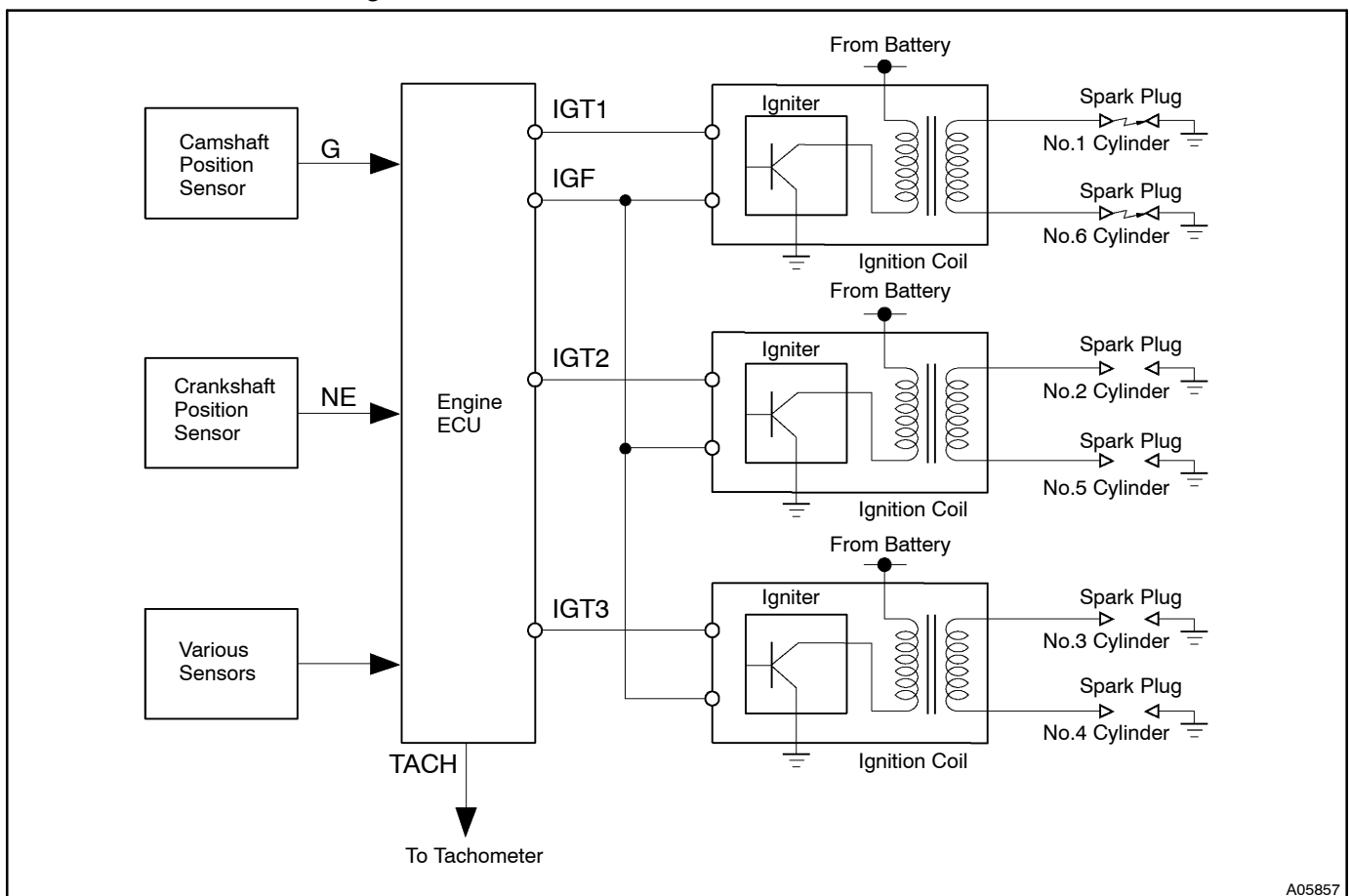


DTC	P 1300/14	Igniter Circuit Malfunction No. 1
DTC	P 1310/15	Igniter Circuit Malfunction No.2
DTC	P 1320/14	Igniter Circuit Malfunction No.3

CIRCUIT DESCRIPTION

A DIS (Direct Ignition System) has been adopted. The DIS improves the ignition timing accuracy, reduces high-voltage loss, and enhances the overall reliability of the ignition system by eliminating the distributor.

