

14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

A: DTC 11 ENGINE SPEED SIGNAL

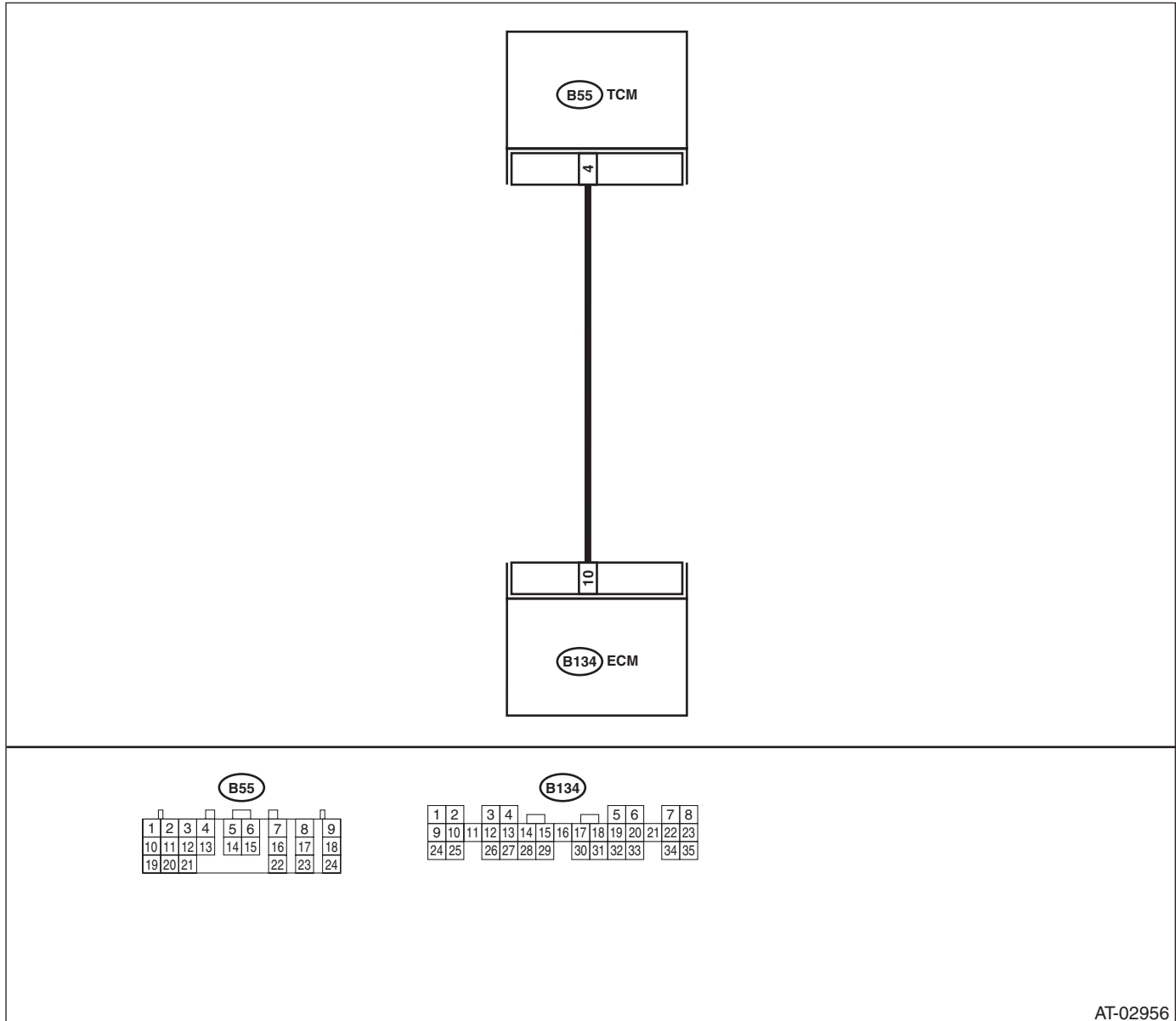
DIAGNOSIS:

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".

WIRING DIAGRAM:



AT-02956

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B55) No. 4 — (B134) No. 10:</i>	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and ECM connector.
2 CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. <i>Connector & terminal</i> <i>(B55) No. 4 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(B55) No. 4 (+) — Chassis ground (-):</i>	Is the voltage more than 10.5 V?	Even if the AT OIL TEMP warning light blinks, 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 blinks, 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. to 4AT-77, Transmission Control Module (TCM).>	Replace the ECM.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

B: DTC 27 ATF TEMPERATURE SENSOR

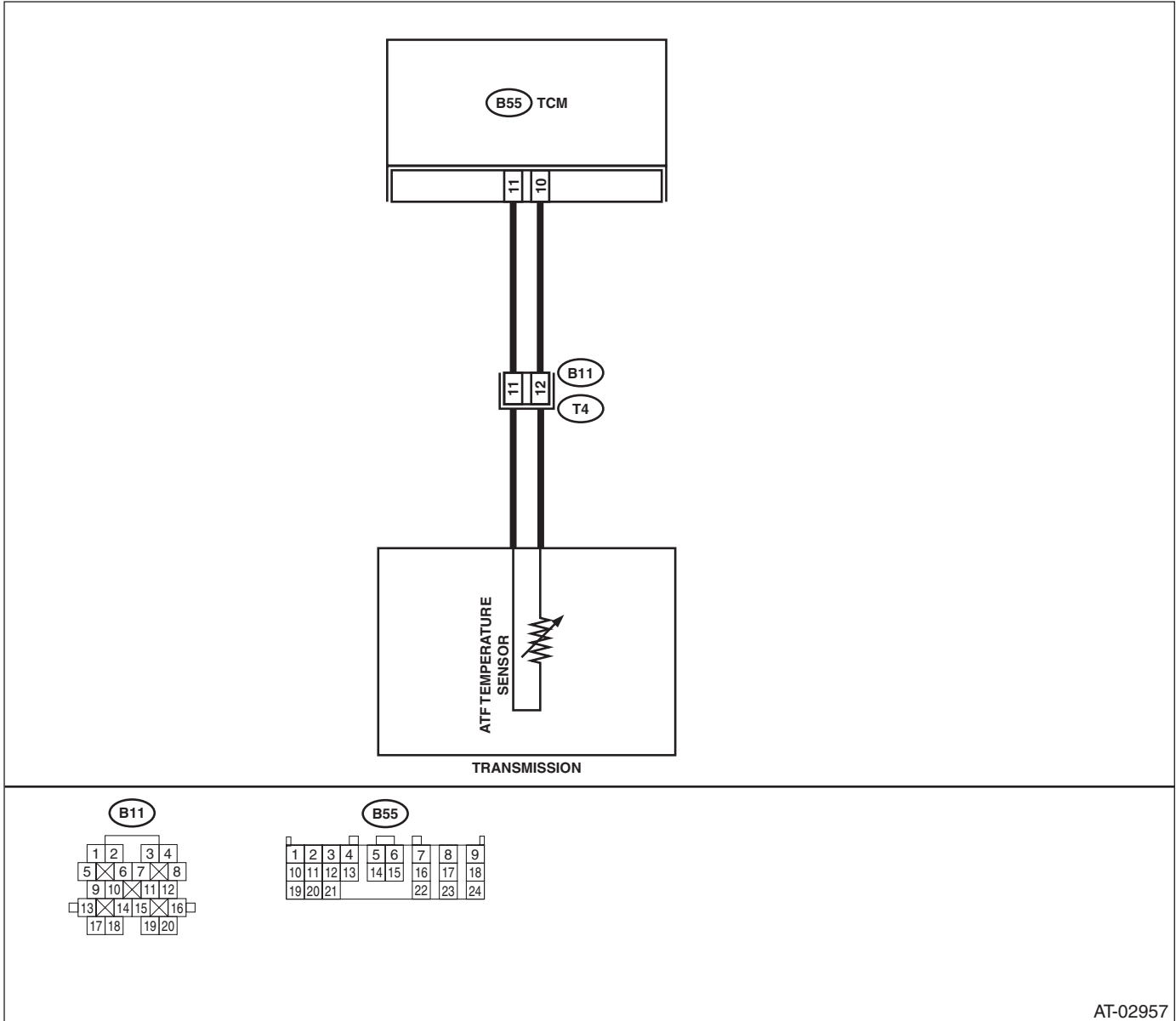
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



AT-02957

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal (B55) No. 10 — (B11) No. 12:</i>	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. <i>Connector & terminal (B55) No. 11 — (B11) No. 11:</i>	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. <i>Connector & terminal (B55) No. 10 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal (B55) No. 11 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal (T4) No. 11 — No. 12:</i>	Is the resistance 275 — 375 Ω ?	Go to step 6.	Replace the ATF temperature sensor. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
6 CHECK ATF TEMPERATURE SENSOR. 1) Turn the ignition switch to ON (engine OFF). 2) Measure the resistance between transmission connector terminals. <i>Connector & terminal (T4) No. 11 — No. 12:</i>	Does the resistance value increase while ATF temperature decreases?	Go to step 7.	Replace the ATF temperature sensor. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
7 PREPARE SUBARU SELECT MONITOR.	Do you have a Subaru Select Monitor?	Go to step 9.	Go to step 8.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>8 CHECK INPUT SIGNAL FOR TCM.</p> <p>1) Connect the connector to transmission. 2) Warm-up the transmission until ATF temperature is about 80°C (176°F).</p> <p>NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature.</p> <p>3) Measure the voltage between TCM connector terminal.</p> <p>Connector & terminal (B55) No. 11 (+) — No. 10 (-):</p>	<p>Is the voltage 0.4 — 0.9 V?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 10.</p>
<p>9 CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.</p> <p>1) Connect the connector to transmission. 2) Turn the ignition switch to ON (engine OFF).</p>	<p>Does the ATF temperature gradually decrease?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 10.</p>
<p>10 CHECK POOR CONTACT.</p>	<p>Is there poor contact in ATF temperature sensor circuit?</p>	<p>Repair the poor contact.</p>	<p>Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).></p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC) AUTOMATIC TRANSMISSION (DIAGNOSTICS)

