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Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [03/2023 -]
Title: M20A-FXS (BATTERY / CHARGING): SOLAR CHARGING SYSTEM: P196312; Solar Charger Input Voltage Sensor "B" Circuit Short to Battery; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	P196312	Solar Charger Input Voltage Sensor "B" Circuit Short to Battery
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DESCRIPTION

Refer to the description for DTC P1EA412.

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The solar roof (No. 2 roof window glass sub-assembly) supplies power that is generated from sunlight to the solar energy control ECU assembly. The solar energy control ECU assembly monitors the generated voltage of the solar roof (No. 2 roof window glass sub-assembly).

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY
P196312	Solar Charger Input Voltage Sensor "B" Circuit Short to Battery	Solar panel excessive voltage Voltage at VSOP2 terminal is abnormally high (1 trip detection logic)	<ul style="list-style-type: none"> Solar energy control ECU assembly No. 2 roof window glass sub-assembly Wire harness or connector 	Solar Charging Warning Light: Comes on	Solar Charging Control	A

CONFIRMATION DRIVING PATTERN

HINT:

After completing repairs, clear the DTCs and then check that the vehicle has returned to normal by performing the following All Readiness check procedure.

Click here [INFO](#)

1. Park the vehicle in an area where the solar radiation will be steady.

Weather	Clear or mostly clear and sunny
Time	Between 11:00 and 14:00
Place	An area where sunlight strikes the solar roof directly

HINT:

- o Make sure no part of the solar roof is shaded.
 - o If the solar roof is dirty, clean it.
2. Turn the ignition switch off and then disconnect the cable from the negative (-) auxiliary battery terminal.
 3. Wait for 5 seconds or more, then disconnect the power source connector and then all other low voltage connectors the solar energy control ECU assembly.

4. Wait for 30 seconds or more, then connect the low voltage connectors of the solar energy control ECU assembly except the power source connector and then connect the power source connector.
5. Connect the cable to the negative (-) auxiliary battery terminal.
6. Turn the ignition switch to ON, wait for 5 to 10 seconds, and then turn the ignition switch off.

HINT:

Make sure to turn the ignition switch off within 10 seconds.

7. Wait for 20 minutes and then check for DTCs to check that no DTCs have been stored.

HINT:

