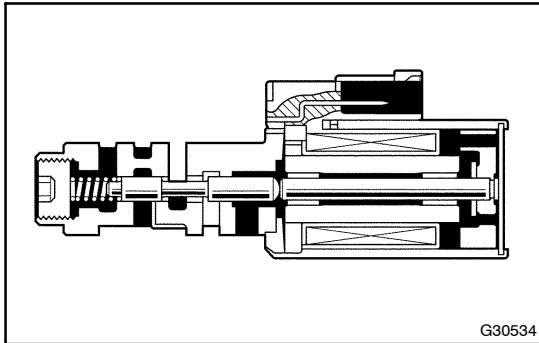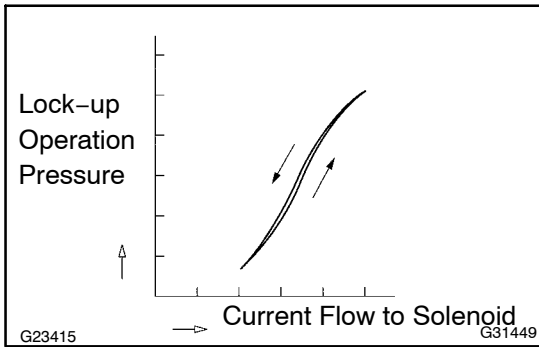| DTC	P2757	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID PERFORMANCE (SHIFT SOLENOID VALVE SLU)

G30534

Lock–up Operation Pressure

Current Flow to Solenoid

G23415   G31449

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)	• Shift solenoid valve SLU remains open or closed • Valve body is blocked • Shift solenoid valve SLU • Torque converter clutch • Automatic transmission (clutch, brake or gear, etc.) • Line pressure is too low • ECM

MONITOR DESCRIPTION

Torque converter lock–up is controlled by the ECM based on 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 shift solenoid SLU. When the SLU is turned on, solenoid SLU 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 before and after torque converters even when the ECM commands lock–up.

(Engine speed is at least 75 rpm greater than input turbine speed.)

(b)   There is no difference in rotation between before and after torque converters even 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	Shift solenoid valve SLU
Frequency of operation	Continuous
Duration	OFF malfunction (A) 2sec. OFF malfunction (B) 0.4 sec. ON malfunction 1.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The following items are common to all conditions below.

The monitor will run whenever this DTC is not present.	
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 S3 circuit	Not circuit malfunction
Shift solenoid valve S4 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 shift position	"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, 5th or 6th
Vehicle speed	25 km/h (15.5 mph) or more
Shift solenoid valve S1 circuit	Not circuit malfunction
Shift solenoid valve S3 circuit	Not circuit malfunction
Shift solenoid valve S4 circuit	Not circuit malfunction
Shift solenoid valve SL2 circuit	Not circuit malfunction
1 – 2 shift valve	Not circuit malfunction

OFF malfunction (A)

ECM lock – up command	ON (SLU pressure: 513 kPa or more)
Duration time from lock–up on command	3 sec. 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	6.5% or more (Varies with engine speed)

ON malfunction

ECM lock – up command	OFF (SLU pressure: less than 4 kPa)
Duration time from lock–up on command	3 sec. or more
Throttle valve opening angle	9% or more
Vehicle speed	Less than 60 km/h (37.3 mph)

TYPICAL MALFUNCTION THRESHOLDS

Both of the following conditions are met: OFF malfunction (A) and (B)

OFF malfunction (A)

Engine speed – Turbine speed (NE – NT)	70 rpm or more

OFF malfunction (B)

Engine speed – Turbine speed (NE – NT)	Not 3.08 to 7.50

ON malfunction

2 detections are necessary per driving cycle:

 1st detection; temporary flag ON

 2md detection; pending fault code ON

Vehicle speed must be under 10 km/h (6.2 mph) once before 2nd detection.

|Engine speed – Turbine speed| (|NE – NT|)	Less than 35 rpm

COMPONENT OPERATING RANGE

Speed sensor (NT)	Input speed is equal to engine speed when lock–up ON.

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.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the hand–held 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) Push the "ON" button of the hand–held tester.

(f) Clear the DTC.

(g) Select the item "DIAGNOSIS/ENHANCED OBD II/ACTIVE TEST/LOCK UP".

(h) According to the display on tester, perform the "ACTIVE TEST".

Item	Test Details	Diagnostic Note
LOCK UP	[Test Details] Control the shift solenoid SLU to set the automatic transmission to the lock–up condition. [Vehicle Condition] • Throttle valve opening angle: Less than 35 % • Vehicle Speed: 60 km/h (37 mph) or more, and 6th gear	Possible to check the SLU operation.

HINT:

• This test can be conducted when the vehicle speed is 58 km/h (36 mph) or more.

• This test can be conducted with the 5th or 6th gear.

