14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

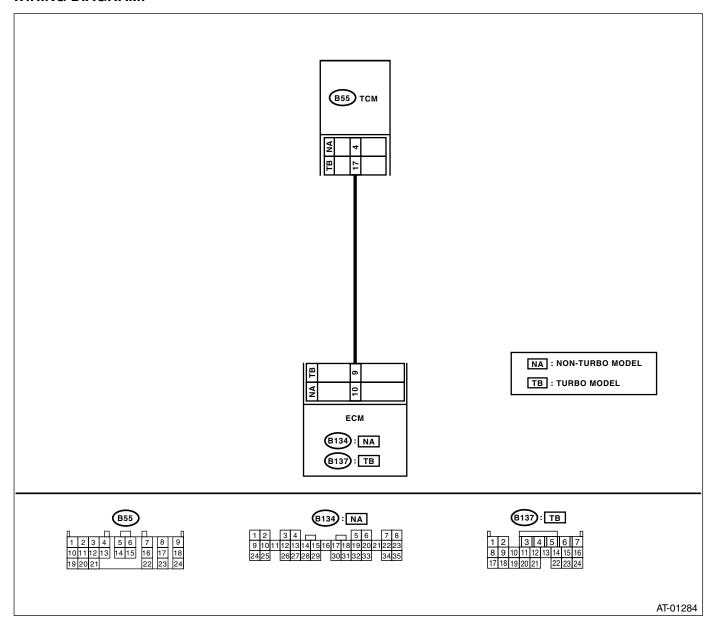
A: DTC 11 ENGINE SPEED SIGNAL

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".



Γ	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. 1)Turn the ignition switch to OFF. 2)Disconnect the connectors from TCM and ECM.	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and ECM connector.
	3)Measure the resistance of harness between TCM and ECM connector. Connector & terminal NON-TURBO MODEL (B55) No. 4 — (B134) No. 10: TURBO MODEL (B55) No. 17 — (B137) No. 9:			
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal NON-TURBO MODEL (B55) No. 4 — Chassis ground: TURBO MODEL (B55) No. 17 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	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 NON-TURBO MODEL (B55) No. 4 (+) — Chassis ground (-): TURBO MODEL (B55) No. 17 (+) — 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.
7	CHECK POOR CONTACT. CONFIRM DTC 11.	Is there poor contact in engine speed signal circuit? Replace the ECM with a new one. Does the DTC appear	Repair the poor contact. Replace the TCM. <ref. 4at-67,<="" th="" to=""><th>Go to step 7. Replace the ECM.</th></ref.>	Go to step 7. Replace the ECM.
		again, after memory has been cleared?	Transmission Control Module (TCM).>	

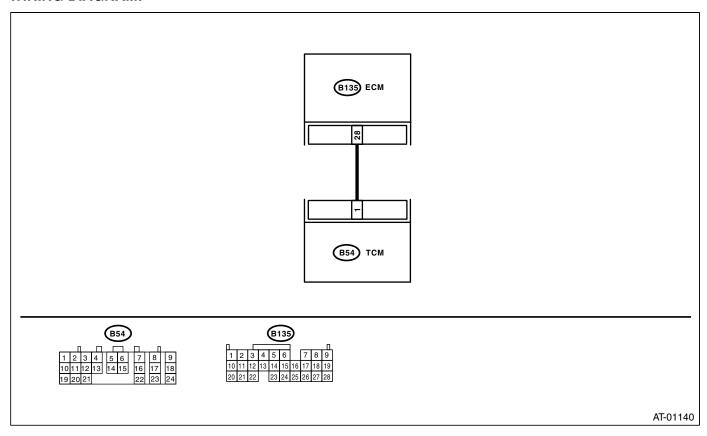
B: DTC 23 MASS AIR FLOW SIGNAL (TURBO MODEL)

DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.



Step	Check	Yes	No
1 CHECK ENGINE GROUND TERMINALS AN GROUND CIRCUIT OF ECM. <ref. (dtc).="" 31="" 4at-44,="" code="" diagnostic="" dtc="" position="" procedure="" sensor,="" throttle="" to="" trouble="" with=""></ref.>	·	Repair the ground terminal and/or ground circuit of ECM.	Go to step 2.
2 CHECK HARNESS CONNECTOR BETWEE TCM AND ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from TCM and ECM. 3) Measure the resistance of harness betwee TCM and ECM connector. Connector & terminal (B54) No. 1 — (B135) No. 28:	Ω?	Go to step 3.	Repair the open circuit in harness between TCM and ECM connector.
3 CHECK HARNESS CONNECTOR BETWEE TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B54) No. 1 — Chassis ground:	N Is the resistance more than 1 M Ω ?	Go to step 4.	Repair the short circuit in harness between TCM and ECM connector.
4 PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 6.	Go to step 5.

	Step	Check	Yes	No
5	Step CHECK INPUT SIGNAL FOR TCM. 1)Connect the 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 ATF reaches its operating temperature. 3)Idle the engine. 4)Measure the voltage between TCM connec-	Check Is the voltage 0.9 — 1.4 V?	Yes Even if the AT OIL TEMP warning light illuminates, the circuit has returned to a nor- mal condition at this time. A tempo- rary poor contact of the connector or harness may be the cause. Repair	No Go to step 7.
6	tor and chassis ground. Connector & terminal (B54) No. 1 (+) — Chassis ground (-): CHECK INPUT SIGNAL FOR TCM USING	Is the value voltage 0.9 — 1.4	harness or con- nector in the TCM and ECM. Even if the AT OIL	Go to step 7.
	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 the 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 mass air flow sensor signal using Subaru Select Monitor. • Display shows the mass air flow sensor signal value sent from ECM.	V?	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 harness or connector in the TCM and ECM.	
7	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal cir- cuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

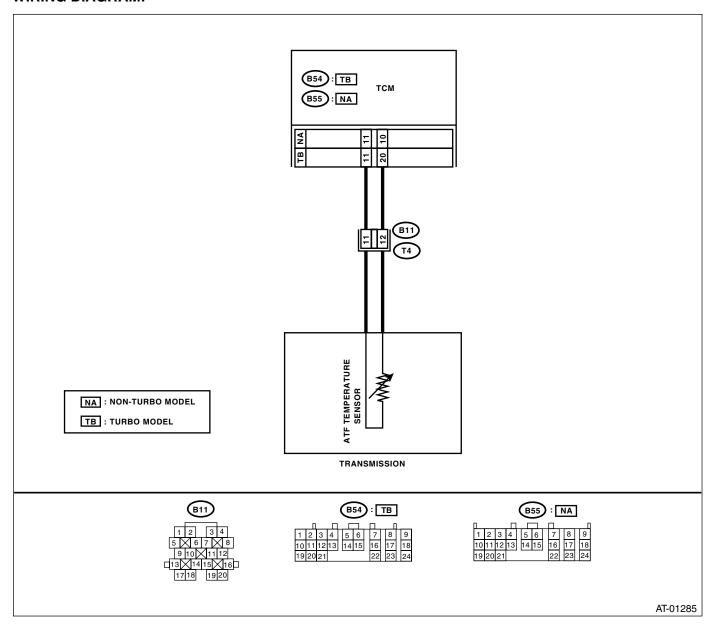
C: DTC 27 ATF TEMPERATURE SENSOR

DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.



Step	Chec	k Yes	No
1 CHECK HARNESS CONNECTOR B	ETWEEN Is the resistance le	ess than 1 Go to step 2.	Repair the open
TCM AND ATF TEMPERATURE SE			circuit in harness
1)Turn the ignition switch to OFF.			between TCM and
2)Disconnect the connector from tran	smission		transmission con-
and TCM.			nector.
3)Measure the resistance of harness	between		
TCM and transmission connector.			
Connector & terminal			
NON-TURBO MODEL (B55) No. 10 — (B11) No. 12:			
TURBO MODEL			
(B54) No. 20 — (B11) No. 12:			
2 CHECK HARNESS CONNECTOR B	ETWEEN Is the resistance le	ess than 1 Go to step 3.	Repair the open
TCM AND ATF TEMPERATURE SE		ess man i do to step 3.	circuit in harness
Measure the resistance of harness b			between TCM and
TCM and transmission connector.	5.W0011		transmission con-
Connector & terminal			nector.
NON-TURBO MODEL			
(B55) No. 11 — (B11) No. 11:			
TURBO MODEL			
(B54) No. 11 — (B11) No. 11:			
3 CHECK HARNESS CONNECTOR B	ETWEEN Is the resistance n	nore than 1 Go to step 4.	Repair the short
TCM AND ATF TEMPERATURE SE		do to step 4.	circuit in harness
Measure the resistance of harness b			between TCM and
TCM connector and chassis ground.			transmission con-
Connector & terminal			nector.
NON-TURBO MODEL			
(B55) No. 10 — Chassis groun	d:		
TURBO MODEL			
(B54) No. 20 — Chassis groun	d:		
4 CHECK HARNESS CONNECTOR B		nore than 1 Go to step 5.	Repair the short
TCM AND ATF TEMPERATURE SE			circuit in harness
Measure the resistance of harness b	etween		between TCM and
TCM connector and chassis ground.			transmission con-
Connector & terminal			nector.
NON-TURBO MODEL			
(B55) No. 11 — Chassis groun	a:		
TURBO MODEL	-d-		
(B54) No. 11 — Chassis groun		N== 0== 0 : : -	
5 CHECK ATF TEMPERATURE SENS		275 — 375 Go to step 6.	Replace the ATF
1)Turn the ignition switch to OFF.	Ω ?		temperature sen-
2)Connect the connectors to transmi TCM.	ssion and		sor. <ref. 4at-<="" th="" to=""></ref.>
1	stort		61, Shift Sole-
3)Turn the ignition switch to ON and engine.	olait		noids, Duty Sole- noids and ATF
4)Warm-up the transmission until AT	temper-		Temperature Sen-
ature reaches to 80°C (176°F).			sor.>
NOTE:			
If ambient temperature is below 0°	C (32°F),		
drive the vehicle until ATF reaches its			
temperature.			
5)Disconnect the connector from trar	smission.		
6)Measure the resistance between tr			
sion connector terminals.			
Connector & terminal			
(T4) No. 11 — No. 12:			

