Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BHVY
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for PHEV Model): P1AC413-P1AC613; Hybrid/EV Battery Stack 1 Current Interrupt Device Circuit Open; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P1AC413**	**Hybrid/EV Battery Stack 1 Current Interrupt Device Circuit Open**

DTC	**P1AC513**	**Hybrid/EV Battery Stack 2 Current Interrupt Device Circuit Open**

DTC	**P1AC613**	**Hybrid/EV Battery Stack 3 Current Interrupt Device Circuit Open**

DESCRIPTION

The battery ECU assembly restricts charging and discharging of the HV battery and stores a DTC when a current interrupt device (CID) located in an HV battery cell has operated and the high voltage circuit is disconnected.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P1AC413	Hybrid/EV Battery Stack 1 Current Interrupt Device Circuit Open	A shut-off by a CID occurs. (1 trip detection logic)	• No. 1 HV supply stack sub-assembly • Battery voltage sensor	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P1AC4
P1AC513	Hybrid/EV Battery Stack 2 Current Interrupt Device Circuit Open	A shut-off by a CID occurs. (1 trip detection logic)	• No. 2 HV supply stack sub-assembly • Battery voltage sensor	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P1AC5
P1AC613	Hybrid/EV Battery Stack 3 Current Interrupt Device Circuit Open	A shut-off by a CID occurs. (1 trip detection logic)	• No. 3 HV supply stack sub-assembly • Battery voltage sensor	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P1AC6

MONITOR DESCRIPTION

If a current interrupt device (CID) located in a HV battery cell is shut off, the battery ECU assembly prohibits charging and discharging, illuminates the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P1AC4 (INF P1AC413): Hybrid/EV Battery Cell Voltage Low Pack 1 Stack "A" at CID interception P1AC5 (INF P1AC513): Hybrid/EV Battery Cell Voltage Low Pack 1 Stack "B" at CID interception P1AC6 (INF P1AC613): Hybrid/EV Battery Cell Voltage Low Pack 1 Stack "C" at CID interception
Required sensors/components	HV battery
Frequency of operation	Continuous
Duration	TMC's intellectual property
MIL operation	1 driving cycle
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever the following DTCs are not stored	TMC's intellectual property
Other conditions belong to TMC's intellectual property	-

TYPICAL MALFUNCTION THRESHOLDS

TMC's intellectual property	-

COMPONENT OPERATING RANGE

Battery ECU assembly	DTC P1AC4 (INF P1AC413) is not detected DTC P1AC5 (INF P1AC513) is not detected DTC P1AC6 (INF P1AC613) is not detected

CONFIRMATION DRIVING PATTERN

HINT:

- After repair has been completed, clear the DTC and then check that the vehicle has returned to normal by performing the following All Readiness check procedure.

  Click here INFO
- When clearing the permanent DTCs, refer to the "CLEAR PERMANENT DTC" procedure.

  Click here INFO

1. Clear the DTCs (even if no DTCs are stored, perform the clear DTC procedure).
2. Turn the ignition switch off and wait for 2 minutes or more.
3. Turn the ignition switch to ON and wait for 10 seconds or more.[*1]
4. Turn the ignition switch off and wait for 2 minutes or more.[*2]
5. Turn the ignition switch to ON (READY) and wait for 30 minutes or more.[*3]

HINT:

[*1] to [*3]: Normal judgment procedure.

The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

6. Enter the following menus: Powertrain / HV Battery / Utility / All Readiness.
7. Check the DTC judgment result.

HINT:

- If the judgment result shows NORMAL, the system is normal.
- If the judgment result shows ABNORMAL, the system has a malfunction.
- If the judgment result shows INCOMPLETE or N/A, perform the normal judgment procedure again.

WIRING DIAGRAM

Refer to the wiring diagram for DTC P1A001C.

Click here INFO

CAUTION / NOTICE / HINT

CAUTION:

Refer to the precautions before inspecting high voltage circuit.

Click here INFO

NOTICE:

- Be sure to check that the applicable DTC is output from the hybrid battery system.
- After the ignition switch is turned off, there may be a waiting time before disconnecting the auxiliary negative (-) 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
- Do not turn the ignition switch to ON (READY) until the repair is completed.

PROCEDURE

1.	**CHECK DTC OUTPUT (HV BATTERY, HYBRID CONTROL)**

Pre-procedure1

(a) None

Procedure1

(b) Check for DTCs.

