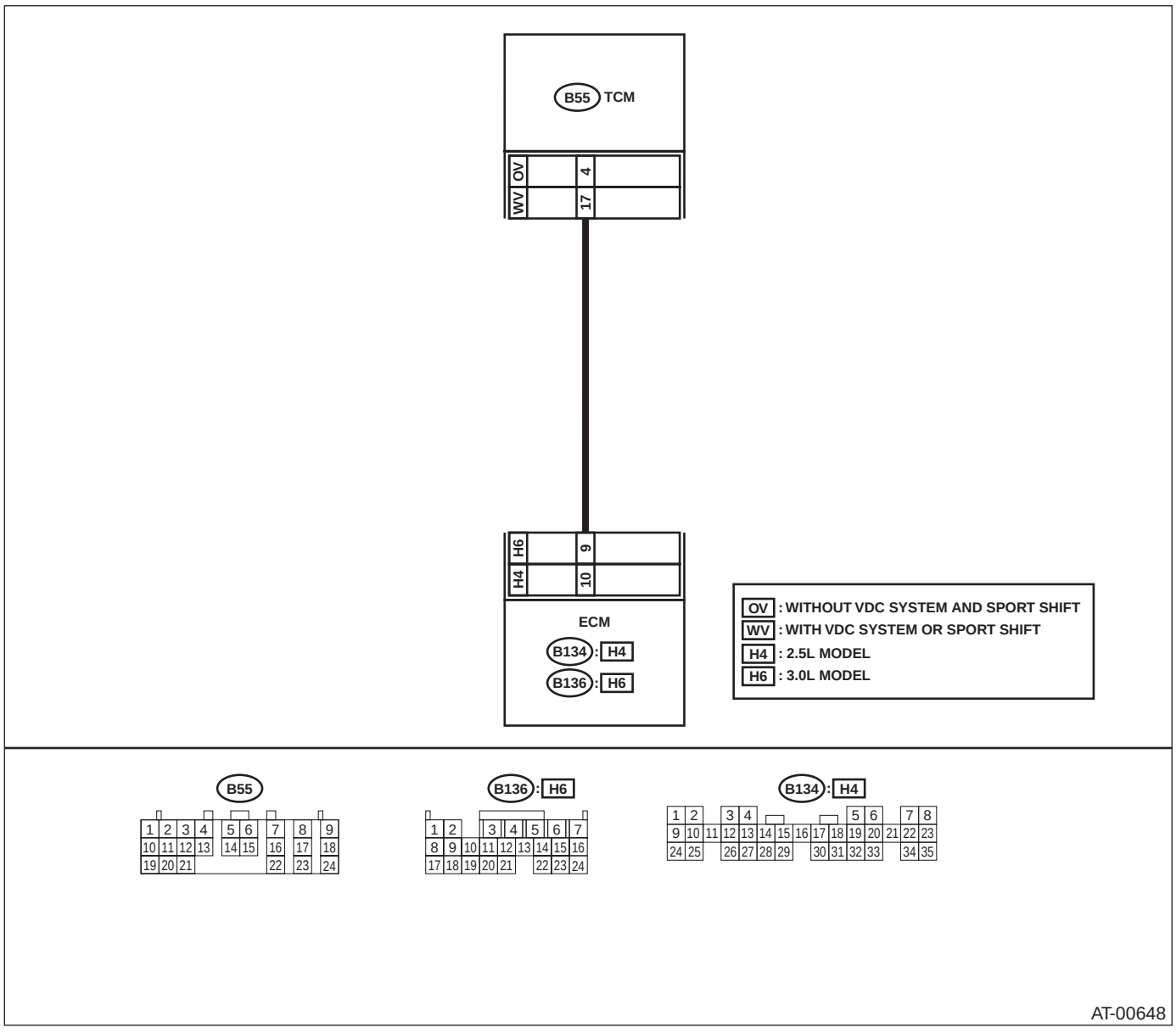
14.Diagnostic Procedure with Diagnostic Trouble Code (DTC)

A: DTC 11 ENGINE SPEED SIGNAL

DIAGNOSIS:
Engine speed input signal circuit is open or shorted.
TROUBLE SYMPTOM:
- No lock-up (after engine warm-up).
- AT OIL TEMP warning light remains on when vehicle speed is “0”.

WIRING DIAGRAM:



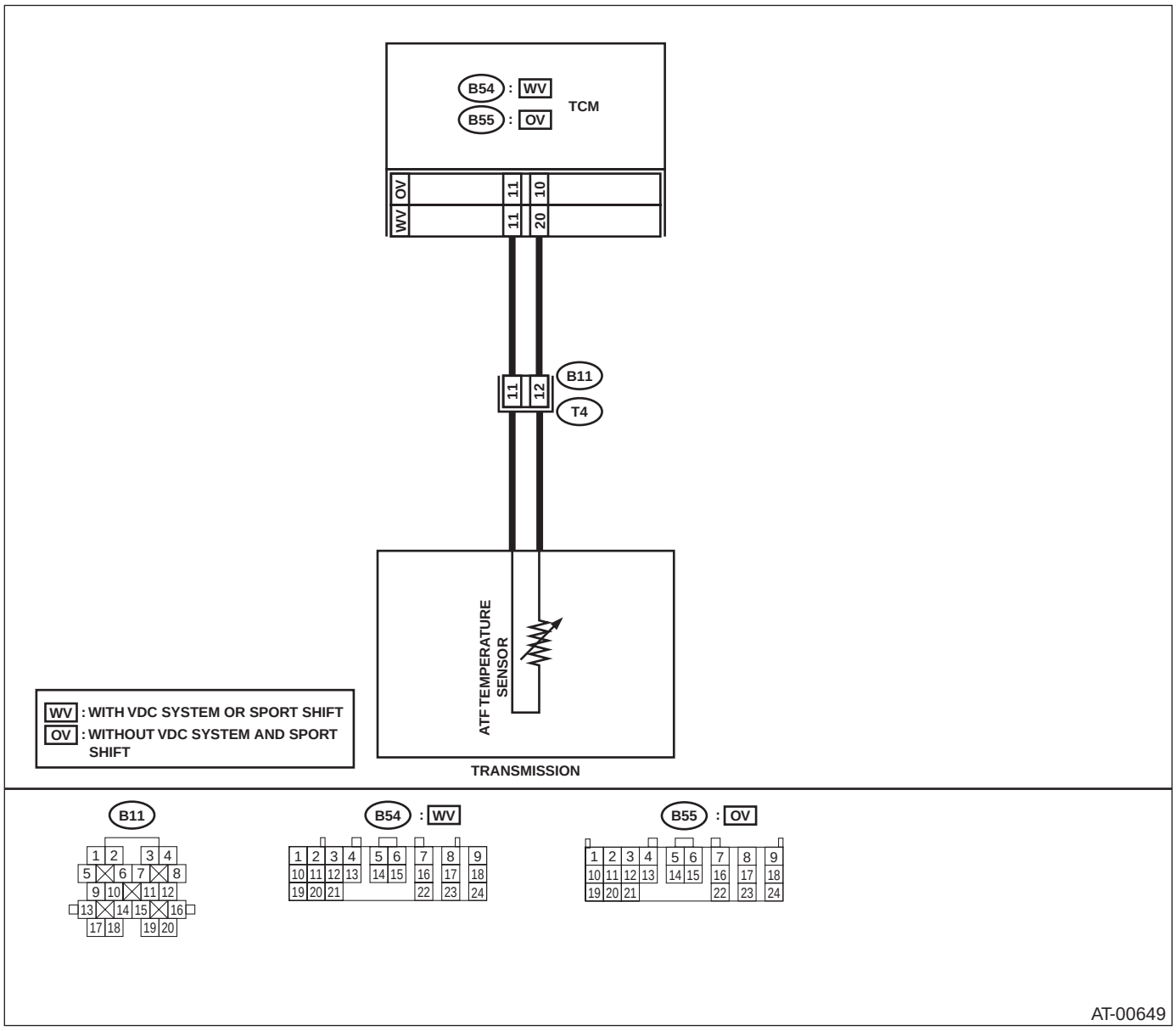
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***With SPORT shift:*** ***(B55) No. 17 — (B135) No. 10:*** ***With VDC system:*** ***(B55) No. 17 — (B136) No. 9:*** ***2.5 L model (Without VDC system and SPORT shift):*** ***(B55) No. 4 — (B134) No. 10:*** ***3.0 L model (Without VDC system and SPORT shift):*** ***(B55) No. 4 — (B136) No. 9:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and ECM connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 17 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 4 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and ECM connector.
3	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **5.**	Go to step **4.**
4	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and ECM. 2) Turn ignition switch to ON (engine OFF). 3) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 17 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 4 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	10.5 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6.**

	Step	Value	Yes	No
5	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and ECM. 2) Connect Subaru Select Monitor to data link connector. 3) Start the engine, and turn Subaru Select Monitor switch to ON. 4) Warm-up the engine until engine coolant temperature is above 80°C (176°F). 5) Engine idling. 6) Read data of engine speed using Subaru Select Monitor. •Display shows engine speed signal value sent from ECM. Is the revolution value the same as the tachometer reading shown on the combination meter?	Same.	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6.**
6	**CHECK POOR CONTACT.** Is there poor contact in engine speed signal circuit?	There is poor contact.	Repair poor contact.	Go to step **7.**
7	**CONFIRM DTC 11.** Replace ECM with a new one. Does the diagnostic trouble code (DTC) appear again, after the memory has been cleared?	DTC 11 indicated.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>	Replace ECM.

MEMO:

B: DTC 27 ATF TEMPERATURE SENSOR

DIAGNOSIS:
Input signal circuit of TCM to ATF temperature sensor is open or shorted.
TROUBLE SYMPTOM:
Excessive shift shock.
WIRING DIAGRAM:



	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission and TCM. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 20 — (B11) No. 12:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 10 — (B11) No. 12:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 11 — (B11) No. 11:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 11 — (B11) No. 12:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and transmission connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 20 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 10 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **4.**	Repair short circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ATF TEMPERATURE SENSOR.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 11 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 11 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and transmission connector.

	Step	Value	Yes	No
5	**CHECK ATF TEMPERATURE SENSOR.** 1) Turn ignition switch to OFF. 2) Connect connectors to transmission and TCM. 3) Turn 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 the ATF reaches its operating temperature. 5) Disconnect connector from transmission. 6) Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 11 — No. 12:*** Is the measured value within the specified range?	275 - 375 Ω	Go to step **6.**	Replace ATF temperature sensor. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
6	**CHECK ATF TEMPERATURE SENSOR.** 1) Turn ignition switch to ON (engine OFF). 2) Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 11 — No. 12:*** Does the resistance value increase while the ATF temperature decreases?	Resistance value increases.	Go to step **7.**	Replace ATF temperature sensor. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
7	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **9.**	Go to step **8.**
8	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect 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 the ATF reaches its operating temperature. 3) Measure voltage between TCM connector terminal. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 11 (+) — No. 20 (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 11 (+) — No. 10 (–):*** Is the measured value within the specified range?	0.4 - 0.9 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. Temporary poor contact of the connector or harness may be the case. Repair harness or contact in the ATF temperature sensor and transmission connector.	Go to step **10.**

	Step	Value	Yes	No
9	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connector to transmission. 2) Turn ignition switch to ON (engine OFF). Does the ATF temperature gradually decrease?	ATF temperature gradually increases.	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. Temporary poor contact of the connector or harness may be the case. Repair harness or contact in the ATF temperature sensor and transmission connector.	Go to step **10.**
10	**CHECK POOR CONTACT.** Is there poor contact in ATF temperature sensor circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

C: DTC 31 THROTTLE POSITION SENSOR

DIAGNOSIS:

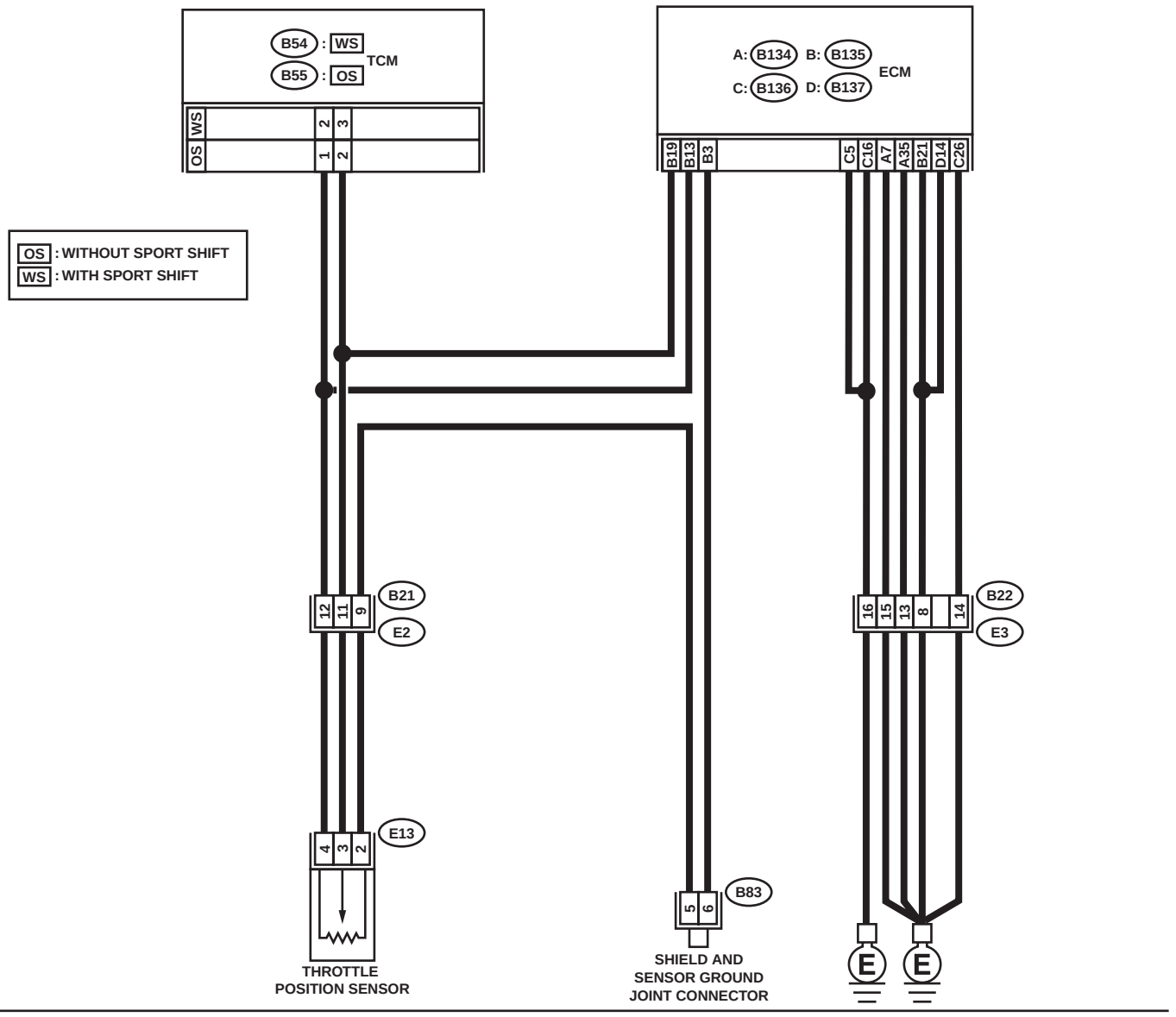
Input signal circuit of throttle position sensor is open or shorted.

