

<b>DTC</b>	<b>P0776</b>	<b>PRESSURE CONTROL SOLENOID "B" PERFORMANCE (SHIFT SOLENOID VALVE SL2)</b>
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## SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect mechanical problems of the shift solenoid valves and valve body.

DTC No.	DTC Detecting Condition	Trouble Area
P0776	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	<ul style="list-style-type: none"> <li>• Shift solenoid valve SL2 remains open or closed</li> <li>• Valve body is blocked</li> <li>• Shift solenoid valve SL2</li> <li>• Automatic transaxle (clutch, brake or gear etc.)</li> <li>• ECM</li> </ul>

## MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd, 4th or 5th gear position). When the gear position commanded by the ECM and the actual gear position are not the same, the ECM illuminates the MIL and stores the DTC.

## MONITOR STRATEGY

Related DTCs	P0776: Shift solenoid valve SL2/OFF malfunction Shift solenoid valve SL2/ON malfunction
Required sensors/Components	Shift solenoid valve SL2, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous
Duration	OFF malfunction (A) 1.8 sec. OFF malfunction (B) and (C) 0.8 sec. ON malfunction (A) and (B) 0.8 sec. ON malfunction (C) 0.4 sec.
MIL operation	2 driving cycles
Sequence of operation	None

**TYPICAL ENABLING CONDITIONS****All:**

ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more
TFT sensor circuit	Not circuit malfunction
ECT sensor circuit	Not circuit malfunction
Turbine speed sensor circuit	Not circuit malfunction
Intermediate shaft speed sensor circuit	Not circuit malfunction
Output speed sensor circuit	Not circuit malfunction
Shift solenoid valve SL1 circuit	Not circuit malfunction
Shift solenoid valve SL2 circuit	Not circuit malfunction
Shift solenoid valve SL3 circuit	Not circuit malfunction
Shift solenoid valve S4 circuit	Not circuit malfunction
Shift solenoid valve SR circuit	Not circuit malfunction
Shift solenoid valve DSL circuit	Not circuit malfunction
Electronic throttle system	Not circuit malfunction

**OFF malfunction (A):**

ECM lock-up command	OFF
Vehicle speed	Less than 60 km/h (37.3 mph)
Throttle valve opening angle	7% or more (3MZ-FE) 13% or more (1MZ-FE)

**OFF malfunction (B):**

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (24.9 mph)
Throttle valve opening angle	4.5% or more (Varies with engine speed)

**OFF malfunction (C):**

ECM selected gear	3rd
Throttle valve opening angle	4.5% or more (Varies with engine speed)

**OFF malfunction (D):**

Duration time from shift command of ECM	15 sec. or more
ECM selected gear	4th or 5th

**ON malfunction (A):**

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (24.9 mph)
Throttle valve opening angle	4.5% or more (Varies with engine speed)

**ON malfunction (B):**

ECM selected gear	3rd
Throttle valve opening angle	7.0% or more (Varies with engine speed)
Malfunction of pressure control solenoid "B" (SL2) and "C" (SL3)	Not detected

**ON malfunction (C):**

Throttle valve opening angle	7.0% or more (Varies with engine speed)
Malfunction of pressure control solenoid "B" (SL2)	Not detected

## TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met:

OFF malfunction (A), (B), (C) and (D), or ON malfunction (A), (B) and (C)

### OFF malfunction (A):

Difference between engine speed and input (turbine) speed	Less than 35 rpm
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### OFF malfunction (B) and (C):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07
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### OFF malfunction (D):

Input (turbine) speed/Intermediate shaft speed	0.64 to 0.74
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### ON malfunction (A):

Input (turbine) speed/Intermediate shaft speed	2.72 to 2.86
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### ON malfunction (B):

Input (turbine) speed – Intermediate shaft speed	700 rpm or more
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### ON malfunction (C):

Input (turbine) speed – Intermediate shaft speed	Less than –500 rpm or 700 rpm or more
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## INSPECTION PROCEDURE

### HINT:

Performing the ACTIVE TEST using the hand-held tester allows the relay, VSV, actuator and so on to operate without parts removal. Performing the ACTIVE TEST as the first step of troubleshooting is one method to shorten labor time.

It is possible to display the DATA LIST during the ACTIVE TEST.

- Warm up the engine.
- Turn the ignition switch off.
- Connect the hand-held tester to the DLC3.
- Turn the ignition switch to the ON position.
- Push the "ON" button of the hand-held tester.
- Select the item "DIAGNOSIS/ENHANCED OBD II/ACTIVE TEST/SHIFT".
- According to the display on the tester, perform the "ACTIVE TEST".

### HINT:

While driving, the shift position can be forcibly changed with the hand-held tester.

Comparing the shift position commanded by the ACTIVE TEST with the actual shift position enables you to confirm the problem (see page [05-1276](#)).

Item	Test Details	Diagnostic Note
SHIFT	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	Possible to check the operation of the shift solenoid valves.

### HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the DATA LIST display on the hand-held tester.

**1 CHECK OTHER DTCS OUTPUT(IN ADDITION TO DTC P0776)**

- (a) Connect the OBD II scan tool or the hand-held tester to the DLC3.
- (b) Turn the ignition switch to the ON position and turn the OBD II scan tool or the hand-held tester main switch ON.
- (c) When you use hand-held tester:  
Select the item "DIAGNOSIS/ENHANCED OBD II/DTC INFO/CURRENT CODES".
- (d) Read the DTCS using the OBD II scan tool or the hand-held tester.

**Result:**

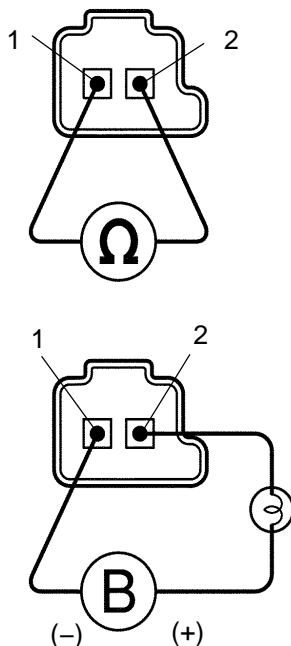
Display (DTC output)	Proceed to
Only "P0776" is output	A
"P0776" and other DTCS	B

**HINT:**

If any other codes besides "P0776" are output, perform the troubleshooting for those DTCS first.

**B**

**GO TO RELEVANT DTC CHART**  
(SEE PAGE [05-1280](#))

**A****2 INSPECT SHIFT SOLENOID VALVE(SL2)****Shift Solenoid Valve SL2:**

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- (a) Remove the shift solenoid valve SL2.
- (b) Measure the resistance according to the value(s) in the table below.

**Standard:**

Tester Connection	Specified Condition 20°C (68°F)
1 – 2	5.0 to 5.6 Ω

- (c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

**Standard:**

**The solenoid makes an operating noise.**

**NG**

**REPLACE SHIFT SOLENOID VALVE(SL2)**

**OK**

3	INSPECT TRANSMISSION VALVE BODY ASSY (See chapter 2 in the problem symptoms table) (SEE PAGE <a href="#">05-1262</a> )
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NG	REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSY (SEE PAGE <a href="#">40-37</a> )
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OK

4	INSPECT TORQUE CONVERTER CLUTCH ASSY (SEE PAGE <a href="#">40-27</a> )
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NG	REPLACE TORQUE CONVERTER CLUTCH ASSY
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OK

REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSY (SEE PAGE <a href="#">40-8</a> )	
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