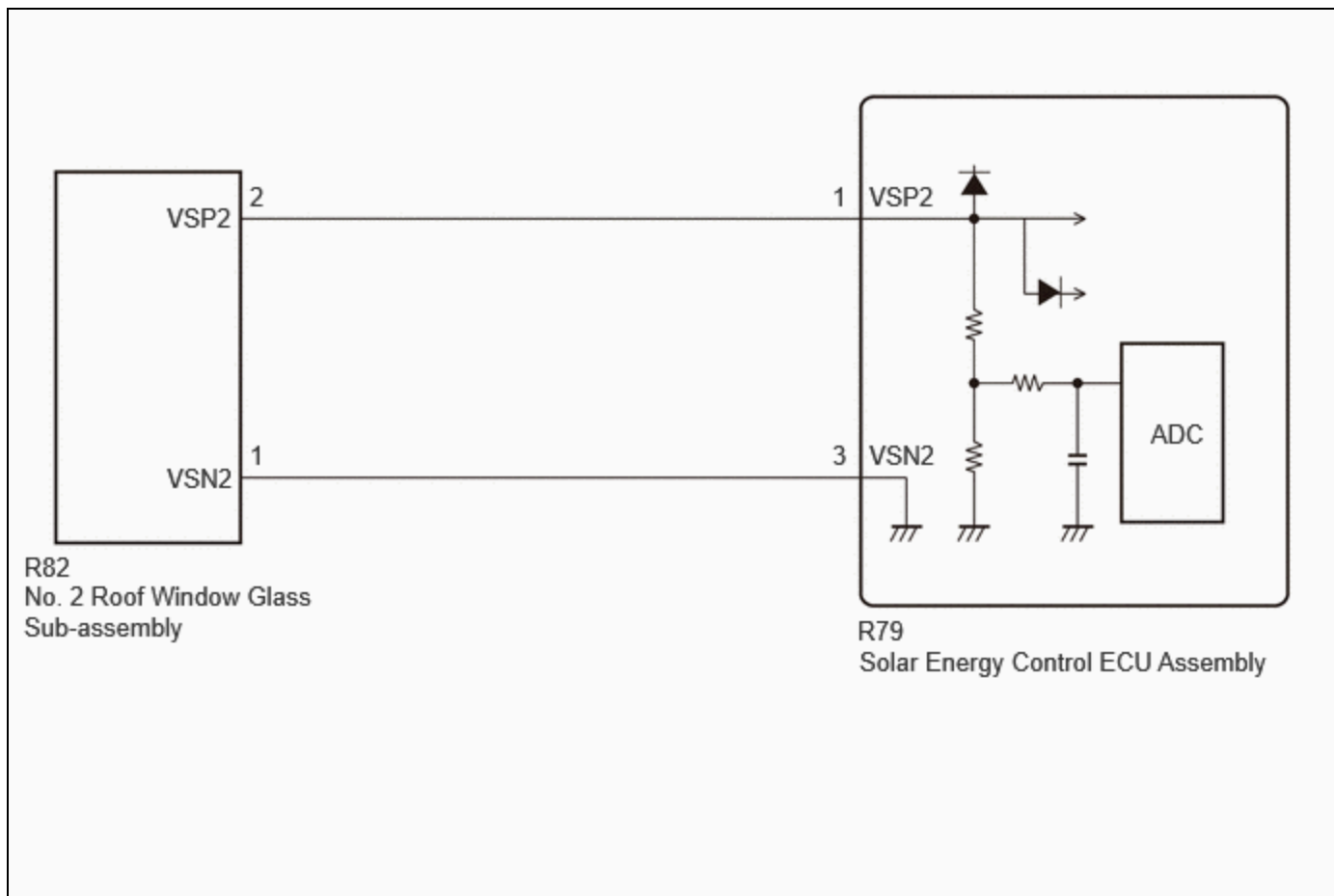
- While waiting, the HV battery will be charged by the solar charging system. However, depending on certain conditions, charging may not be performed.
- When the HV battery is fully charged, high voltage charging to the HV battery is not performed.
- If any of the following conditions is met, the HV battery will not be charged by the solar charging system:
 - The HV battery is charged via an external power source.
 - The ignition switch is turned to ACC.
 - The ignition switch is turned to ON.
 - The ignition switch is turned to ON (READY).
 - The HV battery heating system is operating.
 - The remote air conditioning system is operating.

8. Check that solar charging is being performed.

HINT:

Be sure to check that high voltage battery charging is being performed by the solar roof.

WIRING DIAGRAM



CAUTION / NOTICE / HINT

CAUTION:

Refer to the precautions before inspecting high voltage circuit.

Click here [INFO](#)

NOTICE:

- After the ignition switch is turned off, there may be a waiting time before disconnecting the negative (-) auxiliary battery terminal.

Click here [INFO](#)

- When disconnecting and reconnecting the auxiliary battery

HINT:

When disconnecting and reconnecting the auxiliary battery, there is an automatic learning function that completes learning when the respective system is used.

Click here [INFO](#)

PROCEDURE

1.	CHECK VEHICLE CONDITION
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(a) Check the condition of the vehicle and conditions where the vehicle is normally parked.

1. Check if the solar roof has been modified.
2. Check if light had been focused on the solar roof when the vehicle was parked.

RESULT	PROCEED TO
There are no modifications and the conditions where the vehicle is parked are normal.	A
There are modifications or the conditions where the vehicle is parked are not normal.	B

B ▶ REMOVE EQUIPMENT (MAKE SURE TO OBTAIN CUSTOMERS PERMISSION)

HINT:

Explain to the customer the malfunction, system control or other problem which caused the charging by the solar charging system to not be performed.

- The solar roof was modified or equipment was installed over the solar roof.
- Sunlight was focused onto the solar roof intentionally.
- Sunlight may have been shining on the solar roof when the ambient temperature was excessively low.
- Excessively strong sunlight may have been shining on the solar roof. (Due to sunlight reflecting off of glass, a mirror, white wall, etc.)



2. CHECK CONNECTOR CONNECTION CONDITION (SOLAR ENERGY CONTROL ECU ASSEMBLY LOW VOLTAGE CONNECTOR)

CAUTION:

Be sure to wear insulated gloves.

Pre-procedure1

(a) Check that the service plug grip is not installed.

NOTICE:

After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

Procedure1

(b) Check the connection condition of the solar energy control ECU assembly low voltage connectors and the contact pressure of each terminal. Check the terminals for deformation, and check each connector for water ingress and foreign matter.

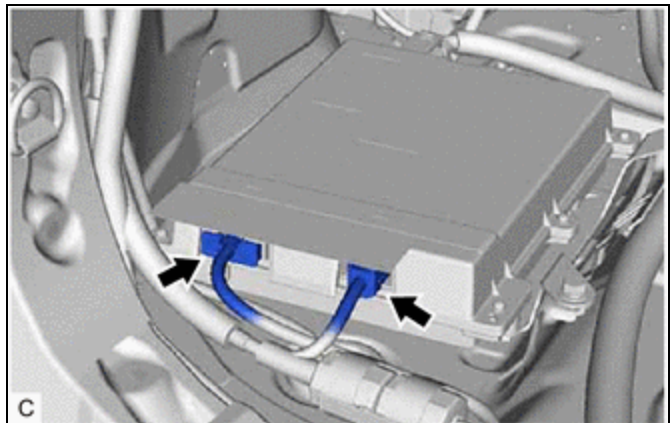
HINT:

[Click here](#) INFO

OK:

- Each connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in each connector.

Result:



RESULT	PROCEED TO
OK	A
NG (A connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in a connector.)	C

Post-procedure1

(c) None

B ▶ CONNECT SECURELY

C ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

A
▼

3.	CHECK CONNECTOR CONNECTION CONDITION (NO. 2 ROOF WINDOW GLASS SUB-ASSEMBLY CONNECTOR)
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(a) Check the connection condition of the No. 2 roof window glass sub-assembly connector and the contact pressure of each terminal. Check the terminals for deformation, and check the connector for water ingress and foreign matter.

HINT:

[Click here](#) INFO

OK:

- The connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in the connector.

RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ CONNECT SECURELY

C ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

A
▼

4.	CHECK SOLAR ENERGY CONTROL ECU ASSEMBLY (SOLAR PANEL 2 OUTPUT VOLTAGE)
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Pre-procedure1

(a) Park the vehicle in an area where the solar radiation will be steady.

Weather	Clear or mostly clear and sunny
Time	Between 11:00 and 14:00
Place	An area where sunlight strikes the solar roof directly

HINT:

- Make sure no part of the solar roof is shaded.
- If the solar roof is dirty, clean it.

(b) Enter the following menus.

Powertrain > Solar Charging Control > Data List

TESTER DISPLAY
Solar Panel 2 Output Voltage

(c) Turn the ignition switch to ON (READY).

Procedure1

(d) According to the display on the GTS, read the Data List.

NOTICE:

Make sure to perform this step with the ignition switch to ON (READY).

RESULT	PROCEED TO
The value of Solar Panel 2 Output Voltage is less than 54.6 V	A
The value of Solar Panel 2 Output Voltage is 54.6 V or more	B

Post-procedure1

(e) Turn the ignition switch off.

A ▶ END (NORMAL OPERATION)

HINT:

Sunlight may have temporarily been focused or reflected onto the solar roof, causing the output voltage to become high.

- Sunlight may have been shining on the solar roof when the ambient temperature was excessively low.
- Excessively strong sunlight may have been shining on the solar roof.

B ▶ REPLACE SOLAR ENERGY CONTROL ECU ASSEMBLY