C: DTC 31 THROTTLE POSITION SENSOR

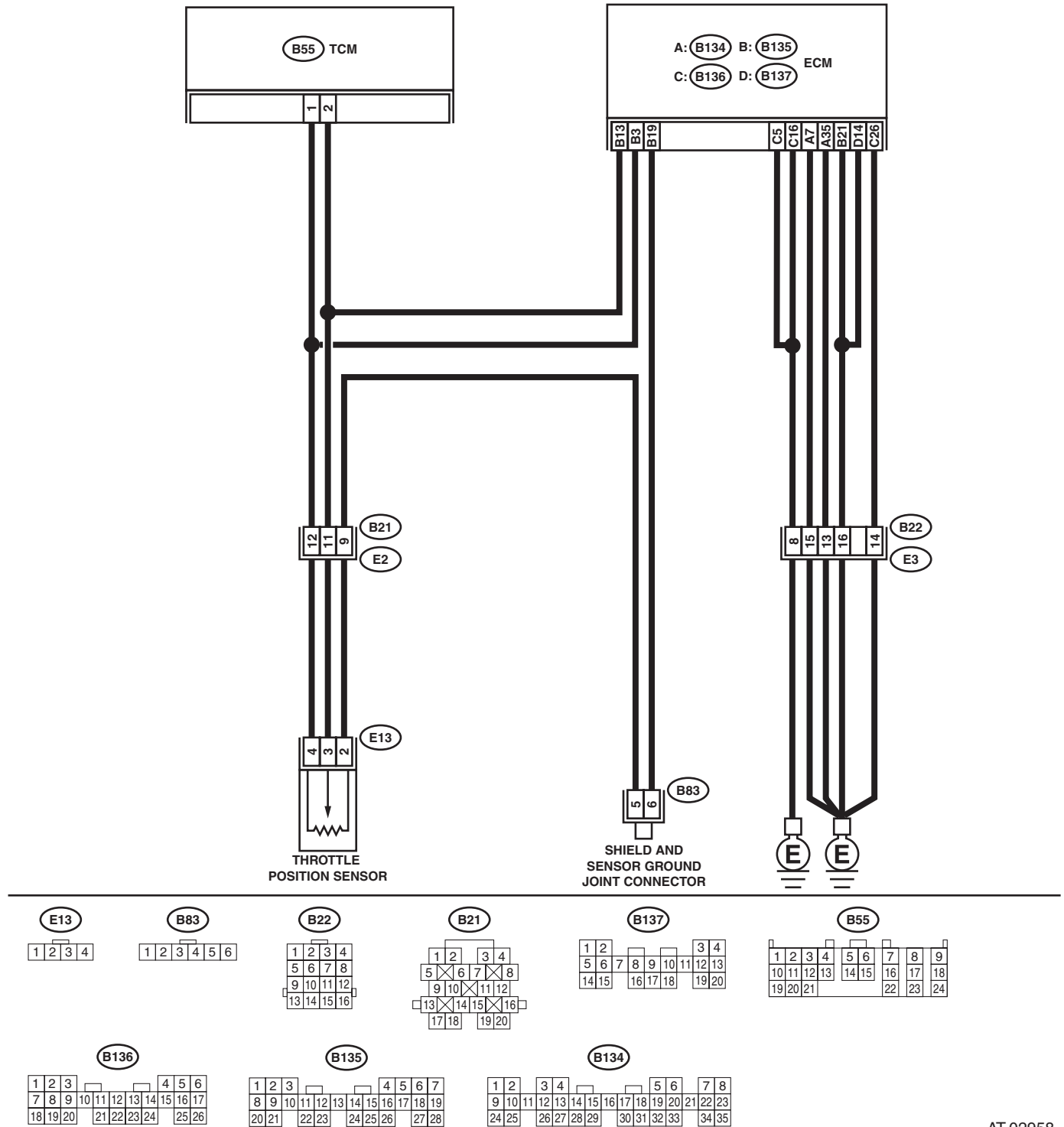
DIAGNOSIS:

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-02958

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK ENGINE GROUND TERMINALS.	Go to step 2.	Tighten the engine ground terminals.
2	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 <i>(B134) No. 7 — Engine ground:</i> <i>(B134) No. 35 — Engine ground:</i> <i>(B136) No. 5 — Engine ground:</i> <i>(B136) No. 16 — Engine ground:</i> <i>(B136) No. 26 — Engine ground:</i> <i>(B135) No. 21 — Engine ground:</i> <i>(B137) No. 14 — Engine ground:</i>	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 <i>No. 4 — No. 2:</i>	Go to step 4.	Replace the throttle position sensor.
4	CHECK THROTTLE POSITION SENSOR. Measure the resistance between throttle position sensor connector receptacle's terminals. Terminals <i>No. 2 — No. 3:</i>	Go to step 5.	Replace the throttle position sensor.
5	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 <i>(B55) No. 2 — (E13) No. 3:</i>	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 TCM AND THROTTLE POSITION SENSOR. Measure the resistance of harness between TCM and throttle position sensor connector. Connector & terminal <i>(B55) No. 1 — (E13) No. 4:</i>	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 <i>(B55) No. 2 — Chassis ground:</i>	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 <i>(B55) No. 1 — Chassis ground:</i>	Go to step 9.	Repair the short circuit in harness between TCM and throttle position sensor connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
9 CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM and ECM connector. <i>Connector & terminal</i> <i>(B55) No. 2 — (B135) No. 13:</i>	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. <i>Connector & terminal</i> <i>(B55) No. 1 — (B135) No. 3:</i>	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. <i>Connector & terminal</i> <i>(B55) No. 2 (+) — Chassis ground (-):</i>	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. <i>Connector & terminal</i> <i>(B55) No. 2 (+) — Chassis ground (-):</i>	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: Depress the accelerator pedal until it touches the stopper.	Is the value voltage 4.2 — 4.7 V?	Go to step 18.	Go to step 17.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
16 CHECK INPUT SIGNAL FOR TCM (THROTTLE POSITION SENSOR POWER SUPPLY). Measure the voltage between TCM connector and chassis ground. <i>Connector & terminal</i> <i>(B55) No. 1 (+) — Chassis ground (-):</i>	Is the voltage 4.8 — 5.3 V?	Even if the AT OIL TEMP warning light blinks, 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 blinks, 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. to 4AT-77, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

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.

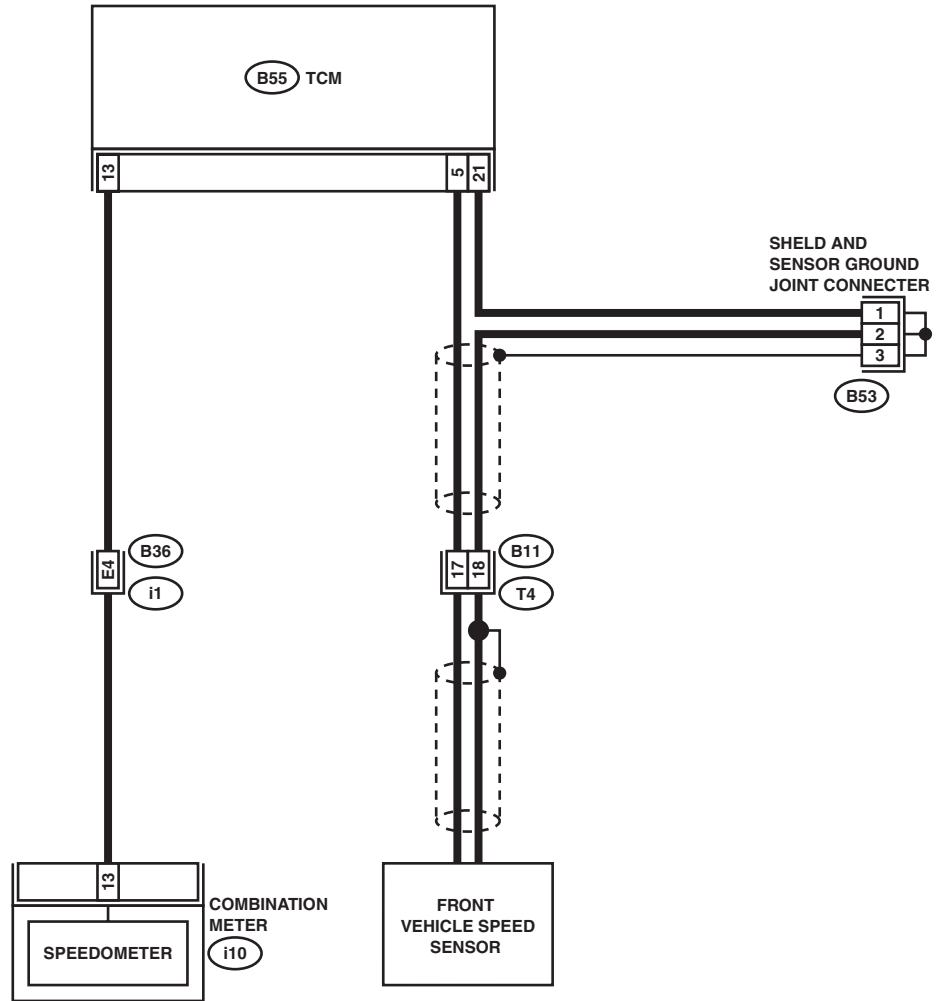
TROUBLE SYMPTOM:

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

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

WIRING DIAGRAM:



B53

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

B11

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20

i10

1	2	3	4	5	6	7	8	9	10	11	12	13	14		
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30

B36

A1	A2	A3	A4	A5	A6
B1	B2	B3	B4	B5	B6
C1	C2	C3	C4	C5	C6
D1	D2	D3	D4	D5	D6
E1	E2	E3	E4	E5	E6
F1	F2	F3	F4	F5	F6
G1	G2	G3	G4	G5	G6
H1	H2	H3	H4	H5	H6
I1	I2	I3	I4	I5	I6
J1	J2	J3	J4	J5	J6
K1	K2	K3	K4	K5	K6
L1	L2	L3	L4	L5	L6
M1	M2	M3	M4	M5	M6
N1	N2	N3	N4	N5	N6
O1	O2	O3	O4	O5	O6
P1	P2	P3	P4	P5	P6

B55

1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24			

AT-02959

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B55) No. 5 — (B11) No. 17:</i>	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 and transmission connector. <i>Connector & terminal</i> <i>(B55) No. 21 — (B11) No. 18:</i>	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 CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION. Measure the resistance of harness between TCM and transmission connector. <i>Connector & terminal</i> <i>(B55) No. 21 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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 transmission connector. <i>Connector & terminal</i> <i>(B55) No. 5 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(T4) No. 17 — No. 18:</i>	Is the resistance 450 — 650 Ω ?	Go to step 6.	Replace the front vehicle speed sensor. <Ref. to 4AT-54, Front Vehicle 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 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 of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.> 4) Measure the voltage between TCM connector terminals. <i>Connector & terminal</i> <i>(B55) No. 5 (+) — (B55) No. 21 (-):</i>	Is the voltage more than AC 1 V?	Even if the AT OIL TEMP warning light blinks, 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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>9 CHECK FRONT VEHICLE SPEED SENSOR USING OSCILLOSCOPE.</p> <p>1) Connect all connectors. 2) Lift-up the vehicle and place safety stand.</p> <p>NOTE: Raise all wheels off ground.</p> <p>3) Set the oscilloscope to TCM connector terminals.</p> <p>Connector & terminal Positive probe; (B55) No. 5: Ground lead; (B55) No. 21:</p> <p>4) Start the engine, and drive the wheels slowly.</p> <p>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. to ABS-21, Clear Memory Mode.></p> <p>5) Measure the signal voltage indicated on oscilloscope.</p>	<p>Is the voltage more than AC 4 V?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 11.</p>
<p>10 CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.</p> <p>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.</p> <p>NOTE: Raise all wheels off floor.</p> <p>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.</p> <p>•Compare the speedometer with Subaru Select Monitor indications. •Vehicle speed is indicated in “km/h” or “MPH”.</p> <p>7) Slowly increase the vehicle speed to 60 km/h or 37 MPH.</p> <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p>	<p>Does the speedometer indication increase as Subaru Select Monitor data increases?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 11.</p>
<p>11 CHECK POOR CONTACT.</p>	<p>Is there poor contact in front vehicle speed sensor circuit?</p>	<p>Repair the poor contact.</p>	<p>Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).></p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

