AUTOMATIC TRANSMISSIONS
Subaru 4-Speed Electronic Controls
Impreza, Legacy, SVX

APPLICATION

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Transaxle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995-96 Impreza</td>
<td>4-Speed</td>
</tr>
<tr>
<td>1995-96 Legacy</td>
<td>4-Speed</td>
</tr>
<tr>
<td>1995-96 SVX</td>
<td>4-Speed</td>
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</tbody>
</table>

CAUTION: Vehicle is equipped with a Supplemental Restraint System (SRS). When servicing vehicle, use care to avoid accidental air bag deployment. All SRS electrical connections and wiring harness are covered with Yellow insulation. SRS-related components are located in steering wheel, steering column, toe-board (center, left and right), instrument panel and lower panel on instrument panel, front seat floor and side seal, left lower front pillar, combination meter, and installment panel (passenger side, if equipped). DO NOT use electrical test equipment on these circuits. It may be necessary to deactivate SRS before servicing components. See AIR BAG SERVICING article in APPLICATIONS & IDENTIFICATION section.

DESCRIPTION

Automatic transaxle is electronically controlled by a Transmission Control Module (TCM). The TCM controls shift points, engine braking, lock-up torque converter operation and other various operations. The TCM receives information from various input devices and uses this information to operate duty and shift control solenoid valves. Depending on throttle position, the TCM controls shift points, lock-up torque converter operation and overdrive. An electronically controlled full-time AWD system is available. This system has a transfer hydraulic pressure control unit incorporating duty solenoid and multi-plate transfer type clutch on rear of transmission.

Vehicle also utilizes AT OIL TEMP light to indicate trouble codes. The TCM incorporates a self-diagnosis ability to detect electronic system or component malfunctions. On all models, transaxle is equipped with shift and key interlock systems. Shift interlock system prevents shift selector lever from being moved from Park unless brake pedal is depressed and accelerator is in idle position. In case of a malfunction, shift selector lever can be released by depressing button on front of shifter console. Key interlock system prevents ignition key from being removed from ignition lock assembly unless shift selector lever is in Park position.

OPERATION

NOTE: For component location, See Figs. 1 and 2.

TRANSAXLE CONTROL MODULE (TCM)
The TCM receives information from various input devices and uses this information to control shift and lock-up control solenoid valves. TCM contains a self-diagnostic system, which will store a trouble code if a failure or problem exists in electronic control system. Trouble code can be retrieved to determine transaxle problem area. See RETRIEVING TROUBLE CODES.

SHIFT INTERLOCK SYSTEM

The shift lock system prevents shifting of selector lever from "P" to any other position unless brake pedal is depressed. Shifter can be moved with manual release button located in front of console in case of malfunction or lack of battery power. When shift position console switch is in Park, A/T shift lock control unit provides voltage to shift lock circuit in interlock control unit, provided brake pedal is depressed and accelerator is in idle position. Shift lock control unit then operates shift lock solenoid by controlling ground circuit. When shift lock solenoid is energized, shift selector lever is released and can be moved.

KEY INTERLOCK SYSTEM

Key interlock system prevents ignition key from being removed from ignition lock assembly on steering column unless shift selector lever is in Park. When ignition key is in ignition lock assembly, key interlock switch closes, providing voltage to key interlock solenoid and interlock control unit.

If shift selector lever is not in Park, interlock control unit energizes key interlock solenoid by completing ground circuit. When key interlock solenoid is energized, ignition key cannot be removed from ignition lock assembly. Key interlock switch and solenoid are located on ignition lock assembly.

TCM INPUT DEVICES

NOTE: For component location, See Figs. 1 and 2.

ABS Signal
When ABS system is operating, transfer clutch torque is controlled to eliminate influence of engine braking and reduce degree of coupling between front and rear wheels. This optimizes ABS control.

ATF Temperature Sensor
ATF sensor detects ATF temperature. This signal is used for inhibiting of torque converter lock-up and release of overdrive. Sensor is mounted to valve body.

Cruise Switch
The cruise switch, which is part of cruise control system, detects operation of cruise control and expands 4th gear operating range.

Engine Speed Sensor (Tach Signal)
Engine speed sensor detects engine speed. This signal is used for torque converter lock-up operation. This provides for smooth and controlled operation and prevents engine overrunning in 1st and 2nd range.

FWD Switch
FWD switch is used to change from AWD to FWD. Inserting of fuse into holder is necessary for testing purposes.
Inhibitor Switch
Inhibitor switch is used to determine shifting and line pressure for all shift ranges. Inhibitor switch also incorporates a neutral safety switch and back-up light switch. Switch is mounted to shift selector lever shaft. See Fig. 1.

Throttle Sensor
Throttle sensor detects throttle opening and speed of throttle being depressed. Sensor also determines shift point, line pressure and torque converter lock-up speed according to engine load.

Vehicle Speed Sensor "1"
Vehicle speed sensor "1" detects vehicle speed. This signal is used to control shifting, torque converter lock-up, line pressure and transfer clutch. Sensor is mounted to transmission. See Fig. 1.

Vehicle Speed Sensor "2"
In FWD mode, vehicle speed sensor "2" is used as a backup in case of failure of vehicle speed sensor "1". In AWD mode, sensor is used to control transfer clutch and as backup for sensor "1". Vehicle speed sensor "2" is built into combination meter.

**TCM OUTPUT DEVICES**

**NOTE:** For component location, See Figs. 1 and 2.

AT OIL TEMP Warning Light
Warning light illuminates when ATF exceeds a set temperature level.

Duty Solenoid "A"
Duty Solenoid "A" regulates line pressure according to driving conditions. Duty ratio of solenoid is controlled by TCM. Solenoid "A" is mounted to valve body. See Fig. 1.

Duty Solenoid "B"
Duty Solenoid "B" regulates hydraulic pressure of torque converter lock-up clutch and operates in 3 modes; open, smooth and lock-up. Duty ratio of solenoid is controlled by TCM. Solenoid "B" is mounted to valve body. See Fig. 1.

Duty Solenoid "C"
Duty Solenoid "C" regulates hydraulic pressure of transfer clutch and controls driving force to rear drive shaft. Duty ratio of solenoid is controlled by TCM. Solenoid is mounted to transfer control valve on side of extension case.

AT OIL TEMP light
Indicator light is used for oil temperature warning and self-diagnostics.

Shift Solenoids "1" & "2"
Shift Solenoids "1" and "2" controls shift stage by turning solenoid ON/OFF. When shifting, timing is controlled for each solenoid to reduce shock.

Shift Solenoid "3"
Shift Solenoid "3" controls shift timing and overrunning clutch operation. Shift timing is controlled by controlling release speed of oil pressure to reduce shock while downshifting. Overrunning clutch is controlled so it will operate during coasting to apply engine brake.
Fig. 1: Identifying Electronic Component Locations
Courtesy of Subaru of America, Inc.
Fig. 2: Identifying Electronic Component Locations
Courtesy of Subaru of America, Inc.

SELF-DIAGNOSTIC SYSTEM

1. Throttle Position Sensor
2. Dropping Resistor
3. Vehicle Speed Sensor
4. Inhibitor Switch
5. ECM
6. Vehicle Speed Sensor 1 (AWD)
7. Vehicle Speed Sensor 1 (FWD)
8. TCM
9. OBD II Data Link Connector
10. Diagnostic Connector
11. Diagnosis Terminal
12. AT OIL TEMP Indicator Light
SYSTEM DIAGNOSIS

System Overview
Transmission control module (TCM) monitors transaxle operation. TCM contains a self-diagnostic system which stores trouble codes if failure or problem exists. If trouble code is stored, TCM will flash AT OIL TEMP indicator light after engine starts. Self-diagnostic system is capable of detecting any malfunction with speed sensors, throttle sensor, shift solenoids, duty solenoids, temperature sensor, ignition pulse and atmospheric pressure.

Fail Safe Function
A fail safe function is provided to maintain driveability even if trouble should occur in vehicle speed sensor, throttle sensor, inhibitor switch or any of solenoids (duty and shift).

Vehicle Speed Sensor (VSS)
A dual speed sensing system is used. Speed signal is taken from transmission (output shaft revolution sensor) and also from a sensor built in speedometer. If one sensor system fails, vehicle can be controlled normally with other sensor system.

Throttle Sensor
If throttle sensor becomes faulty, throttle position input signal will be set to predetermined position.

Inhibitor Switch
If 2 signals are input due to inhibitor switch failure, vehicle can still be driven with limited shifting capability.

Shift Solenoids "1" & "2"
If a malfunction occurs in either solenoid, both solenoids are turned off. Vehicle can be driven only in 3rd gear. If both solenoids fail, mechanical hydraulic circuit is used.

Shift Solenoid "3"
If overrunning clutch solenoid fails, solenoid is turned off. Overrunning clutch will engage so engine brake will be applied when reducing vehicle speed.

Duty Solenoid "A"
If duty solenoid "A" fails, solenoid is turned off and line pressure is raised to maximum to enable vehicle operation.

Duty Solenoid "B"
If duty solenoid "B" fails, solenoid is turned off and torque converter lock-up is released.

Duty Solenoid "C"
If duty solenoid "C" fails, solenoid is turned off. This causes maximum oil pressure to be applied to transfer clutch so power is always transmitted to rear axle (direct coupling AWD).

RETRIEVING TROUBLE CODES

Indicator Light
1) If a malfunction occurs in any on board diagnostic components, AT OIL TEMP light will flash immediately when engine is started. See Fig. 3. AT OIL TEMP indicator light will come on for 2 seconds and will either signal a self-diagnosis malfunction (blinking for 8 seconds) or okay signal (light will go out).
NOTE: Warning can be noticed only when engine is initially started.

2) If light does not flash after initial 2 seconds, system is okay. In case of malfunction, trouble code is output as light flashes. Once preliminary procedure is performed, malfunctioning part or unit can be determined by a trouble code. See TROUBLE CODE IDENTIFICATION table for flow chart diagnosis procedures. Problems which occurred previously can also be identified through memory function. If a problem is occurring, it can be determined by checking performance characteristics of each sensor using a select monitor.

