DTC	P0088/78	FUEL RAIL/SYSTEM PRESSURE – TOO HIGH

DTC	P0627/78	FUEL PUMP CONTROL CIRCUIT / OPEN

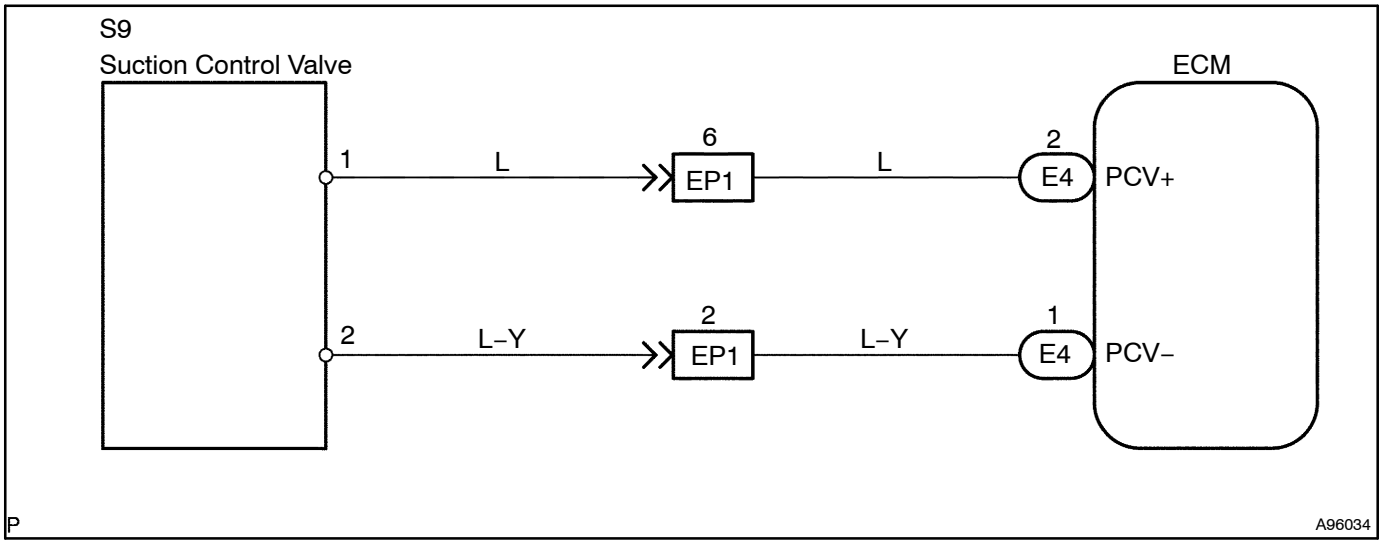
DTC	P1229/78	FUEL PUMP SYSTEM

CIRCUIT DESCRIPTION

The injection (supply) pump is single–type pump and has a circuit for fuel suction that achieves high pressure force feed and reduction of driving torque, and for force feed process. The ECM controls the suction control valve, which operates fuel suction by the plunger in the process of suction.
When the internal fuel pressure of the common rail exceeds the target pressure, the pressure limiter on the common rail starts operating to control the internal fuel pressure of the common rail.

DTC No.	DTC Detection Condition	Trouble Area
P0088/78	Conditions (a) and (b) continue 2 times or more: (a) Ignition switch ON (b) Internal fuel pressure of the common rail: 180 MPa (1,835 kg/cm^2, 25,106 psi) or more	• Supply pump (suction control valve) • Open or short in supply pump (suction control valve) circuit • Common rail • ECM
P0627/78	Open or short in suction control valve circuit for more than 0.5 seconds	Same as DTC No. P0088/78
P1229/78	Fuel over–feed: Internal fuel pressure is beyond target fuel pressure despite ECM closing suction control valve	Same as DTC No. P0088/78

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:
Read freeze frame data using the hand–held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.

1	CHECK OTHER DTC OUTPUT

(a) Connect the hand–held tester (with 24 V VIM) to the DLC3.
(b) Turn the ignition switch ON and turn the hand–held tester ON.
(c) On the hand–held tester, enter the following menus: DIAGNOSIS / OBD/MOBD / DTC INFO / CURRENT CODES.
(d) Read DTCs.