E: DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR

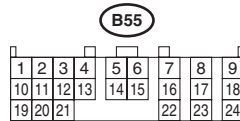
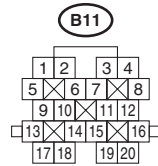
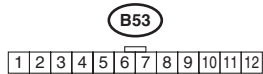
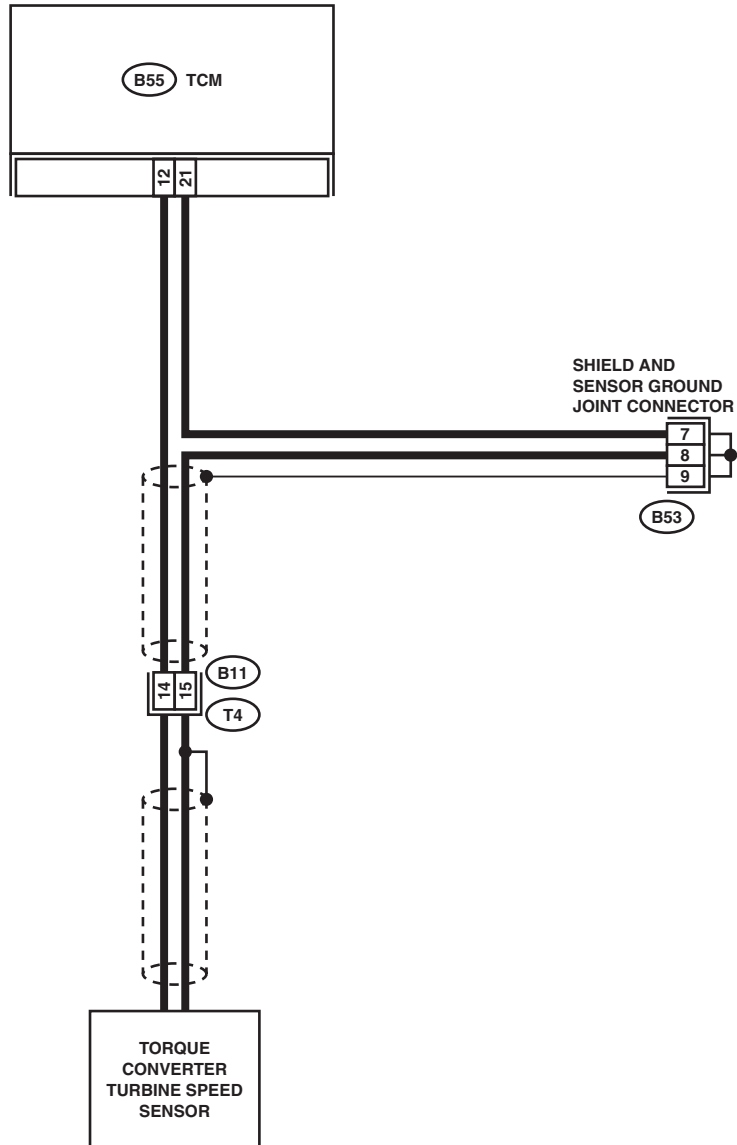
DIAGNOSIS:

The input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(T4) No. 14 — No. 15:</i>	Is the resistance 450 — 650 Ω ?	Go to step 2.	Replace the turbine speed sensor. <Ref. to 4AT-60, Torque Converter Turbine Speed Sensor.>
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. <i>Connector & terminal</i> <i>(B55) No. 12 — (B11) No. 14:</i>	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. <i>Connector & terminal</i> <i>(B55) No. 21 — (B11) No. 15:</i>	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. <i>Connector & terminal</i> <i>(B55) No. 21 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(B55) No. 12 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	Go to step 6.	Repair the short circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
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) Start the engine and move select lever to "P" or "N" range. 3) Measure the voltage between TCM connector terminals. <i>Connector & terminal</i> <i>(B55) No. 12 (+) — No. 21 (-):</i>	Is the voltage more than AC 1 V?	Even if the AT OIL TEMP warning light blinks, 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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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 blinks, 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. <i>Connector & terminal</i> <i>Positive probe; (B55) No. 12:</i> <i>Ground lead; (B55) No. 21:</i> 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 blinks, 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. to 4AT-77, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)
AUTOMATIC TRANSMISSION (DIAGNOSTICS)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

F: DTC 38 TORQUE CONTROL SIGNAL

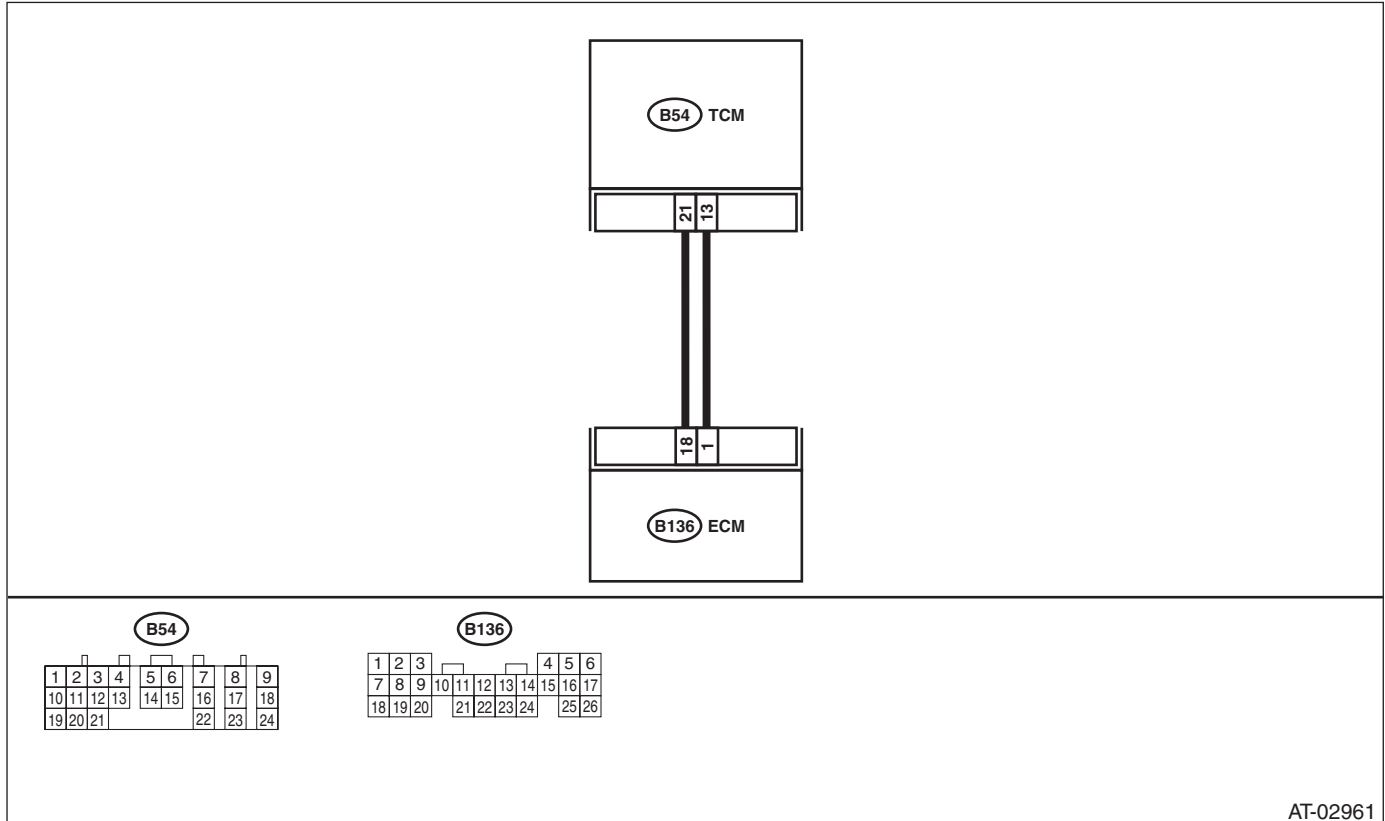
DIAGNOSIS:

- 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. 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 (B54) No. 21 — (B136) No. 18: (B54) No. 13 — (B136) No. 1:	Is the resistance less than 1 Ω?	Go to step 2.	Repair the open circuit in harness between TCM and ECM connector.
2 CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM. Measure the resistance of harness between TCM connector and chassis ground. Connector & terminal (B54) No. 21 — Chassis ground: (B54) No. 13 — Chassis ground:	Is the resistance more than 1 MΩ?	Go to step 3.	Repair the short circuit in harness between TCM and ECM connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
3 CHECK OUTPUT SIGNAL EMITTED FROM 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 terminals. <i>Connector & terminal</i> <i>(B54) No. 21 (+) — Chassis ground (-):</i> <i>(B54) No. 13 (+) — Chassis ground (-):</i>	Is the voltage more than 4.8 V?	Even if the AT OIL TEMP warning light blinks, 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 4.
4 CHECK POOR CONTACT.	Is there poor contact in torque control signal circuit?	Repair the poor contact.	Go to step 5.
5 CHECK GROUND LINE BETWEEN TRANSMISSION AND BODY. Check installing condition of the ground line in transmission and body.	Is there any dirt or rust at the ground line installing point?	Remove dirt and rust.	Go to step 6.
6 CHECK GROUND LINE BETWEEN TRANSMISSION AND BODY. Check installing condition of the ground line in transmission and body. <i>Tightening torque:</i> <i>10 — 16 N·m (1.0 — 1.6 kgf·m, 7.2 — 11.6 ft·lb)</i>	Is the tightening torque value within specification?	Go to step 7.	Tighten to the specified torque.
7 CHECK GROUND LINE INSIDE TRANSMISSION. 1) Drain the ATF and remove oil pan. 2) Check the tightening torque value of ground line installing bolt. <i>Tightening torque:</i> <i>7 — 9 N·m (0.7 — 0.9 kgf·m, 5.1 — 6.5 ft·lb)</i>	Is the tightening torque value within specification?	Go to step 9.	Tighten to the specified torque.
8 CHECK GROUND CIRCUIT OF ECM. <Ref. to 4AT-44, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	Is there any trouble?	Repair the ground terminal and/or ground circuit of ECM.	Go to step 9.
9 RECHECK OUTPUT SIGNAL EMITTED FROM TCM. Measure the voltage between TCM connector and chassis ground. <i>Connector & terminal</i> <i>(B54) No. 21 (+) — Chassis ground (-):</i> <i>(B54) No. 13 (+) — Chassis ground (-):</i>	Is each voltage more than 4 V?	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>	Replace the ECM.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

