DTC	P1300/14	IGNITER CIRCUIT MALFUNCTION(NO.1)

DTC	P1305/15	IGNITER CIRCUIT MALFUNCTION(NO.2)

DTC	P1310/14	IGNITER CIRCUIT MALFUNCTION(NO.3)

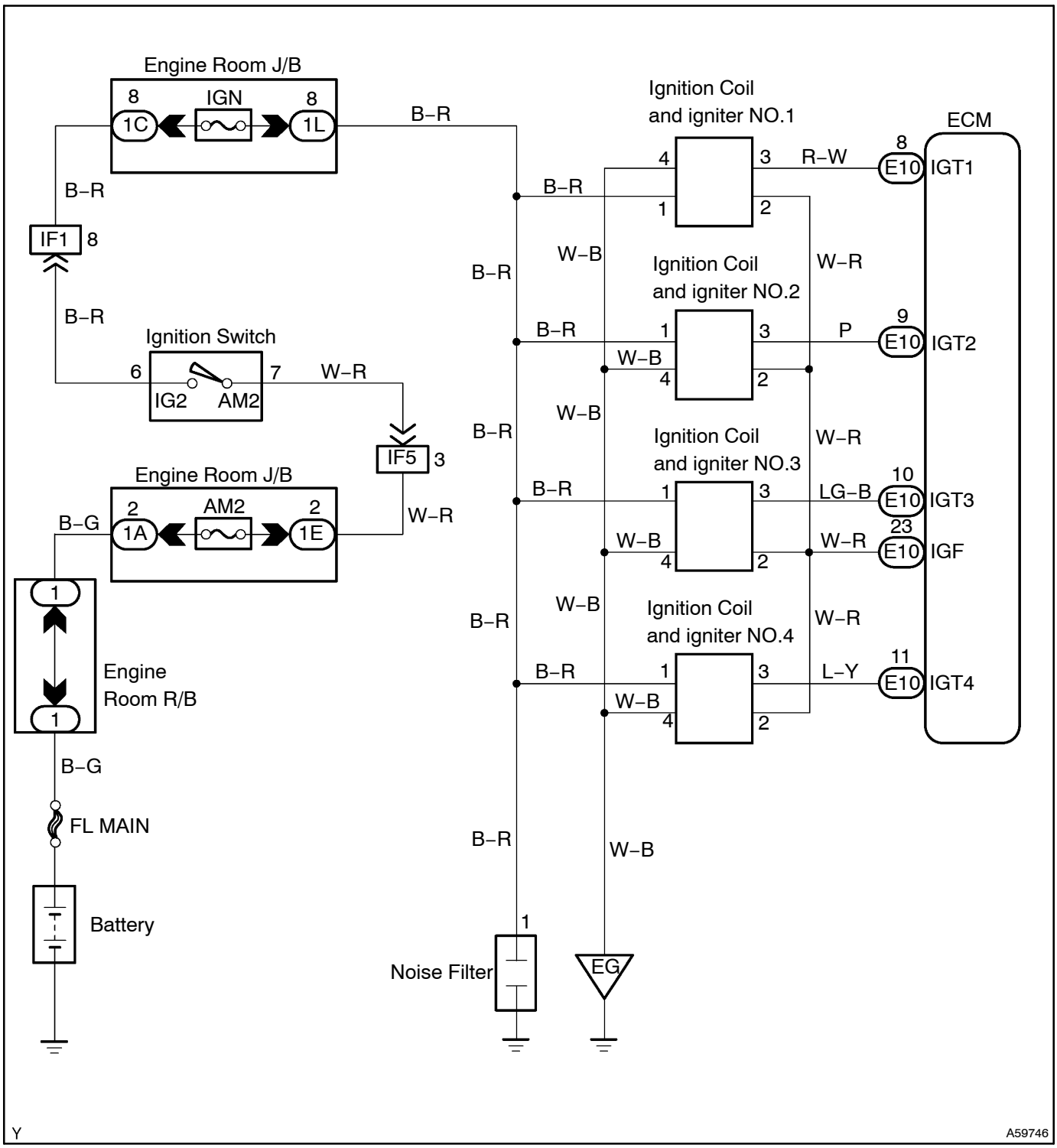
DTC	P1315/15	IGNITER CIRCUIT MALFUNCTION(No.4)