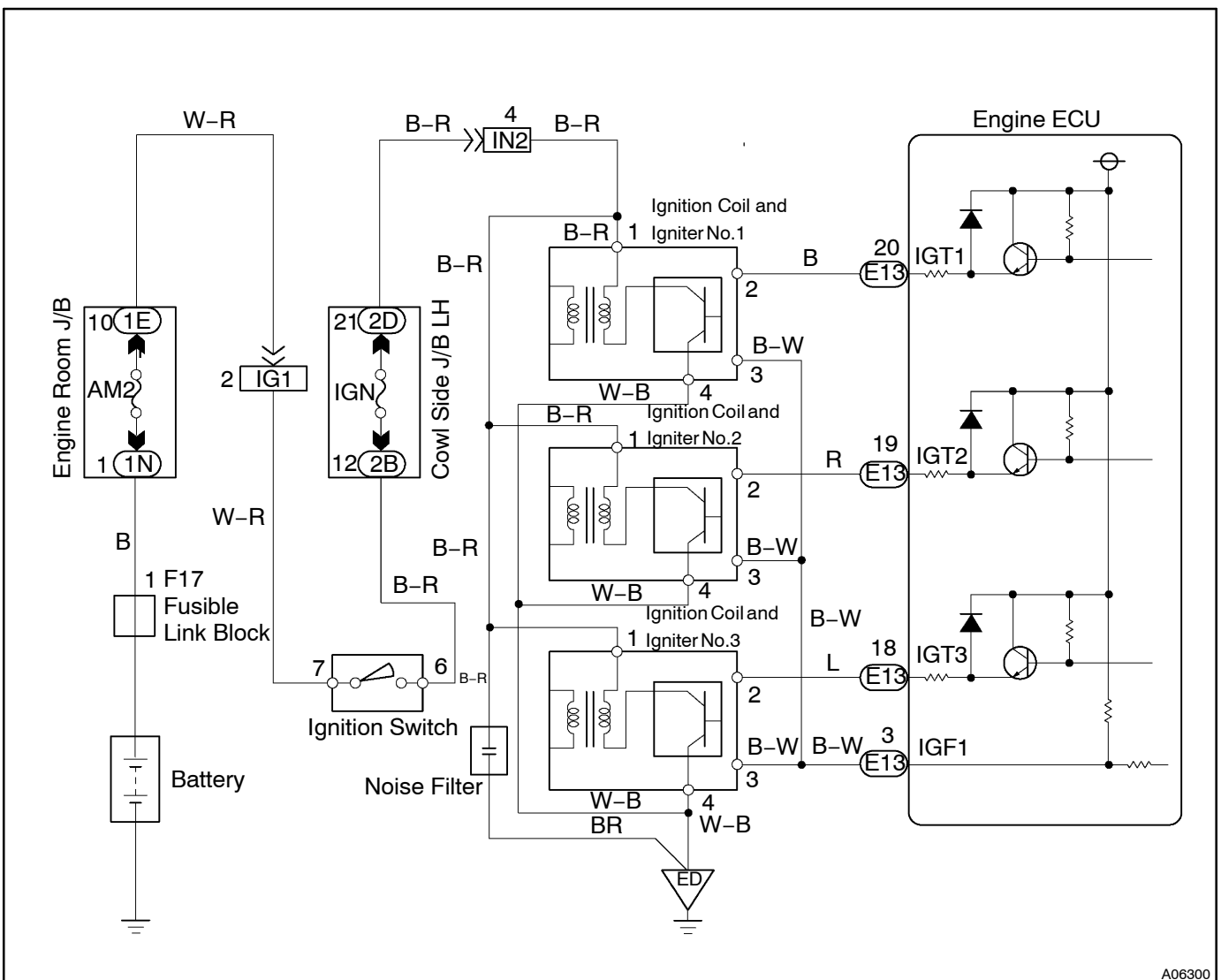
The DIS is a 2-cylinder simultaneous ignition system which ignites 2 cylinders simultaneously with 1 ignition coil. In the 2-cylinder simultaneous ignition system, each of the 2 spark plugs is connected to the end of the secondary winding. High voltage generated in the secondary winding is applied directly to the 2 spark plugs. The sparks of the 2 spark plugs pass simultaneously from the center electrode to the ground electrode. The engine ECU determines ignition timing and outputs the ignition signals (IGT) for each cylinder. Based on IGT signals, the power transistors in the igniter cut off the current to the primary coil in the ignition coil. The current is supplied simultaneously to the 2 spark plugs via the high-tension cords that are connected to the both ends of the secondary coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail-safe measure to the engine ECU.



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DTC No	DTC Detecting Condition	Trouble Area
P1300/14	No IGF signal to engine ECU for 6 consecutive IGT1 signals during engine running	<ul style="list-style-type: none"> • Open or short in IGF or IGT1 circuit from ignition coil to engine ECU. • Ignition coil No.1 (w/ Igniter) • Engine ECU
P1310/15	No IGF signal to engine ECU for 6 consecutive IGT2 signals during engine running	<ul style="list-style-type: none"> • Open or short in IGF or IGT2 circuit from ignition coil to engine ECU. • Ignition coil No.2 (w/ Igniter) • Engine ECU
P1320/14	No IGF signal to engine ECU for 6 consecutive IGT3 signals during engine running	<ul style="list-style-type: none"> • Open or short in IGF or IGT3 circuit from ignition coil to engine ECU. • Ignition coil No.3 (w/ Igniter) • Engine ECU

WIRING DIAGRAM



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 warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- DTC P1300/14 is for the ignition circuit of No.1 and No.6 cylinders.
- DTC P1310/15 is for the ignition circuit of No.2 and No.5 cylinders.
- DTC P1320/14 is for the ignition circuit of No.3 and No.4 cylinders.

1 Check spark plug and spark (See page IG-1).

NG

Go to step 4.

OK

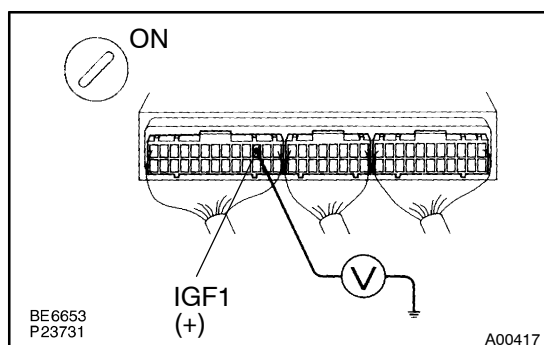
2 Check for open and short in harness and connector in IGF 1 signal circuit between engine ECU and ignition coil No.1, No.2 No.3 (See page IN-19).

NG

Repair or replace harness or connector.

OK

3 Disconnect ignition coil No. 1, No.2, No.3 connectors and check voltage between terminal IGF 1 of engine ECU connector and body ground.



PREPARATION:

- Disconnect the ignition coil No.1, No.2, No.3 connectors.
- Remove the glove compartment door.
- Turn the ignition switch ON.

CHECK:

Measure voltage between terminal IGF1 of engine ECU connector and body ground.

OK:

Voltage: 4.5 – 5.5 V

OK

Replace ignition coil No. 1, No.2, No.3.

NG

Check and replace engine ECU
(See page IN-19).

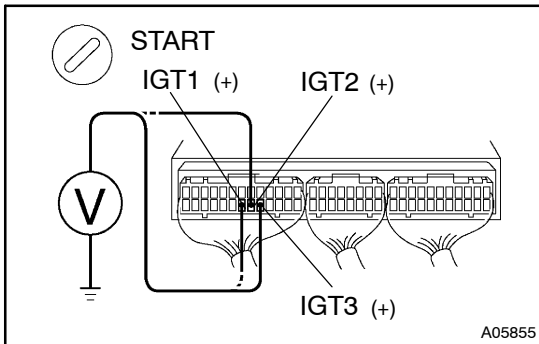
- 4 Check for open and short in harness and connector in IGT1, 2, 3 signal circuit between engine ECU and ignition coil No.1, No.2, No.3 (See page IN-19).

NG

Repair or replace harness or connector.

OK

- 5 Check voltage between terminals IGT1, 2, 3 of engine ECU connector and body ground.



PREPARATION:

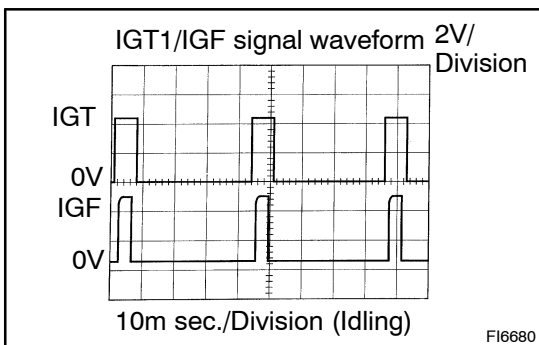
Remove the glove compartment door.

CHECK:

Measure voltage between terminals IGT1, 2, 3 of engine ECU connector and body ground when engine is cranked.

OK:

Voltage: More than 0.1 V and less than 4.5 V



Reference: INSPECTION USING OSCILLOSCOPE

During idling, check waveform between terminals IGT1, 2, 3 and E1 of engine ECU.

HINT:

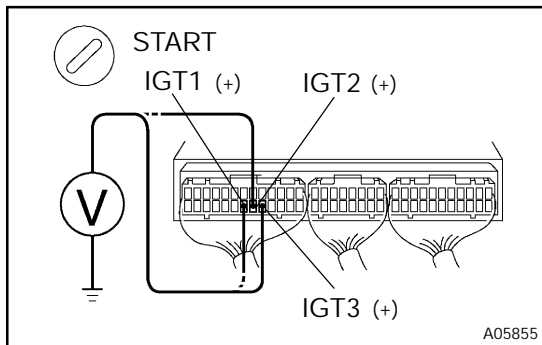
The correct waveform are as shown.

IGT2, IGT3 signal waveform is same as the IGT1 signal waveform.

NG Check and replace engine ECU
(See page IN-19).

OK

- 6 Disconnect ignition coil No.1, No.2, No.3 connector and check voltage between terminals IGT1, 2, 3 of engine ECU connector and body ground.

**PREPARATION:**

- (a) Disconnect the ignition coil No.1, No.2, No.3 connectors.
- (b) Remove the glove compartment door.

CHECK:

Measure voltage between terminals IGT1, 2, 3 of engine ECU connector and body ground when engine is cranked.

OK:

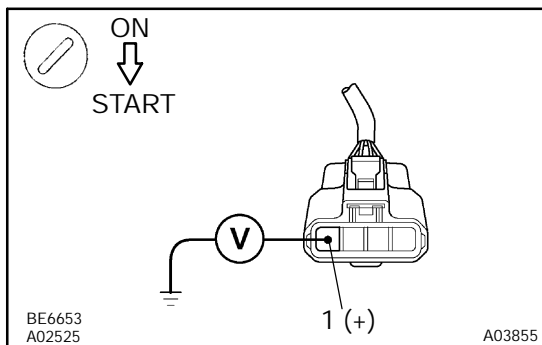
Voltage: More than 0.1 V and less than 4.5 V

NG

Replace ignition coil No.1, No.2, No.3.

OK

- 7 Check ignition coil No.1, No.2, No.3 power source circuit.

**PREPARATION:**

Disconnect the ignition coil No.1, No.2, No.3 connectors.

CHECK:

Measure voltage between terminal 1 of ignition coil (w/ ignitor) connector and body ground, when ignition switch is turned to "ON" and "START" position.

OK:

Voltage: 9 - 14 V

NG

Repair ignition coil No.1, No.2, No.3 power source circuit.

OK

- 8 Check for open and short in harness and connector between ignition switch and ignition coil No.1, No.2, No.3 (See page IN-19).

NG

Repair or replace harness or connector.

OK

9	Check EFI main relay (Marking: EFI) (See page FI-44).
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NG	Replace EFI main relay (Marking: EFI).
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OK

Replace ignition coil No.1, No.2, ,No.3.