	Step	Check	Yes	No
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="">61, 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.
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 NON-TURBO MODEL (B55) No. 11 (+) — No. 10 (-): TURBO MODEL (B54) No. 11 (+) — No. 20 (-):	Is the voltage 0.4 — 0.9 V?	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-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

D: DTC 31 THROTTLE POSITION SENSOR

DIAGNOSIS:

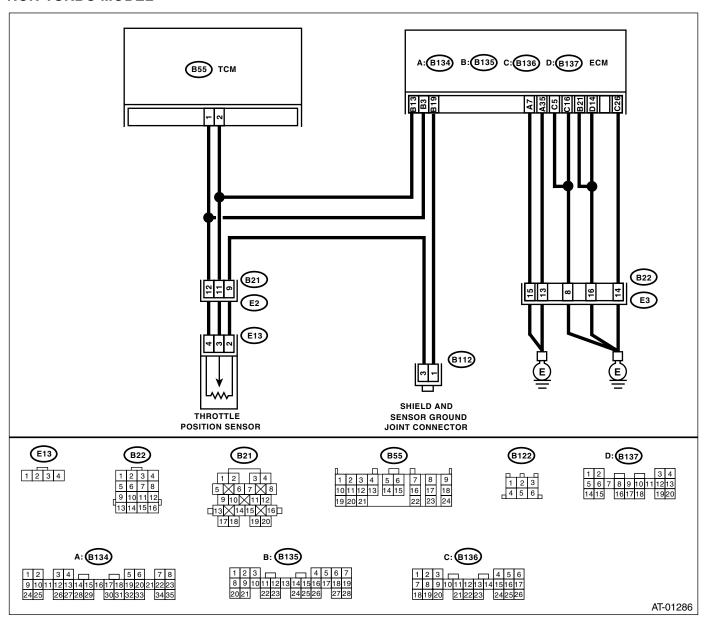
The input signal circuit of throttle position sensor is open or shorted.

TROUBLE SYMPTOM:

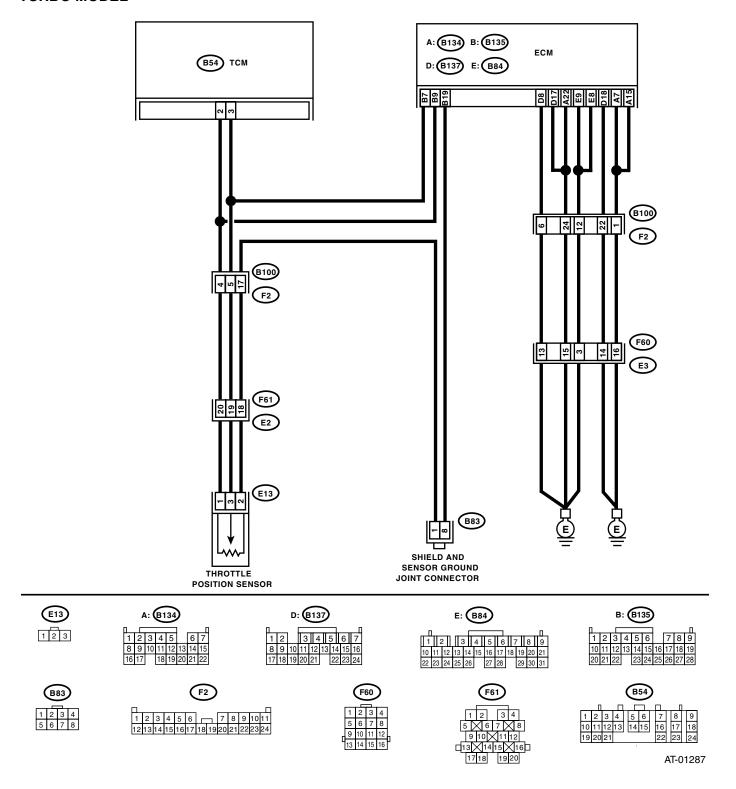
Shift point too high or too low; excessive shift shock; excessive tight corner "braking".

WIRING DIAGRAM:

NON-TURBO MODEL



TURBO MODEL



Step		Check	Yes	No
1 CHECK ENGINE GROUND 1	TERMINALS.	Have engine ground terminals been tightened?	Go to step 2.	Tighten the engine ground terminals.
2 CHECK GROUND CIRCUIT (1) Turn the ignition switch to C2) Disconnect the connector fr 3) Measure the resistance of PECM and engine ground. Connector & terminal NON-TURBO MODEL (B134) No. 35 — Engine (B135) No. 21 — Engine (B136) No. 5 — Engine (B136) No. 16 — Engine (B137) No. 14 — Engine (B137) No. 14 — Engine (B134) No. 7 — Engine (B134) No. 7 — Engine (B134) No. 15 — Engine (B134) No. 15 — Engine (B134) No. 17 — Engine (B137) No. 18 — Engine (B84) No. 8 — Engine g (B84) No. 9 — Engine g	operations of the second of th	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 1) Disconnect the connector from tion sensor. 2) Measure the resistance beth position sensor connector reconals. Terminals NON-TURBO MODEL No. 4 — No. 2: TURBO MODEL No. 1 — No. 2:	ON SENSOR. com throttle posi-	Is the resistance $3.0-4.2$ k Ω ?	Go to step 4.	Replace the throt- tle position sensor.
4 CHECK THROTTLE POSITION Measure the resistance between tion sensor connector receptant transport of the sen	een throttle posi-	Is the resistance 0.35 — 0.5 $k\Omega$?	Go to step 5.	Replace the throt- tle position sensor.
5 CHECK HARNESS CONNECT TCM AND THROTTLE POSITE 1) Disconnect the connector from 2) Measure the resistance of the TCM and throttle position sen Connector & terminal NON-TURBO MODEL (B55) No. 2 — (E13) No. TURBO MODEL (B54) No. 3 — (E13) No.	TION SENSOR. om TCM. narness between sor connector.	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 CONNECT TCM AND THROTTLE POSITE Measure the resistance of hat TCM and throttle position sen Connector & terminal NON-TURBO MODEL (B55) No. 1 — (E13) No. TURBO MODEL (B54) No. 2 — (E13) No.	rness between sor connector.	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.

	Step	Check	Yes	No
7	CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal NON-TURBO MODEL	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 8.	Repair the short circuit in harness between TCM and throttle position sensor connector.
	(B55) No. 2 — Chassis ground: TURBO MODEL (B54) No. 3 — Chassis ground:			
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.
9	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM and ECM connector. Connector & terminal NON-TURBO MODEL (B55) No. 2 — (B135) No. 13: TURBO MODEL (B54) No. 3 — (B135) No. 7:	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 NON-TURBO MODEL (B55) No. 1 — (B135) No. 3: TURBO MODEL (B54) No. 2 — (B135) No. 9:	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 NON-TURBO MODEL (B55) No. 2 (+) — Chassis ground (-): TURBO MODEL (B54) No. 3 (+) — 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 NON-TURBO MODEL (B55) No. 2 (+) — Chassis ground (-): TURBO MODEL (B54) No. 3 (+) — Chassis ground (-):	Is the voltage 4.2 — 4.7 V?	Go to step 16.	Go to step 18.

