

DTC	78(2)	FUEL PUMP CIRCUIT MALFUNCTION (OPEN CIRCUIT)
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DTC	78(3)	FUEL PUMP CIRCUIT MALFUNCTION (OVER FORCE FEED)
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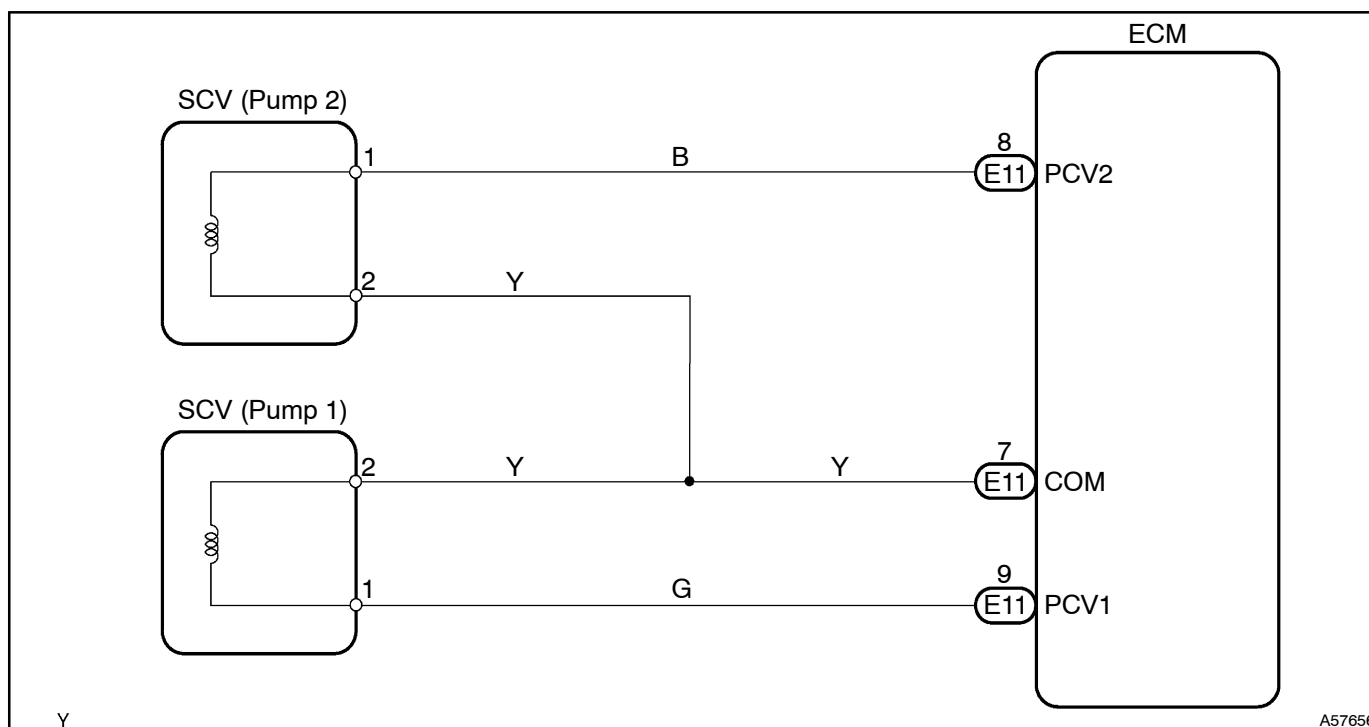
CIRCUIT DESCRIPTION

Supply pump is a tandem type and has two circuits of the fuel suction and force feed processes that achieve both high pressure force feed of fuel and reduction of driving torque.

In the suction process, it control SCV (Suction Control Valve) which suctions fuel by a plunger.

