DTC	P0746	Pressure Control Solenoid "A" Performance (Shift Solenoid Valve SL1)

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, valve body or automatic transaxle (clutch, brake, gear, etc.).

DTC No.	DTC Detection Condition	Trouble Area
P0746	Gear required by the ECM does not match the actual gear when driving (2 trip detection logic)	• Shift solenoid valve SL1 remains open or closed • Valve body is blocked • Shift solenoid valve SL1 • Automatic transaxle (clutch, brake, gear, etc.) • ECM

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.

HINT:

Example:

When either condition (a) or (b) is met, the ECM detects a malfunction.

(a) The ECM commands the 1st gear, but the actual gear is 2nd.

(b) The ECM commands the 2nd gear, but the actual gear is 1st.

MONITOR STRATEGY

Related DTCs	P0746: Shift solenoid valve SL1/OFF malfunction Shift solenoid valve SL1/ON malfunction
Required sensors/Components	Shift solenoid valve SL1, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous
Duration	0.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

ALL:

The monitor will run whenever these DTCs are not present.	P0115 - P0118 (ECT sensor) P0125 (Insufficient ECT for closed loop) P0500 (VSS) P0748, P0778, P0798 (Shift solenoid valve (range))
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
ATF temperature	-20°C (-4°F) or more
ATF temperature 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

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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:

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (24.9 mph)
Throttle valve opening angle	4.5% or more at engine speed 1,900 rpm (Varies with engine speed)

ON malfunction:

ECM selected gear	2nd
Throttle valve opening angle	4.5% or more at engine speed 1,900 rpm (Varies with engine speed)

TYPICAL MALFUNCTION THRESHOLDS
Either of the following conditions is met: OFF malfunction or ON malfunction
OFF malfunction:
2 detections are necessary per driving cycle:
  1st detection: temporary flag ON
  2nd detection: pending fault code ON

Input (turbine) speed/Intermediate shaft speed	1.49 to 1.63

ON malfunction:

Input (turbine) speed/Intermediate shaft speed	2.72 to 2.86

INSPECTION PROCEDURE
HINT:
Performing the intelligent tester's ACTIVE TEST allows relay, VSV, actuator and other items to be operated without removing any parts. Performing the ACTIVE TEST early in troubleshooting is one way to save time.
The DATA LIST can be displayed during the ACTIVE TEST.
1. Warm up the engine.
2. Turn the ignition switch OFF.
3. Connect the intelligent tester to the CAN VIM. Then connect the CAN VIM to the DLC3.
4. Turn the ignition switch ON and turn the tester ON.
5. Enter the following menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST.
6. Follow the instructions on the tester and perform the ACTIVE TEST.
   HINT:
   While driving, the shift position can be forcibly changed with the tester. Comparing the shift position commanded by the ACTIVE TEST with the actual shift position enables you to confirm the problem (see page AX-35).

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ECM:

Item	Test Details	Diagnostic Note
SHIFT	[Test Details] Operate shift solenoid valve and set each shift lever position by yourself [Vehicle Condition] • IDL: ON • 50 km/h (31 mph) or less [Other information] • Press "→" button: Shift up • Press "←" button: Shift down	Possible to check operation of shift solenoid valves

HINT:
• This test can be conducted when the vehicle speed is 50 km/h (31 mph) or more.
• This shift position commanded by the ECM is shown in the DATA LIST/SHIFT display on the tester.

1	**CHECK OTHER DTC OUTPUT (IN ADDITION TO DTC P0746)**

(a) Connect the intelligent tester to the CAN VIM. Then connect the CAN VIM to the DLC3.
(b) Turn the ignition switch ON and turn the tester ON.
(c) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES.
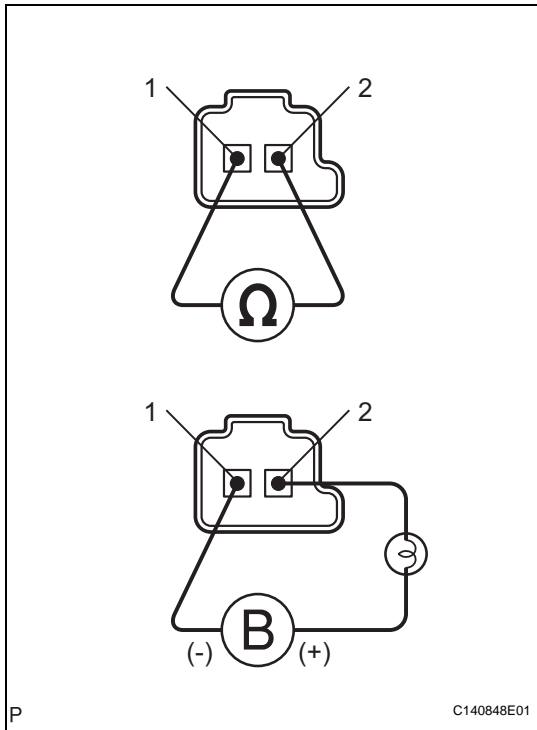(d) Read the DTCs using the tester.
Result

Display (DTC output)	Proceed to
Only P0746 is output	**A**
P0746 and other DTCs are output	**B**

HINT:
If any other codes besides P0746 are output, perform the troubleshooting for those DTCs first.

B	**GO TO DTC CHART**

A

2	INSPECT SHIFT SOLENOID VALVE SL1

(a) Remove the shift solenoid valve SL1.
(b) Measure the resistance of the solenoid valve.
   Standard resistance:
   5.0 to 5.6 Ω at 20°C (68°F)
(c) Connect the battery's positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector. Then check that the valve moves and makes an operating noise.
   OK:
   Valve moves and makes operating noise.

NG ▷ | **REPLACE SHIFT SOLENOID VALVE SL1** |

OK ▽

3	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

(a) Check the transmission valve body assembly.
   OK:
   There are no foreign objects on each valve.

NG ▷ | **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY** |

OK ▽

4	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

(a) Check the torque converter clutch assembly (see page AX-178).
   OK:
   The torque converter clutch operates normally.

NG ▷ | **REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY** |

OK ▽

AX

| REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY |