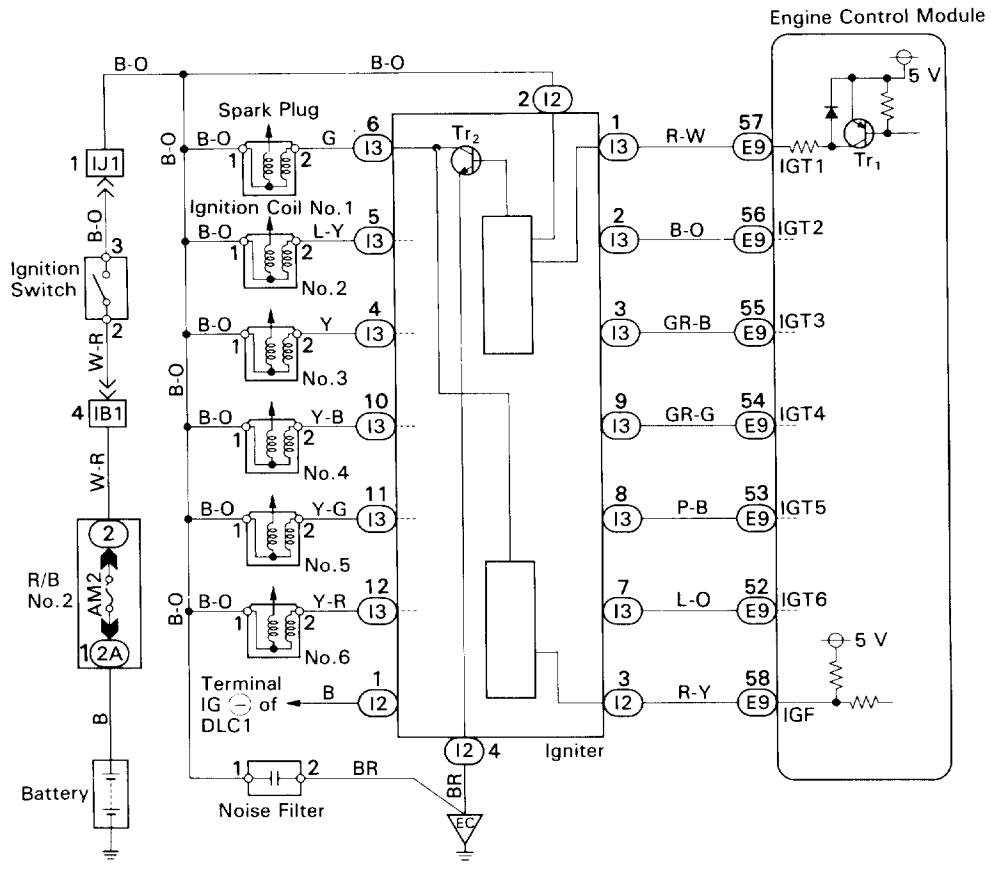
DTC 14 Ignition Signal Circuit

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 "O".
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.

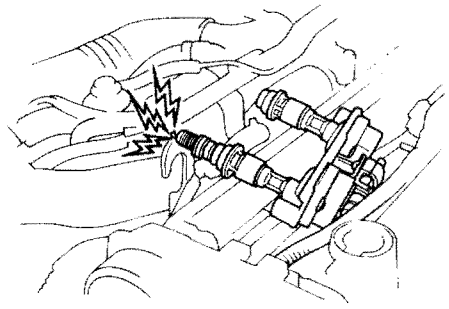
DTC No.	Diagnostic Trouble Code Detecting Condition	Trouble Area
14	No IGF signal to ECM for 4 ~ 7 consecutive IGT signals with engine speed less than 3,000 rpm	• Open or short in IGF circuit from igniter to ECM • Igniter • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

1 Check for spark.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P
(1) Remove ignition coil. (See page IG–26)
(2) Remove spark plug.
(3) Install the spark plug to the ignition coil, and connect the ignition coil connector.
(4) Ground the spark plug.

