AUTOMATIC TRANSMISSION AND DIFFERENTIAL 3-2

1. Supplemental Restraint System “Airbag”

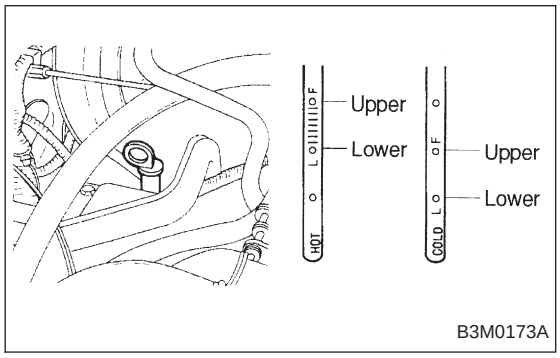
Airbag system wiring harness is routed near the transmission control module (TCM).

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

2. Pre-inspection

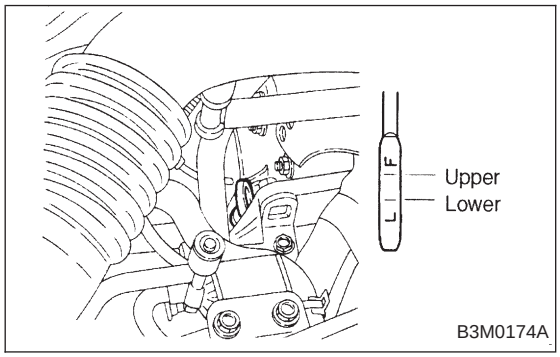
1. ATF LEVEL

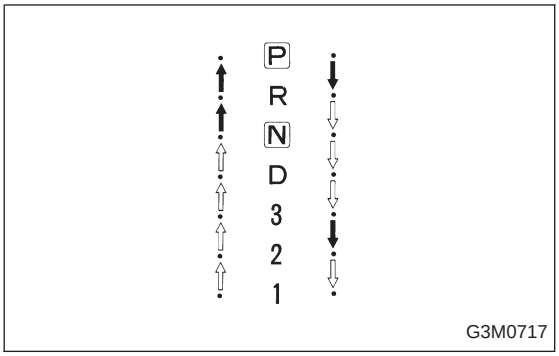
Make sure that ATF level is in the specification.



2. FRONT DIFFERENTIAL OIL LEVEL

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





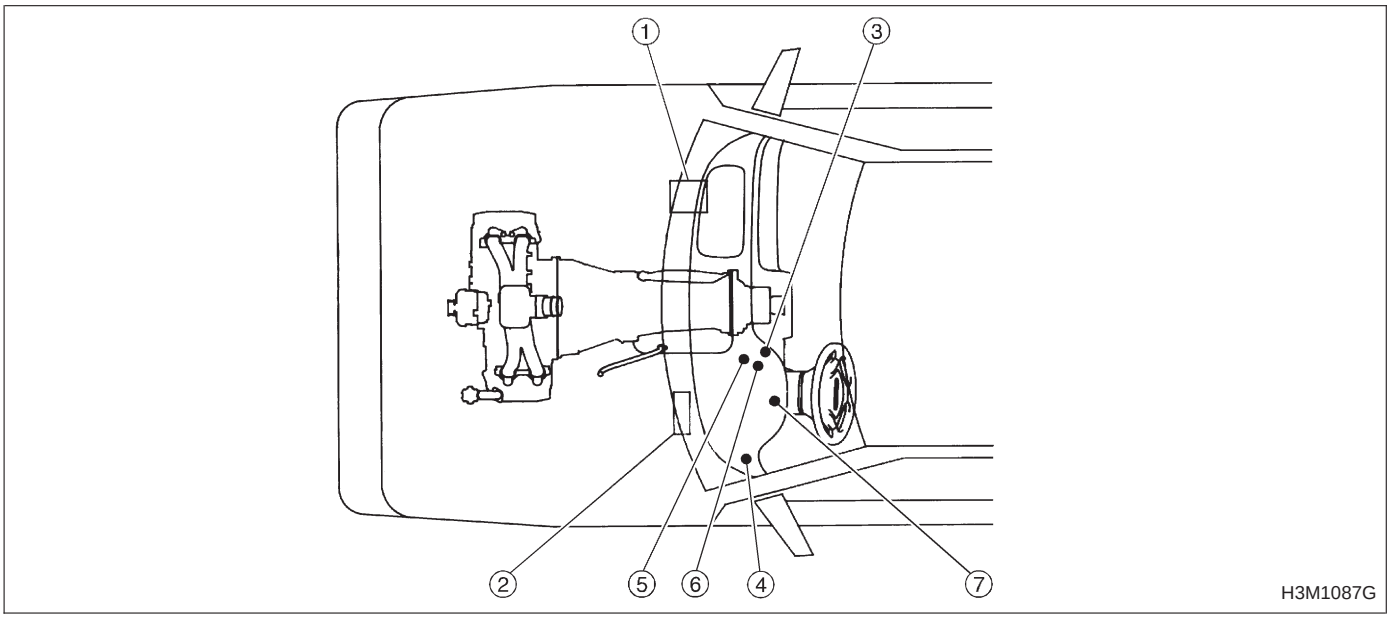
3. OPERATION OF SHIFT SELECTOR LEVER

WARNING:
Stop the engine while checking operation of selector lever.

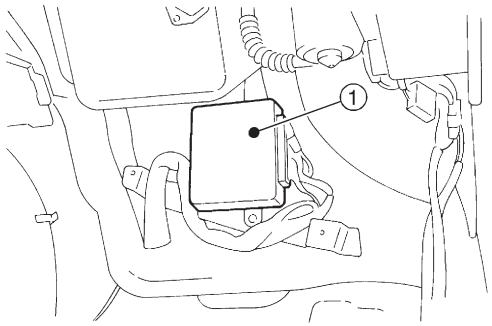
1) Check that selector lever does not move from “N” to “R” without pushing the button.
2) Check that selector lever does not move from “R” to “P” without pushing the button.
3) Check that selector lever does not move from “P” to “R” without pushing the button.
4) Check that selector lever does not move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

3. Electrical Components Location

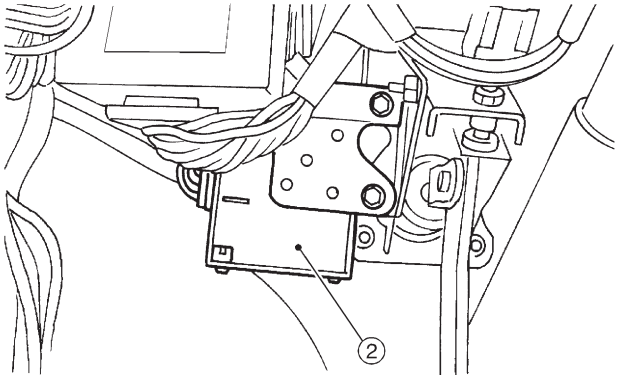
1. MODULE



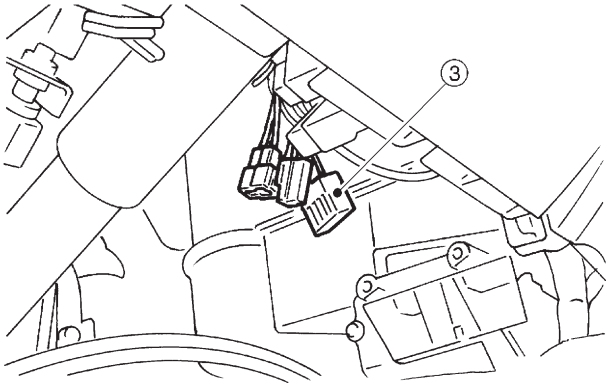
① ECM
② TCM
③ Data link connector (for Subaru select monitor only)
④ Data link connector (for Subaru select monitor and OBD-II general scan tool)
⑤ Diagnosis connector
⑥ Diagnosis terminal
⑦ AT OIL TEMP indicator light (AT diagnostic indicator light)



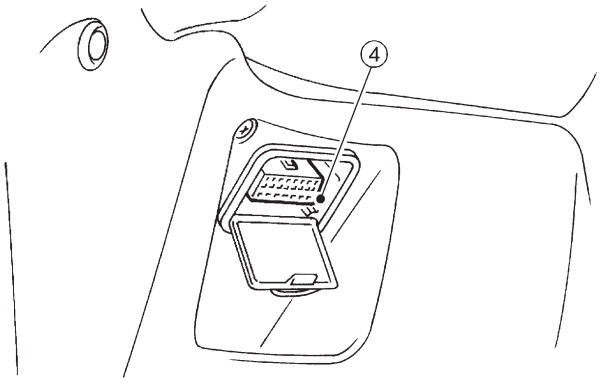
B3M0183D



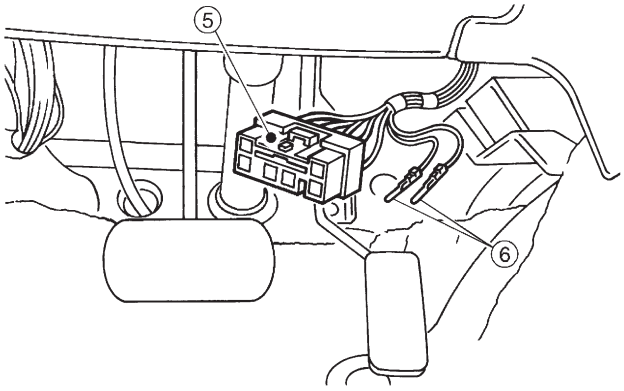
B3M0443I



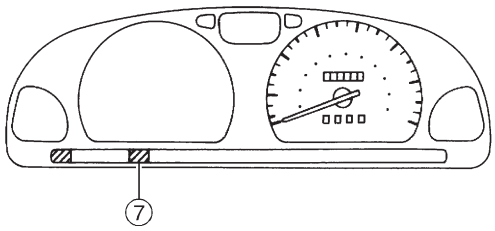
H2M1133C



H2M1134E

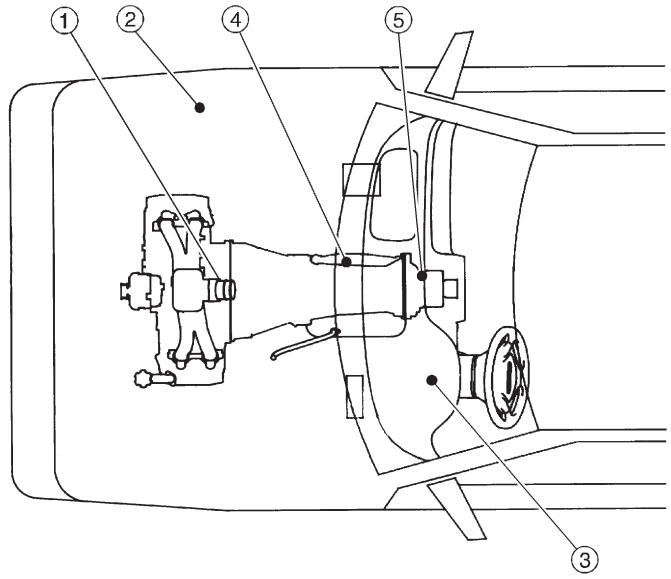


H3M1161E



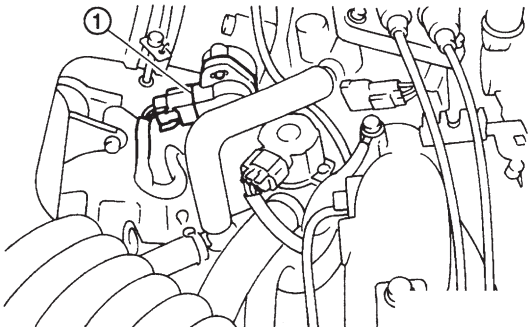
H2M1135F

2. SENSOR

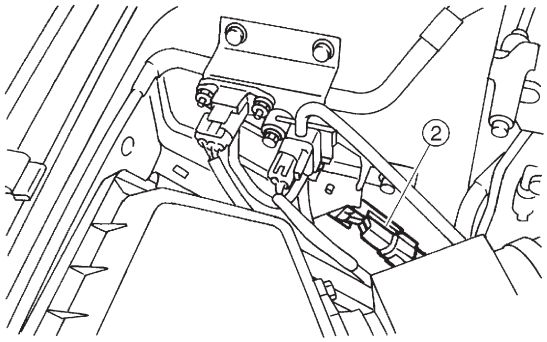


H3M1087H

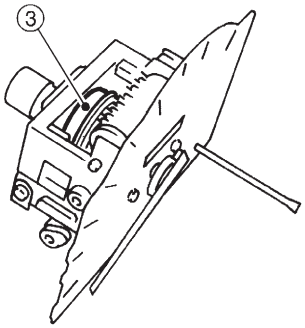
① Throttle position sensor
② Dropping resistor
③ Vehicle speed sensor 2
④ Inhibitor switch
⑤ Vehicle speed sensor 1



B2M0155A

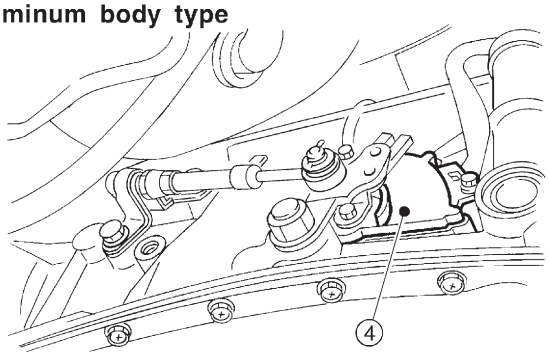


OBD0046A

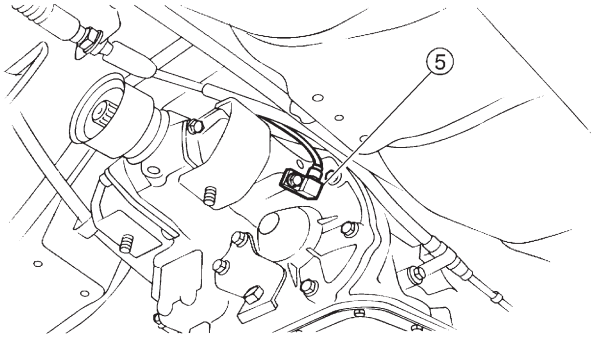


H2M1144B

Aluminum body type

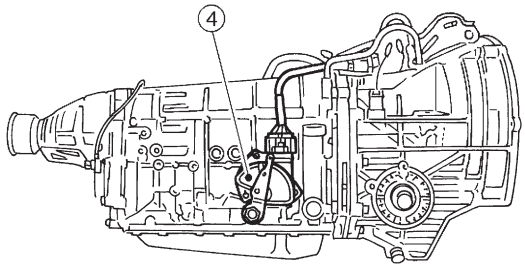


B3M0182C



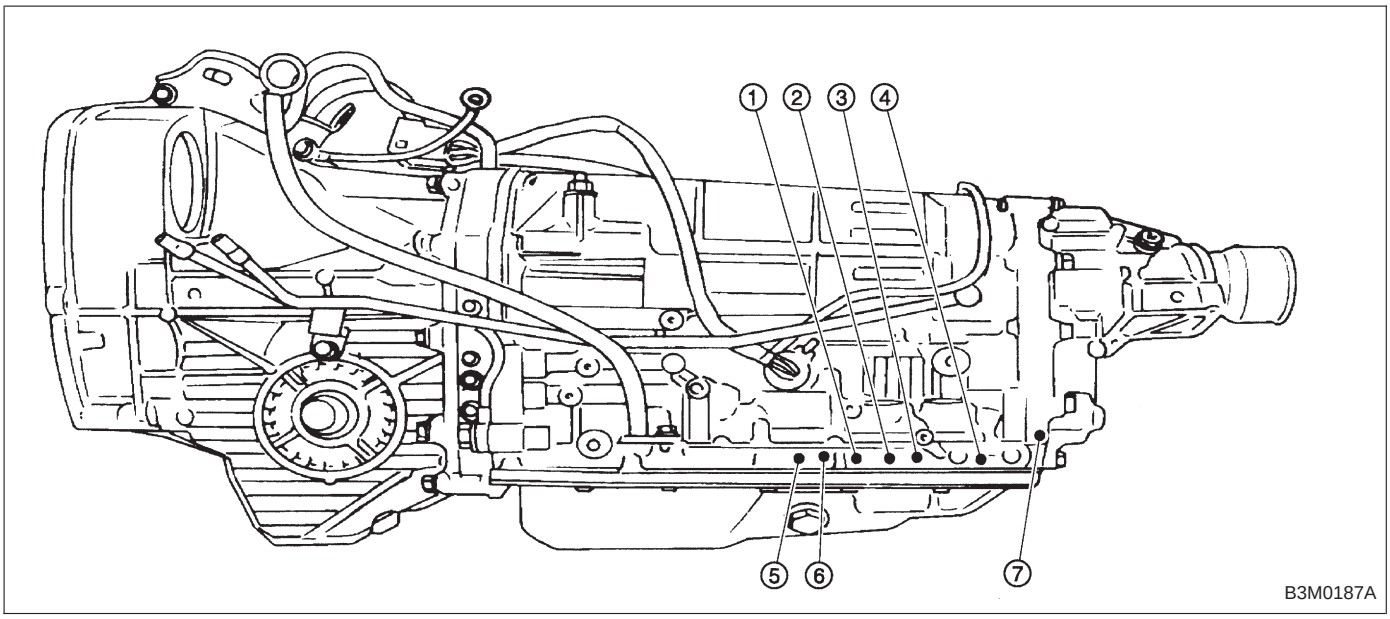
B3M0184D

Plastic body type

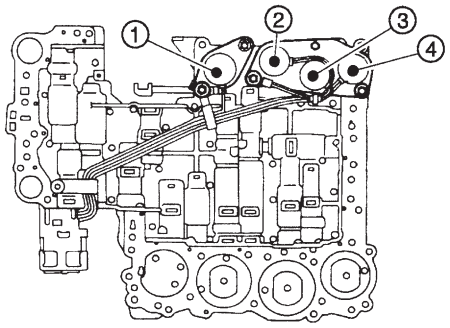


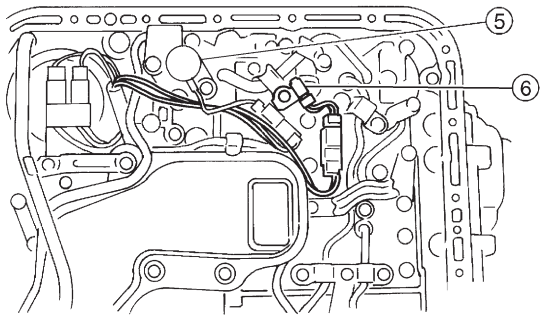
B2M1043C

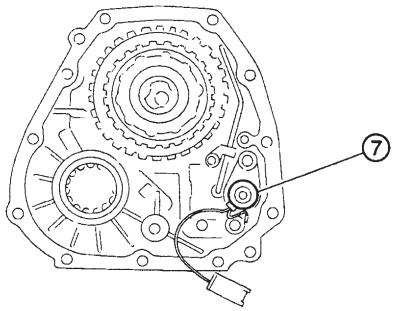
3. SOLENOID



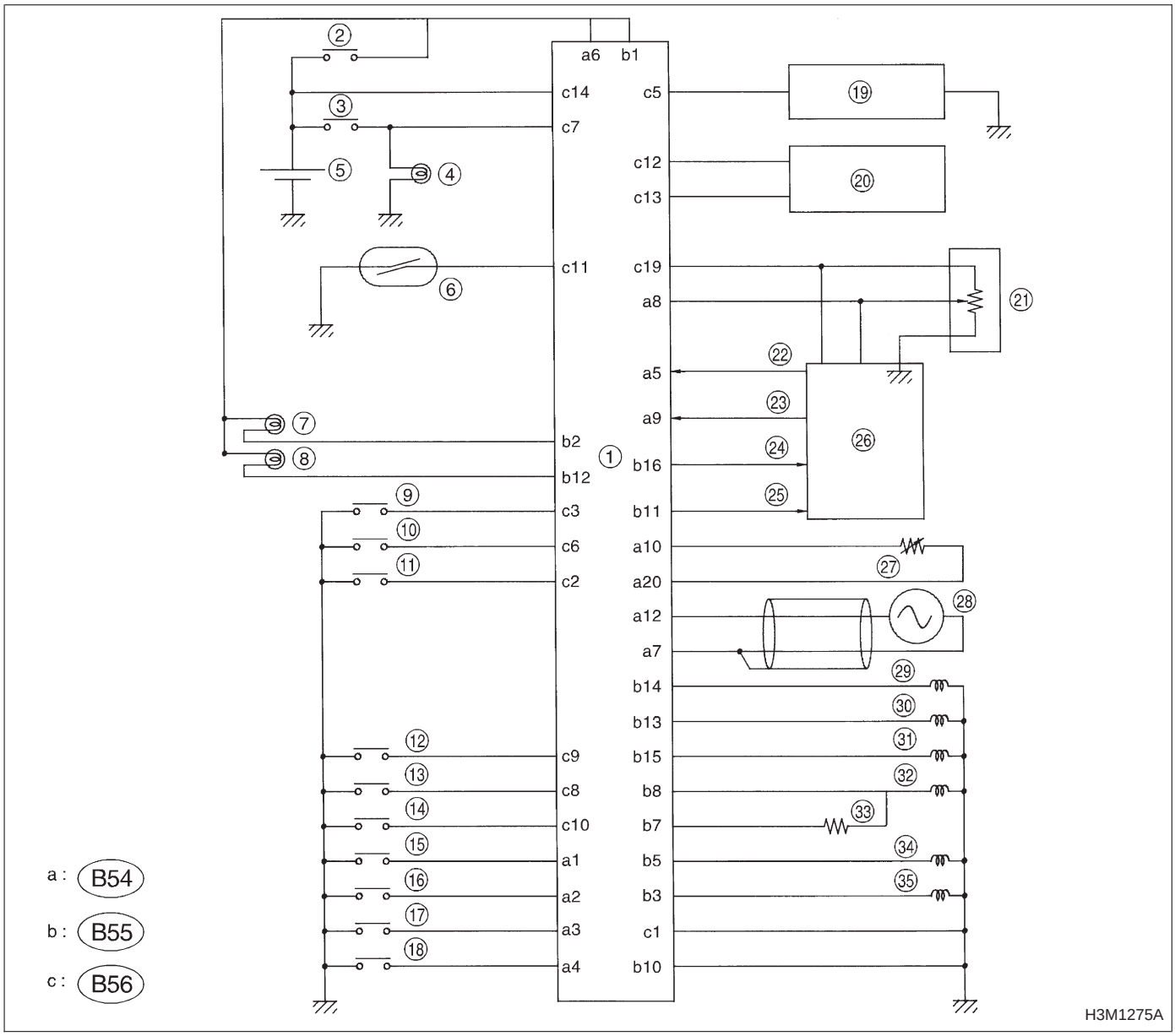
① Duty solenoid A
② Solenoid 2
③ Solenoid 1
④ Solenoid 3
⑤ Duty solenoid B
⑥ ATF temperature sensor
⑦ Duty solenoid C (AWD)





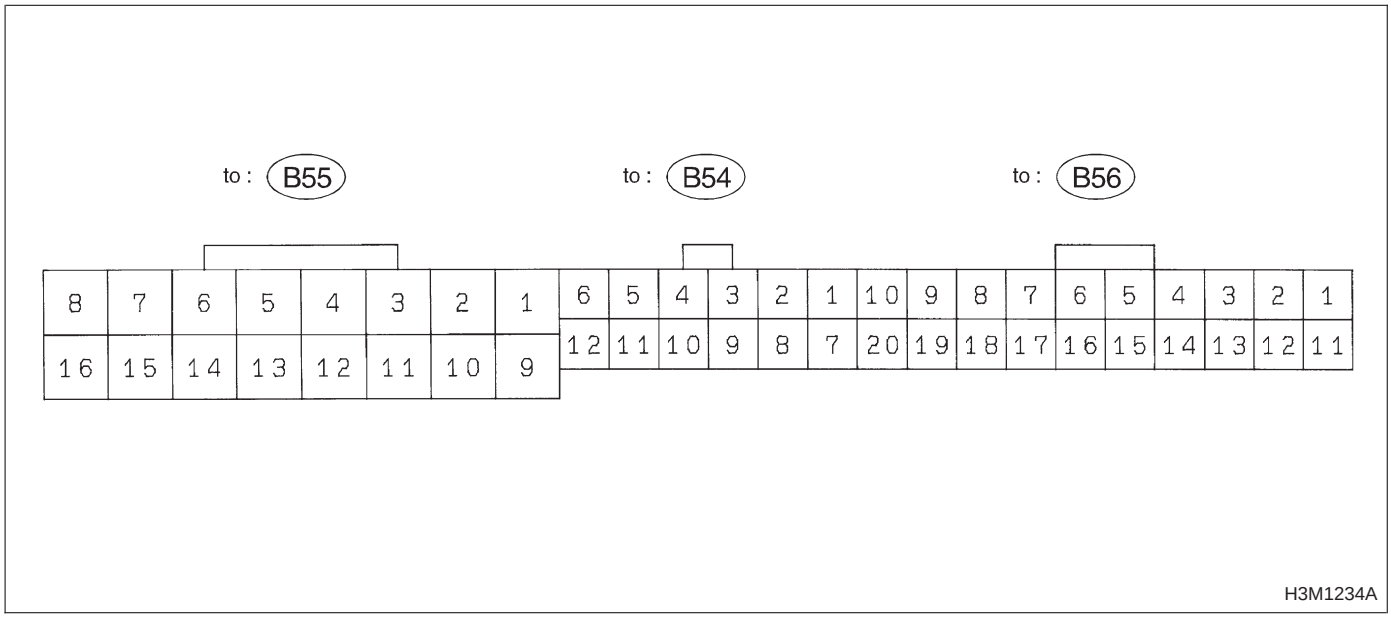


4. Schematic



① Transmission control module
② Ignition switch
③ Brake switch
④ Brake light
⑤ Battery
⑥ Vehicle speed sensor 2
⑦ FWD indicator light
⑧ AT OIL TEMP indicator light
⑨ Cruise set switch
⑩ Diagnosis switch
⑪ FWD switch
⑫ “P” range switch
⑬ “R” range switch
⑭ “N” range switch
⑮ “D” range switch
⑯ “3” range switch
⑰ “2” range switch
⑱ “1” range switch
⑲ ABS control module
⑳ Data link connector
㉑ Throttle position sensor
㉒ Engine speed signal
㉓ Mass air flow signal
㉔ Torque control signal
㉕ AT diagnostics signal
㉖ Engine control module
㉗ ATF temperature sensor
㉘ Vehicle speed sensor 1
㉙ Shift solenoid 1
㉚ Shift solenoid 2
㉛ Shift solenoid 3
㉜ Duty solenoid A
㉝ Dropping resistor
㉞ Duty solenoid B
㉟ Duty solenoid C

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



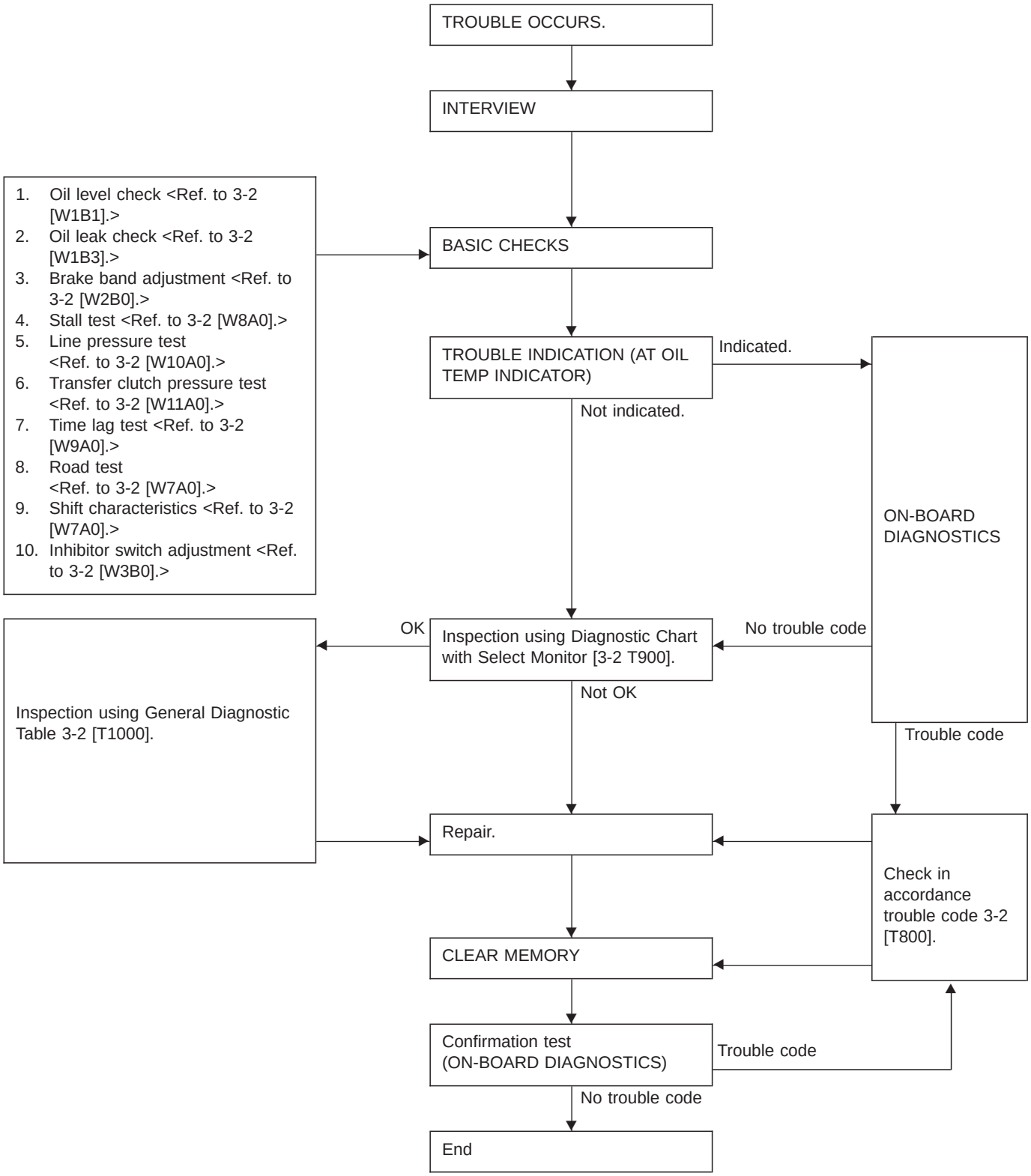
Check with ignition switch ON.

Content		Connector No.	Terminal No.	Measuring conditions	Voltage (V)
Back-up power supply		B56	14	Ignition switch OFF	10 — 16
Ignition power supply		B54	6	Ignition switch ON (with engine OFF)	10 — 16
		B55	1		
Inhibitor switch	“P” range switch	B56	9	Select lever in “P” range	Less than 1
				Select lever in any other than “P” range (except “N” range)	More than 8
	“N” range switch	B56	8	Select lever in “N” range	Less than 1
				Select lever in any other than “N” range (except “P” range)	More than 8
	“R” range switch	B56	10	Select lever in “R” range	Less than 1
				Select lever in any other than “R” range	More than 6
	“D” range switch	B54	1	Select lever in “D” range	Less than 1
				Select lever in any other than “D” range	More than 6
	“3” range switch	B54	2	Select lever in “3” range	Less than 1
				Select lever in any other than “3” range	More than 6
	“2” range switch	B54	3	Select lever in “2” range	Less than 1
				Select lever in any other than “2” range	More than 6
	“1” range switch	B54	4	Select lever in “1” range	Less than 1
				Select lever in any other than “1” range	More than 6
Diagnosis switch		B56	6	Diagnosis connector connected	Less than 1
				Diagnosis connector disconnected	More than 6
Brake switch		B56	7	Brake pedal depressed.	More than 10.5
				Brake pedal released.	Less than 1
ABS signal		B56	5	ABS switch ON	Less than 1
				ABS switch OFF	More than 6.5
AT diagnostic signal		B55	11	Ignition switch ON (With engine OFF)	Less than 1
				Ignition switch ON (With engine ON)	More than 10

Content	Connector No.	Terminal No.	Measuring conditions	Voltage (V)	Resistance to body (ohms)
Throttle position sensor	B54	8	Throttle fully closed.	0.5±0.2	—
			Throttle fully open.	4.6±0.3	
Throttle position sensor power supply	B56	19	Ignition switch ON (With engine OFF)	5.05±0.25	—
ATF temperature sensor	B54	10	ATF temperature 20°C (68°F)	3.45±0.55	2.1 — 2.9 k
			ATF temperature 80°C (176°F)	1.2±0.2	272 — 374
Vehicle speed sensor 1	B54	12	Vehicle stopped.	0	450 — 720
			Vehicle speed at least 20 km/h (12 MPH)	More than 1 (AC range)	
Vehicle speed sensor 2	B56	11	When vehicle is slowly moved at least 2 meters (7ft).	Less than 1↔More than 4	—
Engine speed signal	B54	5	Ignition switch ON (with engine OFF).	More than 10.5	—
			Ignition switch ON (with engine ON).	8 — 11	
Cruise set signal	B56	3	When cruise control is set (SET lamp ON).	Less than 1	—
			When cruise control is not set (SET lamp OFF).	More than 6.5	
Torque control signal	B55	16	Ignition switch ON	5±1	—
Mass air flow signal	B54	9	Engine idling after warm-up	0.5 — 1.2	—
Shift solenoid 1	B55	14	1st or 4th gear	More than 9	20 — 32
			2nd or 3rd gear	Less than 1	
Shift solenoid 2	B55	13	1st or 2nd gear	More than 9	20 — 32
			3rd or 4th gear	Less than 1	
Shift solenoid 3	B55	15	Select lever in “N” range (with throttle fully closed).	Less than 1	20 — 32
			Select lever in “D” range (with throttle fully closed).	More than 9	
Duty solenoid A	B55	8	Throttle fully closed (with engine OFF) after warm-up.	1.5 — 4.0	2.0 — 4.5
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Dropping resistor	B55	7	Throttle fully closed (with engine OFF) after warm-up.	More than 8.5	12 — 18
			Throttle fully open (with engine OFF) after warm-up.	Less than 1	
Duty solenoid B	B55	5	When lock up occurs.	More than 8.5	9 — 17
			When lock up is released.	Less than 0.5	
Duty solenoid C	B55	3	Fuse on FWD switch	More than 8.5	9 — 17
			Fuse removed from FWD switch (with throttle fully open and with select lever in 1st gear).	Less than 0.5	
Sensor ground line 1	B54	7	—	0	Less than 1
Sensor ground line 2	B56	20	—	0	Less than 1
System ground line	B56	1	—	0	Less than 1
Power system ground line	B55	10	—	0	Less than 1
FWD switch	B56	2	Fuse removed.	6 — 9.1	—
			Fuse installed.	Less than 1	

6. Diagnostic Chart for On-board Diagnostics System

A: BASIC DIAGNOSTICS PROCEDURE

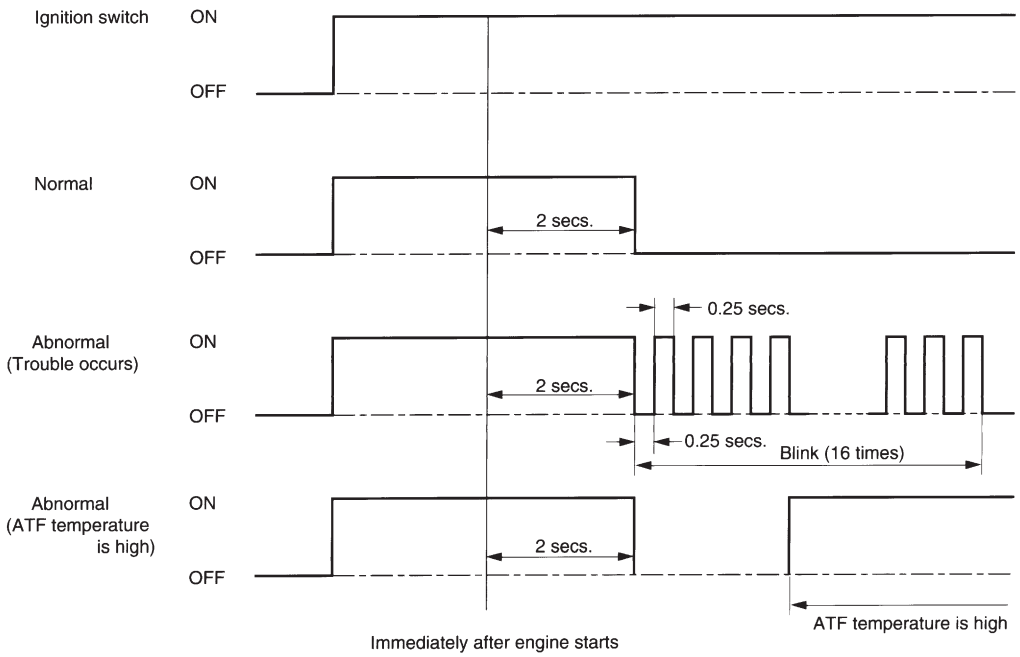


B: ABNORMAL DISPLAY ON AT OIL TEMP INDICATOR

When any on-board diagnostics item is malfunctioning, the display on the AT OIL TEMP indicator blinks immediately after the engine starts.
The malfunctioning part or unit can be determined by a trouble code during on-board diagnostics operation. Problems which occurred previously can also be identified through the memory function.
If the AT OIL TEMP indicator does not show a problem (although a problem is occurring), the problem can be determined by checking the performance characteristics of each sensor using the select monitor.
Indicator signal is as shown in the figure.

