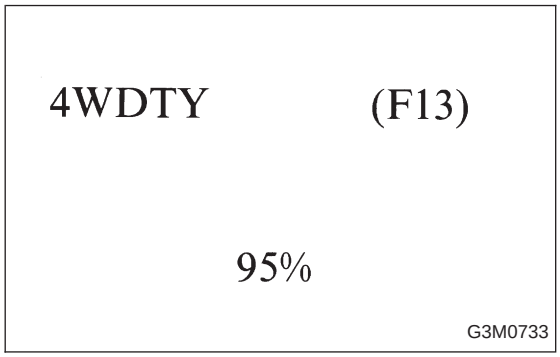


● **FUNCTION MODE: F10**
— GEAR POSITION (GEAR) —

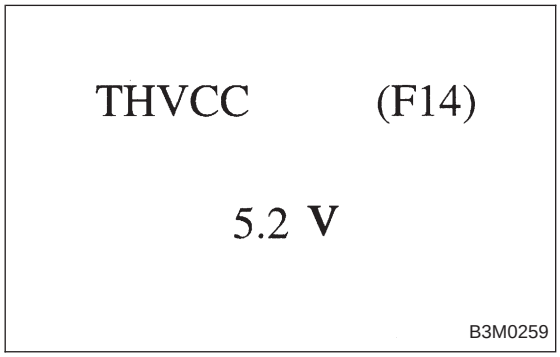
● **FUNCTION MODE: F11**
— LINE PRESSURE DUTY (PLDTY) —



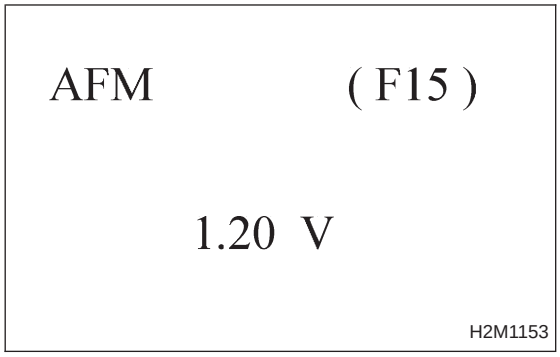
● **FUNCTION MODE: F12**
— LOCK-UP DUTY (LUDTY) —



● **FUNCTION MODE: F13**
— AWD DUTY (4WDTY) —



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



- **FUNCTION MODE: F15**

— MASS AIR FLOW SENSOR (AFM) —

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

FF	KD	—	—	BR
AB	CR	PW	—	—

1	2	3	4	5
6	7	8	9	10

● 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	—	—

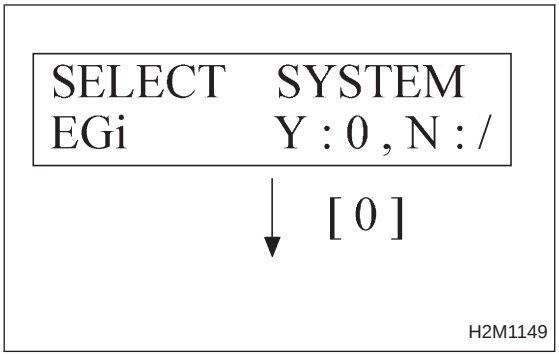
NP	RR	RD	R3	R2
R1	SS	—	—	—

1	2	3	4	5
6	7	8	9	10

● 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.



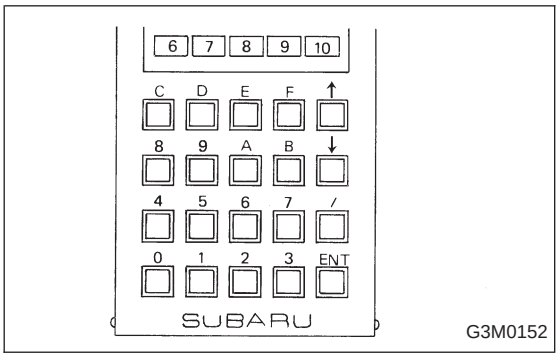
D: CLEAR MEMORY MODE

1. SUBARU SELECT MONTOR

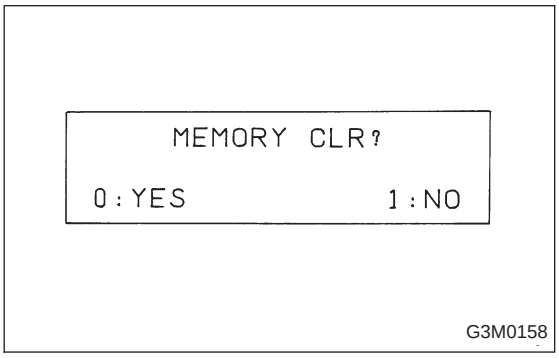
1) Select engine mode or AT mode using function key.
- Engine mode:

Press the function key [0].
- AT mode:

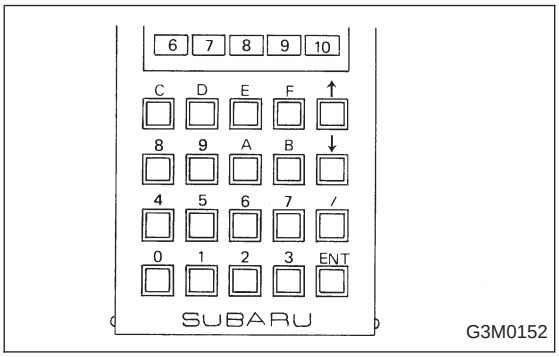
Press the function key [/] [0] in that order.



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



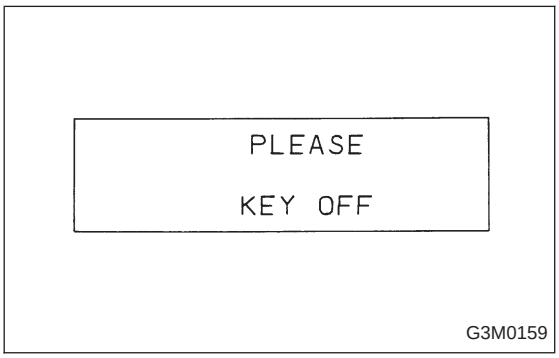
3) Ensure displayed message.



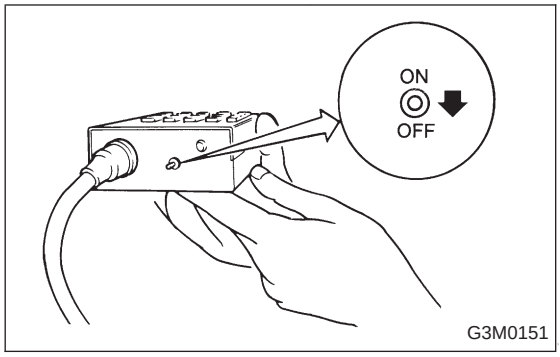
4) Press function key.
- When executing, (YES)

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.

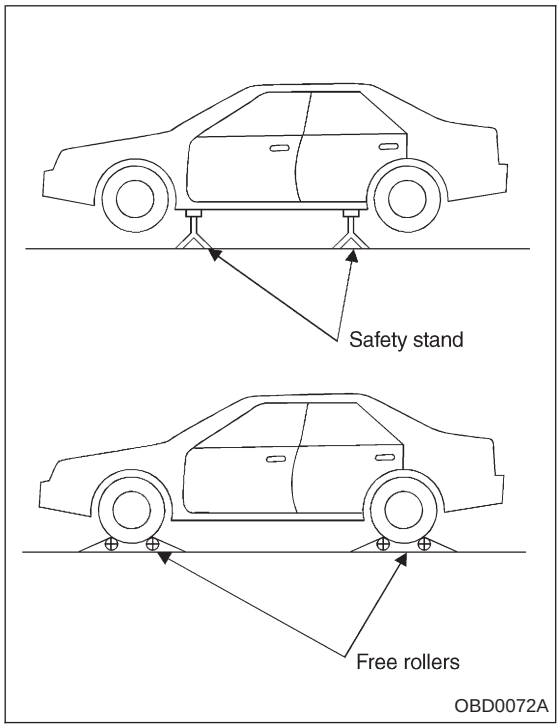


6) After the display is gone, turn Subaru select monitor switch and ignition switch to OFF.

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

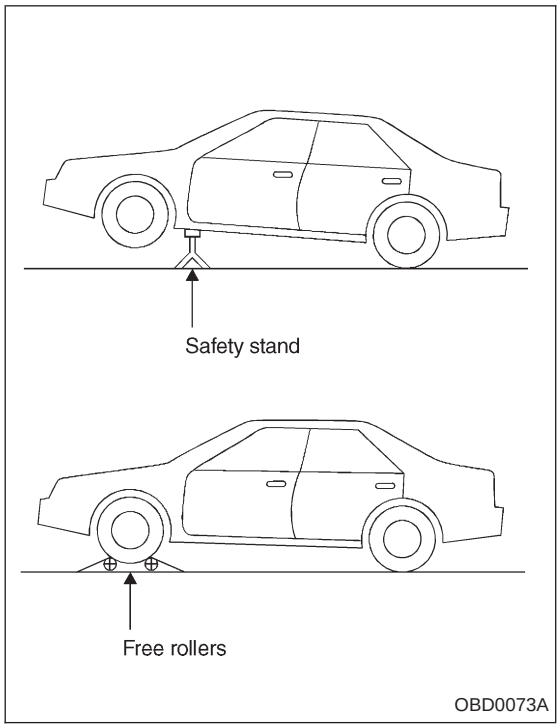
Raise the vehicle using a garage jack and place on safety stands or drive the vehicle onto free rollers.

- **FULL-TIME AWD MODELS**

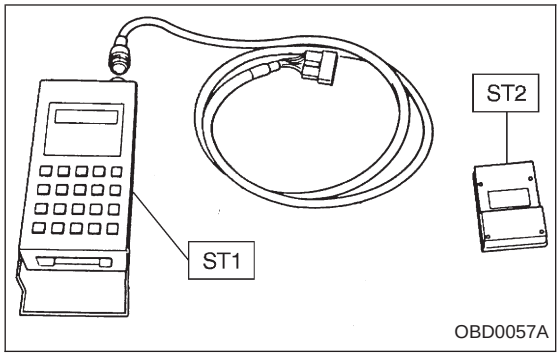
WARNING:

- **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 roting, do not place anything near them. Also, make sure that nobody goes in front of the vehicle.



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

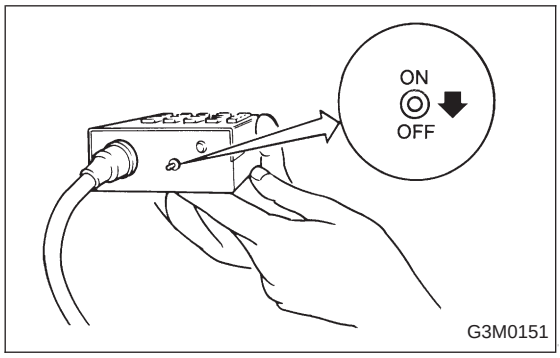


2. SUBARU SELECT MONITOR

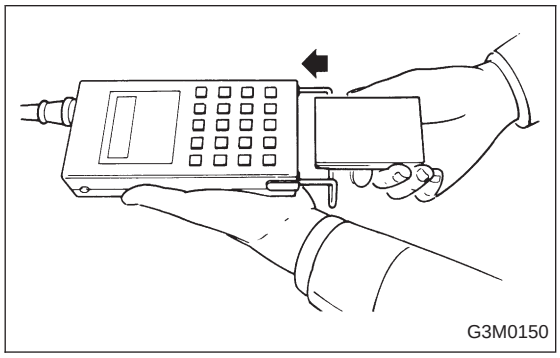
After performing diagnostics and clearing the memory, check for any remaining unresolved trouble data.

1) Prepare Subaru select monitor and cartridge.

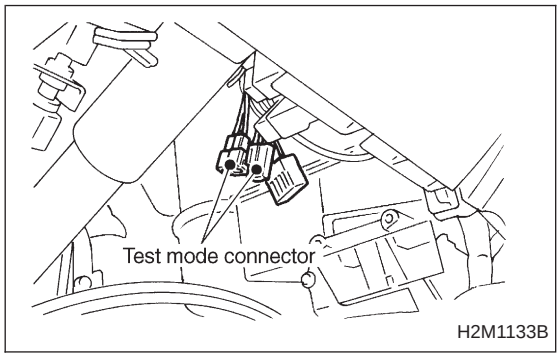
ST1 498307500 SELECT MONITOR KIT
ST2 498345500 CARTRIDGE



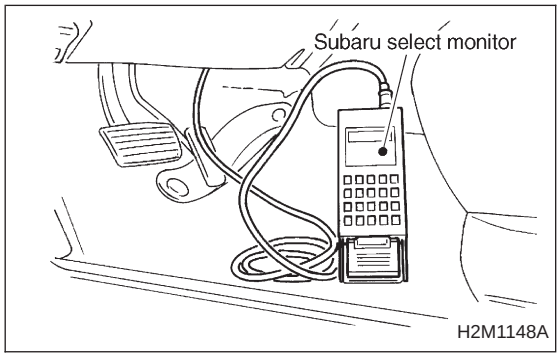
2) Turn ignition switch and monitor switch to OFF.



3) Insert cartridge into Subaru select monitor.

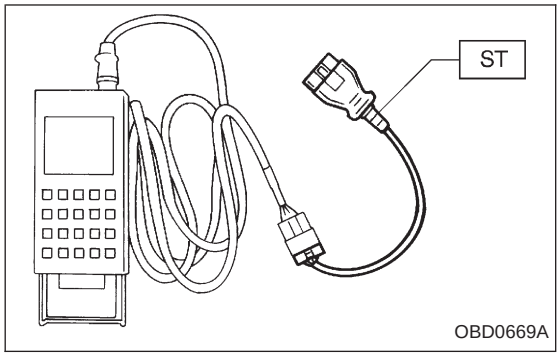


4) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.



5) Connect Subaru select monitor to data link connector.

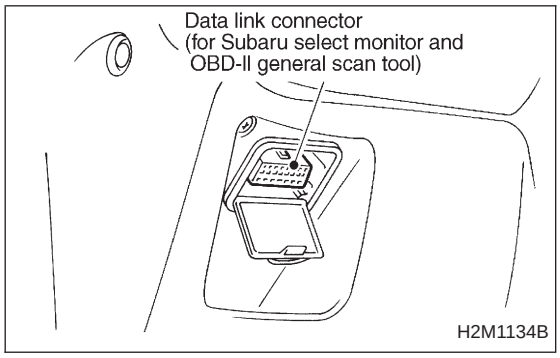
● Using data link connector for Subaru select monitor only:
Connect Subaru select monitor to its data link connector located in the lower portion of the instrument panel (on the driver's side), to the side of the center console box.



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

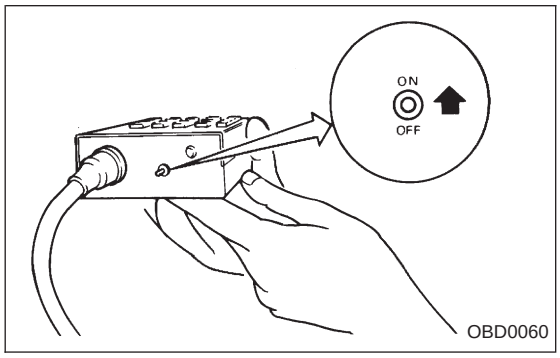
(1) Connect ST to Subaru select monitor cable.

ST 498357200 ADAPTER CABLE



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

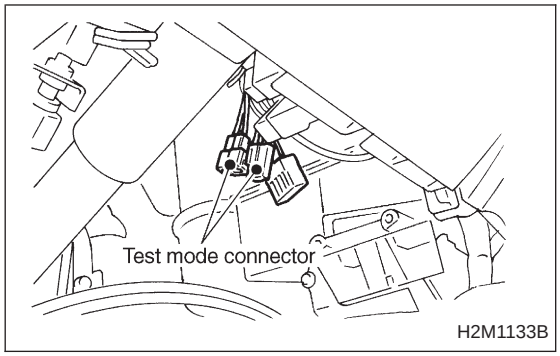
CAUTION:
Do not connect scan tools except for Subaru select monitor and OBD-II general scan tool.



6) Turn ignition switch ON (engine OFF) and Subaru select monitor switch ON.
7) Start the engine.
NOTE:
Ensure the selector lever is placed in the "P" position before starting.
8) Using the selector lever or shift lever, turn the "P" position switch and the "N" position switch to ON.
9) Depress the brake pedal to turn the brake switch ON.
10) Keep engine speed in the 2,500 — 3,000 rpm range for 40 seconds.

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

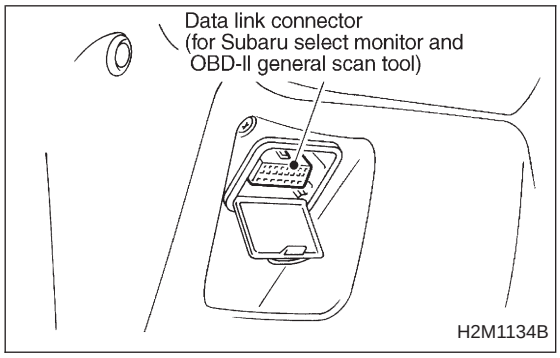
11) Place the selector lever or shift lever in the "D" position and drive the vehicle at 5 to 10 km/h (3 to 6 MPH).
NOTE:
● On AWD vehicles, release the parking brake.
● The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to 4-4 [T1C2].>



3. OBD-II GENERAL SCAN TOOL

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

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



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

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

3) Start the engine.

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

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

5) Depress the brake pedal to turn the brake switch ON.

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

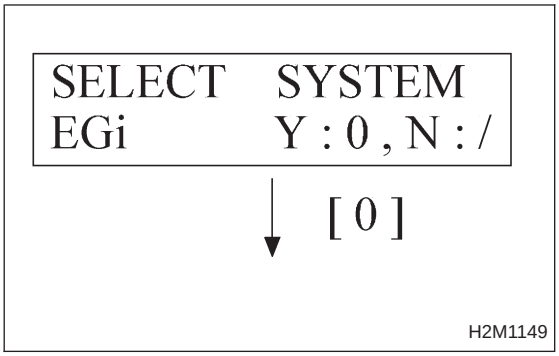
NOTE:
On models without tachometer, use the Subaru select monitor or tachometer (Secondary pickup type).

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

NOTE:
- On AWD vehicles, release the parking brake.
- The speed difference between front and rear wheels may light either the ABS warning light, but this indicates no malfunctions. When engine control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to 4-4 [T1C2].>

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

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

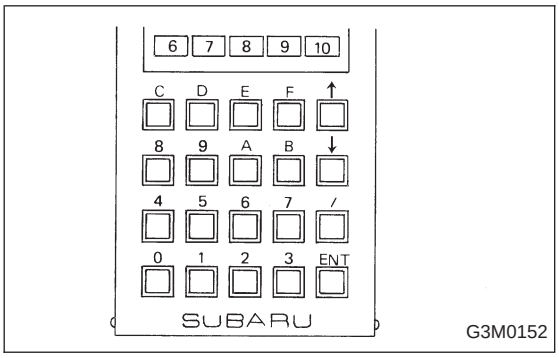


4. CHECK FOR DIAGNOSTICS TROUBLE CODE

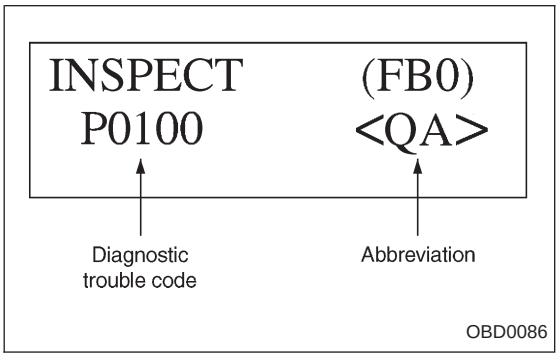
Using Subaru select monitor, check for diagnostic trouble code(s) and record the result(s).

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

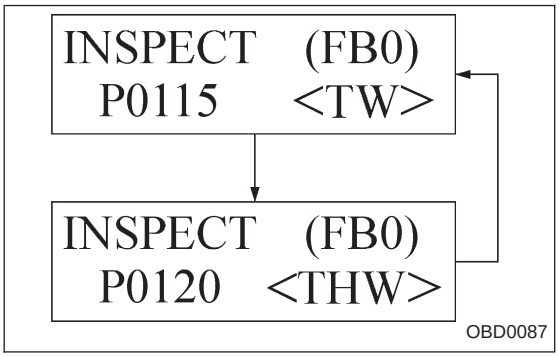
(1) Press the function key [0].



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

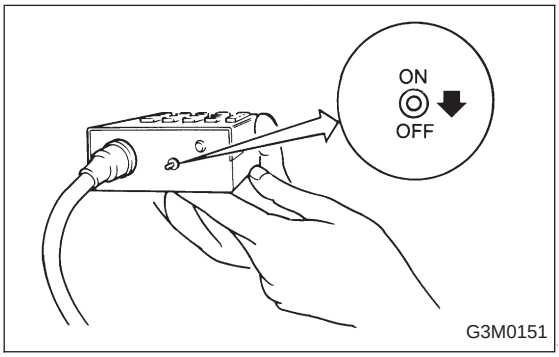


(3) Ensure diagnostic trouble code(s) is shown.
- When there is only one diagnostic trouble code.



- 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. FINISHING DIAGNOSIS OPERATION

1) Disconnect test mode connector at the lower portion of instrument panel (on the driver’s side), to the side of the center console box.
2) Turn Subaru select monitor switch and ignition switch to OFF.
3) Disconnect Subaru select monitor from its data link connector.

4. Cautions

A: SUPPLEMENTAL RESTRAINT SYSTEM "AIRBAG"

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

CAUTION:

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

B: PRECAUTIONS

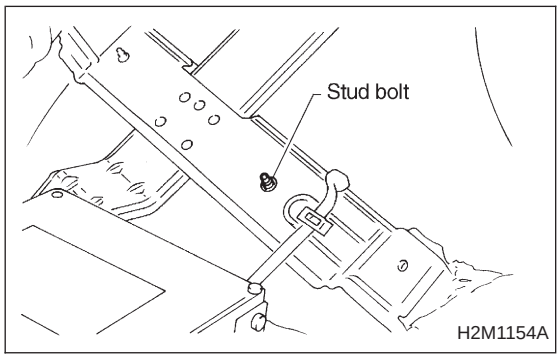
1) Never connect the battery in reverse polarity.
- The ECM will be destroyed instantly.
- The fuel injector and other part will be damaged in just a few minutes more.

2) Do not disconnect the battery terminals while the engine is running.
- A large counter electromotive force will be generated in the alternator, and this voltage may damage electronic parts such as ECM, etc.

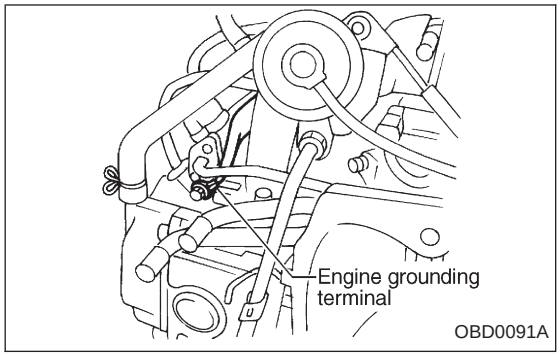
3) Before disconnecting the connectors of each sensor and the ECM, be sure to turn OFF the ignition switch.

4) Before removing ECM from the located position, disconnect two cables on battery.
- Otherwise, the ECM may be damaged.

5) The connectors to each sensor in the engine compartment and the harness connectors on the engine side and body side are all designed to be waterproof. However, it is still necessary to take care not to allow water to get into the connectors when washing the vehicle, or when servicing the vehicle on a rainy day.



6) Use ECM mounting stud bolts at the body head grounding point when measuring voltage and resistance inside the passenger compartment.



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

8) Every MFI-related part is a precision part. Do not drop them.
9) Observe the following cautions when installing a radio in MFI equipped models.

CAUTION:
● The antenna must be kept as far apart as possible from the control unit.
(The ECM is located under the steering column, inside of the instrument panel lower trim panel.)
● The antenna feeder must be placed as far apart as possible from the ECM and MFI harness.
● Carefully adjust the antenna for correct matching.
● When mounting a large power type radio, pay special attention to the three items above mentioned.
● Incorrect installation of the radio may affect the operation of the ECM.

10) Before disconnecting the fuel hose, disconnect the fuel pump connector and crank the engine for more than five seconds to release pressure in the fuel system. If engine starts during this operation, run it until it stops.
11) Problems in the electronic-controlled automatic transmission may be caused by failure of the engine, the electronic control system, the transmission proper, or by a combination of these. These three causes must be distinguished clearly when performing diagnostics.
12) Diagnostics should be conducted by rotating with simple, easy operations and proceeding to complicated, difficult operations. The most important thing in diagnostics is to understand the customer's complaint, and distinguish between the three causes.
13) In AT vehicles, do not continue the stall for more than five seconds at a time (from closed throttle, fully open throttle to stall engine speed).
14) On ABS vehicle, when performing driving test in jacked-up or lifted-up position, sometimes the warning light may be lit, but this is not a malfunction of the system. The reason for this is the speed difference between the front and rear wheels. After diagnosis of engine control system, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to 4-4 [T1C2].>

C: PRE-INSPECTION

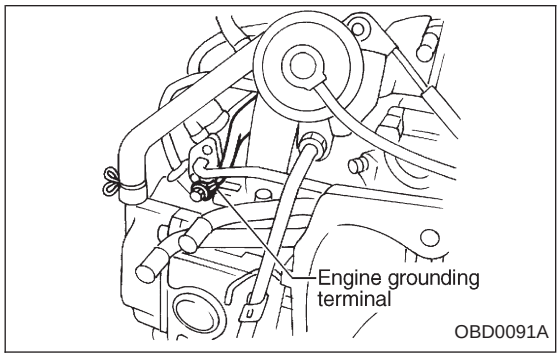
Before performing diagnostics, check the following items which might affect engine problems:

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.

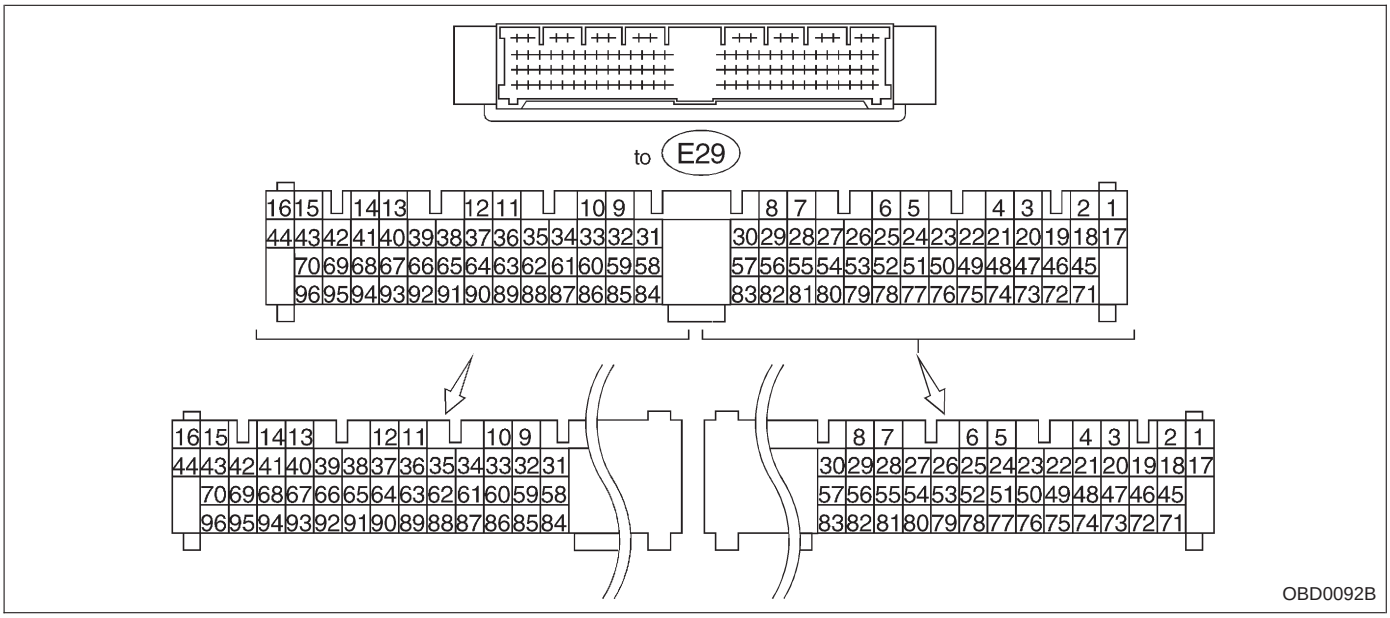


2. ENGINE GROUNDING

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

5. Specified Data

1. ENGINE CONTROL MODULE (ECM) I/O SIGNAL



Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Crankshaft position sensor	Signal (+)	E29	8	0	−7 — +7	Sensor output waveform
	Signal (−)	E29	7	0	0	—
	Shield	E29	52	0	0	—
Camshaft position sensor	Signal (+)	E29	6	0	−7 — +7	Sensor output waveform
	Signal (−)	E29	5	0	0	—
	Shield	E29	52	0	0	—
Mass air flow sensor	Signal	E29	26	0 — 0.3	0.8 — 1.2	—
	Shield	E29	54	0	0	—
	GND	E29	25	0	0	—
Throttle position sensor	Signal	E29	24	Fully closed: 0.2 — 1.0 Fully opened: 4.2 — 4.7		—
	Power supply	E29	22	5	5	—
	GND	E29	25	0	0	—
Front oxygen sensor	Signal	E29	28	0	0 — 0.9	—
	Shield	E29	56	0	0	—
Rear oxygen sensor	Signal	E29	27	0	0 — 0.9	—
	Shield	E29	56	0	0	—
Engine coolant temperature sensor		E29	29	1.0 — 1.4	1.0 — 1.4	After warm-up
Vehicle speed sensor 2		E29	57	0 or 5	0 or 5	“5” and “0” are repeatedly displayed when vehicle is driven.
Starter switch		E29	81	0	0	Cranking: 8 to 14
A/C switch		E29	80	ON: 10 — 13 OFF: 0	ON: 13 — 14 OFF: 0	—
Ignition switch		E29	79	10 — 13	13 — 14	—

Content		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON (Engine OFF)	Engine ON (Idling)	
Neutral position switch		E29	78	ON: 0 OFF: 5.0±0.5		Switch is ON when shift is in "N" or "P" position.
Test mode connector		E29	75	5	5	When connected: 0
Knock sensor	Signal	E29	30	2.8	2.8	—
	Shield	E29	56	0	0	—
Back-up power supply		E29	42	10 — 13	13 — 14	Ignition switch "OFF": 10 — 13
Control unit power supply		E29	15	10 — 13	13 — 14	—
			16			
Ignition control	# 1, # 2	E29	14	0	1 — 3.4	—
	# 3, # 4	E29	13	0	1 — 3.4	—
Fuel injector	# 1	E29	2	10 — 13	1 — 14	Waveform
	# 2	E29	1	10 — 13	1 — 14	Waveform
	# 3	E29	18	10 — 13	1 — 14	Waveform
	# 4	E29	17	10 — 13	1 — 14	Waveform
Idle air control solenoid valve	OPEN end	E29	12	—	1 — 13	Waveform
	CLOSE end	E29	11	—	13 — 1	Waveform
Fuel pump relay control		E29	84	ON: 0.5, or less OFF: 10 — 13	0.5, or less	—
A/C relay control		E29	85	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
Radiator fan relay 1 control		E29	77	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	—
			88			
Radiator fan relay 2 control		E29	61	ON: 0.5, or less OFF: 10 — 13	ON: 0.5, or less OFF: 13 — 14	With A/C vehicles only
Self-shutoff control		E29	86	10 — 13	13 — 14	—
Malfunction indicator lamp		E29	31	—	—	Light "ON": 1, or less Light "OFF": 10 — 14
Engine speed output		E29	33	—	0 — 13, or more	Waveform
Torque control signal		E29	49	5	5	—
Torque control cut signal		E29	36	8	8	—
Mass air flow signal for AT		E29	35	0 — 0.3	0.8 — 1.2	—
Purge control solenoid valve		E29	59	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Atmospheric pressure sensor		E29	23	3.9 — 4.1	2.0 — 2.3	—
Pressure sources switching solenoid valve		E29	58	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
EGR solenoid valve		E29	60	ON: 1, or less OFF: 10 — 13	ON: 1, or less OFF: 13 — 14	—
Front oxygen sensor heater signal		E29	44	0 — 1.0	0 — 1.0	—
Rear oxygen sensor heater signal		E29	43	0 — 1.0	0 — 1.0	—
AT diagnosis input signal		E29	48	Less than 1 ↔ More than 4	Less than 1 ↔ More than 4	Waveform
GND (sensors)		E29	25	0	0	—
GND (injectors)		E29	71	0	0	—
			72			
GND (ignition system)		E29	69	0	0	—

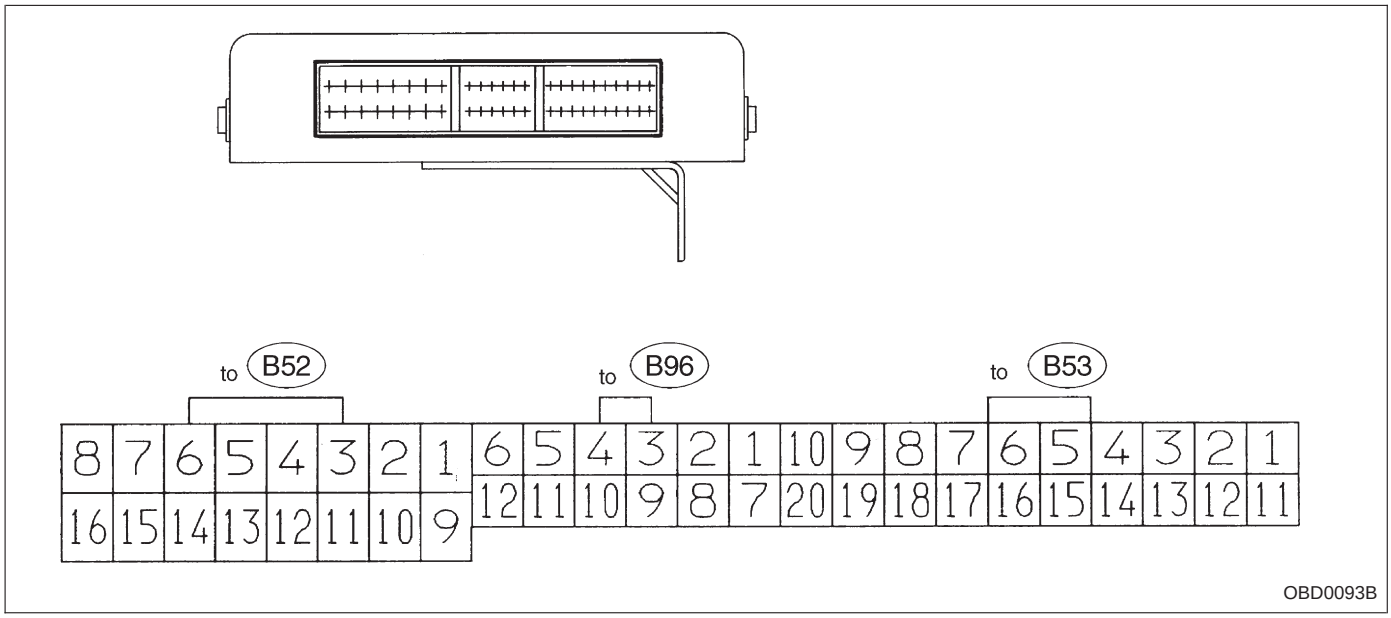
Content	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON (Engine OFF)	Engine ON (Idling)	
GND (power supply)	E29	95	0	0	—
		96			
GND (control systems)	E29	45	0	0	—
		46			
GND (oxygen sensor heater)	E29	70	0	0	—

2. ENGINE CONDITION DATA

Content	Specified data
Mass air flow	1.9 — 3.6 (g/sec): Idling
	7.0 — 14.8 (g/sec): 2,500 rpm racing
Engine load	1.9 — 3.6 (%): Idling
	7.0 — 14.8 (%): 2,500 rpm racing

Measuring condition:
- 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

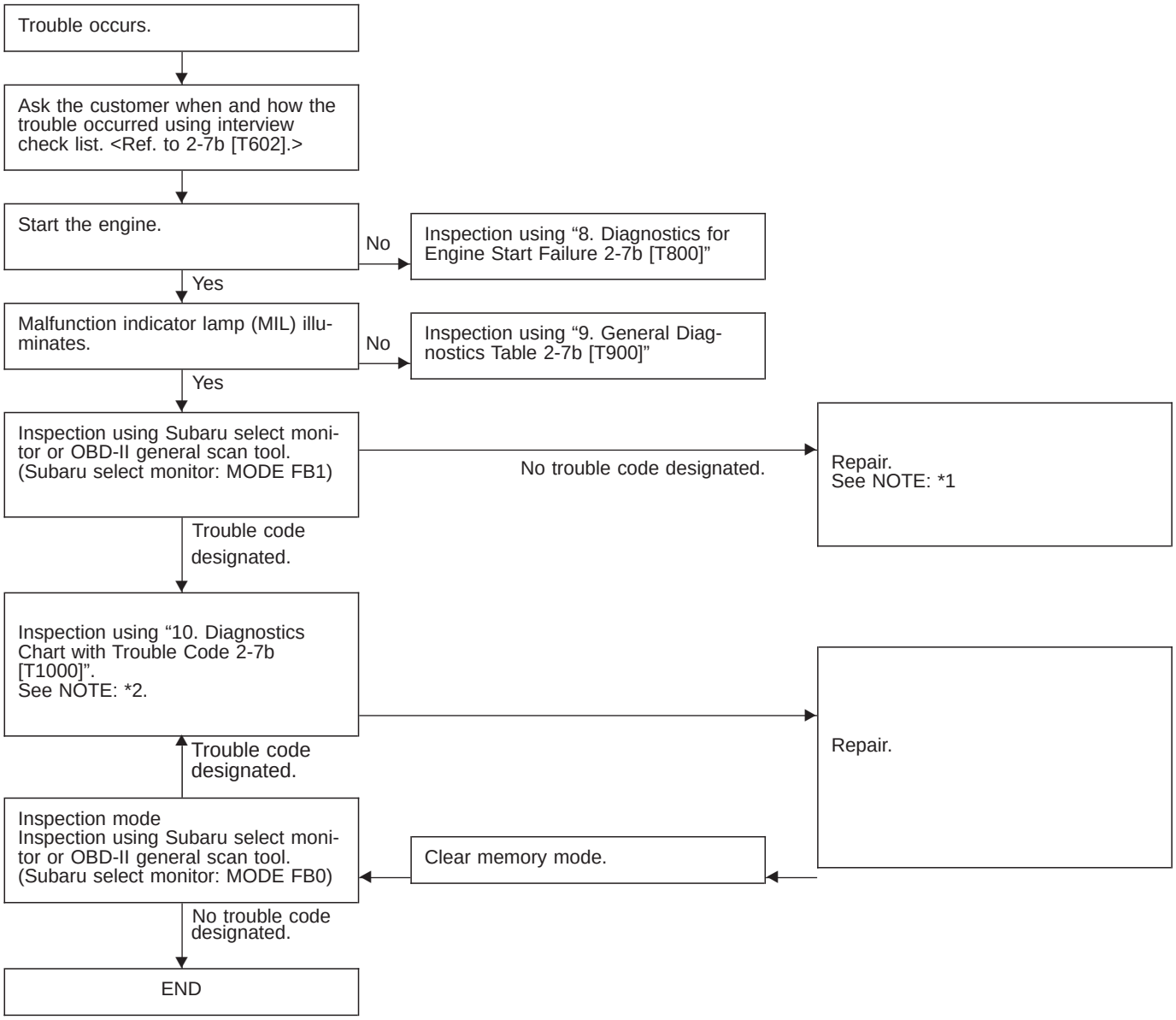


Check with ignition switch ON.

Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B53	14	Ignition switch OFF	10 — 16
Ignition power supply		B96	6	Ignition switch ON (with engine OFF)	10 — 16
		B52	1		
Inhibitor switch	“P” range switch	B53	9	Selector lever in “P” range	Less than 1
				Selector lever in any other than “P” range	More than 8
	“N” range switch	B53	8	Selector lever in “N” range	Less than 1
				Selector lever in any other than “N” range	More than 8
	“R” range switch	B53	10	Selector lever in “R” range	Less than 1
				Selector lever in any other than “R” range	More than 6
	“D” range switch	B96	1	Selector lever in “D” range	Less than 1
				Selector lever in any other than “D” range	More than 6
	“3” range switch	B96	2	Selector lever in “3” range	Less than 1
				Selector lever in any other than “3” range	More than 6
	“2” range switch	B96	3	Selector lever in “2” range	Less than 1
				Selector lever in any other than “2” range	More than 6
	“1” range switch	B96	4	Selector lever in “1” range	Less than 1
				Selector lever in any other than “1” range	More than 6
Brake switch		B53	7	Brake pedal depressed	More than 10.5
				Brake pedal released	Less than 1
ABS signal		B53	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5
AT diagnostics signal		B52	12	Ignition switch ON (with engine OFF)	Less than 1
				Ignition switch ON (with engine ON)	More than 10
Diagnosis switch		B53	6	Diagnosis connector connected.	Less than 1
				Diagnosis connector disconnected.	More than 6

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B96	8	Throttle fully closed.	0.3 — 0.7	—
			Throttle fully open.	4.3 — 4.9	
Throttle position sensor power supply	B53	19	Ignition switch ON (with engine OFF)	4.8 — 5.3	—
ATF temperature sensor	B96	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	B96	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B53	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1 ↔ More than 4	—
Engine speed signal	B96	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B53	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	B52	16	Ignition switch ON	4 — 6	—
Torque control cut signal	B53	16	Ignition switch ON	6 — 9	—
Mass air flow signal	B96	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B52	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B52	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B52	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	B52	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	B52	7	Throttle fully closed (with engine OFF) after warm-up.	5 — 14	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 0.5	
Duty solenoid B	B52	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C	B52	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	B96	7	—	0	Less than 1
Sensor ground line 2	B53	20	—	0	Less than 1
System ground line	B53	1	—	0	Less than 1
Power system ground line	B52	10	—	0	Less than 1
FWD switch	B53	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	
Data link signal (Subaru select monitor)	B53	12	—	—	—
		13	—	—	
AT diagnosis signal	B53	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. <Ref. to “7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL), 2-7b [T700]”.>
*2: Carry out the basic check, only when trouble code about automatic transmission is shown on display. <Ref. to 2-7b [T601].>

1. BASIC CHECK ITEMS FOR AT

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

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

NOTE:
As for the method, refer to 3-2 [W200], [W300].

2. CHECK LIST FOR INTERVIEW

Check the following items when problem occurred.

Customer's name		Engine no.	
Date of sale		Fuel brand	
Date of repair		Odometer reading	km miles
Vin no.			
Weather	☐ Fine ☐ Cloudy ☐ Rainy ☐ Snowy ☐ Various/Other___		
Outdoor Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold (approx.___ °F/ ___ °C)		
Place	☐ Highway ☐ Suburbs ☐ Inner City ☐ Uphill ☐ Downhill ☐ Rough road ☐ Other_____		
Engine Temp.	☐ Cold ☐ Warming-up ☐ After warming-up ☐ Any temp. ☐ Other		
Engine speed	0 2,000 4,000 6,000 8,000 rpm		
Driving conditions	☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH) Vehicle speed 0 10 20 30 40 50 60 MPH		
Headlight	☐ ON / ☐ OFF		
Blower	☐ ON / ☐ OFF		
A/C compressor	☐ ON / ☐ OFF		
Cooling fan	☐ ON / ☐ OFF		
Front wiper	☐ ON / ☐ OFF		
Rear wiper	☐ ON / ☐ OFF		
Rear defogger	☐ ON / ☐ OFF		
Radio	☐ ON / ☐ OFF		
CD/Cassette	☐ ON / ☐ OFF		
Car phone	☐ ON / ☐ 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. ☐ Yes / ☐ No
☐ ① Low fuel warning light
☐ ② Charge indicator light
☐ ③ AT diagnostics indicator light
☐ ④ ABS warning light
☐ ⑤ Engine oil pressure warning light
b) Fuel level
● Lack of gasoline: ☐ Yes / ☐ No
● Indicator position of fuel gauge:
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: ☐ Yes / ☐ No
● What:
d) Intentional connecting or disconnecting of hoses: ☐ Yes / ☐ No
● What:
e) Installing of parts other than genuine parts ☐ Yes / ☐ No
● What:
● Where:
f) Occurrence of noise ☐ Yes / ☐ No
● From where:
● What kind:
g) Occurrence of smell ☐ Yes / ☐ No
● From where:
● What kind:
h) Intrusion of water into engine compartment or passenger compartment ☐ Yes / ☐ No
i) Troubles occurred
☐ ① Engine does not start.
☐ ② Engine stalls during idling.
☐ ③ Engine stalls while driving.
☐ ④ Engine speed decreases.
☐ ⑤ Engine speed does not decrease.
☐ ⑥ Rough idling
☐ ⑦ Poor acceleration
☐ ⑧ Back fire
☐ ⑨ After fire
☐ ⑩ No shift
☐ ⑪ Excessive shift shock

NOTE: Use copies of this page for interviewing customers.

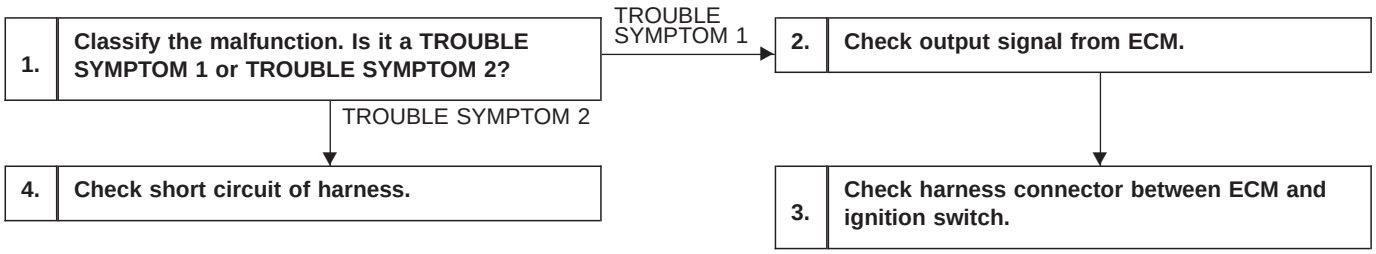
7. Diagnostics for CHECK ENGINE Malfunction Indicator Lamp (MIL)

DIAGNOSIS:

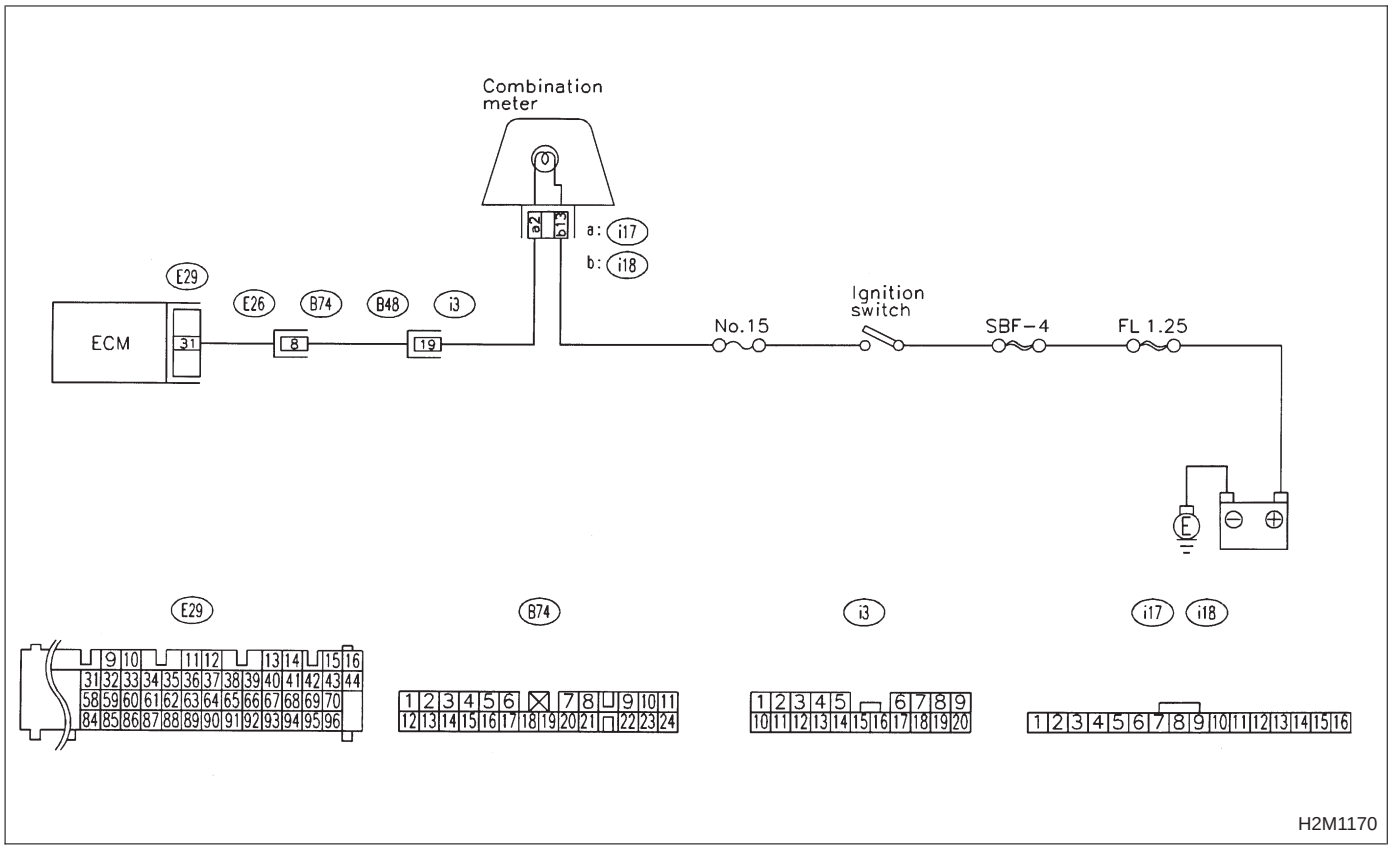
● The CHECK ENGINE malfunction indicator lamp (MIL) circuit is in short or open.

TROUBLE SYMPTOM:

● When ignition switch is turned to ON (engine OFF), MIL does not illuminate.....TROUBLE SYMPTOM 1
● Although MIL illuminates, trouble code is not shown on Subaru select monitor or the OBD-II general scan tool display.....TROUBLE SYMPTOM 2

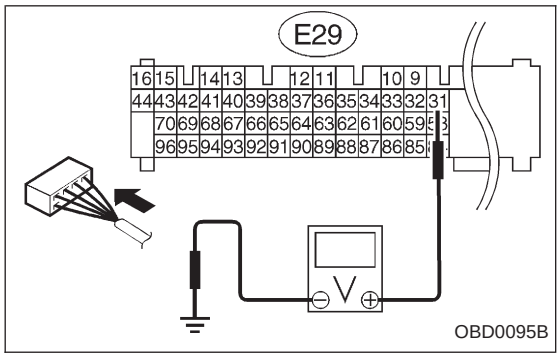


WIRING DIAGRAM:



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

If the malfunction shows TROUBLE SYMPTOM 1, go to step 2.
If the malfunction shows TROUBLE SYMPTOM 2, go to step 4.



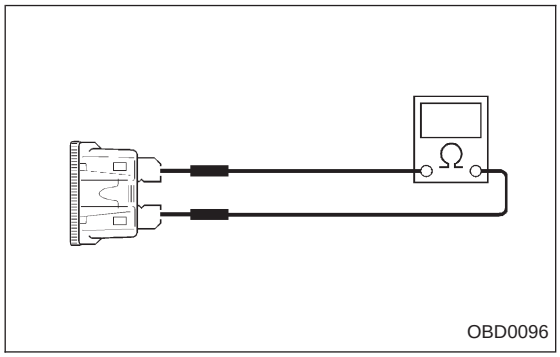
2	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and body.

CHECK : ***Connector & terminal (E29) No. 31 — Body/1 V, or less***

YES : Go to step 3.

NO : ● If MIL comes on when shaking or pulling ECM connector and harness, repair ECM connector.
● Check that ECM connector is correctly connected. If the MIL does not come on even when ECM connector is correctly connected, replace the ECM.



3	CHECK HARNESS CONNECTOR BETWEEN ECM AND IGNITION SWITCH.

Check the following and repair if necessary.
① Check that fuse (No. 15) is not blown out.
NOTE:
If replaced fuse (No. 15) blows out easily, check the harness for short circuit between fuse (No. 15) and combination meter.
② Check that harness from fuse to combination meter is not open.
③ Check that the MIL wiring is not open.
④ Check that harness from combination meter to the ECM is not open.
⑤ Check that the connectors (B48) and (B74) are correctly connected as the wiring diagram shows.

4	CHECK SHORT CIRCUIT OF HARNESS.

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

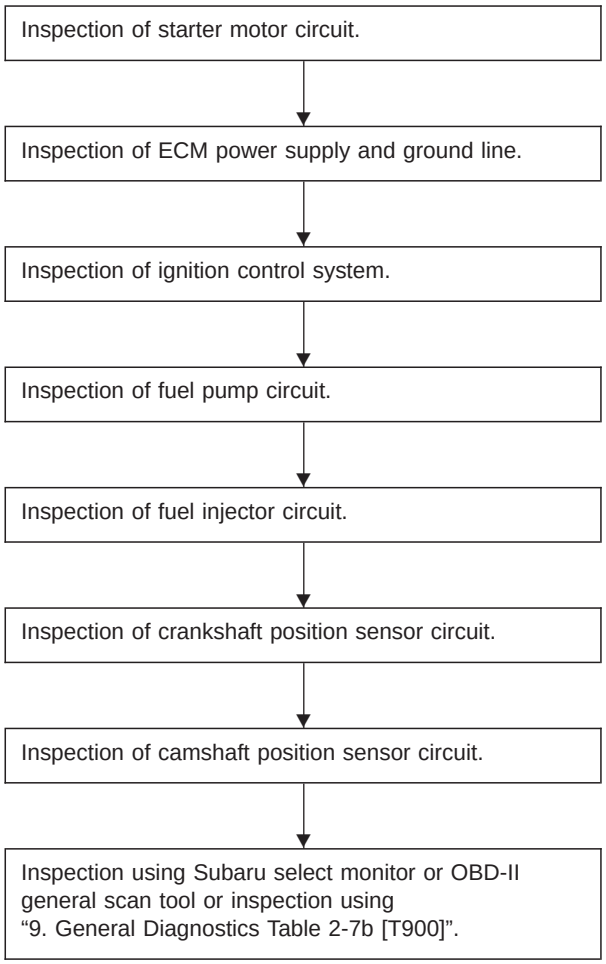
CHECK ***: Does the MIL comes on?***

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

NO : Replace ECM.

8. Diagnostics for Engine Starting Failure

A: BASIC DIAGNOSTICS CHART

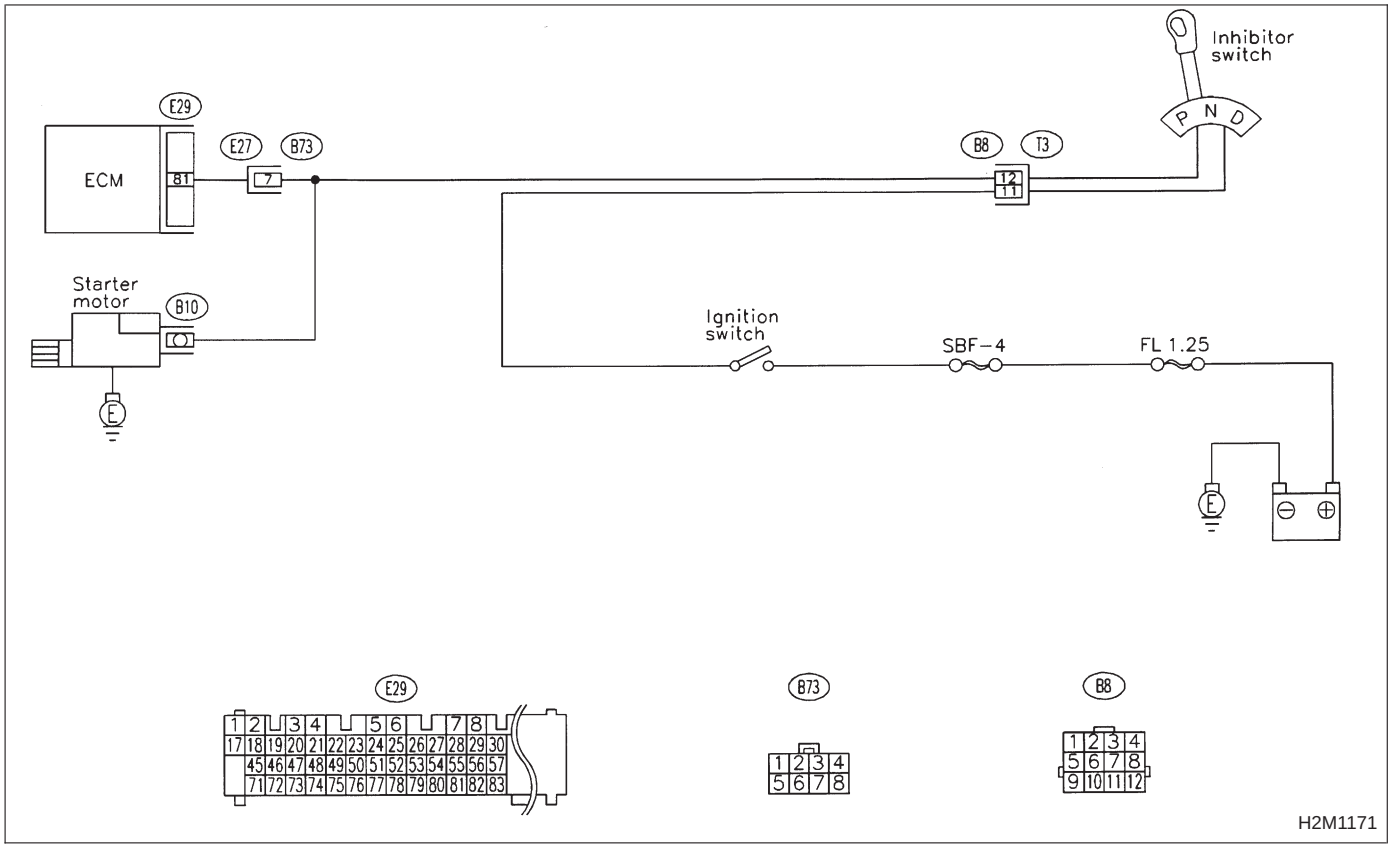


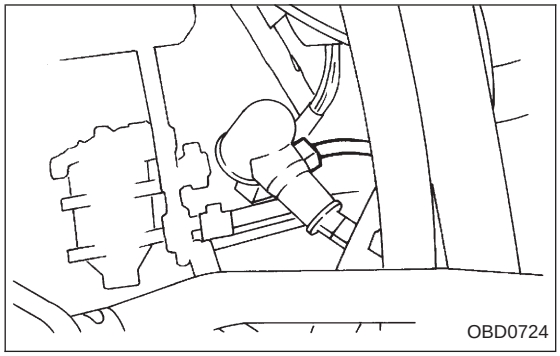
B: STARTER MOTOR CIRCUIT

1.	Check input signal for starter motor.
2.	Check ground circuit of starter motor.
3.	Check harness connector between battery and ignition switch.
4.	Check inhibitor switch.

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

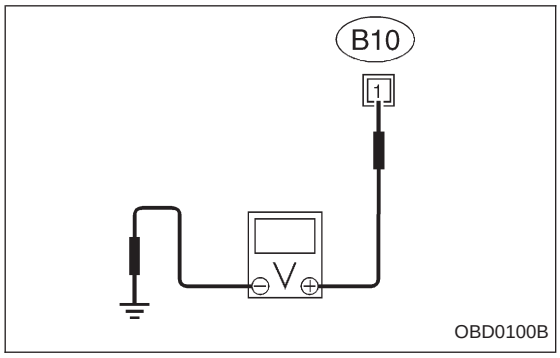
WIRING DIAGRAM:




OBD0724

1	CHECK INPUT SIGNAL FOR STARTER MOTOR.

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



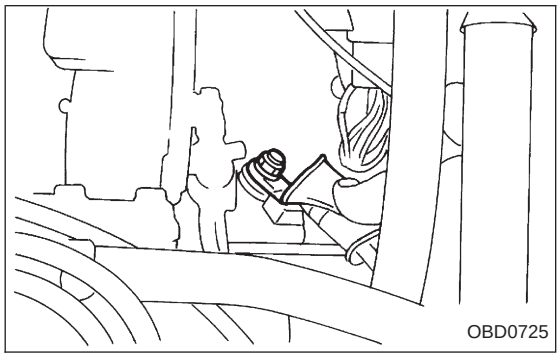
OBD0100B

4) Measure power supply voltage between starter motor connector terminal and body.

CHECK ***: Connector & terminal (B10) No. 1 — Body/10 V, or more***

NOTE:
Place the selector lever in the “P” or “N” position.

YES : Go to step 2.
NO : Go to step 3.


OBD0725

2	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 body.

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

YES : Check starter motor. <Ref. to 6-1 [T100].>
NO : Repair open circuit of ground cable.

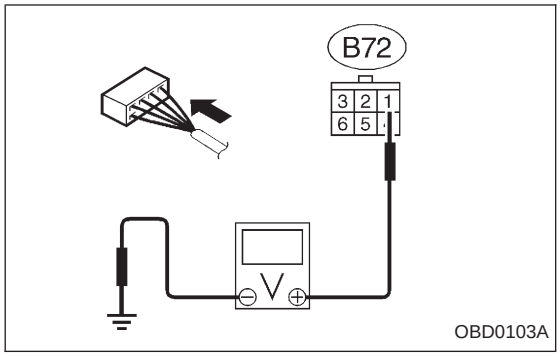
3	CHECK HARNESS CONNECTOR BETWEEN BATTERY AND IGNITION SWITCH.

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

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

NO : Replace SBF No. 4.
YES : Go to next step.

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

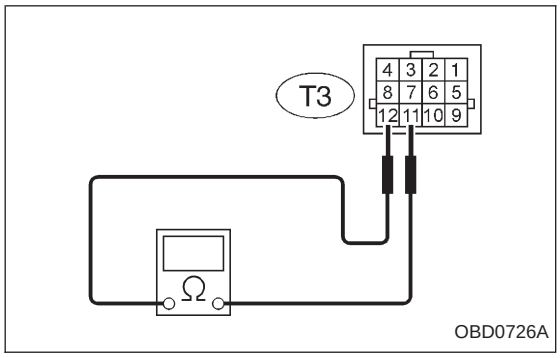


6) Measure power supply voltage between ignition switch connector and body.

CHECK : ***Connector & terminal***
(B72) No. 1 — Body/10 V, or more

YES : Go to step 4.

NO : Repair harness between ignition switch connector and body.



