

|            |              |                                           |
|------------|--------------|-------------------------------------------|
| <b>DTC</b> | <b>P1300</b> | <b>Igniter Circuit Malfunction (No.1)</b> |
| <b>DTC</b> | <b>P1305</b> | <b>Igniter Circuit Malfunction (No.2)</b> |
| <b>DTC</b> | <b>P1310</b> | <b>Igniter Circuit Malfunction (No.3)</b> |
| <b>DTC</b> | <b>P1315</b> | <b>Igniter Circuit Malfunction (No.4)</b> |
| <b>DTC</b> | <b>P1320</b> | <b>Igniter Circuit Malfunction (No.5)</b> |
| <b>DTC</b> | <b>P1325</b> | <b>Igniter Circuit Malfunction (No.6)</b> |

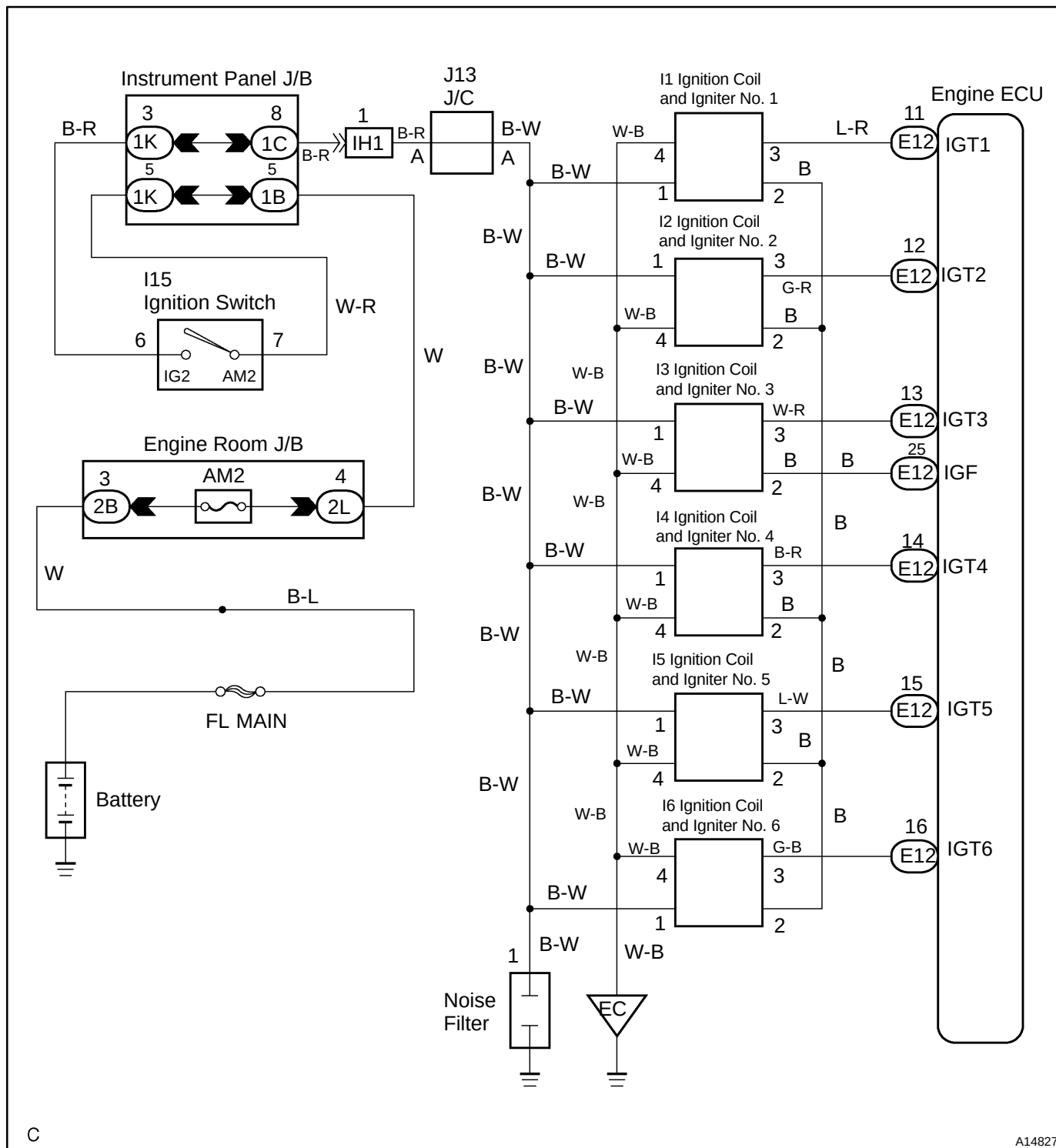
## CIRCUIT DESCRIPTION

A Direct Ignition System (DIS) has been adopted. The DIS improves the ignition timing accuracy, reduces high-voltage loss, and enhances the the overall reliability of the ignition system by eliminating the distributor. The DIS is a 1-cylinder ignition system which ignites one cylinder with one ignition coil. In the 1-cylinder ignition system, the one spark plug is connected to the end of the secondary winding. High voltage generated in the secondary winding is applied directly to the spark plug. The spark of the spark plug pass from the center electrode to the ground electrode.

The ECM determines ignition timing and outputs the ignition signals (IGT) for each cylinder. Based on IGT signals, the power transistors in the igniter cuts off the current to the primary coil in the ignition coil is supplied to the spark plug that are connected to the end of the secondary coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail-safe measure to the ECM.

| DTC No.                                            | DTC Detecting Condition                                                                                                                                                  | Trouble Area                                                                                                                                                                                            |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| P1300<br>P1305<br>P1310<br>P1315<br>P1320<br>P1325 | Condition (a) is repeated 3 times consecutively during 6 consecutively IGT signals while engine is running<br>(a) IGF signal is not input to ECM for 2 or more ignitions | <ul style="list-style-type: none"> <li>• Ignition system</li> <li>• Open or short in IGF or IGT circuit from ignition coil with igniter</li> <li>• Ignition coil with igniter</li> <li>• ECM</li> </ul> |

## WIRING DIAGRAM



## INSPECTION PROCEDURE

### HINT:

- If DTC P1300 is displayed, check No.1 ignition coil with igniter circuit.
- If DTC P1305 is displayed, check No.2 ignition coil with igniter circuit.
- If DTC P1310 is displayed, check No.3 ignition coil with igniter circuit.
- If DTC P1315 is displayed, check No.4 ignition coil with igniter circuit.
- If DTC P1320 is displayed, check No.5 ignition coil with igniter circuit.
- If DTC P1325 is displayed, check No.6 ignition coil with igniter circuit.
- If DTCs P1300, P1315 and P1325, are output simultaneously, IGF1 circuit may be open or short.
- If DTCs P1305, P1310 and P1320, are output simultaneously, IGF2 circuit may be open or short.
- Read freeze frame data using TOYOTA hand-held tester or OBD II scan tool. 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 ratio was lean or rich, etc. at the time of the malfunction.

**1** Check spark plug and spark (See page [DI-57](#) ).

NG

Go to step 4.

OK

**2** Check for open and short in harness and connector in IGF and IGT signal circuits between ECM and ignition coil with igniter (See page [IN-31](#) ).

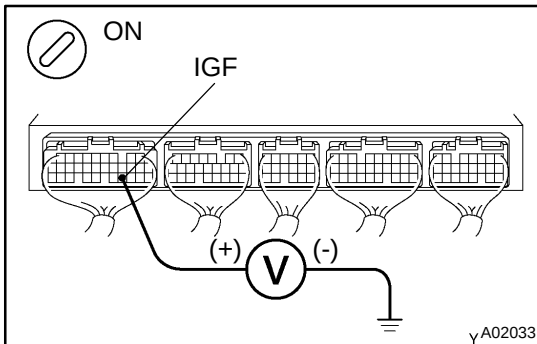
NG

Repair or replace harness or connector.

OK

**3**

**Disconnect ignition coil with igniter connector, and check voltage between terminals IGF of ECM connector and body ground.**

**PREPARATION:**

- (a) Remove the glove compartment (See page [SF-84](#) ).
- (b) Disconnect the ignition coil with the igniter connector.
- (c) Turn the ignition switch ON.

**CHECK:**

Measure the voltage between terminals IGF of the ECM connector and body ground.

**OK:**

**Voltage: 4.5 - 5.5 V**

**OK**

**Replace ignition coil with igniter.**

**NG**

**Check and replace ECM (See page [IN-31](#) ).**

**4**

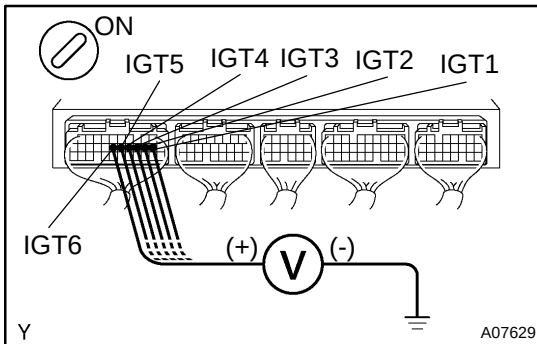
**Check for open and short in harness and connector in IGT signal circuit between ECM and ignition coil with igniter (See page [IN-31](#) ).**

**NG**

**Repair or replace harness or connector.**

**OK**

## 5 Check voltage between terminals IGT1 - IGT6 of ECM connector and body ground.



### PREPARATION:

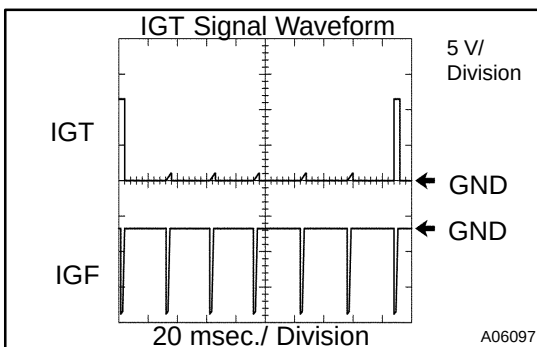
- Remove the glove compartment (See page [SF-84](#)).
- Turn the ignition switch ON.

### CHECK:

Measure the voltage between terminals IGT1 - IGT6 of the ECM connector and body ground when the engine is cranked.

### OK:

**Voltage: More than 0.1 V and less than 4.5 V**



### Reference: INSPECTION USING OSCILLOSCOPE

During cranking or idling, check the waveform between terminals IGT1 - IGT6 and E1 of the ECM connector.

### HINT:

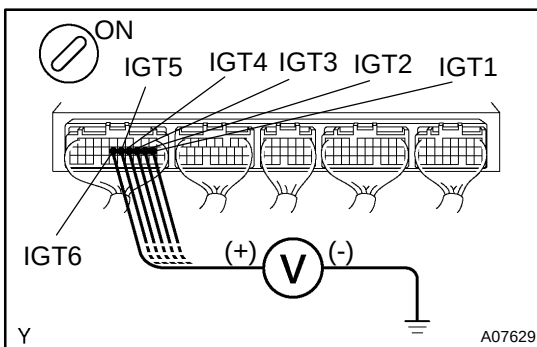
Correct waveform appears as shown, with rectangle waves.

NG

Check and replace ECM (See page [IN-31](#)).

OK

## 6 Disconnect ignition coil with igniter connector, and check voltage between terminals IGT1 - IGT6 of ECM connector and body ground.



### PREPARATION:

- Remove the glove compartment (See page [SF-84](#)).
- Disconnect the ignition coil with the igniter connector.
- Turn the ignition switch ON.

### CHECK:

Measure the voltage between terminals IGT1 - IGT6 of the ECM connector and body ground when the engine is cranked.

### OK:

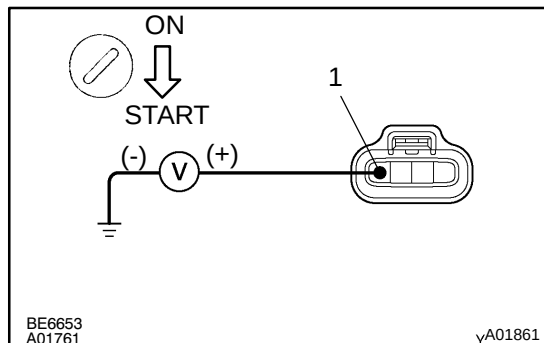
**Voltage: More than 0.1 V and less than 4.5 V**

NG

Check and replace ECM (See page [IN-31](#)).

OK

## 7 Check ignition coil with igniter power source circuit.



### PREPARATION:

Disconnect the ignition coil with the igniter connector.

### CHECK:

Measure the voltage between terminal 1 of the ignition coil with the igniter connector and body ground when the ignition switch is turned to ON and START position.

### OK:

**Voltage: 9 - 14 V**

**NG**

**Repair ignition coil with igniter power source circuit.**

**OK**

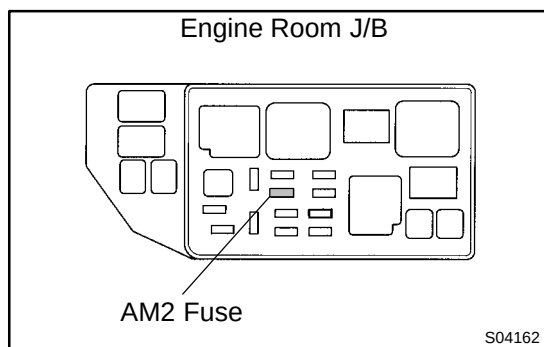
## 8 Check for open and short in harness and connector between ignition switch and ignition coil with igniter (See page [IN-31](#) ).

**NG**

**Repair or replace harness or connector.**

**OK**

## 9 Check AM2 fuse.



### PREPARATION:

Remove the AM2 fuse from the engine room J/B.

### CHECK:

Check the continuity of the AM2 fuse.

### OK:

**Continuity**

**NG**

**Check for short in all harness and components connected to AM2 fuse.**

**OK**

**Replace ignition coil with igniter.**