AUTOMATIC TRANSMISSION (DIAGNOSTICS)

14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

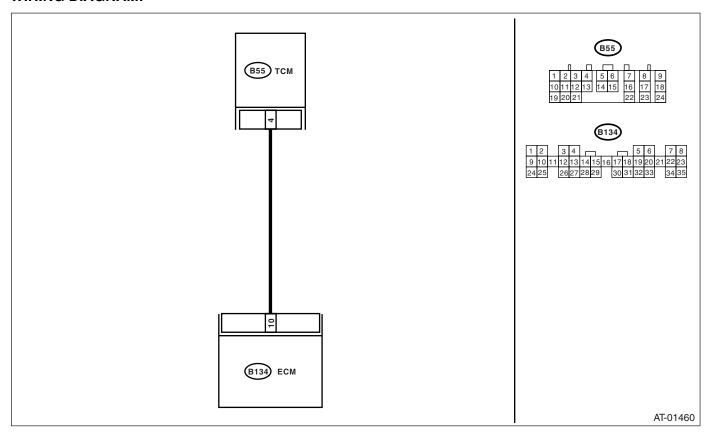
A: DTC 11 ENGINE SPEED SIGNAL

DIAGNOSIS:

The engine speed input signal circuit is open or shorted.

TROUBLE SYMPTOM:

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



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1	Go to step 2.	Repair the open
	TCM AND ECM.1) Turn the ignition switch to OFF.2) Disconnect the connectors from TCM and ECM.3) Measure the resistance of harness	Ω?		circuit in harness between TCM and ECM connector.
	between TCM and ECM connector. Connector & terminal (B55) No. 4 — (B134) No. 10:			
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B55) No. 4 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit in harness between TCM and ECM connector.
3	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 5.	Go to step 4.
4	CHECK INPUT SIGNAL FOR TCM. 1) Connect the connectors to TCM and ECM. 2) Turn the ignition switch to ON (engine OFF). 3) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 4 (+) — Chassis ground (-):	Is the voltage more than 10.5 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and ECM.	Go to step 6.
5	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect the connectors to TCM and ECM. 2) Connect the 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). 5) Idle the engine. 6) Read the data of engine speed using Subaru Select Monitor. • Display shows the engine speed signal value sent from ECM.	Is the revolution value same as tachometer reading shown on combination meter?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and ECM.	Go to step 6.
6	CHECK POOR CONTACT.	Is there poor contact in engine speed signal circuit?	Repair the poor contact.	Go to step 7.
7	CONFIRM DTC 11.	Replace the ECM with a new one. Does the DTC appear again, after memory has been cleared?	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>	Replace the ECM.

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

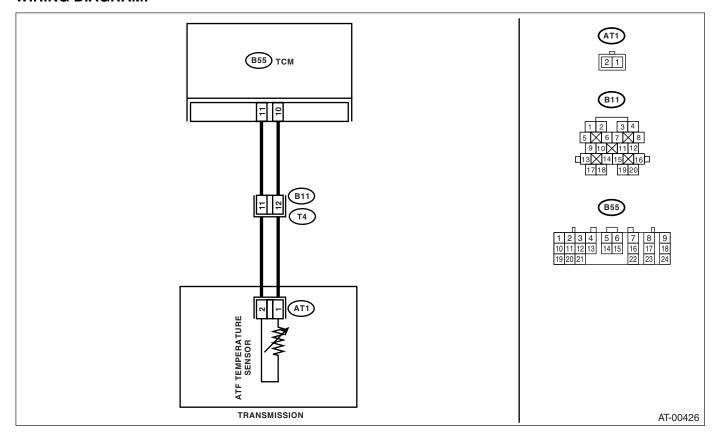
B: DTC 27 ATF TEMPERATURE SENSOR

DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from transmission and TCM. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B55) No. 10 — (B11) No. 12:	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR. Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B55) No. 11 — (B11) No. 11:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit in harness between TCM and transmission connector.
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B55) No. 10 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair the short circuit in harness between TCM and transmission connector.
4	CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B55) No. 11 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 5.	Repair the short circuit in harness between TCM and transmission connector.
5	CHECK ATF TEMPERATURE SENSOR. 1) Turn the ignition switch to OFF. 2) Connect the connectors to transmission and TCM. 3) Turn the ignition switch to ON and start engine. 4) Warm-up the transmission until ATF temperature reaches to 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature. 5) Disconnect the connector from transmission. 6) Measure the resistance between transmission connector terminals. Connector & terminal (T4) No. 11 — No. 12:	Is the resistance 275 — 375 Ω ?	Go to step 6.	Replace the ATF temperature sen- sor. <ref. 4at-<br="" to="">70, Shift Sole- noids, Duty Sole- noids and ATF Temperature Sen- sor.></ref.>
6	CHECK ATF TEMPERATURE SENSOR. 1) Turn the ignition switch to ON (engine OFF). 2) Measure the resistance between transmission connector terminals. Connector & terminal (T4) No. 11 — No. 12:	Does the resistance value increase while ATF temperature decreases?	Go to step 7.	Replace the ATF temperature sen- sor. <ref. 4at-<br="" to="">70, Shift Sole- noids, Duty Sole- noids and ATF Temperature Sen- sor.></ref.>
7	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 9.	Go to step 8.

	Step	Check	Yes	No
8	CHECK INPUT SIGNAL FOR TCM. 1) Connect the connector to transmission. 2) Warm-up the transmission until ATF temperature is about 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature. 3) Measure the voltage between TCM connector terminal. Connector & terminal (B55) No. 11 (+) — No. 10 (-):	Is the voltage 0.4 — 0.9 V?	Even if the AT OIL TEMP warning light illuminates, the circuit has returned to a normal condition at this time. Temporary poor contact of the connector or harness may be the cause. Repair the harness or contact in ATF temperature sensor and transmission connector.	Go to step 10.
9	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect the connector to transmission. 2) Turn the ignition switch to ON (engine OFF).	Does the ATF temperature gradually decrease?	Even if the AT OIL TEMP warning light illuminates, the circuit has returned to a normal condition at this time. Temporary poor contact of the connector or harness may be the cause. Repair the harness or contact in ATF temperature sensor and transmission connector.	Go to step 10.
10	CHECK POOR CONTACT.	Is there poor contact in ATF temperature sensor circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

C: DTC 31 THROTTLE POSITION SENSOR

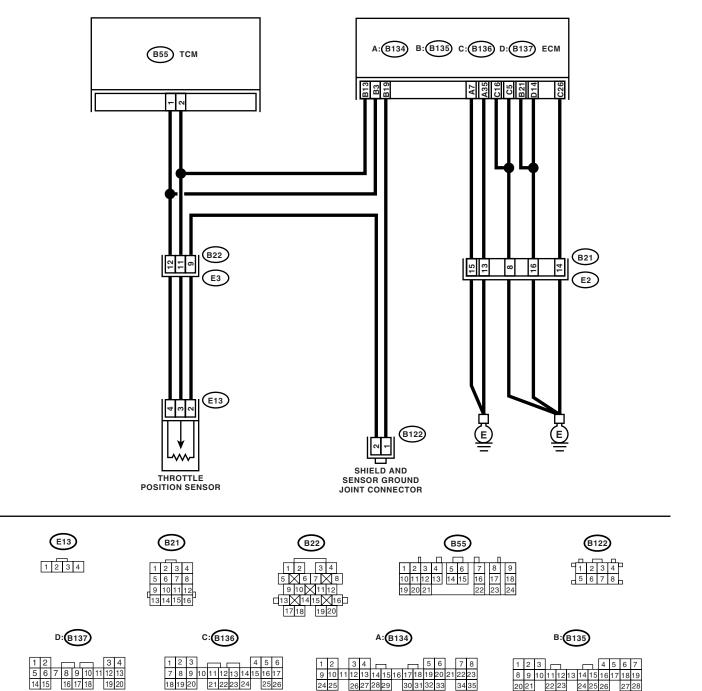
DIAGNOSIS:

The input signal circuit of throttle position sensor is open or shorted.

TROUBLE SYMPTOM:

Shift point too high or too low; excessive shift shock; excessive tight corner "braking".

WIRING DIAGRAM:



AT-01462

	Step	Check	Yes	No
1	CHECK ENGINE GROUND TERMINALS.	Have engine ground terminals been tightened?	Go to step 2.	Tighten the engine ground terminals.
	CHECK GROUND CIRCUIT OF ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from ECM. 3) Measure the resistance of harness between ECM and engine ground. Connector & terminal (B134) No. 35 — Engine ground: (B135) No. 21 — Engine ground: (B136) No. 5 — Engine ground: (B136) No. 16 — Engine ground: (B137) No. 14 — Engine ground: (B137) No. 14 — Engine ground: (B134) No. 7 — Engine ground:	Is the resistance less than 5 Ω ?	Go to step 3.	Repair the open circuit in harness between ECM connector and engine grounding terminal.
3	CHECK THROTTLE POSITION SENSOR. 1) Disconnect the connector from throttle position sensor. 2) Measure the resistance between throttle position sensor connector receptacle's terminals. Terminals No. 4 — No. 2:	Is the resistance 3.0 — 4.2 $k\Omega$?	Go to step 4.	Replace the throt- tle position sensor.
	CHECK THROTTLE POSITION SENSOR. Measure the resistance between throttle position sensor connector receptacle's terminals. Terminals No. 2 — No. 3:	Is the resistance 0.35 — 0.5 $k\Omega$?	Go to step 5.	Replace the throt- tle position sensor.
	CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR. 1) Disconnect the connector from TCM. 2) Measure the resistance of harness between TCM and throttle position sensor connector. Connector & terminal (B55) No. 2 — (E13) No. 3:	Is the resistance less than 1 Ω ?	Go to step 6.	Repair the open circuit in harness between TCM and throttle position sensor connector, and poor contact in coupling connector.
6	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1 Ω ?	Go to step 7.	Repair the open circuit in harness between TCM and throttle position sensor connector, and poor contact in coupling connector.
7	CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B55) No. 2 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 8.	Repair the short circuit in harness between TCM and throttle position sensor connector.
8	CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B54) No. 2 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 9.	Repair the short circuit in harness between TCM and throttle position sensor connector.