4	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***
(T3) No. 11 — No. 12/1 Ω, or less

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

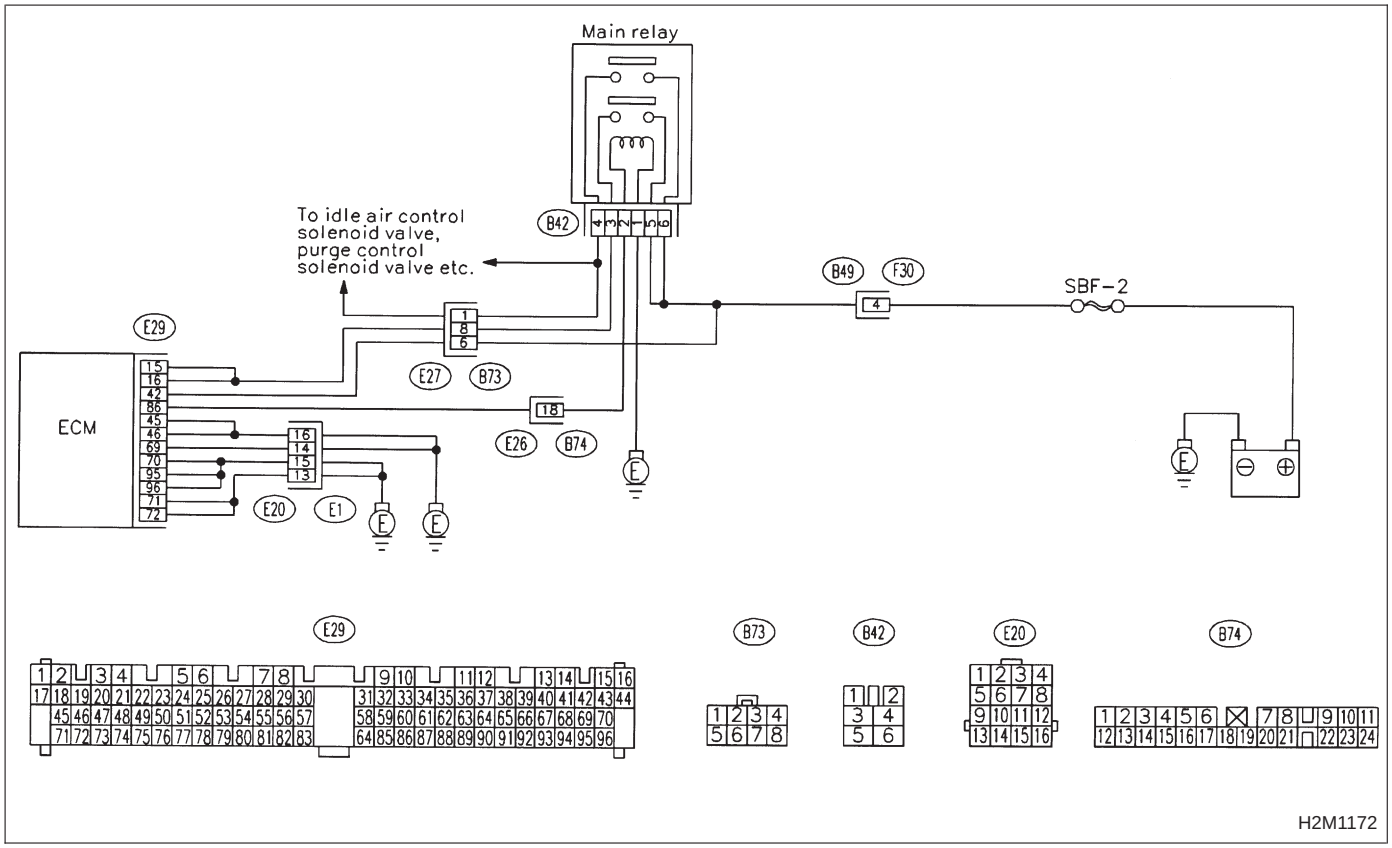
NO : Repair or replace inhibitor switch.

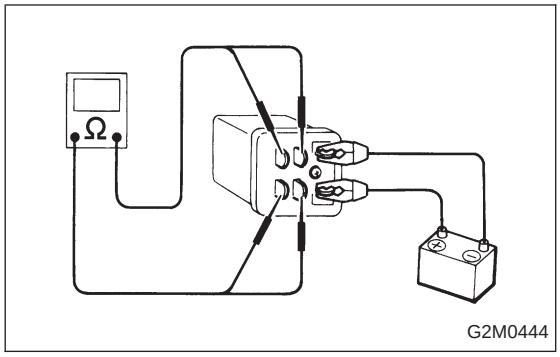
C: CONTROL MODULE POWER SUPPLY AND GROUND LINE

1.	Check main relay.
2.	Check power supply circuit of ECM.
3.	Check ground circuit of ECM.

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

WIRING DIAGRAM:



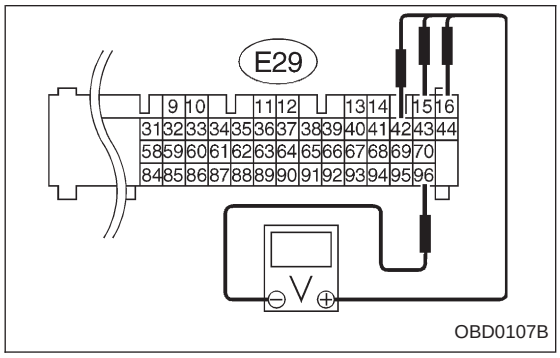


1	CHECK MAIN RELAY.

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. 5/10 Ω, or less
No. 4 — No. 6/10 Ω, or less

YES : Go to step 2.
NO : Replace main relay.

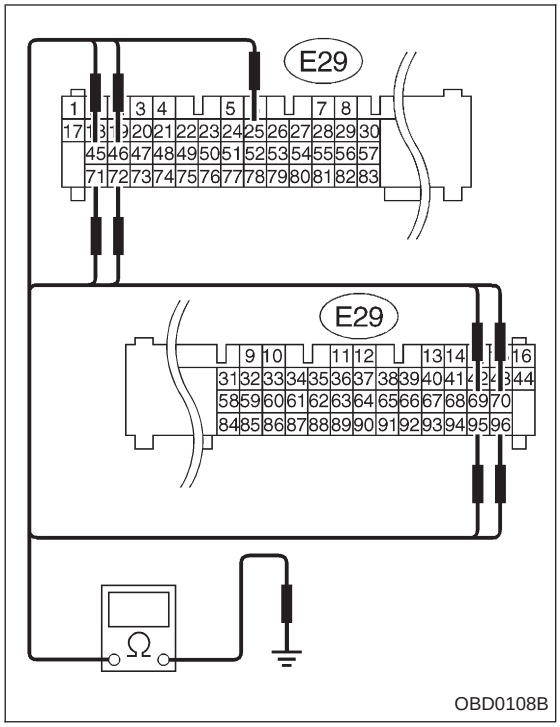


2	CHECK POWER SUPPLY CIRCUIT OF ECM.

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***
(E29) No. 15 — No. 96/10 V, or more
(E29) No. 16 — No. 96/10 V, or more
(E29) No. 42 — No. 96/10 V, or more

YES : Go to step 3.
NO : Repair harness of power supply circuit.



3	CHECK GROUND CIRCUIT OF ECM.

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

CHECK ***: Connector & terminal***
(E29) No. 25 — Body/5 Ω, or less
(E29) No. 45 — Body/5 Ω, or less
(E29) No. 46 — Body/5 Ω, or less
(E29) No. 69 — Body/5 Ω, or less
(E29) No. 70 — Body/5 Ω, or less
(E29) No. 71 — Body/5 Ω, or less
(E29) No. 72 — Body/5 Ω, or less
(E29) No. 95 — Body/5 Ω, or less
(E29) No. 96 — Body/5 Ω, or less

YES : Check ignition control system. <Ref. to 2-7b [T8D0].>

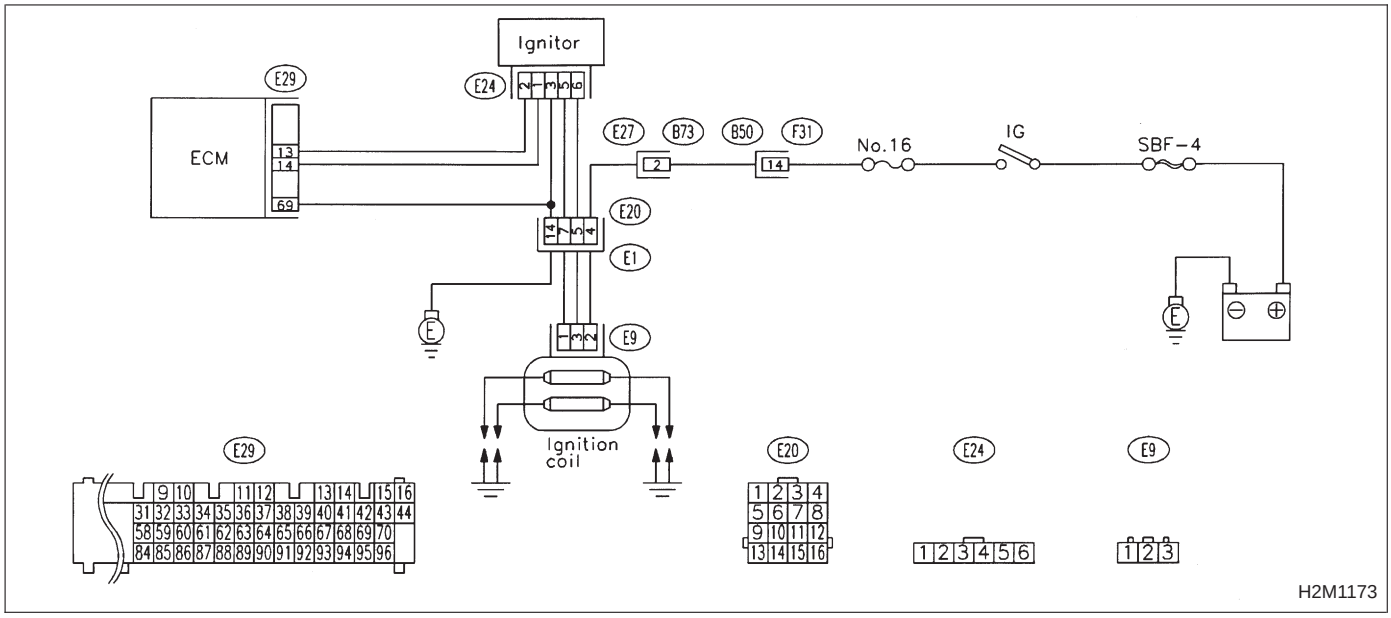
NO : Repair harness between ECM connector and body.

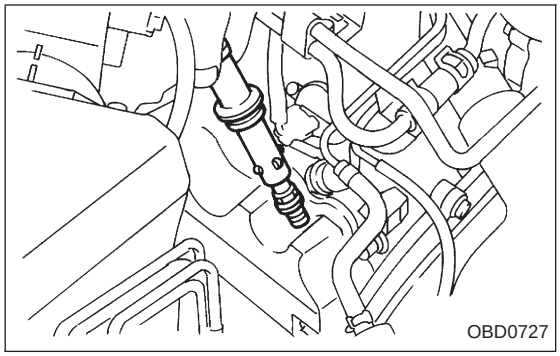
D: IGNITION CONTROL SYSTEM

1.	Check ignition system for sparks.
2.	Check power supply circuit for ignition coil.
3.	Check ignition coil.
4.	Check harness connector between ignitor and ignition coil.
5.	Check input signal for ignitor.
6.	Check harness connector of ignitor ground circuit.
7.	Check harness connector between ECM and ignitor.

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

WIRING DIAGRAM:





1	CHECK IGNITION SYSTEM FOR SPARKS.

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

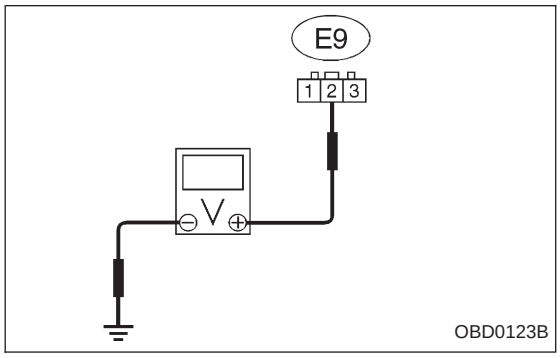
CAUTION:
Do not remove spark plug from engine.

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

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

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

NO : Go to step 2.



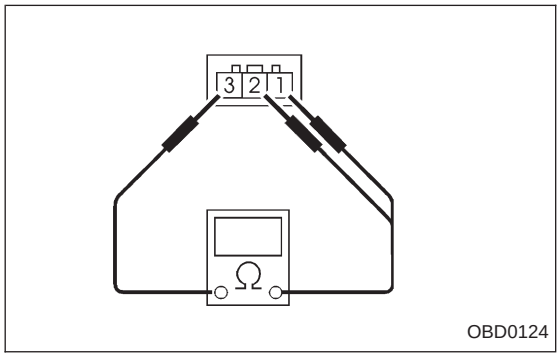
2	CHECK POWER SUPPLY CIRCUIT FOR IGNITION COIL.

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

CHECK ***: Connector & terminal***
(E9) No. 2 — Body/10 V, or more

YES : Go to step 3.

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



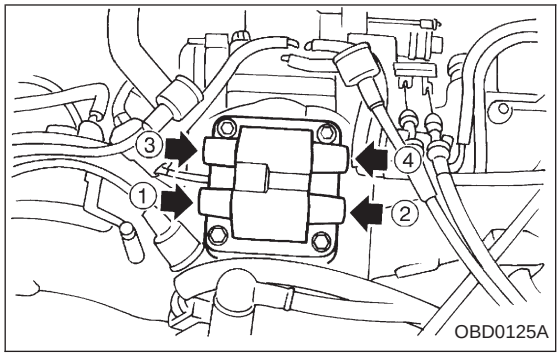
3	CHECK IGNITION COIL.

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

CHECK ***: Terminals***
No. 2 — No. 1/0.7±0.3 Ω
No. 2 — No. 3/0.7±0.3 Ω

NO : Replace ignition coil.

YES : Go to next step.

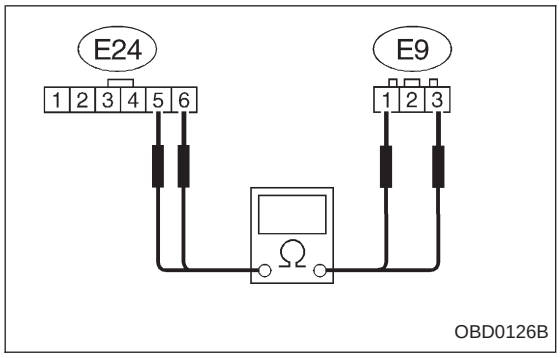


2) Measure resistance between spark plug cord contact portions to check secondary coil.

CHECK ***: Connector & terminal***
#1 — #2 /21±3 kΩ
#3 — #4 /21±3 kΩ

YES : Go to step 4.

NO : Replace ignition coil.



4	CHECK HARNESS CONNECTOR BETWEEN IGNITOR AND IGNITION COIL.

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

CHECK ***: Connector & terminal***
(E24) No. 5 — (E9) No. 1/1 Ω, or less
(E24) No. 6 — (E9) No. 3/1 Ω, or less

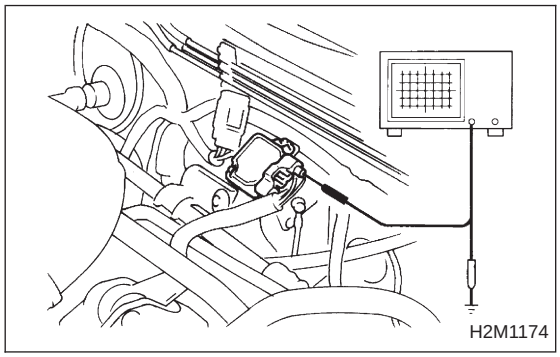
YES : Go to step 5.

NO : Go to next CHECK .

CHECK ***: Is there poor contact in coupling connector (B20)?***

YES : Repair poor contact in coupling connector.

NO : Repair harness between ignition coil and ignitor connector.



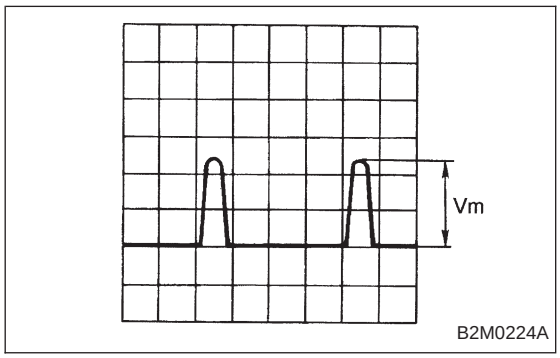
5	CHECK INPUT SIGNAL FOR IGNITOR.

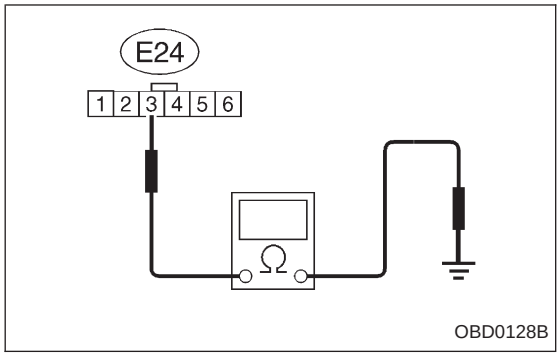
Check if voltage varies synchronously with engine speed when cranking, while monitoring voltage between ignitor connector and body.

CHECK ***: Connector & terminal:***
(E24) No. 1 — Body/10 V, or more
(E24) No. 2 — Body/10 V, or more

YES : Go to step 6.

NO : Replace ignitor.





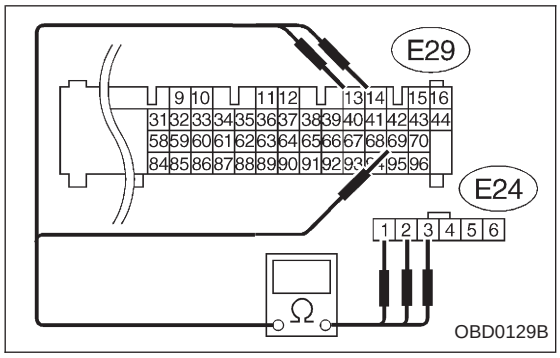
6	CHECK HARNESS CONNECTOR OF IGNITOR GROUND CIRCUIT.

1) Turn ignition switch to OFF.
2) Measure resistance between ignitor and body.

CHECK : ***Connector & terminal***
(E24) No. 3 — Body/5 Ω, or less

YES : Go to step 7.

NO : Repair harness between ignitor connector and body.



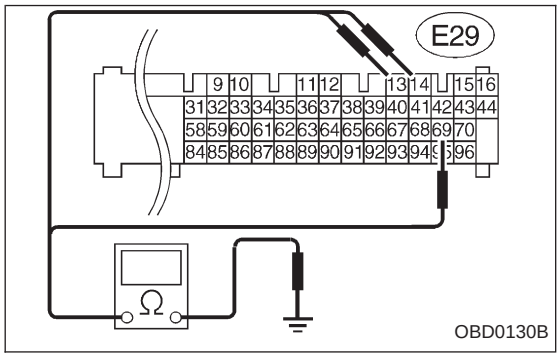
7	CHECK HARNESS CONNECTOR BETWEEN ECM AND IGNITOR.

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

CHECK : ***Connector & terminal***
(E29) No. 14 — (E24) No. 1/1 Ω, or less
(E29) No. 13 — (E24) No. 2/1 Ω, or less
(E29) No. 69 — (E24) No. 3/1 Ω, or less

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

YES : Go to next step.



3) Measure resistance of harness connector between ECM and body.

CHECK : ***Connector & terminal***
(E29) No. 13 — Body/1 MΩ, or more
(E29) No. 14 — Body/1 MΩ, or more

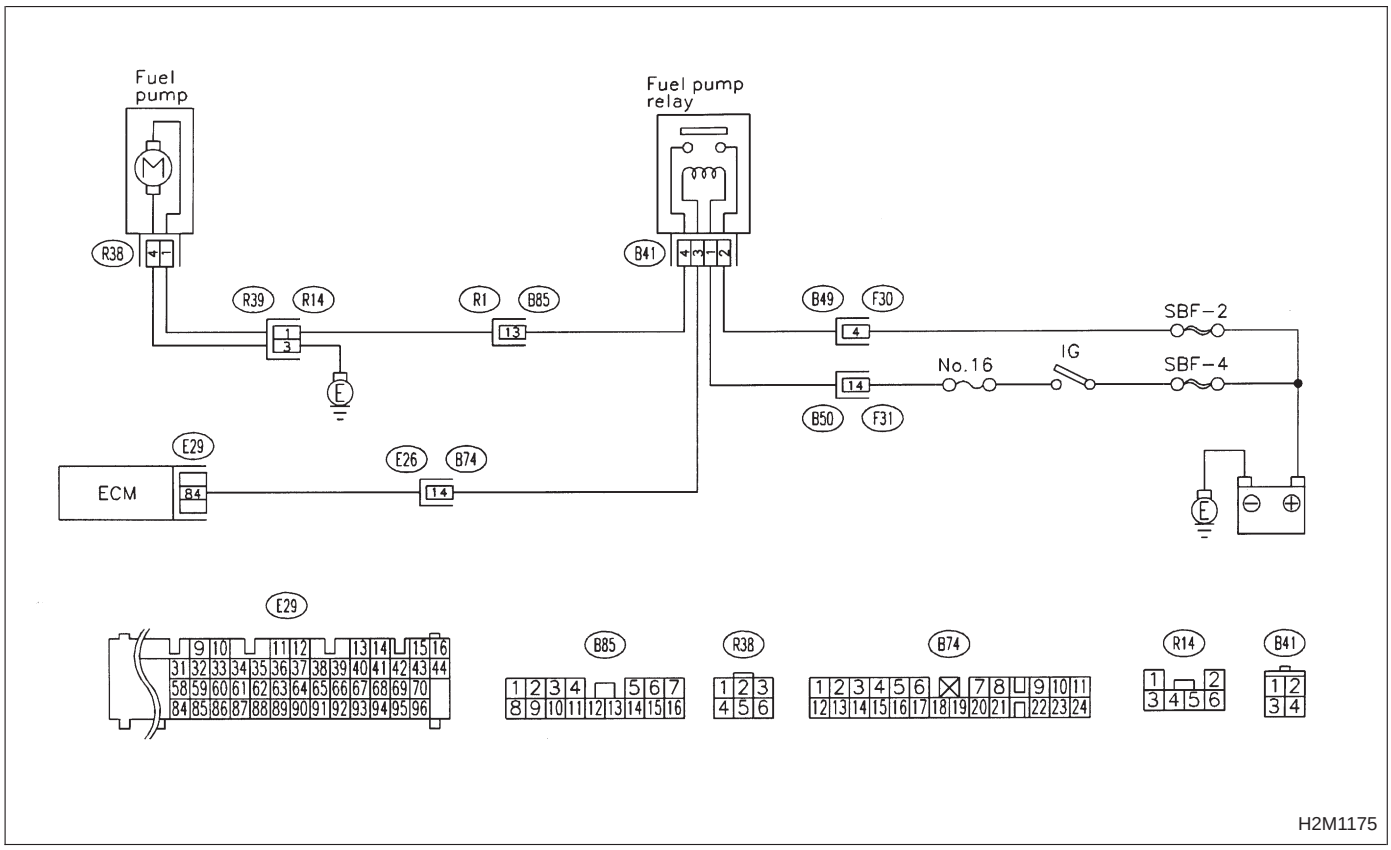
NO : Repair short circuit of harness between ECM and ignitor.

YES : Confirm good connection in ECM connector.

E: FUEL PUMP CIRCUIT

1. Check operating sound of fuel pump.
2. Check ground circuit of fuel pump.
3. Check power supply to fuel pump.
4. Check harness connector between fuel pump and fuel pump relay.
5. Check fuel pump relay.
6. Check harness connector between ECM and fuel pump relay.

WIRING DIAGRAM:



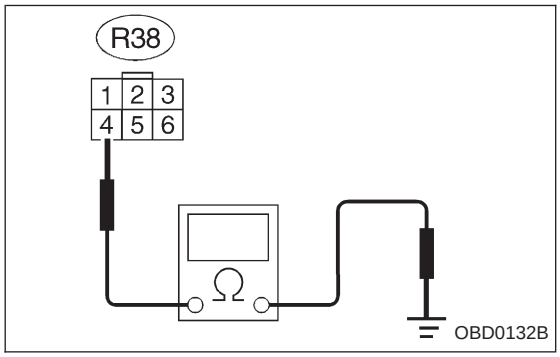
1	CHECK OPERATING SOUND OF FUEL PUMP.

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 [T10Q0].>

NO : Go to step 2.



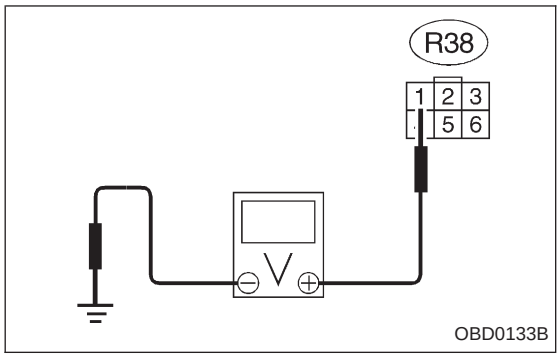
2	CHECK GROUND CIRCUIT OF FUEL PUMP.

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

CHECK ***: Connector & terminal***
(R38) No. 4 — Body/5 Ω, or less

YES : Go to step 3.

NO : Repair open circuit of fuel pump ground circuit.



3	CHECK POWER SUPPLY TO FUEL PUMP.

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

CHECK ***: Connector & terminal***
(R38) No. 1 — Body/10 V, or more

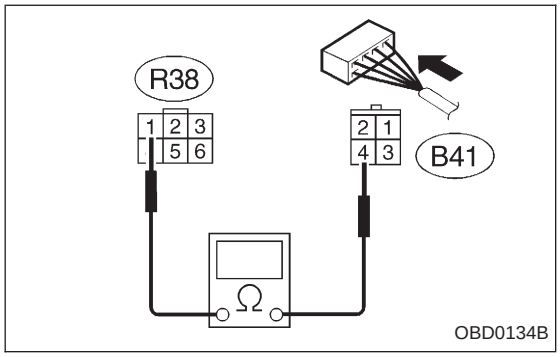
YES : Go to next CHECK .

NO : Go to step 4.

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

YES : Repair poor contact in fuel pump connector.

NO : Replace fuel pump.



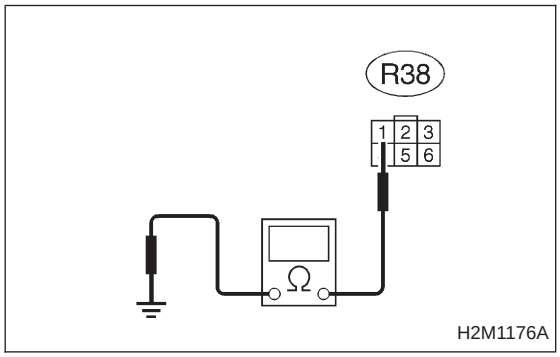
4	CHECK HARNESS CONNECTOR BETWEEN FUEL PUMP AND FUEL PUMP RELAY.

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

CHECK ***: Connector & terminal***
(R38) No. 1 — (B41) No. 4/1 Ω, or less

YES : Go to next CHECK .

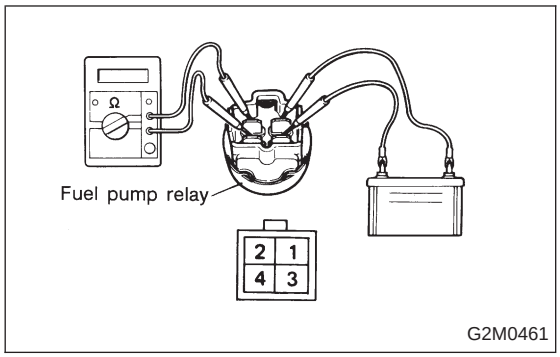
NO : Repair open circuit of harness between fuel pump and fuel pump relay connector.



CHECK : ***Connector & terminal***
(R38) No. 1 — Body/1 MΩ, or more

YES : Go to step 5.

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



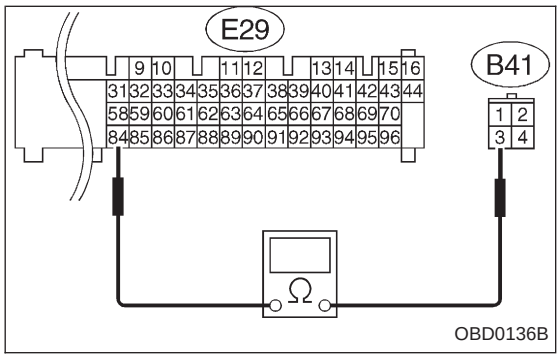
5	CHECK FUEL PUMP RELAY.

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

CHECK : ***Terminals***
No. 2 — No. 4/10 Ω, or less

YES : Go to step 6.

NO : Replace fuel pump relay.



6	CHECK HARNESS CONNECTOR BETWEEN ECM AND FUEL PUMP RELAY.

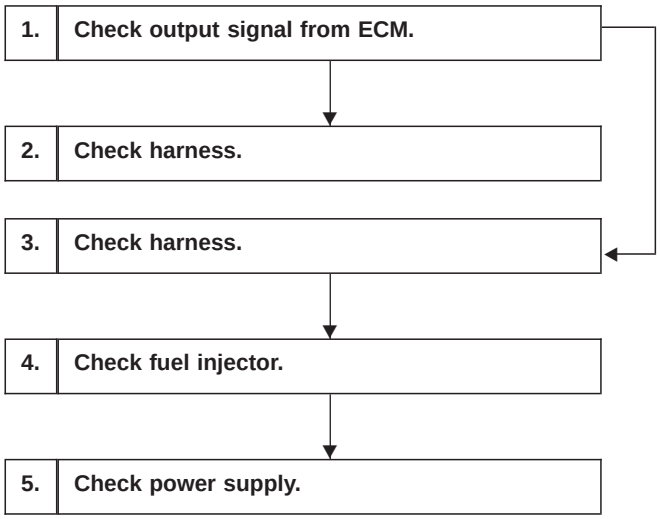
1) Disconnect connectors from ECM.
2) Measure resistance of harness connector between ECM and fuel pump relay.

CHECK : ***Connector & terminal***
(E29) No. 84 — (B41) No. 3/1 Ω, or less

NO : Confirm good connection in ECM connector.

YES : Repair open circuit of harness between ECM and fuel pump relay connector.

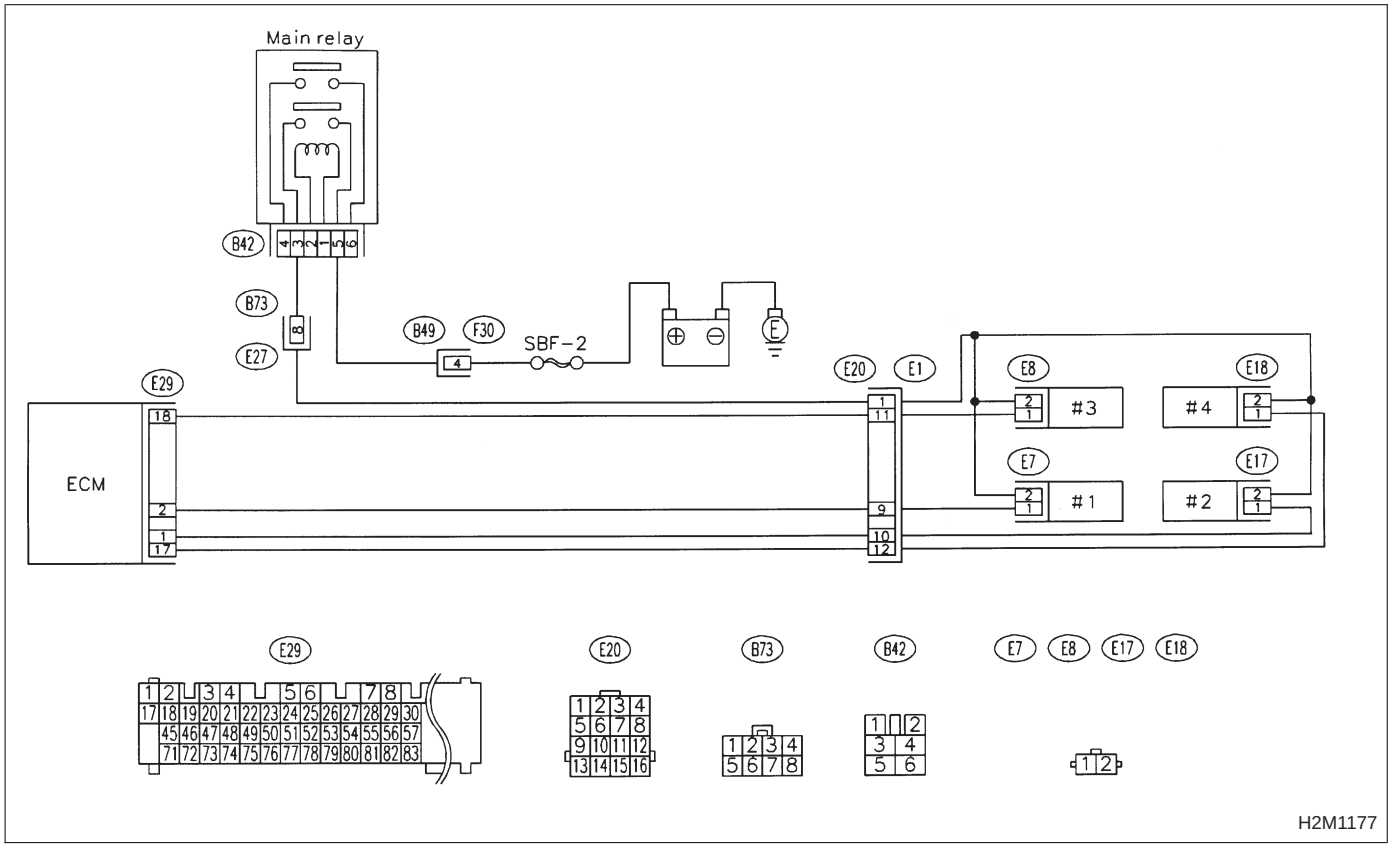
F: FUEL INJECTOR CIRCUIT



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].>

WIRING DIAGRAM:



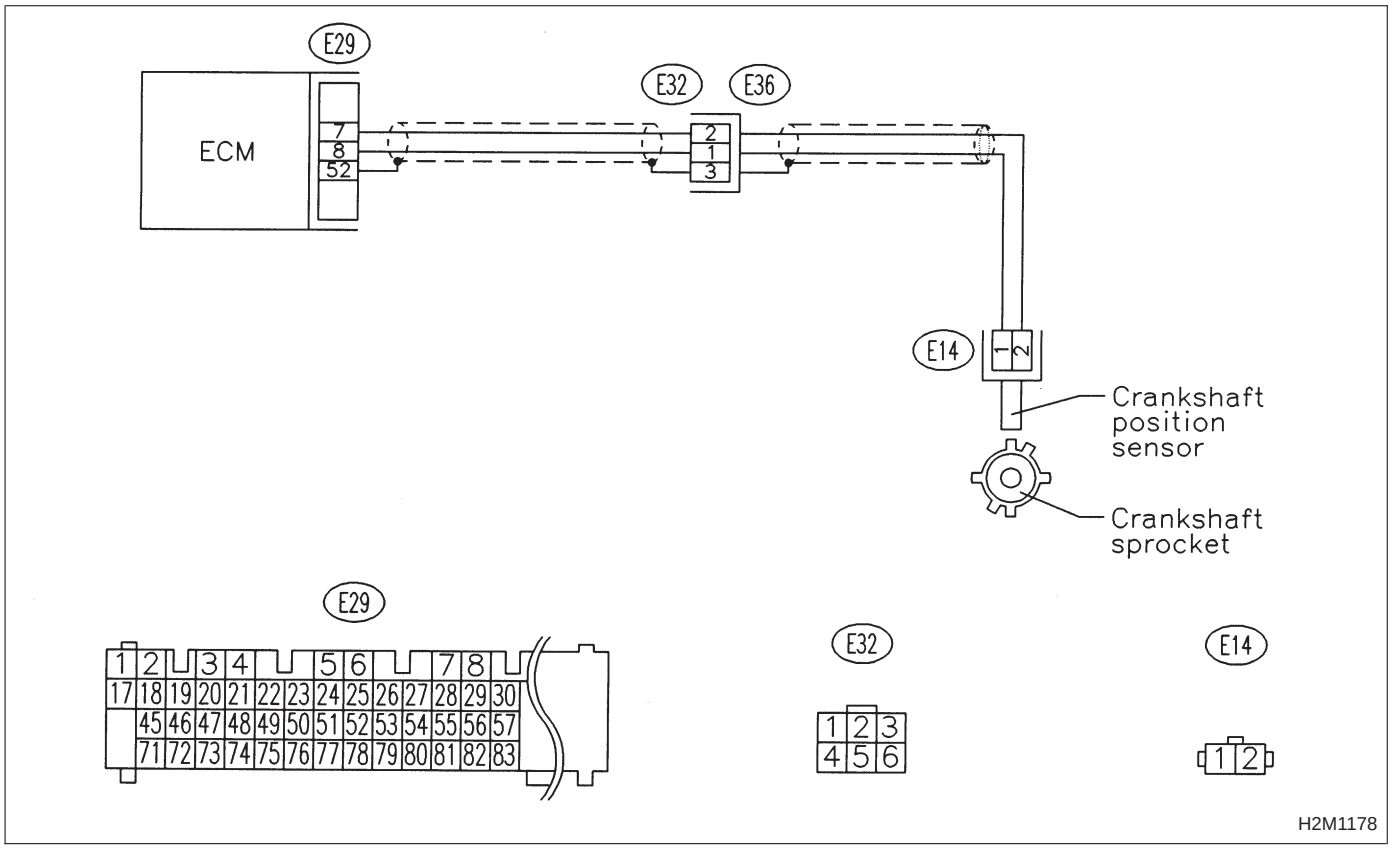
NOTE:
For the diagnostic procedure on fuel injector circuit, refer to 2-7b [T10Q0].

G: CRANKSHAFT POSITION SENSOR CIRCUIT

1.	Check harness.
2.	Check crankshaft position sensor.

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

WIRING DIAGRAM:



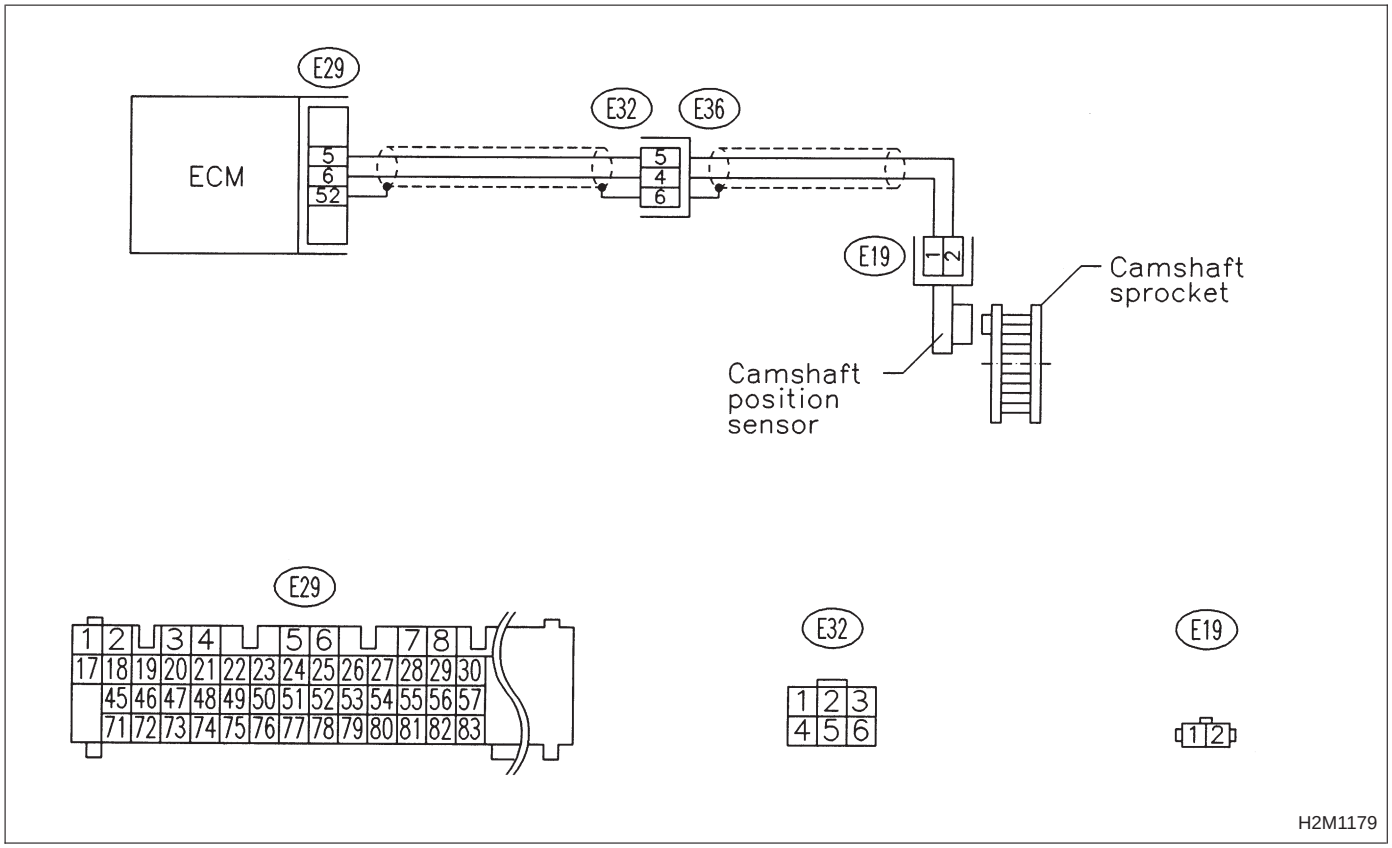
NOTE:
For the diagnostic procedure on crankshaft position sensor circuit, refer to 2-7b [T10Z0].

H: CAMSHAFT POSITION SENSOR CIRCUIT

1.	Check harness.
2.	Check camshaft position sensor.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on camshaft position sensor circuit, refer to 2-7b [T10A0].

9. General Diagnostics Table

1. FOR ENGINE

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

*1: The mark, △, indicates the symptom occurring only in cold temperatures.
*2: For items with the mark, □, ensure the secure installation of crankshaft position sensor and camshaft position sensor. Replacement is not necessary.
*3: Check fuel injector, fuel pressure regulator and fuel filter.
*4: Check igniter, ignition coil and spark plug.
NOTE:
Malfunction of parts other than the above is also possible. Refer to 1. Engine Trouble in General [T100] in Repair Section 2-3 of the Service Manual.

2. FOR AT

Problem parts / Symptom	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Hold switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Starter does not rotate when select lever is in "P" or "N."; starter rotates when select lever is "R", "D", "3" or "2."	○				○	○		○																					
Abnormal noise when select lever is in "P" or "N."																○												○	
Hissing noise occurs during standing starts.																○													
Noise occurs while driving in "D_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.																						○							
Vehicle moves when select lever is in "N."																													○
Shock occurs when select lever is moved from "N" to "D."		○									○											○							
Excessive time lag occurs when select lever is moved from "N" to "D."																						○							○
Shock occurs when select lever is moved from "N" to "R."		○											○									○							
Excessive time lag occurs when select lever is moved from "N" to "R."																						○							
Vehicle does not start in any shift range (engine revving up).																○						○							
Vehicle does not start in any shift range (engine stall).																													
Vehicle does not start in "R" range only (engine revving up).					○	○																○							
Vehicle does not start in "R" range only (engine stall).																													○
Vehicle does not start in "D" or "3" range (engine revving up).																													○
Vehicle does not start in "D", "3" or "2" range (engine revving up).																													○
Vehicle does not start in "D", "3" or "2" range (engine stall).																													
Vehicle starts in "R" range only (engine revving up).																						○							
Acceleration during standing starts is poor (high stall rpm).																						○							○
Acceleration during standing starts is poor (low stall rpm).																													
Acceleration is poor when select lever is in "D", "3" or "2" range (normal stall rpm).		○																				○							
Acceleration is poor when select lever is in "R" (normal stall rpm).																						○							
No shift occurs from 1st to 2nd gear.		○	○	○					○										○	○		○							
No shift occurs from 2nd to 3rd gear.		○																				○							
No shift occurs from 3rd to 4th gear.		○												○	○						○	○							
No "kick-down" shifts occur.		○							○																				
Engine brake is not effected when select lever is in "3" range.	○	○							○													○							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Overrunning clutch	Drive pinion	Crown gear	Axle shaft	Differential gear	Final gear	Seal pipe	Oil pump	High clutch	Band brake	Low & reverse clutch	Reverse clutch	One-way clutch (1-2)	One-way clutch (3-4)	Double oil seal	Input shaft	Output shaft	Planetary gear	Reduction gear	Drive plate	Torque converter one-way clutch	Lock-up facing	Lock-up damper	ATF deterioration	ATF level too high or too low	Differential gear oil level too high or too low	Engine performance	Engine speed signal	Parking brake mechanism	Problem parts
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	Symptom
																													Starter does not rotate when select lever is in “P” or “N.”; starter rotates when select lever is “R”, “D”, “3” or “2.”
							○												○					○					Abnormal noise when select lever is in “P” or “N.”
																								○					Hissing noise occurs during standing starts.
					○												○	○							○				Noise occurs while driving in “D_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.
																													Vehicle moves when select lever is in “N.”
																							○						Shock occurs when select lever is moved from “N” to “D.”
																													Excessive time lag occurs when select lever is moved from “N” to “D.”
																							○						Shock occurs when select lever is moved from “N” to “R.”
										○	○																		Excessive time lag occurs when select lever is moved from “N” to “R.”
	○	○	○	○			○								○	○	○		○					○					Vehicle does not start in any shift range (engine revving up).
																												○	Vehicle does not start in any shift range (engine stall).
										○	○																		Vehicle does not start in “R” range only (engine revving up).
									○								○												Vehicle does not start in “R” range only (engine stall).
												○																	Vehicle does not start in “D” or “3” range (engine revving up).
																													Vehicle does not start in “D”, “3” or “2” range (engine revving up).
											○																		Vehicle does not start in “D”, “3” or “2” range (engine stall).
																													Vehicle starts in “R” range only (engine revving up).
											○														○				Acceleration during standing starts is poor (high stall rpm).
							○													○						○			Acceleration during standing starts is poor (low stall rpm).
								○	○								○												Acceleration is poor when select lever is in “D”, “3” or “2” range (normal stall rpm).
○								○	○								○												Acceleration is poor when select lever is in “R” (normal stall rpm).
									○																				No shift occurs from 1st to 2nd gear.
								○					○																No shift occurs from 2nd to 3rd gear.
									○																				No shift occurs from 3rd to 4th gear.
																													No “kick-down” shifts occur.
																													Engine brake is not effected when select lever is in “3” range.
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	Inhibitor switch	Control module	Vehicle speed sensor 1	Vehicle speed sensor 2	Select cable	Select lever	FWD switch	Starter motor and harness	Throttle position sensor	Hold switch	Accumulator ("N" — "D")	Accumulator (2A)	Accumulator (4A)	Accumulator (3R)	ATF temperature sensor	Strainer	Duty solenoid A	Duty solenoid B	Shift solenoid 1	Shift solenoid 2	Shift solenoid 3	Control valve	Detent spring	Manual plate	Transfer clutch	Transfer valve	Transfer pipe	Duty solenoid C	Forward clutch
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Engine brake is not effected when select lever is in "3" or "2" range.																													
Engine brake is not effected when select lever is in "1" range.																						○							
Shift characteristics are erroneous.	○	○	○	○					○													○							
No lock-up occurs.		○							○						○							○							
Vehicle cannot be set in "D" range power mode.		○							○																				
"D" range power mode cannot be released.		○							○						○														
Parking brake is not effected.					○	○																							
Shift lever cannot be moved or is hard to move from "P" range.					○	○																							
Select lever is hard to move.					○	○																	○	○					
Select lever is too light to move (unreasonable resistance).																							○	○					
ATF spurts out.																													
Differential oil spurts out.																													
Differential oil level changes excessively.																													
Odor is produced from oil supply pipe.																									○				○
Shock occurs when select lever is moved from "1" to "2" range.		○							○			○			○		○					○							
Slippage occurs when select lever is moved from "1" to "2" range.		○							○			○			○		○					○							
Shock occurs when select lever is moved from "2" to "3" range.		○							○					○	○		○					○							
Slippage occurs when select lever is moved from "2" to "3" range.		○							○					○	○		○					○							
Shock occurs when select lever is moved from "3" to "4" range.		○							○				○		○		○					○							
Slippage occurs when select lever is moved from "3" to "4" range.		○							○				○		○		○					○							
Shock occurs when select lever is moved from "3" to "2" range.		○							○						○		○					○							
Shock occurs when select lever is moved from "D" to "1" range.		○							○						○		○					○							
Shock occurs when select lever is moved from "2" to "1" range.		○							○						○		○					○							
Shock occurs when accelerator pedal is released at medium speeds.		○							○						○		○					○							
Vibration occurs during straight-forward operation.		○																○											
Select lever slips out of position during acceleration or while driving on rough terrain.					○	○																	○	○					
Vibration occurs during turns (tight corner "braking" phenomenon).		○	○	○					○	○					○										○	○		○	
Front wheel slippage occurs during standing starts.		○		○			○		○	○					○							○			○	○	○	○	
Vehicle is not set in FWD mode.		○					○																		○	○		○	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

Overrunning clutch	Drive pinion	Crown gear	Axle shaft	Differential gear	Final gear	Seal pipe	Oil pump	High clutch	Band brake	Low & reverse clutch	Reverse clutch	One-way clutch (1-2)	One-way clutch (3-4)	Double oil seal	Input shaft	Output shaft	Planetary gear	Reduction gear	Drive plate	Torque converter one-way clutch	Lock-up facing	Lock-up damper	ATF deterioration	ATF level too high or too low	Differential gear oil level too high or too low	Engine performance	Engine speed signal	Parking brake mechanism	Problem parts
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	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.
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	

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	95
P0101	QA — R	Mass air flow sensor circuit range/performance problem	100
P0105	P — S	Pressure sensor circuit malfunction	101
P0106	P — R	Pressure sensor circuit range/performance problem	107
P0115	TW	Engine coolant temperature sensor circuit malfunction	111
P0120	THV	Throttle position sensor circuit malfunction	115
P0121	TH — R	Throttle position sensor circuit range/performance problem	121
P0125	TW — CL	Insufficient coolant temperature for closed loop fuel control	122
P0130	FO2 — V	Front oxygen sensor circuit malfunction	123
P0133	FO2 — R	Front oxygen sensor circuit slow response	127
P0135	FO2H	Front oxygen sensor heater circuit malfunction	129
P0136	RO2 — V	Rear oxygen sensor circuit malfunction	134
P0139	RO2 — R	Rear oxygen sensor circuit slow response	138
P0141	RO2H	Rear oxygen sensor heater circuit malfunction	140
P0170	FUEL	Fuel trim malfunction	145
P0201	INJ1	Fuel injector circuit malfunction - #1	150
P0202	INJ2	Fuel injector circuit malfunction - #2	
P0203	INJ3	Fuel injector circuit malfunction - #3	
P0204	INJ4	Fuel injector circuit malfunction - #4	
P0301	MIS — 1	Cylinder 1 misfire detected	155
P0302	MIS — 2	Cylinder 2 misfire detected	
P0303	MIS — 3	Cylinder 3 misfire detected	
P0304	MIS — 4	Cylinder 4 misfire detected	
P0325	KNOCK	Knock sensor circuit malfunction	161
P0335	CRANK	Crankshaft position sensor circuit malfunction	165
P0340	CAM	Camshaft position sensor circuit malfunction	168
P0400	EGR	Exhaust gas recirculation flow malfunction	171
P0403	EGRSOL	Exhaust gas recirculation circuit malfunction	176
P0420	CAT	Catalyst system efficiency below threshold	181
P0441	CPC — F	Evaporative emission control system incorrect purge flow	183
P0443	CPC	Evaporative emission control system purge control valve circuit malfunction	185
P0500	VSP	Vehicle speed sensor malfunction	189
P0505	ISC	Idle control system malfunction	191
P0506	ISC — L	Idle control system RPM lower than expected	196
P0507	ISC — H	Idle control system RPM higher than expected	198
P0600	—	Serial communication link malfunction	200
P0601	RAM	Internal control module memory check sum error	202
P0703	BRK	Brake switch input malfunction	204

DTC No.	Abbreviation (Subaru select monitor)	Item	Page
P0705	RNG	Transmission range sensor circuit malfunction	207
P0710	ATF	Transmission fluid temperature sensor circuit malfunction	212
P0720	ATVSP	Output speed sensor (vehicle speed sensor 1) circuit malfunction	214
P0725	ATNE	Engine speed input circuit malfunction	216
P0731	GR — 1	Gear 1 incorrect ratio	218
P0732	GR — 2	Gear 2 incorrect ratio	
P0733	GR — 3	Gear 3 incorrect ratio	
P0734	GR — 4	Gear 4 incorrect ratio	
P0740	LU — F	Torque converter clutch system malfunction	222
P0743	LU	Torque converter clutch system electrical	226
P0748	PL	Pressure control solenoid electrical	228
P0753	SFT1	Shift solenoid A electrical	230
P0758	SFT2	Shift solenoid B electrical	232
P0760	OVR — F	Shift solenoid C malfunction	234
P0763	OVR	Shift solenoid C electrical	238
P1100	ST — SW	Starter switch circuit malfunction	240
P1101	N — SW	Neutral position switch circuit malfunction	242
P1102	BR	Pressure sources switching solenoid valve circuit malfunction	246
P1103	TRQ	Engine torque control signal circuit malfunction	250
P1500	FAN — 1	Radiator fan relay 1 circuit malfunction	252
P1502	FAN — F	Radiator fan function problem	258
P1700	ATTH	Throttle position sensor circuit malfunction for automatic transmission	260
P1701	CRS	Cruise control set signal circuit malfunction for automatic transmission	262
P1702	ATDIAG	Automatic transmission diagnosis input signal circuit malfunction	265

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

DTC DETECTING CONDITION:

- Immediately at fault recognition

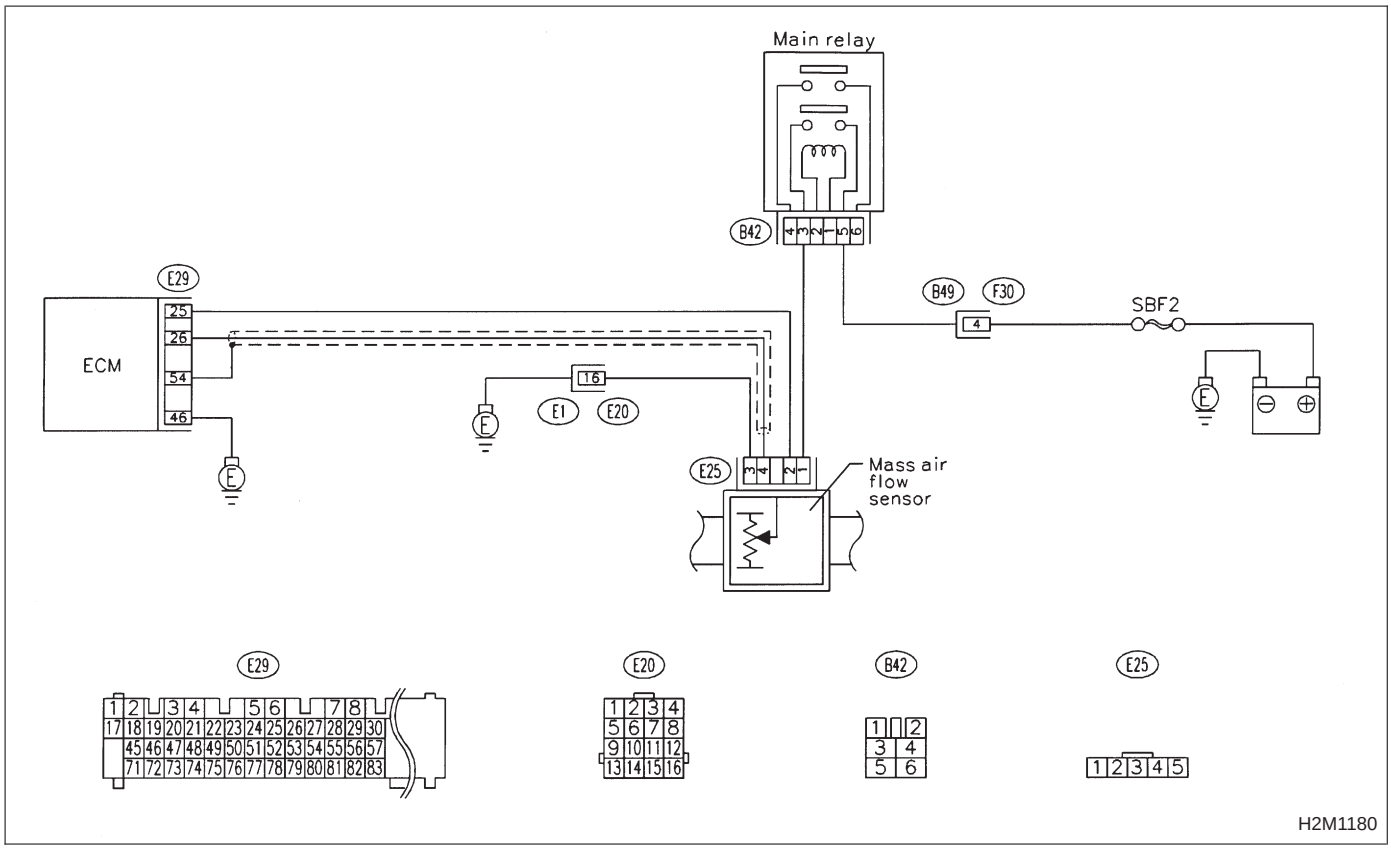
TROUBLE SYMPTOM:

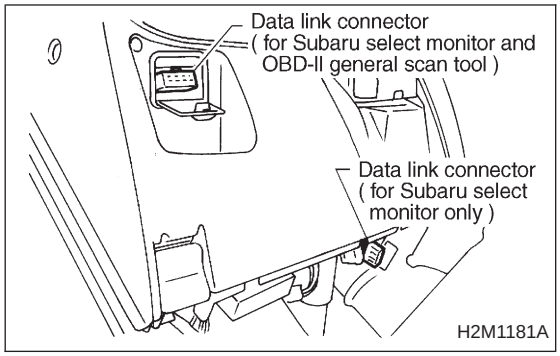
- Erroneous idling
- Engine stalls.
- Poor driving performance

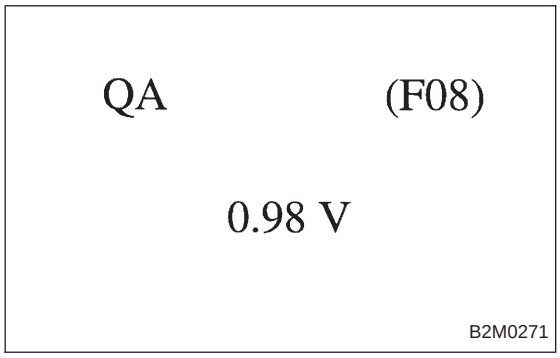
1.	Connect Subaru Select Monitor or the OBD-II general scan tool, and read data.
2.	Check input signal for ECM. (Using voltage meter and Subaru Select Monitor.)
3.	Check power supply to mass air flow sensor.
4.	Check harness connector between ECM and mass air flow sensor.
5.	Check harness.

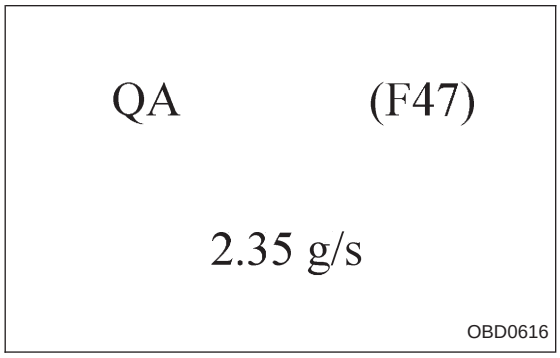
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:









1	**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: F08 or F47

● F08: Voltage input from mass air flow sensor is shown on display.
● F47: Mass air flow is shown on display.

CHECK
- ***F08: Is sensor output equal to or more than 0.3 V and equal to or less than 5.0 V?***
- ***F47: Is sensor output equal to or more than 1.3 g/sec and equal to or less than 250 g/sec?***

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 of the mass air flow sensor.

HINT: ① Open or short circuit between mass air flow sensor and ECM.
② Poor contact of connectors for mass air flow sensor or ECM.

NO : Go to next CHECK .

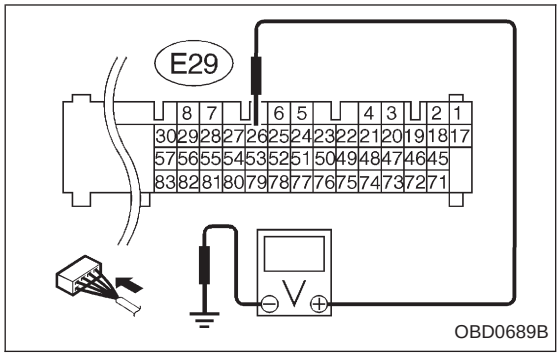
CHECK ***: Is the value less than 0.3 V (1.3 g/sec)?***

YES : Go to step 2.

NO : Go to step 5.

● OBD-II general scan tool

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



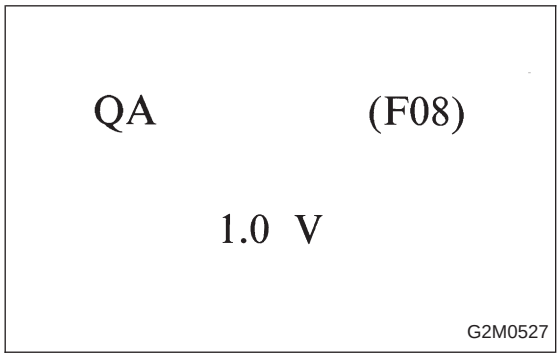
2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

Measure voltage between ECM and body while engine is idling.

CHECK ***: Connector & terminal (E29) No. 26 — Body/0.3 V, or less***

YES : Go to step 3.

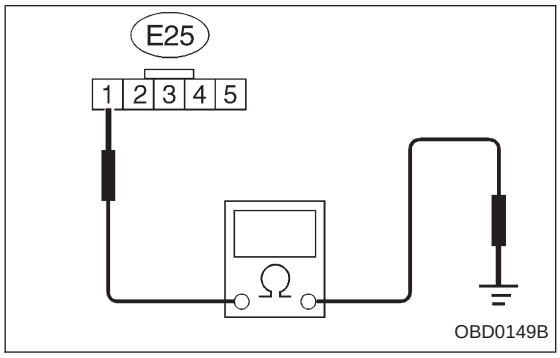
NO : Go to next CHECK .



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

YES : Repair poor contact in ECM connector.

NO : Replace ECM with a new one.



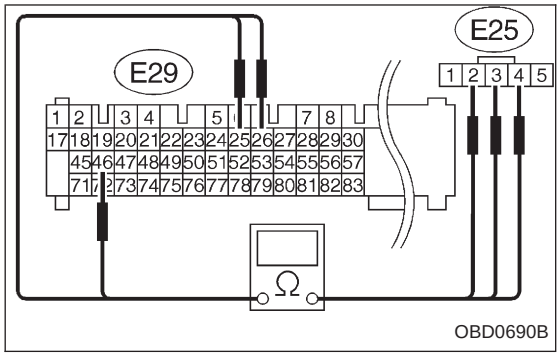
3	CHECK POWER SUPPLY TO MASS AIR FLOW SENSOR.

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 body.

CHECK ***: Connector & terminal (E25) No. 1 — Body/10 V, or more***

YES : Go to step 4.

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



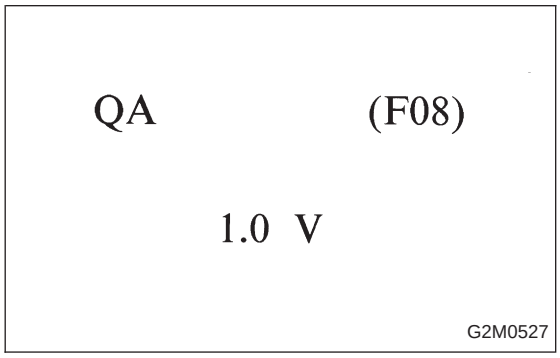
4	CHECK HARNESS CONNECTOR BETWEEN ECM AND MASS AIR FLOW SENSOR.

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

CHECK ***: Connector & terminal***
- ① ***(E29) No. 26 — (E25) No. 4/1 Ω, or less***
- ② ***(E29) No. 46 — (E25) No. 3/1 Ω, or less***
- ③ ***(E29) No. 25 — (E25) No. 2/1 Ω, or less***

YES : Replace mass air flow sensor with a new one.

NO : Repair poor contact and open circuit of harness between ECM and mass air flow sensor connector.



5	CHECK HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from mass air flow sensor.
3) Connect Subaru Select Monitor or OBD-II General Scan Tool to data link connector.
4) Turn ignition switch to ON.
5) Read data on Subaru select monitor or OBD-II general scan tool.