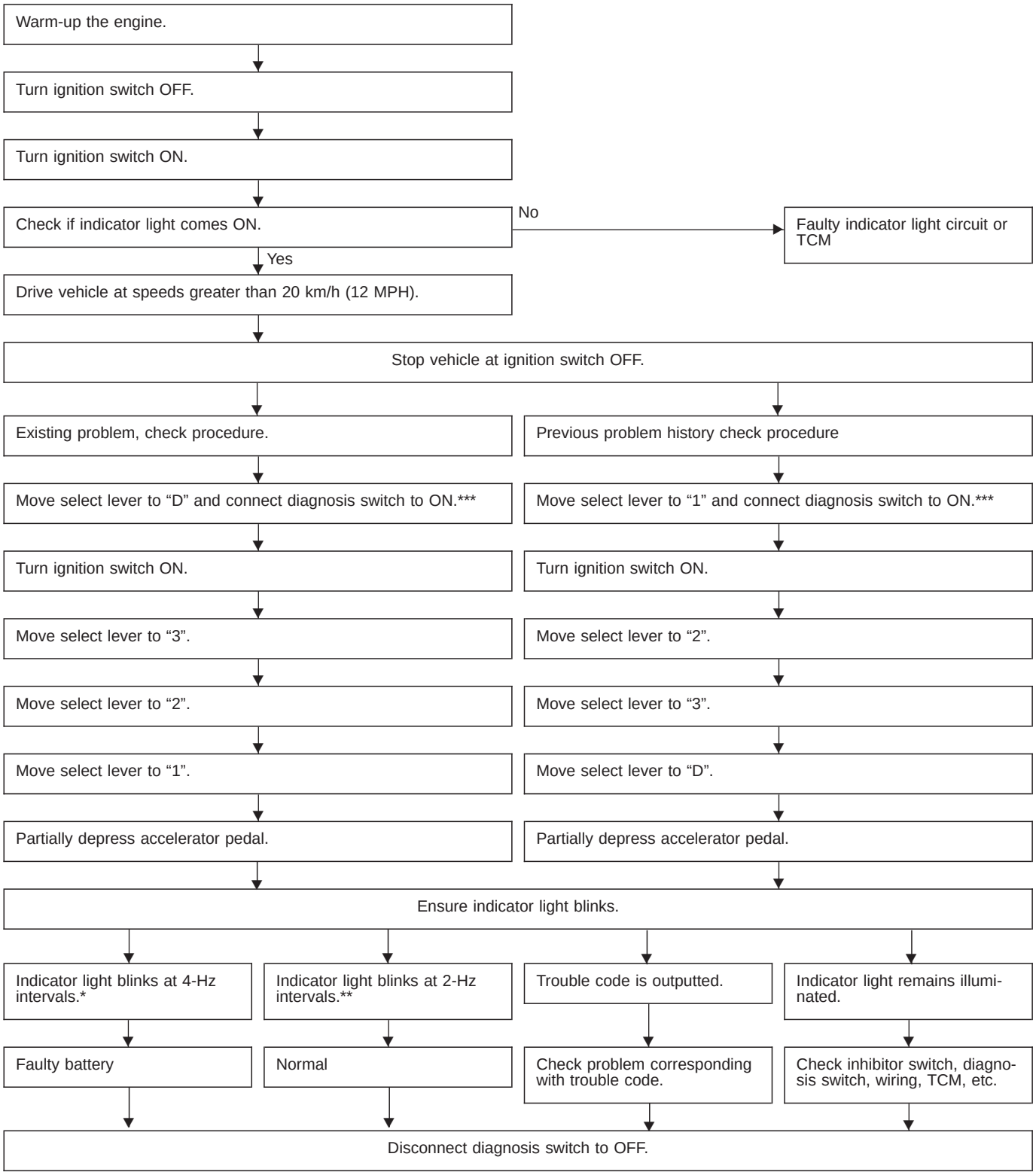
WARNING:

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



H3H1066

C: ON-BOARD DIAGNOSTICS



* : Blinks every 0.125 (1/8) seconds (until ignition switch is turned OFF).
** : Blinks every 0.25 (1/4) seconds (until ignition switch is turned OFF).
***: Plug in diagnosis terminal to diagnosis connector No. 5 located below instrument lower cover.

7. Diagnostics for On-board Diagnostics Failed

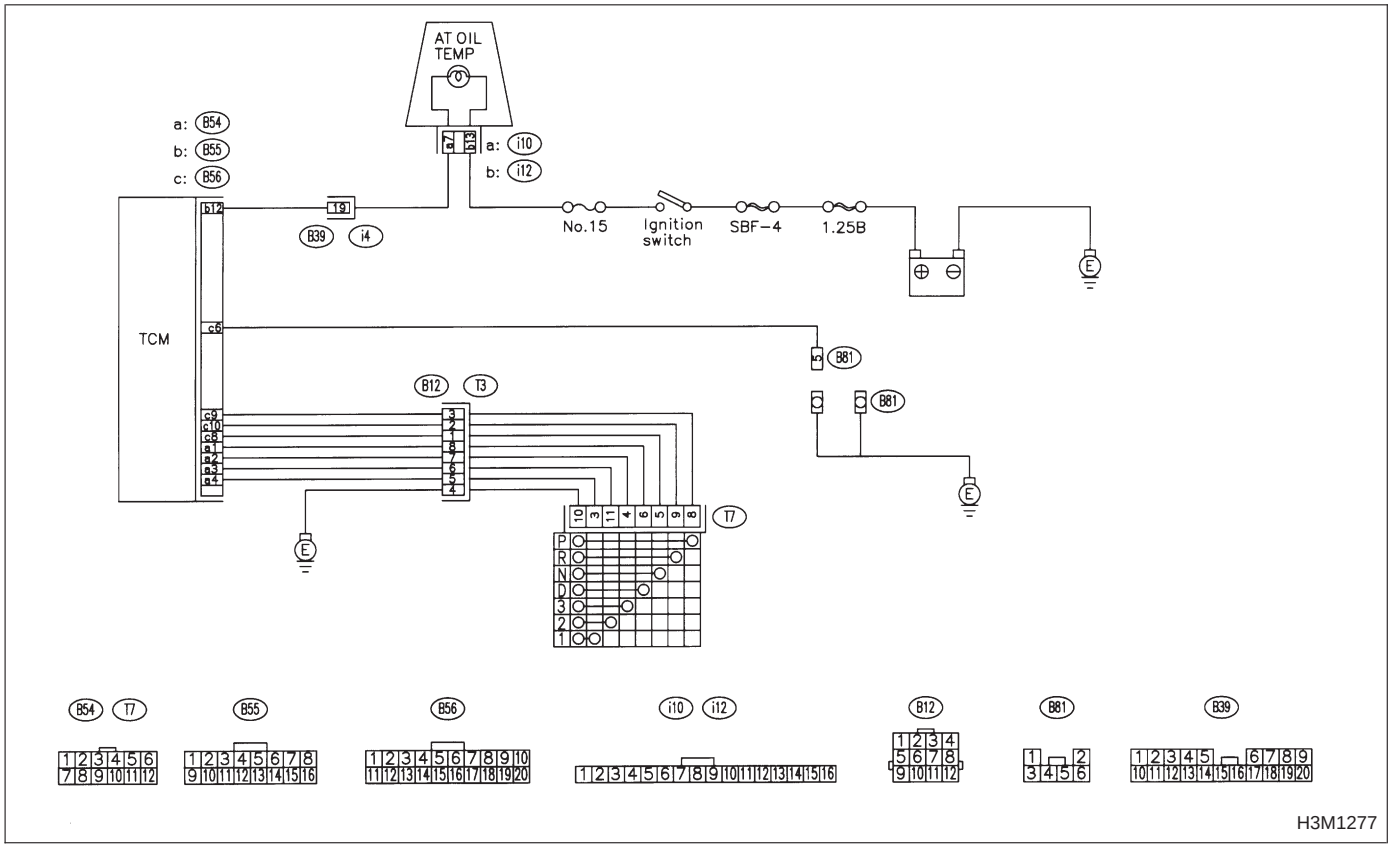
A: AT OIL TEMP INDICATOR LIGHT

DIAGNOSIS:

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

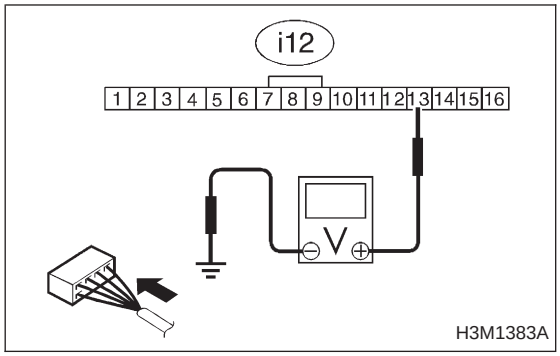
TROUBLE SYMPTOM:

● When ignition switch is turned to ON (engine OFF), AT OIL TEMP indicator light does not illuminate.
..... TROUBLE 1
● When on board diagnostics is performed, AT OIL TEMP indicator light remains illuminated. ..... TROUBLE 2



7A1	CLASSIFY THE MALFUNCTION. IS IT TROUBLE 1 OR TROUBLE 2?

If the malfunction shows TROUBLE 1, go to **7A2**.
If the malfunction shows TROUBLE 2, go to **7A5**.



7A2	CHECK HARNESS CONNECTOR BETWEEN COMBINATION METER AND IGNITION SWITCH.

1) Turn ignition switch to OFF.
2) Remove combination meter.
3) Turn ignition switch to ON (engine OFF).
4) Measure voltage between combination meter connector and chassis ground.

Connector & terminal
(i12) No. 13 (+) — Chassis ground (−):

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

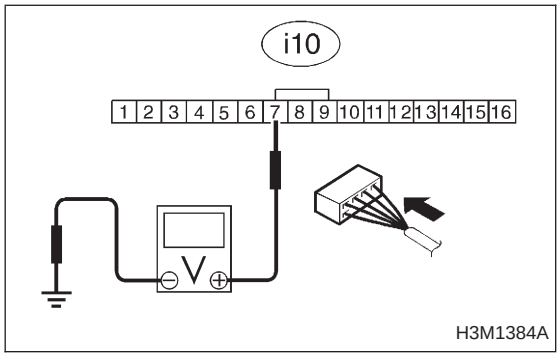
YES : Go to next CHECK .

NO : Check the following and repair if necessary.

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

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

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



Connector & terminal
(i10) No. 7 (+) — Chassis ground (−):

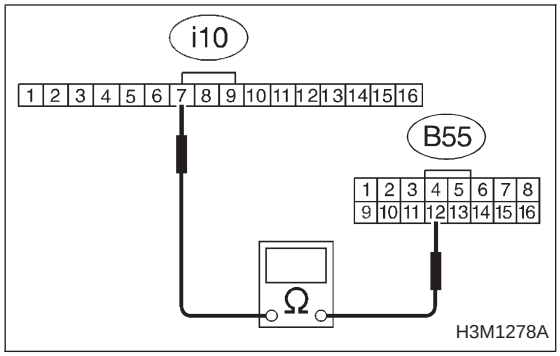
CHECK ***: Is voltage less than 1 V?***

YES : Go to step **7A3**.

NO : Replace bulb or combination meter.

7A3	CHECK OPEN CIRCUIT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from TCM and combination meter connector.



3) Measure resistance of harness between TCM and combination meter.

Connector & terminal
(B55) No. 12 — (i10) No. 7:

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

YES : Go to step **7A4**.

NO : Repair harness connector.

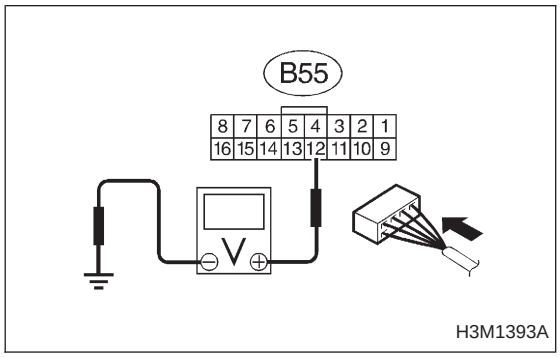
NOTE:
In this case, repair the following:

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

7A4	CHECK INPUT SIGNAL FROM TCM.

1) Turn ignition switch to OFF.
2) Connect connector to TCM and combination meter.
3) Install combination meter.
4) Turn ignition switch to ON (engine OFF).
5) Measure voltage between TCM connector and chassis ground.

Connector & terminal
(B55) No. 12 (+) — Chassis ground (−):



CHECK ***: Is the voltage less than 1 V?***

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

NO : Replace TCM.

7A5	CHECK INHIBITOR SWITCH.

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

Function mode FA1

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

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

YES : Go to step **7A6**.

NO : Check inhibitor switch circuit.

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

7A6	CHECK DIAGNOSIS SWITCH.

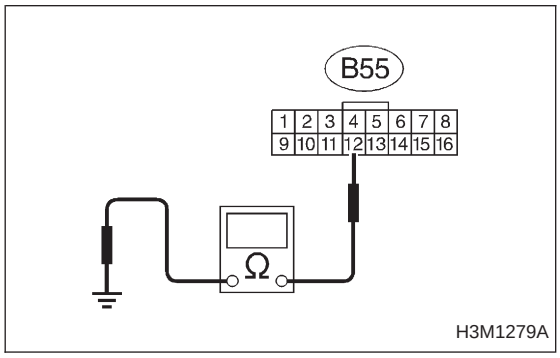
1) Designate mode using function key.
Function mode FA1
● FA1: Check diagnosis switch (SS) ON ↔ OFF signal.
2) Diagnosis switch to ON.

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

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

NO : Check diagnosis switch circuit.

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



7A7	CHECK SHORT CIRCUIT OF HARNESS.

1) Turn ignition switch to OFF.
2) Disconnect connector from TCM.
3) Remove combination meter.
4) Disconnect connector from combination meter.
5) Measure resistance of harness connector between TCM and combination meter.

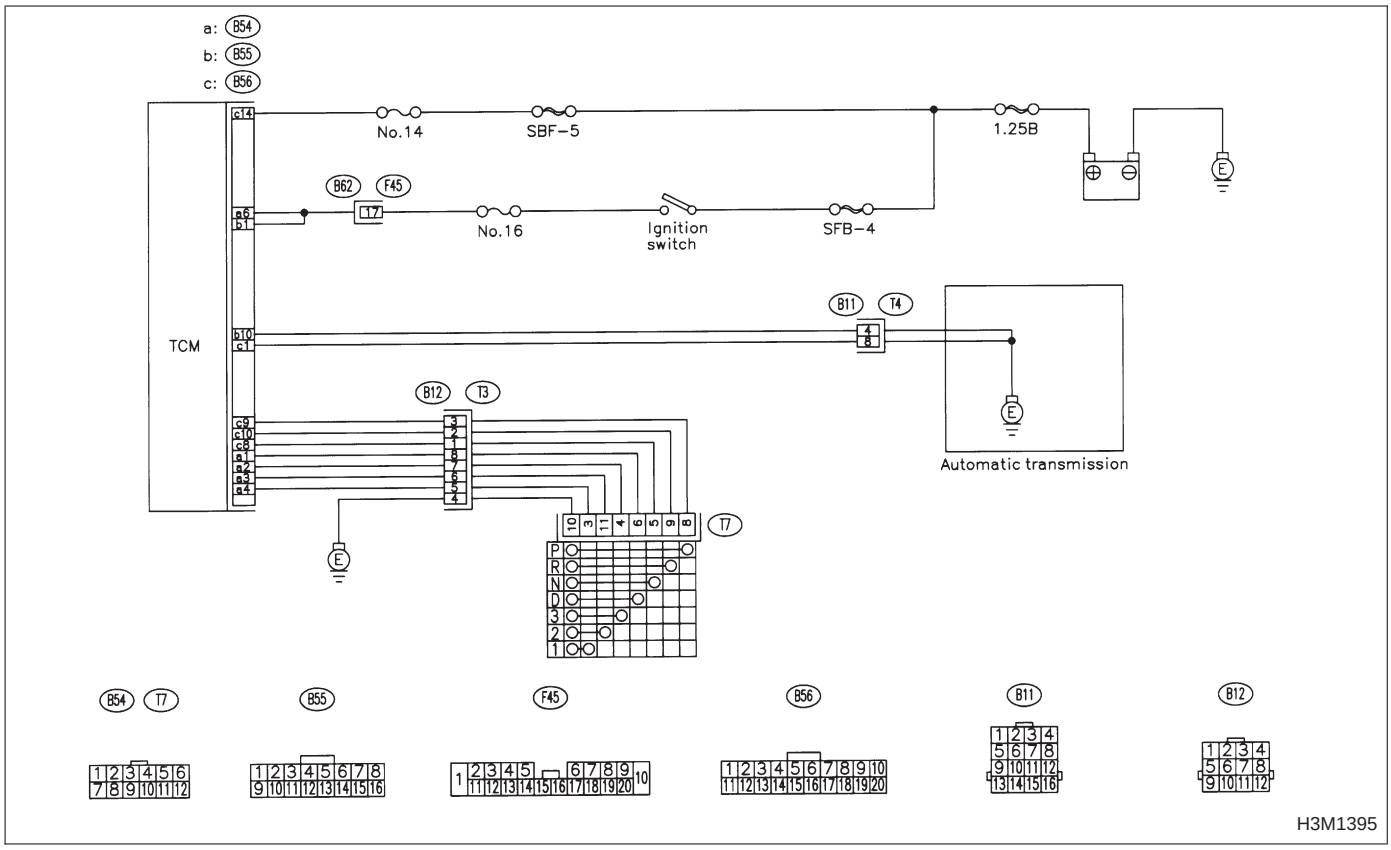
Connector & terminal/specified resistance (B55) No. 12 — Chassis ground:

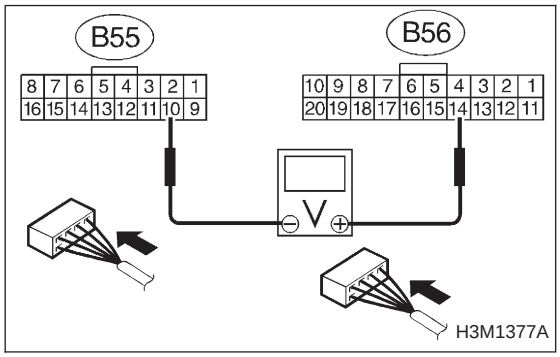
CHECK ***: Is the resistance less than 1 MΩ?***

YES : Replace TCM.

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

B: CONTROL MODULE POWER SUPPLY AND GROUND LINE



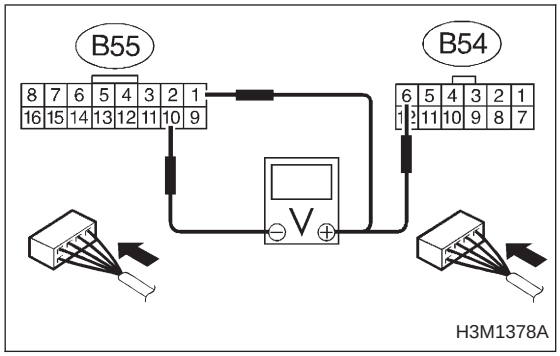


7B1	CHECK BACK-UP POWER SUPPLY CIRCUIT.

1) Turn ignition switch to OFF.
2) Measure back-up power supply voltage between TCM connector terminal.

Connector & terminal
(B56) No. 14 (+) — (B55) No. 10 (−):

CHECK ***: Is the voltage more than 10 V?***
YES : Go to next CHECK .
NO : Repair harness of back-up power supply circuit.
CHECK ***: Is there poor contact of TCM connector?***
YES : Repair poor contact in TCM connector.
NO : Go to step **7B2**.

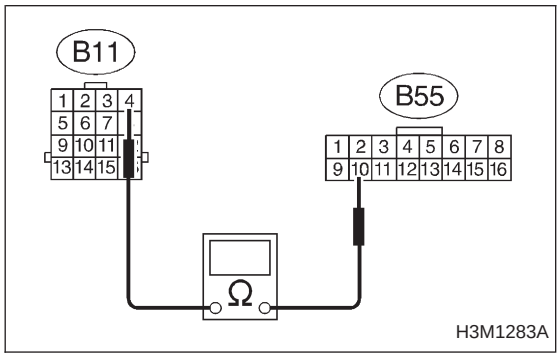


7B2	CHECK IGNITION POWER SUPPLY CIRCUIT.

1) Turn ignition switch to ON (engine OFF).
2) Measure ignition power supply voltage between TCM connector terminal.

Connector & terminal
(B54) No. 6 (+) — (B55) No. 10 (−):
(B55) No. 1 (+) — No. 10 (−):

CHECK ***: Is the voltage more than 10 V?***
YES : Go to next CHECK .
NO : Repair harness of ignition power supply circuit.
CHECK ***: Is there poor contact of TCM connector?***
YES : Repair poor contact in TCM connector.
NO : Go to step **7B3**.

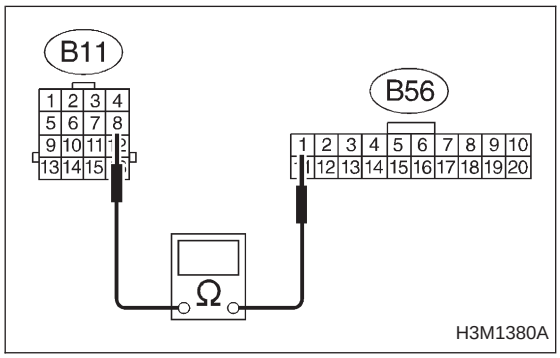


7B3	CHECK HARNESS CONNECTOR BETWEEN TCM, INHIBITOR SWITCH AND TRANSMISSION.

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

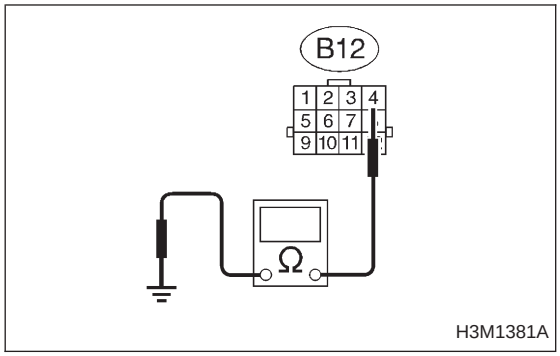
Connector & terminal
(B55) No. 10 — (B11) No. 4:

CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next CHECK .
NO : Repair open circuit in harness between TCM and transmission.



Connector & terminal
(B56) No. 1 — (B11) No. 8:

CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next CHECK .
NO : Repair open circuit in harness between TCM and transmission.

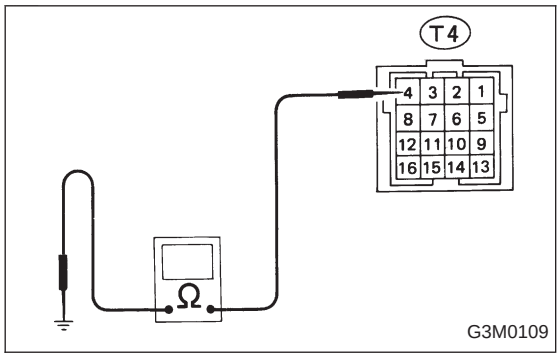


Connector & terminal
(B12) No. 4 — Chassis ground:

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

YES : Go to step **7B4**.

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



7B4	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND TRANSMISSION GROUND.**

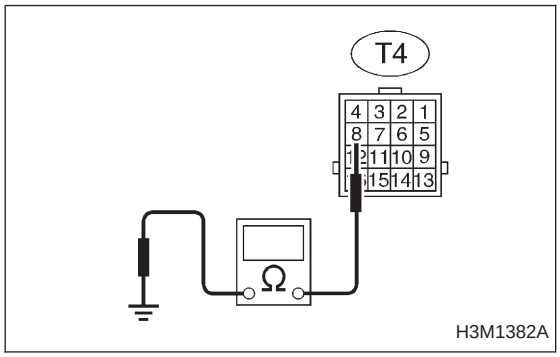
1) Drain automatic transmission fluid.
2) Remove oil pan.
3) Measure resistance of harness between transmission and transmission ground.

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

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

YES : Go to next CHECK .

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



Connector & terminal
(T4) No. 8 — Transmission ground:

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

YES : Repair transmission ground terminal.

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

8. Diagnostic Chart with Trouble Code

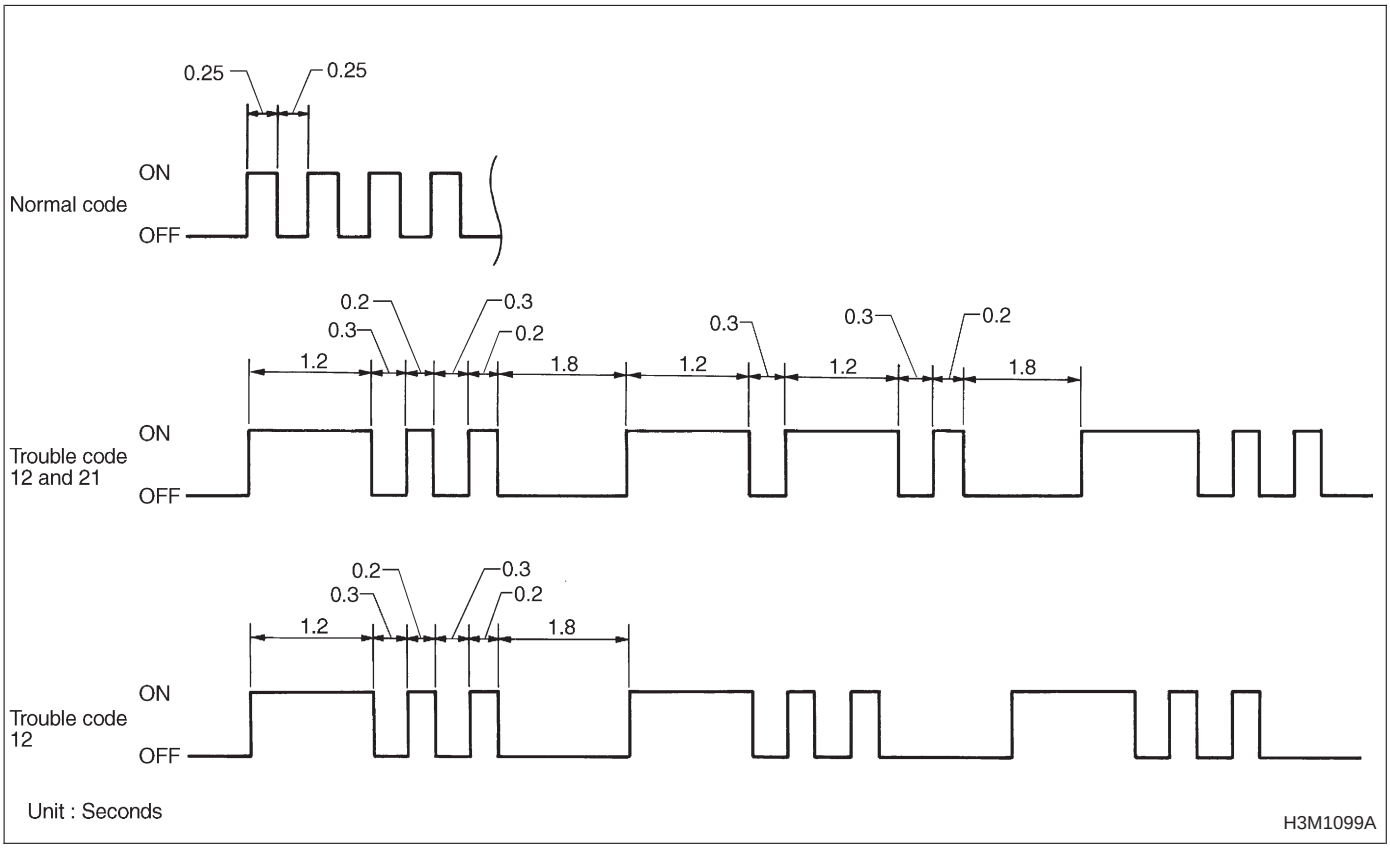
A: LIST OF TROUBLE CODE

1. TROUBLE CODE

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

2. HOW TO READ TROUBLE CODE OF INDICATOR LIGHT

The AT OIL TEMP indicator light flashes the code corresponding to the faulty part.
The long segment (1.2 sec on) indicates a “ten”, and the short segment (0.2 sec on) signifies a “one”.



B: CLEAR MEMORY

Current trouble codes shown on the display are cleared by turning the ignition switch OFF after conducting on-board diagnostics operation. Previous trouble codes, however, cannot be cleared since they are stored in the TCM memory which is operating on the back-up power supply. These trouble codes can be cleared by removing the specified fuse (located under the right lower portion of the instrument panel).

CLEAR MEMORY:

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

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

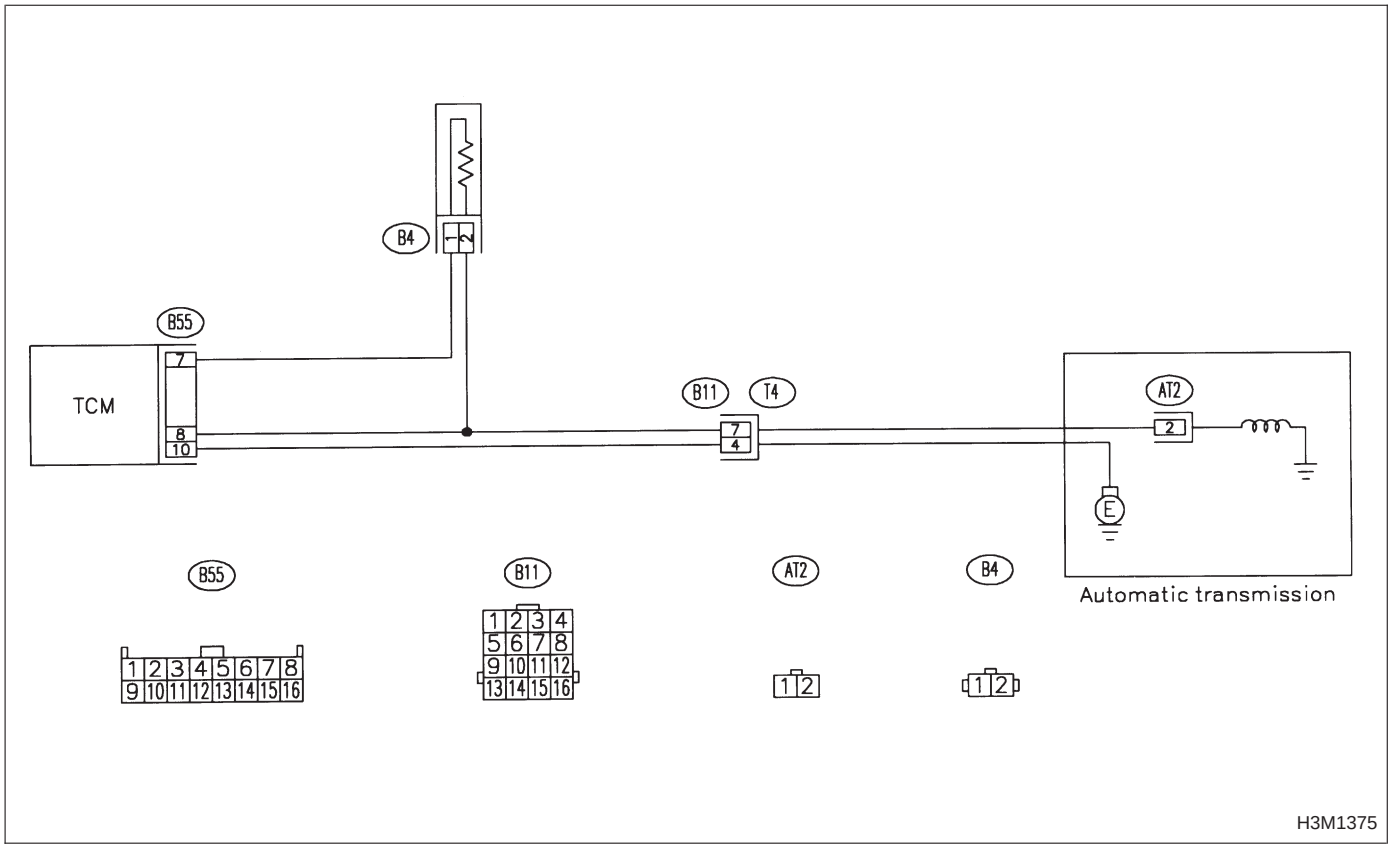
C: TROUBLE CODE 11 — DUTY SOLENOID A —

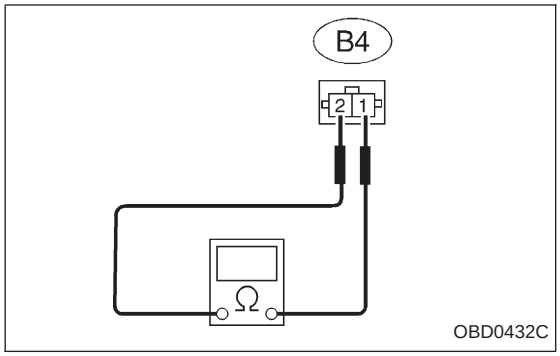
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.



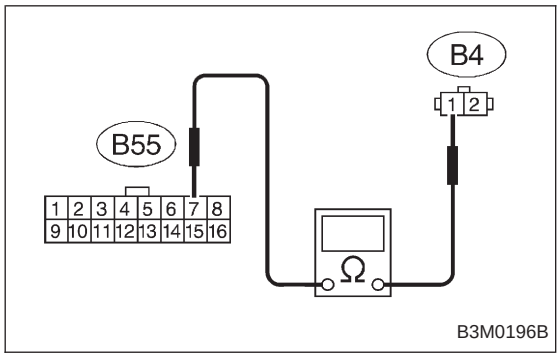


8C1	CHECK RESISTOR.

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

Terminals
(B4) No. 1 — No. 2:

CHECK ***: Is the resistance between 9 and 15 Ω?***
YES : Go to step **8C2**.
NO : Replace dropping resistor.



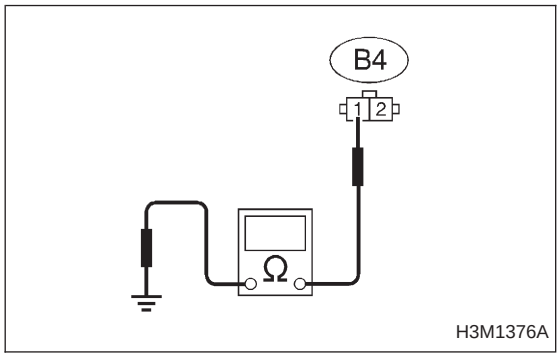
8C2	CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.

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

Connector & terminal
(B55) No. 7 — (B4) No. 1:

CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next step 4).
NO : Repair harness and connector.

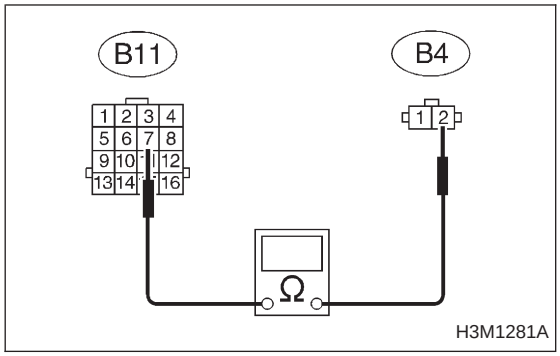
NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and dropping resistor connector.
- Poor contact in TCM connector.
- Poor contact in dropping resistor connector.



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

Connector & terminal
(B4) No. 1 — Chassis ground:

CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to step **8C3**.
NO : Repair short circuit in harness between TCM and dropping resistor connector.



8C3	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.

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

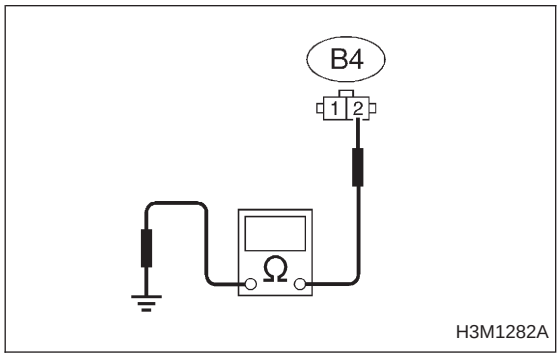
Connector & terminal
(B4) No. 2 — (B11) No. 7:

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

YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between dropping resistor and transmission connector.
- Poor contact in transmission connector.
- Poor contact in dropping resistor connector.



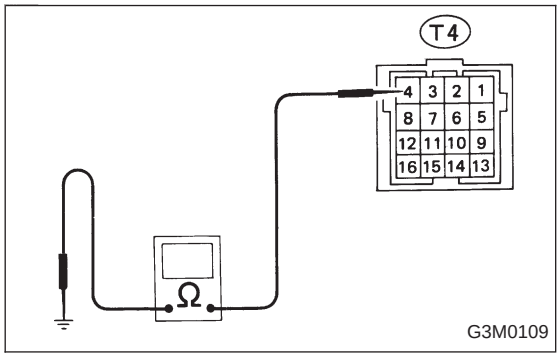
3) Measure resistance of harness between dropping resistor connector and chassis ground.

Connector & terminal
(B4) No. 2 — Chassis ground:

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

YES : Go to step **8C4**.

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



8C4	CHECK DUTY SOLENOID A GROUND LINE.

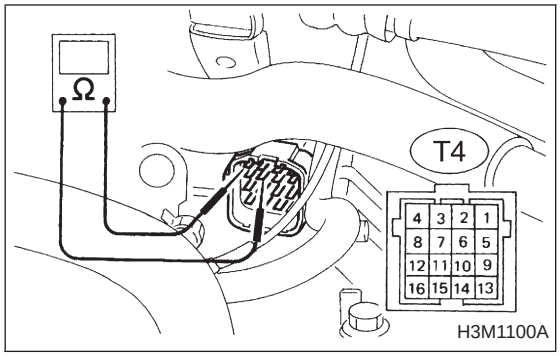
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector and transmission ground.

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

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

YES : Go to step **8C5**.

NO : Repair open circuit in transmission harness connector.



8C5	CHECK DUTY SOLENOID A.

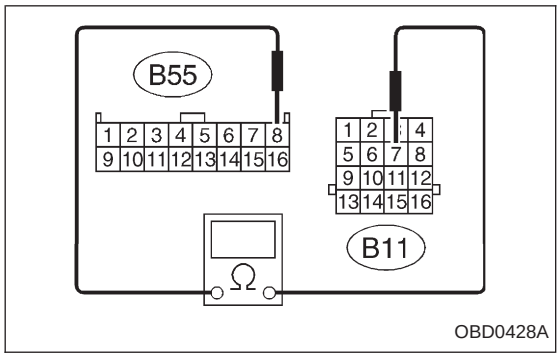
Measure resistance between transmission connector receptacle's terminals.

Connector & terminal
(T4) No. 7 — No. 4:

CHECK ***: Is the resistance between 1.5 and 4.5 Ω?***

YES : Go to step **8C6**.

NO : Go to step **8C8**.