Powertrain > HV Battery > Trouble Codes
Powertrain > Hybrid Control > Trouble Codes

RESULT	PROCEED TO
"P1AC413, P1AC513 or P1AC613" only is output, or DTCs except the ones in the table below are also output.	A
DTCs of hybrid battery system in the table below are output.	B
DTCs of hybrid control system in the table below are output.	C

SYSTEM	RELEVANT DTC	
Hybrid battery system	P060A47	Hybrid/EV Battery Energy Control Module Monitoring Processor Watchdog / Safety MCU Failure
	P060B49	Hybrid/EV Battery Energy Control Module A/D Processing Internal Electronic Failure
	P060687	Hybrid/EV Battery Energy Control Module Processor to Monitoring Processor Missing Message
Hybrid control system	P0A1F94	Hybrid/EV Battery Energy Control Module Unexpected Operation

Post-procedure1

(c) Turn the ignition switch off.

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

C ▶ **GO TO DTC CHART (HYBRID CONTROL SYSTEM)**

A ▼

2.	**CHECK DTC**

(a) Check the DTCs that were output when the vehicle was brought to the workshop.

RESULT	PROCEED TO
"P1AC413" is also output.	A
"P1AC513" is also output.	B
"P1AC613" is also output.	C

B ▶ **GO TO STEP 8**

C GO TO STEP 13

A

3.	READ VALUE USING GTS (HYBRID/EV BATTERY CELL 1 TO 24 VOLTAGE)

Pre-procedure1

(a) None

Procedure1

(b) Read the value of Data List items "Hybrid/EV battery cell 1 voltage" through "Hybrid/EV battery cell 24 voltage" and make a note if the value of any is 1.6 V or less.

Powertrain > HV Battery > Data List

TESTER DISPLAY
Hybrid/EV Battery Cell 1 Voltage
Hybrid/EV Battery Cell 2 Voltage
Hybrid/EV Battery Cell 3 Voltage
Hybrid/EV Battery Cell 4 Voltage
Hybrid/EV Battery Cell 5 Voltage
Hybrid/EV Battery Cell 6 Voltage
Hybrid/EV Battery Cell 7 Voltage
Hybrid/EV Battery Cell 8 Voltage
Hybrid/EV Battery Cell 9 Voltage
Hybrid/EV Battery Cell 10 Voltage
Hybrid/EV Battery Cell 11 Voltage
Hybrid/EV Battery Cell 12 Voltage

TESTER DISPLAY
Hybrid/EV Battery Cell 13 Voltage
Hybrid/EV Battery Cell 14 Voltage
Hybrid/EV Battery Cell 15 Voltage
Hybrid/EV Battery Cell 16 Voltage
Hybrid/EV Battery Cell 17 Voltage
Hybrid/EV Battery Cell 18 Voltage
Hybrid/EV Battery Cell 19 Voltage
Hybrid/EV Battery Cell 20 Voltage
Hybrid/EV Battery Cell 21 Voltage
Hybrid/EV Battery Cell 22 Voltage
Hybrid/EV Battery Cell 23 Voltage
Hybrid/EV Battery Cell 24 Voltage

Post-procedure1

(c) Turn the ignition switch off.

NEXT

4.	**CHECK CONNECTOR CONNECTION CONDITION (BATTERY VOLTAGE SENSOR CONNECTOR)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

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 connections of the battery voltage sensor connector.

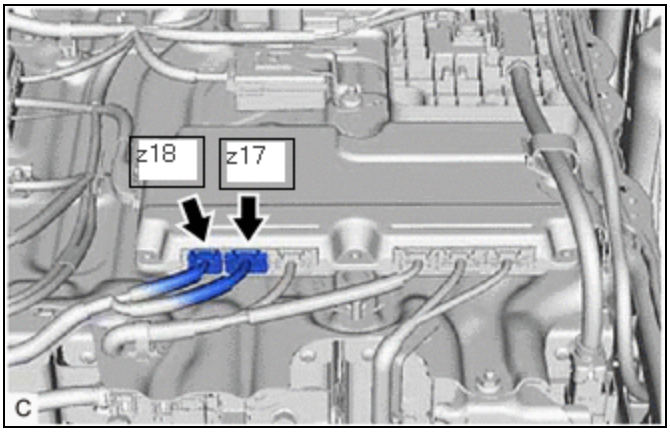
HINT:

Click here INFO

OK:

The connector is connected securely and there are no contact problems.