	Step	Check	Yes	No
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.
16	CHECK INPUT SIGNAL FOR TCM (THROT-TLE POSITION SENSOR POWER SUPPLY). Measure the voltage between TCM connector and chassis ground. Connector & terminal NON-TURBO MODEL (B55) No. 1 (+) — Chassis ground (-): TURBO MODEL (B54) No. 2 (+) — 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?		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-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

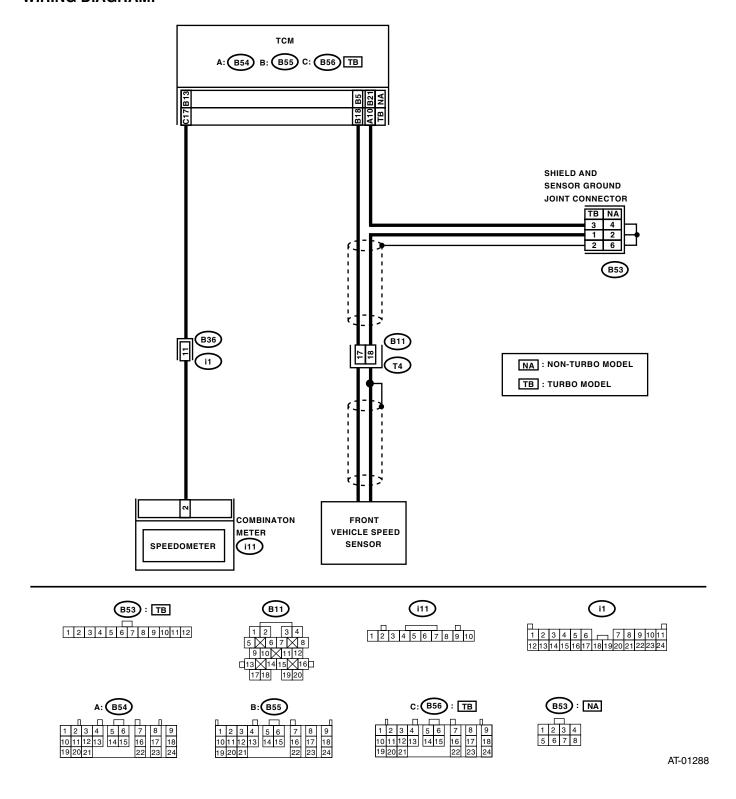
E: DTC 33 FRONT VEHICLE SPEED SENSOR

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		Go to step 2.	Repair the open
'	TCM AND TRANSMISSION.	Ω ?	do to step 2.	circuit in harness
	1)Turn the ignition switch to OFF.			between TCM and
	2)Disconnect the connector from TCM and			transmission con-
	transmission.			nector.
	3)Measure the resistance of harness between			
	TCM and transmission connector.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B55) No. 5 — (B11) No. 17:			
	TURBO MODEL			
	(B55) No. 18 — (B11) No. 17:			
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
	Measure the resistance of harness between			between TCM and
	TCM and transmission connector.			transmission con-
	Connector & terminal			nector, and poor
	NON-TURBO MODEL			contact in cou-
	(B55) No. 21 — (B11) No. 18:			pling connector.
	TURBO MODEL			
	(B54) No. 10 — (B11) No. 18:			
3	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 4.	Repair the short
	TCM AND TRANSMISSION.	ΜΩ?	·	circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and transmission connector.			transmission con-
	Connector & terminal			nector.
	NON-TURBO MODEL			
	(B55) No. 21 — Chassis ground:			
	TURBO MODEL			
	(B54) No. 10 — Chassis ground:			
4	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 5.	Repair the short
	TCM AND TRANSMISSION.	ΜΩ?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and transmission connector.			transmission con-
	Connector & terminal			nector, and poor
	NON-TURBO MODEL			contact in cou-
	(B55) No. 5 — Chassis ground:			pling connector.
	TURBO MODEL			
	(B55) No. 18 — Chassis ground:			
5	CHECK FRONT VEHICLE SPEED SENSOR.	Is the resistance 450 — 650	Go to step 6.	Replace the front
	Measure the resistance between transmission	Ω ?		vehicle speed sen-
	connector receptacle's terminals.			sor. <ref. 4at-<="" th="" to=""></ref.>
	Connector & terminal			49, Front Vehicle
	(T4) No. 17 — No. 18:			Speed Sensor.>
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	Go to step 10.	Go to step 8.
		Monitor?		

	Step	Check	Yes	No
8		Is the voltage more than AC 1	Even if the AT OIL	Go to step 11.
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 of on-board diagnostics system. <ref. abs-21,="" clear="" memory="" mode.="" to=""> 4)Measure the voltage between TCM connector terminals. Connector & terminal NON-TURBO MODEL (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.
	TURBO MODEL (B55) No. 18 (+) — (B54) No. 10 (-):			
0		Is the voltage more than AC 4	Even if the AT OIL	Go to stop 11
9	CHECK FRONT VEHICLE SPEED SENSOR 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 NON-TURBO MODEL Positive probe; (B55) No. 5: Ground lead; (B55) No. 21: TURBO MODEL Positive probe; (B55) No. 18: Ground lead; (B54) No. 10: 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 AT control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <ref. abs-21,="" clear="" memory="" mode.="" to=""> 5) Measure the signal voltage indicated on oscilloscope.</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.

	Step	Check	Yes	No
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 of on-board diagnostics system. <ref. abs-21,="" 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 connector or harness may be the cause. Repair the harness or connector in front vehicle speed sensor circuit.	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-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

F: DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR

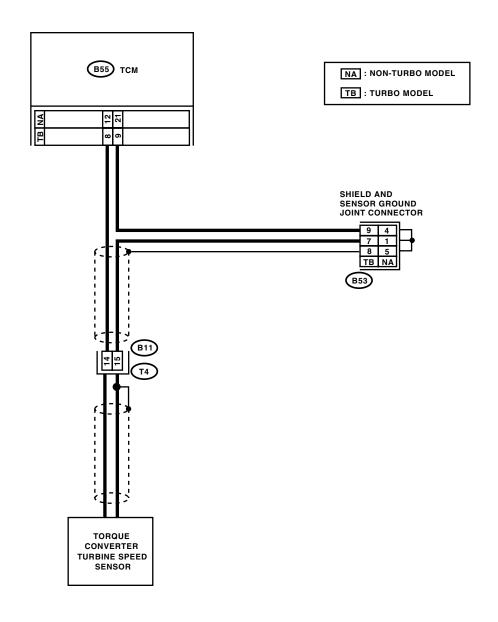
DIAGNOSIS:

The input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

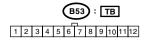
Excessive shift shock.

WIRING DIAGRAM:











AT-01289

Step	Check	Yes	No
1 CHECK TORQUE CONVERTER TURBINE SPEED SENSOR. 1) Turn the ignition switch to OFF. 2) Disconnect the connector from transmission. 3) Measure the resistance between transmission connector receptacle's terminals. Connector & terminal (T4) No. 14 — No. 15:	Is the resistance 450 — 650 Ω ?	Go to step 2.	Replace the tur- bine speed sen- sor. <ref. 4at-<br="" to="">54, Torque Con- verter Turbine Speed Sensor.></ref.>
2 CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1)Disconnect the connector from TCM. 2)Measure the resistance of harness between TCM and transmission connector. Connector & terminal NON-TURBO MODEL (B55) No. 12 — (B11) No. 14: TURBO MODEL (B55) No. 8 — (B11) No. 14:	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 between TCM and transmission connector. Connector & terminal NON-TURBO MODEL (B55) No. 21 — (B11) No. 15: TURBO MODEL (B55) No. 9 — (B11) No. 15:	Is the resistance less than 1 Ω ?	Go to step 4.	Repair the open circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
4 CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and chassis ground. Connector & terminal NON-TURBO MODEL (B55) No. 21 — Chassis ground: TURBO MODEL (B55) No. 9 — Chassis ground:	ΜΩ?	Go to step 5.	Repair the short circuit in harness between TCM and transmission connector.
5 CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and chassis ground. Connector & terminal NON-TURBO MODEL (B55) No. 12 — Chassis ground: TURBO MODEL (B55) No. 8 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega\mbox{?}$	Go to step 6.	Repair the short circuit in harness between TCM and transmission con- nector, and poor contact in cou- pling connector.
6 PREPARE OSCILLOSCOPE. 7 PREPARE SUBARU SELECT MONITOR.	Do you have an oscilloscope? Do you have a Subaru Select Monitor?	Go to step 10. Go to step 9.	Go to step 7 . Go to step 8 .

	Step	Check	Yes	No
8	CHECK INPUT SIGNAL FOR TCM. 1) Connect the connectors to TCM and transmission. 2) Start the engine and move select lever to "P" or "N" range. 3) Measure the voltage between TCM connector terminals. Connector & terminal NON-TURBO MODEL (B55) No. 12 (+) — No. 21 (-): TURBO MODEL (B55) No. 8 (+) — No. 9 (-):	Is the voltage more than AC 1 V?		Go to step 11.
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 NON-TURBO MODEL Positive probe; (B55) No. 12: Ground lead; (B55) No. 21: TURBO MODEL Positive probe; (B55) No. 8: Ground lead; (B55) No. 9: 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-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

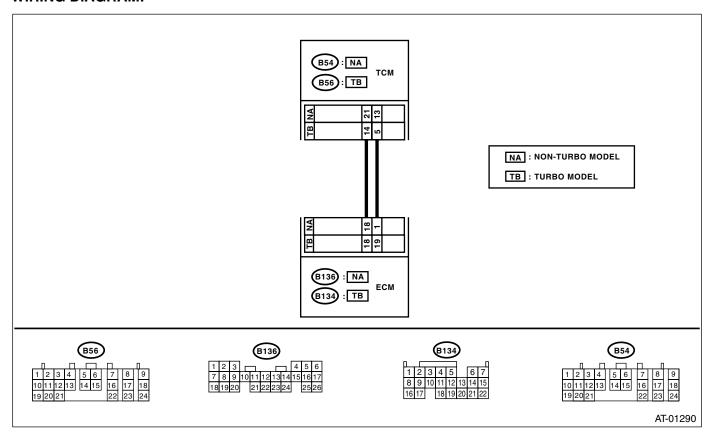
G: DTC 38 TORQUE CONTROL SIGNAL

DIAGNOSIS:

• The signal circuit is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.



