

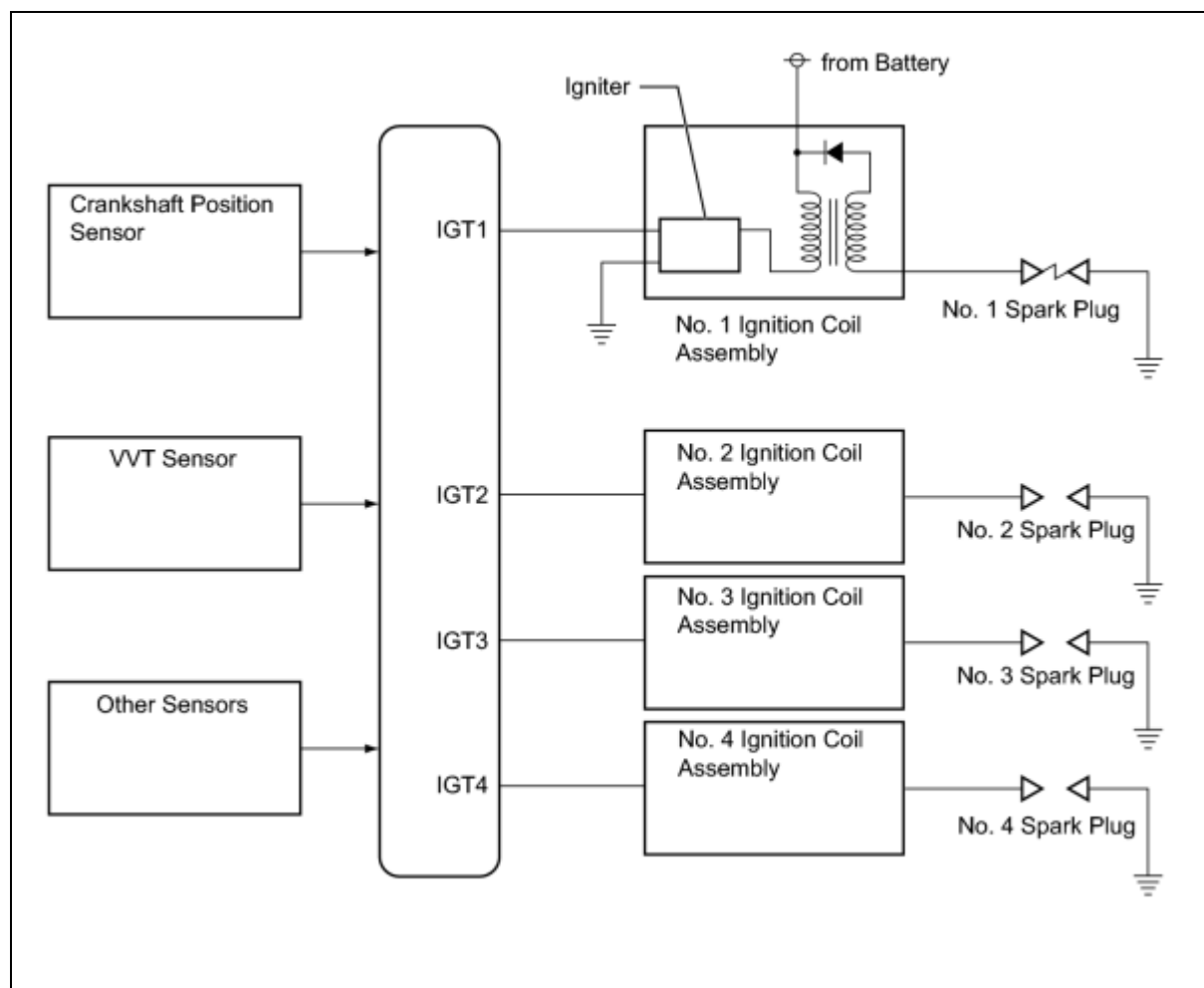
Last Modified: 3-27-2012		6.4 C	From: 201203
Model Year: 2013		Model: FR-S	Doc ID: RM000000XH40PUX
Title: FA20 ENGINE CONTROL: SFI SYSTEM: P0351-P0354: Ignition Coil "A" Primary / Secondary Circuit (2013 FR-S)			
DTC	P0351	Ignition Coil "A" Primary / Secondary Circuit	
DTC	P0352	Ignition Coil "B" Primary / Secondary Circuit	
DTC	P0353	Ignition Coil "C" Primary / Secondary Circuit	
DTC	P0354	Ignition Coil "D" Primary / Secondary Circuit	

DESCRIPTION

A Direct Ignition System (DIS) is used on this vehicle.