Result:



RESULT		PROCEED TO
OK		A
Not connected securely	The terminals are not damaged or corroded	B
Not connected securely	The terminals are damaged or corroded	C

Post-procedure1

(c) None

B ▶ **CONNECT SECURELY**

C ▶ **REPLACE NO. 1 HV SUPPLY STACK SUB-ASSEMBLY**

A

5.	**CHECK NO. 1 HV SUPPLY STACK SUB-ASSEMBLY (HYBRID BATTERY CELL 1 TO 24 VOLTAGE)**

Click here INFO

RESULT	PROCEED TO
The voltage between the terminals is 1.6 V or less.	A

RESULT	PROCEED TO
Other than above	B

B ▶ **REPLACE BATTERY VOLTAGE SENSOR**

A

6.	**CHECK BATTERY VOLTAGE SENSOR (VA1 - VA24)**

NOTICE:

Make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage.

Pre-procedure1

(a) Remove the battery voltage sensor.

HINT:

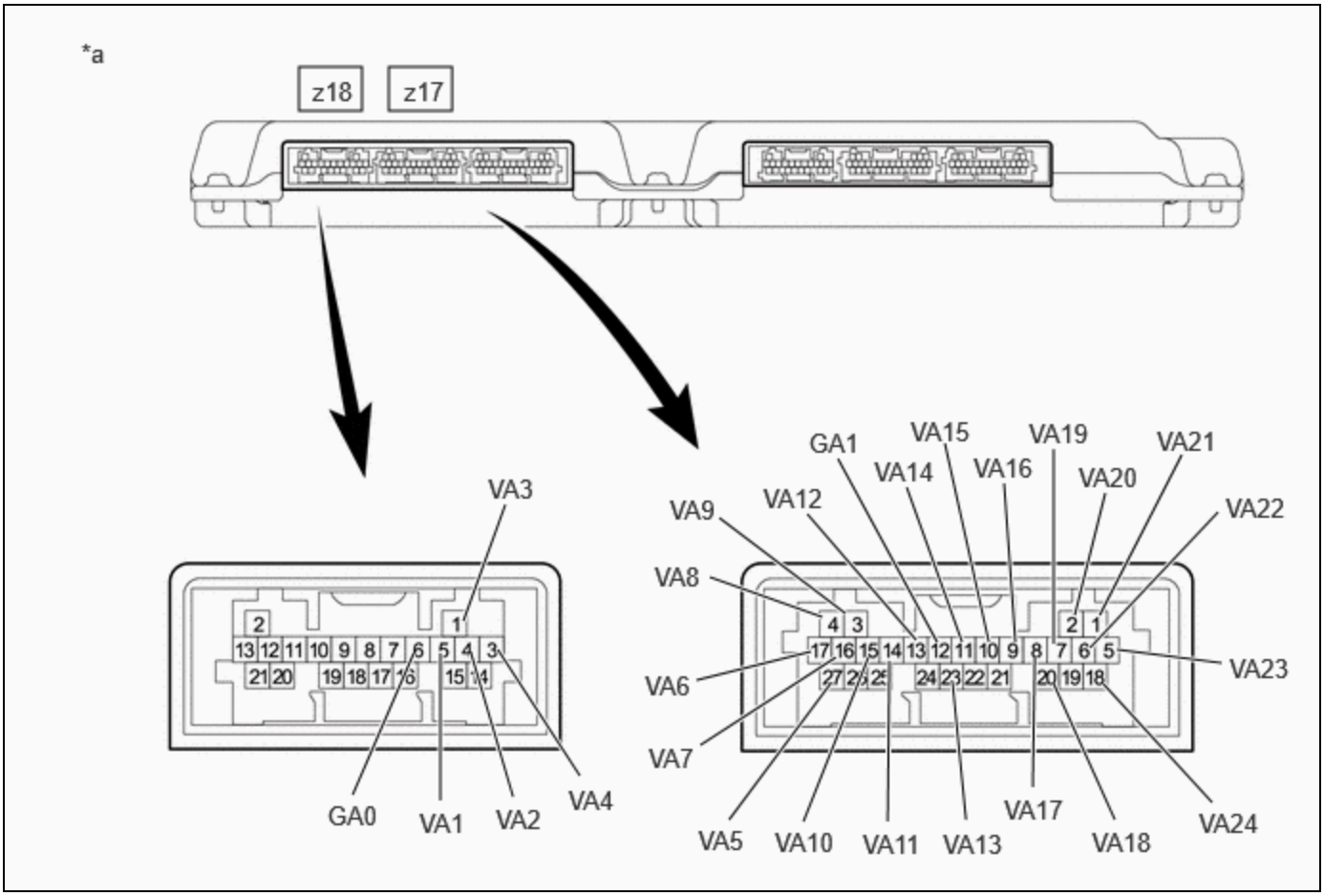
Click here INFO

Procedure1

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

HINT:

Only inspect the terminals of the battery voltage sensor which correspond to the HV battery cells which measured 1.6 V or less in the previous step.



*a	Component without harness connected (Battery Voltage Sensor)	-	-

Standard Voltage:

HYBRID BATTERY CELL	TESTER CONNECTION (TESTER PROBE POLARITY)	CONDITION	SPECIFIED CONDITION
1	z18-6 (GA0) (-) - z18-5 (VA1) (+)	Always	0.3 to 1.0 V
2	z18-5 (VA1) (-) - z18-4 (VA2) (+)	Always	0.3 to 1.0 V
3	z18-4 (VA2) (-) - z18-1 (VA3) (+)	Always	0.3 to 1.0 V
4	z18-1 (VA3) (-) - z18-3 (VA4) (+)	Always	0.3 to 1.0 V
5	z18-3 (VA4) (-) - z17-27 (VA5) (+)	Always	0.3 to 1.0 V
6	z17-27 (VA5) (-) - z17-17 (VA6) (+)	Always	0.3 to 1.0 V
7	z17-17 (VA6) (-) - z17-16 (VA7) (+)	Always	0.3 to 1.0 V
8	z17-16 (VA7) (-) - z17-4 (VA8) (+)	Always	0.3 to 1.0 V
9	z17-4 (VA8) (-) - z17-3 (VA9) (+)	Always	0.3 to 1.0 V
10	z17-3 (VA9) (-) - z17-15 (VA10) (+)	Always	0.3 to 1.0 V
11	z17-15 (VA10) (-) - z17-14 (VA11) (+)	Always	0.3 to 1.0 V
12	z17-14 (VA11) (-) - z17-13 (VA12) (+)	Always	0.3 to 1.0 V
13	z17-12 (GA1) (-) - z17-23 (VA13) (+)	Always	0.3 to 1.0 V

HYBRID BATTERY CELL	TESTER CONNECTION (TESTER PROBE POLARITY)	CONDITION	SPECIFIED CONDITION
14	z17-23 (VA13) (-) - z17-11 (VA14) (+)	Always	0.3 to 1.0 V
15	z17-11 (VA14) (-) - z17-10 (VA15) (+)	Always	0.3 to 1.0 V
16	z17-10 (VA15) (-) - z17-9 (VA16) (+)	Always	0.3 to 1.0 V
17	z17-9 (VA16) (-) - z17-8 (VA17) (+)	Always	0.3 to 1.0 V
18	z17-8 (VA17) (-) - z17-20 (VA18) (+)	Always	0.3 to 1.0 V
19	z17-20 (VA18) (-) - z17-7 (VA19) (+)	Always	0.3 to 1.0 V
20	z17-7 (VA19) (-) - z17-2 (VA20) (+)	Always	0.3 to 1.0 V
21	z17-2 (VA20) (-) - z17-1 (VA21) (+)	Always	0.3 to 1.0 V
22	z17-1 (VA21) (-) - z17-6 (VA22) (+)	Always	0.3 to 1.0 V
23	z17-6 (VA22) (-) - z17-5 (VA23) (+)	Always	0.3 to 1.0 V
24	z17-5 (VA23) (-) - z17-18 (VA24) (+)	Always	0.3 to 1.0 V

NOTICE:

- Make sure to check the polarity of each terminal (positive (+) or negative (-)) before connecting a tester.
- Be sure to set the Toyota electrical tester to diode range when performing this test.
- Read the voltage after the value has stabilized.
- In order to avoid damaging the terminals of the battery voltage sensor, make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage of the battery voltage sensor.

RESULT	PROCEED TO
The voltage between the terminals is 0.3 to 1.0 V.	A
Other than above	B

Post-procedure1

(c) Install the battery voltage sensor.

