DTC	P0766	SHIFT SOLENOID ”D” PERFORMANCE (SHIFT SOLENOID VALVE S4)

SYSTEM DESCRIPTION

The ECM uses signals from the output shaft speed sensor and input speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th, 5th or 6th 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 Detection Condition	Trouble Area
P0766	”S4 stuck OFF malfunction”, ”SL2 stuck ON malfunction” or ”Brake control valve malfunction”*1: Shifting to 5th and 6th gears is impossible. The ECM determines there is a malfunction when the following conditions are both met: (a) When the ECM directs the gearshift to switch to 5th gear, the actual gear is shifted to 4th. (b) When the ECM directs the gearshift to switch to 6th gear, the actual gear is shifted to 4th.	• Shift solenoid valve S4 remains closed • Shift solenoid valve SL2 remains open • Valve body is blocked (Brake control valve) • Automatic transmission (clutch, brake or gear, etc.) • ECM

HINT:

- Gear positions in the event of a solenoid valve mechanical problem:

ECM command gearshift	1st	2nd	3rd	4th	5th	6th
*1: Actual gear position under malfunction	↑	↑	↑	↑	4th	4th

- Gear position during fail–safe operation:
  If any malfunction is detected, the ECM changes into the fail–safe mode to shift into the gear positions as shown in the table below.

Gear position under normal conditions	1st	2nd	3rd	4th	5th	6th
*1: Actual gear position under fail safe mode	↑	↑	↑	3rd	3rd	3rd

MONITOR DESCRIPTION

This DTC indicates ”stuck OFF malfunction” of the shift solenoid valve S4, ”stuck ON malfunction” of the shift solenoid valve SL2, or brake control valve malfunction. The ECM commands gear shifts by turning the shift solenoid valves ”ON/OFF”. When the gear position commanded by the ECM and the actual gear position are not same, the ECM illuminates the MIL and stores the DTC.

INSPECTION PROCEDURE

HINT:

Performing the Intelligent Tester II Active Test allows relay, Vacuum Switching Valve (VSV), actuator and other items to be operated without removing any parts. Performing the Active Test early in troubleshooting is one way to shorten labor time. The Data List can be displayed during the Active Test.

(a) Warm up the engine.
(b) Turn the ignition switch off.
(c) Connect the Intelligent Tester II to the DLC3.
(d) Turn the ignition switch to the ON position.
(e) Turn on the tester.
(f) Clear the DTC.
(g) Select the item "Diagnosis / OBD·MOBD / Power train / Engine and ECT / Active Test / Control the Shift Position".
(h) Follow the instructions on the tester and read the Active Test.

HINT:

While driving, the shift position can be forcibly changed with the Intelligent Tester II.

Comparing the shift position commanded by the ACTIVE TEST with the actual shift position enables you to confirm the problem (see page 05–553).

Item	Test Details	Diagnostic Note
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set the each shift position by yourself. [Vehicle Condition] • IDL: ON • 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 4th to 5th and 5th to 6th up–shiftings must be performed with the accelerator pedal released.
- The 6th to 5th and 5th to 4th down–shiftings must be performed with the accelerator pedal released.
- Do not operate the accelerator pedal for at least 2 seconds after shifting and do not shift successively.
- The shift position commanded by the ECM is shown in the DATA LIST (Shift Status) display on the Intelligent Tester II.
- The shift solenoid valves S4 and SL2 are turned on/off normally when the shift lever is in the D position:

ECM command gearshift	1st	2nd	3rd	4th	5th	6th
Shift solenoid valve S4	OFF	OFF	OFF	OFF	ON	ON
Shift solenoid valve SL2	ON	ON	ON	ON	OFF	OFF

1 CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0766)

(a) Connect the Intelligent Tester II to the DLC3.
(b) Turn the ignition switch to the ON position.
(c) Turn on the tester.
(d) Select the item "Powertrain / Engine and ECT / DTC / Current or Pending".
(e) Read the DTCs using the Intelligent Tester II.

Result:

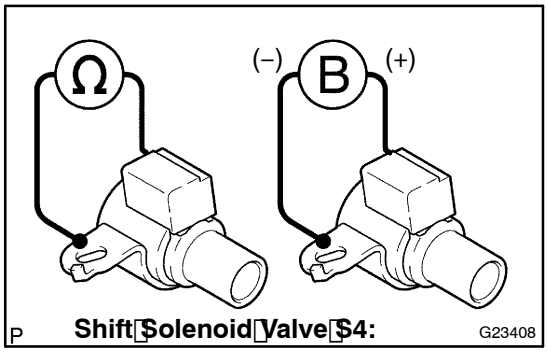
Display (DTC output)	Proceed to
Only "P0766" is output	A
"P0766" and other DTCs	B

HINT:
If any other codes besides "P0766" are output, perform troubleshooting for those DTCs first.

B → **GO TO RELEVANT DTC CHART (SEE PAGE 05–560)**

A

2 INSPECT SHIFT SOLENOID VALVE (S4)



(a) Remove the shift solenoid valve S4.
(b) Measure the resistance according to the value(s) in the table below.

Standard:

Tester Connection	Specified Condition 20°C (68°F)
Solenoid Connector (S4) – Solenoid Body (S4)	11 to 15 Ω

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

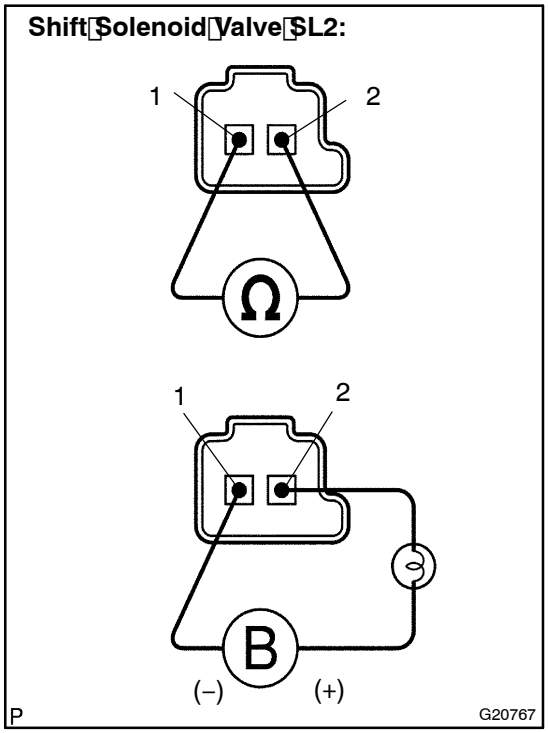
OK:

The solenoid makes an operating noise.

NG → **REPLACE SHIFT SOLENOID VALVE (S4)**

OK

3	INSPECT SHIFT SOLENOID VALVE (SL2)



(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.

OK:

The solenoid makes an operating noise.

NG → **REPLACE SHIFT SOLENOID VALVE (SL2)**

OK

4	INSPECT TRANSMISSION VALVE BODY ASSY (See chapter 2 in the problem symptoms table) (SEE PAGE 05–539)

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

5	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 40–15)