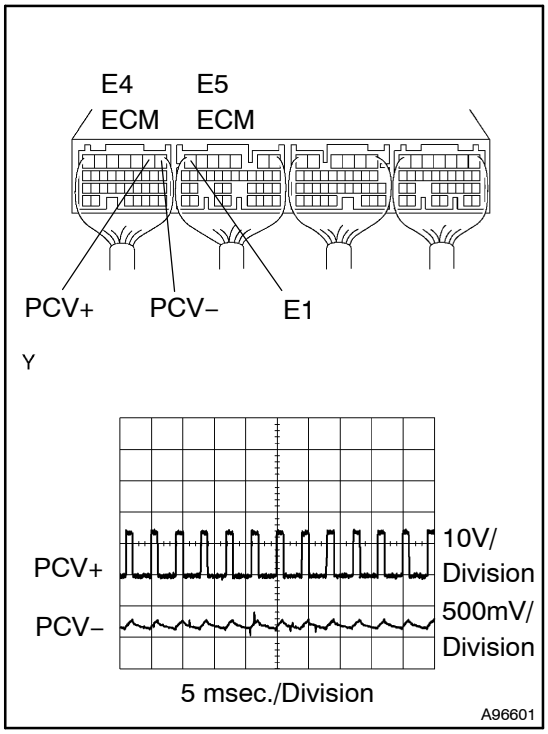
Result:

Display (DTC output)	Proceed to
P0180/39, P0182/39, P0183/39, P190/49, P191/49, P192/49, P193/49 or P0200/97 is not output	A
P0180/39, P0182/39, P0183/39, P190/49, P191/49, P192/49, P193/49 or P0200/97 is output	B

B → **Go to RELEVANT DTC CHART (See page 05–38)**

A

2	CHECK ECM



(a) Inspect using an oscilloscope.
(1) While the engine is cranking or idling, check the waveforms between the specified terminals of the E4 and E5 ECM connectors.

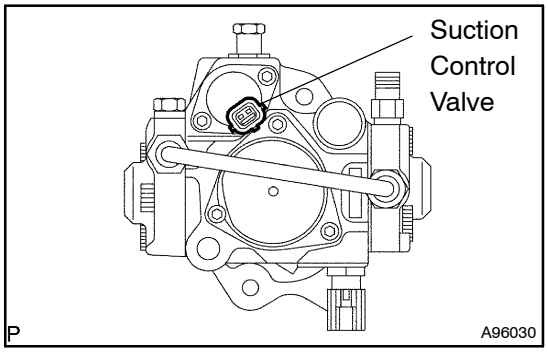
Standard:

Tester Connection	Specified Condition
E4–2 (PCV+) – E5–7 (E1) E4–1 (PCV–) – E5–7 (E1)	Correct waveform is as shown

NG → **REPLACE ECM (See page 10–10)**

OK

3 INSPECT SUPPLY PUMP ASSY (SUCTION CONTROL VALVE)

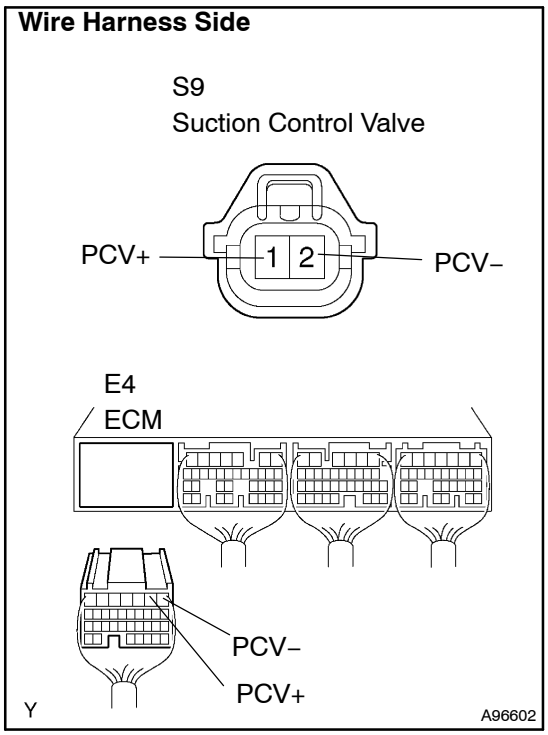


(a) Measure the resistance of the suction control valve.
Standard: 7.5 to 8.1 Ω at 20°C (68°F)

NG → **REPLACE SUPPLY PUMP ASSY (SUCTION CONTROL VALVE) (See page 11–10)**

OK

4 CHECK WIRE HARNESS (SUCTION CONTROL VALVE – ECM)



(a) Disconnect the S9 suction control valve connector.
(b) Disconnect the E4 ECM connector.
(c) Measure the resistance of the wire harness side connectors.
Standard:

Tester Connection	Specified Condition
S9–1 (PCV+) – E4–2 (PCV+) S9–2 (PCV–) – E4–1 (PCV–)	Below 1 Ω
S9–1 (PCV+) or E4–2 (PCV+) – Body ground S9–2 (PCV–) or E4–1 (PCV–) – Body ground	10 kΩ or higher

NG → **REPAIR OR REPLACE HARNESS AND CONNECTOR**

OK

5 REPLACE COMMON RAIL ASSY (See page 11–15)

GO

6	CHECK DTC OUTPUT

(a) Read the DTCs using the hand–held tester.
Result:

Display (DTC output)	Proceed to
P0088/87, P0627/78 or P1229/78 is output	A
P0088/87, P0627/78 or P1229/78 is not output	B

B → **SYSTEM IS OK**

A

REPLACE SUPPLY PUMP ASSY (See page 11–10)