C
Check if spark occurs while engine is being cranked.

Hint
To prevent excess fuel being injected from injectors during this test, don't crank the engine for more than 1—2 seconds at a time.

OK

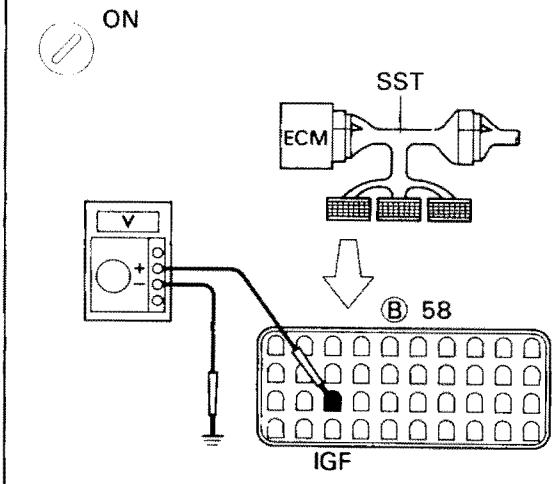
NG → Go to step 4.

2 Check for open and short in harness and connector in IGF signal circuit between engine control module and igniter (See page IN–30).

OK

NG → Repair or replace harness or connector.

3 Disconnect igniter connector and check voltage between terminal IGF of engine control module connector and body ground.



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P
(1) Disconnect igniter connector.
(2) Connect SST (check harness "A"). (See page EG–510)
SST 09990–01000
(3) Turn ignition switch ON.

C
Measure voltage between terminal IGF of engine control module connector and body ground.

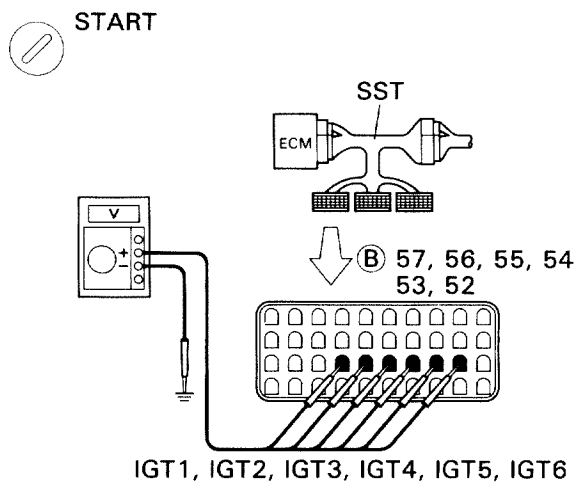
OK
Voltage: 4.5 — 5.5 V

NG

OK → Replace igniter.

Check and replace engine control module.

4 Check voltage between terminal IGT (1 ~ 6) of engine control module connector and body ground.

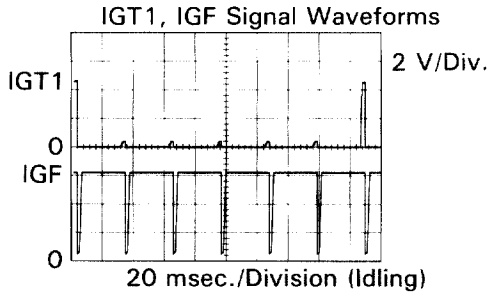


P Connect SST (check harness "A").
(See page EG–510)
SST 09990–01000

C Measure voltage between terminal IGT (1 ~ 6) 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



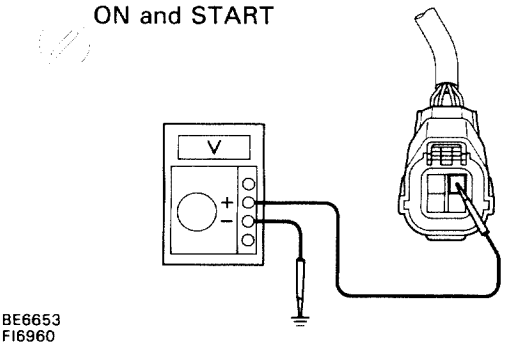
- During idling, check waveforms between terminals IGT1, IGF and E1 of engine control module.