Preliminary Procedure
1) Start and warm engine. Turn ignition switch off, then back on. If AT OIL TEMP light comes on, test drive vehicle at speeds above 12 MPH. Once test drive is completed, turn ignition off and then back on. Ensure AT OIL TEMP indicator light illuminates. If AT OIL TEMP light is not functioning, check for faulty bulb, lamp circuit or TCM.
2) If lamp is working properly, turn ignition to OFF position. If checking for previous problem stored in ECU memory, go to step 4). To check existing problem, move shift selector lever to "D" position and connect diagnosis terminal to diagnostic connector terminal 6. See Fig. 2. Turn ignition switch to ON position. Move shift selector to "3" position. Move selector lever to "2" position. Move select lever to "1" position and partially depress accelerator pedal. Ensure AT OIL TEMP indicator light blinks.
3) If indicator light blinks 4 times per second (with ignition switch OFF), vehicle has faulty battery. If indicator continuously blinks until ignition switch is turned off, system is okay. If a trouble code is present, AT OIL TEMP light will flash in long and short sequences. See TROUBLE CODE IDENTIFICATION table for diagnosis and repair procedures. If indicator light remains illuminated, check inhibitor switch, diagnosis connector, wiring, TCM, etc.
4) To access trouble codes stored in memory, move shift selector lever to "1" position with ignition switch in OFF position, and connect diagnosis terminal to diagnostic connector terminal 6. See Fig. 2. Turn ignition switch to ON position. Move shift selector lever to "2" position. Move selector to "3" position. Move selector to "D" position. Partially depress accelerator pedal. Ensure indicator light blinks.
5) If indicator light blinks 4 times per second (with ignition switch OFF), vehicle has faulty battery. If indicator continuously blinks until ignition switch is turned off, system is okay. If a trouble code is present, AT OIL TEMP light will flash in long and short sequences. See TROUBLE CODE IDENTIFICATION table for diagnosis and repair procedures. If indicator light remains illuminated, check inhibitor switch, diagnosis connector, wiring, TCM, etc.

TROUBLE CODE IDENTIFICATION

<table>
<thead>
<tr>
<th>Trouble Code</th>
<th>Component</th>
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</thead>
<tbody>
<tr>
<td>11</td>
<td>Duty Solenoid &quot;A&quot;</td>
</tr>
<tr>
<td>12</td>
<td>Duty Solenoid &quot;B&quot;</td>
</tr>
<tr>
<td>13</td>
<td>Shift Solenoid &quot;3&quot;</td>
</tr>
<tr>
<td>14</td>
<td>Shift Solenoid &quot;2&quot;</td>
</tr>
<tr>
<td>15</td>
<td>Shift Solenoid &quot;1&quot;</td>
</tr>
<tr>
<td>16</td>
<td>Torque Control Cut Signal</td>
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<tr>
<td>21</td>
<td>ATF Temperature Sensor</td>
</tr>
<tr>
<td>22</td>
<td>Mass Airflow Sensor</td>
</tr>
<tr>
<td>23</td>
<td>Engine Speed Sensor</td>
</tr>
<tr>
<td>24</td>
<td>Duty Solenoid C</td>
</tr>
</tbody>
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CLEARING DIAGNOSTIC TROUBLE CODES (DTC)

Current trouble codes shown are cleared by turning ignition off after conducting self-diagnosis procedures. Previous trouble codes cannot be cleared since they are stored in ECU memory. ECU memory operates on back-up power supply. Previous trouble codes can be cleared by removing No. 14 fuse from fuse panel located behind hood release. Clearing memory requires fuse to be removed for one minute.

DIAGNOSTIC TESTS

DTC 11: DUTY SOLENOID "A"

Symptom
Output signal circuit of duty solenoid "A" or resistor is open or shorted, causing excessive shift shock.

Impreza
1) Check harnesses between TCM and duty solenoid "A", and between TCM and resistor. Disconnect connector from TCM. Disconnect connector from transmission and resistor. Measure resistance between
TCM (B52) connector and transmission connector.

2) Resistance between pin No. 8 of connector (B52) and No. 7 of transmission connector should be 0-1 ohms. See Figs. 4 and 5. Measure resistance between TCM (B52) and body. Resistance between pin No. 8 of connector (B52) and vehicle body should be 100k/ohms minimum. Measure resistance between TCM (B52) connector and dropping resistor connector. Resistance between pin No. 7 of connector (B52) and pin No. 1 of resistor connector (B1) should be 0-1 ohms.

3) Measure resistance between TCM connector (B52) and vehicle body. Resistance between pin No. 7 of connector (B52) and vehicle body should be 100k/ohms minimum. If any previous resistance measurements are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check ground circuit of duty solenoid "A". Disconnect connector from transmission. Measure resistance between transmission connector receptacle (on transmission) and transmission case. See Fig. 5. Resistance between pin No. 4 of transmission connector and transmission should be 0-1 ohm maximum. Repair as needed.


6) Check duty solenoid "A". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. Resistance between pins No. 7 and No. 4 of connector should be 1.5-4.5 ohms. Replace as needed.

7) Measure signal voltage output from TCM. Warm engine and transmission. Turn ignition on. DO NOT start engine. Move shift selector to "N" position. While opening and closing throttle valve, measure voltage between TCM connector and vehicle body.

8) Voltage between pins No. 8 and 10 on (B52) connector with throttle fully closed should be 1.5-4.0 volts. See Fig. 4. With throttle fully open (WOT), voltage should not exceed one volt maximum. Voltage between pins No. 7 and No. 10 with throttle fully closed should be 5-14 volts. With throttle fully open voltage at pins No. 7 and No. 10 should be one volt maximum. If voltage is not within specification, replace TCM and retest.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX

1) Check Harnesses Between TCM and duty solenoid "A", and between TCM and resistor. Disconnect connector from TCM. Disconnect connector from transmission and resistor. Measure resistance between TCM (B55/68) connector and transmission connector.

2) Resistance between pin No. 8 of connector (B55/68) and pin No. 7 of transmission connector should be 0-1 ohms. See Fig. 5. Measure resistance between TCM (B55/68) and body. Resistance between pin No. 8 of connector (B55/68) and vehicle body should be 100k/ohms minimum. Measure resistance between TCM (B55/68) connector and dropping resistor connector. Resistance between pin No. 7 of connector (B55/68) and pin No. 1 of resistor connector should be 0-1 ohms.

3) Measure resistance between TCM connector (B55/68) and vehicle body. Resistance between pin No. 7 of connector (B55/68) and vehicle body should be 100 k/ohms minimum. If any previous resistance measurements are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check ground circuit of duty solenoid "A". Disconnect connector from transmission. Measure resistance between transmission
connector receptacle (on transmission) and transmission case. See Fig. 5. Resistance between pin No. 4 of transmission connector and transmission should be one ohm maximum. Repair as needed.


6) Check duty solenoid "A". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. Resistance between pins No. 7 and No. 4 of connector should be 1.5-4.5 ohms. Replace as needed.

7) Measure signal voltage output from TCM. Warm engine and transmission. Turn ignition on. DO NOT start engine. Move shift selector to "N" position. While opening and closing throttle valve, measure voltage between TCM connector (B55/68) and vehicle body.

8) Voltage between pins No. 8 and 10 on (B55/68) connector with throttle fully closed should be 1.5-4.0 volts. With throttle fully open (WOT), voltage should not exceed 1 volt. Measure voltage between pins No. 7 and 10 on (B55/68) connector. With throttle fully closed, voltage should be 5-14 volts. With throttle fully open (WOT), voltage should not exceed .05 volts. If voltage is not within specification, replace TCM and retest. If voltage is not within specification, replace TCM and retest. Pin No. 10 is connected to vehicle ground through duty solenoid "A".

Fig. 4: Identifying TCM Connector Pin Locations (Component View)
Courtesy of Subaru of America, Inc.

Fig. 5: Identifying Transmission Connector Pin Locations
Courtesy of Subaru of America, Inc.
DTC 12: DUTY SOLENOID "B"

Symptom
Output signal circuit of duty solenoid "B" is open or shorted, causing no "lock-up" after engine warm-up.

Impreza
1) Check harness between TCM and duty solenoid "B". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B52) connector and transmission connector. See Figs. 4 and 5.
2) Resistance between pin No. 7 of connector (B52) and pin No. 6 of transmission connector should be 0-1 ohms. Measure resistance between TCM (B52) connector and vehicle body. Resistance between pin No. 7 of connector (B52) and vehicle body should be 100 k/ohms minimum.
3) Check ground circuit of duty solenoid "B". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. See Fig. 5. Resistance between pin No. 4 of connector and case should be one ohm maximum. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.
4) Check duty solenoid "B". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals No. 6 and No. 4. Resistance should be 10-17 ohms. Replace solenoid as needed.
5) Measure signal voltage output emitted from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector to "D" position. Slowly increase vehicle speed to 37 MPH (60 km/h), when wheels are locked up (converter lock-up). Measure voltage output emitted from TCM (B52). Do not disconnect TCM connector. See Fig. 4.
6) Voltage between pin No. 7 and No. 13 of connector (B52) should be 8.5 volts minimum. Move shift selector to "N" position. Voltage should be reduced to .5 volts, maximum. If voltage is not within specification, replace TCM and retest.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX
1) Check harness between TCM and duty solenoid "B". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B55/68) connector and transmission connector. See Figs. 4 and 5.
2) Resistance between pin No. 5 of connector (B55/68) and pin No. 6 of transmission connector should be 0-1 ohms. Measure resistance between TCM (B55/68) connector and vehicle body. Resistance between pin No. 5 of connector (B55/68) and vehicle body should be 100 k/ohms minimum.
3) Check ground line of duty solenoid "B". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. Resistance between pin No. 4 of connector and case should be one ohm maximum. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.
4) Check duty solenoid "B". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals No. 6 and No. 4. Resistance should be 9-17 ohms.
5) Measure signal voltage output emitted from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector to "D" position. Slowly increase vehicle speed to 47 MPH (75 km/h), when wheels are locked up. Measure voltage output emitted from TCM (B55/68). See Fig. 4. Do not disconnect TCM connector.