A ▶ **REPLACE NO. 1 HV SUPPLY STACK SUB-ASSEMBLY**

B ▼

7.	**REPLACE NO. 1 HV SUPPLY STACK SUB-ASSEMBLY**

HINT:

Click here INFO

NEXT ▶ **REPLACE BATTERY VOLTAGE SENSOR**

8.	READ VALUE USING GTS (HYBRID/EV BATTERY CELL 25 TO 48 VOLTAGE)

Pre-procedure1

(a) None

Procedure1

(b) Read the value of Data List items "Hybrid/EV battery cell 25 voltage" through "Hybrid/EV battery cell 48 voltage" and make a note if the value of any is 1.6 V or less.

Powertrain > HV Battery > Data List

TESTER DISPLAY
Hybrid/EV Battery Cell 25 Voltage
Hybrid/EV Battery Cell 26 Voltage
Hybrid/EV Battery Cell 27 Voltage
Hybrid/EV Battery Cell 28 Voltage
Hybrid/EV Battery Cell 29 Voltage
Hybrid/EV Battery Cell 30 Voltage
Hybrid/EV Battery Cell 31 Voltage
Hybrid/EV Battery Cell 32 Voltage
Hybrid/EV Battery Cell 33 Voltage
Hybrid/EV Battery Cell 34 Voltage
Hybrid/EV Battery Cell 35 Voltage
Hybrid/EV Battery Cell 36 Voltage
Hybrid/EV Battery Cell 37 Voltage
Hybrid/EV Battery Cell 38 Voltage

TESTER DISPLAY
Hybrid/EV Battery Cell 39 Voltage
Hybrid/EV Battery Cell 40 Voltage
Hybrid/EV Battery Cell 41 Voltage
Hybrid/EV Battery Cell 42 Voltage
Hybrid/EV Battery Cell 43 Voltage
Hybrid/EV Battery Cell 44 Voltage
Hybrid/EV Battery Cell 45 Voltage
Hybrid/EV Battery Cell 46 Voltage
Hybrid/EV Battery Cell 47 Voltage
Hybrid/EV Battery Cell 48 Voltage

Post-procedure1

(c) Turn the ignition switch off.

NEXT

9.	**CHECK CONNECTOR CONNECTION CONDITION (BATTERY VOLTAGE SENSOR CONNECTOR)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

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 connections of the battery voltage sensor connectors.

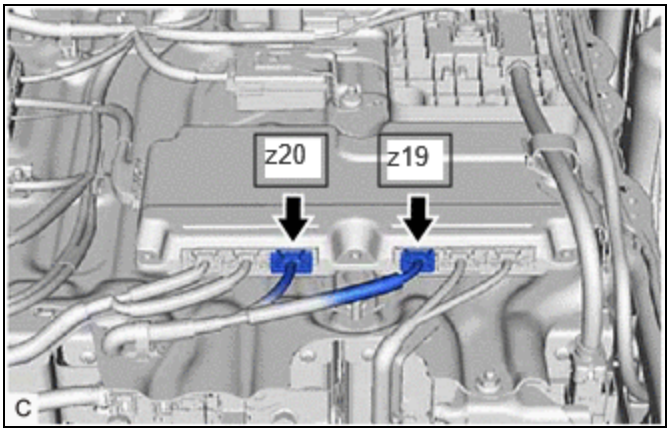
HINT:

Click here INFO

OK:

The connector is connected securely and there are no contact problems.

Result:



RESULT		PROCEED TO
OK		A
Not connected securely	The terminals are not damaged or corroded	B
Not connected securely	The terminals are damaged or corroded	C

Post-procedure1

(c) None

B ▶ **CONNECT SECURELY**

C ▶ **REPLACE NO. 2 HV SUPPLY STACK SUB-ASSEMBLY**

A ▼

10.	**CHECK NO. 2 HV SUPPLY STACK SUB-ASSEMBLY (HYBRID BATTERY CELL 25 TO 48 VOLTAGE)**

Click here INFO

RESULT	PROCEED TO
The voltage between the terminals is 1.6 V or less.	A
Other than above	B

B ▶ **REPLACE BATTERY VOLTAGE SENSOR**

A

11.	CHECK BATTERY VOLTAGE SENSOR (VA25 - VA48)

NOTICE:

Make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage.

Pre-procedure1

(a) Remove the battery voltage sensor.

