DI1IO–08

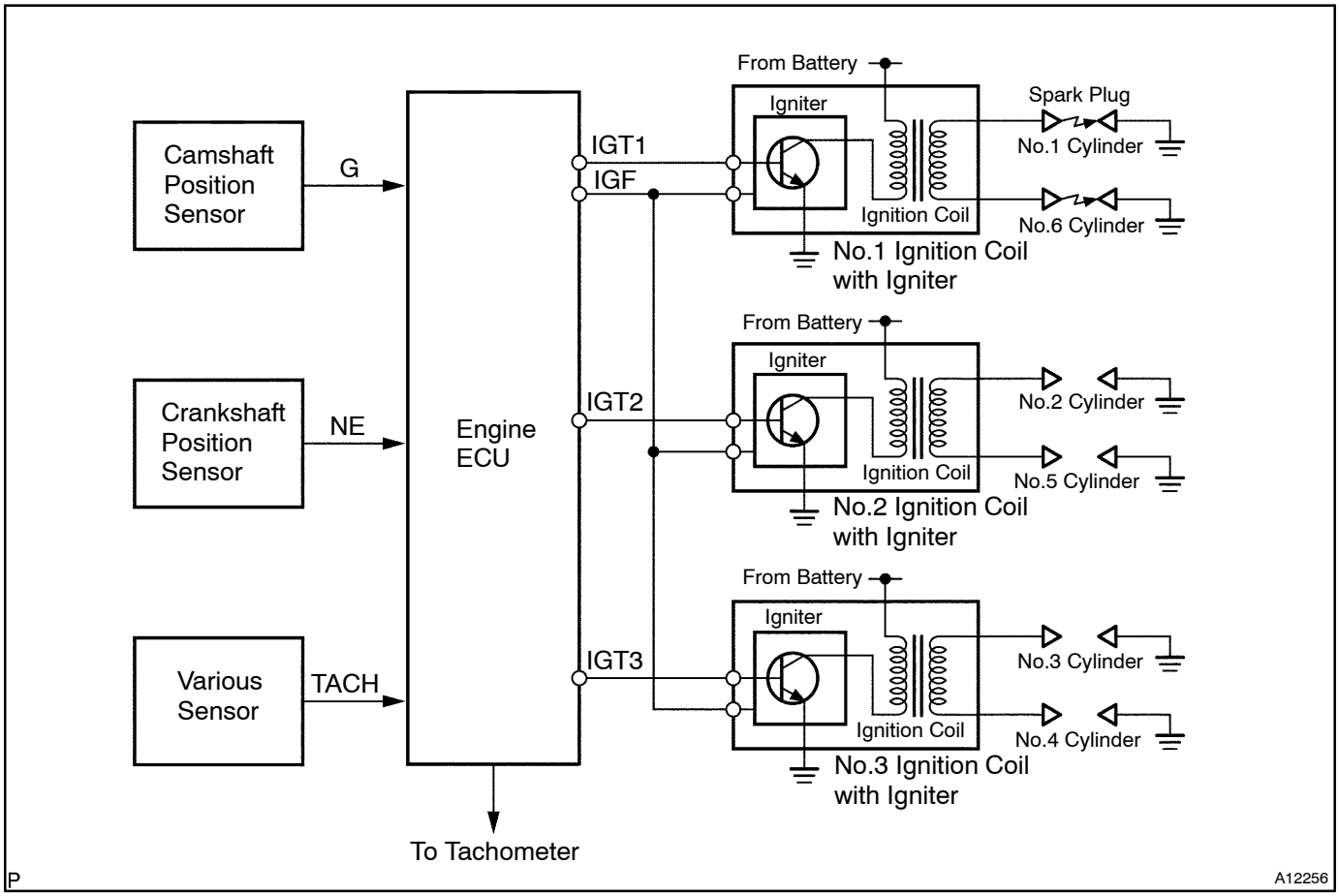
DTC	P1300/14	Igniter Circuit Malfunction (No.1)

DTC	P1310/15	Igniter Circuit Malfunction (No.2)

DTC	P1320/14	Igniter Circuit Malfunction (No.3)

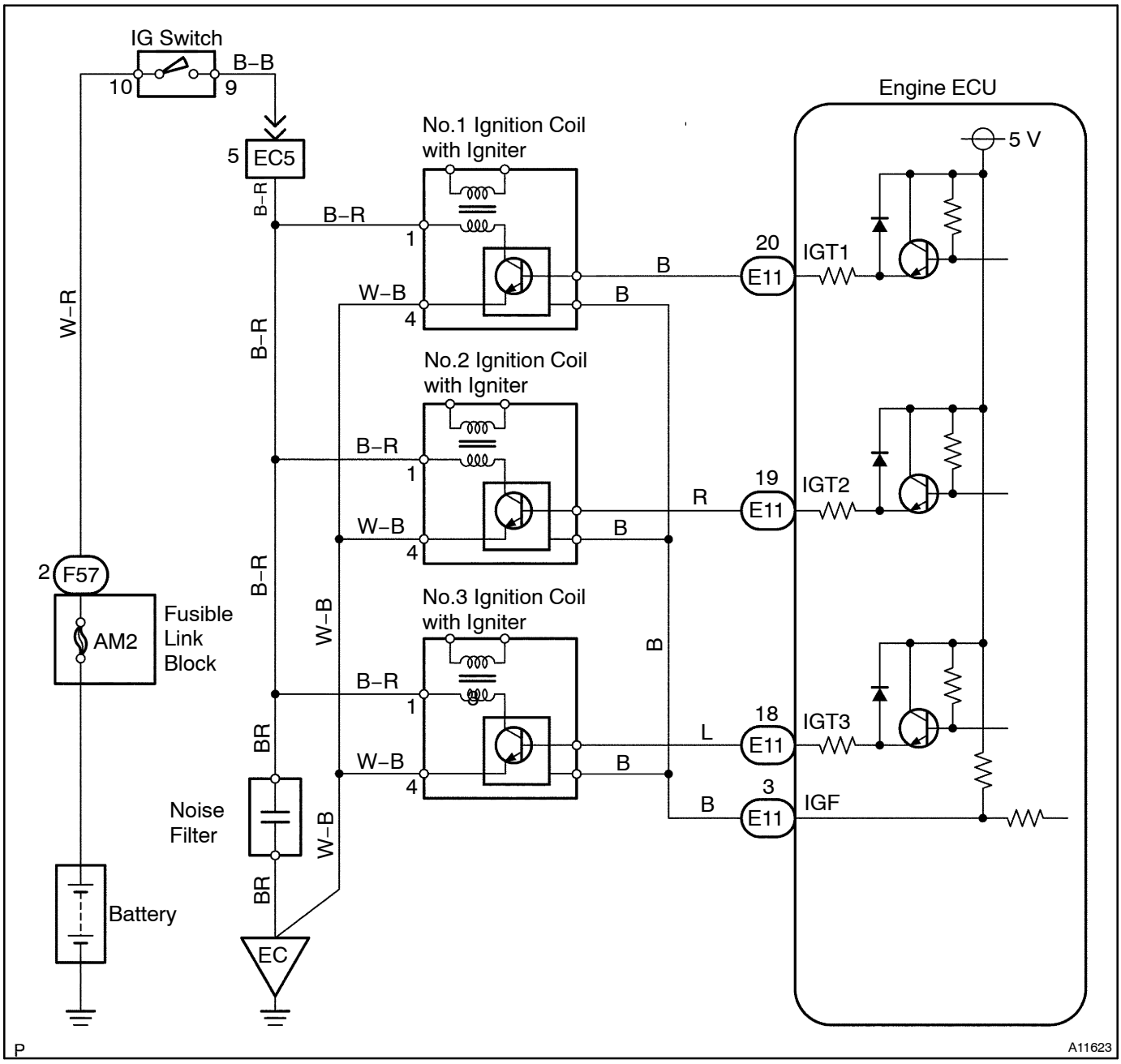
CIRCUIT DESCRIPTION

A Direct Ignition System (DIS) 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 cuts off the current to the primary coil in the ignition coil 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.



DTC No.	DTC Detection Condition	Trouble Area
P1300/14 P1310/15 P1320/14	No IGF signal to engine ECU for 6 consecutive IGT signals during engine running	• Ignition system • Open or short in IGF or IGT circuit from ignition coil with igniter to engine ECU • Ignition coil with Igniter • Engine ECU

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

- Read freed 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 ratio was 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 for spark plug and spark of misfiring cylinder (See page IG–1).

NG → Go to step 4.

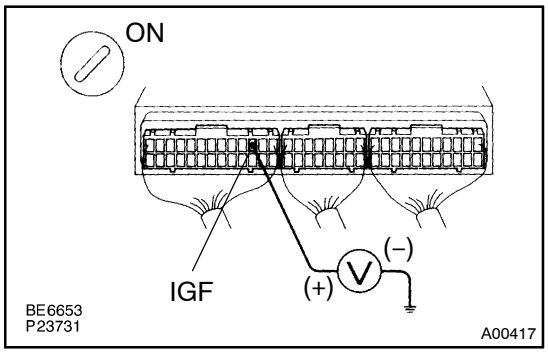
OK

2	Check for open and short in harness and connector in IGF signal circuit between engine ECU and ignition coil with igniter (See page IN–19).

NG → Repair or replace harness or connector.

OK

3	Disconnect ignition coil with igniter connectors, and check voltage between terminal IGF of engine ECU connector and body ground.



PREPARATION:

(a) Disconnect the ignition coil with the igniter connectors.

(b) Turn the ignition switch ON.

CHECK:

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

OK:

Voltage: 4.5 – 5.5 V

OK → Replace ignition coil with igniter.

NG

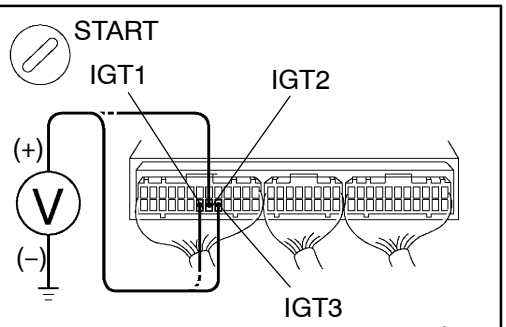
Check and replace engine ECU (See page IN–19).

4	Check for open and short in harness and connector in IGT signal circuit between engine ECU and ignition coil with igniter (See page IN–19).

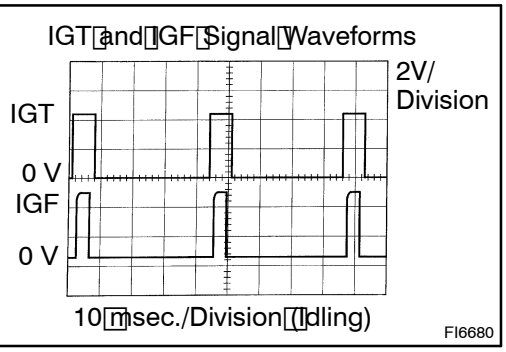
NG → Repair or replace harness or connector.

OK

5	Check voltage between terminals IGT1, IGT2, IGT3 of engine ECU connector and body ground.



PREPARATION:
Remove the glove compartment (See page IN–19).
CHECK:
Measure the voltage between terminals IGT1, IGT2, IGT3 of the engine ECU connector and body ground when the engine is cranked.
OK:
Voltage: More than 0.1 V and less than 4.5 V

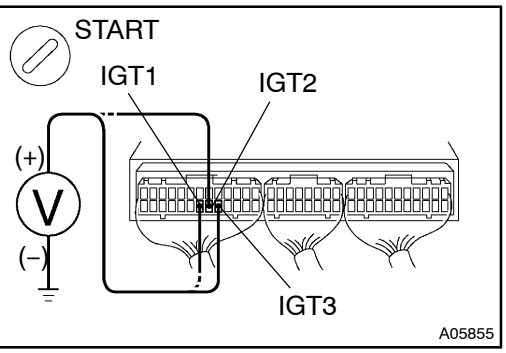


Reference: INSPECTION USING OSCILLOSCOPE
During idling, check the waveforms between terminals IGT1 and E1, IGT2 and E1, and IGT3 and E1 of the engine ECU connector.
HINT:
The correct waveform are as shown.

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

OK

6	Disconnect ignition coil with igniter connectors, and check voltage between terminals IGT1, IGT2, IGT3 of engine ECU connector and body ground.

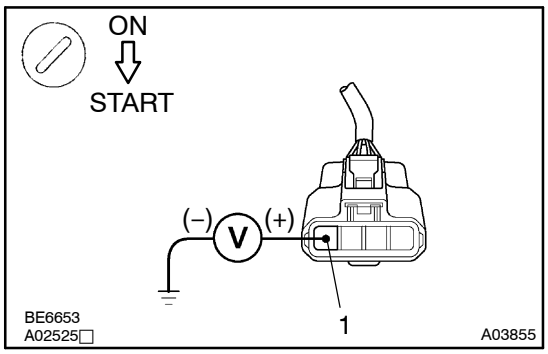


PREPARATION:
(a) Disconnect the ignition coil with the igniter connectors.
(b) Remove the glove compartment (See page IN–19).
CHECK:
Measure the voltage between terminals IGT1, IGT2, IGT3 of the engine ECU connector and body ground when the engine is cranked.
OK:
Voltage: More than 0.1 V and less than 4.5 V

NG → Replace ignition coil with igniter.

OK

7	Check ignition coil with igniter power source circuit.



PREPARATION:
Disconnect the ignition coil with the igniter connectors.
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–19).

NG → Repair or replace harness or connector.

OK

Replace ignition coil with igniter.