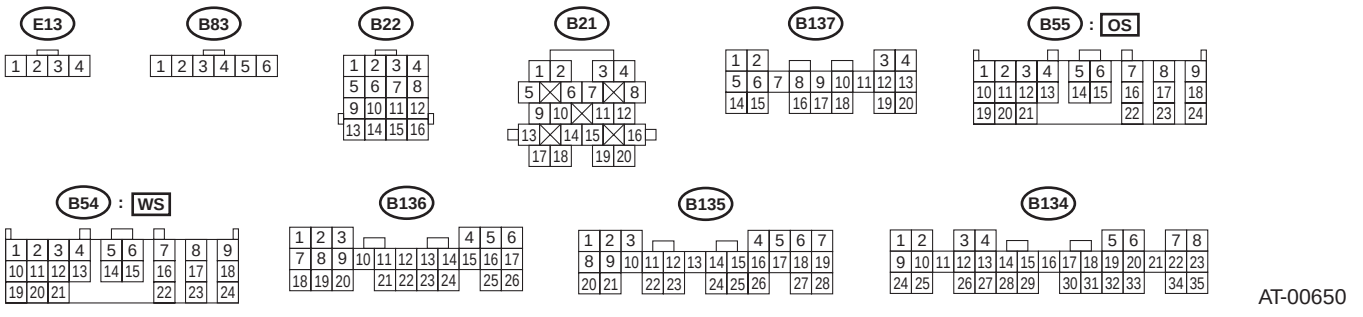
TROUBLE SYMPTOM:

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

WIRING DIAGRAM:

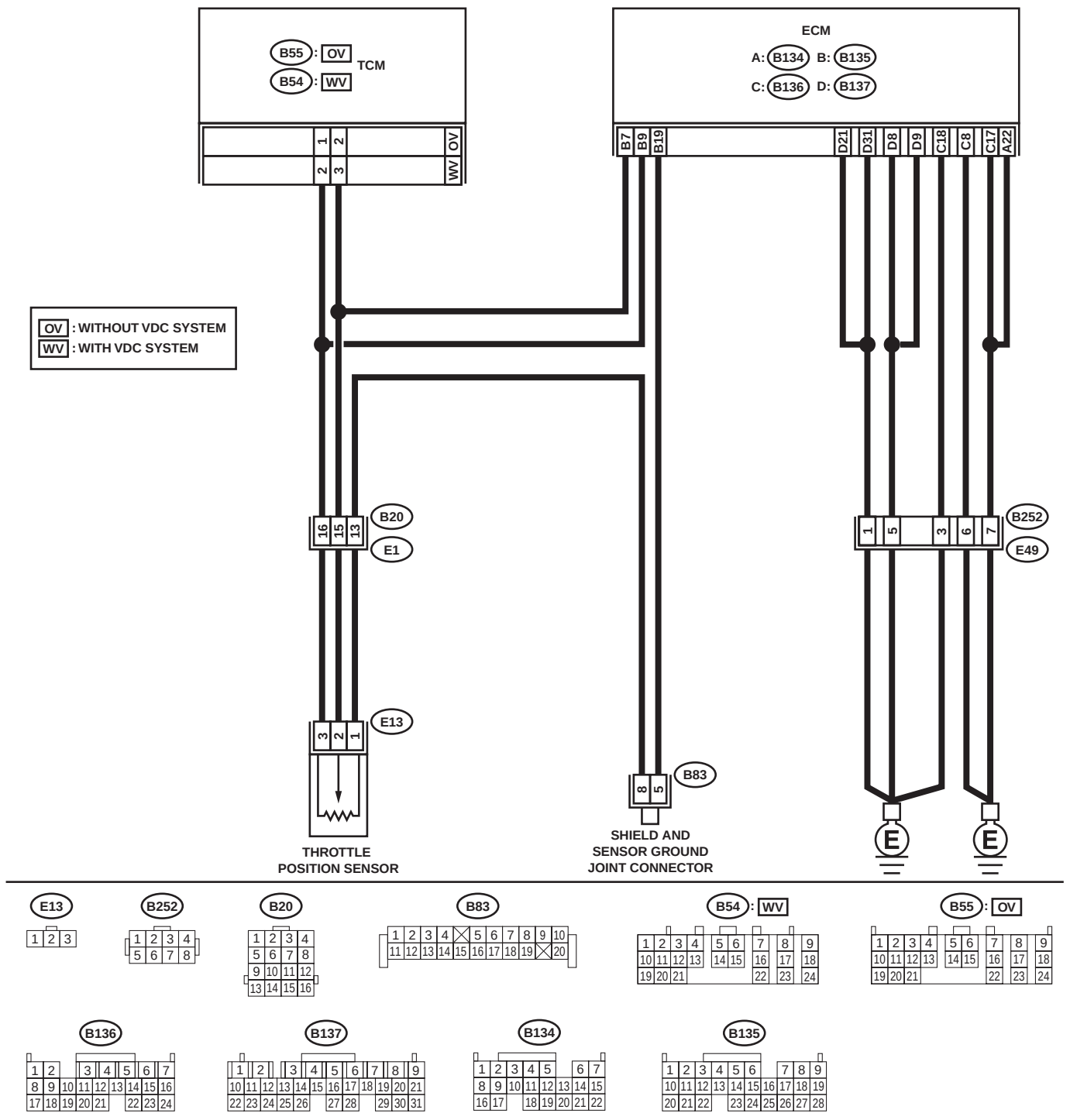
EXCEPT 2.5 L MODEL





AT-00650

3.0 L MODEL



AT-00651

	Step	Value	Yes	No
1	**CHECK ENGINE GROUND TERMINALS.** Have engine ground terminals been tightened?	Terminals have been tightened.	Go to step **2.**	Tighten engine ground terminals.
2	**CHECK GROUND CIRCUIT OF ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connector from ECM. 3) Measure resistance of harness between ECM and engine ground. ***Connector & terminal*** ***2.5 L model:*** ***(B134) No. 7 — Engine ground:*** ***(B134) No. 35 — Engine ground:*** ***(B136) No. 5 — Engine ground:*** ***(B136) No. 16 — Engine ground:*** ***(B136) No. 26 — Engine ground:*** ***(B135) No. 21 — Engine ground:*** ***(B137) No. 14 — Engine ground:*** ***3.0 L model:*** ***(B134) No. 22 — Engine ground:*** ***(B136) No. 8 — Engine ground:*** ***(B136) No. 17 — Engine ground:*** ***(B136) No. 18 — Engine ground:*** ***(B137) No. 8 — Engine ground:*** ***(B137) No. 9 — Engine ground:*** ***(B137) No. 21— Engine ground:*** ***(B137) No. 31 — Engine ground:*** Is the measured value less than the specified value?	5 Ω	Go to step **3.**	Repair open circuit in harness between ECM connector and engine grounding terminal.
3	**CHECK THROTTLE POSITION SENSOR.** 1) Disconnect connector from throttle position sensor. 2) Measure resistance between throttle position sensor connector receptacle's terminals. ***Terminals*** ***2.5 L model:*** ***No. 4 — No. 2:*** ***3.0 L model:*** ***No. 1 — No. 3:*** Is the measured value within the specified range?	3.0 - 4.2 kΩ	Go to step **4.**	Replace throttle position sensor.
4	**CHECK THROTTLE POSITION SENSOR.** Measure resistance between throttle position sensor connector receptacle's terminals. ***Terminals*** ***2.5 L model:*** ***No. 2 — No. 3:*** ***3.0 L model:*** ***No. 1 — No. 2:*** Is the measured value within the specified range?	0.35 - 0.5 kΩ	Go to step **5.**	Replace throttle position sensor.

	Step	Value	Yes	No
5	**CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and throttle position sensor connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 3 — (E13) No. 2:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 2 — (E13) No. 3:*** Is the measured value less than the specified value?	1 Ω	Go to step **6.**	Repair 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 resistance of harness between TCM and throttle position sensor connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 2 — (E13) No. 3:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 1 — (E13) No. 4:*** Is the measured value less than the specified value?	1 Ω	Go to step **7.**	Repair 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 resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 3 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 2 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **8.**	Repair short circuit in harness between TCM and throttle position sensor connector.
8	**CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 2 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 1 — Chassis ground:***	1 MΩ	Go to step **9.**	Repair short circuit in harness between TCM and throttle position sensor connector.
9	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***2.5 L model (With SPORT shift) :*** ***(B54) No. 3 — (B135) No. 19:*** ***2.5 L model (Without SPORT shift) :*** ***(B55) No. 2 — (B135) No. 19:*** ***3.0 L model (With VDC system) :*** ***(B54) No. 3 — (B135) No. 7:*** ***3.0 L model (Without VDC system) :*** ***(B55) No. 2 — (B135) No. 7:*** Does the measured value exceed the specified value?	1 Ω	Go to step **10.**	Repair open circuit in harness between TCM and ECM connector.

	Step	Value	Yes	No
10	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***2.5 L model (With SPORT shift) :*** ***(B54) No. 2 — (B135) No. 13:*** ***2.5 L model (Without SPORT shift) :*** ***(B55) No. 1 — (B135) No. 13:*** ***3.0 L model (With VDC system) :*** ***(B54) No. 2 — (B135) No. 9:*** ***3.0 L model (With VDC system) :*** ***(B55) No. 1 — (B135) No. 9:*** Is the measured value less than the specified value?	1 Ω	Go to step **11.**	Repair open circuit in harness between TCM and ECM connector.
11	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **14.**	Go to step **12.**
12	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM, throttle position sensor and ECM. 2) Turn ignition switch to ON (engine OFF). 3) Close the throttle completely. 4) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 3 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 2 (+) — Chassis ground (–):*** Is the measured value within the specified range?	0.2 - 1.0 V	Go to step **13.**	Go to step **18.**
13	**CHECK INPUT SIGNAL FOR TCM.** 1) Open the throttle completely. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 3 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 2 (+) — Chassis ground (–):*** Is the measured value within the specified range?	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 connectors to TCM, throttle position sensor and ECM. 2) Connect Subaru Select Monitor to data link connector. 3) Turn ignition switch to ON (engine OFF). 4) Turn Subaru Select Monitor switch to ON. 5) Throttle fully closed. 6) Read data of throttle position sensor using Subaru Select Monitor. •Throttle position sensor input signal is indicated. Is data of throttle position sensor within the specified range?	0.2 - 1.0 V	Go to step **15.**	Go to step **18.**

	Step	Value	Yes	No
15	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** Throttle fully open. NOTE: Must be changed correspondingly with accelerator pedal operation (from “released” to “depressed” position). Data of throtle position sensor is within the specified range?	4.2 - 4.7 V	Go to step **18.**	Go to step **17.**
16	**CHECK INPUT SIGNAL FOR TCM (THROTTLE POSITION SENSOR POWER SUPPLY).** Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 2 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 1 (+) — Chassis ground (–):*** Is the measured value within the specified range?	4.8 - 5.3 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in throttle position sensor circuit.	Go to step **18.**
17	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR (THROTTLE POSITION SENSOR POWER SUPPLY).** Read data of throttle position sensor power supply using Subaru Select Monitor. •Throttle position sensor power supply voltage is indicated. Is data of throttle position sensor power supply within the specified range?	4.8 - 5.3 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in throttle position sensor circuit.	Go to step **18.**
18	**CHECK POOR CONTACT.** Is there poor contact in throttle position sensor circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

D: DTC 33 FRONT VEHICLE SPEED SENSOR

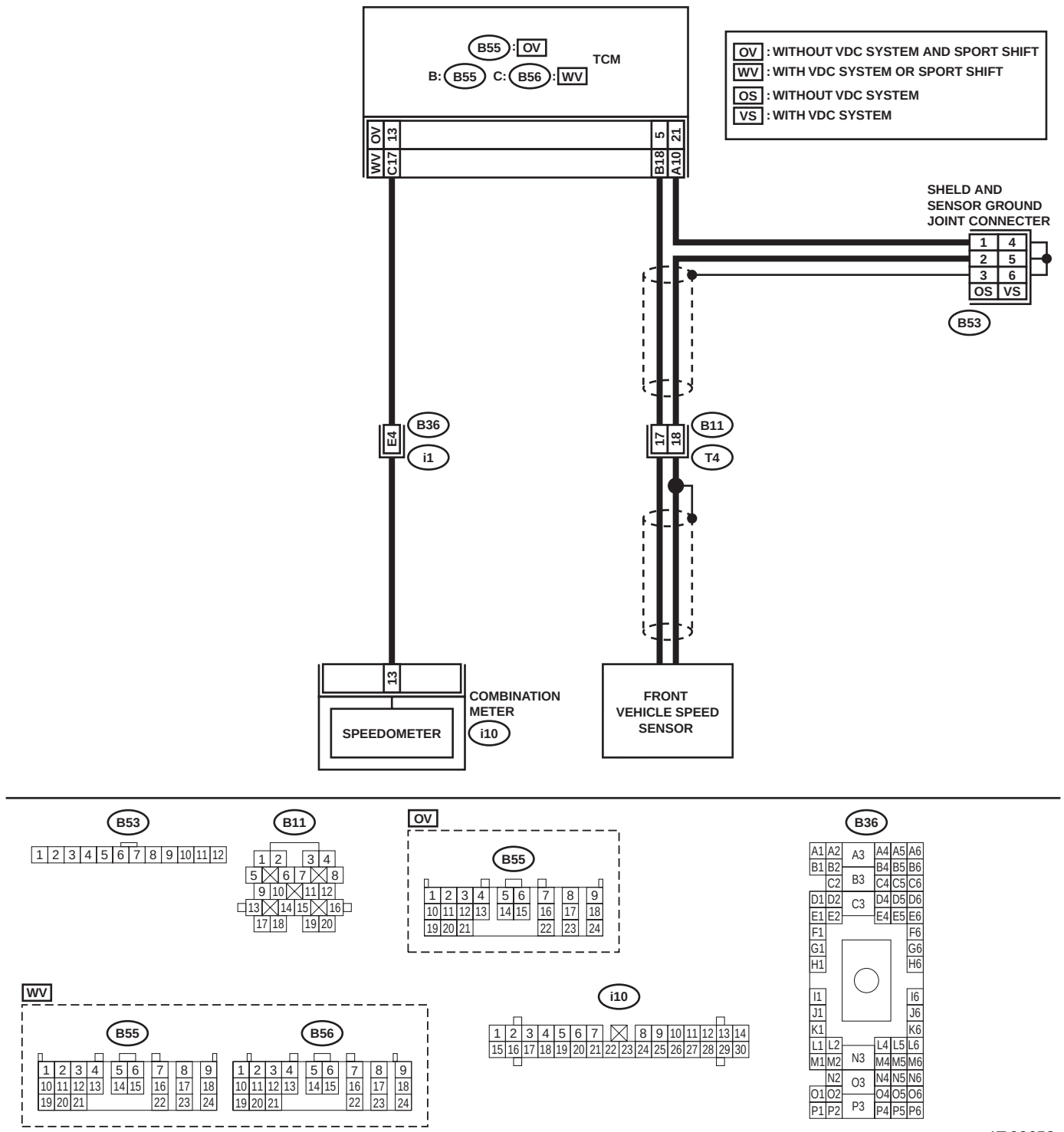
DIAGNOSIS:

- 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.

