

<b>DTC</b>	<b>P0351</b>	<b>IGNITION COIL "A" PRIMARY/SECONDARY CIRCUIT</b>
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<b>DTC</b>	<b>P0352</b>	<b>IGNITION COIL "B" PRIMARY/SECONDARY CIRCUIT</b>
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<b>DTC</b>	<b>P0353</b>	<b>IGNITION COIL "C" PRIMARY/SECONDARY CIRCUIT</b>
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<b>DTC</b>	<b>P0354</b>	<b>IGNITION COIL "D" PRIMARY/SECONDARY CIRCUIT</b>
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**HINT:**

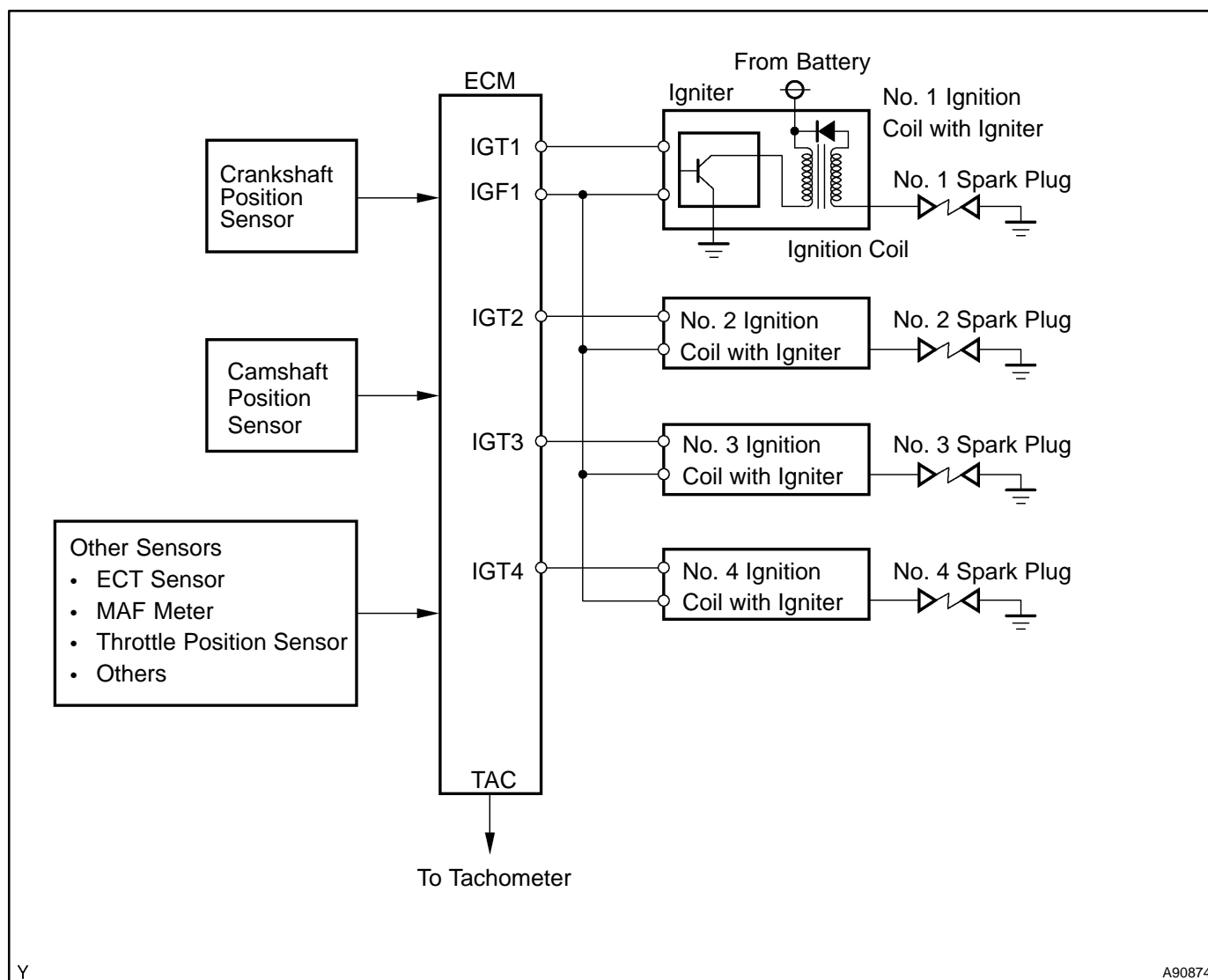
- These DTCs indicate a malfunction related to primary circuit.
- If DTC P0351 is displayed, check No. 1 ignition coil with igniter circuit.
- If DTC P0352 is displayed, check No. 2 ignition coil with igniter circuit.
- If DTC P0353 is displayed, check No. 3 ignition coil with igniter circuit.
- If DTC P0354 is displayed, check No. 4 ignition coil with igniter circuit.