8C6	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

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

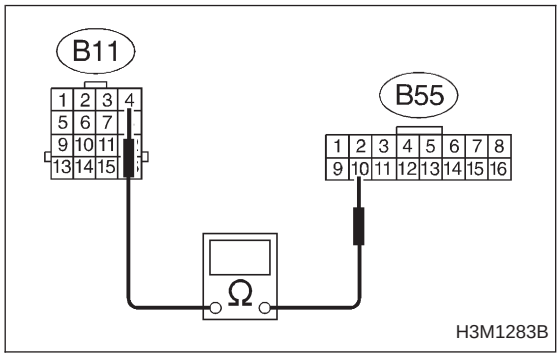
Connector & terminal
(B55) No. 8 — (B11) No. 7:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



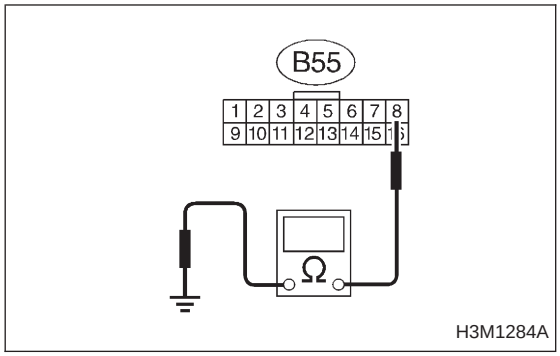
Connector & terminal
(B55) No. 10 — (B11) No. 4:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.

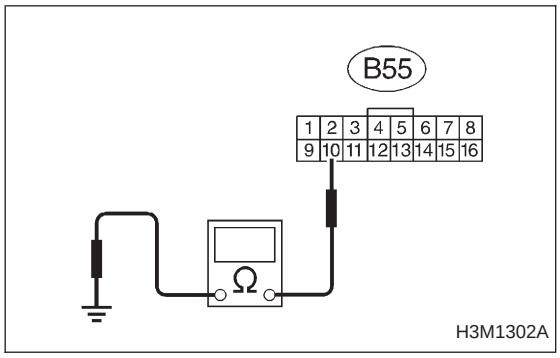


Connector & terminal
(B55) No. 8 — Chassis ground:

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

YES : Go to next CHECK .

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



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

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

YES : Go to step **8C7**.

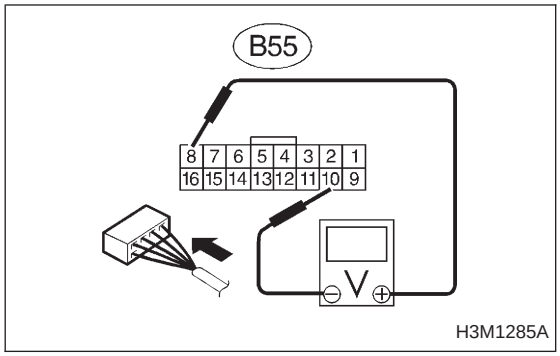
NO : Repair short circuit harness between TCM and transmission connector.

8C7	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

1) Turn ignition switch to OFF.
2) Connect connectors to TCM, transmission and dropping resistor.
3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

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



6) Measure voltage between TCM connector terminal.

Connector & terminal
(B55) No. 8 (+) — No. 10 (−):

CHECK ***: Is the voltage between 1.5 and 4.0 V with throttle fully closed?***

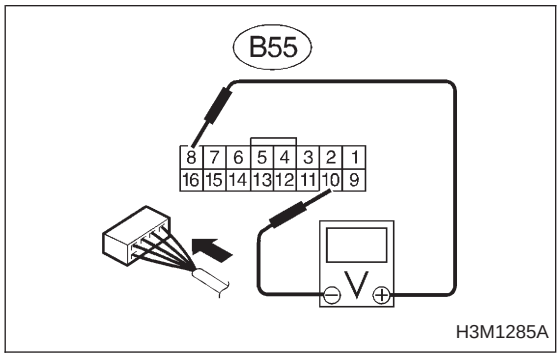
YES : Go to next step CHECK1 .

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal
(B55) No. 8 (+) — No. 10 (−):

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

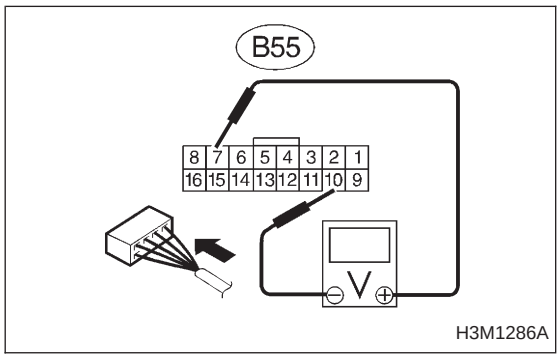
YES : Go to next step CHECK1 .

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal
(B55) No. 7 (+) — No. 10 (−):

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

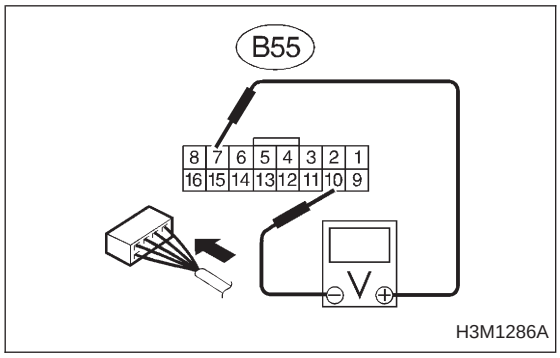
YES : Go to next step CHECK1 .

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal
(B55) No. 7 (+) — No. 10 (−):

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

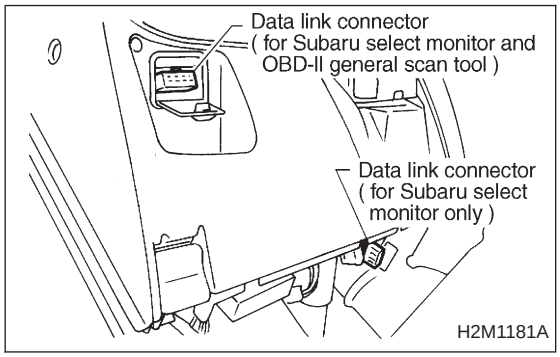
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



● Using Subaru Select Monitor

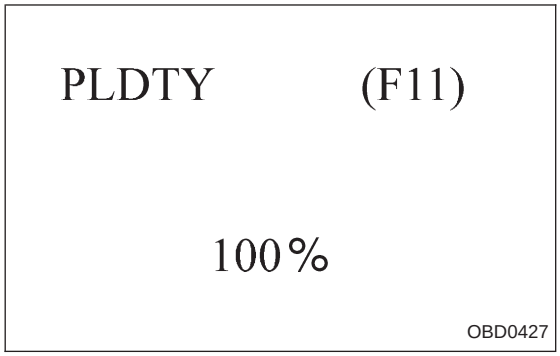
1) Turn ignition switch to OFF.
2) Connect connectors to TCM and transmission.
3) Connect Subaru Select Monitor to data link connector.
4) Start the engine, and turn Subaru Select Monitor switch to ON.
5) Warm-up the transmission until ATF temperature is above 80°C (176°F).

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

6) Stop the engine and turn ignition switch to ON (engine OFF).
7) Move selector lever to “N”.
8) Read data on Subaru Select Monitor.
9) Designate mode using function key.

Function mode F11

● F11: Line pressure duty is indicated in “%”.



10) Throttle is fully closed.

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

YES : Go to next step 11).

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

11) Throttle is fully open.

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

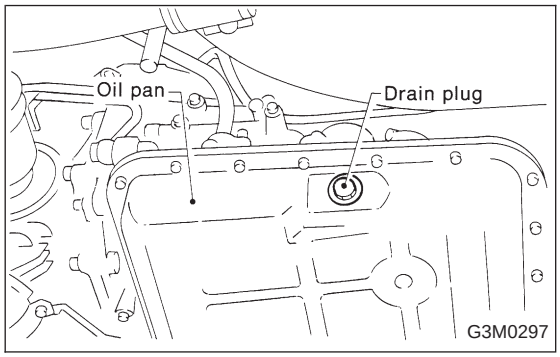
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

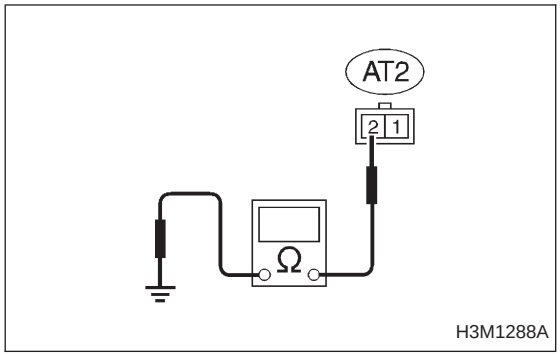


8C8	CHECK DUTY SOLENOID A (IN TRANSMISSION).

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

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

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



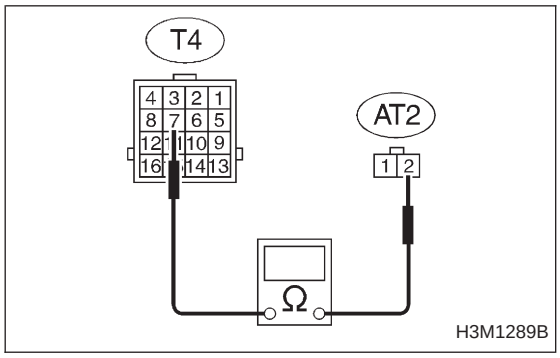
6) Measure resistance between duty solenoid A connector and transmission ground.

Terminal
(AT2) No. 2 — Transmission ground:

CHECK ***: Is the resistance 1.5 and 4.5 Ω?***

YES : Go to step **8C9**.

NO : Replace duty solenoid A.



8C9	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DUTY SOLENOID A.

1) Disconnect connector from transmission.
2) Measure resistance of harness between duty solenoid A and transmission connector.

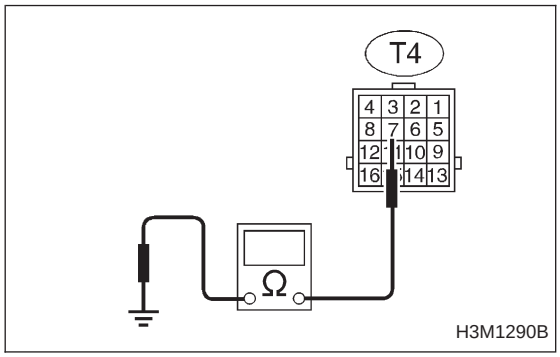
Connector & terminal
(T4) No. 7 — (AT2) No. 2:

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

YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between duty solenoid A and transmission connector.
- Poor contact in duty solenoid A connector.
- Poor contact in transmission connector.



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

Connector & terminal
(T4) No. 7 — Transmission ground:

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

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

NO : Repair short circuit in harness between duty solenoid A and transmission connector.

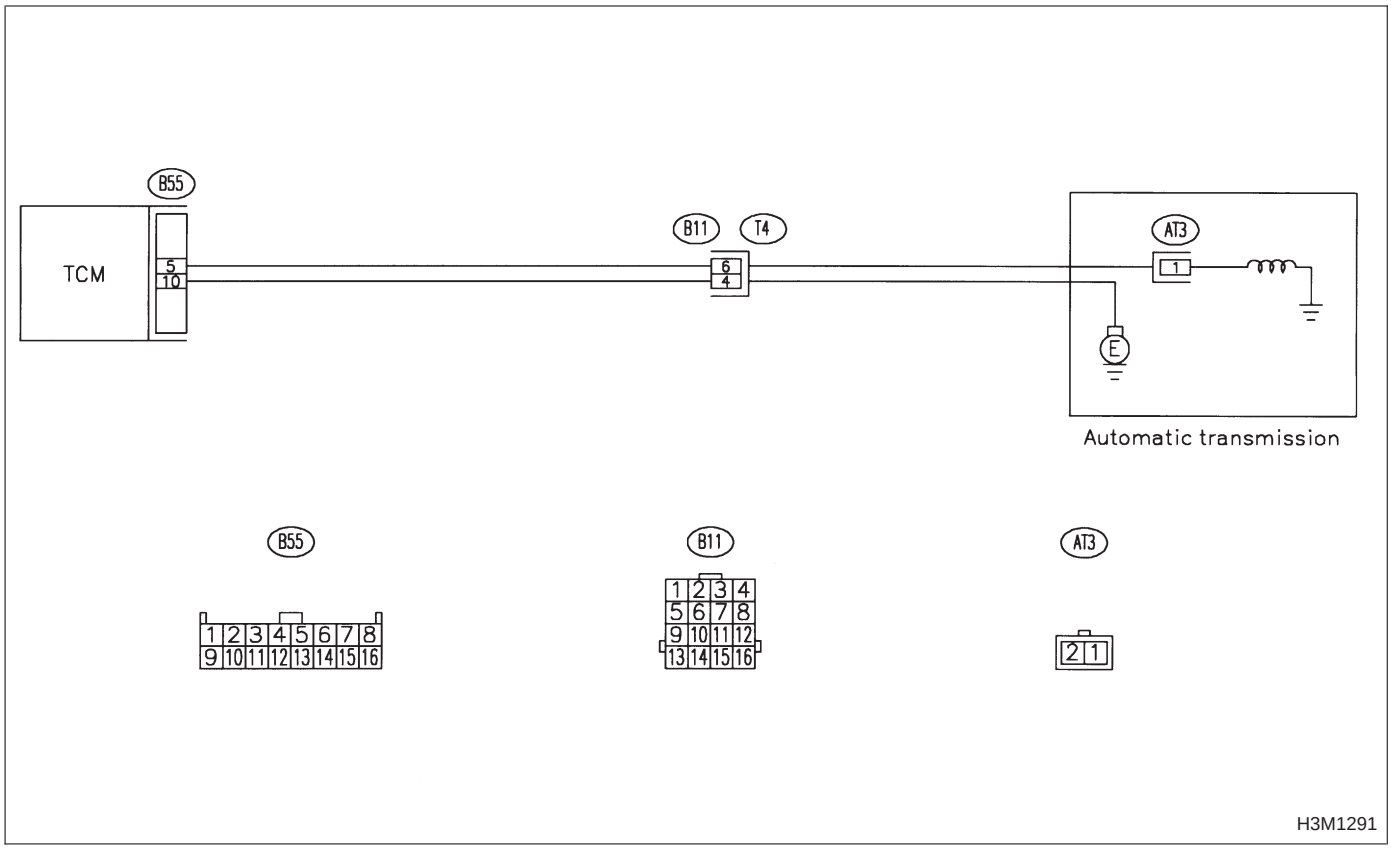
D: TROUBLE CODE 12 — DUTY SOLENOID B —

DIAGNOSIS:

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

TROUBLE SYMPTOM:

No “lock-up” (after engine warm-up).

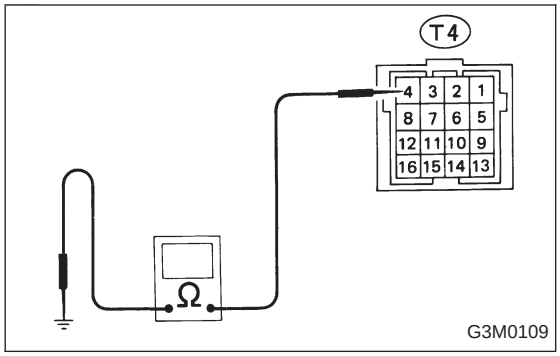


8D1	CHECK TROUBLE CODE.

CHECK ***: Do multiple trouble codes appear in the on-board diagnostics test mode?***

YES : Go to another trouble code.

NO : Go to step **8D2**.



8D2	CHECK DUTY SOLENOID B GROUND LINE.

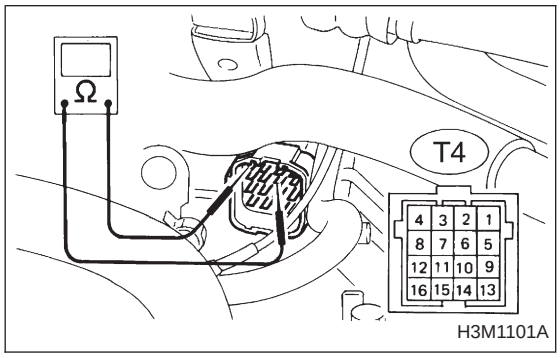
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector receptacle's terminals.

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

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

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

NO : Repair open circuit in transmission harness connector.



8D3	CHECK DUTY SOLENOID B.

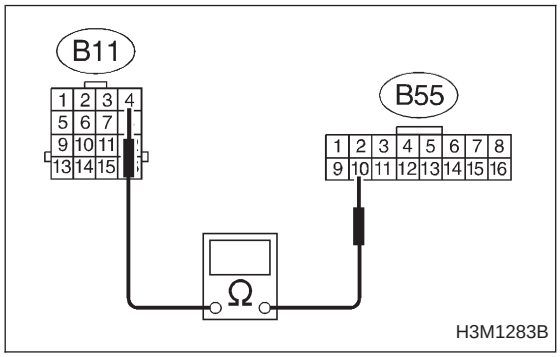
Measure resistance between transmission connector receptacle's terminals.

Connector & terminal
(T4) No. 6 — No. 4:

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

YES : Go to step **8D4**.

NO : Go to step **8D7**.



8D4	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

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

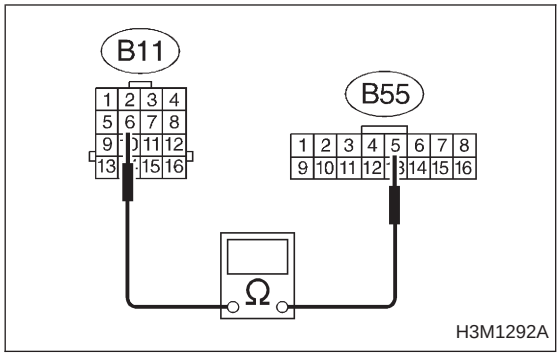
Connector & terminal
(B55) No. 10 — (B11) No. 4:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



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

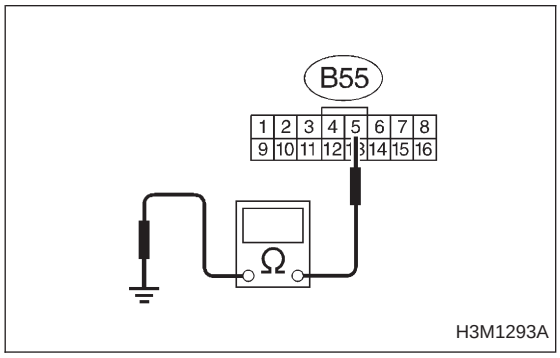
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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

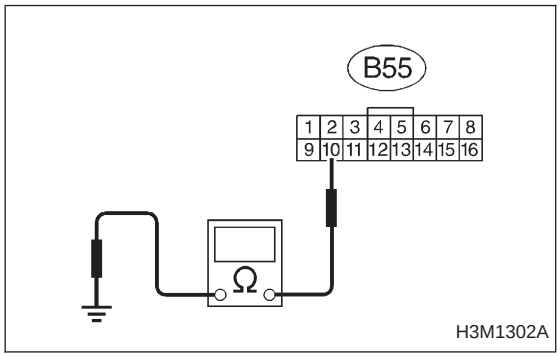


Connector & terminal
(B55) No. 5 — Chassis ground:

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

YES : Go to next CHECK .

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



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

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

YES : Go to step **8D5**.

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

8D5	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

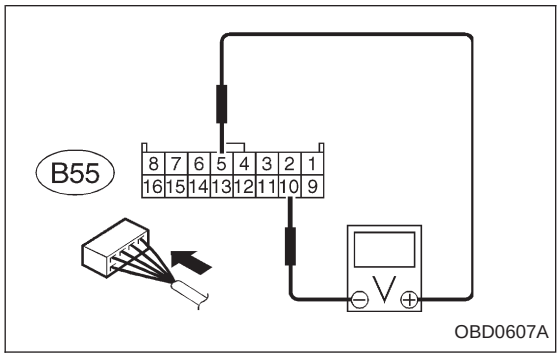
1) Turn ignition switch to OFF.
2) Connect connectors to TCM and transmission.
3) Lift-up the vehicle and place safety stand.

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

4) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

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



6) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 5 (+) — No. 10 (−):

CHECK ***: Is the voltage more than 8.5 V?***

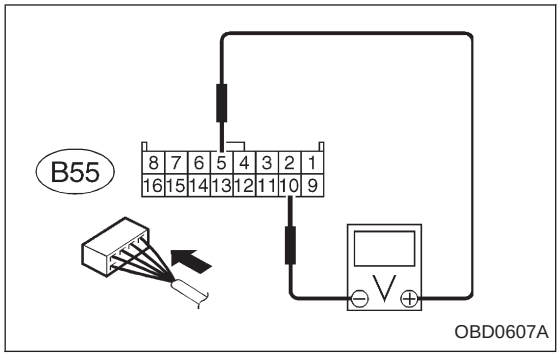
YES : Go to next step 7).

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



7) Return the engine to idling speed and move selector lever to “N”.
8) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 5 (+) — No. 10 (−):

CHECK ***: Is the voltage less than 0.5 V?***

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

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

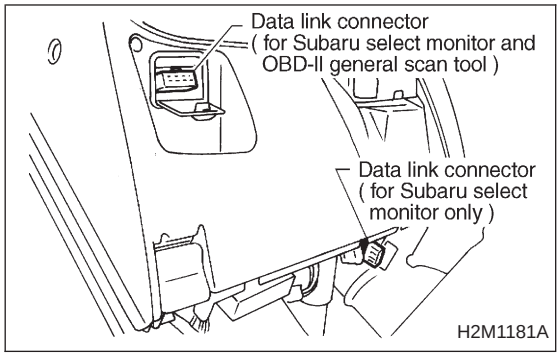
NO : Replace TCM.

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

● Using Subaru Select Monitor

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

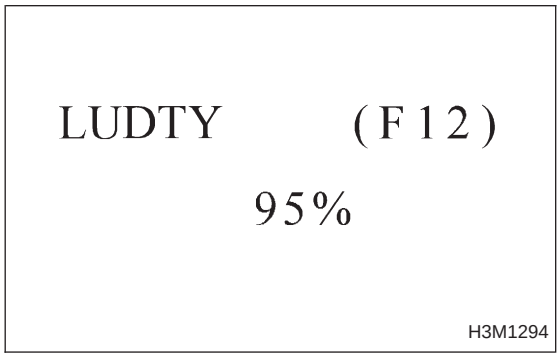
CAUTION:
On AWD models, make sure that all wheels are raised off floor.



4) Connect Subaru Select Monitor to data link connector.
5) Start the engine, and turn Subaru Select Monitor switch to ON.
6) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

7) Read data on Subaru Select Monitor.
8) Designate mode using function key.
Function mode F12
- F12: Lock-up duty is indicated in “%”.



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

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

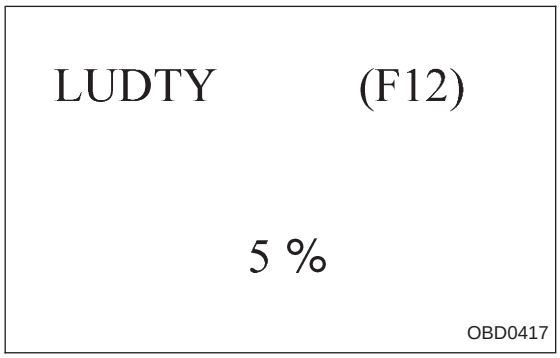
YES : Go to next step 10).

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM.



10) Return the engine to idling speed and move selector lever to “N”.

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

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

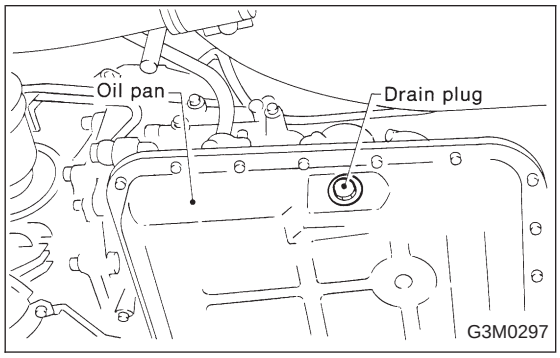
NO : Go to next CHECK .

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

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

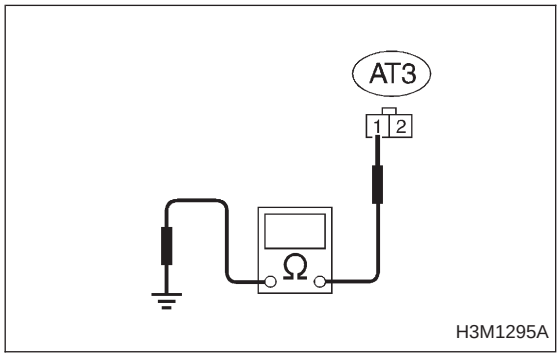


8D6	CHECK DUTY SOLENOID B (IN TRANSMISSION).

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

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

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



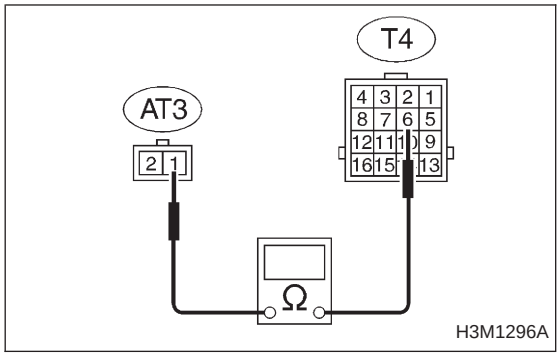
6) Measure resistance between duty solenoid B connector and transmission ground.

Connector & terminal
(AT3) No. 1 — Transmission ground:

CHECK ***: Is the resistance between 9 and 17 Ω?***

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

NO : Replace duty solenoid B.



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

1) Disconnect connector from transmission.
2) Measure resistance of harness between duty solenoid B and transmission connector.

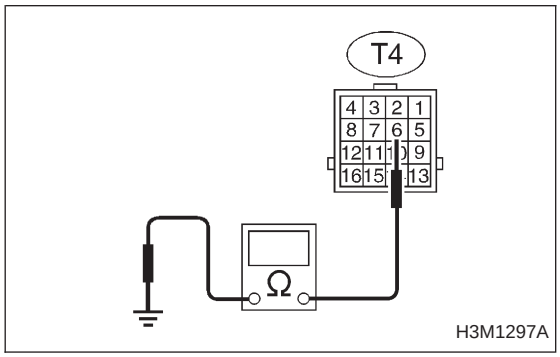
Connector & terminal
(T4) No. 6 — (AT3) No. 1:

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

YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



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

Connector & terminal
(T4) No. 6 — Transmission ground:

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

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

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

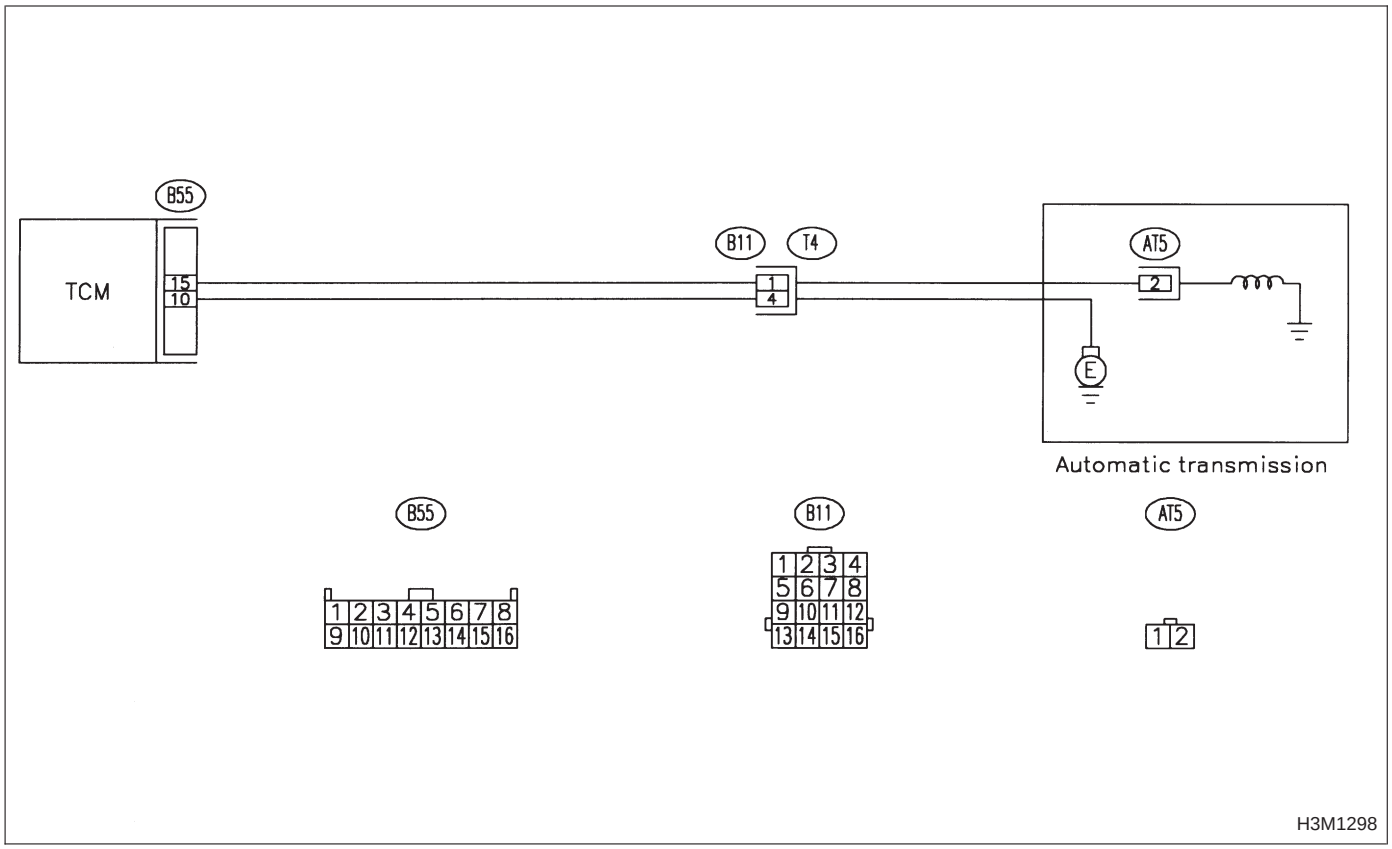
E: TROUBLE CODE 13 — SHIFT SOLENOID 3 —

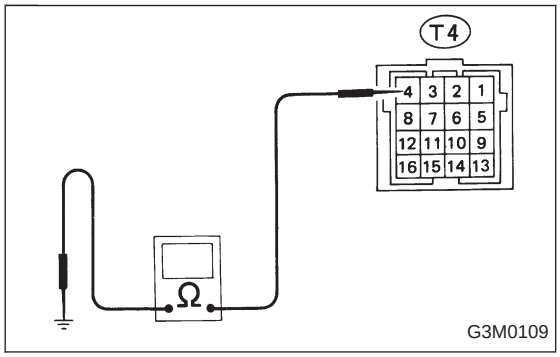
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Ineffective engine brake with shift lever in “3”.





8E1	**CHECK SHIFT SOLENOID 3 GROUND LINE.**

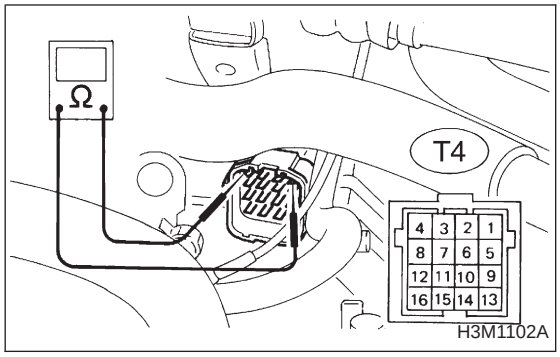
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector and transmission ground.

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

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

YES : Go to step **8E2**.

NO : Repair open circuit in transmission harness connector.



8E2	CHECK SHIFT SOLENOID 3.

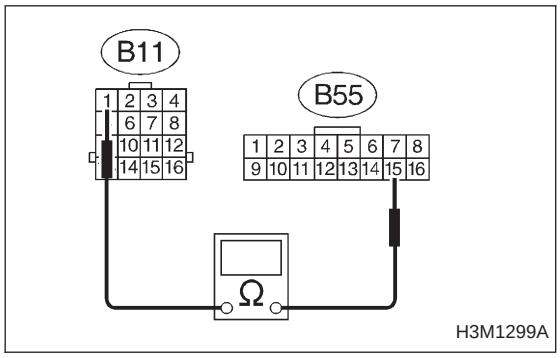
Measure resistance between transmission connector terminals.

Connector & terminal
(T4) No. 1 — No. 4:

CHECK ***: Is the resistance between 20 and 32 Ω?***

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

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



8E3	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

1) Disconnect connector from TCM.
2) Measure resistance of harness between TCM and transmission connector.

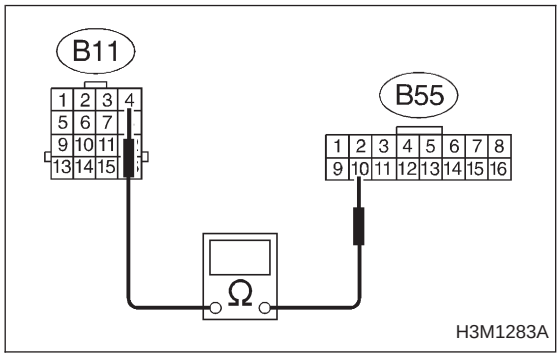
Connector & terminal
(B55) No. 15 — (B11) No. 1:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



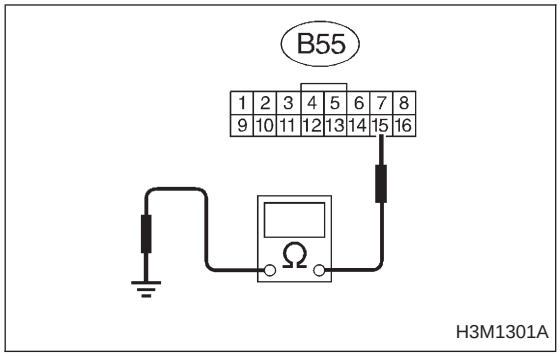
Connector & terminal
(B55) No. 10 — (B11) No. 4:

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

YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



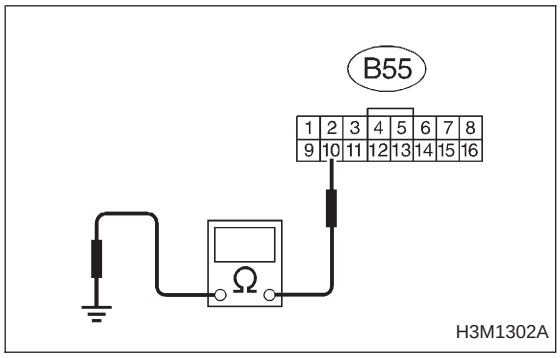
3) Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal
(B55) No. 15 — Chassis ground:

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

YES : Go to next CHECK .

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



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

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

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

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

8E4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

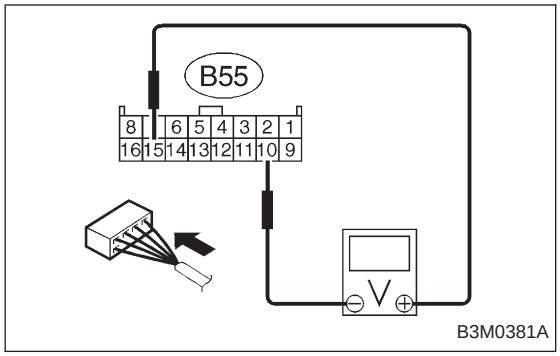
1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and support with safety stand.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

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



5) Measure voltage between TCM connector terminals.
Connector & terminal
(B55) No. 15 (+) — No. 10 (−):

CHECK ***: Is the voltage less than 1 V?***

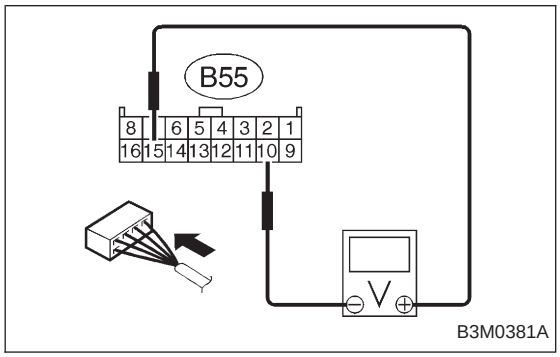
YES : Go to next step 6).

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



6) Move selector lever to “D”, and slowly increase vehicle speed to 65 km/h (41 m/h).
7) Measure voltage between TCM connector terminals.
Connector & terminal
(B55) No. 15 (+) — No. 10 (−):

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

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

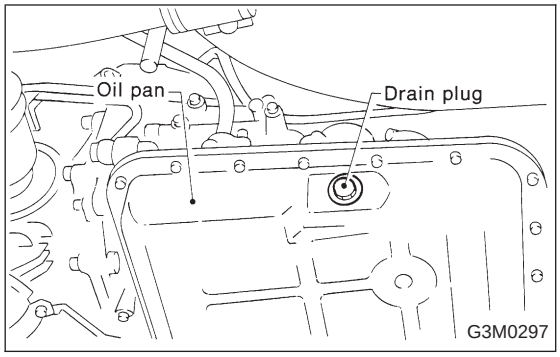
NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

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



8E5	CHECK SHIFT SOLENOID 3 (IN TRANSMISSION).

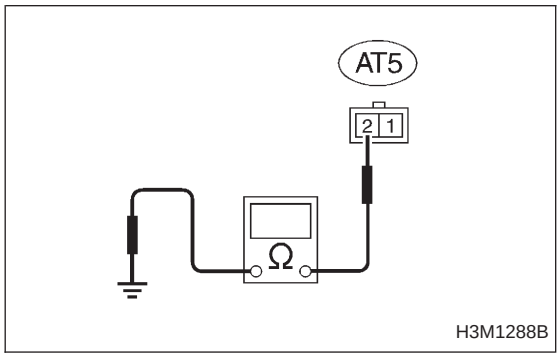
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Remove transmission connector from bracket.
4) Lift-up or raise the vehicle and support with safety stand.

CAUTION:
On AWD models, raise all wheels off ground.

5) Drain automatic transmission fluid.

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

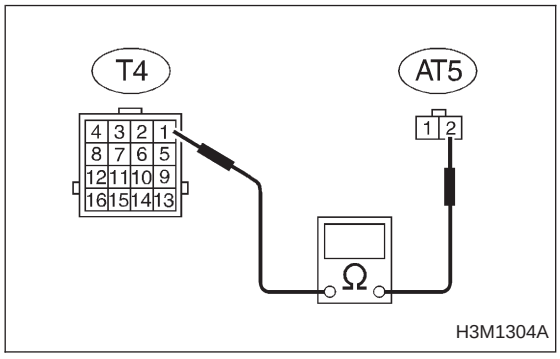
6) Remove oil pan, and disconnect connector from shift solenoid 3.