DTC No.	DTC Detection condition	Trouble Area
78 (2) 78 (3)	Pressure change of common rail against supply quantity of supply pump is abnormal	<ul style="list-style-type: none"> • Open or short in SCV circuit • SCV • Supply pump • ECM

WIRING DIAGRAM



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:

1 READ OUTPUT DTC

Result:

	A	B
Result	39, 49, or 97 are not output	39, 49 or 97 are output

B

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

A

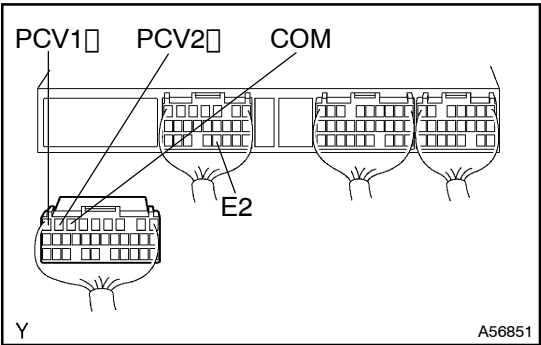
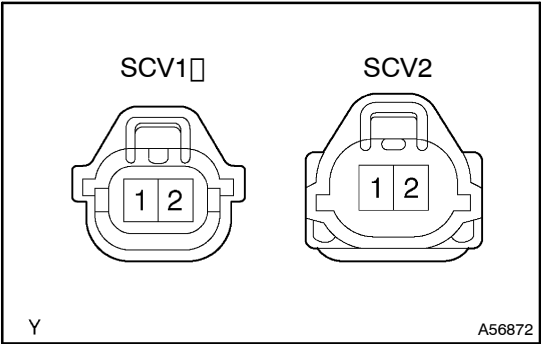
2 INSPECT INJECTION PUMP ASSY (CHECK SCV1 AND SCV2) (See page 11-20)

NG

REPLACE INJECTION PUMP ASSY

OK

3 CHECK HARNESS AND CONNECTOR (SCV-ECM)



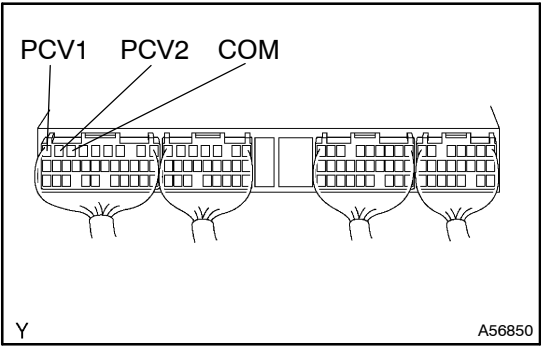
- (a) Disconnect the SCV1 and SCV2 connector.
- (b) Disconnect the ECM E11 connector.
- (c) Check for open between the terminals 1 of the SCV1 harness side connector and PCV1 of the ECM E11 connector.
Resistance: 1 Ω or less
- (d) Check for open between the terminals 1 of the SCV2 harness side connector and PCV2 of the ECM E11 connector.
Resistance: 1 Ω or less
- (e) Check for open between the terminals 2 of the SCV1 and SCV2 harness side connector and COM of the ECM E11 connector.
Resistance: 1 Ω or less
- (f) Check for short between the terminals PCV1, PCV2 and COM of the ECM E11 connector.
Resistance: 1 MΩ or more
- (g) Check for short between the terminals PCV1, PCV2, COM of the ECM E11 connector and E2 of the ECM E10 connector.
Resistance: 1 MΩ or more

NG

REPLACE HARNESS AND CONNECTOR

OK

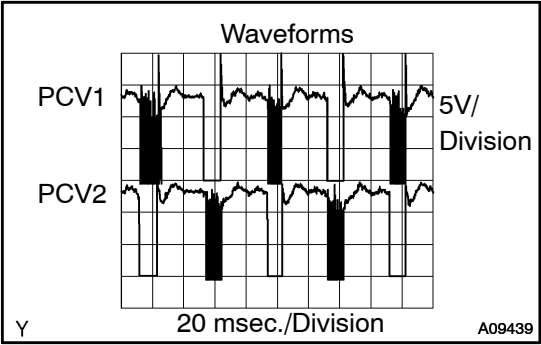
4 INSPECT ECM



(a) Check the output waveform.

Item	Contents
Terminal	CH1: PCV1 ⇔ COM CH2: PCV2 ⇔ COM
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

HINT:
The correct waveforms are as shown.