**CIRCUIT DESCRIPTION**

A Direct Ignition System (DIS) is used on this vehicle.

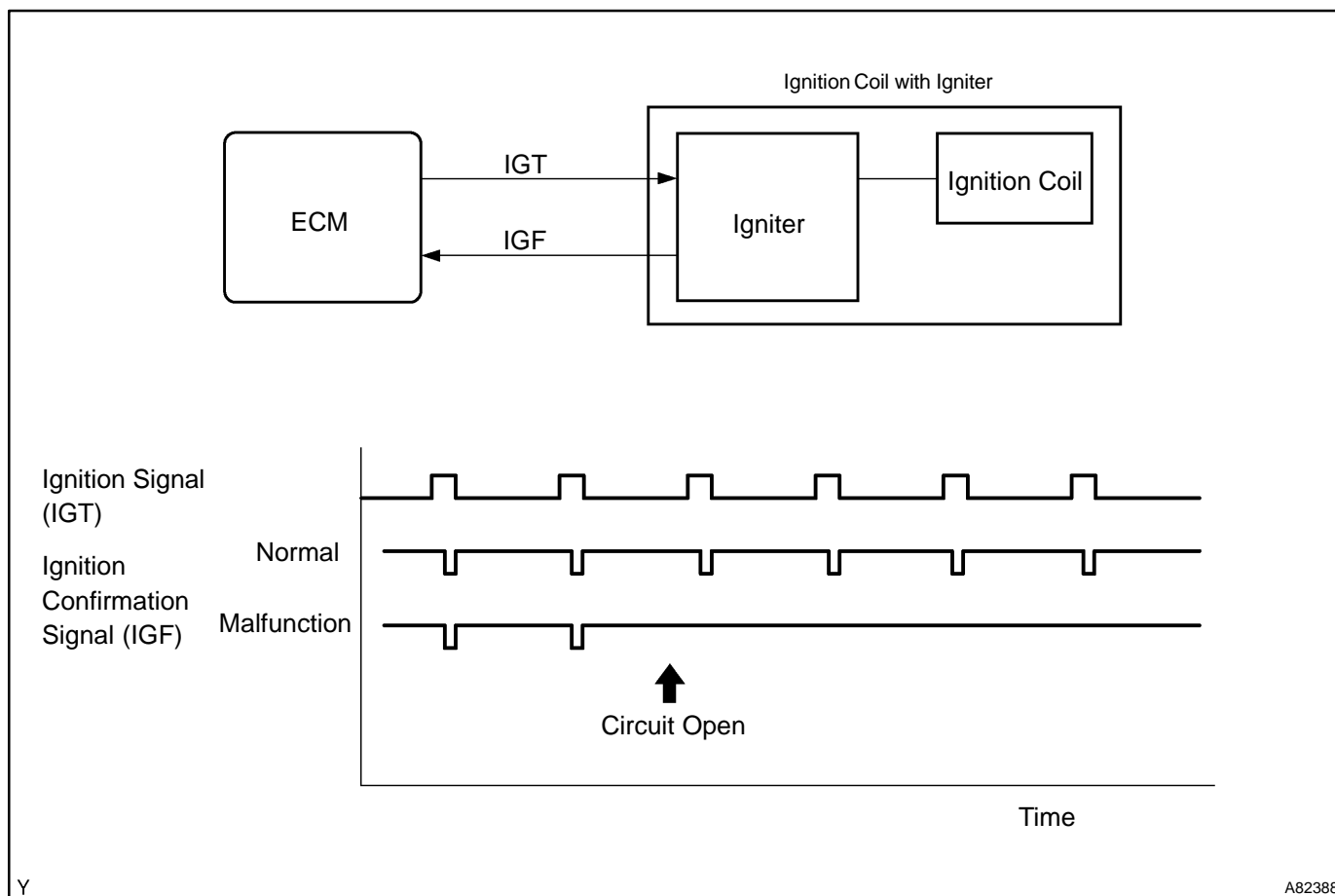
The DIS is a 1-cylinder ignition system which ignites one cylinder with one ignition coil. In the 1-cylinder ignition system, one spark plug is connected to the end of the secondary winding. High-voltage is generated in the secondary winding and is applied directly to the spark plug. The spark of the spark plug passes from the center electrode to the ground electrode.