WIRING DIAGRAM:



	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 18 — (B11) No. 17:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 5 — (B11) No. 17:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 10 — (B11) No. 18:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 5 — (B11) No. 18:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 10 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 21 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **4.**	Repair short circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B55) No. 18 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
5	**CHECK FRONT VEHICLE SPEED SENSOR.** Measure resistance between transmission connector receptacle's terminals. ***Connector & terminal*** ***(T4) No. 17 — No. 18:*** Is the measured value within the specified range?	450 - 650 Ω	Go to step **6.**	Replace front vehicle speed sensor. <Ref. to AT-54, Front Vehicle Speed Sensor.>
6	**PREPARE OSCILLOSCOPE.** Do you have oscilloscope?	Oscilloscope is available.	Go to step **9.**	Go to step **7.**
7	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **10.**	Go to step **8.**

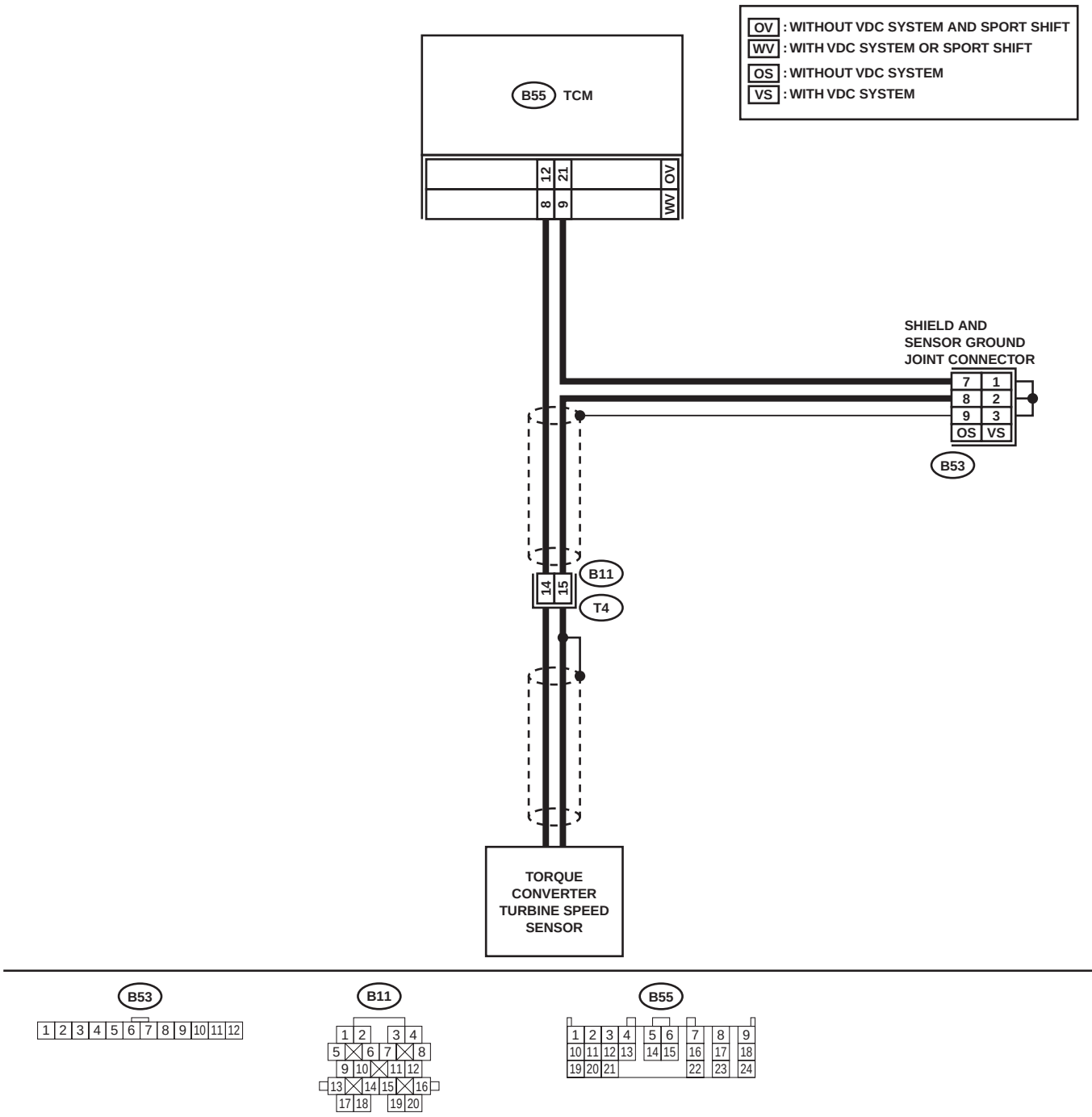
	Step	Value	Yes	No
8	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect all connectors. 2) Lift-up or raise the vehicle and place safety stands. NOTE: Raise all wheels off floor. 3) Start the engine and set vehicle in 20 km/h (12 MPH) condition. NOTE: The speed difference between front and rear wheels may light 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-22, Clear Memory Mode.> 4) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 18 (+) — (B54) No. 10 (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 5 (+) — No. 21 (–):*** Does the measured value exceed the specified value?	More than AC 1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor connector or harness may be the case. Repair harness or connector in the front vehicle speed sensor circuit.	Go to step **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 oscilloscope to TCM connector terminals. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***Positive probe; (B55) No. 18*** ***Ground; (B54) No. 10*** ***Without VDC system and SPORT shift:*** ***Positive probe; (B55) No. 5*** ***Ground; (B55) No. 21*** 4) Start the engine, and drive the wheels slowly. NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to ABS-22, Clear Memory Mode.> 5) Measure signal voltage indicated on oscilloscope. Does the measured value exceed the specified value?	AC 4 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor connector or harness may be the case. Repair harness or connector in the front vehicle speed sensor circuit.	Go to step **11.**

	Step	Value	Yes	No
10	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect all connectors. 2) Connect 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 ignition switch to ON and turn Subaru Select Monitor switch to ON. 5) Start the engine. 6) Read data of vehicle speed using Subaru Select Monitor. •Compare speedometer with Subaru Select Monitor indications. •Vehicle speed is indicated in “km/h” or “MPH”. 7) Slowly increase 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. to ABS-22, Clear Memory Mode.> Does the speedometer indication increase as the Subaru Select Monitor data increases?	Speedometer indication increases as the Subaru Select Monitor data increases.	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor connector or harness may be the case. Repair harness or connector in the front vehicle speed sensor circuit.	Go to step **11.**
11	**CHECK POOR CONTACT.** Is there poor contact in front vehicle speed sensor circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

MEMO:

E: DTC 36 TORQUE CONVERTER TURBINE SPEED SENSOR

DIAGNOSIS:
Input signal circuit of TCM is open or shorted.
TROUBLE SYMPTOM:
Excessive shift shock.
WIRING DIAGRAM:



AT-00653

Vehicle-id:
SIE-id::E:DTC 36 Torque Converter Turbine Speed Sensor
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	Step	Value	Yes	No
1	**CHECK TORQUE CONVERTER TURBINE SPEED SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector receptacle's terminals. ***Connector & terminal*** ***(T4) No. 14 — No. 15:*** Is the measured value within the specified range?	450 - 650 Ω	Go to step **2.**	Replace turbine speed sensor. <Ref. to AT-59, Torque Converter Turbine Speed Sensor.>
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 8 — (B11) No. 14:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 12 — (B11) No. 14:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and transmission connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 9 — (B11) No. 15:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 21 — (B11) No. 15:*** Is the measured value less than the specified value?	1 Ω	Go to step **4.**	Repair open circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 9 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 21 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and transmission connector.
5	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 8 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 12 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **6.**	Repair short circuit in harness between TCM and transmission connector, and poor contact in coupling connector.
6	**PREPARE OSCILLOSCOPE.** Do you have oscilloscope?	Oscilloscope is available.	Go to step **10.**	Go to step **7.**
7	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor data increase.	Go to step **9.**	Go to step **8.**

	Step	Value	Yes	No
8	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and transmission. 2) Start the engine and move select lever to “P” or “N” range. 3) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 8 (+) — No. 9 (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 12 (+) — No. 21 (–):*** Does the measured value exceed the specified value?	AC 1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11.**
9	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Connect Subaru Select Monitor to data link connector. 3) Turn ignition switch to ON and turn Subaru Select Monitor switch to ON. 4) Start the engine. 5) Move select lever to “P” or “N” range. 6) Read data of turbine speed using Subaru Select Monitor. •Compare tachometer with Subaru Select Monitor indications. Is the revolution value same as the tachometer reading shown on the combination meter?	Same as tachometer indication.	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11.**
10	**CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.** 1) Connect connectors to TCM and transmission. 2) Set oscilloscope to TCM connector terminals. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***Positive probe; (B55) No. 8*** ***Without VDC system and SPORT shift:*** ***Positive probe; (B55) No. 12*** ***Ground; (B55) No. 21*** 3) Start the engine and move select lever to “P” or “N” range. Does the measured value exceed the specified value?	AC 1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11.**
11	**CHECK POOR CONTACT.** Is there poor contact in torque converter turbine speed sensor circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

MEMO:

F: DTC 38 TORQUE CONTROL SIGNAL

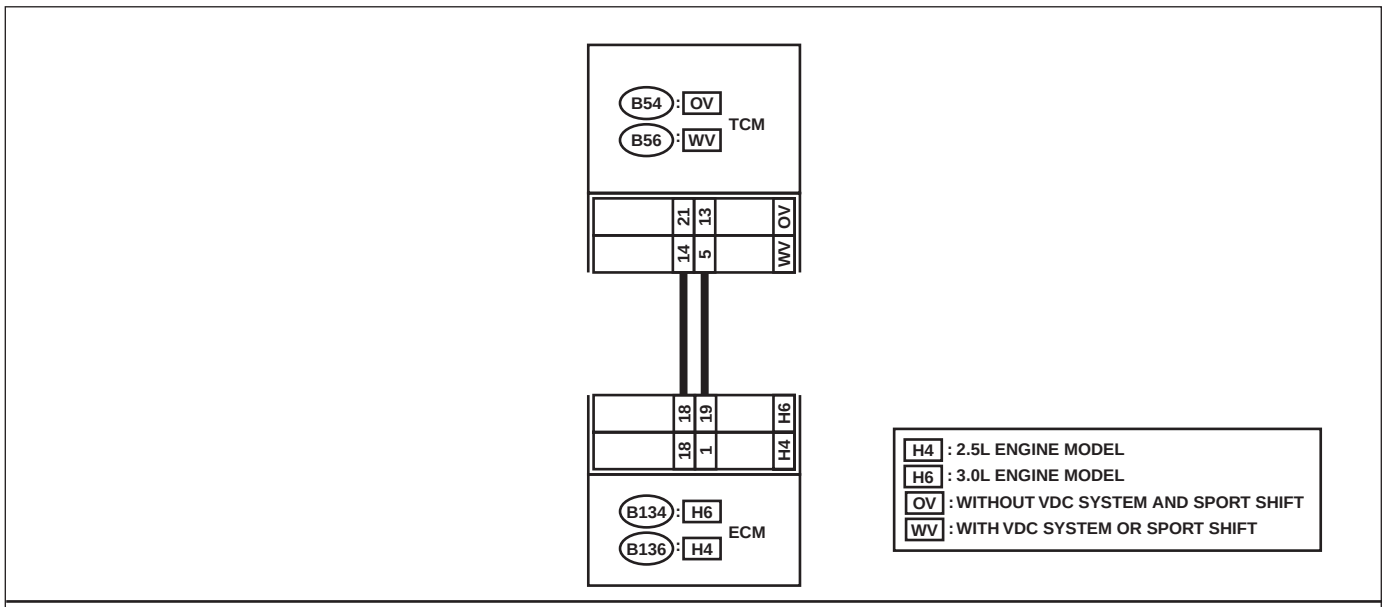
DIAGNOSIS:

- The signal circuit is open or shorted.

TROUBLE SYMPTOM:

Excessive shift shock.

WIRING DIAGRAM:



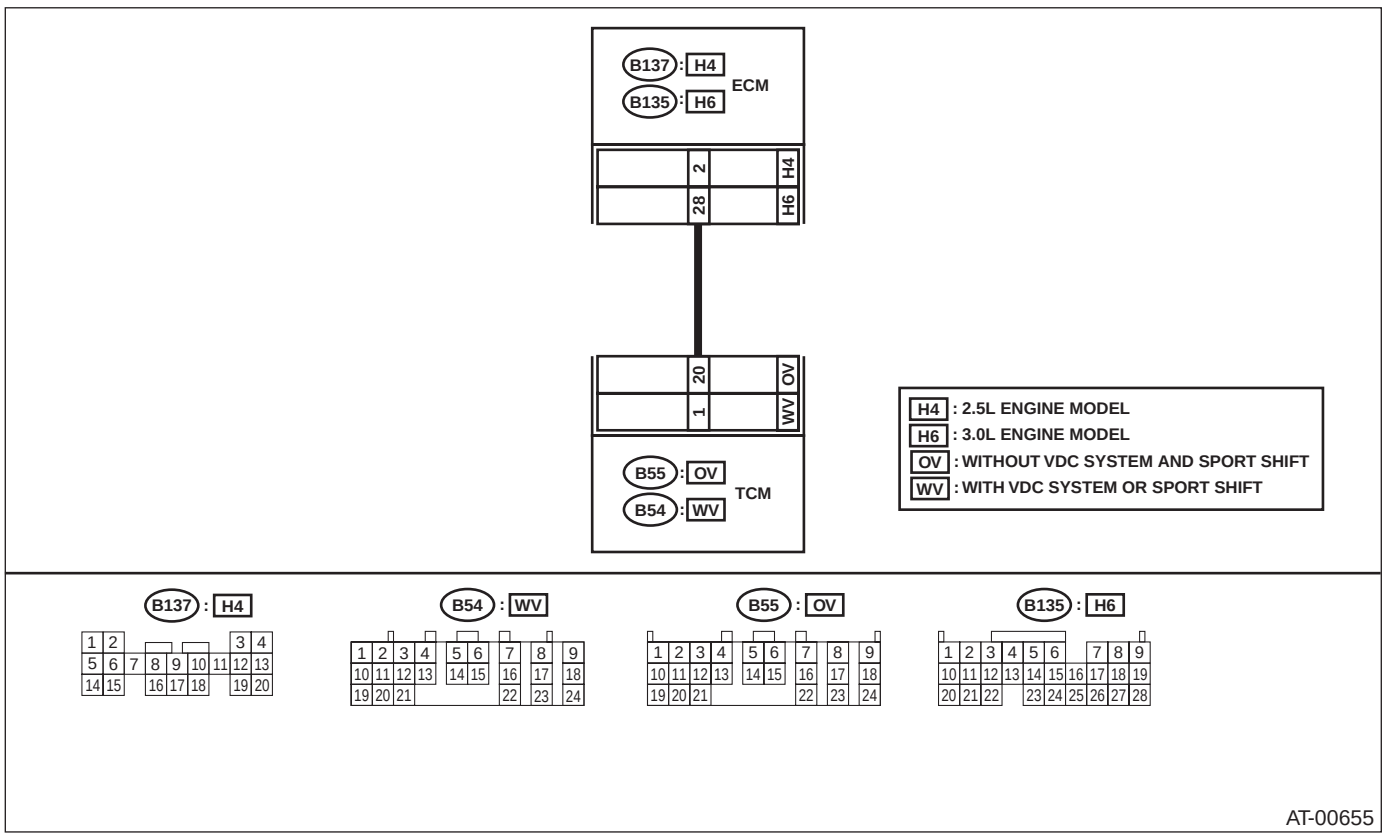
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***3.0 L model (With VDC system) :*** ***(B56) No. 14 — (B136) No. 18:*** ***(B56) No. 5 — (B136) No. 19:*** ***3.0 L model (Without VDC system) :*** ***(B54) No. 21 — (B134) No. 18:*** ***(B54) No. 13 — (B134) No. 19:*** ***2.5 L model (With SPORT shift) :*** ***(B56) No. 14 — (B136) No. 18:*** ***(B56) No. 5 — (B136) No. 1:*** ***2.5 L model (Without SPORT shift) :*** ***(B54) No. 21 — (B136) No. 18:*** ***(B54) No. 13 — (B136) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and ECM connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B56) No. 14 — Chassis ground:*** ***(B56) No. 5 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 21 — Chassis ground:*** ***(B54) No. 13 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and ECM connector.
3	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and ECM. 2) Turn ignition switch to ON (engine OFF). 3) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B56) No. 14 (+) — Chassis ground (–):*** ***(B56) No. 5 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 21 (+) — Chassis ground (–):*** ***(B54) No. 13 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	4.8 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **4.**
4	**CHECK POOR CONTACT.** Is there poor contact in torque control signal circuit?	There is poor contact.	Repair poor contact.	Go to step **5.**
5	**CHECK GROUND LINE BETWEEN TRANSMISSION AND BODY.** Check installing condition of ground line in transmission and body. Is there any dirt or rust at ground line installing point?	There is dirt or rust.	Remove dirt and rust.	Go to step **6.**

	Step	Value	Yes	No
6	**CHECK GROUND LINE BETWEEN TRANSMISSION AND BODY.** Check installing condition of ground line in transmission and body. Is tightening torque value within specification?	10 – 16 N·m (1.0 – 1.6 kgf-m, 7.2 – 11.6 ft-lb)	Go to step **7.**	Tighten to specified torque.
7	**CHECK GROUND LINE INSIDE TRANSMISSION.** 1) Drain AT fluid and remove oil pan. 2) Check tightening torque value of ground line installing bolt. Is tightening torque value within specification?	7 – 9 N·m (0.7 – 0.9 kgf-m, 5.1 – 6.5 ft-lb)	Go to step **9.**	Tighten to specified torque.
8	**CHECK GROUND CIRCUIT OF ECM.** <Ref. to AT-52, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> Is there any trouble?	There is a problem.	Repair ground terminal and/or ground circuit of ECM.	Go to step **9.**
9	**RECHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B56) No. 14 (+) — Chassis ground (–):*** ***(B56) No. 5 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 21 (+) — Chassis ground (–):*** ***(B54) No. 13 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	4.0 V	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>	Replace ECM.