The DIS is a 1-cylinder ignition system in which each cylinder is ignited by one ignition coil and one spark plug is connected to the end of each secondary wiring. A powerful voltage, generated in the secondary wiring, is applied directly to each spark plug. The spark current of the spark plugs passes from the ground electrodes to the center electrode.

The ECM determines the ignition timing and transmits the ignition (IGT) signals to each cylinder. Using the IGT signal, the ECM turns the power transistor inside the igniter on and off. The power transistor, in turn, switches on and off the current to the primary coil. When the current to the primary coil is cut off, a powerful voltage is generated in the secondary coil. This voltage is applied to the spark plugs, causing them to spark inside the cylinders.



DTC No.	DTC Detection Condition	Trouble Area
P0351	Received diagnostic information (open circuit detected / GND short / +B short or overheating) from the ignition coil driver IC for No. 1 ignition coil assembly continuously 10 times or more. (1 trip detection logic)	• Ignition system • Open or short in IGT circuit (1 to 4) between ignition coil and ECM • Ignition coil (No. 1 to No. 4 cylinder) • ECM
P0352	Received diagnostic information (open circuit detected / GND short / +B short or overheating) from the ignition coil driver IC for No. 2 ignition coil assembly continuously 10 times or more. (1 trip detection logic)	
P0353	Received diagnostic information (open circuit detected / GND short / +B short or overheating) from the ignition coil driver IC for No. 3 ignition coil assembly continuously 10 times or more. (1 trip detection logic)	

MONITOR DESCRIPTION

If the ECM receives the malfunction signal from the ignition coil driver IC, it interprets this as a fault in the igniter and stores a DTC.

MONITOR STRATEGY

Related DTCs	P0351: Ignition Coil "A" Primary / Secondary Circuit P0352: Ignition Coil "B" Primary / Secondary Circuit P0353: Ignition Coil "C" Primary / Secondary Circuit P0354: Ignition Coil "D" Primary / Secondary Circuit
Required Sensors/Components (Main)	Igniter
Required Sensors/Components (Related)	Crankshaft position sensor
Frequency of Operation	Continuous
Duration	2.5 seconds (256 msec. X 10 counts)
MIL Operation	Immediately
Sequence of Operation	None