G: DTC 45 INTAKE MANIFOLD PRESSURE SIGNAL

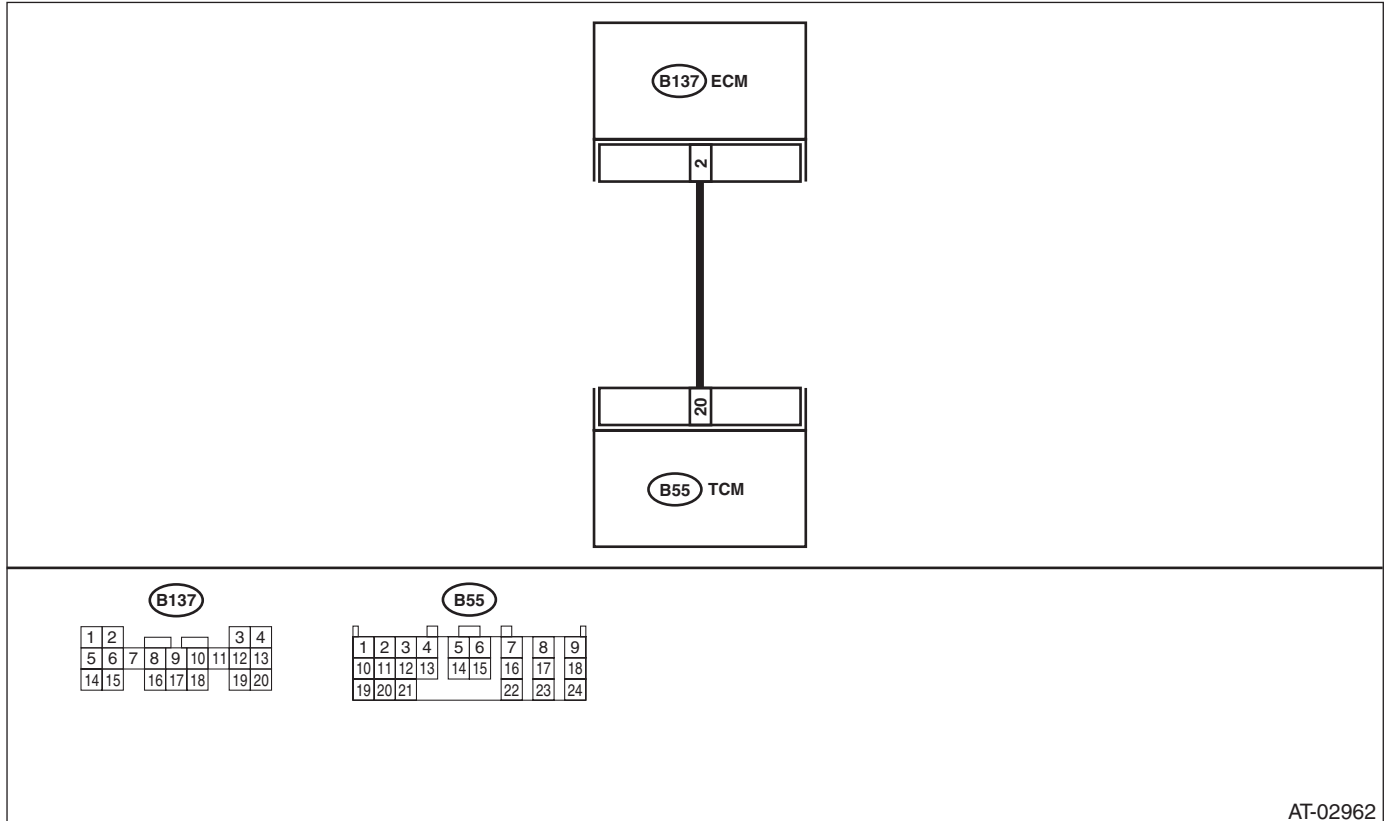
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



AT-02962

Step	Check	Yes	No
1	CHECK ENGINE GROUND TERMINALS AND GROUND CIRCUIT OF ECM <Ref. to 4AT-44, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).>	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 (B54) 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 MΩ?	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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>5 CHECK INPUT SIGNAL FOR TCM.</p> <ol style="list-style-type: none"> 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). <p>NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature.</p> <ol style="list-style-type: none"> 3) Idle the engine. 4) Measure the voltage between TCM connector and chassis ground. <p>Connector & terminal (B55) No. 20 (+) - Chassis ground (-):</p>	<p>Is the voltage 0.4 — 1.6 V?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 7.</p>
<p>6 CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.</p> <ol style="list-style-type: none"> 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. <p>•Display shows the intake manifold pressure signal value sent from ECM.</p>	<p>Is the value voltage 0.4 — 1.6 V?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 7.</p>
<p>7 CHECK POOR CONTACT.</p>	<p>Is there poor contact in intake manifold pressure signal circuit?</p>	<p>Repair the poor contact.</p>	<p>Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).></p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

H: DTC 71 SHIFT SOLENOID 1

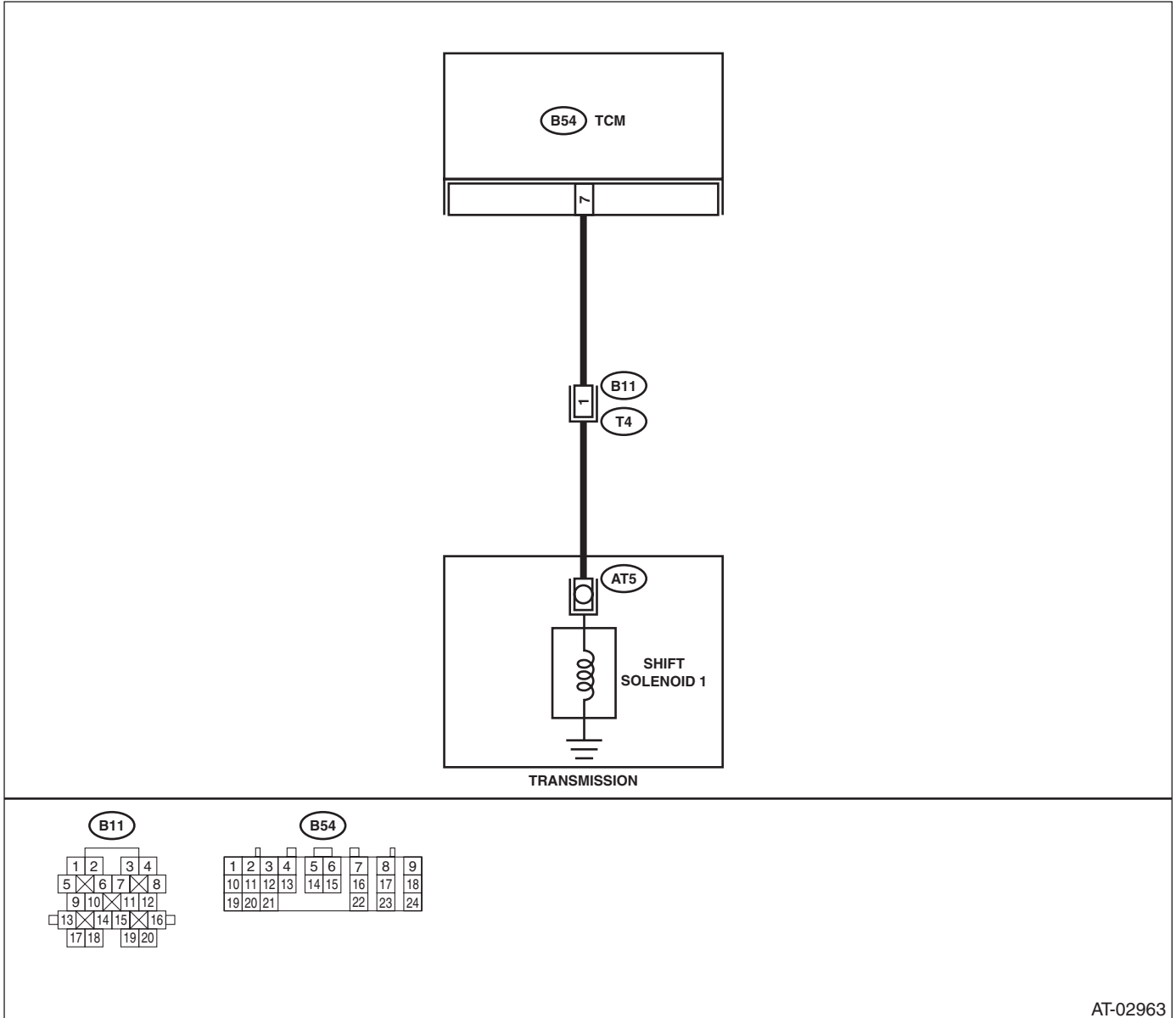
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Does not shift.

WIRING DIAGRAM:



AT-02963

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B54) No. 7 — (B11) No. 1:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 7 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(T4) No. 1 — No. 16:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 7 (+) — Chassis ground (-):</i>	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. <i>Connector & terminal</i> <i>(B54) No. 7 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light blinks, 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. to 4AT-77, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>7</p> <p>CHECK SHIFT SOLENOID 1 (IN TRANSMISSION).</p> <p>1) Remove the transmission connector from bracket.</p> <p>2) Lift-up or raise the vehicle and support with safety stand.</p> <p>NOTE: Raise all wheels off ground.</p> <p>3) Drain the ATF.</p> <p>CAUTION: Do not drain the ATF until it cools down.</p> <p>4) Remove the oil pan, and disconnect connector from shift solenoid 1.</p> <p>5) Measure the resistance between shift solenoid 1 connector and transmission ground.</p> <p>Terminals No. 1 — Transmission ground:</p>	<p>Is the resistance 10 — 16 Ω?</p>	<p>Go to step 8.</p>	<p>Replace the shift solenoid 1. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.></p>
<p>8</p> <p>CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.</p> <p>Measure the resistance of harness between shift solenoid 1 and transmission connector.</p> <p>Connector & terminal (T4) No. 1 — (AT5) No. 1:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 9.</p>	<p>Repair the open circuit in harness between shift solenoid 1 and transmission connector.</p>
<p>9</p> <p>CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.</p> <p>Measure the resistance of harness between shift solenoid 1 connector and transmission ground.</p> <p>Connector & terminal (T4) No. 1 — Transmission ground:</p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Repair the short circuit harness between shift solenoid 1 and transmission connector.</p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

I: DTC 72 SHIFT SOLENOID 2

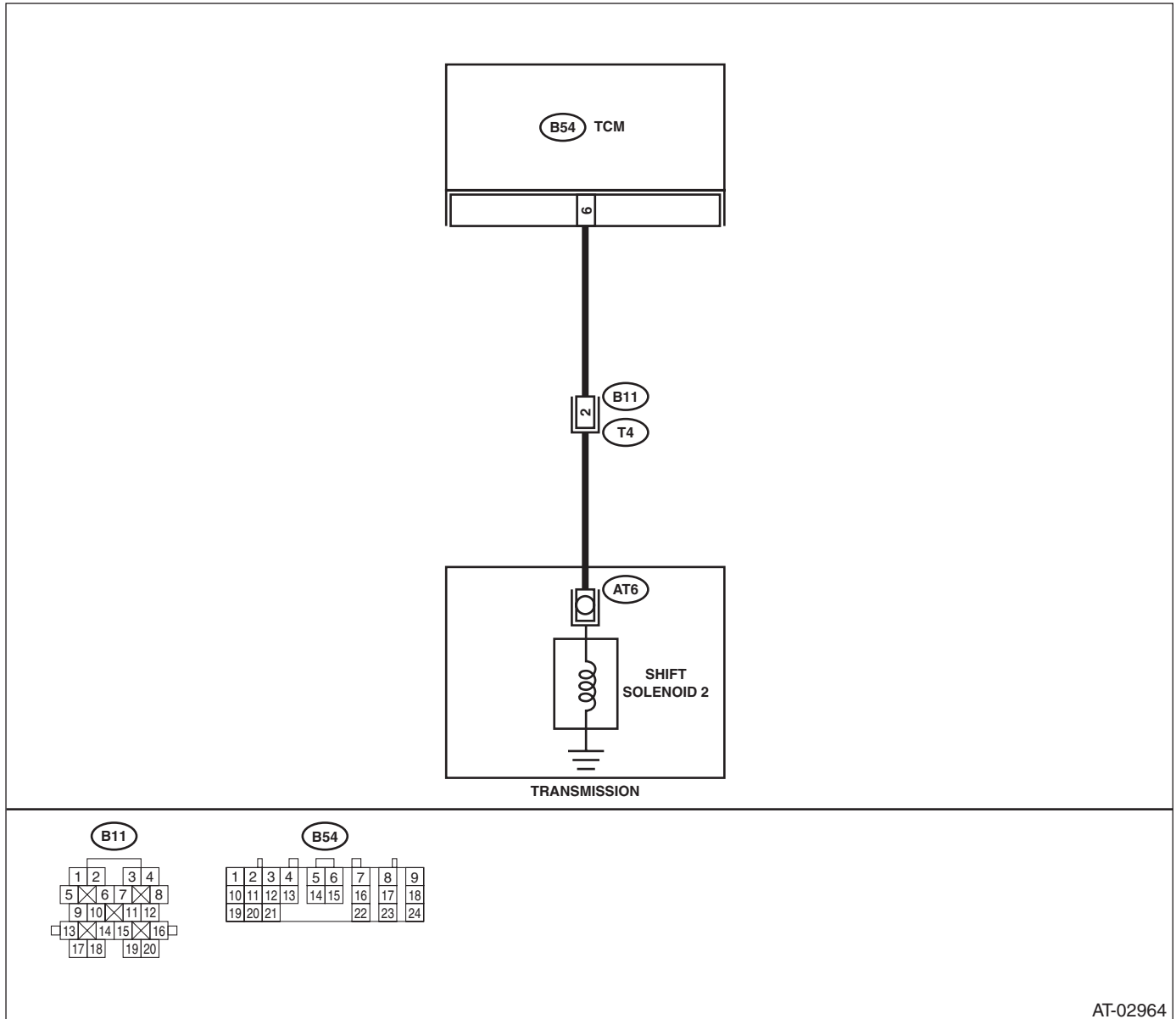
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Does not shift.

