

DTC	P0093	FUEL SYSTEM LEAK DETECTED – LARGE LEAK
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HINT:

- If DTC P1229 is detected, P0093 (Fuel leaks in high-pressurized areas) may be detected simultaneously. This may be due to the extremely high internal fuel pressure in the common rail opening the pressure limiter, and the ECM interpreting this as a fault and setting P0093.
- For more information on the common rail system, see page 05-432.
- If P0093 is present, refer to the diagnostic trouble codes (DTCs) table for the fuel system on page 05-432.

CIRCUIT DESCRIPTION

Refer to the description on page 05-432.

DTC No.	DTC Detection Condition	Trouble Area
P0093	Fuel leaks in high-pressurized area (1 trip detection logic)	<ul style="list-style-type: none"> • Fuel line between supply pump and common rail • Fuel line between common rail and injector • Supply pump • Common rail • Injector (P1238 is set simultaneously) • Pressure limiter • Open or short in EDU circuit (P0200 is set simultaneously) • Open or short in injector circuit (P0200 and P1238 are set simultaneously) • EDU (P0200 is set simultaneously) • ECM

HINT:

When DTC P0093 is detected, check the internal fuel pressure of the common rail by selecting Powertrain / Engine and ECT / Data List / Common Rail Pressure on the intelligent tester II.

Reference:

Engine Speed	Fuel Pressure (MPa)
Idling	Approximately 20 to 40
2,500 rpm (No engine load)	Approximately 40 to 80

MONITOR DESCRIPTION**P0093 (Fuel leaks in high-pressurized area):**

This DTC indicates for fuel leaks that exists in high-pressurized areas in the common rail system. The ECM constantly monitors the internal fuel pressure of the common rail after the engine is started, and the ECM will then set this DTC if the drop in the internal fuel pressure is large when injecting the fuel.

In the common rail system, high-pressurized fuel, approximately 20 to 135 MPa (204 to 1,377 kgf/cm², 2,901 to 19,580 psi), is always supplied to the high-pressurized area including the supply pump, common rail, injector and piping. The ECM adjusts the suction control valve opening angle to obtain the target internal fuel pressure.

If this DTC is present, the ECM enters fail-safe mode. The fail-safe mode suspends both fuel injection and supply pump operation, and then stops the engine. Before stopping the engine, the ECM permits the vehicle to be driven for 1 minute. The fail-safe mode continues until the ignition switch is turned to OFF.

MONITOR STRATEGY

Required sensors	Fuel pressure sensor
Frequency of operation	Continuous
Duration	1 second
MIL operation	1 driving cycle

TYPICAL ENABLING CONDITIONS

Item	Specification	
	Minimum	Maximum
Engine speed	600 rpm	–
The monitor will not run if the fuel pressure sensor, or suction control valve circuit is malfunctioning		

TYPICAL MALFUNCTION THRESHOLDS

Threshold
Drop of the internal fuel pressure is large when injecting fuel

INSPECTION PROCEDURE

HINT:

Read freeze frame data using the Intelligent Tester II. Freeze frame data record the engine condition when malfunctions are detected. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, and other data from the time the malfunction occurred.

1 CHECK OTHER DTC OUTPUT (IN ADDITION TO DTC P0093)

- Connect the Intelligent Tester II to the DLC3.
- Turn the ignition switch to ON and turn the Intelligent Tester II ON.
- Select the following menu items: Powertrain / Engine and ECT / DTC.
- Read DTCs.

Result:

Display (DTC Output)	Proceed To
P0093	A
P0093 and P1238	B
P0093 and P0200	C

B**Go to step 3****C****GO TO RELEVANT DTC CHART**
(See page 05-458)**A****2 CHECK FUEL LEAKAGE (IN HIGH-PRESSURIZED FUEL PARTS AND AREA)**

- Visually check the supply pump, injector and fuel line located between the supply pump and common rail for fuel leaks or fuel pressure leaks. Also, perform the same on the fuel line between the common rail and injector (see page 11-22 and/or 11-31 of Pub. No. RM864E AVENSIS VERSO/ PICNIC RE-PAIR MANUAL).

HINT:

There is possibility that fuel leaks inside the components (supply pump, etc) have been occurred.

NG**REPAIR OR REPLACE****OK**

3 READ VALUE OF INTELLIGENT TESTER II (COMPENSATION OF INJECTION VOLUME FOR EACH CYLINDER)

- Connect the intelligent tester II to the DLC3.
- Start the engine and turn the intelligent tester II ON.
- On the intelligent tester II, select the following menu items: Powertrain / Engine and ECT / Data List / Revised Injection Volume #1, #2, #3 and #4.
- Read the value.

Result:

Result	Compensatory Injection Volume (mm ³)
Standard	-3 to 3
Maximum	-4.9 to 4.9

NG

REPLACE INJECTOR ASSY
(See page 11-22 of Pub. No. RM864E AVENSIS
VERSO/ PICNIC REPAIR MANUAL)

OK

4 PERFORM ACTIVE TEST BY INTELLIGENT TESTER II (FUEL LEAK TEST)

- Connect the intelligent tester II to the DLC3.
- Start the engine and turn the intelligent tester II ON.
- Select the following menu items: Powertrain / Engine and ECT / Active Test / Fuel leak test.
- Check for fuel leaks in the high-pressure area.

GO

CHECK IF DTC OUTPUT RECURS (DTC P0093)

HINT:

- After clearing the DTC, let the engine idle for 1 minute and then run it at 2,500 rpm for 30 seconds.
- At the same time, check the fuel pressure inside the common rail by selecting Powertrain / Engine and ECT / Data List / Common Rail Pressure on the intelligent tester II.
- The internal fuel pressure of the common rail must be stable under each driving condition.

Reference:

Engine Speed	Fuel Pressure (MPa)
Idling	Approximately 20 to 40
2,500 rpm (No engine load)	Approximately 40 to 80