Step	Check	Yes	No
1 CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from TCM and ECM. 3) Measure the resistance of harness between TCM and ECM connector. Connector & terminal NON-TURBO MODEL (B54) No. 21 — (B136) No. 18: (B54) No. 13 — (B136) No. 1: TURBO MODEL (B56) No. 14 — (B134) No. 18: (B56) No. 5 — (B134) No. 19:	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and ECM connector.

	Step	Check	Yes	No
2	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 3.	Repair the short
	TCM AND ECM.	ΜΩ?	•	circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM connector and chassis ground.			ECM connector.
	Connector & terminal			
	NON-TURBO MODEL			
	(B54) No. 21 — Chassis ground:			
	(B54) No. 13 — Chassis ground:			
	TURBO MODEL			
	(B56) No. 14 — Chassis ground:			
	(B56) No. 5 — Chassis ground:			
3	CHECK OUTPUT SIGNAL EMITTED FROM	Is the voltage more than 4.8 V?		Go to step 4.
	TCM.		TEMP warning	
	1)Connect the connectors to TCM and ECM.		light illuminates,	
	2)Turn the ignition switch to ON (engine OFF).		the circuit has	
	3)Measure the voltage between TCM connec-		returned to a nor- mal condition at	
	tor terminals. Connector & terminal			
	NON-TURBO MODEL		this time. A temporary poor contact	
	(B54) No. 21 (+) — Chassis ground (–):		of the connector or	
	(B54) No. 13 (+) — Chassis ground (–):		harness may be	
	TURBO MODEL		the cause. Repair	
	(B56) No. 14 (+) — Chassis ground (–):		the harness or	
	(B56) No. 5 (+) — Chassis ground (–):		connector in TCM	
			and ECM.	
4	CHECK POOR CONTACT.	Is there poor contact in torque	Repair the poor	Go to step 5.
		control signal circuit?	contact.	
5	CHECK GROUND LINE BETWEEN TRANS-	Is there any dirt or rust at the	Remove dirt and	Go to step 6.
	MISSION AND BODY.	ground line installing point?	rust.	
	Check installing condition of the ground line in			
	transmission and body.			
6	CHECK GROUND LINE BETWEEN TRANS-	Is the tightening torque value	Go to step 7.	Tighten to the
	MISSION AND BODY.	within specification?		specified torque.
	Check installing condition of the ground line in			
	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?	ao io siep s.	specified torque.
	1)Drain the ATF and remove oil pan.	Within Specification:		opcomed torque.
	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-			
	lb)			
8	CHECK GROUND CIRCUIT OF ECM.	Is there any trouble?	Repair the ground	Go to step 9.
	<ref. 31="" 4at-44,="" dtc="" posi-<="" td="" throttle="" to=""><td>_</td><td>terminal and/or</td><td></td></ref.>	_	terminal and/or	
	TION SENSOR, Diagnostic Procedure with		ground circuit of	
	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. Connector & terminal	Is each voltage more than 4 V?	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>	Replace the ECM.
	NON-TURBO MODEL (B54) No. 21 (+) — Chassis ground (-): (B54) No. 13 (+) — Chassis ground (-): TURBO MODEL (B56) No. 14 (+) — Chassis ground (-): (B56) No. 5 (+) — Chassis ground (-):			

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

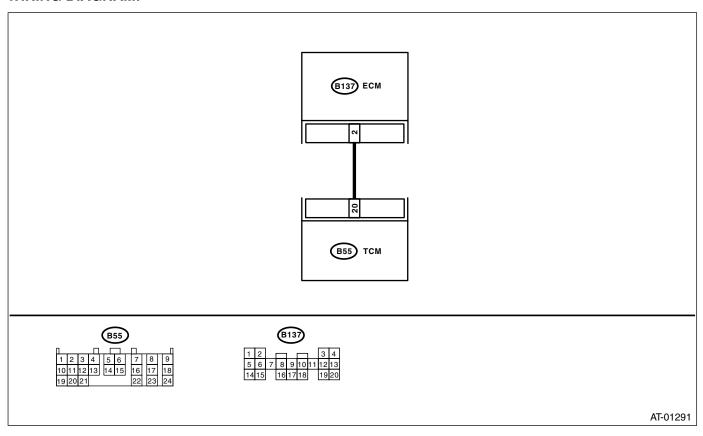
AUTOMATIC TRANSMISSION (DIAGNOSTICS)

H: DTC 45 INTAKE MANIFOLD PRESSURE SIGNAL (NON-TURBO MODEL) DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.



	Step	Check	Yes	No
1	CHECK ENGINE GROUND TERMINALS AND GROUND CIRCUIT OF ECM <ref. (dtc).="" 31="" 4at-44,="" code="" diagnostic="" dtc="" position="" procedure="" sensor,="" throttle="" to="" trouble="" with=""></ref.>	Is there any trouble?	Repair the ground terminal and/or ground circuit of ECM.	Go to step 2.
2	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. 1) Turn the ignition switch to OFF. 2) Disconnect the connectors from TCM and ECM. 3) Measure the resistance of harness between TCM and ECM connector. Connector & terminal (B55) No. 20 — (B137) No. 2:	Is the resistance less than 1 Ω ?	Go to step 3.	Repair the open circuit in harness between TCM and ECM connector.
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B55) No. 20 — Chassis ground:	Is the resistance more than 1 $\mbox{M}\Omega ?$	Go to step 4.	Repair the short circuit in harness between TCM and ECM connector.
4	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 6.	Go to step 5.

	Step	Check	Yes	No
5	CHECK INPUT SIGNAL FOR TCM. 1)Connect the 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 ATF reaches its operating temperature. 3)Idle the engine. 4)Measure the voltage between TCM connector and chassis ground. Connector & terminal (B55) No. 20 (+) — Chassis 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 TCM and ECM.	
6	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 intake manifold pressure signal using Subaru Select Monitor. •Display shows the intake manifold pressure signal value sent from ECM.	Is the value voltage 0.4 — 1.6 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 7.
7	CHECK POOR CONTACT.	Is there poor contact in intake manifold pressure signal cir- cuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

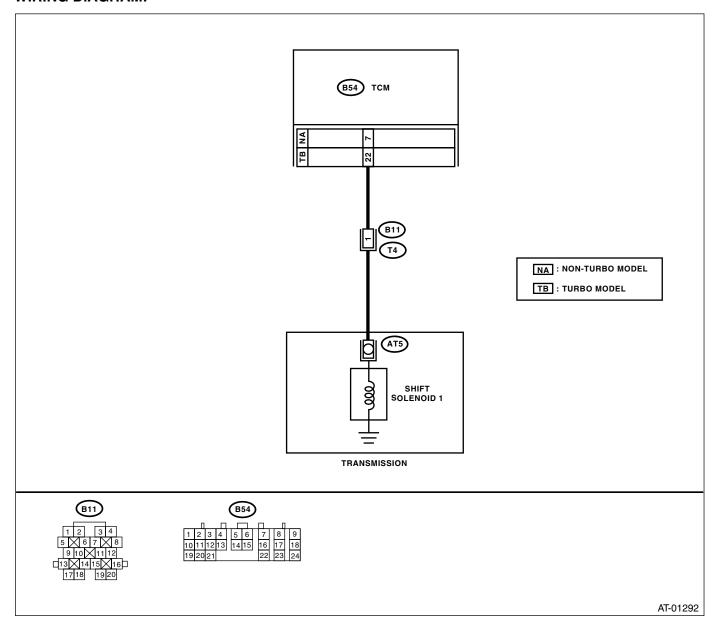
I: DTC 71 SHIFT SOLENOID 1

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 NON-TURBO MODEL (B54) No. 7 — (B11) No. 1: TURBO MODEL (B54) No. 22 — (B11) 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	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal NON-TURBO MODEL (B54) No. 7 — Chassis ground: TURBO MODEL (B54) No. 22 — 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 NON-TURBO MODEL (B54) No. 7 (+) — Chassis ground (-): TURBO MODEL (B54) No. 22 (+) — 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 NON-TURBO MODEL (B54) No. 7 (+) — Chassis ground (-): TURBO MODEL (B54) No. 22 (+) — 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-67,<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-61, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.></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		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.

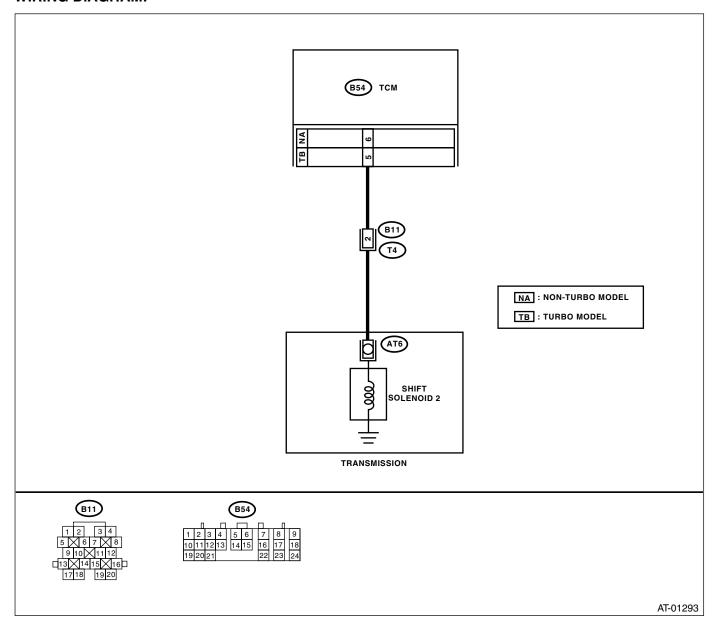
J: DTC 72 SHIFT SOLENOID 2

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.	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness
	1)Turn the ignition switch to OFF.			between TCM and
	2)Disconnect the connector from TCM and			transmission con-
	transmission.			nector.
	3)Measure the resistance of harness between			
	TCM and shift solenoid 2 connector.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B54) No. 6 — (B11) No. 2:			
	TURBO MODEL			
	(B54) No. 5 — (B11) No. 2:			
2	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 3.	Repair the short
	TCM AND TRANSMISSION.	ΜΩ?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM connector and transmission ground.			transmission con-
	Connector & terminal			nector.
	NON-TURBO MODEL			
	(B54) No. 6 — Chassis ground:			
	TURBO MODEL			
	(B54) No. 5 — Chassis ground:			
3	CHECK SHIFT SOLENOID 2.	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 6.
	Measure the resistance between transmission			
	connector terminals.			
	Connector & terminal			
	(T4) No. 2 — No. 16:			
4	CHECK OUTPUT SIGNAL EMITTED FROM	Is the voltage less than 1 V?	Even if the AT OIL	Go to step 5.
	TCM.		TEMP warning	
	1)Connect the connectors to TCM and trans-		light illuminates,	
	mission.		the circuit has	
	2)Lift-up or raise the vehicle and support with		returned to a nor-	
	safety stand.		mal condition at	
	NOTE:		this time. A temporary poor contact	
	Raise all wheels off ground.		of the connector or	
	3)Start the engine and warm-up the transmis-		harness may be	
	sion until ATF temperature is above 80°C		the cause. Repair	
	(176°F).		the harness or	
	NOTE: If ambient temperature is below 0°C (32°F),		connector in TCM	
	drive the vehicle until ATF reaches its operating		and transmission.	
	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 di-			
	agnosis is finished, perform the ABS memory			
	clearance procedure of on-board diagnostics			
	system. <ref. abs-21,="" clear="" memory<="" td="" to=""><td></td><td></td><td></td></ref.>			
	Mode.>			
	5)Measure the voltage between TCM connec-			
	tor and chassis ground.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B54) No. 6 (+) — Chassis ground (–):			
	TURBO MODEL			
	(B54) No. 5 (+) — Chassis ground (–):			

	Step	Check	Yes	No
5	CHECK POOR CONTACT.	Is there poor contact in shift solenoid 2 circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
6	CHECK SHIFT SOLENOID 2 (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 shift solenoid 2. 4)Measure the resistance between shift solenoid 2 connector and transmission ground. Terminals No. 1 — Transmission ground:		Go to step 7.	Replace the shift solenoid 2. <ref. to 4AT-61, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.></ref.
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 solenoid 2 and transmission 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 trans- mission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

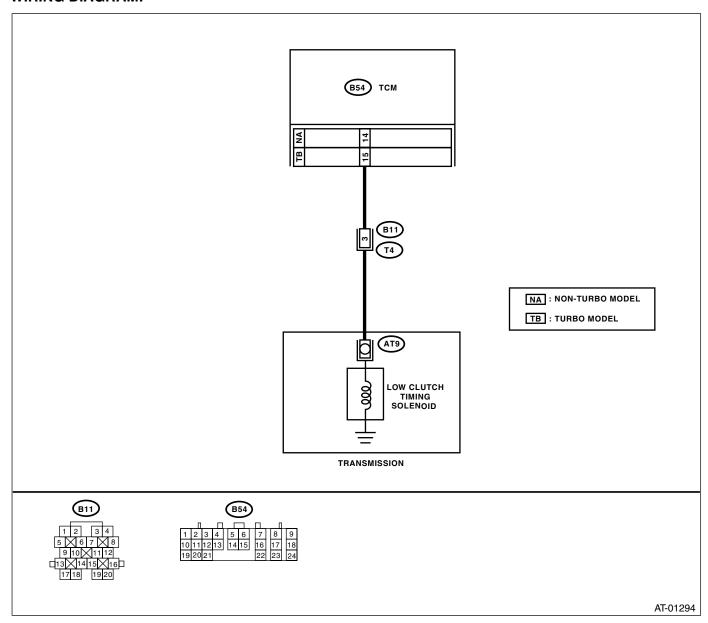
K: DTC 73 LOW CLUTCH TIMING SOLENOID

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 TCM AND TRANSMISSION. 1)Turn the ignition switch to OFF. 2)Disconnect the connector from TCM and transmission.	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
	3)Measure the resistance of harness between TCM and transmission connector. Connector & terminal NON-TURBO MODEL (B54) No. 14 — (B11) No. 3: TURBO MODEL			noder.
	(B54) No. 15 — (B11) No. 3:			
2	TCM AND TRANSMISSION. Measure the resistance of harness between TCM connector and transmission ground. Connector & terminal NON-TURBO MODEL (B54) No. 14 — Chassis ground: TURBO MODEL	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	(B54) No. 15 — Chassis ground: 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 NON-TURBO MODEL (B54) No. 14 (+) — Chassis ground (-): TURBO MODEL (B54) No. 15 (+) — 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 NON-TURBO MODEL (B54) No. 14 (+) — Chassis ground (-): TURBO MODEL (B54) No. 15 (+) — 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-67,<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="">61, 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.

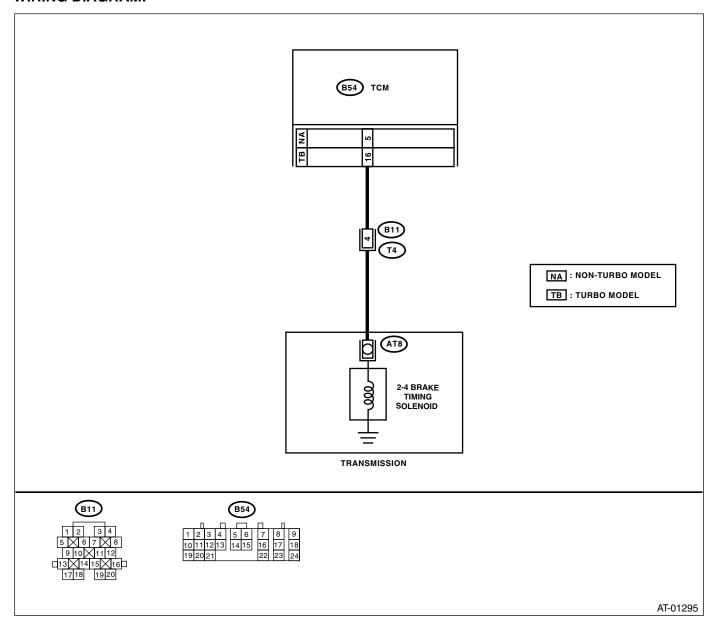
L: DTC 74 2-4 BRAKE TIMING SOLENOID

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	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness
	1)Turn the ignition switch to OFF.			between TCM and
	2)Disconnect the connector from TCM and			transmission con-
	transmission.			nector.
	3)Measure the resistance of harness between			
	TCM and transmission connector.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B54) No. 5 — (B11) No. 4:			
	TURBO MODEL			
	(B54) No. 16 — (B11) No. 4: CHECK HARNESS CONNECTOR BETWEEN	le the registeres mare than 1	Co to oton 2	Danair the short
2	TCM AND TRANSMISSION.	Is the resistance more than 1 $M\Omega$?	Go to step 3.	Repair the short circuit in harness
	Measure the resistance of harness between	IVIS2?		between TCM and
	TCM connector and chassis ground.			transmission con-
	Connector & terminal			nector.
	NON-TURBO MODEL			
	(B54) No. 5 — Chassis ground:			
	TURBO MODEL			
2	(B54) No. 16 — Chassis ground: CHECK 2-4 BRAKE TIMING SOLENOID.	le the registeres 10 10 00	Co to stop 4	Co to cton 7
3	Measure the resistance between transmission	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 7.
	connector terminals.			
	Connector & terminal			
	(T4) No. 4 — No. 16:			
4	CHECK OUTPUT SIGNAL EMITTED FROM	Is the voltage less than 1 V?	Go to step 5.	Go to step 6.
•	TCM.	is the voltage less than i V!	ao io siep s.	αυ ιυ δι ο ρ υ.
	1)Connect the connectors to TCM and trans-			
	mission.			
	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 transmis-			
	sion 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 di-			
	agnosis is finished, perform the ABS memory			
	clearance procedure of on-board diagnostics			
	system. <ref. abs-21,="" clear="" memory="" mode.="" to=""></ref.>			
	5)Measure the voltage between TCM connec-			
	tor and chassis ground.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B54) No. 5 (+) — Chassis ground (–):			
	TURBO MODEL			
	(B54) No. 16 (+) — Chassis ground (–):			