WIRING DIAGRAM:



AT-02964

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>1 CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.</p> <p>1) Turn the ignition switch to OFF.</p> <p>2) Disconnect the connector from TCM and transmission.</p> <p>3) Measure the resistance of harness between TCM and shift solenoid 2 connector.</p> <p>Connector & terminal (B54) No. 6 — (B11) No. 2:</p>	Is the resistance less than 1 Ω ?	Go to step 2.	Repair the open circuit in harness between TCM and transmission connector.
<p>2 CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.</p> <p>Measure the resistance of harness between TCM connector and transmission ground.</p> <p>Connector & terminal (B54) No. 6 — Chassis ground:</p>	Is the resistance more than 1 $M\Omega$?	Go to step 3.	Repair the short circuit in harness between TCM and transmission connector.
<p>3 CHECK SHIFT SOLENOID 2.</p> <p>Measure the resistance between transmission connector terminals.</p> <p>Connector & terminal (T4) No. 2 — No. 16:</p>	Is the resistance 10 — 16 Ω ?	Go to step 4.	Go to step 6.
<p>4 CHECK OUTPUT SIGNAL EMITTED FROM TCM.</p> <p>1) Connect the connectors to TCM and transmission.</p> <p>2) Lift-up or raise the vehicle and support with safety stand.</p> <p>NOTE: Raise all wheels off ground.</p> <p>3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).</p> <p>NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature.</p> <p>4) Move the selector lever to “D” range, and slowly increase vehicle speed to 50 km/h (31 MPH).</p> <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p> <p>5) Measure the voltage between TCM connector and chassis ground.</p> <p>Connector & terminal (B54) No. 6 (+) — Chassis ground (-):</p>	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light blinks, 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.
<p>5 CHECK POOR CONTACT.</p>	Is there poor contact in shift solenoid 2 circuit?	Repair the poor contact.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

	Step	Check	Yes	No
6	<p>CHECK SHIFT SOLENOID 2 (IN TRANSMISSION).</p> <p>1) Remove the transmission connector from bracket.</p> <p>2) Drain the ATF.</p> <p>CAUTION: Do not drain the ATF until it cools down.</p> <p>3) Remove the oil pan, and disconnect connector from shift solenoid 2.</p> <p>4) Measure the resistance between shift solenoid 2 connector and transmission ground.</p> <p>Terminals No. 1 — Transmission ground:</p>	Is the resistance 10 — 16 Ω ?	Go to step 7.	Replace the shift solenoid 2. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
7	<p>CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.</p> <p>Measure the resistance of harness between shift solenoid 2 and transmission connector.</p> <p>Connector & terminal (AT6) No. 1 — (T4) No. 2:</p>	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	<p>CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.</p> <p>Measure the resistance of harness between shift solenoid 2 connector and transmission ground.</p> <p>Connector & terminal (T4) No. 2 — Transmission ground:</p>	Is the resistance more than 1 M Ω ?	Even if the AT OIL TEMP warning light blinks, 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 solenoid 2 and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

J: DTC 73 LOW CLUTCH TIMING SOLENOID

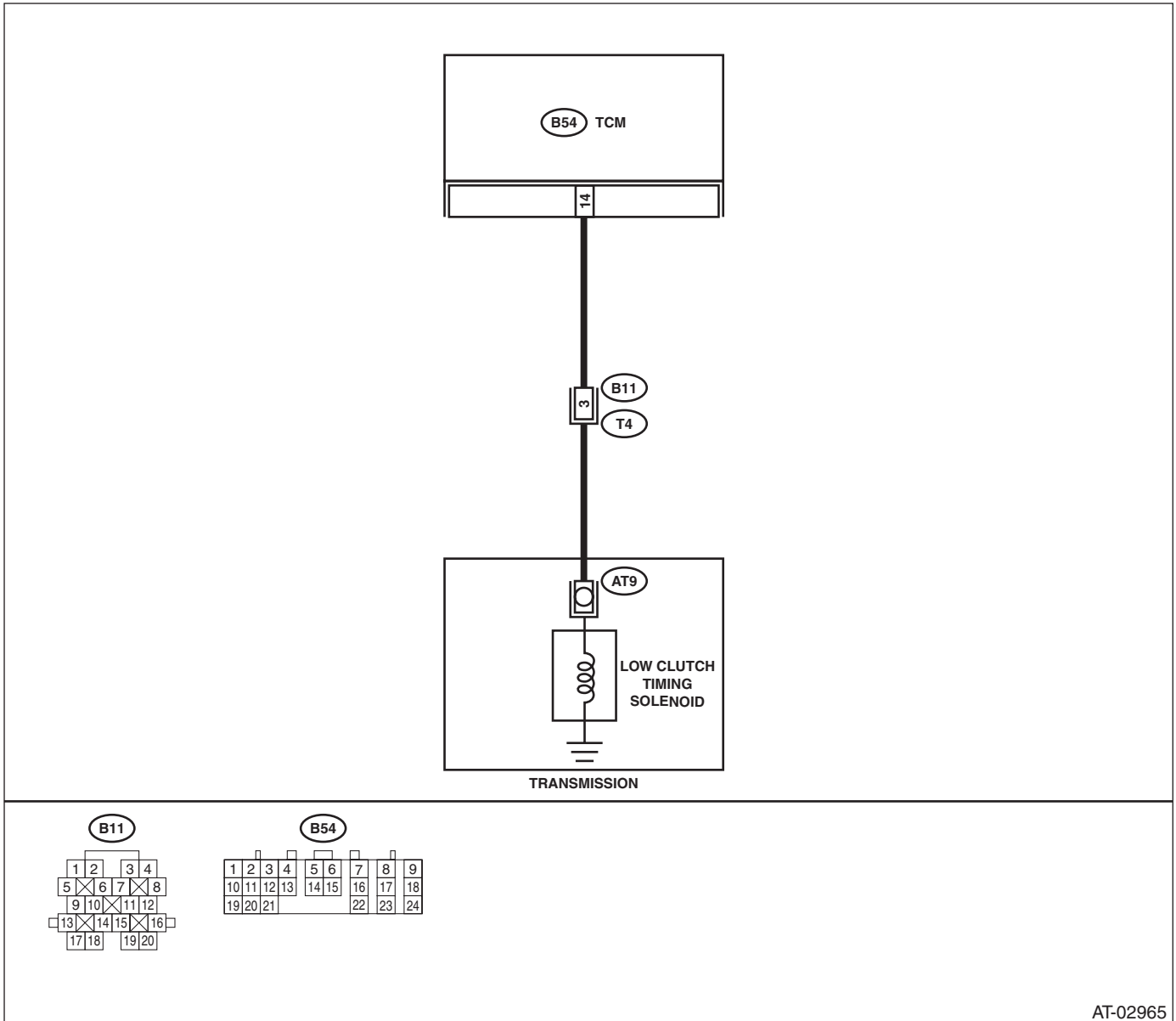
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



AT-02965

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B54) No. 14 — (B11) No. 3:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 14 — Chassis ground:</i>	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 LOW CLUTCH TIMING SOLENOID. Measure the resistance between transmission connector terminals. <i>Connector & terminal</i> <i>(T4) No. 3 — No. 16:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 14 (+) — Chassis ground (-):</i>	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. <i>Connector & terminal</i> <i>(B54) No. 14 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light blinks, 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. to 4AT-77, Transmission Control Module (TCM).>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>7</p> <p>CHECK LOW CLUTCH TIMING SOLENOID (IN TRANSMISSION).</p> <p>1) Remove the transmission connector from bracket.</p> <p>2) Lift-up or raise the vehicle and support with safety stand.</p> <p>NOTE: Raise all wheels off ground.</p> <p>3) Drain the ATF.</p> <p>CAUTION: Do not drain the ATF until it cools down.</p> <p>4) Remove the oil pan, and disconnect connector from low clutch timing solenoid.</p> <p>5) Measure the resistance between low clutch timing solenoid connector and transmission ground.</p> <p>Terminals No. 1 — Transmission ground:</p>	<p>Is the resistance 10 — 16 Ω?</p>	<p>Go to step 8.</p>	<p>Replace the low clutch timing solenoid. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.></p>
<p>8</p> <p>CHECK HARNESS CONNECTOR BETWEEN LOW CLUTCH TIMING SOLENOID AND TRANSMISSION.</p> <p>Measure the resistance of harness between low clutch timing solenoid and transmission connector.</p> <p>Connector & terminal (AT9) No. 1 — (T4) No. 3:</p>	<p>Is the resistance less than 1 Ω?</p>	<p>Go to step 9.</p>	<p>Repair the open circuit in harness between low clutch timing solenoid and transmission connector.</p>
<p>9</p> <p>CHECK HARNESS CONNECTOR BETWEEN LOW CLUTCH TIMING SOLENOID AND TRANSMISSION.</p> <p>Measure the resistance of harness between low clutch timing solenoid connector and transmission ground.</p> <p>Connector & terminal (T4) No. 3 — Transmission ground:</p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Repair the short circuit harness between low clutch timing solenoid and transmission connector.</p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

MEMO:

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

K: DTC 74 2-4 BRAKE TIMING SOLENOID

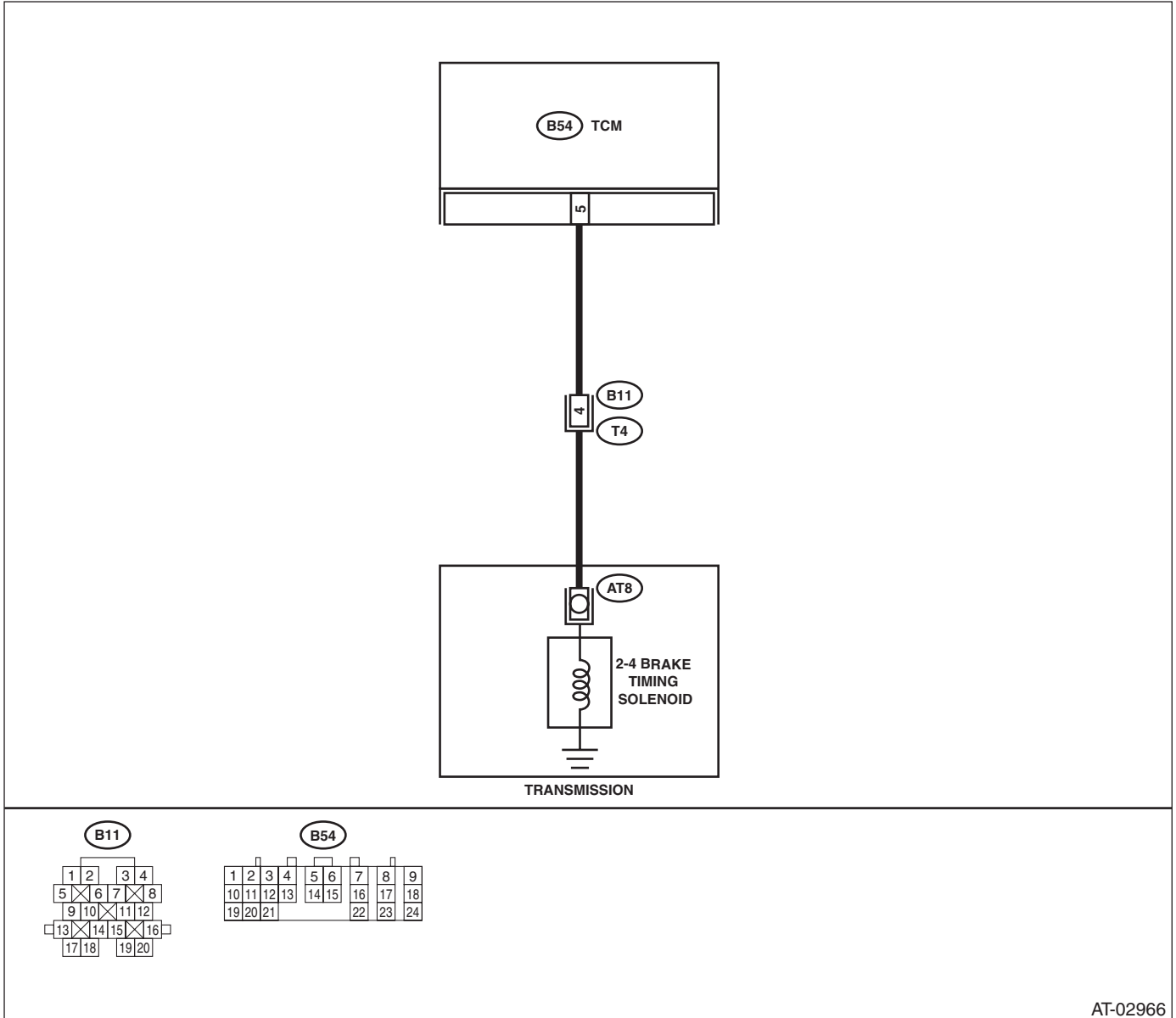
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



AT-02966

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B54) No. 5 — (B11) No. 4:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 5 — Chassis ground:</i>	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 2-4 BRAKE TIMING SOLENOID. Measure the resistance between transmission connector terminals. <i>Connector & terminal</i> <i>(T4) No. 4 — No. 16:</i>	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 of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.> 5) Measure the voltage between TCM connector and chassis ground. <i>Connector & terminal</i> <i>(B54) No. 5 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 5.	Go to step 6.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>5</p> <p>CHECK OUTPUT SIGNAL EMITTED FROM TCM.</p> <p>1) Move the selector lever to “D” range, and slowly increase vehicle speed to 65 km/h (40 MPH).</p> <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p> <p>2) Measure the voltage between TCM connector and chassis ground.</p> <p>Connector & terminal (B54) No. 5 (+) — Chassis ground (-):</p>	Is the voltage more than 9 V?	Even if the AT OIL TEMP warning light blinks, 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.
<p>6</p> <p>CHECK POOR CONTACT.</p>	Is there poor contact in 2-4 brake timing solenoid circuit?	Repair the poor contact.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>
<p>7</p> <p>CHECK 2-4 BRAKE TIMING SOLENOID (IN TRANSMISSION).</p> <p>1) Remove the transmission connector from bracket.</p> <p>2) Lift-up or raise the vehicle and support with safety stand.</p> <p>NOTE: Raise all wheels off ground.</p> <p>3) Drain the ATF.</p> <p>CAUTION: Do not drain the ATF until it cools down.</p> <p>4) Remove the oil pan, and disconnect connector from 2-4 brake timing solenoid.</p> <p>5) Measure the resistance between 2-4 brake timing solenoid connector and transmission ground.</p> <p>Terminals No. 1 — Transmission ground:</p>	Is the resistance 10 — 16 Ω?	Go to step 8.	Replace the 2-4 brake timing solenoid. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
<p>8</p> <p>CHECK HARNESS CONNECTOR BETWEEN 2-4 BRAKE TIMING SOLENOID AND TRANSMISSION.</p> <p>Measure the resistance of harness between 2-4 brake timing solenoid and transmission connector.</p> <p>Connector & terminal (AT8) No. 1 — (T4) No. 4:</p>	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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>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:</p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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 2-4 brake timing solenoid and transmission.</p>	<p>Repair the short circuit harness between 2-4 brake timing solenoid and transmission connector.</p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

L: DTC 75 LINE PRESSURE DUTY SOLENOID

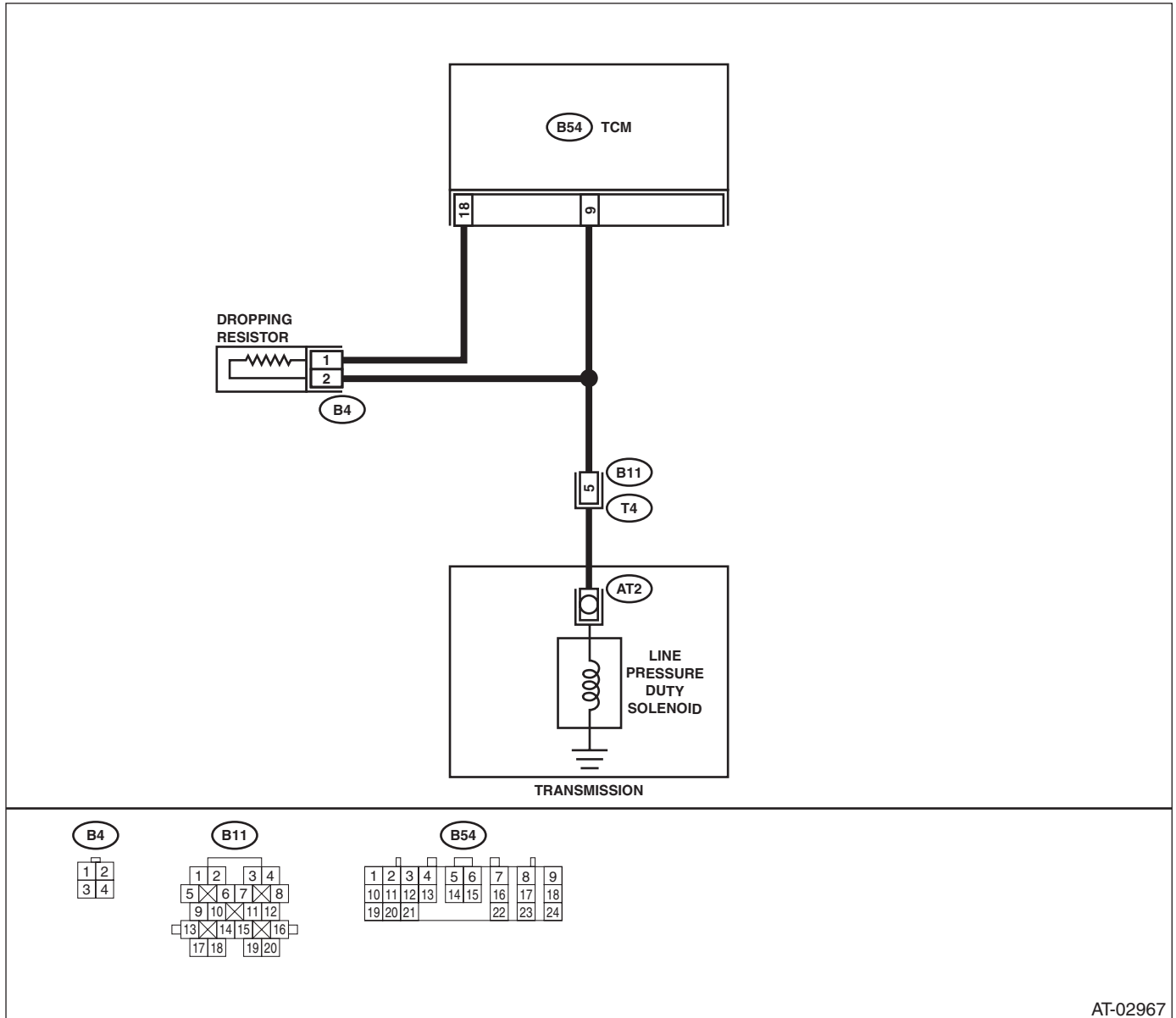
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



AT-02967

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Terminals</i> <i>No. 1 — No. 2:</i>	Is the resistance 9 — 15 Ω ?	Go to step 2.	Replace the dropping resistor. <Ref. to 4AT-79, Dropping Resistor.>
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. <i>Connector & terminal</i> <i>(B54) No. 18 — (B4) No. 1:</i>	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. <i>Connector & terminal</i> <i>(B4) No. 1 — Chassis ground:</i>	Is the resistance more than 1 M Ω ?	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. <i>Connector & terminal</i> <i>(B4) No. 2 — (B11) No. 5:</i>	Is the resistance less than 1 Ω ?	Go to step 5.	Repair open circuit in harness between dropping resistor and transmission connector.
5 CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR. Measure the resistance of harness between dropping resistor connector and chassis ground. <i>Connector & terminal</i> <i>(B4) No. 2 — Chassis ground:</i>	Is the resistance more than 1 M Ω ?	Go to step 6.	Repair short circuit in harness between dropping resistor and transmission 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. <i>Connector & terminal</i> <i>(B54) No. 9 — (B11) No. 5:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 9 — Chassis ground:</i>	Is the resistance more than 1 M Ω ?	Go to step 8.	Repair the short circuit in harness between TCM and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK LINE PRESSURE DUTY SOLENOID. Measure the resistance between transmission connector receptacle's terminals. <i>Terminals</i> <i>(T4) No. 5 — No. 16:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 9 (+) — Chassis ground (-):</i>	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. <i>Connector & terminal</i> <i>(B54) No. 9 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light blinks, 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.
12 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 13.	Go to step 14.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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 blinks, 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.
14 CHECK POOR CONTACT.	Is there poor contact in line pressure duty solenoid circuit?	Repair the poor contact.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>
15 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 16.	Replace the line pressure duty solenoid. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
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 M Ω ?	Even if the AT OIL TEMP warning light blinks, 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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