6) Voltage between pin No. 5 and No. 10 of connector (B55/68) should be 8.5 volts or more when wheels are locked up. If voltage is not within specification, replace TCM and retest.

**DTC 13: SHIFT SOLENOID "3"**

**Symptom**
Output signal circuit of shift solenoid "3" is open or shorted, causing ineffective engine brake with shift lever in "3" position.

**Impreza**
1) Check harness between TCM and shift solenoid "3". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B52) and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 8 of TCM connector and pin No. 1 of transmission connector should be 0-1 ohms. Resistance between pin No. 13 of TCM connector and pin No. 4 of transmission connector should be 0-1 ohms. Measure resistance between TCM connector and vehicle body. Resistance between pins No. 8 and 13 of connector and vehicle body should be 100 k/ohms minimum.

3) Check ground circuit of shift solenoid. Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. Resistance between pin No. 4 of connector and transmission case should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check shift solenoid. Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. See Fig. 5. Resistance between pin No. 1 and No. 4 of connector should be 20-30 ohms. Replace solenoid as needed.

5) Measure signal voltage output from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector lever to "D" position. Measure signal voltage output emitted from TCM connector while engine is idling. Do not disconnect connector. Measure voltage between pin No. 8 and No. 13 of connector B52. See Fig. 4. Voltage should be 10-14 volts. If voltage is not within specification, replace TCM and retest.

**Legacy & SVX**
1) Check harness between TCM and shift solenoid "3". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B55/68) and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 15 of TCM connector and pin No. 1 of transmission connector should be 0-1 ohms. Resistance between pin No. 10 of TCM connector and pin No. 4 of transmission connector should be 0-1 ohms. Measure resistance between TCM connector and vehicle body. Resistance between pins No. 10 and 15 of connector and vehicle
body should be 100 k/ohms minimum.

3) Check ground circuit of shift solenoid. Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. Resistance between pin No. 4 of connector and transmission case should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check shift solenoid. Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. See Fig. 5. Resistance between pin No. 1 and No. 4 of connector should be 20-30 ohms. Replace solenoid as needed.

5) Measure signal voltage output from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector lever to "D" position. Measure signal voltage output emitted from TCM connector while engine is idling. Do not disconnect connector. Measure voltage between pin No. 15 and No. 10 of connector (B55/68). See Fig. 4. Voltage should be 10-14 volts. If voltage is not within specification, replace TCM and retest.

DTC 14: SHIFT SOLENOID "2"

Symptom
Output signal circuit of shift solenoid "2" is open or shorted, causing "No Shift" condition.

Impreza
1) Check harness between TCM and shift solenoid "2". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B52) connector and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 9 of connector (B52) and pin No. 2 of transmission connector should be 0-1 ohms. Resistance between pin No. 13 of TCM connector and pin No. 4 of transmission connector should be 0-1 ohms. Measure resistance between TCM connector and vehicle body. Resistance between pin No. 9 and No. 13 of connector and vehicle body both should be 0-1 ohms.

3) Check ground circuit of shift solenoid "2". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. See Fig. 5. Resistance between pin No. 4 of connector and transmission case should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check shift solenoid "2". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminal pins No. 2 and No. 4. Resistance should be 20-30 ohms. Replace solenoid as needed.

5) Measure signal voltage output from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector lever to "D" position. Measure signal voltage output emitted from TCM (B52) when engine is idling. See Fig. 4. Do not disconnect connector.

6) Voltage between pin No. 13 and No. 9 of connector (B52) should be 10-14 volts. If voltage is not within specification, replace TCM and retest.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX
1) Check harness between TCM and shift solenoid "2". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B55/68) connector and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 13 of connector (B55/68) and pin No. 2 of transmission connector should be 0-1 ohms. Resistance between pin No. 10 of TCM connector and pin No. 4 of transmission connector should be 100 k/ohms minimum. Measure resistance between TCM connector and vehicle body. Resistance between pin No. 13 and No. 10 of connector and vehicle body both should be 0-1 ohms.

3) Check ground circuit of shift solenoid "2". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. See Fig. 5. Resistance between pin No. 4 of connector and transmission case should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check shift solenoid "2". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminal pins No. 2 and No. 4. Resistance should be 20-32 ohms. Replace solenoid as needed.

5) Measure signal voltage output from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector lever to "D" position. Measure signal voltage output emitted from TCM (B55/68) when engine is idling. See Fig. 4. Do not disconnect connector.

6) Voltage between pin No. 13 and No. 10 of connector (B55/68) should be 10-14 volts. If voltage is not within specification, replace TCM and retest.

DTC 15: SHIFT SOLENOID "1"

Symptom
Output signal circuit of shift solenoid "1" is open or shorted causing a no shift condition.

Impreza
1) Check harness between TCM and shift solenoid "1". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B52) connector and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 10 of (B52) connector and pin No. 3 of transmission connector should be 0-1 ohms. Resistance between pin No. 13 of (B52) connector and pin No. 4 of transmission connector should be 0-1 ohms. Measure resistance between TCM (B52) connector and vehicle body. Resistance between pins No. 10 and No. 13 and vehicle body should both be 100k/ohms minimum.

3) Check ground line of shift solenoid "1". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. Resistance between pin No. 4 of connector and transmission case should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check shift solenoid "1". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. See Fig. 5. Resistance between pins No. 3 and No. 4 should be 20-30 ohms. Replace solenoid as needed.

5) Measure signal voltage output from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector to "D" position.

6) Measure signal voltage output emitted from TCM (B52) when engine is idling. See Fig. 4. Do not disconnect connector. Voltage between pin No. 10 and No. 13 of connector (B52) should be 10-14
volts. If voltage is not within specification, replace TCM.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example: (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX
1) Check harness between TCM and shift solenoid "1". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B55/68) connector and transmission connector. See Figs. 4 and 5.
2) Resistance between pin No. 14 of (B55/68) connector and pin No. 3 of transmission connector should be 0-1 ohms. Resistance between pin No. 10 of (B55/68) connector and pin No. 4 of transmission connector should be 0-1 ohms. Measure resistance between TCM (B55/68) connector and vehicle body. Resistance between pins No. 14 and No. 10 and vehicle body should both be 100k/ohms minimum.
3) Check ground circuit of shift solenoid "1". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. Resistance between pin No. 4 of connector and transmission case should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.
4) Check shift solenoid "1". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. See Fig. 5. Resistance between pins No. 3 and No. 4 should be 20-30 ohms. Replace solenoid as needed.
5) Measure signal voltage output from TCM. Raise vehicle on hoist. Warm engine and transmission. Move shift selector to "D" position.
6) Measure signal voltage output emitted from TCM (B55/68) when engine is idling. See Fig. 4. Do not disconnect connector. Voltage between pins No. 14 and No. 10 of connector (B55/68) should be 10-14 volts. If voltage is not within specification, replace TCM and retest.

DTC 16: TORQUE CONTROL CUT SIGNAL

Symptom
Torque control signal is open or shorted from ECM.

Impreza
1) Check harness connector between TCM and ECM. With ignition OFF, disconnect connectors from ECM and TCM. Measure resistance between connector (B53) No. 16 and connector (E29) No. 36. Resistance should be 0-1 ohms. Measure resistance of harness connector (B53) No. 16 and body. Resistance should be 100k ohms minimum.
2) Check ground line of TCM. Measure resistance of harness connector (B53) terminal No. 1 and vehicle body. Resistance should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.
3) Measure signal voltage input of TCM. Turn ignition switch ON. Measure voltage between pins (B53) No. 16 and vehicle body. Voltage should be 6-9 volts. If voltage is not within specification replace TCM.

Legacy & SVX
1) Check resistance between TCM harness connector (B56/66) terminal No. 16 and ECM harness connector (B84/B59) terminal No.
36/20. Resistance should be 0-1 ohms. Measure resistance between TCM harness connector (B56/B66) terminal No. 16 and vehicle body. Resistance should be 100k ohms minimum.

2) Check TCM ground. Measure resistance of harness connector (B56/66) terminal No. 1 to vehicle body. Resistance should be 0-1 ohms. If any previously measured resistances are not within specification, repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

3) Check voltage signal to TCM. With ignition switch on, measure voltage between TCM (B56/66) connector terminal No. 1 and body. Voltage should be 6-9 volts. If voltage is not within specifications, replace TCM and retest.

DTC 21: ATF TEMPERATURE SENSOR

Symptom
Input signal circuit of TCM to ATF temperature sensor is open or shorted causing harsh shift feel (excessive shift shock).

Impreza
1) Check harness between TCM and ATF temperature sensor. Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B53) connector and transmission connector. See Figs. 4 and 5. Resistance between pin No. 19 of connector (B53) and pin No. 5 of transmission connector should be 0-1 ohms.

2) Measure resistance between TCM (B53) connector and transmission connector. Resistance between pin No. 4 of connector (B53) and pin 12 of transmission connector should be 0-1 ohms.

3) Measure resistance between TCM (B53) connector and vehicle body. Resistance between pin No. 19 of connector (B53) and vehicle body should be 100k/ohms minimum. If any previously measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check ATF temperature sensor. Disconnect connector from transmission. Measure resistance between transmission receptacle terminals. See Fig. 5. Resistance between pin No. 5 and No. 12 of connector receptacle should be 2.1-2.9 k/ohms with ATF temperature of 68°F (20°C).

5) Connect connector to transmission. Warm engine to increase ATF temperature. Stop engine and disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. Resistance between pin No. 5 and No. 12 should be 275-375 ohms with ATF temperature of 176°F (80°C). Replace sensor as needed.

6) Measure signal voltage input of TCM. Turn ignition on with engine not running. Measure signal voltage input of TCM. Do not disconnect TCM connector. Measure voltage between pins No. 19 and 4 of connector (B53). See Fig. 4. Voltage should be 2.9-4.0 volts with ATF temperature of 68°F (20°C).

7) Start and warm engine and transmission. Measure voltage. Voltage should be 1.0-1.4 volts with ATF temperature of 176°F (80°C). If voltage is not within specification, replace TCM and retest.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX
1) Check harness between TCM and ATF temperature sensor.
Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B54/67) connector and transmission connector. See Figs. 4 and 5. Resistance between pin No. 10 of connector (B54/67) and pin No. 5 of transmission connector should be 0-1 ohms.