HINT: The correct rectangular waveforms are as shown, IGT2, IGT3, IGT4, IGT5 and IGT6 signal waveforms are same as IGT1 signal waveform.

OK

NG Go to step 8.

5 Check voltage between terminal 2 of igniter connector (I2) and body ground.



P Disconnect igniter connector.

C Measure voltage between terminal 2 of igniter connector (I2) and body ground, when ignition switch is turned to "ON" and and "START" position.

OK **Voltage: 9 — 14 V**

OK

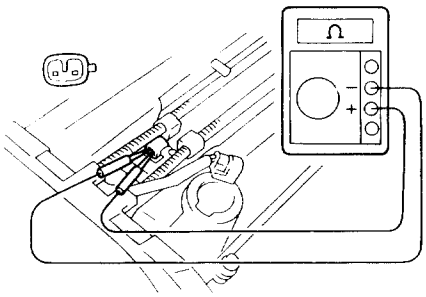
NG **Check and repair igniter power source circuit.**

6 **Check for open and short in harness and connector between ignition switch and ignition coil, ignition coil and igniter (See page IN–30).**

OK

NG → Repair or replace harness or connector.

7 **Check ignition coil.**



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P Disconnect ignition coil connector.
(See page IG–23)

C Measure resistance between terminals of ignition coil connector.

OK

	Resistance
Cold	0.54 ~ 0.84 Ω
Hot	0.68 ~ 0.98 Ω

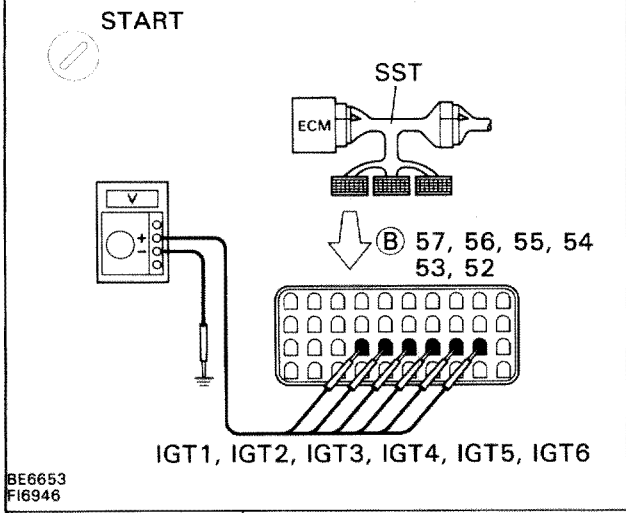
"Cold" is from — 10°C (14°F) to 50°C (122°F) and "Hot" is from 50°C (122°F) to 100°C (212°F).

OK

NG → Replace ignition coil.

Replace igniter.

8 **Disconnect igniter connector and check voltage between terminal IGT (1 ~ 6) of engine control module connector and body ground.**

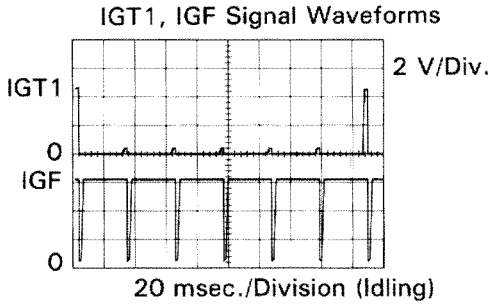


P Disconnect igniter connector.

C Measure voltage between terminal IGT (1 ~ 6) 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 idling, check waveforms between terminals IGF1, IGF and E1 of engine control module.

HINT: The correct rectangular waveforms are as shown, IGT2, IGT3, IGT4, IGT5 and IGT6 signal waveforms are same as IGT1 signal waveform.

NG

OK → **Replace igniter.**

9 **Check for open and short in harness and connector in IGT (1 ~ 6) signal circuit between engine control module and igniter (See page IN–30).**

OK

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

Check and replace engine control module.