	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 of on-board diagnostics system. <ref. abs-21,="" clear="" memory="" mode.="" to=""> 2) Measure the voltage between TCM connector and chassis ground. Connector & terminal NON-TURBO MODEL (B54) No. 5 (+) — Chassis ground (-): TURBO MODEL (B54) No. 16 (+) — 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-67,<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="">61, 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	Is the resistance more than 1	Even if the AT OIL	Repair the short
	2-4 BRAKE TIMING SOLENOID AND	ΜΩ?	TEMP warning	circuit harness
	TRANSMISSION.		light illuminates,	between 2-4 brake
	Measure the resistance of harness between 2-		the circuit has	timing solenoid
	4 brake timing solenoid connector and trans-		returned to a nor-	and transmission
	mission ground.		mal condition at	connector.
	Connector & terminal		this time. A tempo-	
	(T4) No. 4 — Transmission ground:		rary poor contact	
			of the connector or	
			harness may be	
			the cause. Repair	
			the harness or	
			connector in 2-4	
			brake timing sole-	
			noid and transmis-	
			sion.	

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIÀGNOSTICS)

M: DTC 75 LINE PRESSURE DUTY SOLENOID

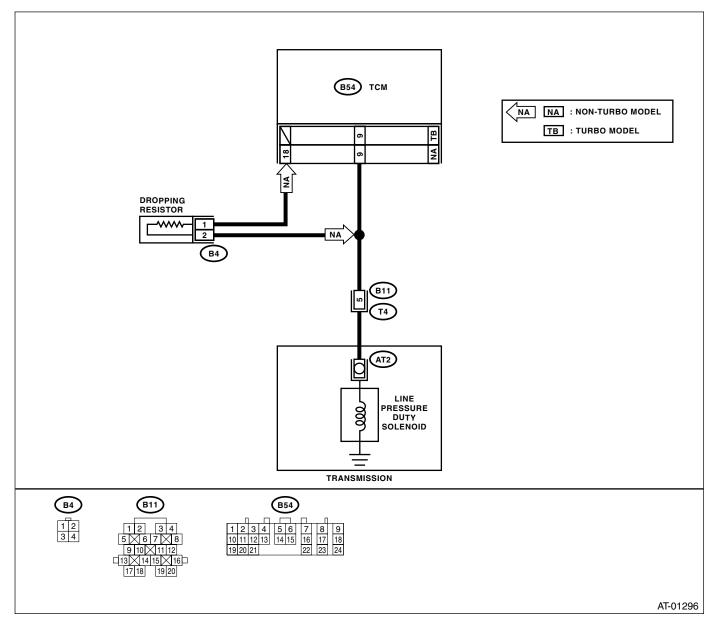
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



	Step	Check	Yes	No
1	CHECK VEHICLE.	Is the target non-turbo model?	Go to step 2.	Go to step 7.
2	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 No. 1 — No. 2:	Is the resistance 9 — 15 Ω ?		Replace the drop- ping resistor. <ref. to 4AT-68, Drop- ping Resistor.></ref.

	Step	Check	Yes	No
3	CHECK HARNESS CONNECTOR BETWEEN		Go to step 4.	Repair open circuit
	TCM AND DROPPING RESISTOR.	Ω ?	Go to dtop 4.	in harness
	1)Disconnect the connector from TCM.			between TCM and
	2)Measure the resistance of harness between			dropping resistor
	TCM connector and dropping resistor connec-			connector.
	tor.			
	Connector & terminal			
	(B54) No. 18 — (B4) No. 1:			
4	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 5.	Repair short circuit
	TCM AND DROPPING RESISTOR.	ΜΩ?		in harness
	Measure the resistance of harness between			between TCM and
	dropping resistor connector and chassis			dropping resistor
	ground.			connector.
	Connector & terminal			
ļ	(B4) No. 1 — Chassis ground:			
5	CHECK HARNESS CONNECTOR BETWEEN		Go to step 6.	Repair open circuit
	TRANSMISSION AND DROPPING RESIS-	Ω ?		in harness
	TOR.			between dropping
	1)Disconnect the connector from transmission.2)Measure the resistance of harness between			resistor and trans- mission connector.
	transmission and dropping resistor connector.			mission connector.
	Connector & terminal			
	(B4) No. 2 — (B11) No. 5:			
6	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 7.	Repair short circuit
	TRANSMISSION AND DROPPING RESIS-	$M\Omega$?	Go to stop 11	in harness
	TOR.			between dropping
	Measure the resistance of harness between			resistor and trans-
	dropping resistor connector and chassis			mission connector.
	ground.			
	Connector & terminal			
	(B4) No. 2 — Chassis ground:			
7	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance less than 1	Go to step 8.	Repair the open
	TCM AND TRANSMISSION.	Ω ?		circuit in harness
	1)Turn the ignition switch to OFF.			between TCM and
	2)Disconnect the connector from transmission			transmission con-
	and TCM.			nector.
	3)Measure the resistance of harness between TCM and transmission connector.			
	Connector & terminal			
	(B54) No. 9 — (B11) No. 5:			
8	CHECK HARNESS CONNECTOR BETWEEN	le the resistance more than 1	Go to step 9.	Repair the short
ا	TCM AND CHASSIS GROUND.	$M\Omega$?	00 10 step 3.	circuit in harness
	Measure the resistance of harness between	17122.		between TCM and
	TCM and chassis ground.			transmission con-
	Connector & terminal			nector.
	(B54) No. 9 — Chassis ground:			
9	CHECK LINE PRESSURE DUTY SOLENOID.	Is the resistance between 2.0	Go to step 10.	Go to step 16.
	Measure the resistance between transmission	and 4.5 Ω ?		
	connector receptacle's terminals.			
	Terminals			
	(T4) No. 5 — No. 16:			
10	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select	Go to step 13.	Go to step 11.
		Monitor?		

	Step	Check	Yes	No
11	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 12.	Go to step 15.
12	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 15.
13	CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. 1) Connect the connectors to TCM and transmission. 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) Throttle is fully closed. • Line pressure duty solenoid is indicated in "%". 8) Read the data of line pressure duty solenoid using Subaru Select Monitor.	Is the value 100%?	Go to step 14.	Go to step 15.

	Step	Check	Yes	No
14	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 transmission.	Go to step 15.
15	CHECK POOR CONTACT.	Is there poor contact in line pressure duty solenoid circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
16	CHECK LINE PRESSURE 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 line pressure duty solenoid. 4)Measure the resistance between line pressure duty solenoid connector and transmission ground. Terminals No. 1 — Transmission ground:	Is the resistance 2.0 — 4.5 Ω ?	Go to step 17.	Replace the line pressure duty solenoid. <ref. to<br="">4AT-61, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.></ref.>
17	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 18.	Repair the open circuit in harness between line pressure duty solenoid and transmission connector.
18	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.

N: DTC 76 2-4 BRAKE DUTY SOLENOID

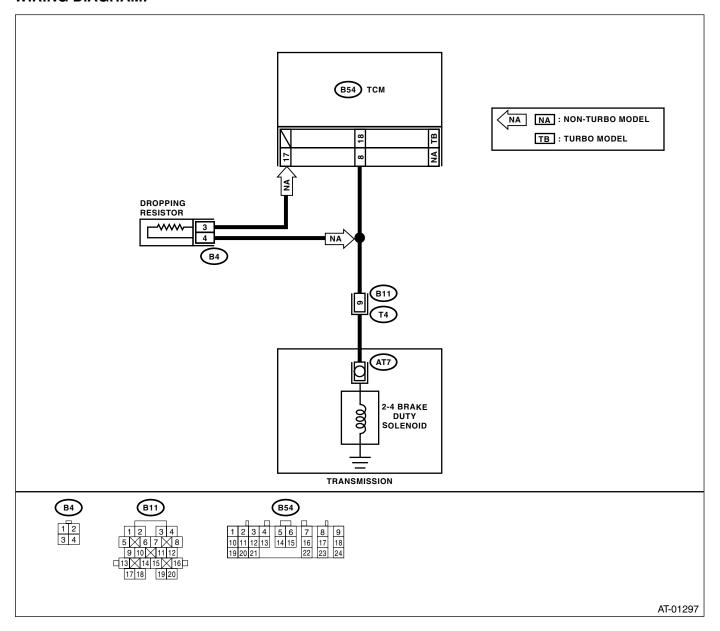
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



	Step	Check	Yes	No
1	CHECK VEHICLE.	Is the target non-turbo model?	Go to step 2.	Go to step 7.
2	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 No. 3 — No. 4:	Is the resistance 9 — 15 Ω ?	'	Replace the drop- ping resistor. <ref. to 4AT-68, Drop- ping Resistor.></ref.