The ECM determines the ignition timing and outputs the ignition signals (IGTs) for each cylinder. Using the IGT, the ECM turns on and off the power transistor inside the igniter, which switches on and off current to the primary coil. When current to the primary coil is cut off, high-voltage is generated in the secondary coil and this voltage is applied to the spark plugs to create sparks inside the cylinders. As the ECM cuts the current to the primary coil, the igniter sends back the ignition confirmation signal (IGF) for each cylinder ignition to the ECM.



DTC No.	DTC Detection Condition	Trouble Area
P0351 P0352 P0353 P0354	No IGF signal to ECM while engine is running (1 trip detection logic)	<ul style="list-style-type: none"> <li>• Ignition system</li> <li>• Open or short in IGF1 and IGT circuits (1 through 4) from ignition coil Assy to ECM</li> <li>• Ignition coil Assy (No. 1 through No. 4)</li> <li>• ECM</li> </ul>

## MONITOR DESCRIPTION



If the ECM does not receive the IGF after sending the IGT, it interprets this as a fault in the igniter and sets a DTC.

## MONITOR STRATEGY

Related DTCs	P0351: Igniter (Cylinder 1) malfunction P0352: Igniter (Cylinder 2) malfunction P0353: Igniter (Cylinder 3) malfunction P0354: Igniter (Cylinder 4) malfunction
Required sensors/ components (Main)	Igniter
Required sensors / components (Related)	CKP sensor
Frequency of operation	Continuous
Duration	0.256 sec. + 4 sparks
MIL operation	Immediate
Sequence of operation	None

## TYPICAL ENABLING CONDITIONS

The monitor will run whenever these DTCs are not present	See page <a href="#">05-16</a>
Either of the following condition is met:	Condition 1 or 2
1. Engine RPM	1,500 rpm or less
2. Starter	OFF

