

<b>DTC</b>	<b>78(1)</b>	<b>FUEL PUMP CIRCUIT MALFUNCTION(FUEL LEAKAGE)</b>
------------	--------------	--

## CIRCUIT DESCRIPTION

Refer to DTC 49 on [page 05-238](#).

Refer to DTC 97 on [page 05-257](#).

DTC No.	DTC Detection Condition	Trouble Area
78(1)	Pressure change of common rail is abnormal against injection quantify and supply quantify of supply pump	<ul style="list-style-type: none"> <li>• Open or short in EDU circuit</li> <li>• EDU</li> <li>• Open or short in injector circuit</li> <li>• Injector</li> <li>• Open or short in common rail pressure sensor circuit</li> <li>• Common rail pressure sensor</li> <li>• Fuel line between supply pump and common rail</li> <li>• Fuel line between common rail and injector</li> <li>• Pressure limiter</li> <li>• ECM</li> </ul>

## WIRING DIAGRAM

Refer to DTC 49 on [page 05-238](#).

Refer to DTC 97 on [page 05-257](#).

## INSPECTION PROCEDURE

HINT:

Read freeze frame data using hand-held tester, as freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, etc. at the time of the malfunction.

### When using hand-held tester:

<b>1</b>	<b>READ OUTPUT DTC</b>
----------	------------------------

**Result:**

	A	B
Result	39, 49, 78 (2), 78 (3) or 97 are not output	39, 49, 78 (2), 78 (3) or 97 are output

**B**

**GO TO RELEVANT DTC CHART**  
(See [page 05-164](#))

**A**

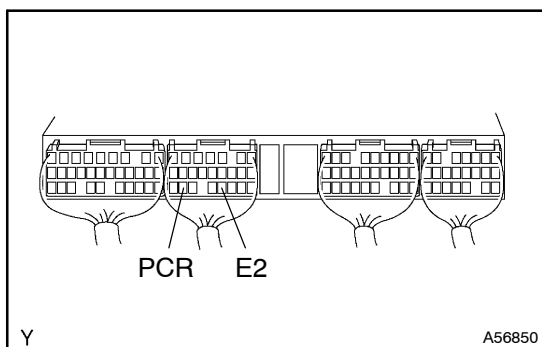
<b>2</b>	<b>CHECK FUEL LEAKAGE(ENGINE ROOM)</b>
----------	--

**NG**

**REPAIR OR REPLACE**

**OK**

### 3 INSPECT ECM



- (a) Turn the ignition switch ON.
- (b) Measure the voltage between terminals PCR and E2 of the ECM connector.

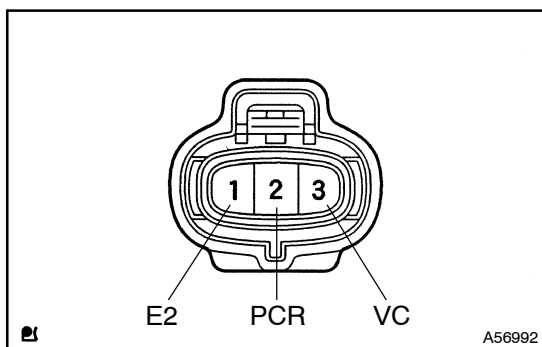
**Voltage: Approx. 1 V at 20°C (68°F)**

**OK**

**Go to step 5**

**NG**

### 4 CHECK HARNESS AND CONNECTOR(COMMON RAIL FUEL PRESSURE SENSOR-ECM)



- (a) Disconnect the fuel pressure sensor connector.
- (b) Disconnect the ECM E10 connector.
- (c) Check for open between the terminals 3 of the fuel pressure sensor harness side connector and VC of the ECM E10 connector.

**Resistance: 1 Ω or less**

- (d) Check for open between the terminals 2 of the fuel pressure sensor harness side connector and PCR of the ECM E10 connector.

**Resistance: 1 Ω or less**

- (e) Check for open between the terminals 1 of the fuel pressure sensor harness side connector and E2 of the ECM E10 connector.

**Resistance: 1 Ω or less**

- (f) Check for short between the terminals VC and PCR of the ECM E10 connector.

**Resistance: 1 MΩ or more**

- (g) Check for short between the terminals VC, PCR and E2 of the ECM E10 connector.