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

Terminal
(AT5) No. 2 — Transmission ground:

CHECK ***: Is the resistance between 20 and 32 Ω?***
YES : Go to step **8E6**.
NO : Replace shift solenoid assembly.



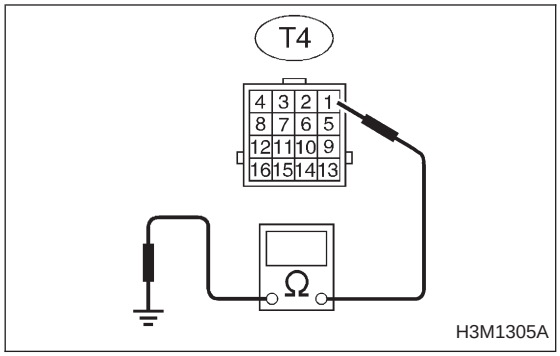
8E6	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 3 AND TRANSMISSION.

1) Measure resistance of harness between shift solenoid 3 and transmission connector.

Connector & terminal
(AT5) No. 2 — (T4) No. 1:

CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next step 2).
NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between shift solenoid 3 and transmission connector.
- Poor contact in shift solenoid 3 connector.
- Poor contact in transmission connector.



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

Connector & terminal
(T4) No. 1 — Transmission ground:

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

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

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

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

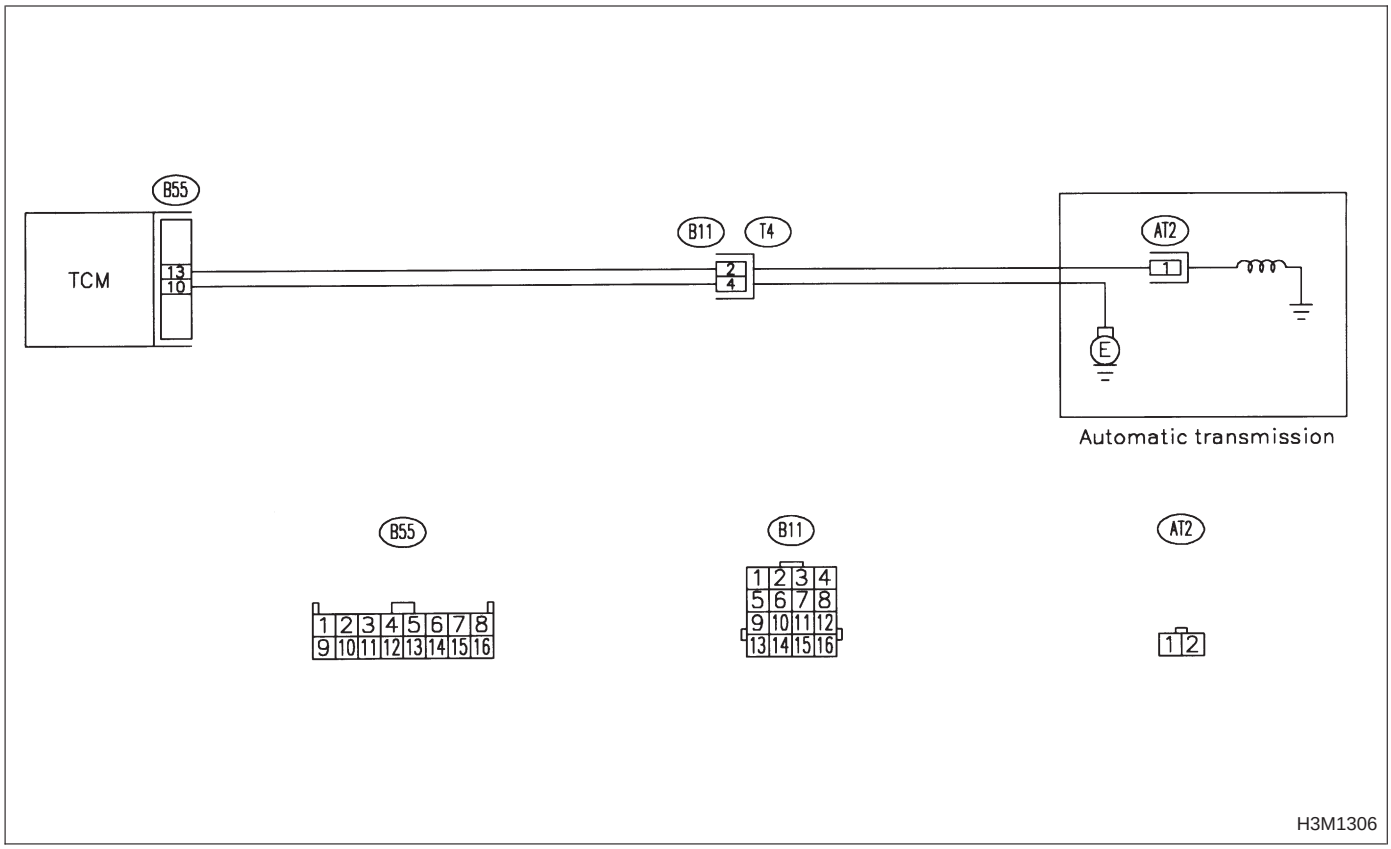
F: TROUBLE CODE 14 — SHIFT SOLENOID 2 —

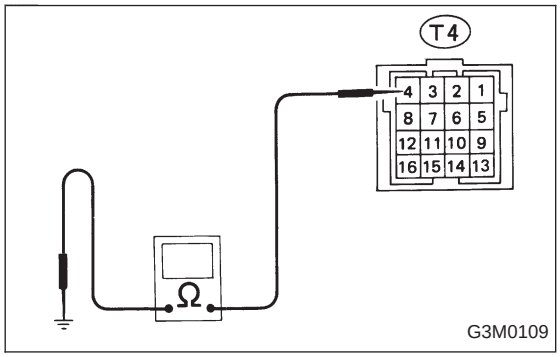
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Does not shift.





8F1	**CHECK SHIFT SOLENOID 2 GROUND LINE.**

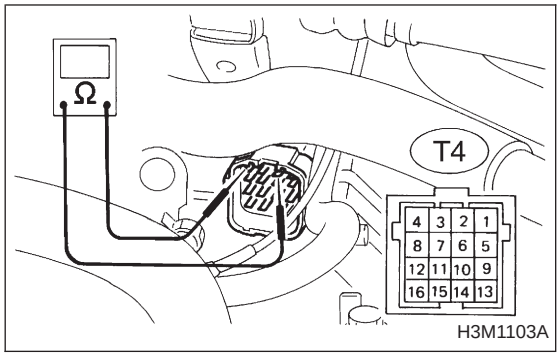
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector and transmission ground.

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

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

YES : Go to step **8F2**.

NO : Repair open circuit in transmission harness connector.



8F2	CHECK SHIFT SOLENOID 2.

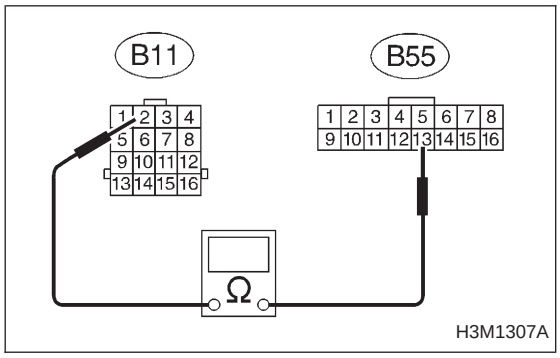
Measure resistance between transmission connector terminals.

Connector & terminal
(T4) No. 2 — No. 4:

CHECK ***: Is the resistance between 20 and 32 Ω?***

YES : Go to step **8F3**.

NO : Go to step **8F5**.



8F3	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

1) Disconnect connector from TCM.
2) Measure resistance of harness between TCM and shift solenoid 2 connector.

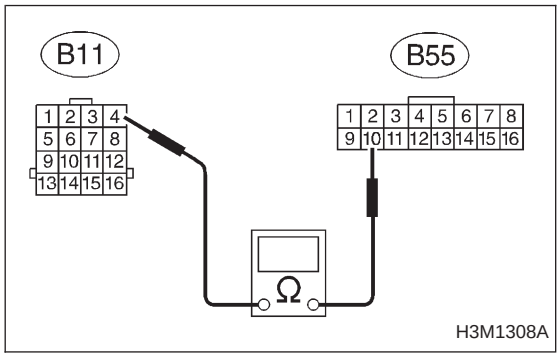
Connector & terminal
(B55) No. 13 — (B11) No. 2:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



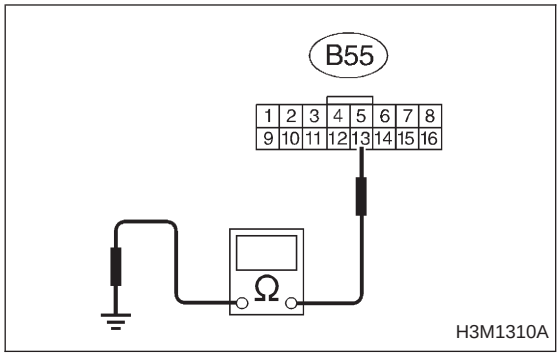
Connector & terminal
(B55) No. 10 — (B11) No. 4:

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

YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



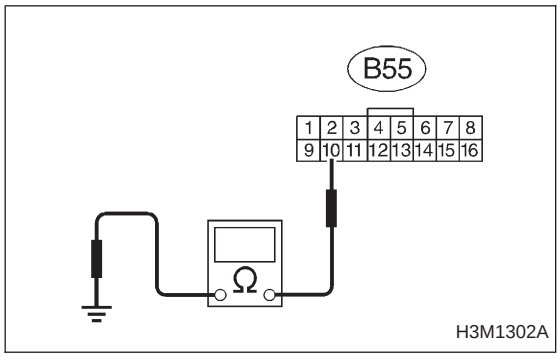
3) Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal
(B55) No. 13 — Chassis ground:

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

YES : Go to next CHECK .

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



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

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

YES : Go to step **8F4**.

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

8F4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.**

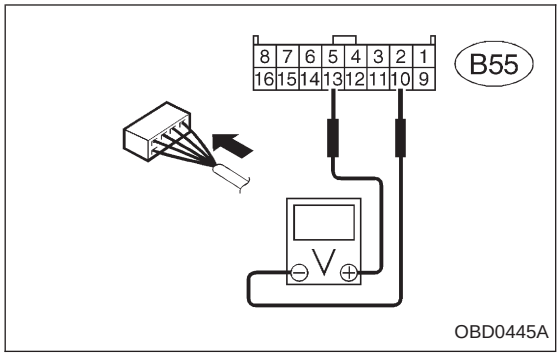
1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and support with safety stand.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

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



5) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 13 (+) — No. 10 (−):

CHECK ***: Is the voltage 9 V → 1 V?***

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

NO : Go to next step 6).

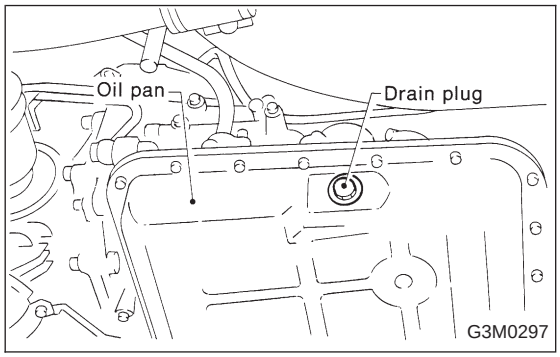
6) Move selector lever to “D”, and slowly increase vehicle speed to 50 km/h (31 m/h).

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

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

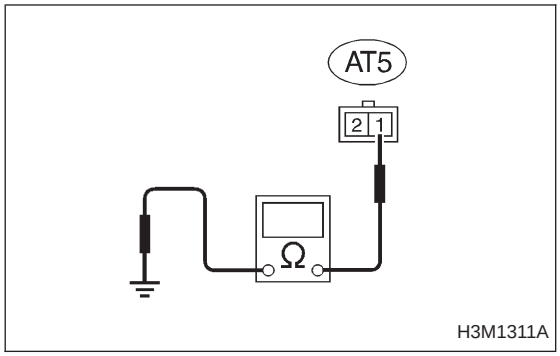


8F5	CHECK SHIFT SOLENOID 2 (IN TRANSMISSION).

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

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

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



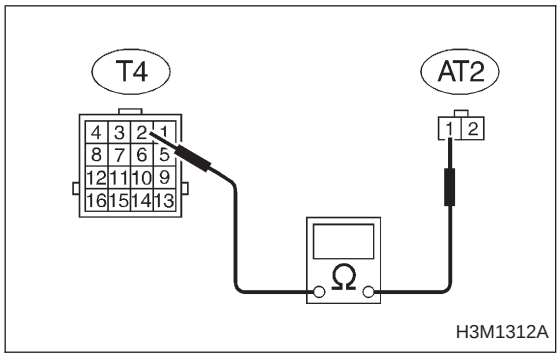
6) Measure resistance between shift solenoid 2 connector and transmission ground.

Terminal
(AT2) No. 1 — Transmission ground:

CHECK ***: Is the resistance between 20 and 32 Ω?***

YES : Go to step **8F6**.

NO : Replace shift solenoid assembly.



8F6	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.

1) Measure resistance of harness between shift solenoid 2 and transmission connector.

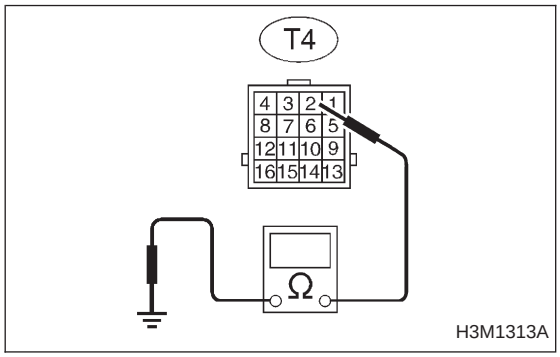
Connector & terminal
(AT2) No. 1 — (T4) No. 2:

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

YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between shift solenoid 2 and transmission connector.
- Poor contact in shift solenoid 2 connector.
- Poor contact in transmission connector.



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

Connector & terminal
(T4) No. 2 — Transmission ground:

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

YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.
- Poor contact in shift solenoid 2 connector.
- Poor contact in transmission connector.

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

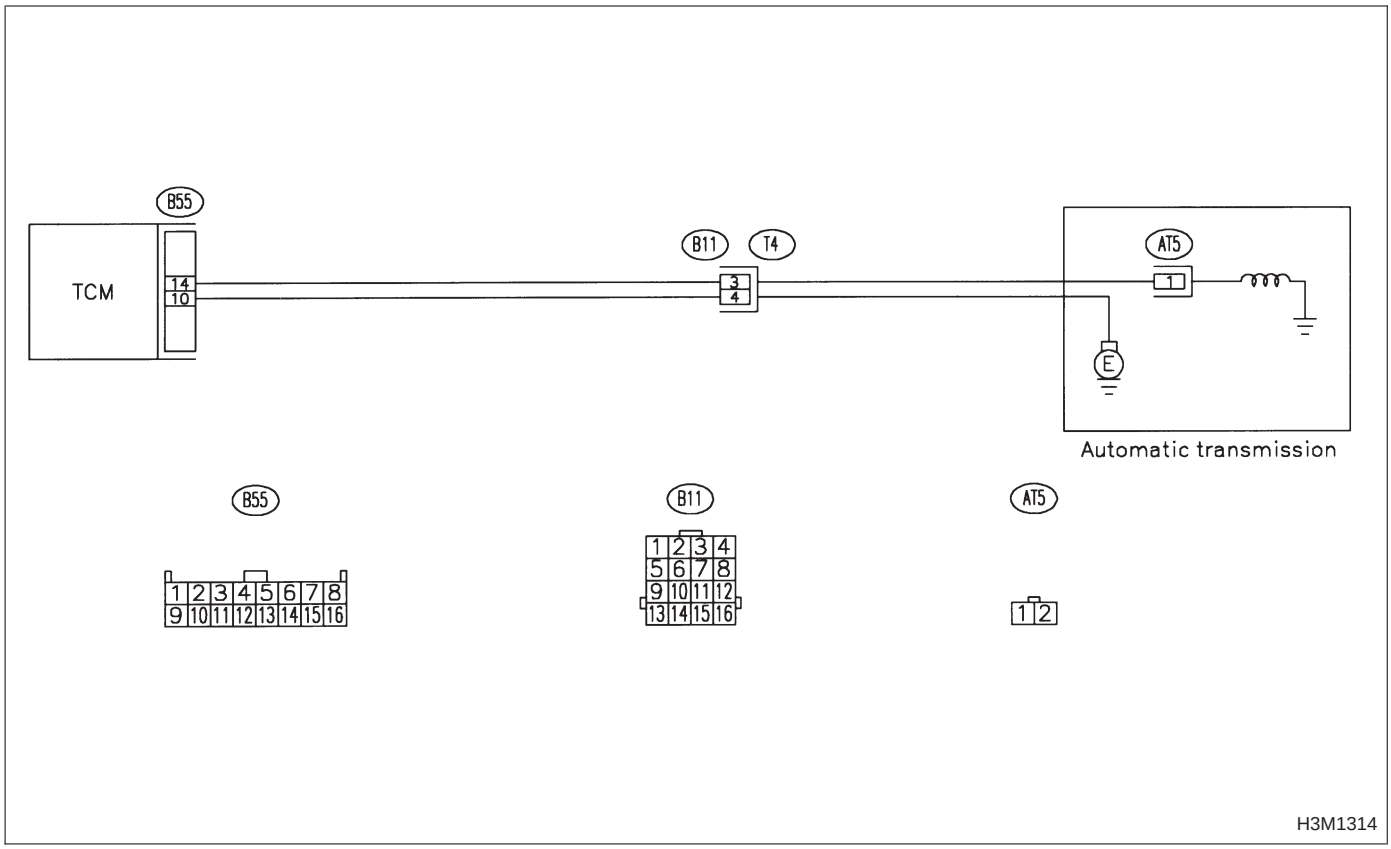
G: TROUBLE CODE 15 — SHIFT SOLENOID 1 —

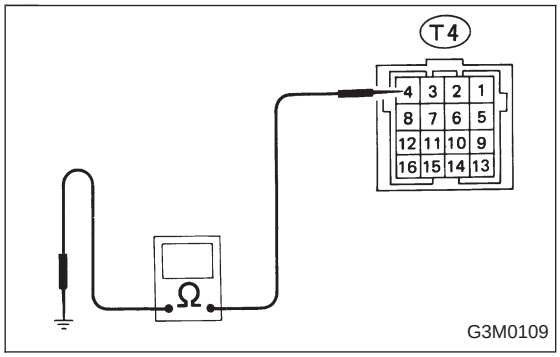
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Does not shift.





8G1	CHECK SHIFT SOLENOID 1 GROUND LINE.

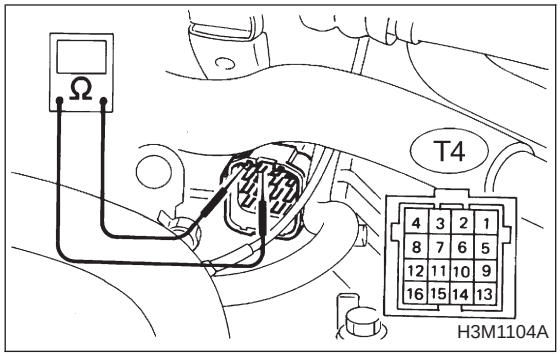
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector and transmission ground.

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

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

YES : Go to step **8G2**.

NO : Repair open circuit in transmission harness connector.



8G2	CHECK SHIFT SOLENOID 1.

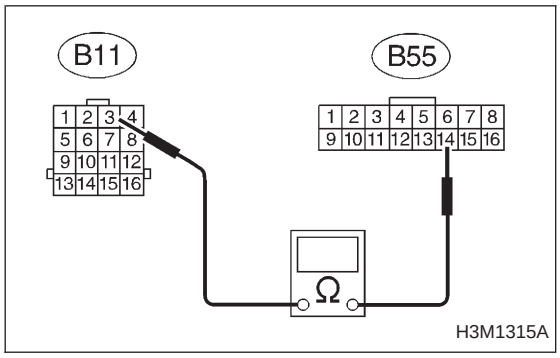
Measure resistance between transmission connector terminals.

Connector & terminal
(T4) No. 3 — No. 4:

CHECK ***: Is the resistance between 20 and 32 Ω?***

YES : Go to step **8G3**.

NO : Go to step **8G5**.



8G3	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

1) Disconnect connector from TCM.
2) Measure resistance of harness between TCM and shift solenoid 1 connector.

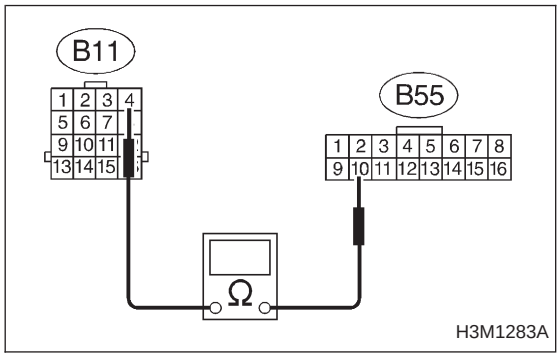
Connector & terminal
(B55) No. 14 — (B11) No. 3:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



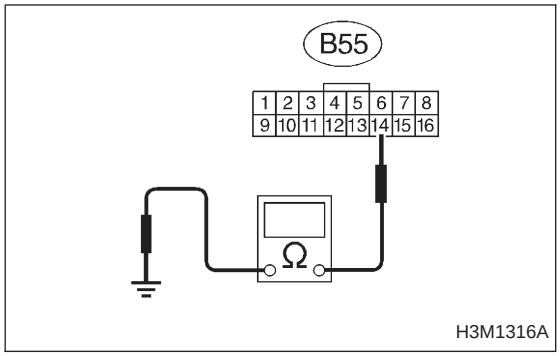
Connector & terminal
(B55) No. 10 — (B11) No. 4:

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

YES : Go to next step 3).

NO : Repair harness connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM connector.
- Poor contact in transmission connector.



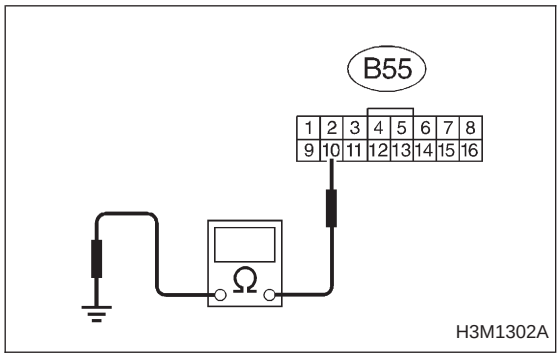
3) Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal
(B55) No. 14 — Chassis ground:

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

YES : Go to next CHECK .

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



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

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

YES : Go to step **8G4**.

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

8G4	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

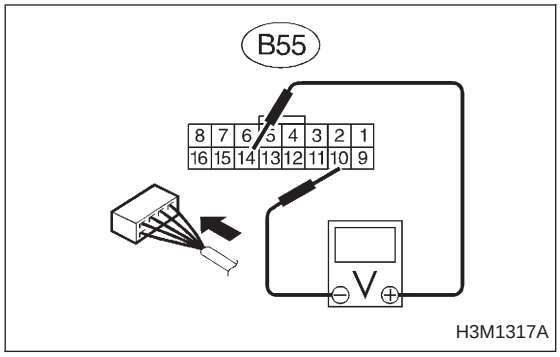
1) Connect connectors to TCM and transmission.
2) Lift-up or raise the vehicle and support with safety stand.

CAUTION:
On AWD models, raise all wheels off ground.

3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

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



5) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 14 (+) — No. 10 (−):

CHECK ***: Is the voltage 1 V → 9 V?***

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

NO : Go to next step 7).

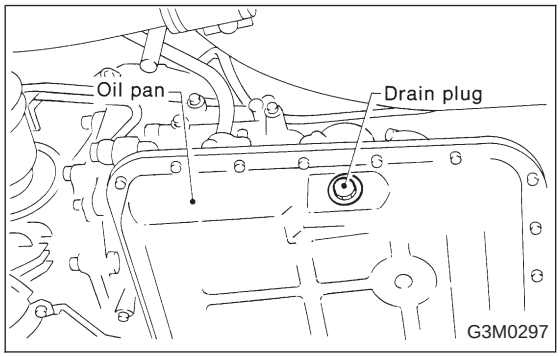
6) Move selector lever to “D”, and slowly increase vehicle speed to 50 km/h (31 m/h).

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

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

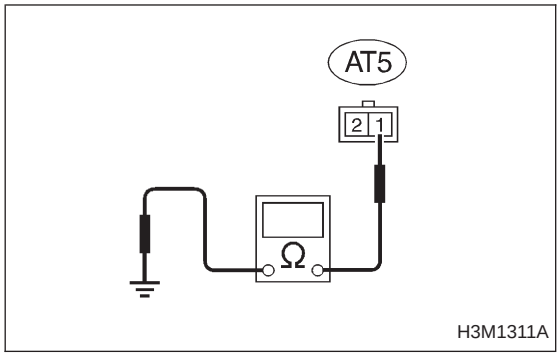


8G5	CHECK SHIFT SOLENOID 1 (IN TRANSMISSION).

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

CAUTION:
On AWD models, raise all wheels off ground.

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



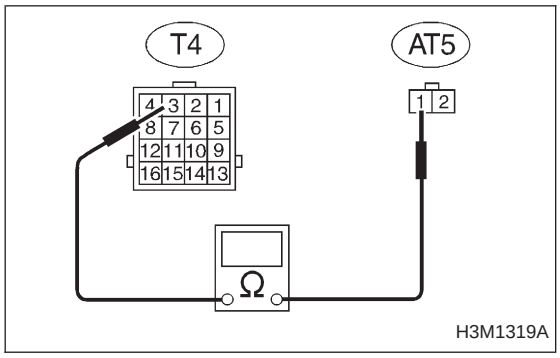
7) Measure resistance between shift solenoid 1 connector and transmission ground.

Terminal
(AT5) No. 1 — Transmission ground:

CHECK ***: Is the resistance between 20 and 32 Ω?***

YES : Go to step **8G6**.

NO : Replace shift solenoid assembly.



8G6	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.

1) Measure resistance of harness between shift solenoid 1 and transmission connector.

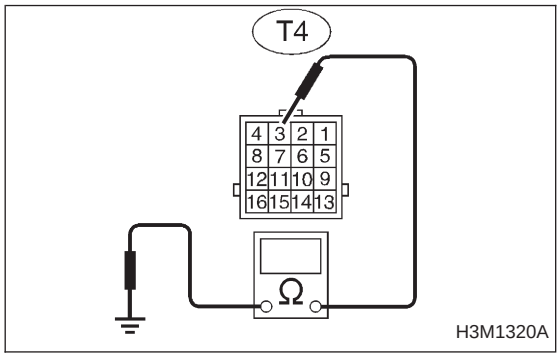
Connector & terminal
(AT5) No. 1 — (T4) No. 3:

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

YES : Go to next step 2).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in shift solenoid 1 connector.
- Poor contact in transmission connector.



2) Measure resistance of harness between shift solenoid 1 connector and transmission ground.

Connector & terminal
(T4) No. 3 — Transmission ground:

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

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

NOTE:
In this case, repair the following:
- Poor contact in shift solenoid 1 connector.
- Poor contact in transmission connector.

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

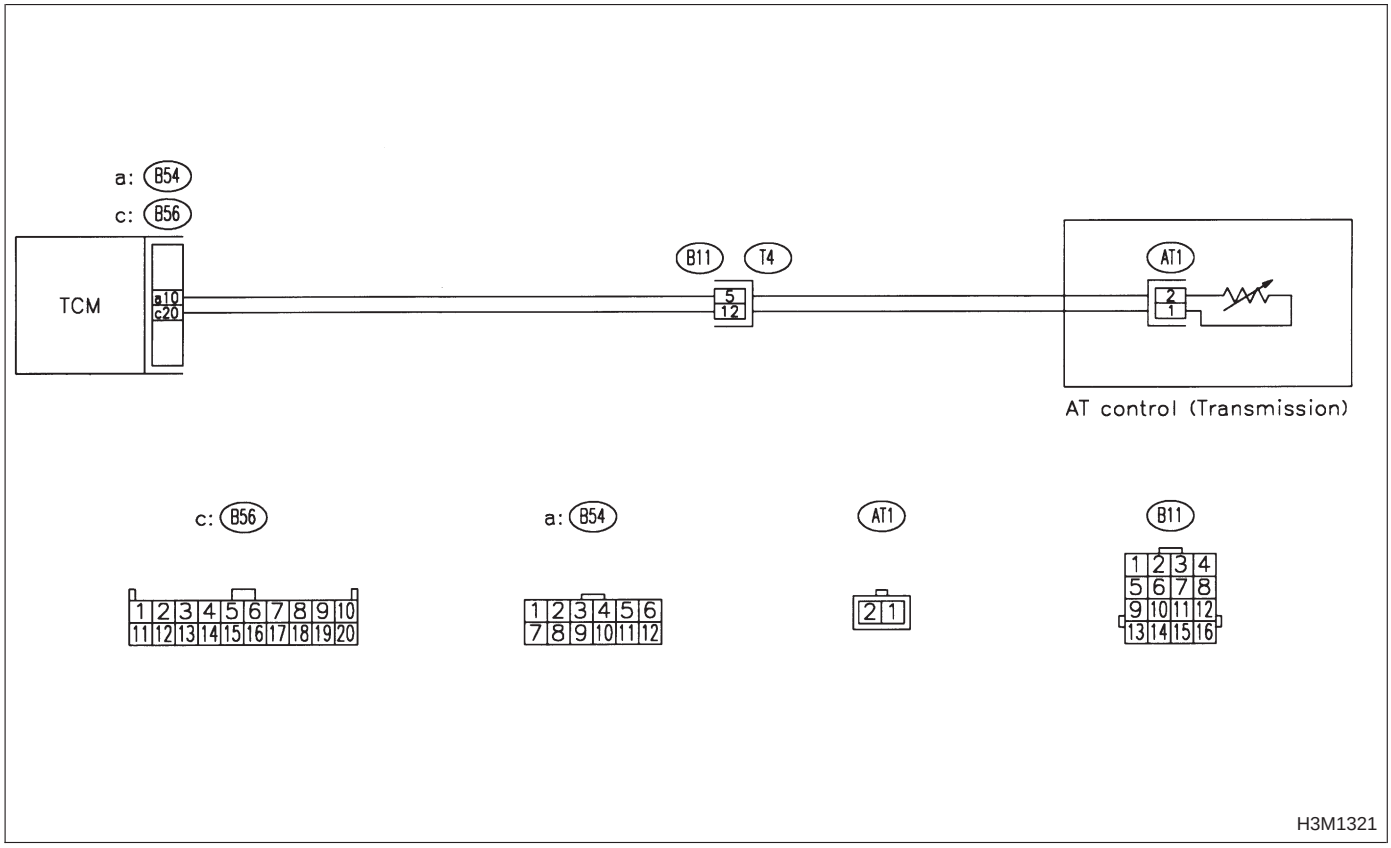
H: TROUBLE CODE 21
— ATF TEMPERATURE SENSOR —

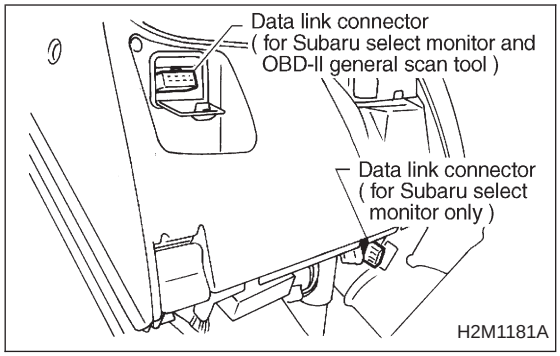
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.





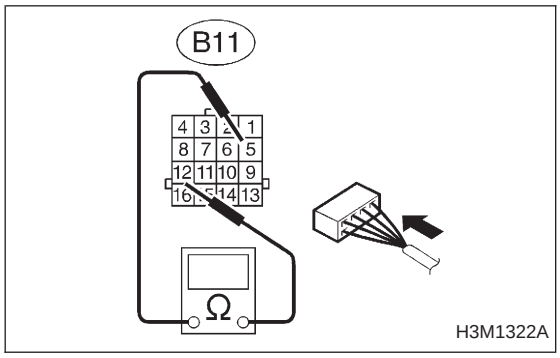
8H1	CHECK ATF TEMPERATURE SENSOR.

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

Function mode F07 or F08

- F07: ATF temperature is indicated in “°F”.

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

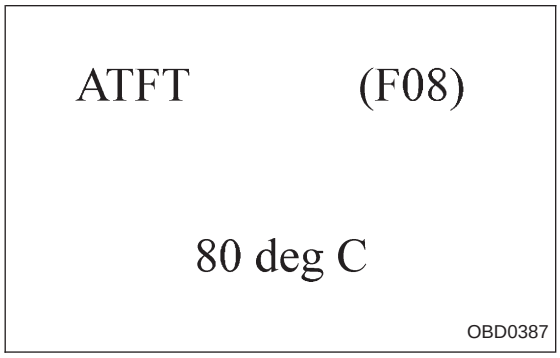


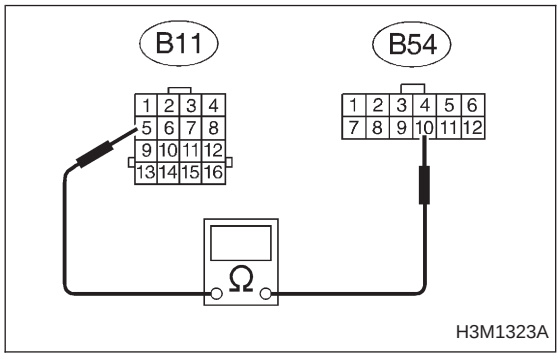
7) Measure resistance between transmission connector receptacle's terminals shown in the following table.

Connector & terminal
(B11) No. 12 — No. 5:

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

CHECK ***: Is the resistance in range?***
YES : Go to step **8H2**.
NO : Go to step **8H4**.





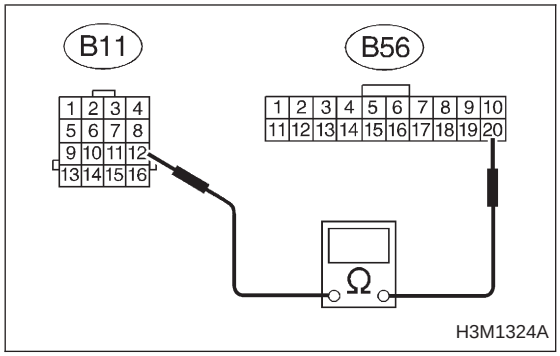
8H2	CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.

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

Connector & terminal
(B54) No. 10 — (B11) No. 5:

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

NOTE:
In this case, repair the following:
● Open circuit in harness between TCM and transmission connector.
● Poor contact in TCM.
● Poor contact in transmission connector.



Connector & terminal
(B56) No. 20 — (B11) No. 12:

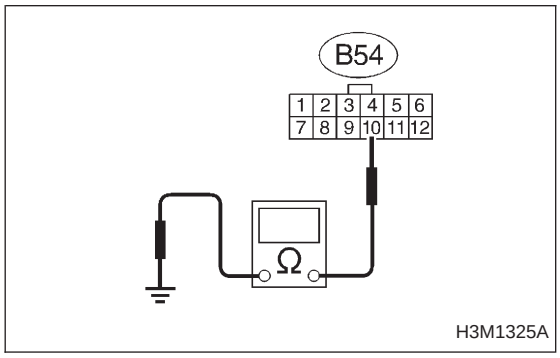
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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



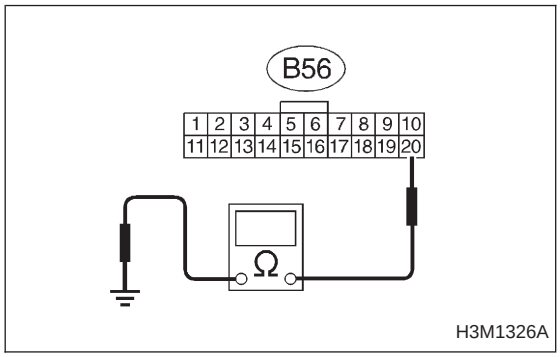
4) Measure resistance of harness between TCM connector and transmission ground.

Connector & terminal
(B54) No. 10 — Chassis ground:

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

YES : Go to next CHECK .

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

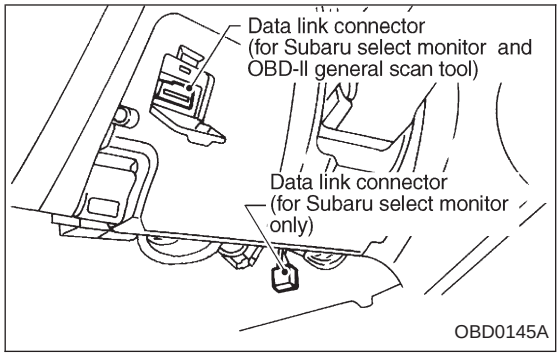


Connector & terminal
(B56) No. 20 — Chassis ground:

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

YES : Go to step **8H3**.

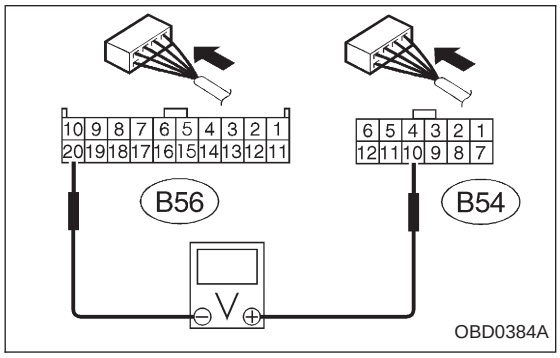
NO : Repair short circuit in harness between TCM and transmission connector.



8H3	CHECK INPUT SIGNAL FOR TCM.