● Subaru Select Monitor
Designate mode using function key.

Function mode: F08

CHECK ***: Is the value more than 5 V?***

YES : Repair short circuit of harness between mass air flow sensor and ECM.

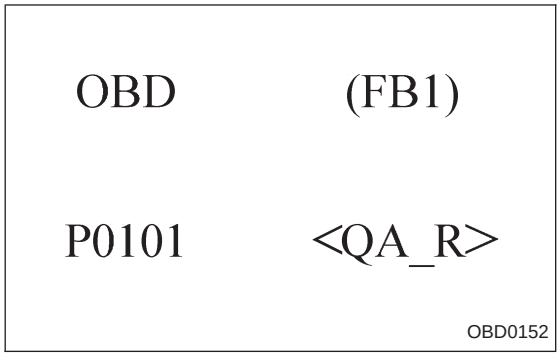
NO : Go to next CHECK .

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.



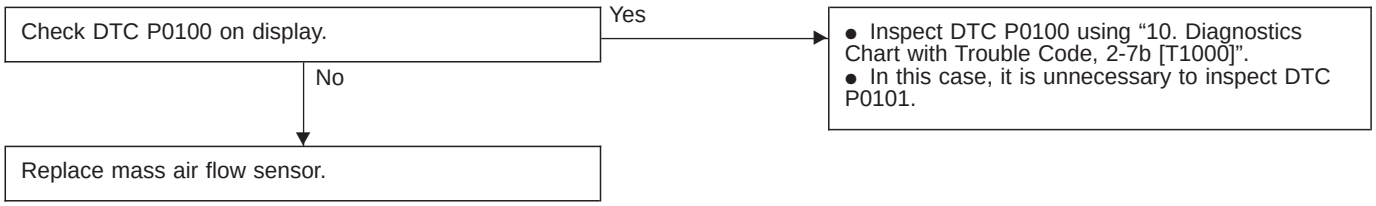
C: DTC P0101 — MASS AIR FLOW SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (QA – R) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

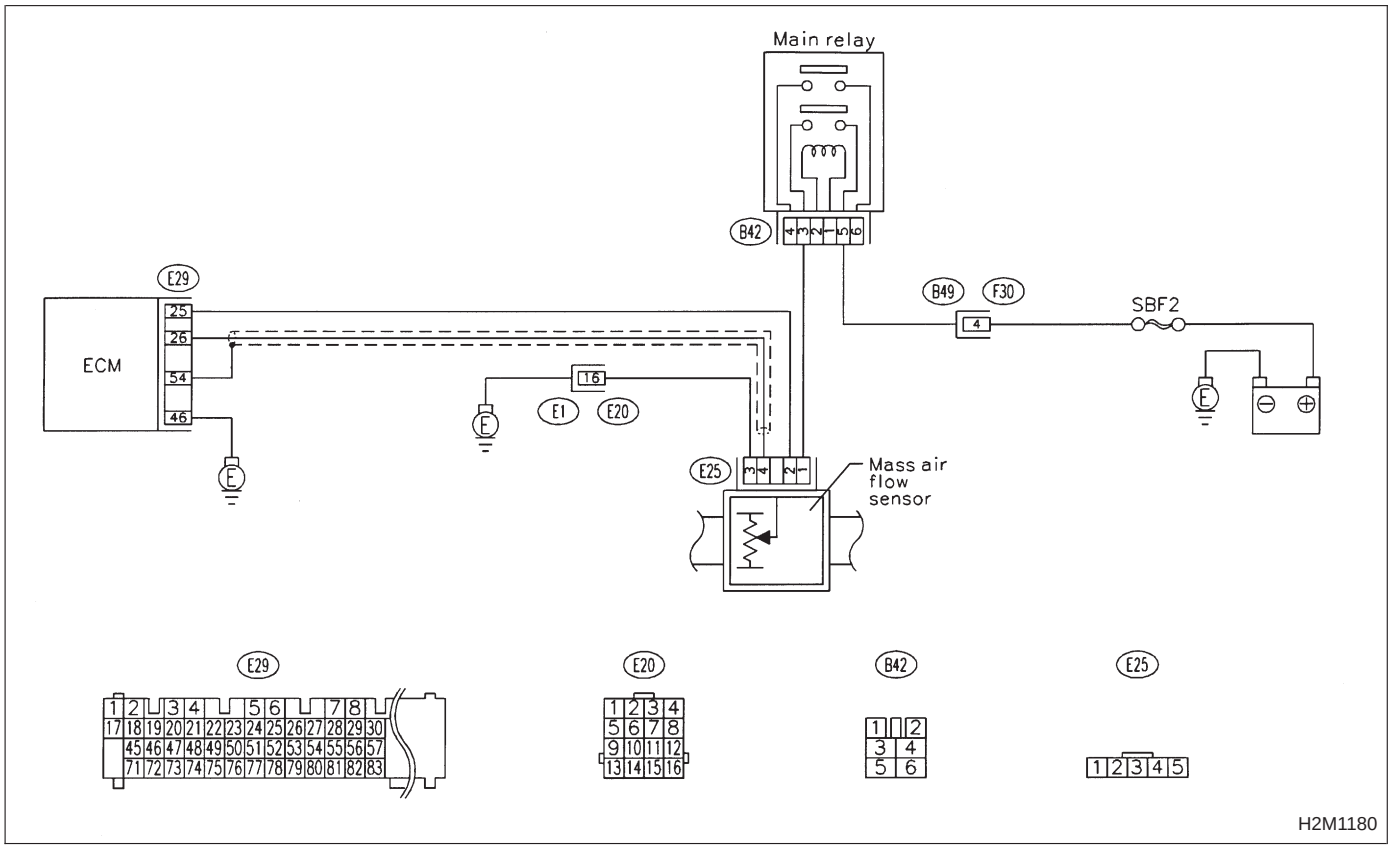
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance



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

WIRING DIAGRAM:



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

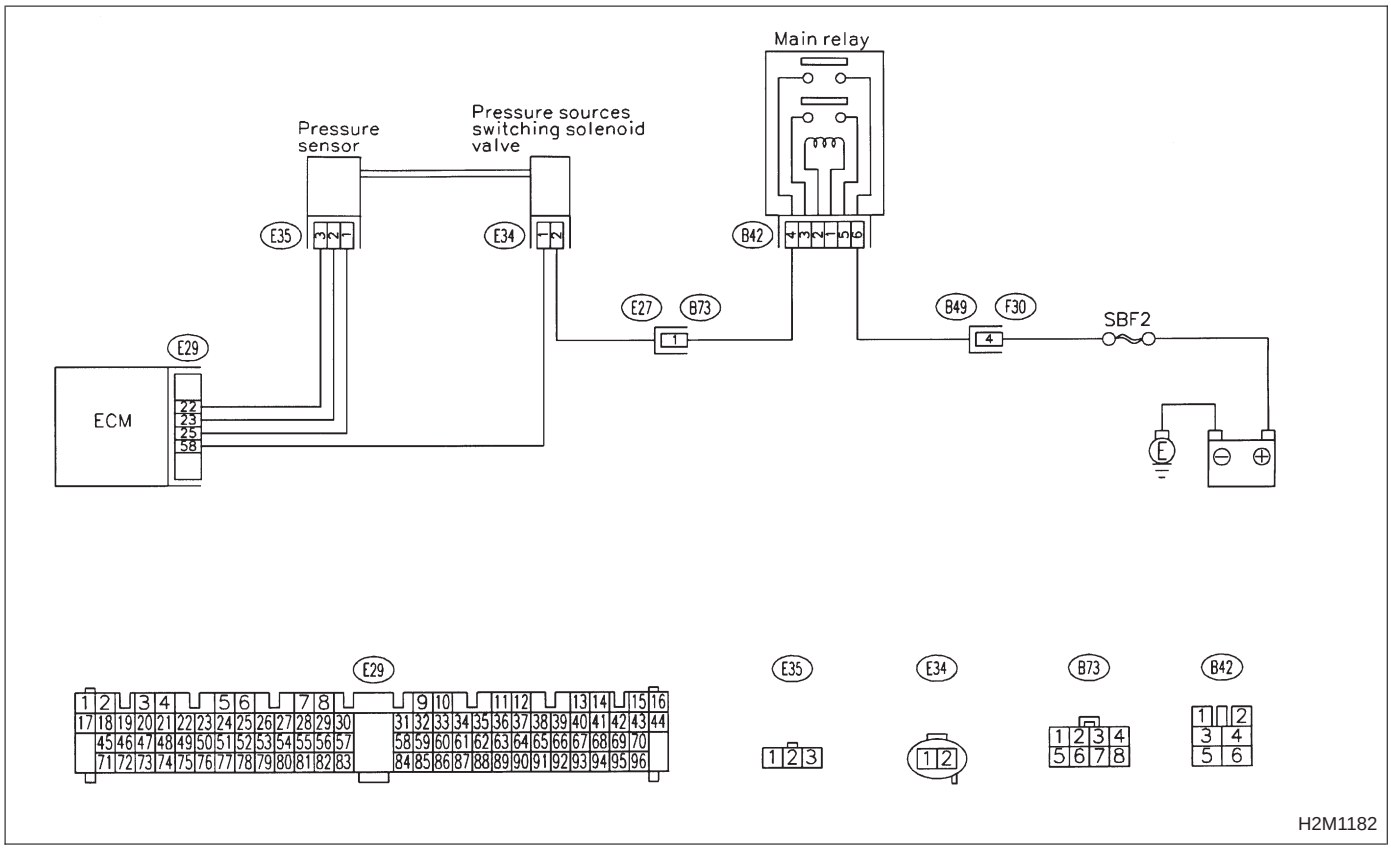
DTC DETECTING CONDITION:

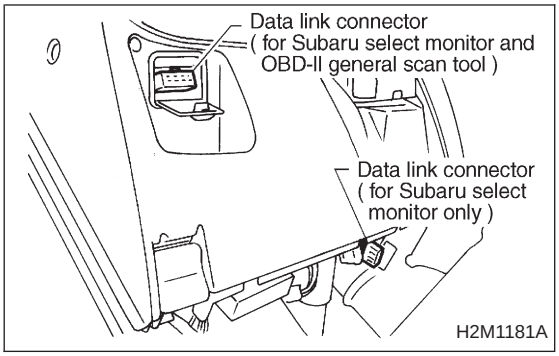
- Immediately at fault recognition

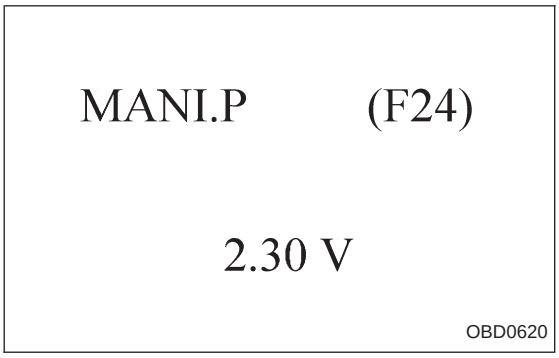
1.	**Connect Subaru Select Monitor or the OBD-II general scan tool, and read data.**
2.	**Check input signal for ECM. (Using voltage meter and Subaru Select Monitor.)**
3.	**Check harness connector between ECM and pressure sensor.**
4.	**Check harness connector between ECM and pressure sensor.**

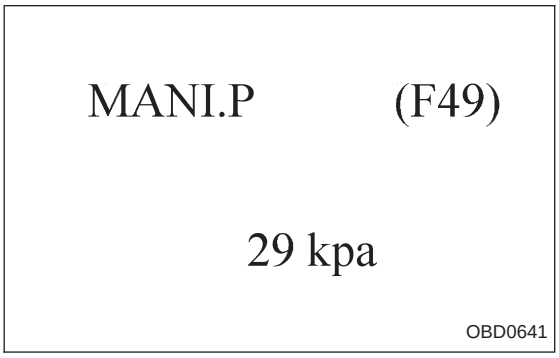
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:









1	**CONNECT SUBARU SELECT MONITOR OR THE OBD-II GENERAL SCAN TOOL, AND READ DATA.**

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor or the OBD-II general scan tool to data link connector.
3) Turn ignition switch to ON and Subaru Select Monitor or the OBD-II general scan tool switch to ON.
4) Start engine.
5) Read the data on Subaru Select Monitor or the OBD-II general scan tool.

● Subaru Select Monitor

Designate mode using function key.

Function mode: F24 or F49

● F24: Display shows voltage signal value sent from pressure sensor.

● F49: Display shows pressure signal value sent from pressure sensor.

CHECK ***: Less than 0.2 V or 0 kPa***

YES : Go to step 2.

NO : Go to next CHECK .

CHECK ***: More than 4.9 V or 140 kPa***

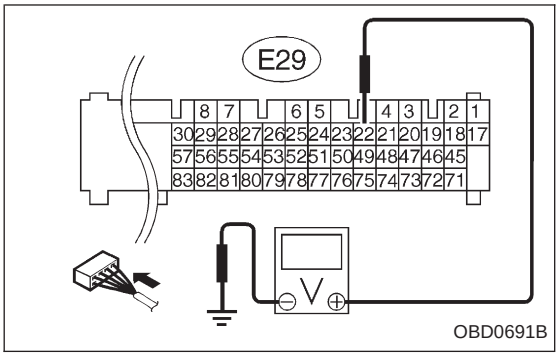
YES : Go to step 4.

NO : Repair the harness and connector between pressure sensor and ECM.

HINT: ① Open or short circuit of harness between pressure sensor and ECM.
② Poor contact of pressure sensor connector and ECM connector.

● OBD-II general scan tool

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



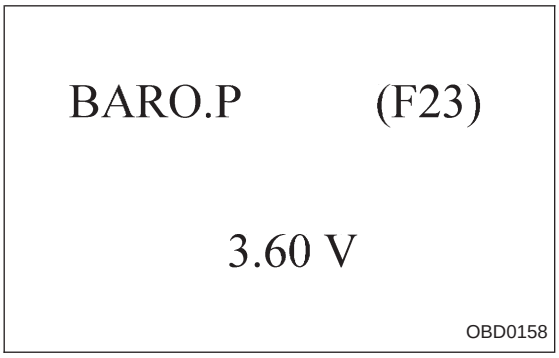
2	CHECK INPUT SIGNAL FOR ECM. (USING VOLTAGE METER AND SUBARU SELECT MONITOR.)

1) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 22 — Body/4.5 V, or more***

YES : Go to next step.

NO : Go to next CHECK .



CHECK ***: Is the voltage more than 4.5 V while shaking harness and connector of ECM?***

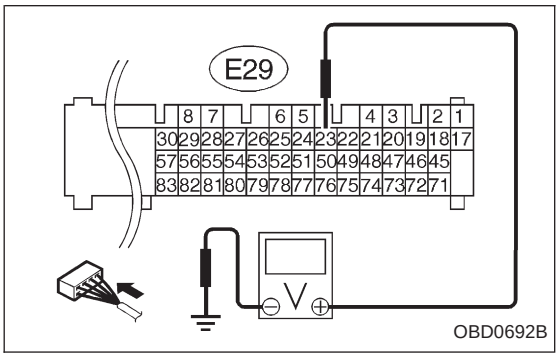
● Subaru Select Monitor
Designate mode using function key.

Function mode: F23

● F23: Display shows voltage signal value sent from pressure sensor.

YES : Repair poor contact in ECM connector.

NO : Replace ECM with a new one.

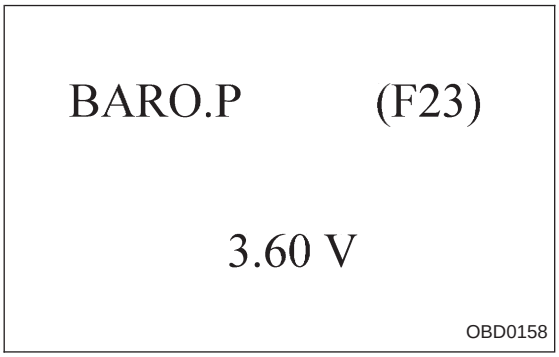


2) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 23 — Body/0.2 V, or less***

YES : Go to step 3.

NO : Go to next CHECK .



CHECK ***: Is the voltage more than 0.2 V while shaking harness and connector of ECM and monitoring the value with Subaru select monitor?***

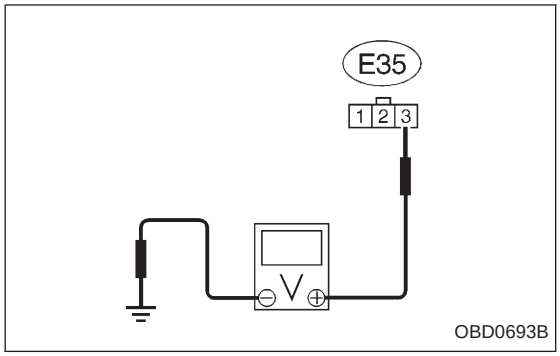
● Subaru Select Monitor
Designate mode using function key.

Function mode: F23

● F23: Display shows voltage signal value sent from pressure sensor.

YES : Repair poor contact in ECM connector.

NO : Go to step 3.



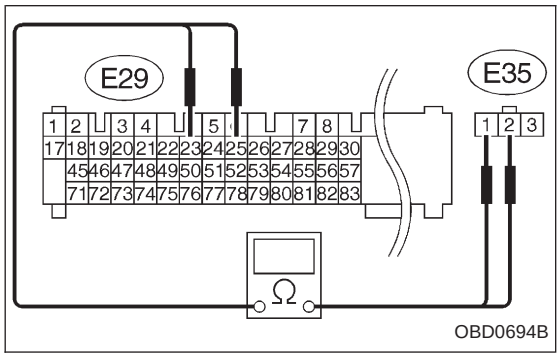
3	CHECK HARNESS CONNECTOR BETWEEN ECM AND PRESSURE SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector pressure sensor.
3) Turn ignition switch to ON.
4) Measure voltage of harness connector between pressure sensor and body.

CHECK : ***Connector & terminal***
(E35) No. 3 — Body/4.5 V, or more

YES : Go to the next step.

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

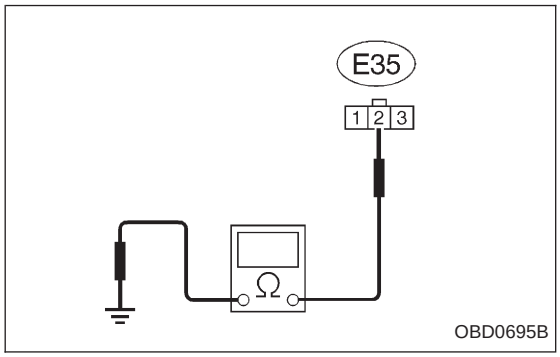


5) Turn ignition switch to OFF.
6) Disconnect connector from ECM.
7) Measure resistance of harness connector between ECM and pressure sensor.

CHECK : ***Connector & terminal***
(E29) No. 23 — (E35) No. 2/1 Ω, or less
(E29) No. 25 — (E35) No. 1/1 Ω, or less

YES : Go to the next step.

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



8) Measure resistance of the connector between pressure sensor and body.

CHECK : ***Connector & terminal***
(E35) No. 2 — Body/500 kΩ, or more

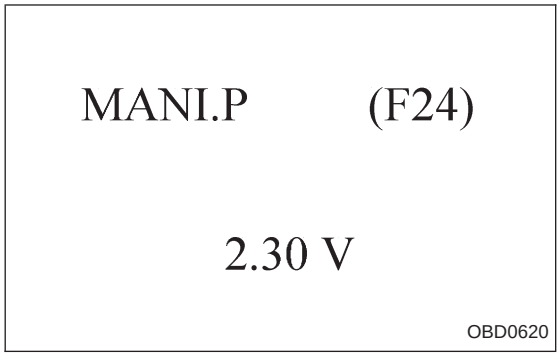
YES : Go to the next CHECK .

NO : Repair short circuit of the 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 with a new one.



4	CHECK HARNESS CONNECTOR BETWEEN ECM AND PRESSURE SENSOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from pressure sensor.
3) Turn ignition 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: F24

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

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

NO : Replace pressure sensor with a new one.

● 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 (P — R) —

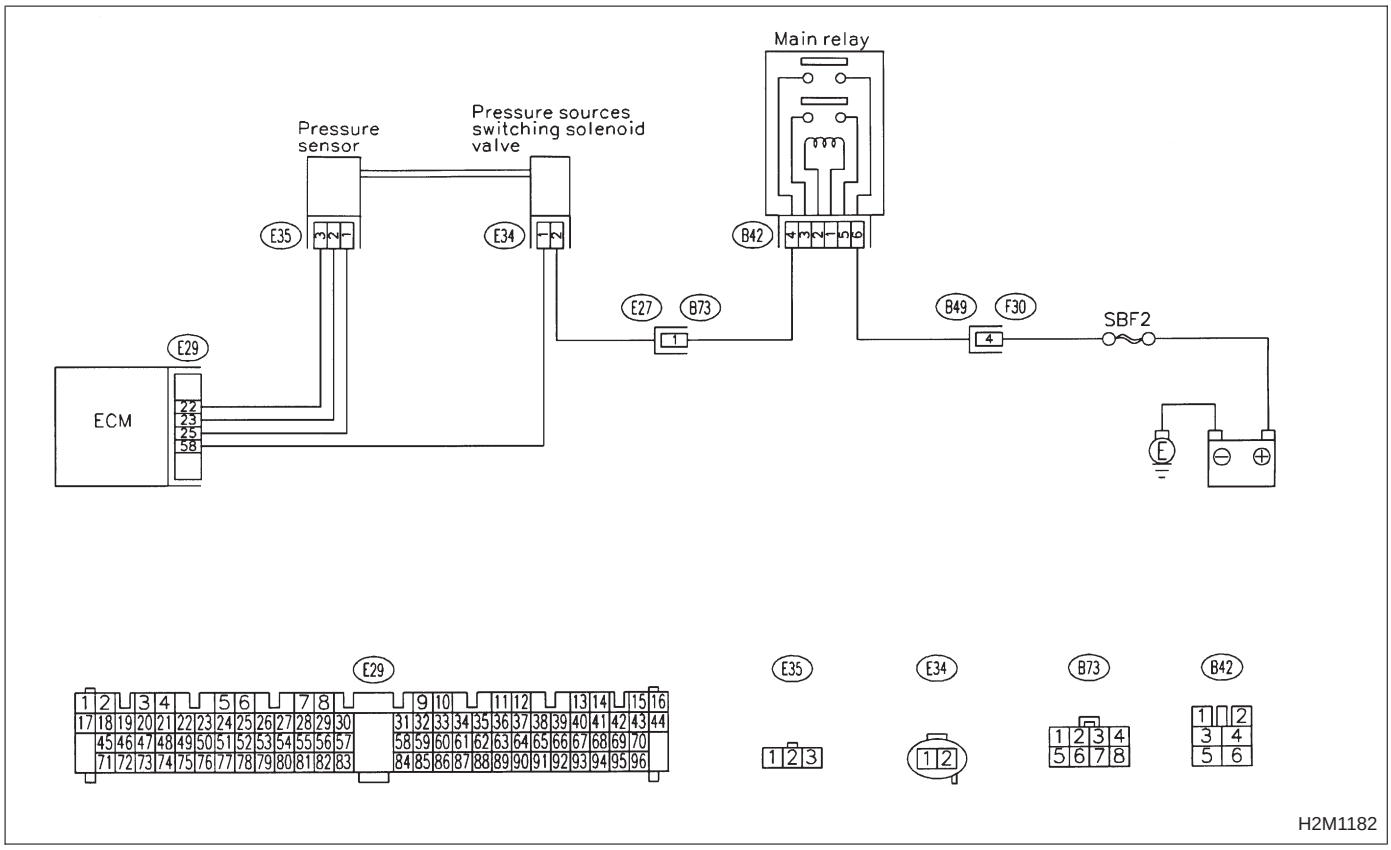
DTC DETECTING CONDITION:

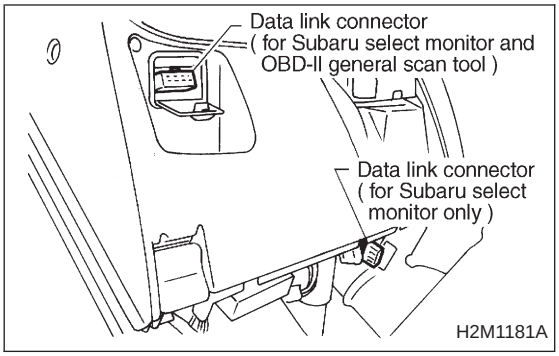
- Two consecutive trips with fault

1.	Check DTC P0105 or P1102 on display.	Yes	● Inspect DTC P0105 or P1102 using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”. ● In this case, it is unnecessary to inspect DTC P0106.
		No	
2.	**Check data for control.**		
3.	**Check vacuum hose.**		
4.	**Check pressure sources of switching solenoid valve.**		

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

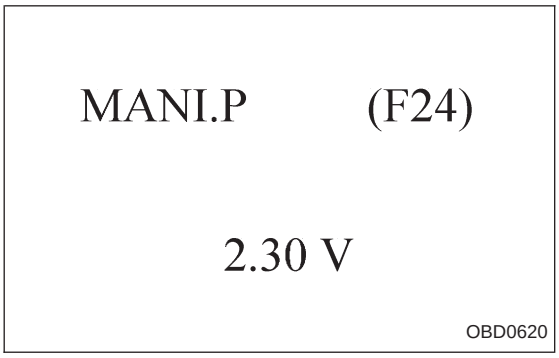
WIRING DIAGRAM:





2	CHECK DATA FOR CONTROL.

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



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

- Subaru Select Monitor

Designate mode using function key.

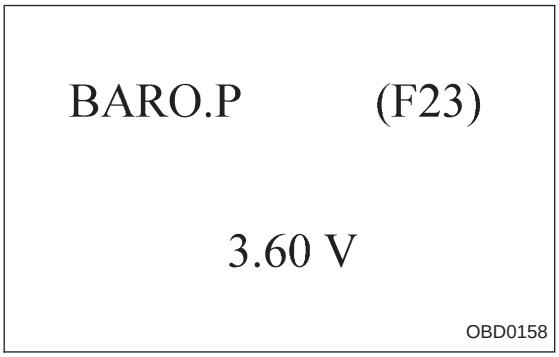
Function mode: F24 and F23

- F24: Display shows a voltage signal value sent from the pressure sensor.
- F23: Display shows a voltage signal value sent from the pressure sensor.

CHECK ***: Is the voltage more than 3.24 V with function mode F24?***

YES : Go to step 3.

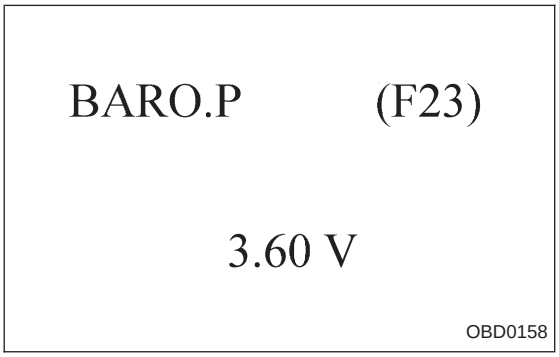
NO : Go to next CHECK .



CHECK ***: Is the voltage less than 1.6 V with function mode F23?***

YES : Go to step 4.

NO : Go to next CHECK .



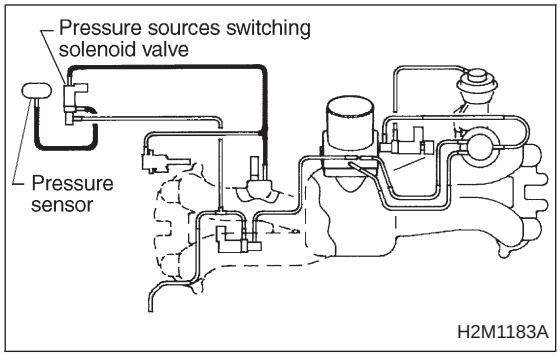
CHECK ***: Is the voltage more than 4.7 V with function mode F23?***

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.

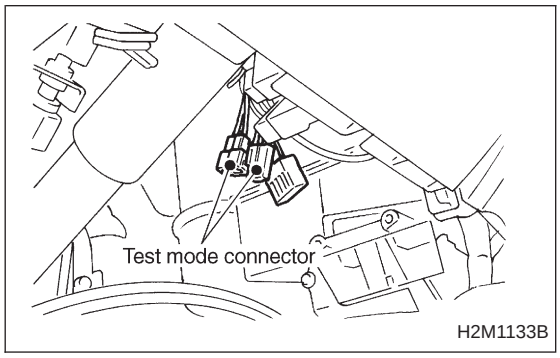


3	CHECK VACUUM HOSE.

CHECK : ***Check for disconnection, holes, or clogging of the vacuum hoses.***

NOTE:
Check the hoses;
- From pressure sources switching solenoid valve to intake manifold.
- From pressure sensor to pressure sources switching solenoid valve.

YES : Repair hoses.
NO : Go to step 4.



4	CHECK PRESSURE SOURCES OF SWITCHING SOLENOID VALVE.

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

CHECK : ***Is operation sound of the pressure sources solenoid valve heard? (ON ↔ OFF each 1.5 sec.)***

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

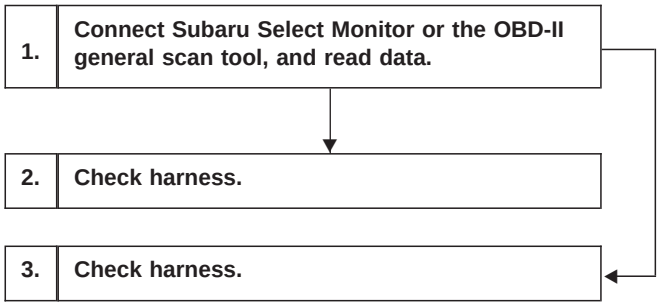
F: DTC P0115 — ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT MALFUNCTION (TW) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

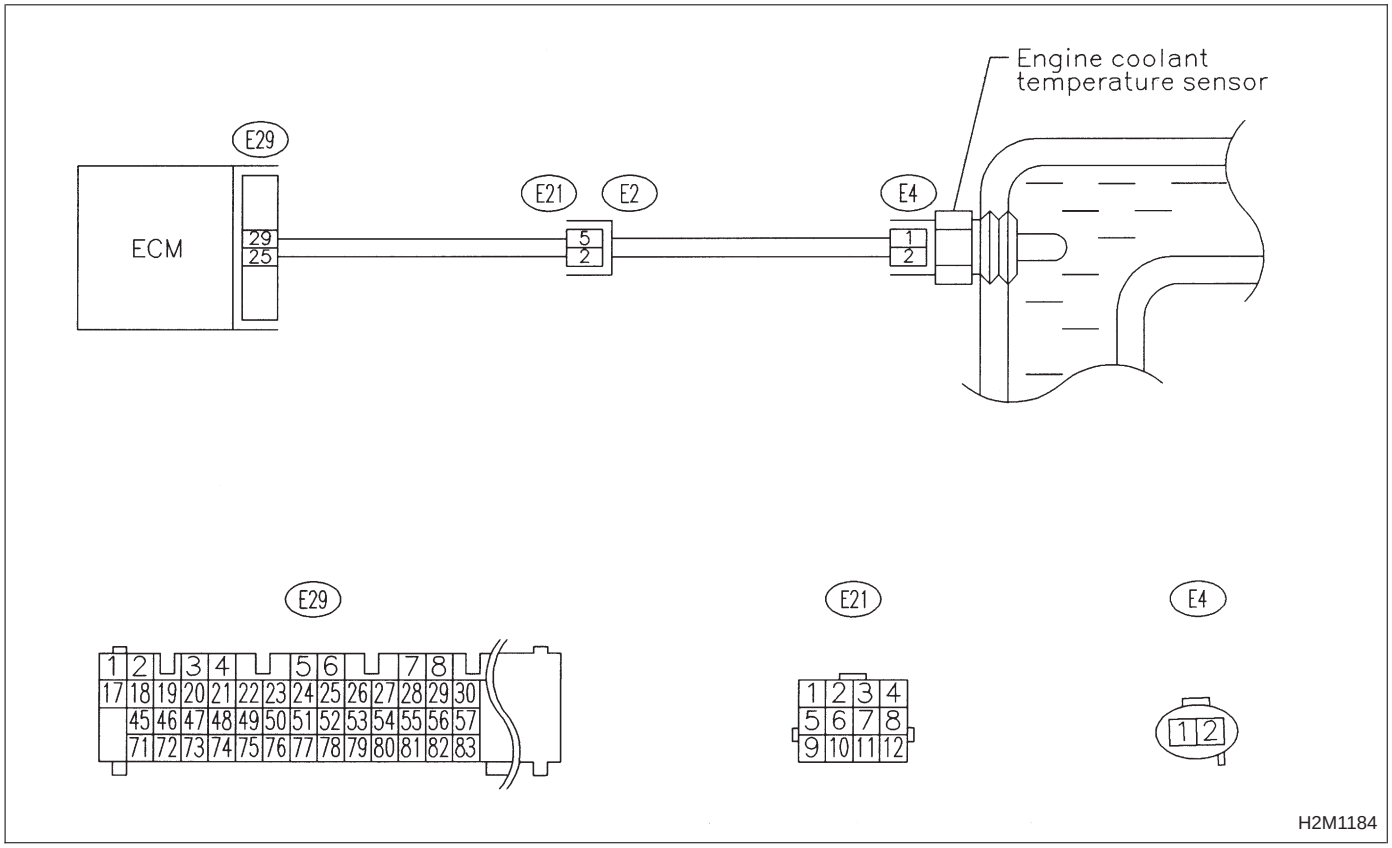
TROUBLE SYMPTOM:

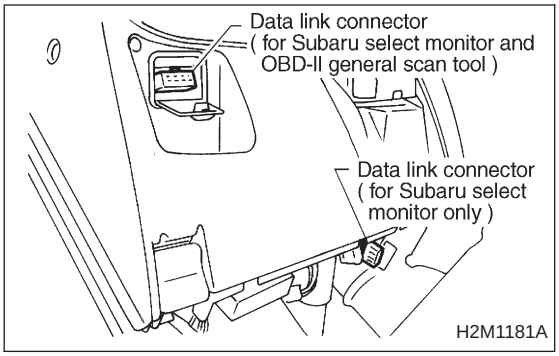
- Hard to start
- Erroneous idling
- Poor driving performance

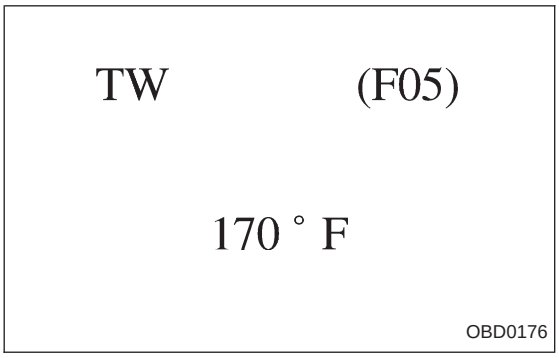


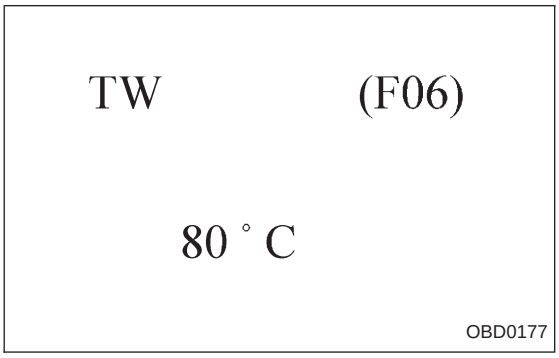
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:









1	**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: F05 or F06

● F05: Water temperature is indicated in "°F".
● F06: Water temperature is indicated in "°C".

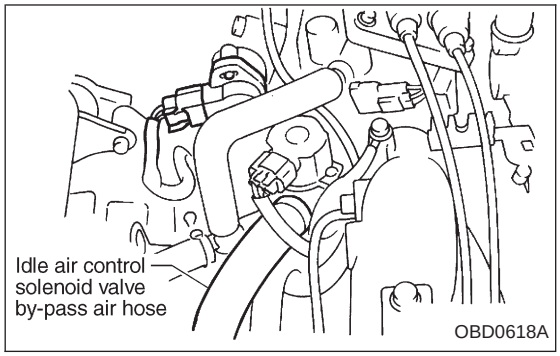
CHECK ***: ● Is the value greater than 300°F with function mode F05?***
● Is the value greater than 150°C with function mode F06?

YES : Go to step 2.
NO : Go to next CHECK .

CHECK ***: ● Is the value less than −40°F with function mode F05?***
● Is the value less than −40°C with function mode F06?

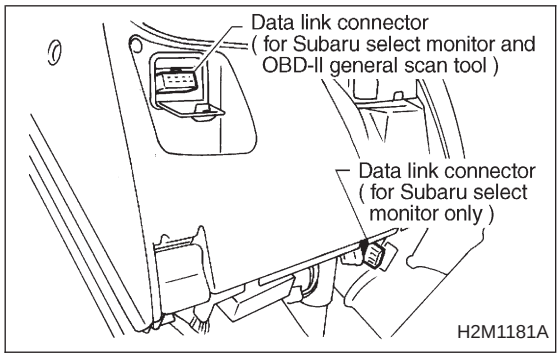
YES : Go to step 3.
NO : Repair poor contact in connectors or harness.
- Engine coolant temperature sensor connector
- ECM connector
- Coupling connector (B21)

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

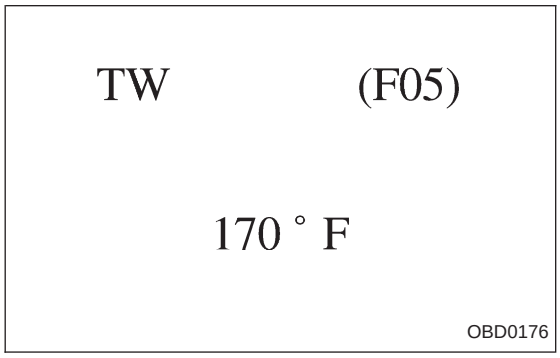


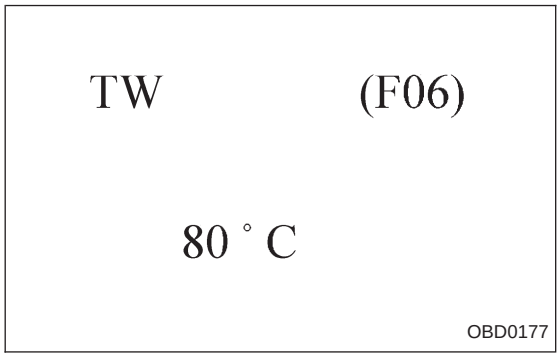
2	CHECK HARNESS.

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



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





5) Turn ignition switch and Subaru Select Monitor or OBD-II general scan tool switch to ON.
6) Read data on Subaru Select Monitor or the OBD-II general scan tool.

- Subaru Select Monitor

Designate mode using function key.

Function mode: F05 or F06

- F05: Water temperature is indicated in "°F".
- F06: Water temperature is indicated in "°C".

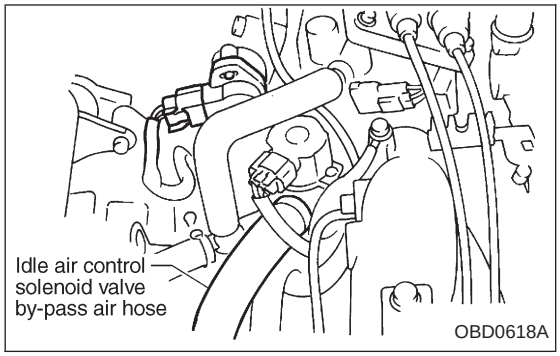
CHECK ***: ● Is the value less than −40°F with function mode F05?***
● Is the value less than −40°C with function mode F06?

YES : Replace engine coolant temperature sensor.

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

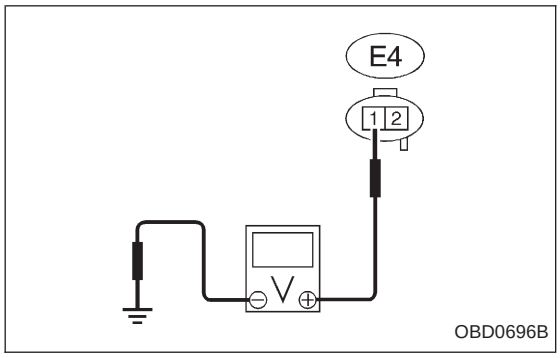
- OBD-II general scan tool

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



3	CHECK HARNESS.

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



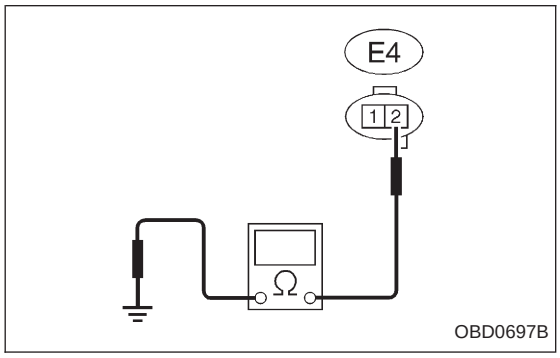
5) Measure voltage between engine coolant temperature sensor and body.

CHECK ***: Connector & terminal (E4) No. 1 — Body/4 V, or more***

YES : Go to the next step.

NO : Repair open circuit of harness or poor contact in ECM and engine coolant temperature sensor connector.

6) Turn ignition switch to OFF.



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

CHECK ***: Connector & terminal (E4) No. 2 — Body/5 Ω, or less***

YES : Replace engine coolant temperature sensor.

NO : Repair open circuit of harness or poor contact in ECM and engine coolant temperature sensor connector.

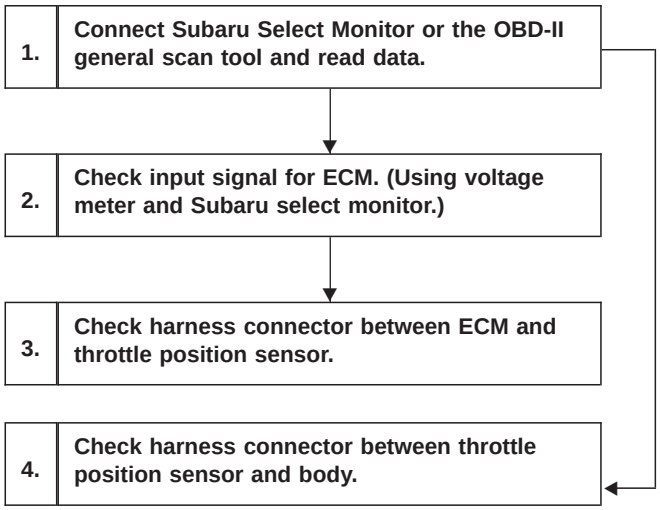
G: DTC P0120 — THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION (THV) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

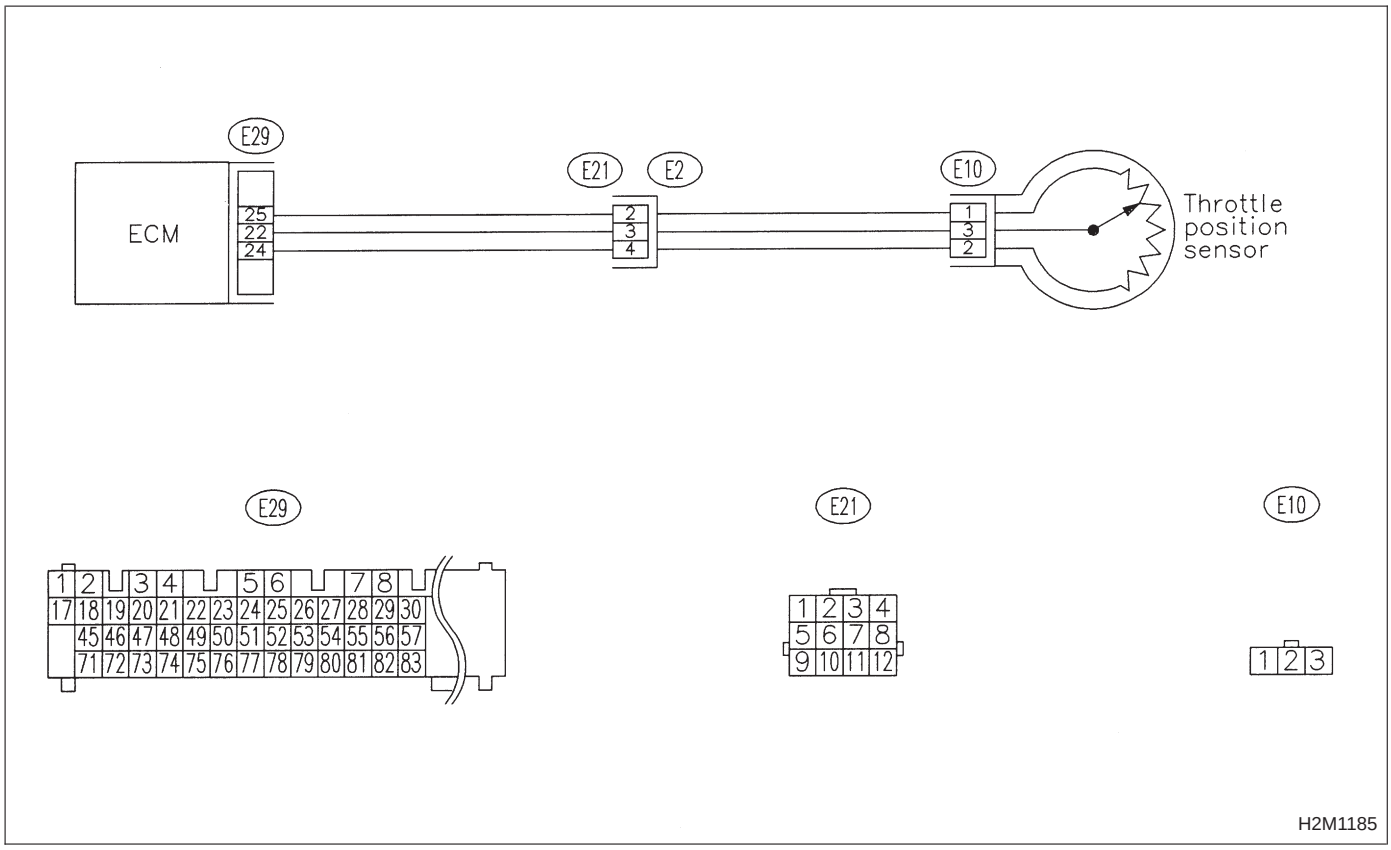
TROUBLE SYMPTOM:

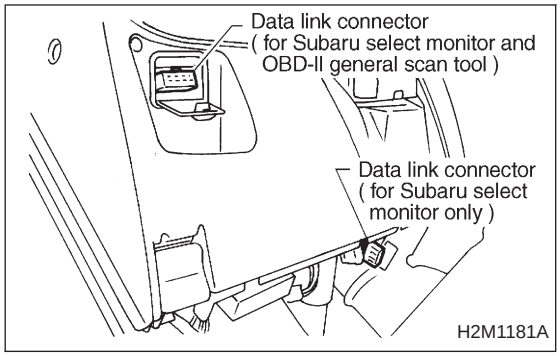
- Erroneous idling
- Engine stalls.
- Poor driving performance

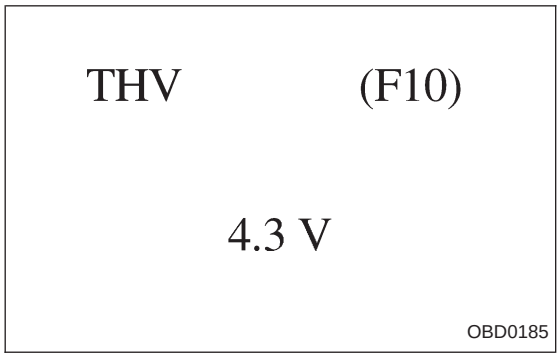


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:







1	**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: F10

- F10: Throttle position sensor output signal is indicated.

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

YES : Go to step 2.

NO : Go to next CHECK .

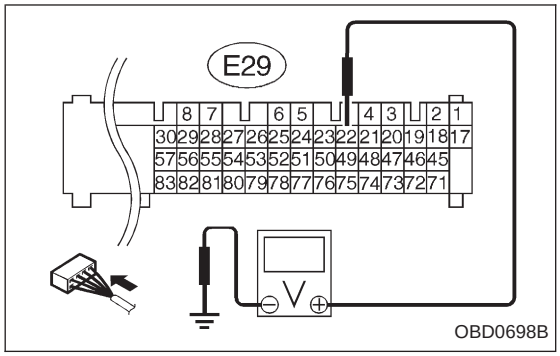
CHECK ***: Is the voltage more than 4.9 V?***

YES : Go to step 4.

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. Check and repair the following connectors.
- Throttle position sensor connector.
- ECM connector
- Coupling connector (E21)

- OBD-II general scan tool

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



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

1) Measure voltage between ECM and body while throttle valve is fully closed.

CHECK ***: Connector & terminal (E29) No. 22 — Body/4.5 V, or more***

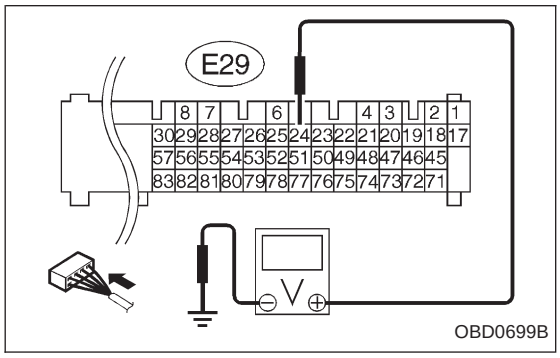
YES : Go to next step.

NO : Go to next CHECK .

CHECK ***: Is the voltage more than 4.5 V while shaking harness and connector of ECM?***

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



2) Measure signal voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 24 — Body/0.1 V, or less***

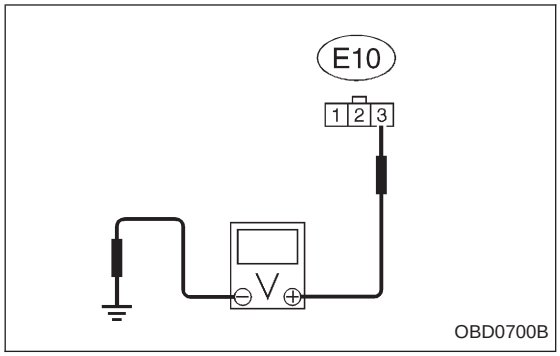
YES : Go to step 3.

NO : Go to next CHECK .

CHECK ***: Is the voltage more than 0.1 V while shaking harness and connector of ECM and monitoring the value with Subaru select monitor?***

YES : Repair poor contact in ECM connector.

NO : Go to step 3.



3	CHECK HARNESS CONNECTOR BETWEEN ECM AND THROTTLE POSITION SENSOR.

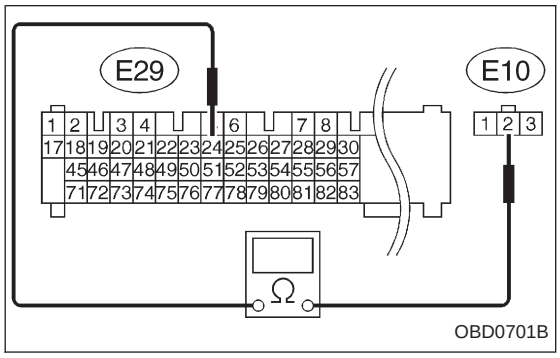
1) Turn ignition switch to OFF.
2) Disconnect connectors from throttle position sensor.
3) Turn ignition switch to ON.
4) Measure voltage between throttle position sensor connector and body.

CHECK ***: Connector & terminal***
(E10) No. 3 — Body/4.5 V, or more

YES : Go to the next step.

NO : Repair harness and connector.

NOTE:
In this case, the possible causes are:
① Open circuit of the harness between connector (E10) terminal No. 3 and connector (E29) terminal No. 22, or the following:
② Poor contact in throttle position sensor connector
③ Poor contact in ECM connector
④ Poor contact in coupling connector (E21)



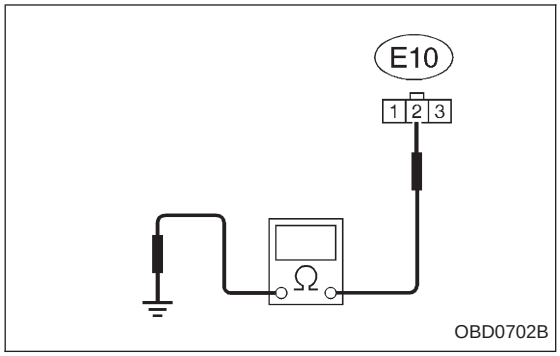
5) Turn ignition switch to OFF.
6) Measure resistance of harness between ECM connector and throttle position sensor connector.

CHECK ***: Connector & terminal***
(E29) No. 24 — (E10) No. 2/1 Ω, or less

YES : Go to next step.

NO : Repair harness and connector.

NOTE:
In this case, the following are the possible causes.
① Open circuit between connector (E29) terminal No. 24 and connector (E10) terminal No. 2.
② Poor contact in ECM connector.
③ Poor contact in throttle position sensor connector
④ Poor contact in coupling connector (E21)



7) Measure resistance of harness between throttle position sensor connector and body.

CHECK ***: Connector & terminal (E10) No. 2 — Body/10 Ω, or less***

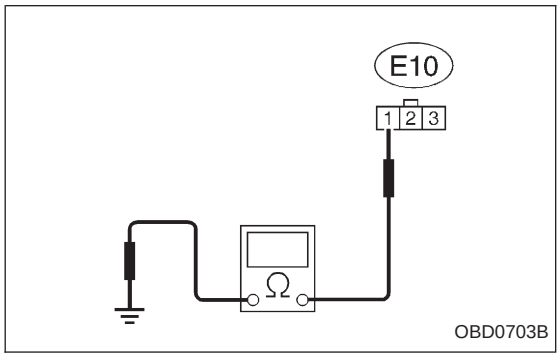
YES : Repair short circuit of harness between throttle position sensor and ECM connector.

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.



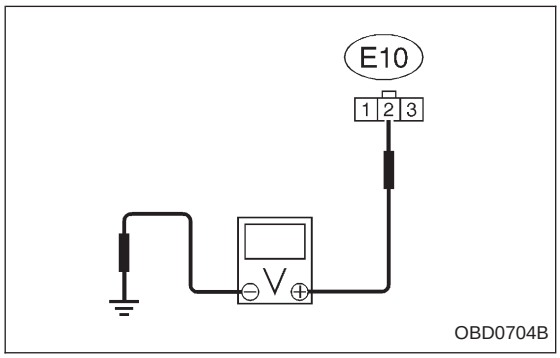
4	CHECK HARNESS CONNECTOR BETWEEN THROTTLE POSITION SENSOR AND BODY.

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

CHECK ***: Connector & terminal (E10) No. 1 — Body/5 Ω, or less***

YES : Go to the next step.

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



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

CHECK ***: Connector & terminal (E10) No. 2 — Body/4.9 V, or more***

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

NO : Replace throttle position sensor.

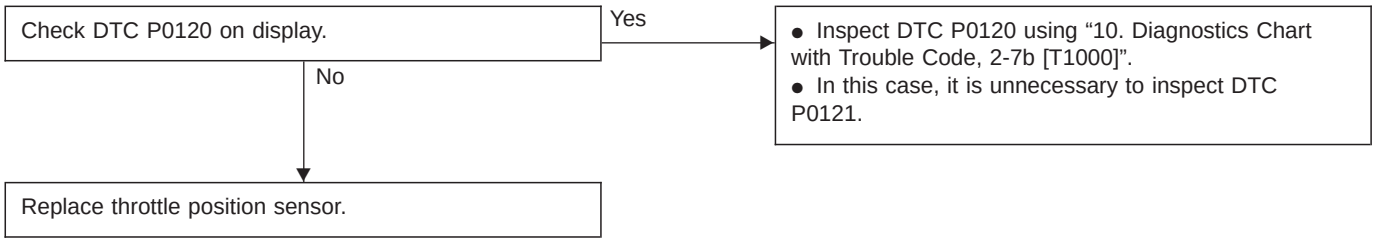
H: DTC P0121 — THROTTLE POSITION SENSOR CIRCUIT RANGE/PERFORMANCE PROBLEM (TH – R) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

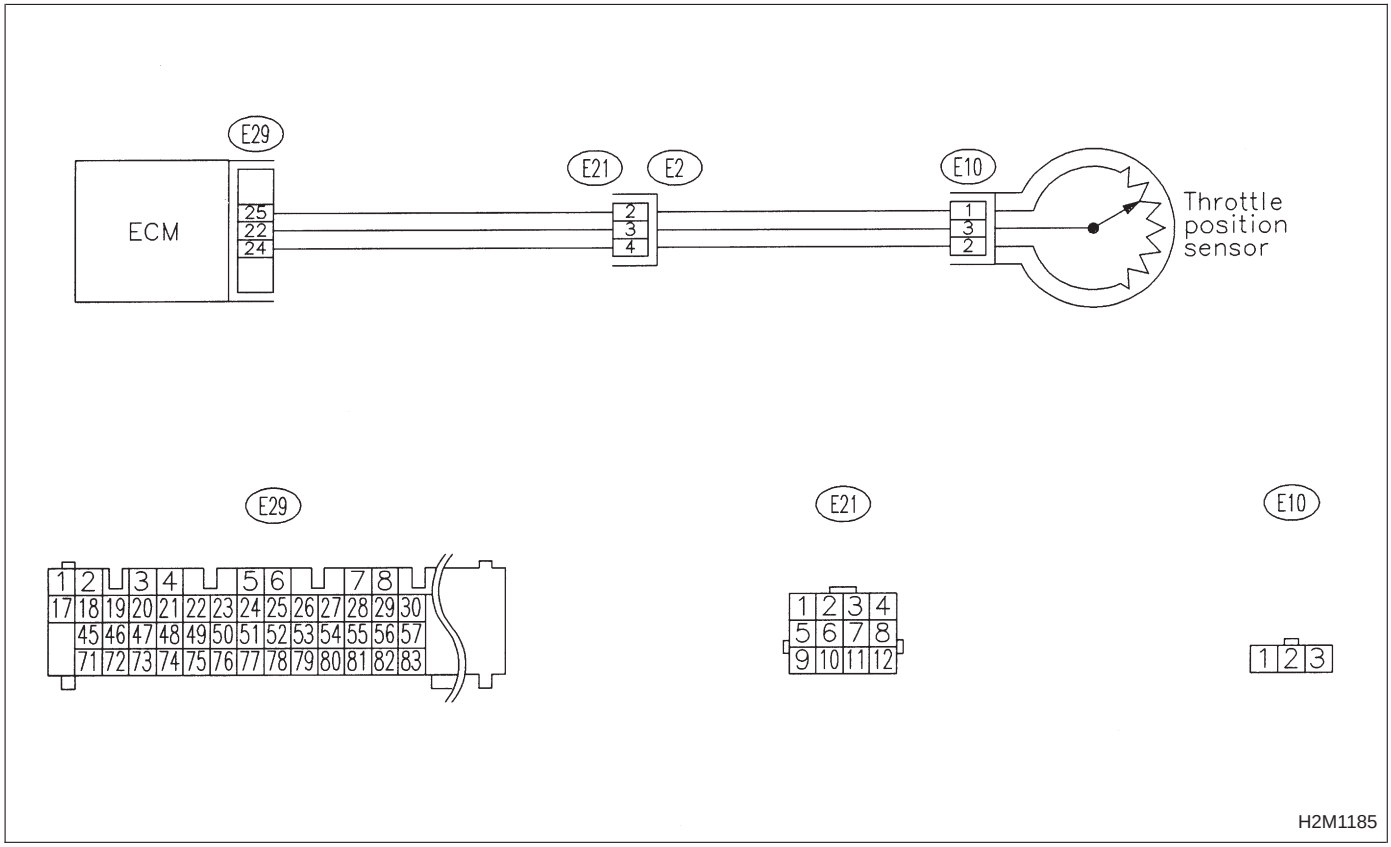
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance



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

WIRING DIAGRAM:



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.

Check DTC P0115 on display.

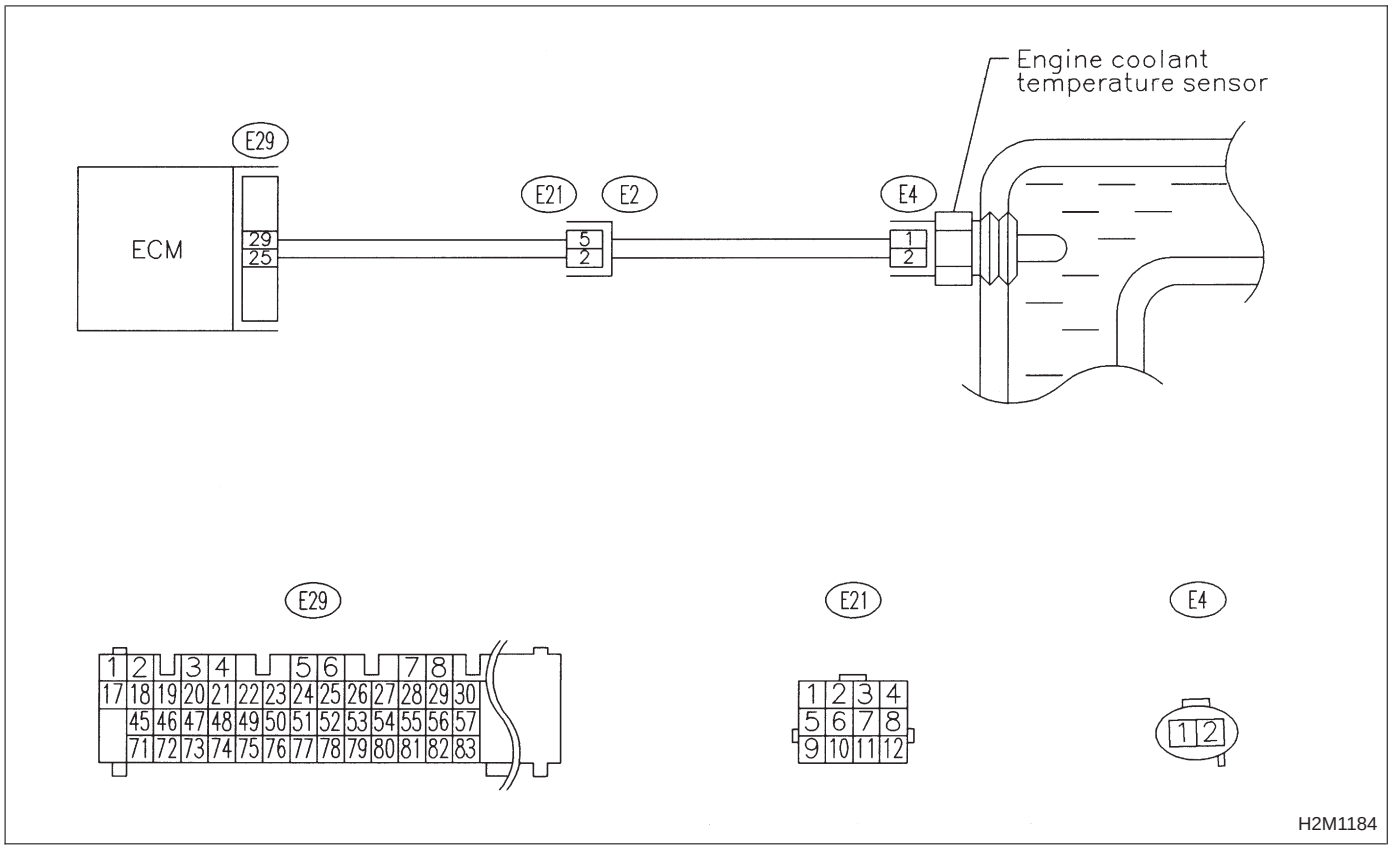
Yes → • Inspect DTC P0115 using "10. Diagnostics Chart with Trouble Code, 2-7b [T1000]".
• In this case, it is unnecessary to inspect DTC P0125.

