DTC	78(1)	FUEL LINE MALFUNCTION

CIRCUIT DESCRIPTION

Refer to DTC 49 on page 05–515.
Refer to DTC 97 on page 05–531.

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	• Open or short in EDU circuit • EDU • Open or short in injector circuit • Injector • Open or short in common rail pressure sensor circuit • Common rail pressure sensor • Fuel line between supply pump and common rail • Fuel line between common rail and injector • Pressure limiter • ECM

WIRING DIAGRAM

Refer to DTC 49 on page 05–515.
Refer to DTC 97 on page 05–531.

INSPECTION PROCEDURE

HINT:

- If different DTCs that are related to different systems are output simultaneously while terminal E2 is used as a ground terminal, terminal E2 may be open.
- Read freeze frame data using the 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:

1	READ OUTPUT DTC

Result:

Display (DTC output)	Proceed
39, 49, 78 (2), 78 (3) or 97 are not output	A
39, 49, 78 (2), 78 (3) or 97 are output	B

B → GO TO RELEVANT DTC CHART

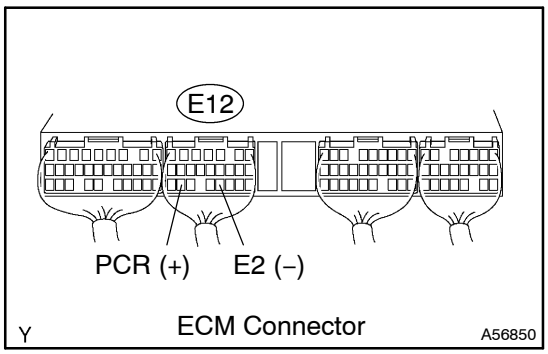
A

2	CHECK FUEL LEAKAGE (See page 11–106)

NG → REPAIR OR REPLACE

OK

3 INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between the terminals of the ECM E12 connector.

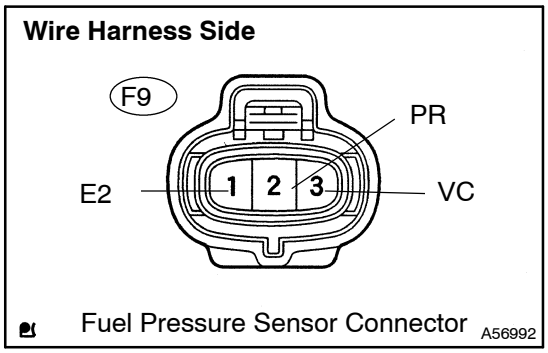
Voltage:

Symbols (Terminal No.)	Specified condition
PCR (E12 – 23) ⇔ E2 (E12 – 20)	Approx. 1 V at 20 °C (68 °F)

OK → **Go to step 5**

NG

4 CHECK HARNESS AND CONNECTOR(FUEL PRESSURE SENSOR FOR COMMON RAIL – ECM)



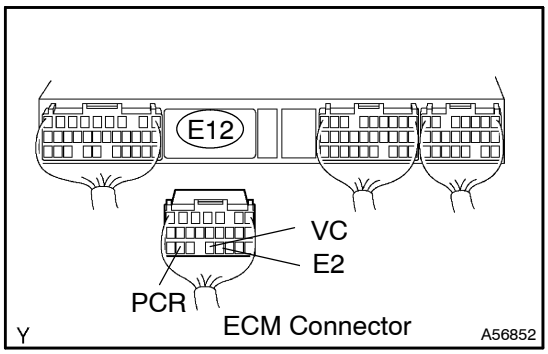
(a) Disconnect the fuel pressure sensor connector.
(b) Disconnect the ECM E12 connector.
(c) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
VC (F9 – 3) ⇔ VC (E12 – 21)	Continuity
PR (F9 – 2) ⇔ PCR (E12 – 23)	
E2 (F9 – 1) ⇔ E2 (E12 – 20)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
VC (E12 – 21) ⇔ PCR (E12 – 23)	No continuity
VC (E12 – 21) ⇔ E2 (E12 – 20)	
PCR (E12 – 23) ⇔ E2 (E12 – 20)	



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

OK

REPLACE COMMON RAIL ASSY (See page 11–122)

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^3/st
Maximum – 4 – 4 mm^3/st

NG → **REPLACE INJECTOR ASSY (See page 11–106)**

OK

6	CHECK FUEL(MIXED WITH ENGINE OIL)

NG → **REPLACE INJECTOR ASSY (See page 11–106)**

OK

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

NG → **REPLACE INJECTOR ASSY (See page 11–106)**

OK

8	INSPECT INJECTOR ASSY (See page 11–102)

NG → **REPLACE INJECTOR ASSY (See page 11–106)**

OK

REPLACE COMMON RAIL ASSY (See page 11–122)

When not using hand–held tester:

1	READ OUTPUT DTC

Result:

Display (DTC output)	Proceed
39, 49, 78 (2), 78 (3) or 97 are not output	A
39, 49, 78 (2), 78 (3) or 97 are output	B

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B → **GO TO RELEVANT DTC CHART (See page 05–437)**

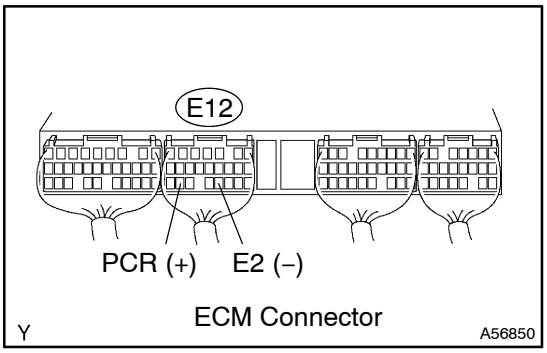
A

2	CHECK FUEL LEAKAGE (See page 11–106)

NG → REPAIR OR REPLACE

OK

3	INSPECT ECM(CHECK VOLTAGE)



(a) Turn the ignition switch ON.
(b) Measure the voltage between the terminals of the ECM E12 connector.

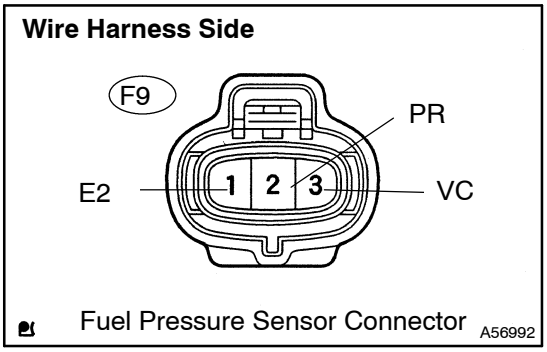
Voltage:

Symbols (Terminal No.)	Specified condition
PCR (E12 – 23) ⇔ E2 (E12 – 20)	Approx. 1 V at 20 °C (68 °F)

OK → Go to step 5

NG

4	CHECK HARNESS AND CONNECTOR(FUEL PRESSURE SENSOR FOR COMMON RAIL – ECM)



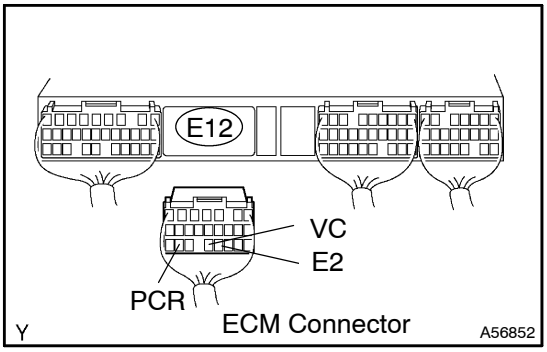
(a) Disconnect the fuel pressure sensor connector.
(b) Disconnect the ECM E12 connector.
(c) Check the continuity between the wire harness side connector.

Standard (Check for open):

Symbols (Terminal No.)	Specified condition
VC (F9 – 3) ⇔ VC (E12 – 21)	Continuity
PR (F9 – 2) ⇔ PCR (E12 – 23)	
E2 (F9 – 1) ⇔ E2 (E12 – 20)	

Standard (Check for short):

Symbols (Terminal No.)	Specified condition
VC (E12 – 21) ⇔ PCR (E12 – 23)	No continuity
VC (E12 – 21) ⇔ E2 (E12 – 20)	
PCR (E12 – 23) ⇔ E2 (E12 – 20)	



NG → REPAIR OR REPLACE HARNESS OR CONNECTOR

OK

REPLACE COMMON RAIL ASSY (See page 11–122)

5	CHECK FUEL(MIXED WITH ENGINE OIL)

NG → REPLACE INJECTOR ASSY (See page 11–106)

OK

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

NG → REPLACE INJECTOR ASSY (See page 11–106)

OK

GO TO EACH DTC CHART (GO TO STEP 1 IN DTC 78 (2), DTC 78 (3))