M: DTC 76 2-4 BRAKE DUTY SOLENOID

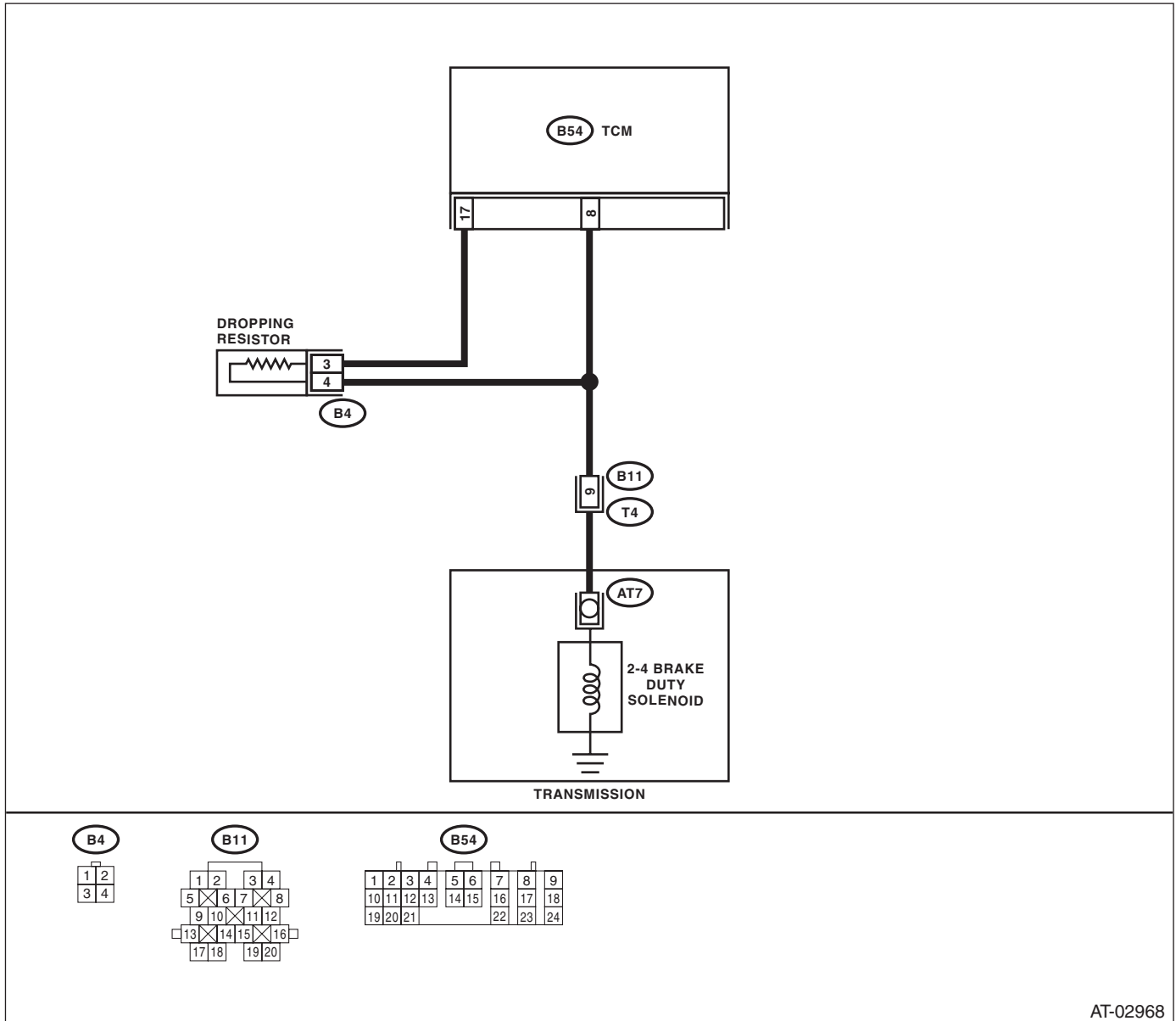
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



AT-02968

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Terminals</i> <i>No. 3 — No. 4:</i>	Is the resistance 9 — 15 Ω?	Go to step 2.	Replace the dropping resistor. <Ref. to 4AT-79, Dropping Resistor.>
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. <i>Connector & terminal</i> <i>(B54) No. 17 — (B4) No. 3:</i>	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. <i>Connector & terminal</i> <i>(B4) No. 3 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	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. <i>Connector & terminal</i> <i>(B4) No. 4 — (B11) No. 9:</i>	Is the resistance less than 1 Ω?	Go to step 5.	Repair open circuit in harness between dropping resistor and transmission connector.
5 CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR. Measure the resistance of harness between dropping resistor connector and chassis ground. <i>Connector & terminal</i> <i>(B4) No. 4 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 6.	Repair short circuit in harness between dropping resistor and transmission 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. <i>Connector & terminal</i> <i>(B54) No. 8 — (B11) No. 9:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 8 — Chassis ground:</i>	Is the resistance more than 1 MΩ?	Go to step 8.	Repair the short circuit in harness between TCM and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
8 CHECK 2-4 BRAKE DUTY SOLENOID. Measure the resistance between transmission connector receptacle's terminals. <i>Terminals</i> <i>(T4) No. 16 — No. 9:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 8 (+) — Chassis ground (-):</i>	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. <i>Connector & terminal</i> <i>(B54) No. 8 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Even if the AT OIL TEMP warning light blinks, 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) 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.	Is the value 100%?	Go to step 13.	Go to step 14.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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 blinks, 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. to 4AT-77, Transmission Control Module (TCM).>
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 solenoid. <Ref. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
16 CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND 2-4 BRAKE DUTY SOLENOID. 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 SOLENOID. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 9 — Transmission ground:	Is the resistance more than 1 MΩ?	Even if the AT OIL TEMP warning light blinks, 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

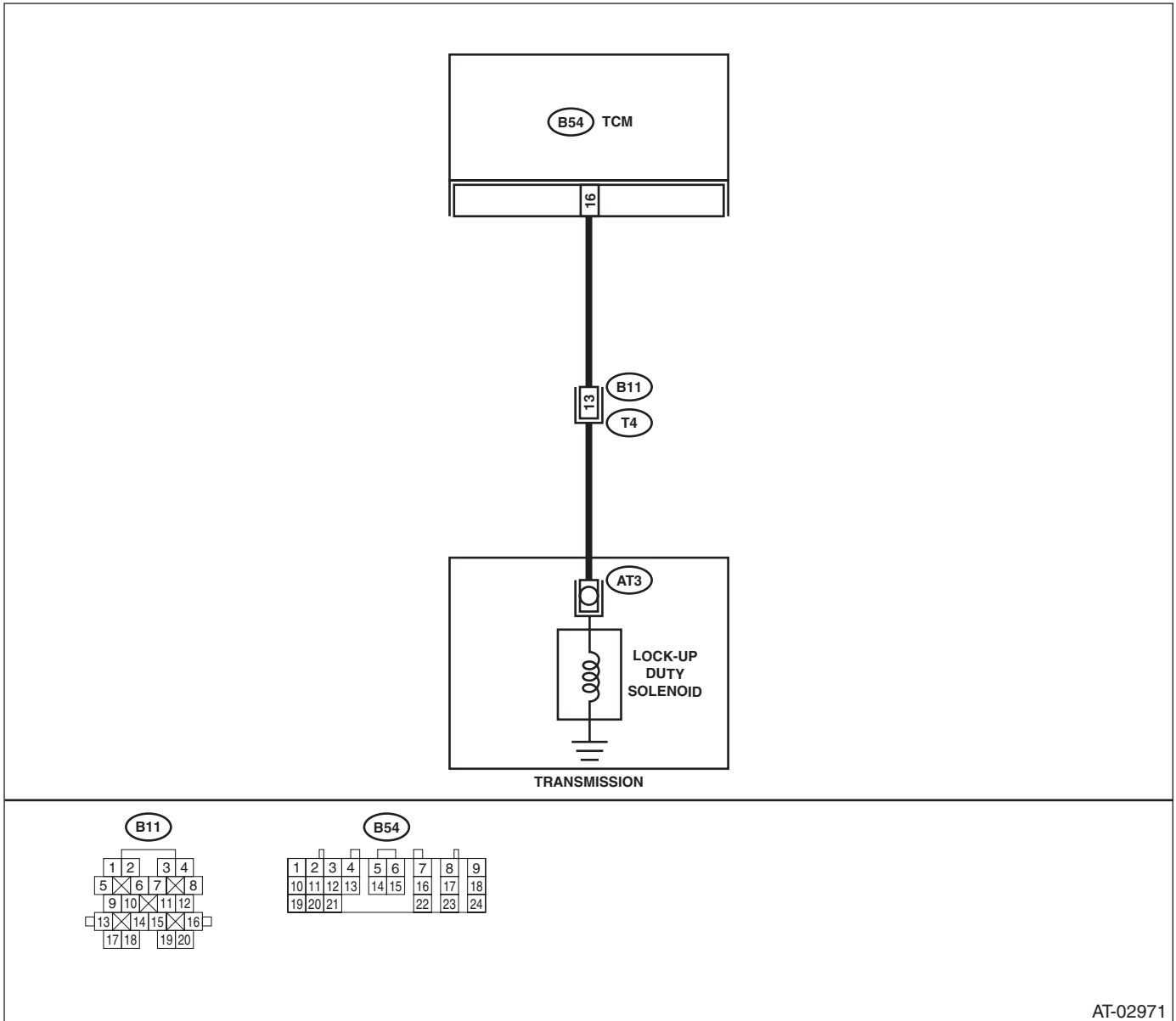
DIAGNOSIS:

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

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



AT-02971

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
1	CHECK DTC.	Go to 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:	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:	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:	Go to step 5.	Go to step 11.
5	PREPARE 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). 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. to ABS-21, Clear Memory Mode.> 5) Measure the voltage between TCM connector and chassis ground. Connector & terminal (B54) No. 16 (+) — Chassis ground (-):	Go to step 7.	Go to step 10.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>7</p> <p>CHECK OUTPUT SIGNAL EMITTED FROM TCM.</p> <p>1) Return the engine to idling speed and move select lever to “N” range.</p> <p>2) Measure the voltage between TCM connector and chassis ground.</p> <p>Connector & terminal (B54) No. 16 (+) — Chassis ground (-):</p>	Is the voltage less than 0.5 V?	Even if the AT OIL TEMP warning light blinks, 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.
<p>8</p> <p>CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.</p> <p>1) Connect the connectors to TCM and transmission.</p> <p>2) Lift-up the vehicle and place safety stand.</p> <p>NOTE: Raise all wheels off ground.</p> <p>3) Connect the Subaru Select Monitor to data link connector.</p> <p>4) Start the engine and turn Subaru Select Monitor switch to ON.</p> <p>5) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F).</p> <p>NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until ATF reaches its operating temperature.</p> <p>6) Read the data of lock-up duty solenoid using Subaru Select Monitor.</p> <p>•Lock-up duty solenoid is indicated in “%”.</p> <p>7) Move the selector lever to “D” range and slowly increase vehicle speed to 75 km/h (47 MPH). Wheels will lock-up.</p> <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p>	Is the value 95%?	Go to step 9.	Go to step 10.
<p>9</p> <p>CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.</p> <p>Return the engine to idling speed and move selector lever to “N” range.</p> <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p>	Is the value 5%?	Even if the AT OIL TEMP warning light blinks, 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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. to 4AT-77, Transmission Control Module (TCM).>
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. to 4AT-71, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
12	CHECK HARNESS CONNECTOR BETWEEN LOCK-UP DUTY SOLENOID AND TRANSMISSION. 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 TRANSMISSION. Measure the resistance of harness between transmission connector and transmission ground. Connector & terminal (T4) No. 13 — Transmission ground:	Is the resistance more than 1 MΩ?	Even if the AT OIL TEMP warning light blinks, 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)