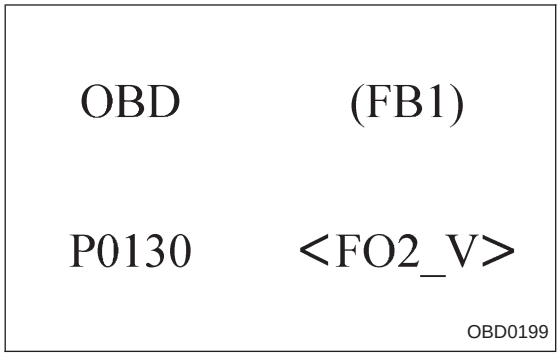
No ↓

Replace engine coolant temperature sensor.

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

WIRING DIAGRAM:

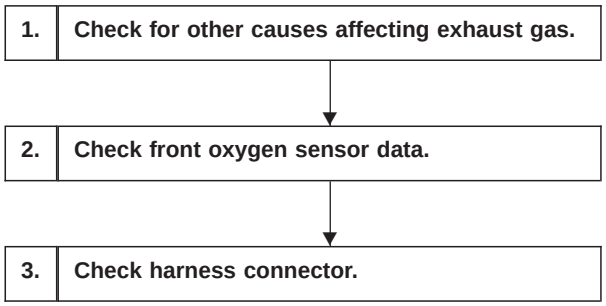




J: DTC P0130 — FRONT OXYGEN SENSOR CIRCUIT MALFUNCTION (FO2 — V) —

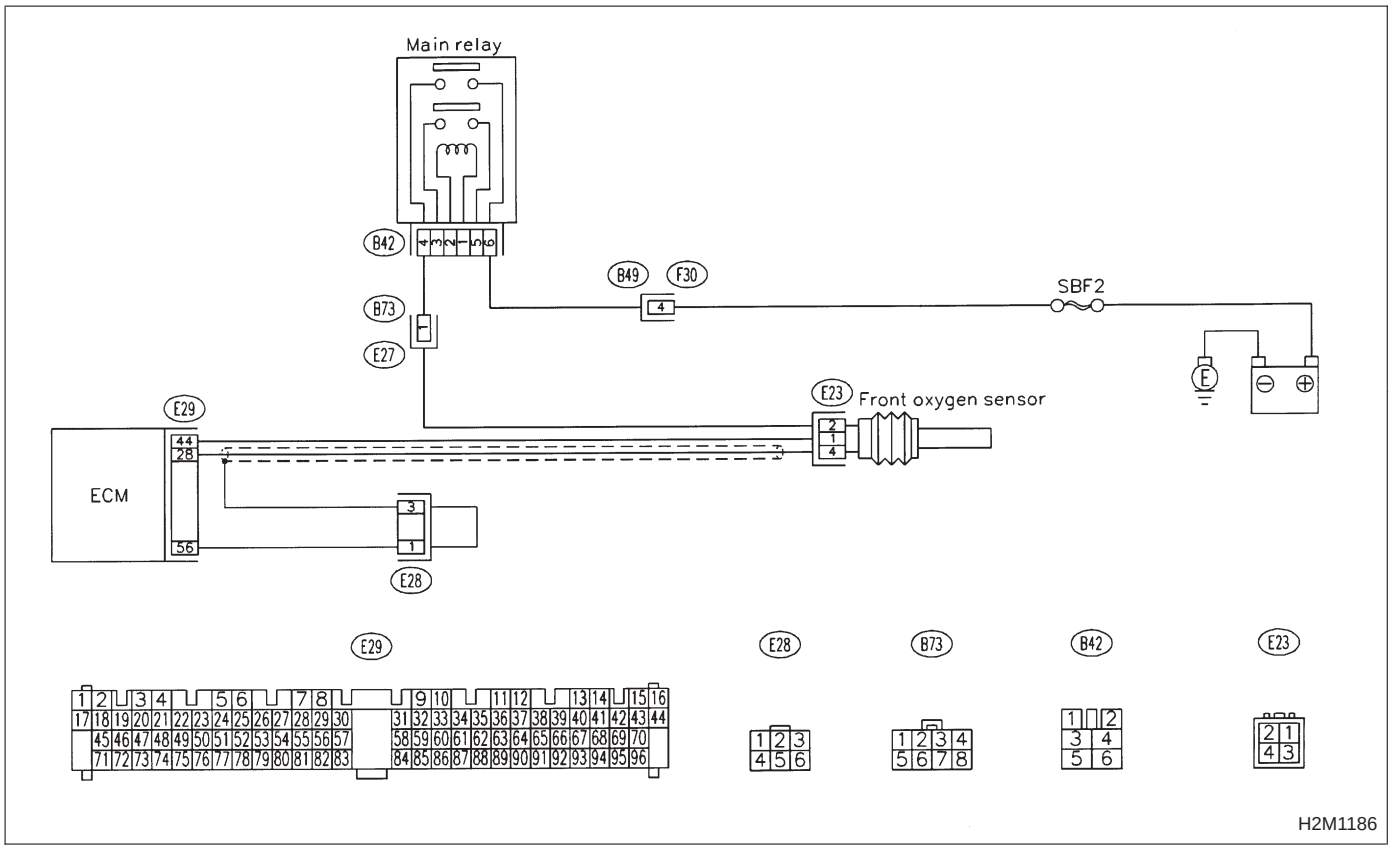
DTC DETECTING CONDITION:

- Two consecutive trips with fault



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

WIRING DIAGRAM:



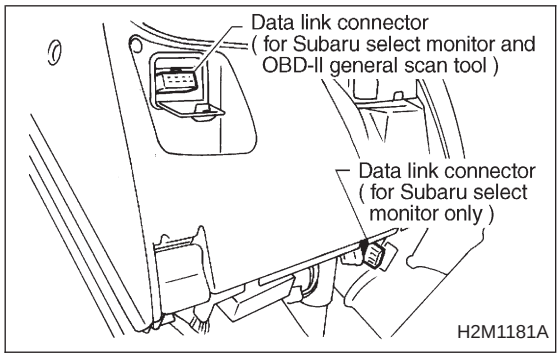
1	CHECK FOR OTHER CAUSES AFFECTING EXHAUST GAS.

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

YES : Check fuel system.

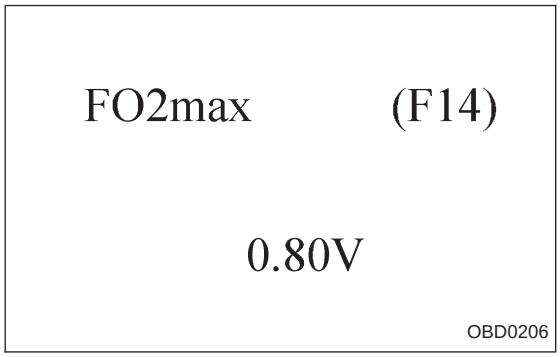
NOTE:
Check for use of improper fuel.
Check if engine oil or coolant level is extremely low.

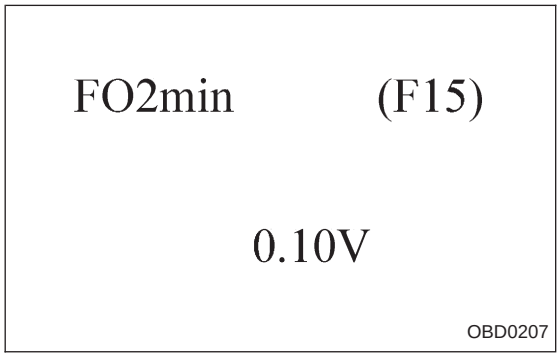
NO : Go to step 2.



2	CHECK FRONT OXYGEN SENSOR DATA.

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





- Subaru Select Monitor

Designate mode using function key.

Function mode: F14 or F15

- F14: Front oxygen sensor max. output signal is indicated.
- F15: Front oxygen sensor min. output signal is indicated.

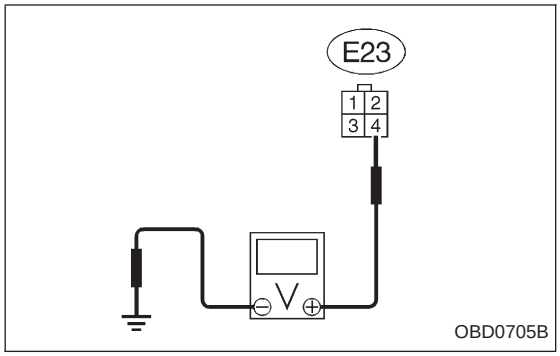
CHECK ***: Is the difference of voltage between F14 and F15 0.1 V, or less?***

YES : Go to step 3.

NO : Replace front oxygen sensor.

- OBD-II general scan tool

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



3	CHECK HARNESS CONNECTOR.

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

CHECK ***: Connector & terminal (E23) No. 4 — Body/0.2 V, or more***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, the following are the possible causes.
① Open circuit of harness between ECM and front oxygen sensor.
② Poor contact in the ECM connector.

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

YES : Repair poor contact in front oxygen sensor connector.

NO : Replace front oxygen sensor.

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

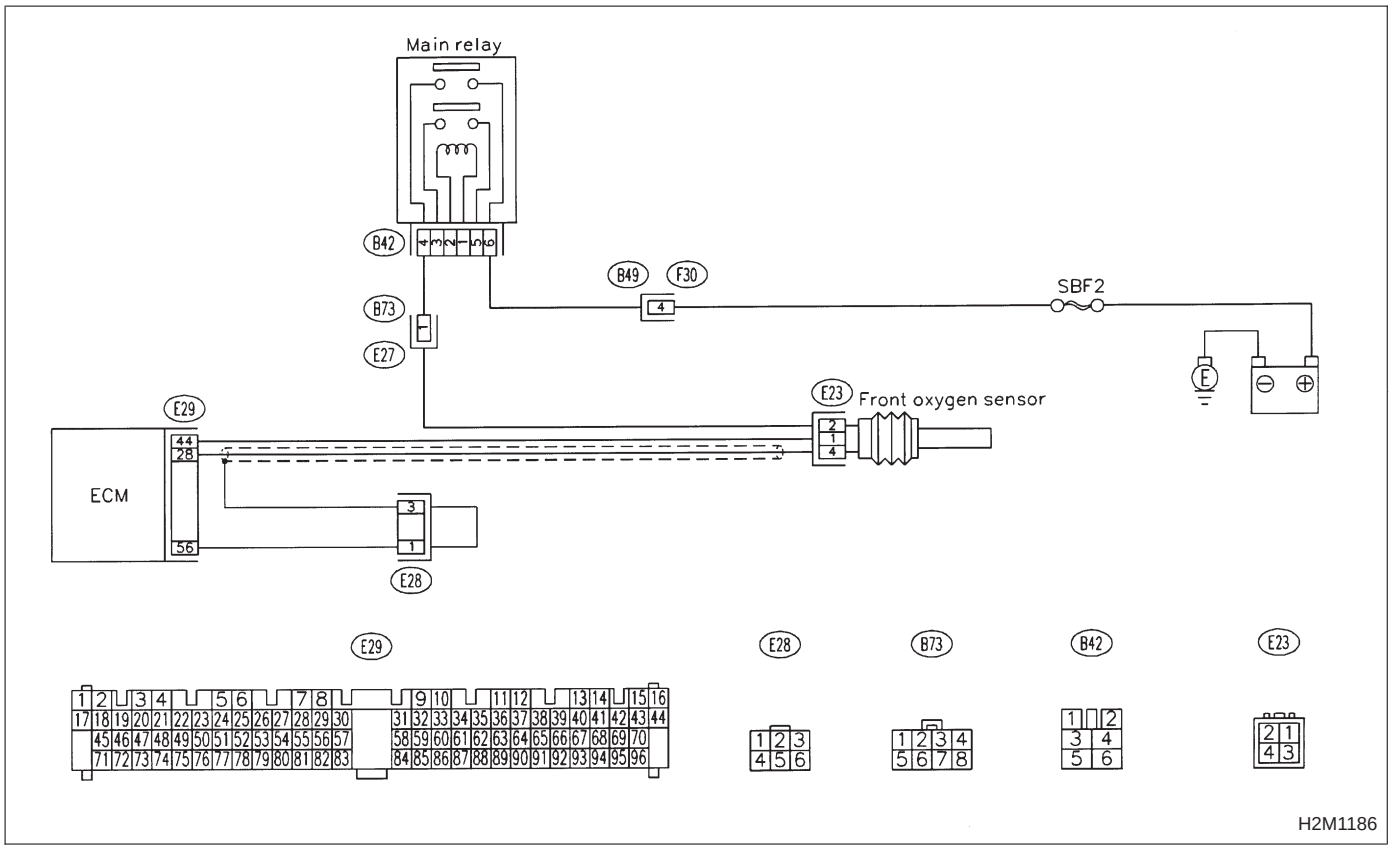
DTC DETECTING CONDITION:

- Two consecutive trips with fault

1.	Check DTC P0130 on display.	Yes →	● Inspect DTC P0130 using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”. ● In this case, it is unnecessary to inspect DTC P0133.
	No ↓		
2.	**Check exhaust system.**		

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

WIRING DIAGRAM:



2	CHECK EXHAUST SYSTEM.

CHECK : ***Check the following.***
- ***Looseness of installation portion of front exhaust pipe onto cylinder heads***
- ***Loosened connection of front exhaust pipe and front catalytic converter***
- ***Damage of exhaust pipe which make a hole***

YES : Repair exhaust system.

NO : Replace front oxygen sensor.

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

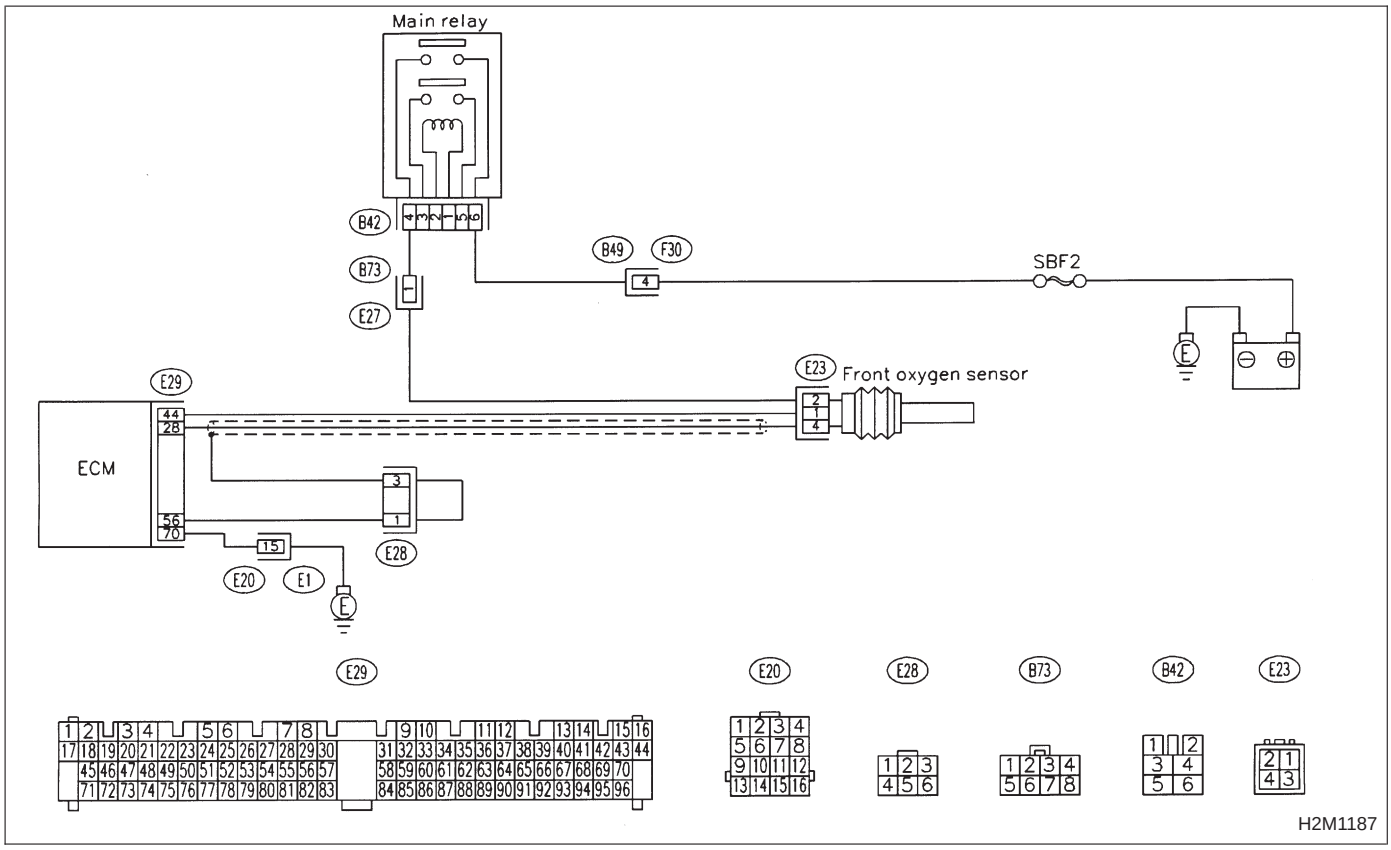
DTC DETECTING CONDITION:

- Two consecutive trips with fault

1.	**Check DTC P0141 on display.**
2.	**Connect Subaru Select Monitor or the OBD-II general scan tool, and read data.**
3.	**Check output signal from ECM. (Using voltage meter.)**
4.	**Check power supply to front oxygen sensor.**
5.	**Check front oxygen sensor.**

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

WIRING DIAGRAM:

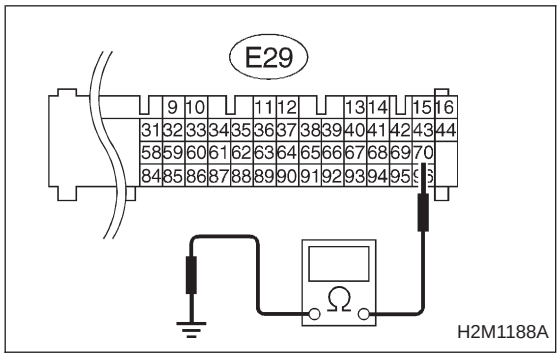


1	CHECK DTC P0141 ON DISPLAY.

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

YES : Go to next step.

NO : Go to step 2.



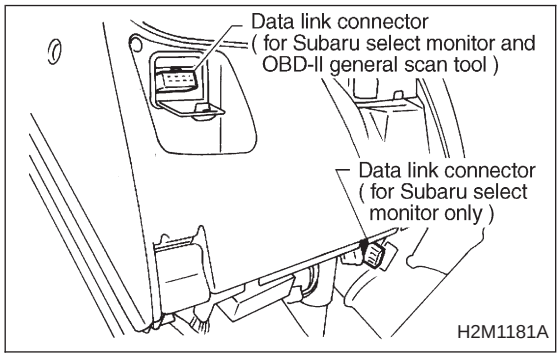
1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and body.

CHECK : ***Connector & terminal (E29) No. 70 — Body/5 Ω, or less***

YES : Repair poor contact in ECM connector.

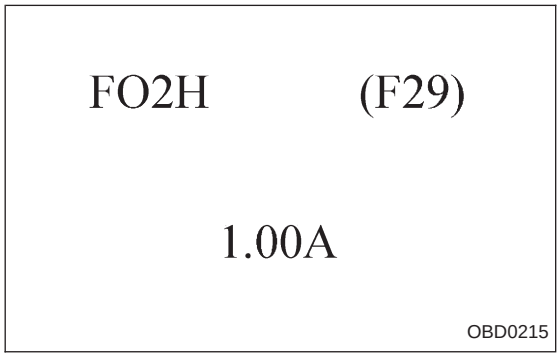
NO : Repair harness and connector.

NOTE:
In this case, repair the following items.
- Open circuit of harness between ECM and coupling connector (E20).
- Open circuit of harness between coupling connector (E20) and engine grounding terminal.
- Poor contact in front oxygen sensor connector.
- Poor contact in coupling connector (E20).



2	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: F29

- F29: Front oxygen sensor heater current is indicated.

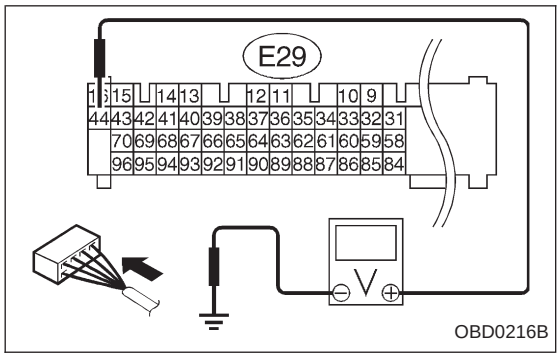
CHECK ***: Is the reading of F29 0.2 A, or more?***

YES : Repair connector.

NOTE:
In this case, poor contact in front oxygen sensor connector and ECM connector can be the possible cause.

NO : Go to step 3.

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



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

1) Start and idle the engine.
2) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 44 — Body/1.0 V, or less***

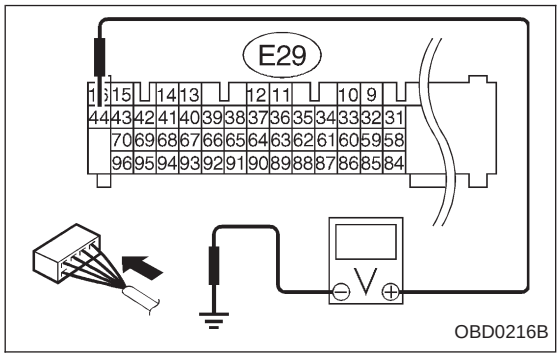
YES : Go to step 4.

NO : Go to next CHECK .

CHECK ***: Is the voltage less than 1.0 V while shaking harness and connector of ECM?***

YES : Repair poor contact in ECM connector.

NO : Go to next step.

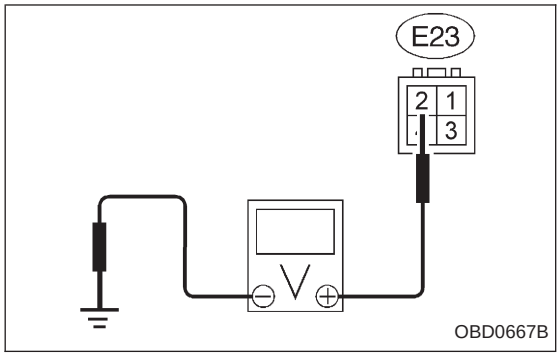


3) Disconnect connector from front oxygen sensor.
4) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 44 — Body/1.0 V, or less***

YES : Replace ECM.

NO : Repair short circuit of harness between ECM and front oxygen sensor connector. After repair short circuit of harness, replace ECM.



4	CHECK POWER SUPPLY TO FRONT OXYGEN SENSOR.

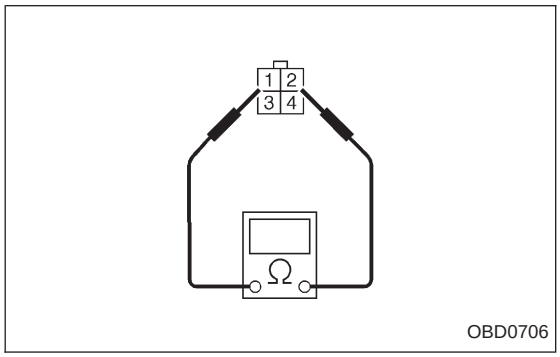
1) Turn ignition switch to OFF.
2) Disconnect connector from front oxygen sensor.
3) Turn ignition switch to ON.
4) Measure voltage between front oxygen sensor connector and body.

CHECK ***: Connector & terminal***
(E23) No. 2 — Body/10 V, or more

YES : Go to step 5.

NO : Repair power supply line.

NOTE:
In this case, repair poor contact in connector or open circuit of harness between main relay and front oxygen sensor.



5	CHECK FRONT OXYGEN SENSOR.

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

CHECK ***: Terminals***
No. 1 — No. 2/30 Ω, or less

YES : Repair harness and connector.

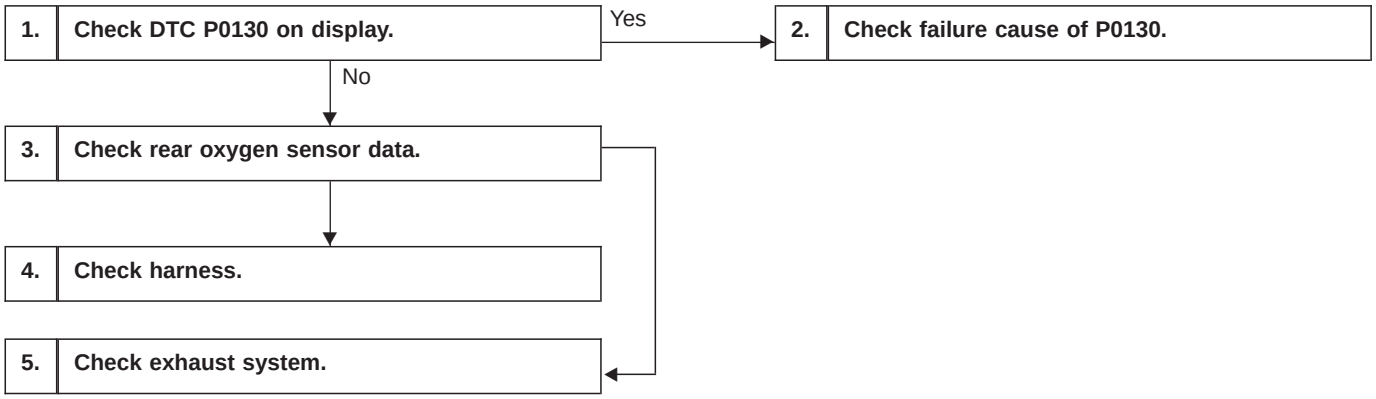
NOTE:
In this case, repair the following:
- Open circuit of harness between the front oxygen sensor connector and the ECM connector
- Poor contact in front oxygen sensor connector
- Poor contact in ECM connector

NO : Replace front oxygen sensor.

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

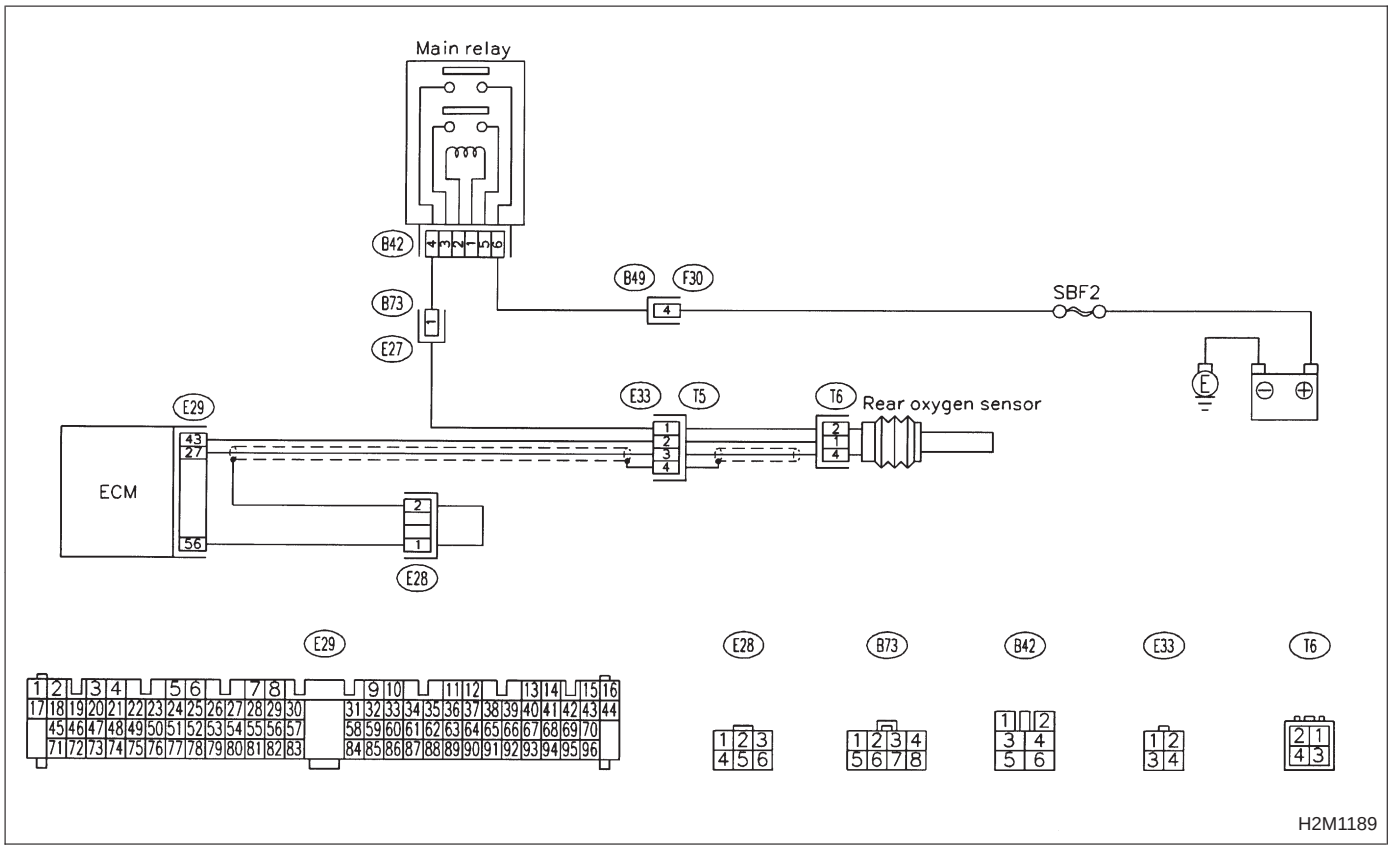
DTC DETECTING CONDITION:

- Two consecutive trips with fault



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

WIRING DIAGRAM:



1	CHECK DTC P0130 ON DISPLAY.

CHECK : ***Check that Subaru Select Monitor or the OBD-II general scan tool shows P0130.***

YES : Go to step 2.

NO : Go to step 3.

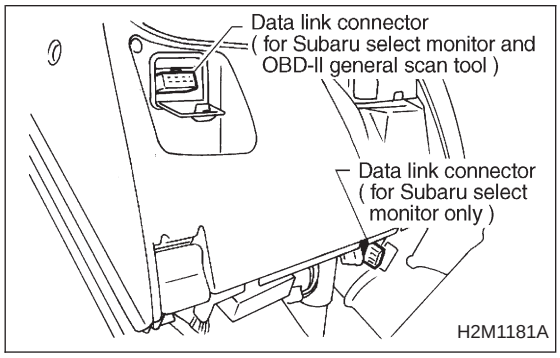
2	CHECK FAILURE CAUSE OF P0130.

Perform the step 1 of DTC P0130.

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

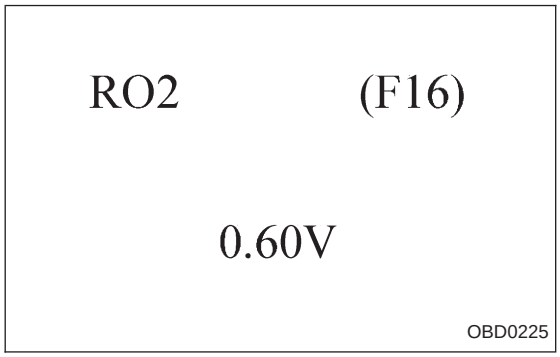
YES : Check fuel system. In this case, inspection of P0136 is not necessary.

NO : Go to step 3.



3	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: F16

- F16: Rear oxygen sensor output signal is indicated.

CHECK : ***Is the indicated data fluctuate?***

YES : Go to step 5.

NO : Go to next CHECK .

CHECK : ***Is the indicated data fixed at 0.3±0.1 V?***

YES : Go to step 4.

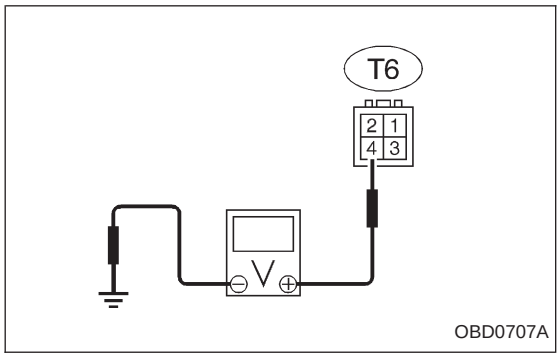
NO : Replace rear oxygen sensor.

- OBD-II general scan tool

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

4	CHECK HARNESS.

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 body.

CHECK ***: Connector & terminal (T6) No. 4 — Body/0.2 V, or more***

YES : Replace rear oxygen sensor.

NO : Repair harness and connector.

NOTE:
In this case, the following are the possible causes.
- Open circuit of 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.

5	CHECK EXHAUST SYSTEM.

CHECK ***: Check the following items.***
- ***Looseness of installation portions***
- ***Damage (crack, hole etc.) of parts***
- ***Looseness and opening of parts between front oxygen sensor and rear oxygen sensor.***

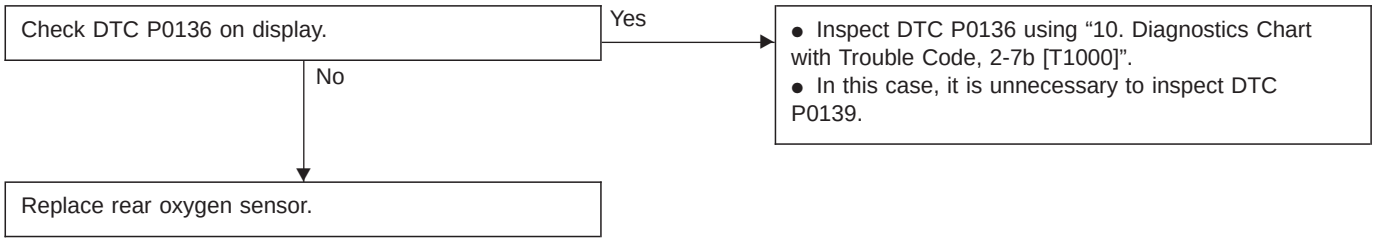
YES : Repair or replace faulty parts.

NO : Replace rear oxygen sensor.

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

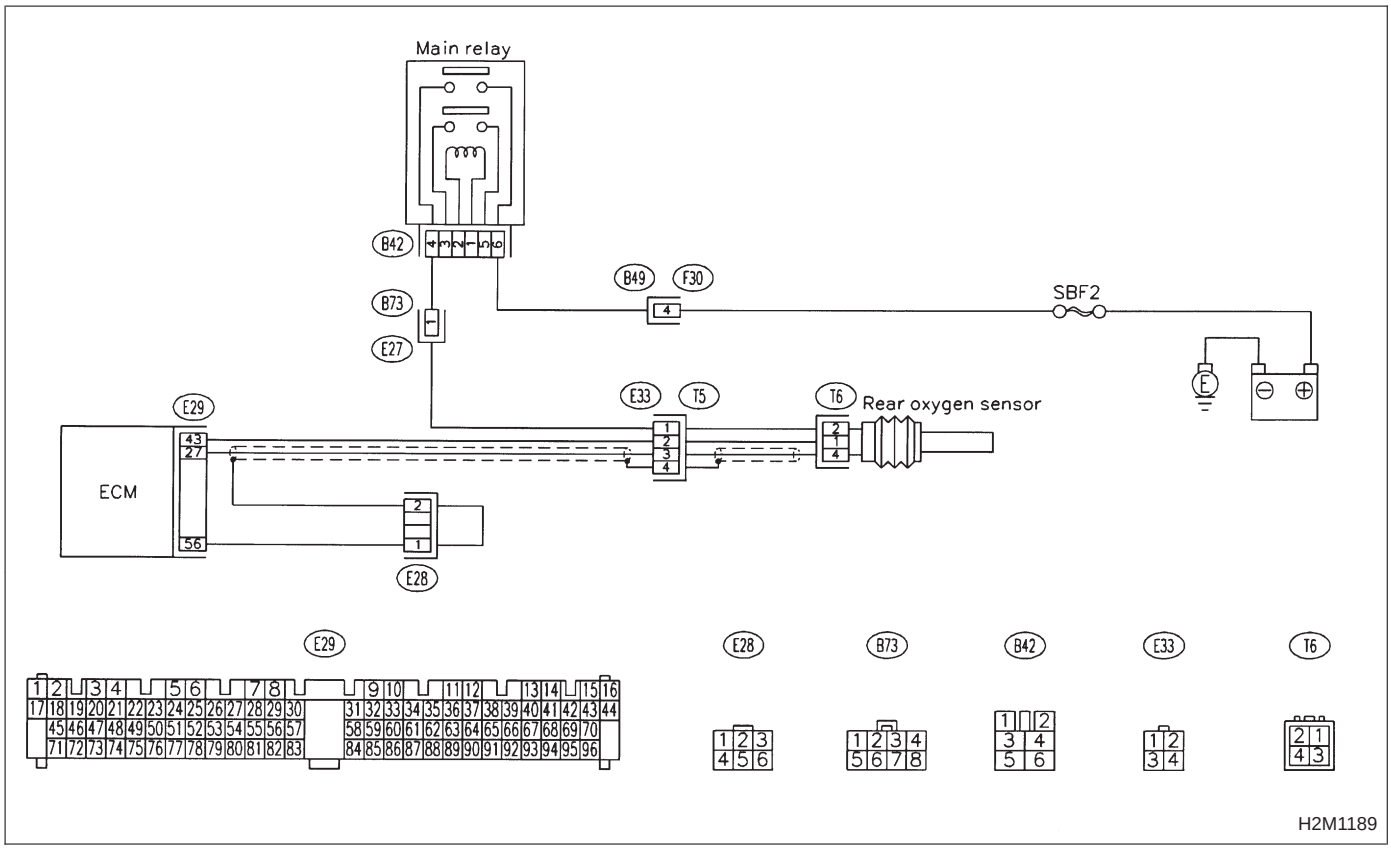
DTC DETECTING CONDITION:

- 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].>

WIRING DIAGRAM:



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

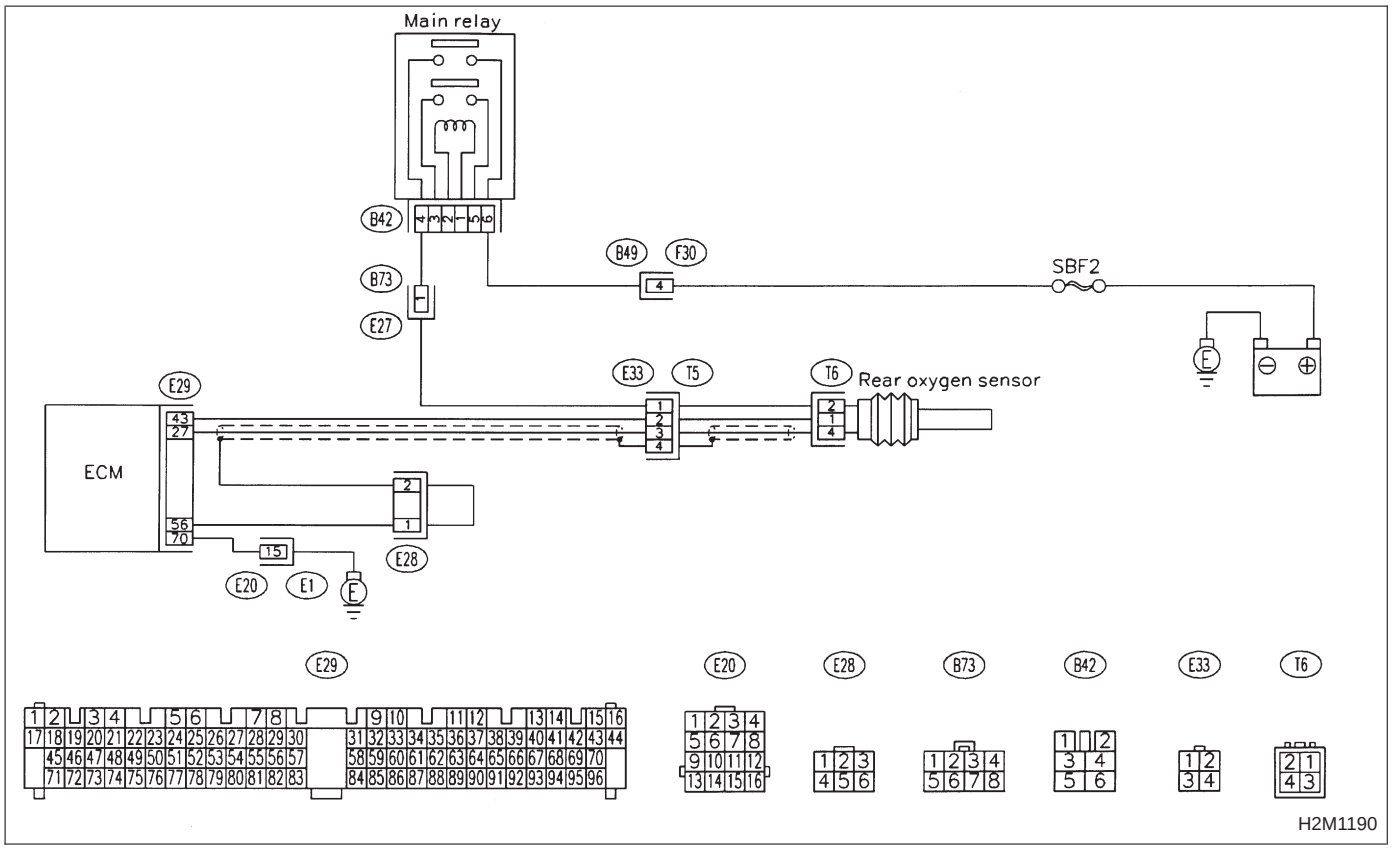
DTC DETECTING CONDITION:

- Two consecutive trips with fault

1.	**Check DTC P0135 on display.**
2.	**Connect Subaru Select Monitor or the OBD-II general scan tool, and read data.**
3.	**Check output signal from ECM. (Using voltage meter.)**
4.	**Check power supply to rear oxygen sensor.**
5.	**Check rear oxygen sensor.**

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

WIRING DIAGRAM:

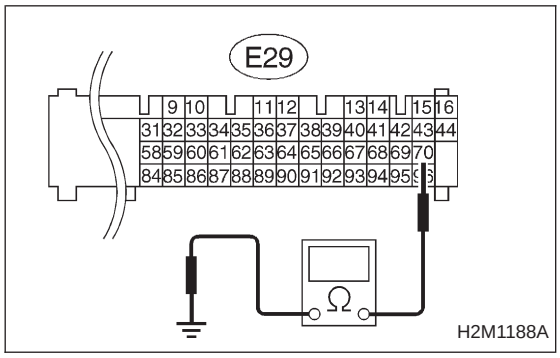


1	CHECK DTC P0135 ON DISPLAY.

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

YES : Go to next step.

NO : Go to step 2.



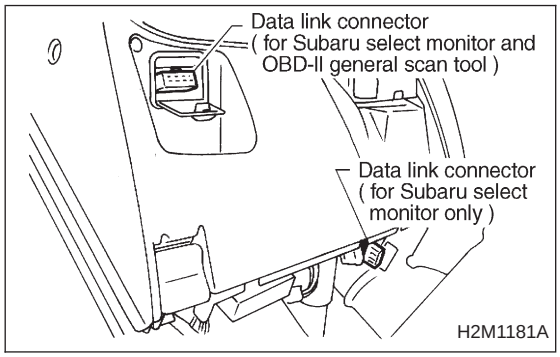
1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness between ECM connector and body.

CHECK : ***Connector & terminal (E29) No. 70 — Body/5 Ω, or less***

YES : Repair poor contact in ECM connector.

NO : Repair harness and connector.

NOTE:
In this case, repair the following items.
- Open circuit of harness between ECM and coupling connector (E20).
- Open circuit of harness between coupling connector (E20) and engine grounding terminal.
- Poor contact in rear oxygen sensor connector.
- Poor contact in rear oxygen sensor connecting harness connector (E33).
- Poor contact in coupling connector (E20).



2	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: F30

- F30: Rear oxygen sensor heater current is indicated.

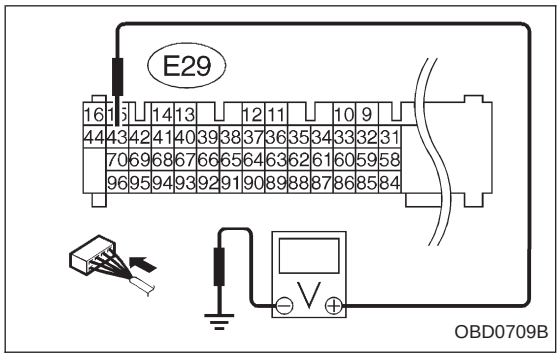
CHECK ***: Is the reading of F30 0.2 A, or more?***

YES : Repair connector.

NOTE:
In this case, poor contact of rear oxygen sensor connector and ECM connector can be the possible cause.

NO : Go to step 3.

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



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

1) Start and idle the engine.
2) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 43 — Body/1.0 V, or less***

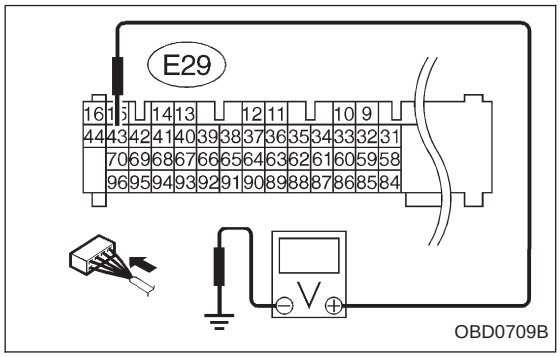
YES : Go to step 4.

NO : Go to next CHECK .

CHECK ***: Is the voltage less than 1.0 V while shaking harness and connector of ECM?***

YES : Repair poor contact in ECM connector.

NO : Go to next step.

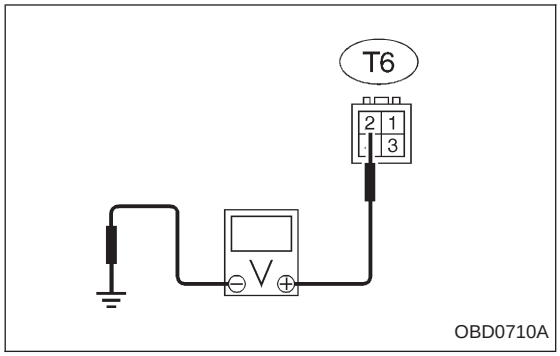


3) Disconnect connector from rear oxygen sensor.
4) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 43 — Body/1.0 V, or less***

YES : Replace ECM.

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



4	CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.

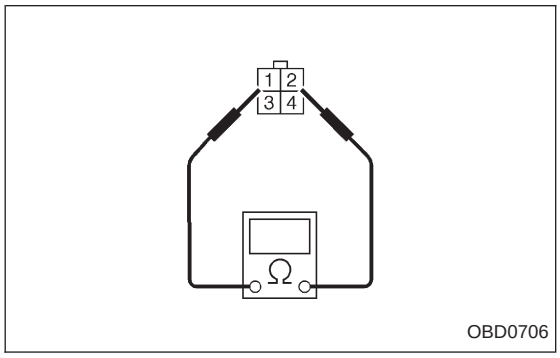
1) Turn ignition switch to OFF.
2) Disconnect connector from rear oxygen sensor.
3) Turn ignition switch to ON.
4) Measure voltage between rear oxygen sensor connector and body.

CHECK ***: Connector & terminal***
(T6) No. 2 — Body/10 V, or more

YES : Go to step 5.

NO : Repair power supply line.

NOTE:
In this case, repair poor contact in connector or open circuit of harness between main relay and rear oxygen sensor.



5	CHECK REAR OXYGEN SENSOR.

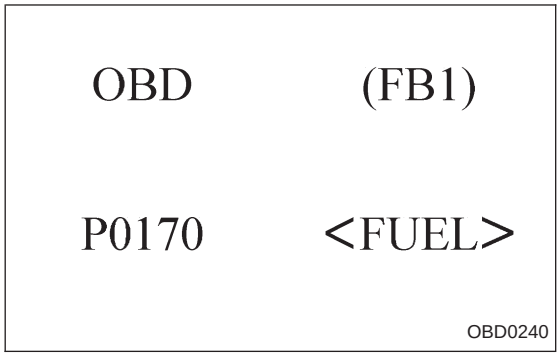
1) Turn ignition switch to OFF.
2) Measure resistance between rear oxygen sensor connector terminals.

CHECK ***: Terminals***
No. 1 — No. 2/30 Ω, or less

YES : Repair harness and connector.

NOTE:
In this case, repair the following.
- Open circuit of harness between rear oxygen sensor connector and ECM connector
- Poor contact in rear oxygen sensor connector
- Poor contact in ECM connector
- Poor contact in rear oxygen sensor connecting harness connector

NO : Replace rear oxygen sensor.



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

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Poor driving performance

1.	**Check exhaust system.**
2.	**Check air intake system.**
3.	**Check fuel pressure.**
4.	**Check engine coolant temperature sensor. <Ref. to F: DTC P0115 2-7b [T10F0].>**
5.	**Check mass air flow sensor.**

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

1	CHECK EXHAUST SYSTEM.

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

YES : Repair exhaust system.

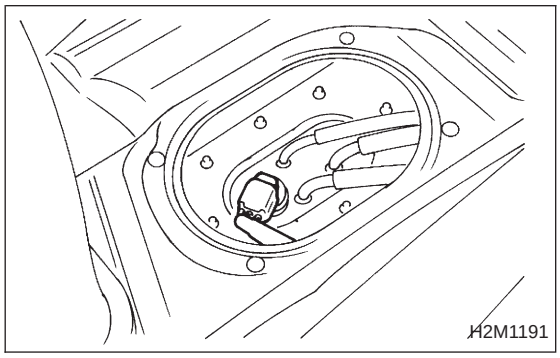
NO : Go to step 2.

2	CHECK AIR INTAKE SYSTEM.

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

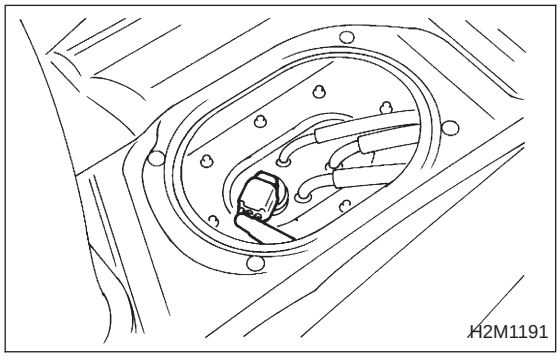
YES : Repair air intake system.

NO : Go to step 3.

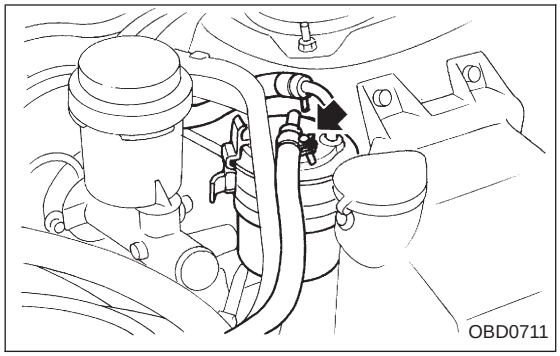


3	CHECK FUEL PRESSURE.

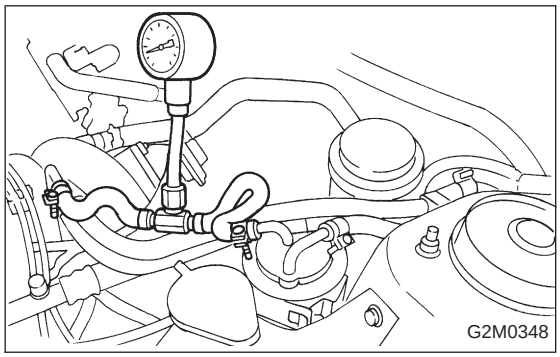
1) Release fuel pressure.
   (1) Remove fuel pump access hole lid located on the right rear of trunk compartment floor (Sedan) or luggage compartment floor (Wagon).
   (2) Disconnect connector from fuel tank.
   (3) Start the engine, and run it until it stalls.
   (4) After stopping the engine, crank the engine for 5 to 7 seconds to reduce fuel pressure.
   (5) Turn ignition switch to OFF.



2) Connect connector to fuel tank.



3) Disconnect fuel delivery hose from fuel filter, and connect fuel pressure gauge.



4) Start the engine and idle while gear position is neutral.
5) Measure fuel pressure while disconnecting pressure regulator vacuum hose from intake manifold.

CHECK ***: Fuel pressure:***
226 — 275 kPa (2.3 — 2.8 kg/cm², 33 — 40 psi)

YES : Go to next step.

NO : Repair the following items.

Fuel pressure too high	● Clogged fuel return line or bent hose
Fuel pressure too low	● Improper fuel pump discharge ● Clogged fuel supply line

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

CHECK ***: Fuel pressure:***
157 — 206 kPa (1.6 — 2.1 kg/cm², 23 — 30 psi)

YES : Go to step 4.

NO : Repair the following items.

Fuel pressure too high	● Faulty pressure regulator ● Clogged fuel return line or bent hose
Fuel pressure too low	● Faulty pressure regulator ● Improper fuel pump discharge ● Clogged fuel supply line

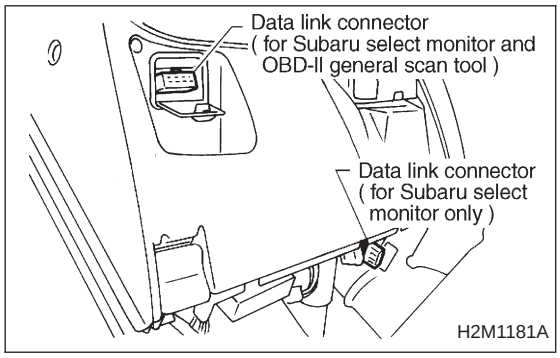
WARNING:
Before removing fuel pressure gauge, release fuel pressure.

NOTE:

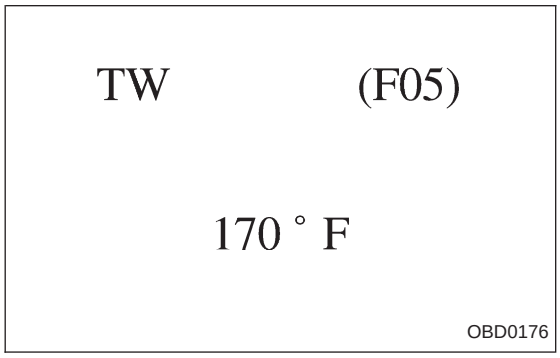
● If fuel pressure does not increase, squeeze fuel return hose 2 to 3 times, then measure fuel pressure again.
● If out of specification as measured at step 6), check or replace pressure regulator and pressure regulator vacuum hose.

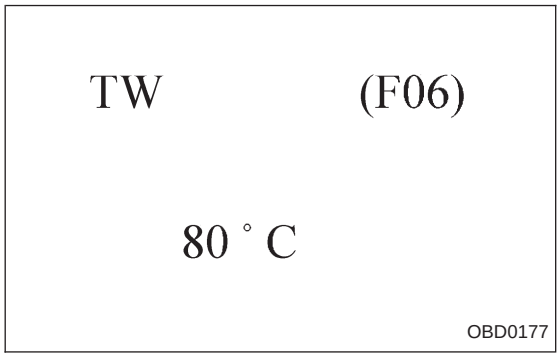
4	**CHECK ENGINE COOLANT TEMPERATURE SENSOR.** **< REF. TO F: DTC P0115, 2-7b [T10F0].>**

1) Turn ignition switch to OFF.



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





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

- Subaru Select Monitor

Designate mode using function key.

Function mode: F05 or F06

- F05: Water temperature is indicated in "°F".
- F06: Water temperature is indicated in "°C".

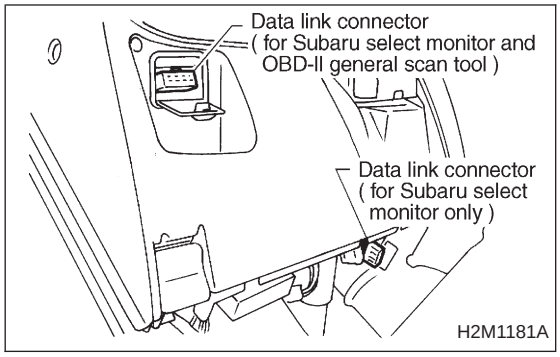
CHECK ***: Is temperature indicated on Subaru Select Monitor (F05) greater than 140°F?***
Is temperature indicated on Subaru Select Monitor (F06) greater than 60°C?

YES : Go to step 5.

NO : Replace engine coolant temperature sensor.

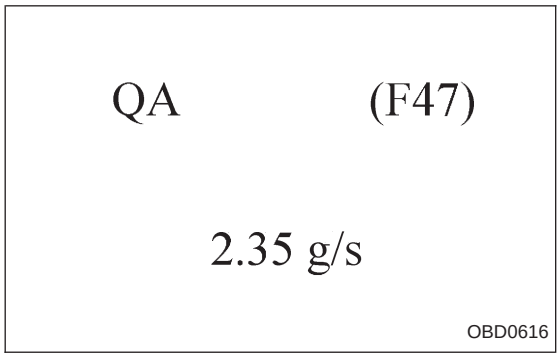
- OBD-II general scan tool

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



5	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: F47

● F47: Mass air flow is shown on display.

CHECK ***: Is the voltage within the specifications shown in the following table?***

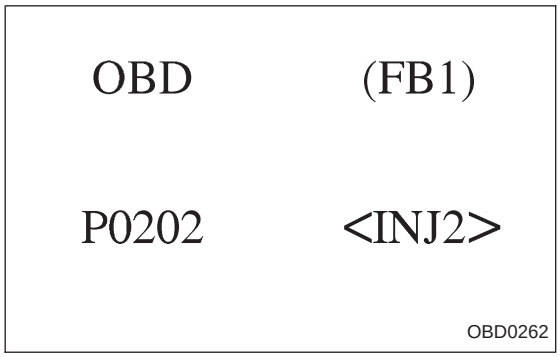
Engine speed	Specified value
Idling	1.9 — 3.6 (g/sec)
2,500 rpm	7.0 — 14.8 (g/sec)

YES : Contact with SOA service.
Note: Inspection by DTM is required.
Probable cause: Deterioration of plural 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.

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



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

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

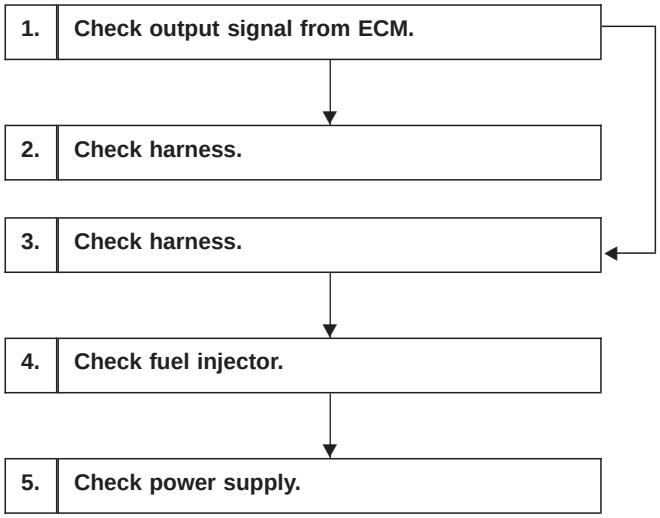
T: DTC P0204
— FUEL INJECTOR CIRCUIT MALFUNCTION - #4 (INJ4) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

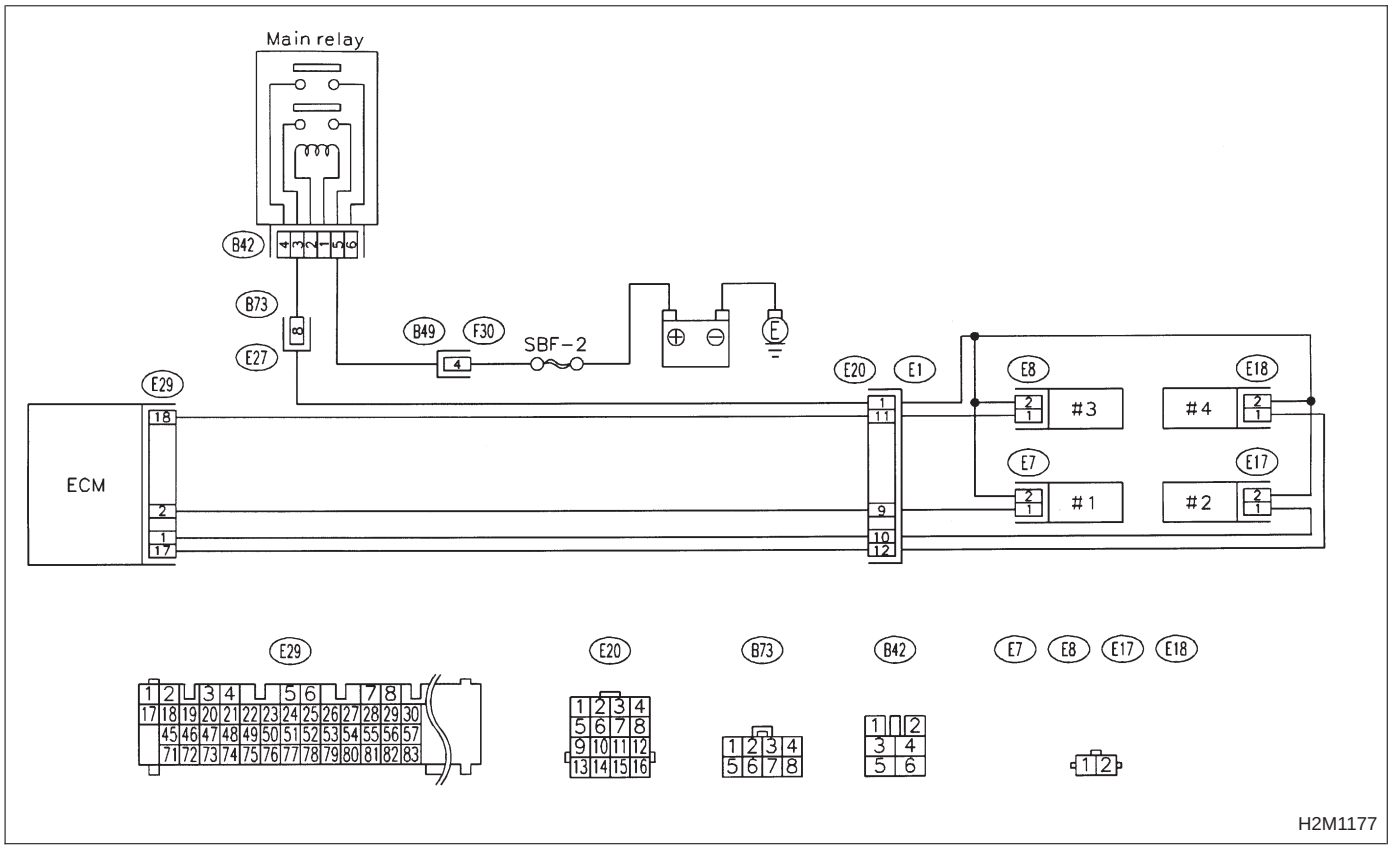
TROUBLE SYMPTOM:

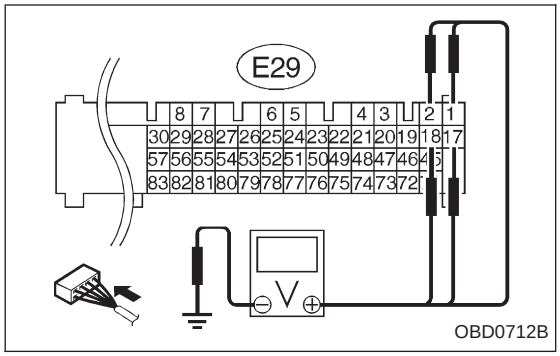
- Failure of engine to start
- Engine stalls.
- Erroneous idling
- Rough driving



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

WIRING DIAGRAM:



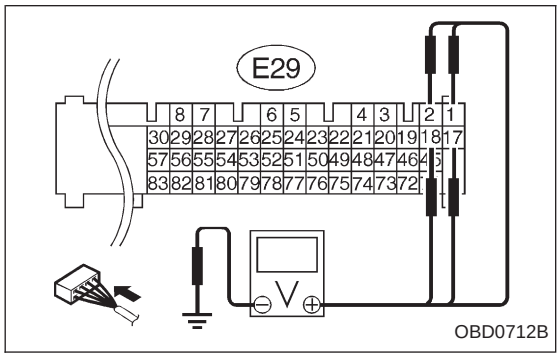


1	CHECK OUTPUT SIGNAL FROM ECM.

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

CHECK ***: Connector & terminal***
#1 (E29) No. 2 — Body/10 V, or more
#2 (E29) No. 1 — Body/10 V, or more
#3 (E29) No. 18 — Body/10 V, or more
#4 (E29) No. 17 — Body/10 V, or more

YES : Go to step 2.
NO : Go to step 3.

