

<b>DTC</b>	<b>97</b>	<b>EDU CIRCUIT MALFUNCTION</b>
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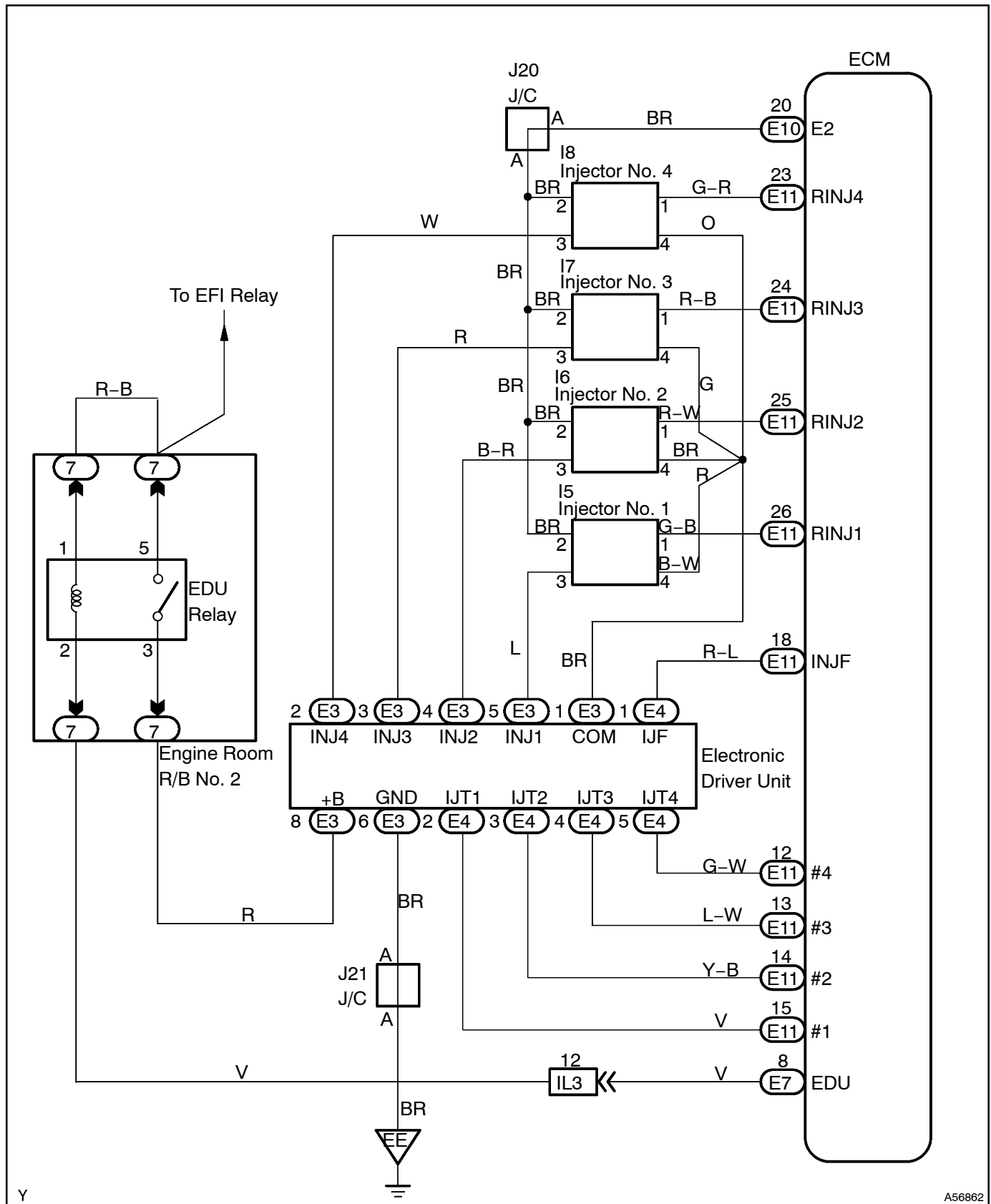
## CIRCUIT DESCRIPTION

The ECM has been adopted to drive the injector at high speeds. The EDU has realized high-speed driving under high fuel pressure conditions through the use of a DC/DC converter that provides a high-voltage, quick-charging system.