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

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



9) Measure voltage between TCM connector terminal.
Connector & terminal
(B54) No. 10 (+) — (B56) No. 20 (−):

CHECK ***: Is the voltage between 2.9 and 4.0 V?***

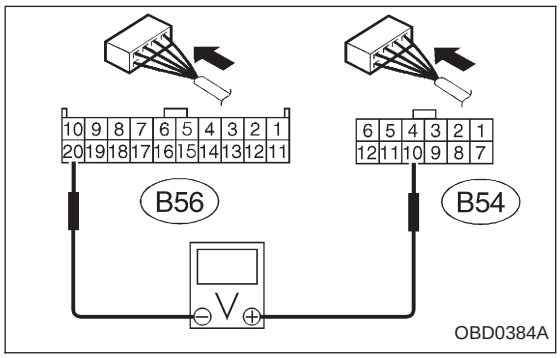
YES : Go to next step 10).

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



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

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

11) Measure voltage between TCM connector terminal.
Connector & terminal
(B54) No. 10 (+) — (B56) No. 20 (−):

CHECK ***: Is the voltage between 1.0 and 1.4 V?***

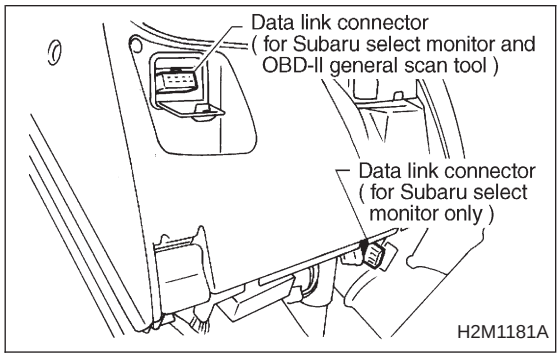
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



- Using Subaru Select Monitor

1) Turn ignition switch to OFF.
2) Connect connectors to TCM and transmission.
3) Connect Subaru Select Monitor to data link connector.
4) Start the engine, and turn Subaru Select Monitor switch to ON.
5) Warm-up the transmission until ATF temperature is above 80°C (176°F).

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

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

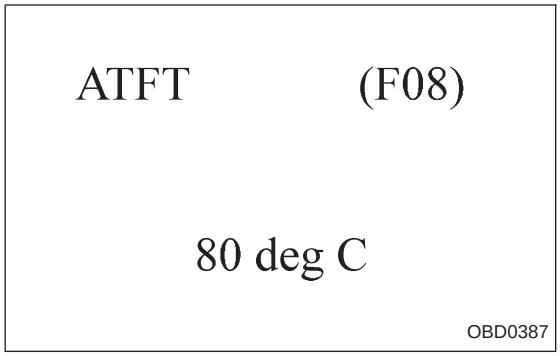
Function mode F07 or F08

- F07: ATF temperature is indicated in “°F”.
- F08: ATF temperature is indicated in “°C”.

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

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

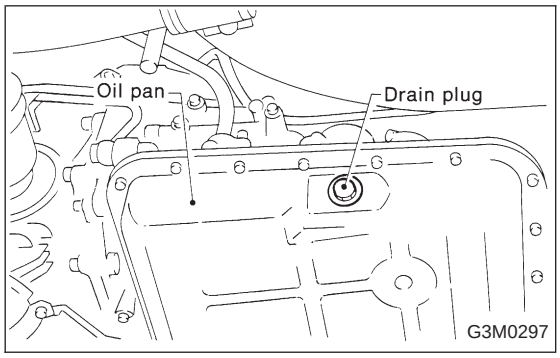
NO : Go to next CHECK .



CHECK : ***Is the ATF temperature between 70 and 110°C (158 and 230°F) by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?***

YES : Repair poor contact in TCM.

NO : Replace TCM.



8H4	CHECK ATF TEMPERATURE SENSOR (IN TRANSMISSION).

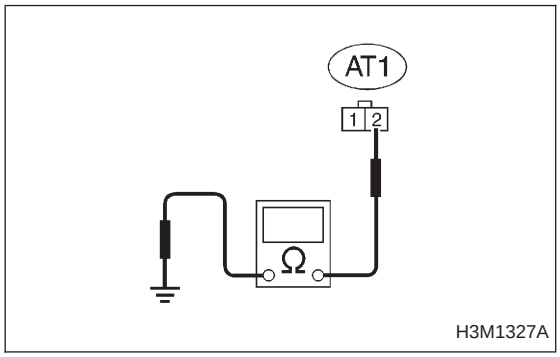
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Remove transmission connector from bracket.
4) Lift-up the vehicle and place safety stand.

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

5) Drain automatic transmission fluid.

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

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



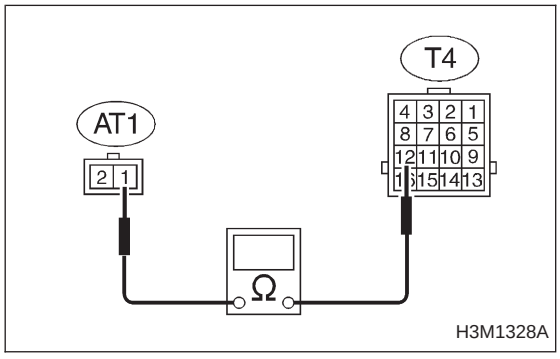
7) Measure resistance between ATF temperature sensor connector and transmission ground.

Connector & terminal
(AT1) No. 2 — Transmission ground:

CHECK : ***Is the resistance between 1.5 and 4.5 Ω?***

YES : Go to step **8H5**.

NO : Replace ATF temperature sensor.

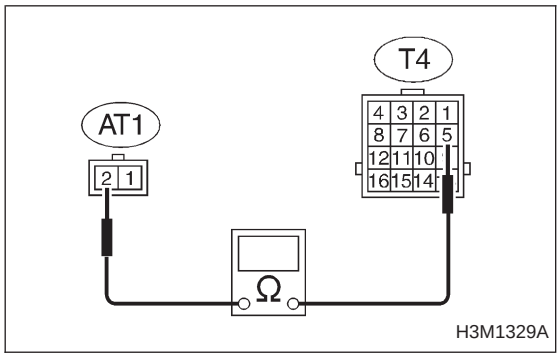


8H5	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.

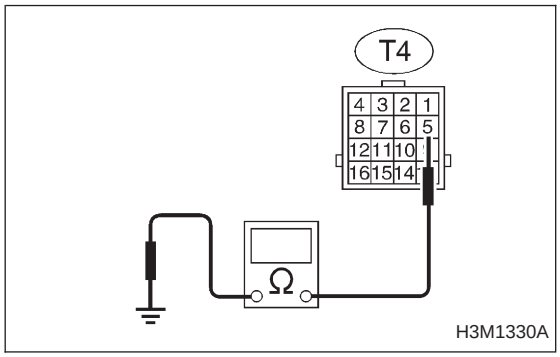
1) Disconnect connector from transmission.
2) Measure resistance of harness between ATF temperature sensor and transmission connector.

Connector & terminal
(T4) No. 12 — (AT1) No. 1:

CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next CHECK .
NO : Repair harness and connector.
NOTE:
In this case, repair the following:
- Open circuit in harness between ATF temperature sensor and transmission connector.
- Poor contact in ATF temperature sensor connector.
- Poor contact in transmission connector.

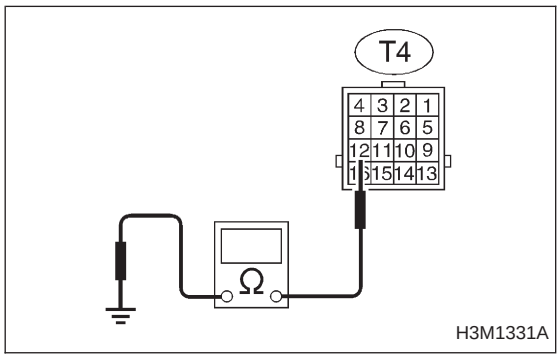


Connector & terminal
(T4) No. 5 — (AT1) No. 2:
CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next step 3).
NO : Repair harness and connector.
NOTE:
In this case, repair the following:
- Open circuit in harness between ATF temperature sensor and transmission connector.
- Poor contact in ATF temperature sensor connector.
- Poor contact in transmission connector.



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

Connector & terminal
(T4) No. 5 — Transmission ground:
CHECK ***: Is the resistance more than 1 MΩ?***
YES : Go to next CHECK .
NO : Repair short circuit in harness between ATF temperature sensor and transmission connector.



Connector & terminal
(T4) No. 12 — Transmission ground:
CHECK ***: Is the resistance more than 1 MΩ?***
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the ATF temperature sensor and transmission connector.
NO : Repair short circuit in harness between ATF temperature sensor and transmission connector.

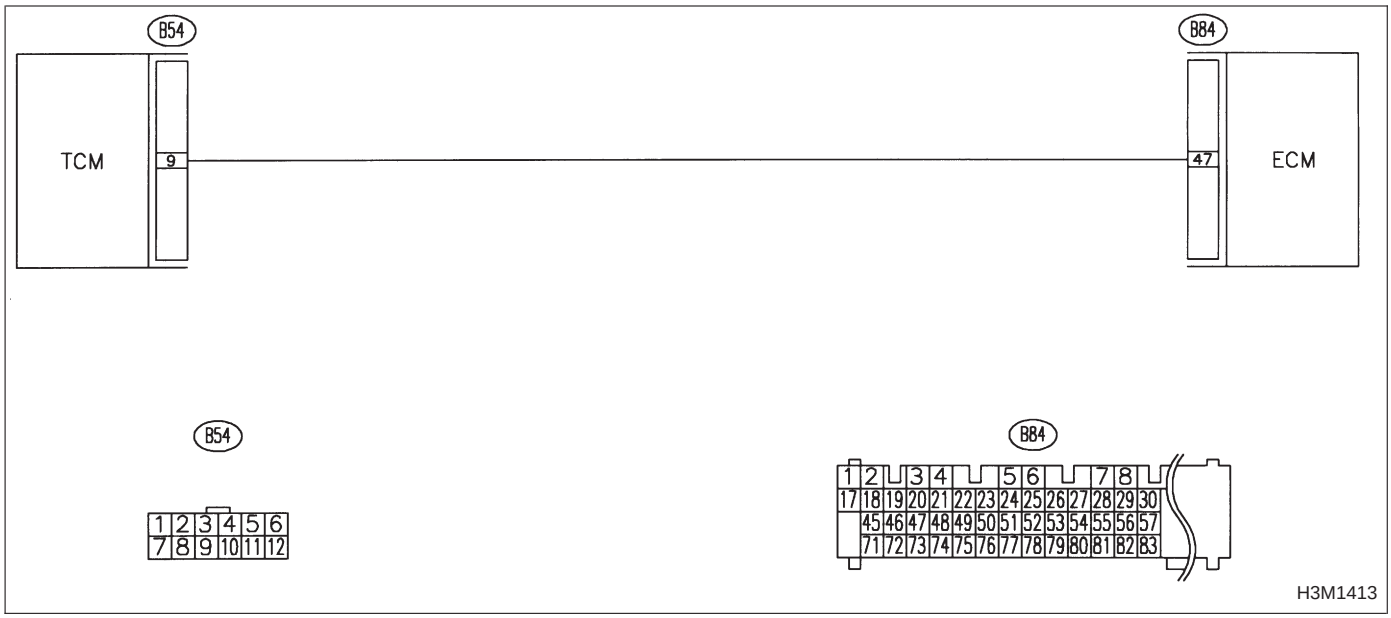
I: TROUBLE CODE 22 — MASS AIR FLOW SIGNAL —

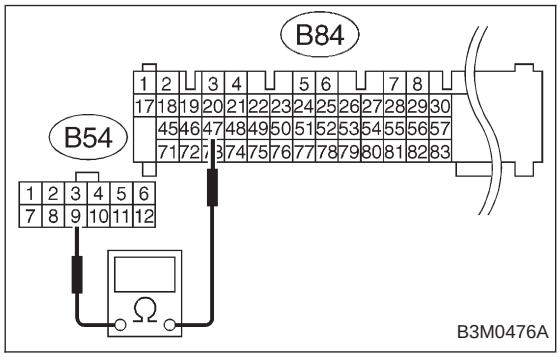
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.





8I1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.**

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

Connector & terminal
(B54) No. 9 — (B84) No. 47:

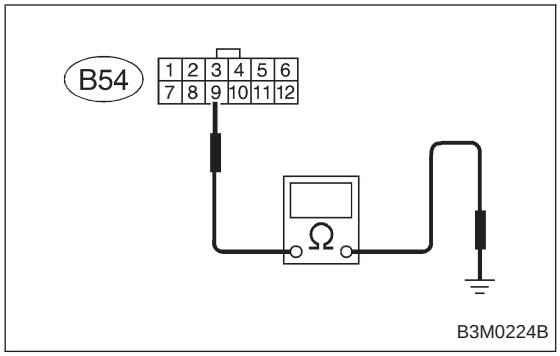
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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



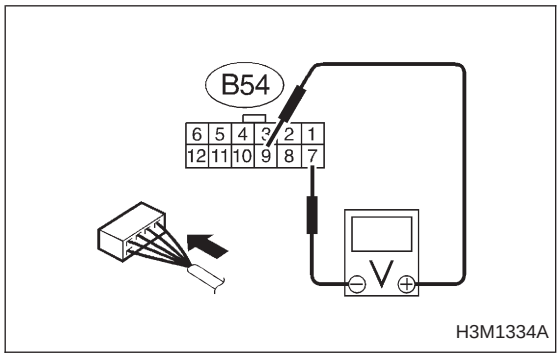
4) Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal
(B54) No. 9 — Chassis ground:

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

YES : Go to step **8I2**.

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



8I2	CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to TCM and ECM.
2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F).

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

3) Engine idling.
4) Measure voltage between TCM connectors.

Connector & terminal
(B54) No. 9 (+) — No. 7 (−):

CHECK ***: Is the voltage between 0.5 and 1.2 V?***

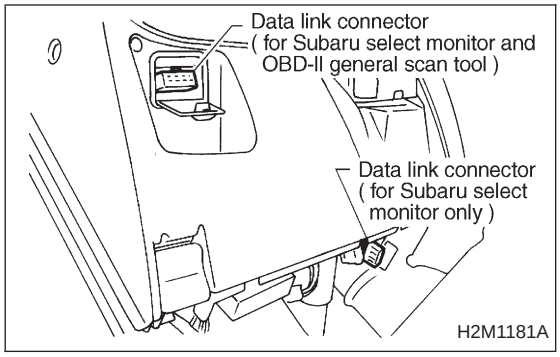
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.

NO : Go to next CHECK .

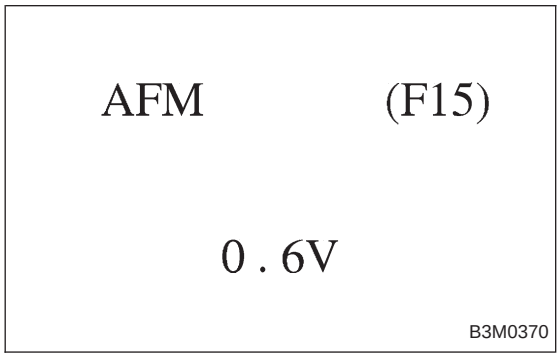
CHECK ***: Is the voltage between 0.5 V and 1.2 V while shaking harness and connector of TCM?***

YES : Repair poor contact in TCM.

NO : Replace TCM.



● Using Subaru Select Monitor
1) Connect connectors to TCM and ECM.
2) Turn ignition switch to OFF.
3) Connect Subaru Select Monitor to data link connector.
4) Start the engine, and turn Subaru Select monitor switch to ON.
5) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
6) Engine idling.
7) Read data on Subaru Select Monitor.
8) Designate mode using function key.
Function mode: F15
● F15: Display shows mass air flow signal value sent from ECM.



CHECK ***: Is the value between 0.5 and 1.2 V in function mode F15?***

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

NO : Go to next CHECK .

CHECK ***: Is the voltage between 0.5 V and 1.2 V by shaking harness and connector of TCM while monitoring the value with Subaru Select Monitor?***

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

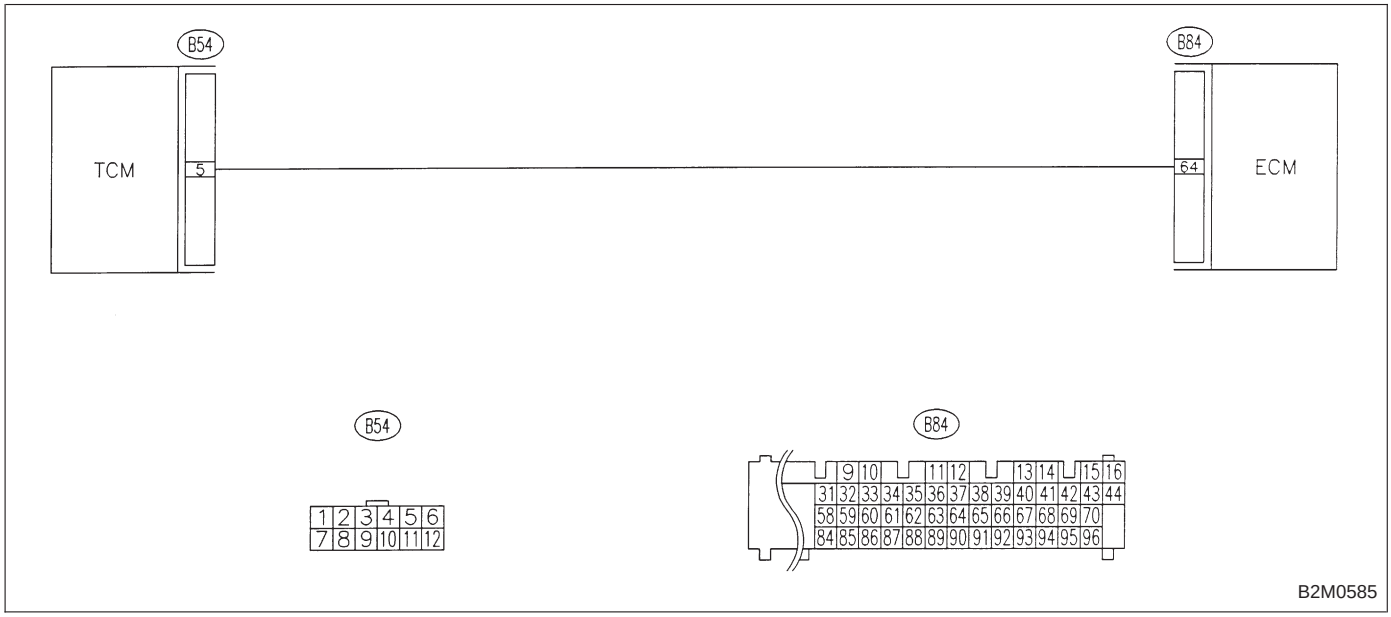
J: TROUBLE CODE 23 — ENGINE SPEED SIGNAL —

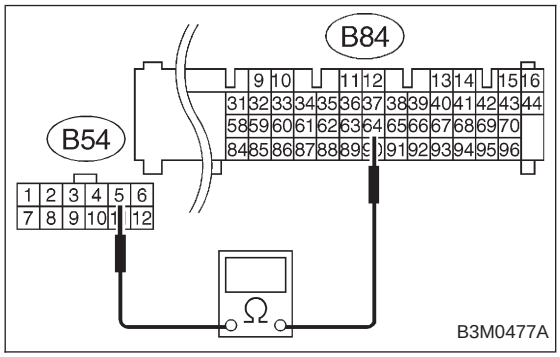
DIAGNOSIS:

Engine speed input signal circuit is open or shorted.

TROUBLE SYMPTOM:

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





8J1	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

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

Connector & terminal
(B54) No. 5 — (B84) No. 64:

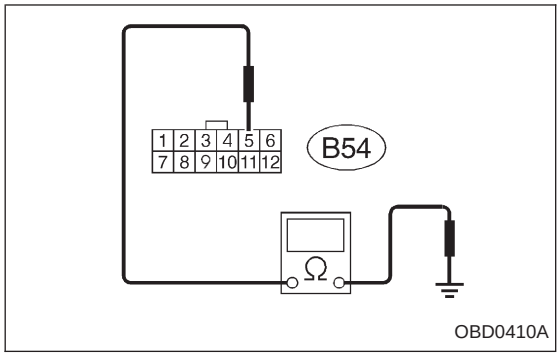
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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



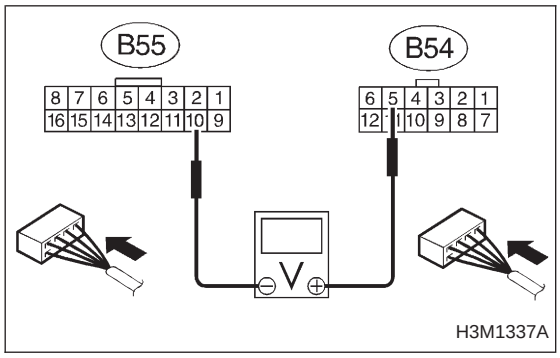
4) Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal
(B54) No. 5 — Chassis ground:

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

YES : Go to step **8J2**.

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



8J2	CHECK INPUT SIGNAL FOR TCM.

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

Connector & terminal
(B54) No. 5 (+) — (B55) No. 10 (−):

CHECK ***: Is the voltage more than 10.5 V?***

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

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

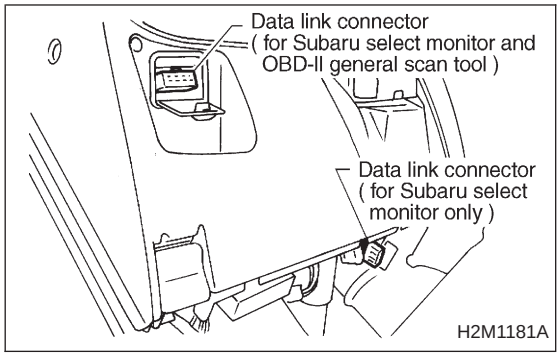
NO : Go to next CHECK .

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

YES : Replace TCM.

NOTE:
Install the old ECM.

NO : Replace ECM.



● Using Subaru Select Monitor
1) Connect connectors to TCM and ECM.
2) Turn ignition switch to OFF.
3) Connect Subaru Select Monitor to data link connector.
4) Start the engine, and turn Subaru Select Monitor switch to ON.
5) Warm-up the engine until engine coolant temperature is above 80°C (176°F).
6) Engine idling.
7) Read on Subaru Select Monitor.
8) Designate mode using function key.
Function mode: F06
● F06: Display shows engine speed signal value sent from ECM.

CHECK ***: Is the revolution value the same as the tachometer reading shown on the combination meter?***

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

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM connector.

NO : Replace TCM.

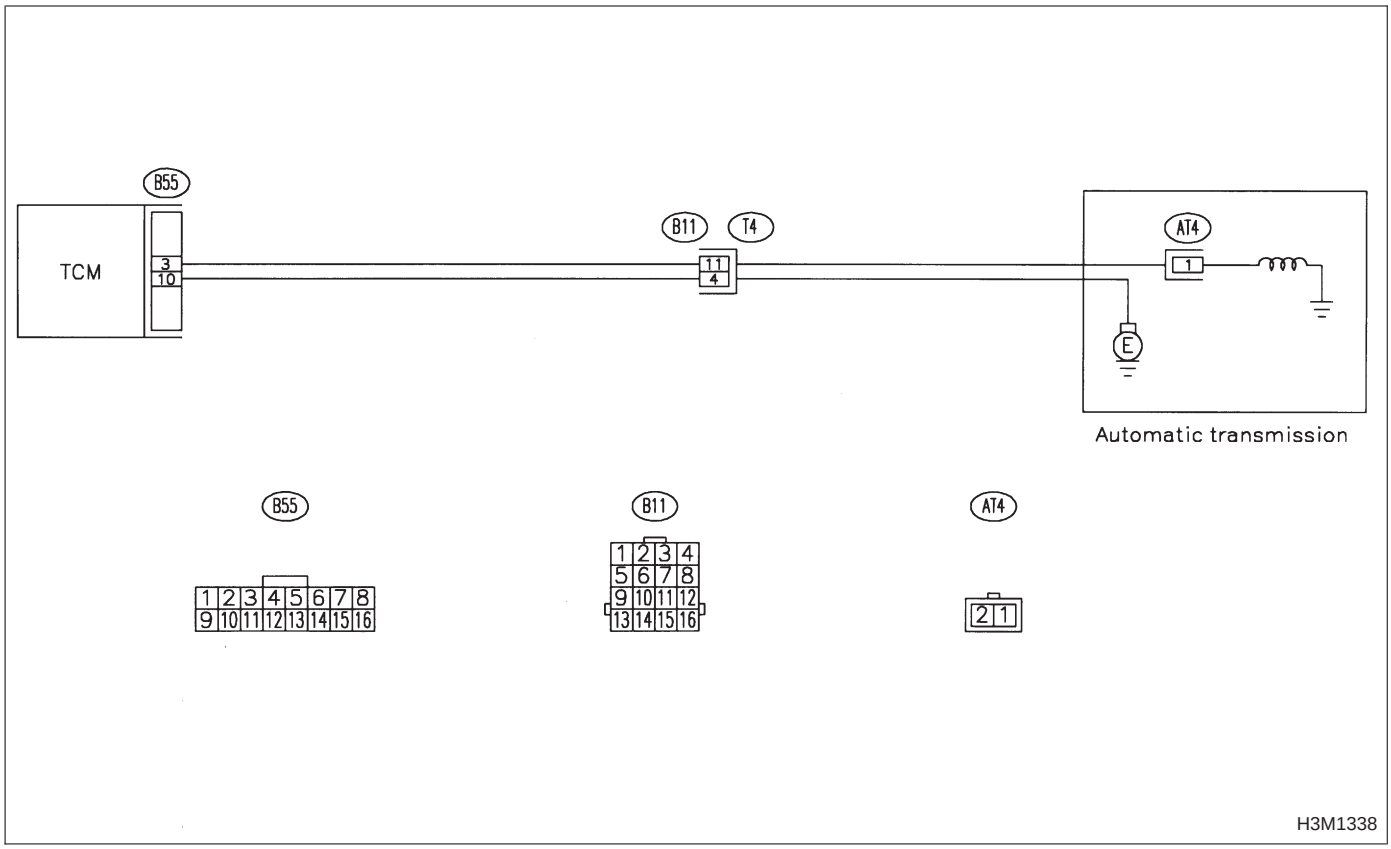
K: TROUBLE CODE 24 — DUTY SOLENOID C —

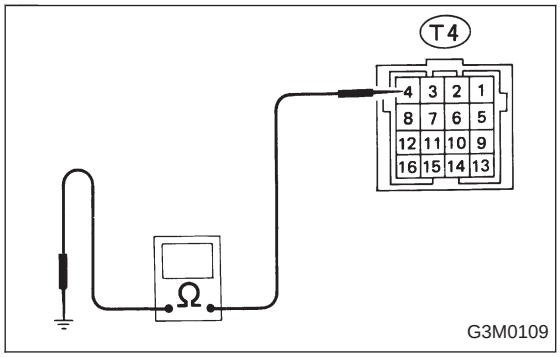
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive “braking” in tight corners.





8K1	**CHECK DUTY SOLENOID C GROUND LINE.**

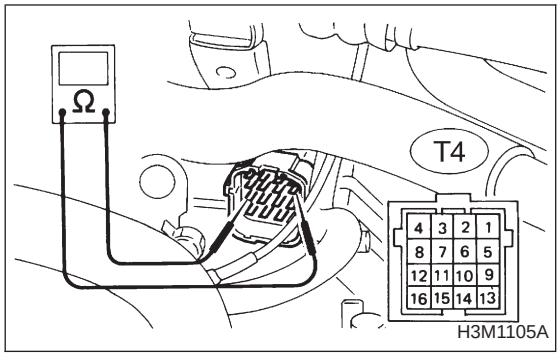
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector and transmission ground.

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

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

YES : Go to step **8K2**.

NO : Repair open circuit in transmission harness connector.



8K2	CHECK DUTY SOLENOID C.

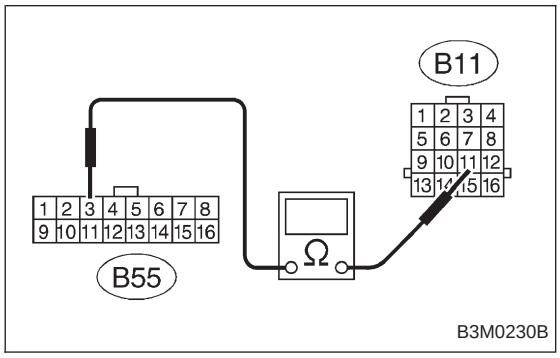
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector and transmission terminals.

Connector & terminal
(T4) No. 11 — No. 4:

CHECK ***: Is the resistance between 9 and 17 Ω?***

YES : Go to step **8K3**.

NO : Go to step **8K5**.



8K3	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.

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

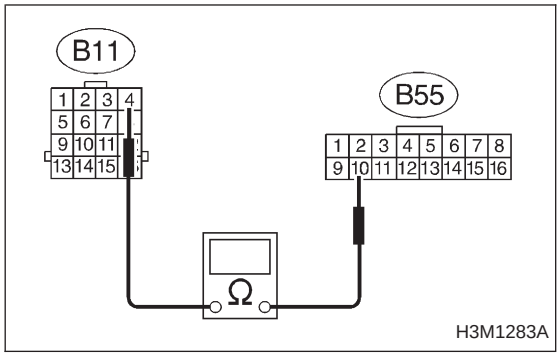
Connector & terminal
(B55) No. 3 — (B11) No. 11:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission connector.



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

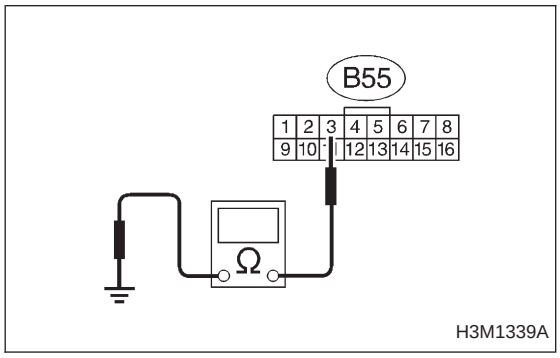
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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

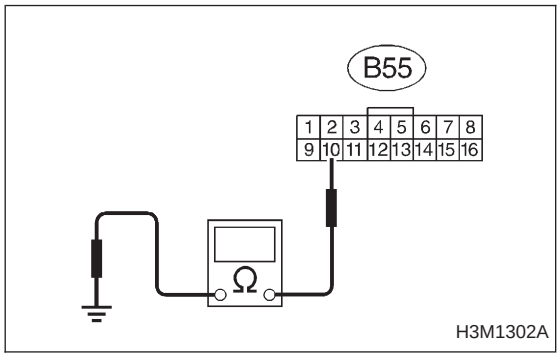


Connector & terminal
(B55) No. 3 — Chassis ground:

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

YES : Go to step **8K4**.

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

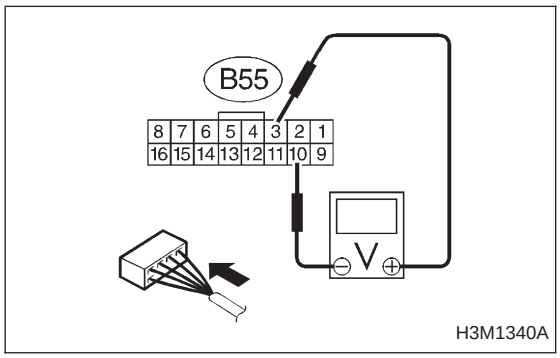


Connector & terminal
(B55) No. 10 — Chassis ground:

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

YES : Go to step **8K4**.

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



8K4	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Turn ignition switch to OFF.
2) Connect connectors to TCM and transmission.
3) Turn ignition switch to ON (engine OFF).
4) Throttle is fully closed.
5) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 3 (+) — No. 10 (−):

CHECK ***: Is the voltage less than 1 V in "P" position?***

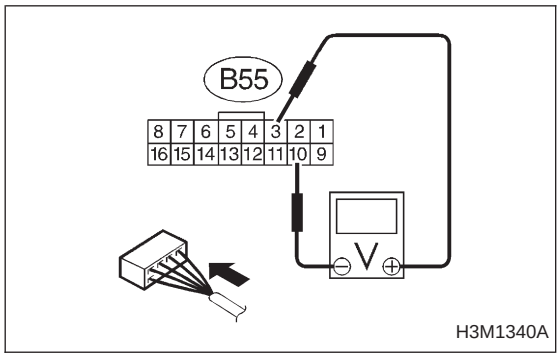
YES : Go to next step CHECK1 .

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



Connector & terminal
(B55) No. 3 (+) — No. 10 (−):

CHECK1 ***: Is the voltage between 5 V and 7 V in "D" position?***

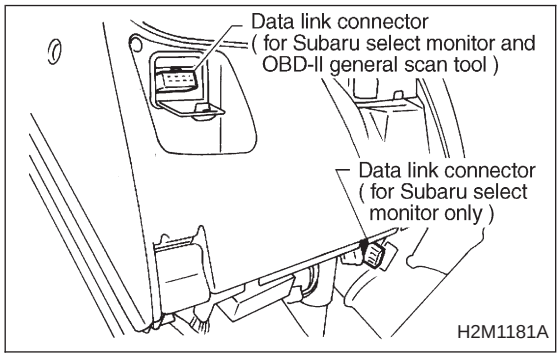
YES : Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the ATF temperature sensor and transmission connector.

NO : Go to next CHECK .

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

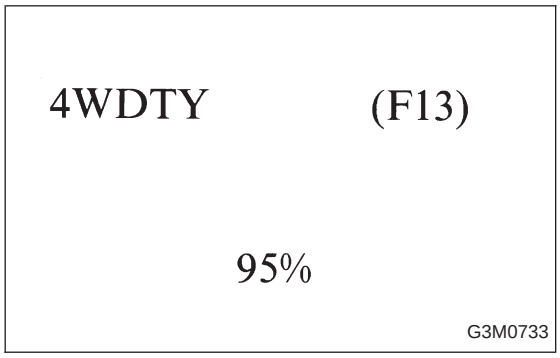
YES : Repair poor contact in TCM.

NO : Replace TCM.



● Using Subaru Select Monitor
1) Turn ignition switch to OFF.
2) Connect connectors to TCM and transmission.
3) Connect Subaru Select Monitor to data link connector.
4) Turn ignition switch to ON (engine OFF) and turn Subaru Select Monitor switch to ON.
5) Move selector lever to "D" with throttle fully open (vehicle speed 0 km/h or 0 m/h).
6) Read data on Subaru Select Monitor.
7) Designate mode using function key.
Function mode F13
● F13: AWD duty is indicated in "%".

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

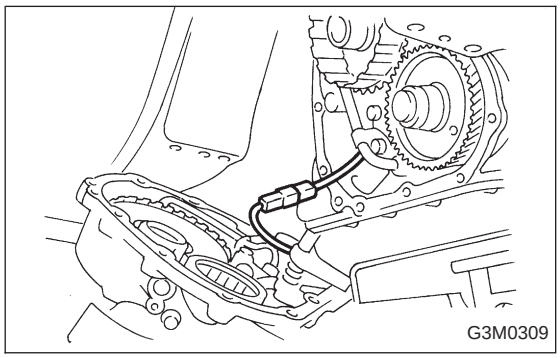


8) Set FWD mode.
9) Throttle fully closed.
CHECK ***: Is the value 95% in function mode F13?***
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the ATF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

8K5	**CHECK DUTY SOLENOID C (IN TRANSMISSION).**

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

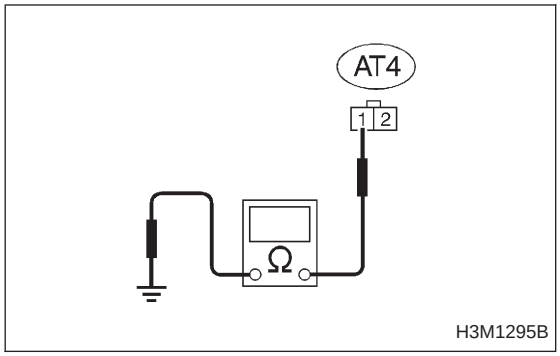
CAUTION:
On AWD models, make sure that all wheels are raised off floor.



3) Drain automatic transmission fluid.

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

4) Remove extension case, and disconnect connector from duty solenoid C.
<Ref. to 3-2 [W6A0].>

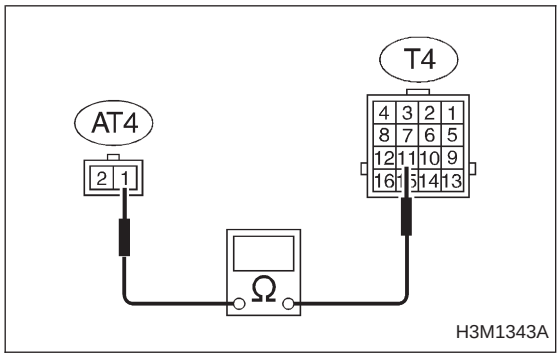


5) Measure resistance between duty solenoid C connector and transmission ground.

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

YES : Go to step **8K6**.

NO : Replace duty solenoid C.



8K6	**CHECK HARNESS CONNECTOR BETWEEN DUTY SOLENOID C AND TRANSMISSION.**

1) Disconnect connector from transmission.
2) Remove transmission bracket.
3) Measure resistance of harness between duty solenoid C and transmission connector.

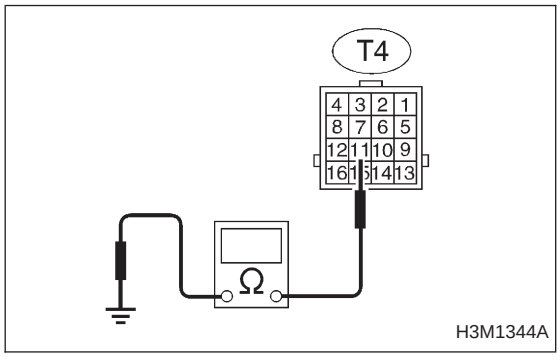
Connector & terminal
(T4) No. 11 — (AT4) No. 1:

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

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between duty solenoid C and transmission connector.
- Poor contact in duty solenoid C connector.
- Poor contact in transmission connector.



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

Connector & terminal
(T4) No. 11 — Transmission ground:

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

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

NO : Repair short circuit in harness between duty solenoid C and transmission connector.

