DTC	P0771	SHIFT SOLENOID ”E” PERFORMANCE (SHIFT SOLENOID VALVE SR)

SYSTEM 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 and valve body.

DTC No.	DTC Detecting Condition	Trouble Area
P0771	The gear required by the ECM does not match the actual gear when driving (2−trip detection logic)	• Shift solenoid valve SR remains open or closed • Valve body is blocked • Shift solenoid valve SR • Automatic transaxle (clutch, brake or 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 and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0771: Shift solenoid valve SR/OFF malfunction Shift solenoid valve SR/ON malfunction
Required sensors/Components	Shift solenoid valve SR, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous
Duration	OFF malfunction (A) 1 sec. OFF malfunction (B) 3.5 sec. ON malfunction (A) Continuous ON malfunction (B) and (C) 0.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	”D”
TFT (Transmission fluid temperature)	−20°C (−4°F) or more
TFT 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
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 (A):

ECM selected gear	5th
Throttle valve opening angle	5% or more
Vehicle speed	10 km/h (6.2 mph) or more

OFF malfunction (B):

ECM lock−up command	ON
ECM selected gear	3rd, 4th or 5th
Vehicle speed	25 km/h (15.5 mph) or more

ON malfunction (A):

ECM lock−up command	OFF

ON malfunction (B):

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

ON malfunction (C):

ECM selected gear	3rd
Throttle valve opening angle	4.5% or more (Varies with engine speed)

ON malfunction (D):

Duration time from shift command of ECM	15 sec. or more
ECM selected gear	4th or 5th

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met:

OFF malfunction (A) and (B), or ON malfunction (A), (B), (C) and (D)

OFF malfunction (A):

Intermediate shaft speed/Output speed	1.44 to 1.58

OFF malfunction (B):

Engine speed − Input (turbine) speed	75 rpm or more

ON malfunction (A):

Difference between engine speed and input (turbine) speed	150 rpm or more

ON malfunction (B):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

ON malfunction (C):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

ON malfunction (D):

Input (turbine) speed/Intermediate shaft speed	0.64 to 0.74

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 to the DLC3.
(d) Turn the ignition switch to the ON position.
(e) Push the ”ON” button of the hand−held tester.
(f) Select the item ”DIAGNOSIS/ENHANCED OBD II/ACTIVE TEST/SHIFT”.
(g) According to the display on the tester, perform the ”ACTIVE TEST”.

HINT:

While driving, the shift position can be forcibly changed with the hand−held tester.

Comparing the shift position commanded by the ACTIVE TEST with the actual shift position enables you to confirm the problem (see page 05−1276).

Item	Test Details	Diagnostic Note
SHIFT	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] 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 shift position commanded by the ECM is shown in the DATA LIST display on the hand−held tester.

1	CHECK OTHER DTCS OUTPUT(IN ADDITION TO DTC P0771)

(a) Connect the OBD II scan tool or the hand−held tester to the DLC3.
(b) Turn the ignition switch to the ON position and turn the OBD II scan tool or the hand−held tester main switch ON.
(c) When you use hand−held tester:
Select the item ”DIAGNOSIS/ENHANCED OBD II/DTC INFO/CURRENT CODES”.
(d) Read the DTCs using the OBD II scan tool or the hand−held tester.

Result:

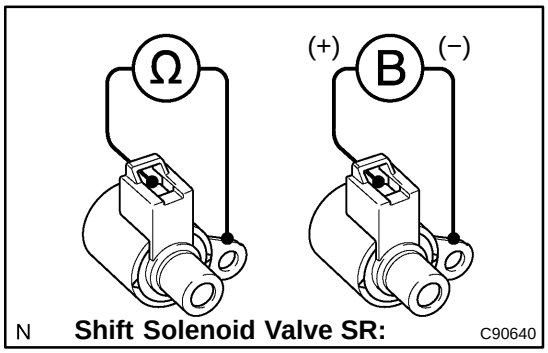
Display (DTC output)	Proceed to
Only ”P0771” is output	A
”P0771” and other DTCs	B

HINT:
If any other codes besides ”P0771” are output, perform the troubleshooting for those DTCs first.

B → **GO TO RELEVANT DTC CHART (SEE PAGE 05−1280)**

A

2	INSPECT SHIFT SOLENOID VALVE(SR)



N **Shift Solenoid Valve SR:** C90640

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

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

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (−) lead to the solenoid body.
Standard:
The solenoid makes an operating noise.

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

OK

3	INSPECT TRANSMISSION VALVE BODY ASSY (See chapter 2 in the problem symptoms table) (SEE PAGE 05−1262)

NG → **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSY (SEE PAGE 40−37)**

OK

4	INSPECT TORQUE CONVERTER CLUTCH ASSY (SEE PAGE 40−27)

NG → REPLACE TORQUE CONVERTER CLUTCH ASSY

OK

REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSY (SEE PAGE 40−8)