**Resistance: 1 MΩ or more**

**NG**

**REPAIR OR REPLACE HARNESS AND CONNECTOR**

**OK**

### REPLACE COMMON RAIL ASSY

## 5 READ VALUE OF HAND-HELD TESTER (COMPENSATION OF INJECTION QUANTIFY BETWEEN CYLINDERS)

- (a) Turn the ignition switch ON.  
 (b) Read the compensation of the injection quantify between the cylinders on the hand-held tester.

### Result:

STD -3 -3 mm<sup>3</sup>/st

Maximum -5 -5 mm<sup>3</sup>/st

NG

REPLACE INJECTOR ASSY

OK

## 6 CHECK FUEL (MIXED WITH ENGINE OIL)

NG

REPLACE INJECTOR ASSY

OK

## 7 CHECK EXHAUST GAS (WHEN YOU START ENGINE, WHITE SMOKE)

NG

REPLACE INJECTOR ASSY

OK

## 8 INSPECT INJECTOR ASSY (See page 05-212)

NG

REPLACE INJECTOR ASSY

OK

REPLACE COMMON RAIL ASSY

## When not using hand-held tester:

### 1 READ OUTPUT DTC

### Result:

	A	B
Result	39, 49, 78 (2), 78 (3) or 97 are not output	39, 49, 78 (2), 78 (3) or 97 are output

SST 09843-18040

B

GO TO RELEVANT DTC CHART  
 (See page 05-164)

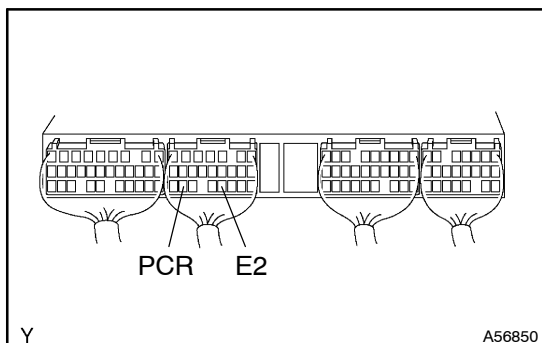
A

## 2 CHECK FUEL LEAKAGE(ENGINE ROOM)

NG REPAIR OR REPLACE

OK

## 3 INSPECT ECM



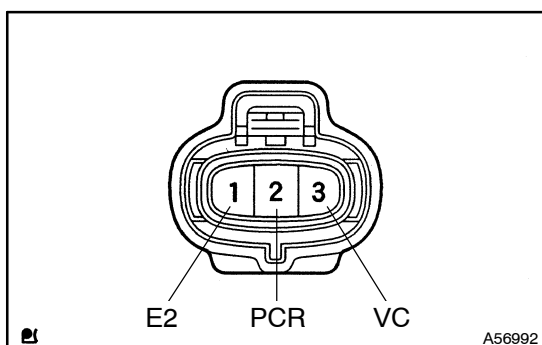
- Turn the ignition switch ON.
- Measure the voltage between terminals PCR and E2 of the ECM connector.

**Voltage: Approx. 1 V at 20°C (68°F)**

OK Go to step 5

NG

## 4 CHECK HARNESS AND CONNECTOR(COMMON RAIL FUEL PRESSURE SENSOR-ECM)



- Disconnect the fuel pressure sensor connector.
- Disconnect the ECM E10 connector.
- Check for open between the terminals 3 of the fuel pressure sensor harness side connector and VC of the ECM E10 connector.

**Resistance: 1 Ω or less**

- Check for open between the terminals 2 of the fuel pressure sensor harness side connector and PCR of the ECM E10 connector.

**Resistance: 1 Ω or less**

- Check for open between the terminals 1 of the fuel pressure sensor harness side connector and E2 of the ECM E10 connector.

**Resistance: 1 Ω or less**

- Check for short between the terminals VC and PCR of the ECM E10 connector.

**Resistance: 1 MΩ or more**

- Check for short between the terminals VC, PCR and E2 of the ECM E10 connector.

**Resistance: 1 MΩ or more**

NG REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

## REPLACE COMMON RAIL ASSY

**5 CHECK FUEL(MIXED WITH ENGINE OIL)****NG****REPLACE INJECTOR ASSY****OK****6 CHECK EXHAUST GAS(WHEN YOU START ENGINE,WHITE SMOKE)****NG****REPLACE INJECTOR ASSY****OK****GO TO DTC CHART (See [page 05-251](#))**