

DTC	P1300	IGNITER CIRCUIT MALFUNCTION(NO.1)
DTC	P1305	IGNITER CIRCUIT MALFUNCTION(NO.2)
DTC	P1310	IGNITER CIRCUIT MALFUNCTION(NO.3)
DTC	P1315	IGNITER CIRCUIT MALFUNCTION(No.4)
DTC	P1320	IGNITER CIRCUIT MALFUNCTION(NO.5)
DTC	P1325	IGNITER CIRCUIT MALFUNCTION(NO.6)

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 P1305 P1310 P1315 P1320 P1325	No IGF signal to engine ECU while engine is running	• Ignition system • Open or short in IGF and IGT1 - 6 circuit from ignition coil with ignite • No.1 - No.6 ignition coil with igniter • ECM

Engine Room J/B

Ignition Coil and Igniter No. 1

Ignition Coil and Igniter No. 2

Ignition Coil and Igniter No. 3

Ignition Coil and Igniter No. 4

Ignition Coil and Igniter No. 5

Ignition Coil and Igniter No. 6

ECM

IGT1

IGT2

IGT3

IGF

IGT4

IGT5

IGT6

Ignition Switch

Engine Room J/B

Engine Room R/B

FL MAIN

Battery

Noise Filter

EF

Wiring Details:

- Power Source:** Battery (+) connected to FL MAIN (B-G).
- Engine Room R/B:** Contains two fuses (1) connected to the main power line.
- Engine Room J/B:** Contains fuses IF3 (3) and IF6 (8). IF3 is connected to the Ignition Switch (6) via W-R. IF6 is connected to the Ignition Switch (7) via W-R.
- Ignition Switch:** Controls the flow of current to the ignition coils.
- Ignition Coils and Igniters:** Six units, each with terminals 1, 2, 3, and 4. Terminal 1 is connected to the Ignition Switch (7) via W-R. Terminal 2 is connected to the Ignition Switch (6) via W-R. Terminal 3 is connected to the Ignition Switch (8) via B-R. Terminal 4 is connected to the Ignition Switch (8) via W-B.
- ECM:** Receives IGT signals from the Ignition Coils and Igniters. The signals are: IGT1 (8, R-W), IGT2 (9, P), IGT3 (10, LG-B), IGF (23, W-R), IGT4 (11, L-Y), IGT5 (12, G-R), and IGT6 (13, L).
- Noise Filter:** Connected to the Ignition Switch (8) via B-R.
- EF (Earth Filter):** Connected to the Ignition Switch (8) via W-B.

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.
- 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.

1 CHECK SPARK PLUG (See page 18-1)

NG

Go to step 4

OK

2 CHECK HARNESS AND CONNECTOR(ECM - IGNITION COIL)

HINT:

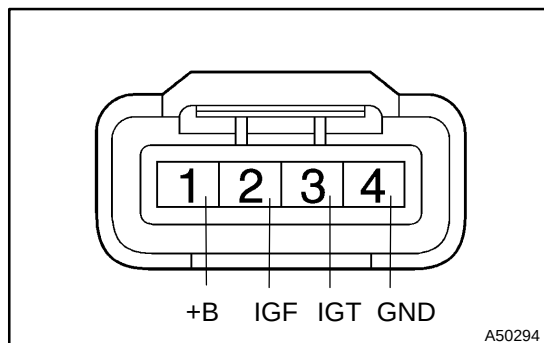
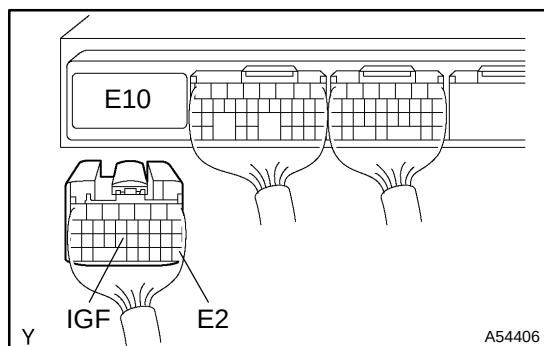
The procedure below is for No.1 cylinder. If a malfunction is found on the other cylinders, check the circuit for the cylinder with referring to this procedure.