	Step	Check	Yes	No
9	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM and ECM connector. Connector & terminal (B55) No. 1 — (B135) No. 3:	Is the resistance less than 1 Ω ?	Go to step 10.	Repair the open circuit in harness between TCM and ECM connector.
10	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM and ECM connector. Connector & terminal (B55) No. 1 — (B135) No. 3:	Is the resistance less than 1 Ω ?	Go to step 11.	Repair the open circuit in harness between TCM and ECM connector.
11	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 14.	Go to step 12.
12	CHECK INPUT SIGNAL FOR TCM. 1) Connect the connectors to TCM, throttle position sensor and ECM. 2) Turn the ignition switch to ON (engine OFF). 3) Close the throttle completely. 4) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 2 (+) — Chassis ground (-):	Is the voltage 0.2 — 1.0 V?	Go to step 13.	Go to step 18.
13	CHECK INPUT SIGNAL FOR TCM. 1) Open the throttle completely and hold it. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 2 (+) — Chassis ground (-):	Is the voltage 4.2 — 4.7 V?	Go to step 16.	Go to step 18.
14	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect the connectors to TCM, throttle position sensor and ECM. 2) Connect the Subaru Select Monitor to data link connector. 3) Turn the ignition switch to ON (engine OFF). 4) Turn the Subaru Select Monitor switch to ON. 5) Throttle fully closed. 6) Read the data of throttle position sensor using Subaru Select Monitor. • Throttle position sensor input signal is indicated.	Is the value voltage 0.2 — 1.0 V?	Go to step 15.	Go to step 18.
15	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. Throttle fully open. NOTE: Must be changed correspondingly with the accelerator pedal operation (from "released" to "depressed" position).		Go to step 18.	Go to step 17.

	Step	Check	Yes	No
16	CHECK INPUT SIGNAL FOR TCM (THROT-TLE POSITION SENSOR POWER SUPPLY). Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 1 (+) — Chassis ground (-):	Is the voltage 4.8 — 5.3 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in throttle position sensor circuit.	Go to step 18.
17	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR (THROTTLE POSITION SENSOR POWER SUPPLY). Read the data of throttle position sensor power supply using Subaru Select Monitor. • Throttle position sensor power supply voltage is indicated.	Is the value voltage 4.8 — 5.3 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in throttle position sensor circuit.	Go to step 18.
18	CHECK POOR CONTACT.	Is there poor contact in throttle position sensor circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

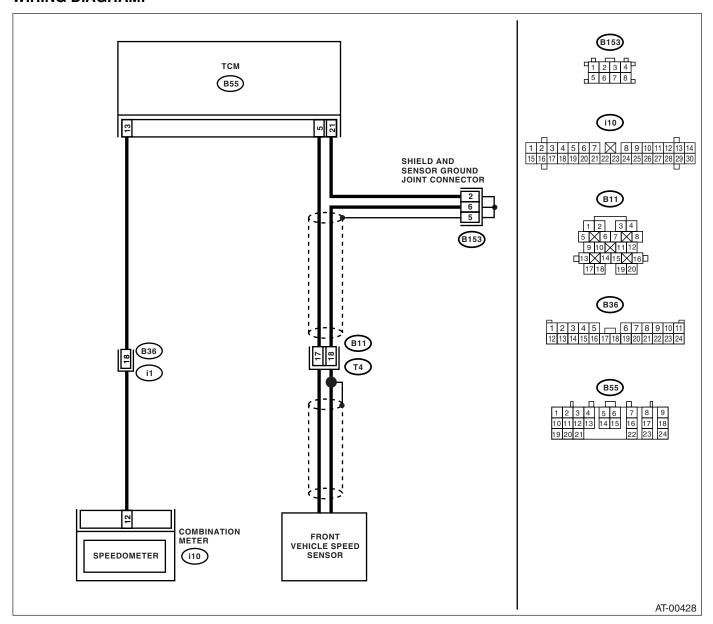
D: DTC 33 FRONT VEHICLE SPEED SENSOR

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.



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
	(B55) No. 5 — (B11) No. 17:			
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B55) No. 21 — (B11) No. 18:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
3	TCM AND TRANSMISSION. Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B55) No. 21 — Chassis ground:	ΜΩ?	Go to step 4.	Repair the short circuit in harness between TCM and transmission con- nector.
4	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B55) No. 5 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 5.	Repair the short circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
5	CHECK FRONT VEHICLE SPEED SENSOR. Measure the resistance between transmission connector receptacle's terminals. Connector & terminal (T4) No. 17 — No. 18:	Is the resistance 450 — 650 Ω ?	Go to step 6.	Replace the front vehicle speed sen- sor. <ref. 4at-<br="" to="">53, Front Vehicle Speed Sensor.></ref.>
6	PREPARE OSCILLOSCOPE.	Do you have an oscilloscope?	Go to step 9.	Go to step 7.
7	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 10.	Go to step 8.
8	CHECK INPUT SIGNAL FOR TCM. 1) Connect all connectors. 2) Lift-up or raise the vehicle and place safety stands. NOTE: Raise all wheels off floor. 3) Start the engine and set vehicle in 20 km/h (12 MPH) condition. 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 4) Measure the voltage between TCM connector terminals. Connector & terminal (B55) No. 5 (+) — (B55) No. 21 (-):</ref.>		Even if the AT OIL TEMP warning light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact or harness may be the cause. Repair the harness or connector in the front vehicle speed sensor circuit.	Go to step 11.

	Step	Check	Yes	No
9	USING OSCILLOSCOPE. 1) Connect all connectors. 2) Lift-up the vehicle and place safety stand. NOTE: Raise all wheels off ground. 3) Set the oscilloscope to TCM connector terminals. Connector & terminal Positive probe; (B55) No. 5: Ground lead; (B55) No. 21: 4) Start the engine, and drive the wheels slowly. NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When TCM diagnosis is finished, perform the ABS memory clearance procedure. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 5) Measure the signal voltage indicated on</ref.>		Even if the AT OIL TEMP warning light illuminates, the circuit has returned to a normal condition at this time. A temporary poor contact or harness may be the cause. Repair the harness or connector in front vehicle speed sensor circuit.	Go to step 11.
10	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect all connectors. 2) Connect the Subaru Select Monitor to data link connector. 3) Lift-up or raise the vehicle and place safety stands. NOTE: Raise all wheels off floor. 4) Turn the ignition switch to ON and turn Subaru Select Monitor switch to ON. 5) Start the engine. 6) Read the data of vehicle speed using Subaru Select Monitor. • Compare the speedometer with Subaru Select Monitor indications. • Vehicle speed is indicated in "km/h" or "MPH". 7) Slowly increase the vehicle speed to 60 km/h or 37 MPH. 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""></ref.>			Go to step 11.
11	CHECK POOR CONTACT.	Is there poor contact in front vehicle speed sensor circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

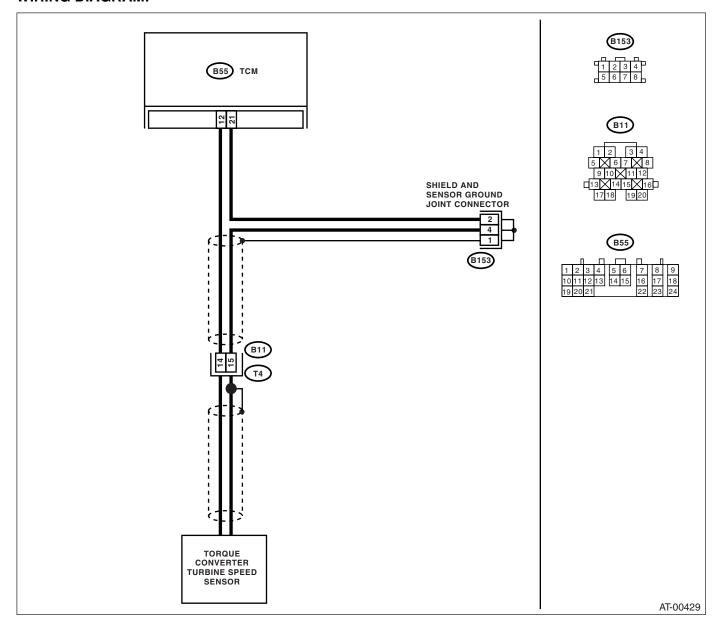
E: DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR

DIAGNOSIS:

The input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	CHECK TORQUE CONVERTER TURBINE	Is the resistance 450 — 650	Go to step 2.	Replace the
1	SPEED SENSOR.	Ω ?	Go to stop 2.	torque converter
	Turn the ignition switch to OFF.			turbine speed sen-
	Disconnect the connector from transmis-			sor. <ref. 4at-<="" th="" to=""></ref.>
	sion.			59, Torque Con-
	3) Measure the resistance between transmis-			verter Turbine
	sion connector receptacle's terminals.			Speed Sensor.>
	Connector & terminal			
	(T4) No. 14 — No. 15:			
2	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1	Go to step 3.	Repair the open
	TCM AND TRANSMISSION.	Ω?		circuit in harness
	Disconnect the connector from TCM.			between TCM and
	2) Measure the resistance of harness			transmission con-
	between TCM and transmission connector.			nector.
	Connector & terminal			
	(B55) No. 12 — (B11) No. 14:			
3	CHECK HARNESS CONNECTOR BETWEEN		Go to step 4.	Repair the open
	TCM AND TRANSMISSION.	Ω?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and transmission connector.			transmission con-
	Connector & terminal			nector, and poor
	(B55) No. 21 — (B11) No. 15:			contact in cou-
4	CHECK HARNESS CONNECTOR BETWEEN	la tha wasistawaa waaya than d	Co to oton 5	pling connector.
4	TCM AND TRANSMISSION.	$M\Omega$?	Go to step 5.	Repair the short circuit in harness
	Measure the resistance of harness between	IVIS 2 !		between TCM and
	TCM and chassis ground.			transmission con-
	Connector & terminal			nector.
	(B55) No. 21 — Chassis ground:			
5	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 6.	Repair the short
	TCM AND TRANSMISSION.	MΩ?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and chassis ground.			transmission con-
	Connector & terminal			nector, and poor
	(B55) No. 12 — Chassis ground:			contact in cou-
				pling connector.
6	PREPARE OSCILLOSCOPE.	Do you have an oscilloscope?	-	Go to step 7.
7	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 9.	Go to step 8.
8	CHECK INPUT SIGNAL FOR TCM.	Is the voltage more than AC 1	Even if the AT OIL	Go to step 11.
1	Connect the connectors to TCM and trans-	V?	TEMP warning	=== 10 5top 111
	mission.		light illuminates,	
	Start the engine and move select lever to		the circuit has	
	"P" or "N" range.		returned to a nor-	
	3) Measure the voltage between TCM con-		mal condition at	
	nector terminals.		this time. A tempo-	
	Connector & terminal		rary poor contact	
	(B55) No. 12 (+) — No. 21 (-):		of the connector or	
			harness may be	
			the cause. Repair	
			the harness or	
			connector in TCM	
			and transmission.	

	Step	Check	Yes	No
9	CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR. 1) Connect the connectors to TCM and transmission. 2) Connect the Subaru Select Monitor to data link connector. 3) Turn the ignition switch to ON and turn Subaru Select Monitor switch to ON. 4) Start the engine. 5) Move the select lever to "P" or "N" range. 6) Read the data of turbine speed using Subaru Select Monitor. • Compare the tachometer with Subaru Select Monitor indications.	Is the revolution value same as the tachometer reading shown on the combination meter?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 11.
10	CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE. 1) Connect the connectors to TCM and transmission. 2) Set the oscilloscope to TCM connector terminals. Connector & terminal Positive probe; (B55) No. 12: Ground lead; (B55) No. 21: 3) Start the engine and move select lever to "P" or "N" range.	Is the signal voltage more than AC 1 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 11.
11	CHECK POOR CONTACT.	Is there poor contact in torque converter turbine speed sensor circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

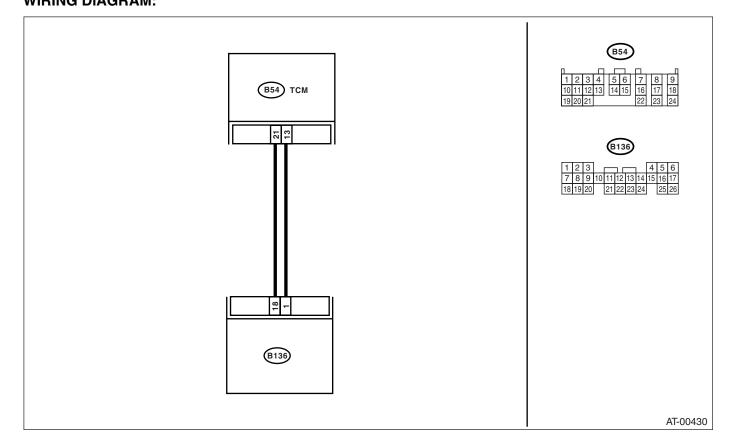
AUTOMATIC TRANSMISSION (DIAGNOSTICS)

F: DTC 38 TORQUE CONTROL SIGNAL

DIAGNOSIS:

The signal circuit is open or shorted.

TROUBLE SYMPTOM: Excessive shift shock. WIRING DIAGRAM:



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness
	 Turn the ignition switch to OFF. Disconnect the connectors from TCM and 			between TCM and ECM connector.
	ECM.			ECIVI COnnector.
	3) Measure the resistance of harness			
	between TCM and ECM connector. Connector & terminal			
	(B54) No. 21 — (B136) No. 18:			
	(B54) No. 13 — (B136) No. 1:			
2	CHECK HARNESS CONNECTOR BETWEEN		Go to step 3.	Repair the short
	TCM AND ECM. Measure the resistance of harness between	ΜΩ?		circuit in harness between TCM and
	TCM connector and chassis ground.			ECM connector.
	Connector & terminal			
	(B54) No. 21 — Chassis ground:			
	(B54) No. 13 — Chassis ground:			
3	TCM. 1) Connect the connectors to TCM and ECM. 2) Turn the ignition switch to ON (engine OFF).	Is the voltage more than 4.8 V?	TEMP warning light illuminates, the circuit has returned to a nor-	Go to step 4.
	Measure the voltage between TCM connector terminals. Connector & terminal		mal condition at this time. A tempo-	
	(B54) No. 21 (+) — Chassis ground (–):		rary poor contact of the connector or	
	(B54) No. 13 (+) — Chassis ground (-):		harness may be	
	. , .,		the cause. Repair	
			the harness or connector in TCM	
			and ECM.	
4	CHECK POOR CONTACT.	Is there poor contact in torque	Repair the poor	Go to step 5.
5	CHECK GROUND LINE BETWEEN TRANS-	control signal circuit? Is there any dirt or rust at the	contact. Remove dirt and	Co to oton 6
٦	MISSION AND BODY.	ground line installing point?	rust.	Go to step 6.
	Check installing condition of the ground line in			
	transmission and body.			
6	CHECK GROUND LINE BETWEEN TRANS- MISSION AND BODY.	Is the tightening torque value	Go to step 7.	Tighten to the
	Check installing condition of the ground line in	within specification?		specified torque.
	transmission and body.			
	Tightening torque:			
	10 — 16 N·m (1.0 — 1.6 kgf-m, 7.2 — 11.6 ft-lb)			
7	CHECK GROUND LINE INSIDE TRANSMIS-	Is the tightening torque value	Go to step 9.	Tighten to the
	SION.	within specification?	-	specified torque.
	Drain the ATF and remove oil pan. Chock the tightening targue value of ground.			
	2) Check the tightening torque value of ground line installing bolt.			
	Tightening torque:			
	7 — 9 N·m (0.7 — 0.9 kgf-m, 5.1 — 6.5 ft-			
8	CHECK GROUND CIRCUIT OF ECM.	Is there any trouble?	Repair the ground	Go to step 9.
ľ	<ref. 31="" 4at(h4so)-38,="" dtc="" th="" throttle<="" to=""><th>no more any measie!</th><th>terminal and/or</th><th>Go to step 3.</th></ref.>	no more any measie!	terminal and/or	Go to step 3.
	POSITION SENSOR, Diagnostic Procedure		ground circuit of	
	with Diagnostic Trouble Code (DTC).>		ECM.	

