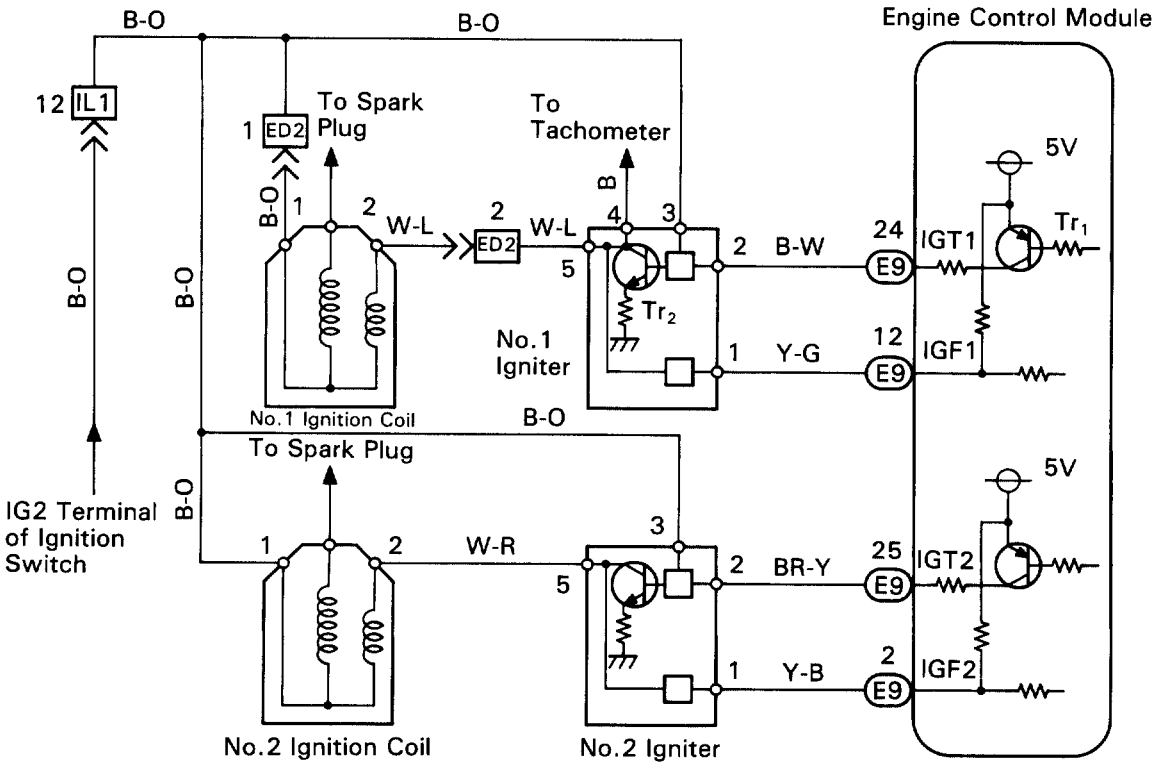
DTC 14, 15 Ignition Signal Circuit

CIRCUIT DESCRIPTION

The ECM determines the ignition timing, turns on Tr_1 at a predetermined angle (°CA) before the desired ignition timing and outputs an ignition signal (IGT) “1” to the igniter.
Since the width of the IGT signal is constant, the dwell angle control circuit in the igniter determines the time the control circuit starts primary current flow to the ignition coil based on the engine rpm and ignition timing one revolution ago, that is, the time the Tr_2 turns on.
When it reaches the ignition timing, the ECM turns Tr_1 off and outputs the IGT signal “0”.
This turns Tr_2 off, interrupting the primary current flow and generating a high voltage in the secondary coil which causes the spark plug to spark. Also, by the counter electromotive force generated when the primary current is interrupted, the igniter sends an ignition confirmation signal (IGF) to the ECM. The ECM stops fuel injection as a fail safe function when the IGF signal is not input to the ECM.