## TYPICAL MALFUNCTION THRESHOLDS

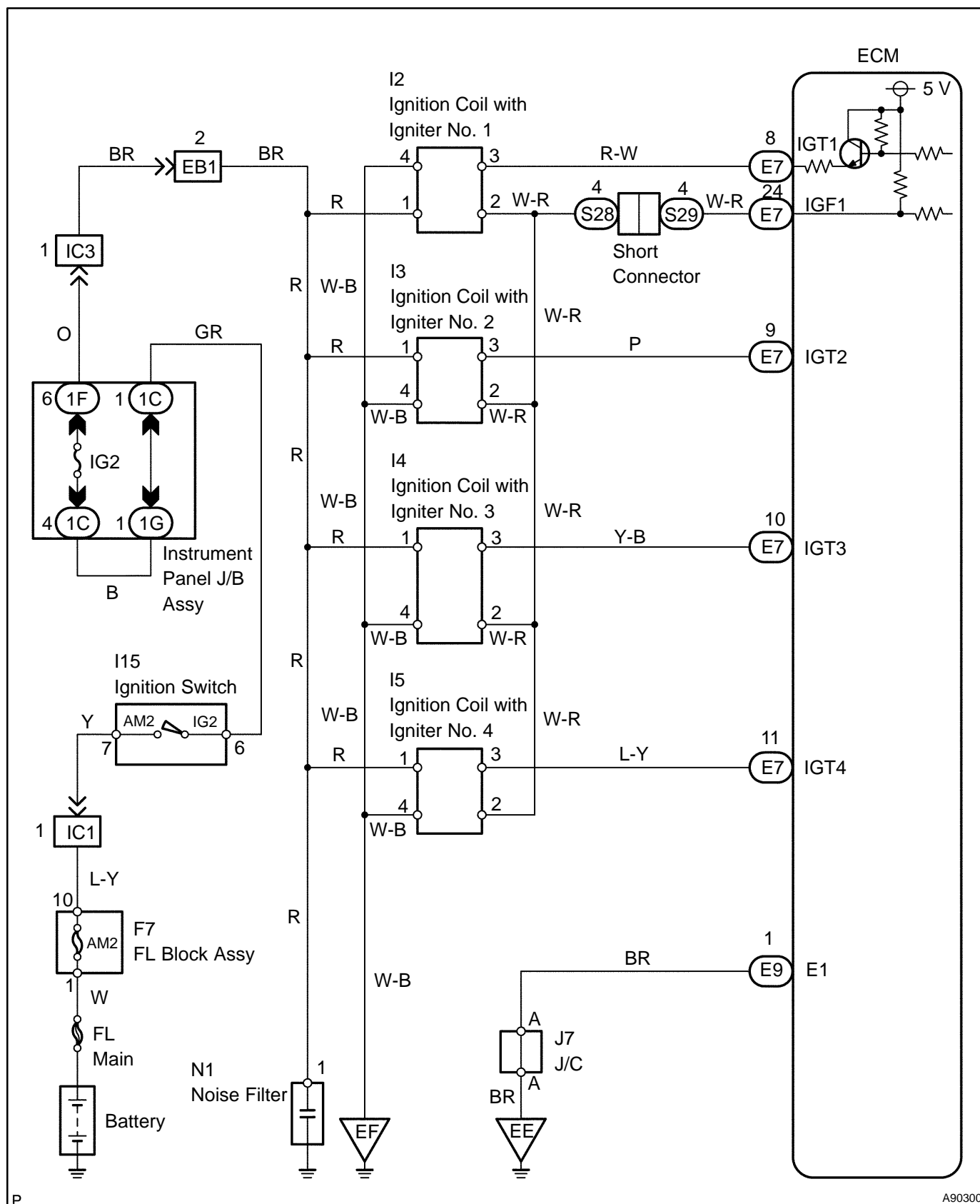
IGF signal	ECM does not receive any IGF signal when ECM sends IGT signal to igniter
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## COMPONENT OPERATING RANGE

IGF signal

Igniter outputs IGF signal when it receives IGT signal from ECM

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### HINT:

Read freeze frame data using the hand-held tester or the OBD II scan tool. 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 SPARK PLUG AND SPARK OF MISFIRING CYLINDER (See page 18-3)

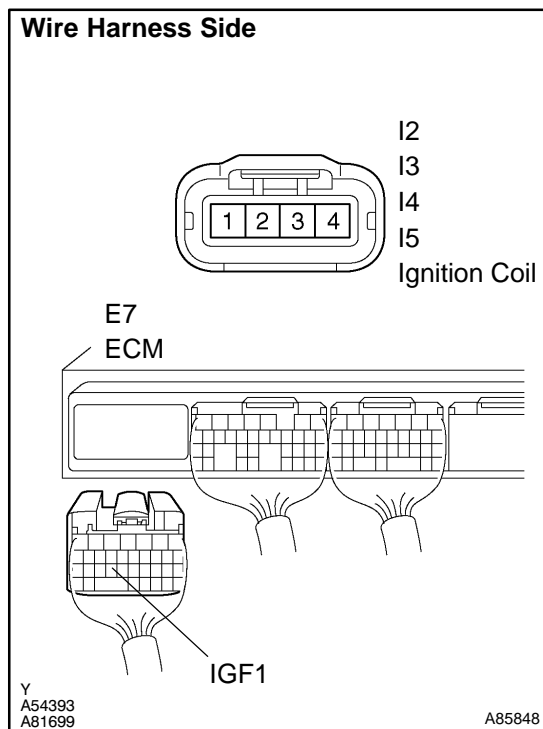
OK: Spark occurs.