MEMO:

G: DTC 45 INTAKE MANIFOLD PRESSURE SIGNAL

DIAGNOSIS:
Input signal circuit of TCM from ECM is open or shorted.
TROUBLE SYMPTOM:
Excessive shift shock.
WIRING DIAGRAM:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

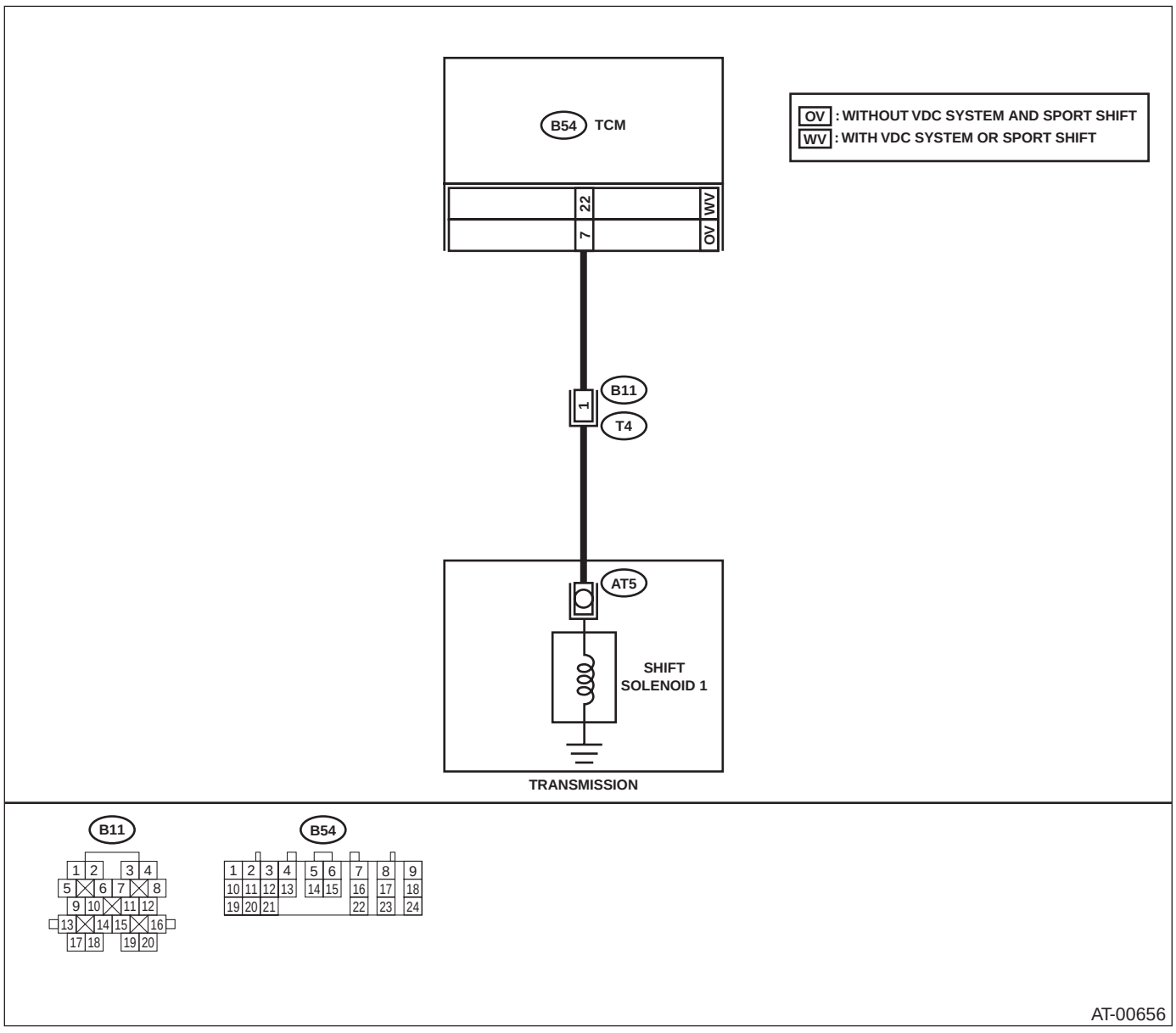
	Step	Value	Yes	No
1	**CHECK ENGINE GROUND TERMINALS AND GROUND CIRCUIT OF ECM** <Ref. to AT-52, DTC 31 THROTTLE POSITION SENSOR, Diagnostic Procedure with Diagnostic Trouble Code (DTC).> Is there any trouble?	There is a problem in ground terminal or ground circuit.	Repair ground terminal and/or ground circuit of ECM.	Go to step **2.**
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***3.0 L model (With VDC system) :*** ***(B54) No. 1 — (B135) No. 28:*** ***3.0 L model (Without VDC system) :*** ***(B54) No. 20 — (B135) No. 28:*** ***2.5 L model (With SPORT shift:) :*** ***(B54) No. 1 — (B137) No. 2:*** ***2.5 L model (Without SPORT shift:) :*** ***(B54) No. 20 — (B137) No. 2:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and ECM connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 1 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 20 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **4.**	Repair short circuit in harness between TCM and ECM connector.
4	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor data increase.	Go to step **6.**	Go to step **5.**
5	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and ECM. 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 3) Engine idling. 4) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 1 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 20 (+) — Chassis ground (–):*** Is the measured value within the specified range?	0.4 - 1.6 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **7.**

	Step	Value	Yes	No
6	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and ECM. 2) Connect Subaru Select Monitor to data link connector. 3) Start the engine, and turn Subaru Select monitor switch to ON. 4) Warm-up the engine until engine coolant temperature is above 80°C (176°F). 5) Engine idling. 6) Read data of intake manifold pressure signal using Subaru Select Monitor. •Display shows intake manifold pressure signal value sent from ECM. Is the measured value within the specified range?	0.4 - 1.6 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **7.**
7	**CHECK POOR CONTACT.** Is there poor contact in intake manifold pressure signal circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

MEMO:

H: DTC 71 SHIFT SOLENOID 1

DIAGNOSIS:
Output signal circuit of shift solenoid 1 is open or shorted.
TROUBLE SYMPTOM:
Does not shift.
WIRING DIAGRAM:



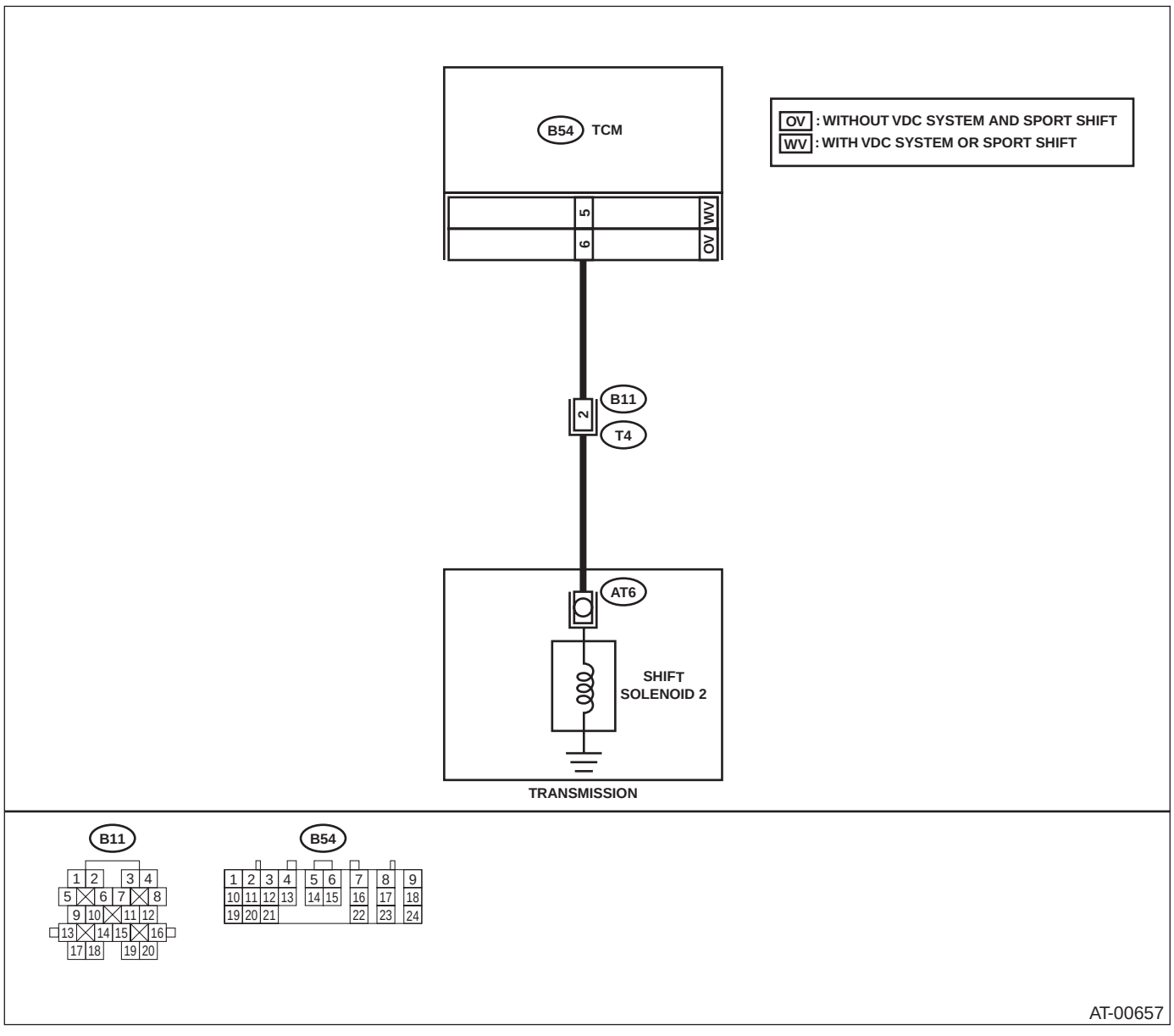
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and shift solenoid 1 connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 22 — (B11) No. 1:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 7 — (B11) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 22 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 7 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and transmission connector.
3	**CHECK SHIFT SOLENOID 1.** Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 1 — No. 16:*** Is the measured value within the specified range?	10 - 16 Ω?	Go to step **4.**	Go to step **7.**
4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Turn ignition switch to ON (engine OFF). 3) Move select lever to “D” range. 4) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 22 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 7 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	9 V	Go to step **5.**	Go to step **6.**

	Step	Value	Yes	No
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Move select lever to “2“ range. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 22 (+) — Chassis ground (–):*** ***With VDC system or SPORT shift:*** ***(B54) No. 7 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.	Go to step **6.**
6	**CHECK POOR CONTACT.** Is there poor contact in shift solenoid 1 circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>
7	**CHECK SHIFT SOLENOID 1 (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. 3) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 4) Remove oil pan, and disconnect connector from shift solenoid 1. 5) Measure resistance between shift solenoid 1 connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **8.**	Replace shift solenoid 1. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
8	**CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.** Measure resistance of harness between shift solenoid 1 and transmission connector. ***Connector & terminal*** ***(AT5) No. 1 — (T4) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **9.**	Repair open circuit in harness between shift solenoid 1 and transmission connector.
9	**CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 1 AND TRANSMISSION.** Measure resistance of harness between shift solenoid 1 connector and transmission ground. ***Connector & terminal*** ***(T4) No. 1 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in shift solenoid 1 and transmission.	Repair short circuit harness between shift solenoid 1 and transmission connector.

MEMO:

I: DTC 72 SHIFT SOLENOID 2

DIAGNOSIS:
Output signal circuit of shift solenoid 2 is open or shorted.
TROUBLE SYMPTOM:
Does not shift.
WIRING DIAGRAM:



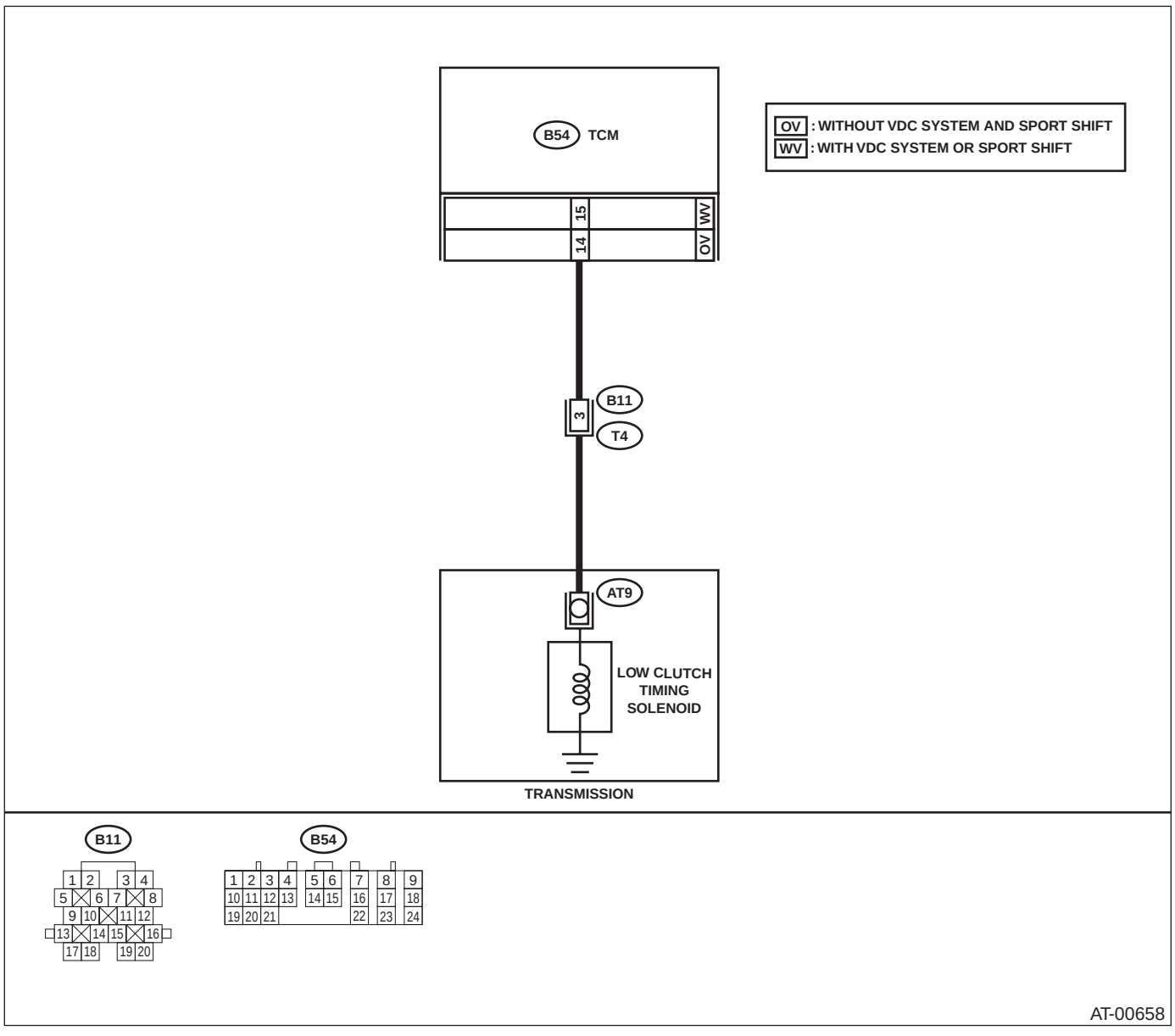
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and shift solenoid 2 connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 5 — (B11) No. 2:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 6 — (B11) No. 2:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 5 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 6 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and transmission connector.
3	**CHECK SHIFT SOLENOID 2.** Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 2 — No. 16:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **4.**	Go to step **6.**