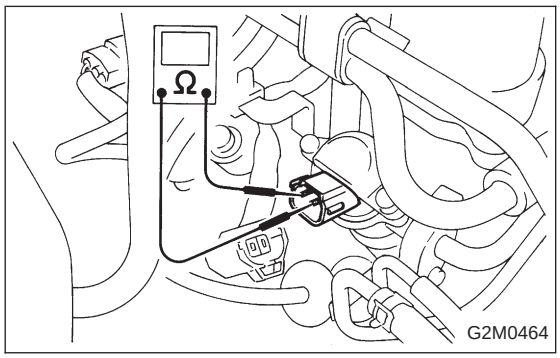


2	CHECK HARNESS.

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 body on faulty cylinders.

CHECK ***: Connector & terminal***
#1 (E29) No. 2 — Body/10 V, or more
#2 (E29) No. 1 — Body/10 V, or more
#3 (E29) No. 18 — Body/10 V, or more
#4 (E29) No. 17 — Body/10 V, or more

YES : Repair short circuit of harness between ECM and fuel injector. After repair, replace ECM.
NO : Go to next step.

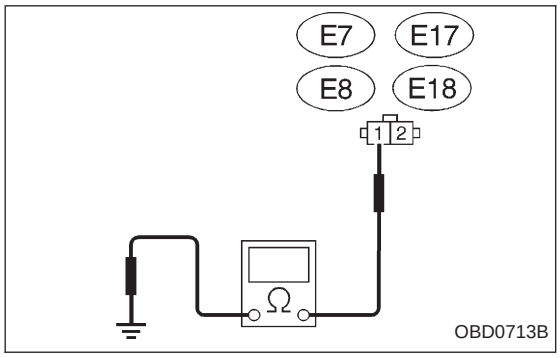


5) Turn ignition switch to OFF.
6) Measure resistance between fuel injector terminals on faulty cylinder.

CHECK ***: Terminals***
No. 1 — No. 2/1 Ω, or less

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.

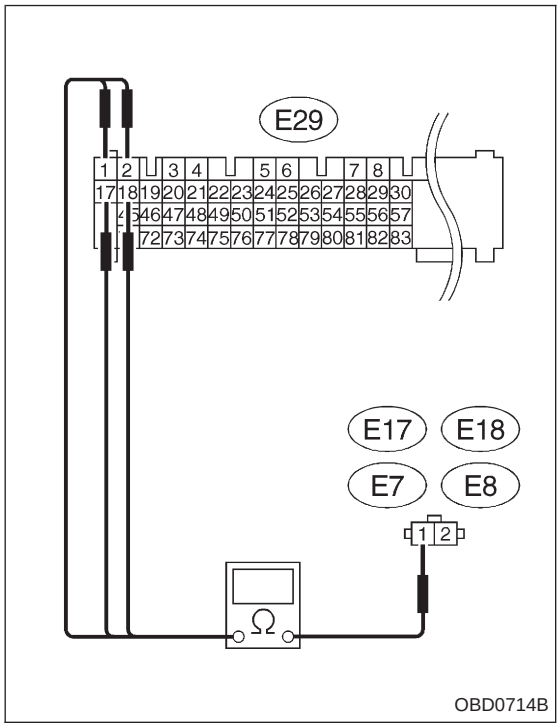


3	CHECK HARNESS.

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

CHECK ***: Connector & terminal***
#1 (E7) No. 1 — Body/10 Ω, or less
#2 (E17) No. 1 — Body/10 Ω, or less
#3 (E8) No. 1 — Body/10 Ω, or less
#4 (E18) No. 1 — Body/10 Ω, or less

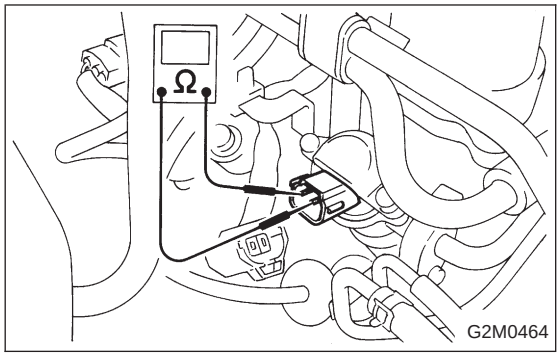
YES : Repair short circuit of harness between fuel injector and body.
NO : Go to the next step.



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

CHECK ***: Connector & terminal***
#1 (E29) No. 2 — (E7) No. 1/1 Ω, or less
#2 (E29) No. 1 — (E17) No. 1/1 Ω, or less
#3 (E29) No. 18 — (E8) No. 1/1 Ω, or less
#4 (E29) No. 17 — (E18) No. 1/1 Ω, or less

YES : Go to step 4.
NO : Repair open circuit of harness between ECM and fuel injector.



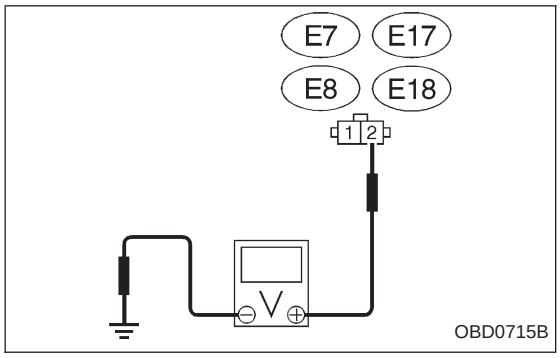
4	CHECK FUEL INJECTOR.

Measure resistance between fuel injector terminals on faulty cylinder.

CHECK ***: Terminals***
No. 1 — No. 2/5 — 20 Ω

YES : Go to step 5.

NO : Replace faulty fuel injector.



5	CHECK POWER SUPPLY.

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

CHECK ***: Connector & terminal***
#1 (E7) No. 2 — Body/10 V, or more
#2 (E17) No. 2 — Body/10 V, or more
#3 (E8) No. 2 — Body/10 V, or more
#4 (E18) No. 2 — Body/10 V, or more

YES : Check for poor contact of all connectors in WIRING DIAGRAM on page 151.

NO : Check and repair the following items.
- Open circuit of harness between main relay and fuel injector for faulty cylinders
- Poor contact in main relay connector
- Poor contact in fuel injector connector for the faulty cylinders

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

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

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

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

DTC DETECTING CONDITION:

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

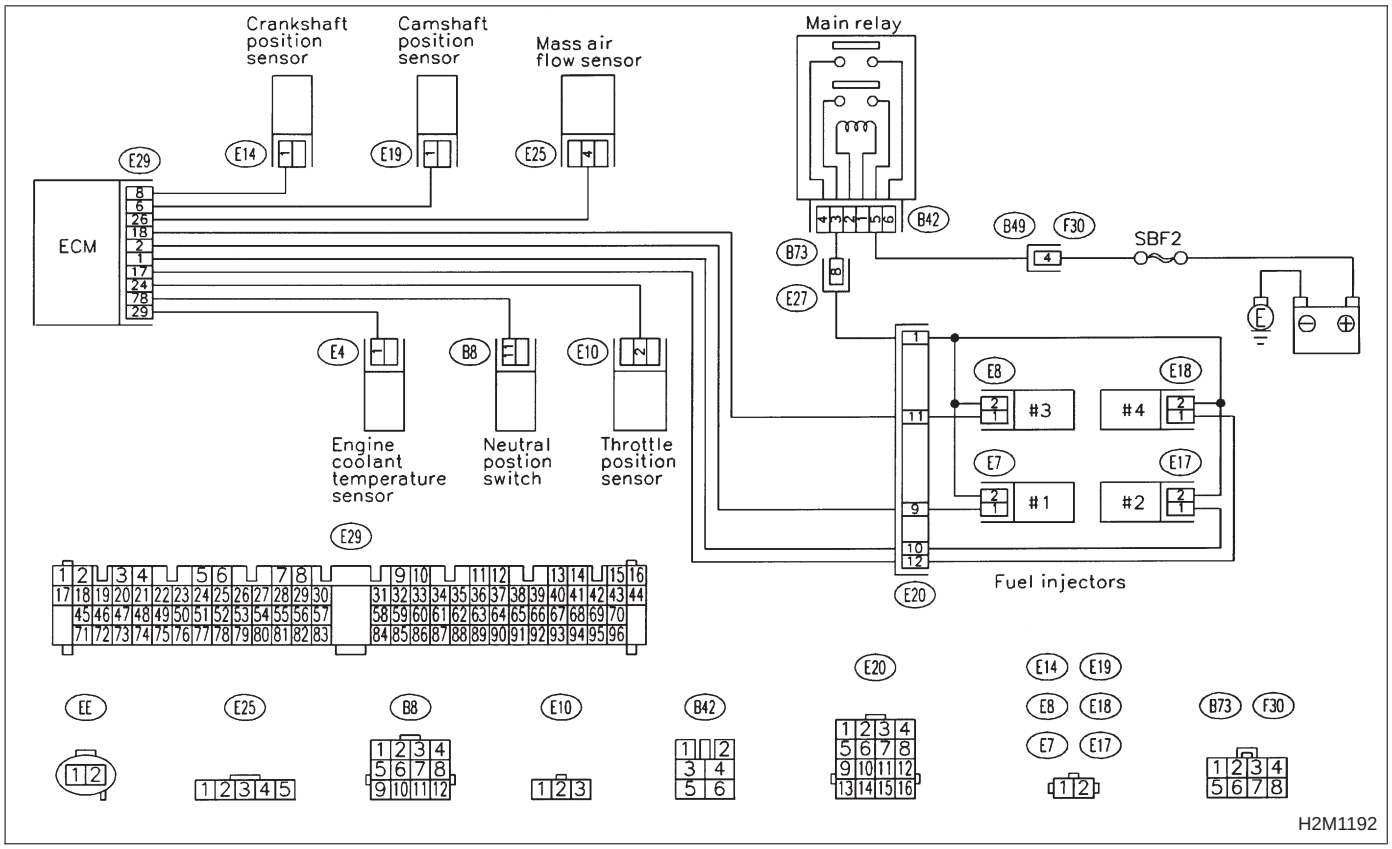
TROUBLE SYMPTOM:

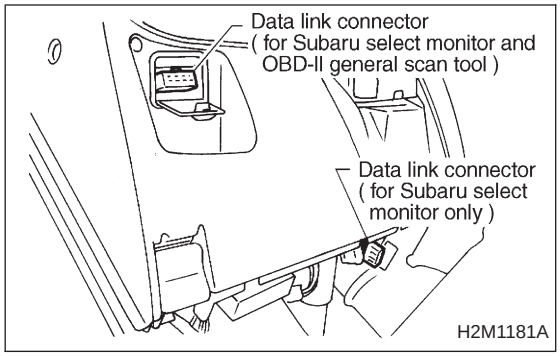
- Engine stalls.
- Erroneous idling
- Rough driving

1.	Check DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203, P0204 and P0400 on display.	Yes	• Inspect DTC P0100, P0101, P0115, P0125, P0201, P0202, P0203, P0204 and P0400 using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”. • In this case, it is unnecessary to inspect DTC P0301, P0302, P0303 and P0304.
	No		
2.	**Connect Subaru Select Monitor and read data.**		
3.	**Check air intake system.**		
4.	**Check misfire symptom.**		

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

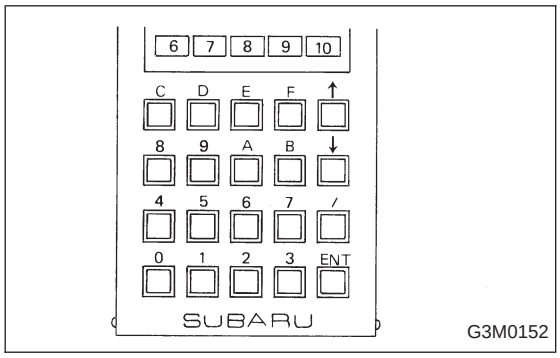
WIRING DIAGRAM:



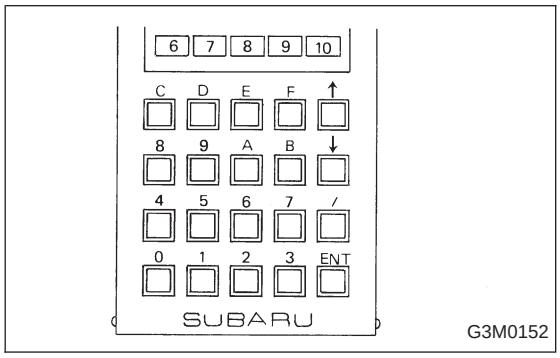


2	CONNECT SUBARU SELECT MONITOR AND READ DATA.

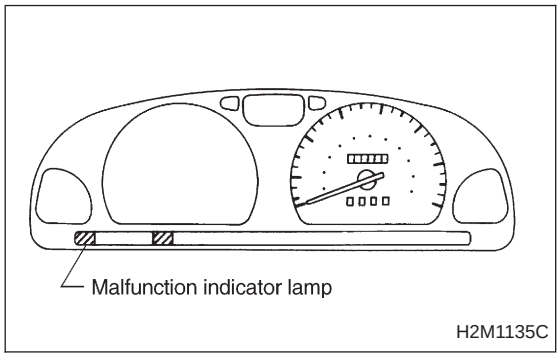
1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor to the data link connector.
3) Turn ignition switch to ON, and turn Subaru Select Monitor switch to ON.



4) Read data on Subaru Select Monitor.
Designate mode use function key.
Function mode: F38
NOTE:
F38: Minimum EGR system pressure value is indicated.



5) Clear memory on Subaru Select Monitor.
Designate mode use function key.
Press [F], [C], [0], [ENT] in that order.



6) Start engine, and drive the vehicle more than 10 minutes.

CHECK ***: Is the MIL coming on or blinking?***
YES : Go to step 3.
NO : Go to next CHECK .

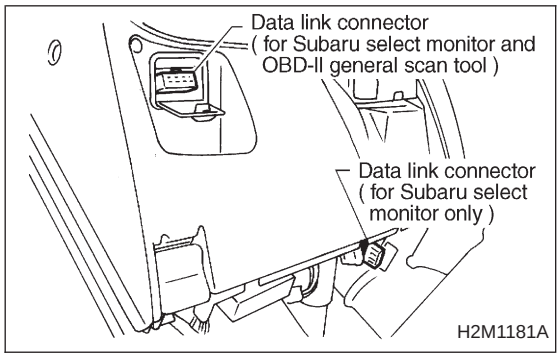
CHECK ***: The vehicle has been empty of fuel.***
YES : ● The engine has no abnormality.
● Finish diagnostics operation.
NO : Go to next CHECK .
CHECK ***: Check if the cause of misfire was made when the engine is running.***
Ex. Remove spark plug cord, etc.
YES : ● The engine has no abnormality.
● Finish diagnostics operation.
NO : Repair poor contact in ignitor, ignition coil, fuel injector, ECM and coupling harness connector.

3	CHECK AIR INTAKE SYSTEM.

CHECK : ***Check the following items.***
① Are there air leaks or air suction caused by loose or dislocated nuts and bolts?
② Are there cracks or any disconnection of hoses?

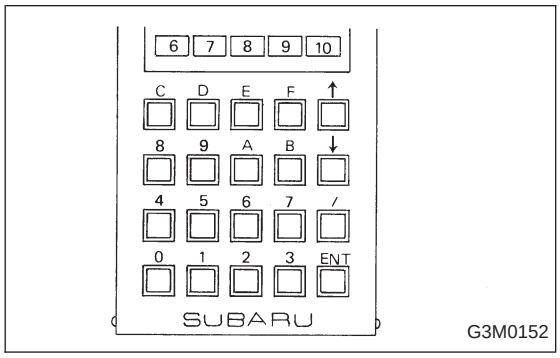
YES : Repair air intake system.

NO : Go to step 4.



4	CHECK MISFIRE SYMPTOM.

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



3) Turn ignition switch to ON, and turn Subaru Select Monitor or OBD-II general scan tool switch to ON.
4) Read diagnostic trouble code (DTC).
● Subaru Select Monitor
Designate mode use function key.
Function mode: FB1

● OBD-II general scan tool

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

NOTE:
Perform diagnosis according to the items listed below.

DTC	Next CHECK
Only one cylinder	Go to step ①.
P0301 and P0302	Go to step ②.
P0303 and P0304	Go to step ③.
P0301 and P0303	Go to step ④.
P0302 and P0304	Go to step ⑤.
Others	Go to step ⑥.

① ONLY ONE CYLINDER

CHECK ***: Check the following items for that cylinder.***
- ***Spark plug***
- ***Spark plug cord***
- ***Fuel injector***
- ***Compression ratio***

② GROUP OF #1 AND #2 CYLINDERS

CHECK ***: Check the following items for #1 and #2 cylinders.***
- ***Spark plugs***
- ***Fuel injectors***
- ***Ignition coil***

NOTE:
If no abnormal is discovered, check for “8. F: IGNITION SYSTEM” of #1 and #2 cylinders side.

③ GROUP OF #3 AND #4 CYLINDERS

CHECK ***: Check the following items for #3 and #4 cylinders.***
- ***Spark plugs***
- ***Fuel injectors***
- ***Ignition coil***

NOTE:
If no abnormal is discovered, check for “8. F: IGNITION SYSTEM” of #3 and #4 cylinders side.

④ GROUP OF #1 AND #3 CYLINDERS

CHECK ***: Check the following items for #1 and #3 cylinders.***
- ***Spark plugs***
- ***Fuel injectors***
- ***Skipping timing belt teeth***

⑤ **GROUP OF #2 AND #4 CYLINDERS**

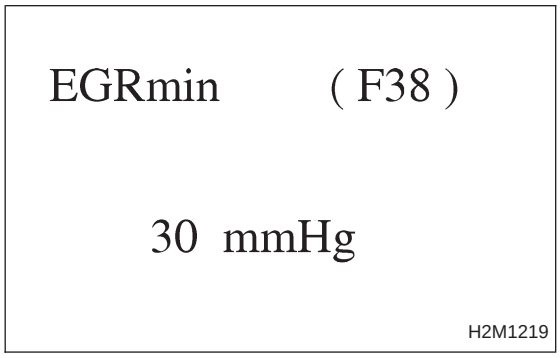
CHECK ***: Check the following items for #2 and #4 cylinders.***
- ***Spark plugs***
- ***Fuel injectors***
- ***Skipping timing belt teeth***

⑥ **THE CYLINDER AT RANDOM**

CHECK ***: Is the engine idle rough?***

YES : Go to next CHECK .

NO : Go to DTC P0170, 2-7b [T10P3], [T10P4] and [T10P5].



CHECK ***: Is the minimum EGR system pressure value (value of function mode (F38) less than 10 mmHg?***

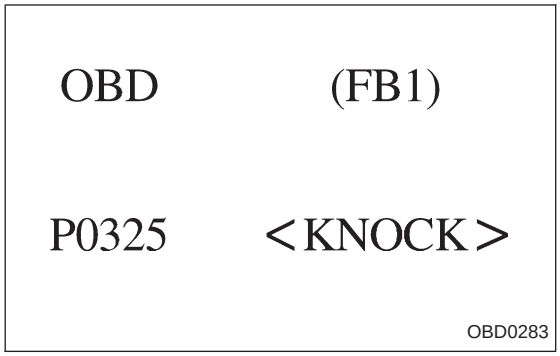
NOTE:
Use the value read in step 2 for function mode F38.

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 [T10P3], [T10P4] and [T10P5].



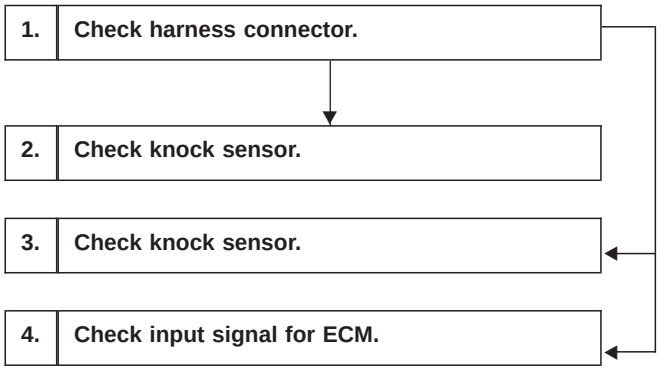
Y: DTC P0325 — KNOCK SENSOR CIRCUIT MALFUNCTION (KNOCK) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

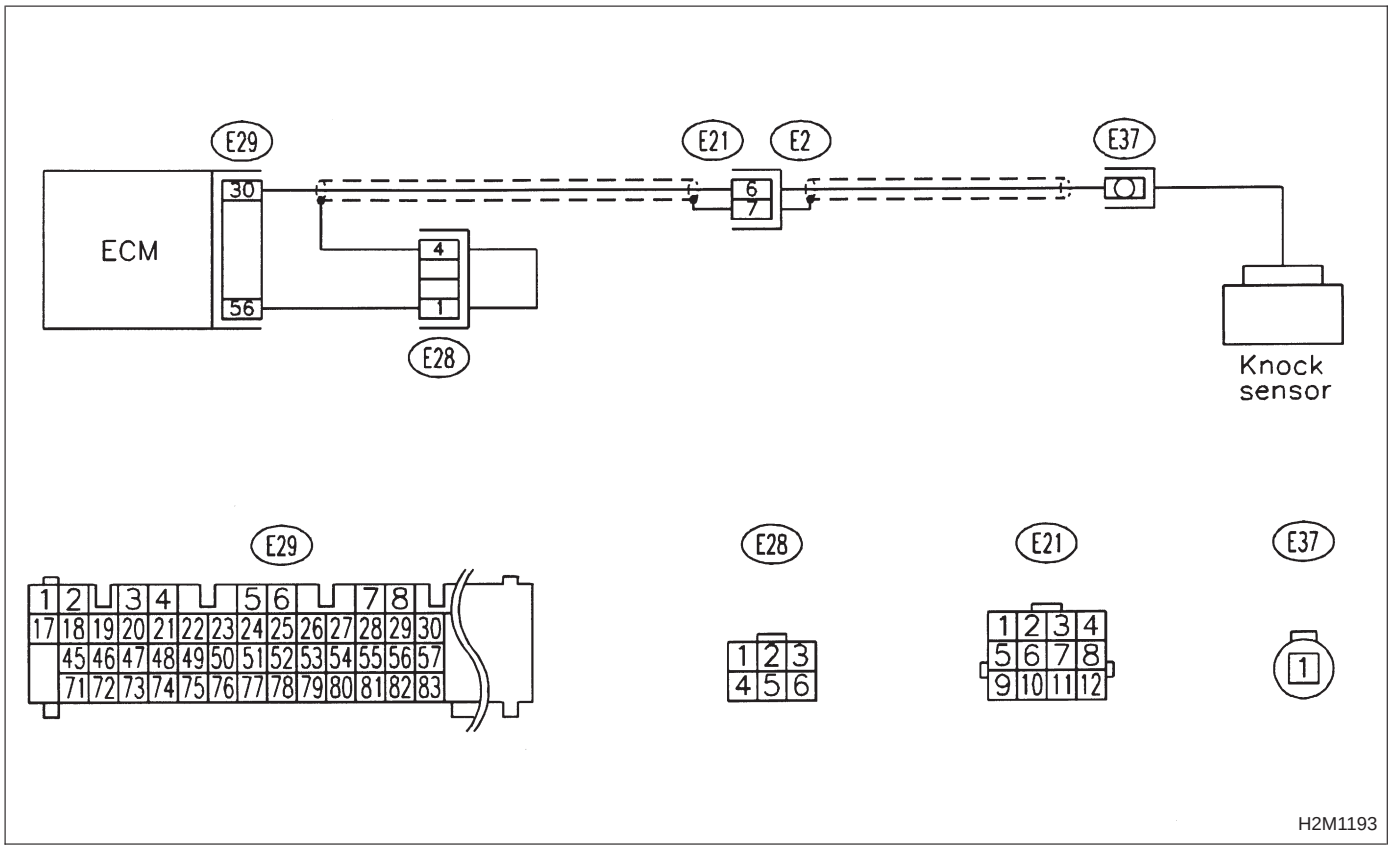
TROUBLE SYMPTOM:

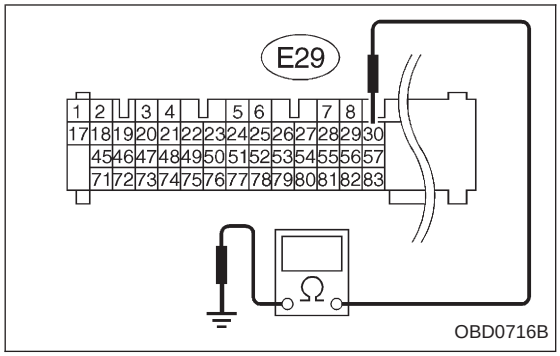
- Poor driving performance
- Knocking occurs.

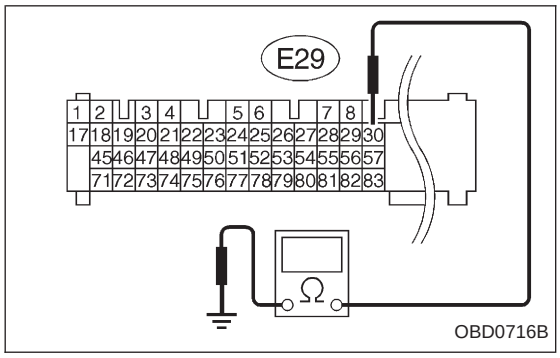


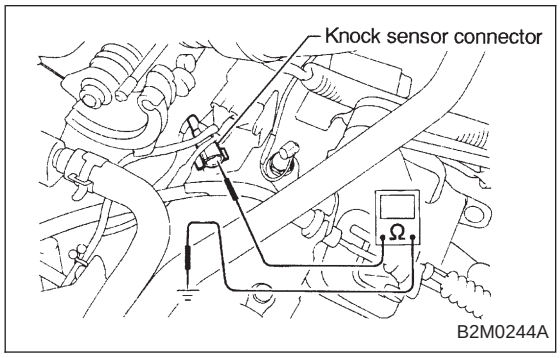
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:









1	CHECK HARNESS CONNECTOR.

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

CHECK : ***Connector & terminal (E29) No. 30 — Body/700 kΩ, or more***

YES : Go to step 2.

NO : Go to next CHECK .

CHECK : ***Connector & terminal (E29) No. 30 — Body/400 kΩ, or less***

YES : Go to step 3.

NO : Go to step 4.

2	CHECK KNOCK SENSOR.

1) Disconnect connector from knock sensor.
2) Measure voltage between knock sensor connector and body.

CHECK : ***Connector & terminal (E37) No. 1 — Body/700 kΩ, or more***

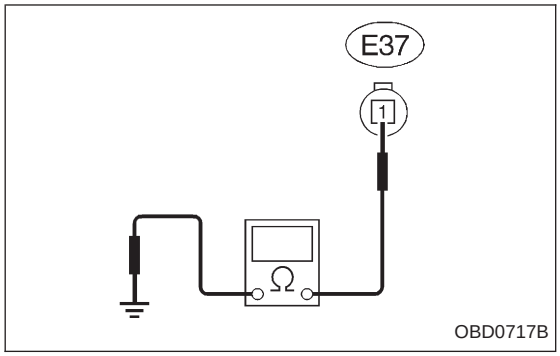
YES : Go to next CHECK .

NO : Check and repair the following items.
- Open circuit of the harness between knock sensor connector and ECM connector
- Poor contact of the knock sensor connector
- Poor contact of coupling connector (E21)

CHECK : ***Check for secure tightening of the knock sensor installation bolt.***

YES : Replace knock sensor.

NO : Tighten knock sensor installation bolt securely.



3	CHECK KNOCK SENSOR.

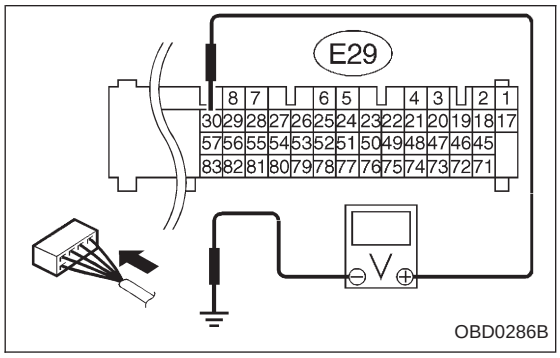
1) Disconnect connector from knock sensor.
2) Measure resistance of harness between knock sensor connector and body.

CHECK ***: Connector & terminal (E37) No. 1 — Body/400 kΩ, or less***

YES : Replace knock sensor.

NO : Repair short circuit of harness between knock sensor connector and ECM connector.

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



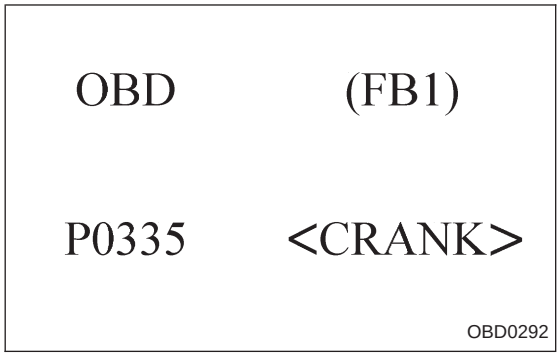
4	CHECK INPUT SIGNAL FOR ECM.

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

CHECK ***: Connector & terminal (E29) No. 30 — Body/2 V, or more***

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.)
Check and repair the following connectors.
- Knock sensor connector
- ECM connector
- Coupling connector (E21)

NO : Repair poor contact in ECM connector.



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

DTC DETECTING CONDITION:

- Immediately at fault recognition

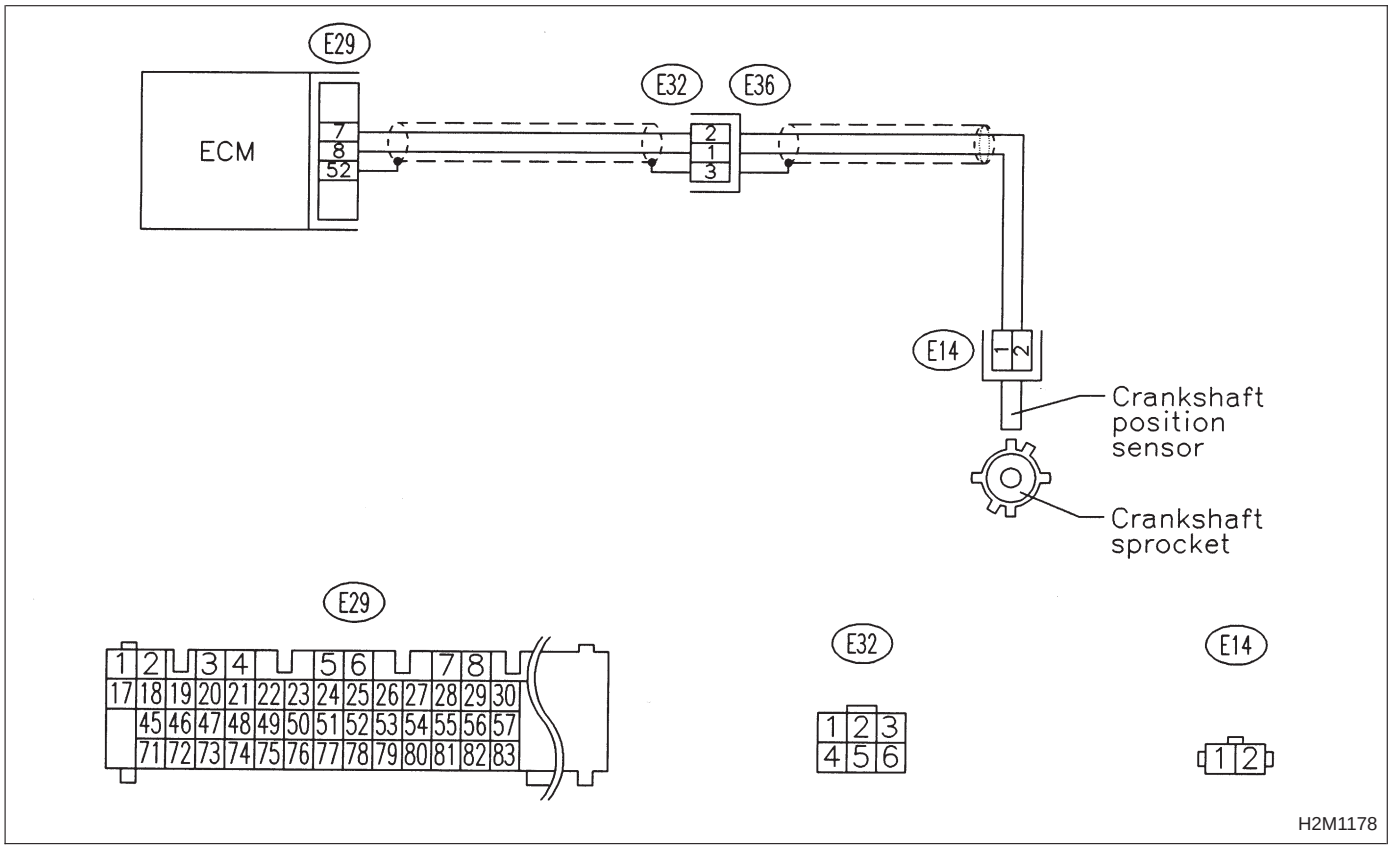
TROUBLE SYMPTOM:

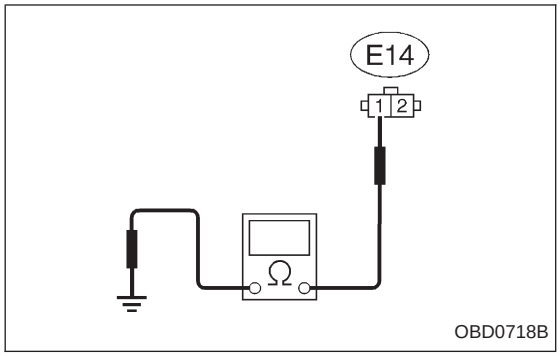
- Engine stalls.
- Failure of engine to start

1.	Check harness.
2.	Check crankshaft position sensor.

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

WIRING DIAGRAM:





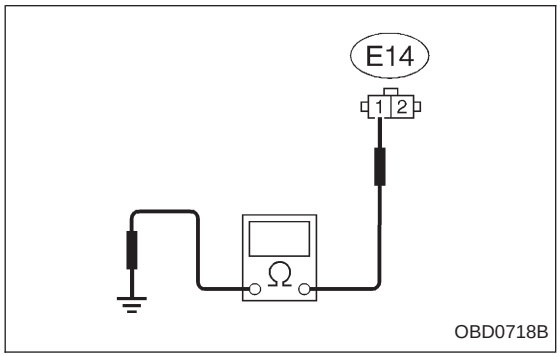
1	CHECK HARNESS.

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

CHECK ***: Connector & terminal (E14) No. 1 — Body/100 kΩ, or more***

YES : Check and repair the following items.
- Open circuit of harness between crankshaft position sensor connector and ECM connector
- Poor contact in ECM connector
- Poor contact in the coupling connector (E32)

NO : Go to next CHECK .

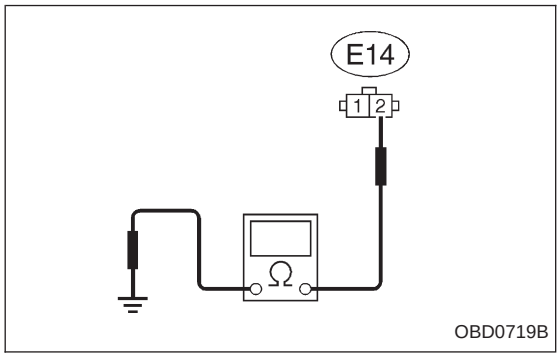


CHECK ***: Connector & terminal (E14) No. 1 — Body/10 Ω, or less***

YES : Repair short circuit of harness between crankshaft position sensor connector and ECM connector.

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

NO : Go to next CHECK .



CHECK ***: Connector & terminal (E14) No. 2 — Body/5 Ω, or less***

YES : Go to step 2.

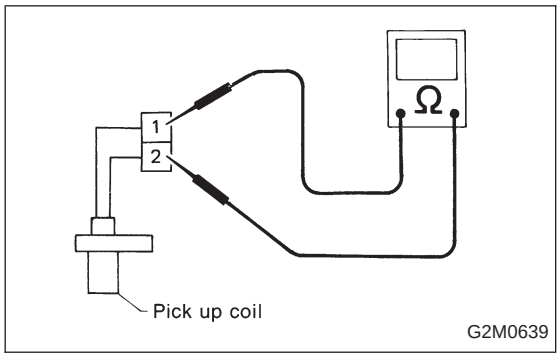
NO : Check and repair the following items.
- Open circuit of harness between crankshaft position sensor connector and ECM connector
- Poor contact in ECM connector
- Poor contact in the coupling connector (E32)

2	CHECK CRANKSHAFT POSITION SENSOR.

CHECK ***: Check for secure tightening of the installation bolts of the crankshaft position sensor.***

YES : Go to the next step.

NO : Tighten securely.



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

CHECK ***: Terminals***
No. 1 — No. 2/1 — 4 kΩ

YES : Repair poor contact in crankshaft position sensor connector.

NO : Replace crankshaft position sensor.

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

DTC DETECTING CONDITION:

- Immediately at fault recognition

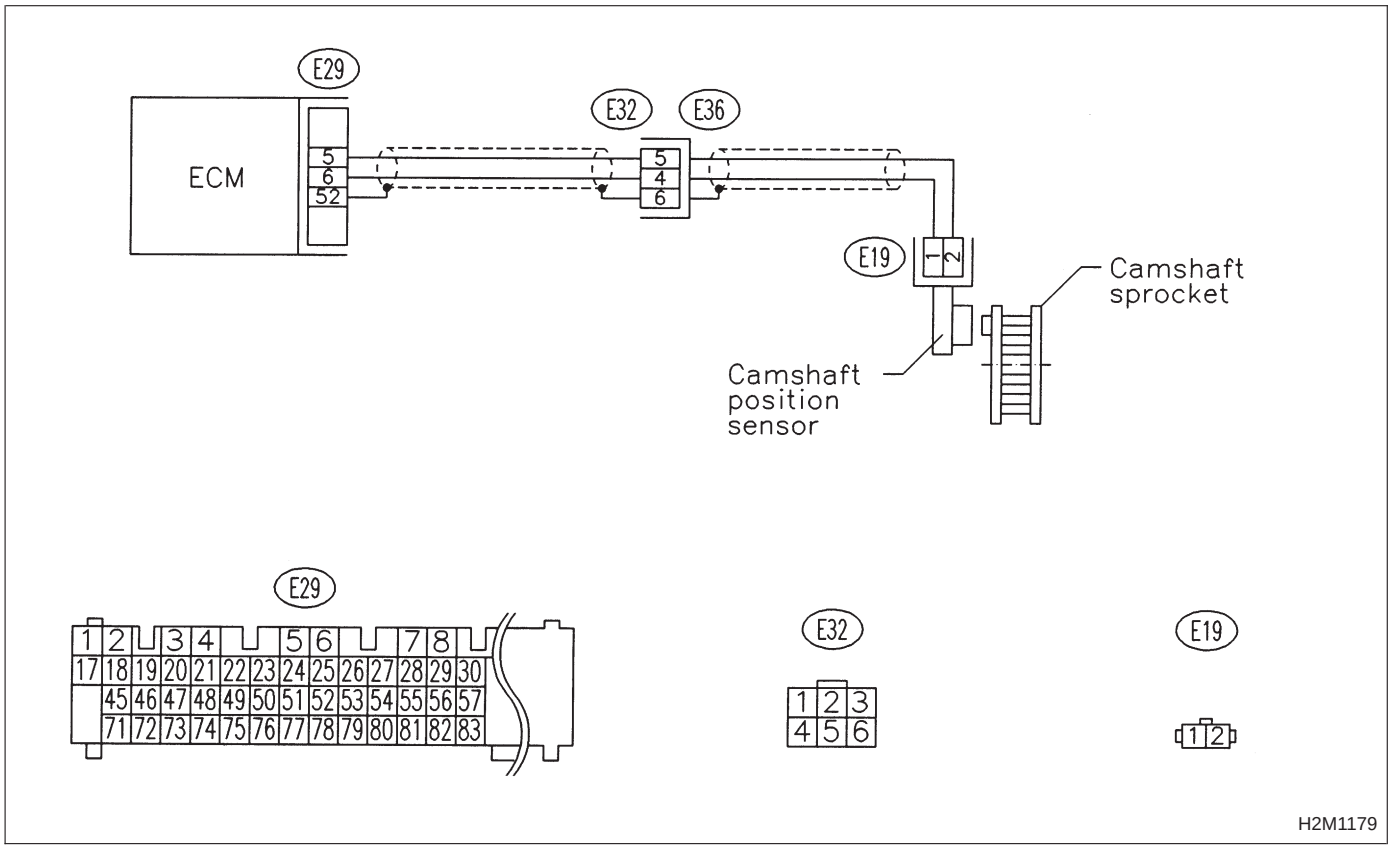
TROUBLE SYMPTOM:

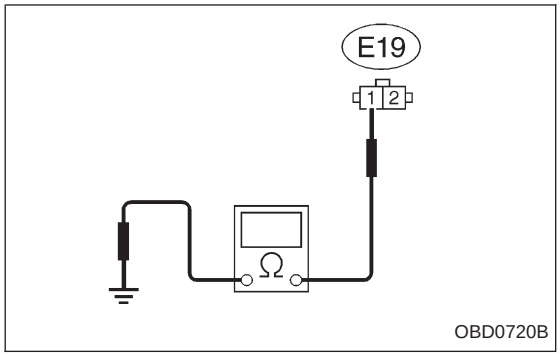
- Engine stalls.
- Failure of engine to start

1.	Check harness.
2.	Check camshaft position sensor.

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

WIRING DIAGRAM:





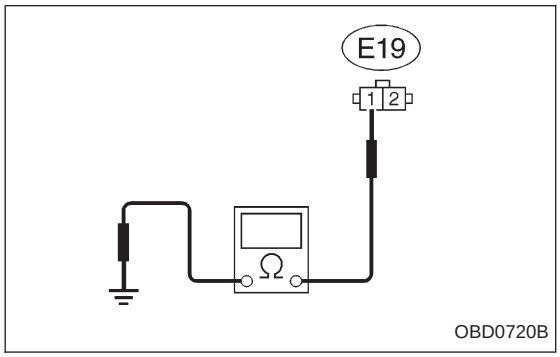
1	CHECK HARNESS.

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

CHECK ***: Connector & terminal (E19) No. 1 — Body/100 kΩ, or more***

YES : Check and repair the following items.
- Open circuit of harness between camshaft position sensor connector and ECM connector
- Poor contact in ECM connector
- Poor contact in the coupling connector (E32)

NO : Go to next CHECK .

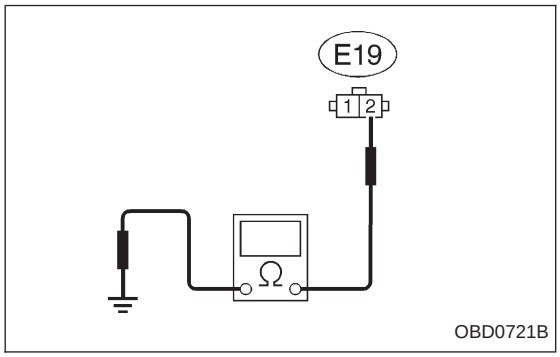


CHECK ***: Connector & terminal (E19) No. 1 — Body/10 Ω, or less***

YES : Repair short circuit of harness between camshaft position sensor connector and ECM connector.

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

NO : Go to next CHECK .



CHECK ***: Connector & terminal (E19) No. 2 — Body/5 Ω, or less***

YES : Go to step 2.

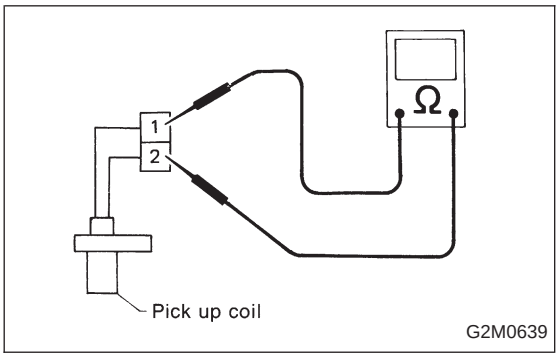
NO : Check and repair the following items.
- Open circuit of harness between camshaft position sensor connector and ECM connector
- Poor contact in ECM connector
- Poor contact in the coupling connector (E32)

2	CHECK CAMSHAFT POSITION SENSOR.

CHECK ***: Check for secure tightening of the installation bolts of the camshaft position sensor.***

YES : Go to the next step.

NO : Tighten securely.



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

CHECK ***: Terminals***
No. 1 — No. 2/1 — 4 kΩ

YES : Repair poor contact in camshaft position sensor connector.

NO : Replace camshaft position sensor.

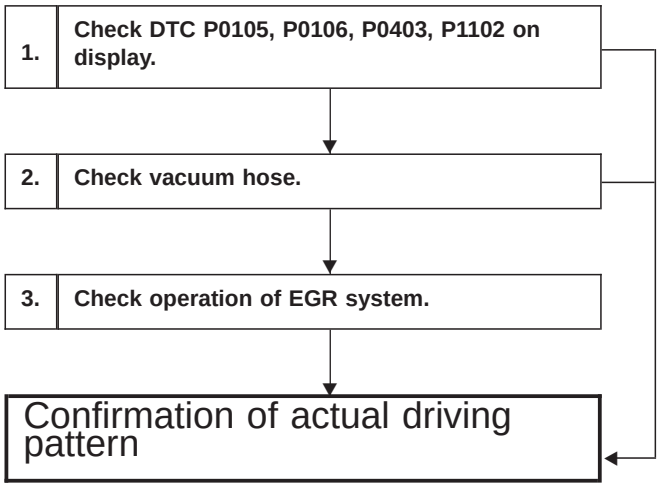
AB: DTC P0400 — EXHAUST GAS RECIRCULATION FLOW MALFUNCTION (EGR) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

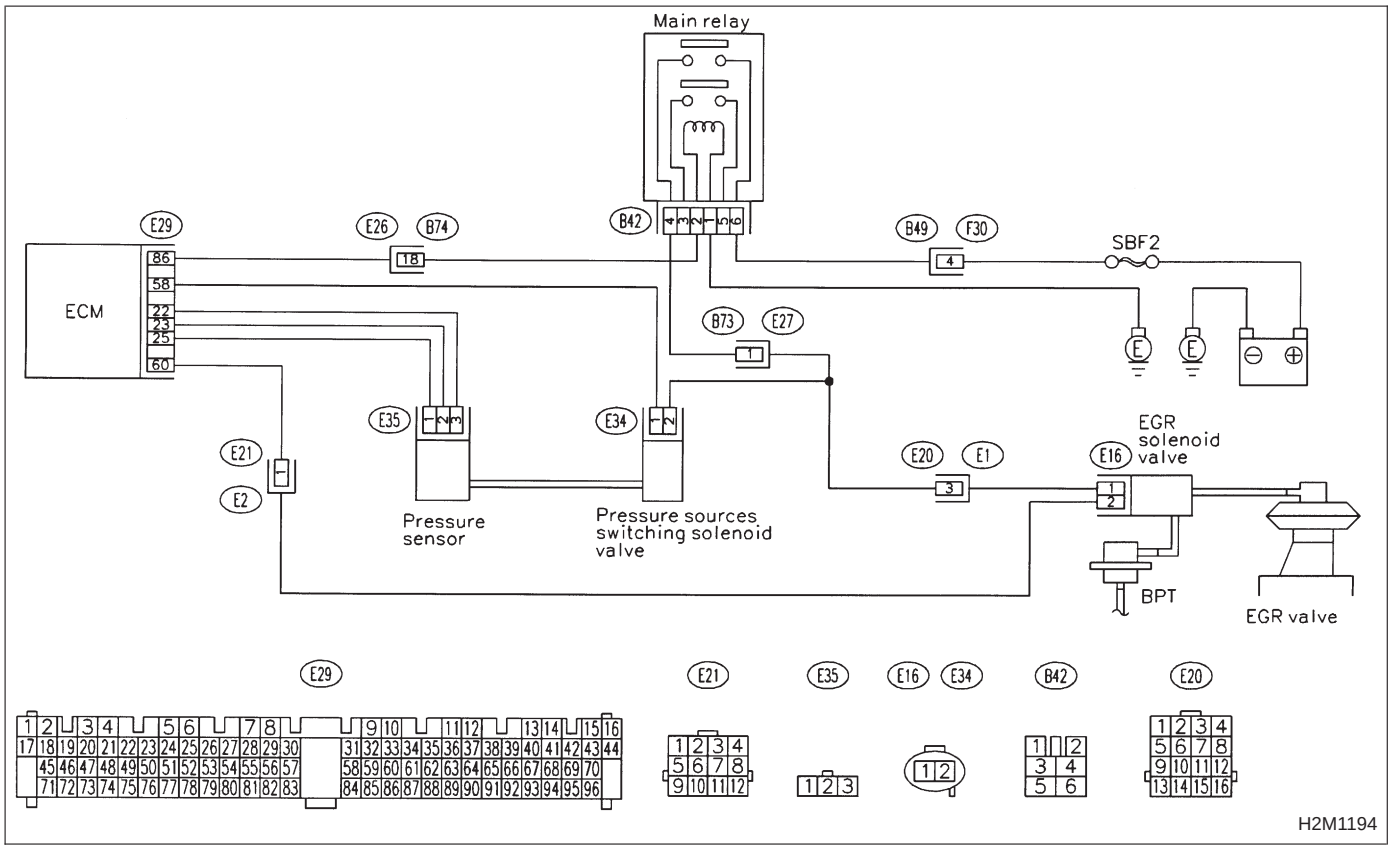
- Poor driving performance on low engine speed



CAUTION:

Before confirmation of actual driving pattern, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:



1	**CHECK DTC P0105, P0106, P0403, P1102 ON DISPLAY.**

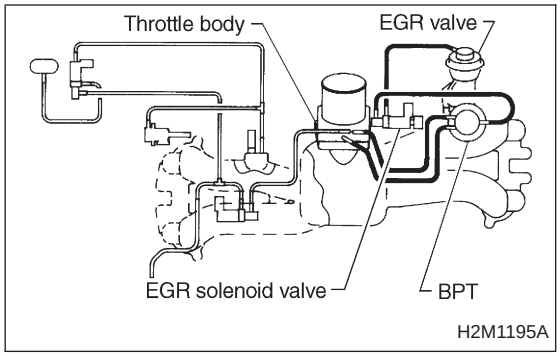
CHECK ***: Check that Subaru Select Monitor or OBD-II general scan tool shows P0105, P0106, P0403 and P1102.***

YES : ● Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”.
● Manually check that EGR valve diaphragm is not stuck.
● In this case, inspection of DTC P0400 is not necessary after the above items.

WARNING:
Be careful when checking EGR valve, since it may be extremely hot.

After checking the above item, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

NO : Go to step 2.



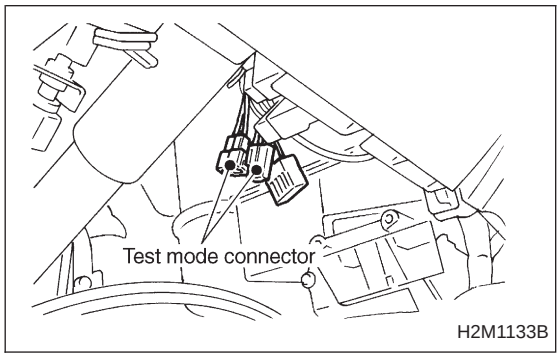
2	CHECK VACUUM HOSE.

CHECK : ***Check vacuum hoses for disconnection, leakage and clogging.***

YES : Check and repair the following items.
- Two lines of pipes and hoses running between throttle body and BPT
- Pipe and hose line connecting BPT and EGR solenoid valve
- Hose between EGR solenoid valve and EGR valve
- BPT pressure transmitting hose

And after the checking and repairing, go to **CONFIRMATION OF ACTUAL DRIVING PATTERN**.

NO : Go to step 3.



3	CHECK OPERATION OF EGR SYSTEM.

1) Turn ignition switch to OFF.
2) Connect the test mode connector.
3) Turn ignition switch to ON.

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

NO : Replace EGR solenoid valve.

YES : Go to next step.

4) Turn ignition switch to OFF.
5) Disconnect connector from EGR solenoid valve.
6) Connect 12 V battery's ground ⊖ terminal to one terminal of the EGR solenoid valve. Then connect 12 V battery's ⊕ terminal to the other terminal of it.

CAUTION:
Do not use the 12 V battery installed in the vehicle, because the electrical system may be damaged.

7) Start the engine.

CHECK ***: Open throttle valve by 5 to 10 degrees and visually check EGR valve operation.***

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?***

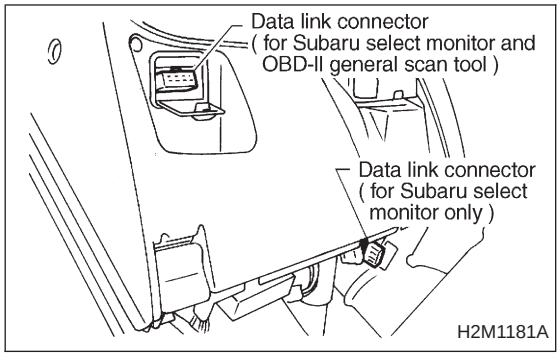
YES : Repair or replace intake manifold or cylinder head. And go to **CONFIRMATION OF ACTUAL DRIVING PATTERN.**

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.

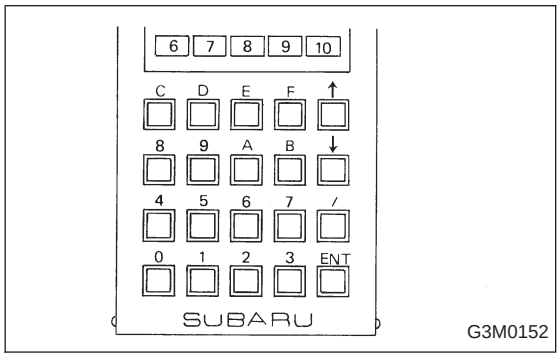
NOTE:

- 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.

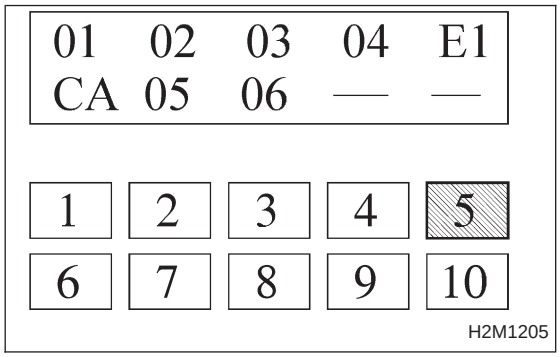


CONFIRMATION OF ACTUAL DRIVING PATTERN.

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

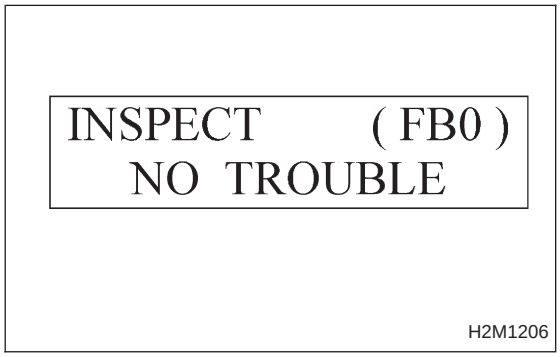


5) Designate mode using function key.
Function mode: FA4



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

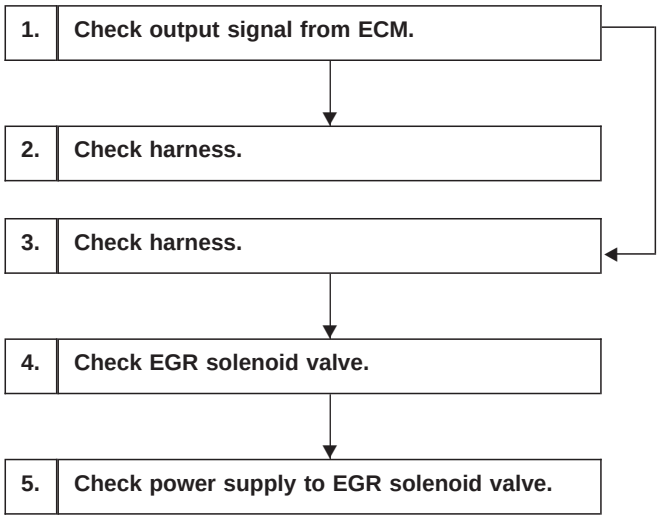
AC: DTC P0403 — EXHAUST GAS RECIRCULATION CIRCUIT MALFUNCTION (EGRSOL) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

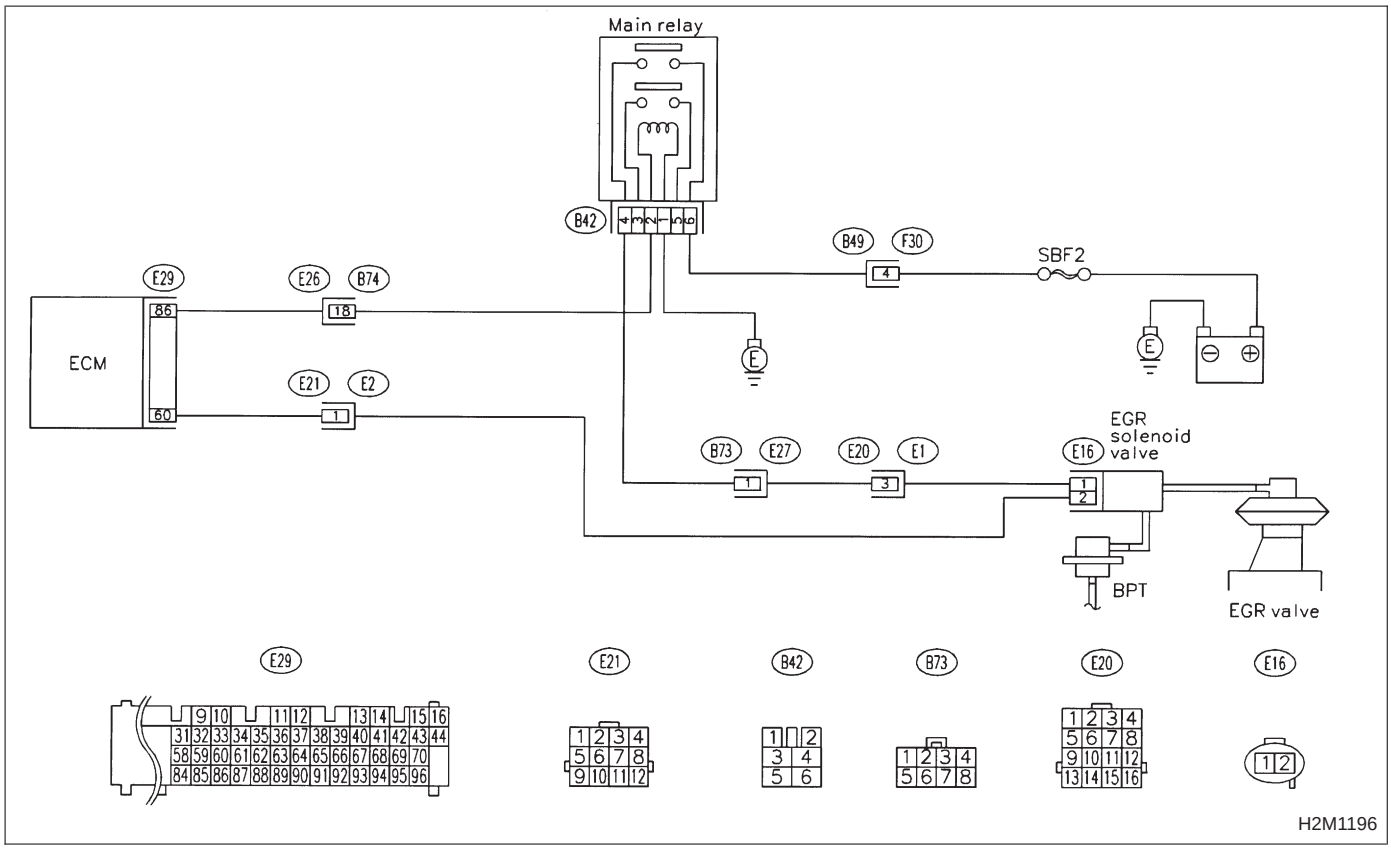
TROUBLE SYMPTOM:

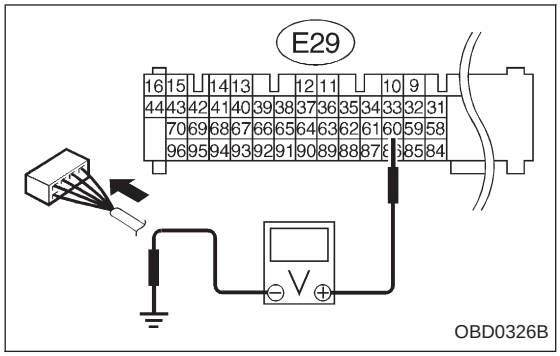
- Poor driving performance on low engine speed



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

WIRING DIAGRAM:





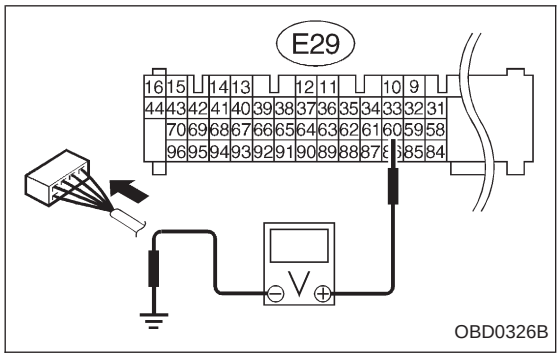
1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure signal voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 60 — Body / 10 V, or more***

YES : Go to step 2.

NO : Go to step 3.



2	CHECK HARNESS.

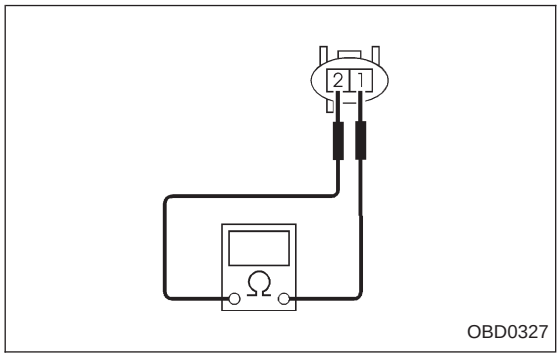
1) Turn ignition switch to OFF.
2) Disconnect connector from EGR solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 60 — Body / 10 V, or more***

YES : Repair short circuit of harness and replace ECM.

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

NO : Go to next step.



5) Turn ignition switch to OFF.
6) Measure resistance between EGR solenoid valve terminals.

CHECK ***: Terminals No. 1 — No. 2/1 Ω, or less***

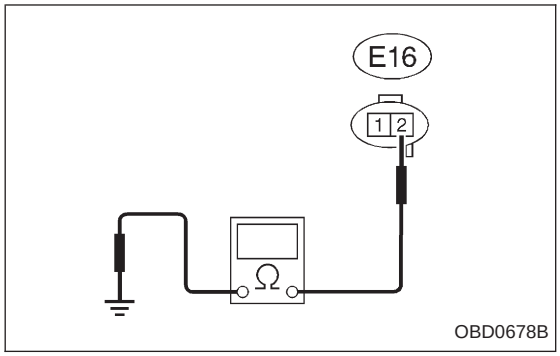
YES : Replace EGR solenoid valve and ECM.

NO : Go to next CHECK .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



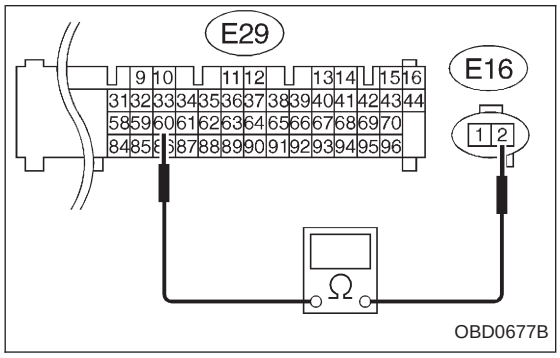
3	CHECK HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connectors from EGR solenoid valve and ECM.
3) Measure resistance of harness connector between EGR solenoid valve and body.