DTC No.	DTC Detecting Condition	Trouble Area
14	No IGF1 signal to ECM for 8–11 consecutive IGT1 signal.	•Open or short in IGF1 and IGT1 circuit from No. 1 igniter to ECM. •No.1 igniter •ECM
15	No IGF2 signal to ECM for 8–11 consecutive IGT2 signal.	•Open or short in IGF2 and IGT2 circuit from No.2 igniter to ECM •No.2 igniter •ECM

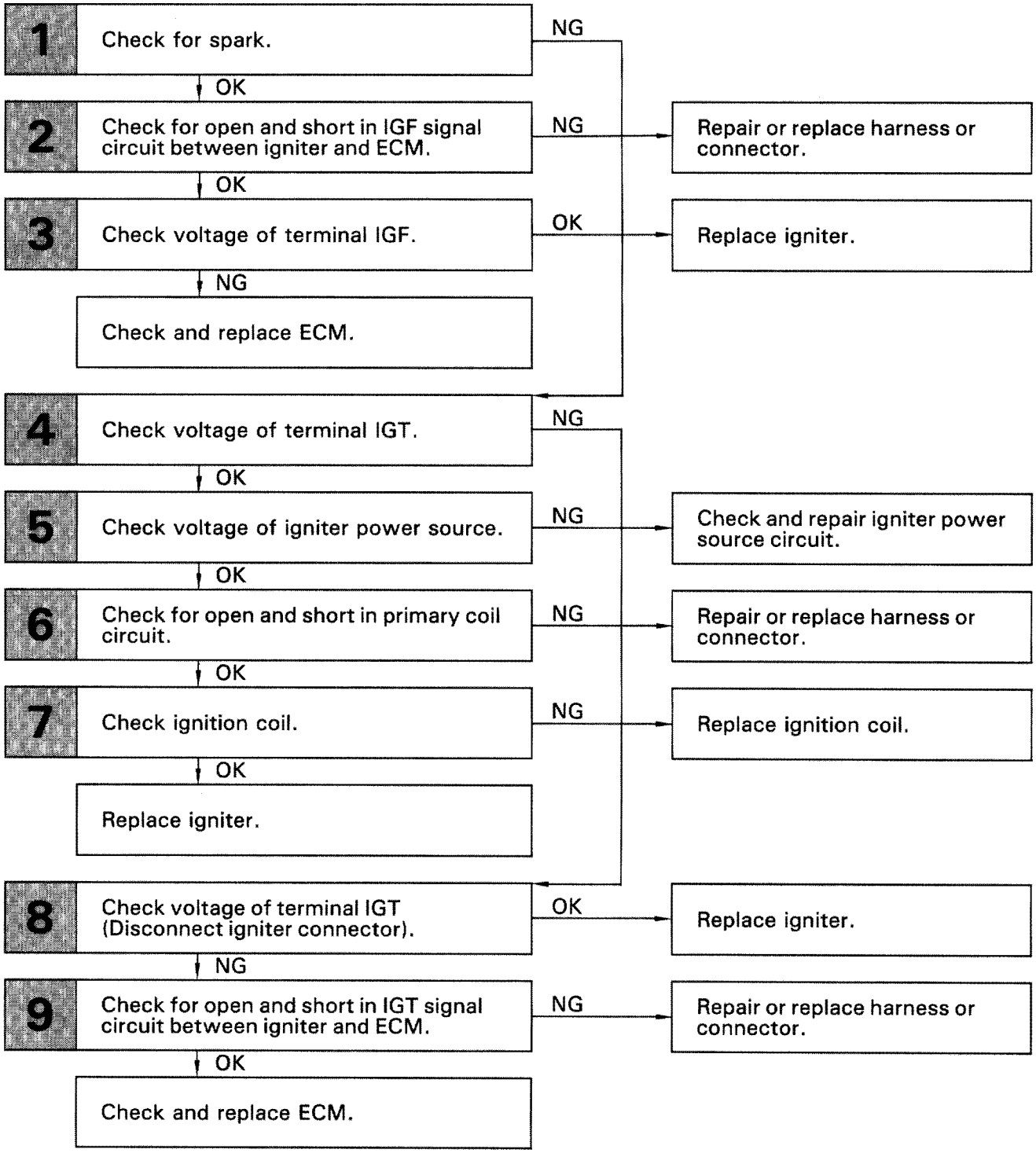
WIRING DIAGRAM



DIAGNOSTIC CHART

Refer to inspection procedure in details.