	Step	Value	Yes	No
4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. 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 the ATF reaches its operating temperature. 4) Move selector lever to “D”, and slowly increase vehicle speed to 50 km/h (31 MPH). NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure of on-board diagnostics system. <Ref. to ABS-22, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 22 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 6 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **5.**
5	**CHECK POOR CONTACT.** Is there poor contact in shift solenoid 2 circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>
6	**CHECK SHIFT SOLENOID 2 (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 3) Remove oil pan, and disconnect connector from shift solenoid 2. 4) Measure resistance between shift solenoid 2 connector and transmission ground. ***Connector & terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 16 Ω?	Go to step **7.**	Replace shift solenoid 2 assembly. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>

	Step	Value	Yes	No
7	**CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.** Measure resistance of harness between shift solenoid 2 and transmission connector. ***Connector & terminal*** ***(AT6) No. 1 — (T4) No. 2:*** Is the measured value less than the specified value?	1 Ω	Go to step **8.**	Repair open circuit in harness between shift solenoid 2 and transmission connector.
8	**CHECK HARNESS CONNECTOR BETWEEN SHIFT SOLENOID 2 AND TRANSMISSION.** Measure resistance of harness between shift solenoid 2 connector and transmission ground. ***Connector & terminal*** ***(T4) No. 2 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in shift solenoid 2 and transmission.	Repair short circuit harness between shift solenoid 2 and transmission connector.

J: DTC 73 LOW CLUTCH TIMING SOLENOID

DIAGNOSIS:
Output signal circuit of low clutch timing solenoid is open or shorted.
TROUBLE SYMPTOM:
Excessive shift shock.
WIRING DIAGRAM:



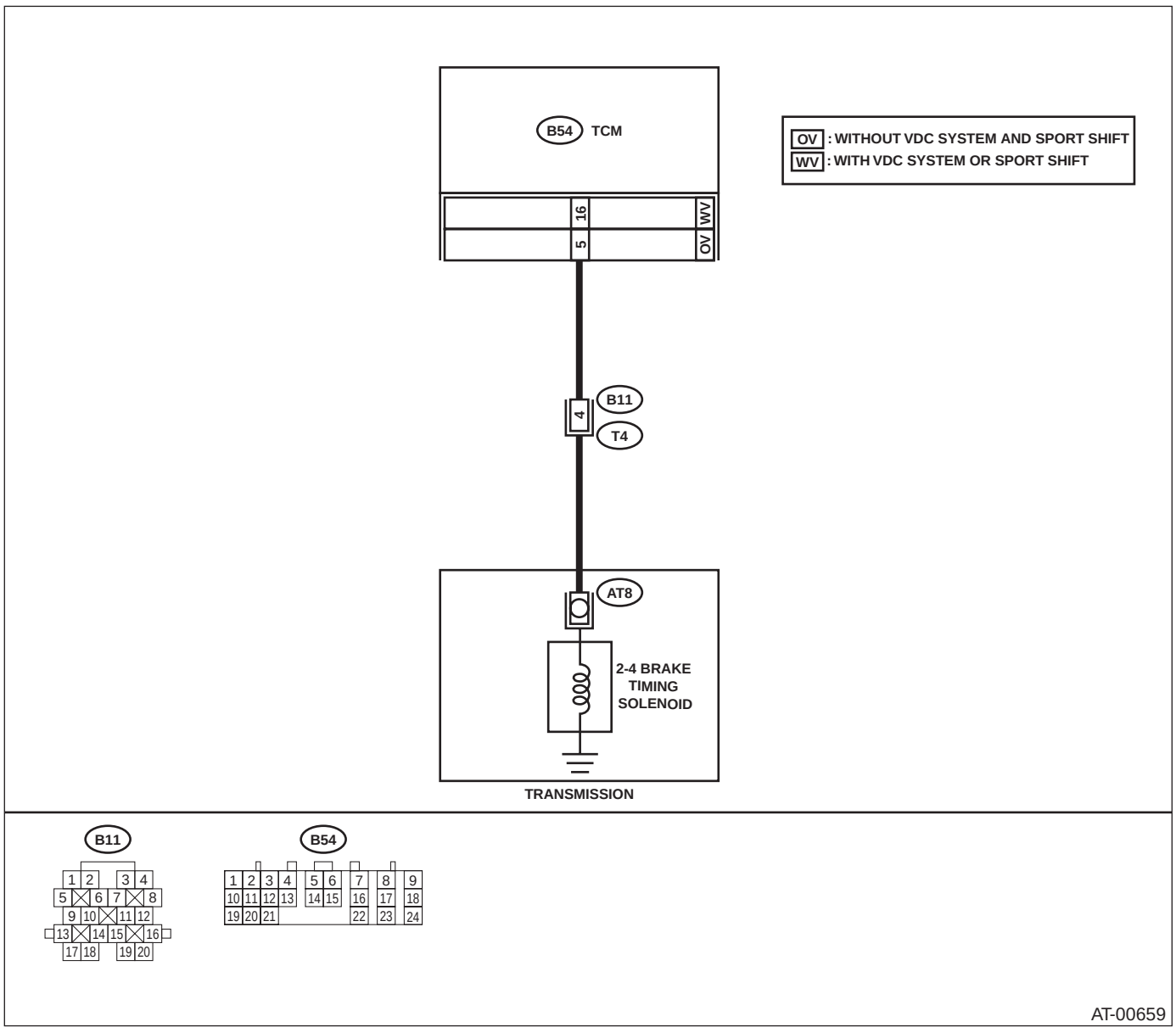
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 15 — (B11) No. 3:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 14 — (B11) No. 3:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 15 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 14 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and transmission connector.
3	**CHECK LOW CLUTCH TIMING SOLENOID.** Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 3 — No. 16:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **4.**	Go to step **7.**
4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Turn ignition switch to ON (engine OFF). 3) Move select lever to “D” range. 4) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 15 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 14 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	9 V	Go to step **5.**	Go to step **6.**

	Step	Value	Yes	No
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Move select lever to “2“ range. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 15 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 14 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM and transmission.	Go to step **6.**
6	**CHECK POOR CONTACT.** Is there poor contact in low clutch timing solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>
7	**CHECK LOW CLUTCH TIMING SOLENOID (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. 3) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 4) Remove oil pan, and disconnect connector from low clutch timing solenoid. 5) Measure resistance between low clutch timing solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **8.**	Replace low clutch timing solenoid. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
8	**CHECK HARNESS CONNECTOR BETWEEN LOW CLUTCH TIMING SOLENOID AND TRANSMISSION.** Measure resistance of harness between low clutch timing solenoid and transmission connector. ***Connector & terminal*** ***(AT9) No. 1 — (T4) No. 3:*** Is the measured value less than the specified value?	1 Ω	Go to step **9.**	Repair open circuit in harness between low clutch timing solenoid and transmission connector.

Step		Value	Yes	No
9	**CHECK HARNESS CONNECTOR BETWEEN LOW CLUTCH TIMING SOLENOID AND TRANSMISSION.** Measure resistance of harness between low clutch timing solenoid connector and transmission ground. ***Connector & terminal*** ***(T4) No. 3 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in low clutch timing solenoid and transmission.	Repair short circuit harness between low clutch timing solenoid and transmission connector.

K: DTC 74 2-4 BRAKE TIMING SOLENOID

DIAGNOSIS:
Output signal circuit of 2-4 brake timing solenoid is open or shorted.
TROUBLE SYMPTOM:
Excessive shift shock.
WIRING DIAGRAM:



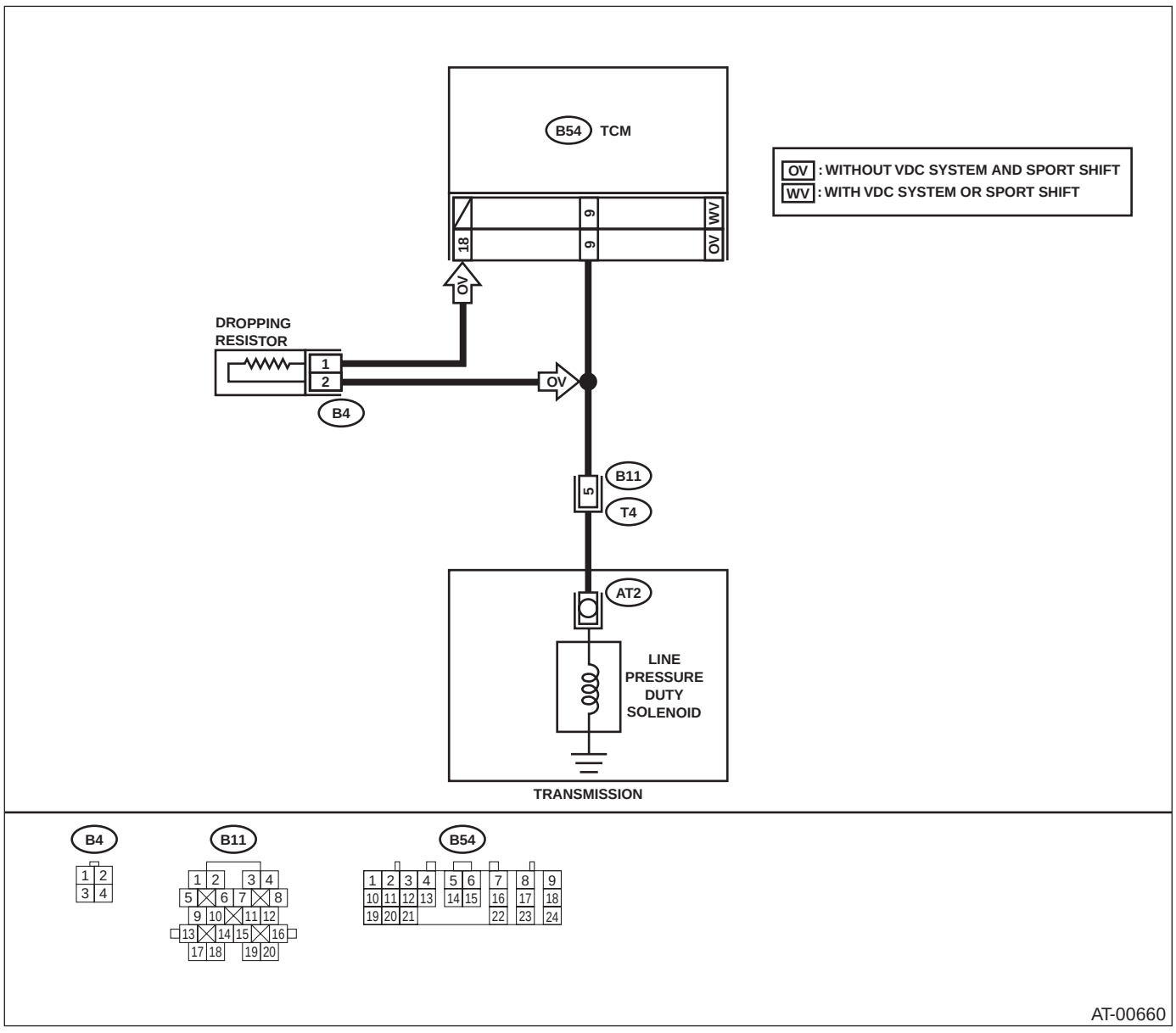
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 16 — (B11) No. 4:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 5 — (B11) No. 4:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and transmission ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 16 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 5 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and transmission connector.
3	**CHECK 2-4 BRAKE TIMING SOLENOID.** Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 4 — No. 16:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **4.**	Go to step **7.**

	Step	Value	Yes	No
4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. 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 the ATF reaches its operating temperature. 4) Move selector lever to “1”, 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-22, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 16 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 5 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Go to step **5.**	Go to step **6.**
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Move selector lever to “D”, 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. to ABS-22, Clear Memory Mode.> 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 16 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 5 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	9 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the transmission.	Go to step **6.**

	Step	Value	Yes	No
6	**CHECK POOR CONTACT.** Is there poor contact in 2-4 brake timing solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>
7	**CHECK 2-4 BRAKE TIMING SOLENOID (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. 3) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 4) Remove oil pan, and disconnect connector from 2-4 brake timing solenoid. 5) Measure resistance between 2-4 brake timing solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 16 Ω?	Go to step **8.**	Replace 2-4 brake timing solenoid. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
8	**CHECK HARNESS CONNECTOR BETWEEN 2-4 BRAKE TIMING SOLENOID AND TRANSMISSION.** Measure resistance of harness between 2-4 brake timing solenoid and transmission connector. ***Connector & terminal*** ***(AT8) No. 1 — (T4) No. 4:*** Is the measured value less than the specified value?	1 Ω	Go to step **9.**	Repair open circuit in harness between 2-4 brake timing solenoid and transmission connector.
9	**CHECK HARNESS CONNECTOR BETWEEN 2-4 BRAKE TIMING SOLENOID AND TRANSMISSION.** Measure resistance of harness between 2-4 brake timing solenoid connector and transmission ground. ***Connector & terminal*** ***(T4) No. 4 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in 2-4 brake timing solenoid and transmission.	Repair short circuit harness between 2-4 brake timing solenoid and transmission connector.