TYPICAL ENABLING CONDITIONS

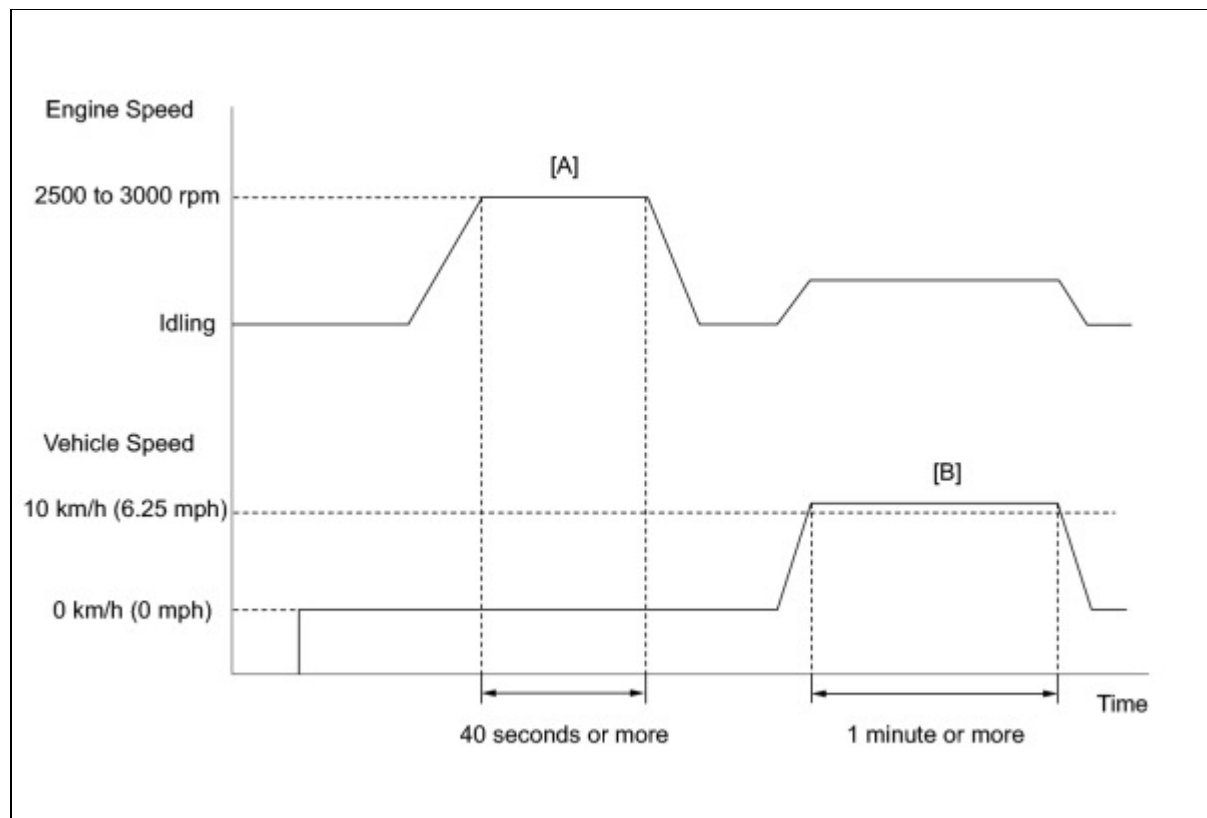
Monitor runs whenever following DTCs not stored	None
Battery voltage	10.9 V or more
Elapsed time after engine start	1 second or more
Engine speed	500 rpm or higher

TYPICAL MALFUNCTION THRESHOLDS

Signal of malfunction from ignition coil driver IC

On

CONFIRMATION DRIVING PATTERN



1. Connect the Techstream to the DLC3.
2. Turn the ignition switch to ON and turn the Techstream on.
3. Clear DTCs (even if no DTCs are stored, perform the clear DTC operation) INFO.
4. Turn the ignition switch off and wait for at least 30 seconds.
5. Turn the ignition switch to ON and turn the Techstream on.
6. Start the engine and warm it up until the engine coolant temperature reaches 75°C (167°F) or higher.
7. With the vehicle stationary, depress the accelerator pedal and maintain an engine speed of between 2500 and 3000 rpm for 40 seconds or more [A].
8. Drive the vehicle at 10 km/h (6.25 mph) or more for 1 minute or more [B].

CAUTION:

When performing the confirmation driving pattern, obey all speed limits and traffic laws.

9. Enter the following menus: Powertrain / Engine / Trouble Codes.
10. Read pending DTCs.

HINT:

- If a pending DTC is output, the system is malfunctioning.
 - If a pending DTC is not output, perform the following procedure.
11. Enter the following menus: Powertrain / Engine / Utility / All Readiness.
 12. Input the DTC: P0351, P0352, P0353 or P0354.
 13. Check the DTC judgment result.

Techstream Display	Description
NORMAL	○ DTC judgment completed ○ System normal
ABNORMAL	○ DTC judgment completed ○ System abnormal
INCOMPLETE	○ DTC judgment not completed ○ Perform driving pattern after confirming DTC enabling conditions
N/A	○ Unable to perform DTC judgment ○ Number of DTCs which do not fulfill DTC preconditions has reached ECU memory limit

