14. Diagnostic Procedure with Trouble Code S004509

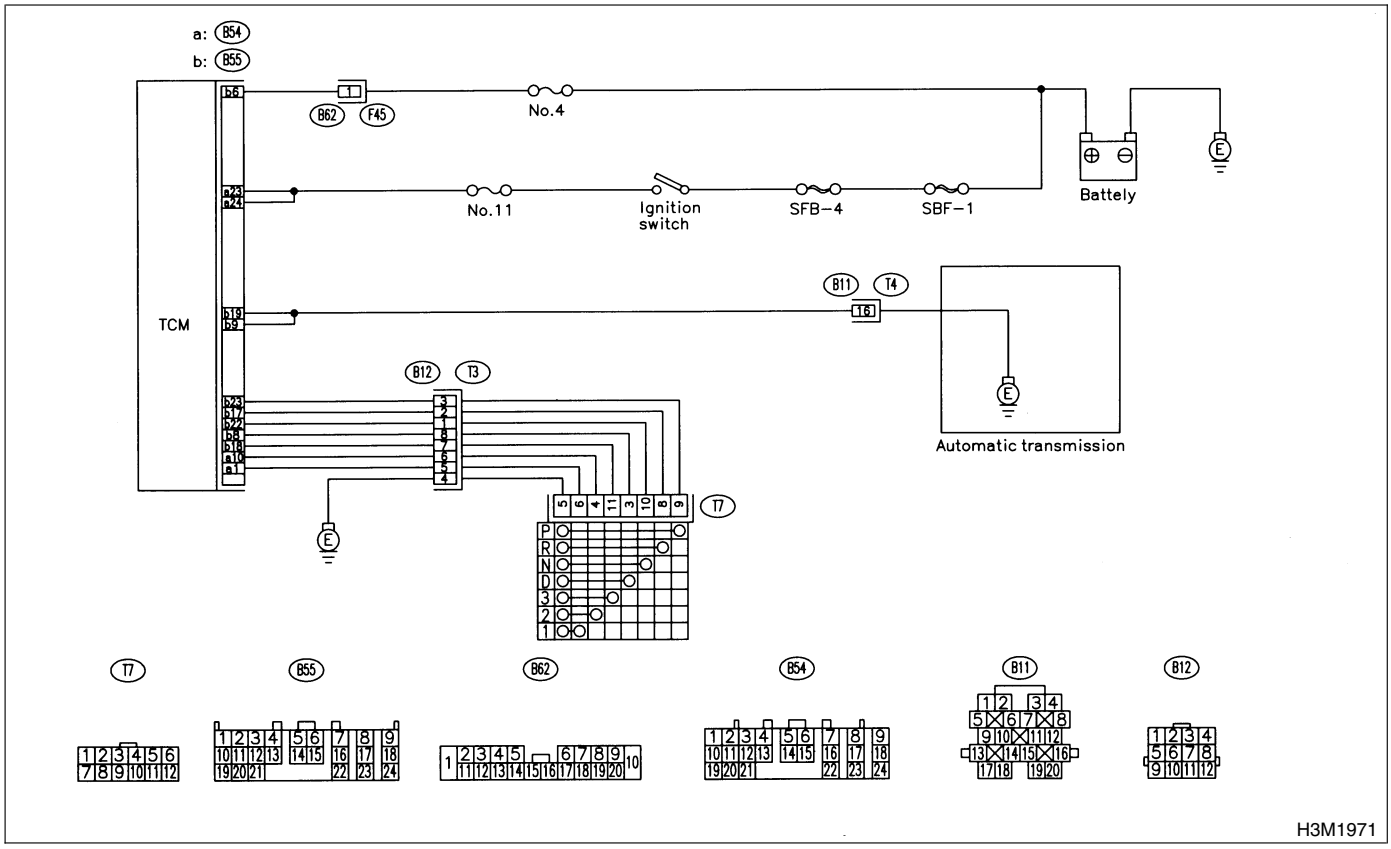
A: COMMUNICATION FOR INITIALIZING IMPOSSIBLE S004509E34

1. CONTROL MODULE POWER SUPPLY AND GROUND LINE S004509E3401

DIAGNOSIS:
- Faulty harness connector

TROUBLE SYMPTOM:
- AT OIL TEMP warning light remains on.

WIRING DIAGRAM:



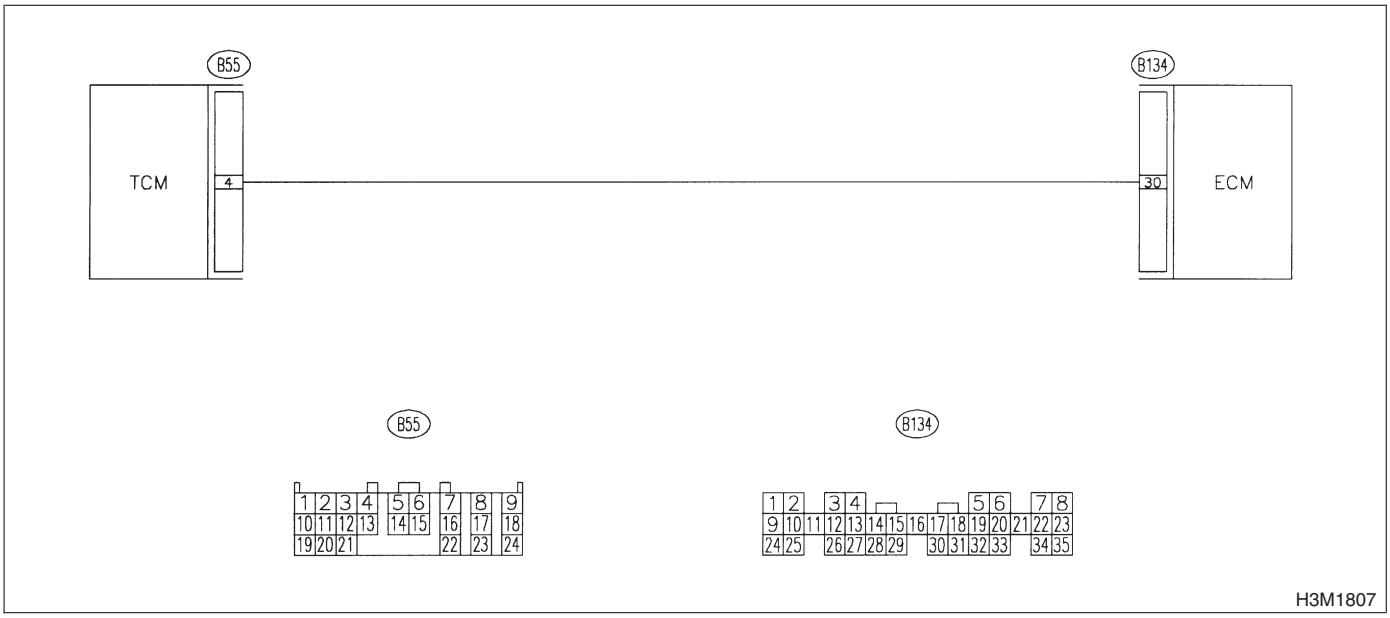
No.	Step	Check	Yes	No
1	**CHECK FUSE (NO. 4).** Remove fuse (No. 4).	Is the fuse (No. 4) blown out?	Replace fuse (No. 4). If replaced fuse (No. 4) has blown out easily, repair short circuit in harness between fuse (No. 4) and TCM.	Go to step **2**.
2	**CHECK BACK-UP POWER SUPPLY CIRCUIT.** 1) Turn ignition switch to ON. 2) Measure back-up power supply voltage between TCM connector terminal. ***Connector & terminal*** ***(B55) No. 6 (+) — No. 19 (–):***	Is the voltage more than 10 V?	Go to step **3**.	Repair open circuit harness between TCM and battery, and poor contact in coupling connector.

No.	Step	Check	Yes	No
3	**CHECK FUSE (NO. 11).** Remove fuse (No. 11).	Is the fuse (No. 11) blown out?	Replace fuse (No. 11). If replaced fuse (No. 11) has blown out easily, repair short circuit in harness between fuse (No. 11) and TCM.	Go to step **4**.
4	**CHECK IGNITION POWER SUPPLY CIRCUIT.** 1) Turn ignition switch to ON (engine OFF). 2) Measure ignition power supply voltage between TCM connector terminal. ***Connector & terminal*** ***(B54) No. 23 (+) — (B55) No. 19 (–):***	Is the voltage more than 10 V?	Go to step **5**.	Go to step **6**.
5	**CHECK IGNITION POWER SUPPLY CIRCUIT.** 1) Turn ignition switch to ON (engine OFF). 2) Measure ignition power supply voltage between TCM connector terminal. ***Connector & terminal*** ***(B54) No. 24 (+) — (B55) No. 19 (–):***	Is the voltage more than 10 V?	Go to step **6**.	Repair open circuit in harness between TCM and battery, and poor contact in coupling connector.
6	**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*** ***(B55) No. 19 — (B11) No. 16:***	Is the resistance less than 1 Ω?	Go to step **7**.	Repair open circuit in harness between TCM and transmission harness connector.
7	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND TRANSMISSION GROUND.** Measure resistance of harness between transmission and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between transmission and transmission ground.
8	**CHECK HARNESS CONNECTOR BETWEEN TCM AND INHIBITOR SWITCH.** 1) Turn ignition switch to OFF. 2) Disconnect connector from inhibitor switch. 3) Measure resistance of harness between inhibitor switch side connector and TCM. ***Connector & terminal*** ***(B11) No. 16 — (B55) No. 9:***	Is the resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between TCM and inhibitor side connector, and poor contact in coupling connector.
9	**CHECK POOR CONTACT.**	Is there poor contact in control module power supply and ground line?	Repair poor contact and ground terminal.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

B: TROUBLE CODE 11 — ENGINE SPEED SIGNAL — S004509C39

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

WIRING DIAGRAM:

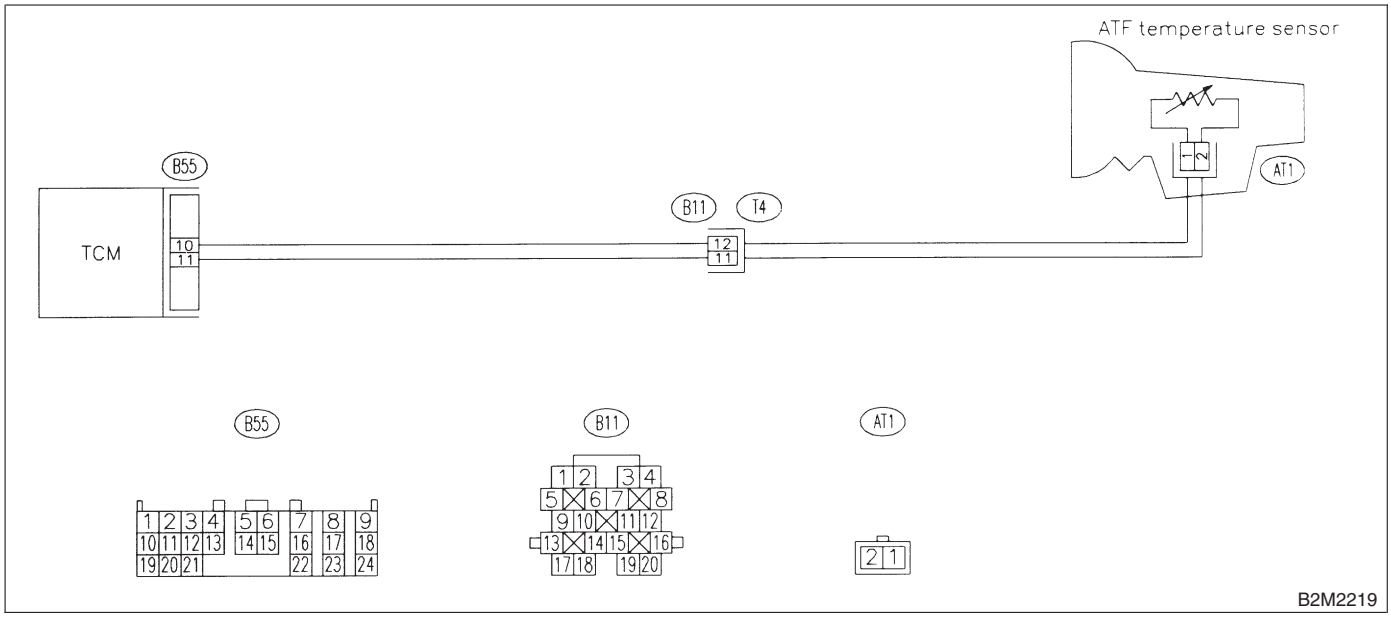


No.	Step	Check	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***(B55) No. 4 — (B134) No. 30:***	Is the resistance less than 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*** ***(B55) No. 4 — Chassis ground:***	Is the resistance more than 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?	Go to step **5**.	Go to step **4**.