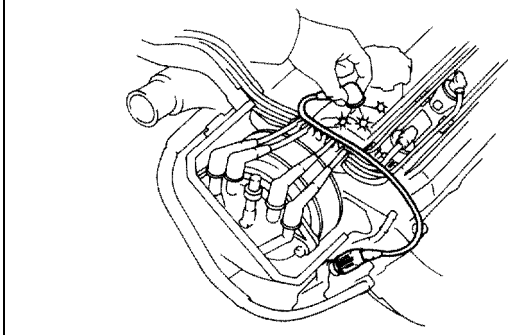
HINT: If diagnostic trouble code 14 is displayed, check No.1 igniter circuit.
If diagnostic trouble code 15 is displayed, check No.2 igniter circuit.



INSPECTION PROCEDURE

HINT: If diagnostic trouble code 14 is displayed, check No.1 igniter circuit.
If diagnostic trouble code 15 is displayed, check No.2 igniter circuit.

1 Check for spark.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C Disconnect the high–tension cord from the distributor, hold its end about 12.5 mm (1/2”) from the ground, see if spark occurs while the engine is being cranked.

OK **Spark should be generated.**

NOTICE:
To prevent excessive fuel injection from the injectors during this check don’t crank the engine for more than 1 – 2 seconds at a time.

OK → **2**

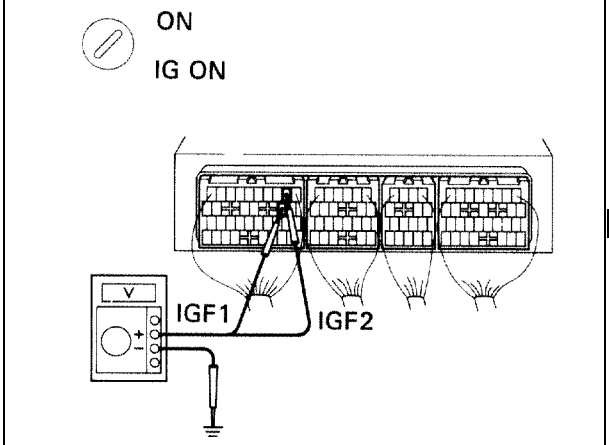
NG → **Go to step 4.**

2 Check for open and short in harness and connector in IGF and IGT signal circuit between engine control module and igniter (See page IN–34).

OK → **3**

NG → **Repair or replace harness or connector.**

3 Disconnect igniter connector and check voltage between terminals IGF1, 2 of engine control module connector and body ground.



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P
1. Remove the instrument panel under cover.
2. Disconnect igniter connector.
3. Turn ignition switch ON.

C Measure voltage between terminals IGF1, 2 of engine control module connector and body ground.

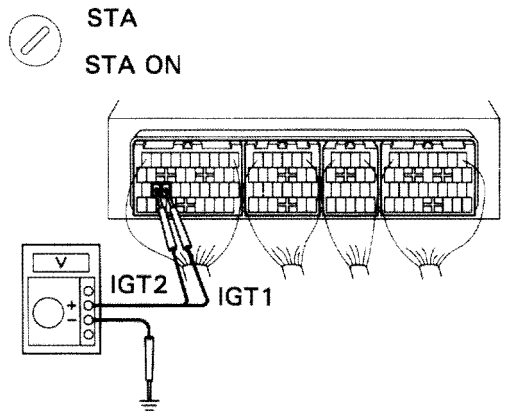
OK **Voltage: 4.5 ~ 5.5 V**

NG → **Check and replace engine control module.**

OK → **Replace igniter. *1**

*1: When diagnostic trouble code 14 is displayed, replace the igniter with 5 wire harness. (extra wire is for tachometer). When diagnostic trouble code 15 is displayed, replace the igniter with 4 wire harness.

