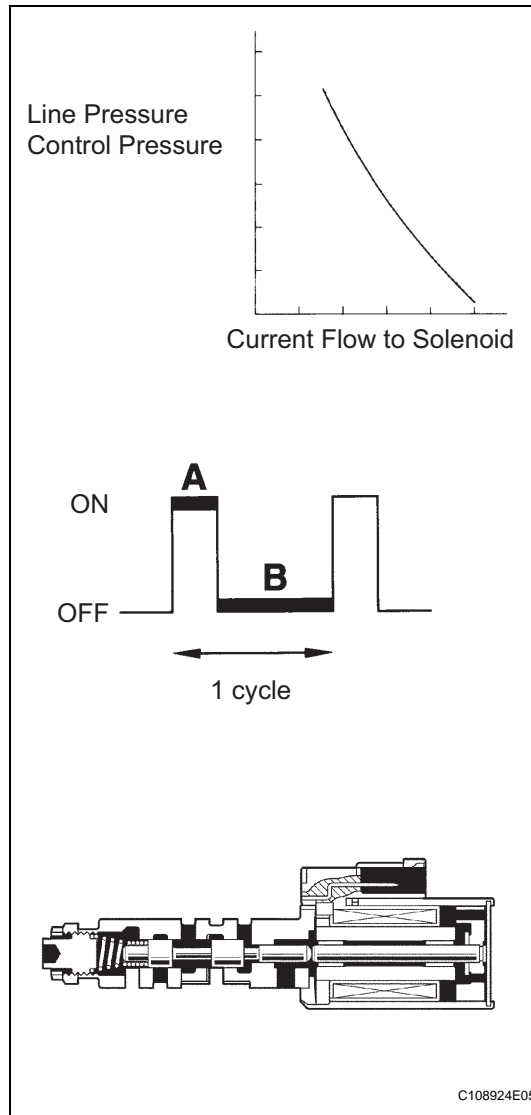


DTC	P2714	Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT)
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DESCRIPTION



C108924E05

The linear solenoid valve (SLT) controls the transmission line pressure for smooth transmission operation based on signals from the throttle position sensor and the vehicle speed sensor. The ECM adjusts the duty ratio* of the SLT solenoid valve output signal to control the hydraulic line pressure coming from the primary regulator valve. Appropriate line pressure assures smooth shifting with varying engine outputs.

*: The duty ratio is the ratio of the continuity to non-continuity in one cycle.

For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then Duty Ratio = $A / (A + B) \times 100$ (%)

DTC No.	DTC Detection Condition	Trouble Area
P2714	ECM detects malfunctions on SLT (ON side) according to the revolution difference between the turbine and the output shaft, and also by monitoring the oil pressure. (2 trip detection logic)	<ul style="list-style-type: none"> • Shift solenoid valve SLT remains open or closed • Shift solenoid valve S1, S2, SR, SL1 or SL2 remains open or closed • Valve body is blocked • Automatic transmission (clutch, brake or gear, etc.)

MONITOR DESCRIPTION

The ECM calculates the amount of heat absorbed by the friction material based on the difference in revolution (clutch slippage) between the turbine and output shaft. The ECM turns on the MIL and outputs this DTC when the amount of heat absorption exceeds the specified value.

When the shift solenoid valve SLT remains on, the oil pressure goes down and the clutch engagement force decreases.

NOTE: If driving continues under these conditions, the clutch will burn out and the vehicle will no longer be drivable.

MONITOR STRATEGY

Related DTCs	P2714 : Shift solenoid valve SLT/ON malfunction
Required sensors/Components (Main)	Shift solenoid valve SLT
Required sensors/Components (Related)	Valve body, ATF temperature sensor, Speed sensor (NT), Speed sensor (SP2)
Frequency of operation	Continuous
Duration	Immediate
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever the following DTCs are not present.	None
Turbine speed sensor (NT) circuit	No circuit malfunction
Output speed sensor (SP2) circuit	No circuit malfunction
Transmission fluid temperature sensor "A" circuit	No circuit malfunction
Shift solenoid "A" (S1) circuit	No circuit malfunction
Shift solenoid "B" (S2) circuit	No circuit malfunction
Shift solenoid "E" (SR) circuit	No circuit malfunction
Pressure control solenoid "A" (SL1) circuit	No circuit malfunction
Pressure control solenoid "B" (SL2) circuit	No circuit malfunction
Pressure control solenoid "D" (SLT) circuit	No circuit malfunction
ECT (Engine Coolant Temperature) sensor circuit	No circuit malfunction
Knock sensor circuit	No circuit malfunction
ETCS (Electronic Throttle Control System)	System not down
Transmission shift position	"D"
ECT	40°C (104°F) or more
Spark advance from max. retard timing by knock sensor control	0° CA or more
Engine	Starting
Transfer range	"High"*1
ATF temperature	10°C (50°F) or more