	Step	Check	Yes	No
9	RECHECK OUTPUT SIGNAL EMITTED FROM TCM. Measure the voltage between TCM connector and chassis ground.	Is each voltage more than 4 V?	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module</ref.>	Replace the ECM.
	Connector & terminal (B54) No. 21 (+) — Chassis ground (–): (B54) No. 13 (+) — Chassis ground (–):		(TCM).>	

AUTOMATIC TRANSMISSION (DIÀGNOSTICS)

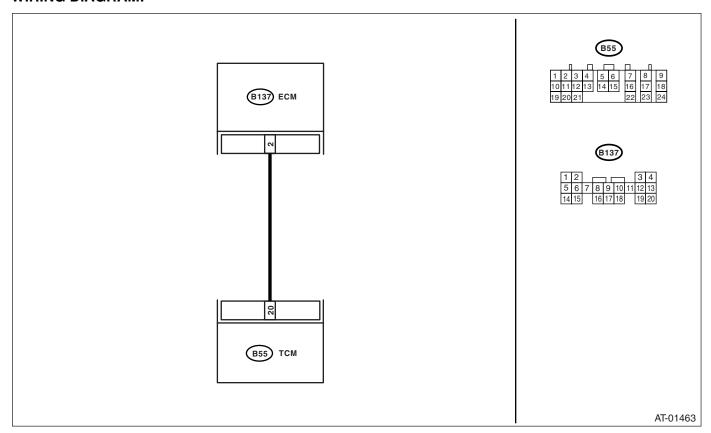
G: DTC 45 INTAKE MANIFOLD PRESSURE SIGNAL

DIAGNOSIS:

The input signal circuit of TCM from ECM is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	-	Is there any trouble?	Repair the ground	Go to step 2.
	GROUND CIRCUIT OF ECM	,	terminal and/or	он на спор —
	<ref. 31="" 4at(h4so)-38,="" dtc="" th="" throttle<="" to=""><th></th><th>ground circuit of</th><th></th></ref.>		ground circuit of	
	POSITION SENSOR, Diagnostic Procedure		ECM.	
	with Diagnostic Trouble Code (DTC).>			
2	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1	Go to step 3.	Repair the open
	TCM AND ECM.	Ω?		circuit in harness
	 Turn the ignition switch to OFF. 			between TCM and
	2) Disconnect the connectors from TCM and			ECM connector.
	ECM.			
	3) Measure the resistance of harness			
	between TCM and ECM connector.			
	Connector & terminal			
	(B55) No. 20 — (B137) No. 2:		0 1 1	D : 11
3	CHECK HARNESS CONNECTOR BETWEEN		Go to step 4.	Repair the short
	TCM AND ECM.	ΜΩ?		circuit in harness between TCM and
	Measure the resistance of harness between TCM connector and chassis ground.			ECM connector.
	Connector & terminal			ECIVI CONTIECTOI.
	(B55) No. 20 — Chassis ground:			
4	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select	Go to step 6.	Go to step 5.
	PREPARE SUBARU SELECT WONTON.	Monitor?	Go to step o.	Go to step 3.
5	CHECK INPUT SIGNAL FOR TCM.	Is the voltage 0.4 — 1.6 V?	Even if the AT OIL	Go to step 7.
	1) Connect the connectors to TCM and ECM.		TEMP warning	·
	2) Start the engine, and warm-up the trans-		light illuminates,	
	mission until ATF temperature is above 80°C		the circuit has	
	(176°F).		returned to a nor-	
	NOTE:		mal condition at	
	If ambient temperature is below 0°C (32°F),		this time. A tempo-	
	drive the vehicle until ATF reaches its operating		rary poor contact	
	temperature.		of the connector or	
	3) Idle the engine.		harness may be the cause. Repair	
	Measure the voltage between TCM con-		the harness or	
	nector and chassis ground.		connector in TCM	
	Connector & terminal		and ECM.	
	(B55) No. 20 (+) — Chassis ground (-): CHECK INPUT SIGNAL FOR TCM USING			0-447
6		Is the value voltage 0.4 — 1.6		Go to step 7.
	SUBARU SELECT MONITOR. 1) Connect the connectors to TCM and ECM.	V?	I EMP warning light illuminates,	
	2) Connect the Subaru Select Monitor to data		the circuit has	
	link connector.		returned to a nor-	
	Start the engine, and turn Subaru Select		mal condition at	
	Monitor switch to ON.		this time. A tempo-	
	Warm-up the engine until engine coolant		rary poor contact	
	temperature is above 80°C (176°F).		of the connector or	
	5) Idle the engine.		harness may be	
	6) Read the data of intake manifold pressure		the cause. Repair	
	signal using Subaru Select Monitor.		the harness or	
	 Display shows the intake manifold pressure 		connector in TCM	
	signal value sent from ECM.		and ECM.	
7	CHECK POOR CONTACT.	Is there poor contact in intake	Repair the poor	Replace the TCM.
		manifold pressure signal cir-	contact.	<ref. 4at-77,<="" th="" to=""></ref.>
		cuit?		Transmission Con-
				trol Module
				(TCM).>

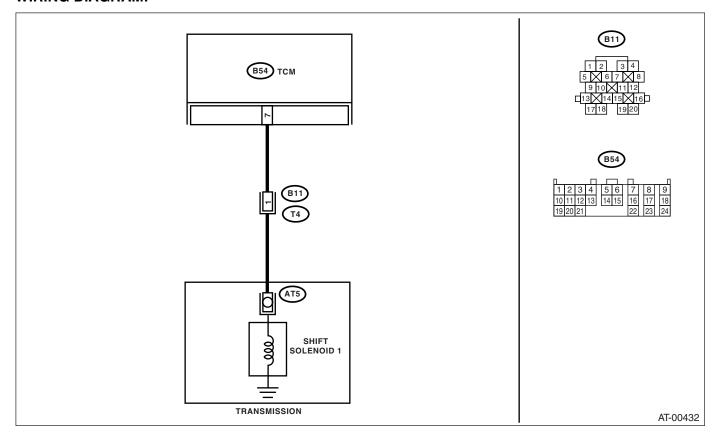
H: DTC 71 SHIFT SOLENOID 1

DIAGNOSIS:

The output signal circuit of shift solenoid 1 is open or shorted.

TROUBLE SYMPTOM:

Does not shift.



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and shift solenoid 1 connector. Connector & terminal	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
2	(B54) No. 7 — (B11) No. 1: CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B54) No. 7 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit in harness between TCM and transmission connector.
3	CHECK SHIFT SOLENOID 1. Measure the resistance between transmission connector terminals. Connector & terminal (T4) No. 1 — No. 16:	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 7.
4	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect the connectors to TCM and transmission. 2) Turn the ignition switch to ON (engine OFF). 3) Move the select lever to "D" range. 4) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 7 (+) — Chassis ground (-):	Is the voltage more than 9 V?	Go to step 5.	Go to step 6.
5	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Move the select lever to "2" range. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 7 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or contact in TCM.	Go to step 6.
6	CHECK POOR CONTACT.	Is there poor contact in shift solenoid 1 circuit?	Repair poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

	Step	Check	Yes	No
7	CHECK SHIFT SOLENOID 1 (IN TRANSMISSION). 1) Remove the transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. NOTE: Raise all wheels off ground. 3) Drain the ATF.	Is the resistance 10 — 16 Ω ?	Go to step 8.	Replace the shift solenoid 1. <ref. to 4AT-70, Shift Solenoids, Duty Solenoids and ATF Temperature Sen- sor.></ref.
	CAUTION: Do not drain the ATF until it cools down. 4) Remove the oil pan, and disconnect connector from shift solenoid 1. 5) Measure the resistance between shift solenoid 1 connector and transmission ground. Terminals No. 1 — Transmission ground:			
8	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION. Measure the resistance of harness between shift solenoid 1 and transmission connector. Connector & terminal (T4) No. 1 — (AT5) No. 1:	Is the resistance less than 1 Ω ?	Go to step 9.	Repair the open circuit in harness between shift sole- noid 1 and trans- mission connector.
9	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION. Measure the resistance of harness between shift solenoid 1 connector and transmission ground. Connector & terminal (T4) No. 1 — Transmission ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in shift solenoid 1 and transmission.	Repair the short circuit harness between shift sole- noid 1 and trans- mission connector.

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

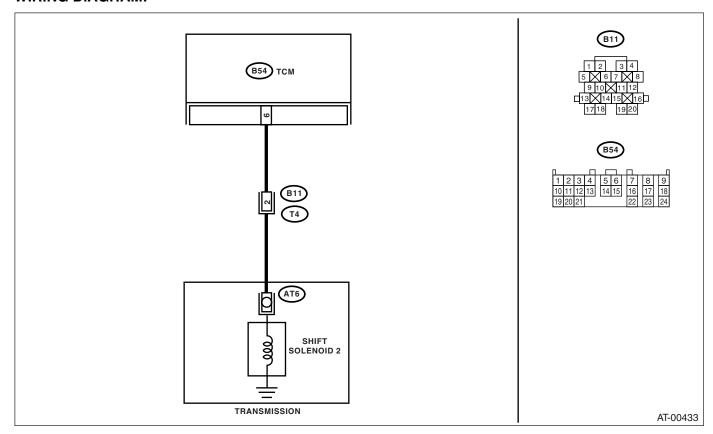
I: DTC 72 SHIFT SOLENOID 2

DIAGNOSIS:

The output signal circuit of shift solenoid 2 is open or shorted.

TROUBLE SYMPTOM:

Does not shift.