NG

Go to step 4

OK

### 2 CHECK WIRE HARNESS (IGNITION COIL ASSY - ECM (IGF TERMINAL))



- Disconnect the I2, I3, I4 and I5 ignition coil connectors.
- Disconnect the E7 ECM connector.
- Measure the resistance of the wire harness side connectors.

#### Standard:

Tester Connection	Specified Condition
I2-2 - E7-24 (IGF1) I3-2 - E7-24 (IGF1) I4-2 - E7-24 (IGF1) I5-2 - E7-24 (IGF1)	Below 1 $\Omega$
I2-2 or E7-24 (IGF1) - Body ground I3-2 or E7-24 (IGF1) - Body ground I4-2 or E7-24 (IGF1) - Body ground I5-2 or E7-24 (IGF1) - Body ground	10 k $\Omega$ or higher

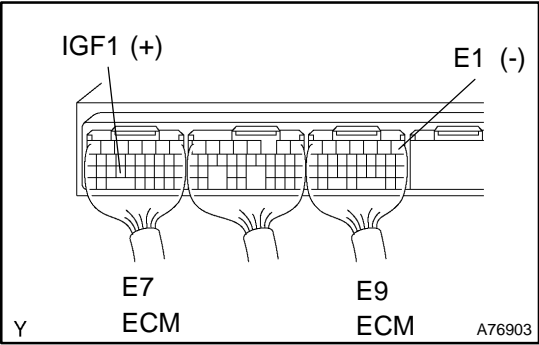
NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3

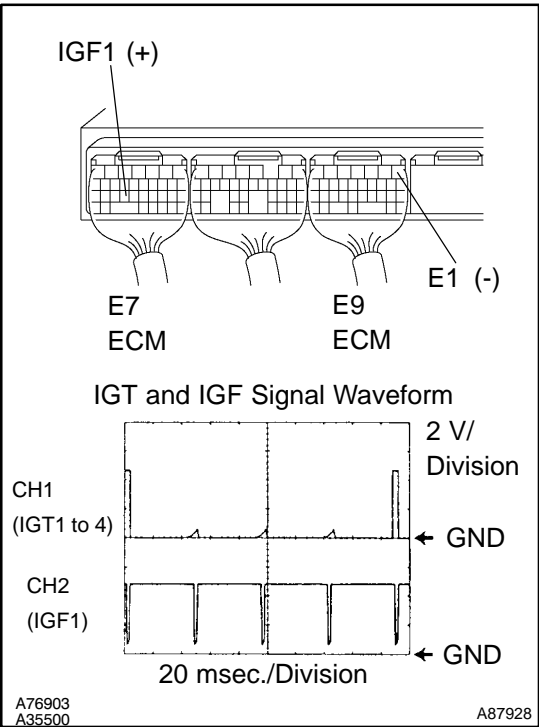
CHECK ECM (IGF1 VOLTAGE)



- (a) Disconnect the I2, I3, I4 and I5 ignition coil connectors.
- (b) Turn the ignition switch ON.
- (c) Measure the voltage of the ECM connectors.

Standard:

Tester Connection	Specified Condition
E7-24 (IGF1) - E9-1 (E1)	4.5 to 5.5 V



HINT:  
Reference: Inspection using the oscilloscope.  
During cranking or idling, check the waveform of the ECM connectors.

Standard:

Tester Connection	Specified Condition
E7-24 (IGF1) - E9-1 (E1)	Correct waveform is as shown

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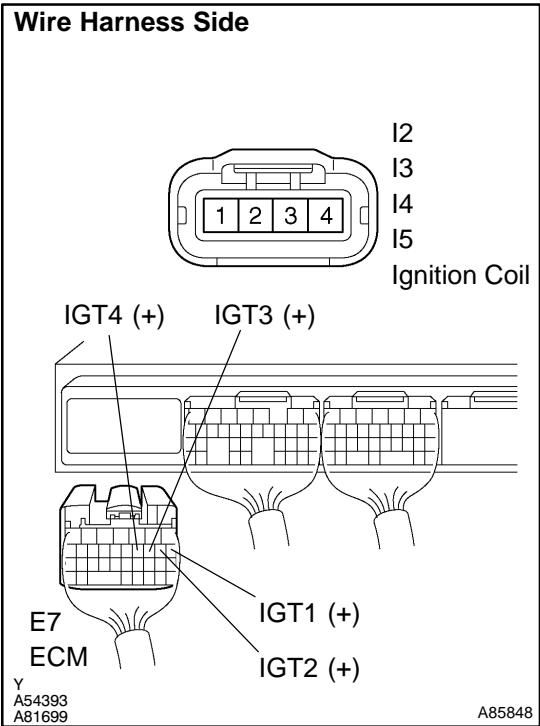
REPLACE ECM (See page 10-9 )

OK

REPLACE IGNITION COIL ASSY

4

CHECK WIRE HARNESS (IGNITION COIL ASSY - ECM (IGT TERMINAL))



- (a) Disconnect the I2, I3, I4 and I5 ignition coil connectors.
- (b) Disconnect the E7 ECM connector.
- (c) Measure the resistance of the wire harness side connectors.

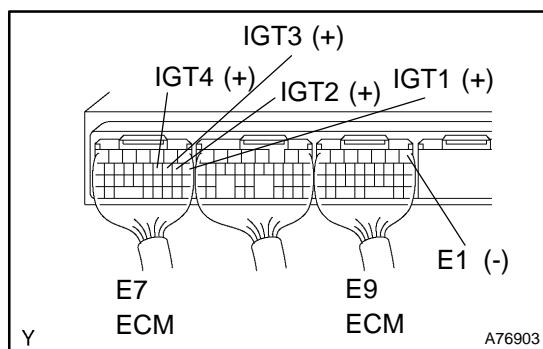
Standard:

Tester Connection	Specified Condition
I2-3 - E7-8 (IGT1) I3-3 - E7-9 (IGT2) I4-3 - E7-10 (IGT3) I5-3 - E7-11 (IGT4)	Below 1 $\Omega$
I2-3 or E7-8 (IGT1) - Body ground I3-3 or E7-9 (IGT2) - Body ground I4-3 or E7-10 (IGT3) - Body ground I5-3 or E7-11 (IGT4) - Body ground	10 k $\Omega$ or higher

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REPAIR OR REPLACE HARNESS AND CONNECTOR

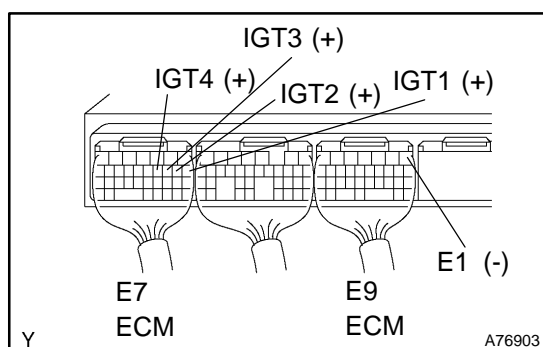
OK

**5 CHECK ECM**

- (a) Measure the voltage of the ECM connectors when the engine is cranked.

**Standard:**

Tester Connection	Specified Condition
E7-8 (IGT1) - E9-1 (E1) E7-9 (IGT2) - E9-1 (E1) E7-10 (IGT3) - E9-1 (E1) E7-11 (IGT4) - E9-1 (E1)	More than 0.1 V or less than 4.5 V



- (b) Disconnect the I2, I3, I4 and I5 ignition coil connectors.  
(c) Measure the voltage of the ECM connectors when the engine is cranked.

**Standard:**

Tester Connection	Specified Condition
E7-8 (IGT1) - E9-1 (E1) E7-9 (IGT2) - E9-1 (E1) E7-10 (IGT3) - E9-1 (E1) E7-11 (IGT4) - E9-1 (E1)	4.5 V or more

