

DTC	P0741	Torque Converter Clutch Solenoid Performance (Shift Solenoid Valve SL)
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SYSTEM DESCRIPTION

The ECM uses the signals from the throttle position sensor, Air-flow meter, turbine (input) speed sensor and crankshaft position sensor to monitor the engagement condition of the lock-up clutch.

Then the ECM compares the engagement condition of the lock-up clutch with the lock-up schedule in the ECM memory to detect a mechanical problems of the shift solenoid valve SL, valve body and torque converter clutch or automatic transaxle (clutch, brake or gear etc.).

DTC No.	DTC Detection Condition	Trouble Area
P0741	- Lock-up does not occur when driving in the lock-up range (normal driving at 80 km/h [50 mph]), or lock-up remains ON in the lock-up OFF range. (2-trip detection logic) - When lock-up is ON, clutch or brake slips or gear is broken. (2-trip detection logic)	- Shift solenoid valve SL remains open or closed - Valve body is blocked - Shift solenoid valve SL - Torque converter clutch - Automatic transaxle (clutch, brake or gear etc.) - Line pressure is too low - ECM

MONITOR DESCRIPTION

Based on the signals from the throttle position sensor, the airflow meter and the crankshaft position sensor, the ECM sends a signal to the shift solenoid valve SL to regulate the hydraulic pressure and provide smoother gearshifts. The shift-solenoid valve SL responds to commands from the ECM. The valve controls the lock-up relay valve to perform torque-converter lock-up and flexible lock-up functions. The ECM compares the engine rpm (NE) signal and the input speed calculated by output speed sensor (output speed) and gear ratio to detect torque converter lock-up. The ECM then compares the lock-up status against the lock-up schedule in the ECM memory. If the ECM does not detect lock-up at the appropriate time, it will conclude that there is a malfunction of shift solenoid SL. The ECM will illuminate the MIL.

AX

MONITOR STRATEGY

Related DTCs	P0741: Shift solenoid valve SL/OFF malfunction Shift solenoid valve SL/ON malfunction
Required sensors/Components	Shift solenoid valve SL
Frequency of operation	Continuous
Duration	3.6 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present.	P0115 - P0118 (ECT sensor) P0125 (Insufficient ECT for closed loop) P0500 (VSS) P0751, P0756 (Shift solenoid valve (range))
ECT (Engine coolant temperature)	55°C (131°F) or more and Less than 105°C (221°F)
IAT (only for malfunction)	-10°C (14°F) or more and Less than 70°C (158°F)
Transmission range	"D"
Shift solenoid valve S1 circuit	Not circuit malfunction
Shift solenoid valve S2 circuit	Not circuit malfunction
Shift solenoid valve SL circuit	Not circuit malfunction
Battery voltage	10 V or more

Spark retard by KCS control	0° CA or more
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OFF malfunction:

ECM selected gear	4th with lock up
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ON malfunction:

ECM selected gear	4th
Throttle valve opening angle	7% or more

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: **OFF malfunction or ON malfunction**

Engine Speed	4th gear ratio x NO + 100 rpm or more and Less than 3rd gear ratio x NO - 100 rpm NO: Transmission output speed
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ON malfunction:

2 detections are necessary per driving cycle:

1st detection; temporary flag ON

2nd detection; pending fault code ON

Engine speed	4th gear ratio x NO - 50 rpm or more and Less than 4th gear ratio x NO + 50 rpm NO: Transmission output speed
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INSPECTION PROCEDURE**HINT:**

Performing the ACTIVE TEST using the intelligent 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.

1. PERFORM ACTIVE TEST

- (a) Warm up the engine.
- (b) Turn the ignition switch off.
- (c) Connect the intelligent tester together with the CAN VIM (controller area network vehicle interface module) to the DLC3.
- (d) Turn the ignition switch to the on position.
- (e) Turn on the tester.
- (f) Select the item "DIAGNOSIS / OBD/MOBD / ECT / ACTIVE TEST".
- (g) According to the display on the tester, perform the "ACTIVE TEST".

Tester Display	Test Part	Control Range	Diagnostic Note
LOCK UP	[Test Details] Control the shift solenoid SL to set the automatic transaxle to the lock-up condition. [Vehicle Condition] - Throttle valve opening angle: Less than 35% - Vehicle Speed: 58 km/h (36 mph) or more, and 4th gear	ON/OFF	Possible to check the SL operation.