2) Measure resistance between TCM (B56/66) connector and transmission connector. Resistance between pin No. 20 of connector (B56/66) and pin No. 12 of transmission connector should be 0-1 ohms.

3) Measure resistance between TCM (B54/67) connector and vehicle body. Resistance between pin No. 10 of connector (B54/67) and vehicle body should be 100k/ohms minimum. If any previously measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check ATF temperature sensor. Disconnect connector from transmission. Measure resistance between transmission receptacle terminals. See Fig. 5. Resistance between pin No. 5 and No. 12 of connector receptacle should be 2.1-2.9k/ohms for Legacy 2.3-2.7k/ohms for SVX with ATF temperature of 68°F (20°C).

5) Connect connector to transmission. Warm engine to increase ATF temperature. Stop engine and disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. Resistance between pin No. 5 and No. 12 should be 275-378 ohms for Legacy and 280-360 ohms for SVX with ATF temperature of 176°F (80°C). Replace sensor as needed.

6) Measure signal voltage input of TCM. Turn ignition on with engine not running. Measure signal voltage input of TCM. Do not disconnect TCM connector. Measure voltage between pin No. 10 of connector (B54/67) and pin No. 20 of connector (B56/66). See Fig. 4. Voltage should be 2.9-4.0 volts with ATF temperature of 68°F (20°C).

7) Start and warm engine and transmission. Measure voltage. Voltage should be 1.0-1.4 volt with ATF temperature of 176°F (80°C). If voltage is not within specification, replace TCM and retest.

### DTC 22: MASS AIR FLOW SIGNAL

**Symptom**

Input signal circuit of TCM from ECM is open or shorted.

**Impreza**

1) Check vehicle for engine related DTC’S. Using scan tool, check for mass air flow trouble code. Check harness connector between TCM and ECM. With ignition off, disconnect connectors from TCM and ECM. Measure resistance between TCM harness connector (B96) terminal No. 9 and ECM harness connector (E29) terminal No. 35. Resistance should be .0-1 ohms. Measure resistance of TCM harness connector (B96) terminal No. 9 and vehicle body. Resistance should be 100 k/ohms minimum. If any previously measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

2) Check input signal for TCM. Reconnect connectors to TCM and ECM. Start engine. After engine warm up, measure signal voltage between TCM connector (B96) terminal No. 9 and vehicle body. Voltage should be .5-1.2 volts. If voltage is not within specification, replace TCM and retest.

**Legacy & SVX**

1) Check vehicle for engine related DTC’S. Using scan tool, check for mass air flow trouble code. Check harness connector between TCM and ECM. With ignition off, disconnect connectors from TCM and ECM. Measure resistance between TCM harness connector (B54/B67) terminal No. 9 and ECM connector (B84/B59) terminal No. 35/16. Resistance should be 0-1 ohms.
2) Measure resistance between TCM harness connector (B54/67) terminal No. 9 and vehicle body. Resistance should be 100k/ohms minimum. If any previously measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

3) Check input signal for TCM. Reconnect connectors to TCM and ECM. Start engine. After engine warm up, measure signal voltage between TCM connector (B54/67) terminal No. 9 and vehicle body. Voltage should be .5-1.2 volts. If voltage is not within specification, replace TCM and retest.

DTC 23: ENGINE SPEED SIGNAL

Symptom
Engine speed input signal circuit is open or shorted causing a no lock-up condition after engine warm-up, and AT OIL TEMP indicator remains on when vehicle is not moving.

Impreza
1) Check harness between TCM and ECU (MPFI). Disconnect connector from TCM. Disconnect connector from ECU. Measure resistance between TCM (B52) connector and ECU (B29) connector. See Figs. 4 and 6. Resistance between pin No. 4 of connector (B52) and pin No. 3 of connector (B29) should be 0-1 ohms.

2) Measure resistance between pin No. 4 of connector (B52) and vehicle body. Resistance should be 100 k/ohms minimum. If any measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

3) Measure signal voltage input of TCM. Turn ignition on with engine not running. Measure signal voltage input of TCM. Do not disconnect connector. See Fig. 4. Voltage between pin No. 4 of connector (B52) and vehicle body should be 10.5 volts minimum. If voltage is not within specification, replace TCM and retest.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX
1) Check harness between TCM and ECU (MPFI). Disconnect connector from TCM. Disconnect connector from ECU. Measure resistance between TCM (B54/67) connector and ECU (B56/61) connector. See Figs. 4 and 6. Resistance between pin No. 5 of connector (B54/67) and pin No. 16 of connector B56/61 should be 0-1 ohms.

2) Measure resistance between pin No. 5 of connector (B54/67) and vehicle body. Resistance should be 100 k/ohms minimum. If any measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

3) Measure signal voltage input of TCM. Turn ignition on with engine not running. Measure signal voltage input of TCM. Do not disconnect connector. See Fig. 4. Voltage between pin No. 5 of connector (B54/67) and vehicle body should be 10 volts minimum. If voltage is not within specification, replace TCM and retest.
Fig. 6: Identifying ECU Connector Terminals  
Courtesy of Subaru of America, Inc.

DTC 24: DUTY SOLENOID "C"

Symptom
Output signal circuit of duty solenoid "C" is open or shorted causing excessive engine braking in tight corners.

Impreza
1) Check harness between TCM and duty solenoid "C". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B52) connector and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 6 of connector (B52) and pin No. 11 of transmission connector should be 0-1 ohms. Resistance between pin No. 13 of connector (B52) and pin No. 4 of transmission connector should be 0-1 ohms.

3) Measure resistance between TCM (B52) connector and vehicle body. Resistance between pins No. 6 and No. 13 and vehicle body should be 100 k/ohms minimum for both circuits. If any measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

4) Check ground line of duty solenoid "C". Disconnect connector from transmission. Measure resistance between transmission connector receptacle and transmission case. See Fig. 5. Resistance between pin No. 4 of connector and transmission case should be one ohm maximum.

5) Check duty solenoid "C". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. Resistance between pins No. 11 and No. 4 should be 10-17 ohms. Replace solenoid as needed.

6) Check signal voltage output from TCM. Install spare fuse on FWD connector and set in FWD mode. Turn ignition on with engine not running. Move shift selector lever to "D" position. Measure voltage output from TCM (B52) with accelerator pedal released. See Fig. 4. Do not disconnect connector.

7) Voltage between pin No. 6 and No. 13 of (B52) connector should be 8-14 volts. Turn ignition switch off. Remove spare fuse from FWD switch. Turn ignition switch on with engine not running. Move shift selector lever to "D" position.

8) Measure voltage output emitted from TCM (B52) with
accelerator pedal fully depressed (WOT). Voltage between pin No. 6 and No. 13 of connector (B52) should be .5 volts maximum. If voltage is not within specification, replace TCM and retest.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal No. 36/20.

Legacy & SVX
1) Check harness between TCM and duty solenoid "C". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM (B55/68) connector and transmission connector. See Figs. 4 and 5.
2) Resistance between pin No. 3 of connector (B55/68) and pin No. 11 of transmission connector should be 0-1 ohms. Resistance between pin No. 10 of connector (B55/68) and pin No. 4 of transmission connector should be 0-1 ohms.
3) Measure resistance between TCM (B55/68) connector and vehicle body. Resistance between pins No. 3 and No. 10 and vehicle body should be 100 k/ohms minimum for both circuits. If any measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.
4) Check ground line of duty solenoid "C". Disconnect connect from transmission. Measure resistance between transmission connector receptacle and transmission case. See Fig. 5. Resistance between pin No. 4 of connector and transmission case should be one ohm maximum.
5) Check duty solenoid "C". Disconnect connector from transmission. Measure resistance between transmission connector receptacle terminals. Resistance between pins No. 11 and No. 4 should be 9-15 ohms. Replace solenoid as needed.
6) Check signal voltage output from TCM. Install spare fuse on FWD connector and set in FWD mode. Turn ignition on with engine not running. Move shift selector lever to "D". Measure voltage output from TCM (B55/68) with accelerator pedal released. See Fig. 4. Do not disconnect connector.
7) Voltage between pin No. 3 and No. 10 of (B55/68) connector should be 8-14 volts. Turn ignition switch off. Remove spare fuse from FWD switch. Turn ignition switch on with engine not running. Move shift selector lever to "D" position.
8) Measure voltage output emitted from TCM (B55/68) with accelerator pedal fully depressed (WOT). Voltage between pin No. 3 and No. 10 of connector (B55/68) should be .5 volts maximum. If voltage is not within specification, replace TCM and retest.

DTC 25: ENGINE TORQUE CONTROL SIGNAL

Symptom
Engine torque control output signal circuit is open or shorted causing harsh shift feel.

Impreza
1) Check harness connector between TCM and ECM. Turn ignition switch OFF. Disconnect connectors from TCM and ECM. Measure resistance of TCM harness connector (B52) terminal No. 16 and ECM harness connector (E29) terminal No. 49. Resistance should be 0-1 ohms. Measure resistance of harness connector (B52) terminal No. 16 and vehicle body. Resistance should be 100 k/ohms minimum. If any measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in
WIRING DIAGRAMS.

2) Check input signal for TCM. Reconnect connector to TCM and ECM. Turn ignition switch on. Measure voltage between TCM connector (B52) terminal No. 16 and vehicle body. Voltage should be 4-6 volts. If voltage is not within specification, replace TCM and retest.

Legacy

1) Check harness connector between TCM and ECM. Turn ignition switch OFF. Disconnect connectors from TCM and ECM. Measure resistance of TCM harness connector (B55) terminal No. 16 and ECM harness connector (B84) terminal No. 49. Resistance should be 0-1 ohms. Measure resistance of harness connector (B55) terminal No. 16 and vehicle body. Resistance should be 100 k/ohms minimum. If any measured resistances are not within specification, inspect and repair circuit(s) as needed. See appropriate wiring diagram in WIRING DIAGRAMS.