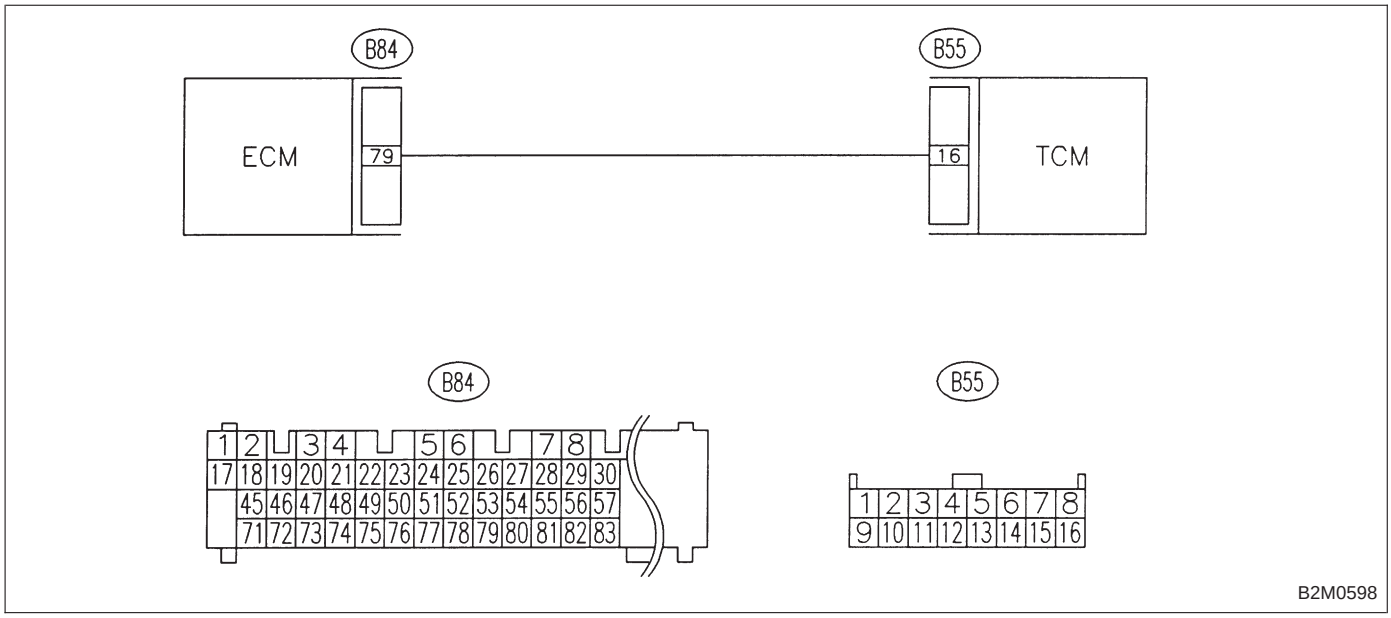
L: TROUBLE CODE 25 — TORQUE CONTROL SIGNAL —

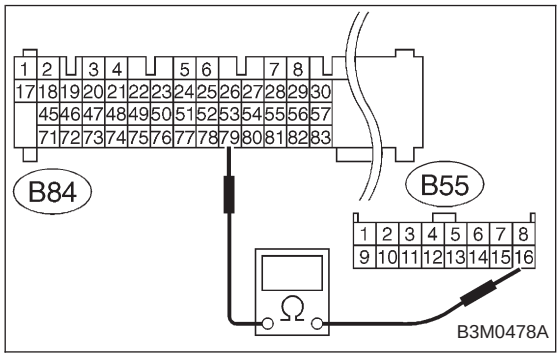
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.





8L1	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

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

Connector & terminal
(B55) No. 16 — (B84) No. 79:

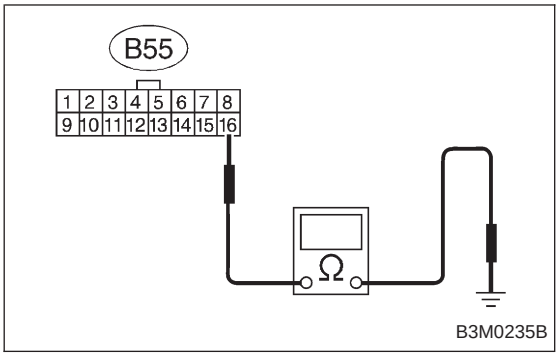
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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



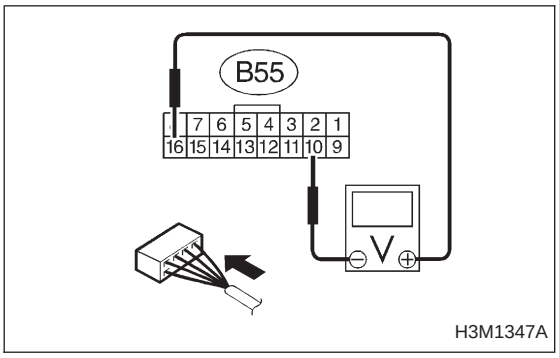
4) Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal
(B55) No. 16 — Chassis ground:

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

YES : Go to step **8L2**.

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



8L2	CHECK OUTPUT SIGNAL EMITTED FROM TCM.

1) Turn ignition switch to OFF.
2) Connect connectors to TCM and ECM.
3) Turn ignition switch to ON (engine OFF).
4) Measure voltage between TCM connector terminals.

Connector & terminal
(B55) No. 16 (+) — No. 10 (−):

CHECK ***: Is the voltage between 4 and 6 V?***

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

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Go to next CHECK .

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

YES : Replace TCM.

NOTE:
Install the old ECM.

NO : Replace ECM.

M: TROUBLE CODE 31

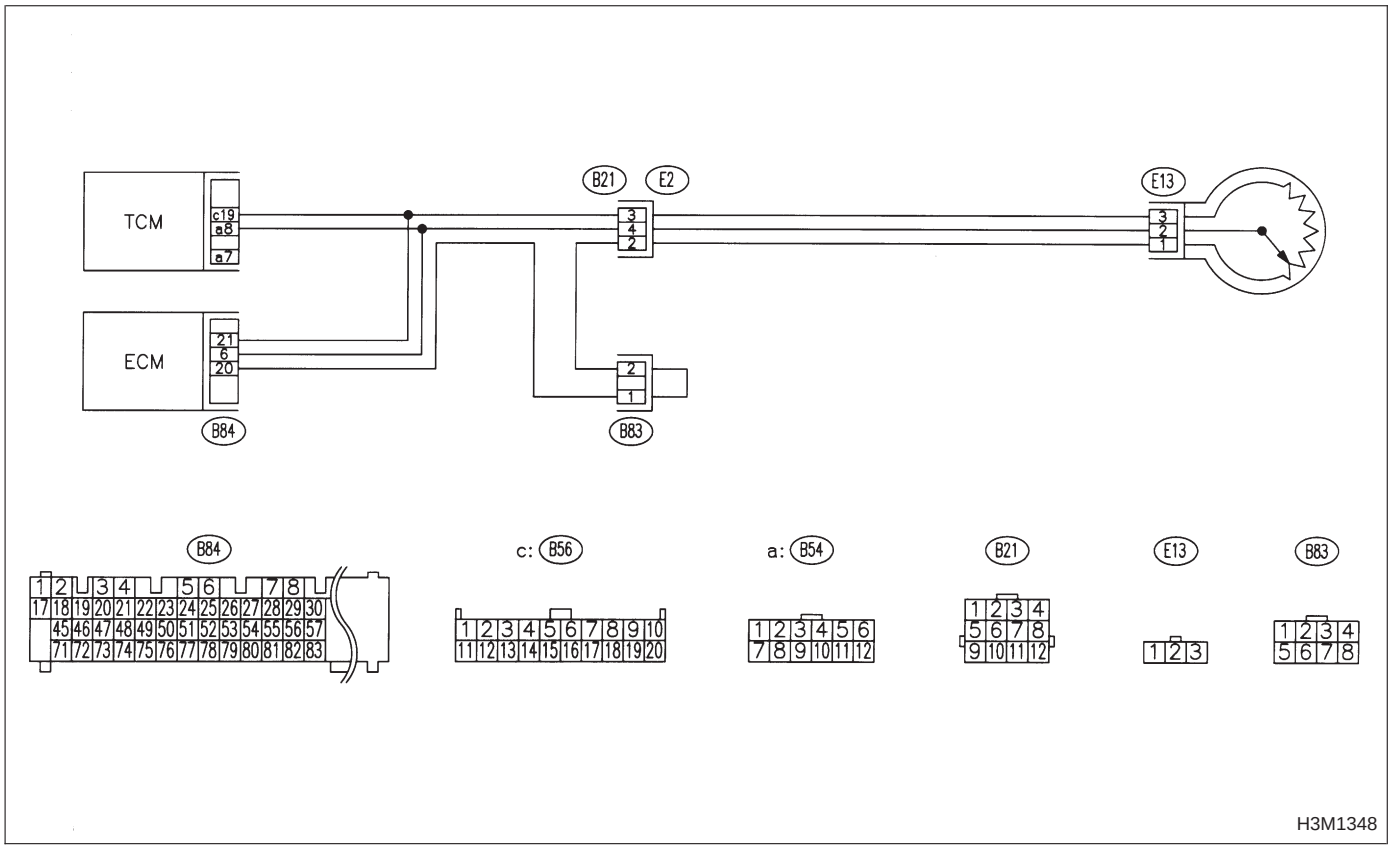
— THROTTLE POSITION SENSOR —

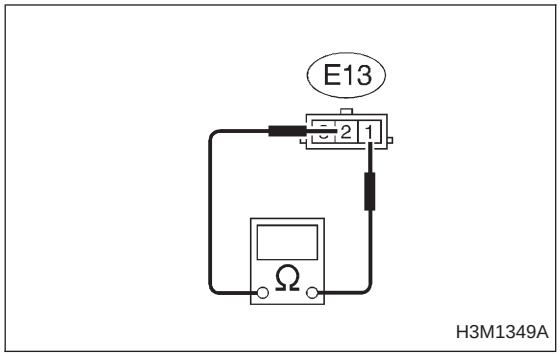
DIAGNOSIS:

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

TROUBLE SYMPTOM:

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



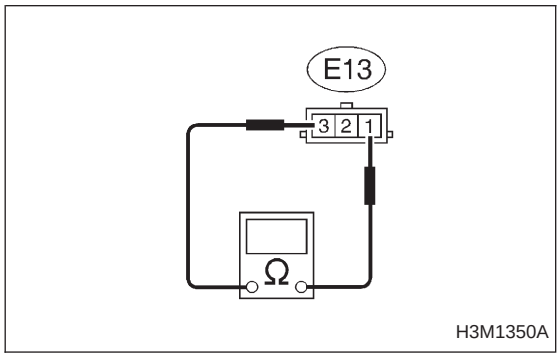


8M1	CHECK THROTTLE POSITION SENSOR.

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

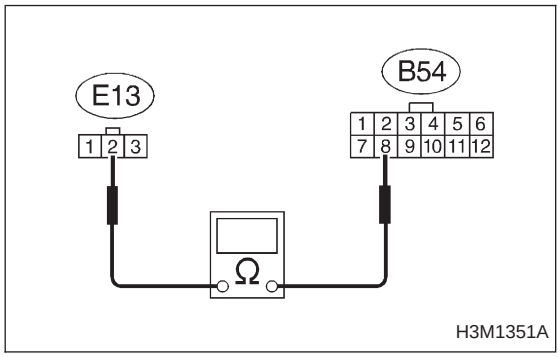
Terminals
(E13) No. 1 — No. 2:

CHECK ***: Is the resistance between 0.3 and 0.7 kΩ?***
YES : Go to next CHECK .
NO : Replace throttle position sensor.



Terminals
(E13) No. 1 — No. 3:

CHECK ***: Is the resistance between 3.5 and 6.5 kΩ?***
YES : Go to step **8M2**.
NO : Replace throttle position sensor.



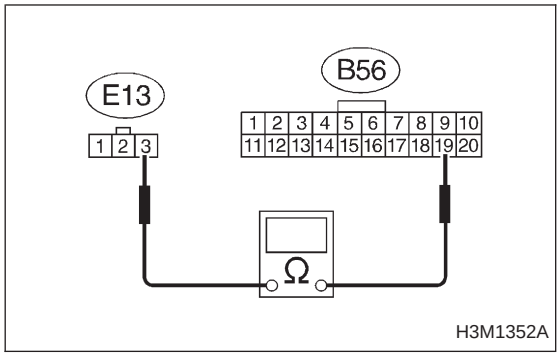
8M2	CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.

1) Disconnect connector from TCM.
2) Measure resistance of harness between TCM and throttle position sensor connector.

Connector & terminal
(B54) No. 8 — (E13) No. 2:

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

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and throttle position sensor.
- Poor contact in TCM connector.
- Poor contact in throttle position sensor connector.
- Poor contact in coupling connector (B21).



Connector & terminal
(B56) No. 19 — (E13) No. 3:

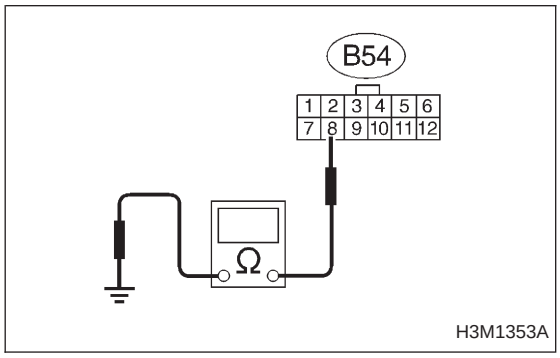
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next step 3).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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



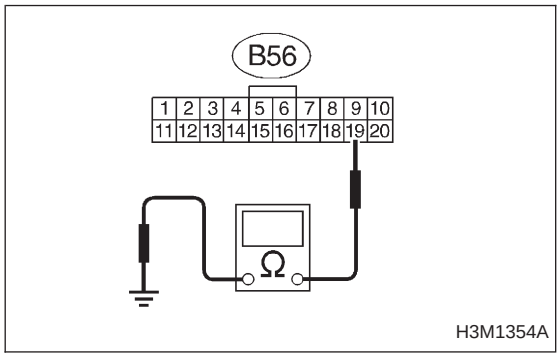
3) Measure resistance of harness between TCM connector and chassis ground.

Connector & terminal
(B54) No. 8 — Chassis ground:

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

YES : Go to next CHECK .

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

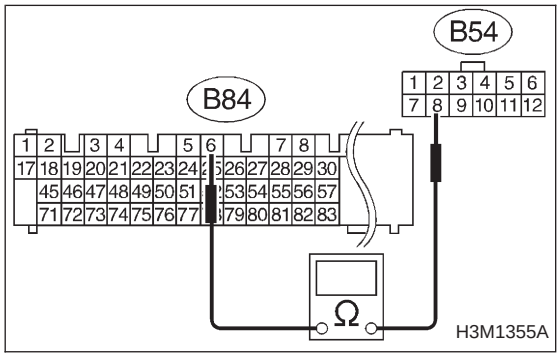


Connector & terminal
(B56) No. 19 — Chassis ground:

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

YES : Go to step **8M3**.

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

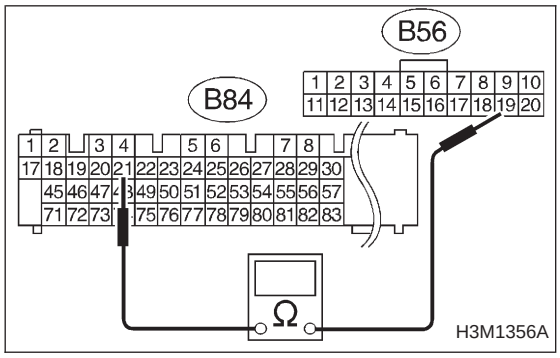


8M3	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.

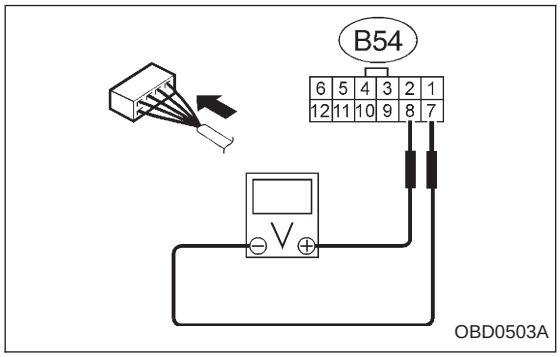
1) Disconnect connector from ECM.
2) Measure resistance of harness between TCM and ECM connector.

Connector & terminal
(B54) No. 8 — (B84) No. 6:

CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to next CHECK .
NO : Repair harness and connector.
NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and ECM.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



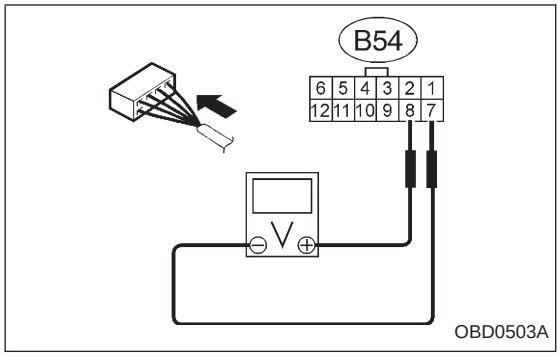
Connector & terminal
(B56) No. 19 — (B84) No. 21:
CHECK ***: Is the resistance less than 1 Ω?***
YES : Go to step **8M4**.
NO : Repair harness and connector.
NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and ECM.
- Poor contact in TCM connector.
- Poor contact in ECM connector.



8M4	CHECK INPUT SIGNAL FOR TCM.

1) Connect connectors to TCM, throttle position sensor and ECM.
2) Turn ignition switch to ON (engine OFF).
3) Measure voltage between TCM connector terminals.

Connector & terminal
(B54) No. 8 (+) — No. 7 (−):
CHECK ***: Is the voltage between 0.3 and 0.7 V in throttle fully closed?***
YES : Go to next step CHECK .
NO : Go to next CHECK1 .
CHECK1 ***: Is the voltage between 0.3 and 0.7 V while shaking harness and connector of TCM?***
YES : Repair poor contact in TCM.
NO : Replace TCM.



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

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

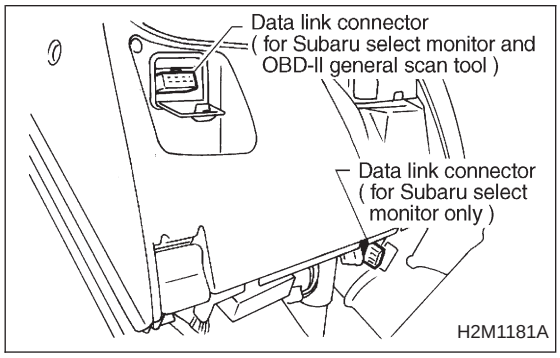
YES : Go to step **8M5**.

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

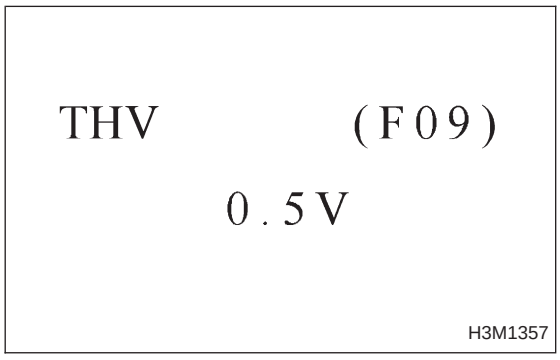


● Using Subaru Select Monitor

1) Connect connectors to TCM, throttle position sensor and ECM.
2) Connect Subaru Select Monitor to data link connector.
3) Turn ignition switch to ON (engine OFF).
4) Turn Subaru Select Monitor switch to ON.
5) Throttle fully closed.
6) Read data on Subaru Select Monitor.
7) Designate mode using function key.

Function mode F09

● F09: Throttle position sensor input signal is indicated.



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

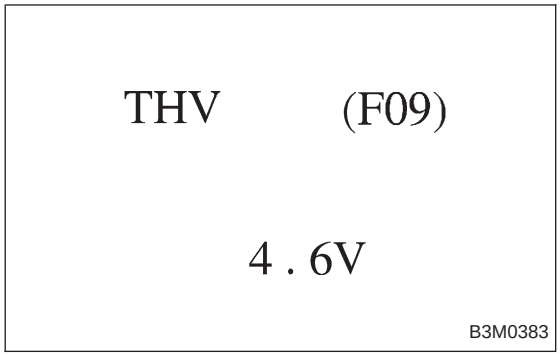
YES : Go to next step 8).

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



8) Throttle fully open.

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

NOTE:
Must be changed correspondingly with accelerator pedal operation (from “released” to “depressed” position).

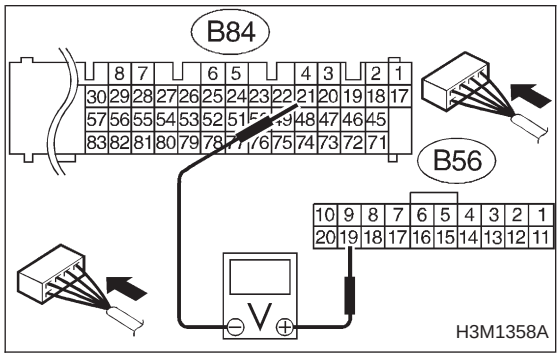
YES : Go to step **8M5**.

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



8M5	CHECK INPUT SIGNAL FOR TCM (THROTTLE POSITION SENSOR POWER SUPPLY).

Measure voltage between TCM connector terminals.

Connector & terminal
(B56) No. 19 (+) — (B84) No. 21 (−):

CHECK ***: Is the voltage between 5.02 and 5.22 V?***

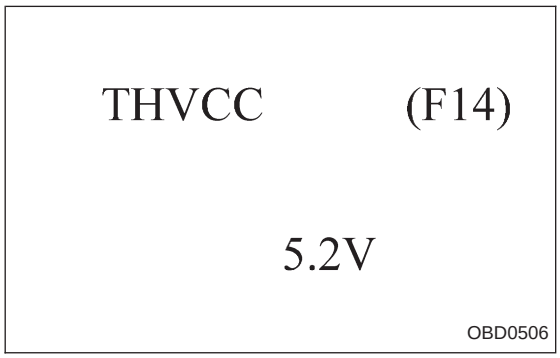
YES : Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



● Using Subaru Select Monitor
1) Read data on Subaru Select Monitor.
2) Designate mode using function key.
Function mode F14
● F14: Throttle position sensor power supply voltage is indicated.

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

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

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

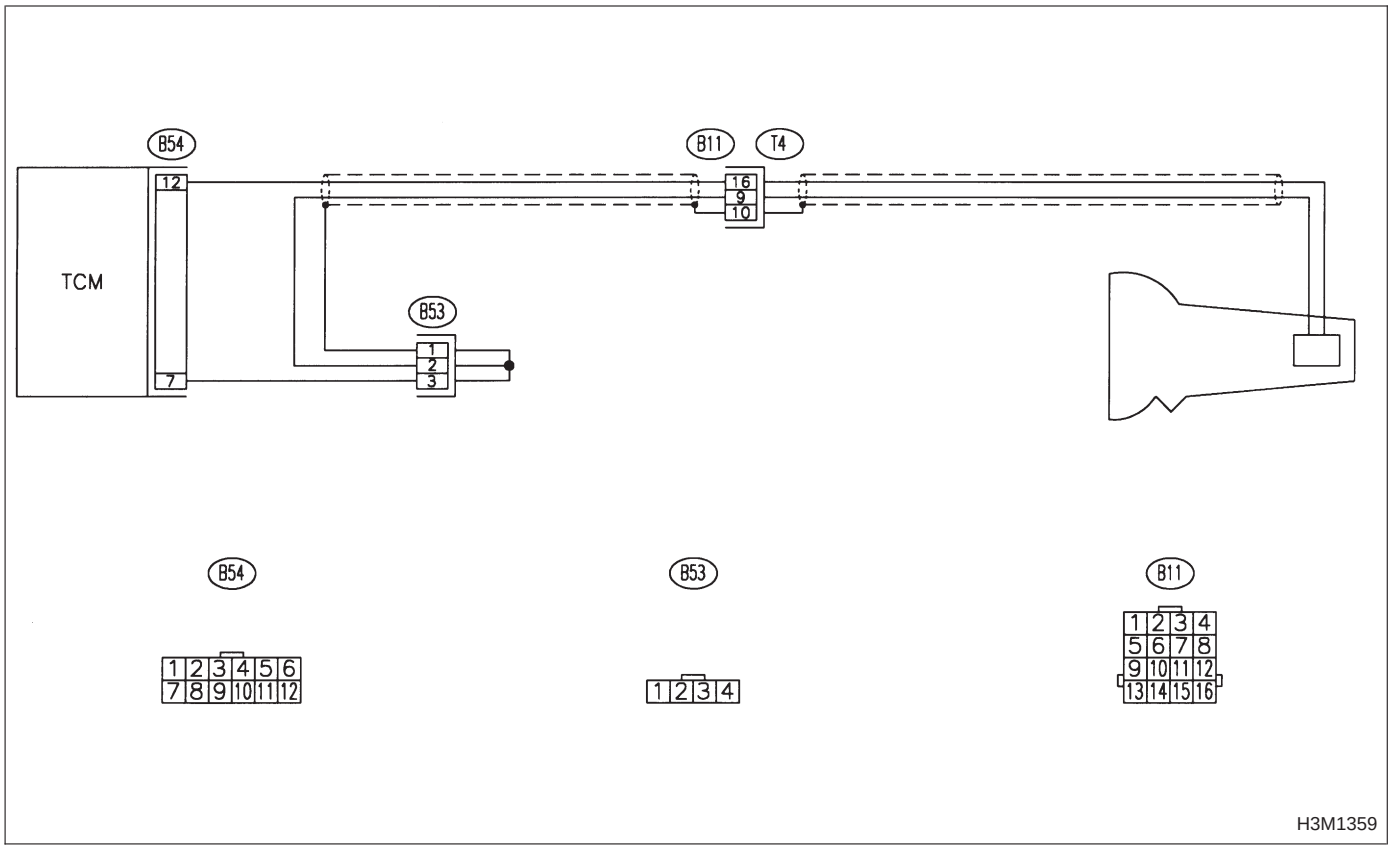
N: TROUBLE CODE 32 — VEHICLE SPEED SENSOR 1 —

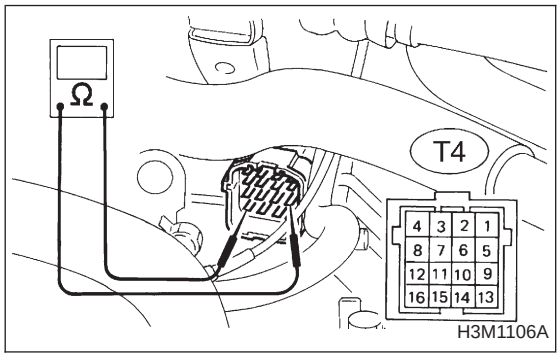
DIAGNOSIS:

Input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

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





8N1	CHECK VEHICLE SPEED SENSOR 1.

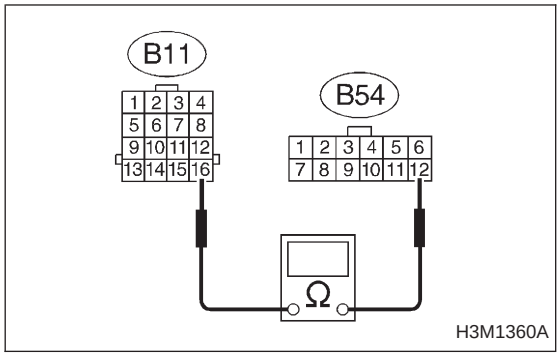
1) Turn ignition switch to OFF.
2) Disconnect connector from transmission.
3) Measure resistance between transmission connector receptacle’s terminals.

Connector & terminal
(T4) No. 16 — No. 9:

CHECK ***: Is the resistance between 450 and 720 Ω?***

YES : Go to step **8N2**.

NO : Replace vehicle speed sensor 1 connector.



8N2	CHECK HARNESS BETWEEN TCM AND TRANSMISSION CONNECTOR.

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

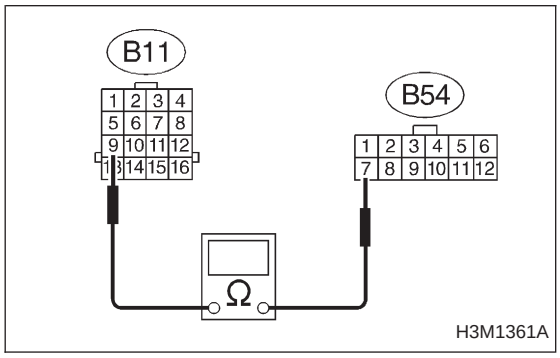
Connector & terminal
(B54) No. 12 — (B11) No. 16:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission.



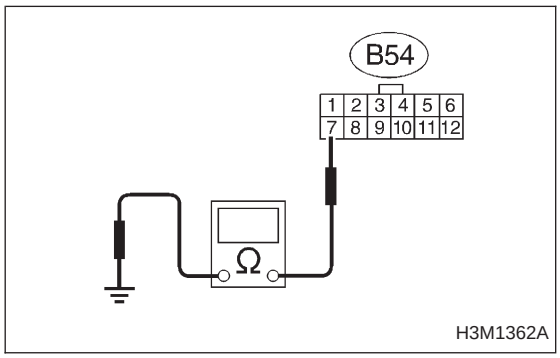
Connector & terminal
(B54) No. 7 — (B11) No. 9:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and transmission connector.
- Poor contact in TCM.
- Poor contact in transmission.
- Poor contact in shield joint connector (B53).

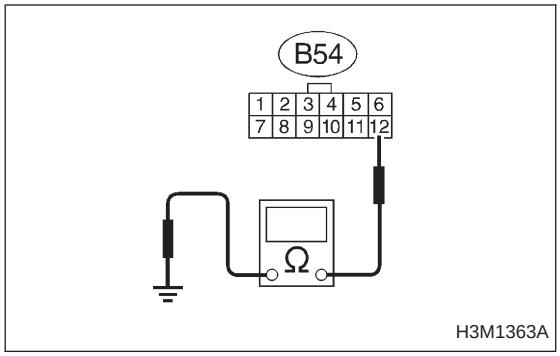


Connector & terminal
(B54) No. 7 — Chassis ground:

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

YES : Go to next CHECK .

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



Connector & terminal
(B54) No. 12 — Chassis ground:

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

YES : Go to step **8N3**.

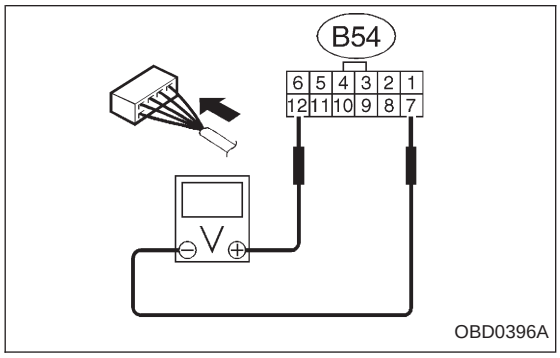
NO : Repair short circuit in harness between TCM and transmission connector.

8N3	CHECK INPUT SIGNAL FOR TCM.

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

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

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



5) Measure voltage between TCM connector terminals.

Connector & terminal
(B54) No. 12 (+) — No. 7 (−):

CHECK ***: Is the voltage more than AC 1 V?***

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

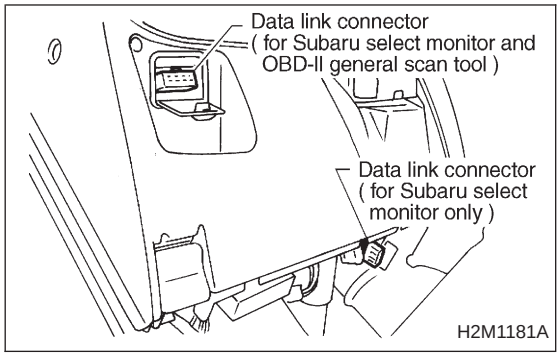
NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

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

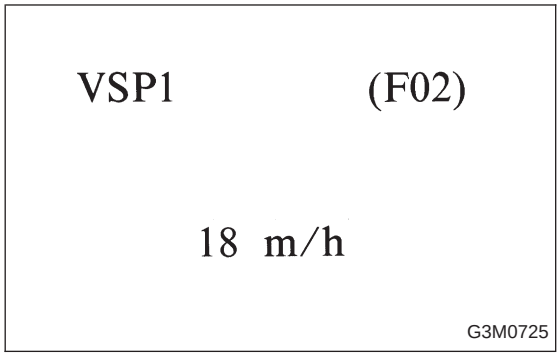


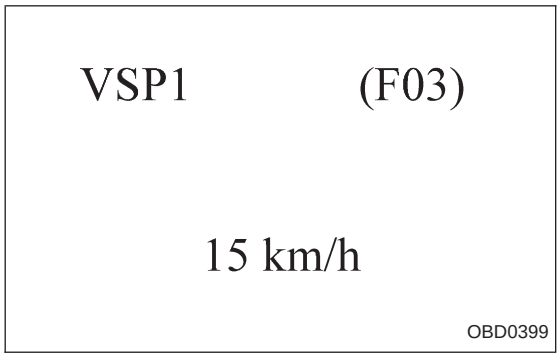
● Using Subaru Select Monitor
1) Turn ignition switch to OFF.
2) Connect connectors to TCM and transmission.
3) Connect Subaru Select Monitor to data link connector.

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

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

5) Turn ignition switch to ON and turn Subaru Select Monitor switch to ON.
6) Start the engine.
7) Read data on Subaru Select Monitor.
8) Designate mode using function key.
Function mode F02 or F03
● F02: Compare speedometer with Subaru Select Monitor indications.
● F02: Vehicle speed is indicated in “m/h”.
● F03: Compare speedometer with Subaru Select Monitor indications.
● F03: Vehicle speed is indicated in “km/h”.





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

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

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

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

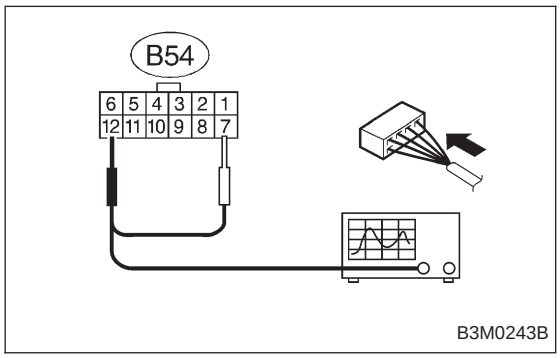
NO : Replace TCM.

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

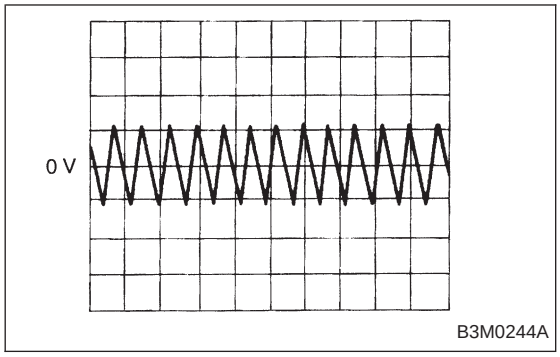
- Using Oscilloscope

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

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



4) Set oscilloscope to TCM connector terminals.
Position prove; (B54) No. 12
Earth lead; (B54) No. 7
5) Start the engine and set vehicle in 20 km/h (12 m/h) condition.
6) Measure signal voltage indicated on oscilloscope.



CHECK ***: Is the signal voltage more than AC 1 V?***

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

NO : Go to next CHECK .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

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

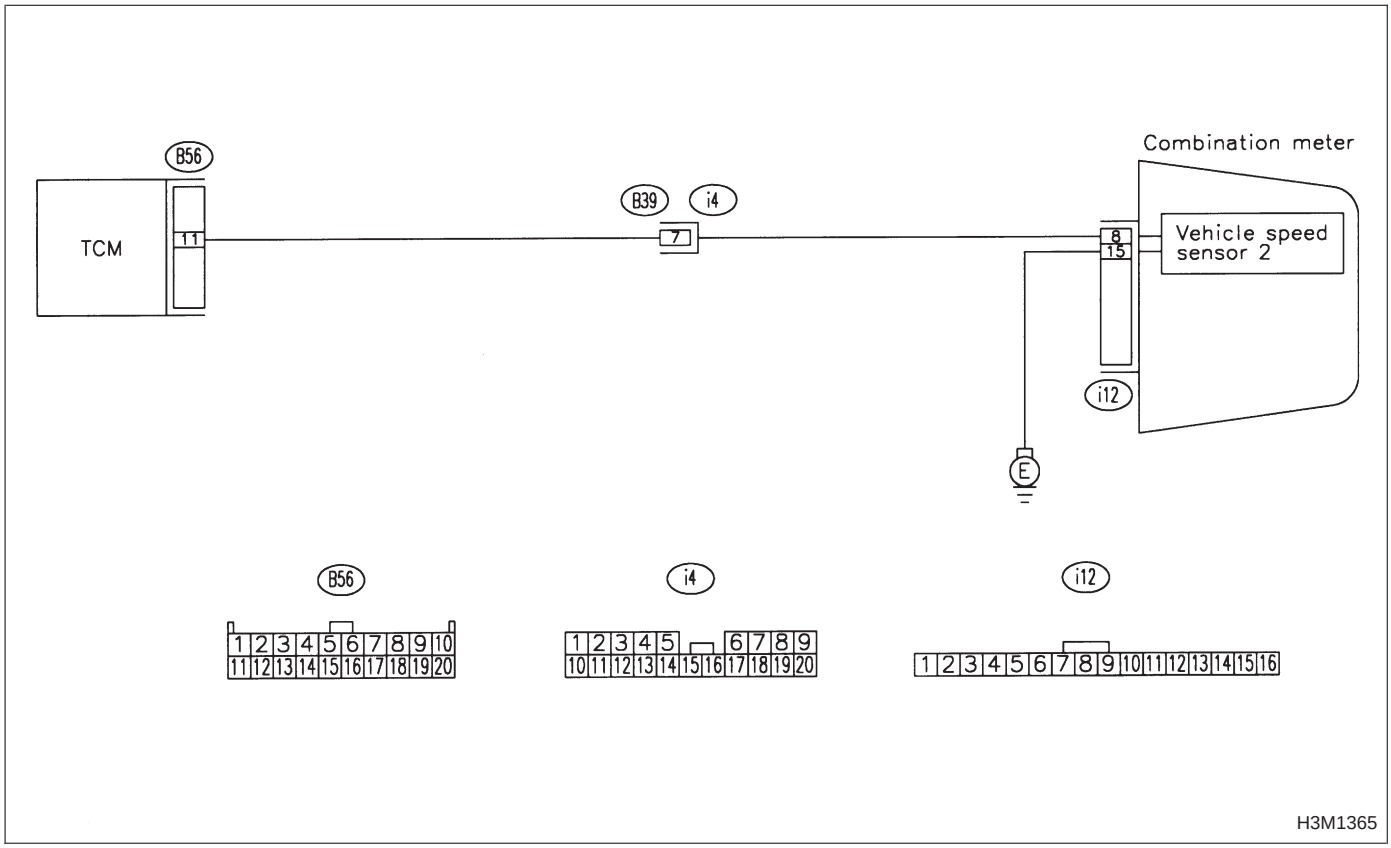
O: TROUBLE CODE 33
— VEHICLE SPEED SENSOR 2 —

DIAGNOSIS:

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

TROUBLE SYMPTOM:

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

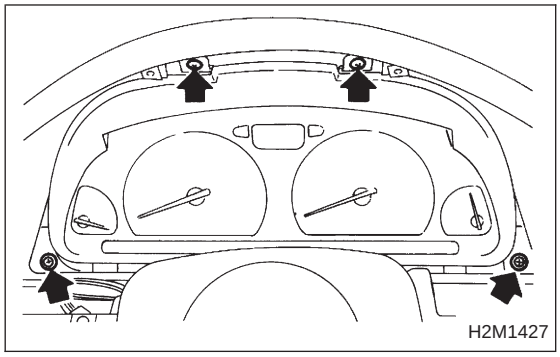


8O1	CHECK OPERATION OF SPEEDOMETER.