- Disconnect the ignition coil connector.
- Disconnect the ECM E10 connector.
- Check for open between the terminals IGF of the ECM connector and IGF of the ignition coil connector.

Resistance: 1 Ω or less

- Check for short between the terminals IGF and E2 of the ECM connector.

Resistance: 1 M Ω or less

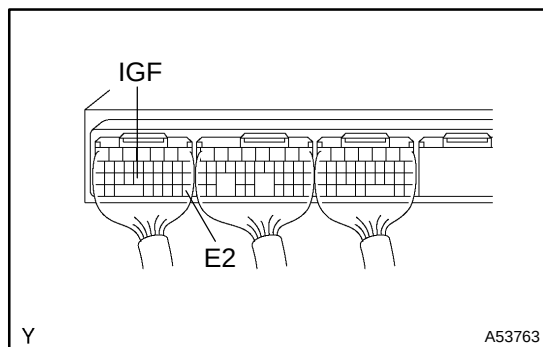


NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3 INSPECT ECM



- Disconnect the ignition coil connector.
- Turn the ignition switch ON
- Measure voltage between the terminals IGF and E2 of the ECM connector.

Voltage: 4.5 - 5.5 V

OK

CHECK AND REPLACE ECM

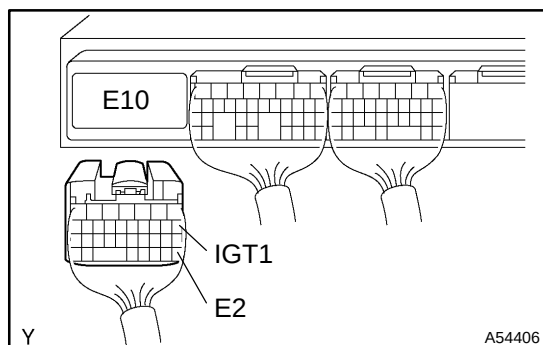
NG

CHECK AND REPLACE ECM

4 CHECK HARNESS AND 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.

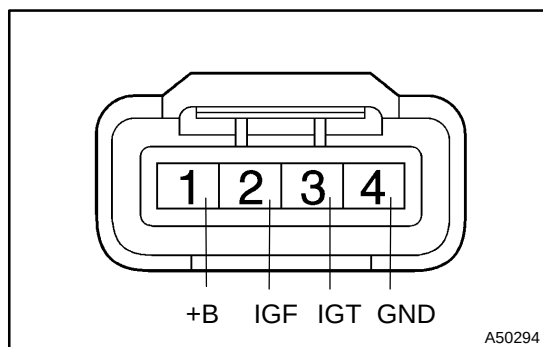


- Disconnect the ignition coil connector.
- Disconnect the ECM E10 connector.
- Check for open between the terminals IGT1 of the ECM connector and IGT of the ignition coil connector.

Resistance: 1 Ω or less

- Check for short between the terminals IGT1 and E2 of the ECM connector.

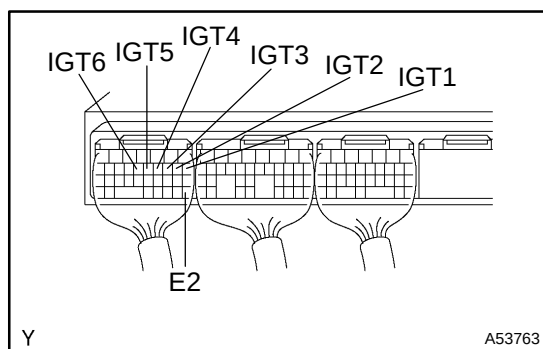
Resistance: 1 M Ω or less



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REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

5 INSPECT ECM

- Turn the ignition switch ON.
- Measure the voltage between terminals IGT1 - IGT6 and E2 of the ECM connector when the engine is cranked.

Voltage: More than 0.1 V and less than 4.5 V

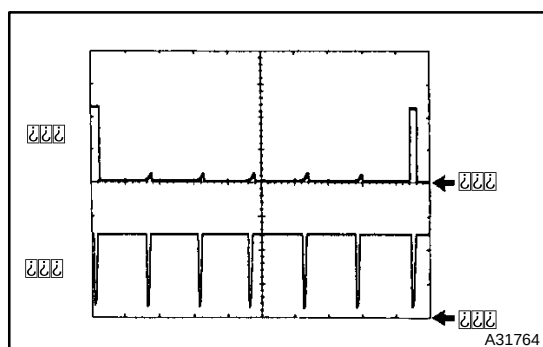
HINT:

During cranking or idling, check the waveform between terminals IGT1 - IGT6 and E2 of the ECM connector.