2) Check input signal for TCM. Reconnect connector to TCM and ECM. Turn ignition switch on. Measure voltage between TCM connector (B55) terminal No. 16 and vehicle body. Voltage should be 4-6 volts. If voltage is not within specification, replace TCM and retest.

SVX

1) Measure signal voltage output of ECU (MPFI). Turn ignition on with engine not running. Measure signal voltage output of ECU (MPFI). Do not disconnect connector.

2) Measure voltage between pin No. 20 of connector (B59) and vehicle body. See Fig. 6. Voltage should be 4-5 volts. If voltage is not within specification, replace ECU and retest.

3) Measure signal voltage input of TCM. Measure voltage between pin No. 9 of connector (B68) and vehicle body. See Fig. 4. Voltage should be 4-5 volts. If voltage is not within specification, inspect and repair circuit. See appropriate wiring diagram in WIRING DIAGRAMS. If circuit is okay, replace TCM and retest.

DTC 31: THROTTLE SENSOR

Symptom
Input signal circuit of throttle sensor is open or shorted causing shift points too high or too low, no engine braking in 3rd, erratic shifting and/or excessive engine braking in tight corners.

Impreza

1) Check harness connector between TCM and Throttle Position Sensor. With ignition switch OFF, disconnect TCM connector (B96) and throttle position sensor (E10). Measure resistance at terminal (B96) terminal No. 8 and (E10) terminal No. 2. Resistance should be 0-1 ohms. Measure resistance at TCM connector (B53) No. 19 and TPS connector (E10) terminal No. 3. Resistance should be 0-1 ohms.

2) Check harness connector for short to ground. Check connector (B96) terminal No. 8 and vehicle body. Resistance should be 100 k/ohms minimum. Measure connector (B53) terminal No. 8 and vehicle body. Resistance should be 100 k/ohms minimum.

3) Measure resistance between throttle position sensor (E10) terminals. No. 1 to terminal No. 2 with throttle fully closed, resistance should be .3-.7 k/ohms. With throttle fully open, resistance should read 3-6 k/ohms. At terminal No. 1 and terminal No. 3 with throttle fully open, resistance should be 3.5-6.5 k/ohms. If resistance values are not within specifications, replace throttle position sensor.

4) Measure signal voltage input of TCM. With KOEO, measure
signal voltage from throttle sensor at wide open throttle (WOT).
Measure voltage between pin No. 8 (B96) and No. 7 (B96). Voltage
should be 4.3-4.9 (throttle fully open). Voltage reading with throttle
fully closed should be .3-.7 volts. If voltage is within
specification, replace TCM and retest.

Legacy
1) Check harness connector between TCM and throttle position
sensor. With Ignition switch OFF, disconnect connectors from TCM and
TPS. Measure resistance at TCM connector (B54) terminal No. 8 and TPS
connector (E13). Resistance should be 0-1 ohms. Measure TPS connector
(B56) terminal No. 19 and TPS connector (E13) terminal No. 3.
Resistance should be 0-1 ohms.
2) Check for short to ground between TCM and vehicle body. At
terminal (B54) No. 8 to vehicle body, Resistance should be 100 k/ohms
minimum. At terminal (B56) No. 19 to vehicle body resistance should be
100 k/ohms minimum. If not within specification, repair or replace
connectors or wiring.
3) Check Throttle Position Sensor (TPS). Measure resistance
at TPS terminals (E13) No. 1 and No. 2. With throttle fully closed,
resistance should be .3-.7 k/ohms. With throttle fully open,
resistance should be 3-6 k/ohms. At terminal No. 1 and terminal No. 3
resistance should be 3.5-6.5 k/ohms. If results are not within
specification, replace TPS and retest.
4) Check input signal to TCM. Connect connectors to TCM and
TPS. With KOEO, measure voltage from TPS. At (B54) terminal No. 8 and
No. 7 voltage should be .3-.7 volts with throttle fully closed. With
throttle fully open, voltage should be 4.3-4.9 volts. If values are
within specification, replace TCM and retest. See Fig. 4.

SVX
1) Measure signal voltage input of TCM. With KOEO, Measure
signal voltage input emitted from throttle sensor with accelerator
pedal fully depressed (WOT). Measure voltage between pin No. 8 of TCM
connector (B67) and vehicle body. Voltage should be .5 volt with
throttle fully closed. With throttle fully open (WOT), voltage should
be 4.5 volts.
2) Check harness/connector between TCM and throttle sensor.
Disconnect connector from TCM. Disconnect connector from throttle
sensor. Measure resistance between TCM (B67) and throttle sensor (E11)
connector. Resistance between pin No. 8 of connector (B67) and pin No.
1 of connector (E11) should be 0-1 ohms. Resistance between pin No. 8
of connector (B67) and vehicle body should be 100 k/ohms minimum.
3) Check throttle sensor. Disconnect connector from throttle
sensor. Measure resistance between throttle sensor terminals.
Resistance between pins No. 1 and 2 should be 1 k/ohms with throttle
fully closed. With wide open throttle, resistance should be 4.3
k/ohms.

Fig. 7: Testing Throttle Sensor (Impreza)
Courtesy of Subaru Of America, Inc.

DTC 32: VEHICLE SPEED SENSOR "1"
Symptom
Input signal circuit of TCM is open or shorted, causing no shifting or excessive transmission braking in tight corners.

Impreza
1) Check harness/connector between TCM and vehicle speed sensor "1". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM connector and transmission connector. See Figs. 4 and 5. Resistance between pin No. 12 of connector (B96) and pin No. 16 of transmission connector (B9) should be 0-1 ohms. Resistance between pin No. 7 of connector (B96) and pin No. 9 of connector (B9) should be 0-1 ohms.

2) Check for short to ground. Measure resistance of pins No. 7 and No. 12 to vehicle body. Resistance should be 100 k/ohms minimum. If results are not within specifications, repair or replace harness connectors.

3) Check vehicle speed sensor "1". Measure resistance between transmission connector (T4) receptacles terminals No. 16 and terminal No. 9. Resistance should be 450-720 ohms. Measure resistance of harness connector between transmission connector and transmission case to check for short. Resistance between terminal pins No. 16 and No. 9 to transmission case should be 100 k/ohms minimum. See Fig. 5. If results are not within specification, replace speed sensor.

4) Measure signal voltage input of TCM. Raise vehicle on hoist. Ensure wheels are off floor. Start engine and set vehicle speed to 12 mph. Measure signal voltage input of TCM (B96). See Fig. 4. Measure voltage between pins No. 12 and 7 of connector (B96). Voltage should be one volt A/C minimum. If voltage is not within specification, replace TCM.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B33/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal 36/20.

Legacy & SVX
1) Check harness/connector between TCM and vehicle speed sensor "1". Disconnect connector from TCM. Disconnect connector from transmission. Measure resistance between TCM connector and transmission connector. See Figs. 4 and 5.

2) Resistance between pin No. 12 of connector (B54/67) and pin No. 16 of transmission connector (B11) should be 0-1 ohms. Resistance between pin No. 7 of connector (B54/67) and pin No. 9 of connector (B11) should be 0-1 ohms.

3) Measure resistance of harness connector between TCM and vehicle body to ensure there is no short to ground. Measure between terminal pins No. 1 and No. 12 to vehicle body. Resistance should be 100 k/ohms. If any resistances measured are not within specification, inspect and repair circuit as needed.

4) Check vehicle speed sensor "1". Disconnect connector from transmission. Measure resistance between connector receptacle terminals. See Fig. 5. Resistance between pins No. 16 and 9 of connector (T4) should be 450-720 ohms. If resistance is not within specification, replace vehicle speed sensor.

5) Measure signal voltage input of TCM. Raise vehicle on hoist. Start engine and set vehicle speed to 12 mph. Measure signal voltage input of TCM (B54/67). See Fig. 4. Measure voltage between pin No. 12 of connector (B54/67) and No. 7 of connector (B56/66). Voltage should be one volt A/C minimum. If voltage is not within specification, replace TCM and retest.
DTC 33: VEHICLE SPEED SENSOR "2"

Symptom
Input signal of vehicle speed sensor "2" is open or shorted, causing incorrect shift points. Poor driving performance.

Impreza
1) Ensure speedometer indicates vehicle speed. Check harness connector between TCM and combination meter. With ignition OFF, remove combination meter. Disconnect connectors from TCM and combination meter. Measure resistance of harness connector (B53) terminal No. 11 and terminal pin No. 8 of connector (i18). Resistance should be 0-1 ohms.

2) Measure resistance of terminal pin No. 8 of connector (i18) and vehicle body. Resistance should be 100 k/ohms minimum. If not within specification, Check for short to ground.

3) Measure signal voltage input of TCM. Connect connector to combination meter and install. Raise and support vehicle. Ensure wheels are off floor. Start engine, drive wheels slowly. Measure voltage between TCM and body. From terminal pin No. 11, connector (B53) to vehicle body. Voltage should fluctuate from 0-1 volts to 4 volts minimum. If voltage is not within specification, replace TCM and retest. See Fig. 4.

Legacy
1) Ensure speedometer indicates vehicle speed. Check harness connector between TCM and combination meter. With ignition OFF, remove combination meter. Disconnect connectors from TCM and combination meter. Measure resistance of harness connector (B56) terminal No. 11 and connector (i10) terminal No. 10. Resistance should be 0-1 ohms. If any resistances are not within specification, inspect and repair circuit as needed.

2) Measure resistance of harness connector (i10) terminal No. 10 and vehicle body. Resistance should be 100 k/ohms minimum. If not within specification, Check for short to ground.

3) Measure resistance of vehicle speed sensor "2". Install combination meter. Connect connector to TCM. Raise and support vehicle. Disconnect connector from vehicle speed sensor "2". Measure resistance between terminals of vehicle speed sensor "2". At (B17) terminal pins No. 1 and No. 2. Resistance should be 350-450 ohms. Resistance between terminal No. 1 and No. 2 to vehicle body should be 100 k/ohms minimum.