CHECK ***: Does speedometer operate normally?***

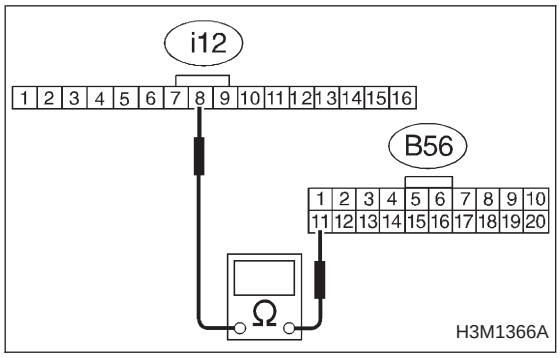
YES : Go to step **8O2**.

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


H2M1427

8O2	CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.

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



H3M1366A

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

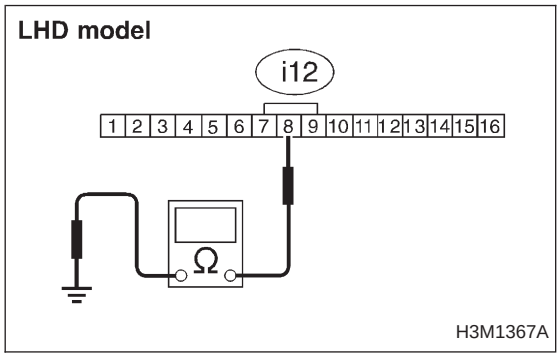
Connector & terminal
(B56) No. 11 — (i12) No. 8:

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

YES : Go to next CHECK .

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Open circuit in harness between TCM and combination meter connector.
- Poor contact in TCM connector.
- Poor contact in combination meter connector.
- Poor contact in coupling connector (B39).



H3M1367A

Connector & terminal
(i12) No. 8 — Chassis ground:

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

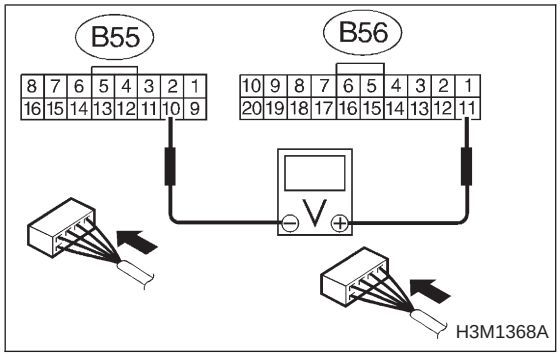
YES : Go to step **8O3**.

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

8O3	CHECK INPUT SIGNAL FOR TCM.

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

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



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

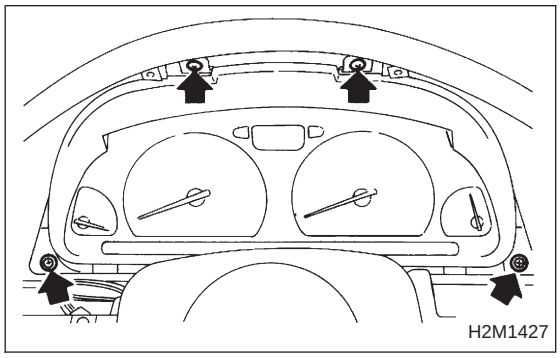
Connector & terminal
(B56) No. 11 (+) — (B55) No. 10 (−):

CHECK ***: Is the voltage less than 1 V ↔ more than 4 V?***

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

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

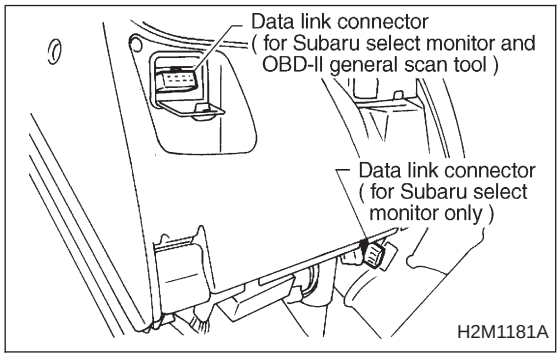
NOTE:
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>



- Using Subaru Select Monitor

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

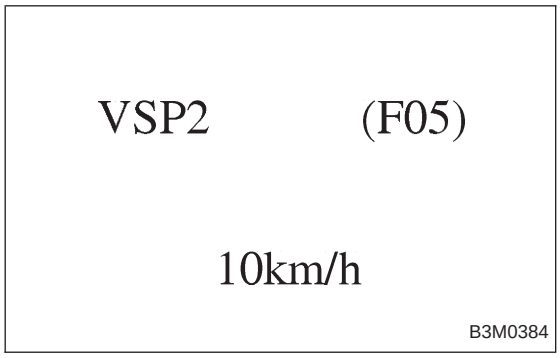
CAUTION:
On AWD models, make sure that all wheels are raised off floor.



5) Connect Subaru Select Monitor to data link connector.
6) Turn ignition switch to ON and Subaru Select Monitor switch to ON.
7) Start the engine, and drive all wheels.
8) Read data on Subaru Select Monitor.
9) Designate mode using function key.

Function mode F04 or F05

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



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

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

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

NO : Go to next CHECK .

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

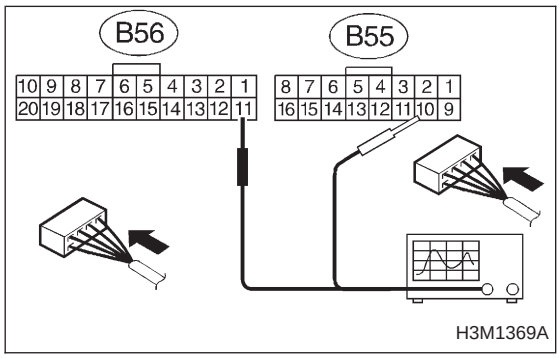
YES : Repair poor contact in TCM.

NO : Replace TCM.

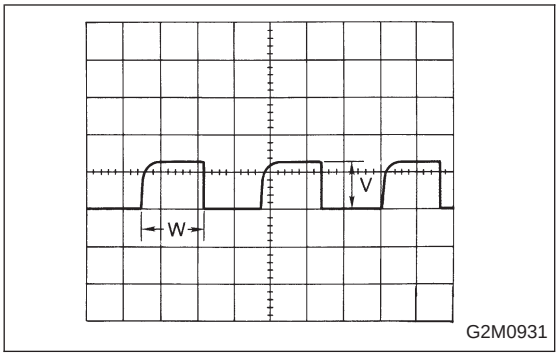
NOTE:
The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

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

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



5) Set oscilloscope to TCM connector terminals.
Positive prove; (B56) No. 11
Earth lead; (B55) No. 10
6) Start the engine.
7) Shift on the gear position, and keep the vehicle speed at constant.



8) Measure signal voltage indicated on oscilloscope.

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

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

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

NO : Go to next CHECK .

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

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

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

9. Diagnostic Chart with Select Monitor

A: BASIC DIAGNOSTIC CHART

If no trouble codes appear in the on-board diagnostics operation (although problems have occurred or are occurring), measure performance characteristics of sensors, actuators, etc., in the “F” mode (select monitor function), and compare with the “basic data” to determine the cause of problems.

1) Trouble occurs.
2) No trouble codes appear in on-board diagnostics operation.
3) Measure each item in select mode function.
4) Compare measured values with basic data.
5) Determine item which is outside basic data specifications.
6) Check sensor and actuator affected.

B: LIST OF OUTPUT MODES

1. FUNCTION MODE

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

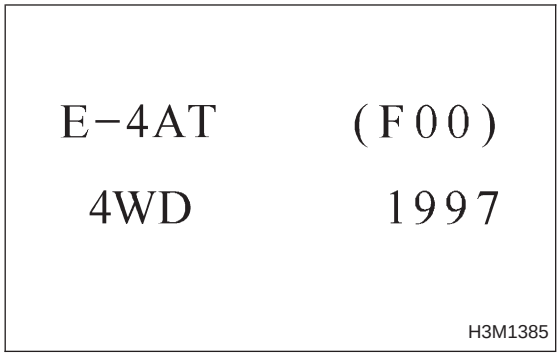
2. ON ←→ OFF SIGNAL LIST

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

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

3. DIAGNOSIS MODE

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



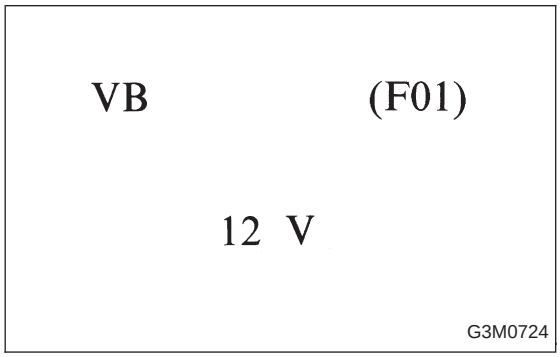
C: MODE F00 — MODE DISPLAY —

SPECIFIED DATA:

Data at the left should be indicated.

Probable cause (if outside “specified data”)

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



D: MODE F01 — BATTERY VOLTAGE (VB) —

CONDITION:

- Ignition switch ON
- Engine idling after warm-up

SPECIFIED DATA:

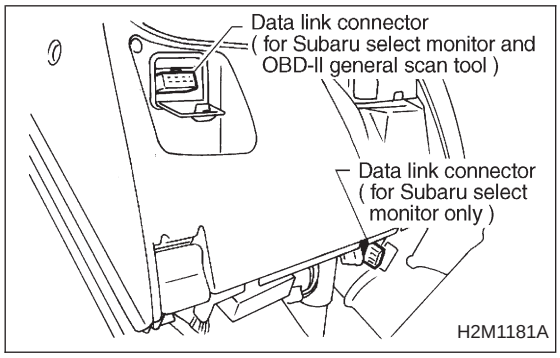
VB: 10 — 16 V

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

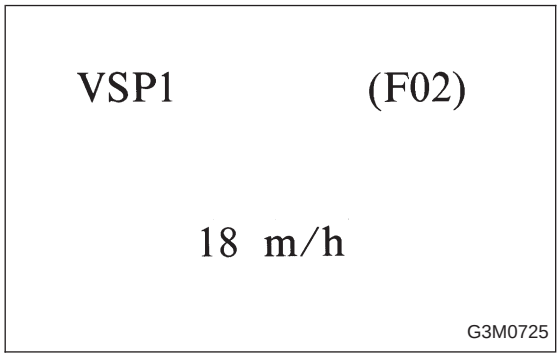
E: MODE F02 OR F03 — CHECK VEHICLE SPEED SENSOR 1 —

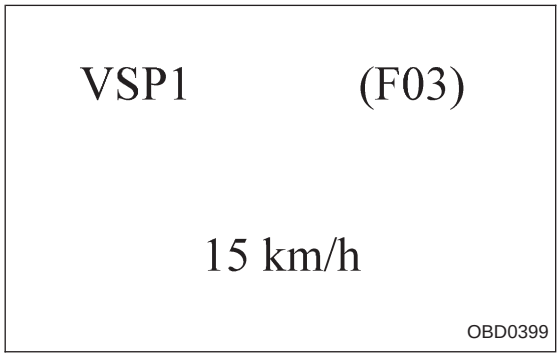
1) Turn ignition switch to OFF.
2) Lift-up the vehicle and place safety stand.

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



3) Connect Subaru Select Monitor to data link connector.
4) Start the engine, and turn Subaru Select Monitor switch to ON.
5) Read data on Subaru Select Monitor.
6) Designate mode using function key.
Function mode: F02 or F03
- F02: Compare speedometer with Subaru Select Monitor indications.
- F02: Vehicle speed is indicated in “m/h”.
- F03: Compare speedometer with Subaru Select Monitor indications.
- F03: Vehicle speed is indicated in “km/h”.





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

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

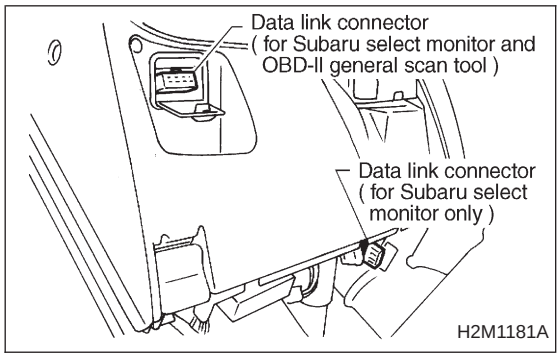
YES : Go to step MODE F04 or F05.
NO : Check vehicle speed sensor 1 circuit.

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

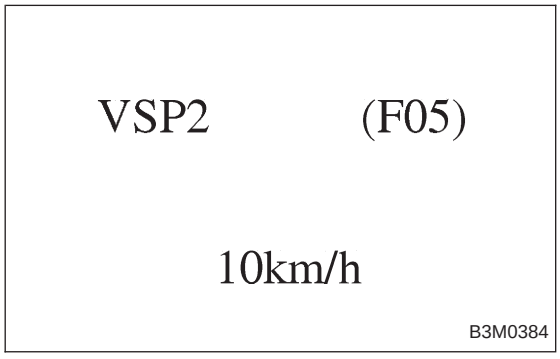
F: MODE F04 OR F05 — CHECK VEHICLE SPEED SENSOR 2 —

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

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



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



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

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

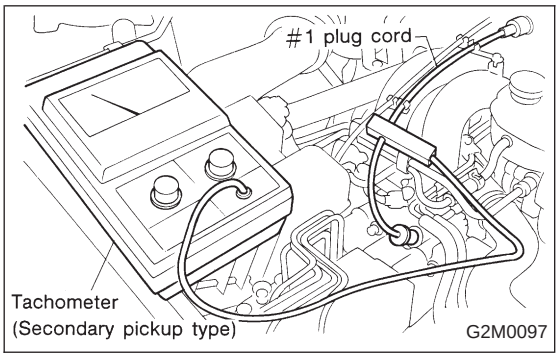
YES : Go to step MODE F06.
NO : Check vehicle speed sensor 2 circuit.

NOTE:
- For the diagnostics procedure on vehicle speed sensor 2 circuit, refer to 3-2 [T8O0].
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

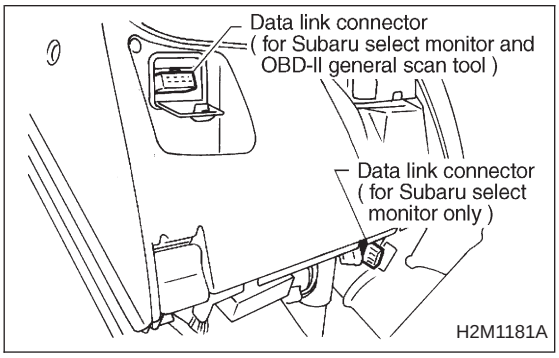
G: MODE F06
— CHECK ENGINE SPEED SIGNAL —

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

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



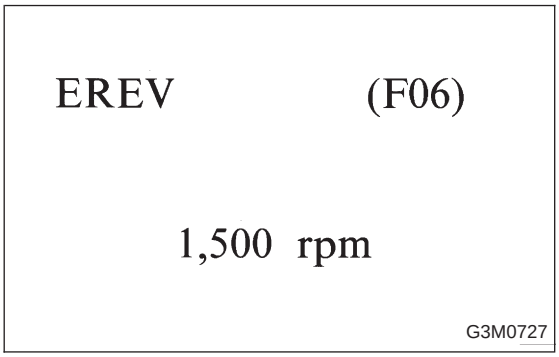
3) Attach the pickup sensor on tachometer (secondary pickup type) to #1 cylinder spark plug cord (without tachometer models).
4) Turn A/C switch to OFF (with A/C models).



5) Connect Subaru Select Monitor to data link connector.
6) Start the engine, and turn Subaru Select Monitor switch to ON.
7) Warm-up the engine until engine coolant temperature is above 80°C (176°F).

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

8) Read data on Subaru Select Monitor.
9) Designate mode using function key.
Function mode: F06
- F06: Engine revolution is indicated in “rpm”.



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

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

YES : Go to step MODE F07.
NO : Check engine speed signal circuit.

NOTE:
- For the diagnostics procedure on engine speed signal circuit, refer to 3-2 [T8J0].
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

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

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

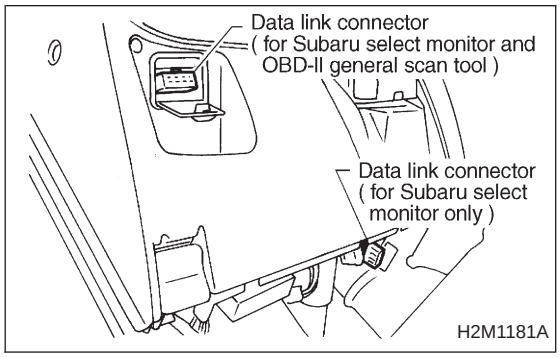
CHECK ***: Does the AT OIL TEMP warning light remain on 2 seconds after the engine has been started?***

YES : Go to next step 3).

NO : Check ATF temperature sensor and combination meter circuit.

NOTE:

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



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

Function mode: F07 or F08

- F07: ATF temperature is indicated in "°F".
- F08: ATF temperature is indicated in "°C".

10) Warm-up the transmission until ATF temperature is above 80°C (176°F).

NOTE:

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

11) Turn ignition switch to OFF.

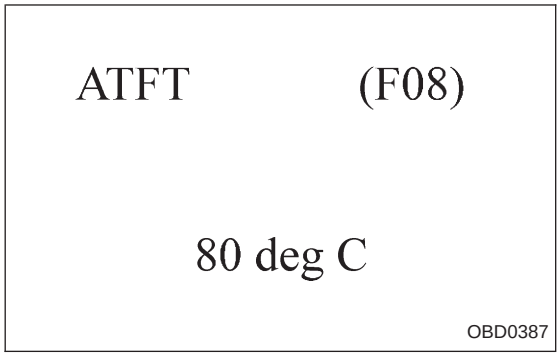
CHECK ***: Does the ATF temperature change from 176°F (80°C)?***

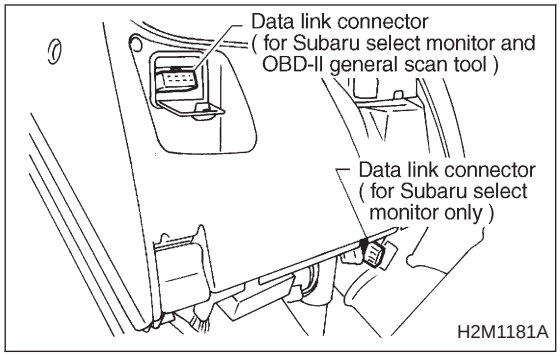
YES : Go to step MODE F09.

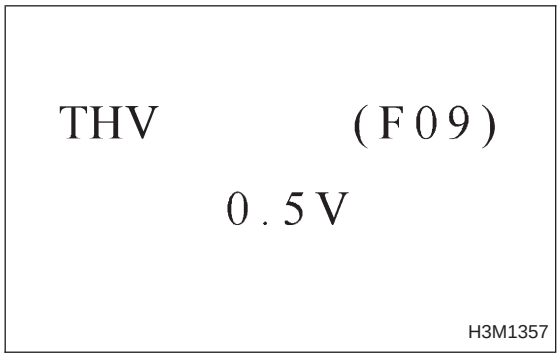
NO : Check ATF temperature sensor circuit.

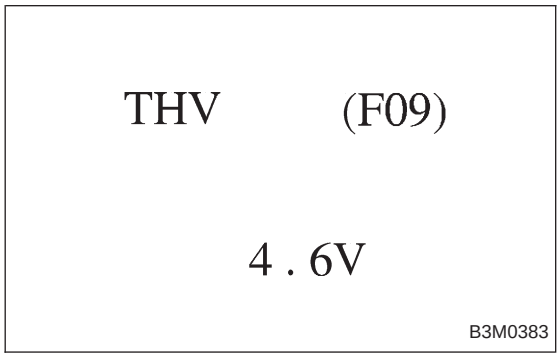
NOTE:

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


ATFT (F08)
80 deg C
OBD0387







I: MODE F09
— CHECK THROTTLE POSITION SENSOR —

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

Function mode: F09

- F09: Throttle position sensor input signal is indicated.

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

YES : Go to next CHECK .

NO : Check throttle position sensor circuit.

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

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

YES : Go to next CHECK .

NO : Check throttle position sensor circuit.

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

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

YES : Go to step MODE F10.

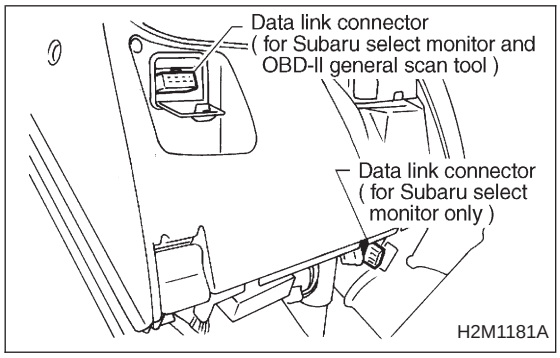
NO : Check throttle position sensor circuit.

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

J: MODE F10
— CHECK GEAR POSITION —

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

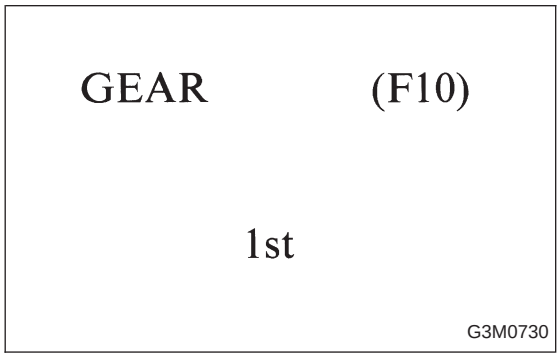
CAUTION:
On AWD models, make sure that all wheels are raised off floor.



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

Function mode: F10

- F10: Gear position is indicated.



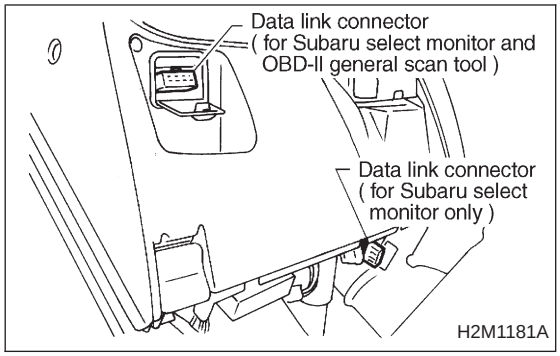
CHECK ***: Does the transmission gear correspond to the gear which is shown on display in the F10 mode?***

YES : Go to step MODE F11.

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

NOTE:

- For the diagnostics procedure on shift solenoid 1 and shift solenoid 2 signal circuit, refer to 3-2 [T8F0] and [T8G0].
- The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to 4-4 [T6D2] or [T9J0].>

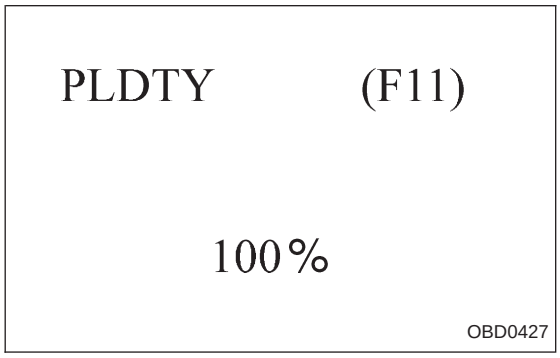


K: MODE F11
— CHECK LINE PRESSURE DUTY —

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor to data link connector.
3) Start the engine, and turn Subaru Select Monitor switch to ON.
4) Warm-up the transmission until ATF temperature is above 80°C (176°F).

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

5) Stop the engine and turn ignition switch to ON (engine OFF).
6) Move selector lever to “N”.
7) Read data on Subaru Select Monitor.
8) Designate mode using function key.
Function mode: F11
- F11: Line pressure duty is indicated in “%”.



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

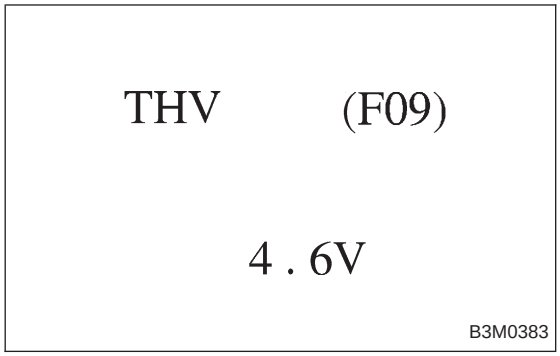
YES : Go to next CHECK .
NO : Go to step **9K1**.

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

YES : Go to next CHECK .
NO : Go to step **9K1**.

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

YES : Go to step MODE F12.
NO : Go to step **9K1**.



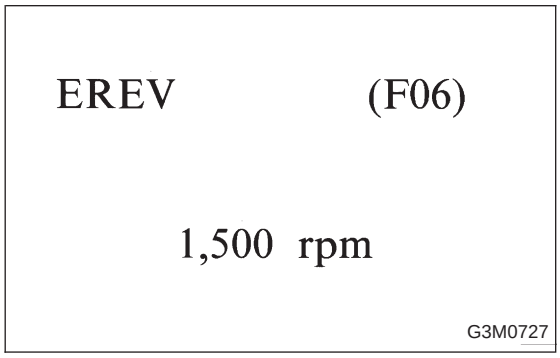
9K1	CHECK THROTTLE POSITION SENSOR CIRCUIT (FUNCTION MODE F09).

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

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

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

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



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

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

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

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

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

9K3	CHECK ATF TEMPERATURE SENSOR CIRCUIT (FUNCTION MODE F07 OR F08).

CHECK ***: Is there any trouble in ATF temperature sensor circuit?***

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

YES : Repair or replace ATF temperature sensor circuit, refer to 3-2 [T8H0].

NO : Go to step **9K4**.

9K4	CHECK INHIBITOR SWITCH.

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

Function mode: FA1

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

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

YES : Go to step MODE FA12.

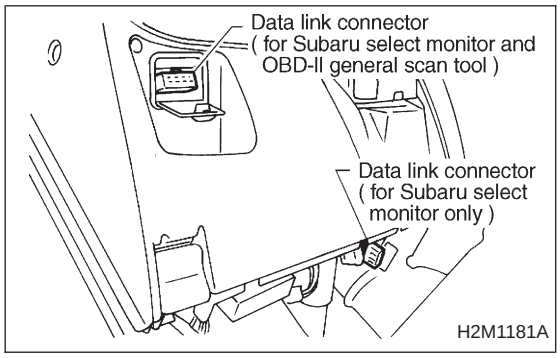
NO : Check inhibitor switch circuit.

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

L: MODE F12
— CHECK LOCK-UP DUTY —

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

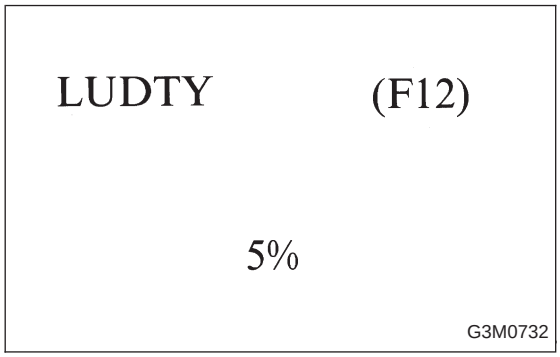
CAUTION:
On AWD models, make sure that all wheels are raised off floor.



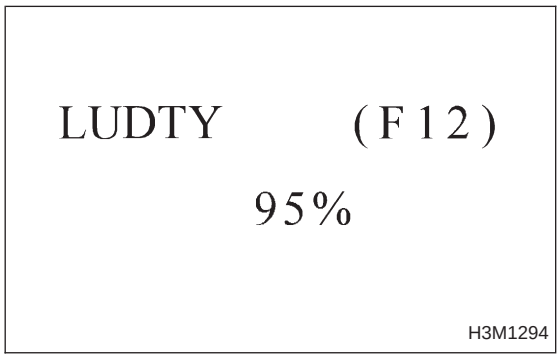
3) Connect Subaru Select Monitor to data link connector.
4) Start the engine, and turn Subaru Select Monitor switch to ON.
5) Warm-up the transmission until ATF temperature is above 80°C (176°F).

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

6) Read data on Subaru Select Monitor.
7) Designate mode using function key.
Function mode: F12
- F12: Lock-up duty is indicated in “%”.



CHECK ***: Does the function mode F12 indicate 5%?***
YES : Go to next step 8).
NO : Go to step **9L1**.

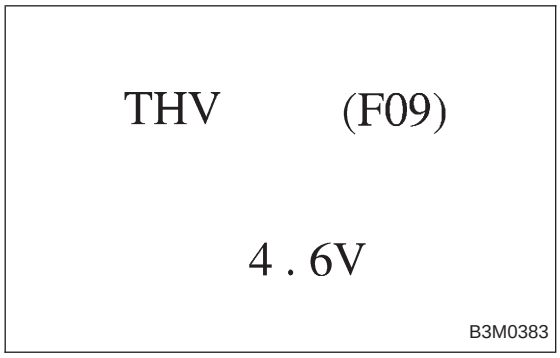


8) Move selector lever to “D” and slowly increase vehicle speed to 75 km/h (47 m/h).

CHECK ***: Does the function mode F12 indicate 95%?***
YES : Go to step MODE F13.

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

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



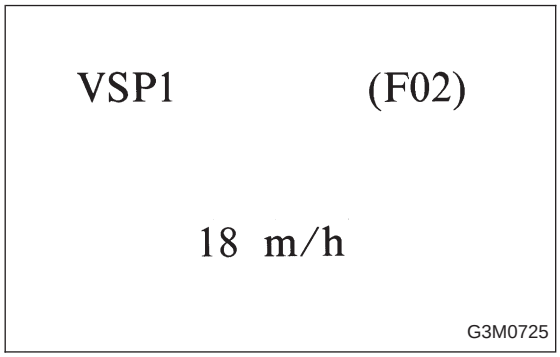
9L1	CHECK THROTTLE POSITION SENSOR CIRCUIT (FUNCTION MODE F09).

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

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

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

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



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

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

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

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

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

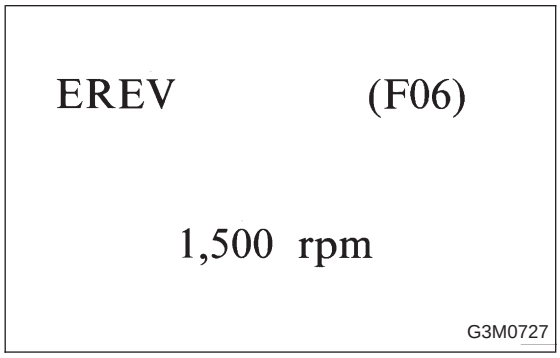
9L3	CHECK VEHICLE SPEED SENSOR 2 CIRCUIT (FUNCTION MODE F04 OR F05).

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

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

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

NO : Go to step **9L4**.



9L4	CHECK ENGINE SPEED SIGNAL CIRCUIT (FUNCTION MODE F06).

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

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

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

NO : Go to step **9L5**.

9L5	CHECK INHIBITOR SWITCH.

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

Function mode: FA1

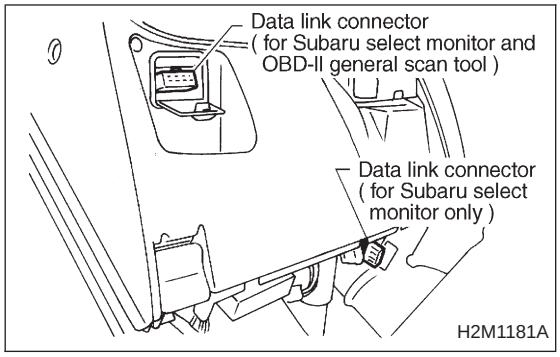
- FA1: Check the inhibitor switch ON ↔ OFF signal.

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

YES : Go to MODE F13.

NO : Check inhibitor switch circuit.

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



M: MODE F13
— CHECK AWD DUTY —

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor to data link connector.
3) Start the engine, and turn Subaru Select Monitor switch to ON.
4) Warm-up the transmission until ATF temperature is above 80°C (176°F).

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

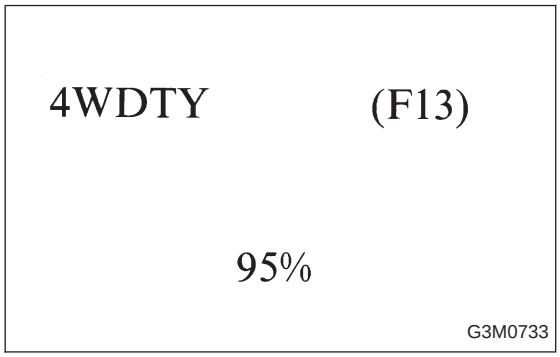
5) Turn ignition switch to ON (engine OFF).
6) Move selector lever to “D”.
7) Read data on Subaru Select Monitor.
8) Designate mode using function key.

Function mode: F13
- F13: AWD duty is indicated in “%”.

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

YES : Go to next step 9).

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

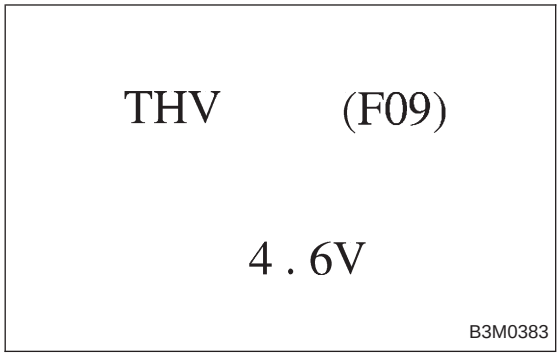


9) Turn ignition switch to OFF.
10) Set FWD mode.
11) Turn ignition switch to ON (engine OFF).

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

YES : Go to step MODE F14.

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



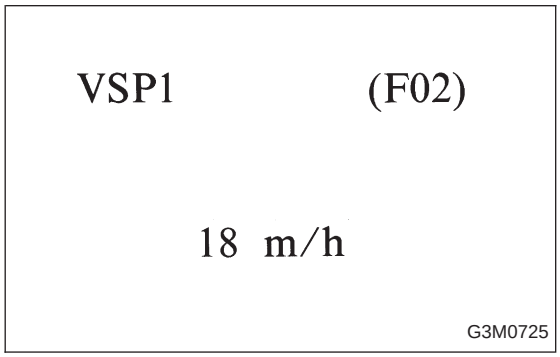
9M1	CHECK THROTTLE POSITION SENSOR (FUNCTION MODE F09).

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

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

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

NO : Go to step **9M2**.



9M2	CHECK VEHICLE SPEED SENSOR 1 (FUNCTION MODE F02 OR F03).

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

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

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

NO : Go to step **9M3**.

9M3	CHECK VEHICLE SPEED SENSOR 2 (FUNCTION MODE F04 OR F05).

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

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

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

NO : Go to step **9M4**.

9M4	CHECK ATF TEMPERATURE SENSOR CIRCUIT (FUNCTION MODE F07 OR F08).

CHECK ***: Is there any trouble in ATF temperature sensor circuit?***

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

YES : Repair or replace ATF temperature sensor circuit, refer to 3-2 [T8H0].

NO : Go to step **9M5**.

9M5	CHECK INHIBITOR SWITCH CIRCUIT.

1) Turn ignition switch and Subaru Select Monitor to ON.
2) Read data on Subaru Select Monitor.
3) Designate mode using function key.
Function mode: FA1
● FA1: Check the inhibitor switch ON ↔ OFF signal.

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

YES : Go to step **9M6**.

NO : Check inhibitor switch circuit.

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

9M6	CHECK ABS SIGNAL.

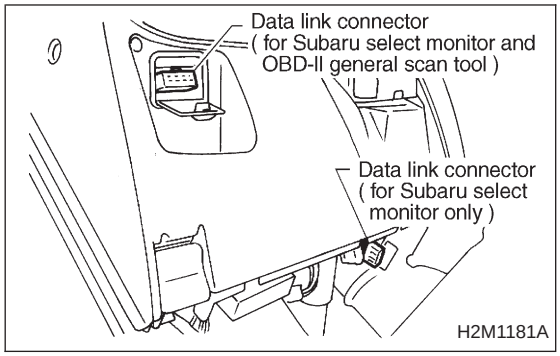
1) Start the engine, and turn Subaru Select Monitor switch to ON.
2) Read data on Subaru Select Monitor.
Designate mode using function key.
Function mode: FA0
● FA0: Check the ABS switch (AB) ON ↔ OFF signal.

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

YES : Go to step MODE F14.

NO : Check ABS signal circuit.

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

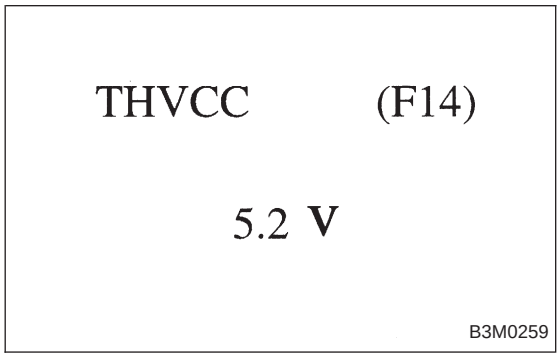


N: MODE F14
— CHECK THROTTLE POSITION SENSOR POWER SUPPLY —

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

Function mode: F14

● Throttle position sensor power supply voltage is indicated.