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:



	Step	Value	Yes	No
1	**CHECK VEHICLE.** Is the target model equipped with VDC system or SPORT shift?	Model with VDC system or SPORT shift	Go to step **7.**	Go to step **2.**
2	**CHECK DROPPING RESISTOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from dropping resistor. 3) Measure resistance between dropping resistor terminals. ***Terminal*** ***No. 1 — No. 2:*** Is the measured value within the specified range?	9 - 15 Ω	Go to step **3.**	Replace dropping resistor. <Ref. to AT-76, Dropping Resistor.>
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** 1) Disconnect connector from TCM. 2) Measure resistance between TCM and dropping resistor. ***Connector & terminal*** ***(B54) No. 18 — (B4) No.1 :*** Is the measured value less than the specified value?	1 Ω	Go to step **4.**	Repair open circuit in harness between TCM and dropping resistor connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** Measure resistance between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 1 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and dropping resistor connector.
5	**CHECK HARNESS CONNECTOR BETWEEN DROPPING RESISTOR AND TRANSMISSION.** Measure resistance of harness between dropping resistor connector and transmission. ***Connector & terminal*** ***(B4) No. 2 — (B11) No.5 :*** Is the measured value less than the specified value?	1 Ω	Go to step **6.**	Repair open circuit in harness between dropping resistor and transmission connector.
6	**CHECK HARNESS CONNECTOR BETWEEN DROPPING RESISTOR AND TRANSMISSION.** Measure resistance between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 2 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **7.**	Repair short circuit in harness between TCM and dropping resistor connector.
7	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission and TCM. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 9 — (B11) No. 5:*** Is the measured value less than the specified value?	1 Ω	Go to step **8.**	Repair open circuit in harness between TCM and transmission connector.

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

	Step	Value	Yes	No
8	**CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***(B54) No. 9 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **9.**	Repair short circuit in harness between TCM and transmission connector.
9	**CHECK LINE PRESSURE DUTY SOLENOID.** Measure resistance between transmission connector receptacle's terminals. ***Terminal*** ***(T4) No. 5 — No. 16:*** Is the measured value within the specified range?	2.0 - 4.5 Ω?	Go to step **10.**	Go to step **16.**
10	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **11.**	Go to step **12.**
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 the ATF reaches its operating temperature. 3) Turn ignition switch to ON (engine OFF). 4) Move select lever to “N”. 5) Throttle is fully closed. 6) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 9 (+) — Chassis ground (–):*** Is the measured value within the specified range?	1.5 - 5.0 V	Go to step **12.**	Go to step **15.**
12	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Throttle is fully opend. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 9 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in transmission.	Go to step **15.**

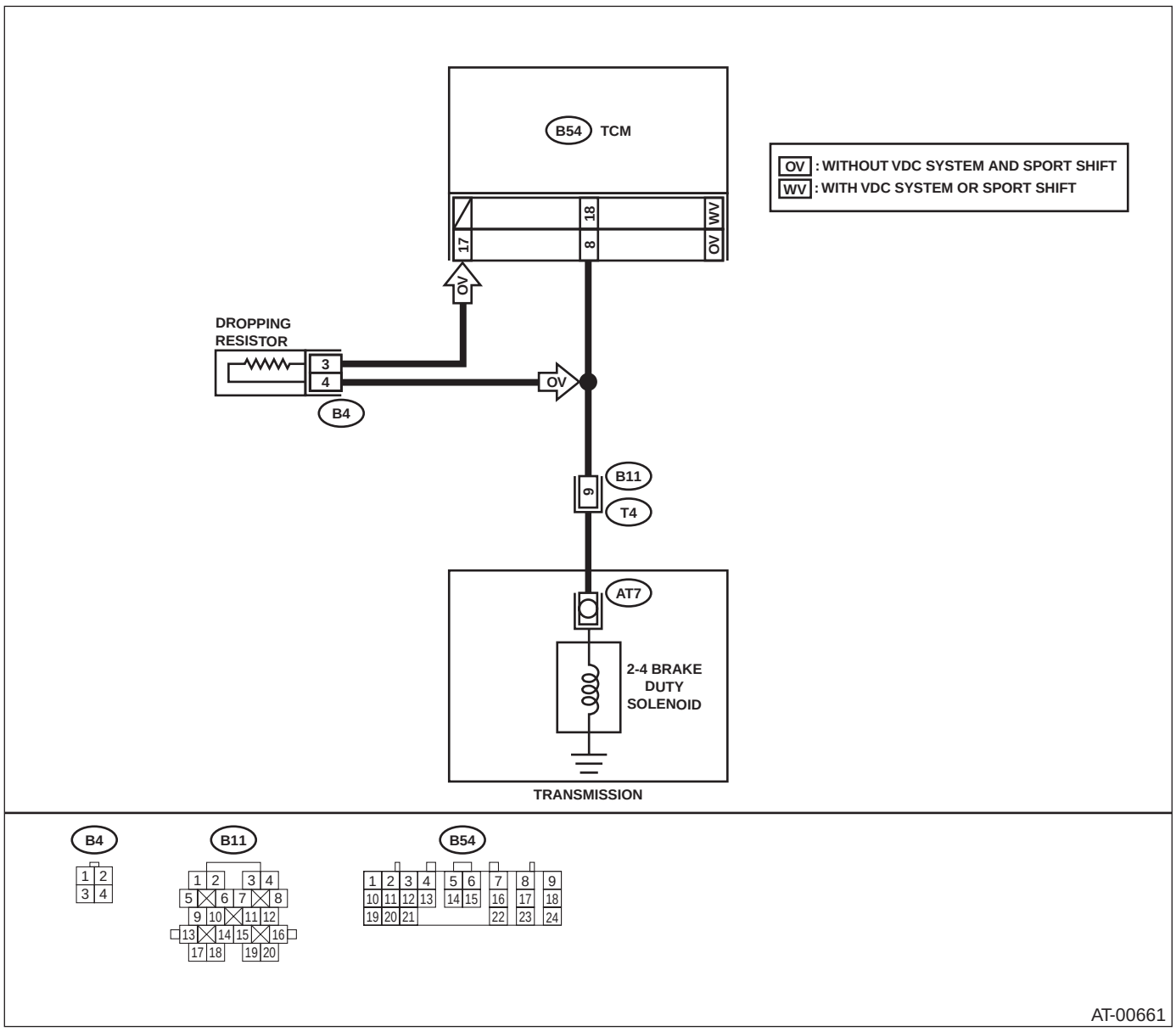
	Step	Value	Yes	No
13	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Connect Subaru Select Monitor to data link connector. 3) Start the engine, and turn Subaru Select Monitor switch to ON. 4) Warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 5) Stop the engine and turn ignition switch to ON (engine OFF). 6) Move select lever to “N”. 7) Read data of line pressure duty solenoid using Subaru Select Monitor. •Line pressure duty solenoid is indicated in “%”. 8) Throttle is fully closed. Is the data of line pressure duty solenoid same as the specified value?	100%	Go to step **14.**	Go to step **15.**
14	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Turn ignition switch to ON (Engine OFF). 2) Throttle is fully open. Is the data of line pressure duty solenoid less than the specified value?	25%	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in transmission.	Go to step **15.**
15	**CHECK POOR CONTACT.** Is there poor contact in line pressure duty solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>
16	**CHECK LINE PRESSURE DUTY SOLENOID (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 3) Remove oil pan, and disconnect connector from line pressure duty solenoid. 4) Measure resistance between line pressure duty solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	2.0 - 4.5 Ω	Go to step **17.**	Replace line pressure duty solenoid. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>

	Step	Value	Yes	No
17	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND LINE PRESSURE DUTY SOLENOID.** Measure resistance of harness between line pressure duty solenoid and transmission connector. ***Connector & terminal*** ***(T4) No. 5 — (AT2) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **18.**	Repair open circuit in harness between line pressure duty solenoid and transmission connector.
18	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND LINE PRESSURE DUTY SOLENOID.** Measure resistance of harness between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 5 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in line pressure duty solenoid and transmission.	Repair short circuit in harness between line pressure duty solenoid and transmission connector.

MEMO:

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:



DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

	Step	Value	Yes	No
1	**CHECK VEHICLE.** Is the target model equipped with VDC system or SPORT shift?	Model with VDC system or SPORT shift	Go to step **7.**	Go to step **2.**
2	**CHECK DROPPING RESISTOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from dropping resistor. 3) Measure resistance between dropping resistor terminals. ***Terminal*** ***No. 3 — No. 4:*** Is the measured value within the specified range?	9 - 15 Ω	Go to step **3.**	Replace dropping resistor. <Ref. to AT-76, Dropping Resistor.>
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** 1) Disconnect connector from TCM. 2) Measure resistance between TCM and dropping resistor. ***Connector & terminal*** ***(B54) No. 17 — (B4) No. 3 :*** Is the measured value less than the specified value?	1 Ω	Go to step **4.**	Repair open circuit in harness between TCM and dropping resistor connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** Measure resistance between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 3 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and dropping resistor connector.
5	**CHECK HARNESS CONNECTOR BETWEEN DROPPING RESISTOR AND TRANSMISSION.** Measure resistance of harness between dropping resistor connector and transmission. ***Connector & terminal*** ***(B4) No. 4 — (B11) No.9 :*** Is the measured value less than the specified value?	1 Ω	Go to step **6.**	Repair open circuit in harness between dropping resistor and transmission connector.
6	**CHECK HARNESS CONNECTOR BETWEEN DROPPING RESISTOR AND TRANSMISSION.** Measure resistance between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 4 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **7.**	Repair short circuit in harness between TCM and dropping resistor connector.

	Step	Value	Yes	No
7	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission and TCM. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 18 — (B11) No. 9:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 8 — (B11) No. 9:*** Is the measured value less than the specified value?	1 Ω	Go to step **8.**	Repair open circuit in harness between TCM and transmission connector.
8	**CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 18 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 8 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **9.**	Repair short circuit in harness between TCM and transmission connector.
9	**CHECK 2-4 BRAKE DUTY SOLENOID.** Measure resistance between transmission connector receptacle's terminals. ***Terminal*** ***(T4) No. 16 — No. 9:*** Is the measured value within the specified range?	2.0 - 4.5 Ω	Go to step **10.**	Go to step **16.**
10	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **13.**	Go to step **11.**
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 the ATF reaches its operating temperature. 3) Turn ignition switch to ON (engine OFF). 4) Move select lever to “N”. 5) Throttle is fully closed. 6) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 18 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 8 (+) — Chassis ground (–):*** Is the measured value within the specified range?	1.5 - 5.0 V	Go to step **12.**	Go to step **15.**

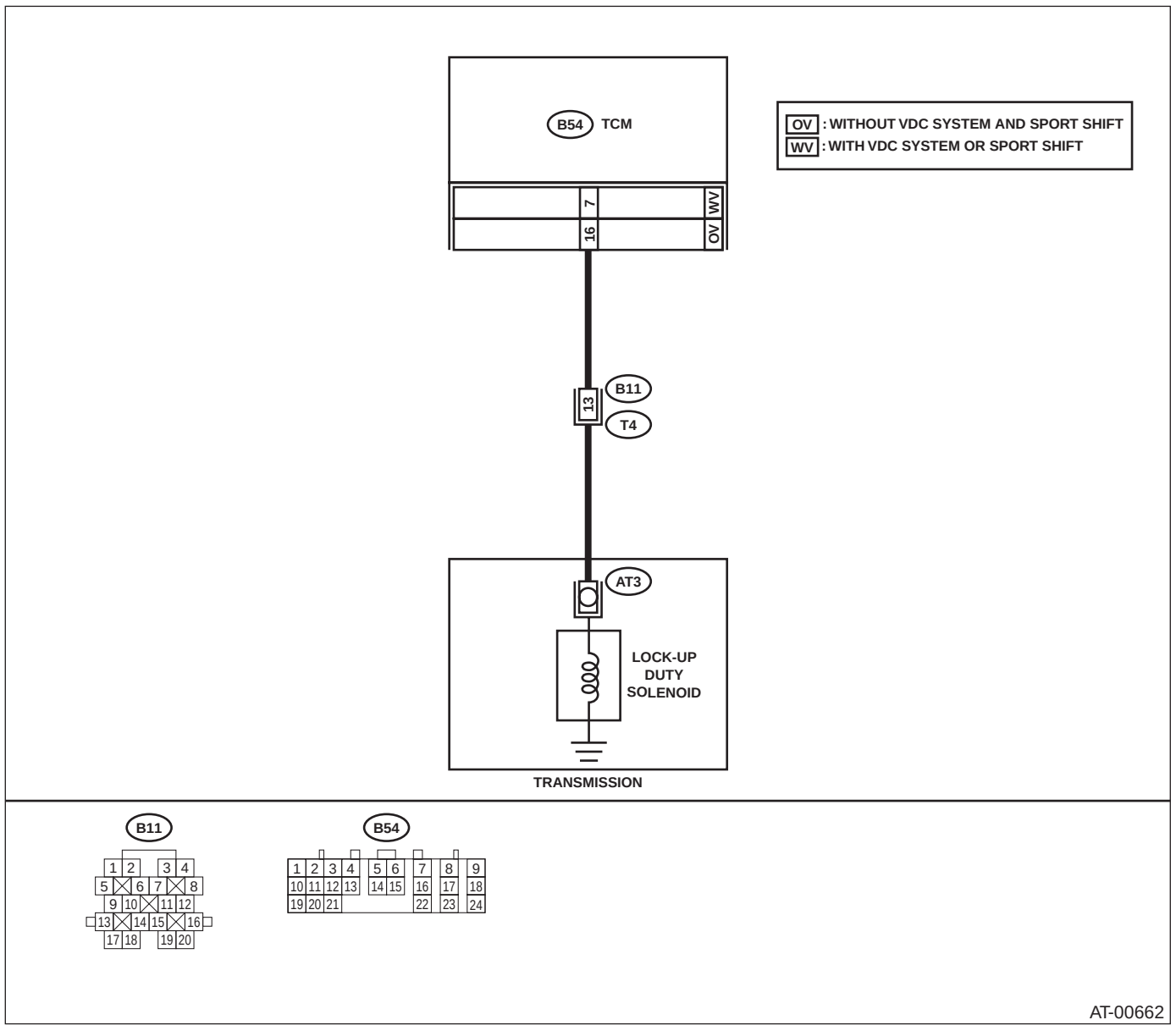
	Step	Value	Yes	No
12	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Throttle is fully open. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 18 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 8 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM and transmission.	Go to step **15.**
13	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Connect all connectors. 2) Connect Subaru Select Monitor to data link connector. 3) Start the engine, and turn Subaru Select Monitor switch to ON. 4) Warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 5) Stop the engine and turn ignition switch to ON (engine OFF). 6) Move select lever to “N”. 7) Read data of 2-4 brake duty solenoid using Subaru Select Monitor. •2-4 brake duty solenoid is indicated in “%”. 8) Throttle is fully closed. Is 2-4 brake duty solenoid same as the specified value?	100%	Go to step **14.**	Go to step **15.**
14	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Turn ignition switch to ON (Engine OFF). 2) Throttle is fully open. 3) Read data of 2-4 brake duty solenoid using Subaru Select Monitor. Is 2-4 brake duty solenoid less than the specified value?	25%	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM and transmission.	Go to step **15.**
15	**CHECK POOR CONTACT.** Is there poor contact in 2-4 brake duty solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

	Step	Value	Yes	No
16	**CHECK 2-4 BRAKE DUTY SOLENOID (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 3) Remove oil pan, and disconnect connector from 2-4 brake duty solenoid. 4) Measure resistance between 2-4 brake duty solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	2.0 - 4.5 Ω	Go to step **17.**	Replace 2-4 brake duty solenoid. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
17	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND 2-4 BRAKE DUTY SOLENOID.** Measure resistance of harness between 2-4 brake duty solenoid and transmission connector. ***Connector & terminal*** ***(T4) No. 9 — (AT7) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **18.**	Repair 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 resistance of harness between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 9 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in line pressure duty solenoid and transmission.	Repair short circuit in harness between 2-4 brake duty solenoid and transmission connector.