Item	Contents
Terminal	CH1: IGT1, IGT2, IGT3, IGT4, IGT5, IGT6 - E2 CH2: IGF - E2
Equipment Set	2V/DIV, 20ms/DIV
Condition	While the engine is cranking or idling

HINT:

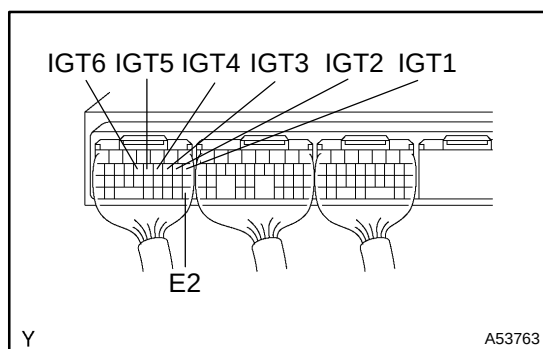
Correct waveform appears as shown, with rectangle waves.



NG

CHECK AND REPLACE ECM

OK

6 INSPECT ECM

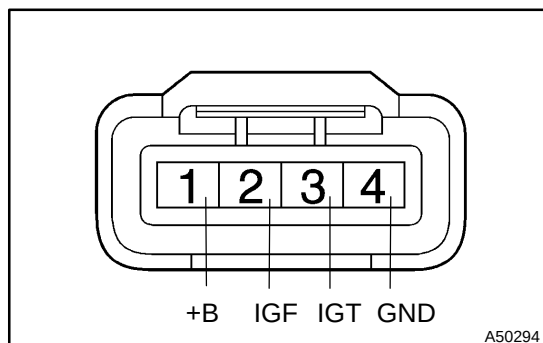
- Disconnect the ignition coil with the igniter connector.
- Turn the ignition switch ON.
- Measure the voltage between terminals IGT1 - IGT6 and E2 of the ECM connector when the engine is cranked.

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)

- Disconnect the ignition coil with the igniter connector.
- Turn the ignition switch ON.
- Measure voltage between terminals +B and GND of the ignition coil with the igniter connector.

Voltage: 9 - 14 V

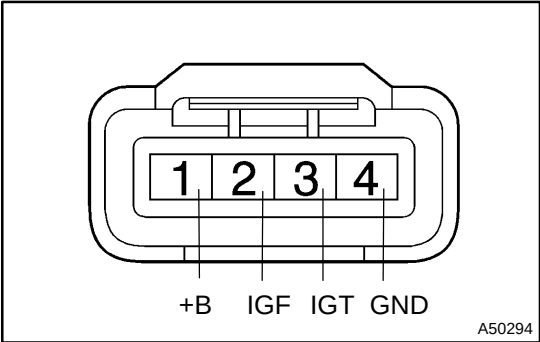
NG

REPAIR OR REPLACE POWER SOURCE

OK

8

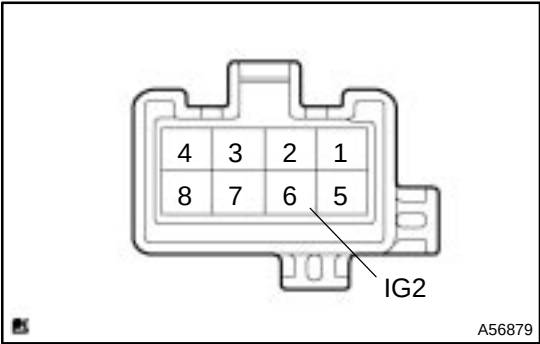
CHECK HARNESS AND CONNECTOR(IGNITION SWITCH - IGNITION COIL)



- (a) Disconnect the ignition coil with the igniter connector.
- (b) Disconnect the ignition switch connector.
- (c) Check 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 HARNESS AND CONNECTOR



OK

REPLACE IGNITION COIL ASSY