The ECM constantly monitors the EDU and stops the engine in case an abnormal condition is detected.

DTC No.	DTC Detection condition	Trouble Area
97	Open or short in EDU circuit	<ul style="list-style-type: none"> <li>• Open or short in EDU circuit</li> <li>• EDU</li> <li>• Open or short in SCV circuit</li> <li>• SCV</li> <li>• Injector</li> <li>• ECM</li> </ul>

## WIRING DIAGRAM



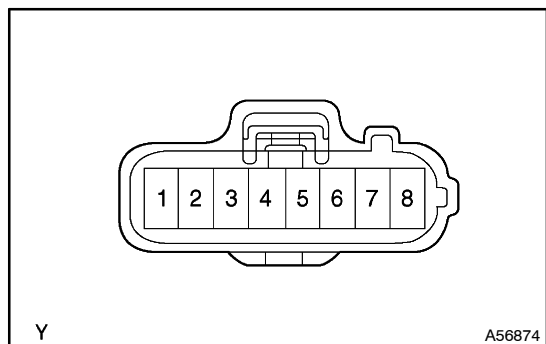
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## INSPECTION PROCEDURE

### HINT:

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

### 1 CHECK HARNESS AND CONNECTOR(EDU PPOWER SOURCE)



- Disconnect the EDU E3 connector.
- Turn the ignition switch ON.
- Measure the voltage between terminals 6 and 8 of the wire harness side connector.

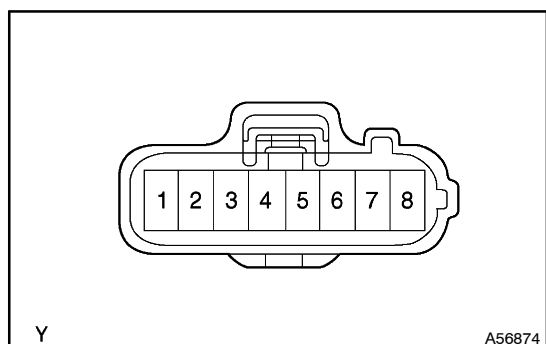
**Voltage: 9 – 14 V**

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CHECK EDU POWER SOUCE CIRCUIT

OK

### 2 CHECK HARNESS AND CONNECTOR (FOR EDU CONNECTOR)



- Disconnect the EDU E3 connector.
- Turn the ignition switch ON.
- Measure the resistance between terminals 1 and 2 – 5 of the wire harness side connector.

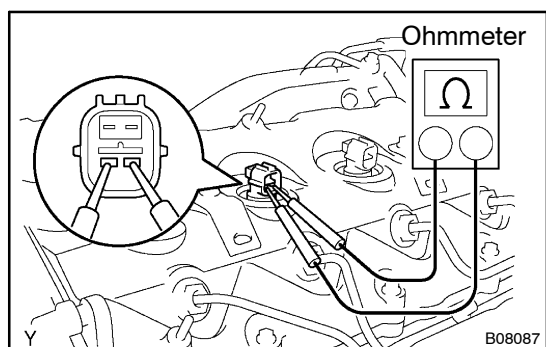
**Resistance: 2.5 – 3.1  $\Omega$  at 20°C (68°F)**

OK

Go to step 4

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### 3 INSPECT INJECTOR ASSY



- Disconnect the 4 injector connectors.
  - Measure the resistance between terminals as shown.
- Resistance: 2.5 – 3.1  $\Omega$  at 20°C (68°F)**