MEMO:

N: DTC 77 LOCK-UP DUTY SOLENOID

DIAGNOSIS:
Output signal circuit of lock-up duty solenoid is open or shorted.
TROUBLE SYMPTOM:
No “lock-up” (after engine warm-up).
WIRING DIAGRAM:



	Step	Value	Yes	No
1	**CHECK DTC.** Do multiple trouble codes appear in the on-board diagnostics test mode?	DTC indicated.	Go to another Diagnostic trouble code (DTC).	Go to step **2.**
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 7 — (B11) No. 13:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 16 — (B11) No. 13:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and transmission connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness connector between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 7 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 16 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **4.**	Repair short circuit in harness between TCM and transmission connector.
4	**CHECK LOCK-UP DUTY SOLENOID.** Measure resistance between transmission connector receptacle's terminals. ***Connector & terminal*** ***(T4) No. 13 — No. 16:*** Is the measured value within the specified range?	10 - 17 Ω	Go to step **5.**	Go to step **11.**
5	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **8.**	Go to step **6.**

	Step	Value	Yes	No
6	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect 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 the ATF reaches its operating temperature. 4) Move selector lever to “D” 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-22, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 7 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 16 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	8.5 V	Go to step **7.**	Go to step **10.**
7	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Return the engine to idling speed and move select lever to “N”. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 7 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 16 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	0.5 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM and transmission.	Go to step **10.**

	Step	Value	Yes	No
8	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Lift-up the vehicle and place safety stand. NOTE: Raise all wheels off ground. 3) Connect 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 the ATF reaches its operating temperature. 6) Read data of lock-up duty solenoid using Subaru Select Monitor. •Lock-up duty solenoid is indicated in “%”. 7) Move selector lever to “D” 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-22, Clear Memory Mode.> Is the data of lock-up duty solenoid same as the specified value?	95%	Go to step **9.**	Go to step **10.**
9	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Return the engine to idling speed and move selector lever to “N”. 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-22, Clear Memory Mode.> 2) Read data of lock-up duty solenoid using Subaru Select Monitor. Is the data of lock-up duty solenoid same as the specified value?	5%	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM and transmission.	Go to step **10.**
10	**CHECK POOR CONTACT.** Is there poor contact in lock-up duty solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

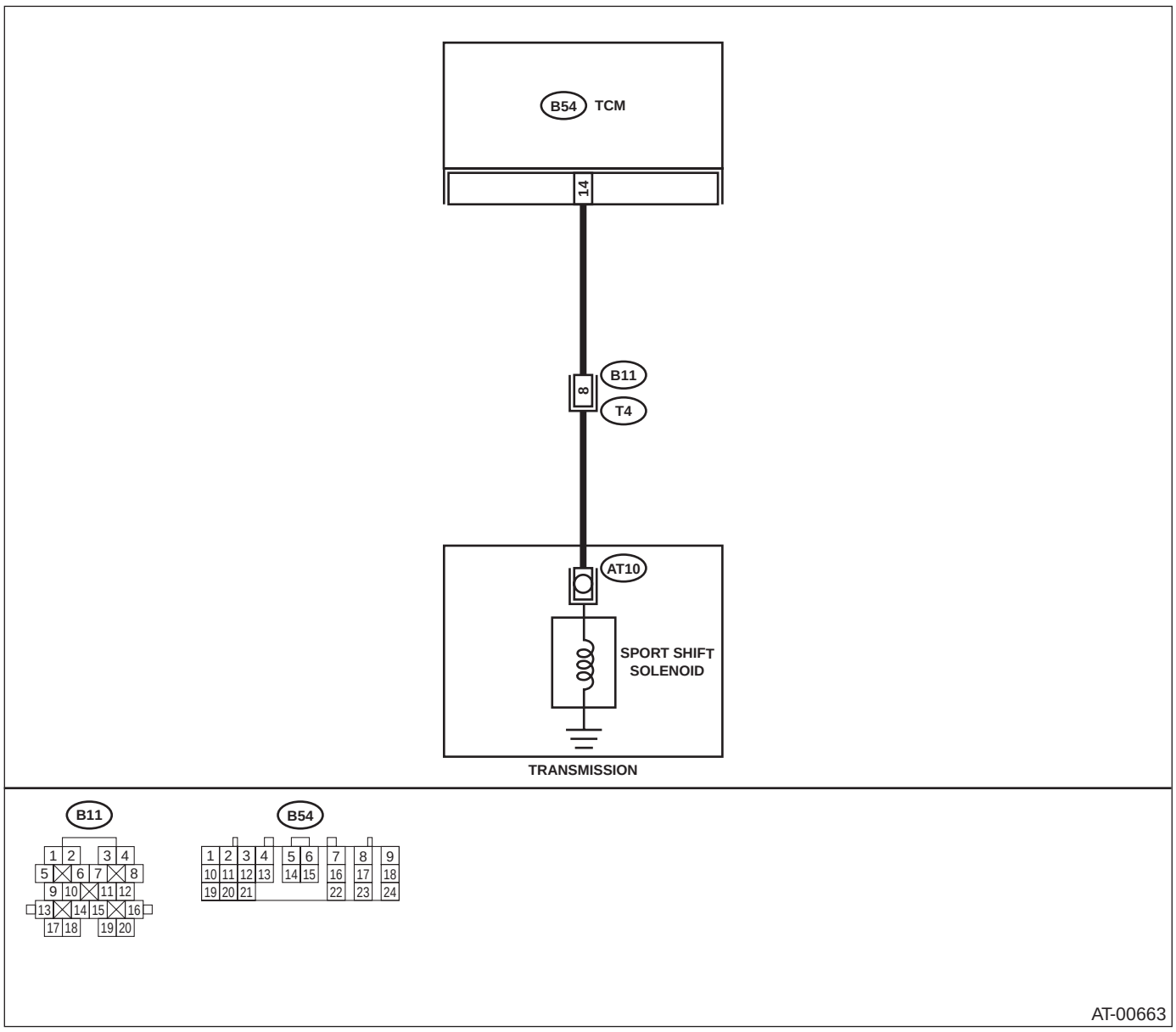
DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

	Step	Value	Yes	No
11	**CHECK LOCK-UP DUTY SOLENOID (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 3) Remove oil pan, and disconnect connector from lock-up duty solenoid. 4) Measure resistance between lock-up duty solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 17 Ω	Go to step **12.**	Replace lock-up duty solenoid. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
12	**CHECK HARNESS CONNECTOR BETWEEN LOCK-UP DUTY SOLENOID AND TRANSMISSION.** Measure resistance of harness between lock-up duty solenoid and transmission connector. ***Connector & terminal*** ***(T4) No. 13 — (AT3) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **13.**	Repair open circuit in harness between TCM and transmission connector.
13	**CHECK HARNESS CONNECTOR BETWEEN LOCK-UP DUTY SOLENOID AND TRANSMISSION.** Measure resistance of harness between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 13 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in lock-up duty solenoid and transmission.	Repair short circuit in harness between lock-up duty solenoid and transmission connector.

MEMO:

O: DTC 78 SPORT SHIFT SOLENOID

DIAGNOSIS:
Output signal circuit of SPORT shift solenoid is open or shorted.
TROUBLE SYMPTOM:
Engine brake is effected when select lever is in “D” or “3” range with 1st gear.
WIRING DIAGRAM:



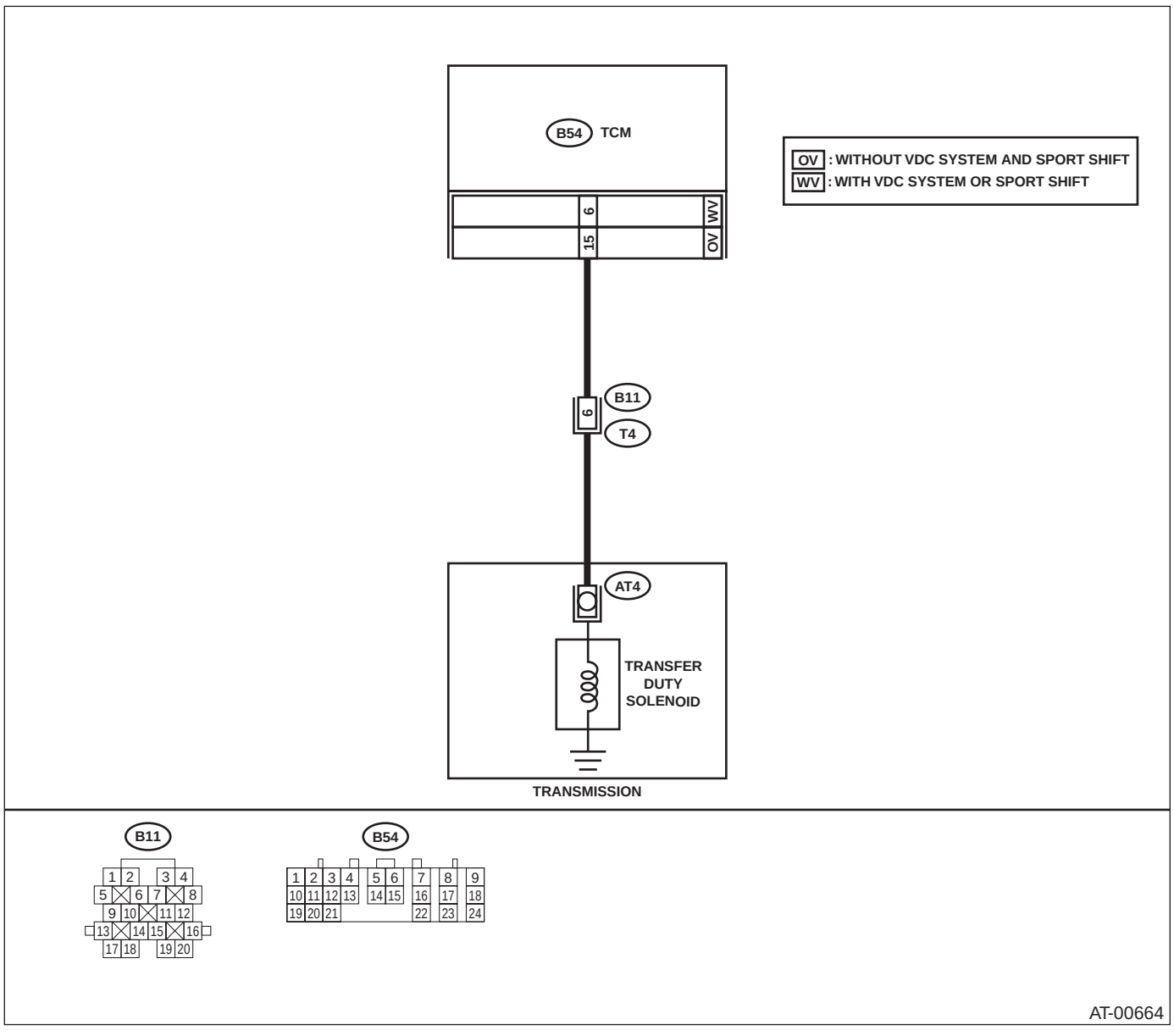
	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and SPORT shift solenoid connector. ***Connector & terminal*** ***(B54) No. 14 — (B11) No. 8:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 14 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and transmission connector.
3	**CHECK SHIFT SOLENOID 1.** Measure resistance between transmission connector terminals. ***Connector & terminal*** ***(T4) No. 8 — No. 16:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **4.**	Go to step **7.**
4	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Turn ignition switch to ON (engine OFF). 3) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 14 (+) — Chassis ground (–):*** Does the measured value exceed the specified value?	9 V	Go to step **5.**	Go to step **6.**
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Move select lever to SPORT shift mode. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 14 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.	Go to step **6.**
6	**CHECK POOR CONTACT.** Is there poor contact in SPORT shift solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

	Step	Value	Yes	No
7	**CHECK SPORT SHIFT SOLENOID (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. NOTE: On AWD models, raise all wheels off ground. 3) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 4) Remove oil pan, and disconnect connector from SPORT shift solenoid. 5) Measure resistance between SPORT shift solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 16 Ω	Go to step **8.**	Replace SPORT shift solenoid. <Ref. to AT-67, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
8	**CHECK HARNESS CONNECTOR BETWEEN SPORT SHIFT SOLENOID AND TRANSMISSION.** Measure resistance of harness between SPORT shift solenoid and transmission connector. ***Connector & terminal*** ***(AT10) No. 1 — (T4) No. 8:*** Is the measured value less than the specified value?	1 Ω	Go to step **9.**	Repair open circuit in harness between SPORT shift solenoid and transmission connector.
9	**CHECK HARNESS CONNECTOR BETWEEN SPORT SHIFT SOLENOID AND TRANSMISSION.** Measure resistance of harness between SPORT shift solenoid connector and transmission ground. ***Connector & terminal*** ***(T4) No. 8 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in SPORT shift solenoid and transmission.	Repair short circuit harness between SPORT shift solenoid and transmission connector.

MEMO:

P: DTC 79 TRANSFER DUTY SOLENOID

DIAGNOSIS:
Output signal circuit of transfer duty solenoid is open or shorted.
TROUBLE SYMPTOM:
Excessive “braking” in tight corners.
WIRING DIAGRAM:



	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 6 — (B11) No. 6:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 15 — (B11) No. 6:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance harness connector between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 6 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B54) No. 15 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **3.**	Repair short circuit in harness between TCM and transmission connector.
3	**CHECK TRANSFER DUTY SOLENOID.** Measure resistance between transmission connector and transmission terminals. ***Connector & terminal*** ***(T4) No. 6 — No. 16:*** Is the measured value within the specified range?	10 - 17 Ω	Go to step **4.**	Go to step **13.**
4	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **7.**	Go to step **5.**
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Turn ignition switch to ON (engine OFF). 3) Move select lever to “P” range. 4) Throttle is fully closed. 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 6 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 15 (+) — Chassis ground (–):*** Is the measured value less than the specified value?	1 V	Go to step **9.**	Go to step **12.**

	Step	Value	Yes	No
6	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Move select lever to “D” range. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 6 (+) — Chassis ground (–):*** ***Without VDC system and SPORT shift:*** ***(B54) No. 15 (+) — Chassis ground (–):*** Is the measured value within the specified range?	5 - 7 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the transfer duty solenoid and TCM connector.	Go to step **12.**
7	**CHECK SPECIFICATION.** Is the vehicle equipped with the VDC system?	VDC system or SPORT shift is equipped.	Go to step **10.**	Go to step **8.**
8	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Connect Subaru Select Monitor to data link connector. 3) Turn ignition switch to ON (engine OFF) and turn Subaru Select Monitor switch to ON. 4) Move select lever to “D” 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 “%”. Is the data of transfer duty solenoid within the specified value?	5 - 10%	Go to step **9.**	Go to step **12.**
9	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Move select lever to “N” with throttle fully closed (vehicle speed 0 km/h or 0 MPH). 2) Read data of transfer duty solenoid using Subaru Select Monitor. •Transfer duty solenoid is indicated in “%”. Is the data of transfer duty solenoid within the specified value?	Approx. 60 - 70%	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the transfer duty solenoid and TCM connector.	Go to step **12.**

	Step	Value	Yes	No
10	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Connect Subaru Select Monitor to data link connector. 3) Turn ignition switch to ON (engine OFF) and turn Subaru Select Monitor switch to ON. 4) Move select lever to “D” 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 “%”. Is the data of transfer duty solenoid within the specified value?	80 - 95%	Go to step **11.**	Go to step **12.**
11	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Move select lever to “N” with throttle fully close (vehicle speed 0 km/h or 0 MPH). 2) Rear data of transfer duty solenoid using Subaru Select Monitor. •Transfer duty solenoid is indicated in “%”. Is the data of transfer duty solenoid same as the specified value?	Approx. 40%	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the transfer duty solenoid and TCM connector.	Go to step **12.**
12	**CHECK POOR CONTACT.** Is there poor contact in transfer duty solenoid circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>
13	**CHECK TRANSFER DUTY SOLENOID (IN TRANSMISSION).** 1) Lift-up the vehicle and place safety stand. 2) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 3) Remove extension case, and disconnect connector from transfer duty solenoid. 4) Measure resistance between transfer duty solenoid connector and transmission ground. ***Connector & terminal*** ***(AT4) No. 1 — Transmission ground:*** Is the measured value within the specified range?	10 - 17 Ω	Go to step **14.**	Replace transfer duty solenoid. <Ref. to AT-70, Transfer Duty Solenoid and Valve Body.>

Step		Value	Yes	No
14	**CHECK HARNESS CONNECTOR BETWEEN TRANSFER DUTY SOLENOID AND TRANSMISSION.** Measure resistance of harness between transfer duty solenoid and transmission connector. ***Connector & terminal*** ***(T4) No. 6 — (AT4) No. 1:*** Is the measured value less than the specified value?	1 Ω	Go to step **15.**	Repair open circuit in harness between transfer duty solenoid and transmission connector.
15	**CHECK HARNESS CONNECTOR BETWEEN TRANSFER DUTY SOLENOID AND TRANSMISSION.** Measure resistance of harness between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 6 — Transmission ground:*** Does the measured value exceed the specified value?	1 MΩ	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the transfer duty solenoid and transmission connector.	Repair short circuit in harness between transfer duty solenoid and transmission connector.