No.	Step	Check	Yes	No
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*** ***(B55) No. 4 (+) — Chassis ground (–):***	Is the voltage more than 10.5 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6**.
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?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6**.
6	**CHECK POOR CONTACT.**	Is there poor contact in engine speed signal circuit?	Repair poor contact.	Go to step **7**.
7	**CONFIRM TROUBLE CODE 11.**	Replace ECM with a new one. Does the trouble code appear again, after the memory has been cleared?	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>	Replace ECM. <Ref. to FU-60 REMOVAL, Engine Control Module.>

C: TROUBLE CODE 27 — ATF TEMPERATURE SENSOR — S004509C76

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



No.	Step	Check	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*** ***(B55) No. 10 — (B11) No. 12:***	Is the resistance less than 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*** ***(B55) No. 11 — (B11) No. 11:***	Is the resistance less than 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*** ***(B55) No. 10 — Chassis ground:***	Is the resistance more than 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*** ***(B55) No. 11 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.

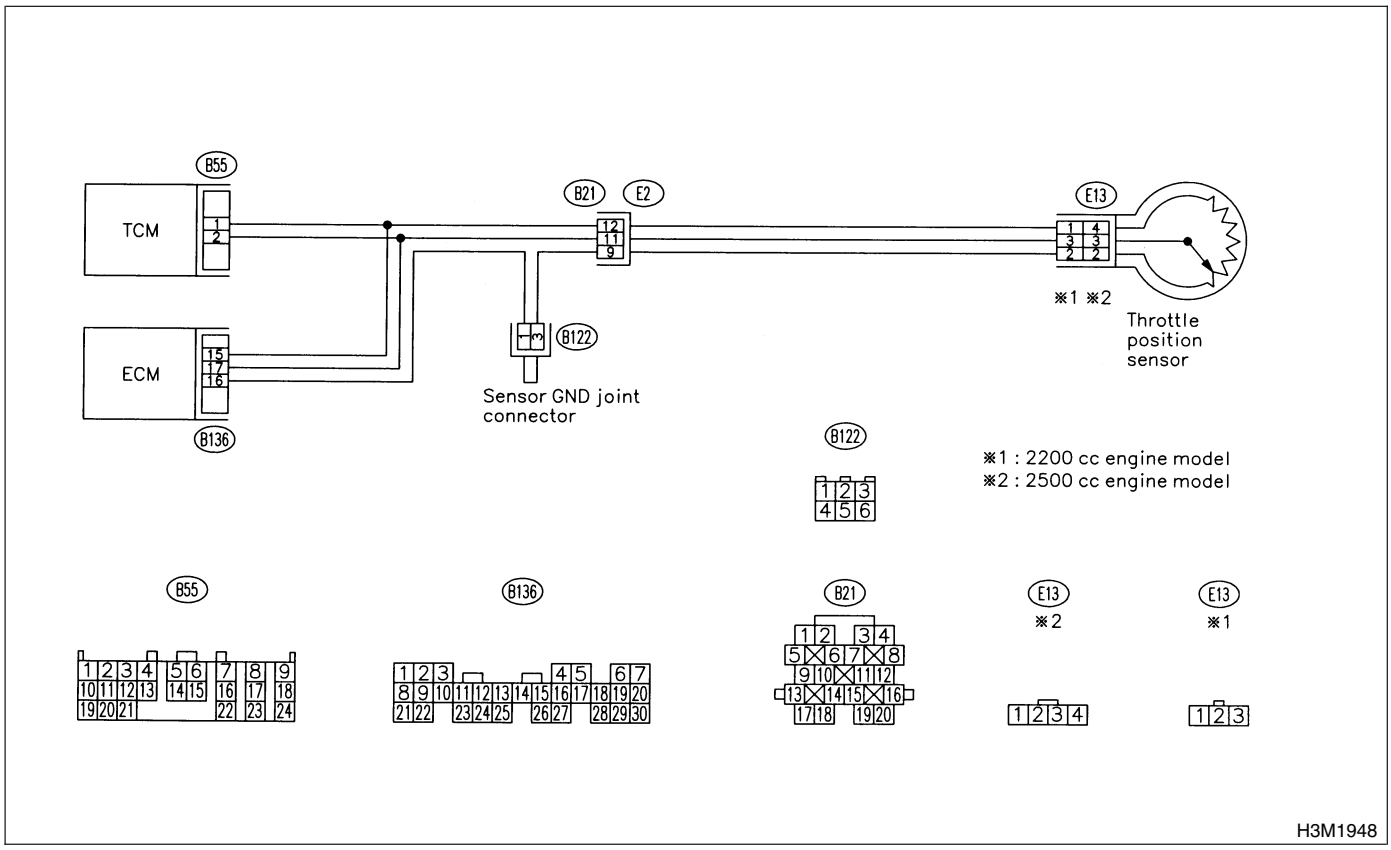
No.	Step	Check	Yes	No
5	**CHECK ATF TEMPERATURE SENSOR.** 1) Turn ignition switch to OFF. 2) Connect connectors to transmission and TCM. 3) Turn ignition switch to ON and start engine. 4) Warm-up the transmission until ATF temperature reaches to 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 5) Measure resistance between transmission connector terminals. 6) Disconnect connector from transmission. ***Connector & terminal*** ***(T4) No. 11 — No. 12:***	Is the resistance between 275 and 375 Ω?	Go to step **6**.	Go to step **12**.
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?	Go to step **7**.	Go to step **12**.
7	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **9**.	Go to step **8**.
8	**CHECK INPUT SIGNAL FOR TCM.** 1) 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. 2) Measure voltage between TCM connector terminal. ***Connector & terminal*** ***(B55) No. 11 (+) — No. 10 (–):***	Is the voltage between 0.5 and 0.8 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.	Go to step **11**.
9	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Turn ignition switch to OFF. 2) Connect connectors to TCM and transmission. 3) Connect Subaru Select Monitor to data link connector. 4) Start the engine, and turn Subaru Select Monitor switch to ON. 5) Warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 6) Read data of ATF temperature using Subaru Select Monitor. ● ATF temperature is indicated in “°F” or “°C”.	Is the ATF temperature between 70 and 110°C (158 and 230°F)?	Go to step **10**.	Go to step **11**.

No.	Step	Check	Yes	No
10	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** Turn ignition switch to ON (engine OFF).	Does the ATF temperature gradually decrease?	Even if "AT OIL TEMP" light 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 **11**.
11	**CHECK POOR CONTACT.**	Is there poor contact in ATF temperature sensor circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>
12	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Remove transmission connector from bracket. 4) Lift-up the vehicle and place safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 5) Drain automatic transmission fluid. **CAUTION:** **Do not drain the automatic transmission fluid until it cools down.** 6) Remove oil pan, and disconnect connector from ATF temperature sensor connector. 7) Measure resistance of harness between ATF temperature sensor and transmission connector. ***Connector & terminal*** ***(T4) No. 11 — (AT1) No. 2:***	Is the resistance less than 1 Ω?	Go to step **13**.	Repair open circuit in harness between ATF temperature sensor and transmission connector.
13	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.** Measure resistance of harness between ATF temperature sensor and transmission connector. ***Connector & terminal*** ***(T4) No. 12 — (AT1) No. 1:***	Is the resistance less than 1 Ω?	Go to step **14**.	Repair open circuit in harness between ATF temperature sensor and transmission connector.
14	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.** Measure resistance of harness between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 11 — Transmission ground:***	Is the resistance more than 1 MΩ?	Go to step **15**.	Repair short circuit in harness between ATF temperature sensor and transmission connector.

No.	Step	Check	Yes	No
15	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND ATF TEMPERATURE SENSOR.** Measure resistance of harness between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 12 — Transmission ground:***	Is the resistance more than 1 MΩ?	Replace ATF temperature sensor. <Ref. to AT-38 REMOVAL, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>	Repair short circuit in harness between ATF temperature sensor and transmission connector.

D: TROUBLE CODE 31 — THROTTLE POSITION SENSOR — S004509C94

DIAGNOSIS:
Input signal circuit of throttle position sensor is open or shorted.
TROUBLE SYMPTOM:
Shift point too high or too low; engine brake not effected in “3” range: excessive shift shock; excessive tight corner “braking”.
WIRING DIAGRAM:



No.	Step	Check	Yes	No
1	**CHECK 2200 cc ENGINE VEHICLES.**	Is the vehicle 2200 cc engine vehicle?	Go to step **6**.	Go to step **2**.
2	**CHECK THROTTLE POSITION SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from throttle position sensor. 3) Measure resistance between throttle position sensor connector receptacle’s terminals. ***Terminals*** ***No. 4 — No. 2:***	Is the resistance between 0.3 and 0.7 kΩ?	Go to step **3**.	Replace throttle position sensor. <Ref. to FU-43 REMOVAL, Throttle Position Sensor.>
3	**CHECK THROTTLE POSITION SENSOR.** Measure resistance between throttle position sensor connector receptacle’s terminals. ***Terminals*** ***No. 2 — No. 3:***	Is the resistance between 3.5 and 6.5 kΩ?	Go to step **4**.	Replace throttle position sensor. <Ref. to FU-43 REMOVAL, Throttle Position Sensor.>

No.	Step	Check	Yes	No
4	**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*** ***(B55) No. 2 — (E13) No. 3:***	Is the resistance less than 1 Ω?	Go to step **5**.	Repair open circuit in harness between TCM and throttle position sensor connector, and poor contact in coupling connector.
5	**CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.** Measure resistance of harness between TCM and throttle position sensor connector. ***Connector & terminal*** ***(B55) No. 1 — (E13) No. 4:***	Is the resistance less than 1 Ω?	Go to step **10**.	Repair open circuit in harness between TCM and throttle position sensor connector, and poor contact in coupling connector.
6	**CHECK THROTTLE POSITION SENSOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from throttle position sensor. 3) Measure resistance between throttle position sensor connector receptacle's terminals. ***Terminals*** ***No. 1 — No. 2:***	Is the resistance between 0.3 and 0.7 kΩ?	Go to step **7**.	Replace throttle position sensor. <Ref. to FU-43 REMOVAL, Throttle Position Sensor.>
7	**CHECK THROTTLE POSITION SENSOR.** Measure resistance between throttle position sensor connector receptacle's terminals. ***Terminals*** ***No. 2 — No. 3:***	Is the resistance between 3.5 and 6.5 kΩ?	Go to step **8**.	Replace throttle position sensor. <Ref. to FU-43 REMOVAL, Throttle Position Sensor.>
8	**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*** ***(B55) No. 2 — (E13) No. 3:***	Is the resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between TCM and throttle position sensor connector, and poor contact in coupling connector.
9	**CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.** Measure resistance of harness between TCM and throttle position sensor connector. ***Connector & terminal*** ***(B55) No. 1 — (E13) No. 1:***	Is the resistance less than 1 Ω?	Go to step **10**.	Repair open circuit in harness between TCM and throttle position sensor connector, and poor contact in coupling connector.
10	**CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B55) No. 2 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **11**.	Repair short circuit in harness between TCM and throttle position sensor connector.
11	**CHECK HARNESS CONNECTOR BETWEEN TCM AND THROTTLE POSITION SENSOR.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B55) No. 1 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **12**.	Repair short circuit in harness between TCM and throttle position sensor connector.