CHECK : ***Connector & terminal***
(E16) No. 2 — Body / 10 Ω, or less

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

NO : Go to the next step.

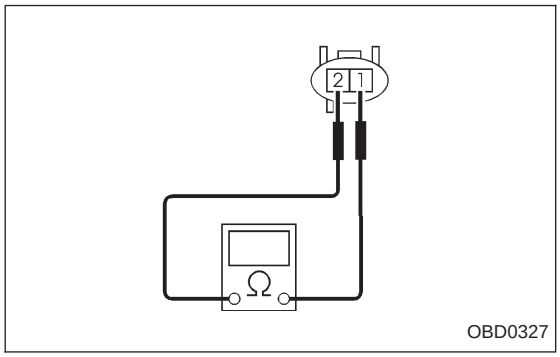


4) Measure resistance of harness connector between ECM and EGR solenoid valve.

CHECK : ***Connector & terminal***
(E29) No. 60 — (E16) No. 2 / 1 Ω, or less

YES : Go to step 4.

NO : Repair open circuit of harness between ECM connector and EGR solenoid valve connector.



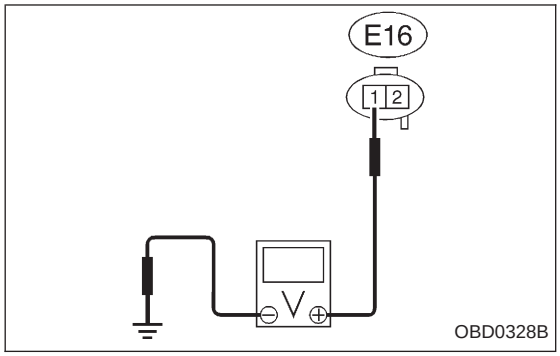
4	CHECK EGR SOLENOID VALVE.

Measure resistance between connector terminals of EGR solenoid valve.

CHECK : ***Terminals***
No. 1 — No. 2 / 10 — 100 Ω

YES : Go to step 5.

NO : Replace EGR solenoid valve.



5	CHECK POWER SUPPLY TO EGR SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between EGR solenoid valve harness connector and body.

CHECK ***: Connector & terminal (E16) No. 1 — Body / 10 V, or more***

YES : Confirm good connection at EGR solenoid valve connector.

NO : Repair open circuit of harness between main relay connector and EGR solenoid valve connector.

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

DTC DETECTING CONDITION:

- Immediately at fault recognition

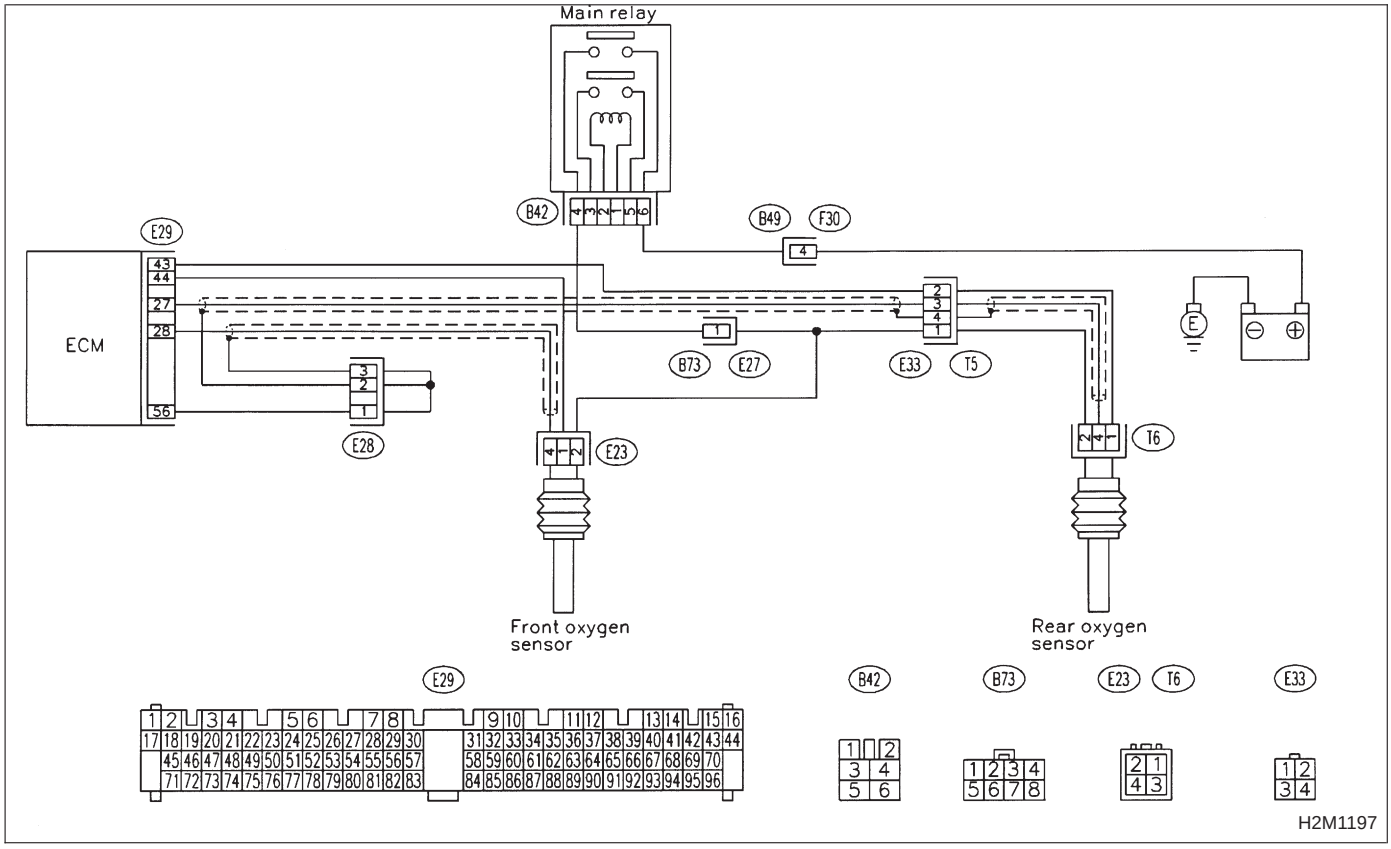
TROUBLE SYMPTOM:

- Engine stalls.
- Idle mixture is out of specifications.

1.	**Check any other DTC P0130, P0133, P0135, P0136, P0139 and P0141 on display.**
2.	**Check exhaust system.**
3.	**Check rear catalytic converter.**

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

WIRING DIAGRAM:



1	CHECK ANY OTHER DTC P0130, P0133, P0135, P0136, P0139 AND P0141 ON DISPLAY.

CHECK : ***Check that Subaru Select Monitor or the OBD-II general scan tool shows P0130, P0133, P0135, P0136, P0139 and P0141.***

YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”. Inspection of P0420 is not necessary after above.

NO : Go to step 2.

2	CHECK EXHAUST SYSTEM.

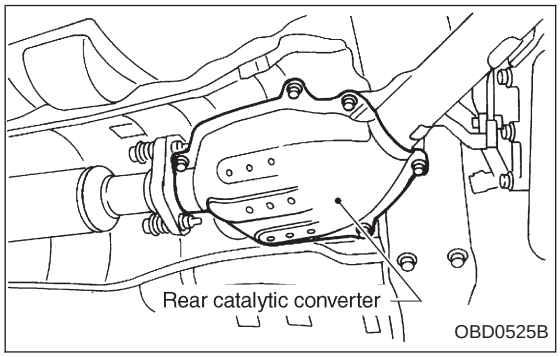
Check for gas leaks or air suction caused by loose or dislocated nuts and bolts, and open hole at exhaust pipes.

CHECK : ***Check the following position of exhaust system.***

- ***Between cylinder head and front exhaust pipe.***
- ***Between front exhaust pipe and front catalytic converter.***
- ***Between front catalytic converter and rear catalytic converter.***

YES : Repair or replace exhaust system.

NO : Go to step 3.



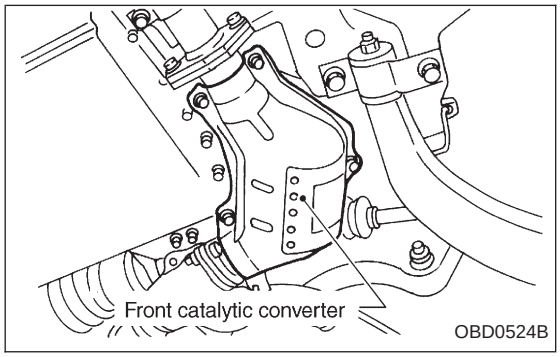
3	CHECK REAR CATALYTIC CONVERTER.

1) Separate rear catalytic converter from rear exhaust pipe.

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

YES : Replace front and rear catalytic converters.

NO : Go to next step.



2) Remove front catalytic converter.

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

If there is damage in front catalyst, replace front catalytic converter.

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

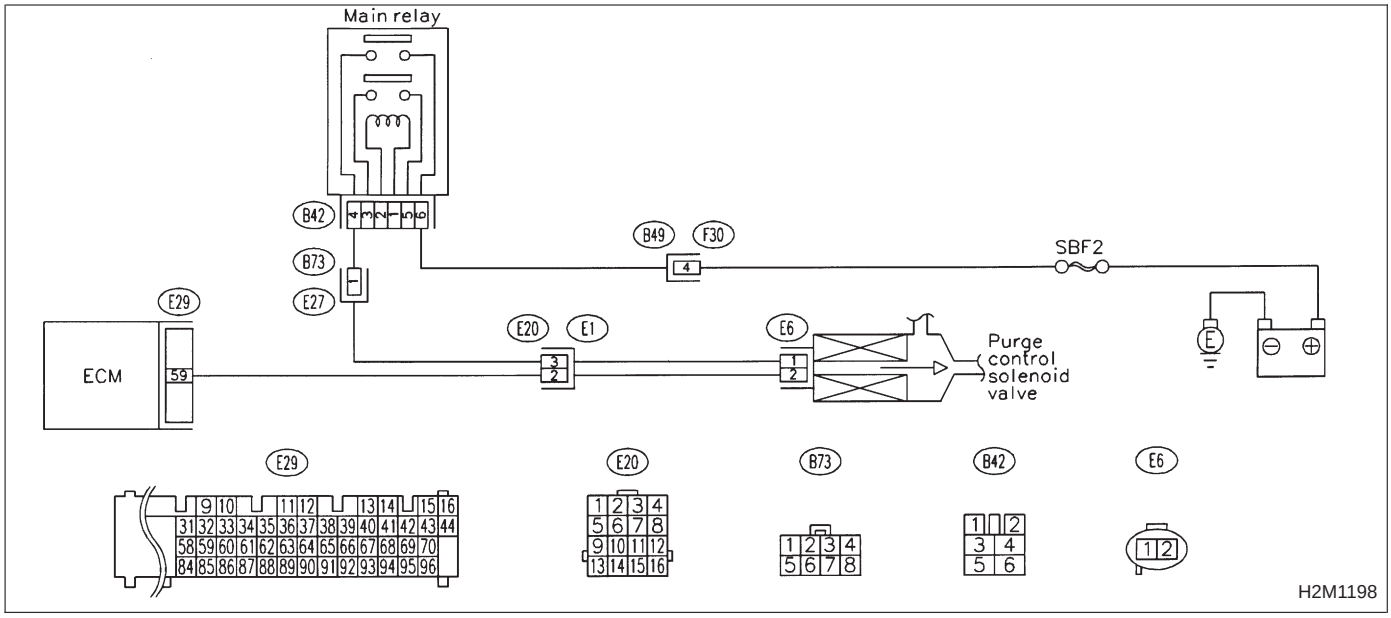
DTC DETECTING CONDITION:

- Two consecutive trips with fault

1.	**Check any other DTC P0105, P0106, P0443 and P1102 on display.**	● Inspect P0105, P0106, P0443 and P1102 using "10. Diagnostics Chart with Trouble Code, 2-7b [T1000]". ● It is unnecessary to inspect DTC P0441.
2.	**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].>

WIRING DIAGRAM:

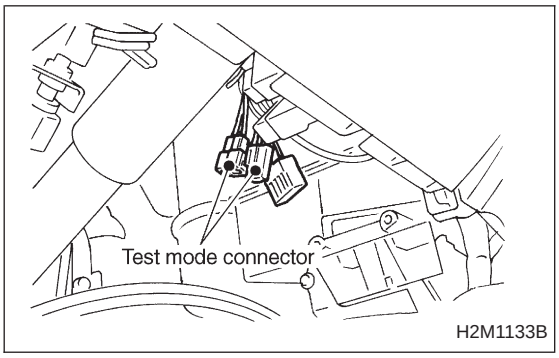


1	CHECK ANY OTHER DTC P0105, P0106, P0443 AND P1102 ON DISPLAY.

CHECK : ***Check that Subaru select monitor or the OBD-II general scan tool shows P0105, P0106, P0443 and P1102.***

YES : Inspect the relevant DTC using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”.

NO : Go to step 2.



2	CHECK PURGE CONTROL SOLENOID VALVE OPERATION.

1) Turn ignition switch to OFF.
2) Connect test mode connector at the lower portion of instrument panel (on the driver’s side), to the side of the center console box.
3) Turn ignition switch to ON.

CHECK : ***Make sure that the ON/OFF operating sound of purge control solenoid valve occurs at about 0.3 Hz.***

YES : Go to next step.

NO : Replace purge control solenoid valve.

4) Disconnect canister purge hose from canister.

CHECK : ***Blow through the canister purge hose to check if pulsations occur.***

YES : Check and repair loose connections, cracks, and clogging in evaporation line.

NO : Replace purge control solenoid valve.

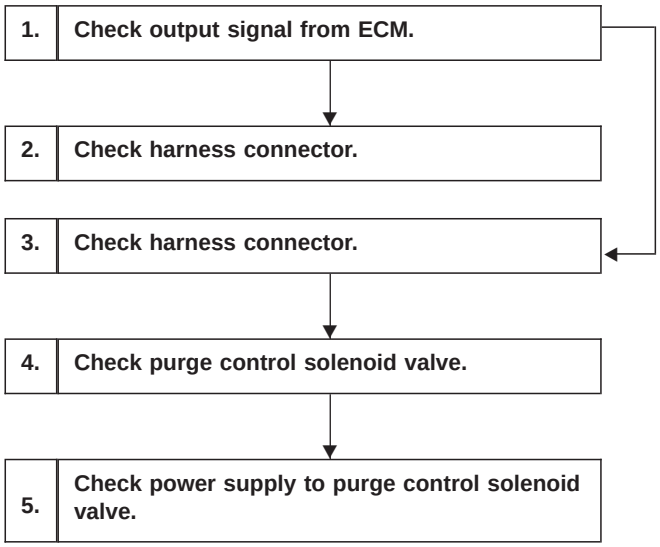
AF: DTC P0443 — EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL VALVE CIRCUIT MALFUNCTION (CPC) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

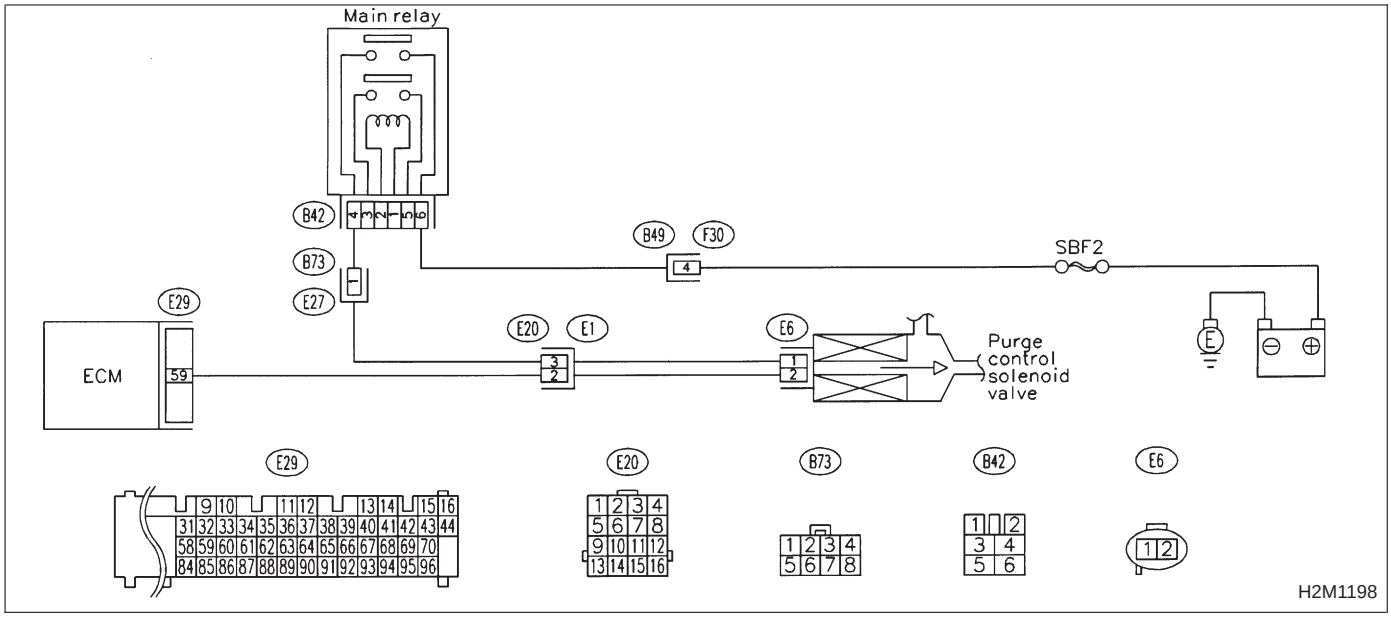
TROUBLE SYMPTOM:

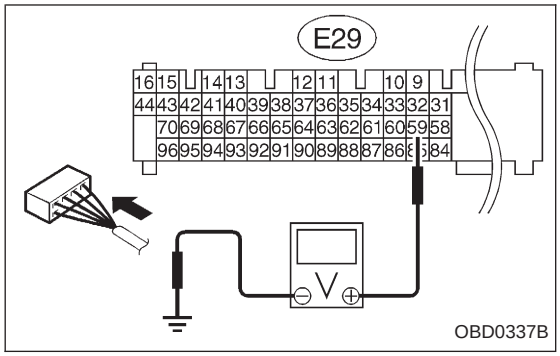
- Erroneous idling



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

WIRING DIAGRAM:





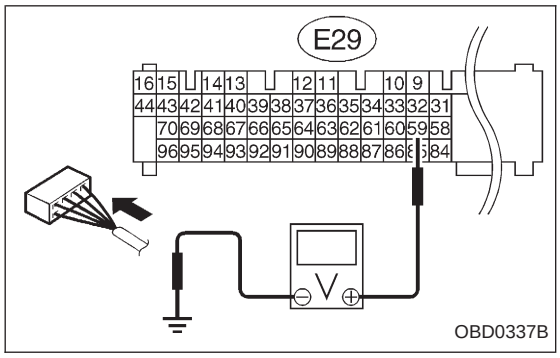
1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM connector terminal and body.

CHECK ***: Connector & terminal***
(E29) No. 59 — Body / 10 V, or more

YES : Go to step 2.

NO : Go to step 3.



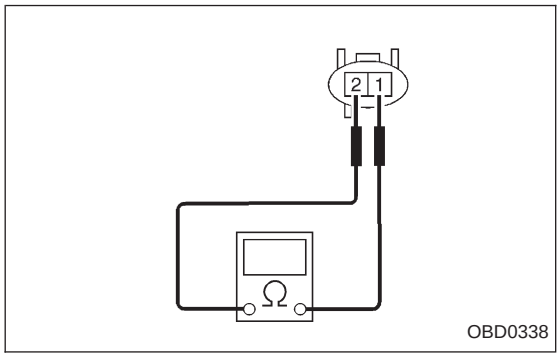
2	CHECK HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from purge control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between ECM connector and body.

CHECK ***: Connector & terminal***
(E29) No. 59 — Body / 10 V, or more

YES : Repair short circuit of harness between ECM connector and purge control solenoid valve connector.

NO : Go to next step.



5) Turn ignition switch to OFF.
6) Measure resistance between purge control solenoid valve terminals.

CHECK ***: Terminals***
No. 1 — No. 2/1 Ω, or less

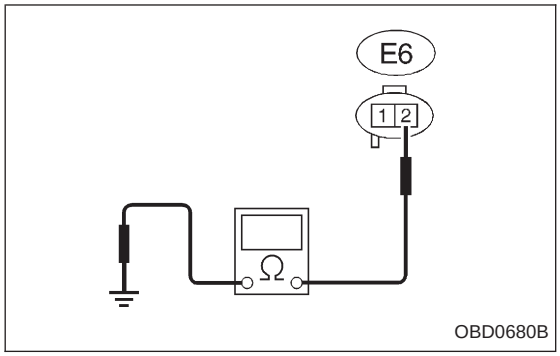
YES : Replace purge control solenoid valve and ECM.

NO : Go to next CHECK .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



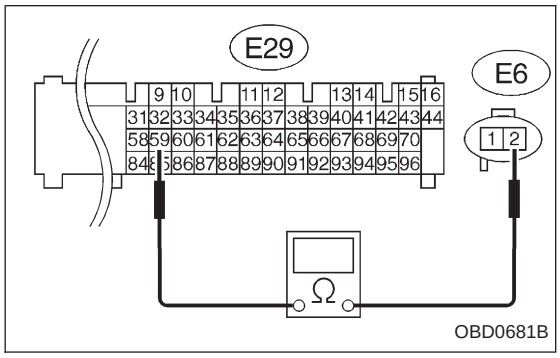
3	CHECK HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connectors from purge control solenoid valve and ECM.
3) Measure resistance between purge control solenoid valve connector and body.

CHECK : ***Connector & terminal***
(E6) No. 2 — Body / 10 Ω, or less

YES : Repair short circuit of harness between ECM connector and purge control solenoid valve connector.

NO : Go to next step.

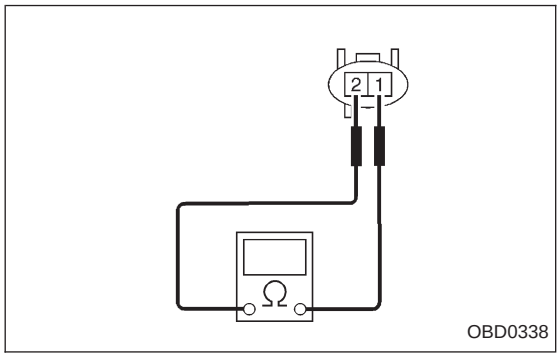


4) Measure resistance between ECM and purge control solenoid valve of harness connector.

CHECK : ***Connector & terminal***
(E29) No. 59 — (E6) No. 2 / 1 Ω, or less

YES : Go to step 4.

NO : Repair open circuit of harness between ECM connector and purge control solenoid valve connector.



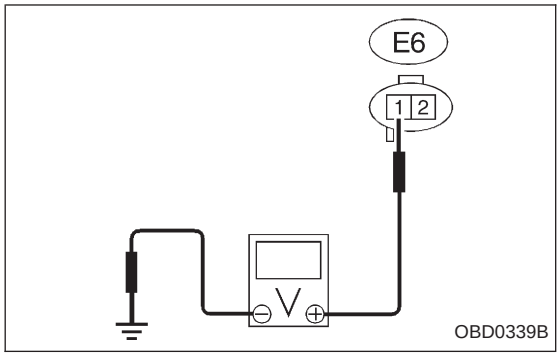
4	CHECK PURGE CONTROL SOLENOID VALVE.

1) Remove purge control solenoid valve.
2) Measure resistance between purge control solenoid valve terminals.

CHECK : ***Terminals***
No. 1 — No. 2 / 10 — 100 Ω

YES : Go to step 5.

NO : Replace purge control solenoid valve.



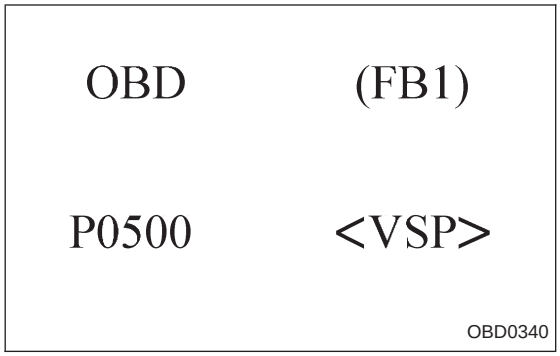
5	CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.

1) Turn ignition switch to ON.
2) Measure voltage between purge control solenoid valve connector and body.

CHECK ***: Connector & terminal (E6) No. 1 — Body / 10 V, or more***

YES : Confirm good connection at purge control solenoid valve connector.

NO : Repair open circuit of harness between main relay connector and purge control solenoid valve connector.



AG: DTC P0500 — VEHICLE SPEED SENSOR MALFUNCTION (VSP) —

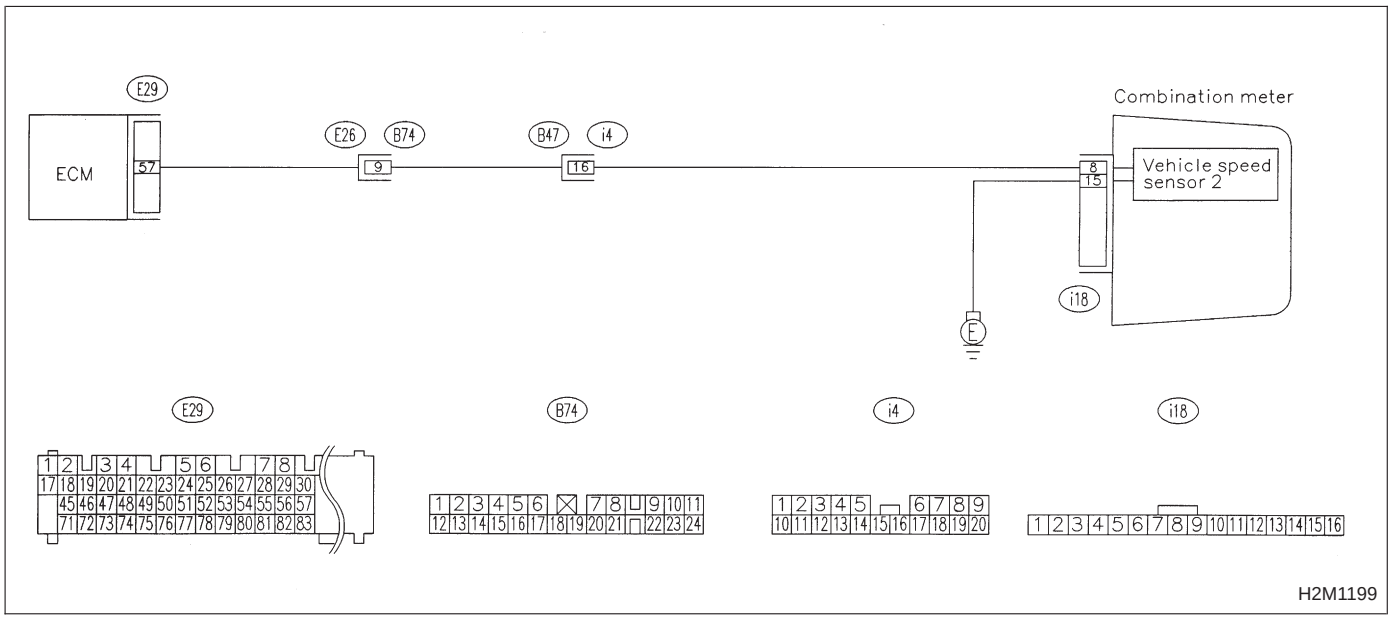
DTC DETECTING CONDITION:

- Immediately at fault recognition

1.	**Check speedometer operation in combination meter.**
2.	**Check harness connector.**
3.	**Check harness connector.**

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

WIRING DIAGRAM:

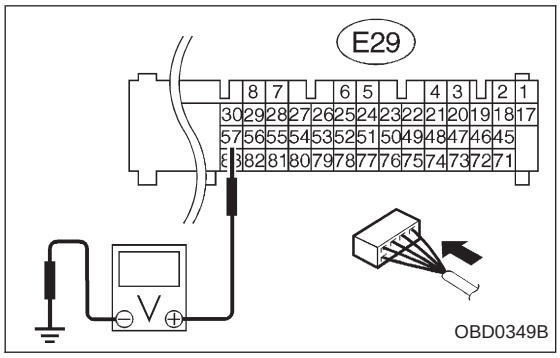


1	CHECK SPEEDOMETER OPERATION IN COMBINATION METER.

CHECK ***: Check normal operation of speedometer.***

YES : Go to step 2.

NO : Check speedometer and vehicle speed sensor <Ref. to 6-2 [K2A0].>.



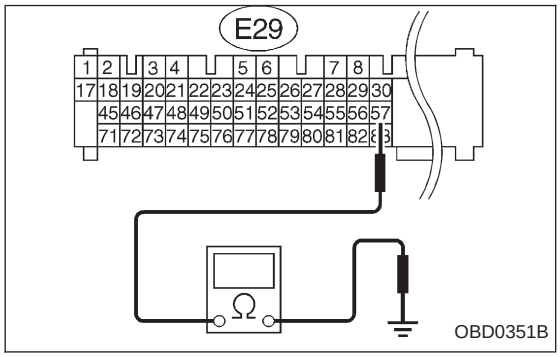
2	CHECK HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from TCM.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 57 — Body / 2 V, or more***

YES : Check the following and repair if necessary.
- Open circuit of harness between ECM connector and combination meter connector
- Poor contact in ECM connector
- Poor contact in combination meter connector
- Poor contact in coupling connectors (B74) and (i4)

NO : Go to step 3.



3	CHECK HARNESS CONNECTOR.

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

CHECK ***: Connector & terminal (E29) No. 57 — Body / 10 Ω, or less***

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

NO : Repair poor contact in ECM connector.

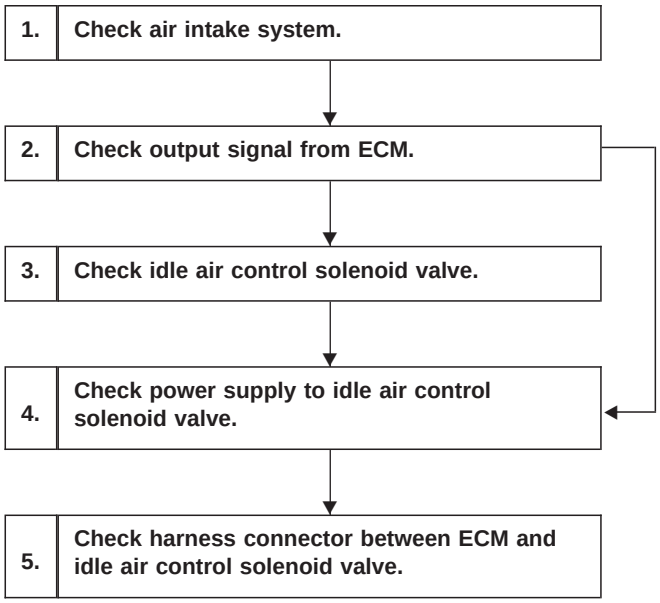
AH: DTC P0505 — IDLE CONTROL SYSTEM MALFUNCTION (ISC) —

DTC DETECTING CONDITION:

- Immediately at fault recognition

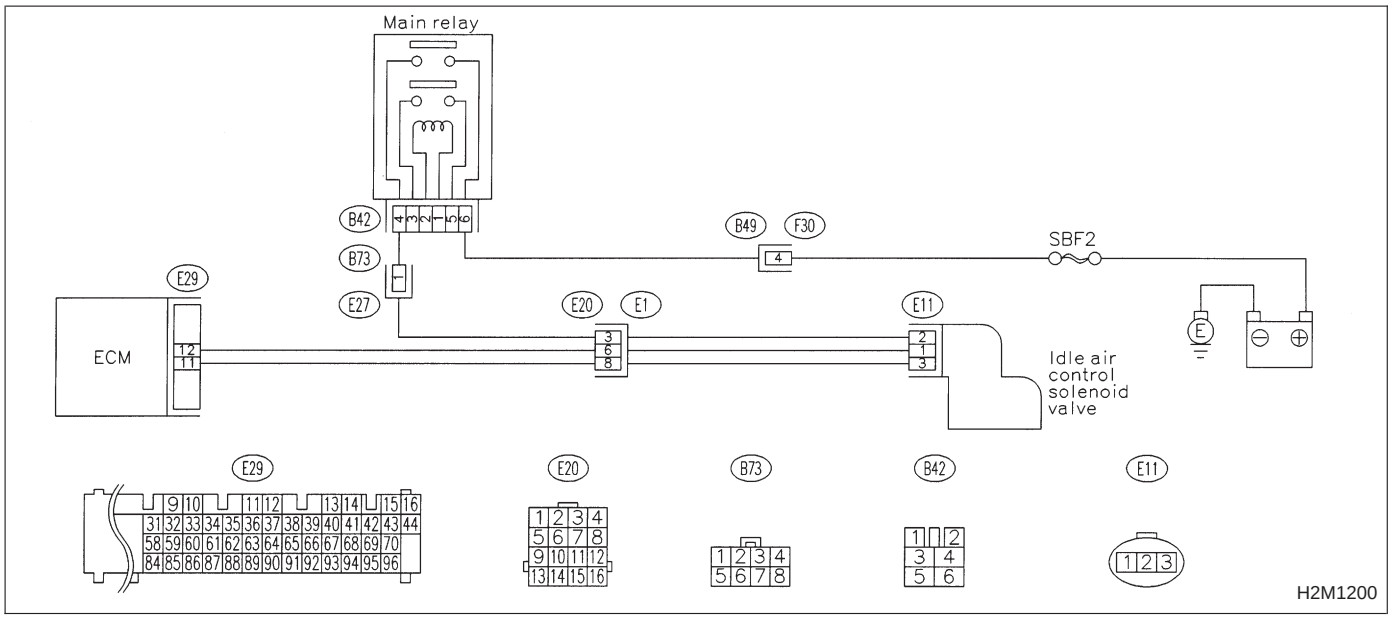
TROUBLE SYMPTOM:

- Erroneous idling
- Engine stalls.
- Engine breathing



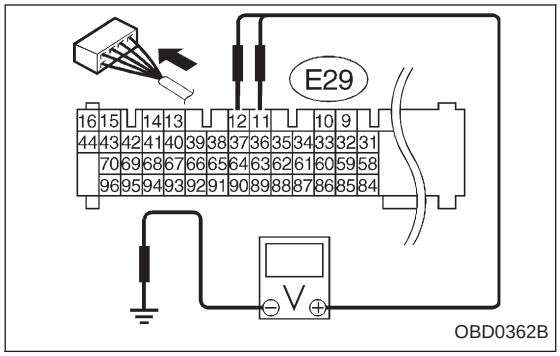
CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:



1	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.
3) Check intake manifold, idle air control solenoid valve and throttle body for loose installation and gasket for cracks.
4) Check by-pass hoses for loose connections and cracks.
5) Check vacuum hoses for disconnections.



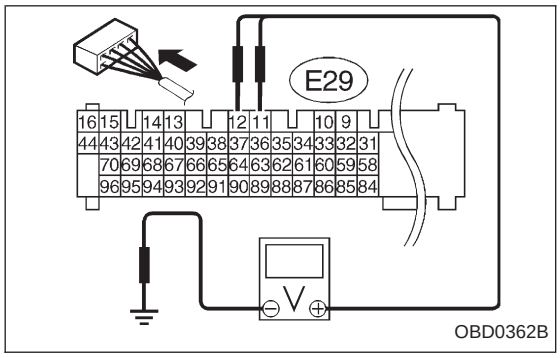
2	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and body.

CHECK : ***Connector & terminal***
(E29) No. 11 — Body / 3 V, or more
(E29) No. 12 — Body / 3 V, or more

YES : Go to the next step.

NO : Go to step 4.



3) Turn ignition switch to OFF.
4) Disconnect connector from idle air control solenoid valve.
5) Turn ignition switch to ON.
6) Measure voltage between ECM and body.

CHECK : ***Connector & terminal***
(E29) No. 11 — Body / 10 V, or more
(E29) No. 12 — Body / 10 V, or more

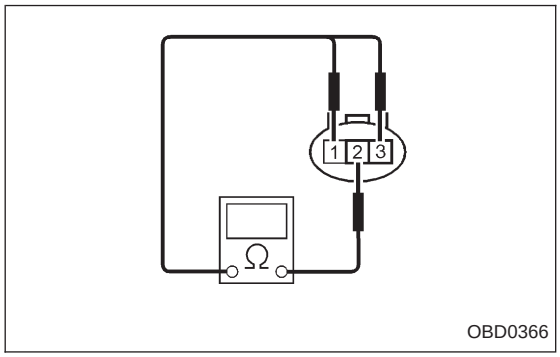
YES : Repair short circuit of harness and replace ECM.

NO : Go to next CHECK .

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

YES : Repair poor contact in ECM connector.

NO : Go to step 3.



3	CHECK IDLE AIR CONTROL SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Measure resistance between solenoid valve terminals.

CHECK : ***Terminals***
No. 1 — No. 2 / 20 Ω, or more
No. 2 — No. 3 / 20 Ω, or more

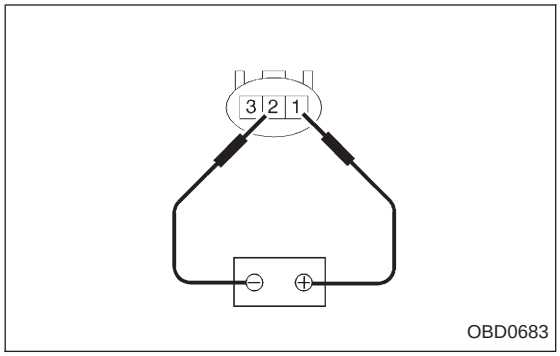
YES : Replace idle air control solenoid valve.

NO : Go to next CHECK .

CHECK : ***Terminals***
No. 1 — No. 2 / 5 Ω, or less
No. 2 — No. 3 / 5 Ω, or less

YES : Replace idle air control solenoid valve and ECM.

NO : Go to next step.

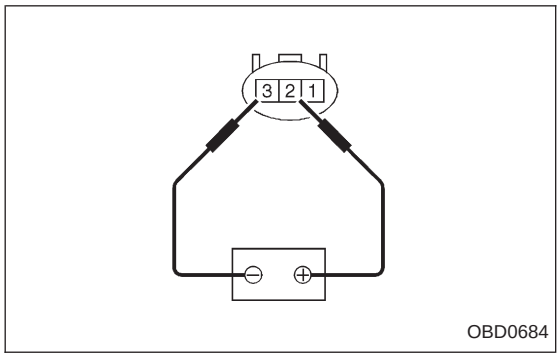


3) Remove idle air control solenoid valve. <Ref. to 2-7b [W12A0].>
4) Check operation of idle air control solenoid valve.

CHECK : ***When connecting the battery to terminals No. 1 and No. 2 of idle air control solenoid valve, check if it is fully opened.***

YES : Go to next CHECK .

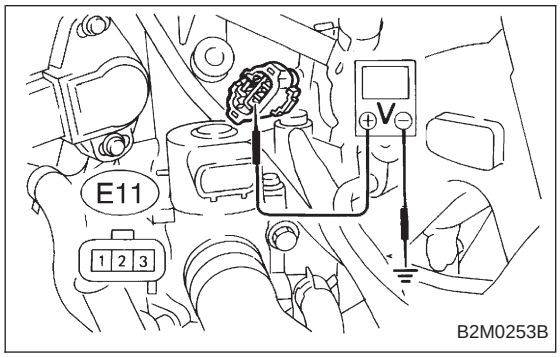
NO : Clean idle air control solenoid valve. <Ref. to 2-7b [W12B0].>



CHECK : ***When connecting the battery to terminals No. 3 and No. 2 of idle air control solenoid valve, check if it is fully closed.***

YES : Go to step 4.

NO : Clean idle air control solenoid valve. <Ref. to 2-7b [W12B0].>



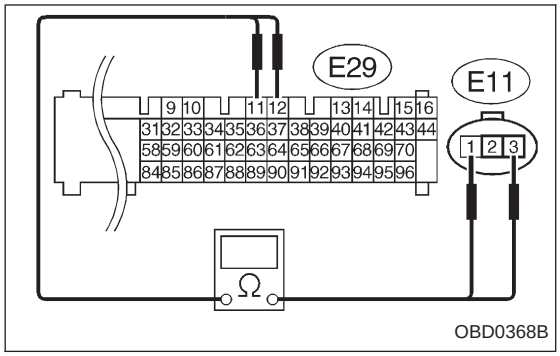
4	CHECK POWER SUPPLY TO IDLE AIR CONTROL SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect connector from idle air control solenoid valve.
3) Turn ignition switch to ON.
4) Measure voltage between idle air control solenoid valve and body.

CHECK : ***Connector & terminal (E11) No. 2 — Body / 10 V, or more***

YES : Go to step 5.

NO : Repair open circuit of harness between idle air control solenoid valve connector and ECM connector.



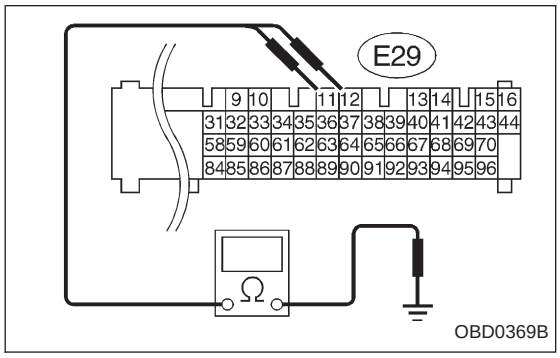
5	CHECK HARNESS CONNECTOR BETWEEN ECM AND IDLE AIR CONTROL SOLENOID VALVE.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness connector between ECM and idle air control solenoid valve.

CHECK ***: Connector & terminal***
(E29) No. 11 — (E11) No. 3 / 1 Ω, or less
(E29) No. 12 — (E11) No. 1 / 1 Ω, or less

YES : Go to the next step.

NO : Repair open circuit of harness between ECM connector and idle air control solenoid valve connector.



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

CHECK ***: Connector & terminal***
(E29) No. 11 — Body / 1 MΩ, or more
(E29) No. 12 — Body / 1 MΩ, or more

YES : Confirm good condition in connectors of idle air control solenoid valve circuit.

NO : Repair short circuit of harness between ECM connector and idle air control solenoid valve connector.

AI: DTC P0506 — IDLE CONTROL SYSTEM RPM LOWER THAN EXPECTED (ISC – L) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

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

1.	Check DTC P0505 on display.	Yes	• Inspect DTC P0505 using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”. • In this case, it is unnecessary to inspect DTC P0506.
		No	
2.	**Check air intake system.**		

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

2	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.

CHECK ***: Is clogging the by-pass line between by-pass hose and intake duct?***

YES : Repair the by-pass line.

NO : Replace idle air control solenoid valve.

AJ: DTC P0507 — IDLE CONTROL SYSTEM RPM HIGHER THAN EXPECTED (ISC – H) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Engine keeps running at higher revolution than specified idling revolution.

1.	Check DTC P0505 on display.	Yes →	• Inspect DTC P0505 using “10. Diagnostics Chart with Trouble Code, 2-7b [T1000]”. • In this case, it is unnecessary to inspect DTC P0507.
	No ↓		
2.	**Check air intake system.**		

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

2	CHECK AIR INTAKE SYSTEM.

1) Turn ignition switch to ON.
2) Start engine, and idle it.

CHECK : ● ***Check intake manifold, idle air control solenoid valve and throttle body for loose installation and gasket for cracks.***
● ***Check by-pass hose for loose connection and cracks.***
● ***Check vacuum hoses for disconnections.***

YES : Repair air suction and leaks.

NO : Replace idle air control solenoid valve.

AK: DTC P0600 — SERIAL COMMUNICATION LINK MALFUNCTION —

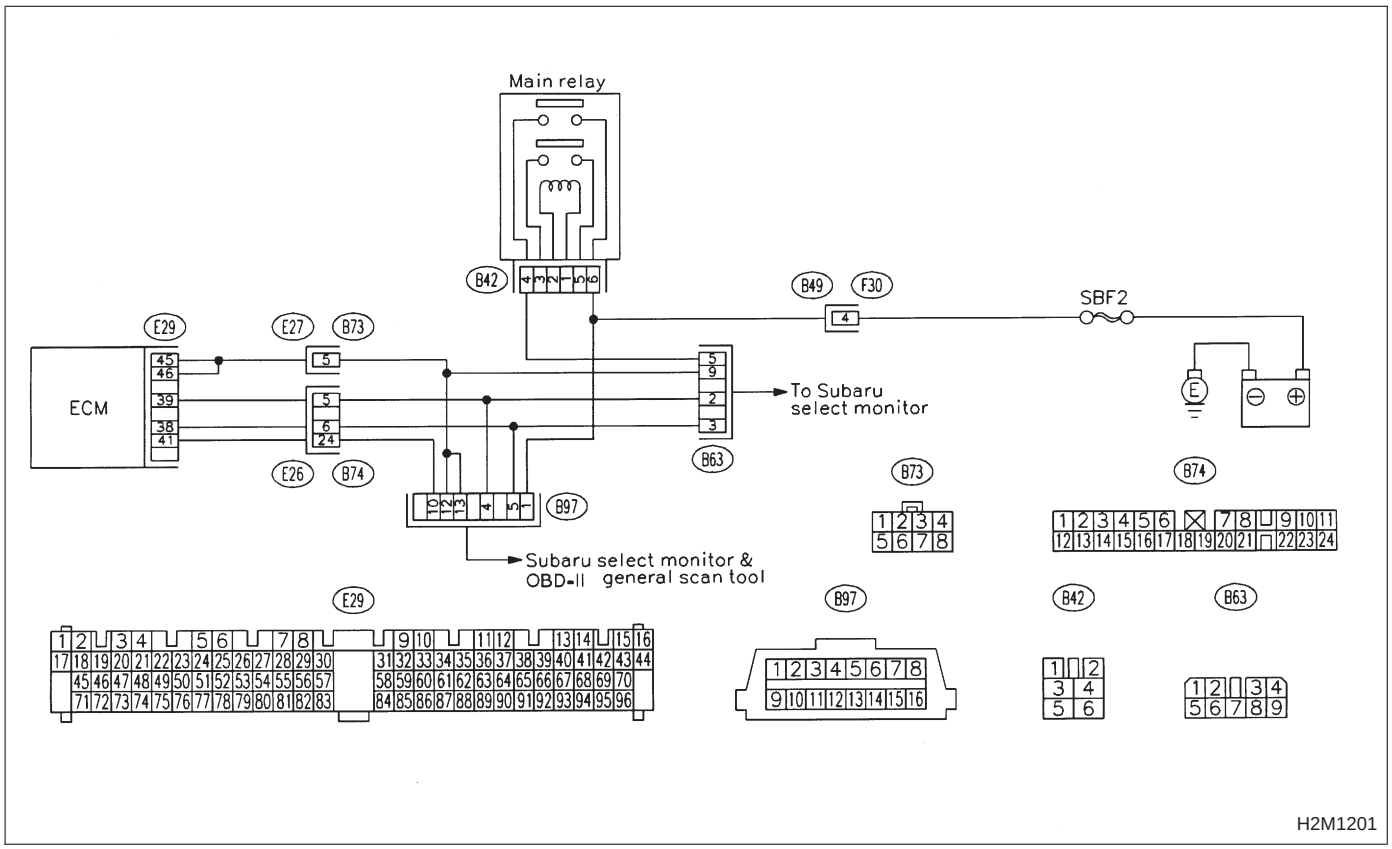
DTC DETECTING CONDITION:

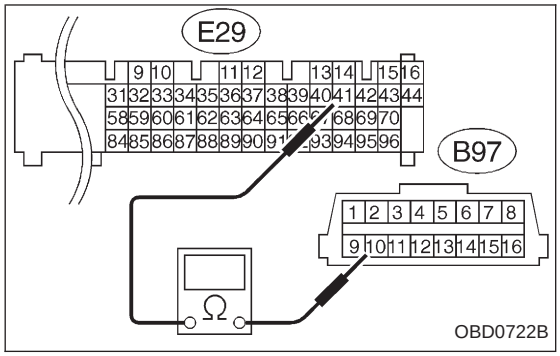
- Two consecutive trips with fault

1.	Check harness connector.

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

WIRING DIAGRAM:





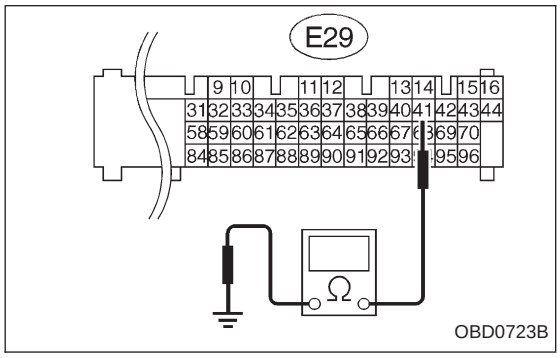
1	CHECK HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from ECM.
3) Measure resistance of harness connector between ECM and data link connector (for OBD-II general scan tool).

CHECK ***: Connector & terminal***
(E29) No. 41 — (B97) No. 10 / 1 Ω, or less

YES : Go to the next step.

NO : Repair open circuit of harness between ECM connector and data link connector.



4) Measure resistance between ECM harness connector and body.

CHECK ***: Connector & terminal***
(E29) No. 41 — Body / 10 Ω, or less

YES : Repair short circuit of harness between ECM connector and data link connector.

NO : Repair poor contact in ECM connector and data link connector.

AL: 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.

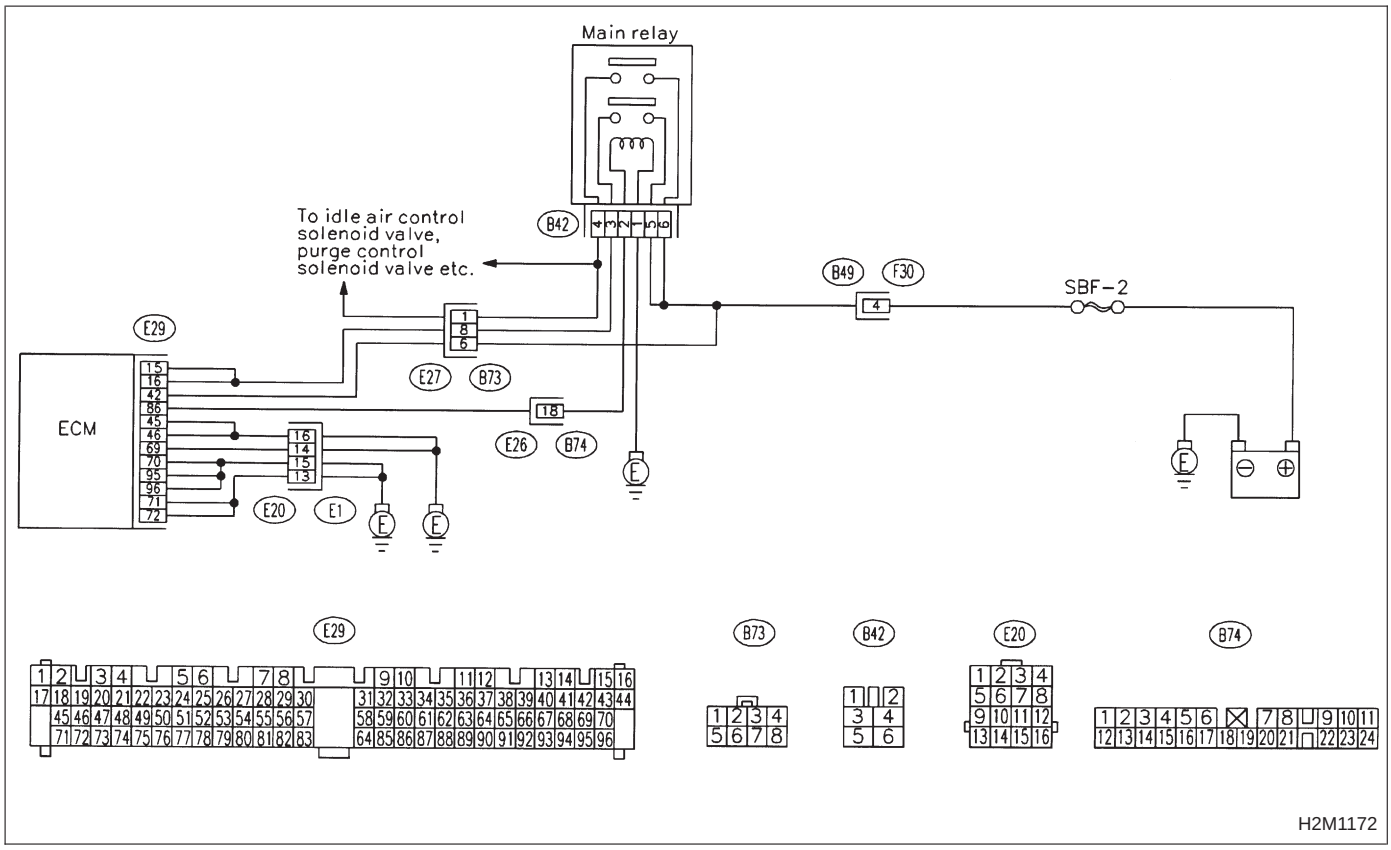
1.	**Check DTC P0601 on display.**

Yes

Replace ECM.

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

WIRING DIAGRAM:



1	CHECK DTC P0601 ON DISPLAY.

CHECK : ***Check that DTC P0601 is indicated on Subaru Select Monitor or OBD-II general scan tool.***

YES : Replace ECM.

AM: DTC P0703 — BRAKE SWITCH INPUT MALFUNCTION (BRK) —

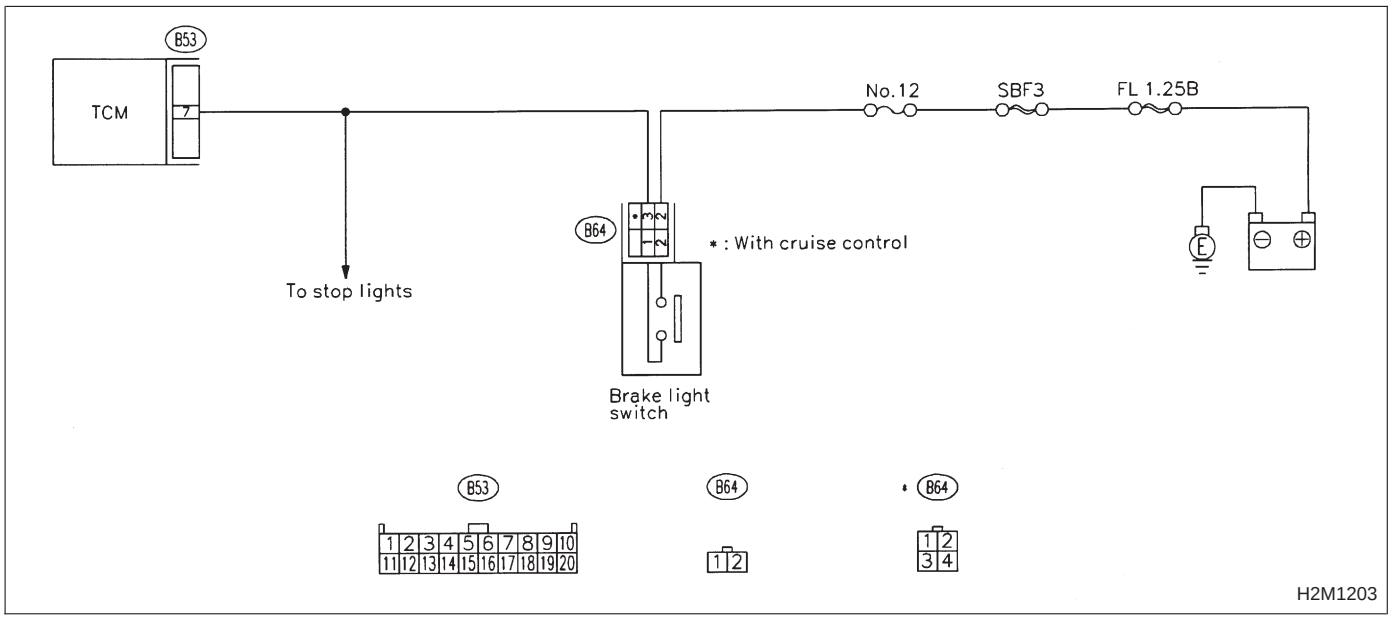
DTC DETECTING CONDITION:

- Two consecutive trips with fault

1.	**Check operation of brake light.**
2.	**Check harness connector between TCM and brake light switch.**
3.	**Check input signal for TCM.**

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

WIRING DIAGRAM:

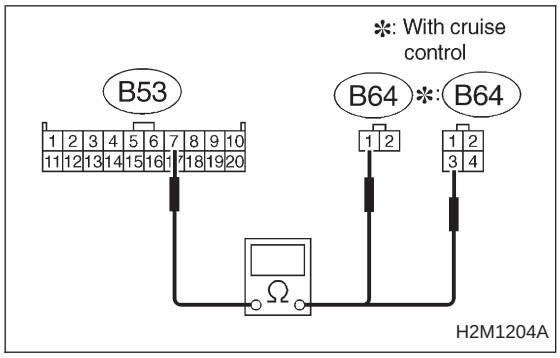


1	CHECK OPERATION OF BRAKE LIGHT.

CHECK : ***Depress brake pedal to ensure that brake light comes on.***

YES : Go to step 2.

NO : Repair or replace brake light circuit.



2	CHECK HARNESS CONNECTOR BETWEEN TCM AND BRAKE LIGHT SWITCH.

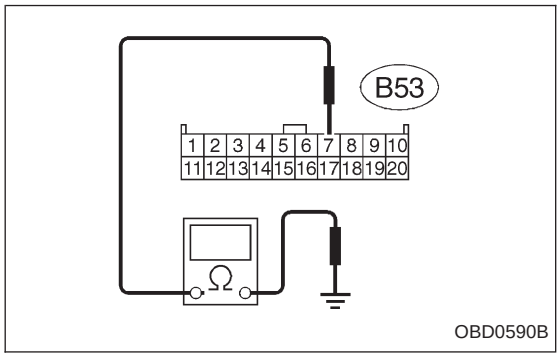
1) Disconnect connectors from TCM and brake light switch.
2) Measure resistance of harness connector between TCM and brake light switch.

CHECK : ***Connector & terminal***
(B53) No. 7 — (B64) No. 1 / 1 Ω, or less
(B53) No. 7 — (B64) No. 3 / 1 Ω, or less
(With cruise control)

YES : Go to next step.

NO : Repair or replace harness and connector.

NOTE:
In this case, there is a possibility of open circuit in the harness between the brake light switch connector and TCM connector.

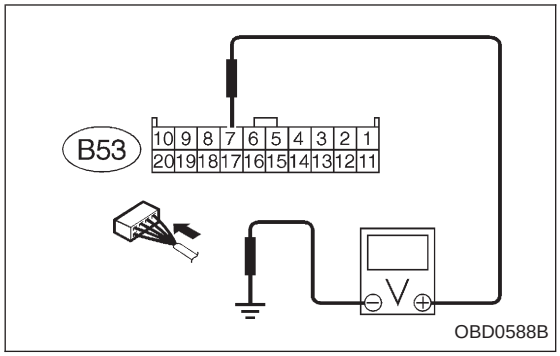


3) Measure resistance of harness connector between TCM and body.

CHECK : ***Connector & terminal***
(B53) No. 7 — Body / 1 MΩ, or more

YES : Go to step 3.

NO : Repair short circuit of harness between TCM connector and body.



3	CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to TCM and brake light switch.
2) Measure voltage between TCM and body.

CHECK ***: Connector & terminal***
(B53) No. 7 — Body / 1 V, or less [When release the brake pedal.]
(B53) No. 7 — Body / 10 V, or more [When depress 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 with a new one.

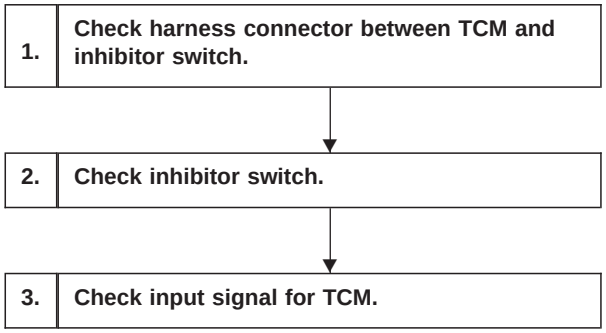
AN: DTC P0705 — TRANSMISSION RANGE SENSOR CIRCUIT MALFUNCTION (RNG) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

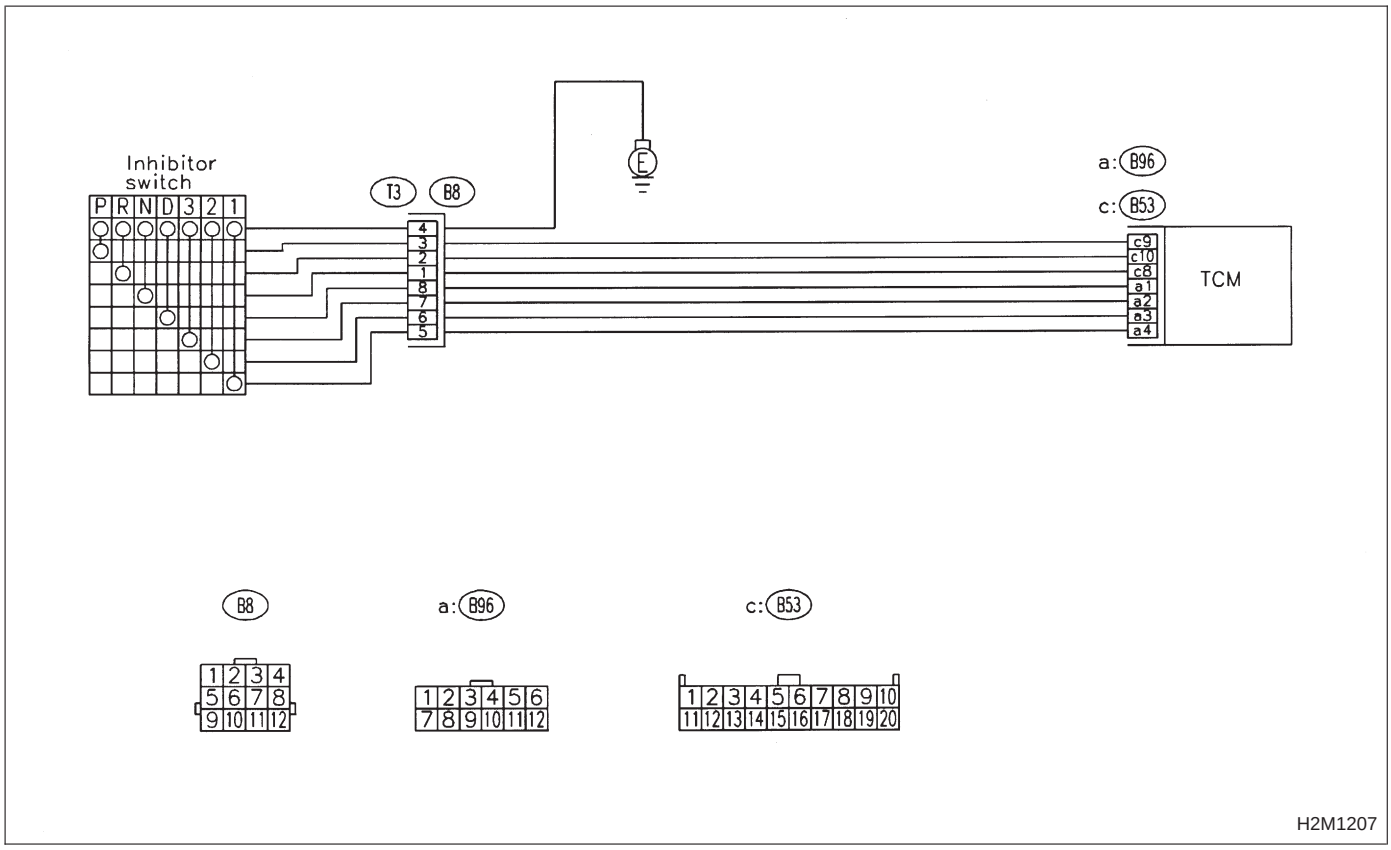
TROUBLE SYMPTOM:

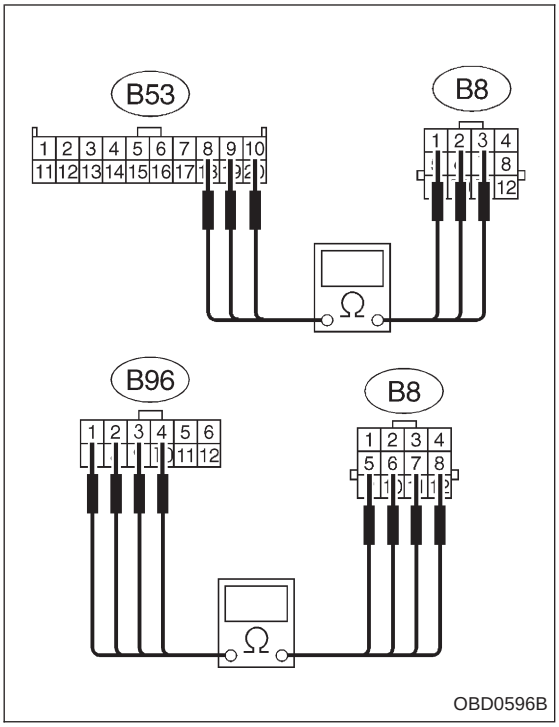
- Starter does not rotate when selector lever is in “P” or “N” range.
- Starter rotates when selector lever is in “R”, “D”, “3”, “2” or “1” range.
- Engine brake is not effected when selector lever is in “3” range.
- Shift characteristics are erroneous.