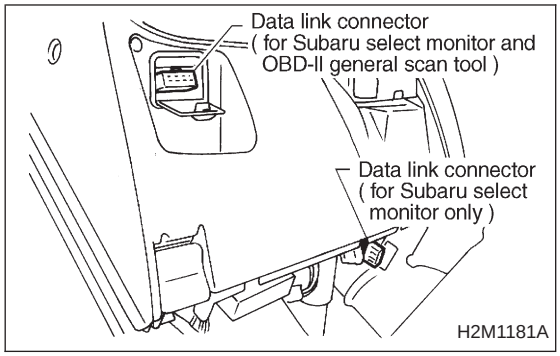


CHECK ***: Is the value fixed between 5.02 and 5.22 V in function mode F14?***

YES : Go to step MODE F15.

NO : Check throttle position sensor power supply circuit.

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



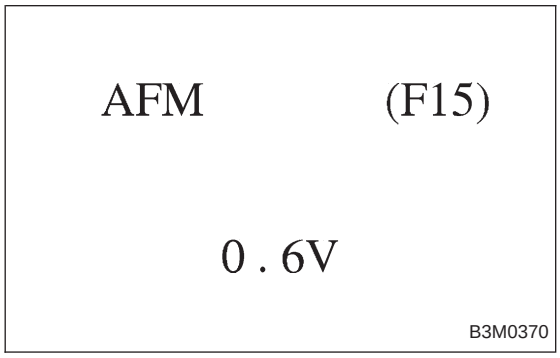
O: MODE F15
— CHECK MASS AIR FLOW SIGNAL —

1) Turn ignition switch to OFF.
2) Connect Subaru Select Monitor to data link connector.
3) Start the engine, and turn Subaru Select Monitor switch to ON.
4) Warm-up the engine until engine coolant temperature is above 80°C (176°F).

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

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

Function mode: F15
● F15: Display shows mass air flow signal value sent from ECM.



CHECK ***: Does voltage change in response to the depress-release motion of the accelerator pedal in the function mode F15?***

YES : Go to next CHECK .

NO : Check mass air flow signal circuit.

NOTE:
For the diagnostics procedure on mass air flow signal circuit, refer to 3-2 [T8I0].

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

YES : Replace ECM.

NO : Go to next CHECK .

NOTE:
Install the old ECM.

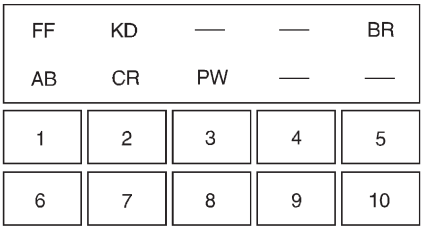
CHECK ***: Has trouble been eliminated after TCM replacement?***

YES : Replace TCM.

NO : Go to MODE FA0.

DISPLAY

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



H3M1373A

P: MODE FA0
— SWITCH 1 (SW1) —

Reference values

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

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

9P1	CHECK FWD SWITCH (FF).

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

YES : Go to step **9P2**.

NO : Check FWD switch circuit.

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

9P2	CHECK BRAKE (BR).

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

YES : Go to **9P3**.

NO : Check brake switch circuit.

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

9P3	CHECK ABS SWITCH (AB).

Engine start.

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

YES : Go to **9P4**.

NO : Check ABS switch circuit.

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

9P4	CHECK CRUISE CONTROL SET (CR).

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

YES : Go to MODE FA1.

NO : Check cruise control set circuit.

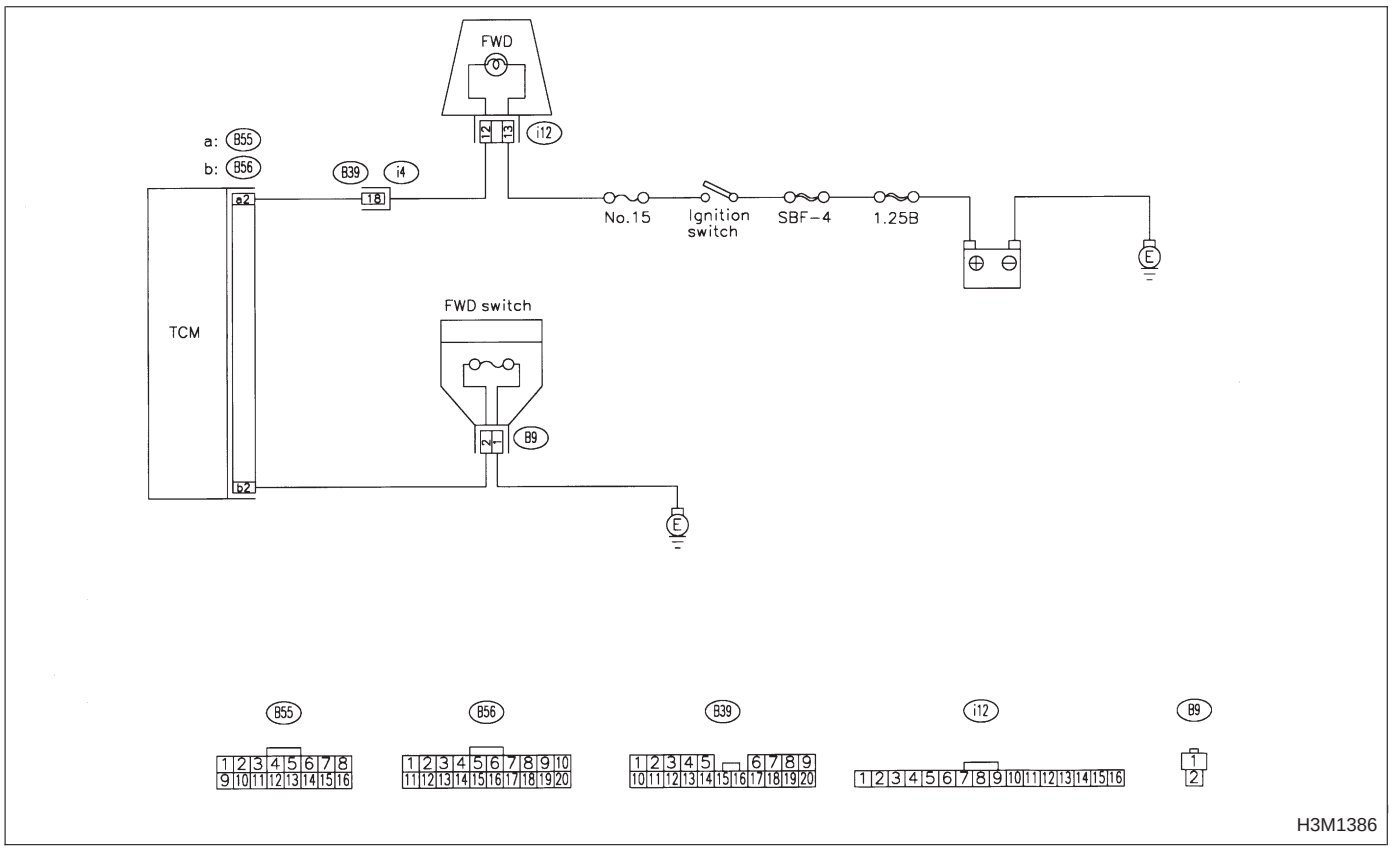
NOTE:
For diagnostics procedure on cruise control circuit, refer to 2-7 [T10CX0].

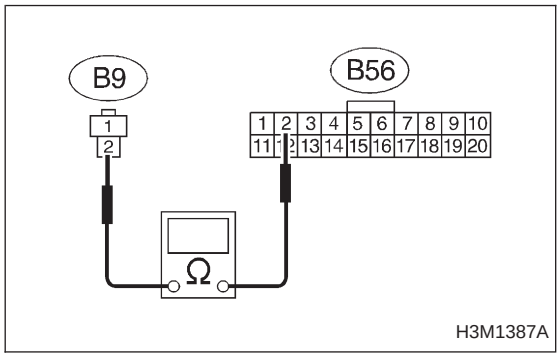
Q: MODE FA0

— LED NO. 1, FWD SWITCH —

DIAGNOSIS:

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





9Q1	CHECK HARNESS CONNECTOR BETWEEN TCM AND FWD SWITCH.

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

Connector & terminal
(B56) No. 2 — (B9) No. 2:

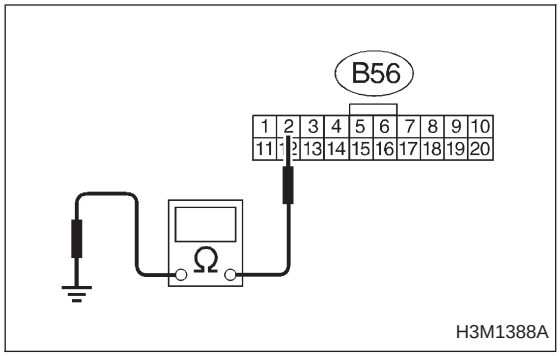
CHECK ***: Is the resistance less than 1 Ω?***

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:

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



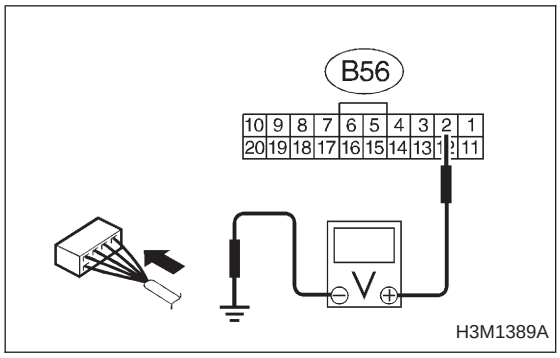
4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal
(B56) No. 2 — Chassis ground:

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

YES : Go to step **9Q2**.

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



9Q2	CHECK INPUT SIGNAL FOR TCM.

1) Turn ignition switch to OFF.
2) Connect connector to TCM and FWD switch.
3) Turn ignition switch to ON.
4) Measure signal voltage for TCM while installing and removing the fuse to FWD switch connector.

Connector & terminal
(B56) No. 2 (+) — Chassis ground (−):

CHECK ***: Is the voltage less than 1 V in FWD switch while installing?***

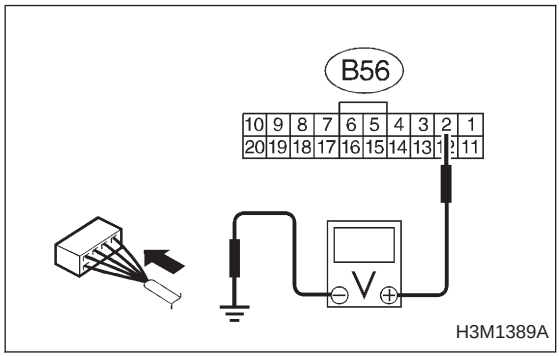
YES : Go to next step CHECK .

NO : Go to next CHECK1 .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

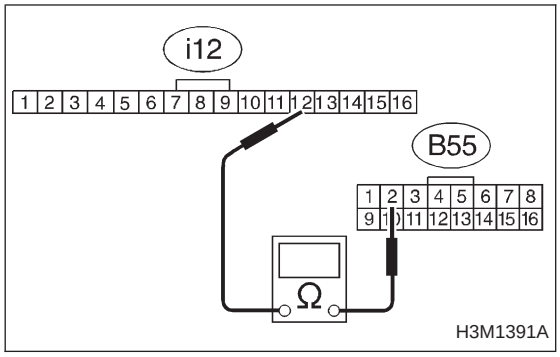


Connector & terminal
(B56) No. 2 (+) — Chassis ground (−):

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

YES : Go to step **9Q3**.

NO : Replace TCM.



9Q3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.**

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

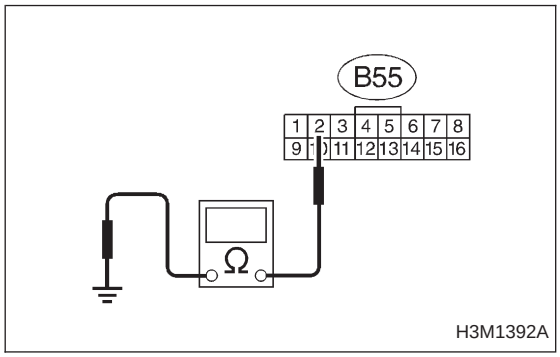
Connector & terminal
(B55) No. 2 — (i12) No. 12:

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

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Poor contact in TCM connector.
- Poor contact in combination meter.
- Open circuit in harness between TCM and combination meter.
- Poor contact in coupling connector (B39).



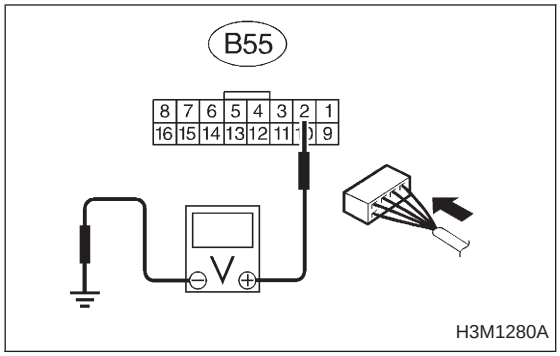
4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

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

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

YES : Go to step **9Q4**.

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



9Q4	CHECK OUTPUT SIGNAL FOR TCM.

1) Turn ignition switch to OFF.
2) Connect connector to TCM and combination meter.
3) Install combination meter.
4) Turn ignition switch to ON.
5) Measure signal voltage for TCM while installing and removing the fuse to FWD switch connector.

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

CHECK ***: Is the voltage less than 1 V in FWD switch while installing?***

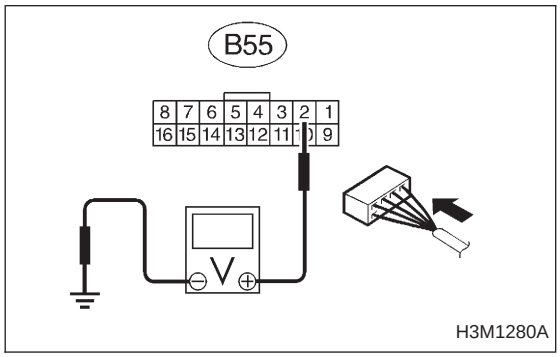
YES : Go to next step CHECK .

NO : Go to next CHECK1 .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



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

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

YES : Go to next CHECK .

NO : Replace TCM.

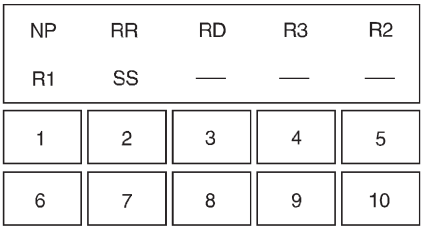
CHECK ***: Is the voltage more than 10 V while shaking harness and connector of TCM?***

YES : Repair poor contact in TCM.

NO : Replace TCM.

DISPLAY

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



H3M1374A

R: MODE FA1
— SWITCH 2 (SW2) —

Reference values

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

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

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

YES : Go to step **9R2**.

NO : Check inhibitor switch circuit.

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

9R2	CHECK R RANGE SWITCH (RR).

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

YES : Go to step **9R3**.

NO : Check inhibitor switch circuit.

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

9R3	CHECK D RANGE SWITCH (RD).

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

YES : Go to step **9R4**.

NO : Check inhibitor switch circuit.

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

9R4	CHECK 3 RANGE SWITCH (R3).

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

YES : Go to step **9R5**.

NO : Check inhibitor switch circuit.

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

9R5	CHECK 2 RANGE SWITCH (R2).

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

YES : Go to step **9R6**.

NO : Check inhibitor switch circuit.

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

9R6	CHECK 1 RANGE SWITCH (R1).

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

YES : Go to step **9R7**.

NO : Check inhibitor switch circuit.

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

9R7	CHECK DIAGNOSIS SWITCH (SS).

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

YES : Go to general diagnostics table.

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

NO : Check diagnosis switch circuit.

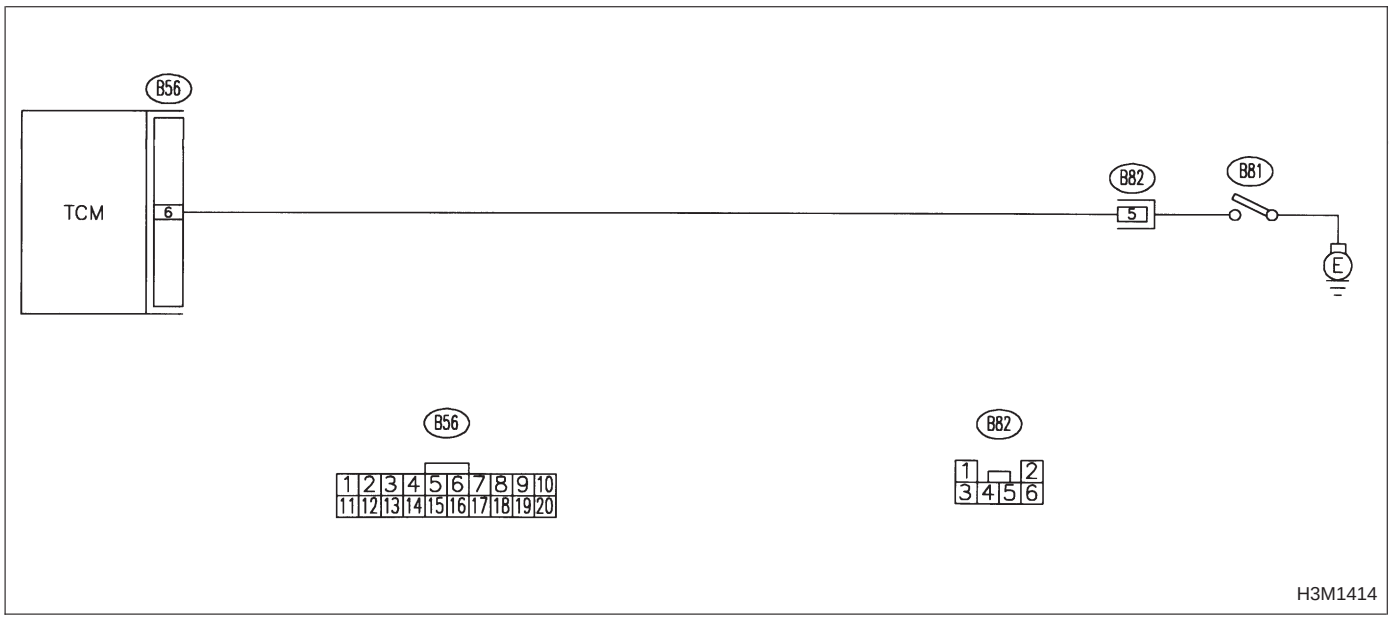
NOTE:
For diagnostics procedure on inhibitor switch circuit, refer to 3-2 [T9R0].

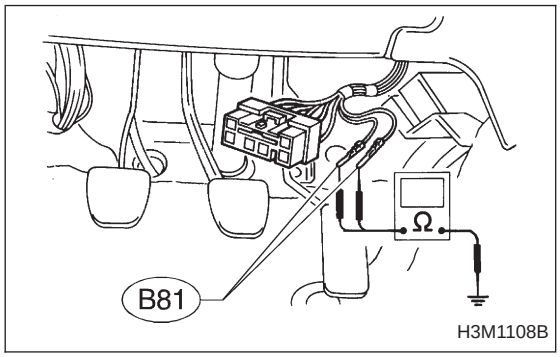
S: MODE FA1

— LED NO. 7, DIAGNOSIS SWITCH —

DIAGNOSIS:

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





9S1	CHECK DIAGNOSIS SWITCH GROUND LINE.

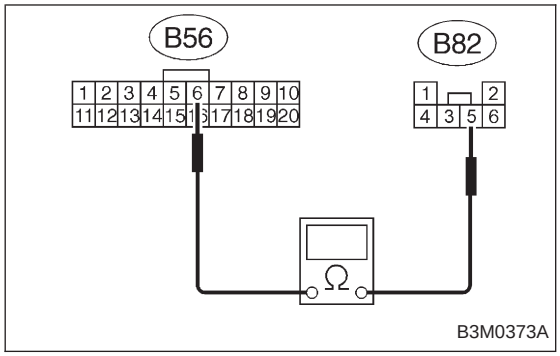
1) Turn ignition switch to OFF.
2) Measure resistance of harness between diagnosis ground terminals and chassis ground.

Terminal
(B81) — Chassis ground:

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

YES : Go to step **9S2**.

NO : Repair open circuit in diagnosis ground terminals.



9S2	CHECK HARNESS CONNECTOR BETWEEN TCM AND DIAGNOSIS SWITCH.

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

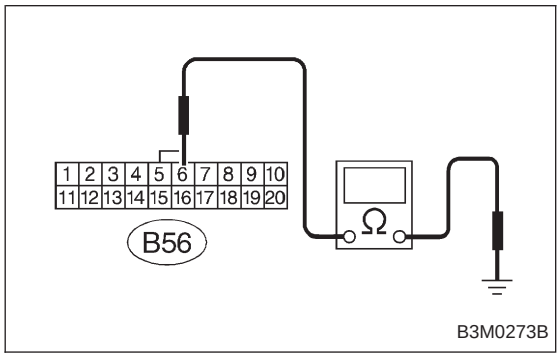
Connector & terminal
(B56) No. 6 — (B82) No. 5:

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

YES : Go to next step 4).

NO : Repair harness and connector.

NOTE:
In this case, repair the following:
- Poor contact in TCM connector.
- Poor contact in diagnosis switch.
- Open circuit in harness between TCM and diagnosis connector.



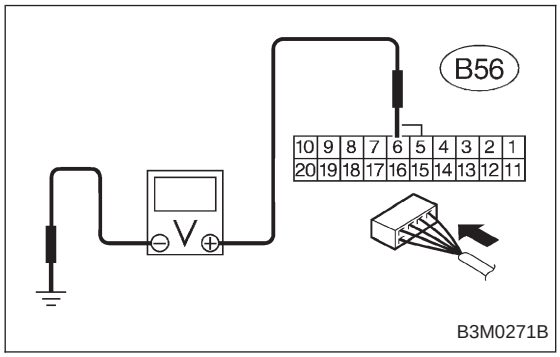
4) Measure resistance of harness connector between TCM and body to make sure that circuit does not short.

Connector & terminal
(B56) No. 6 — Chassis ground:

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

YES : Go to step **3**.

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



9S3	CHECK INPUT SIGNAL FOR TCM.

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

Connector & terminal
(B56) No. 6 — Chassis ground:

CHECK ***: Is the voltage less than 1 V in diagnosis connector connected?***

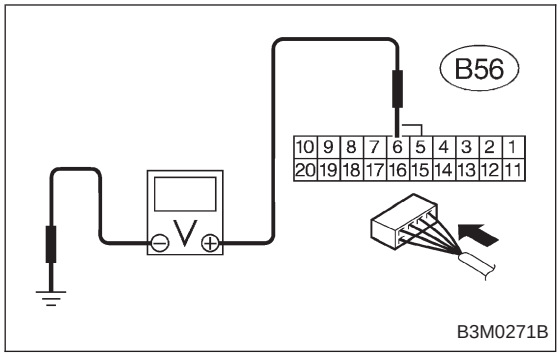
YES : Go to next step CHECK .

NO : Go to next CHECK1 .

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

YES : Repair poor contact in TCM.

NO : Replace TCM.

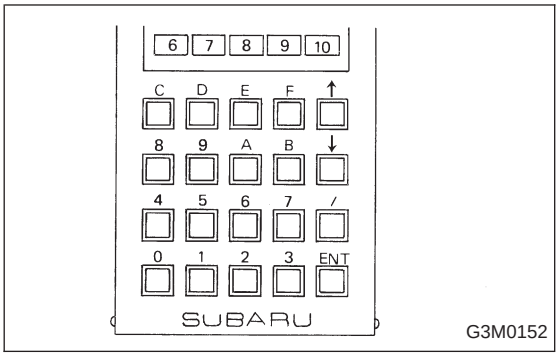


Connector & terminal
(B56) No. 6 — Chassis ground:

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

YES : Repair poor contact in TCM.

NO : Replace TCM.



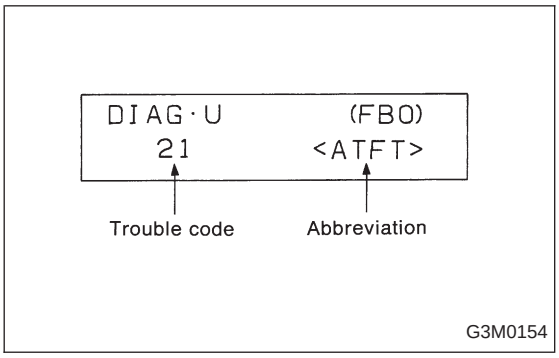
G3M0152

T: MODE FB0
— ON-BOARD DIAGNOSTICS (DIAG. U) —

DISPLAY:

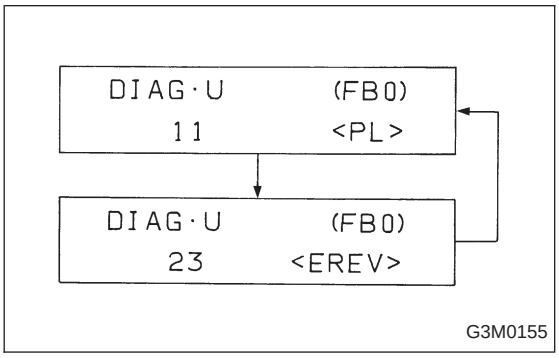
Current trouble code determined by on-board diagnostics.

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



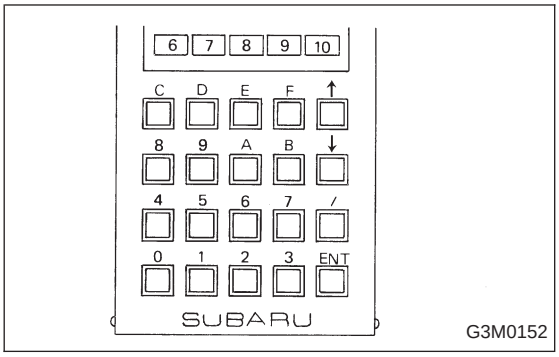
G3M0154

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



G3M0155

- When there are multiple trouble codes



G3M0152

U: MODE FB1
— ON-BOARD DIAGNOSTICS (DIAG. M) —

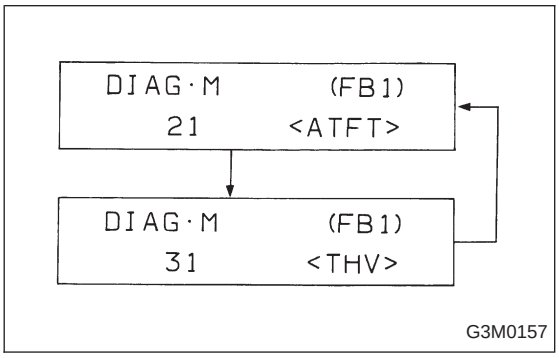
DISPLAY:

Previous trouble code stored in by on-board diagnostics.

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

G3M0156

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



G3M0157

- When there are multiple trouble codes

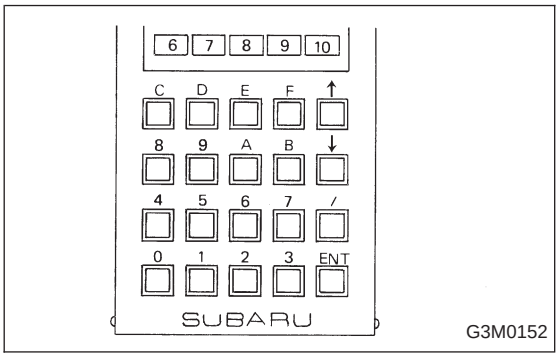
V: MODE FC0 — BACK-UP CLEAR —

DISPLAY:

Function of clearing trouble code stored in memory.

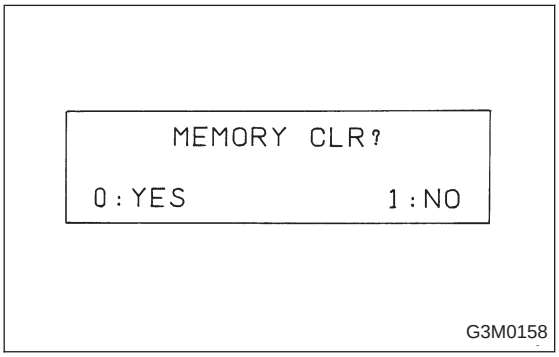
The current trouble history code is deleted from the monitor when the ignition switch is turned OFF after performing on-board diagnostics. However, past trouble history code are stored in TCM. They remain in memory even when the ignition switch is turned OFF, because there is a memory back-up battery. The current trouble history code can be displayed again when on-board diagnostics is performed after driving, provided that no inspection or repair has been made.
To delete past trouble history codes, first perform on-board diagnostics after inspection and repair using the current trouble history code, then confirm that no trouble code is displayed. Next, select and execute a particular mode on the select monitor.

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



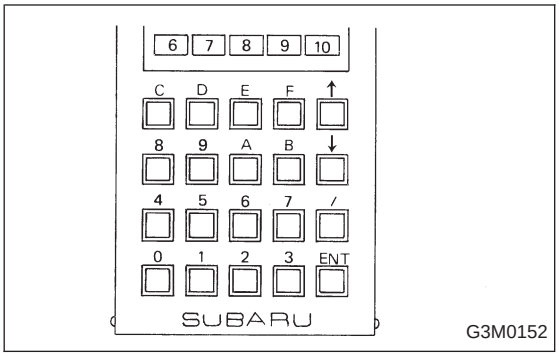
G3M0152

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



G3M0158

3) Ensure displayed message.

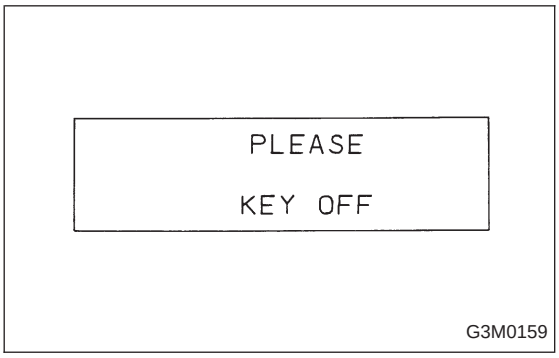


G3M0152

4) Press [ENT] key.
- When executing, (YES)

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

Press [1] [ENT] in that order.



G3M0159

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

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

10. General Diagnostic Table

Symptom	Problem parts
Starter does not rotate when select lever is in “P” or “N”; starter rotates when select lever is in “R”, “D”, “3” or “2”.	1) Inhibitor switch 2) Select cable 3) Select lever 4) Starter motor and harness
Abnormal noise when select lever is in “P” or “N”.	1) Strainer 2) Duty solenoid C 3) Oil pump 4) Drive plate 5) ATF level too high or too low
Hissing noise occurs during standing start.	1) Strainer 2) ATF level too high or too low
Noise occurs while driving in “D1”.	1) Final gear 2) Planetary gear 3) Reduction gear 4) Differential gear oil level too high or too low
Noise occurs while driving in “D2”.	
Noise occurs while driving in “D3”.	1) Final gear 2) Low & reverse brake 3) Reduction gear 4) Differential gear oil level too high or too low
Noise occurs while driving in “D4”.	1) Final gear 2) Low & reverse brake 3) Planetary gear 4) Reduction gear 5) Differential gear oil level too high or too low
Engine stalls while shifting from one range to another.	1) Control valve 2) Lock-up damper 3) Engine performance
Vehicle moves when select lever is in “N”.	1) Control unit 2) Inhibitor switch 3) Forward clutch
Shock occurs when select lever is moved from “N” to “D”.	1) Control module 2) Accumulator (“N” to “D”) 3) Control valve 4) ATF deterioration 5) Dropping resistor
Excessive time lag occurs when select lever is moved from “N” to “D”.	1) Control module 2) Control valve 3) Forward clutch 4) Duty solenoid A 5) Forward clutch seal ring 6) Front gasket transmission case
Shock occurs when select lever is moved from “N” to “R”.	1) Control module 2) Accumulator (4A) 3) Control valve 4) ATF deterioration 5) Dropping resistor
Excessive time lag occurs when select lever is moved from “N” to “R”.	1) Control valve 2) Low & reverse clutch 3) Reverse clutch 4) Duty solenoid A 5) Forward clutch seal ring 6) Front gasket transmission case
Vehicle does not start in any shift range (engine stalls).	1) Parking brake mechanism 2) Planetary gear

Symptom	Problem parts
Vehicle does not start in any shift range (engine revving up).	1) Strainer 2) Duty solenoid A 3) Control valve 4) Drive pinion 5) Hypoid gear 6) Axle shaft 7) Differential gear 8) Oil pump 9) Input shaft 10) Output shaft 11) Planetary gear 12) Drive plate 13) ATF level too low 14) Front gasket transmission case
Vehicle does not start in “R” range only (engine revving up).	1) Select cable 2) Select lever 3) Control valve 4) Low & reverse clutch 5) Reverse clutch
Vehicle does not start in “R” range only (engine stalls).	1) Forward clutch 2) Band brake 3) Planetary gear 4) Parking brake mechanism
Vehicle does not start in “D”, “3” or “2” range only (engine revving up).	1) Forward clutch 2) One-way clutch (1-2)
Vehicle does not start in “D”, “3”, “2” or “1” range only (engine revving up).	1) Forward clutch
Vehicle does not start in “D”, “3”, “2” or “1” range only (engine stalls).	1) Reverse clutch
Vehicle starts in “R” range only (engine revving up).	1) Control valve
Acceleration during standing starts is poor (high stall rpm).	1) Control valve 2) Forward clutch 3) Reverse clutch 4) ATF level too low 5) Front gasket transmission case
Acceleration during standing starts is poor (low stall rpm).	1) Oil pump 2) Torque converter one-way clutch 3) Engine performance
Acceleration is poor when select lever is in “D”, “3” or “2” range (normal stall rpm).	1) Control module 2) Control valve 3) High clutch 4) Brake band 5) Planetary gear
Acceleration is poor when select lever is in “R” (normal stall rpm).	1) Control module 2) Overrunning clutch 3) High clutch 4) Brake band 5) Planetary gear
No shift occurs from 1st to 2nd gear.	1) Control module 2) Vehicle speed sensor 1 3) Vehicle speed sensor 2 4) Throttle position sensor 5) Shift solenoid 1 6) Shift solenoid 2 7) Control valve 8) Brake band

Symptom	Problem parts
No shift occurs from 2nd to 3rd gear.	1) Control module 2) Control valve 3) High clutch 4) One-way clutch (3-4)
No shift occurs from 3rd to 4th gear.	1) Control module 2) Accumulator (3R) 3) ATF temperature sensor 4) Control valve 5) Band brake
Engine brake is not effected when select lever is in “3” range.	1) Inhibitor switch 2) Control module 3) Throttle position sensor 4) Control valve 5) Shift solenoid 3
Engine brake is not effected when select lever is in “3” or “2” range.	1) Control valve 2) Overrunning clutch
Engine brake is not effected when select lever is in “1” range.	1) Control valve 2) Low & reverse brake clutch
Shift characteristics are erroneous.	1) Inhibitor switch 2) Control module 3) Vehicle speed sensor 1 4) Vehicle speed sensor 2 5) Throttle position sensor 6) Control valve
No lock-up occurs.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Control valve 5) Lock-up facing 6) Engine speed signal
Parking brake is not effected.	1) Select cable 2) Select lever 3) Parking mechanism
Shift lever cannot be moved or is hard to move from “P” range.	
ATF spurts out.	1) ATF level too high
Differential oil spurts out.	1) Differential gear oil too high
Differential oil level changes excessively.	1) Seal pipe 2) Double oil seal
Odor is produced from ATF supply pipe.	1) Transfer clutch 2) Forward clutch 3) Overrunning clutch 4) High clutch 5) Band brake 6) Low & reverse clutch 7) Reverse clutch 8) Lock-up facing 9) ATF deterioration
Shock occurs from 1st to 2nd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (2A) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Band brake 8) ATF deterioration 9) Engine performance 10) Dropping resistor

Symptom	Problem parts
Slippage occurs from 1st to 2nd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (2A) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Band brake
Shock occurs from 2nd to 3rd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (3R) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) High clutch 8) Band brake 9) ATF deterioration 10) Engine performance 11) Dropping resistor
Slippage occurs from 2nd to 3rd gear.	1) Control module 2) Throttle position sensor 3) Accumulator (3R) 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) High clutch 8) Band brake
Shock occurs from 3rd to 4th gear.	1) Control module 2) Throttle position sensor 3) Accumulator 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Overrunning clutch 8) Band brake 9) ATF deterioration 10) Engine performance
Slippage occurs from 3rd to 4th gear.	1) Control module 2) Throttle position sensor 3) Accumulator 4) ATF temperature sensor 5) Duty solenoid A 6) Control valve 7) Band brake
Shock occurs when select lever is moved from “3” to “2” range.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) Overrunning clutch 7) Band brake 8) ATF deterioration
Shock occurs when select lever is moved from “D” to “1” range.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) ATF deterioration 7) Low & reverse brake

Symptom	Problem parts
Shock occurs when select lever is moved from “2” to “1” range.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) Low & reverse clutch 7) ATF deterioration
Shock occurs when accelerator pedal is released at medium speeds.	1) Control module 2) Throttle position sensor 3) ATF temperature sensor 4) Duty solenoid A 5) Control valve 6) Lock-up damper 7) Engine performance
Vibration occurs during straight-forward operation.	1) Control module 2) Duty solenoid B 3) Lock-up facing 4) Lock-up damper
Vibration occurs during turns (tight corner “braking” phenomenon).	1) Control module 2) Vehicle speed sensor 1 3) Vehicle speed sensor 2 4) Throttle position sensor 5) ATF temperature sensor 6) Transfer clutch 7) Transfer valve 8) Duty solenoid C 9) ATF deterioration
Front wheel slippage occurs during standing starts.	1) Control module 2) Vehicle speed sensor 2 3) FWD switch 4) Throttle position sensor 5) ATF temperature sensor 6) Control valve 7) Transfer clutch 8) Transfer valve 9) Transfer pipe 10) Duty solenoid C 11) Transfer clutch hub
Vehicle is not set in FWD mode.	1) Control module 2) FWD switch 3) Transfer clutch 4) Transfer valve 5) Duty solenoid C
Select lever is hard to move.	1) Select cable 2) Select lever 3) Detent spring 4) Manual plate
Select lever is too high to move (unreasonable resistance).	1) Detent spring 2) Manual plate
Select lever slips out of operation during acceleration or while driving on rough terrain.	1) Select cable 2) Select lever 3) Detent spring 4) Manual plate