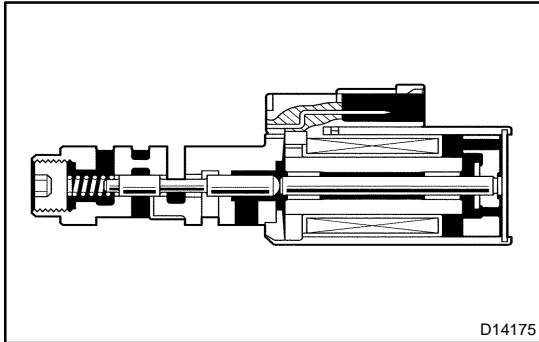


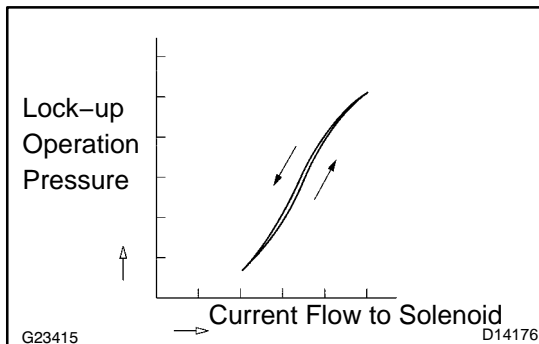
<b>DTC</b>	<b>P2757</b>	<b>Torque Converter Clutch Pressure Control Solenoid Performance(Shift Solenoid Valve SLU)</b>
------------	--------------	--



## SYSTEM DESCRIPTION

The ECM uses the signals from the throttle position sensor, Air-flow meter, turbine (input) speed sensor, output 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 SLU, valve body and torque converter clutch.



DTC No.	DTC Detection Condition	Trouble Area
P2757	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)	<ul style="list-style-type: none"> <li>• Shift solenoid valve SLU remains open or closed</li> <li>• Valve body is blocked</li> <li>• Torque converter clutch</li> <li>• Automatic transmission (clutch, brake or gear, etc.)</li> <li>• Line pressure is too low</li> </ul>

## MONITOR DESCRIPTION

Torque converter lock-up is controlled by the ECM based on the turbine (input) speed sensor NT, output speed sensor SP2, engine rpm, engine load, engine temperature, vehicle speed, transmission temperature, and gear selection. The ECM determines the lock-up status of the torque converter by comparing the engine rpm (NE) to the input turbine rpm (NT). The ECM calculates the actual transmission gear by comparing input turbine rpm (NT) to output shaft rpm (SP2). When conditions are appropriate, the ECM requests "lock-up" by applying control voltage to the shift solenoid SLU. When the SLU is turned on, it applies pressure to the lock-up relay valve and locks the torque converter clutch.

If the ECM detects no lock-up after lock-up has been requested or if it detects lock-up when it is not requested, the ECM interprets this as a fault in the shift solenoid valve SLU or lock-up system performance. The ECM will turn on the MIL and store the DTC.

Example:

When any of the following is met, the system judges it as a malfunction.

- (a) There is a difference in rotation between the input side (engine speed) and output side (input turbine speed) of the torque converter when the ECM commands lock-up.  
(Engine speed is at least 70 rpm greater than input turbine speed.)
- (b) There is no difference in rotation between the input side (engine speed) and output side (input turbine speed) of the torque converter when the ECM commands lock-up off.  
(The difference between engine speed and input turbine speed is less than 35 rpm.)

## MONITOR STRATEGY

Related DTCs	P2757	Shift solenoid valve SLU/OFF malfunction
		Shift solenoid valve SLU/ON malfunction
Required sensors/Components	Main	Shift solenoid valve SLU
	Sub	Valve body, Vehicle speed sensor, Throttle position sensor, Speed sensor (NT), Speed sensor (NO)
Frequency of operation	Continuous	
Duration	OFF malfunction (A)	2 sec.
	OFF malfunction (B)	0.4 sec.
	ON malfunction	1.8 sec.
MIL operation	2 driving cycles	
Sequence of operation	None	

## TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
<b>All:</b>		
Turbine speed sensor circuit	Not circuit malfunction	
Output speed sensor circuit	Not circuit malfunction	
Shift solenoid valve S1 circuit	Not circuit malfunction	
Shift solenoid valve S2 circuit	Not circuit malfunction	
Shift solenoid valve SR circuit	Not circuit malfunction	
Torque converter clutch pressure control solenoid circuit	Not circuit malfunction	
KCS sensor circuit	Not circuit malfunction	
ETCS (Electric throttle control system)	Not system down	
Transmission range	"D"	

ECT (Engine coolant temperature)	40° C (104° F) or more	–
Spark advance from Max. retard timing by KCS control	0° CA or more	–
Engine	Starting	
ECM selected gear	4th or 5th	
Vehicle speed	25 km/h (15.5 mph) or more	–
Shift solenoid valve S1 circuit	Not on malfunction	
Shift solenoid valve S2 circuit	Not on malfunction	
Shift solenoid valve SL2 circuit	Not on malfunction	
1–2 Shift valve	Not on malfunction	
Transfer neutral position switch	OFF	
Transfer range	"HIGH"*1	
Transfer range "HIGH" *1 (This condition is applied only 4WD)		
*1 Following conditions met		
Vehicle speed sensor circuit	Not circuit malfunction	
Output shaft speed sensor circuit	Not circuit malfunction	
Transfer output speed	143 rpm or more	–
NO/NOTf (Transfer input speed/Transfer output speed)	0.9 to 1.1	
OFF malfunction (A)		
ECM lock–up command	ON (SLU pressure: 513kpa or more)	
Vehicle speed	–	Less than 100 km/h (62.2 mph)
OFF malfunction (B)		
ECM selected gear	2nd	
Vehicle speed	2 km/h (1.2 mph) or more	–
Output speed	2nd → 1st down shift point or more	–
Throttle valve opening angle	7.0% or more at 2,000 rpm (Conditions vary with engine speed)	–
ON malfunction		
ECM lock–up command	OFF (SLU pressure: less than 4kpa)	
Throttle valve opening angle	9% or more	–
Vehicle speed	–	Less than 60 km/h (37.3 mph)

**TYPICAL MALFUNCTION THRESHOLDS**

Detection criteria	Threshold
<b>Both of the following conditions are met: OFF malfunctions (A) and (B)</b>	
<b>OFF malfunction (A)</b>	
Engine speed – Turbine speed	70 rpm or more
<b>OFF malfunction (B)</b>	
Turbine speed/Output speed	Not 3.30 to 7.50
<b>ON malfunction</b>	
2 detections are necessary per driving cycle 1st detection; temporary flag ON 2nd detection; pending fault code ON	
Vehicle speed must be under 8 km/h (5 mph) once before 2nd detection	
Difference between engine speed and turbine speed	Less than 35 rpm

## 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.
- Turn on the tester.
- Select the item "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST".
- According to the display on the tester, perform the "ACTIVE TEST".