No.	Step	Check	Yes	No
12	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **15**.	Go to step **13**.
13	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM, throttle position sensor and ECM. 2) Turn ignition switch to ON (engine OFF). 3) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 2 (+) — No. 9 (–):***	Is the voltage between 0.3 and 0.7 V in throttle fully closed?	Go to step **14**.	Go to step **19**.
14	**CHECK INPUT SIGNAL FOR TCM.** Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 2 (+) — No. 9 (–):***	Is the voltage between 4.3 and 4.9 V with throttle fully open?	Go to step **17**.	Go to step **19**.
15	**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 the value voltage between 0.3 and 0.7 V?	Go to step **16**.	Go to step **19**.
16	**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).	Is the value voltage between 4.3 and 4.9 V ?	Go to step **17**.	Go to step **19**.
17	**CHECK INPUT SIGNAL FOR TCM (THROTTLE POSITION SENSOR POWER SUPPLY).** Measure voltage between TCM connector terminals and chassis ground. ***Connector & terminal*** ***(B55) No. 1 (+) — Chassis ground (–):***	Is the voltage between 4.8 and 5.3 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in throttle position sensor circuit.	Go to step **19**.

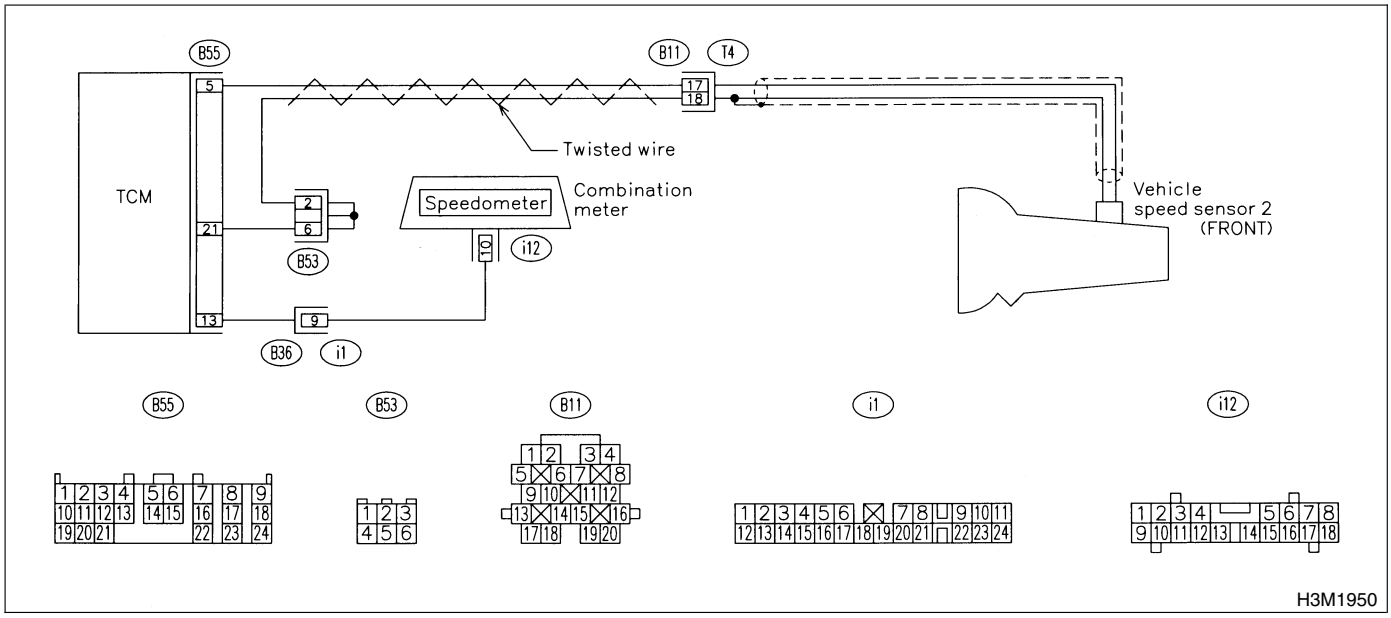
No.	Step	Check	Yes	No
18	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR (THROTTLE POSITION SENSOR POWER SUPPLY).** Read data of throttle position sensor power supply using Subaru Select Monitor. ● Throttle position sensor power supply voltage is indicated.	Is the value voltage between 4.8 and 5.3 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in throttle position sensor circuit.	Go to step **19**.
19	**CHECK POOR CONTACT.**	Is there poor contact in throttle position sensor circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

E: TROUBLE CODE 33 — VEHICLE SPEED SENSOR 2 (FRONT) — S004509D04

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:



No.	Step	Check	Yes	No
1	**CHECK OPERATION OF SPEEDOMETER.**	Does speedometer operate normally?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **2**.
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*** ***(B55) No. 5 — (B11) No. 17:***	Is the resistance less than 1 Ω?	Go to step **3**.	Repair open circuit in harness between TCM and transmission connector.

No.	Step	Check	Yes	No
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B55) No. 21 — (B11) No. 18:***	Is the resistance less than 1 Ω?	Go to step **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*** ***(B55) No. 21 — Chassis ground:***	Is the resistance more than 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*** ***(B55) No. 5 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **6**.	Repair short circuit in harness between TCM and transmission connector.
6	**CHECK VEHICLE SPEED SENSOR 2.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector receptacle's terminals. ***Connector & terminal*** ***(T4) No. 17 — No. 18:***	Is the resistance between 450 and 650 Ω?	Go to step **7**.	Replace vehicle speed sensor 2. <Ref. to AT-33 REMOVAL, Vehicle Speed Sensor 1, 2, Torque Converter Turbine Speed Sensor and Harness Assembly.>
7	**PREPARE OSCILLOSCOPE.**	Do you have oscilloscope?	Go to step **10**.	Go to step **8**.
8	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **11**.	Go to step **9**.
9	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect all connectors. 2) Lift-up or raise the vehicle and place safety stands. **CAUTION:** **On AWD models, 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-18 OPERATION, Clear Memory Mode.> 4) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 5 (+) — No. 21 (–):***	Is the voltage more than AC 1 V?	Go to step **12**.	Go to step **19**.

No.	Step	Check	Yes	No
10	**CHECK VEHICLE SPEED SENSOR 2 USING OSCILLOSCOPE.** 1) Connect all connectors. 2) Lift-up the vehicle and place safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Set oscilloscope to TCM connector terminals. Positive prove; (B55) No. 5 Earth lead; (B55) No. 21 4) Start the engine, and drive the wheels slowly. NOTE: The speed difference between front and rear wheels may light the ABS warning light, but this indicates no malfunctions. When AT control diagnosis is finished, perform the ABS memory clearance procedure of self-diagnosis system. <Ref. to ABS-18 OPERATION, Clear Memory Mode.> 5) Measure signal voltage indicated on oscilloscope.	Is the voltage more than AC 4 V?	Go to step **12**.	Go to step **19**.
11	**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. **CAUTION:** **On AWD models, 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-18 OPERATION, Clear Memory Mode.>	Does the speedometer indication increase as the Subaru Select Monitor data increases?	Go to step **12**.	Go to step **19**.
12	**CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and combination meter. 3) Measure resistance of harness between TCM and combination meter connector. ***Connector & terminal*** ***(B55) No. 13 — (i12) No. 10:***	Is the resistance less than 1 Ω?	Go to step **13**.	Repair open circuit in harness between TCM and combination meter connector, and poor contact in coupling connector.

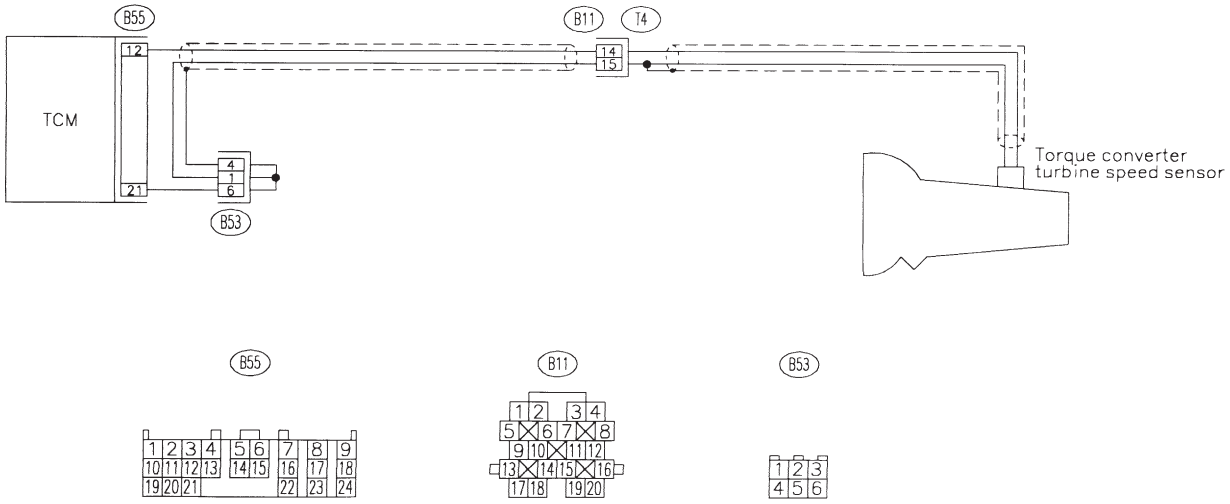
No.	Step	Check	Yes	No
13	**CHECK HARNESS CONNECTOR BETWEEN TCM AND COMBINATION METER.** Measure resistance of harness between combination meter and chassis ground. ***Connector & terminal*** ***(i12) No. 10 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **14**.	Repair short circuit in harness between TCM and combination meter connector.
14	**PREPARE OSCILLOSCOPE.**	Do you have oscilloscope?	Go to step **17**.	Go to step **15**.
15	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **18**.	Go to step **16**.
16	**CHECK OUTPUT SIGNAL FOR TCM.** 1) Connect all connectors. 2) Lift-up the vehicle and place safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Set vehicle in 10 km/h (6 MPH) condition. NOTE: The speed difference between front and rear wheels may light ABS warning light, but this indicates no malfunction. When AT control diagnosis is finished, perform the ABS memory clearance procedure on on-board diagnostics system. <Ref. to ABS-18 OPERATION, Clear Memory Mode.> 4) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 13 (+) — Chassis ground (–):***	Is the voltage less than 1 V ←→ more than 4 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.	Go to step **19**.
17	**CHECK INPUT SIGNAL FOR TCM USING OSCILLOSCOPE.** 1) Connect connectors to TCM and combination meter. 2) Lift-up or raise the vehicle and place safety stands. **CAUTION:** **On AWD models, raise all wheels off floor.** 3) Set oscilloscope to TCM connector terminals. Positive prove; (B55) No. 13 Earth lead; (B55) No. 21 4) Start the engine. 5) Shift on the gear position, and keep the vehicle speed at constant. 6) Measure signal voltage indicated on oscilloscope. NOTE: ● If vehicle speed increases, the width of amplitude (W) decreases. ● 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-18 OPERATION, Clear Memory Mode.>	Is the voltage more than AC 2 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.	Go to step **19**.

No.	Step	Check	Yes	No
18	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect all connectors. 2) Lift-up the vehicle and place safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Connect Subaru Select Monitor to data link connector. 4) Turn ignition switch to ON and Subaru Select Monitor switch to ON. 5) Start the engine, and drive all wheels. 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-18 OPERATION, Clear Memory Mode.>	Does the speedometer indication increase as the Subaru Select Monitor data increases?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.	Go to step **19**.
19	**CHECK POOR CONTACT.**	Is there poor contact in vehicle speed sensor 2 circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

F: TROUBLE CODE 36 — TORQUE CONVERTER TURBINE SPEED SENSOR —

S004509D17

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



H3M1798

No.	Step	Check	Yes	No
1	**CHECK TORQUE CONVERTER TURBINE SPEED SENSOR 1.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector receptacle's terminals. ***Connector & terminal*** ***(T4) No. 14 — No. 15:***	Is the resistance between 450 and 650 Ω?	Go to step **2**.	Replace torque converter turbine speed sensor. <Ref. to AT-33 REMOVAL, Vehicle Speed Sensor 1, 2, Torque Converter Turbine Speed Sensor and Harness Assembly.>
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*** ***(B55) No. 12 — (B11) No. 14:***	Is the resistance less than 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*** ***(B55) No. 21 — (B11) No. 15:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission connector, and poor contact in coupling connector.

No.	Step	Check	Yes	No
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***(B55) No. 21 — Chassis ground:***	Is the resistance more than 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*** ***(B55) No. 12 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **6**.	Repair short circuit in harness between TCM and transmission connector.
6	**PREPARE OSCILLOSCOPE.**	Do you have oscilloscope?	Go to step **10**.	Go to step **7**.
7	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **9**.	Go to step **8**.
8	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and place safety stands. **CAUTION:** **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-18 OPERATION, Clear Memory Mode.> 4) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 12 (+) — No. 21 (–):***	Is the voltage more than AC 1 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11**.

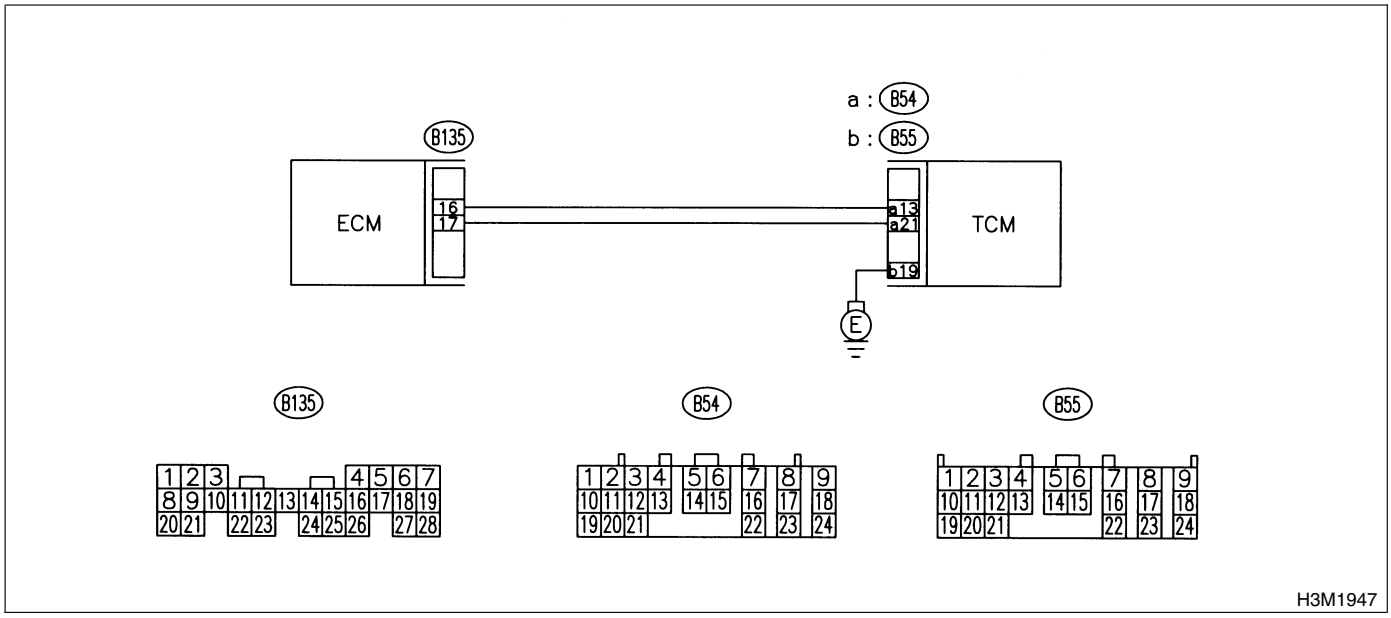
No.	Step	Check	Yes	No
9	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and transmission. 2) Connect Subaru Select Monitor to data link connector. 3) Lift-up or raise the vehicle and place safety stands. **CAUTION:** **Raise all wheels off floor.** 4) Turn ignition 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 20 km/h or 12 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-18 OPERATION, Clear Memory Mode.>	Is the revolution value same as the tachometer reading shown on the combination meter?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11**.
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. **CAUTION:** **Raise all wheels off floor.** 3) Set oscilloscope to TCM connector terminals. Positive prove; (B55) No. 12 Earth lead; (B55) No. 21 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-18 OPERATION, Clear Memory Mode.> 5) Measure signal voltage indicated on oscilloscope.	Is the signal voltage more than AC 1 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11**.
11	**CHECK POOR CONTACT.**	Is there poor contact in vehicle speed sensor 1 circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

G: TROUBLE CODE 38 — TORQUE CONTROL SIGNAL — S004509D26

DIAGNOSIS:
- The signal circuit is open or shorted.

TROUBLE SYMPTOM:
Excessive shift shock.

WIRING DIAGRAM:

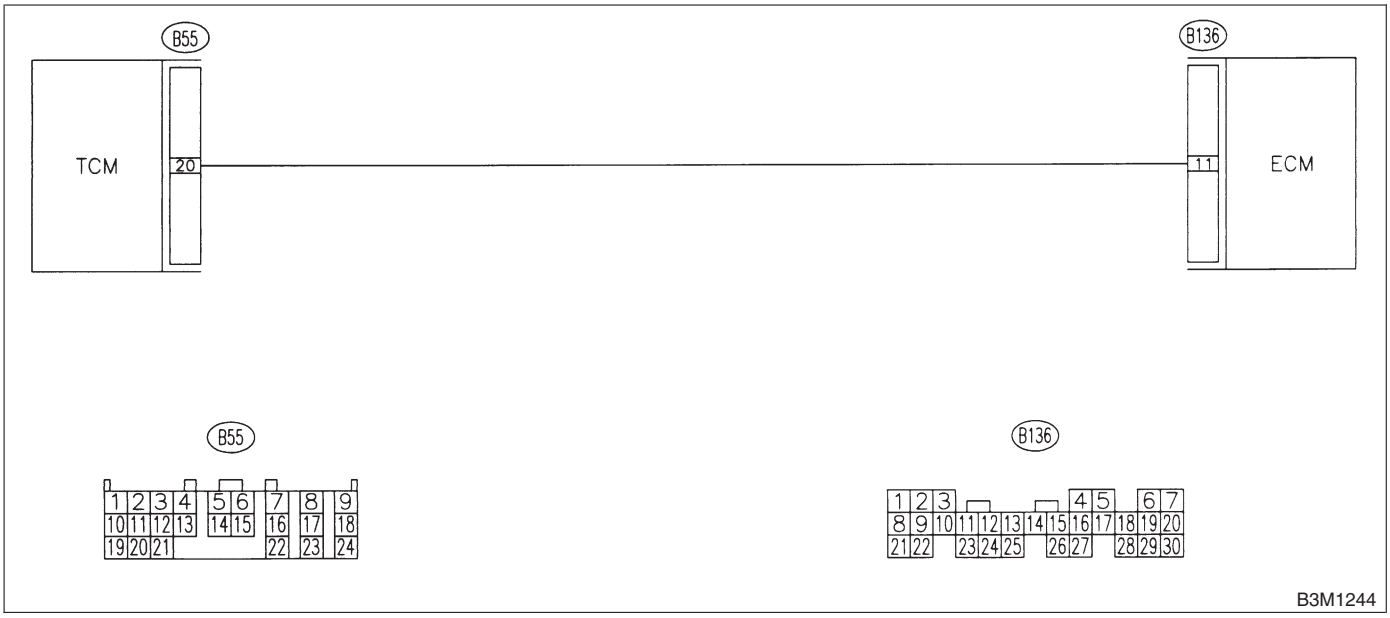


No.	Step	Check	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***(B54) No. 21 — (B135) No. 17:***	Is the resistance less than 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 and ECM connector. ***Connector & terminal*** ***(B54) No. 13 — (B135) No. 16:***	Is the resistance less than 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*** ***(B54) No. 21 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **4**.	Repair short circuit in harness between TCM and ECM connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 13 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and ECM connector.

No.	Step	Check	Yes	No
5	**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*** ***(B54) No. 21 (+) — (B55) No. 19 (–):***	Is the voltage more than 9 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6**.
6	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B54) No. 13 (+) — (B55) No. 19 (–):***	Is the voltage between 4 and 6 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **7**.
7	**CHECK POOR CONTACT.**	Is there poor contact in torque control signal circuit?	Repair poor contact.	Go to step **8**.
8	**CONFIRM TROUBLE CODE 38.**	Replace ECM with a new one. Does the trouble code appear again, after the memory has been cleared?	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>	Replace ECM. <Ref. to FU-60 REMOVAL, Engine Control Module.>

H: TROUBLE CODE 45 — INTAKE MANIFOLD PRESSURE SIGNAL — S004509D48

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

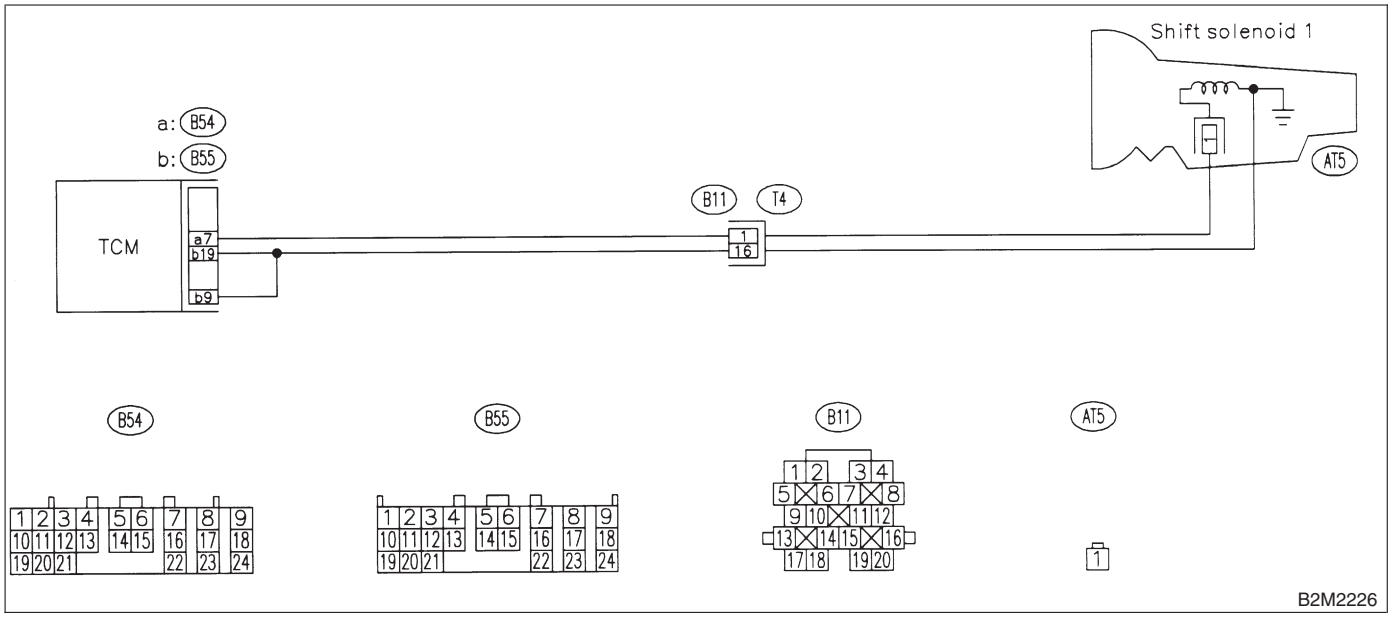


No.	Step	Check	Yes	No
1	**CHECK HARNESS CONNECTOR BETWEEN TCM AND ECM.** 1) Turn ignition switch to OFF. 2) Disconnect connectors from TCM and ECM. 3) Measure resistance of harness between TCM and ECM connector. ***Connector & terminal*** ***(B55) No. 20 — (B136) No. 11:***	Is the resistance less than 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*** ***(B55) No. 20 — Chassis ground:***	Is the resistance more than 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?	Go to step **5**.	Go to step **4**.
4	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and ECM. 2) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 3) Engine idling. 4) Measure voltage between TCM connectors. ***Connector & terminal*** ***(B55) No. 20 (+) — No. 19 (–):***	Is the voltage between 1.2 and 1.8 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6**.

No.	Step	Check	Yes	No
5	**CHECK INPUT SIGNAL FOR TCM USING SUBARU SELECT MONITOR.** 1) Connect connectors to TCM and ECM. 2) Turn ignition switch to OFF. 3) Connect Subaru Select Monitor to data link connector. 4) Start the engine, and turn Subaru Select monitor switch to ON. 5) Warm-up the engine until engine coolant temperature is above 80°C (176°F). 6) Engine idling. 7) Read data of intake manifold pressure signal using Subaru Select Monitor. ● Display shows intake manifold pressure signal value sent from ECM.	Is the value between 1.2 and 1.8 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and ECM.	Go to step **6**.
6	**CHECK POOR CONTACT.**	Is there poor contact in intake manifold pressure signal circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

I: TROUBLE CODE 71 — SHIFT SOLENOID 1 — S004509D91

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



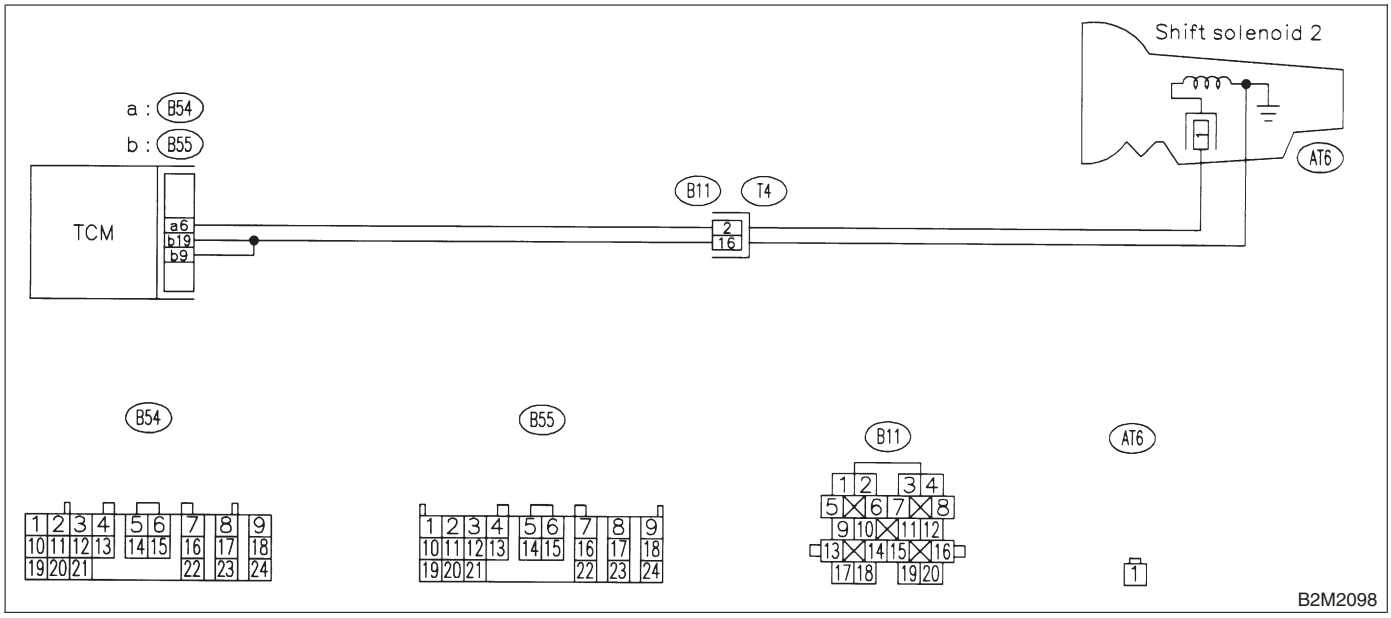
No.	Step	Check	Yes	No
1	**CHECK SHIFT SOLENOID 1 GROUND LINE.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **2**.	Repair open circuit in transmission harness.
2	**CHECK SHIFT SOLENOID 1.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 1 — Transmission ground:***	Is the resistance between 10 and 16 Ω?	Go to step **3**.	Go to step **6**.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 7 — (B11) No. 1:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 7 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.

No.	Step	Check	Yes	No
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 4) Move selector lever to "D", and slowly increase vehicle speed to 50 km/h (31 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-18 OPERATION, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 7 (+) — Chassis ground (–):***	Is the voltage 1 V → 9 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM.	Go to step **8**.
6	**CHECK SHIFT SOLENOID 1 (IN TRANSMISSION).** 1) Remove transmission connector from bracket. 2) Lift-up or raise the vehicle and support with safety stand. **CAUTION:** **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 shift solenoid 1. 5) Measure resistance between shift solenoid 1 connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:***	Is the resistance between 10 and 16 Ω?	Go to step **7**.	Replace shift solenoid 1. <Ref. to AT-38 REMOVAL, Shift Solenoid, Duty Solenoids and ATF Temperature Sensor.>
7	**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 resistance less than 1 Ω?	Go to step **8**.	Repair open circuit in harness between shift solenoid 1 and transmission connector.

No.	Step	Check	Yes	No
8	**CHECK POOR CONTACT.**	Is there poor contact in shift solenoid 1 circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

J: TROUBLE CODE 72 — SHIFT SOLENOID 2 — S004509D98

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

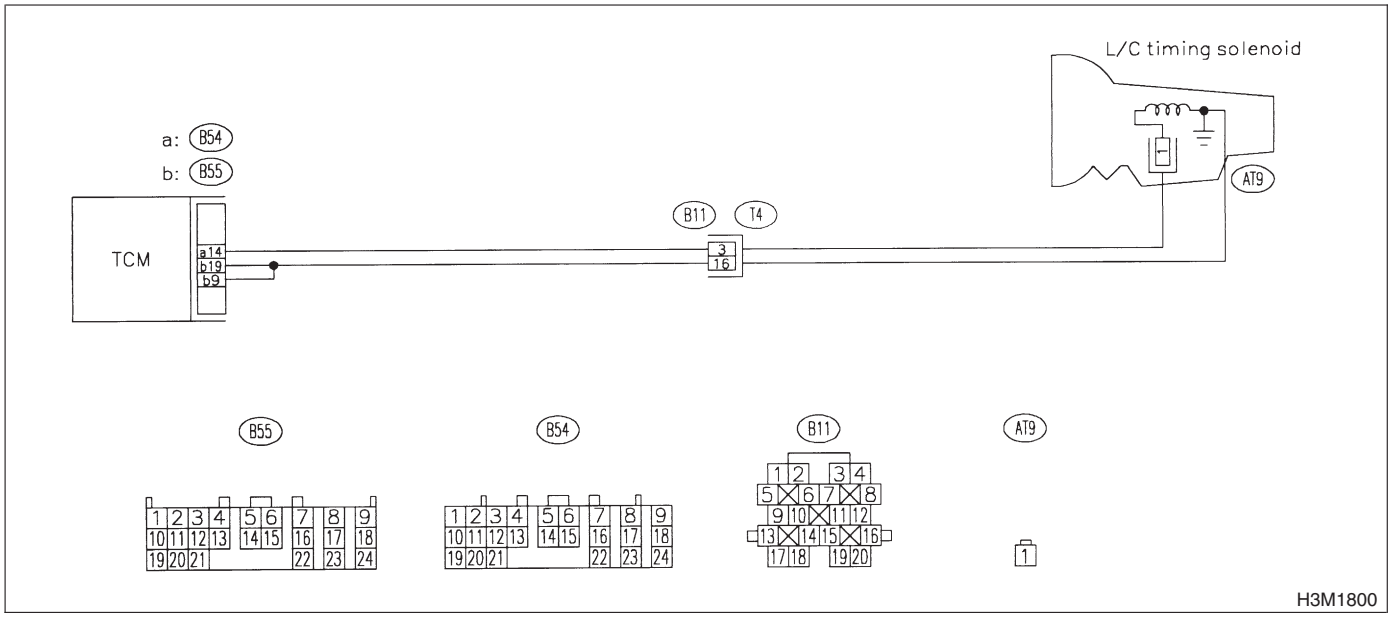


No.	Step	Check	Yes	No
1	**CHECK SHIFT SOLENOID 2 GROUND LINE.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **2**.	Repair open circuit in transmission harness.
2	**CHECK SHIFT SOLENOID 2.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 2 — Transmission ground:***	Is the resistance between 10 and 16 Ω?	Go to step **3**.	Go to step **6**.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 6 — (B11) No. 2:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 6 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.