	Step	Check	Yes	No
3	CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.	Is the resistance less than 1 Ω ?	Go to step 4.	Repair open circuit in harness
	1)Disconnect the connector from TCM.			between TCM and
	2)Measure the resistance of harness between			dropping resistor
	TCM connector and dropping resistor connector.			connector.
	Connector & terminal			
	(B54) No. 17 — (B4) No. 3:			
4	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 5.	Repair short circuit
	TCM AND DROPPING RESISTOR.	ΜΩ?		in harness
	Measure the resistance of harness between dropping resistor connector and chassis			between TCM and dropping resistor
	ground.			connector.
	Connector & terminal			
	(B4) No. 3 — Chassis ground:		_	
5	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESIS-	Is the resistance less than 1 Ω ?	Go to step 6.	Repair open circuit
	TOR.	22?		in harness between dropping
	1)Disconnect the connector from transmission.			resistor and trans-
	2)Measure the resistance of harness between			mission connector.
	transmission and dropping resistor connector.			
	Connector & terminal (B4) No. 4 — (B11) No. 9:			
6	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 7.	Repair short circuit
	TRANSMISSION AND DROPPING RESIS-	$M\Omega$?	G.G. to Gtop 11	in harness
	TOR.			between dropping
	Measure the resistance of harness between			resistor and trans- mission connector.
	dropping resistor connector and chassis ground.			mission connector.
	Connector & terminal			
	(B4) No. 4 — Chassis ground:			
7	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.	Is the resistance less than 1 Ω ?	Go to step 8.	Repair the open circuit in harness
	1)Turn the ignition switch to OFF.			between TCM and
	2)Disconnect the connector from transmission			transmission con-
	and TCM.			nector.
	3)Measure the resistance of harness between TCM and transmission connector.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B54) No. 8 — (B11) No. 9:			
	TURBO MODEL (B54) No. 18 — (B11) No. 9:			
8	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 9.	Repair the short
	TCM AND CHASSIS GROUND.	$M\Omega$?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and chassis ground. Connector & terminal			transmission con- nector.
	NON-TURBO MODEL			nicotor.
	(B54) No. 8 — Chassis ground:			
	TURBO MODEL			
	(B54) No. 18 — Chassis ground:			
9	CHECK 2-4 BRAKE DUTY SOLENOID.	Is the resistance 2.0 — 4.5 Ω ?	Go to step 10.	Go to step 16.
	Measure the resistance between transmission			
	connector receptacle's terminals. Terminals			
	(T4) No. 16 — No. 9:			
10	PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select	Go to step 13.	Go to step 11.
		Monitor?		

	Step	Check	Yes	No
11	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. 18 (+) — Chassis ground (-):		Go to step 12.	Go to step 15.
12	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. 18 (+) — 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 15.
13	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) Throttle is fully closed. •2-4 brake duty solenoid is indicated in "%". 8) Read the data of 2-4 brake duty solenoid using Subaru Select Monitor.		Go to step 14.	Go to step 15.

	Cham	Charle	Vaa	Ma
	Step	Check	Yes	No
14	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 15.
15	CHECK POOR CONTACT.	Is there poor contact in 2-4 brake duty solenoid circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
16	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 17.	Replace the 2-4 brake duty sole- noid. <ref. 4at-<br="" to="">61, Shift Sole- noids, Duty Sole- noids and ATF Temperature Sen- sor.></ref.>
17	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:	Ω?	Go to step 18.	Repair the open circuit in harness between 2-4 brake duty solenoid and transmission connector.
18	CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND 2-4 BRAKE DUTY SOLENOID. 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.

O: DTC 77 LOCK-UP DUTY SOLENOID

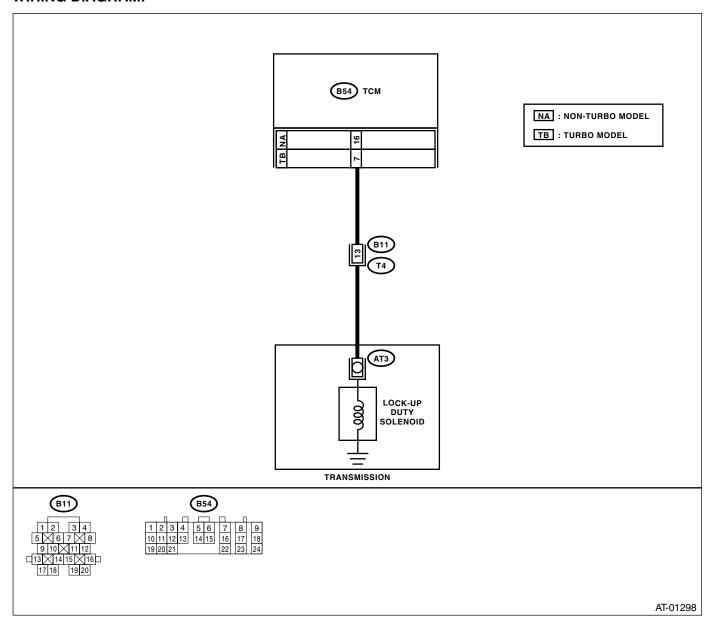
DIAGNOSIS:

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

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



	Step	Check	Yes	No
1	CHECK DTC.	Do multiple DTCs appear in	Go to another	Go to step 2.
		the on-board diagnostics test	DTC.	
		mode?		

		_		
	Step	Check	Yes	No
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 NON-TURBO MODEL (B54) No. 16 — (B11) No. 13: TURBO MODEL (B54) No. 7 — (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 NON-TURBO MODEL (B54) No. 16 — Chassis ground: TURBO MODEL (B54) No. 7 — 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 con- nector.
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.

Step	Check	Yes	No
	Is the voltage more than 8.5 V?	Go to step 7.	Go to step 10.
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). 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 of on-board diagnostics system. <ref. abs-21,="" clear="" memory="" mode.="" to=""> 5)Measure the voltage between TCM connector and chassis ground. Connector & terminal NON-TURBO MODEL (B54) No. 16 (+) — Chassis ground (-): TURBO MODEL</ref.>			
(B54) No. 7 (+) — Chassis ground (-):	lo the veltage less than 0.5.1/0	Even if the ATOU	Co to otor 10
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 NON-TURBO MODEL (B54) No. 16 (+) — Chassis ground (-): TURBO MODEL (B54) No. 7 (+) — 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.

	Step	Check	Yes	No
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 of on-board diagnostics system. <ref. abs-21,="" 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 of on-board diagnostics system. <ref. abs-21,="" clear="" memory="" mode.="" to=""></ref.>		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.
10	CHECK POOR CONTACT.	Is there poor contact in lock-up duty solenoid circuit?	Repair poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>

	Step	Check	Yes	No
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-61,<br="" to="">Shift Solenoids, Duty Solenoids and ATF Temper- ature 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 $M\Omega$?	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 lock-up duty solenoid and transmission.	Repair the short circuit in harness between lock-up duty solenoid and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

P: DTC 79 TRANSFER DUTY SOLENOID

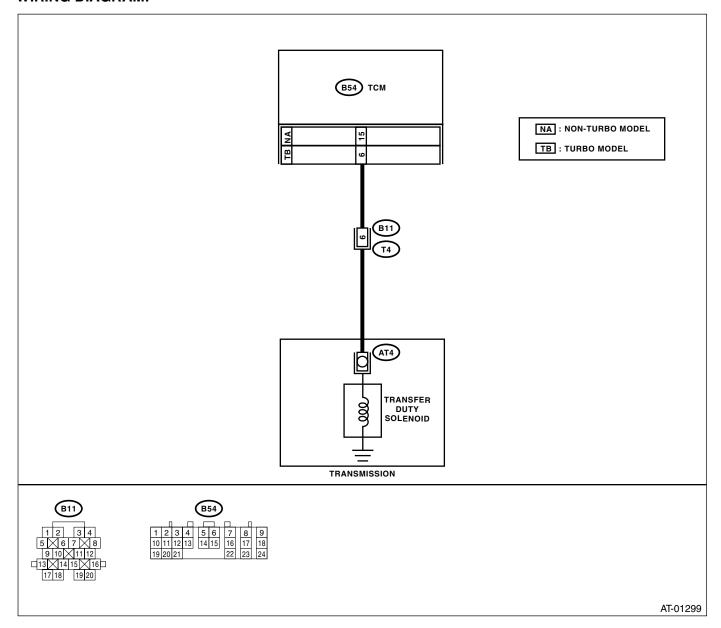
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive "braking" in tight corners.