4 **Check voltage between terminals IGT1, 2 of engine control module connector and body ground.**

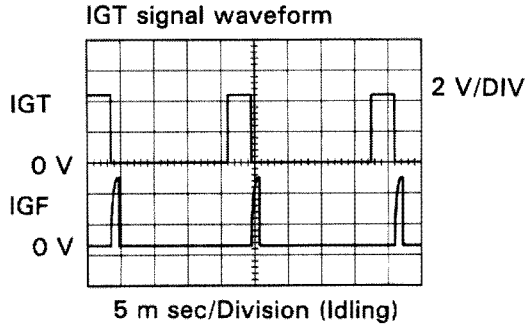


P Remove the instrument panel under cover.

C Measure voltage between terminals IGT1, 2 of engine control module connector and body ground when engine is cranked.

OK **Voltage:** **0.5 – 1.0 V (Neither 0 V nor 5 V)**

Reference **INSPECTION USING OSCILLOSCOPE**

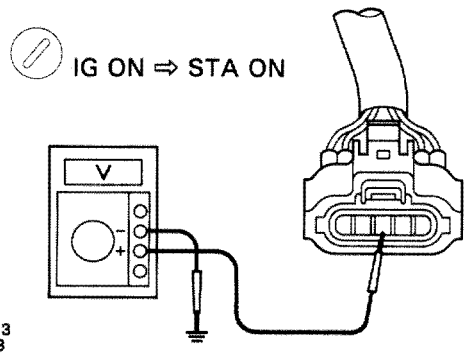


- During cranking or idling, check waveform between terminals IGT1, IGT2 and E1 of engine control module.

HINT: The correct waveform appears as shown in the illustration on the left, with rectangle waves.

OK → **NG** → **Go to step 8.**

5 **Check voltage between terminal 3 of No.1, No.2 igniter connectors and body ground.**



P Disconnect igniter connector.

C Measure voltage between terminal 3 of No.1, No.2 igniter connectors and body ground, when ignition switch is turned “ON” and “STA” position.

OK **Voltage:** **9 – 14 V**

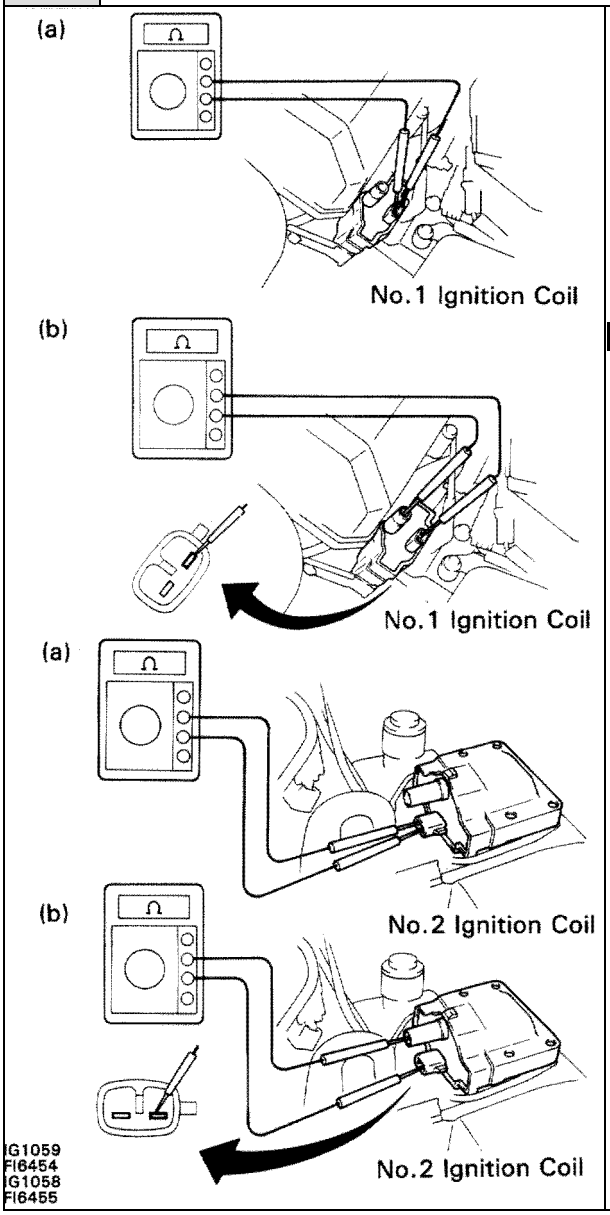
OK → **NG** → **Check and repair igniter power source circuit.**

