

DTC	P0771	Shift Solenoid "E" Performance (Shift Solenoid Valve SR)
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SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor and direct clutch 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, valve body or automatic transmission (clutch, brake or gear etc.).

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 is stuck open or closed - Shift solenoid valve SL1 is stuck open or closed - Valve body is blocked up or stuck - Automatic transmission (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input 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 same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0771	Shift solenoid valve SR/Rationality check
Required sensors/Components	Main	Shift solenoid valve SR
	Sub	Speed sensor (NT), Speed sensor (NO), Crankshaft position sensor (NE)
Frequency of operation	Continuous	
Duration	OFF malfunction (A)	0.4 sec.
	OFF malfunction (B) and (C)	Immediate
	ON malfunction	0.15 sec.
MIL operation	2 driving cycles	
Sequence of operation	None	

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
The following items are common to all condition below: OFF malfunction (A), (B), (C) and ON malfunction		
The monitor will run whenever the following DTCs are not present.	See page DI-361	

Turbine speed sensor (NT) circuit	There is no malfunction in the circuits shown on the left.	
Output speed sensor (NO) circuit		
Shift solenoid "A" (S1) circuit		
Shift solenoid "B" (S2) circuit		
Shift solenoid "E" (SR) circuit		
Pressure control solenoid "A" (SL1) circuit		
Pressure control solenoid "B" (SL2) circuit		
ECT (Engine coolant temperature) sensor circuit		
KCS sensor circuit		
ETCS (Electric throttle control system)	Not system down	
Transmission shift position	"D"	
ECT	40 °C (104 °F) or more	–
Spark advance from Max. retard timing by KCS control	0 ° CA or more	–
Engine	Running	
Transfer range	"HIGH"*1	
Transfer range "HIGH" *1 (This condition is applied only 4WD)		
*1 Following conditions met		
Vehicle speed sensor "A" circuit	There is no malfunction in the circuits shown on the left.	
Output shaft speed sensor circuit		
Transfer output speed	143 rpm or more	–
NO/NOTf (Transfer input speed/Transfer output speed)	0.9 or more	Less than 1.1
OFF malfunction (A)		
ECM selected gear	5th	
Vehicle speed	2 km/h (1 mph)	–
Throttle valve opening angle	6.5% or more at 2,000 rpm (conditions vary with engine speed)	–
OFF malfunction (B)		
Current ECM selected gear	5th	
Last ECM selected gear	4th	
Continuous time for ECM selecting 4th gear	2 sec. or more	–
OFF malfunction (C)		
Current ECM selected gear	5th	
Last ECM selected gear	4th	
ON malfunction		
Current ECM selected gear	2th	
Last ECM selected gear	1st	
Throttle valve opening angle (During transition from 1st to 2nd gear)	4.5% or more at 2,000 rpm (conditions vary with turbine speed)	–

TYPICAL MALFUNCTION THRESHOLDS

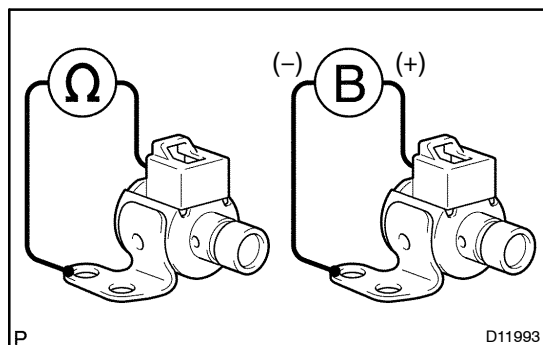
Detection criteria	Threshold
[OFF malfunction]	
All of the following conditions are met: OFF malfunction (A), (B) and (C)	

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It is necessary 2 detections/one drive cycle 1st detection; temporary flag ON 2nd detection; temporary pending fault code ON	
OFF malfunction (A)	
Turbine speed/Output speed (NT/NO)	0.93 or more and 1.07 or less
OFF malfunction (B)	
Turbine speed/Output speed (NT/NO)	Not change as follow 0.93 or more and 1.07 or less ↓ 0.65 or more and 0.79 or less
OFF malfunction (C)	
Output record from ECM for 4th → 5th upshifting	Recorded
[ON malfunction]	
It is necessary 2 detections/one drive cycle 1st detection; temporary flag ON 2nd detection; temporary pending fault code ON	
Turbine speed – Output speed x 1st gear ratio (NT – NO x 1st gear ratio)	150 rpm or more

INSPECTION PROCEDURE

1	Check shift solenoid valve SR operation.
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PREPARATION:

- Jack up the vehicle.
- Remove the oil pan.
- Remove the shift solenoid valve SR.

CHECK:

Measure the resistance between the solenoid connector terminal and the body ground.

OK:

Resistance: 11 to 15 Ω at 20°C (68°F)

CHECK:

Connect the battery positive lead to the solenoid connector terminal and the battery negative lead to the solenoid body ground.

OK:

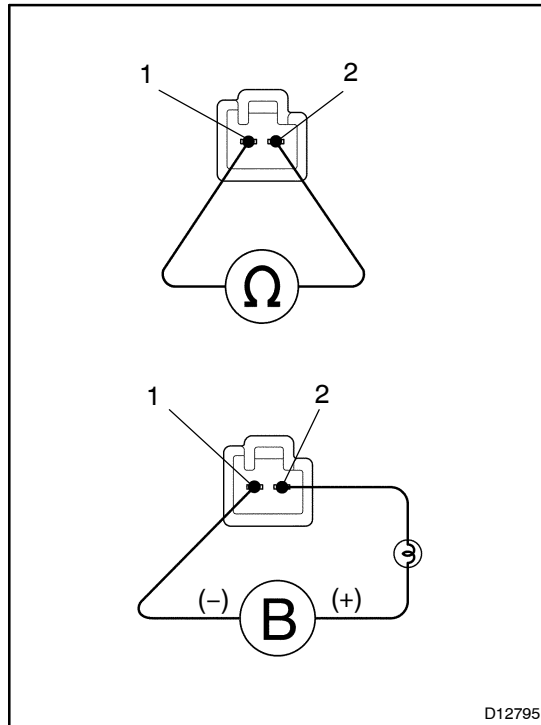
Solenoid sounds operation noise.

NG

Replace shift solenoid valve SR (See page AT-8).

OK

2 Check shift solenoid valve SL1 operation.



PREPARATION:

Remove the shift solenoid valve SL1.

CHECK:

- (a) Measure the resistance between terminals 1 and 2 of solenoid connector.

Standard: 5.0 to 5.6 Ω at 20°C (68°F)

- (b) Connect the positive (+) lead with an 21 W bulb to terminal 2 of solenoid connector and negative (–) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

Standard: Solenoid sounds operation noise.

OK:

Standard

NG

Replace shift solenoid valve SL1 (See page [AT-8](#)).

OK

3 Check valve body (See page [DI-396](#)).

NG

Repair or replace valve body (See page [AT-8](#)).

OK

Repair or replace transmission (See page [AT-30](#)).