O: DTC 79 TRANSFER DUTY SOLENOID

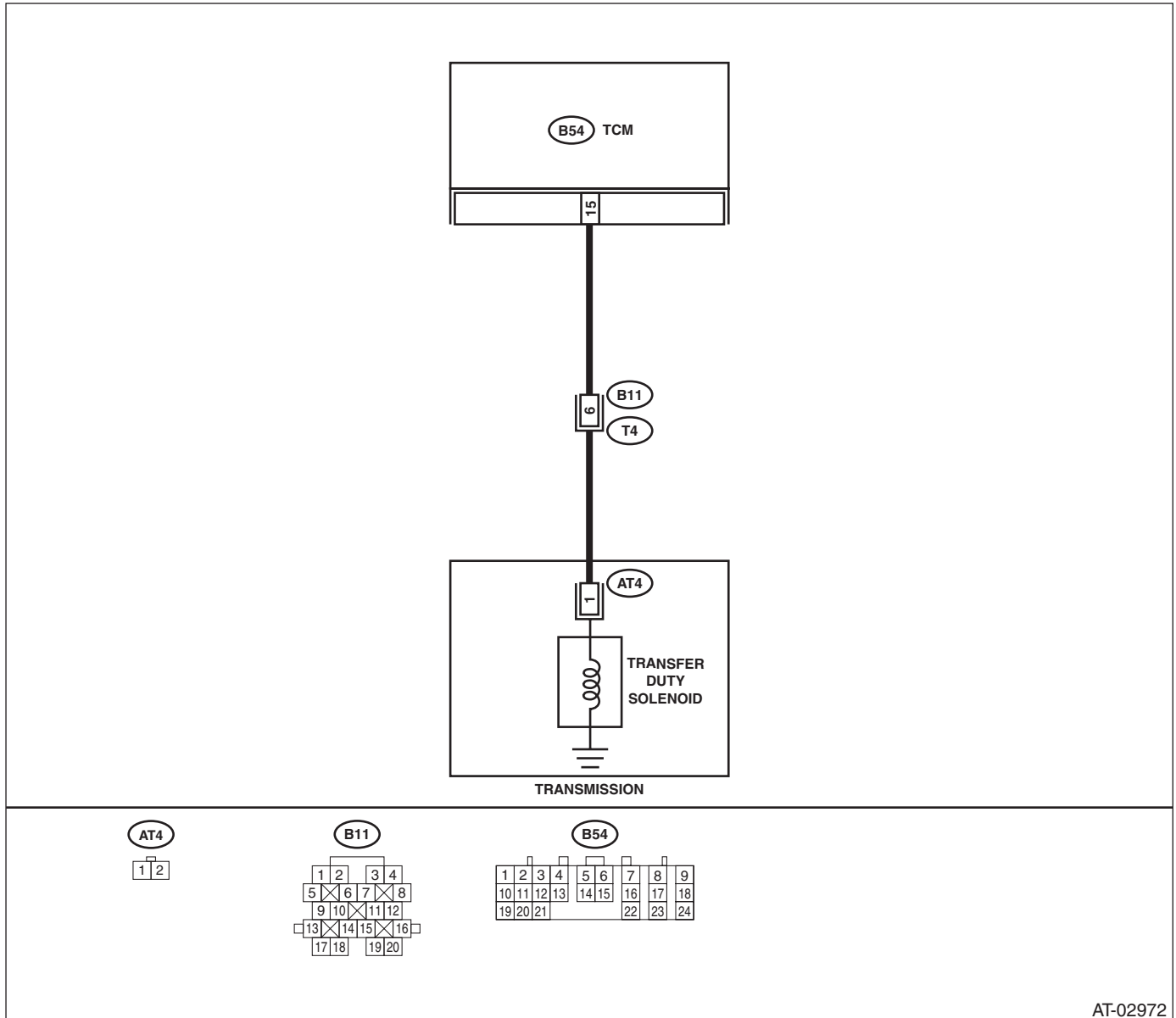
DIAGNOSIS:

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

TROUBLE SYMPTOM:

Excessive "braking" in tight corners.

WIRING DIAGRAM:



AT-02972

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B54) No. 15 — (B11) No. 6:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 15 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(T4) No. 6 — No. 16:</i>	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. <i>Connector & terminal</i> <i>(B54) No. 15 (+) — Chassis ground (-):</i>	Is the voltage less than 1 V?	Go to step 6.	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. <i>Connector & terminal</i> <i>(B54) No. 15 (+) — Chassis ground (-):</i>	Is the voltage more than 8.5 V?	Even if the AT OIL TEMP warning light blinks, 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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
7 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 Subaru Select Monitor. •Transfer duty solenoid is indicated in "%".	Is the value 80 — 95%?	Go to step 8 .	Go to step 9 .
8 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 "%".	Is the value approx. 5 — 10%?	Even if the AT OIL TEMP warning light blinks, 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 9 .
9 CHECK POOR CONTACT.	Is there poor contact in transfer duty solenoid circuit?	Repair the poor contact.	Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).>
10 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 11 .	Replace the transfer duty solenoid.
11 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 12 .	Repair the open circuit in harness between transfer duty solenoid and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>12 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:</p>	<p>Is the resistance more than 1 MΩ?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Repair the short circuit in harness between transfer duty solenoid and transmission connector.</p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

P: DTC 93 REAR VEHICLE SPEED SENSOR

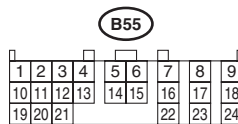
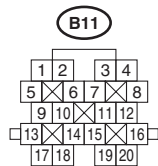
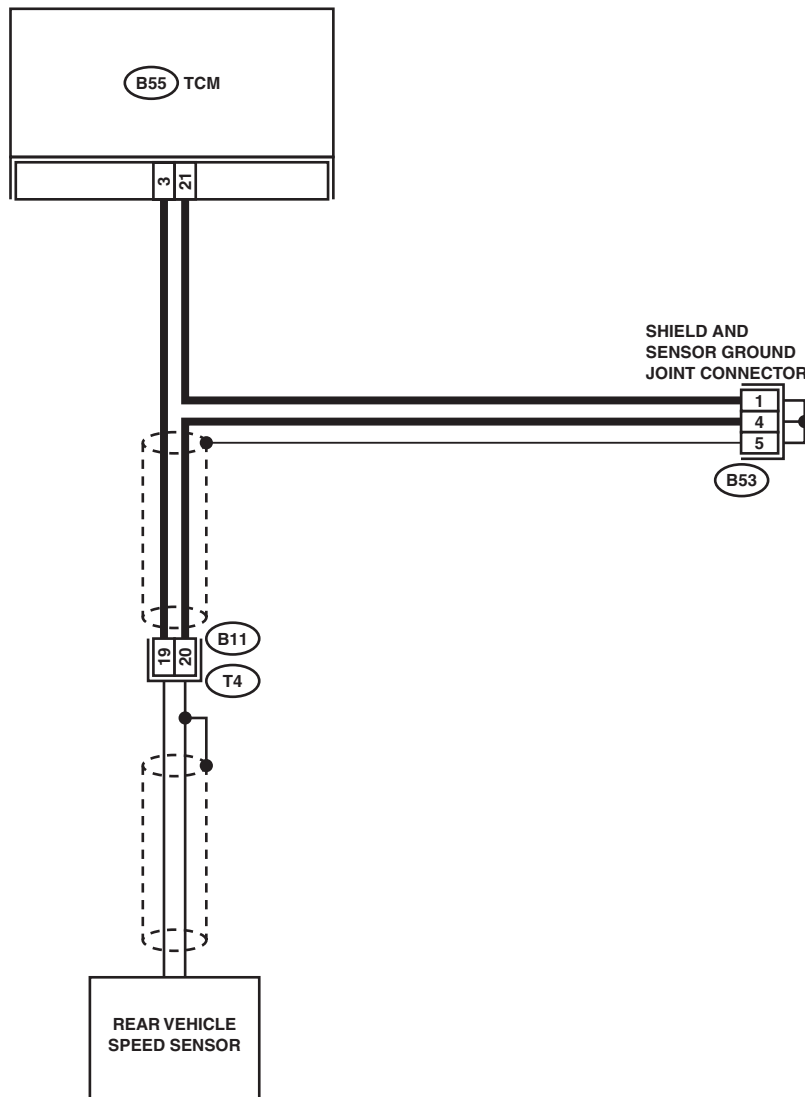
DIAGNOSIS:

The input signal circuit of TCM is open or shorted.

TROUBLE SYMPTOM:

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

WIRING DIAGRAM:



AT-02973

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

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. <i>Connector & terminal</i> <i>(B55) No. 3 — (B11) No. 19:</i>	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 and transmission connector. <i>Connector & terminal</i> <i>(B55) No. 21 — (B11) No. 20:</i>	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. <i>Connector & terminal</i> <i>(B55) No. 3 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(B55) No. 21 — Chassis ground:</i>	Is the resistance more than 1 $M\Omega$?	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. <i>Connector & terminal</i> <i>(T4) No. 19 — No. 20:</i>	Is the resistance 450 — 650 Ω ?	Go to step 6.	Replace the rear vehicle speed sensor. <Ref. to 4AT-59, Rear Vehicle 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 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 of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.> 4) Measure the voltage between TCM connector terminals. <i>Connector & terminal</i> <i>(B55) No. 3 (+) — (B55) No. 21 (-):</i>	Is the voltage more than AC 1 V?	Even if the AT OIL TEMP warning light blinks, 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.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

Step	Check	Yes	No
<p>9</p> <p>CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.</p> <ol style="list-style-type: none"> 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. <p>NOTE: Raise all wheels off floor.</p> <ol style="list-style-type: none"> 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. <ul style="list-style-type: none"> •Compare the speedometer with Subaru Select Monitor indications. •Vehicle speed is indicated in “km/h” or “MPH”. <ol style="list-style-type: none"> 7) Slowly increase the vehicle speed to 60 km/h or 37 MPH. <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p>	<p>Does the speedometer indication increase as the Subaru Select Monitor data increases?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 11.</p>
<p>10</p> <p>CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.</p> <ol style="list-style-type: none"> 1) Connect the connectors to TCM and transmission. 2) Lift-up or raise the vehicle and place safety stands. <p>NOTE: Raise all wheels off floor.</p> <ol style="list-style-type: none"> 3) Set the oscilloscope to TCM connector terminals. <p>Connector & terminal Positive probe; (B55) No. 3: Ground lead; (B55) No. 21:</p> <ol style="list-style-type: none"> 4) Start the engine and set vehicle in 20 km/h (12 MPH) condition. <p>NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-21, Clear Memory Mode.></p> <ol style="list-style-type: none"> 5) Measure the signal voltage indicated on oscilloscope. 	<p>Is the signal voltage more than AC 1 V?</p>	<p>Even if the AT OIL TEMP warning light blinks, 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.</p>	<p>Go to step 11.</p>
<p>11</p> <p>CHECK POOR CONTACT.</p>	<p>Is there poor contact in rear vehicle speed sensor circuit?</p>	<p>Repair the poor contact.</p>	<p>Replace the TCM. <Ref. to 4AT-77, Transmission Control Module (TCM).></p>

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

AUTOMATIC TRANSMISSION (DIAGNOSTICS)

MEMO: