

DTC	P0351/14	Igniter Coil "A" Primary/Secondary Circuit
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DTC	P0352/14	Igniter Coil "B" Primary/Secondary Circuit
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DTC	P0353/15	Igniter Coil "C" Primary/Secondary Circuit
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DTC	P0354/15	Igniter Coil "D" Primary/Secondary Circuit
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DTC	P0355/14	Igniter Coil "E" Primary/Secondary Circuit
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DTC	P0356/14	Igniter Coil "F" Primary/Secondary Circuit
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DTC	P0357/15	Igniter Coil "G" Primary/Secondary Circuit
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DTC	P0358/15	Igniter Coil "H" Primary/Secondary Circuit
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HINT:

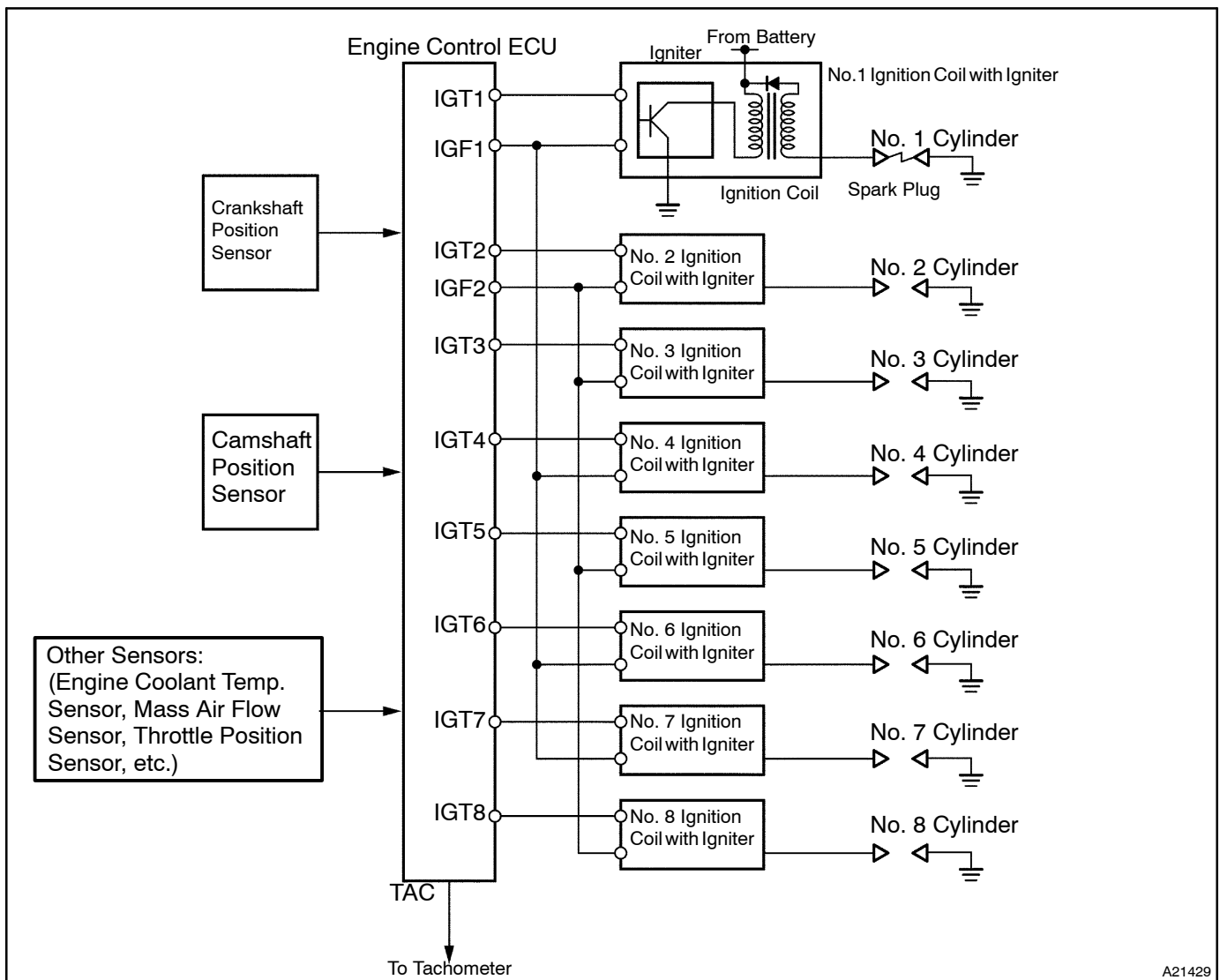
- These DTCs indicate a malfunction related to primary circuit.
- If DTC P0351/14 is displayed, check No. 1 ignition coil with igniter circuit.
- If DTC P0352/14 is displayed, check No. 2 ignition coil with igniter circuit.
- If DTC P0353/15 is displayed, check No. 3 ignition coil with igniter circuit.
- If DTC P0354/15 is displayed, check No. 4 ignition coil with igniter circuit.
- If DTC P0355/14 is displayed, check No. 5 ignition coil with igniter circuit.
- If DTC P0356/14 is displayed, check No. 6 ignition coil with igniter circuit.
- If DTC P0357/15 is displayed, check No. 7 ignition coil with igniter circuit.
- If DTC P0358/15 is displayed, check No. 8 ignition coil with igniter circuit.