6	Check for open and short in harness and connector between ignition switch and ignition coil, ignition coil and igniter (See page IN–34).

OK

NG → Repair or replace harness or connector.

7	Check ignition coil.



P Disconnect ignition coil connector.
(For No.1 ignition coil (on left bank), remove the battery)

C
1. Check primary coil.
Measure resistance between terminals of ignition coil connector.
2. Check secondary coil.
Measure resistance between terminal 1 of ignition coil connector and high–tension terminal.

OK

		Resistance
(a) Primary Coil	Cold	0.36 ~ 0.55 Ω
	Hot	0.45 ~ 0.65 Ω
(b) Secondary Coil	Cold	9.0 ~ 15.4 kΩ
	Hot	11.4 ~ 18.1 kΩ

"Cold" is from –10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

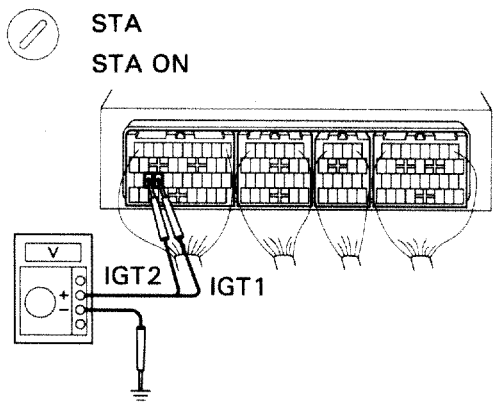
OK

NG → Replace ignition coil.

Replace igniter. *1

*1: When diagnostic trouble code 14 is displayed, replace the igniter with 5 wire harness (extra wire is for tachometer). When diagnostic trouble code 15 is displayed, replace the igniter with 4 wire harness.

8 **Disconnect igniter connector and check voltage between terminals IGT1, 2 of engine control module connector and body ground.**



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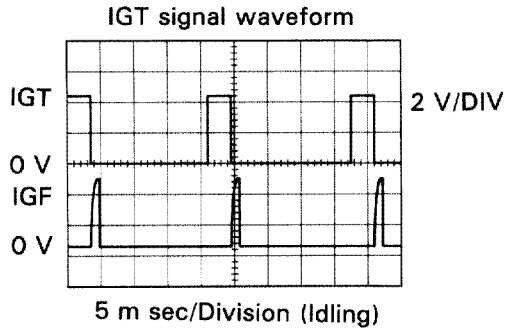
P 1. Remove the instrument panel under cover.
2. Disconnect igniter connector.

C Measure voltage between terminals IGT1, 2 of engine control module connector and body ground when engine is cranked.

OK **Voltage:** **0.5 – 1.0 V**
(Neither 0 V nor 5 V)

Reference **INSPECTION USING OSCILLOSCOPE**



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- During cranking or idling, check waveforms between terminals IGT1, IGT2 and E1 of engine control module.

HINT: The correct waveform appears as shown in the illustration on the left, with rectangle waves.

NG

OK **Replace igniter. *1**

9 **Check for open and short in harness and connector in IGT signal circuit between engine control module and igniter (See page IN–34).**

OK

NG **Repair or replace harness or connector.**

Check and replace engine control module.

*1: When diagnostic trouble code 14 is displayed, replace the igniter with 5 wire harness. (extra wire is for tachometer). When diagnostic trouble code 15 is displayed, replace the igniter with 4 wire harness.