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

WIRING DIAGRAM:





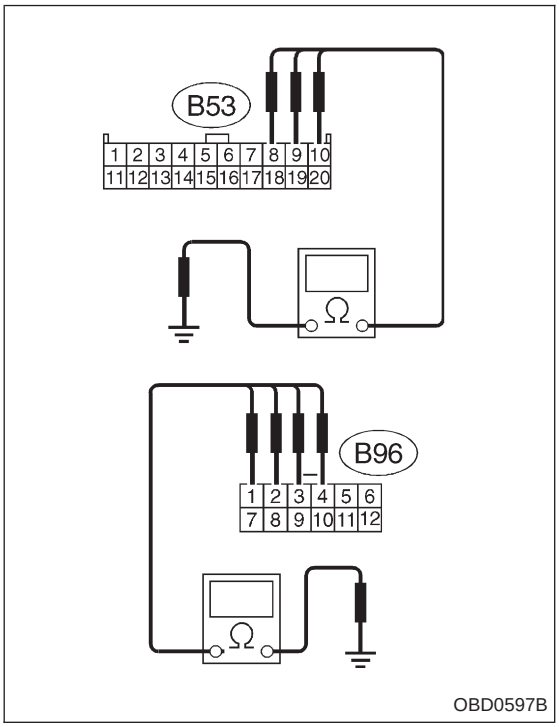
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.

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

CHECK : ***Connector & terminal***
(B53) No. 9 — (B8) No. 3 / 1 Ω, or less
(B53) No. 10 — (B8) No. 2 / 1 Ω, or less
(B53) No. 8 — (B8) No. 1 / 1 Ω, or less
(B96) No. 1 — (B8) No. 8 / 1 Ω, or less
(B96) No. 2 — (B8) No. 7 / 1 Ω, or less
(B96) No. 3 — (B8) No. 6 / 1 Ω, or less
(B96) No. 4 — (B8) No. 5 / 1 Ω, or less

YES : Go to next step.

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

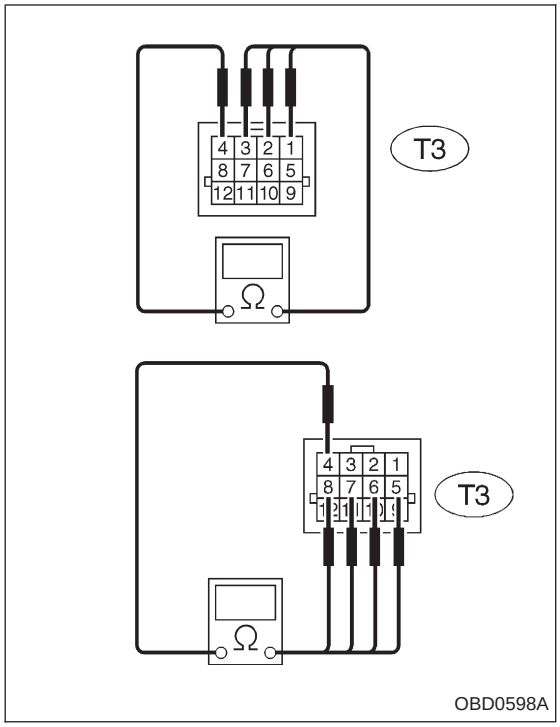


4) Measure resistance of harness connector between TCM and body.

CHECK : ***Connector & terminal***
(B53) No. 9 — Body / 1 MΩ, or more
(B53) No. 10 — Body / 1 MΩ, or more
(B53) No. 8 — Body / 1 MΩ, or more
(B96) No. 1 — Body / 1 MΩ, or more
(B96) No. 2 — Body / 1 MΩ, or more
(B96) No. 3 — Body / 1 MΩ, or more
(B96) No. 4 — Body / 1 MΩ, or more

YES : Go to step 2.

NO : Repair short circuit of harness between TCM and body.

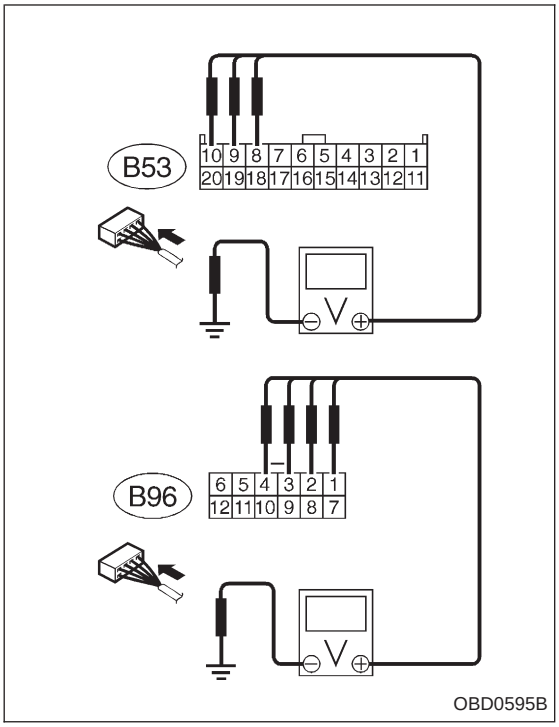


2	CHECK INHIBITOR SWITCH.

Measure resistance between transmission connector receptacle's terminals.

CHECK ***: Connector & terminal***
(T3) No. 3 — No. 4 / 1 Ω, or less ("P" position)
(T3) No. 3 — No. 4 / 1 MΩ, or more (Other positions)
(T3) No. 2 — No. 4 / 1 Ω, or less ("R" position)
(T3) No. 2 — No. 4 / 1 MΩ, or more (Other positions)
(T3) No. 1 — No. 4 / 1 Ω, or less ("N" position)
(T3) No. 1 — No. 4 / 1 MΩ, or more (Other positions)
(T3) No. 8 — No. 4 / 1 Ω, or less ("D" position)
(T3) No. 8 — No. 4 / 1 MΩ, or more (Other positions)
(T3) No. 7 — No. 4 / 1 Ω, or less ("3" position)
(T3) No. 7 — No. 4 / 1 MΩ, or more (Other positions)
(T3) No. 6 — No. 4 / 1 Ω, or less ("2" position)
(T3) No. 6 — No. 4 / 1 MΩ, or more (Other positions)
(T3) No. 5 — No. 4 / 1 Ω, or less ("1" position)
(T3) No. 5 — No. 4 / 1 MΩ, or more (Other positions)

YES : Go to step 3.
NO : Go to next CHECK .
CHECK ***: Is there faulty connection in the selector cable?***
YES : Repair connection of selector cable.
NO : Replace inhibitor switch.



3	CHECK INPUT SIGNAL FOR TCM.

1) Connect connector to TCM and transmission.
2) Turn ignition switch to ON.
3) Measure voltage between TCM and body.

CHECK ***: Connector & terminal***
(B53) No. 9 — Body / 1 V, or less (“P” and “N” positions)
(B53) No. 9 — Body / 8 V, or more (Other positions)
(B53) No. 10 — Body / 1 V, or less (“R” position)
(B53) No. 10 — Body / 6 V, or more (Other positions)
(B53) No. 8 — Body / 1 V, or less (“N” and “P” positions)
(B53) No. 8 — Body / 8 V, or more (Other positions)
(B96) No. 1 — Body / 1 V, or less (“D” position)
(B96) No. 1 — Body / 6 V, or more (Other positions)
(B96) No. 2 — Body / 1 V, or less (“3” position)
(B96) No. 2 — Body / 6 V, or more (Other positions)
(B96) No. 3 — Body / 1 V, or less (“2” position)
(B96) No. 3 — Body / 6 V, or more (Other positions)
(B96) No. 4 — Body / 1 V, or less (“1” position)
(B96) No. 4 — Body / 6 V, or more (Other positions)

YES : Repair poor contact in 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 with a new one.

AO: DTC P0710 — TRANSMISSION FLUID TEMPERATURE SENSOR CIRCUIT MALFUNCTION (ATF) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

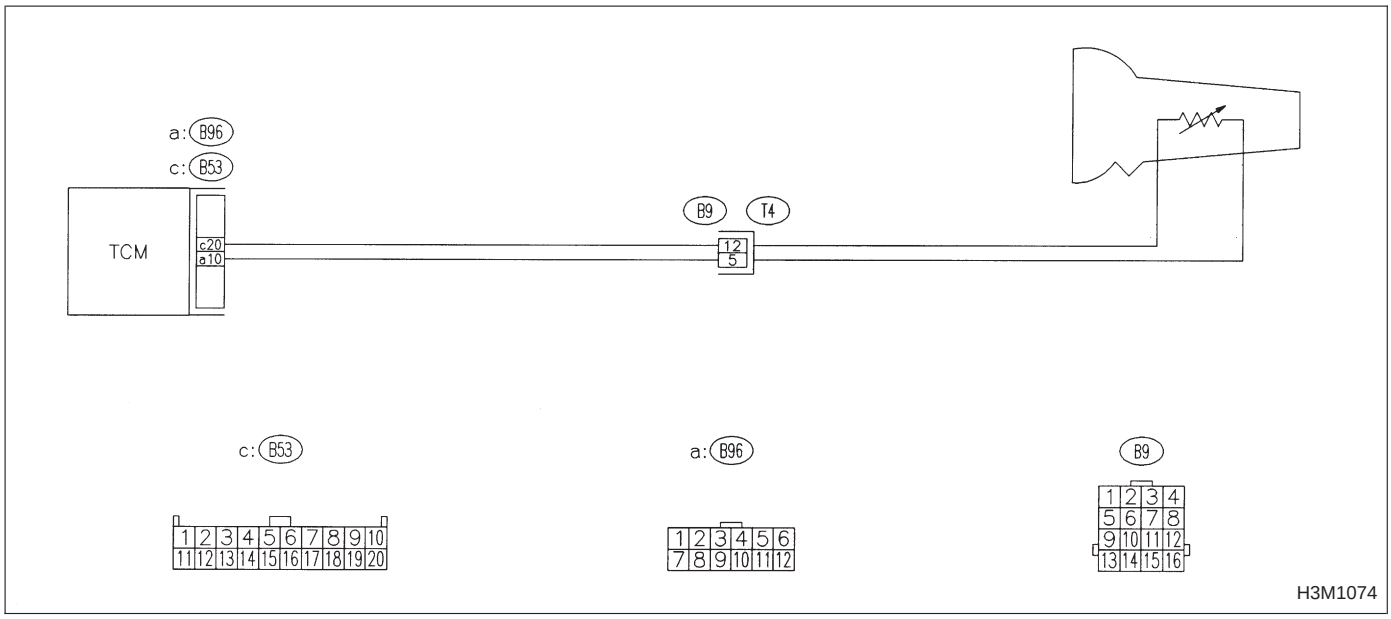
TROUBLE SYMPTOM:

- No shift up to 4th speed (after engine warm-up)
- No lock-up (after engine warm-up)
- Excessive shift shock

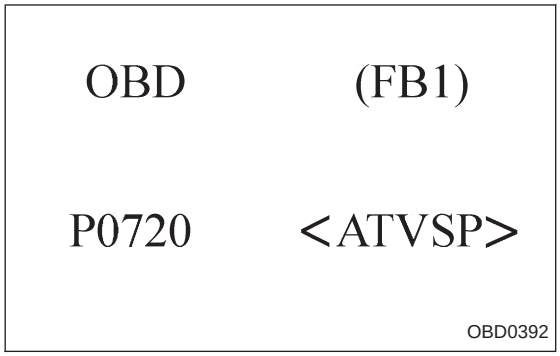
1.	Check harness connector between TCM and ATF temperature sensor.
2.	Check ATF temperature sensor.
3.	Check input signal for TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on transmission fluid temperature sensor circuit, refer to 3-2b [T7G0].



AP: DTC P0720 — OUTPUT SPEED SENSOR (VEHICLE SPEED SENSOR 1) CIRCUIT MALFUNCTION (ATVSP) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

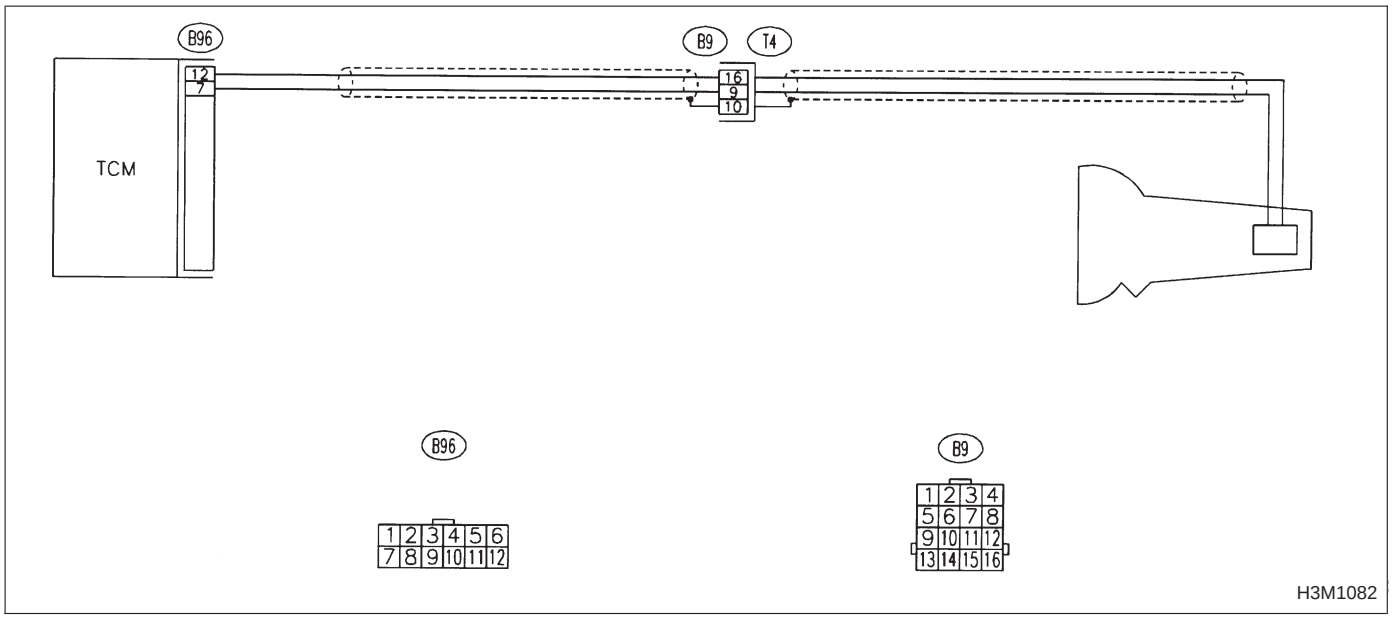
TROUBLE SYMPTOM:

- No shift or excessive tight corner “braking”

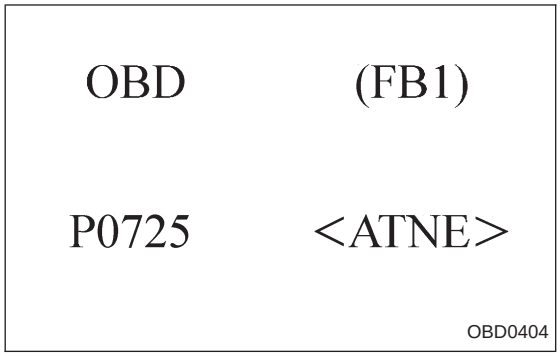
1.	Check harness connector between TCM and vehicle speed sensor 1.
2.	Check vehicle speed sensor 1.
3.	Check input signal for TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on vehicle speed sensor 1 circuit, refer to 3-2b [T7M0].



AQ: DTC P0725 — ENGINE SPEED INPUT CIRCUIT MALFUNCTION (ATNE) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

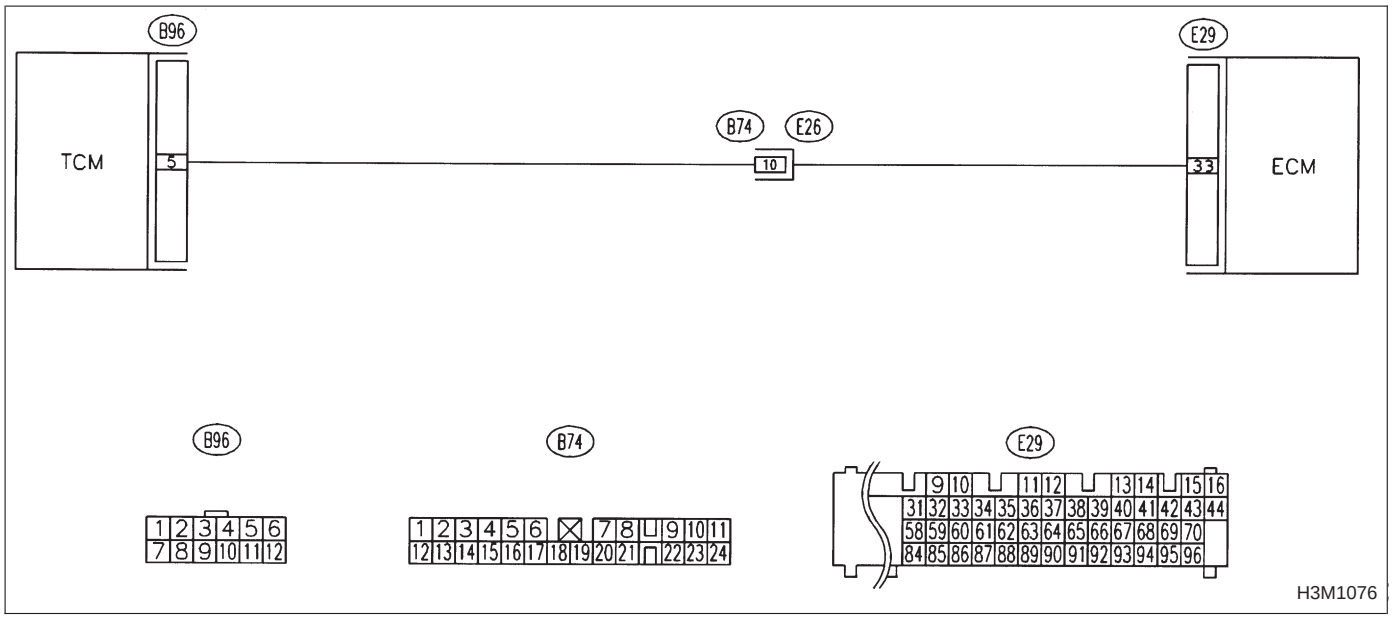
TROUBLE SYMPTOM:

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

1.	Check harness connector between TCM and ECM (MFI).
2.	Check input signal for TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on engine speed input circuit, refer to 3-2b [T7I0].

AR: DTC P0731 — GEAR 1 INCORRECT RATIO (GR — 1) —

AS: DTC P0732 — GEAR 2 INCORRECT RATIO (GR — 2) —

AT: DTC P0733 — GEAR 3 INCORRECT RATIO (GR — 3) —

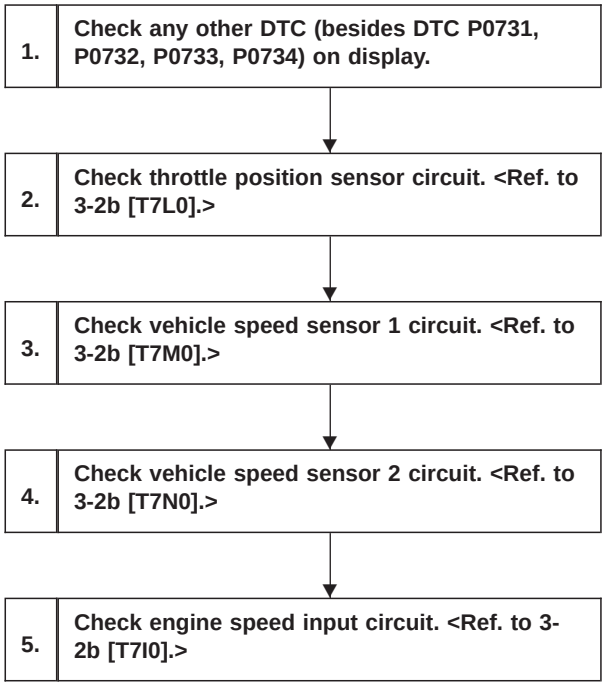
AU: DTC P0734 — GEAR 4 INCORRECT RATIO (GR — 4) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

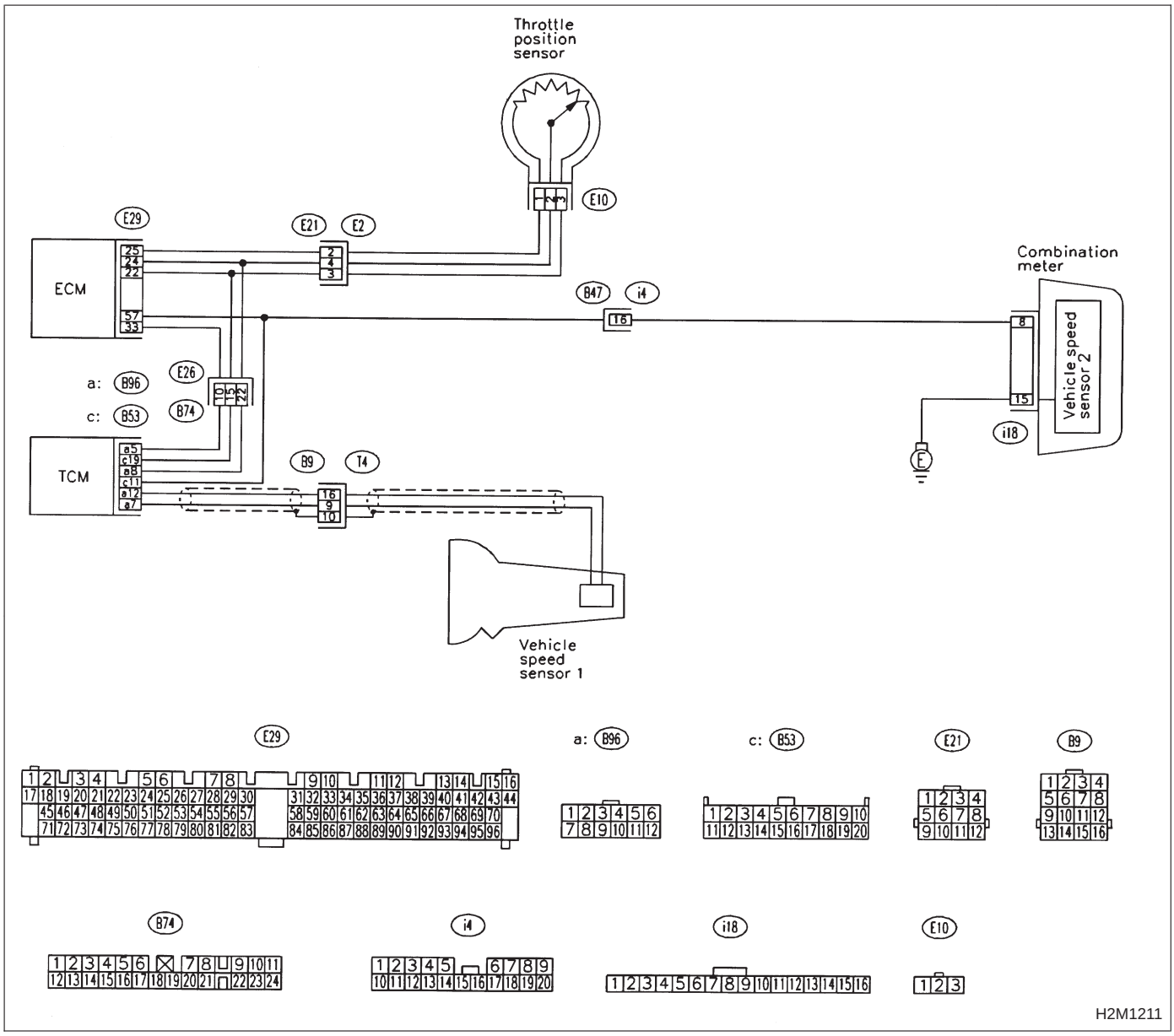
TROUBLE SYMPTOM:

- 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].>

WIRING DIAGRAM:



1	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]”.

NO : Go to step 2.

2	**CHECK THROTTLE POSITION SENSOR CIRCUIT. <REF. TO 3-2b [T7L0].>**

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

YES : Repair or replace throttle position sensor circuit.

NO : Go to step 3.

3	**CHECK VEHICLE SPEED SENSOR 1 CIRCUIT. <REF. TO 3-2b [T7M0].>**

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

YES : Repair or replace vehicle speed sensor 1 circuit.

NO : Go to step 4.

4	**CHECK VEHICLE SPEED SENSOR 2 CIRCUIT. <REF. TO 3-2b [T7N0].>**

CHECK ***: Is there any trouble in vehicle speed sensor 2 circuit?***

YES : Repair or replace vehicle speed sensor 2 circuit.

NO : Go to step 5.

5	**CHECK ENGINE SPEED INPUT CIRCUIT. <REF. TO 3-2b [T7I0].>**

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

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 with a new one.

AV: DTC P0740 — TORQUE CONVERTER CLUTCH SYSTEM MALFUNCTION (LU – F) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

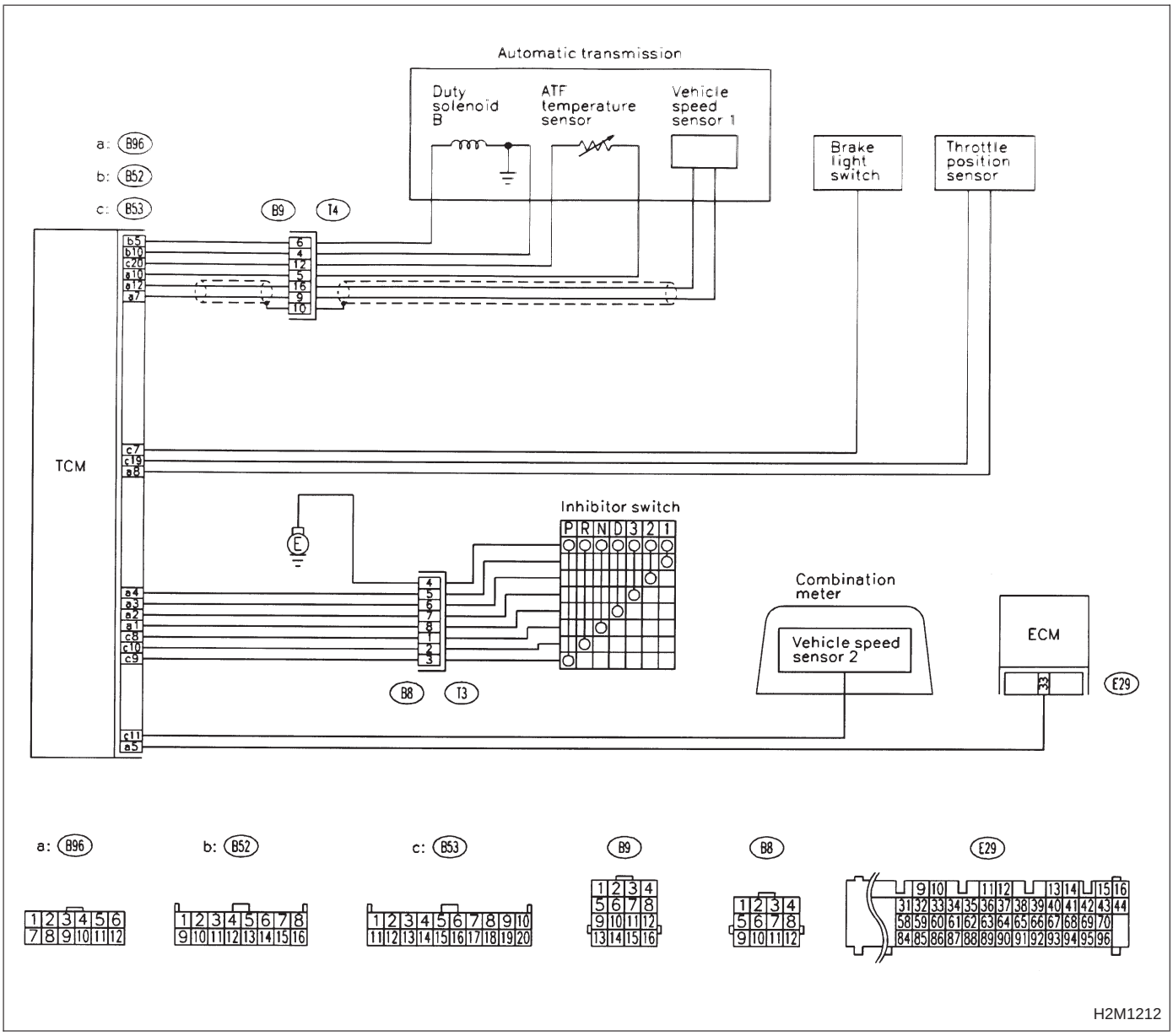
TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)
- No shift or excessive tight corner “braking”

1.	**Check any other DTC (besides DTC P0740) on display.**
2.	**Check duty solenoid B circuit. <Ref. to 3-2b [T7B0].>**
3.	**Check throttle position sensor circuit. <Ref. to 3-2b [T7L0].>**
4.	**Check vehicle speed sensor 1 circuit. <Ref. to 3-2b [T7M0].>**
5.	**Check vehicle speed sensor 2 circuit. <Ref. to 3-2b [T7N0].>**
6.	**Check engine speed input circuit. <Ref. to 3-2b [T7I0].>**
7.	**Check inhibitor switch circuit. <Ref. to AN: DTC P0705, 2-7b [T10AN0].>**
8.	**Check brake light switch circuit. <Ref. to AM: DTC P0703, 2-7b [T10AM0].>**
9.	**Check ATF temperature sensor circuit. <Ref. to 3-2b [T7G0].>**

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

WIRING DIAGRAM:



1	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]”.

NO : Go to step 2.

2	CHECK DUTY SOLENOID B CIRCUIT. <REF. TO 3-2b [T7B0].>

CHECK ***: Is there any trouble in duty solenoid B circuit?***

YES : Repair or replace duty solenoid B circuit.

NO : Go to step 3.

3	CHECK THROTTLE POSITION SENSOR CIRCUIT. <REF. TO 3-2b [T7L0].>

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

YES : Repair or replace throttle position sensor circuit.

NO : Go to step 4.

4	CHECK VEHICLE SPEED SENSOR 1 CIRCUIT. <REF. TO 3-2b [T7M0].>

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

YES : Repair or replace vehicle speed sensor 1 circuit.

NO : Go to step 5.

5	CHECK VEHICLE SPEED SENSOR 2 CIRCUIT. <REF. TO 3-2b [T7N0].>

CHECK ***: Is there any trouble in vehicle speed sensor 2 circuit?***

YES : Repair or replace vehicle speed sensor 2 circuit.

NO : Go to step 6.

6	CHECK ENGINE SPEED INPUT CIRCUIT. <REF. TO 3-2b [T7I0].>

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

YES : Repair or replace engine speed input circuit.

NO : Go to step 7.

7	CHECK INHIBITOR SWITCH CIRCUIT. <REF. TO “AN: DTC P0705, 2-7b [T10AN0]”.>

CHECK ***: Is there any trouble in inhibitor switch circuit?***

YES : Repair or replace inhibitor switch circuit.

NO : Go to step 8.

8	CHECK BRAKE LIGHT SWITCH CIRCUIT. <REF. TO “AM: DTC P0703, 2-7b [T10AM0]”.>

CHECK ***: Is there any trouble in brake light switch circuit?***

YES : Repair or replace brake light switch circuit.

NO : Go to step 9.

9	CHECK ATF TEMPERATURE SENSOR CIRCUIT. <REF. TO 3-2b [T7G0].>

CHECK ***: Is there any trouble in ATF temperature sensor circuit?***

YES : Repair or replace ATF temperature sensor circuit.

NO : Go to next CHECK .

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

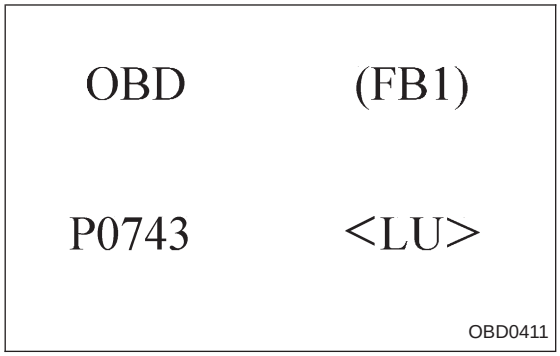
YES : Repair poor contact in TCM connector.

NO : Go to next CHECK .

CHECK ***: Is there any mechanical trouble in automatic transmission?***

YES : Repair or replace automatic transmission.

NO : Replace TCM with a new one.



AW: DTC P0743 — TORQUE CONVERTER CLUTCH SYSTEM (DUTY SOLENOID B) ELECTRICAL (LU) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

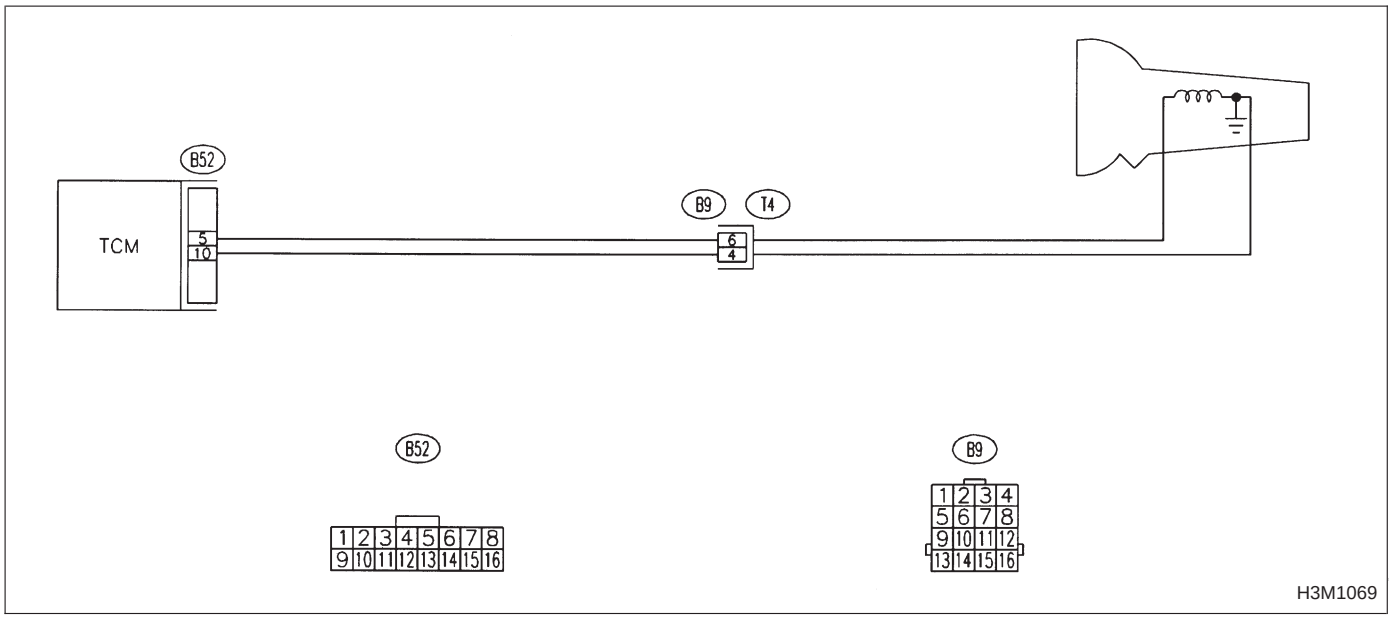
TROUBLE SYMPTOM:

- No lock-up (after engine warm-up)

1.	Check harness connector between TCM and duty solenoid B.
2.	Check duty solenoid B's ground line.
3.	Check duty solenoid B.
4.	Check output signal emitted from TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on duty solenoid B circuit, refer to 3-2b [T7B0].

AX: DTC P0748 — PRESSURE CONTROL SOLENOID (DUTY SOLENOID A) ELECTRICAL (PL) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

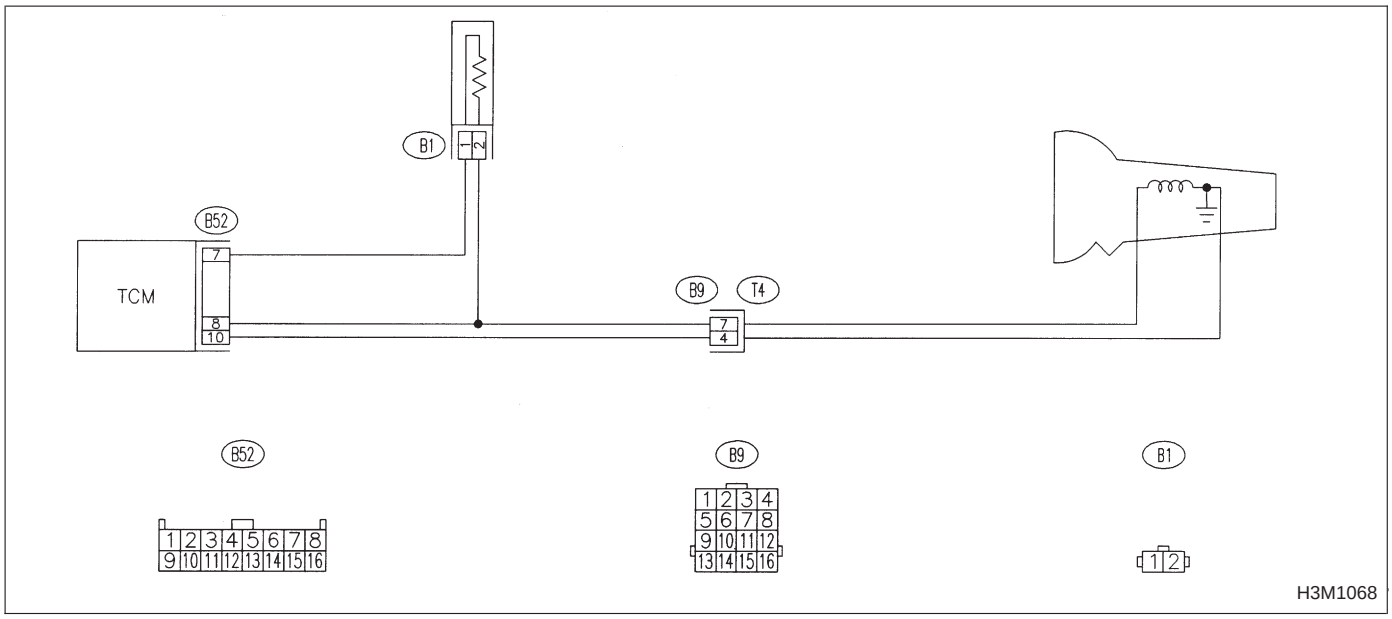
TROUBLE SYMPTOM:

- Excessive shift shock

1.	Check harness connector between TCM and duty solenoid A.
2.	Check harness connector between TCM and dropping resistor.
3.	Check duty solenoid A's ground line.
4.	Check dropping resistor.
5.	Check duty solenoid A.
6.	Check output signal emitted from TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on duty solenoid A circuit, refer to 3-2b [T7A0].

AY: DTC P0753 — SHIFT SOLENOID A (SHIFT SOLENOID 1) ELECTRICAL (SFT1) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

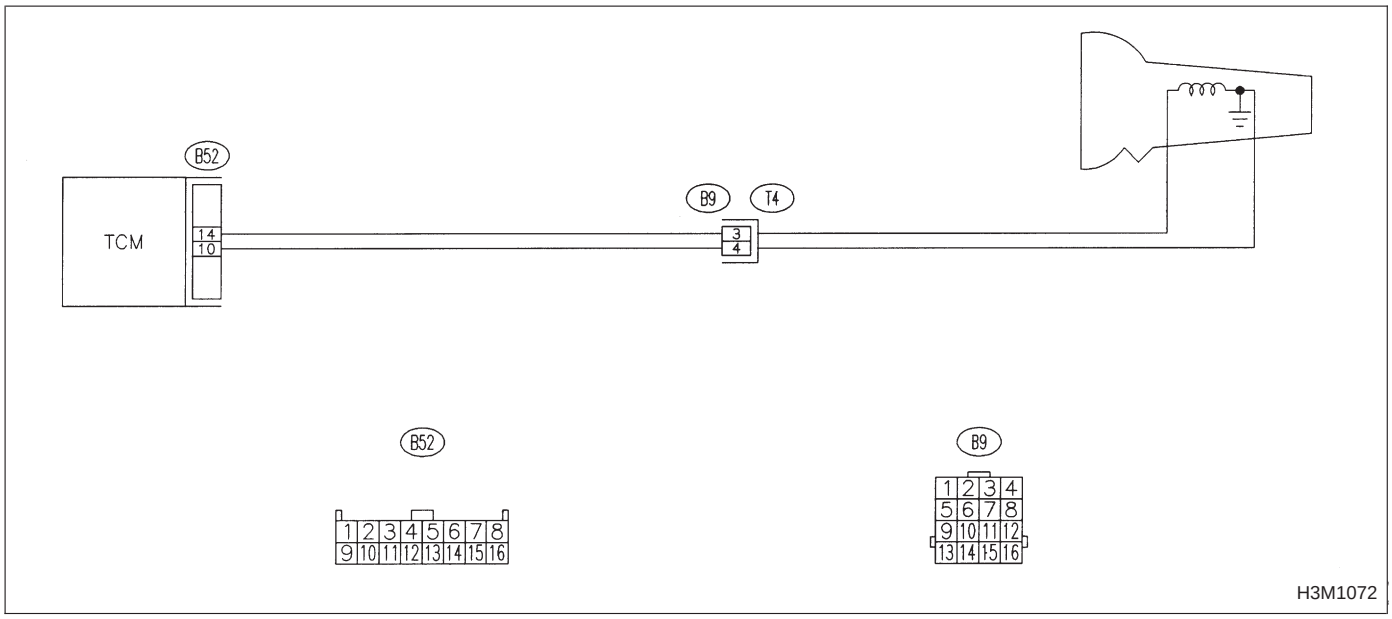
TROUBLE SYMPTOM:

- No shift

1.	Check harness connector between TCM and shift solenoid 1.
2.	Check shift solenoid 1's ground line.
3.	Check shift solenoid 1.
4.	Check output signal emitted from TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on shift solenoid 1 circuit, refer to 3-2b [T7E0].

AZ: DTC P0758 — SHIFT SOLENOID B (SHIFT SOLENOID 2) ELECTRICAL (SFT2) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

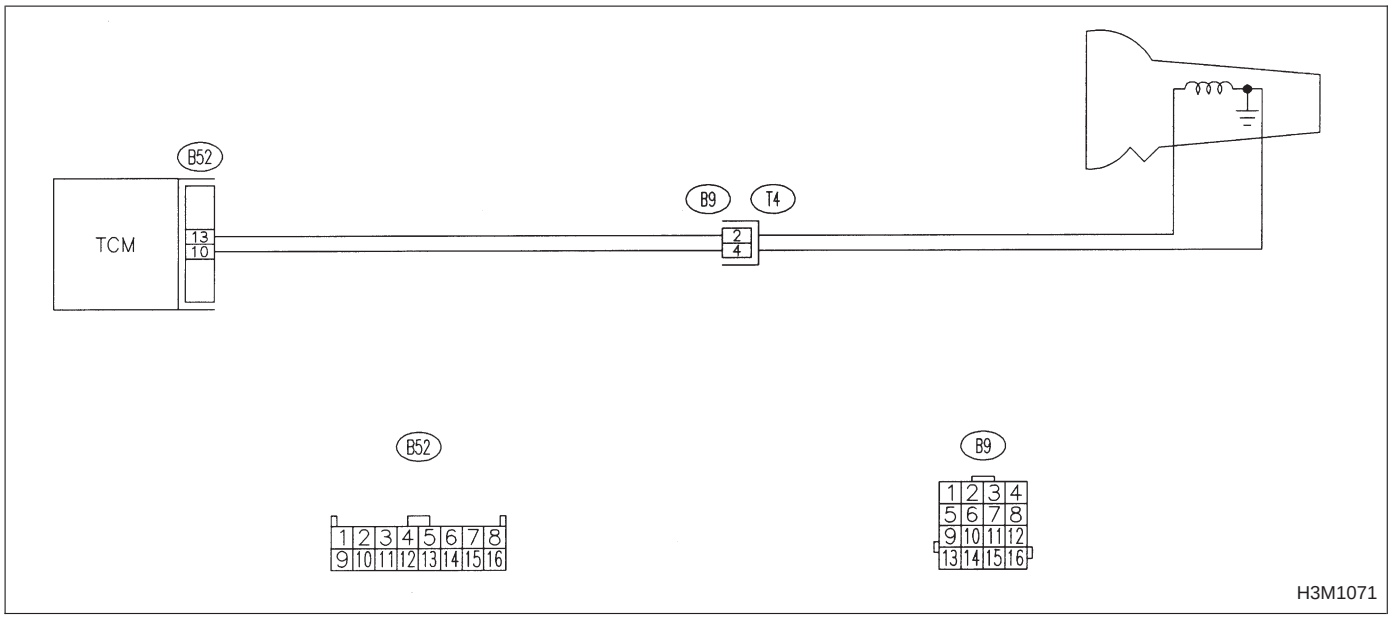
TROUBLE SYMPTOM:

- No shift

1.	Check harness connector between TCM and shift solenoid 2.
2.	Check shift solenoid 2's ground line.
3.	Check shift solenoid 2.
4.	Check output signal emitted from TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on shift solenoid 2 circuit, refer to 3-2b [T7D0].

BA: DTC P0760 — SHIFT SOLENOID C (SHIFT SOLENOID 3) MALFUNCTION (OVR — F) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

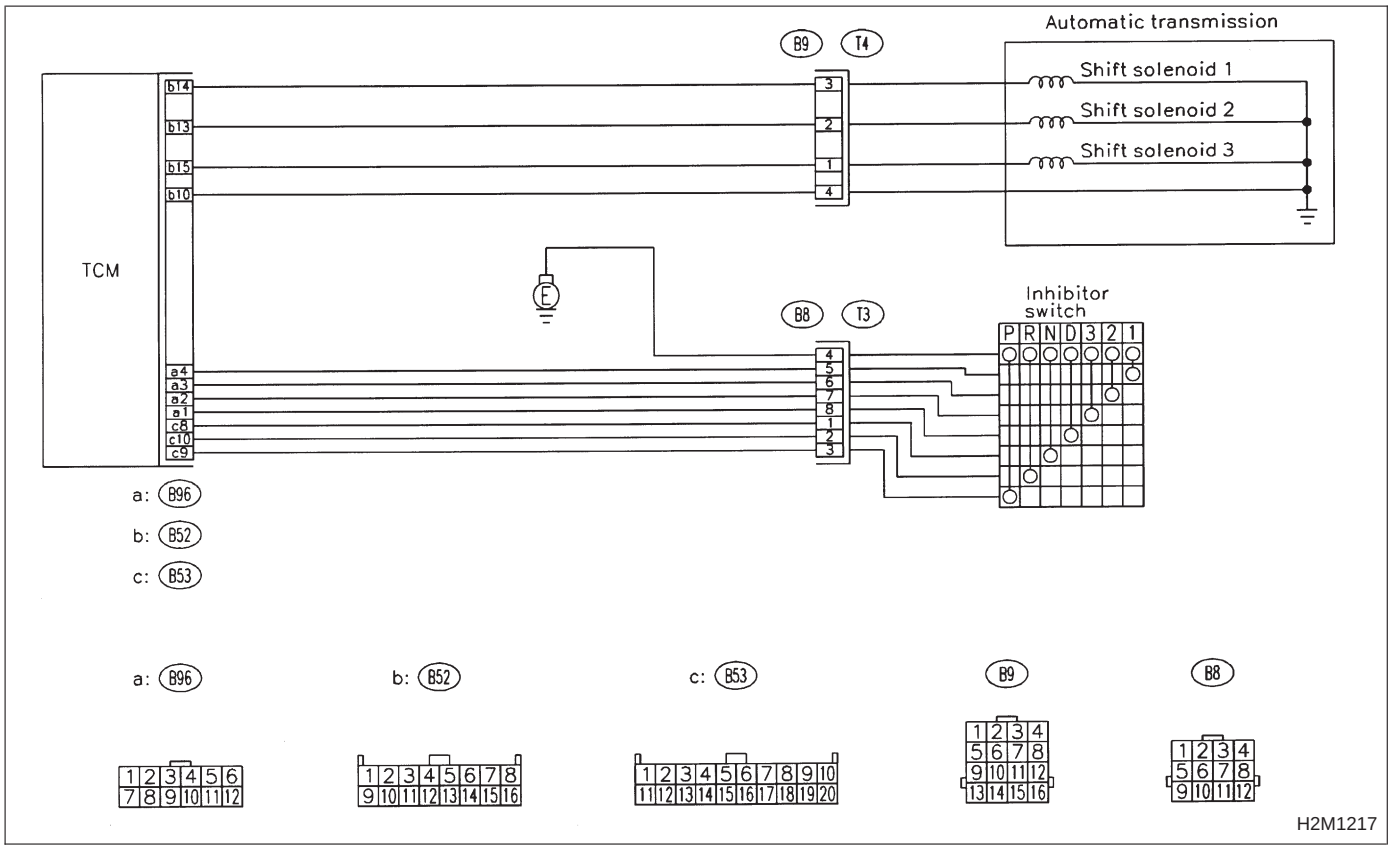
TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in “3”

1.	**Check any other DTC (besides DTC P0760) on display.**
2.	**Check inhibitor switch circuit. <Ref. to “AN: DTC P0705, 2-7b [T10AN0]”.>**
3.	**Check gear position.**
4.	**Check shift solenoid 1 circuit. <Ref. to 3-2b [T7E0].>**
5.	**Check shift solenoid 2 circuit. <Ref. to 3-2b [T7D0].>**
6.	**Check shift solenoid 3 circuit. <Ref. to 3-2b [T7C0].>**

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

WIRING DIAGRAM:



1	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]”.

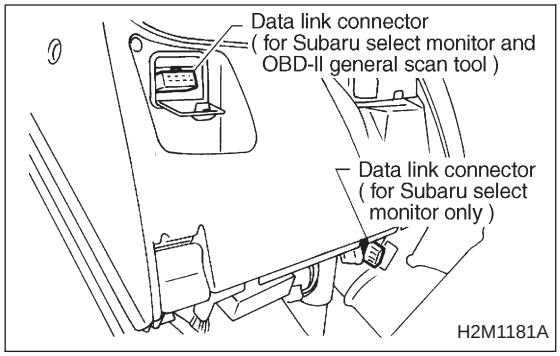
NO : Go to step 2.

2	CHECK INHIBITOR SWITCH CIRCUIT. <REF. TO “AN: DTC P0705, 2-7b [T10AN0]”.>

CHECK ***: Is there any trouble in inhibitor switch circuit?***

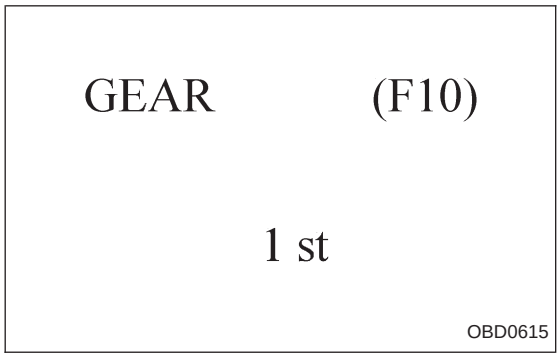
YES : Repair or replace inhibitor switch circuit.

NO : Go to step 3.



3	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) Designate mode using function key.

Function mode for AT: F10

7) Move selector lever to “D” and drive the vehicle.
8) Read data on Subaru select monitor.

CHECK ***: Change gear position according to throttle position and vehicle speed.***

YES : Go to next CHECK .

NO : Go to step 4.

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 with a new one.

4	CHECK SHIFT SOLENOID 1 CIRCUIT. <REF. TO 3-2b [T7E0].>

CHECK ***: Is there any trouble in shift solenoid 1 circuit?***

YES : Repair or replace shift solenoid 1 circuit.

NO : Go to step 5.

5	**CHECK SHIFT SOLENOID 2 CIRCUIT. <REF. TO 3-2b [T7D0].>**

CHECK ***: Is there any trouble in shift solenoid 2 circuit?***

YES : Repair or replace shift solenoid 2 circuit.

NO : Go to step 6.

6	**CHECK SHIFT SOLENOID 3 CIRCUIT. <REF. TO 3-2b [T7C0].>**

CHECK ***: Is there any trouble in shift solenoid 3 circuit?***

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 with a new one.

BB: DTC P0763 — SHIFT SOLENOID C (SHIFT SOLENOID 3) ELECTRICAL (OVR) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

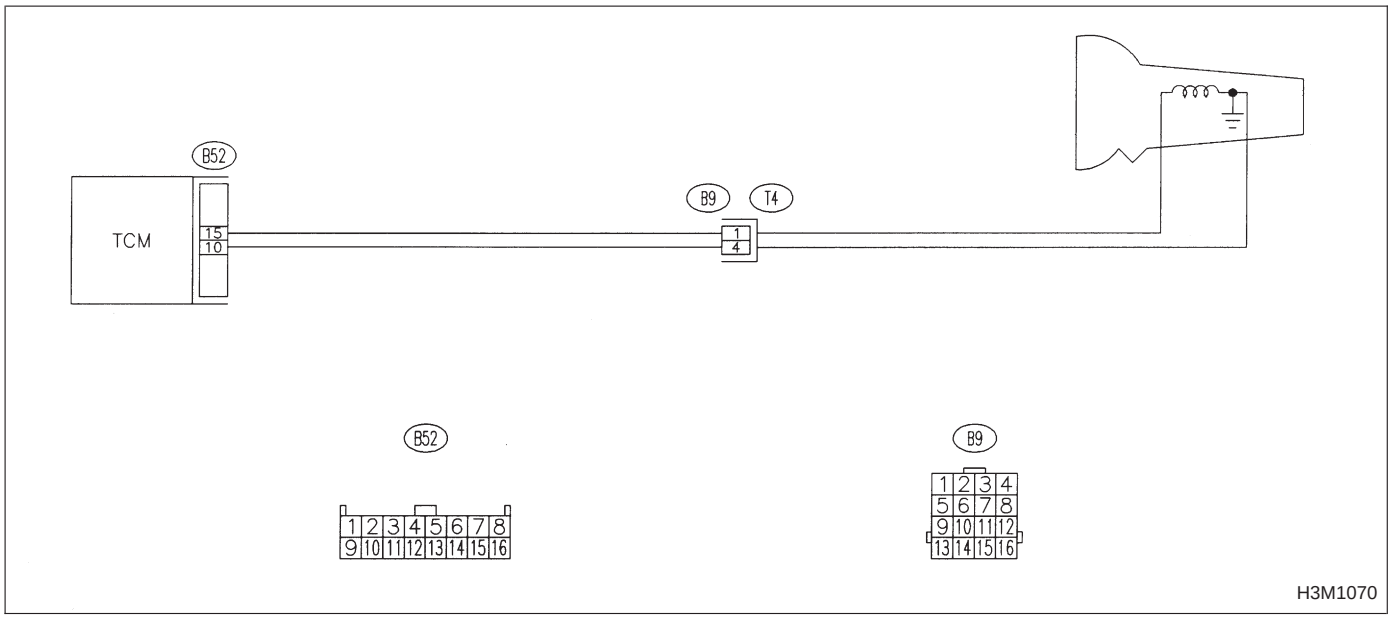
TROUBLE SYMPTOM:

- Ineffective engine brake with selector lever in “3”

1.	Check harness connector between TCM and shift solenoid 3.
2.	Check shift solenoid 3’s ground line.
3.	Check shift solenoid 3.
4.	Check output signal emitted from TCM.

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

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on shift solenoid 3 circuit, refer to 3-2b [T7C0].

OBD	(FB1)
P1100	<ST_SW>

OBD0458

BC: DTC P1100 — STARTER SWITCH CIRCUIT MALFUNCTION (ST — SW) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

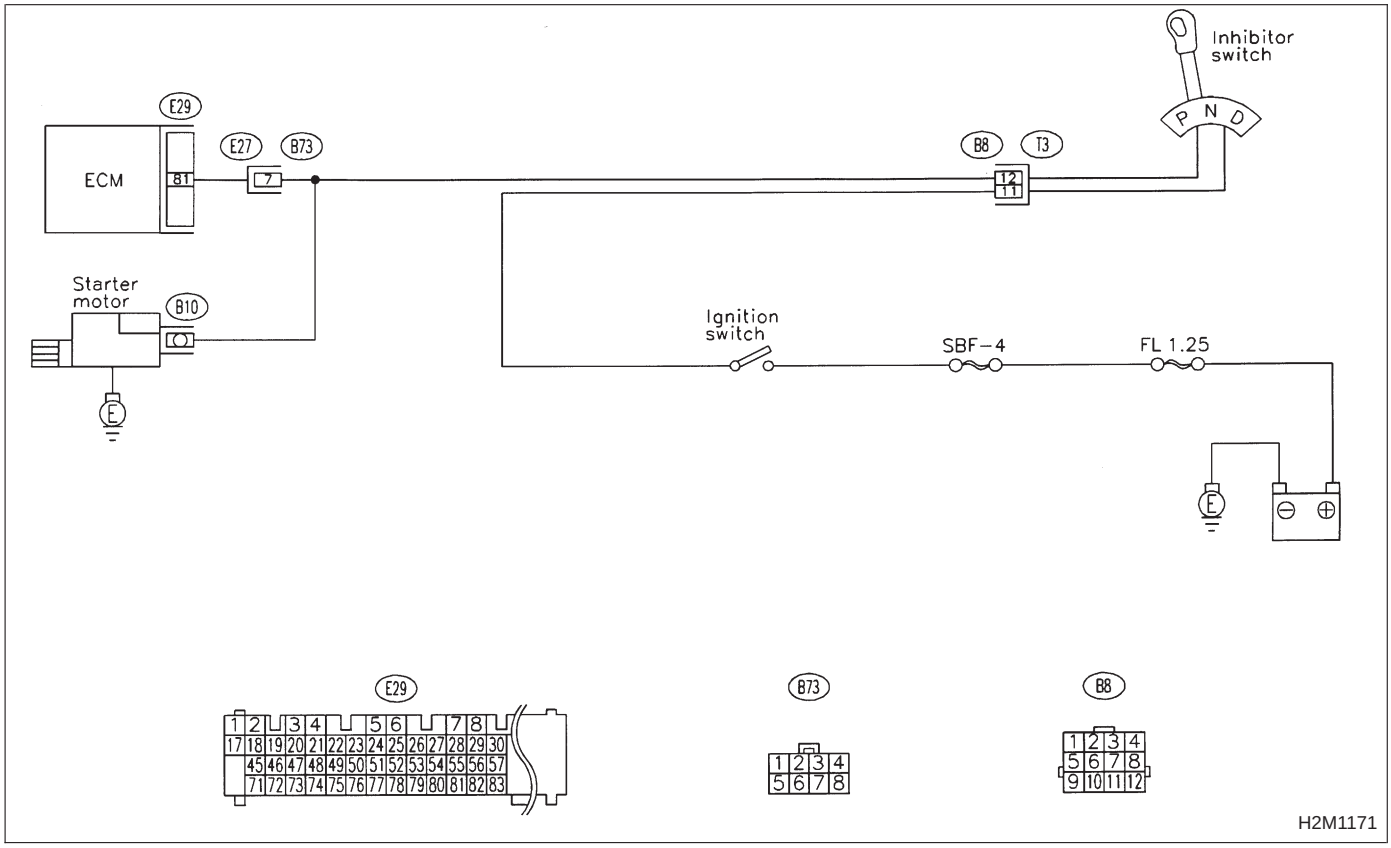
TROUBLE SYMPTOM:

- Failure of engine to start

1.	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].>

WIRING DIAGRAM:



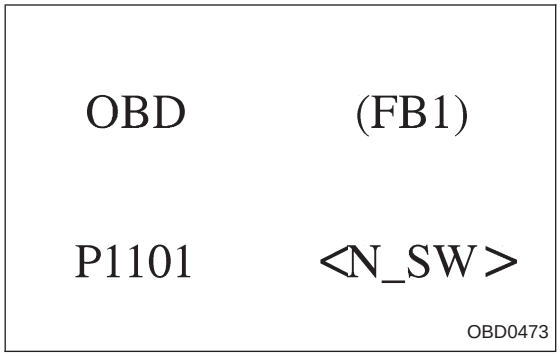
1	CHECK OPERATION OF STARTER MOTOR.

CHECK ***: Turn ignition switch to "ST" to ensure that starter motor operates.***

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

YES : Repair open circuit or poor contact in ECM connector.