CIRCUIT DESCRIPTION

These DTCs indicate a malfunction related to primary circuit.

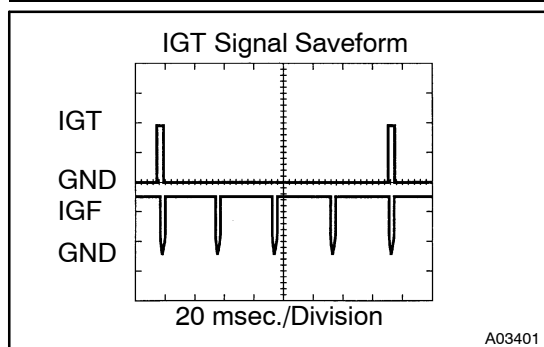
The DIS is a 1-cylinder ignition system which ignites one cylinder with one ignition coil. In the 1-cylinder ignition system, the one spark plug is connected to the end of the secondary winding. High voltage generated in the secondary winding is applied directly to the spark plug. The spark of the spark plug passes from the center electrode to the ground electrode.

The engine control ECU determines the ignition timing and outputs the ignition signals (IGTs) for each cylinder. Using the IGT, the engine control ECU turns on and off the power transistor inside the igniter and this switches on and off the current to the primary coil. When current to the primary coil is cut off, high-voltage is generated in the secondary coil and this voltage is applied to the spark plugs to create sparks inside the cylinders. As the engine control ECU cuts the current to the primary coil, the igniter sends back the ignition confirmation signal (IGF) for each cylinder ignition to the engine control ECU.