No.	Step	Check	Yes	No
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Start the engine, and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 4) Move selector lever to "D", and slowly increase vehicle speed to 50 km/h (31 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-18 OPERATION, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 6 (+) — Chassis ground (–):***	Is the voltage 9 V → 1 V?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.	Go to step **8**.
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 resistance between 10 and 16 Ω?	Go to step **7**.	Replace shift solenoid assembly. <Ref. to AT-38 REMOVAL, Shift Solenoid, Duty Solenoids and ATF Temperature Sensor.>
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 resistance less than 1 Ω?	Go to step **8**.	Repair open circuit in harness between shift solenoid 2 and transmission connector.
8	**CHECK POOR CONTACT.**	Is there poor contact in shift solenoid 2 circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

K: TROUBLE CODE 73 — LOW CLUTCH TIMING SOLENOID — S004509E05

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



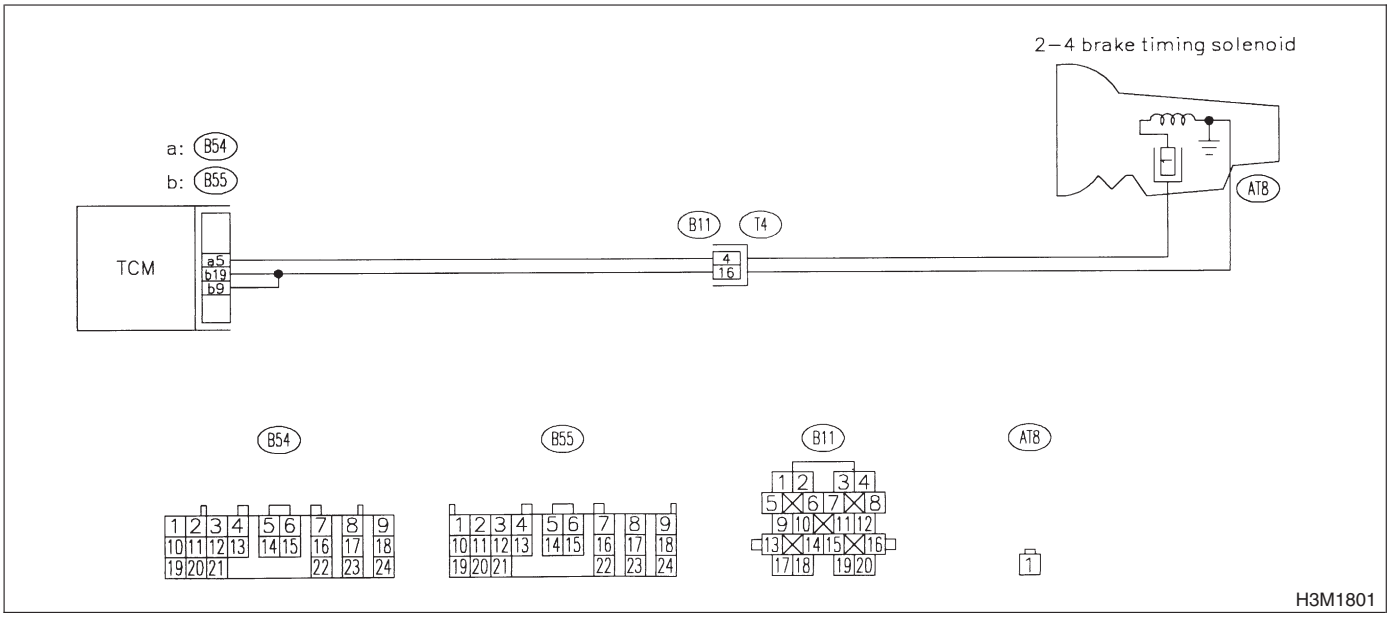
No.	Step	Check	Yes	No
1	**CHECK LOW CLUTCH TIMING SOLENOID GROUND LINE.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **2**.	Repair open circuit in transmission harness.
2	**CHECK LOW CLUTCH TIMING SOLENOID.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 3 — Transmission ground:***	Is the resistance between 10 and 16 Ω?	Go to step **3**.	Go to step **7**.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 14 — (B11) No. 3:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 14 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.

No.	Step	Check	Yes	No
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 4) Move selector lever to “2”, and slowly increase vehicle speed to 35 km/h (22 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-18 OPERATION, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 14 (+) — Chassis ground (–):***	Is the voltage less than 1 V?	Go to step **6**.	Go to step **9**.
6	**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-18 OPERATION, Clear Memory Mode.> 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 14 (+) — Chassis ground (–):***	Is the voltage more than 9 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.	Go to step **9**.

No.	Step	Check	Yes	No
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. **CAUTION:** **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 low clutch timing solenoid. 5) Measure resistance between low clutch timing solenoid connector and transmission ground. ***Terminal*** ***No. 1 — Transmission ground:***	Is the resistance between 10 and 16 Ω?	Go to step **8**.	Replace low clutch timing solenoid. <Ref. to AT-38 REMOVAL, Shift Solenoid, 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 resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between low clutch timing solenoid and transmission connector.
9	**CHECK POOR CONTACT.**	Is there poor contact in low clutch timing solenoid circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

L: TROUBLE CODE 74 — 2-4 BRAKE TIMING SOLENOID — S004509E07

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



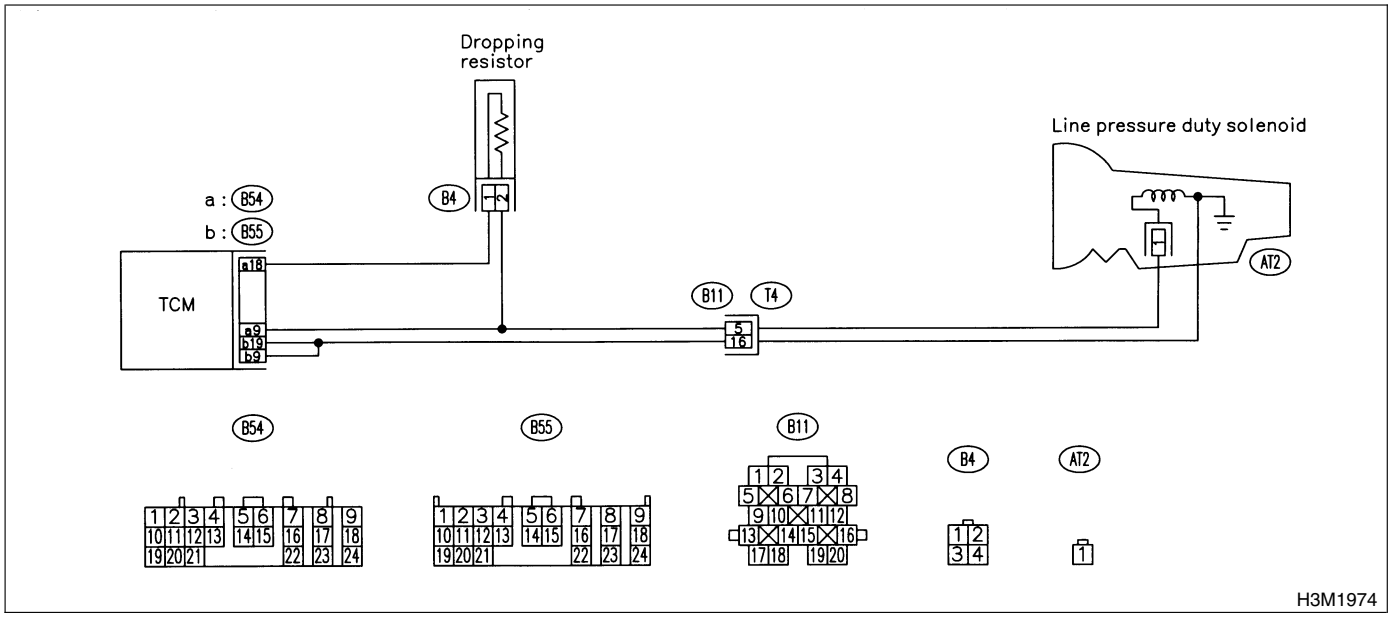
No.	Step	Check	Yes	No
1	**CHECK 2-4 BRAKE TIMING SOLENOID GROUND LINE.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **2**.	Repair open circuit in transmission harness.
2	**CHECK 2-4 BRAKE TIMING SOLENOID.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 4 — Transmission ground:***	Is the resistance between 10 and 16 Ω?	Go to step **3**.	Go to step **7**.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 5 — (B11) No. 4:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 5 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.

No.	Step	Check	Yes	No
5	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and support with safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 4) Move selector lever to “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-18 OPERATION, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 5 (+) — Chassis ground (–):***	Is the voltage less than 1 V?	Go to step **6**.	Go to step **9**.
6	**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-18 OPERATION, Clear Memory Mode.> 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 5 (+) — Chassis ground (–):***	Is the voltage more than 9 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or contact in the TCM.	Go to step **9**.

No.	Step	Check	Yes	No
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. **CAUTION:** **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 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 resistance between 10 and 16 Ω?	Go to step **8**.	Replace 2-4 brake timing solenoid. <Ref. to AT-38 REMOVAL, 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 resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between 2-4 brake timing solenoid and transmission connector.
9	**CHECK POOR CONTACT.**	Is there poor contact in 2-4 brake timing solenoid circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

M: TROUBLE CODE 75 — LINE PRESSURE DUTY SOLENOID — S004509E14

DIAGNOSIS:
Output signal circuit of line pressure duty solenoid or resistor is open or shorted.
TROUBLE SYMPTOM:
Excessive shift shock.
WIRING DIAGRAM:



No.	Step	Check	Yes	No
1	**CHECK RESISTOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from dropping resistor. 3) Measure resistance between dropping resistor terminal. ***Terminals*** ***No. 1 — No. 2:***	Is the resistance between 9 and 15 Ω?	Go to step **2**.	Replace dropping resistor. <Ref. to AT-42 REMOVAL, Dropping Resistor.>
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM connector and dropping resistor connector. ***Connector & terminal*** ***(B54) No. 18 — (B4) No. 1:***	Is the resistance less than 1 Ω?	Go to step **3**.	Repair open circuit in harness between TCM and dropping resistor connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** Measure resistance of harness between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 1 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **4**.	Repair short circuit in harness between TCM and dropping resistor connector.

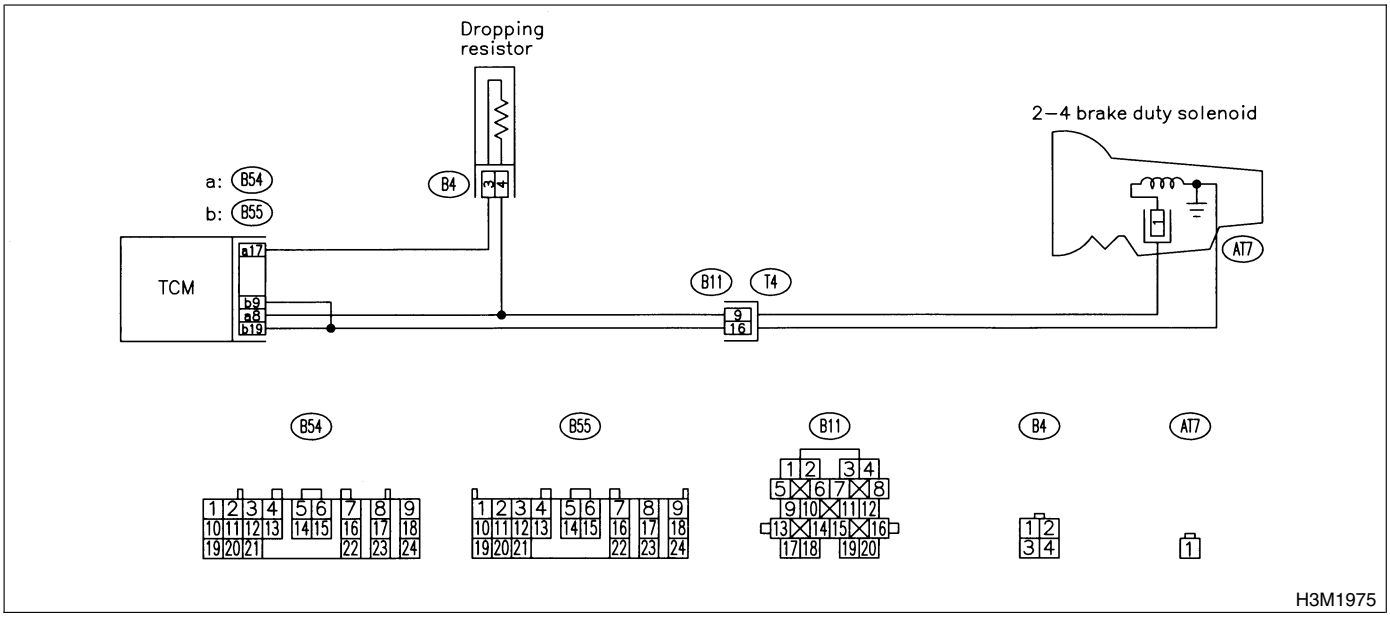
No.	Step	Check	Yes	No
4	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.** 1) Disconnect connector from transmission. 2) Measure resistance of harness between transmission and dropping resistor connector. ***Connector & terminal*** ***(B4) No. 2 — (B11) No. 5:***	Is the resistance less than 1 Ω?	Go to step **5**.	Repair open circuit in harness between dropping resistor and transmission connector.
5	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.** Measure resistance of harness between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 2 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **6**.	Repair short circuit in harness between dropping resistor and transmission connector.
6	**CHECK LINE PRESSURE DUTY SOLENOID GROUND LINE.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **7**.	Repair open circuit in transmission harness.
7	**CHECK LINE PRESSURE DUTY SOLENOID.** Measure resistance between transmission connector and transmission ground. ***Terminal*** ***(T4) No. 5 — Transmission ground:***	Is the resistance between 2.0 and 4.5 Ω?	Go to step **8**.	Go to step **17**.
8	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 9 — (B11) No. 5:***	Is the resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between TCM and transmission connector.
9	**CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***(B54) No. 9 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **10**.	Repair short circuit in harness between TCM and transmission connector.
10	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **15**.	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 selector lever to “N”. 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 9 (+) — Chassis ground (–):***	Is the voltage between 1.5 and 4.0 V with throttle fully closed?	Go to step **12**.	Go to step **19**.