*1: Following conditions are met

Vehicle speed sensor "A" circuit	No circuit malfunction
Output speed sensor circuit	No circuit malfunction
Transfer output speed	143 rpm or more
Transfer input speed/Transfer output speed	0.9 to 1.1

TYPICAL MALFUNCTION THRESHOLDS

Summation of C1 clutch heat generations = SUM (Turbine speed - Output speed x Temporary gear ratio)	Specified value
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INSPECTION PROCEDURE

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 a first step of troubleshooting is one method of shortening labor time.

It is possible to display the DATA LIST during the ACTIVE TEST.

1. Warm up the engine.
2. Turn the ignition switch off.
3. Connect the intelligent tester together with the CAN VIM (Controller Area Network Vehicle Interface Module) to the DLC3.
4. Turn the ignition switch to the ON position.
5. Push the "ON" button of the tester.
6. Clear the DTC.
7. Select the items "DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST / SOLENOID (SLT)".
8. According to the display on the tester, perform the "ACTIVE TEST".

Item	Test Details	Diagnostic Note
SOLENOID (SLT) *	[Test Details] Operate the shift solenoid SLT to raise the line pressure. [Vehicle Condition] <ul style="list-style-type: none"> • Vehicle Stopped • IDL: ON [HINT] OFF: Line pressure up (When the active test of "SOLENOID (SLT)" is performed the ECM commands the SLT solenoid to turn off). ON: No action (normal operation)	-

*: "SOLENOID (SLT)" in the ACTIVE TEST is performed to check the line pressure changes by connecting SST to the automatic transmission, which is used in the HYDRAULIC TEST (See page AT-18) as well.

HINT:

- The pressure values in ACTIVE TEST and HYDRAULIC TEST are different from each other.
- Normally, the line pressure detected in the ACTIVE TEST is approximately half of the value detected in the HYDRAULIC TEST's stall test.

AT

1	CHECK ANY OTHER DTCS OUTPUT (IN ADDITION TO DTC P2714)
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- (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 "P2714" is output	A
"P2714" and other DTCs	B

HINT:

If any codes besides "P2714" are output, perform troubleshooting for those DTCs first.

B	GO TO DTC CHART
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A

2 | **PERFORM ACTIVE TEST USING INTELLIGENT TESTER (SOLENOID (SLT)) (See page AT-86)**

NG

Go to step 9

OK

3 | **PERFORM ACTIVE TEST USING INTELLIGENT TESTER (SHIFT)**

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Turn the intelligent tester ON.
- (d) Clear the DTC (See page AT-33).
- (e) Enter the following menus: DIAGNOSIS / ENHANCED OBD II / ACTIVE TEST.
- (f) Follow the instructions on the tester and perform the ACTIVE TEST.

HINT:

While driving, the shift position can be forcibly changed with the intelligent tester.

Item	Test Details	Diagnostic Note
SHIFT	[Test Details] Operate the shift solenoid valve and set each shift position. [Vehicle Condition] <ul style="list-style-type: none"> • IDL: ON • Less than 30 mph (50 km/h) [Other information] <ul style="list-style-type: none"> • Press "→" button: Shift up • Press "←" button: Shift down 	Possible to check the operation of the shift solenoid valves. HINT: Shifting to the 5th gear is possible only when the vehicle is stationary with the engine idling.

HINT:

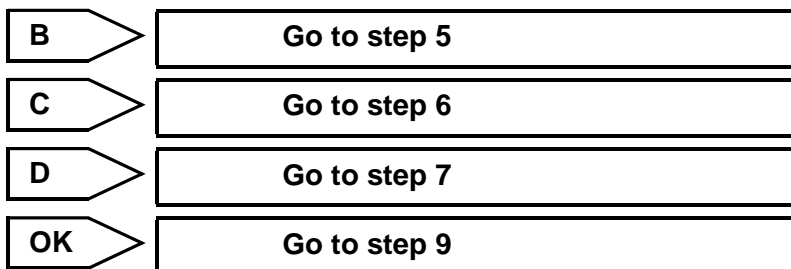
- This test can be conducted when the vehicle speed is 30 mph (50 km/h) or less.
- The 4th to 5th up-shift must be performed with the accelerator pedal released.
- The 5th to 4th down-shift must be performed with the accelerator pedal released.
- Do not operate the accelerator pedal for at least 2 seconds after shifting and do not shift successively.
- The shift position commanded by the ECM is shown in the DATA LIST (SHIFT) display on the intelligent tester.