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and shift solenoid 2 connector. Connector & terminal (B54) No. 6 — (B11) No. 2:	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM connector and transmission ground. Connector & terminal (B54) No. 6 — Chassis ground:	Is the resistance more than 1 M Ω ?	Go to step 3.	Repair the short circuit in harness between TCM and transmission connector.
3	CHECK SHIFT SOLENOID 2. Measure the resistance between transmission connector terminals. Connector & terminal (T4) No. 2 — No. 16:	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 6.
4	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect the connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. NOTE: 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 ATF reaches its operating temperature. 4) Move the selector lever to "D" range, and slowly increase vehicle speed to 50 km/h (31 MPH). 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 5) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 6 (+) — Chassis ground (-):</ref.>		Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 5.
5	CHECK POOR CONTACT.	Is there poor contact in shift solenoid 2 circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

Г	Oton	Obsole	Vaa	N.a
	Step	Check	Yes	No
6	CHECK SHIFT SOLENOID 2 (IN TRANSMISSION). 1) Remove the transmission connector from bracket. 2) Drain the ATF.	Is the resistance 10 — 16 Ω ?	Go to step 7.	Replace the shift solenoid 2. <ref. to 4AT-70, Shift Solenoids, Duty Solenoids and ATF</ref.
	CAUTION: Do not drain the ATF until it cools down.			Temperature Sensor.>
	 3) Remove the oil pan, and disconnect connector from shift solenoid 2. 4) Measure the resistance between shift solenoid 2 connector and transmission ground. Terminals No. 1 — Transmission ground: 			
7	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION. Measure the resistance of harness between shift solenoid 2 and transmission connector. Connector & terminal (AT6) No. 1 — (T4) No. 2:	Is the resistance less than 1 Ω ?	Go to step 8.	Repair the open circuit in harness between shift sole- noid 2 and trans- mission connector.
8	CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION. Measure the resistance of harness between shift solenoid 2 connector and transmission ground. Connector & terminal (T4) No. 2 — Transmission ground:	Is the resistance more than 1 $M\Omega$?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in shift solenoid 2 and transmission.	Repair the short circuit harness between shift sole-noid 2 and transmission connector.

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

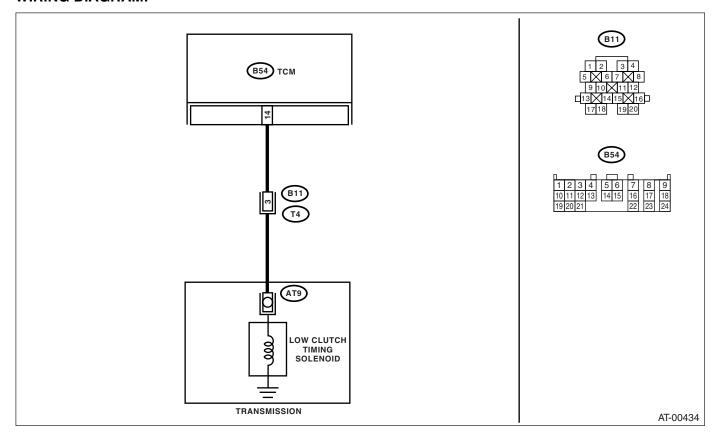
J: DTC 73 LOW CLUTCH TIMING SOLENOID

DIAGNOSIS:

The output signal circuit of low clutch timing solenoid is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1	Go to step 2.	Repair the open
	TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and transmission connector.	Ω ?	20 to 0.0p 21	circuit in harness between TCM and transmission con- nector.
	Connector & terminal (B54) No. 14 — (B11) No. 3:			
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM connector and transmission ground. Connector & terminal (B54) No. 14 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 3.	Repair the short circuit in harness between TCM and transmission connector.
3	CHECK LOW CLUTCH TIMING SOLENOID. Measure the resistance between transmission connector terminals. Connector & terminal (T4) No. 3 — No. 16:	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 7.
4	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect the connectors to TCM and transmission. 2) Turn the ignition switch to ON (engine OFF). 3) Move the select lever to "D" range. 4) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 14 (+) — Chassis ground (-):	Is the voltage more than 9 V?	Go to step 5.	Go to step 6.
5	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Set the select lever to "2" range. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 14 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or contact in TCM and transmission.	Go to step 6.
6	CHECK POOR CONTACT.	Is there poor contact in low clutch timing solenoid circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

	Step	Check	Yes	No
7	CHECK LOW CLUTCH TIMING SOLENOID (IN TRANSMISSION). 1) Remove the transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. NOTE: Raise all wheels off ground. 3) Drain the ATF. CAUTION: Do not drain the ATF until it cools down. 4) Remove the oil pan, and disconnect connector from low clutch timing solenoid. 5) Measure the resistance between low clutch timing solenoid connector and transmission ground. Terminals No. 1 — Transmission ground:	Is the resistance 10 — 16 Ω ?	Go to step 8.	Replace the low clutch timing sole- noid. <ref. 4at-<br="" to="">70, Shift Sole- noids, Duty Sole- noids and ATF Temperature Sen- sor.></ref.>
8	CHECK HARNESS CONNECTOR BETWEEN LOW CLUTCH TIMING SOLENOID AND TRANSMISSION. Measure the resistance of harness between low clutch timing solenoid and transmission connector. Connector & terminal (AT9) No. 1 — (T4) No. 3:	Is the resistance less than 1 Ω ?	Go to step 9.	Repair the open circuit in harness between low clutch timing solenoid and transmission connector.
9	CHECK HARNESS CONNECTOR BETWEEN LOW CLUTCH TIMING SOLENOID AND TRANSMISSION. Measure the resistance of harness between low clutch timing solenoid connector and transmission ground. Connector & terminal (T4) No. 3 — Transmission ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in low clutch timing solenoid and transmission.	Repair the short circuit harness between low clutch timing solenoid and transmission connector.

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

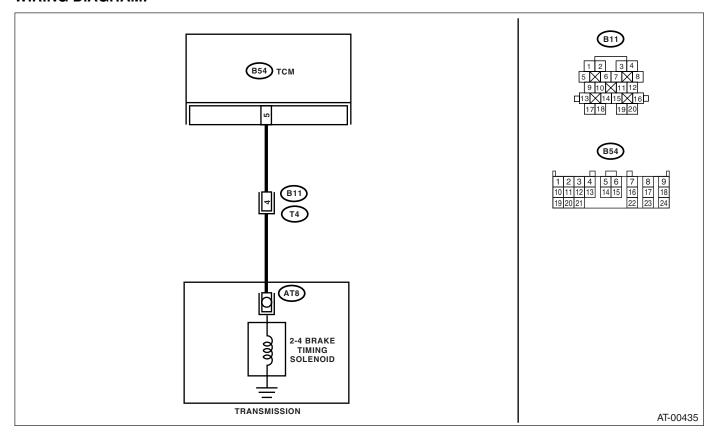
K: DTC 74 2-4 BRAKE TIMING SOLENOID

DIAGNOSIS:

The output signal circuit of 2-4 brake timing solenoid is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	·	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
2		Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 3.	Repair the short circuit in harness between TCM and transmission connector.
3	CHECK 2-4 BRAKE TIMING SOLENOID. Measure the resistance between transmission connector terminals. Connector & terminal (T4) No. 4 — No. 16:	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 7.
4	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect the connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. NOTE: 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 ATF reaches its operating temperature. 4) Move the selector lever to "1" range, and slowly increase vehicle speed to 10 km/h (6 MPH). 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 5) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 5 (+) — Chassis ground (-):</ref.>		Go to step 5.	Go to step 6.

	Step	Check	Yes	No
5	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Move the selector lever to "D" range, and slowly increase vehicle speed to 65 km/h (40 MPH). 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 5 (+) — Chassis ground (-):</ref.>		Even if the AT OIL TEMP warning light illuminates, 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 the harness or contact in transmission.	Go to step 6.
6	CHECK POOR CONTACT.	Is there poor contact in 2-4 brake timing solenoid circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
7	CHECK 2-4 BRAKE TIMING SOLENOID (IN TRANSMISSION). 1) Remove the transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. NOTE: Raise all wheels off ground. 3) Drain the ATF. CAUTION: Do not drain the ATF until it cools down. 4) Remove the oil pan, and disconnect connector from 2-4 brake timing solenoid. 5) Measure the resistance between 2-4 brake timing solenoid connector and transmission ground. Terminals No. 1 — Transmission ground:	Is the resistance 10 — 16 Ω ?	Go to step 8.	Replace the 2-4 brake timing sole- noid. <ref. 4at-<br="" to="">70, Shift Sole- noids, Duty Sole- noids and ATF Temperature Sen- sor.></ref.>
8	CHECK HARNESS CONNECTOR BETWEEN 2-4 BRAKE TIMING SOLENOID AND TRANSMISSION. Measure the resistance of harness between 2-4 brake timing solenoid and transmission connector. Connector & terminal (AT8) No. 1 — (T4) No. 4:	Is the resistance less than 1 Ω ?	Go to step 9.	Repair the open circuit in harness between 2-4 brake timing solenoid and transmission connector.

Step	Check	Yes	No
9 CHECK HARNESS CONNECTOR BETWEEN 2-4 BRAKE TIMING SOLENOID AND TRANSMISSION. Measure the resistance of harness between 2- 4 brake timing solenoid connector and transmission ground. Connector & terminal (T4) No. 4 — Transmission ground:	Is the resistance more than 1 MΩ?	TEMP warning light illuminates,	Repair the short circuit harness between 2-4 brake timing solenoid and transmission connector.

