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Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [12/2022 -]
Title: M20A-FXS (ENGINE CONTROL): SFI SYSTEM: Ignition Circuit; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

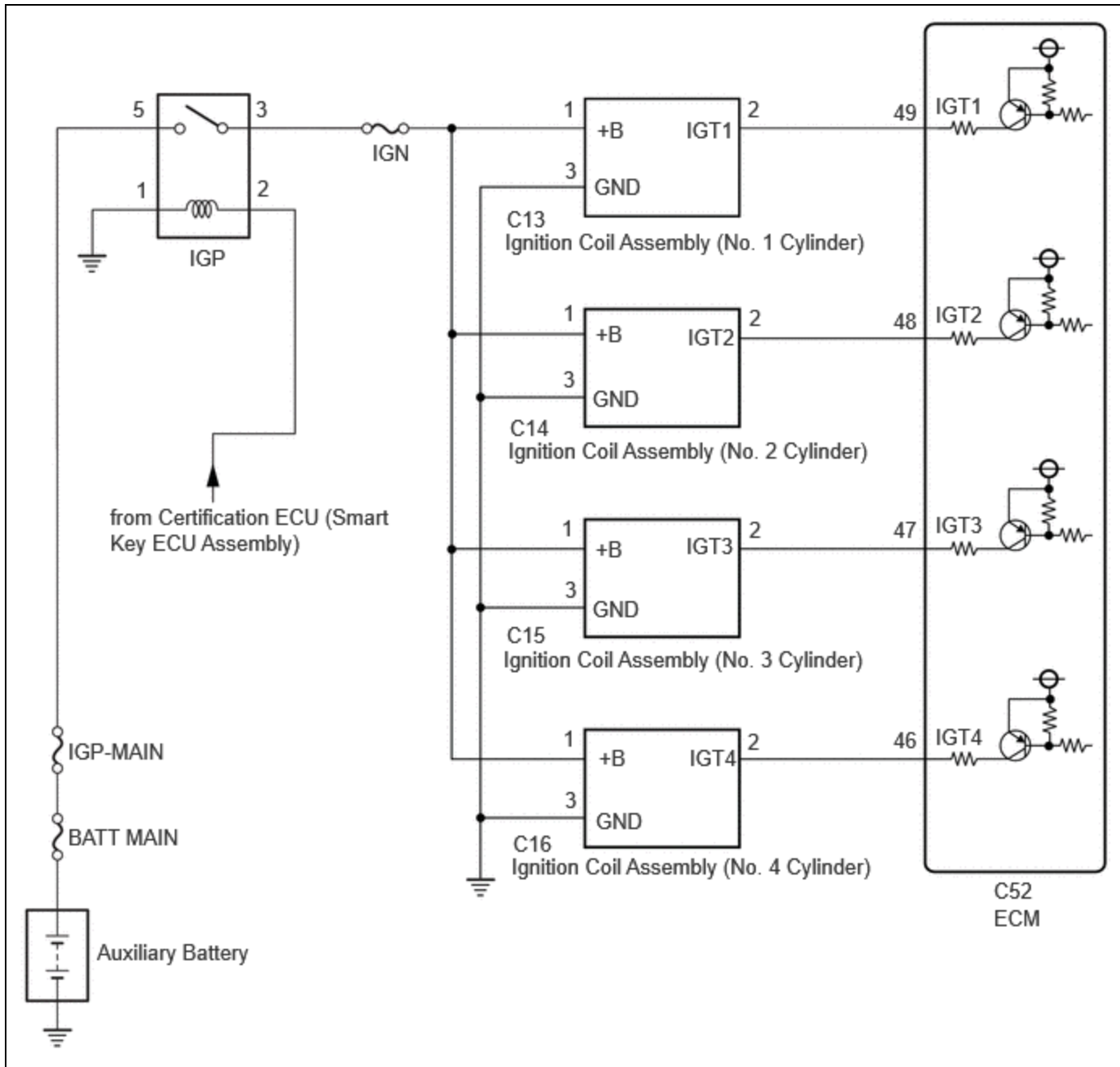
Ignition Circuit

DESCRIPTION

A direct ignition system is used on this vehicle. The direct ignition system is a 1 cylinder ignition system which ignites one cylinder with one ignition coil. In the 1 cylinder ignition system, one spark plug is connected to the end of the secondary winding. High voltage is generated in the secondary winding and is applied directly to the spark plug. The spark of the spark plug passes from the center electrode to the ground electrode.

The ECM determines the ignition timing and transmits the ignition signals for each cylinder. Using the ignition signal, the ECM turns on and off the power transistor inside the igniter, which switches on and off a current to the primary coil. When the 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.