(g) Compare the ECM gear shift command and the actual gear position.

ECM gear shift command			1st	2nd	3rd	4th	5th	Proceed to
Actual gear position under malfunction	Shift solenoid S1	Stuck ON	1st	2nd	2nd	1st	N*1	A
		Stuck OFF	4th	3rd	3rd	4th	5th	
	Shift solenoid S2	Stuck ON*2	2nd	2nd	3rd	3rd	N*1	B
		Stuck OFF*3	1st	1st	4th	4th	5th	
	Shift solenoid SL2	Stuck ON	1st	2nd	3rd	4th	N*1	C
		Stuck OFF	1st	2nd	3rd	4th	5th	
Shift solenoid SR	Stuck ON*4	1st	2nd	3rd	4th	5th	D	
	Stuck OFF*5	1st	2nd	3rd	4th	4th		

HINT:

- *1: Neutral
- *2: When shift solenoid S2 is stuck ON, the vehicle cannot drive in reverse.
- *3: When shift solenoid S2 is stuck OFF, the 4th to 5th up-shift will have a large shift shock. Also the 5th to 4th down-shift will have time lag.
- *4: Stuck ON condition can be determined by checking if shift shock has increased excessively.
- *5: When shift solenoid SR is stuck OFF, moving the shift lever from N to D will cause a large shift shock.
- Gear shift can be determined by paying attention to changes in rpm.



AT

A

4 INSPECT SHIFT SOLENOID VALVE S1 (See page [AT-120](#))

OK → Go to step 10

NG

REPLACE SHIFT SOLENOID VALVE S1

5 INSPECT SHIFT SOLENOID VALVE S2 (See page [AT-124](#))

OK → Go to step 10

NG

REPLACE SHIFT SOLENOID VALVE S2

6 INSPECT SHIFT SOLENOID VALVE SL2 (See page [AT-106](#))

OK

Go to step 10

NG

REPLACE SHIFT SOLENOID VALVE SL2

7 INSPECT SHIFT SOLENOID VALVE SR (See page [AT-128](#))

NG

REPLACE SHIFT SOLENOID VALVE SR

OK

8 INSPECT SHIFT SOLENOID VALVE SL1 (See page [AT-81](#))

OK

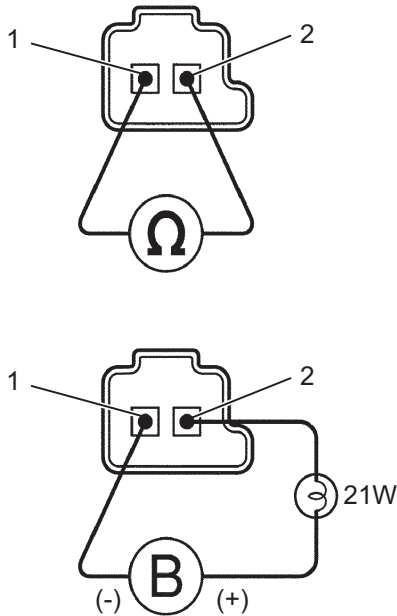
Go to step 10

NG

REPLACE SHIFT SOLENOID VALVE SL1

9 INSPECT SHIFT SOLENOID VALVE SLT

Shift Solenoid Valve SLT:



P

G020767E42

- (a) Remove the shift solenoid valve SLT.
- (b) Measure the resistance.

Standard resistance

Tester Connection	Specified Condition
1 - 2	5.0 to 5.6 Ω at 20°C (68°F)

- (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 operating sounds.

NG → **REPLACE SHIFT SOLENOID VALVE SLT**

OK

10 INSPECT TRANSMISSION VALVE BODY ASSEMBLY (See chapter 2 in the problem symptoms table)

OK:

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

NG → **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY**

OK

11 INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

- (a) Check the torque converter clutch assembly (See page [AT-186](#)).

OK:

The torque converter clutch operates normally.

NG → **REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY**

OK

REPAIR OR REPLACE AUTOMATIC TRANSMISSION ASSEMBLY

AT