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

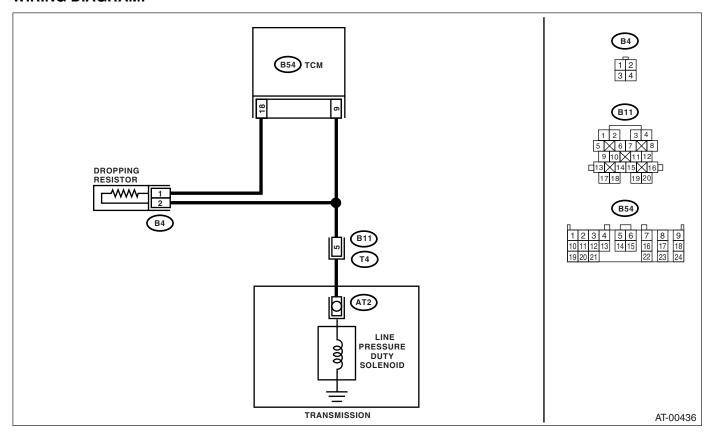
L: DTC 75 LINE PRESSURE DUTY SOLENOID

DIAGNOSIS:

The output signal circuit of line pressure duty solenoid is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	CHECK RESISTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from dropping resistor. 3) Measure the resistance between dropping resistor terminal. Terminals	Is the resistance 9 — 15 Ω ?	Go to step 2.	Replace the drop- ping resistor. <ref. to 4AT-78, Drop- ping Resistor.></ref.
2	No. 1 — No. 2: CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR. 1) Disconnect the connector from TCM. 2) Measure the resistance of harness between TCM connector and dropping resistor connector. Connector & terminal (B54) No. 18 — (B4) No. 1:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair open circuit in harness between TCM and dropping resistor connector.
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR. Measure the resistance of harness between dropping resistor connector and chassis ground. Connector & terminal (B4) No. 1 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair short circuit in harness between TCM and dropping resistor connector.
4	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1 Ω ?	Go to step 5.	Repair open circuit in harness between dropping resistor and trans- mission connector.
5	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR. Measure the resistance of harness between dropping resistor connector and chassis ground. Connector & terminal (B4) No. 2 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 6.	Repair short circuit in harness between dropping resistor and trans- mission connector.
6	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from transmission and TCM. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B54) No. 9 — (B11) No. 5:	Is the resistance less than 1 Ω ?	Go to step 7.	Repair the open circuit in harness between TCM and transmission connector.
7	CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND. Measure the resistance of harness between TCM and chassis ground. Connector & terminal (B54) No. 9 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 8.	Repair the short circuit in harness between TCM and transmission connector.

	Step	Check	Yes	No
8	CHECK LINE PRESSURE DUTY SOLENOID. Measure the resistance between transmission connector receptacle's terminals. Terminals (T4) No. 5 — No. 16:	Is the resistance between 2.0 and 4.5 Ω ?	Go to step 9.	Go to step 15.
9	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 12.	Go to step 10.
10	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect all connectors. 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 ATF reaches its operating temperature. 3) Turn the ignition switch to ON (engine OFF). 4) Move the select lever to "N" range. 5) Throttle fully closed. 6) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 9 (+) — Chassis ground (-):	Is the voltage 1.5 — 5.0 V?	Go to step 11.	Go to step 14.
11	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Throttle fully open and hold it. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 9 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in transmission.	Go to step 14.

	Step	Check	Yes	No
12	CHECK OUTPUT SIGNAL EMITTED FROM	Is the value 100%?	Go to step 13.	Go to step 14.
	TCM USING SUBARU SELECT MONITOR.			
	 Connect the connectors to TCM and trans- 			
	mission.			
	2) Connect the Subaru Select Monitor to data			
	link connector.			
	 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 ATF reaches its operating			
	temperature.			
	•			
	Stop the engine and turn ignition switch to ON (engine OFF).			
	6) Move the select lever to "N" range.			
	7) Read the data of line pressure duty sole-			
	noid using Subaru Select Monitor.			
	 Line pressure duty solenoid is indicated in 			
	"%".			
	8) Throttle is fully closed.			
13	CHECK OUTPUT SIGNAL EMITTED FROM	Is the value less than 25%?	Even if the AT OIL	Go to step 14.
	TCM USING SUBARU SELECT MONITOR.		TEMP warning	
	Turn the ignition switch to ON (engine OFF)		light illuminates, the circuit has	
	OFF). 2) Throttle is fully open.		returned to a nor-	
	2) Throthe is fully open.		mal condition at	
			this time. A tempo-	
			rary poor contact	
			of the connector or	
			harness may be	
			the cause. Repair	
			the harness or	
			connector in trans-	
14	OUTOK BOOD CONTACT	la thous not sented to P	mission.	Double - No. TOM
14	CHECK POOR CONTACT.	Is there poor contact in line	Repair the poor	Replace the TCM.
		pressure duty solenoid circuit?	contact.	<ref. 4at-77,<br="" to="">Transmission Con-</ref.>
				trol Module
				(TCM).>
15	CHECK LINE PRESSURE DUTY SOLENOID	Is the resistance 2.0 — 4.5 Ω ?	Go to step 16.	Replace the line
	(IN TRANSMISSION).			pressure duty
	Remove the transmission connector from			solenoid. <ref. td="" to<=""></ref.>
	bracket.			4AT-70, Shift Sole-
	2) Drain the ATF.			noids, Duty Sole-
	CAUTION: Do not drain the ATF until it cools down.			noids and ATF Temperature Sen-
	3) Remove the oil pan, and disconnect con-			sor.>
	nector from line pressure duty solenoid.			
	4) Measure the resistance between line pres-			
	sure duty solenoid connector and transmission			
	ground.			
	Terminals			
1	No. 1 — Transmission ground:			I

	Step	Check	Yes	No
16	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND LINE PRESSURE DUTY SOLENOID. Measure the resistance of harness between line pressure duty solenoid and transmission connector. Connector & terminal (T4) No. 5 — (AT2) No. 1:	Is the resistance less than 1 Ω ?	Go to step 17.	Repair the open circuit in harness between line pressure duty solenoid and transmission connector.
17	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND LINE PRESSURE DUTY SOLENOID. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 5 — Transmission ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in line pressure duty solenoid and transmission.	Repair the short circuit in harness between line pressure duty solenoid and transmission connector.

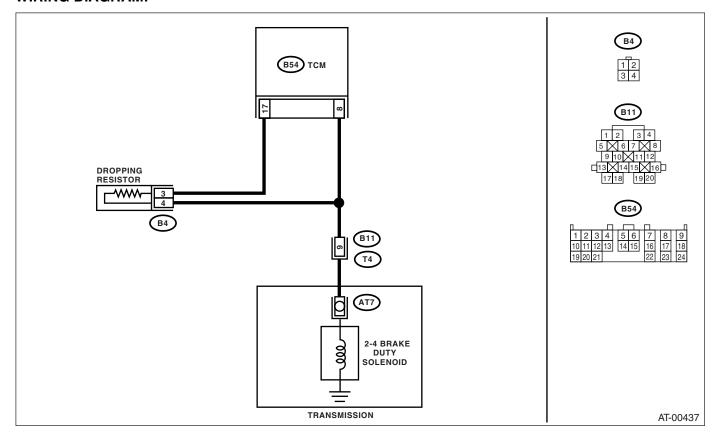
M: DTC 76 2-4 BRAKE DUTY SOLENOID

DIAGNOSIS:

The output signal circuit of 2-4 brake duty solenoid is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	CHECK DROPPING RESISTOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from dropping resistor. 3) Measure the resistance between dropping resistor terminal. Terminals No. 3 — No. 4:	Is the resistance 9 — 15 Ω ?	Go to step 2.	Replace the drop- ping resistor. <ref. to 4AT-78, Drop- ping Resistor.></ref.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR. 1) Disconnect the connector from TCM. 2) Measure the resistance of harness between TCM connector and dropping resistor connector. Connector & terminal (B54) No. 17 — (B4) No. 3:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair open circuit in harness between TCM and dropping resistor connector.
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR. Measure the resistance of harness between dropping resistor connector and chassis ground. Connector & terminal (B4) No. 3 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 4.	Repair short circuit in harness between TCM and dropping resistor connector.
4	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR. 1) Disconnect the connector from transmission. 2) Measure the resistance of harness between transmission and dropping resistor connector. Connector & terminal (B4) No. 4 — (B11) No. 9:	Is the resistance less than 1 Ω ?	Go to step 5.	Repair open circuit in harness between dropping resistor and trans- mission connector.
5	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR. Measure the resistance of harness between dropping resistor connector and chassis ground. Connector & terminal (B4) No. 4 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 6.	Repair short circuit in harness between dropping resistor and trans- mission connector.
6	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from transmission and TCM. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B54) No. 8 — (B11) No. 9:	Is the resistance less than 1 Ω ?	Go to step 7.	Repair the open circuit in harness between TCM and transmission connector.
7	CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND. Measure the resistance of harness between TCM and chassis ground. Connector & terminal (B54) No. 8 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 8.	Repair the short circuit in harness between TCM and transmission connector.

	Step	Check	Yes	No
8	CHECK 2-4 BRAKE DUTY SOLENOID. Measure the resistance between transmission connector receptacle's terminals. Terminals (T4) No. 16 — No. 9:	Is the resistance 2.0 — 4.5 Ω ?	Go to step 9.	Go to step 15.
9	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 12.	Go to step 10.
10	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect all connectors. 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 ATF reaches its operating temperature. 3) Turn the ignition switch to ON (engine OFF). 4) Move the select lever to "N" range. 5) Throttle fully closed. 6) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 8 (+) — Chassis ground (-):	Is the voltage 1.5 — 5.0 V?	Go to step 11.	Go to step 14.
11	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Throttle fully open and hold it. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 8 (+) — Chassis ground (-):	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 14.
12	CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. 1) Connect all connectors. 2) Connect the 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 ATF reaches its operating temperature. 5) Stop the engine and turn ignition switch to ON (engine OFF). 6) Move the select lever to "N" range. 7) Read the data of 2-4 brake duty solenoid using Subaru Select Monitor. • 2-4 brake duty solenoid is indicated in "%". 8) Throttle is fully closed.	Is the value 100%?	Go to step 13.	Go to step 14.