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REPLACE INJECTOR ASSY

OK

### REPAIR OR REPLACE HARNESS AND CONNECTOR

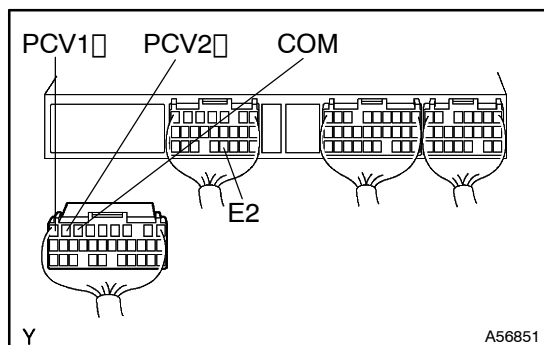
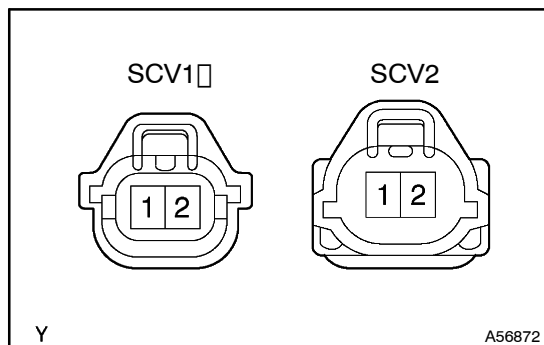
# 4 INSPECT INJECTION PUMP ASSY (CHECK SCV1 AND SCV2) (See page 11-20)

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REPLACE INJECTION PUMP ASSY

OK

# 5 CHECK HARNESS AND CONNECTOR (SCV1 AND SCV2-ECM)



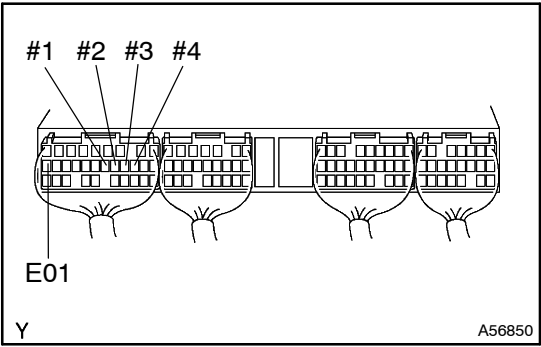
- (a) Disconnect the SCV1 and SCV2 connector.
- (b) Disconnect the ECM E11 connector.
- (c) Check for open between the terminals 1 of the SCV1 harness side connector and PCV1 of the ECM E11 connector.  
**Resistance: 1  $\Omega$  or less**
- (d) Check for open between the terminals 1 of the SCV2 harness side connector and PCV2 of the ECM E11 connector.  
**Resistance: 1  $\Omega$  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  $\Omega$  or less**
- (f) Check for short between the terminals PCV1, PCV2 and COM of the ECM E11 connector.  
**Resistance: 1 M $\Omega$  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 $\Omega$  or more**

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REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

6 INSPECT ECM

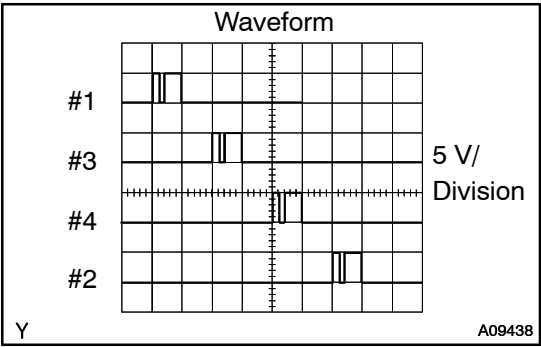


(a) Check the output waveform.

Item	Contents
Terminal	#1 - #4 ⇔ E01
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

HINT:

The correct waveforms are as shown.