HINT:

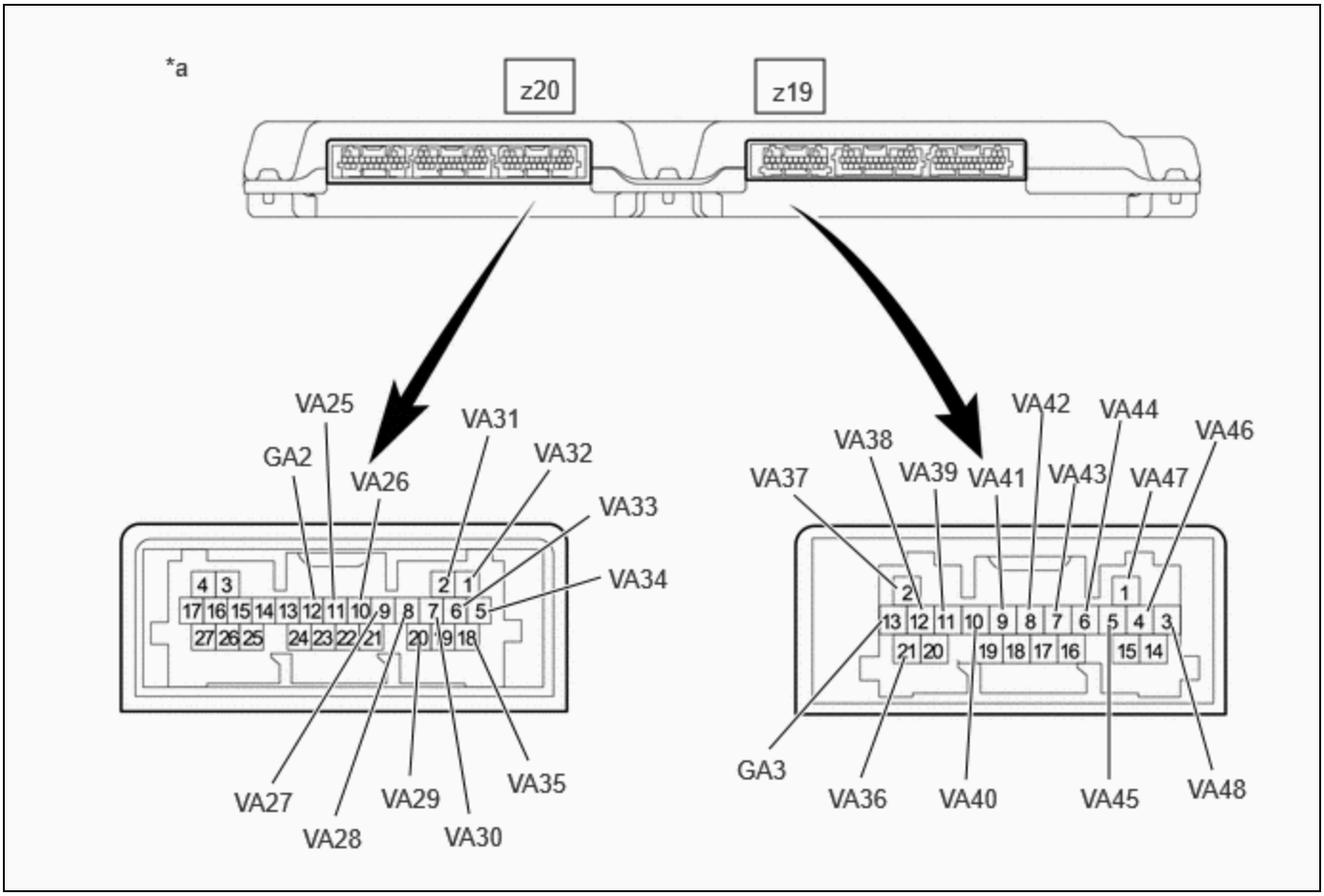
Click here INFO

Procedure1

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

HINT:

Only inspect the terminals of the battery voltage sensor which correspond to the HV battery cells which measured 1.6 V or less in the previous step.