4) On models with TCS, Push TCS OFF switch to ON. Start engine and set vehicle speed to 12 MPH and measure output signal from vehicle speed sensor 2. Measure voltage between terminals (B17) No. 1 and No. 2. AC voltage should be 2 volts minimum. If any resistances are not within specification, replace vehicle speed sensor "2". Ensure no mechanical problem exists between vehicle speed sensor "2" and transmission.

5) Measure signal voltage input of TCM. Reconnect connector to vehicle speed sensor "2". With vehicle raised off the floor, push TCS OFF switch to ON. Start engine and drive wheels slowly. Measure voltage between connector (B56) terminal No. 11 and body. Voltage should fluctuate between 0-1 volts to 9 volts minimum. If voltage is not within specification, replace TCM and retest.

NOTE: Speed difference between front and rear wheels may light either ABS or ABS/TCS warning light. This indicates no malfunction, when AT control diagnosis is finished, clear ABS or ABS/TCS memory clearing procedure of self diagnosis system.

SVX
1) Measure signal voltage input of TCM. Turn ignition on with engine not running. Move shift select lever to "N" position and slowly push vehicle. While vehicle is moving slowly, measure signal voltage input of TCM.

2) Measure voltage between pins No. 11 and 20 of connector (B66). See Fig. 4. Voltage should fluctuate between 0-1 and 5 volts. If voltage is not within specification, replace TCM and retest.

3) Check harness/connector between TCM and vehicle speed sensor "2". Disconnect connector from TCM. Disconnect connector from vehicle speed sensor "2".

4) Measure resistance between TCM (B66) connector and vehicle speed (B9) sensor "2" connector. Resistance between pin No. 11 of connector (B66) and pin No. 1 of connector (B9) should be 0-1 ohms. Resistance between pin No. 11 of connector (B66) and vehicle body should be 100 k/ohms minimum. Measure resistance between pin No. 2 of connector (B9) and vehicle body. Resistance should be 0-1 ohms. If any resistances measured are not within specification, inspect and repair circuits as needed.

5) Check voltage of power supply line. Turn ignition on with engine not running. Measure voltage between vehicle speed sensor "2" connector and vehicle body. Voltage between pin No. 3 of connector (B9) and vehicle body should be 10 volts minimum.

6) Check vehicle speed sensor "2". Remove vehicle speed sensor "2" from transmission, connect body harness connector (B9) to vehicle speed sensor "2" and turn ignition on with engine not running. Rotate vehicle speed sensor "2". Ensure voltage across pins No. 1 and 2 of connector (B9) changes from 0-1 to 5 volts 4 times per revolution. Replace sensor as needed.

TCM PIN INPUT/OUTPUT RESISTANCE SPECIFICATIONS (1),(2) (LEGACY & SVX)

<table>
<thead>
<tr>
<th>Component</th>
<th>Terminal No.</th>
<th>Ohms Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATF Temp (68°F)</td>
<td>(4) 10</td>
<td>2.1-2.9k/2.3-2.7k</td>
</tr>
<tr>
<td>ATF Temp (176°F)</td>
<td>(4) 10</td>
<td>275-375/280-360</td>
</tr>
<tr>
<td>Duty Solenoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solenoid &quot;A&quot;</td>
<td>(3) 8</td>
<td>2.0-4.5/1.5-4.5</td>
</tr>
<tr>
<td>Solenoid &quot;B&quot;</td>
<td>(3) 5</td>
<td>9-15</td>
</tr>
<tr>
<td>Solenoid &quot;C&quot;</td>
<td>(3) 3</td>
<td>9-15</td>
</tr>
<tr>
<td>Ground Circuits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed Sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line &quot;1&quot;</td>
<td>(4) 7</td>
<td>0-1</td>
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<tr>
<td>Temperature Sensor</td>
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<tr>
<td>Line &quot;2&quot;</td>
<td>(5) 20</td>
<td>0-1</td>
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<tr>
<td>System</td>
<td>(5) 1</td>
<td>0-1</td>
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<tr>
<td>Power System</td>
<td>(3) 10</td>
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<tr>
<td>Resistor (Drop)</td>
<td>(3) 7</td>
<td>9-15</td>
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<tr>
<td>Shift Solenoid</td>
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</tr>
<tr>
<td>Solenoid &quot;1&quot;</td>
<td>(3) 14</td>
<td>20-32</td>
</tr>
<tr>
<td>Solenoid &quot;2&quot;</td>
<td>(3) 13</td>
<td>20-32</td>
</tr>
<tr>
<td>Solenoid &quot;3&quot;</td>
<td>(3) 15</td>
<td>20-32</td>
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<tr>
<td>Speed Sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensor &quot;1&quot;</td>
<td>(4) 12</td>
<td>450-720/450-650</td>
</tr>
</tbody>
</table>

(1) - For pin location, See Fig. 4.
(2) - Resistance To Vehicle Body.
(3) - Connector B33/68.
(4) - Connector B44/67.
(5) - Connector B46/66.
<table>
<thead>
<tr>
<th>Component</th>
<th>Terminal No.</th>
<th>Ohms</th>
</tr>
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<tbody>
<tr>
<td>ATF Temp (68°F)</td>
<td>(4) 19</td>
<td>2.1-2.9k</td>
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<tr>
<td>ATF Temp (176°F)</td>
<td>(4) 19</td>
<td>275-375</td>
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<td>Duty Solenoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solenoid &quot;A&quot;</td>
<td>(3) 11</td>
<td>2-4.5</td>
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<tr>
<td>Solenoid &quot;B&quot;</td>
<td>(3) 7</td>
<td>10-17</td>
</tr>
<tr>
<td>Solenoid &quot;C&quot;</td>
<td>(3) 6</td>
<td>10-17</td>
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<td>Ground Circuits</td>
<td></td>
<td></td>
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<tr>
<td>Sensor Line &quot;1&quot;</td>
<td>(4) 16</td>
<td>0-1</td>
</tr>
<tr>
<td>Sensor Line &quot;2&quot;</td>
<td>(4) 4</td>
<td>0-1</td>
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<tr>
<td>System</td>
<td>(3) 14</td>
<td>0-1</td>
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<tr>
<td>Power System</td>
<td>(3) 13</td>
<td>0-1</td>
</tr>
<tr>
<td>Resistor (Drop)</td>
<td>(3) 12</td>
<td>12-18</td>
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<tr>
<td>Shift Solenoid</td>
<td></td>
<td></td>
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<tr>
<td>Solenoid &quot;1&quot;</td>
<td>(3) 10</td>
<td>20-30</td>
</tr>
<tr>
<td>Solenoid &quot;2&quot;</td>
<td>(3) 9</td>
<td>20-30</td>
</tr>
<tr>
<td>Solenoid &quot;3&quot;</td>
<td>(3) 8</td>
<td>20-30</td>
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<td>Speed Sensor</td>
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<tr>
<td>Sensor &quot;1&quot;</td>
<td>(4) 15</td>
<td>450-650</td>
</tr>
</tbody>
</table>

(1) - For pin location, See Fig. 4.
(2) - Resistance To Vehicle Body.
(3) - Connector B52.
(4) - Connector B53.

TCM VOLTAGES

Access TCM. See Fig. 2. Turn ignition on. Using voltmeter, backprobe ECT ECU harness connector. Check voltage between selected terminal and vehicle ground. Voltage should be as specified. See TCM PIN INPUT/OUTPUT VOLTAGE SPECIFICATIONS tables.

NOTE: Connectors are identified for both models. Legacy model is listed first and SVX model second. Example; (B55/68)=(Legacy/SVX). Pin locations and numbers that are not identical for Legacy/SVX, may be identified as follows; Terminal 36/20.

TCM PIN INPUT/OUTPUT VOLTAGE SPECIFICATIONS (1),(2) (LEGACY & SVX)

<table>
<thead>
<tr>
<th>Component</th>
<th>Terminal No.</th>
<th>Connector No.</th>
<th>Requirements</th>
<th>Voltage</th>
</tr>
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<tbody>
<tr>
<td>ABS Signal</td>
<td>5</td>
<td>B56/66</td>
<td>ABS Switch On</td>
<td>0-1</td>
</tr>
<tr>
<td>ABS Signal</td>
<td>5</td>
<td>B56/66</td>
<td>ABS Switch Off</td>
<td>6.5-10</td>
</tr>
<tr>
<td>ATF Temp</td>
<td>10</td>
<td>B54/67</td>
<td>ATF 68°F</td>
<td>2.9-4.0</td>
</tr>
<tr>
<td>ATF Temp</td>
<td>10</td>
<td>B54/67</td>
<td>ATF 176°F</td>
<td>1.0-1.4</td>
</tr>
<tr>
<td>Battery Voltage</td>
<td>14</td>
<td>B56/66</td>
<td>Ignition Key Off</td>
<td>10-14</td>
</tr>
<tr>
<td>Brake Switch</td>
<td>7</td>
<td>B56/66</td>
<td>Pedal On</td>
<td>10.5-14</td>
</tr>
<tr>
<td>Brake Switch</td>
<td>7</td>
<td>B56/66</td>
<td>Pedal Off</td>
<td>0-1</td>
</tr>
<tr>
<td>Cruise Signal</td>
<td>3</td>
<td>B56/66</td>
<td>Cruise On</td>
<td>0-1</td>
</tr>
<tr>
<td>Cruise Signal</td>
<td>3</td>
<td>B56/66</td>
<td>Cruise Off</td>
<td>6-13</td>
</tr>
<tr>
<td>Duty Solenoid</td>
<td></td>
<td>B55/68</td>
<td></td>
<td></td>
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<tr>
<td>Solenoid &quot;A&quot;</td>
<td>8</td>
<td>B55/68</td>
<td>(5) Closed</td>
<td>1.5-4.0</td>
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<tr>
<td>Solenoid &quot;A&quot;</td>
<td>8</td>
<td>B55/68</td>
<td>(6) Open</td>
<td>0-1</td>
</tr>
<tr>
<td>Solenoid &quot;B&quot;</td>
<td>5</td>
<td>B55/68</td>
<td>(9) Lock</td>
<td>8.5-14</td>
</tr>
<tr>
<td>Solenoid &quot;B&quot;</td>
<td>5</td>
<td>B55/68</td>
<td>(10) No Lock</td>
<td>0-0.5</td>
</tr>
<tr>
<td>Solenoid &quot;C&quot;</td>
<td>3</td>
<td>B55/68</td>
<td>(11) Fuse</td>
<td>8.5-14</td>
</tr>
<tr>
<td>Solenoid &quot;C&quot;</td>
<td>3</td>
<td>B55/68</td>
<td>(12) No Fuse</td>
<td>0-0.5</td>
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<tr>
<td>Engine TCS (7)</td>
<td>16</td>
<td>B55/68</td>
<td>&quot;N&quot;</td>
<td>4-6</td>
</tr>
</tbody>
</table>
### FWD Switch
- **2**
- **B46/66**
- **No Fuse**
- **8-9.1**