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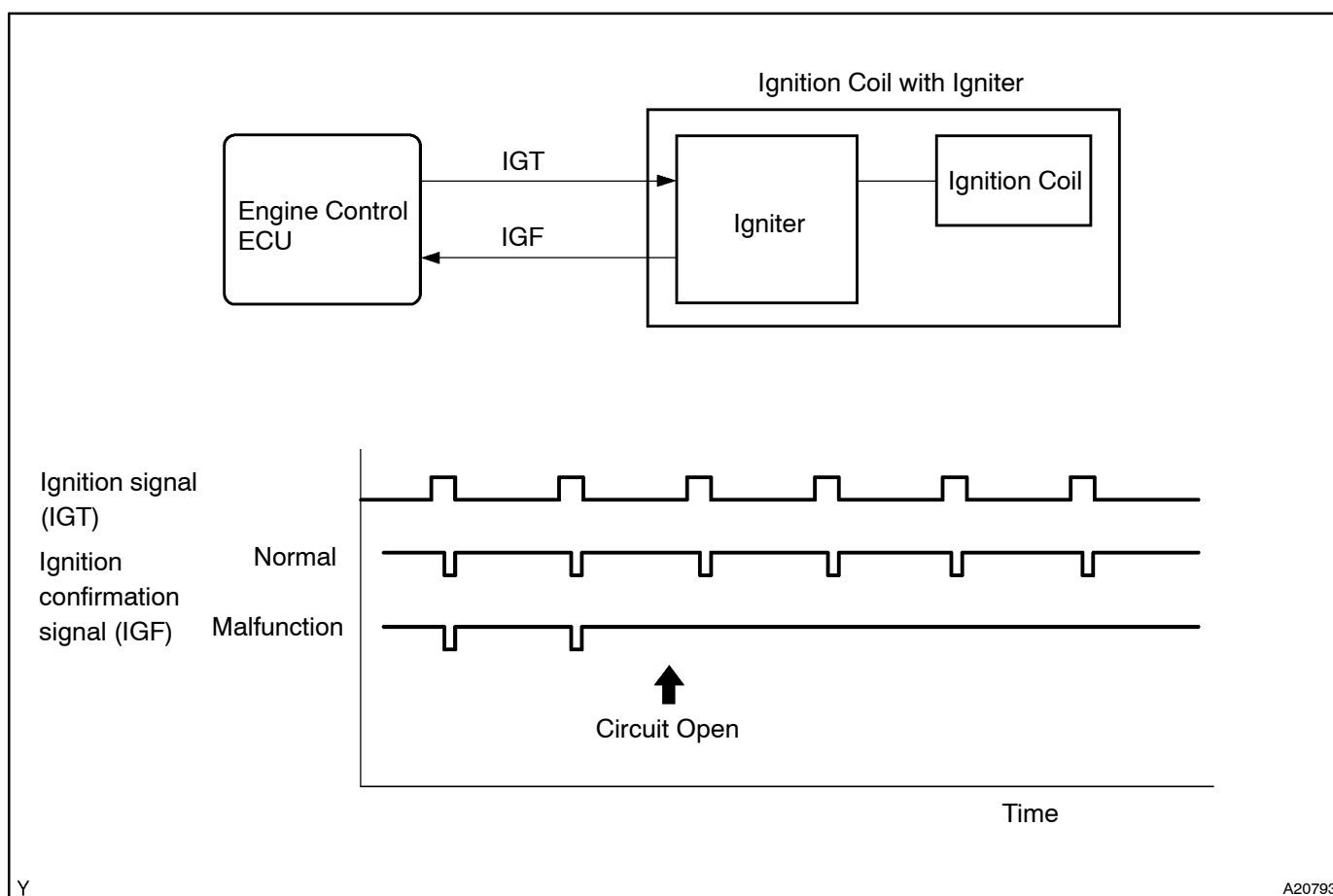
DTC No.	DTC Detecting Condition	Trouble Area
P0351/14 P0352/14 P0353/15 P0354/15 P0355/14 P0356/14 P0357/15 P0358/15	No IGF signal to engine control ECU while engine is running (1 trip detection logic)	• Open or short in IGF1 or IGF2 and IGT1 to IGT8 circuit from ignition coil with igniter to engine control ECU • No. 1 to No. 8 ignition coil with igniter • Ignition system • Engine control ECU



Reference: Inspection using the oscilloscope.

During cranking or idling, check the waveform between terminals IG1 to IG8 and E1, and IGF1, IGF2 and E1 of the E5 and E7 engine control ECU connectors.