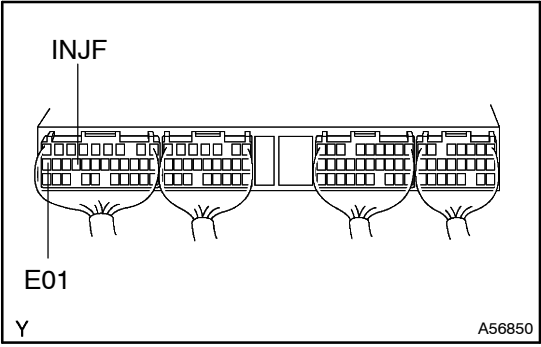


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CHECK AND REPLACE ECM

OK

7 INSPECT ECM

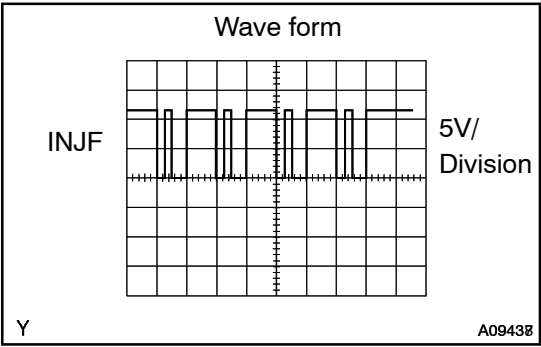


(a) Check the output waveform.

Item	Contents
Terminal	INJF ⇔ E01
Equipment Set	5V/DIV, 20ms/DIV
Condition	During Cranking or idling

HINT:

The correct waveforms are as shown.

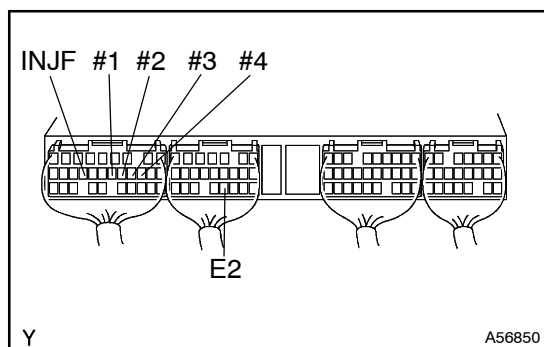
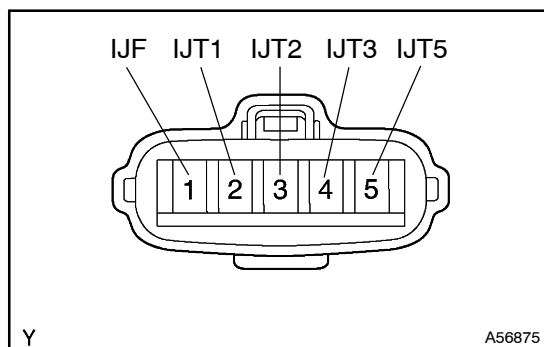


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CHECK AND REPLACE ECM

OK

## 8 CHECK HARNESS AND CONNECTOR(EDU-ECM)



- (a) Disconnect the EDU E4 connector.
- (b) Disconnect the ECU E11 connector.
- (c) Check for open between the terminals IJT1 of the EDU harness side E4 connector and #1 of the ECM E11 connector.  
**Resistance: 1  $\Omega$  or less**
- (d) Check for open between the terminals IJT2 of the EDU harness side E4 connector and #2 of the ECM E11 connector.  
**Resistance: 1  $\Omega$  or less**
- (e) Check for open between the terminals IJT3 of the EDU harness side E4 connector and #3 of the ECM E11 connector.  
**Resistance: 1  $\Omega$  or less**
- (f) Check for open between the terminals IJT4 of the EDU harness side E4 connector and #4 of the ECM E11 connector.  
**Resistance: 1  $\Omega$  or less**
- (g) Check for open between the terminals IJF of the EDU harness side E4 connector and INJF of the ECM E11 connector.  
**Resistance: 1  $\Omega$  or less**
- (h) Check for short between the terminals #1, #2, #3 and #4 of the ECM E11 connector.  
**Resistance: 1 M $\Omega$  or more**
- (i) Check for short between the terminals #1, #2, #3, #4 of the ECM E11 connector and E2 of the ECM E10 connector.  
**Resistance: 1 M $\Omega$  or more**
- (j) Check for short between the terminals INJF of the ECM E11 connector and E2 of the ECM E10 connector.  
**Resistance: 1 M $\Omega$  or more**

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REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE INJECTOR DRIVER