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CHECK AND REPLACE ECM

OK

REPLACE INJECTION PUMP ASSY

When not using hand-held tester:

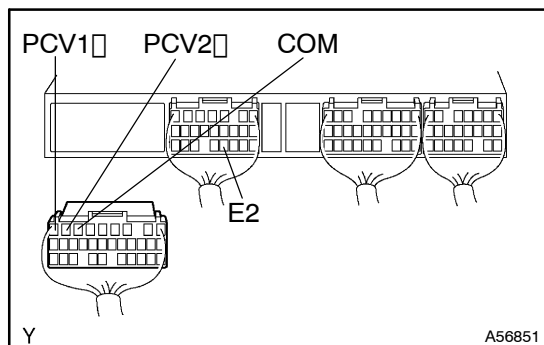
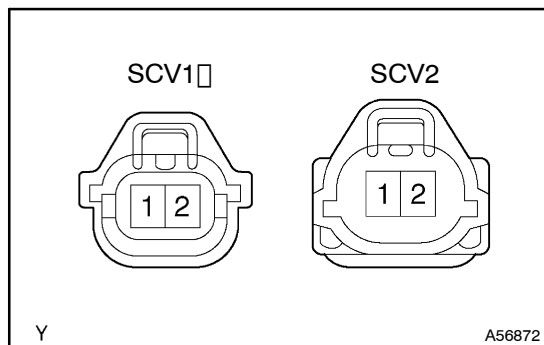
1 INSPECT INJECTION PUMP ASSY (CHECK SCV1 AND SCV2) (See page 11-20)

NG

REPLACE INJECTION PUMP ASSY

OK

2 CHECK HARNESS AND CONNECTOR (SCV-ECM)



- (a) Disconnect the SCV1 and SCV2 connector.
- (b) Disconnect the ECM E11 connector.
- (c) Check for open between the terminals 1 of the SCV1 harness side connector and PCV1 of the ECM E11 connector.

Resistance: 1 Ω or less

- (d) Check for open between the terminals 1 of the SCV2 harness side connector and PCV2 of the ECM E11 connector.

Resistance: 1 Ω or less

- (e) Check for open between the terminals 2 of the SCV1 and SCV2 harness side connector and COM of the ECM E11 connector.

Resistance: 1 Ω or less

- (f) Check for short between the terminals PCV1, PCV2 and COM of the ECM E11 connector.

Resistance: 1 M Ω or more

- (g) Check for short between the terminals PCV1, PCV2, COM of the ECM E11 connector and E2 of the ECM E10 connector.

Resistance: 1 M Ω or more

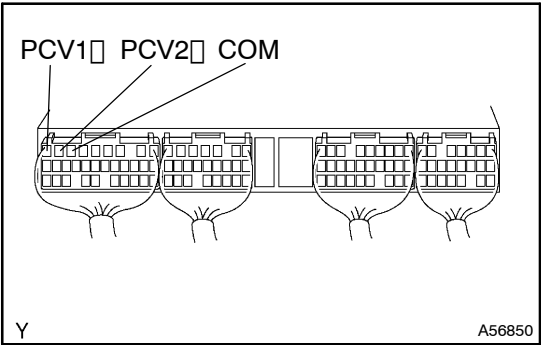
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REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3

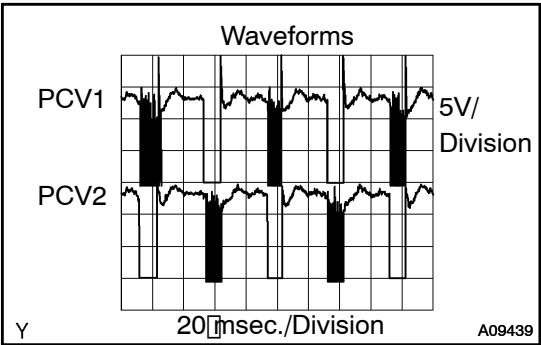
INSPECT ECM



(a) Check the output waveform.

Item	Contents
Terminal	CH1: PCV1 ↔ COM CH2: PCV2 ↔ COM
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or Idling

HINT:
The correct waveforms are as shown.



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CHECK AND REPLACE ECM

OK

4

CHECK ENGINE START

YES

REPLACE INJECTION PUMP ASSY

NO

5

INSPECT INJECTOR ASSY (See page 05-212)

NG

REPLACE INJECTOR ASSY

OK

REPLACE COMMON RAIL ASSY