(i) 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.)
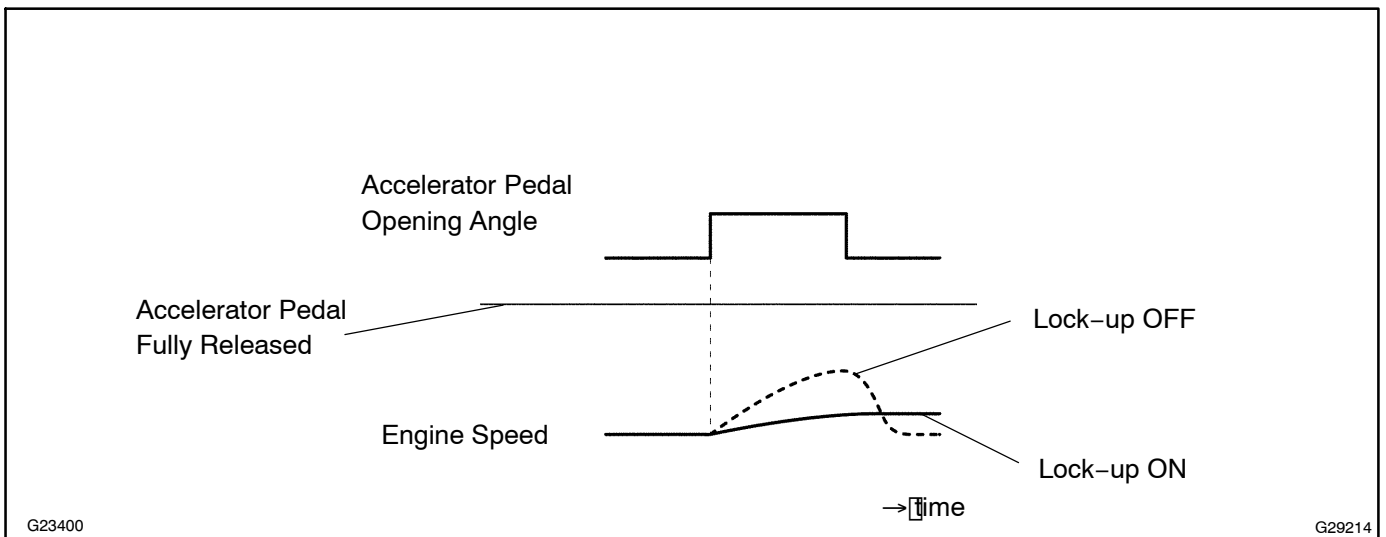
1	CHECK OTHER DTCS OUTPUT(IN ADDITION TO DTC P2757)

(a)   Connect the hand–held tester to the DLC3.

(b)   Turn the ignition switch to the ON position and push the hand–held tester main switch ON.

(c)   Select the item "DIAGNOSIS/ENHANCED OBD II/DTC INFO/CURRENT CODES".

(d)   Read the DTCs using the hand–held tester.

Result:

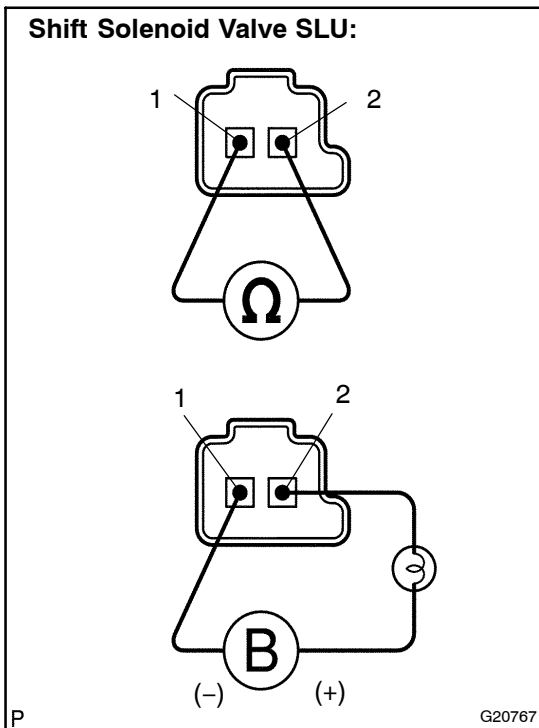| Display (DTC output)	Proceed to
Only "P2757" is output	A
"P2757" and other DTCs	B

HINT:

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

B ⟩ **GO TO RELEVANT DTC CHART
(SEE PAGE 05–650)**

A

2	INSPECT SHIFT SOLENOID VALVE(SLU)

Shift Solenoid Valve SLU:

(a)   Remove the shift solenoid valve SLU.

(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.

OK:

The solenoid makes an operating noise.

NG ⟩ **REPLACE SHIFT SOLENOID VALVE(SLU)**

OK

3	INSPECT TRANSMISSION VALVE BODY ASSY(See chapter 2 in the problem symptoms table) (SEE PAGE 05–630)

OK:

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

NG ⟩ **REPAIR OR REPLACE TRANSMISSION VALVE
BODY ASSY (SEE PAGE 40–32)**

OK

| 4 | INSPECT TORQUE CONVERTER CLUTCH ASSY (SEE PAGE **40–26**) |

OK:

The torque converter clutch operates normally.

NG ⟩ **REPLACE TORQUE CONVERTER CLUTCH ASSY**

OK

REPAIR OR REPLACE AUTOMATIC TRANSMISSION ASSY (SEE PAGE **40–16**)