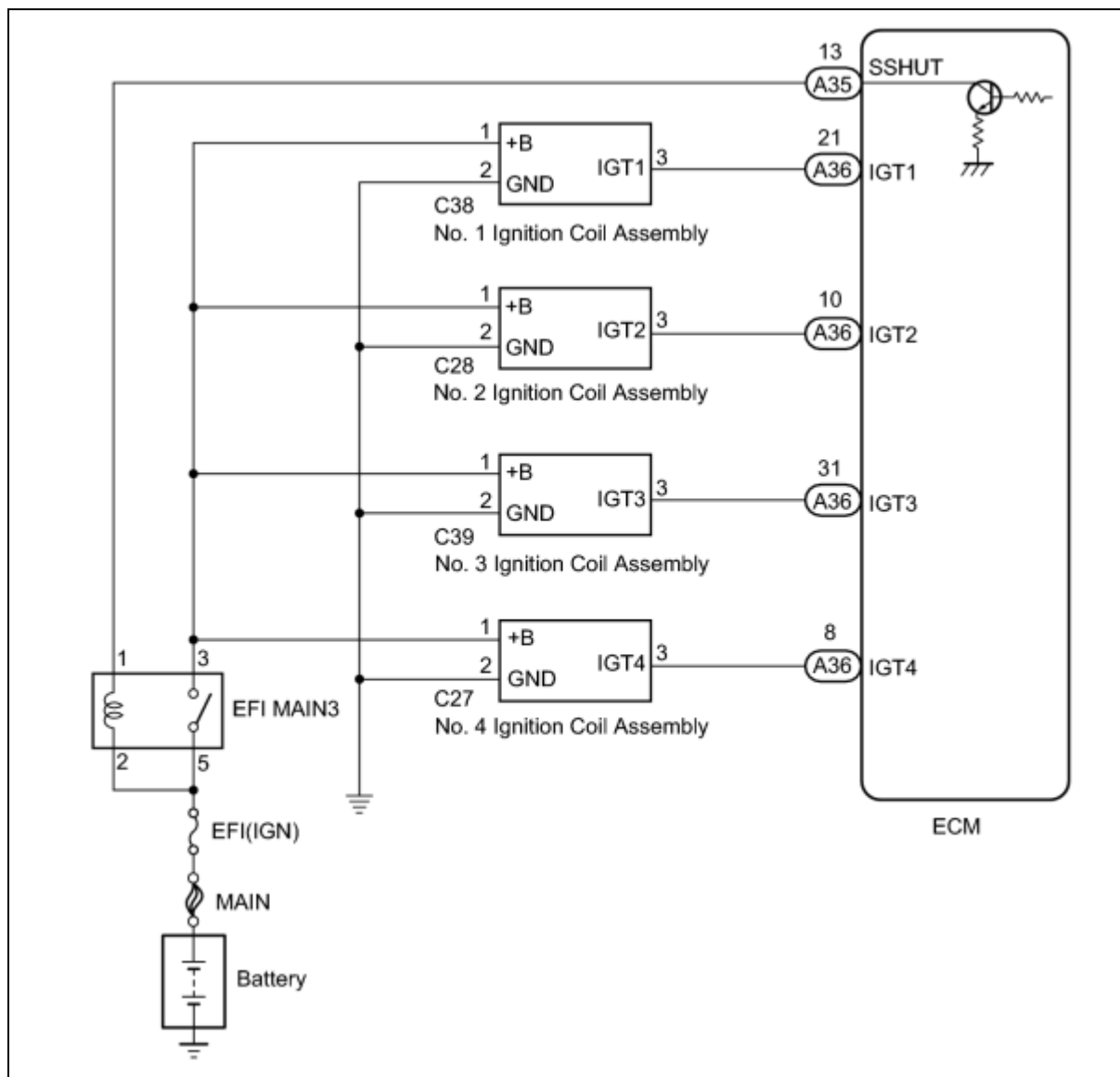
HINT:

- If the judgment result shows NORMAL, the system is normal.
 - If the judgment result shows ABNORMAL, the system has a malfunction.
14. If the test result is INCOMPLETE or N/A and no DTC is output, perform a universal trip and check for permanent DTCs .

HINT:

- If a permanent DTC is output, the system is malfunctioning.
- If no permanent DTC is output, the system is normal.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

Inspect the fuses for circuits related to this system before performing the following inspection procedure.

