Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BMEK
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: M20A-FXS (BATTERY / CHARGING): SOLAR CHARGING SYSTEM: U117B87; Lost Communication with Battery Energy Control Module "A" (ch2) Missing Message; 2023 - 2024 MY Prius Prius Prime [03/2023 -]		

DTC	**U117B87**	**Lost Communication with Battery Energy Control Module "A" (ch2) Missing Message**

DESCRIPTION

The solar energy control ECU assembly communicates with the battery ECU assembly via CAN communication.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY
U117B87	Lost Communication with Battery Energy Control Module "A" (ch2) Missing Message	A CAN communication error between the battery ECU assembly and solar energy control ECU assembly occurs. (1 trip detection logic)	• Battery ECU assembly • Solar energy control ECU assembly • Wire harness or connector	Solar Charging Warning Light: Comes on	Solar Charging Control	B

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

When the solar energy control computer assembly is not replaced

1. Turn the ignition switch to ON and wait for 15 seconds or more.

When the solar energy control computer assembly is replaced

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:

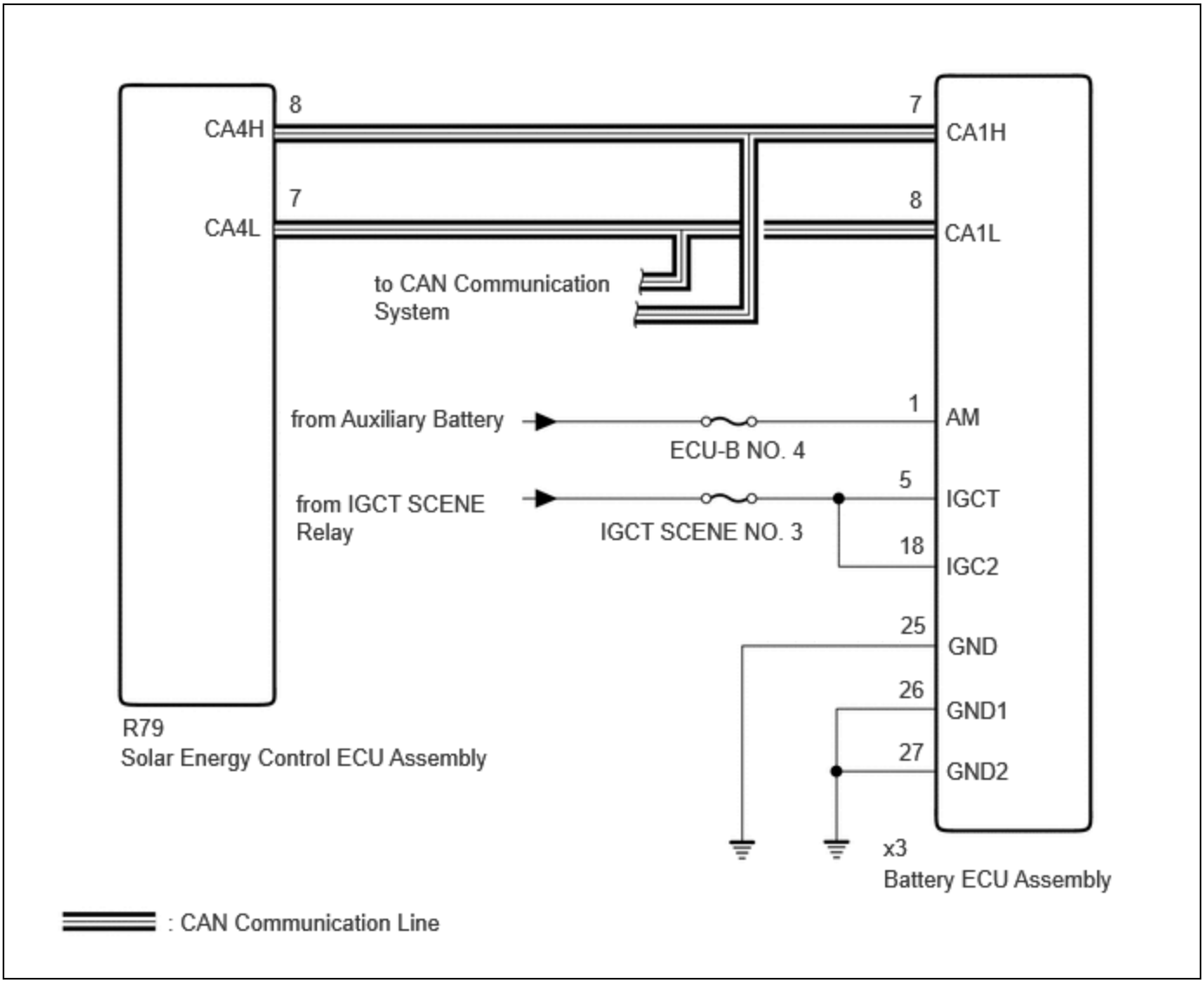
- While waiting, the HV battery will be charged by the solar charging system. However, depending on certain conditions, charging may not be performed.
- When the HV battery is fully charged, high voltage charging to the HV battery is not performed.
- If any of the following conditions is met, the HV 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



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 DTC OUTPUT (HV BATTERY)**

Pre-procedure1

(a) None

Procedure1

(b) Enter the following menus.

Powertrain > HV Battery > Trouble Codes

RESULT	PROCEED TO
DTCs are not output	A
DTCs are output	B

Post-procedure1

(c) Turn the ignition switch off.

B ▶ **GO TO DTC CHART (HYBRID BATTERY SYSTEM)**

A ▼

2.	**CHECK BATTERY ECU ASSEMBLY (POWER SOURCE CIRCUIT)**

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) Connect the cable to the negative (-) auxiliary battery terminal.

(c) Disconnect the battery ECU assembly connector.

Procedure1

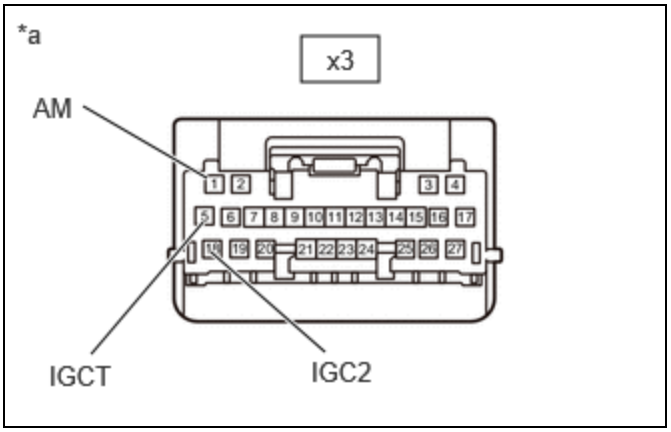
(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

EWD INFO

Click Location & Routing(x3)
Click Connector(x3)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x3-1 (AM) - Body ground	Ignition switch off	11 to 14 V	V
x3-5 (IGCT) - Body ground	Ignition switch ON	11 to 14 V	V
x3-18 (IGC2) - Body ground	Ignition switch ON	11 to 14 V	V



*a	Front view of wire harness connector (to Battery ECU Assembly)

NOTICE:

Turning the ignition switch to ON with the service plug grip removed causes other DTCs to be stored. Clear the DTCs after performing this inspection.

HINT:

As there might be an intermittent malfunction in the battery ECU assembly power source circuit, inspect the following even if the measured voltage is as specified:

- Installation condition of fuse(s) (before removing fuse(s)) (Power Source Circuit)
- Fuse condition (before and after removing fuse(s)) (Power Source Circuit)
- Connection condition of connectors (Power Source Circuit)
- Wire harness condition (Power Source Circuit)
- Wire harness condition (GND circuit)

Pre-procedure2

(e) Turn the ignition switch off.

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

Procedure2

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

Standard Resistance:

EWD INFO

Click Location & Routing(x3)
Click Connector(x3)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x3-25 (GND) - Body ground	Ignition switch off	Below 1 Ω	Ω
x3*26 (GND1) - Body ground	Ignition switch off	Below 1 Ω	Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x3-27 (GND2) - Body ground	Ignition switch off	Below 1 Ω	Ω

Post-procedure1

(h) Reconnect the battery ECU assembly connector.

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

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

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 connector.

NOTICE:

- Before disconnecting the connector, check that it is not loose or disconnected.
- Check the terminals of the connector for deformation and corrosion.

Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(R79)
Click Connector(R79)

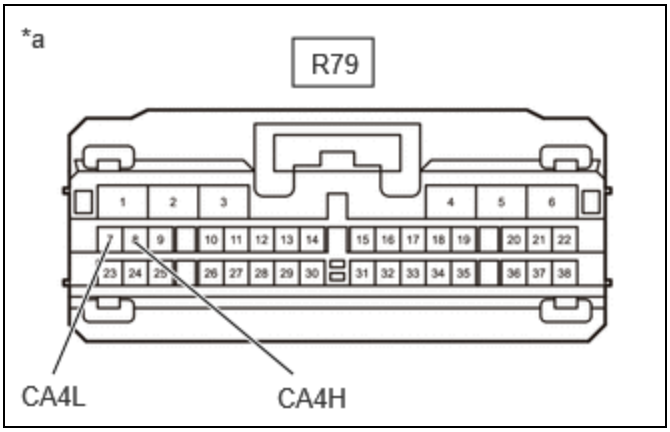
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
R79-8 (CA4H) - R79-7 (CA4L)	Ignition switch off	54 to 69 Ω	Ω

NOTICE:

Make sure that each connector between the battery ECU assembly and solar energy control ECU assembly is not loose or disconnected and its terminals are not deformed or corroded.

Result:

PROCEED TO
OK
NG



*a	Front view of wire harness connector (to Solar Energy Control ECU Assembly)

Post-procedure1

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

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

NG ▼

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

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 hybrid vehicle control ECU connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

(c) Disconnect the solar energy control ECU assembly connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

(d) Disconnect the plugin charge control ECU assembly connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

(e) Disconnect the battery ECU assembly connector.

NOTICE:

- Before disconnecting the connector, check that it is not loose or disconnected.
- Check the terminals of the connector for deformation and corrosion.

(f) Disconnect the transmission floor shift assembly connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

(g) Disconnect the inverter with converter assembly connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

(h) Disconnect the shift control actuator assembly connector.

NOTICE:

Before disconnecting the connector, check that it is not loose or disconnected.

Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(x3,R79)
Click Connector(x3)
Click Connector(R79)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x3-7 (CA1H) - R79-8 (CA4H)	Ignition switch off	Below 1 Ω	Ω
x3-8 (CA1L) - R79-7 (CA4L)	Ignition switch off	Below 1 Ω	Ω
x3-7 (CA1H) or R79-8 (CA4H) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ
x3-8 (CA1L) or R79-7 (CA4L) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ

NOTICE:

Make sure that each connector between the battery ECU assembly and solar energy control ECU assembly is not loose or disconnected and its terminals are not deformed or corroded.

Post-procedure1

(j) Reconnect the shift control actuator assembly connector.

(k) Reconnect the inverter with converter assembly connector.

(l) Reconnect the transmission floor shift assembly connector.

(m) Reconnect the battery ECU assembly connector.

(n) Reconnect the plugin charge control ECU assembly connector.

(o) Reconnect the solar energy control ECU assembly connector.

(p) Reconnect the hybrid vehicle control ECU connector.

OK ▶ **REPLACE BATTERY ECU ASSEMBLY**

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