No.	Step	Check	Yes	No
12	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector terminal and chassis ground. ***Connector & terminal*** ***(B54) No. 9 (+) — Chassis ground (–):***	Is the voltage less than 1 V with throttle fully open?	Go to step **13**.	Go to step **19**.
13	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 18 (+) — Chassis ground (–):***	Is the voltage more than 8.5 V with throttle fully closed?	Go to step **14**.	Go to step **19**.
14	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 18 (+) — Chassis ground (–):***	Is the voltage less than 1 V with throttle fully open?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.	Go to step **19**.
15	**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 selector lever to “N”. 7) Read data of line pressure duty solenoid using Subaru Select Monitor. ● Line pressure duty is indicated in “%”. 8) Throttle is fully closed.	Is the value 100%?	Go to step **15**.	Go to step **19**.
16	**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 value between 10 and 20%?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.	Go to step **19**.

No.	Step	Check	Yes	No
17	**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 resistance between 2.0 and 4.5 Ω?	Go to step **18**.	Replace line pressure duty solenoid. <Ref. to AT-38 REMOVAL, Shift Solenoid, Duty Solenoids and ATF Temperature Sensor.>
18	**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 resistance less than 1 Ω?	Go to step **19**.	Repair open circuit in harness between line pressure duty solenoid and transmission connector.
19	**CHECK POOR CONTACT.**	Is there poor contact in line pressure duty solenoid circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

N: TROUBLE CODE 76 — 2-4 BRAKE DUTY SOLENOID — S004509E15

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



No.	Step	Check	Yes	No
1	**CHECK RESISTOR.** 1) Turn ignition switch to OFF. 2) Disconnect connector from dropping resistor. 3) Measure resistance between dropping resistor terminal. ***Terminals*** ***No. 3 — No. 4:***	Is the resistance between 9 and 15 Ω?	Go to step **2**.	Replace dropping resistor. <Ref. to AT-42 REMOVAL, Dropping Resistor.>
2	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM connector and dropping resistor connector. ***Connector & terminal*** ***(B54) No. 17 — (B4) No. 3:***	Is the resistance less than 1 Ω?	Go to step **3**.	Repair open circuit in harness between TCM and dropping resistor connector.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND DROPPING RESISTOR.** Measure resistance of harness between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 3 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **4**.	Repair short circuit in harness between TCM and dropping resistor connector.

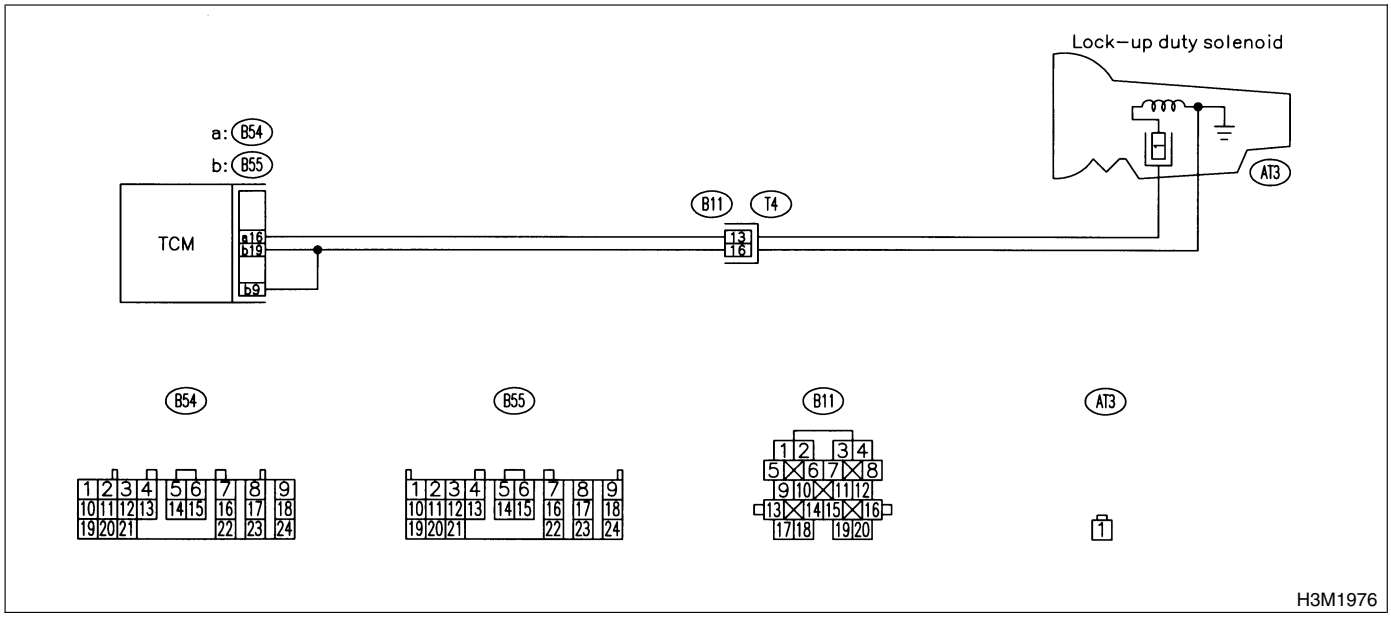
No.	Step	Check	Yes	No
4	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.** 1) Disconnect connector from transmission. 2) Measure resistance of harness between transmission and dropping resistor connector. ***Connector & terminal*** ***(B4) No. 4 — (B11) No. 9:***	Is the resistance less than 1 Ω?	Go to step **5**.	Repair open circuit in harness between dropping resistor and transmission connector.
5	**CHECK HARNESS CONNECTOR BETWEEN TRANSMISSION AND DROPPING RESISTOR.** Measure resistance of harness between dropping resistor connector and chassis ground. ***Connector & terminal*** ***(B4) No. 4 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **6**.	Repair short circuit in harness between dropping resistor and transmission connector.
6	**CHECK 2-4 BRAKE DUTY SOLENOID GROUND LINE.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **7**.	Repair open circuit in transmission harness.
7	**CHECK 2-4 BRAKE DUTY SOLENOID.** Measure resistance between transmission connector receptacle's terminals. ***Terminal*** ***(T4) No. 16 — No. 9:***	Is the resistance between 2.0 and 4.5 Ω?	Go to step **8**.	Go to step **17**.
8	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 8 — (B11) No. 9:***	Is the resistance less than 1 Ω?	Go to step **9**.	Repair open circuit in harness between TCM and transmission connector.
9	**CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***(B54) No. 8 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **10**.	Repair short circuit in harness between TCM and transmission connector.
10	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **15**.	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 selector lever to "N". 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 8 (+) — Chassis ground (–):***	Is the voltage between 1.5 and 4.0 V with throttle fully closed?	Go to step **12**.	Go to step **19**.

No.	Step	Check	Yes	No
12	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector terminal and chassis ground. ***Connector & terminal*** ***(B54) No. 8 (+) — Chassis ground (–):***	Is the voltage less than 1 V with throttle fully open?	Go to step **13**.	Go to step **19**.
13	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector terminal and chassis ground. ***Connector & terminal*** ***(B54) No. 17 (+) — Chassis ground (–):***	Is the voltage more than 8.5 V with throttle fully closed?	Go to step **14**.	Go to step **19**.
14	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector terminal and chassis ground. ***Connector & terminal*** ***(B54) No. 17 (+) — Chassis ground (–):***	Is the voltage less than 1 V with throttle fully open?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.	Go to step **19**.
15	**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 selector lever to "N". 7) Read data of 2-4 brake duty solenoid using Subaru Select Monitor. ● Line pressure duty is indicated in "%". 8) Throttle is fully closed.	Is the value 100%?	Go to step **16**.	Go to step **19**.
16	**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 value between 10 and 20%?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.	Go to step **19**.

No.	Step	Check	Yes	No
17	**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 resistance between 2.0 and 4.5 Ω?	Go to step **18**.	Replace 2-4 brake duty solenoid. <Ref. to AT-38 REMOVAL, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>
18	**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 resistance less than 1 Ω?	Go to step **19**.	Repair open circuit in harness between 2-4 brake duty solenoid and transmission connector.
19	**CHECK POOR CONTACT.**	Is there poor contact in line pressure duty solenoid circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

O: TROUBLE CODE 77 — LOCK-UP DUTY SOLENOID — S004509E16

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



No.	Step	Check	Yes	No
1	**CHECK TROUBLE CODE.**	Do multiple trouble codes appear in the on-board diagnostics test mode?	Go to another trouble code.	Go to step **2**.
2	**CHECK LOCK-UP DUTY SOLENOID GROUND LINE.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **3**.	Repair open circuit in transmission harness.
3	**CHECK LOCK-UP DUTY SOLENOID.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 13 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **4**.	Go to step **12**.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness connector between TCM and transmission. ***Connector & terminal*** ***(B54) No. 16 — (B11) No. 13:***	Is the resistance less than 1 Ω?	Go to step **5**.	Repair open circuit in harness between TCM and transmission connector.
5	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness connector between TCM and chassis ground. ***Connector & terminal*** ***(B54) No. 16 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **6**.	Repair short circuit in harness between TCM and transmission connector.
6	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **9**.	Go to step **7**.