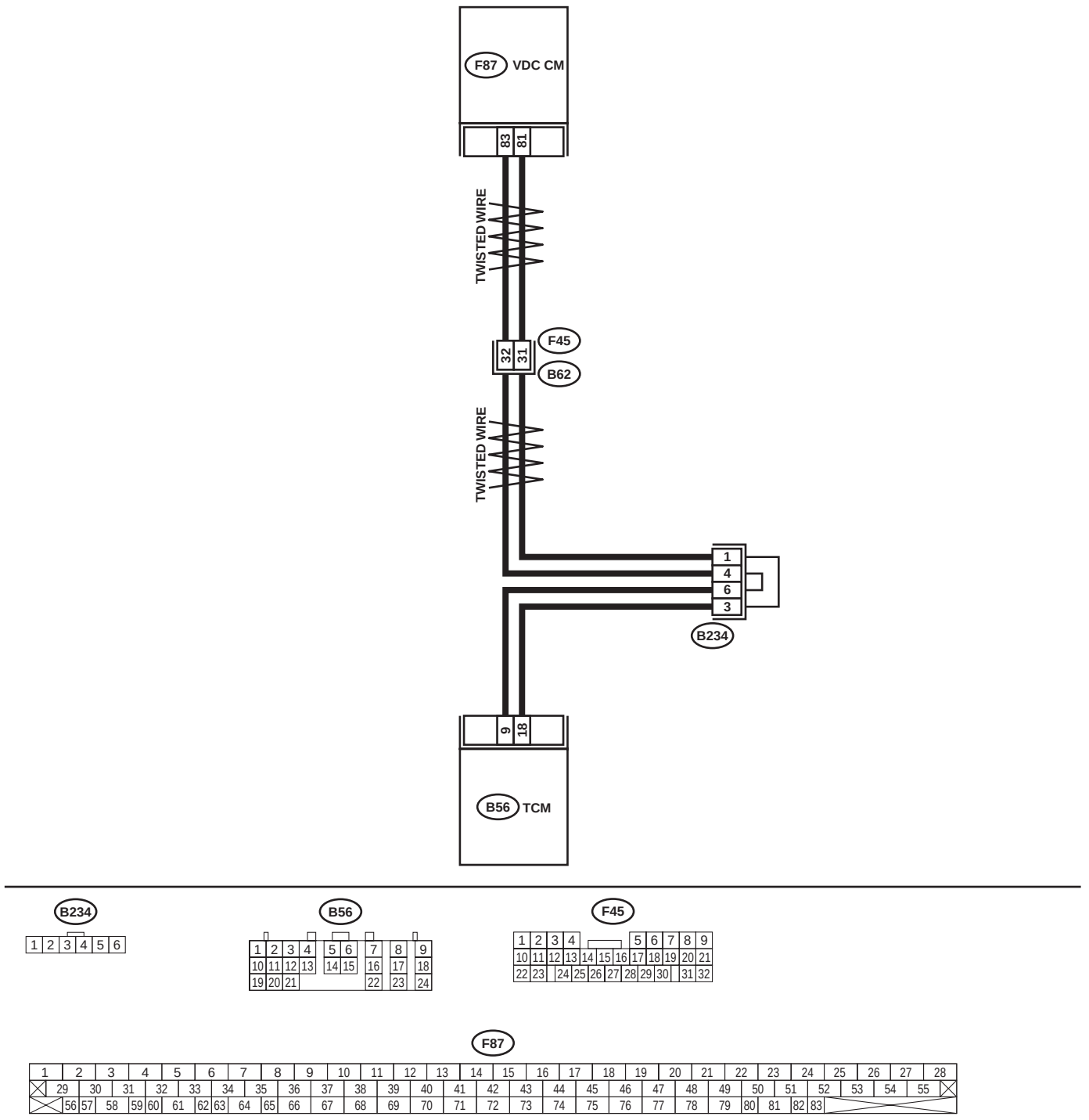
MEMO:

Q: DTC 86 VDC COMMUNICATION SIGNAL

DIAGNOSIS:

Input signal circuit of TCM is open or shorted.

WIRING DIAGRAM:



AT-00665

DIAGNOSTIC PROCEDURE WITH DIAGNOSTIC TROUBLE CODE (DTC)

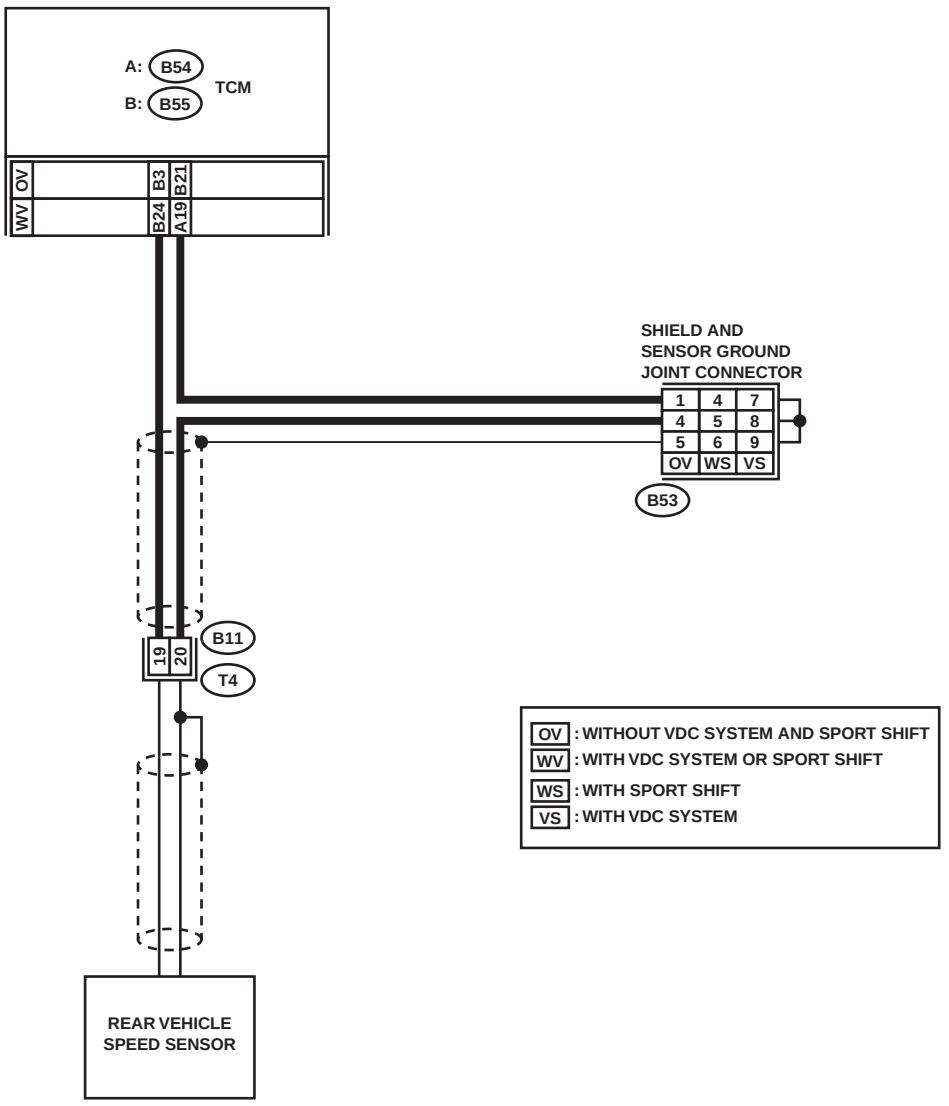
	Step	Value	Yes	No
1	**CHECK TROUBLE CODE.** Do multiple trouble codes appear in the on-board diagnostics test mode?	DTC indicated.	Go to another trouble code.	Go to step **2.**
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND VDCCM.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and VDCCM. 3) Measure resistance of harness between TCM and VDCCM connector. ***Connector & terminal*** ***(B56) No. 18 — (F87) No. 81:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and VDCCM, and poor contact in coupling connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND VDCCM.** Measure resistance of harness between TCM and VDCCM connector. ***Connector & terminal*** ***(B56) No. 9 — (F87) No. 83:*** Is the measured value less than the specified value?	1 Ω	Go to step **4.**	Repair open circuit in harness between TCM and VDCCM, and poor contact in coupling connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND VDCCM.** Measure resistance of harness between TCM and VDCCM connector. ***Connector & terminal*** ***(B56) No. 18 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and VDCCM connector.
5	**CHECK HARNESS CONNECTOR BETWEEN TCM AND VDCCM.** Measure resistance of harness between TCM and VDCCM connector. ***Connector & terminal*** ***(B56) No. 9 — Chassis ground:*** Is the measured value less than the specified value?	1 MΩ	Go to step **6.**	Repair short circuit in harness between TCM and VDCCM connector.
6	**PREPARE OSCILLOSCOPE.** Do you have oscilloscope?	Oscilloscope is available.	Go to step **8.**	Go to step **7.**
7	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and VDCCM. 2) Turn ignition switch to ON (engine OFF). 3) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B56) No. 9 (+) — Chassis ground (–):*** ***(B56) No. 18 (+) — Chassis ground (–):*** Does input voltage value change?	Input voltage value changes.	Go to step **10.**	Repair poor contact in VDCCM.

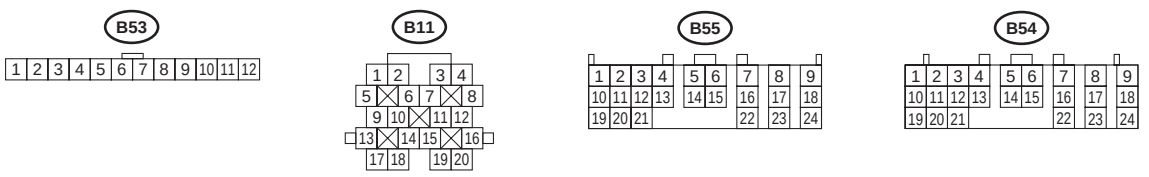
	Step	Value	Yes	No
8	**CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.** 1) Set oscilloscope to TCM connector terminals. ***Connector & terminal*** ***Positive probe; (B56) No. 9*** ***Ground; (B55) No. 9*** 2) Turn ignition switch to ON (engine OFF). Check signal waveform pattern on oscilloscope. <Ref. to AT-22, WAVEFORM, MEASUREMENT, Transmission Control Module (TCM) I/O Signal.> Is waveform pattern same as that shown in the figure?	Waveform pattern is same as that shown in the figure.	Go to step **9.**	Repair poor contact in VDCCM.
9	**CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.** 1) Set oscilloscope to TCM connector terminals. ***Connector & terminal*** ***Positive probe; (B56) No. 18*** ***Ground; (B55) No. 9*** 2) Turn ignition switch to ON (engine OFF). Check signal waveform pattern on oscilloscope. <Ref. to AT-22, WAVEFORM, MEASUREMENT, Transmission Control Module (TCM) I/O Signal.> Is waveform pattern same as that shown in the figure?	Waveform pattern is same as that shown in the figure.	Go to step **10.**	Repair poor contact in VDCCM.
10	**CHECK POOR CONTACT.** Is there poor contact in TCM?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

MEMO:

R: DTC 93 REAR VEHICLE SPEED SENSOR

DIAGNOSIS:
Input signal circuit of TCM is open or shorted.
TROUBLE SYMPTOM:
No lock-up or excessive tight corner “braking”.
WIRING DIAGRAM:





AT-00666

	Step	Value	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Turn ignition switch to OFF. 2) Disconnect connector from TCM and transmission. 3) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 24 — (B11) No. 19:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 3 — No. 21:*** Is the measured value less than the specified value?	1 Ω	Go to step **2.**	Repair open circuit in harness between TCM and transmission connector.
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 19 — (B11) No. 20:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 21 — (B11) No. 20:*** Is the measured value less than the specified value?	1 Ω	Go to step **3.**	Repair open circuit in harness between TCM and transmission, and poor contact in coupling connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 24 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 3 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **4.**	Repair short circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B54) No. 19 — Chassis ground:*** ***Without VDC system and SPORT shift:*** ***(B55) No. 21 — Chassis ground:*** Does the measured value exceed the specified value?	1 MΩ	Go to step **5.**	Repair short circuit in harness between TCM and transmission connector.
5	**CHECK REAR VEHICLE SPEED SENSOR.** Measure resistance between transmission connector receptacle's terminals. ***Connector & terminal*** ***(T4) No. 19 — No. 20:*** Is the measured value within the specified range?	450 - 650 Ω	Go to step **6.**	Replace rear vehicle speed sensor. <Ref. to AT-58, Rear Vehicle Speed Sensor.>
6	**PREPARE OSCILLOSCOPE.** Do you have oscilloscope?	Oscilloscope is available.	Go to step **10.**	Go to step **7.**
7	**PREPARE SUBARU SELECT MONITOR.** Do you have a Subaru Select Monitor?	Subaru Select Monitor is available.	Go to step **9.**	Go to step **8.**

	Step	Value	Yes	No
8	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect 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-22, Clear Memory Mode.> 4) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***With VDC system or SPORT shift:*** ***(B55) No. 24 (+) — (B54) No. 19 (–):*** ***Without VDC system and SPORT shift:*** ***(B55) No. 3 (+) — No. 21 (–):*** Does the measured value exceed the specified value?	AC 1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11.**
9	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Connect 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 ignition switch to ON and turn Subaru Select Monitor switch to ON. 5) Start the engine. 6) Read data of vehicle speed using Subaru Select Monitor. •Compare speedometer with Subaru Select Monitor indications. •Vehicle speed is indicated in “km/h” or “MPH”. 7) Slowly increase 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. to ABS-22, Clear Memory Mode.> Does the speedometer indication increase as the Subaru Select Monitor data increases?	Subaru Select Monitor data increase.	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11.**

	Step	Value	Yes	No
10	**CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and place safety stands. NOTE: Raise all wheels off floor. 3) Set oscilloscope to TCM connector terminals. ***Connector & terminal*** ***Positive probe; (B55) No. 24*** ***Ground; (B54) 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. to ABS-22, Clear Memory Mode.> 5) Measure signal voltage indicated on oscilloscope. Does the measured value exceed the specified value?	AC 1 V	Even if AT OIL TEMP warning light lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11.**
11	**CHECK POOR CONTACT.** Is there poor contact in rear vehicle speed sensor circuit?	There is poor contact.	Repair poor contact.	Replace TCM. <Ref. to AT-75, Transmission Control Module (TCM).>

MEMO:

Vehicle-id:
SIE-id::R:DTC 93 Rear Vehicle Speed Sensor
~