DTC	P0751	Shift Solenoid "A" Performance (Shift Solenoid Valve S1)

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 or 4th 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 Detection Conditions	Trouble Areas
P0751	S1 stuck ON malfunction*1: The ECM determines that there is a malfunction when the following conditions are met: (a) When the ECM directs the gearshift to switch to 4th gear, the engine overruns (clutch slips). (b) When the ECM directs the gearshift to switch to 4th gear, the actual gear is shifted to 1st.	• Shift solenoid valve S1 is stuck open • Valve body is blocked • Shift solenoid valve S1 • Automatic transmission (clutch, brake or gear, etc.)
P0751	S1 stuck OFF malfunction*2: The ECM determines that there is a malfunction when the following conditions are met: (a) When the ECM directs the gearshift to switch to 1st gear, the actual gear is shifted to 4th. (b) When the ECM directs the gearshift to switch to 4th gear, the actual gear is also shifted to 4th.	• Shift solenoid valve S1 is stuck closed • Valve body is blocked • Shift solenoid valve S1 • Automatic transmission (clutch, brake or gear, etc.)

HINT:

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

Gearshift controlled by ECM	1st	2nd	3rd	4th
*1: Actual gear position under S1 stuck ON malfunction	1st	2nd	2nd	1st
*2: Actual gear position under S1 stuck OFF malfunction	4th	3rd	3rd	4th

MONITOR DESCRIPTION

This DTC indicates "stuck ON malfunction" or "stuck OFF malfunction" of the shift solenoid valve S1.
The ECM controls the gearshifts by turning the shift solenoid valves "ON/OFF". When the gear position directed by the ECM and the actual gear position do not match, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0751: Shift solenoid valve S1/OFF malfunction Shift solenoid valve S1/ON malfunction
Required sensors/Components	Shift solenoid valve S1, Speed sensor (SP2), Speed sensor (NCO), Crankshaft position sensor (NE), Throttle position sensor, MAF
Frequency of operation	Continuous
Duration	OFF malfunction (A): 1.0 second OFF malfunction (B): 0.4 seconds ON malfunction (A): 0.8 seconds
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The following conditions are common to all OFF malfunctions (A), (B) and ON malfunctions (A), (B).

The monitor will run whenever the following DTCs are not present.	P0115 - P0118 (ECT sensor) P0125 (Insufficient ECT for closed loop) P0500 (VSS) P0748 - P0798 (Trans solenoid (range))
Shift solenoid "A" (S1) circuit Shift solenoid "B" (S2) circuit ECT (Engine Coolant Temperature) sensor circuit Input speed sensor (NCO) circuit Output speed sensor (SP2) circuit	There is no malfunction in the sensor circuits shown on the left
Transmission shift position	"D"
ECT (Engine Coolant Temperature)	40°C (104°F) or more
Spark advance from max. retard timing by knock control	0° CA or more
Engine	Running

OFF malfunction (A)

ECM selected gear	1st
Vehicle speed	6.2 mph (10 km/h) or more and Less than 24.8 mph (40 km/h)
Throttle valve opening angle	15 % or more and 6.5 % or more at engine speed of 2,000 rpm (Conditions vary with engine speed)

OFF malfunction (B)

Current ECM selected gear	4th
Last ECM selected gear	3rd
Actual gear when ECM selected 3th gear	3rd

ON malfunction (A)

ECM selected gear	4th
Vehicle speed at current ECM selected gear - Vehicle speed at last ECM selected gear	Less than 6.2 mph (10 km/h)
Throttle valve opening angle at current ECM selected gear - Throttle valve opening angle at last ECM selected gear	Less than 10 %
Throttle valve opening angle	Less than 20 %
Vehicle speed	Less than 52.8 mph (85 km/h)

ON malfunction (B)

Current ECM selected gear	4th
Last ECM selected gear	3rd

TYPICAL MALFUNCTION THRESHOLDS

[OFF malfunction]