	Step	Check	Yes	No
13	CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. 1) Turn the ignition switch to ON (engine OFF). 2) Throttle is fully open.	Is the value less than 25%?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 14.
14	CHECK POOR CONTACT.	Is there poor contact in 2-4 brake duty solenoid circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
15	CHECK 2-4 BRAKE DUTY SOLENOID (IN TRANSMISSION). 1) Remove the transmission connector from bracket. 2) Drain the ATF. CAUTION: Do not drain the ATF until it cools down. 3) Remove the oil pan, and disconnect connector from 2-4 brake duty solenoid. 4) Measure the resistance between 2-4 brake duty solenoid connector and transmission ground. Terminals No. 1 — Transmission ground:	Is the resistance 2.0 — 4.5 Ω ?	Go to step 16.	Replace the 2-4 brake duty sole- noid. <ref. 4at-<br="" to="">70, Shift Sole- noids, Duty Sole- noids and ATF Temperature Sen- sor.></ref.>
16	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND 2-4 BRAKE DUTY SO-LENOID. Measure the resistance of harness between 2-4 brake duty solenoid and transmission connector. Connector & terminal (T4) No. 9 — (AT7) No. 1:	Is the resistance less than 1 Ω ?	Go to step 17.	Repair the open circuit in harness between 2-4 brake duty solenoid and transmission connector.
17	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND 2-4 BRAKE DUTY SO- LENOID. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 9 — Transmission ground:		Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in line pressure duty solenoid and transmission.	Repair the short circuit in harness between 2-4 brake duty solenoid and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

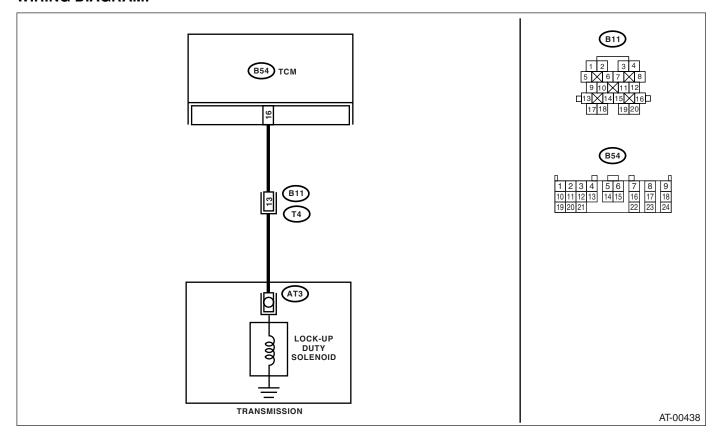
N: DTC 77 LOCK-UP DUTY SOLENOID

DIAGNOSIS:

The output signal circuit of lock-up duty solenoid is open or shorted.

TROUBLE SYMPTOM:

No "lock-up" (after engine warm-up).



	Step	Check	Yes	No
1	CHECK DIAGNOSTIC TROUBLE CODE (DTC).	Do multiple DTCs appear in the on-board diagnostics test mode?	Diagnose another DTC.	Go to step 2.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B54) No. 16 — (B11) No. 13:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit in harness between TCM and transmission connector.
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness connector between TCM and chassis ground. Connector & terminal (B54) No. 16 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair the short circuit in harness between TCM and transmission connector.
4	CHECK LOCK-UP DUTY SOLENOID. Measure the resistance between transmission connector receptacle's terminals. Connector & terminal (T4) No. 13 — No. 16:	Is the resistance 10 — 17 Ω ?	Go to step 5.	Go to step 11.
5	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 8.	Go to step 6.
6	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect the connectors to TCM and transmission. 2) Lift-up the vehicle and place safety stand. NOTE: Raise all wheels off ground. 3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).	Is the voltage more than 8.5 V?	Go to step 7.	Go to step 10.
	NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature. 4) Move the selector lever to "D" range and slowly increase vehicle speed to 75 km/h (47 MPH). Wheels will lock-up. 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 5) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 16 (+) — Chassis ground (-):</ref.>			

	Step	Check	Yes	No
7	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Return the engine to idling speed and move select lever to "N" range. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 16 (+) — Chassis ground (-):	Is the voltage less than 0.5 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 10.
8	CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. 1) Connect the connectors to TCM and transmission. 2) Lift-up the vehicle and place safety stand. NOTE: Raise all wheels off ground. 3) Connect the Subaru Select Monitor to data link connector. 4) Start the engine and turn Subaru Select Monitor switch to ON. 5) 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 ATF reaches its operating temperature. 6) Read the data of lock-up duty solenoid using Subaru Select Monitor. • Lock-up duty solenoid is indicated in "%". 7) Move the selector lever to "D" range and slowly increase vehicle speed to 75 km/h (47 MPH). Wheels will lock-up. 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""></ref.>		Go to step 9.	Go to step 10.
9	CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. Return the engine to idling speed and move selector lever to "N" range. 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""></ref.>		Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 10.

	Step	Check	Yes	No
10	CHECK POOR CONTACT.	Is there poor contact in lock-up duty solenoid circuit?	Repair poor contact.	Replace the TCM. <ref. 4at-77,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
11	CHECK LOCK-UP DUTY SOLENOID (IN TRANSMISSION). 1) Remove the transmission connector from bracket. 2) Drain the ATF. CAUTION: Do not drain the ATF until it cools down. 3) Remove the oil pan and disconnect connector from lock-up duty solenoid. 4) Measure the resistance between lock-up duty solenoid connector and transmission ground. Terminals No. 1 — Transmission ground:	Is the resistance 10 $-$ 17 Ω ?	Go to step 12.	Replace the lock- up duty solenoid. <ref. 4at-70,<br="" to="">Shift Solenoids, Duty Solenoids and ATF Tempera- ture Sensor.></ref.>
12	CHECK HARNESS CONNECTOR BETWEEN LOCK-UP DUTY SOLENOID AND TRANS-MISSION. Measure the resistance of harness between lock-up duty solenoid and transmission connector. Connector & terminal (T4) No. 13 — (AT3) No. 1:	Is the resistance less than 1 Ω ?	Go to step 13.	Repair the open circuit in harness between TCM and transmission connector.
13	CHECK HARNESS CONNECTOR BETWEEN LOCK-UP DUTY SOLENOID AND TRANS-MISSION. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 13 — Transmission ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in lock-up duty solenoid and transmission.	Repair the short circuit in harness between lock-up duty solenoid and transmission connector.

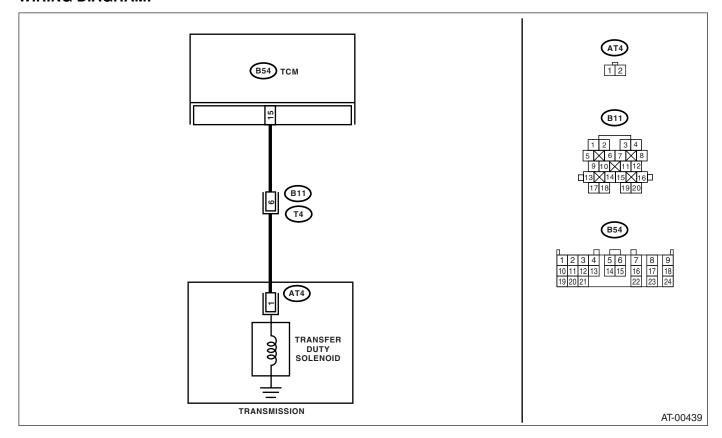
O: DTC 79 TRANSFER DUTY SOLENOID

DIAGNOSIS:

The output signal circuit of transfer duty solenoid is open or shorted.

TROUBLE SYMPTOM:

Excessive "braking" in tight corners.



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B54) No. 15 — (B11) No. 6:	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance harness connector between TCM and chassis ground. Connector & terminal (B54) No. 15 — Chassis ground:	ΜΩ?	Go to step 3.	Repair the short circuit in harness between TCM and transmission connector.
3	CHECK TRANSFER DUTY SOLENOID. Measure the resistance between transmission connector and transmission terminals. Connector & terminal (T4) No. 6 — No. 16:	Is the resistance 10 — 17 Ω ?	Go to step 4.	Go to step 10.
4	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 7.	Go to step 5.
5	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Connect the connectors to TCM and transmission. 2) Turn the ignition switch to ON (engine OFF). 3) Throttle is fully closed. 4) Move the select lever to "P" range. 5) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 15 (+) — Chassis ground (-):	Is the voltage more than 8.5 V?		Go to step 9.
6	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1) Move the select lever to "D" range. 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 15 (+) — Chassis ground (-):	Is the voltage 3.0 — 6.0 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 9.