**Ground Circuits**

#### Speed Sensor
- **Line "1"**
  - **7**
  - **B54/68**
  - **N/A**
  - **0**

#### Temperature
- **Sensor Line**
  - **20**
  - **B56/66**
  - **N/A**
  - **0**

#### System
- **1**
- **B56/66**
- **N/A**
- **0**

#### Power System
- **10**
- **B55/68**
- **N/A**
- **0**

#### Ignition Voltage
- **1**
- **B55/68**
- *(2) KOEO*
- **10-14**

#### Ignition Voltage
- **6**
- **B54/67**
- *(2) KOEO*
- **10-14**

### Inhibitor Switch
- **"P" Range**
  - **9**
  - **B56/66**
  - *(3) "P"*
  - **0-1**

#### "P" Range
- **9**
- **B56/66**
- *(4) "ALL"*
- **9-13**

#### "R" Range
- **10**
- **B56/66**
- *(3) "R"*
- **0-1**

#### "R" Range
- **10**
- **B56/66**
- *(4) All*
- **6-13**

#### "N" Range
- **8**
- **B6/66**
- *(3) "N"*
- **0-1**

#### "N" Range
- **8**
- **B56/66**
- *(4),(13) All*
- **9-13**

#### "D" Range
- **1**
- **B54/67**
- *(3) "D"*
- **0-1**

#### "D" Range
- **1**
- **B54/67**
- *(4) All*
- **6-123**

#### "3" Range
- **2**
- **B54/67**
- *(3) "3"*
- **0-1**

#### "3" Range
- **2**
- **B54/67**
- *(4) All*
- **6-10**

#### "2" Range
- **3**
- **B54/67**
- *(3) "2"*
- **0-1**

#### "2" Range
- **3**
- **B54/67**
- *(4) All*
- **6-10**

#### "1" Range
- **4**
- **B54/67**
- *(3) "1"*
- **0-1**

#### "1" Range
- **4**
- **B54/67**
- *(4) All*
- **6-10**

### Manual Switch
- **6**
- **B56/66**
- **Switch On**
- **0-1**

#### Manual Switch
- **6**
- **B56/66**
- **Switch Off**
- **6-10**

### Resistor (Drop)
- **7**
- **B55/68**
- *(5) Closed*
- **5-14**

#### Resistor (Drop)
- **7**
- **B55/68**
- *(6) Open*
- **0-5**

### Shift Solenoid
- **"1"**
  - **14**
  - **B55/68**
  - *(3) 1st,4th*
  - **9-14**

#### Solenoid "1"
- **14**
- **B55/68**
- *(3) 2nd,3rd*
- **0-1**

#### Solenoid "2"
- **13**
- **B55/68**
- *(3) 1st,2nd*
- **9-14**

#### Solenoid "2"
- **13**
- **B55/68**
- *(3) 3rd,4th*
- **0-1**

#### Solenoid "3"
- **15**
- **B55/68**
- *(3) "N"*
- **0-1**

#### Solenoid "3"
- **15**
- **B55/68**
- *(3) "D"*
- **9-14**

### Speed Sensor
- **Sensor "1"**
  - **12**
  - **B54/67**
  - **Stopped**
  - **0**

#### Sensor "1" (8) 20 MPH
- **12**
- **B54/67**
- **1-2 AC**

#### Sensor "2" (8) 20 MPH
- **11**
- **B56/66**
- **Push Car**
- **0-1 to 9-14 Pulse**

### Throttle Sensor
- **Legacy**
  - **8**
  - **B54/67**
  - *(5) Closed*
  - **.3-.7**

#### Legacy
- **8**
- **B54/67**
- *(6) Open*
- **4.3-4.9**

#### SVX
- **8**
- **B54/67**
- *(5) Closed*
- **.5**

#### SVX
- **8**
- **B54/67**
- *(6) Open*
- **4.5**

---

1. For Terminal Identification, See Fig. 4.
2. Key On, Engine Off.
3. Shift Lever Selection (1 or 2 choices).
4. Select Any Gear Selection Other Than Previously Used.
5. Throttle Fully Closed (Engine-Operating Temperature, KOEO).
6. Throttle Fully Open (Engine-Operating Temperature, KOEO).
7. Engine Torque Control Signal.
8. 20 MPH minimum.
10. Torque Converter Lock Up Not Engaged.
11. Fuse Installed In FWD Switch, See Fig. 5.
13. Except In "P" Range
## TCM Pin Input/Output Voltage Specifications

<table>
<thead>
<tr>
<th>Component</th>
<th>Terminal No.</th>
<th>Connector No.</th>
<th>Requirements</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS Signal</td>
<td>7</td>
<td>B53</td>
<td>ABS Switch On</td>
<td>0-1</td>
</tr>
<tr>
<td>ABS Signal</td>
<td>7</td>
<td>B53</td>
<td>ABS Switch Off</td>
<td>6.5-13</td>
</tr>
<tr>
<td>ATF Temp</td>
<td>19</td>
<td>B53</td>
<td>ATF 68°F</td>
<td>2.9-4.0</td>
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<tr>
<td>ATF Temp</td>
<td>19</td>
<td>B53</td>
<td>ATF 176°F</td>
<td>1.0-1.4</td>
</tr>
<tr>
<td>Batt. Voltage</td>
<td>1</td>
<td>B52</td>
<td>Ignition Key Off</td>
<td>11-13</td>
</tr>
<tr>
<td>Brake Switch</td>
<td>8</td>
<td>B53</td>
<td>Pedal On</td>
<td>10-14</td>
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<tr>
<td>Brake Switch</td>
<td>8</td>
<td>B53</td>
<td>Pedal Off</td>
<td>0-1</td>
</tr>
<tr>
<td>Cruise Signal</td>
<td>6</td>
<td>B53</td>
<td>Cruise On</td>
<td>0-1</td>
</tr>
<tr>
<td>Cruise Signal</td>
<td>6</td>
<td>B53</td>
<td>Cruise Off</td>
<td>6-10</td>
</tr>
<tr>
<td>Duty Solenoid</td>
<td>11</td>
<td>B52</td>
<td>(5) Closed</td>
<td>1.5-4.0</td>
</tr>
<tr>
<td>Solenoid &quot;A&quot;</td>
<td>11</td>
<td>B52</td>
<td>(6) Open</td>
<td>0-1</td>
</tr>
<tr>
<td>Solenoid &quot;B&quot;</td>
<td>7</td>
<td>B52</td>
<td>(8) Lock</td>
<td>8-14</td>
</tr>
<tr>
<td>Solenoid &quot;B&quot;</td>
<td>7</td>
<td>B52</td>
<td>(9) No Lock</td>
<td>0.5</td>
</tr>
<tr>
<td>Solenoid &quot;C&quot;</td>
<td>6</td>
<td>B52</td>
<td>(10) Fuse</td>
<td>8-14</td>
</tr>
<tr>
<td>Solenoid &quot;C&quot;</td>
<td>6</td>
<td>B52</td>
<td>(11) No Fuse</td>
<td>0.5</td>
</tr>
<tr>
<td>FWD Switch</td>
<td>2</td>
<td>B52</td>
<td>No Fuse</td>
<td>10-14</td>
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<tr>
<td>FWD Switch</td>
<td>2</td>
<td>B52</td>
<td>Fuse</td>
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<tr>
<td>Ground Circuits</td>
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<tr>
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<tr>
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<td>0</td>
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<tr>
<td>System</td>
<td>14</td>
<td>B52</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Power System</td>
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<td>B52</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>Ignition Voltage</td>
<td>15</td>
<td>B52</td>
<td>(2) KOEO</td>
<td>11-13</td>
</tr>
<tr>
<td>Ignition Voltage</td>
<td>16</td>
<td>B52</td>
<td>(2) KOEO</td>
<td>11-13</td>
</tr>
<tr>
<td>Inhibitor Switch</td>
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<tr>
<td>&quot;P&quot; Range</td>
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<td>B53</td>
<td>&quot;P&quot; Or &quot;N&quot;</td>
<td>0-1</td>
</tr>
<tr>
<td>&quot;P&quot; Range</td>
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<td>B53</td>
<td>(4) &quot;ALL&quot;</td>
<td>8-13</td>
</tr>
<tr>
<td>&quot;R&quot; Range</td>
<td>3</td>
<td>B52</td>
<td>(3) &quot;R&quot;</td>
<td>0-1</td>
</tr>
<tr>
<td>&quot;R&quot; Range</td>
<td>3</td>
<td>B52</td>
<td>(4) All</td>
<td>9.5-13</td>
</tr>
<tr>
<td>&quot;N&quot; Range</td>
<td>12</td>
<td>B53</td>
<td>(3) &quot;N&quot;</td>
<td>0-1</td>
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<tr>
<td>&quot;N&quot; Range</td>
<td>12</td>
<td>B53</td>
<td>(4) All</td>
<td>9.5-13</td>
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<tr>
<td>&quot;D&quot; Range</td>
<td>11</td>
<td>B53</td>
<td>(3) &quot;D&quot;</td>
<td>0-1</td>
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<tr>
<td>&quot;D&quot; Range</td>
<td>11</td>
<td>B53</td>
<td>(4) All</td>
<td>9.5-13</td>
</tr>
<tr>
<td>&quot;3&quot; Range</td>
<td>3</td>
<td>B53</td>
<td>(3) &quot;3&quot;</td>
<td>0-1</td>
</tr>
<tr>
<td>&quot;2&quot; Range</td>
<td>10</td>
<td>B53</td>
<td>(3) &quot;2&quot;</td>
<td>0-1</td>
</tr>
<tr>
<td>&quot;2&quot; Range</td>
<td>10</td>
<td>B53</td>
<td>(4) All</td>
<td>9.5-13</td>
</tr>
<tr>
<td>&quot;1&quot; Range</td>
<td>9</td>
<td>B53</td>
<td>(3) &quot;1&quot;</td>
<td>0-1</td>
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<tr>
<td>&quot;1&quot; Range</td>
<td>9</td>
<td>B53</td>
<td>(4) All</td>
<td>9.5-13</td>
</tr>
<tr>
<td>Resistor (Drop)</td>
<td>12</td>
<td>B52</td>
<td>(5) Closed</td>
<td>5-14</td>
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<tr>
<td>Resistor (Drop)</td>
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<td>B52</td>
<td>(6) Open</td>
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</tr>
<tr>
<td>Shift Solenoid</td>
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<td></td>
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</tr>
<tr>
<td>Solenoid &quot;1&quot;</td>
<td>10</td>
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<td>1st,4th</td>
<td>10-14</td>
</tr>
<tr>
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<td>10</td>
<td>B52</td>
<td>2nd,3rd</td>
<td>0-1</td>
</tr>
<tr>
<td>Solenoid &quot;2&quot;</td>
<td>9</td>
<td>B52</td>
<td>1st,2nd</td>
<td>10-14</td>
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<tr>
<td>Solenoid &quot;2&quot;</td>
<td>9</td>
<td>B52</td>
<td>3rd,4th</td>
<td>0-1</td>
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<td>Solenoid &quot;3&quot;</td>
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<td>B52</td>
<td>&quot;N&quot;</td>
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</tr>
<tr>
<td>Solenoid &quot;3&quot;</td>
<td>8</td>
<td>B52</td>
<td>&quot;D&quot;</td>
<td>10-14</td>
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<tr>
<td>Speed Sensor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensor &quot;1&quot;</td>
<td>15</td>
<td>B53</td>
<td>Stopped</td>
<td>0</td>
</tr>
<tr>
<td>Sensor &quot;1&quot;</td>
<td>15</td>
<td>B53</td>
<td>(7) 12 MPH</td>
<td>1-2 AC</td>
</tr>
<tr>
<td>Sensor &quot;2&quot;</td>
<td>5</td>
<td>B52</td>
<td>Push Car</td>
<td>0-1, 4+ Pulse</td>
</tr>
</tbody>
</table>
**ELECTRONIC SYSTEM TESTING**