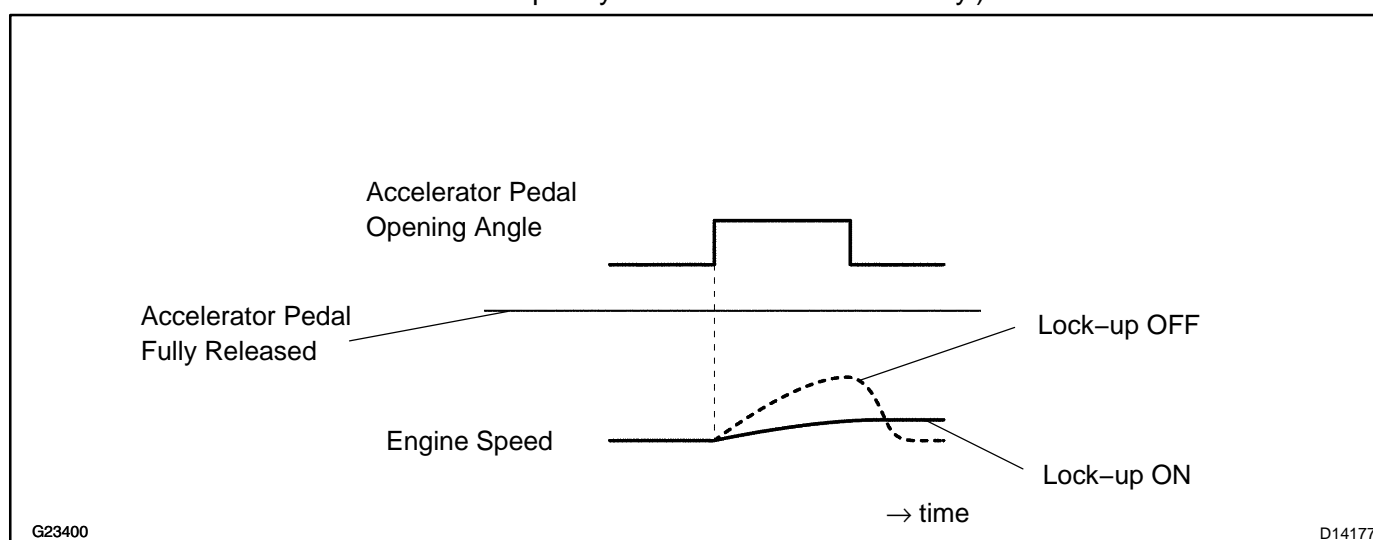
Item	Test Details	Diagnostic Note
LOCK UP	<p>[Test Details] Control the shift solenoid SLU to set the automatic transmission to the lock-up condition.</p> <p>[Vehicle Condition]</p> <ul style="list-style-type: none"> <li>Throttle valve opening angle: Less than 35 %</li> <li>Vehicle Speed: 60 km/h (37 mph) or more</li> </ul>	Possible to check the SLU operation.

### HINT:

- This test can be conducted when the vehicle speed is 60 km/h (37 mph) or more.
- This test can be conducted in the 5th gear.
- 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 automatically.)



1	Check other DTCs output (in addition to DTC P2757).
---	---

**PREPARATION:**

- (a) Turn the ignition switch off.
- (b) Connect the OBD II scan tool or hand-held tester to the DLC3.
- (c) Turn the ignition switch to the ON position.
- (d) Turn on the tester.
- (e) Select the item "DIAGNOSIS / ENHANCED OBD II / DTC INFO / CURRENT CODES".

**CHECK:**

Read the DTCs using the OBD II scan tool or the hand-held tester.

**RESULT:**

Display (DTC output)	Proceed to
Only "P2757" is output	A
"P2757" and other DTCs	B

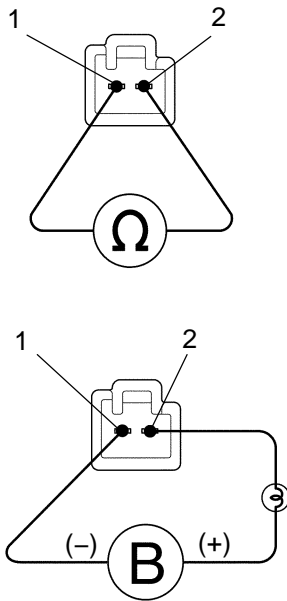
**HINT:**

If any other codes besides "P2757" are output, perform troubleshooting for those DTCs first.

**B****Go to DTC chart (See page [DI-1156](#)).****A**

## 2 Check shift solenoid valve SLU operation.

### Shift Solenoid Valve SLU:



D12795

### PREPARATION:

Remove the shift solenoid valve SLU (See page [AT-12](#)).

### CHECK:

Measure the resistance according to the value(s) in the table below.

### OK:

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

### CHECK:

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.

### OK:

The solenoid makes an operating sound.

NG

Replace the shift solenoid valve SLU (See page [AT-12](#)).

OK

## 3 Inspect valve body (See page [AT-12](#)).

### OK:

There are no foreign objects on each valve.

NG

Repair or replace valve body.

OK

4	Check torque converter clutch (See page <a href="#">AT-39</a> ).
---	--

**OK:**

The torque converter clutch operates normally.

**NG****Replace the torque converter clutch.****OK**

**Repair or replace transmission (See page [AT-34](#)).**