Both of the following conditions are met: OFF malfunctions (A) and (B)
2 detections are necessary in 1 driving cycle.
1st detection: Temporary flag ON
2nd detection: Pending fault code ON

OFF malfunctions (A) and (B)

Input speed/Output speed (NC0/SP2)	0.00 or more and 0.22 or less (This means actual gear is 4th)

[ON malfunction]

Both of the following conditions are met: ON malfunctions (A) and (B)

ON malfunction (A)

NE current - NE last NE current: Engine speed at current ECM selected gear NE last: Engine speed at last ECM selected gear	950 rpm or more

ON malfunction (B)

Input speed/Output speed (NC0/SP2)	Not change as follows 0.93 or more and 1.07 or less (This means actual gear is 3rd) ↓ 0.00 or more and 0.22 or less (This means actual gear is 4th)

1. ACTIVE TEST

HINT:

Performing the ACTIVE TEST using the intelligent tester allows components, such as the relay, VSV, and actuator, to be operated without removing any parts. Performing the ACTIVE TEST as the first step of troubleshooting is one method of shortening 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 intelligent 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 tester.

(f) Select the items "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 changed with the intelligent tester.

Comparing the shift position directed by the ACTIVE TEST with the actual shift position enables you to confirm the problem (See page AT-27).

Item	Test Details	Diagnostic Note
SHIFT	[Test Details] Operate the shift solenoid valve and set each shift position by manually. [Vehicle Condition] • IDL: ON • Less than 31 mph (50 km/h) [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 31 mph (50 km/h) or less.
- The 3rd to 4th up-shifting must be performed with the accelerator pedal released.
- The 4th to 3rd down-shifting 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 directed by the ECM is shown in the DATA LIST/ SHIFT display on the intelligent tester.
- The shift solenoid valve S1 is turned on/off normally when the shift lever is in the D position:

Gearshift controlled by ECM	1st	2nd	3rd	4th
Shift solenoid valve S1	ON	ON	OFF	OFF

1	CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P0751)

(a) Connect the intelligent tester to the DLC3.
(b) Turn the ignition switch to the ON position and push the intelligent tester main switch ON.
(c) Select the items "DIAGNOSIS/ ENHANCED OBD II/ DTC INFO/ CURRENT CODES".
(d) Read the DTCs using the intelligent tester.

Result

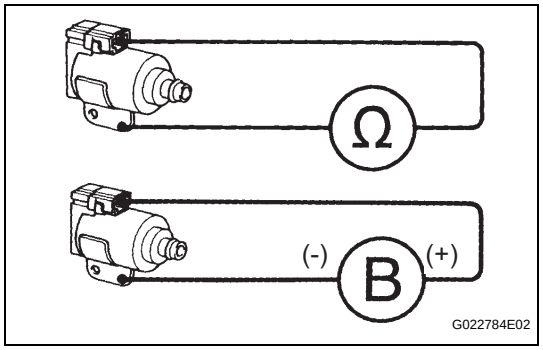
Display (DTC Output)	Proceed to
Only "P0751" is output	A
"P0751" and other DTCs	B

HINT:
If any codes besides "P0751" are output, perform troubleshooting for those DTCs first.

B → GO TO DTC CHART

A

2	INSPECT SHIFT SOLENOID VALVE S1



(a) Remove the shift solenoid valve S1.
(b) Measure the resistance.
Standard resistance

Tester Connection	Specified Condition
Solenoid Connector (S1) - Solenoid Body (S1)	11 to 15 Ω at 20°C (68°F)

(c) Connect positive (+) lead to the terminal of the solenoid connector, negative (-) lead to the solenoid body.
OK:
The solenoid makes an operating sound.

NG → REPLACE SHIFT SOLENOID VALVE S1

OK

3	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:
There are no foreign objects on any valves and they operate smoothly.

NG → REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK

REPAIR OR REPLACE AUTOMATIC TRANSMISSION ASSEMBLY