WIRING DIAGRAM



CAUTION / NOTICE / HINT

NOTICE:

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

HINT:

Perform a spark test first. If none of the cylinders spark, or if only some cylinders do not spark, check this circuit to determine if the ignition coil and spark plug are normal.

Click here [INFO](#)

PROCEDURE

1.	CHECK TERMINAL VOLTAGE (POWER SOURCE OF IGNITION COIL ASSEMBLY)
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- (a) Disconnect the ignition coil assembly connectors.
- (b) Turn the ignition switch to ON.
- (c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:



[Click Location & Routing\(C13,C14,C15,C16\)](#)

[Click Connector\(C13\)](#)

[Click Connector\(C14\)](#)

[Click Connector\(C15\)](#)

[Click Connector\(C16\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C13-1 (+B) - C13-3 (GND)	Ignition switch ON	11 to 14 V
C14-1 (+B) - C14-3 (GND)	Ignition switch ON	11 to 14 V
C15-1 (+B) - C15-3 (GND)	Ignition switch ON	11 to 14 V
C16-1 (+B) - C16-3 (GND)	Ignition switch ON	11 to 14 V

NG **GO TO STEP 3**

OK



2.	CHECK HARNESS AND CONNECTOR (IGNITION COIL ASSEMBLY - ECM)
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- (a) Disconnect the ignition coil assembly connectors.
- (b) Disconnect the ECM connector.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



[Click Location & Routing\(C13,C52,C14,C15,C16\)](#)

[Click Connector\(C13\)](#)

[Click Connector\(C52\)](#)

[Click Connector\(C14\)](#)

[Click Connector\(C15\)](#)

[Click Connector\(C16\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C13-2 (IGT1) - C52-49 (IGT1)	Always	Below 1 Ω
C14-2 (IGT2) - C52-48 (IGT2)	Always	Below 1 Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C15-2 (IGT3) - C52-47 (IGT3)	Always	Below 1 Ω
C16-2 (IGT4) - C52-46 (IGT4)	Always	Below 1 Ω
C13-2 (IGT1) or C52-49 (IGT1) - Body ground and other terminals	Always	10 k Ω or higher
C14-2 (IGT2) or C52-48 (IGT2) - Body ground and other terminals	Always	10 k Ω or higher
C15-2 (IGT3) or C52-47 (IGT3) - Body ground and other terminals	Always	10 k Ω or higher
C16-2 (IGT4) or C52-46 (IGT4) - Body ground and other terminals	Always	10 k Ω or higher

OK  **REPLACE ECM**

Click here 

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

3. CHECK HARNESS AND CONNECTOR (IGNITION COIL ASSEMBLY - BODY GROUND)

- (a) Disconnect the ignition coil assembly connectors.
 (b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



[Click Location & Routing\(C13,C14,C15,C16\)](#)

[Click Connector\(C13\)](#)

[Click Connector\(C14\)](#)

[Click Connector\(C15\)](#)

[Click Connector\(C16\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C13-3 (GND) - Body ground	Always	Below 1 Ω
C14-3 (GND) - Body ground	Always	Below 1 Ω
C15-3 (GND) - Body ground	Always	Below 1 Ω
C16-3 (GND) - Body ground	Always	Below 1 Ω

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



4. CHECK HARNESS AND CONNECTOR (IGP RELAY - IGNITION COIL ASSEMBLY)

- (a) Remove the IGP relay from the No. 1 engine room relay block and No. 1 junction block assembly.
- (b) Disconnect the ignition coil assembly connectors.
- (c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



[Click Location & Routing\(C13,C14,C15,C16\)](#)

[Click Connector\(C13\)](#)

[Click Connector\(C14\)](#)

[Click Connector\(C15\)](#)

[Click Connector\(C16\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (IGP relay) - C13-1 (+B)	Always	Below 1 Ω
3 (IGP relay) - C14-1 (+B)	Always	Below 1 Ω
3 (IGP relay) - C15-1 (+B)	Always	Below 1 Ω
3 (IGP relay) - C16-1 (+B)	Always	Below 1 Ω
3 (IGP relay) or C13-1 (+B) - Body ground and other terminals	Always	10 k Ω or higher
3 (IGP relay) or C14-1 (+B) - Body ground and other terminals	Always	10 k Ω or higher
3 (IGP relay) or C15-1 (+B) - Body ground and other terminals	Always	10 k Ω or higher
3 (IGP relay) or C16-1 (+B) - Body ground and other terminals	Always	10 k Ω or higher

OK ► **GO TO ECM POWER SOURCE CIRCUIT**

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**