NO : Diagnose starter motor circuit <Ref. to 2-7b [T8B0].>



BD: DTC P1101 — NEUTRAL POSITION SWITCH CIRCUIT MALFUNCTION (N — SW) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

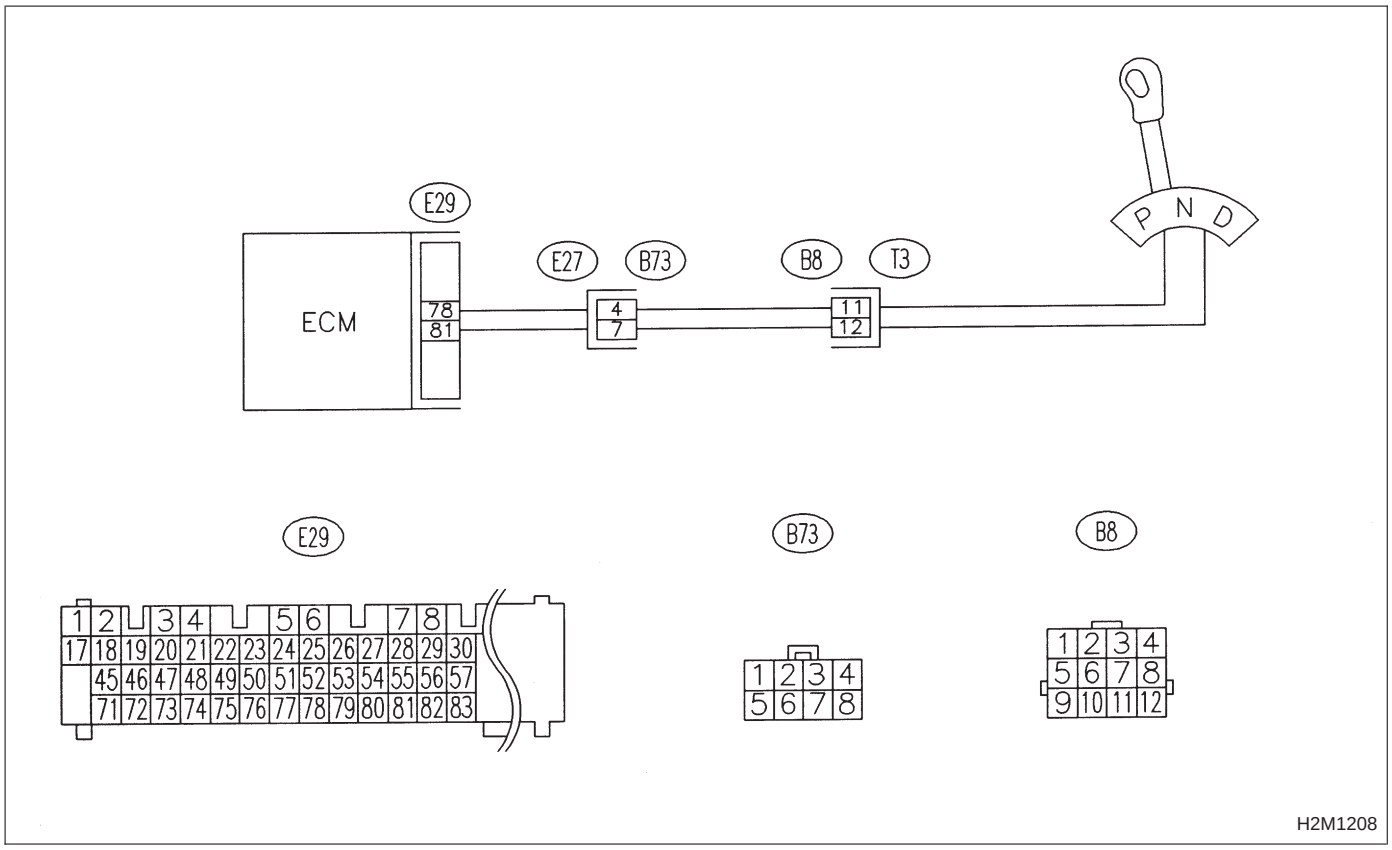
TROUBLE SYMPTOM:

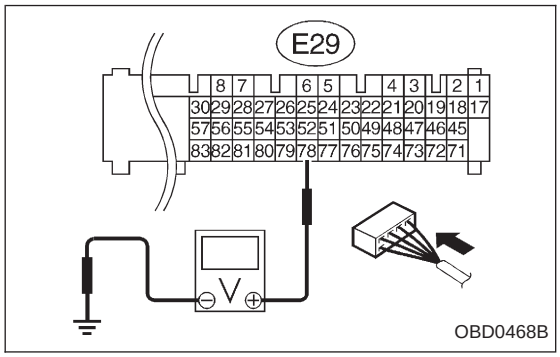
- Erroneous idling

1.	**Check input signal for ECM.**
2.	**Check harness connector between ECM and inhibitor switch.**
3.	**Check inhibitor switch.**

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

WIRING DIAGRAM:



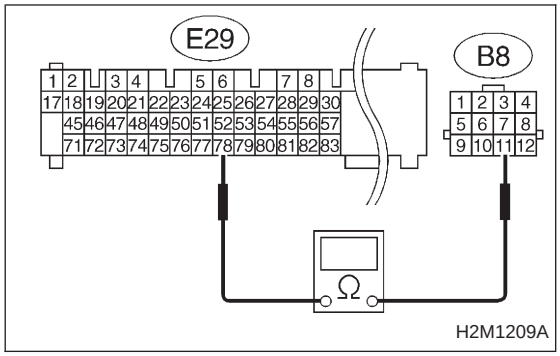


1	CHECK INPUT SIGNAL FOR ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and body.

CHECK ***: Connector & terminal***
(E29) No. 78 — Body / 0 V ("N" and "P" positions)
(E29) No. 78 — Body / 5.0±0.5 V (Other positions)

YES Go to next CHECK .
NO : Go to step 2.
CHECK ***: Is there poor contact in ECM connector?***
YES : Repair poor contact in ECM connector.
NO : Replace ECM with a new one.



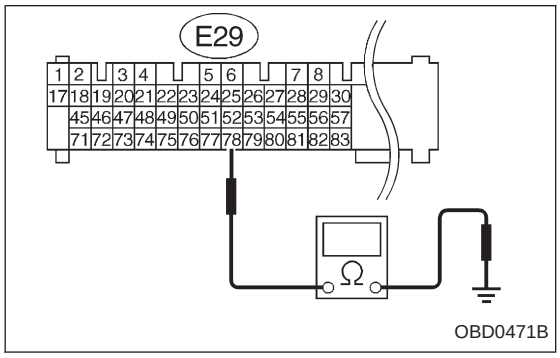
2	CHECK HARNESS CONNECTOR BETWEEN ECM AND INHIBITOR SWITCH.

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

CHECK ***: Connector & terminal***
(E29) No. 78 — (B8) No. 11 / 1 Ω, or less

YES : Go to next step.

NO : Repair open circuit of harness between ECM connector and transmission connector.

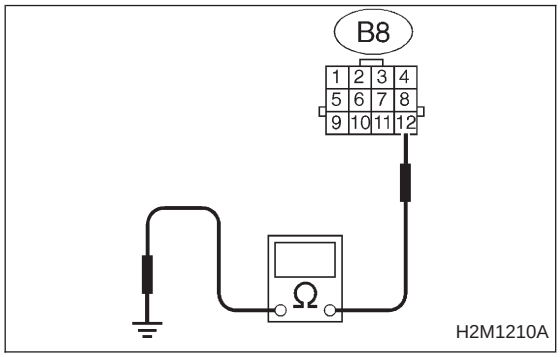


4) Measure resistance of harness connector between ECM and body.

CHECK ***: Connector & terminal***
(E29) No. 78 — Body / 1 MΩ, or more

YES : Go to next step.

NO : Repair short circuit of harness between ECM connector and transmission connector.

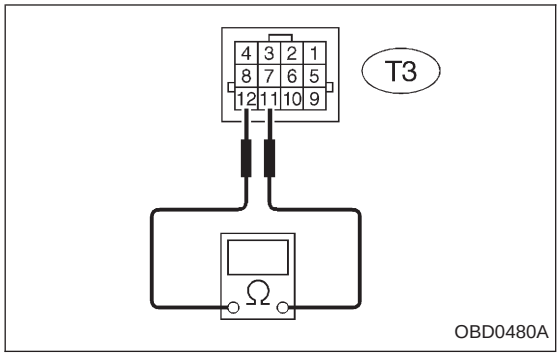


5) Measure resistance of harness connector between inhibitor switch and body.

CHECK ***: Connector & terminal***
(B8) No. 12 — Body / 5 Ω, or less

YES : Go to step 3.

NO : Repair open circuit of inhibitor switch ground line.



3	CHECK INHIBITOR SWITCH.

Measure resistance between transmission connector receptacle's terminals.

CHECK ***: Connector & terminal***
(T3) No. 12 — No. 11 / 10 Ω, or less
("N" and "P" positions)
(T3) No. 12 — No. 11 / 1 MΩ, or more
(Other positions)

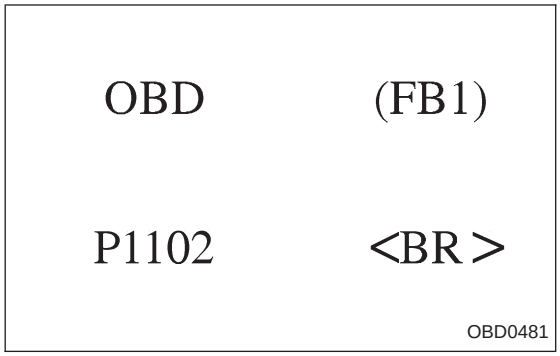
YES : Go to next CHECK .

NO : Replace inhibitor switch.

CHECK ***: Is there any fault in selector cable connection to inhibitor switch?***

YES : Repair selector cable connection. <Ref. to 3-2 [W2B2].>

NO : Replace ECM with a new one.



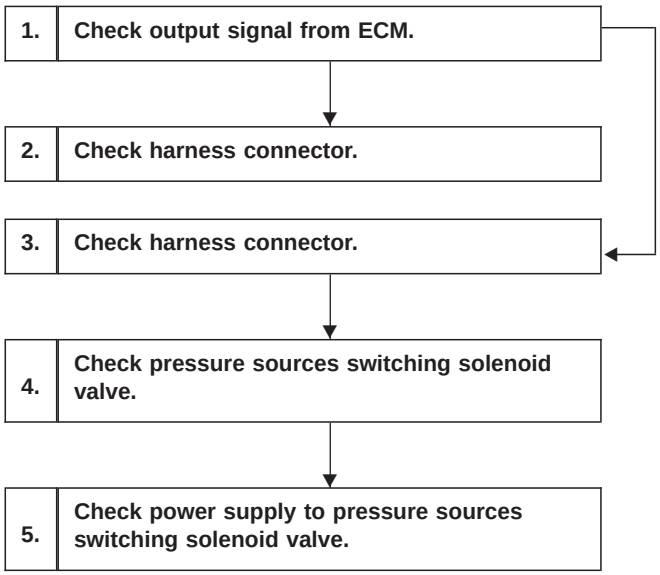
BE: DTC P1102 — PRESSURE SOURCES SWITCHING SOLENOID VALVE CIRCUIT MALFUNCTION (BR) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

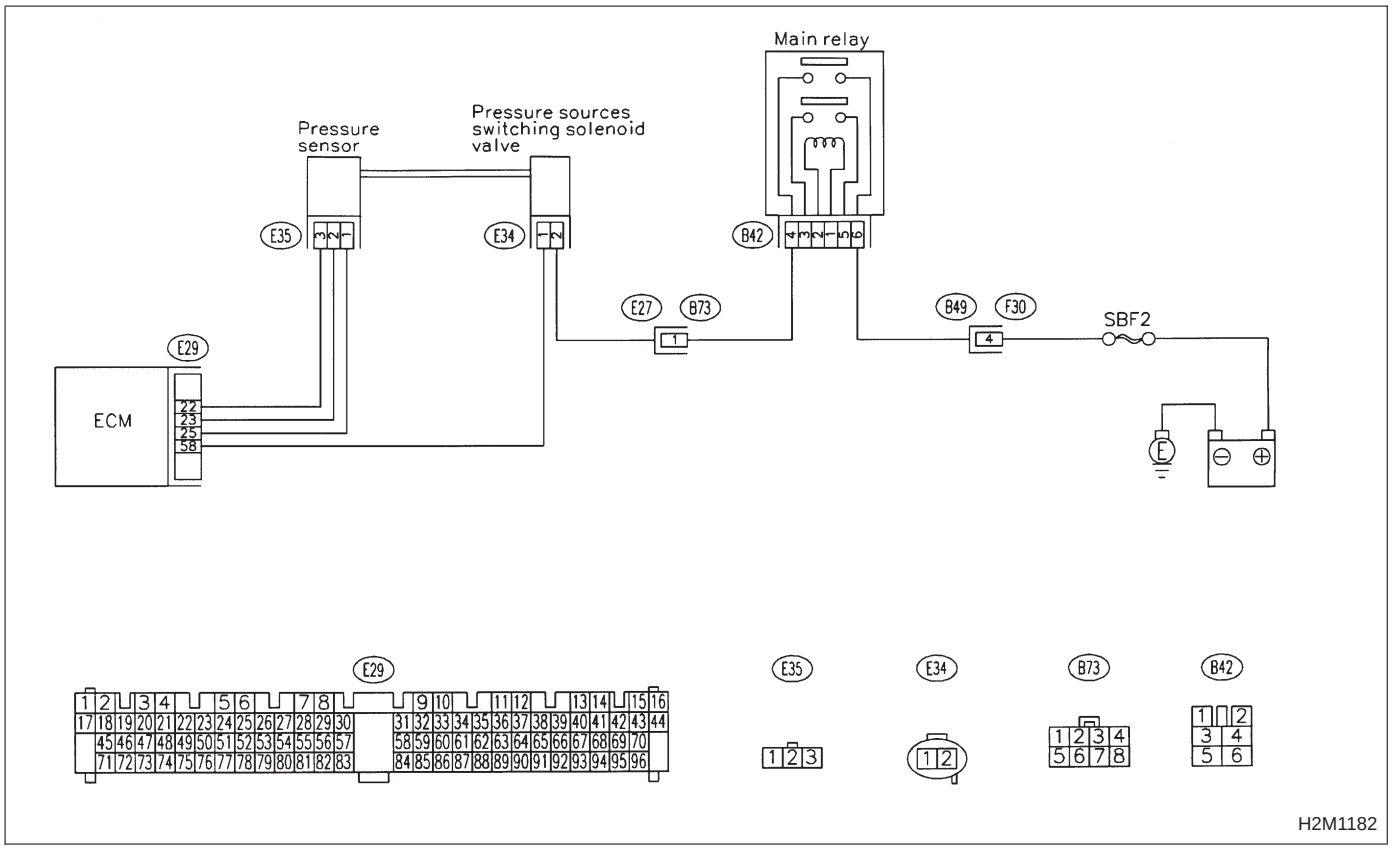
TROUBLE SYMPTOM:

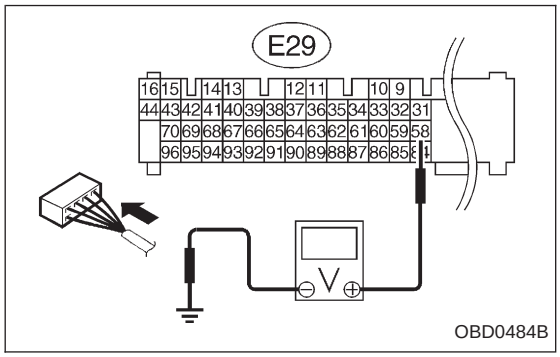
- Erroneous idling
- Failure of engine to start



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

WIRING DIAGRAM:





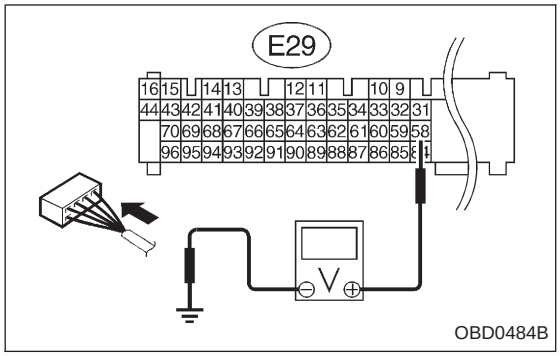
1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 58 — Body / 10 V, or more***

YES : Go to step 2.

NO : Go to step 3.



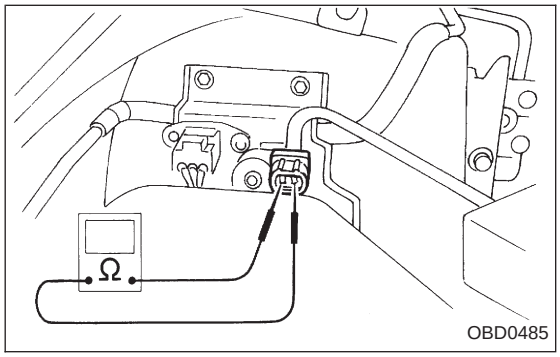
2	CHECK HARNESS CONNECTOR.

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 body.

CHECK ***: Connector & terminal***
(E29) No. 58 — Body / 10 V, or more

YES : Repair short circuit of harness between ECM connector and pressure sources switching solenoid valve connector and replace ECM.

NO : Go to next step.



5) Turn ignition switch to OFF.
6) Measure resistance between pressure sources switching solenoid valve terminals.

CHECK ***: Terminals***
No. 1 — No. 2/1 Ω, or less

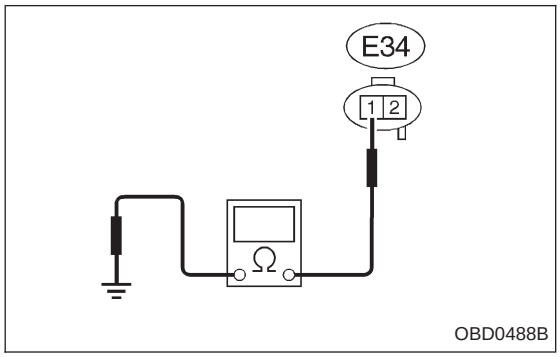
YES : Replace pressure sources switching solenoid valve and ECM.

NO : Go to next CHECK .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM with a new one.



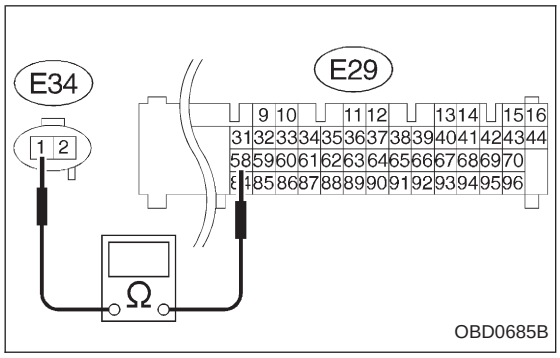
3	CHECK HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Disconnect connector from pressure sources switching solenoid valve and ECM.
3) Measure resistance of harness connector between pressure sources switching solenoid valve and body.

CHECK ***: Connector & terminal***
(E34) No. 1 — Body / 10 Ω, or less

YES : Repair short circuit of harness between ECM connector and pressure sources switching solenoid valve connector.

NO : Go to next step.

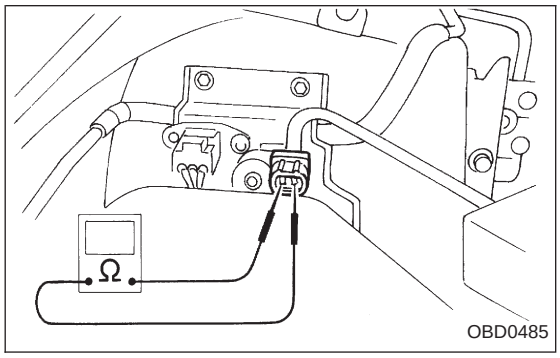


4) Measure resistance of harness connector between ECM and pressure sources switching solenoid valve.

CHECK : ***Connector & terminal***
(E29) No. 58 — (E34) No. 1 / 1 Ω, or less

YES : Go to step 4.

NO : Repair open circuit of harness between ECM connector and pressure sources switching solenoid valve connector.



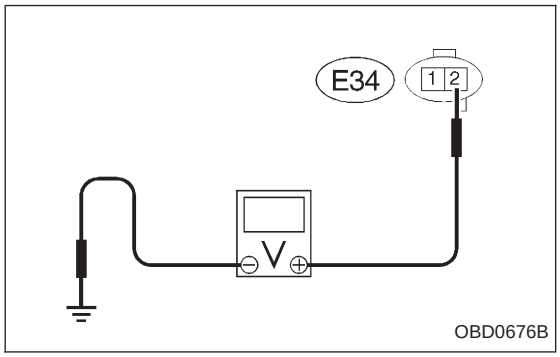
4	CHECK PRESSURE SOURCES SWITCHING SOLENOID VALVE.

Measure resistance between pressure sources switching solenoid valve connector terminals.

CHECK : ***Terminals***
No. 1 — No. 2 / 10 — 100 Ω

YES : Go to step 5.

NO : Replace pressure sources switching solenoid valve.



5	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 body.

CHECK : ***Connector & terminal***
(E34) No. 2 — Body / 10 V, or more

YES : Confirm good connection at pressure sources switching solenoid valve connector.

NO : Repair open circuit of harness between main relay connector and pressure sources switching solenoid valve connector.

BF: DTC P1103 — ENGINE TORQUE CONTROL SIGNAL CIRCUIT MALFUNCTION (TRQ) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

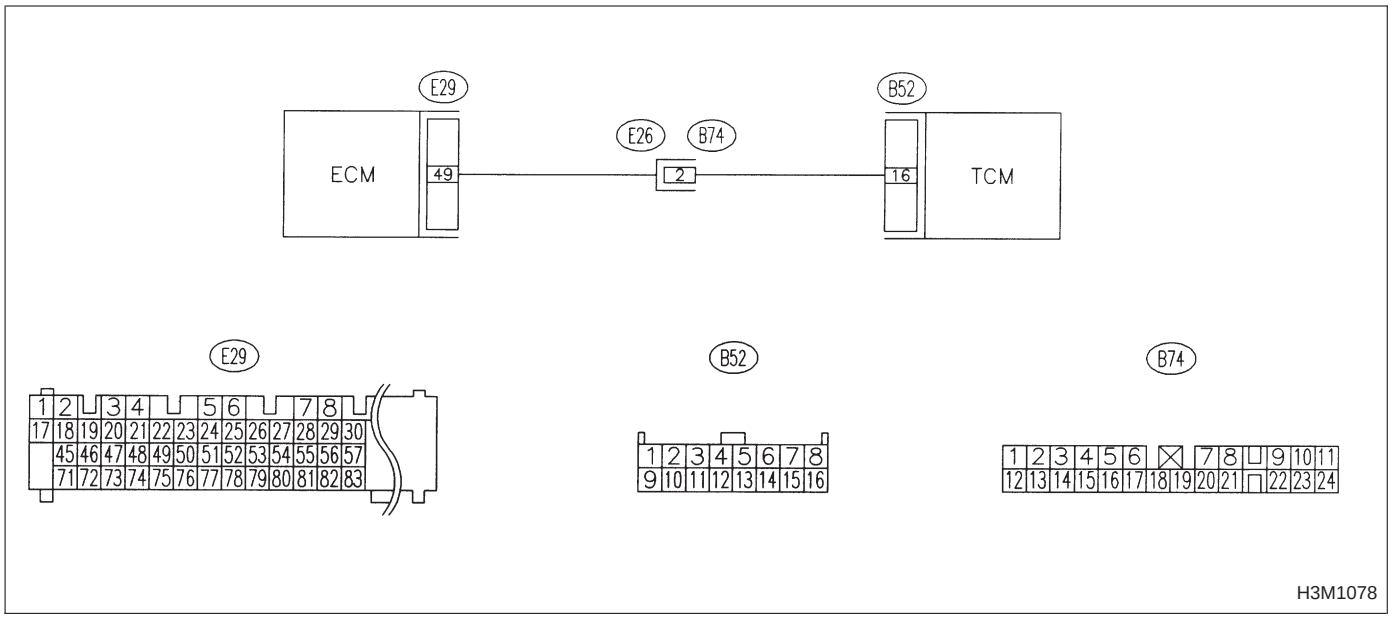
TROUBLE SYMPTOM:

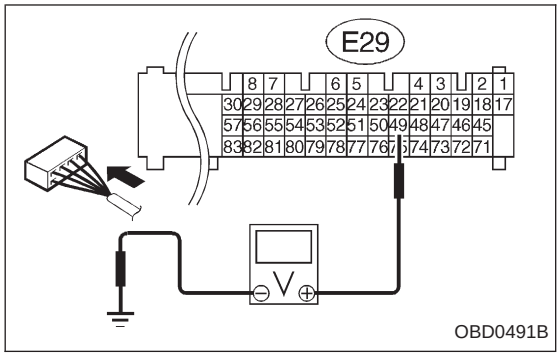
- Excessive shift shock

1.	**Check input signal for ECM.**
2.	**Check harness connector between ECM and TCM.**

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

WIRING DIAGRAM:





1	CHECK INPUT SIGNAL FOR ECM.

1) Turn ignition switch to ON.
2) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 49 — Body / 4.5V, or more***

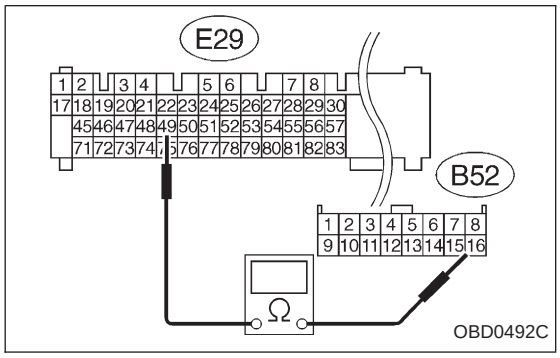
YES : Go to next CHECK .

NO : Go to step 2.

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM with a new one.



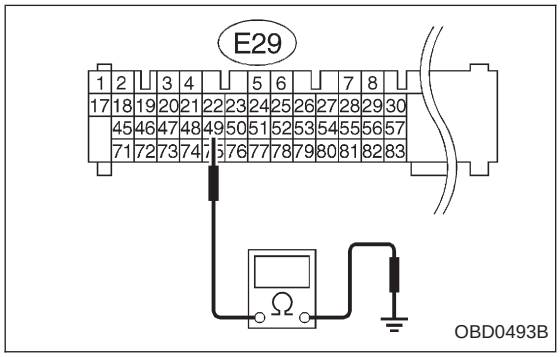
2	CHECK HARNESS CONNECTOR BETWEEN ECM AND TCM.

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

CHECK ***: Connector & terminal (E29) No. 49 — (B52) No. 16 / 1 Ω, or less***

YES : Go to next step.

NO : Repair open circuit of harness between ECM connector and TCM connector.



4) Measure resistance of harness connector between ECM and body.

CHECK ***: Connector & terminal (E29) No. 49 — Body / 1 MΩ, or more***

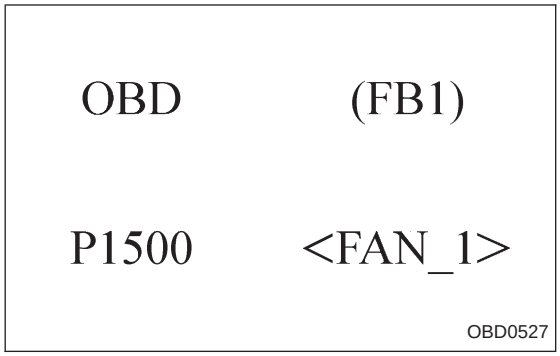
YES : Go to next CHECK .

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

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM with a new one.



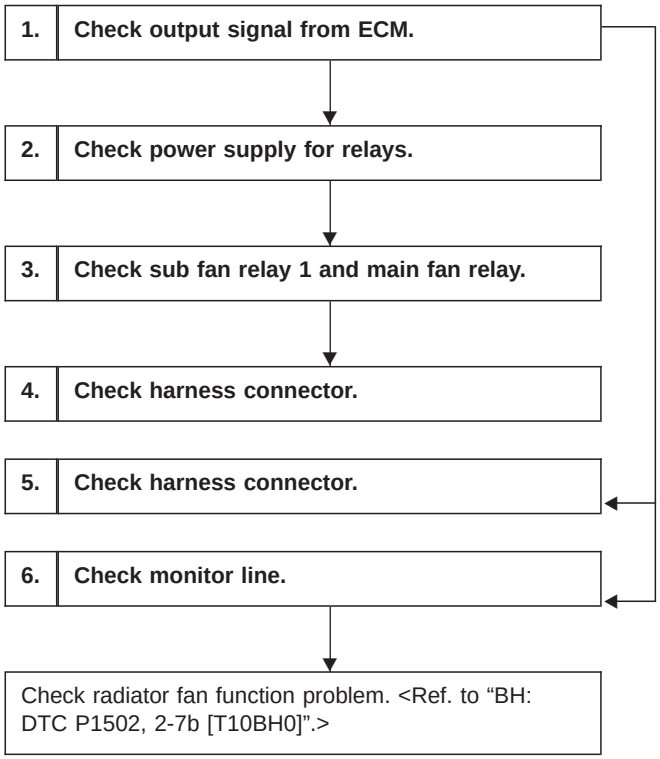
BG: DTC P1500 — RADIATOR FAN RELAY 1 CIRCUIT MALFUNCTION (FAN — 1) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

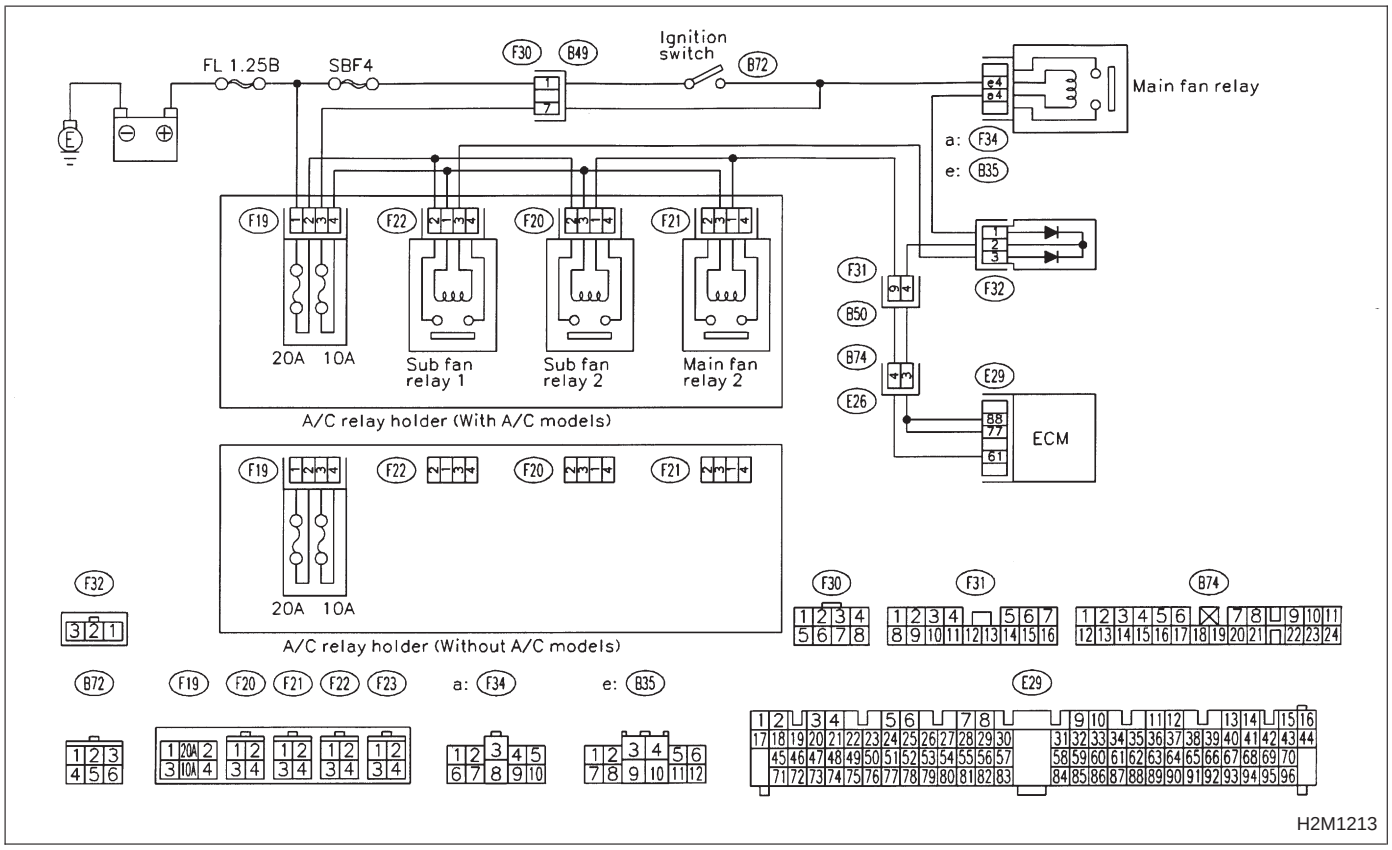
TROUBLE SYMPTOM:

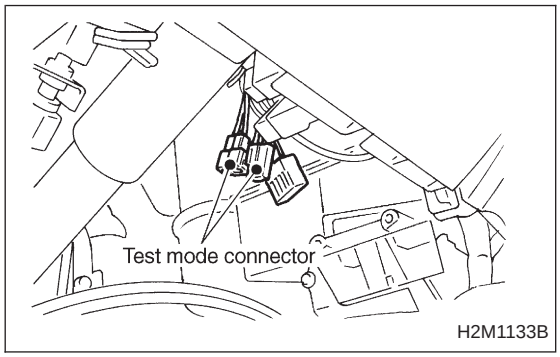
- Radiator fan does not operate properly.
- Overheating

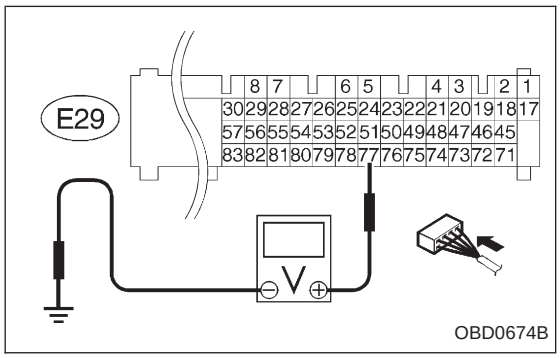


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODE.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:







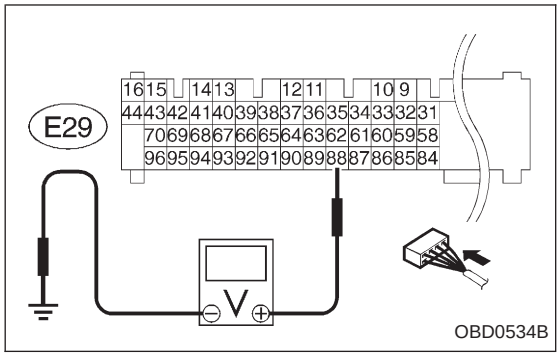
1	CHECK OUTPUT SIGNAL FROM ECM.

1) Turn ignition switch to OFF.
2) Connect test mode connector at the lower portion of instrument panel (on the driver's side), to the side of the center console box.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and body.

CHECK ***: Connector & terminal (E29) No. 77 — Body/10 V, or more and 1 V or less at every 2 seconds***

YES : Go to step 6.

NO : Go to next CHECK .



CHECK ***: Connector & terminal (E29) No. 88 — Body/10 V, or more***

YES : Go to step 5.

NO : Go to step 2.

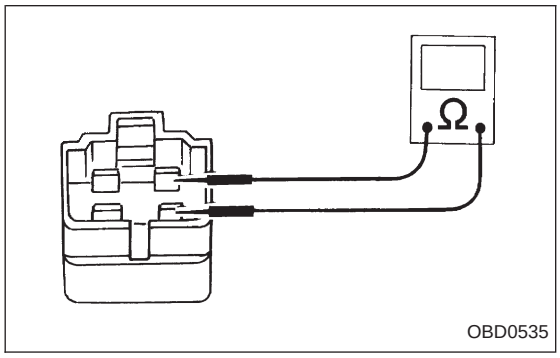
2	**CHECK POWER SUPPLY FOR RELAYS.**

Turn ignition switch to OFF.

CHECK ***: Is the fuse in power supply circuit broken?***

YES : Replace the fuse.

NO : Go to step 3.



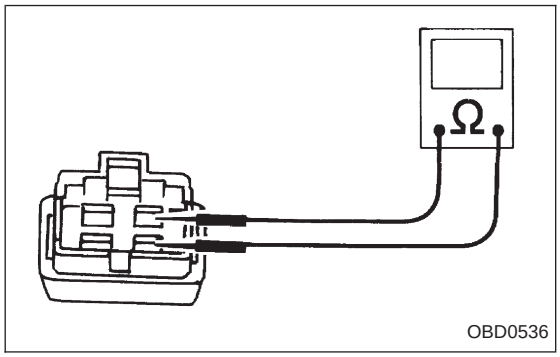
3	**CHECK SUB FAN RELAY 1 AND MAIN FAN RELAY.**

1) Remove sub fan relay 1. (With A/C models only)
2) Measure resistance between sub fan relay 1 terminals.

CHECK ***: Terminal No. 1 — No. 3/97±10 Ω***

YES : Go to next step.

NO : Replace sub fan relay 1.

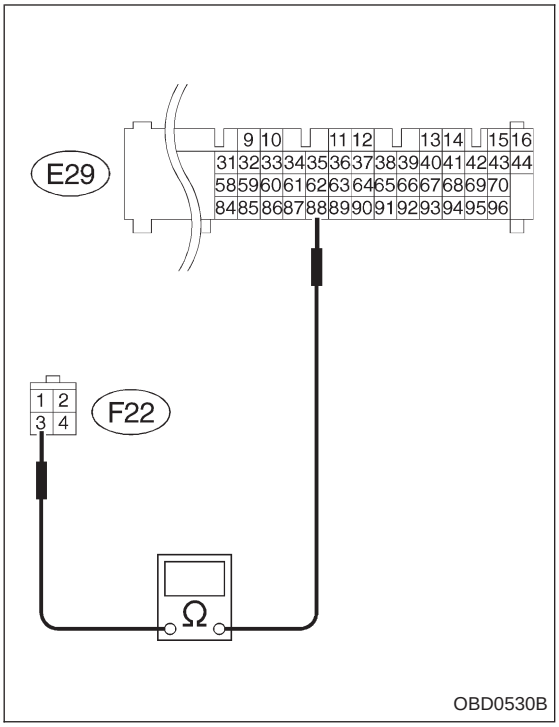


3) Remove main fan relay.
4) Measure resistance between main fan relay terminals.

CHECK ***: Terminal No. 1 — No. 3/100±17 Ω***

YES : Go to step 4.

NO : Replace main fan relay.



4	CHECK HARNESS CONNECTOR.

1) Disconnect connector from ECM.
2) Check if the harness connector is open circuit or has poor contact with the following circuits.

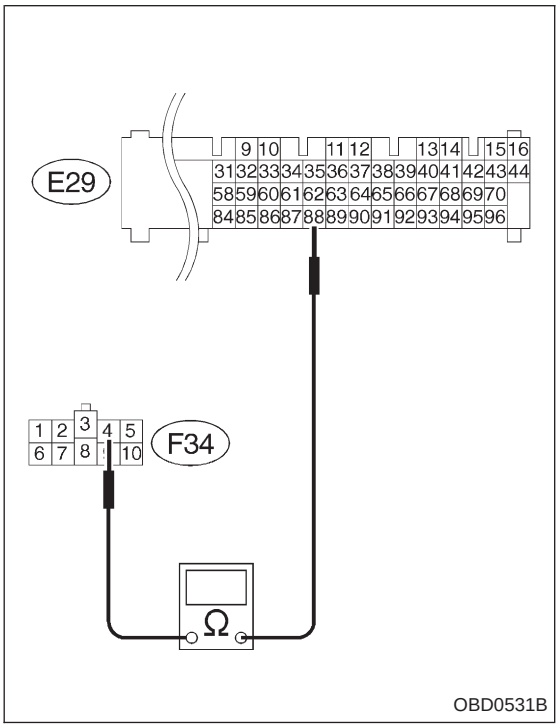
CHECK ***: Connector & terminal (E29) No. 88 — (F22) No. 3 / 1 Ω, or less***

NOTE:
With A/C models only.

YES : Go to next CHECK .
NO : Repair open circuit of harness between ECM connector and sub fan relay 1 connector.

CHECK ***: Is there poor contact in ECM or sub fan relay 1 connector?***

YES : Repair ECM or sub fan relay 1 connector.
NO : Go to next CHECK .

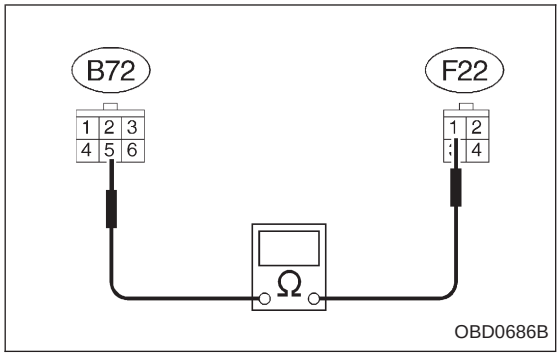


CHECK ***: Connector & terminal (E29) No. 88 — (F34) No. 4 / 1 Ω, or less***

YES : Go to next CHECK .
NO : Repair open circuit of harness between ECM connector and main fan relay connector.

CHECK ***: Is there poor contact in ECM or main fan relay connector?***

YES : Repair ECM or main fan relay connector.
NO : Go to next CHECK .



CHECK ***: Connector & terminal (F22) No. 1 — (B72) No. 5 / 1 Ω, or less***

YES : Go to next CHECK .

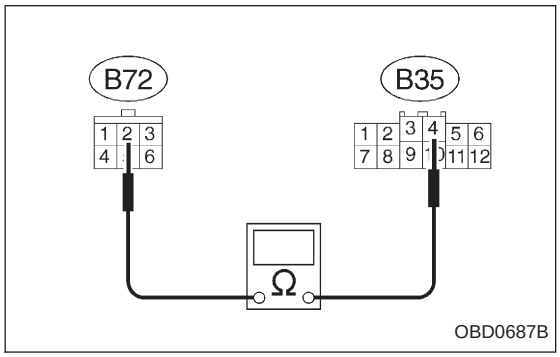
NO : Repair open circuit of harness between sub fan relay 1 connector and ignition switch connector.

CHECK ***: Is there poor contact in sub fan relay 1 or ignition switch connector?***

YES : Repair poor contact in sub fan relay 1 or ignition switch connector.

NO : Go to next CHECK .

NOTE:
With A/C models only.



CHECK ***: Connector & terminal (B35) No. 4 — (B72) No. 2 / 1 Ω, or less***

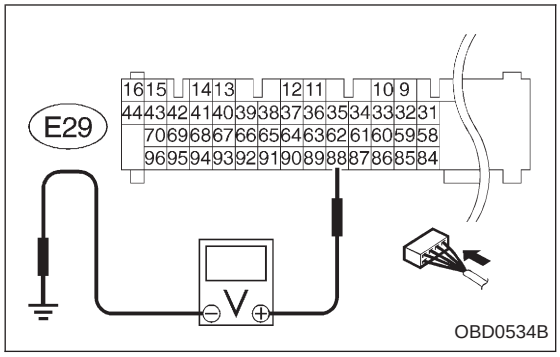
YES : Go to next CHECK .

NO : Repair open circuit of harness between main fan relay connector and ignition switch connector.

CHECK ***: Is there poor contact in main fan relay or ignition switch connector?***

YES : Repair poor contact in main fan relay or ignition switch connector.

NO : Replace ECM with a new one.



5	CHECK HARNESS CONNECTOR.

1) Turn ignition switch to OFF.
2) Remove main fan relay and sub fan relay 1. (with A/C models)
   Remove main fan relay. (without A/C models)
3) Disconnect test mode connector.
4) Turn ignition switch to ON.
5) Measure voltage between ECM and body.

CHECK ***: Connector & terminal***
(E29) No. 88 — Body / 10 V, or more

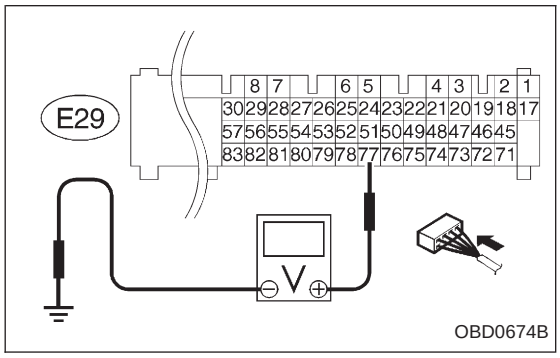
YES : Repair short circuit of harness and replace ECM.

NO : Go to next CHECK .

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

YES : Repair poor contact in ECM connector.

NO : Replace ECM.



6	CHECK MONITOR LINE.

1) Turn ignition switch to OFF.
2) Connect test mode connector.
3) Turn ignition switch to ON.
4) Measure voltage between ECM and body.

CHECK ***: Connector & terminal***
(E29) No. 77 — Body / 10 V, or more and 1 V, or less at every 2 seconds.

YES : Repair poor contact in ECM connector.

NO : Repair open circuit of harness between ECM and main fan relay connector.

OBD (FB1)

P1502 <FAN_F>

OBD0538

BH: DTC P1502 — RADIATOR FAN FUNCTION PROBLEM (FAN – F) —

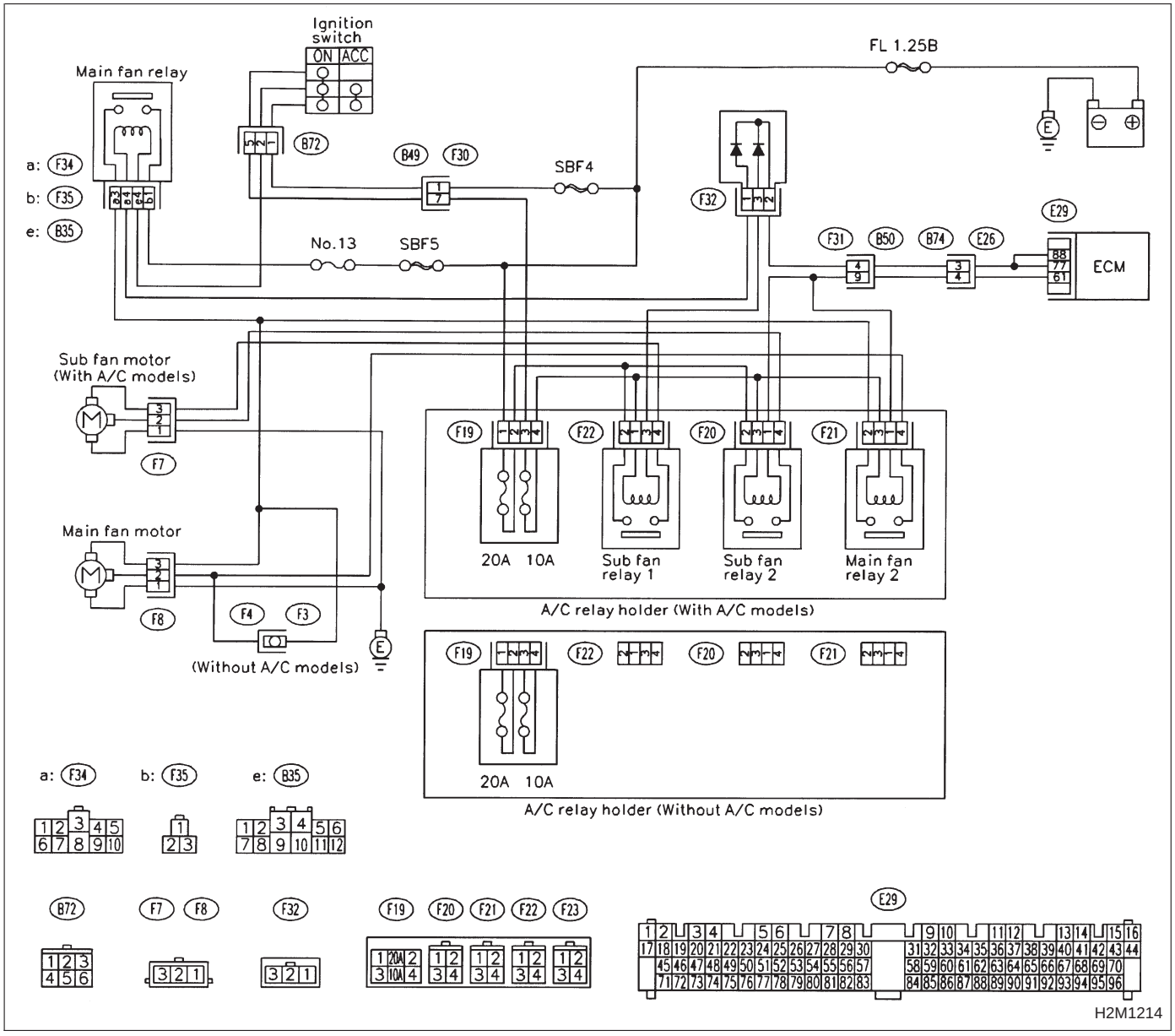
DTC DETECTING CONDITION:

- Two consecutive trips with fault

TROUBLE SYMPTOM:

- Occurrence of noise
- Overheating

WIRING DIAGRAM:



When DTC P1104 is on display, check engine cooling system. <Ref. to 2-5 [T100].>

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

NOTE:
If the vehicle, with the engine idling, is placed very close to a wall or another vehicle, preventing normal cooling function, the OBD system may detect malfunction.

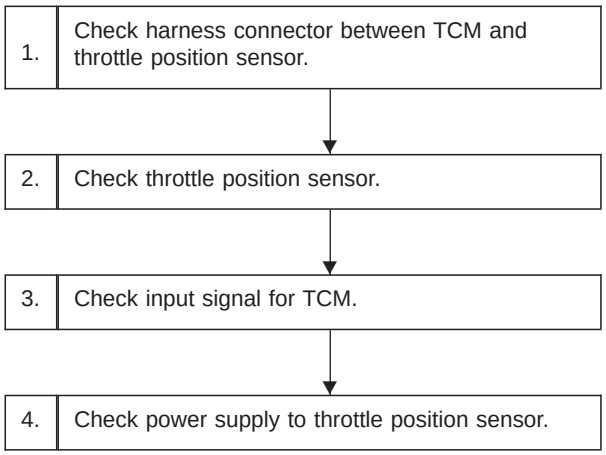
BI: DTC P1700 — THROTTLE POSITION SENSOR CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION (ATTH) —

DTC DETECTING CONDITION:

- Two consecutive trips with fault

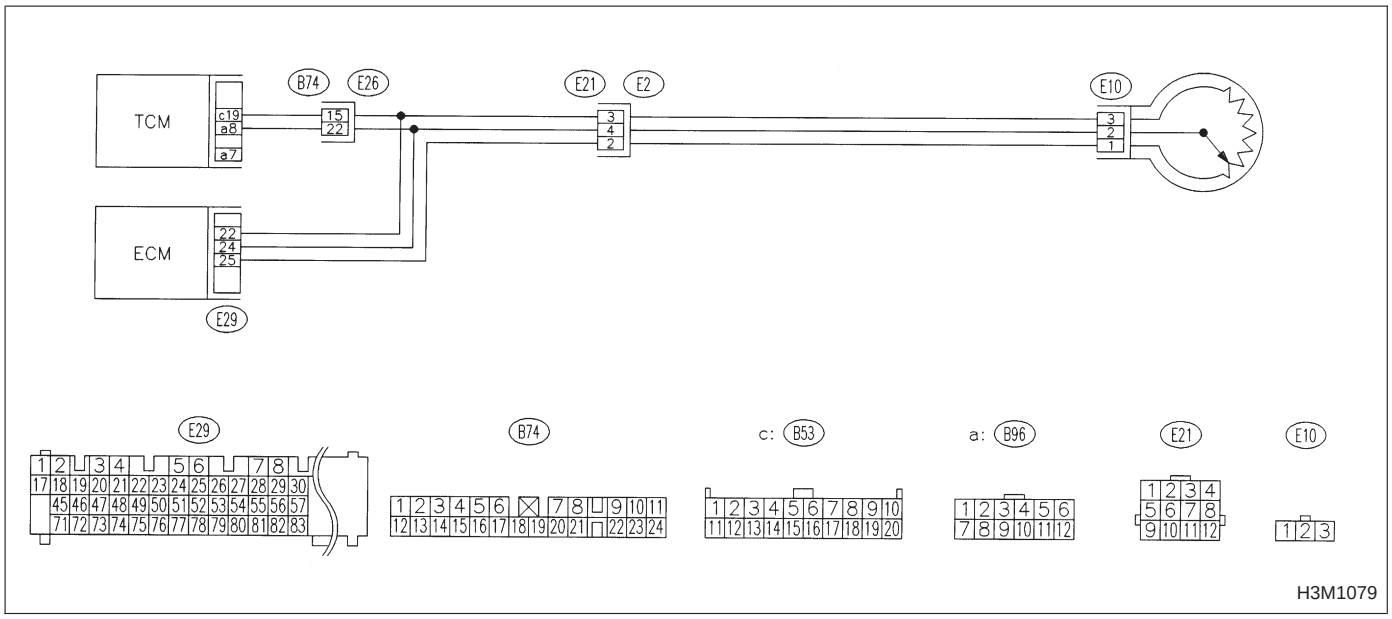
TROUBLE SYMPTOM:

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

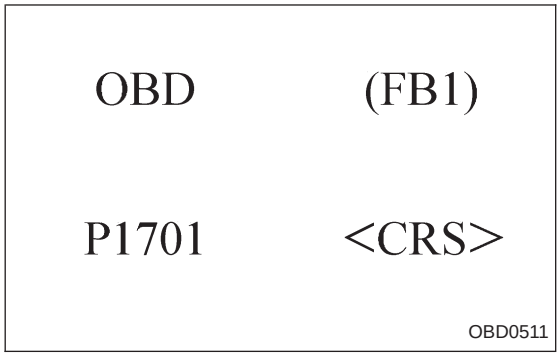


CAUTION:
After repair or replacement of faulty parts, conduct CLEAR MEMORY and INSPECTION MODES.
<Ref. to 2-7b [T3D0] and [T3E0].>

WIRING DIAGRAM:



NOTE:
For the diagnostic procedure on throttle position sensor circuit, refer to 3-2b [T7L0].



BJ: DTC P1701 — CRUISE CONTROL SET SIGNAL CIRCUIT MALFUNCTION FOR AUTOMATIC TRANSMISSION (CRS) —

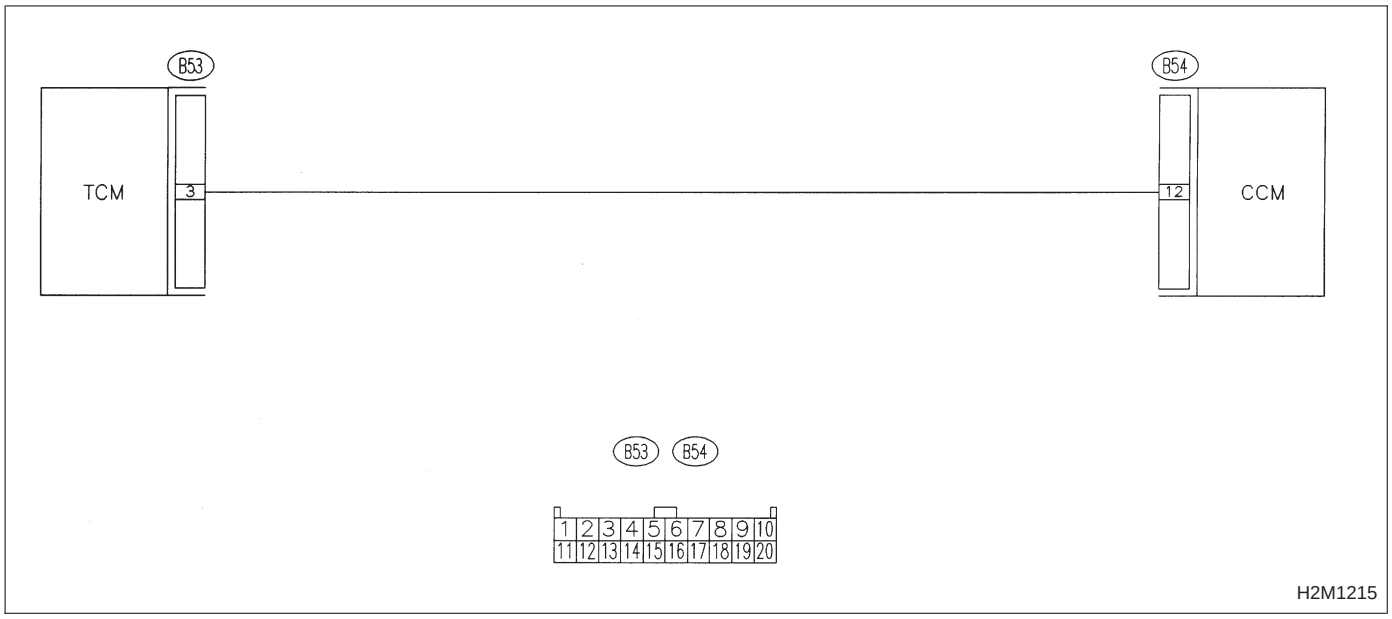
DTC DETECTING CONDITION:

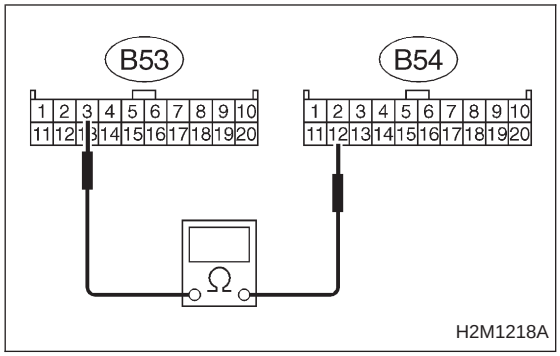
- Two consecutive trips with fault

1.	**Check harness connector between TCM and CCM.**
2.	**Check input signal for TCM.**

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

WIRING DIAGRAM:





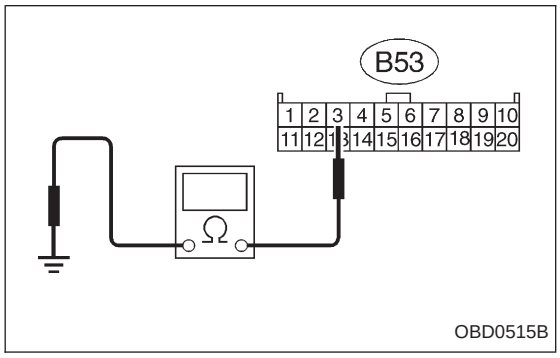
1.	CHECK HARNESS CONNECTOR BETWEEN TCM AND CCM.

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

CHECK ***: Connector & terminal***
(B53) No. 3 — (B54) No. 12 / 1 Ω, or less

YES : Go to next step.

NO : Repair open circuit of harness between TCM connector and CCM connector.

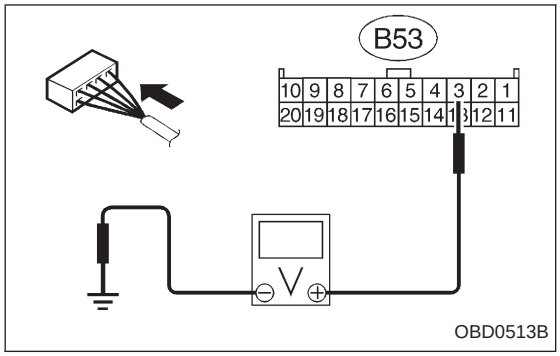


4) Measure resistance of harness connector between TCM and body.

CHECK ***: Connector & terminal***
(B53) No. 3 — Body / 1 MΩ, or more

YES : Go to step 2.

NO : Repair short circuit of harness between TCM connector and CCM connector.



2	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 body.

CHECK ***: Connector & terminal (B53) No. 3 — Body / 1 V, or less***

YES : Go to next CHECK .

NO : Check cruise control set circuit. <Ref. to 6-2 [T600].>

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM with a new one.

OBD (FB1)

P1702 <ATDIAG>

OBD0516

BK: DTC P1702 — AUTOMATIC TRANSMISSION DIAGNOSIS INPUT SIGNAL CIRCUIT MALFUNCTION (ATDIAG) —

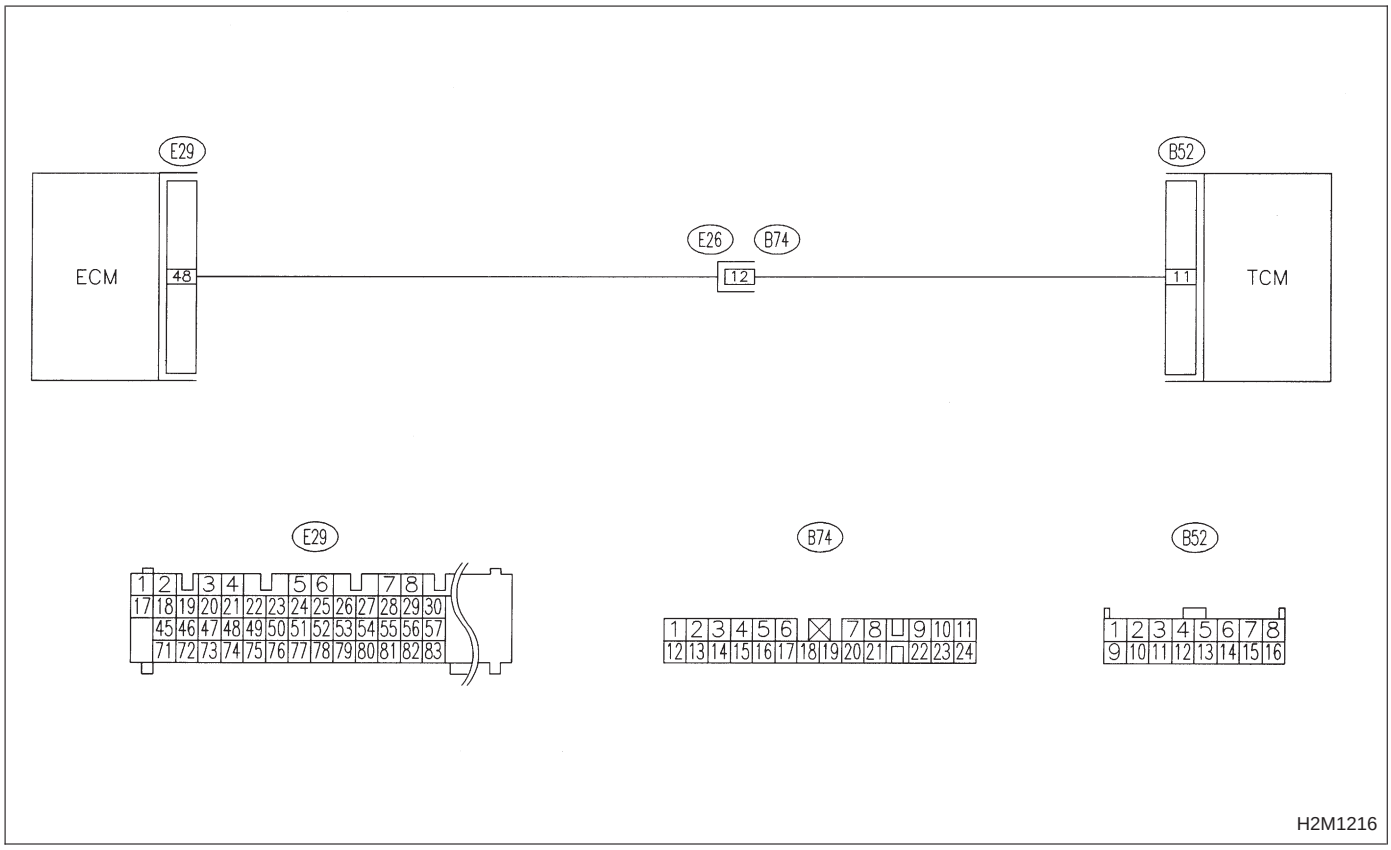
DTC DETECTING CONDITION:

- Two consecutive trips with fault

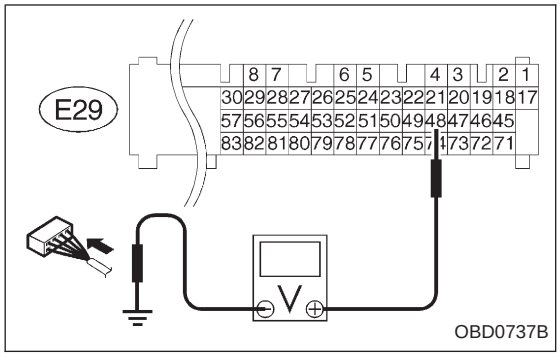
1.	**Check harness connector.**
2.	**Check harness connector.**

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

WIRING DIAGRAM:



H2M1216



1 CHECK HARNESS CONNECTOR

1) Turn ignition switch to ON.
2) Measure voltage between ECM connector and body.

CHECK : ***Connector & terminal (E29) No. 48 — Body / 4 V, or more***

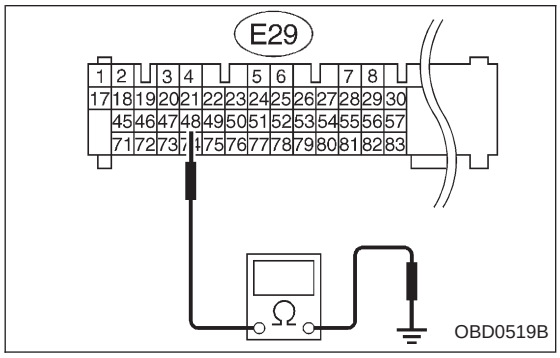
YES : ● Open circuit of harness between ECM connector and TCM connector
● Poor contact in ECM connector
● Poor contact in TCM connector
● Poor contact in coupling connector (B74)
Check the above and repair if necessary.

NO : Go to next CHECK .

CHECK : ***Connector & terminal (B84) No. 48 — Body / 1 V, or less***

YES : Go to step 2.

NO : Although MIL illuminates, circuit is now normal. Check all connectors for possible poor contact between ECM connector and TCM connector.



2 CHECK HARNESS CONNECTOR.

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

CHECK : ***Connector & terminal (E29) No. 48 — Body / 10 Ω, or less***

YES : Repair short circuit of harness between ECM connector and TCM connector.

NO : Repair poor contact in ECM connector.