**SHIFT & KEY INTERLOCK SYSTEM**

**NOTE:** In the following procedures, connectors are identified for both models. Impreza/Legacy model is listed first and SVX model second. Example: (B55/68)=(Legacy/SVX). Pin locations and numbers are identical. For wire color and terminal identification, see appropriate wiring diagram in WIRING DIAGRAMS.

**Preliminary Testing**

Turn ignition switch to ON position. Ensure shift selector lever moves from "P" to any other position. If selector moves, see COMPONENT TESTING. If shift selector will not move, depress brake pedal and recheck. If selector still will not move, see SHIFT LOCK DOES NOT RELEASE.

If shift selector lever will move, shift to "N" position and turn ignition switch to OFF position. If ignition key can be removed from ignition switch, see KEY INTERLOCK DOES NOT OPERATE. If key cannot be removed, move shift selector lever to "P" position and attempt to remove key. If key can be removed, system is functioning properly. If key cannot be removed, see KEY INTERLOCK DOES NOT RELEASE.

**Component Testing**

1) Check if brakelights remain on when brake pedal is released. If lights remain on, check and repair brakelight system as required. If lights go out when brake pedal is released, disconnect connector from shift lock control unit. Control unit is located behind right side of steering column lower panel.

2) If shift lock occurs when shift selector lever is moved to "P" position, replace shift lock control unit. If shift lock does not occur, disconnect connector from shift lock solenoid. Ensure shift lock function occurs when shift selector lever is moved to "P" position. If shift lock still occurs, there is a short in shift lock solenoid’s RED/GRN harness. If shift lock does not occur, check shift selector lever assembly. See Fig. 11, 12 or 13.

**CAUTION:** When conducting operational checks of key lock solenoid, do not apply 12 volts to solenoid for more than one second, solenoid circuit damage may occur.

**Shift Lock Does Not Release**

1) Ensure brakelight turns on when brake pedal is depressed. If brakelights fail to turn on, check and repair brakelight system as
required. If brake lights turn on, ensure 10 volts minimum is present across pin No. 3 of control unit and vehicle ground. If voltage is not within specifications, check and repair harness or faulty connector between main fuse and control unit. See Fig. 11, 12 or 13.

2) If voltage is within specifications, check voltage across pin No. 4 of control unit and vehicle ground. Voltage should be 10 volts minimum when brake pedal is depressed. If voltage is not within specifications, check and repair harness or faulty connector contact between brake light switch and control unit.

3) Ensure voltage across pin No. 1 of control unit and vehicle ground is 10 volts minimum when ignition switch is turned on. If voltage is not within specifications, check fuse. If fuse is okay, check and repair harness or faulty connector contact between ignition switch and control unit. If voltage is within specifications, turn ignition switch to OFF position. Disconnect connector from shift lock control unit.

4) Check for continuity between pin No. 2 of connector (B57/R47) and vehicle ground. Place shift selector lever is in "P" position. If continuity does not exist, check inhibitor switch and/or repair harness. If continuity exists, measure resistance between pin No. 1 of connector (B57/R47) and vehicle ground.

5) If resistance is greater than 20 ohms, shift lock solenoid circuit is shorted. Check and repair harness or faulty connector contact between shift lock solenoid and connector (B57/R47). If resistance is less than 10 ohms, shift lock solenoid is shorted or poorly grounded. After repairs are completed, recheck solenoid operation. If malfunction is still present, replace shift lock control unit.

6) Ensure resistance between pin No. 10 of connector (B69/R47) and vehicle ground is less than 10 ohms. If resistance is not less than 10 ohms, control unit ground circuit is open or has poor connector contact. If resistance is less than 10 ohms, replace shift lock control unit.

NOTE: For shift and key interlock system wiring diagram, see appropriate wiring diagram in WIRING DIAGRAMS.

Key Interlock Does Not Operate

1) Ensure shift lock operates properly. If not, recheck testing procedures previously listed. If shift lock is functioning properly, check if voltage across pin No. 3 of control unit and vehicle ground is 10 volts minimum. If voltage is not within specifications, check and repair harness of faulty connector contact between main fuse and control unit. If voltage is within specifications, check voltage across pin No. 8 of control unit and vehicle ground. See Fig. 11, 12 or 13.

2) Voltage should be 10 volts minimum when key is inserted into ignition switch. If voltage is not within specifications, check and replace faulty ignition switch. Check and replace harness or faulty connector contact between fuse block and control unit.

3) If voltage is within specifications, check voltage across pin No. 7 and vehicle ground. Voltage should be 10 volts minimum when ignition switch is set to ACC position. If voltage is not within specifications, check and repair harness or faulty connector contact between ignition switch and control unit.

4) If voltage is within specifications, disconnect harness connector from control unit. Check resistance between pins No. 9 and No. 11 of connector (B69/R47). If resistance is 8 ohms or greater, key lock solenoid circuit is open. Check and repair harness or faulty connector contact between key lock solenoid and control unit.

5) If resistance is less than 4 ohms, key lock solenoid is shorted. Check and repair harness or faulty connector contact between key lock solenoid and control unit. After repairs are completed,
recheck solenoid operation. If malfunction is still present, replace shift lock control unit.

6) Check resistance between pin No. 11 of connector (B69/R47) and vehicle ground. If resistance is 1k/ohm minimum, replace shift lock control unit.

Key Interlock Does Not Release

1) Ensure shift lock operates properly. If not, recheck testing procedures previously listed. If shift lock is functioning properly, check if voltage across pin No. 3 of control unit and vehicle ground is 10 volts minimum. If voltage is not within specifications, check and repair harness of faulty connector contact between main fuse and control unit. If voltage is within specifications, check voltage across pin No. 8 of control unit and vehicle ground. See Fig. 11, 12 or 13.

2) Voltage should be 10 volts minimum when key is inserted into ignition switch. If voltage is not within specifications, check and replace faulty ignition switch. Check and repair harness or faulty connector contact between fuse block and control unit.

3) If voltage is within specifications, check voltage across pin No. 7 and vehicle ground. Voltage should be 10 volts minimum when ignition switch is set to ACC position. If voltage is not within specifications, check and repair harness or faulty connector contact between ignition switch and control unit.

4) If voltage is within specifications, disconnect harness connector from control unit. Check resistance between pins No. 9 and No. 11 of connector (B69/R47). If resistance is 8 ohms or greater, key lock solenoid circuit is open. Check and repair harness or faulty connector contact between key lock solenoid and control unit.

5) If resistance is less than 4 ohms, key lock solenoid is shorted. Check and repair harness or faulty connector contact between key lock solenoid and control unit. Check resistance between pin No. 9 of connector (B69/R47) and vehicle ground. If resistance is 1k/ohm minimum, check and repair harness or faulty connector contact between key lock solenoid and control unit.

6) After repairs are completed, recheck solenoid operation. If malfunction is still present, replace shift lock control unit. If resistance between pin No. 9 of control unit and vehicle ground is less than 1k/ohm, replace shift lock control unit.

**WIRING DIAGRAMS**
Fig. 8: Transaxle Wiring Diagram (1995 Impreza 1.8L)
Fig. 9: Transaxle Wiring Diagram (1995 Impreza 2.2L)
Fig. 10: Transaxle Wiring Diagram (1996 Impreza)
Fig. 13: Shift Interlock System Wiring Diagram (1995-96 Impreza)
Fig. 14: Shift Interlock System Wiring Diagram (1995-96 Legacy)
Fig. 15: Shift Interlock System Wiring Diagram (1995-96 SVX)