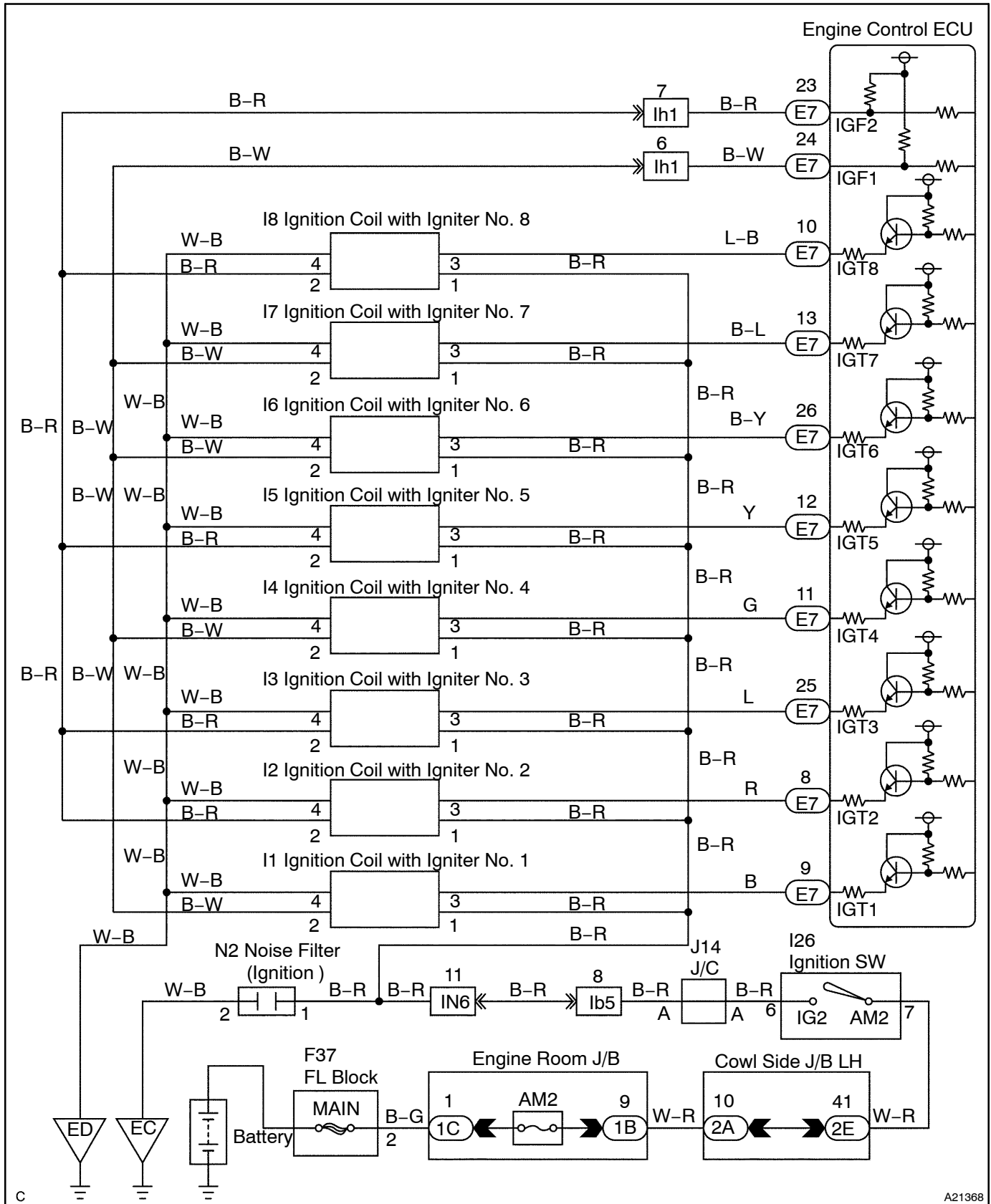
MONITOR DESCRIPTION



If the engine control ECU does not receive the IGF after sending the IGT it interprets this as a fault in the igniter and sets a DTC.

The monitor runs for 1 second (the first second of engine idle) after the engine is started.

WIRING DIAGRAM



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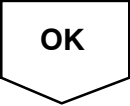
INSPECTION PROCEDURE

HINT:

- If DTCs P0351/14, P0354/15, P0356/14 and P0357/15 are output simultaneously, IGF1 circuit may be open or short.
- If DTCs P0352/14, P0353/15, P0355/14 and P0358/15 are output simultaneously, IGF2 circuit may be open or short.
- Read freeze frame data using the hand-held tester. Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air-fuel ratio was lean or rich, as well as other data from the time when a malfunction occurred.

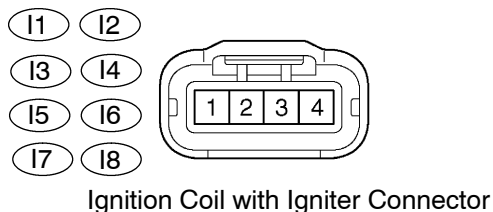
1	Check spark plug and spark (See Pub. No. RM630E, page IG-1).
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NG	Go to step 4.
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2 Check for open and short in harness and connector in IGF signal circuits between engine control ECU and ignition coil with igniter.

Wire Harness Side:



Y

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PREPARATION:

- Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil will igniter connector.
- Disconnect the E7 engine control ECU connector.

CHECK:

Check the resistance between the wire harness side connectors.

OK:

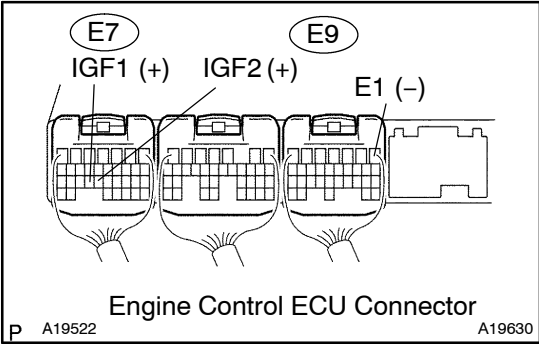
Tester Connection	Specified Condition
Ignition coil (I1-2) - IGF1 (E7-24)	Below 1 Ω
Ignition coil (I2-2) - IGF2 (E7-23)	Below 1 Ω
Ignition coil (I3-2) - IGF1 (E7-24)	Below 1 Ω
Ignition coil (I4-2) - IGF2 (E7-23)	Below 1 Ω
Ignition coil (I5-2) - IGF1 (E7-24)	Below 1 Ω
Ignition coil (I6-2) - IGF2 (E7-23)	Below 1 Ω
Ignition coil (I7-2) - IGF1 (E7-24)	Below 1 Ω
Ignition coil (I8-2) - IGF2 (E7-23)	Below 1 Ω
Ignition coil (I1-2) or IGF1 (E7-24) - Body ground	10 k Ω or higher
Ignition coil (I2-2) or IGF2 (E7-23) - Body ground	10 k Ω or higher
Ignition coil (I3-2) or IGF1 (E7-24) - Body ground	10 k Ω or higher
Ignition coil (I4-2) or IGF2 (E7-23) - Body ground	10 k Ω or higher
Ignition coil (I5-2) or IGF1 (E7-24) - Body ground	10 k Ω or higher
Ignition coil (I6-2) or IGF2 (E7-23) - Body ground	10 k Ω or higher
Ignition coil (I7-2) or IGF1 (E7-24) - Body ground	10 k Ω or higher
Ignition coil (I8-2) or IGF2 (E7-23) - Body ground	10 k Ω or higher

NG

Repair or replace harness or connector.

OK

3 Disconnect ignition coil with igniter connector, and check voltage between terminals IGF1, IGF2 and E1 of engine control ECU connector.



PREPARATION:

- (a) Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil with igniter connector.
- (b) Turn the ignition switch ON.

CHECK:

Measure the voltage between the E7 and E9 engine control ECU connectors.

OK:

Tester Connection	Specified Condition
IGF1 (E7-24) - E1 (E9-1)	4.5 to 5.5 V
IGF2 (E7-23) - E1 (E9-1)	4.5 to 5.5 V

NG

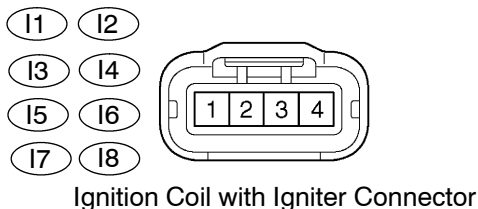
Replace engine control ECU (See Pub. No. RM630E, page FI-74).

OK

Replace ignition coil with igniter.

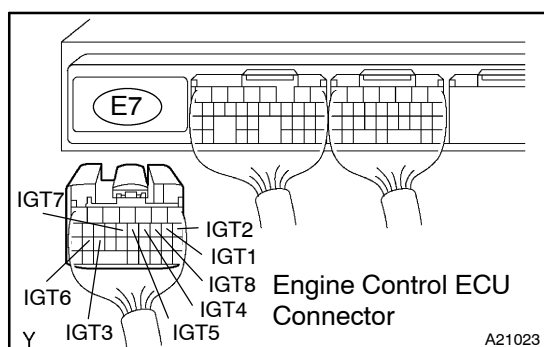
4 Check for open and short in harness and connector in IGT signal circuit between engine control ECU and ignition coil with igniter.

Wire Harness Side:



Y

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PREPARATION:

- Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil connector.
- Disconnect the E7 engine control ECU connector.

CHECK:

Check the resistance between the wire harness side connectors.

OK:

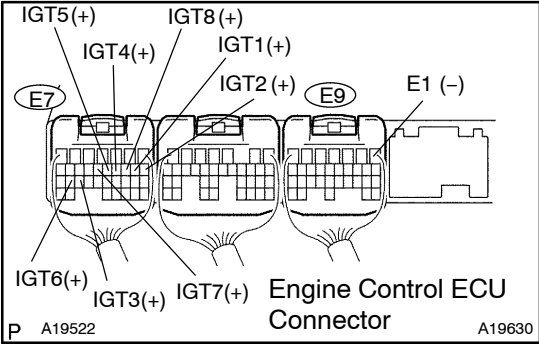
Tester Connection	Specified Condition
Ignition coil (I1-2) – IGT1 (E7-9)	Below 1 Ω
Ignition coil (I2-2) – IGT2 (E7-8)	Below 1 Ω
Ignition coil (I3-2) – IGT3 (E7-25)	Below 1 Ω
Ignition coil (I4-2) – IGT4 (E7-11)	Below 1 Ω
Ignition coil (I5-2) – IGT5 (E7-12)	Below 1 Ω
Ignition coil (I6-2) – IGT6 (E7-26)	Below 1 Ω
Ignition coil (I7-2) – IGT7 (E7-13)	Below 1 Ω
Ignition coil (I8-2) – IGT8 (E7-10)	Below 1 Ω
Ignition coil (I1-2) or IGT1 (E7-9) – Body ground	10 k Ω or higher
Ignition coil (I2-2) or IGT2 (E7-8) – Body ground	10 k Ω or higher
Ignition coil (I3-2) or IGT3 (E7-25) – Body ground	10 k Ω or higher
Ignition coil (I4-2) or IGT4 (E7-11) – Body ground	10 k Ω or higher
Ignition coil (I5-2) or IGT5 (E7-12) – Body ground	10 k Ω or higher
Ignition coil (I6-2) or IGT6 (E7-26) – Body ground	10 k Ω or higher
Ignition coil (I7-2) or IGT7 (E7-13) – Body ground	10 k Ω or higher
Ignition coil (I8-2) or IGT8 (E7-10) – Body ground	10 k Ω or higher

NG

Repair or replace harness or connector.

OK

5 Check voltage between terminals IGT1 – IGT8 and E1 of engine control ECU connector.



CHECK:

Measure the voltage between terminals the E7 and E9 engine control ECU connectors when the engine is cranked.

OK:

Tester Connection	Specified Condition
IGT1 (E7-9) – E1 (E9-1)	More than 0.1 V or less than 4.5 V
IGT2 (E7-8) – E1 (E9-1)	
IGT3 (E7-25) – E1 (E9-1)	
IGT4 (E7-11) – E1 (E9-1)	
IGT5 (E7-12) – E1 (E9-1)	
IGT6 (E7-26) – E1 (E9-1)	
IGT7 (E7-13) – E1 (E9-1)	
IGT8 (E7-10) – E1 (E9-1)	

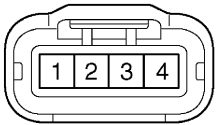
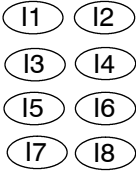
NG

Replace engine control ECU (See Pub. No. RM630E, page FI-74).

OK

6 Check ignition coil with igniter power source circuit.

Wire Harness Side:



Ignition Coil with Igniter Connector

Y

A21025

PREPARATION:

Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil with igniter connector.

CHECK:

- (a) Turn the ignition switch ON and to the START position.
- (b) Measure the voltage between the terminal of the wire harness side connector and body ground.

OK:

Tester Connection	Specified Condition
I1-1 - Body ground	9 to 14 V
I2-1 - Body ground	
I3-1 - Body ground	
I4-1 - Body ground	
I5-1 - Body ground	
I6-1 - Body ground	
I7-1 - Body ground	
I8-1 - Body ground	

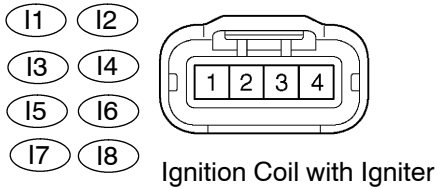
OK

Repair ignition coil with igniter.

NG

7 Check for open and short in harness and connector between ignition switch and ignition coil with igniter.

Wire Harness Side:

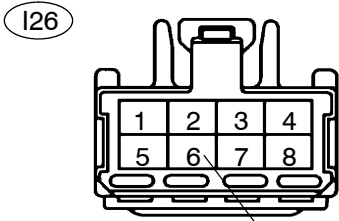


Ignition Coil with Igniter

Y

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Wire Harness Side:



Ignition Switch

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PREPARATION:

- (a) Disconnect the I1, I2, I3, I4, I5, I6, I7 or I8 ignition coil with igniter connector.
- (b) Disconnect the I26 ignition switch connector.

CHECK:

Measure the resistance between the wire harness side connectors.

OK:

Tester Connection	Specified Condition
Ignition coil (I1-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I2-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I3-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I4-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I5-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I6-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I7-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I8-1) - IG2 (I26-6)	Below 1 Ω
Ignition coil (I1-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I2-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I3-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I4-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I5-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I6-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I7-1) or IG2 (I26-6) - Body ground	10 k Ω or higher
Ignition coil (I8-1) or IG2 (I26-6) - Body ground	10 k Ω or higher

NG

Repair or replace harness or connector.

OK

Replace ignition coil with igniter.