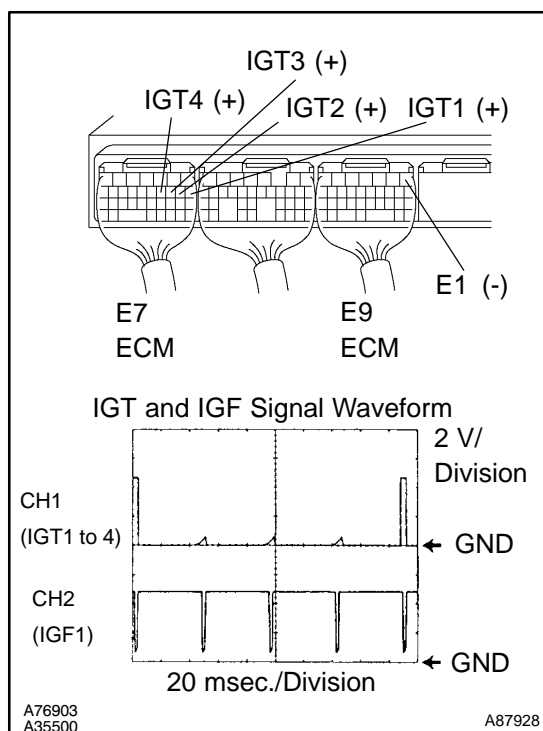
**HINT:**

Reference: Inspection using an oscilloscope.

During cranking or idling, check the waveform of the ECM connectors.

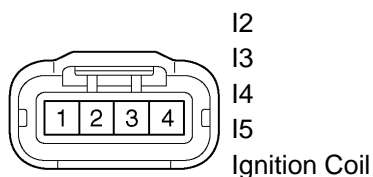
**Standard:**

Tester Connection	Specified Condition
E7-8 (IGT1) - E9-1 (E1) E7-9 (IGT2) - E9-1 (E1) E7-10 (IGT3) - E9-1 (E1) E7-11 (IGT4) - E9-1 (E1)	Correct waveform is as shown

**OK****NG****REPLACE ECM (See page 10-9)**

## 6 CHECK IGNITION COIL ASSY (POWER SOURCE)

### Wire Harness Side



Y

A54393

- Disconnect the I2, I3, I4 and I5 ignition coil connectors.
- Turn the ignition switch ON.
- Measure the voltage of the wire harness side connector and body ground.

#### Standard:

Tester Connection	Specified Condition
I2-1 - Body ground I3-1 - Body ground I4-1 - Body ground I5-1 - Body ground	9 to 14 V

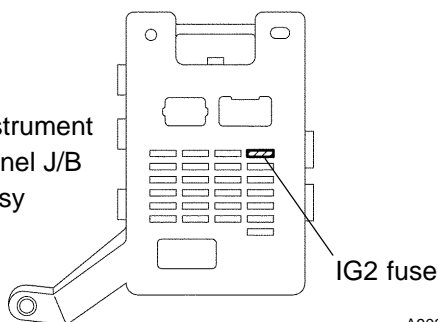
OK

REPLACE IGNITION COIL ASSY

NG

## 7 CHECK WIRE HARNESS (IGNITION COIL ASSY - IGNITION SWITCH)

Instrument  
Panel J/B  
Assy



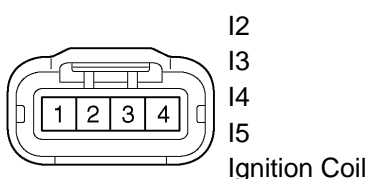
P

A90345

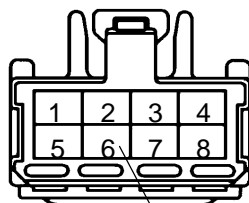
- Check the IG2 fuse.
  - Remove the IG2 fuse from the instrument panel J/B Assy.
  - Measure the resistance of the IG2 fuse.

#### Standard: Below 1 $\Omega$

### Wire Harness Side



I15  
Ignition Switch

Y  
A54393  
A61075

A85536

- Disconnect the I2, I3, I4 and I5 ignition coil connectors.
- Disconnect the I15 ignition switch connector.
- Measure the resistance of the wire harness side connectors.

#### Standard:

Tester Connection	Specified Condition
I2-1 - I15-6 (IG2) I3-1 - I15-6 (IG2) I4-1 - I15-6 (IG2) I5-1 - I15-6 (IG2)	Below 1 $\Omega$
I2-1 or I15-6 (IG2) - Body ground I3-1 or I15-6 (IG2) - Body ground I4-1 or I15-6 (IG2) - Body ground I5-1 or I15-6 (IG2) - Body ground	10 k $\Omega$ or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

**REPLACE IGNITION COIL ASSY**