HINT:

- These DTCs indicate malfunctions relating to the primary circuit.
- If DTC P0351 is output, check the No. 1 ignition coil (No. 1 cylinder) circuit.
- If DTC P0352 is output, check the No. 2 ignition coil (No. 2 cylinder) circuit.
- If DTC P0353 is output, check the No. 3 ignition coil (No. 3 cylinder) circuit.
- If DTC P0354 is output, check the No. 4 ignition coil (No. 4 cylinder) circuit.
- Read freeze frame data using the Techstream. The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can help determine if the vehicle was moving or stationary, if the engine was warmed up or not, if the air fuel ratio was lean or rich, and other data from the time the malfunction occurred.

PROCEDURE

1.	CHECK WHETHER DTC OUTPUT RECURS
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- (a) Connect the Techstream to the DLC3.
- (b) Turn the ignition switch to ON.
- (c) Turn the Techstream on.
- (d) Clear the DTCs .
- (e) Turn the ignition switch off and wait for at least 30 seconds.
- (f) Shuffle the arrangement of the ignition coils (among No. 1 to No. 4 cylinders).

NOTICE:

Do not change the location of the connectors.

- (g) Drive the vehicle in accordance with the driving pattern described in the Confirmation Driving Pattern.
- (h) Enter the following menus: Powertrain / Engine / Trouble Codes.
- (i) Read DTCs.

Result

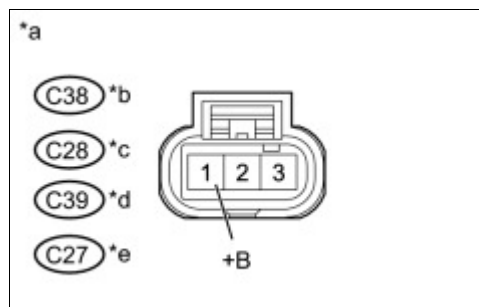
Result	Proceed to
Same DTC output	A
Different ignition coil DTC output	B

B  [REPLACE IGNITION COIL](#)

A


2.	INSPECT TERMINAL VOLTAGE (POWER SOURCE OF IGNITION COIL)
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- (a) Disconnect the ignition coil connectors.



(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

Tester Connection	Switch Condition	Specified Condition
C38-1 (+B) - Body ground	Ignition switch ON	11 to 14 V
C28-1 (+B) - Body ground	Ignition switch ON	11 to 14 V
C39-1 (+B) - Body ground	Ignition switch ON	11 to 14 V
C27-1 (+B) - Body ground	Ignition switch ON	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Ignition Coil)
*b	No. 1 cylinder
*c	No. 2 cylinder
*d	No. 3 cylinder
*e	No. 4 cylinder

NG  REPAIR OR REPLACE HARNESS OR CONNECTOR

OK



3.	CHECK HARNESS AND CONNECTOR (IGNITION COIL - BODY GROUND)
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(a) Disconnect the ignition coil connectors.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for open):

Tester Connection	Condition	Specified Condition
C38-2 (GND) - Body ground	Always	Below 1 Ω
C28-2 (GND) - Body ground	Always	Below 1 Ω
C39-2 (GND) - Body ground	Always	Below 1 Ω
C27-2 (GND) - Body ground	Always	Below 1 Ω

NG  REPAIR OR REPLACE HARNESS OR CONNECTOR

OK



4.	CHECK HARNESS AND CONNECTOR (IGNITION COIL - ECM)
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(a) Disconnect the ECM connector.

(b) Disconnect the ignition coil connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance (Check for open):

Tester Connection	Condition	Specified Condition
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Tester Connection	Condition	Specified Condition
A36-21 (IGT1) - C38-3 (IGT1)	Always	Below 1 Ω
A36-10 (IGT2) - C28-3 (IGT2)	Always	Below 1 Ω
A36-31 (IGT3) - C39-3 (IGT3)	Always	Below 1 Ω
A36-8 (IGT4) - C27-3 (IGT4)	Always	Below 1 Ω

Standard Resistance (Check for short):

Tester Connection	Condition	Specified Condition
A36-21 (IGT1) or C38-3 (IGT1) - Body ground	Always	10 k Ω or higher
A36-10 (IGT2) or C28-3 (IGT2) - Body ground	Always	10 k Ω or higher
A36-31 (IGT3) or C39-3 (IGT3) - Body ground	Always	10 k Ω or higher
A36-8 (IGT4) or- C27-3 (IGT4) - Body ground	Always	10 k Ω or higher

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ► [REPLACE ECM](#)

