Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BI1P
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID CONTROL SYSTEM (for PHEV Model): HV Battery High-voltage Line Circuit; 2023 - 2024 MY Prius Prime [03/2023 -]		

HV Battery High-voltage Line Circuit

DESCRIPTION

The cause of the malfunction may be the HV battery high-voltage line circuit.

Check the continuity in the high-voltage line from the HV battery to the inverter.

Check the connection condition and for an open circuit in the frame wire from the service plug grip, No. 1 traction battery device box assembly and HV battery to the inverter and perform a function check of the system main relay.

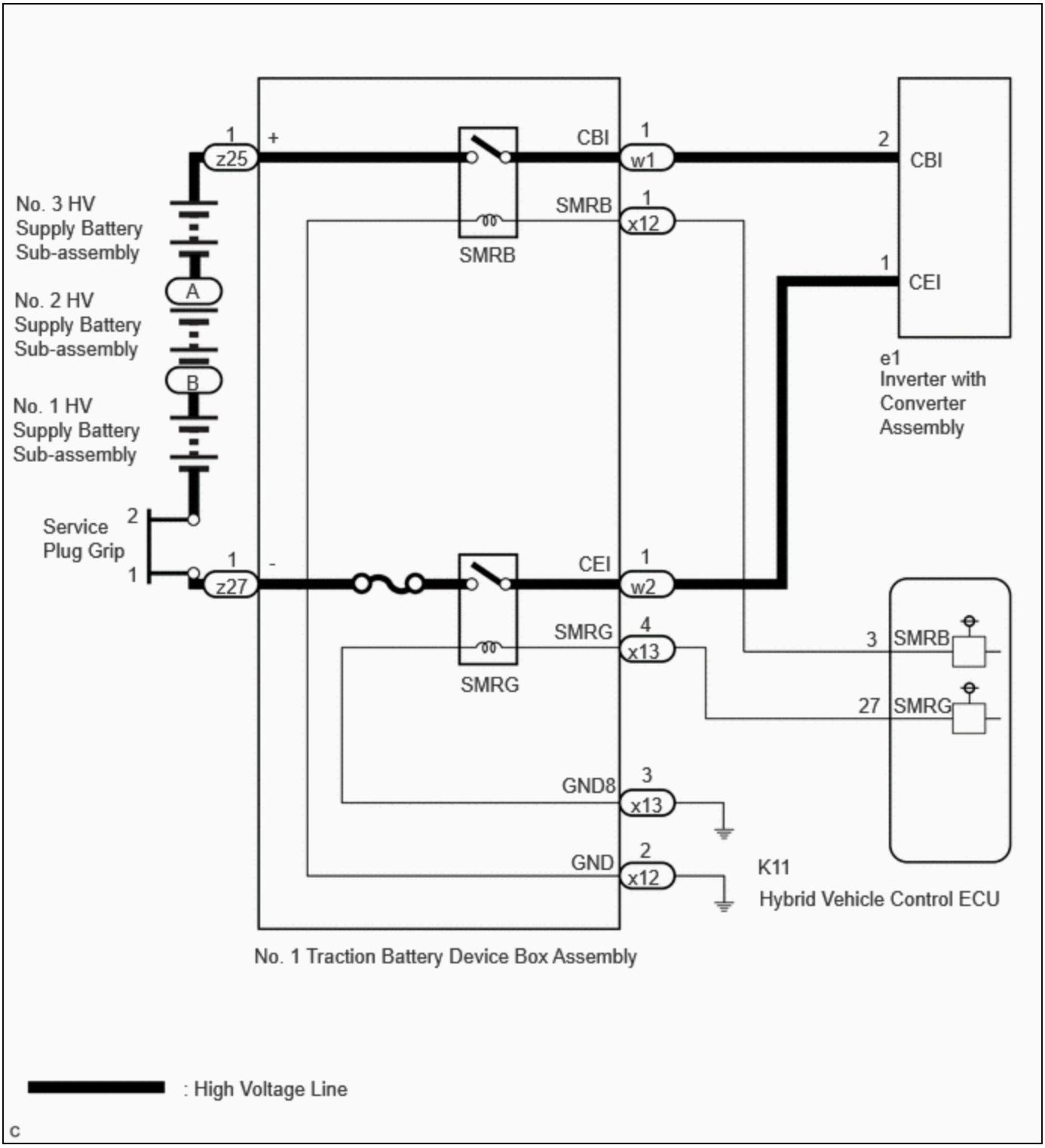
Related Parts Check

AREA	INSPECTION
High-voltage circuit from HV battery to inverter	Check connection condition and for open circuit.
Service plug grip	Check connection condition and for open circuit.
No. 1 traction battery device box assembly	Check for open circuit.
System Main Relay	Check operation condition as relay.

SYSTEM DESCRIPTION

The HV battery high voltage is supplied to the inverter via the system main relay operation.

WIRING DIAGRAM



CAUTION / NOTICE / HINT

This diagnostic procedure is referenced to in the diagnostic procedure of several DTCs.

If the result of this diagnostic procedure is normal, proceed as directed in the procedure for the DTC.

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 INVERTER WITH CONVERTER ASSEMBLY (HV FLOOR UNDER WIRE CONNECTION CONDITION)**

CAUTION:

Be sure to wear insulated gloves.

Pre-procedure1

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

NOTICE:

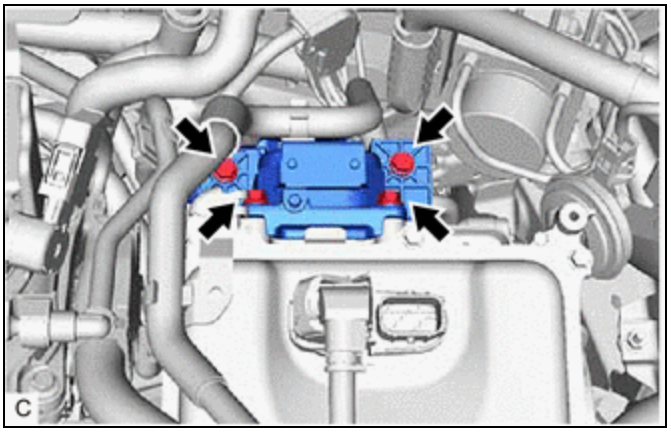
After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

Procedure1

(b) Check that the bolts for the floor under wire is tightened to the specified torque, the HV floor under wire is connected securely, and there are no contact problems.

Specified Condition:

T = 8.0 N*m (82 kgf*cm, 71 in.*lbf)



(c) Disconnect the floor under wire from the inverter with converter assembly.

(d) Check for arc marks on the terminals for the floor under wire and inverter with converter assembly.

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There are no arc marks.	A
The terminals are not connected securely and there is a contact problem.	There are arc marks.	B

RESULT		PROCEED TO
The terminals are not connected securely and there is a contact problem.	There are no arc marks.	C
The terminals are connected securely and there are no contact problems.	There are arc marks.	B

Post-procedure1

(e) Reconnect the floor under wire.

B ▶ **REPLACE MALFUNCTIONING PARTS**

C ▶ **CONNECT SECURELY**

A

2.	CHECK SERVICE PLUG GRIP (CONNECTION CONDITION)

CAUTION:

Be sure to wear insulated gloves.

Pre-procedure1

(a) None.

Procedure1

(b) Visually check the connection of the service plug grip to the HV battery. Remove the service plug grip and check for contamination.

OK:

Dirt or foreign matter has not entered the connectors, and there is no evidence of contamination.

Post-procedure1

(c) Install the service plug grip.

NG ▶ **REPLACE SERVICE PLUG GRIP**

OK

3.	INSPECT SERVICE PLUG GRIP

CAUTION:

Be sure to wear insulated gloves.

Pre-procedure1

(a) Remove the service plug grip.

HINT:

Click here INFO

Procedure1

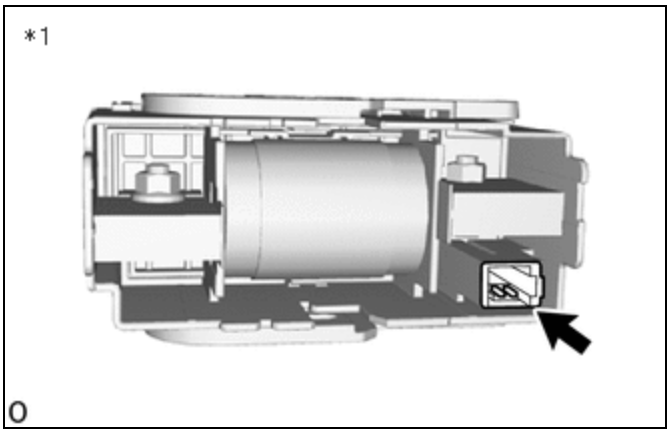
(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
Service plug grip terminals	Always	Below 1 Ω	Ω

Result:

PROCEED TO
OK
NG



*1	Service Plug Grip

Post-procedure1

(c) Install the service plug grip.

NG ▶ **REPLACE SERVICE PLUG GRIP**

OK ▼

4.	CHECK HV SUPPLY BATTERY ASSEMBLY (FLOOR UNDER WIRE CONNECTION CONDITION)

CAUTION:

Be sure to wear insulated gloves.

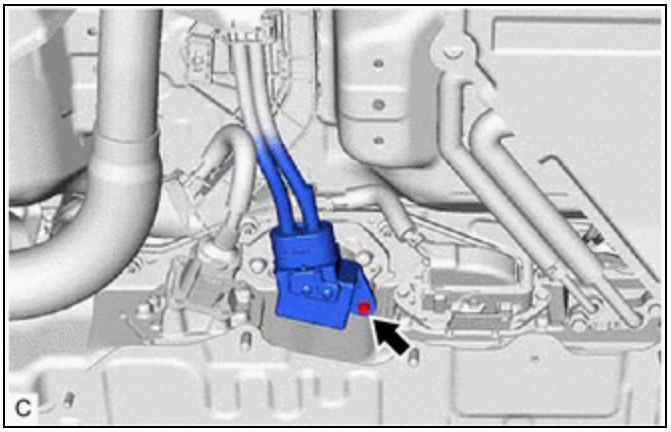
Pre-procedure1

(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) Check that the floor under wire is connected securely, and there are no contact problems.



(c) Disconnect the floor under wire connectors from the HV battery junction block assembly.

Procedure1

(d) Check for arc marks on the terminals of the floor under wire and the HV supply battery assembly.

RESULT		PROCEED TO
The terminals are connected securely and there are no contact problems.	There are no arc marks.	A
The terminals are not connected securely and there is a contact problem.	There are arc marks.	B
The terminals are not connected securely and there is a contact problem.	There are no arc marks.	C
The terminals are connected securely and there are no contact problems.	There are arc marks.	B

Post-procedure1

(e) Reconnect the floor under wire.

B ▶ **REPLACE MALFUNCTIONING PARTS**

C ▶ **CONNECT SECURELY**

A ▼

5.	CHECK FLOOR UNDER WIRE

CAUTION:

Be sure to wear insulated gloves.

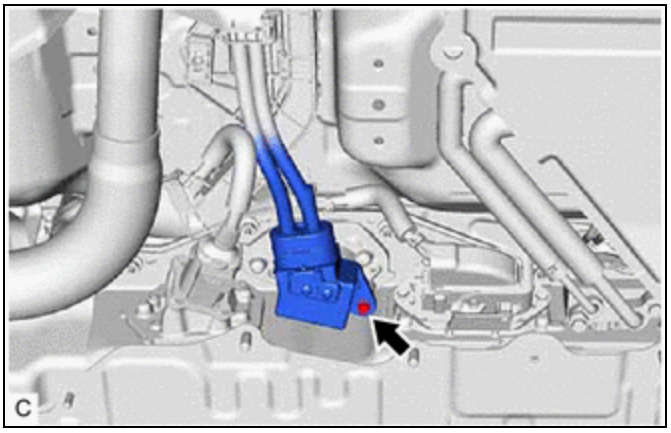
Pre-procedure1

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

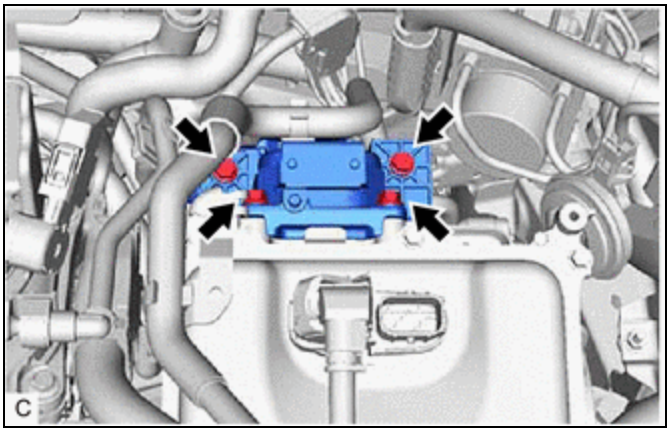
NOTICE:

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 floor under wire connectors from the HV supply battery assembly.

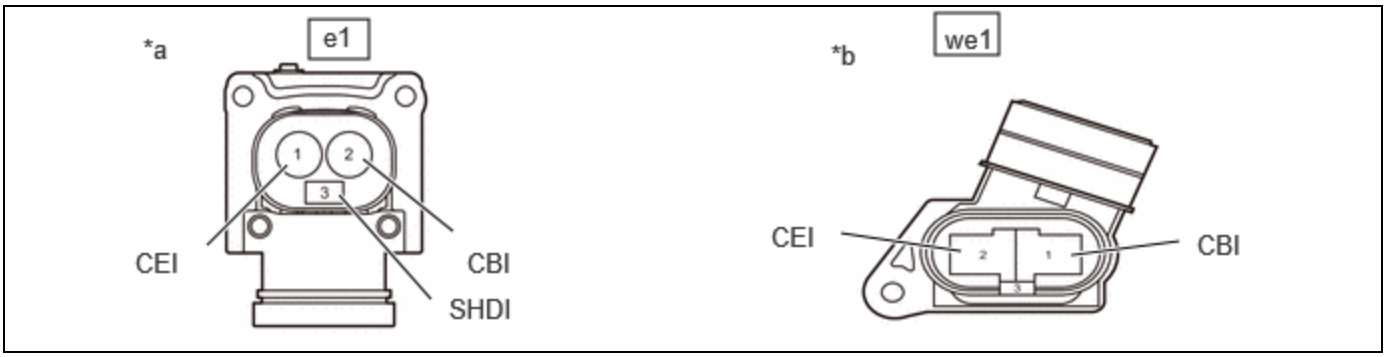


(c) Disconnect the floor under wire connector from the inverter with converter assembly.



Procedure1

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



*a	Floor Under Wire (Inverter with Converter Assembly Side)	*b	Floor Under Wire (HV Supply Battery Assembly Side)

Standard Resistance:

EWD INFO

Click Location & Routing(e1,we1)
Click Connector(e1)
Click Connector(we1)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
e1-2 (CBI) - we1-1 (CBI)	Ignition switch off	Below 1 Ω	Ω
e1-1 (CEI) - we1-2 (CEI)	Ignition switch off	Below 1 Ω	Ω

NOTICE:

Be sure not to damage or deform the terminal being inspected.

(e) Using a megohmmeter set to 500 V, measure the resistance according to the value(s) in the table below.

NOTICE:

Be sure to set the megohmmeter to 500 V when performing this test. Using a setting higher than 500 V can result in damage to the component being inspected.

Standard Resistance:

EWD INFO

Click Location & Routing(e1,we1)
Click Connector(e1)
Click Connector(we1)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
e1-2 (CBI) or we1-1(CBI) - e1-3 (SHDI) and Body ground	Ignition switch off	10 MΩ or higher	MΩ
e1-1 (CEI) or we1-2 (CEI) - e1-3 (SHDI) and Body ground	Ignition switch off	10 MΩ or higher	MΩ
e1-2 (CBI) - e1-1 (CEI)	Ignition switch off	10 MΩ or higher	MΩ
we1-1 (CBI) - we1-2 (CEI)	Ignition switch off	10 MΩ or higher	MΩ

Post-procedure1

(f) Reconnect the floor under wire connector to the inverter with converter assembly.

(g) Reconnect the floor under wire connectors to the HV supply battery assembly.

NG ▶ **REPLACE FLOOR UNDER WIRE**

OK ▼

6.	**INSPECT NO. 1 TRACTION BATTERY DEVICE BOX ASSEMBLY (SMRB)**

CAUTION:

Be sure to wear insulated gloves.

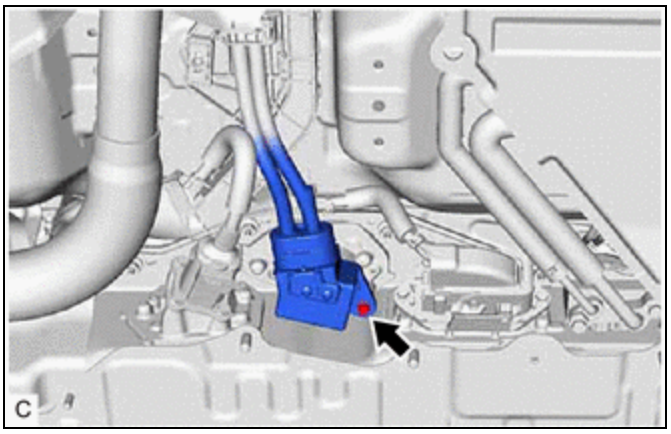
Pre-procedure1

(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 floor under wire from the HV supply battery assembly.

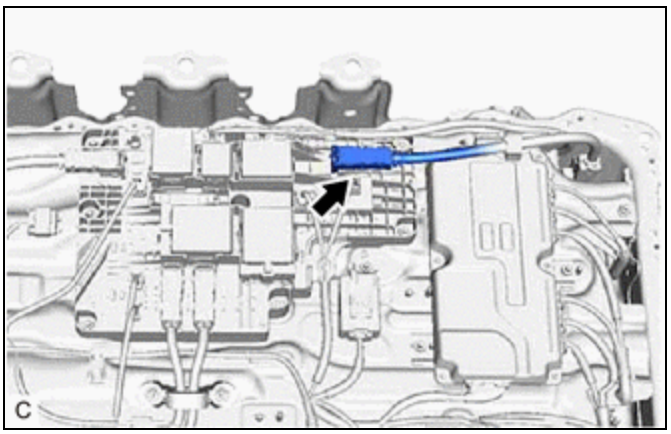


(c) Disconnect the connector from the No. 1 traction battery device box assembly.

(d) Disconnect the HV battery high voltage connectors from the No. 1 traction battery device box assembly.

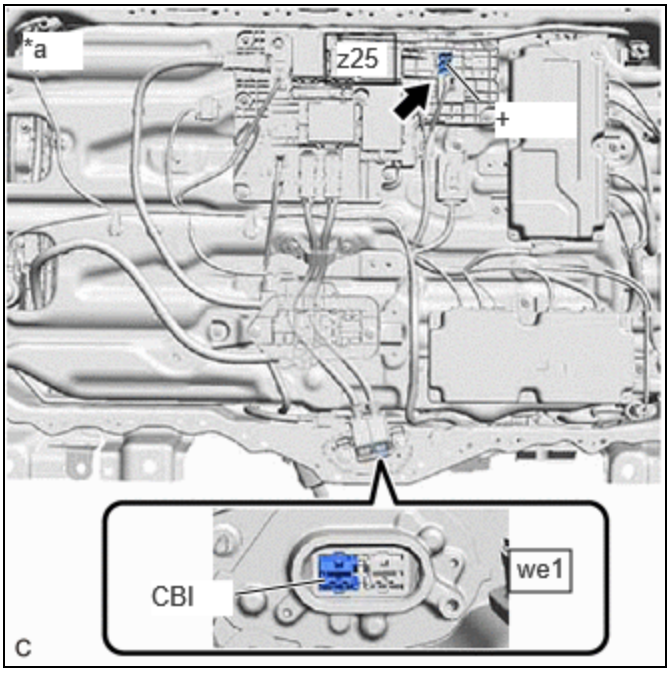
NOTICE:

Insulate each disconnected high-voltage connector with insulating tape. Wrap the connector from the wire harness side to the end of the connector.

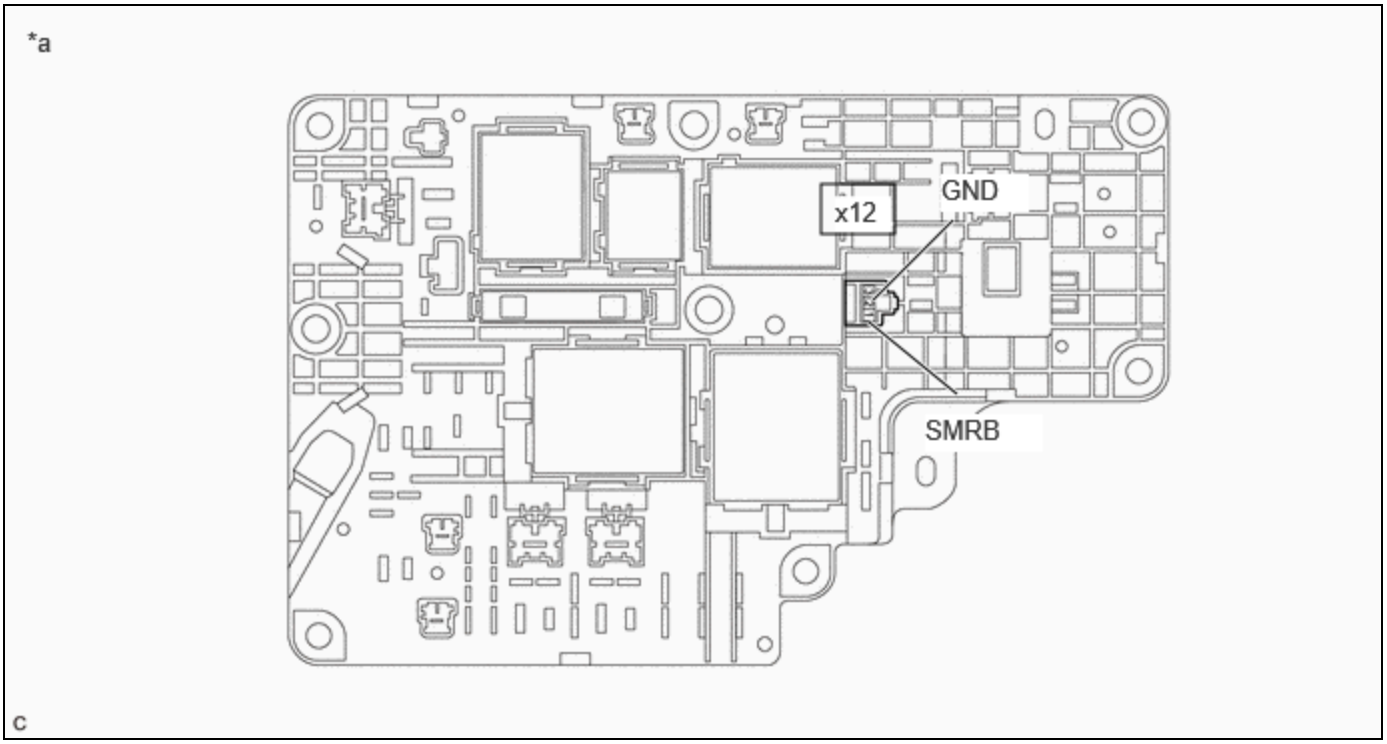


Procedure1

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



*a	Component without harness connected (No. 1 Traction Battery Device Box Assembly)



*a	Component without harness connected (No. 1 Traction Battery Device Box Assembly)	-	-

Standard Resistance:

EWD INFO

Click Location & Routing(z25,we1)
Click Connector(z25)
Click Connector(we1)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
z25-1 (+) - we1-2 (CBI)	Auxiliary battery voltage not applied between terminals x12-1 (SMRB) and x12-2 (GND)	10 kΩ or higher	kΩ
z25-1 (+) - we1-2 (CBI)	Auxiliary battery voltage applied between terminals x12-1 (SMRB) and x12-2 (GND)	Below 1 Ω	Ω

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

Standard Resistance:

EWD INFO

Click Location & Routing(x12)
Click Connector(x12)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x12-1 (SMRB) - x12-2 (GND)	-40 to 80°C (-40 to 176°F)	20.6 to 40.8 Ω	Ω

Post-procedure1

(g) Reconnect the HV battery high voltage connectors.

NG ▶ **REPLACE NO. 1 TRACTION BATTERY DEVICE BOX ASSEMBLY**

OK ▼

7.	**INSPECT NO. 1 TRACTION BATTERY DEVICE BOX ASSEMBLY (SMRG)**

CAUTION:

Be sure to wear insulated gloves.

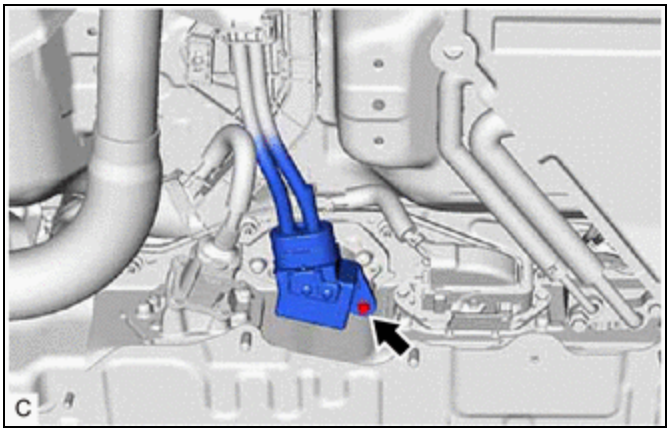
Pre-procedure1

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

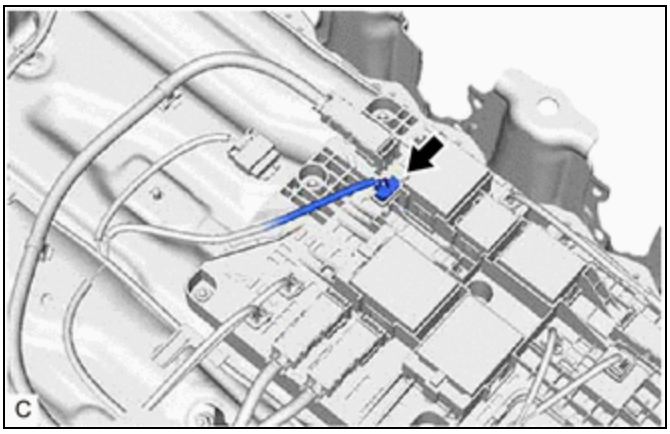
NOTICE:

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 floor under wire from the HV supply battery assembly.



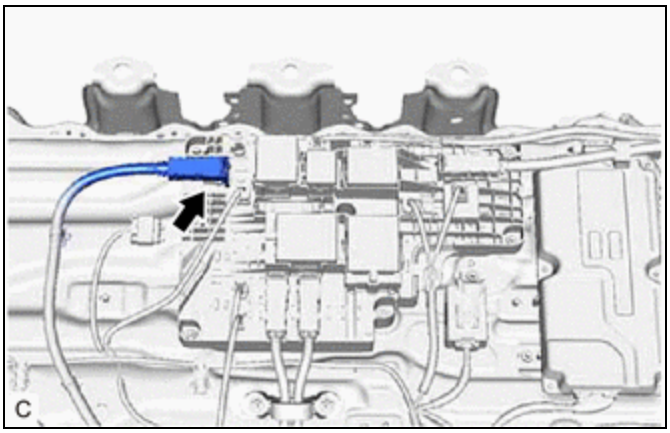
(c) Disconnect the connector from the No. 1 traction battery device box assembly.



(d) Disconnect the HV battery high voltage connectors from the traction battery device box No. 1.

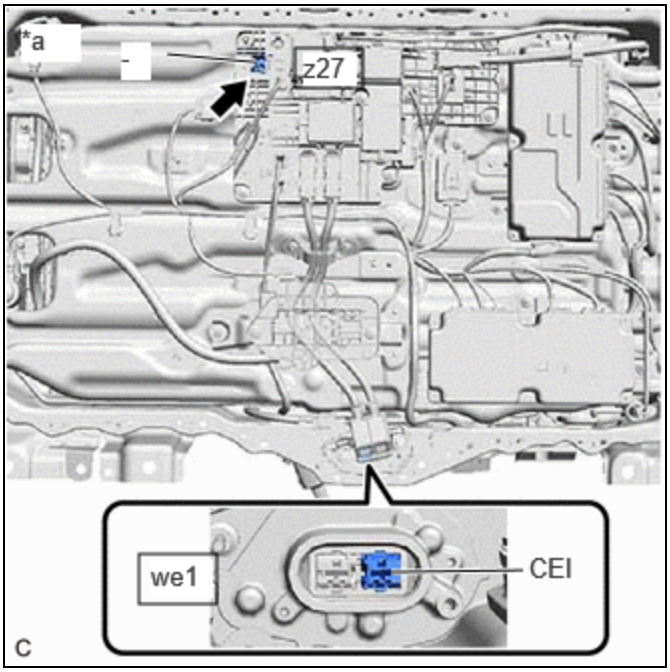
NOTICE:

Insulate each disconnected high-voltage connector with insulating tape. Wrap the connector from the wire harness side to the end of the connector.

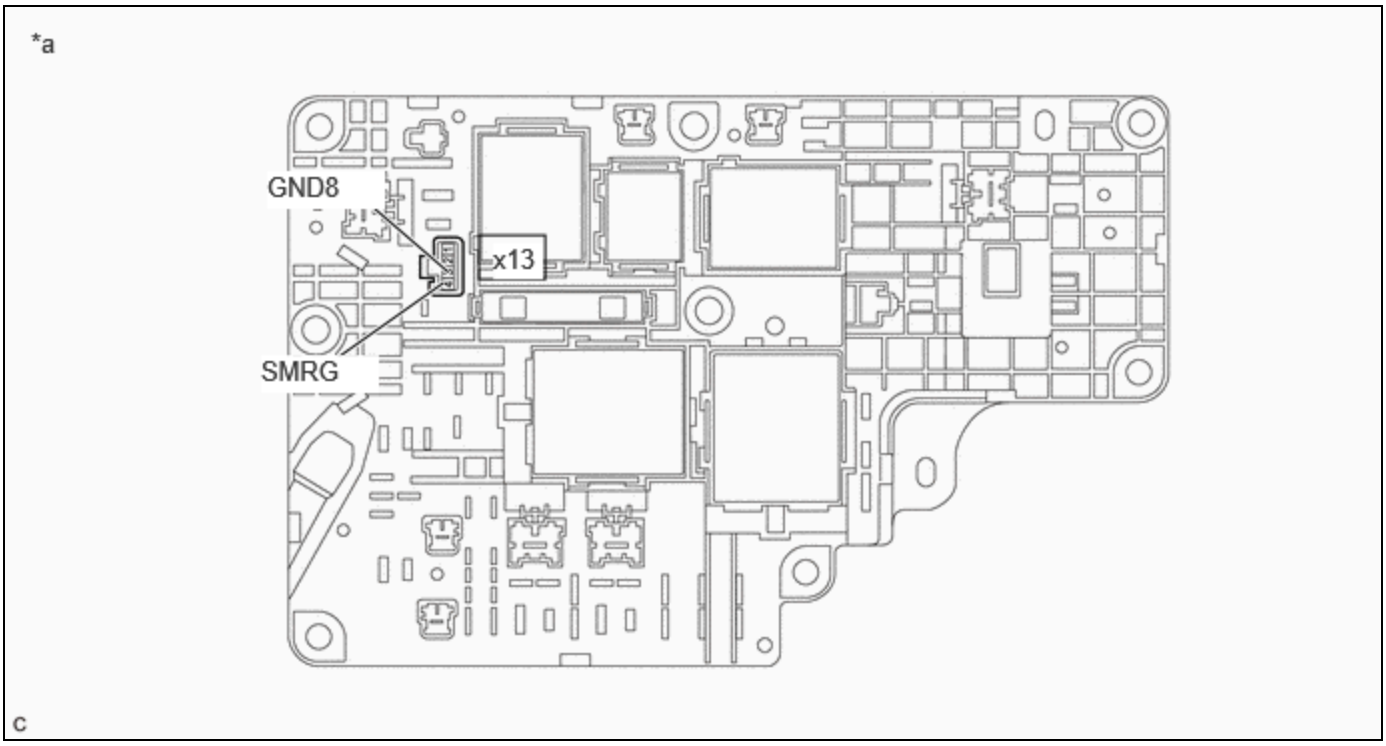


Procedure1

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



*a	Component without harness connected (No. 1 Traction Battery Device Box Assembly)



*a	Component without harness connected (No. 1 Traction Battery Device Box Assembly)	-	-

Standard Resistance:

EWD INFO

Click Location & Routing(z27,we1)

Click Connector(z27)
Click Connector(we1)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
z27-1 (-) - we1-2 (CEI)	Auxiliary battery voltage not applied between terminals x13-4 (SMRG) and x13-3 (GND8)	10 kΩ or higher	kΩ
z27-1 (-) - we1-2 (CEI)	Auxiliary battery voltage applied between terminals x13-4 (SMRG) and x13-3 (GND8)	Below 1 Ω	Ω

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

Standard Resistance:

EWD INFO

Click Location & Routing(x13)
Click Connector(x13)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
x13-4 (SMRG) - x13-3 (GND8)	-40 to 80°C (-40 to 176°F)	20.6 to 40.8 Ω	Ω

Post-procedure1

(g) Reconnect the HV battery high voltage connectors.

OK ▶ **HV BATTERY HIGH-VOLTAGE LINE CIRCUIT NORMAL (PERFORM NEXT STEP FOR REFERENCED DTC)**

NG ▶ **REPLACE NO. 1 TRACTION BATTERY DEVICE BOX ASSEMBLY**