	Step	Check	Yes	No
7	CHECK OUTPUT SIGNAL EMITTED FROM	Is the value 80 — 95%?	Go to step 8.	Go to step 9.
	TCM USING SUBARU SELECT MONITOR.			
	 Connect the connectors to TCM and trans- mission. 			
	Connect the Subaru Select Monitor to data			
	link connector.			
	 Turn the ignition switch to ON (engine OFF) and turn Subaru Select Monitor switch to ON. 			
	4) Move the select lever to "D" range with			
	throttle fully open (vehicle speed 0 km/h or 0 MPH).			
	Fead data of transfer duty solenoid using Subaru Select Monitor.			
	 Transfer duty solenoid is indicated in "%". 			
8	CHECK OUTPUT SIGNAL EMITTED FROM	Is the value approx. 5 — 15%?		Go to step 9.
	TCM USING SUBARU SELECT MONITOR.		TEMP warning	
	Move the select lever to "N" range with throttle fully closed (vehicle speed 0 km/h or 0		light illuminates, the circuit has	
	MPH).		returned to a nor-	
	2) Read the data of transfer duty solenoid		mal condition at	
	using Subaru Select Monitor.		this time. A tempo-	
	 Transfer duty solenoid is indicated in "%". 		rary poor contact of the connector or	
			harness may be	
			the cause. Repair	
			the harness or	
			connector in TCM and transmission.	
9	CHECK POOR CONTACT.	Is there poor contact in transfer		Replace the TCM.
ا	CHECK FOOR CONTACT.	duty solenoid circuit?	contact.	<ref. 4at-77,<="" td="" to=""></ref.>
		-		Transmission Con-
				trol Module
10	CHECK TRANSFER DUTY SOLENOID (IN	Is the resistance 10 — 17 Ω ?	Go to step 11.	(TCM).> Replace the trans-
	TRANSMISSION).	10 110 100 100 17 221		fer duty solenoid.
	1) Lift-up the vehicle and place safety stand.			
	NOTE: Raise all wheels off ground.			
	Drain the automatic transmission fluid.			
	CAUTION: Do not drain the automatic transmission fluid until it cools down.			
	3) Remove the extension case and disconnect			
	connector from transfer duty solenoid.			
	4) Measure the resistance between transfer			
	duty solenoid connector and transmission ground.			
	Connector & terminal			
	(AT4) No. 1 — Transmission ground:			
11	CHECK HARNESS CONNECTOR BETWEEN		Go to step 12.	Repair the open
	TRANSFER DUTY SOLENOID AND TRANS-	Ω ?		circuit in harness
	MISSION. Measure the resistance of harness between			between transfer duty solenoid and
	transfer duty solenoid and transmission con-			transmission con-
	nector.			nector.
	Connector & terminal			
I	(T4) No. 6 — (AT4) No. 1:			

	Step	Check	Yes	No
12	CHECK HARNESS CONNECTOR BETWEEN TRANSFER DUTY SOLENOID AND TRANS-MISSION. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 6 — Transmission ground:		TEMP warning light illuminates, the circuit has	Repair the short circuit in harness between transfer duty solenoid and transmission connector.

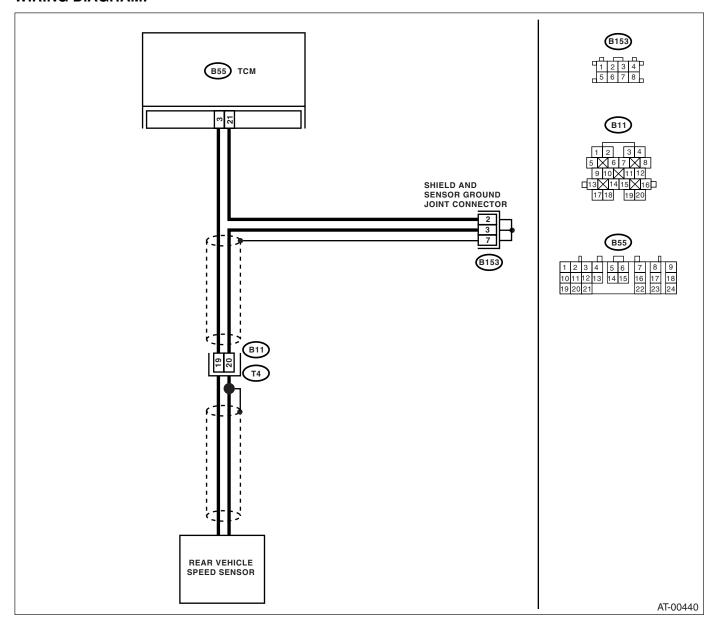
P: DTC 93 REAR VEHICLE SPEED SENSOR

DIAGNOSIS:

The input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

No lock-up or excessive tight corner "braking".



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from TCM and transmission. 3) Measure the resistance of harness between TCM and transmission connector. Connector & terminal		Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
2	(B55) No. 3 — (B11) No. 19: CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and transmission connector. Connector & terminal (B55) No. 21 — (B11) No. 20:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit in harness between TCM and transmission, and poor contact in coupling connector.
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and chassis ground. Connector & terminal (B55) No. 3 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 4.	Repair the short circuit in harness between TCM and transmission connector.
4	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and chassis ground. Connector & terminal (B55) No. 21 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 5.	Repair the short circuit in harness between TCM and transmission connector.
5	CHECK REAR VEHICLE SPEED SENSOR. Measure the resistance between transmission connector receptacle's terminals. Connector & terminal (T4) No. 19 — No. 20:	Is the resistance 450 — 650 Ω ?	Go to step 6.	Replace the rear vehicle speed sen- sor. <ref. 4at-<br="" to="">58, Rear Vehicle Speed Sensor.></ref.>
6	PREPARE OSCILLOSCOPE.	Do you have an oscilloscope?	Go to step 10.	Go to step 7.
7	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 9.	Go to step 8.
8	CHECK INPUT SIGNAL FOR TCM. 1) Connect the connectors to TCM and transmission. 2) Lift-up or raise the vehicle and place safety stands. NOTE: Raise all wheels off floor. 3) Start the engine and set vehicle in 20 km/h (12 MPH) condition. 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. <ref. abs-23,="" clear="" memory="" mode.="" to=""> 4) Measure the voltage between TCM connector terminals. Connector & terminal (B55) No. 3 (+) — (B55) No. 21 (-):</ref.>	Is the voltage more than AC 1 V?	Even if the AT OIL TEMP warning light illuminates, 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 the harness or connector in TCM and transmission.	Go to step 11.

	Step	Check	Yes	No
9	CHECK INPUT SIGNAL FOR TCM USING	Does the speedometer indica-		Go to step 11.
	SUBARU SELECT MONITOR.	tion increase as the Subaru	TEMP warning	
	Connect the connectors to TCM and trans- mission	Select Monitor data increases?	light illuminates,	
	mission. 2) Connect the Subaru Select Monitor to data		the circuit has returned to a nor-	
	link connector.		mal condition at	
	3) Lift-up or raise the vehicle and place safety		this time. A tempo-	
	stands.		rary poor contact	
	NOTE:		of the connector or	
	Raise all wheels off floor.		harness may be	
	4) Turn the ignition switch to ON and turn Sub-		the cause. Repair	
	aru Select Monitor switch to ON.		the harness or connector in TCM	
	5) Start the engine.		and transmission.	
	Read the data of vehicle speed using Sub- aru Select Monitor.		and transmission.	
	 Compare the speedometer with Subaru 			
	Select Monitor indications.			
	 Vehicle speed is indicated in "km/h" or 			
	"MPH".			
	7) Slowly increase the vehicle speed to 60 km/			
	h or 37 MPH.			
	NOTE:			
	The speed difference between front and rear wheels may light the ABS warning light, but this			
	indicates no malfunction. When AT control di-			
	agnosis is finished, perform the ABS memory			
	clearance procedure. <ref. abs-23,="" clear<="" td="" to=""><td></td><td></td><td></td></ref.>			
	Memory Mode.>			
10	CHECK INPUT SIGNAL FOR TCM USING	Is the signal voltage more than		Go to step 11.
	OSCILLOSCOPE.	AC 1 V?	TEMP warning	
	Connect the connectors to TCM and trans-		light illuminates,	
	mission. 2) Lift-up or raise the vehicle and place safety		the circuit has returned to a nor-	
	stands.		mal condition at	
	NOTE:		this time. A tempo-	
	Raise all wheels off floor.		rary poor contact	
	3) Set the oscilloscope to TCM connector ter-		of the connector or	
	minals.		harness may be	
	Connector & terminal		the cause. Repair	
	Positive probe; (B55) No. 3:		the harness or connector in TCM	
	Ground lead; (B55) No. 21:		and transmission.	
	4) Start the engine and set vehicle in 20 km/h(12 MPH) condition.			
	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. <ref. abs-23,="" clear<="" td="" to=""><td></td><td></td><td></td></ref.>			
	Memory Mode.>			
	5) Measure the signal voltage indicated on			
	oscilloscope.			
11	CHECK POOR CONTACT.	Is there poor contact in rear	Repair the poor	Replace the TCM.
		vehicle speed sensor circuit?	contact.	<ref. 4at-77,<="" td="" to=""></ref.>
				Transmission Con-
				trol Module (TCM).>
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