CIRCUIT DESCRIPTION

A Direct Ignition System (DIS) has been adopted. The DIS improves the ignition timing accuracy, reduces the high–voltage loss, and enhances 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 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 passes through from the center electrode to the ground electrode.
The ECM determines ignition timing and outputs the ignition signals (IGT) of each cylinder. Based on IGT signals, the power transistors cut off the current to the primary coil in the ignition coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail–safe measurement to the ECM.

DTC No.	DTC Detecting Condition	Trouble Area
P1300/14 P1305/15 P1310/14 P1315/15	No IGF signal to ECM while engine is running	• Ignition system • Open or short in IGF and IGT circuit from ignition coil with igniter to ECM • Ignition coil with igniter • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

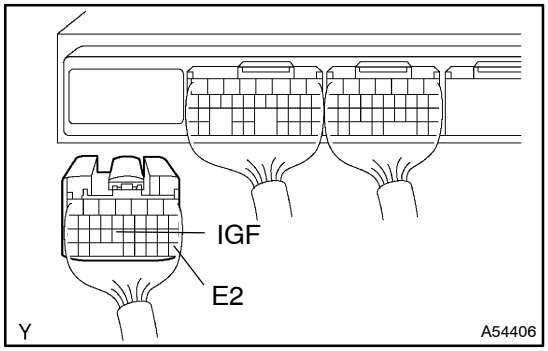
- If DTC P1300/14 is displayed, check No.1 ignition coil with igniter circuit.
- If DTC P1305/15 is displayed, check No.2 ignition coil with igniter circuit.
- If DTC P1310/14 is displayed, check No.3 ignition coil with igniter circuit.
- If DTC P1315/15 is displayed, check No.4 ignition coil with igniter circuit.
- Read freeze frame data using the hand–held tester, as freeze frame data 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

NG → **Go to step 4**

OK

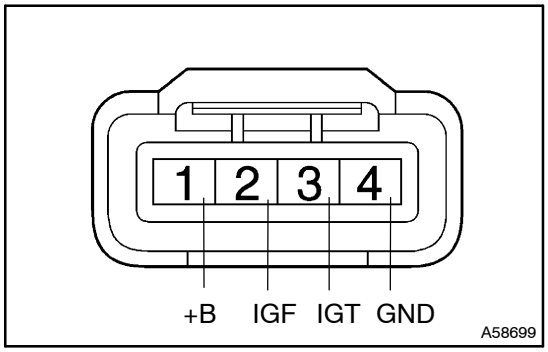
2	CHECK WIRE HARNESS OR CONNECTOR(ECM–IGNITION COIL)



HINT:

The procedure below is for NO.1 cylinder. If a malfunction is found on the other cylinders, check the circuit for the cylinder with referring to this procedure.

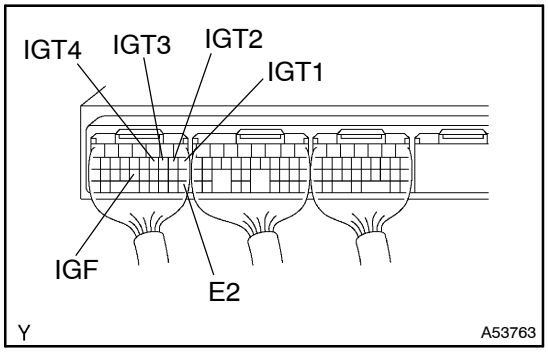
(a) Disconnect the ignition coil connector.
(b) Disconnect the ECM E10 connector.
(c) Check for open between the terminals IGF of the ECM connector and IGF of the ignition coil connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals IGF of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more



NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

3 INSPECT ECM(CHECK VOLTAGE)



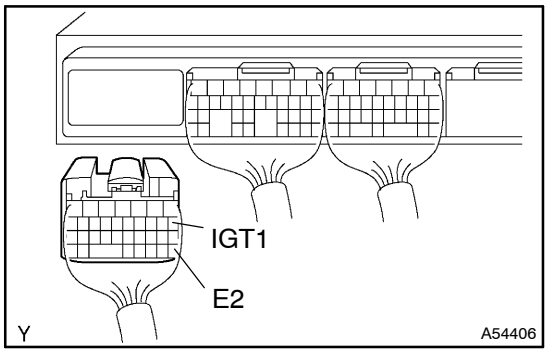
(a) Disconnect the ignition coil with igniter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminals IGF of the ECM connector and E2 of the ECM connector.
Voltage: 4.5 – 5.5 V

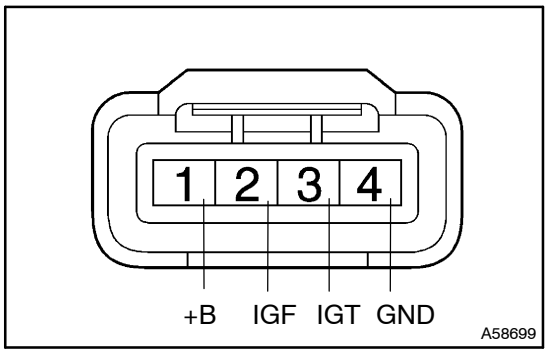
OK → **REPLACE IGNITION COIL ASSY**

NG

CHECK AND REPLACE ECM

4 CHECK WIRE HARNESS OR CONNECTOR(ECM–IGNITION COIL)



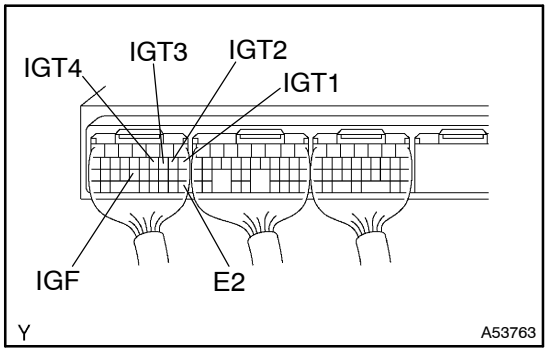


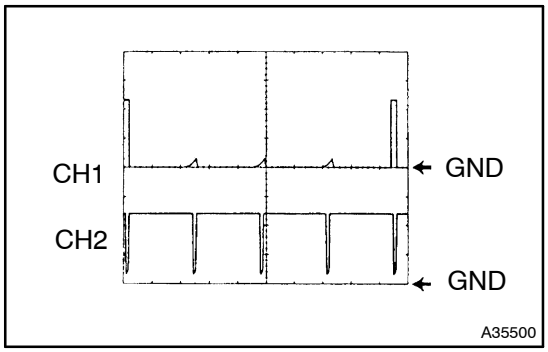
HINT:
The procedure below is for NO.1 cylinder. If a malfunction is found on the other cylinders, check the circuit for the cylinder with referring to this procedure.
(a) Disconnect the ignition coil with igniter connector.
(b) Disconnect the ECM E10 connector.
(c) Check for open between the terminals IGT1 of the ECM connector and IGT of the ignition coil connector.
Resistance: 1 Ω or less
(d) Check for short between the terminals IGT1 of the ECM connector and E2 of the ECM connector.
Resistance: 1 MΩ or more

NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

5 INSPECT ECM(CHECK VOLTAGE)





(a) Turn the ignition switch ON.
(b) Measure the voltage between terminals IGT1 – IGT4 of the ECM connector and E2 of the ECM connector when the engine is cranked.
Voltage: More than 0.1 V and less than 4.5 V

HINT:
During cranking or idling, check the waveform between terminals IGT1 – IGT4 and E2 of the ECM connector.