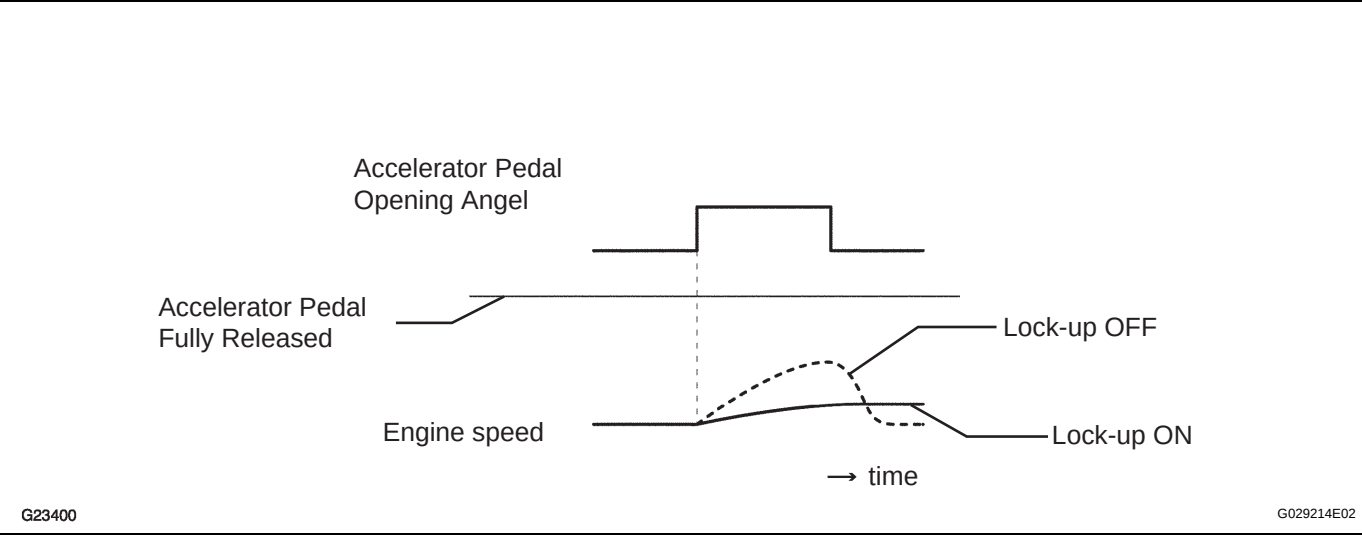
HINT:

- This test can be conducted when the vehicle speed is 58 km/h (36 mph) or more.
 - This test can be conducted in the 3rd or O/D gear.
- (h) Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

HINT:

- When changing the accelerator pedal opening angle while driving, if the engine speed does not change, lock-up is on.

- Slowly release, but not fully, the accelerator pedal in order to decelerate. (Fully releasing the pedal will close the throttle valve and lock-up may be turned off.)



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CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0741)

- (a) Connect the intelligent tester together with the CAN VIM (controller area network vehicle interface module) to the DLC3.
- (b) Turn the ignition switch to the on position and turn the OBD II scan tool or the intelligent tester main switch ON.
- (c) When you use intelligent tester:
Select the item "DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES".
- (d) Read the DTCs using the OBD II scan tool or the intelligent tester.

Result:

Display (DTC output)	Proceed to
Only "P0741" is output	A
"P0741" and other DTCs	B

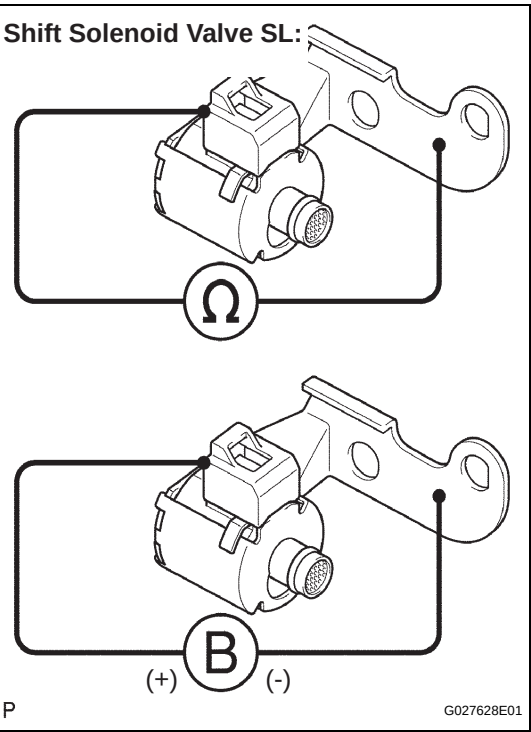
HINT:
If any other codes besides "P0741" are output, perform the troubleshooting for those DTCs first.

A

B

GO TO DTC CHART

2 INSPECT SHIFT SOLENOID VALVE (SL)



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

Standard resistance

Tester Connection	Specified Condition 20°C (68°F)
Solenoid Connector (SL) - Solenoid Body (SL)	11 to 15 Ω

- (c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid valve makes an operating sound.

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REPLACE SHIFT SOLENOID VALVE (SL)

OK

3 INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve and they operate smoothly.

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REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK

4 INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:

The torque converter clutch operates normally.

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REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK

REPAIR AUTOMATIC TRANSAXLE ASSEMBLY