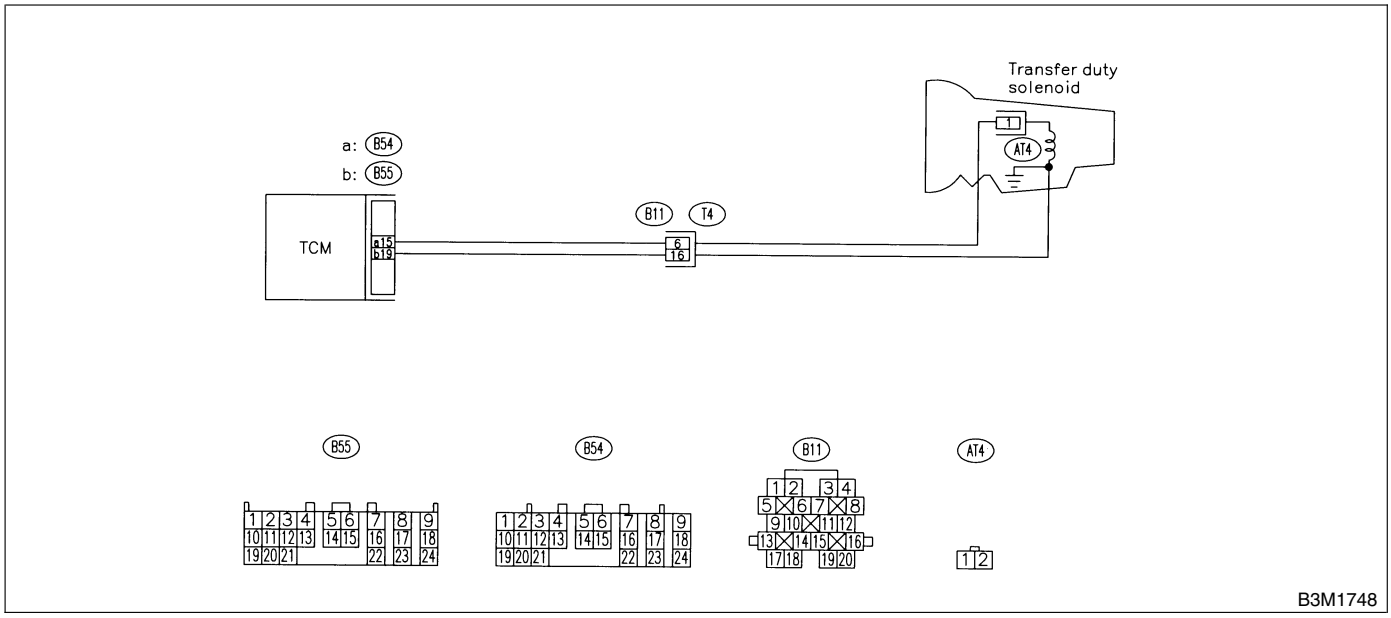
No.	Step	Check	Yes	No
7	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up the vehicle and place safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 3) Start the engine and warm-up the transmission until ATF temperature is above 80°C (176°F). NOTE: If ambient temperature is below 0°C (32°F), drive the vehicle until the ATF reaches its operating temperature. 4) Move selector lever to “D” and slowly increase vehicle speed to 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-18 OPERATION, Clear Memory Mode.> 5) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 16 (+) — Chassis ground (–):***	Is the voltage more than 8.5 V?	Go to step **8**.	Go to step **13**.
8	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Return the engine to idling speed and move selector lever to “N”. 2) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 16 (+) — Chassis ground (–):***	Is the voltage less than 0.5 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.	Go to step **13**.

No.	Step	Check	Yes	No
9	**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. **CAUTION:** **On AWD models, 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 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-18 OPERATION, Clear Memory Mode.>	Is the value 95%?	Go to step **10**.	Go to step **13**.
10	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 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-18 OPERATION, Clear Memory Mode.>	Is the value 5%?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in TCM.	Go to step **13**.
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 resistance between 10 and 17 Ω?	Go to step **12**.	Replace lock-up duty solenoid. <Ref. to AT-38 REMOVAL, Shift Solenoids, Duty Solenoids and ATF Temperature Sensor.>

No.	Step	Check	Yes	No
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 resistance less than 1 Ω?	Go to step **13**.	Repair open circuit in harness between lock-up duty solenoid and transmission connector.
13	**CHECK POOR CONTACT.**	Is there poor contact in lock-up duty solenoid circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

P: TROUBLE CODE 79 — TRANSFER DUTY SOLENOID — S004509E17

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



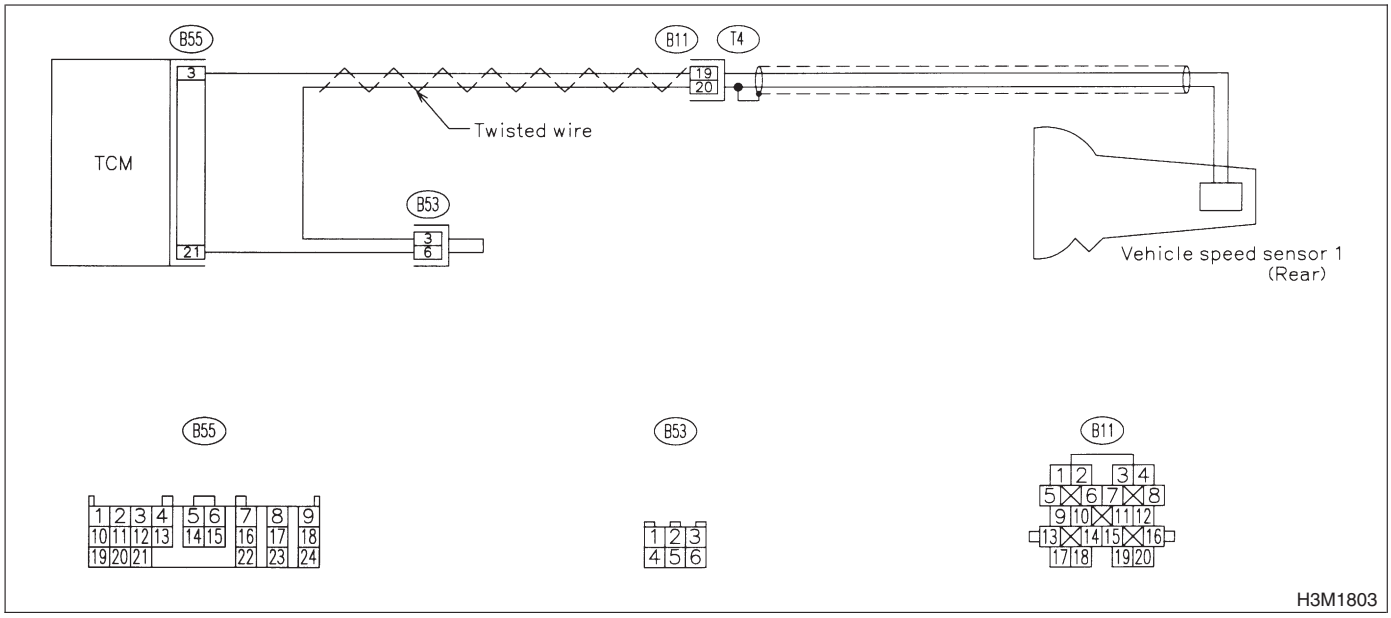
No.	Step	Check	Yes	No
1	**CHECK TRANSFER DUTY SOLENOID GROUND LINE.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 16 — Transmission ground:***	Is the resistance less than 1 Ω?	Go to step **2**.	Repair open circuit in transmission harness.
2	**CHECK TRANSFER DUTY SOLENOID.** Measure resistance between transmission connector and transmission ground. ***Connector & terminal*** ***(T4) No. 6 — Transmission ground:***	Is the resistance between 10 and 17 Ω?	Go to step **3**.	Go to step **10**.
3	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** 1) Disconnect connector from TCM. 2) Measure resistance of harness between TCM and transmission connector. ***Connector & terminal*** ***(B54) No. 15 — (B11) No. 6:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission connector.
4	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance harness connector between TCM and chassis ground. ***Connector & terminal*** ***(B54) No. 15 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.
5	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **8**.	Go to step **6**.

No.	Step	Check	Yes	No
6	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** 1) Connect connectors to TCM and transmission. 2) Turn ignition switch to ON (engine OFF). 3) Throttle is fully closed. 4) Measure voltage between TCM connector and chassis ground. ***Connector & terminal*** ***(B54) No. 15 (+) — Chassis ground (–):***	Is the voltage less than 1 V in "P" range?	Go to step **7**.	Go to step **12**.
7	**CHECK OUTPUT SIGNAL EMITTED FROM TCM.** Measure voltage between TCM connector terminals and chassis ground. ***Connector & terminal*** ***(B54) No. 15 (+) — Chassis ground (–):***	Is the voltage between 5 and 7 V in "D" range?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the transfer duty solenoid and TCM connector.	Go to step **12**.
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 selector 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 value between 5 and 10%?	Go to step **9**.	Go to step **12**.
9	**CHECK OUTPUT SIGNAL EMITTED FROM TCM USING SUBARU SELECT MONITOR.** 1) Set FWD mode. 2) Throttle fully closed.	Is the value 95%?	Even if "AT OIL TEMP" lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the transfer duty solenoid and TCM connector.	Go to step **12**.

No.	Step	Check	Yes	No
10	**CHECK TRANSFER DUTY SOLENOID (IN TRANSMISSION).** 1) Lift-up the vehicle and place safety stand. **CAUTION:** **On AWD models, raise all wheels off ground.** 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 resistance between 10 and 17 Ω?	Go to step **11**.	Replace transfer duty solenoid. <Ref. to AT-42 REMOVAL, Transfer Duty Solenoid and Valve Body.>
11	**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 resistance less than 1 Ω?	Go to step **12**.	Repair open circuit in harness between transfer duty solenoid and transmission connector.
12	**CHECK POOR CONTACT.**	Is there poor contact in transfer duty solenoid circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>

Q: TROUBLE CODE 93 — VEHICLE SPEED SENSOR 1 (REAR) — S004509E21

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



No.	Step	Check	Yes	No
1	**CHECK VEHICLE SPEED SENSOR 1.** 1) Turn ignition switch to OFF. 2) Disconnect connector from transmission. 3) Measure resistance between transmission connector receptacle’s terminals. ***Connector & terminal*** ***(T4) No. 19 — No. 20:***	Is the resistance between 450 and 650 Ω?	Go to step **2**.	Replace transmission harness connector. <Ref. to AT-33 REMOVAL, Vehicle Speed Sensor 1, 2, Torque Converter Turbine Speed Sensor and Harness Assembly.>
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*** ***(B55) No. 3 — (B11) No. 19:***	Is the resistance less than 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*** ***(B55) No. 21 — (B11) No. 20:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair open circuit in harness between TCM and transmission, 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*** ***(B55) No. 3 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **5**.	Repair short circuit in harness between TCM and transmission connector.

No.	Step	Check	Yes	No
5	**CHECK HARNESS CONNECTOR BETWEEN TCM AND TRANSMISSION.** Measure resistance of harness between TCM and chassis ground. ***Connector & terminal*** ***(B55) No. 21 — Chassis ground:***	Is the resistance more than 1 MΩ?	Go to step **6**.	Repair short circuit in harness between TCM and transmission connector.
6	**PREPARE OSCILLOSCOPE.**	Do you have oscilloscope?	Go to step **10**.	Go to step **7**.
7	**PREPARE SUBARU SELECT MONITOR.**	Do you have a Subaru Select Monitor?	Go to step **9**.	Go to step **8**.
8	**CHECK INPUT SIGNAL FOR TCM.** 1) Connect connectors to TCM and transmission. 2) Lift-up or raise the vehicle and place safety stands. **CAUTION:** **On AWD models, 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-18 OPERATION, Clear Memory Mode.> 4) Measure voltage between TCM connector terminals. ***Connector & terminal*** ***(B55) No. 3 (+) — No. 21 (–):***	Is the voltage more than AC 1 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM 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. **CAUTION:** **On AWD models, 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-18 OPERATION, Clear Memory Mode.>	Does the speedometer indication increase as the Subaru Select Monitor data increases?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11**.

No.	Step	Check	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. **CAUTION:** **On AWD models, raise all wheels off floor.** 3) Set oscilloscope to TCM connector terminals. Positive prove; (B55) No. 3 Earth lead; (B55) No. 21 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-18 OPERATION, Clear Memory Mode.> 5) Measure signal voltage indicated on oscilloscope.	Is the signal voltage more than AC 1 V?	Even if “AT OIL TEMP” lights up, the circuit has returned to a normal condition at this time. A temporary poor contact of the connector or harness may be the cause. Repair harness or connector in the TCM and transmission.	Go to step **11**.
11	**CHECK POOR CONTACT.**	Is there poor contact in vehicle speed sensor 1 circuit?	Repair poor contact.	Replace TCM. <Ref. to AT-41 REMOVAL, Transmission Control Module (TCM).>