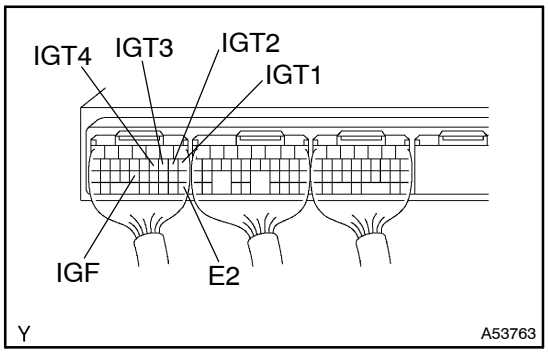
Item	Contents
Terminal	CH1: IGT1, IGT2, IGT3, IGT4 – E2 CH2: IGF – E2
Equipment Set	5V/DIV, 20ms/DIV
Condition	While the engine is cranking or idling

HINT:
Correct waveform appears as shown, with rectangle waves.

NG → **CHECK AND REPLACE ECM**

OK

6 INSPECT ECM(CHECK VOLTAGE)

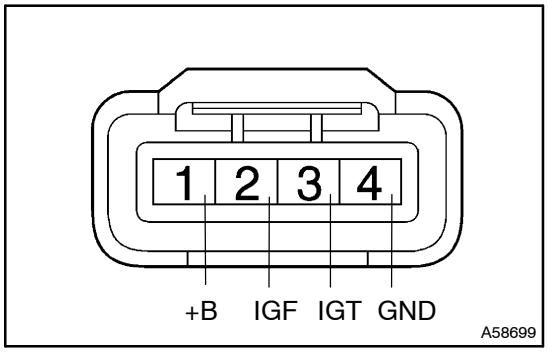


(a) Disconnect the ignition coil with the igniter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminals IGT1 – IGT4 of the ECM connector and E2 of the ECM connector when the engine is cranked.
Voltage: More than 0.1 V and less than 4.5 V

NG → **CHECK AND REPLACE ECM**

OK

7 CHECK IGNITION COIL ASSY(POWER SOUSE CIRCUIT)

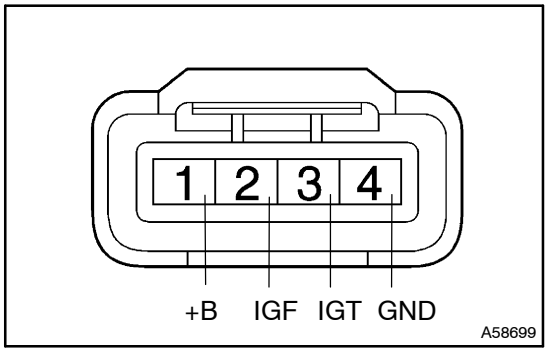


(a) Disconnect the ignition coil with igniter connector.
(b) Turn the ignition switch ON.
(c) Measure the voltage between terminal +B and GND of the ignition coil with igniter connector.
Voltage: 9 – 14 V

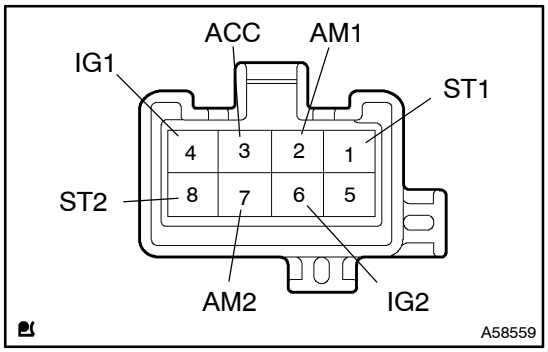
NG → **REPAIR OR REPLACE POWER SOURCE**

OK

8 CHECK WIRE HARNESS OR CONNECTOR(IGNITION SWITCH–IGNITION COIL)



(a) Disconnect the ignition coil with igniter connector.
(b) Disconnect the ignition switch connector.
(c) Check for open between the terminals +B of the ignition coil with igniter connector and IG2 of the ignition switch.
Resistance: 1 Ω or less



NG → **REPAIR OR REPLACE WIRE HARNESS OR CONNECTOR**

OK

REPLACE IGNITION COIL ASSY