WIRING DIAGRAM:



	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. 1)Turn the ignition switch to OFF.	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and
	2)Disconnect the connector from TCM and transmission.3)Measure the resistance of harness between			transmission con- nector.
	TCM and transmission connector. Connector & terminal NON-TURBO MODEL			
	(B54) No. 15 — (B11) No. 6: TURBO MODEL (B54) No. 6 — (B11) No. 6:			
2	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 3.	Repair the short
_	TCM AND TRANSMISSION. Measure the resistance harness connector between TCM and chassis ground. Connector & terminal	$M\Omega$?	GO 10 316P 3.	circuit in harness between TCM and transmission con- nector.
	NON-TURBO MODEL			
	(B54) No. 15 — Chassis ground: TURBO MODEL			
	(B54) No. 6 — Chassis ground:			
3	CHECK TRANSFER DUTY SOLENOID.	Is the resistance 10 — 17 Ω ?	Go to step 4.	Go to step 13.
	Measure the resistance between transmission connector and transmission terminals. Connector & terminal			
4	(T4) No. 6 — No. 16: PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select	Go to step 8.	Go to step 5.
	THE AIL SUBAITO SELECT MONITOR.	Monitor?	αο το στερ σ.	GO to step 3.
5	CHECK OUTPUT SIGNAL EMITTED FROM TCM.	Is the voltage less than 1 V?	Go to step 6.	Go to step 12.
	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 connec-			
	tor and chassis ground. Connector & terminal			
	NON-TURBO MODEL (B54) No. 15 (+) — Chassis ground (–): TURBO MODEL			
	(B54) No. 6 (+) — Chassis ground (–):			
6	CHECK OUTPUT SIGNAL EMITTED FROM TCM. 1)Move the select lever to "D" range.	Is the voltage more than 8.5 V?	TEMP warning light illuminates,	Go to step 12.
	2)Measure the voltage between TCM connec-		the circuit has	
	tor and chassis ground. Connector & terminal		returned to a nor- mal condition at	
	NON-TURBO MODEL		this time. A tempo-	
	(B54) No. 15 (+) — Chassis ground (−): TURBO MODEL		rary poor contact	
	(B54) No. 6 (+) — Chassis ground (–):		of the connector or harness may be	
			the cause. Repair	
			the harness or connector in TCM	
			and transmission.	
7	CHECK VEHICLE	Is the target non-turbo model?	Go to step 8.	Go to step 10.

	Step	Check	Yes	No
9	CHECK OUTPUT SIGNAL EMITTED FROM 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 (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). 5) Read data of transfer duty solenoid using Subaru Select Monitor. •Transfer duty solenoid is indicated in "%". CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. 1) Move the select lever to "N" range with throttle fully closed (vehicle speed 0 km/h or 0 MPH). 2) Read the data of transfer duty solenoid using Subaru Select Monitor. •Transfer duty solenoid is indicated in "%".	Is the value 5 — 10%? Is the value approx. 60 — 70%?	Even if the AT OIL TEMP warning light illuminates, the circuit has returned to a nor- mal condition at this time. A tempo- rary poor contact of the connector or harness may be	Go to step 12.
10	CHECK OUTPUT SIGNAL EMITTED FROM 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 (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). 5)Read the data of transfer duty solenoid using	Is the value 80 — 95%?	the cause. Repair the harness or connector in TCM and transmission. Go to step 11.	Go to step 12.
11	Subaru Select Monitor. •Transfer duty solenoid is indicated in "%". CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR. 1)Move the select lever to "N" range with throttle fully close (vehicle speed 0 km/h or 0 MPH). 2)Read the data of transfer duty solenoid using Subaru Select Monitor. •Transfer duty solenoid is indicated in "%".		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 transfer duty solenoid and TCM connector.	Go to step 12.

	Step	Check	Yes	No
12	CHECK POOR CONTACT.	Is there poor contact in transfer duty solenoid circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>
13	CHECK TRANSFER DUTY SOLENOID (IN TRANSMISSION). 1) Lift-up the vehicle and place safety stand. NOTE: Raise all wheels off ground. 2) 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:	Is the resistance 10 — 17 Ω ?	Go to step 14.	Replace the transfer duty solenoid.
14	CHECK HARNESS CONNECTOR BETWEEN TRANSFER DUTY SOLENOID AND TRANSMISSION. Measure the resistance of harness between transfer duty solenoid and transmission connector. Connector & terminal (T4) No. 6 — (AT4) No. 1:	Is the resistance less than 1 Ω ?	Go to step 15.	Repair the open circuit in harness between transfer duty solenoid and transmission connector.
15	CHECK HARNESS CONNECTOR BETWEEN TRANSFER DUTY SOLENOID AND TRANSMISSION. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 6 — 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 contact in transfer duty solenoid and transmission.	Repair the short circuit in harness between transfer duty solenoid and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Q: DTC 93 REAR VEHICLE SPEED SENSOR

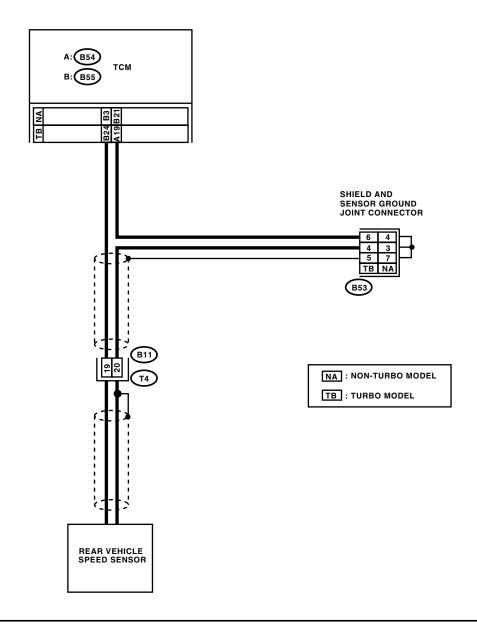
DIAGNOSIS:

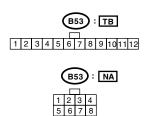
The input signal circuit of TCM is open or shorted.

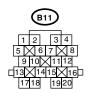
TROUBLE SYMPTOM:

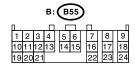
No lock-up or excessive tight corner "braking".

WIRING DIAGRAM:











AT-01300

	Step	Check	Yes	No
1	CHECK HARNESS CONNECTOR BETWEEN	0110011	Go to step 2.	Repair the open
'	TCM AND TRANSMISSION.	Ω ?	do to step 2.	circuit in harness
	1)Turn the ignition switch to OFF.			between TCM and
	2)Disconnect the connector from TCM and			transmission con-
	transmission.			nector.
	3)Measure the resistance of harness between			
	TCM and transmission connector.			
	Connector & terminal			
	NON-TURBO MODEL			
	(B55) No. 3 — (B11) No. 19:			
	TURBO MODEL			
	(B55) No. 24 — (B11) No. 19:			
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
	Measure the resistance of harness between			between TCM and
	TCM and transmission connector.			transmission, and
	Connector & terminal			poor contact in
	NON-TURBO MODEL			coupling connec-
	(B55) No. 21 — (B11) No. 20:			tor.
	TURBO MODEL			
	(B54) No. 19 — (B11) No. 20:			
3	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 4.	Repair the short
	TCM AND TRANSMISSION.	ΜΩ?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and chassis ground.			transmission con-
	Connector & terminal			nector.
	NON-TURBO MODEL			
	(B55) No. 3 — Chassis ground:			
	TURBO MODEL			
	(B55) No. 24 — Chassis ground:			
4	CHECK HARNESS CONNECTOR BETWEEN	Is the resistance more than 1	Go to step 5.	Repair the short
	TCM AND TRANSMISSION.	ΜΩ?		circuit in harness
	Measure the resistance of harness between			between TCM and
	TCM and chassis ground.			transmission con-
	Connector & terminal			nector.
	NON-TURBO MODEL			
	(B55) No. 21 — Chassis ground:			
	TURBO MODEL			
	(B54) No. 19 — Chassis ground:			
5	CHECK REAR VEHICLE SPEED SENSOR.	Is the resistance 450 — 650	Go to step 6.	Replace the rear
	Measure the resistance between transmission	Ω?		vehicle speed sen-
	connector receptacle's terminals.			sor. <ref. 4at-<="" th="" to=""></ref.>
	Connector & terminal			53, Rear Vehicle
	(T4) No. 19 — No. 20:			Speed Sensor.>
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	Go to step 9.	Go to step 8.
		Monitor?		

	Step	Check	Yes	No
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 of on-board diagnostics system. <ref. abs-21,="" clear="" memory="" mode.="" to=""> 4)Measure the voltage between TCM connector terminals. Connector & terminal NON-TURBO MODEL (B55) No. 3 (+) — (B55) No. 21 (-):</ref.>	Is the voltage more than AC 1 V?		Go to step 11.
9	TURBO MODEL (B55) No. 24 (+) — (B54) No. 19 (-): CHECK INPUT SIGNAL FOR TCM USING	Does the speedometer indica-	Even if the AT OIL	Go to step 11.
	SUBARU SELECT MONITOR. 1)Connect the connectors to TCM and transmission. 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 of on-board diagnostics	tion increase as the Subaru Select Monitor data increases?	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.	

	Step	Check	Yes	No
10	CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE. 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) Set the oscilloscope to TCM connector terminals. Connector & terminal NON-TURBO MODEL Positive probe; (B55) No. 3: Ground lead; (B55) No. 21: TURBO MODEL Positive probe; (B55) No. 19: 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 of on-board diagnostics system. <ref. abs-21,="" clear="" memory="" mode.="" to=""> 5) Measure the signal voltage indicated on oscilloscope.</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 11.
11	CHECK POOR CONTACT.	Is there poor contact in rear vehicle speed sensor circuit?	Repair the poor contact.	Replace the TCM. <ref. 4at-67,<br="" to="">Transmission Con- trol Module (TCM).></ref.>