Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BMEA
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (BATTERY / CHARGING): SOLAR CHARGING SYSTEM: P19A412; Solar Charger Output Voltage Sensor "B" Circuit Short to Battery; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**P19A412**	**Solar Charger Output Voltage Sensor "B" Circuit Short to Battery**

DESCRIPTION

Refer to the description for DTC P1EA412.

Click here INFO

The auxiliary battery DC/DC converter built into the solar energy control ECU steps down the voltage generated by the solar charging system to charge the auxiliary battery and provide power for the auxiliary load.

When the solar energy control ECU assembly detects that the auxiliary battery DC/DC converter output voltage sensor is over voltage, it stops the auxiliary battery DC/DC converter until the voltage returns to normal, but if voltage becomes stuck at an overvoltage condition during HV battery charging, power stops being supplied to the auxiliary circuit, and so if the malfunction threshold for overvoltage detection continues for a certain period of time, a malfunction is detected.

HINT:

The solar energy control ECU assembly supplies power to the auxiliary battery while charging the HV battery. If the power supply to the auxiliary battery is lower than necessary, the auxiliary battery may become depleted.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY
P19A412	Solar Charger Output Voltage Sensor "B" Circuit Short to Battery	The auxiliary battery voltage monitor value is a certain value or more for 3 seconds or more. (1 trip detection logic)	• Wire harness or connector • Solar energy control ECU assembly • Auxiliary battery	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:

- Make sure no part of the solar roof is shaded.
- 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

Refer to the wiring diagram for ECU power source circuit.

Click here INFO

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**

(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.)

A

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.

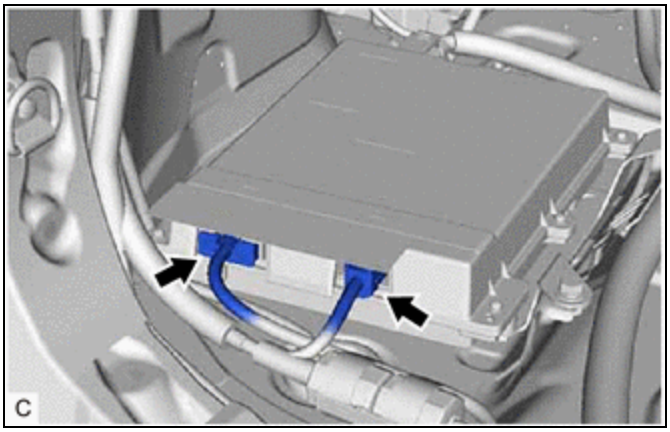
HINT:

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.	**INSPECT AUXILIARY BATTERY TERMINALS**

(a) Check the connection condition of the auxiliary battery terminals and the contact pressure of each terminal. Check the terminals for deformation, and check for water ingress and foreign matter.

OK:

- Each connector is connected securely.

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

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

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A ▼

4.	**CHECK HARNESS AND CONNECTOR (SOLAR ENERGY CONTROL ECU ASSEMBLY - AUXILIARY BATTERY)**

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.

(b) Disconnect the solar energy control ECU assembly connectors.

(c) Disconnect the cable from the negative (-) auxiliary battery terminal.

(d) Disconnect the cable from the positive (+) auxiliary battery terminal.

Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(R80)
Click Connector(R80)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
R80-1 (AMD) - Positive (+) auxiliary battery terminal	Ignition switch off	Below 1 Ω	Ω

Post-procedure1

(f) Reconnect the cable from the positive (+) auxiliary battery terminal.

(g) Reconnect the cable from the negative (-) auxiliary battery terminal.

(h) Reconnect the solar energy control ECU assembly connectors.

OK ▶ **REPLACE SOLAR ENERGY CONTROL ECU ASSEMBLY**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**