*a	Component without harness connected	-	-

	(Battery Voltage Sensor)		

Standard Voltage:

HYBRID BATTERY CELL	TESTER CONNECTION (TESTER PROBE POLARITY)	CONDITION	SPECIFIED CONDITION
25	z20-12 (GA2) (-) - z20-11 (VA25) (+)	Always	0.3 to 1.0 V
26	z20-11 (VA25) (-) - z20-10 (VA26) (+)	Always	0.3 to 1.0 V
27	z20-10 (VA26) (-) - z20-9 (VA27) (+)	Always	0.3 to 1.0 V
28	z20-9 (VA27) (-) - z20-8 (VA28) (+)	Always	0.3 to 1.0 V
29	z20-8 (VA28) (-) - z20-20 (VA29) (+)	Always	0.3 to 1.0 V
30	z20-20 (VA29) (-) - z20-7 (VA30) (+)	Always	0.3 to 1.0 V
31	z20-7 (VA30) (-) - z20-2 (VA31) (+)	Always	0.3 to 1.0 V
32	z20-2 (VA31) (-) - z20-1 (VA32) (+)	Always	0.3 to 1.0 V
33	z20-1 (VA32) (-) - z20-6 (VA33) (+)	Always	0.3 to 1.0 V
34	z20-6 (VA33) (-) - z20-5 (VA34) (+)	Always	0.3 to 1.0 V
35	z20-5 (VA34) (-) - z20-18 (VA35) (+)	Always	0.3 to 1.0 V
36	z20-18 (VA35) (-) - z19-21 (VA36) (+)	Always	0.3 to 1.0 V
37	z19-13 (GA3) (-) - z19-2 (VA37) (+)	Always	0.3 to 1.0 V
38	z19-2 (VA37) (-) - z19-12 (VA38) (+)	Always	0.3 to 1.0 V
39	z19-12 (VA38) (-) - z19-11 (VA39) (+)	Always	0.3 to 1.0 V
40	z19-11 (VA39) (-) - z19-10 (VA40) (+)	Always	0.3 to 1.0 V
41	z19-10 (VA40) (-) - z19-9 (VA41) (+)	Always	0.3 to 1.0 V
42	z19-9 (VA41) (-) - z19-8 (VA42) (+)	Always	0.3 to 1.0 V
43	z19-8 (VA42) (-) - z19-7 (VA43) (+)	Always	0.3 to 1.0 V
44	z19-7 (VA43) (-) - z19-6 (VA44) (+)	Always	0.3 to 1.0 V
45	z19-6 (VA44) (-) - z19-5 (VA45) (+)	Always	0.3 to 1.0 V
46	z19-5 (VA45) (-) - z19-4 (VA46) (+)	Always	0.3 to 1.0 V
47	z19-4 (VA46) (-) - z19-1 (VA47) (+)	Always	0.3 to 1.0 V
48	z19-1 (VA47) (-) - z19-3 (VA48) (+)	Always	0.3 to 1.0 V

NOTICE:

- Make sure to check the polarity of each terminal (positive (+) or negative (-)) before connecting a tester.
- Be sure to set the Toyota electrical tester to diode range when performing this test.
- Read the voltage after the value has stabilized.
- In order to avoid damaging the terminals of the battery voltage sensor, make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage of the battery voltage sensor.

RESULT	PROCEED TO
The voltage between the terminals is 0.3 to 1.0 V.	A

RESULT	PROCEED TO
Other than above	B

Post-procedure1

(c) Install the battery voltage sensor.

A ▶ **REPLACE NO. 2 HV SUPPLY STACK SUB-ASSEMBLY**

B ▼

12.	REPLACE NO. 2 HV SUPPLY STACK SUB-ASSEMBLY

HINT:

Click here INFO

NEXT ▶ **REPLACE BATTERY VOLTAGE SENSOR**

13.	READ VALUE USING GTS (HYBRID/EV BATTERY CELL 49 TO 72 VOLTAGE)

Pre-procedure1

(a) None

Procedure1

(b) Read the value of Data List items "Hybrid/EV battery cell 49 voltage" through "Hybrid/EV battery cell 72 voltage" and make a note if the value of any is 1.6 V or less.

Powertrain > HV Battery > Data List

TESTER DISPLAY
Hybrid/EV Battery Cell 49 Voltage
Hybrid/EV Battery Cell 50 Voltage
Hybrid/EV Battery Cell 51 Voltage
Hybrid/EV Battery Cell 52 Voltage
Hybrid/EV Battery Cell 53 Voltage

TESTER DISPLAY
Hybrid/EV Battery Cell 54 Voltage
Hybrid/EV Battery Cell 55 Voltage
Hybrid/EV Battery Cell 56 Voltage
Hybrid/EV Battery Cell 57 Voltage
Hybrid/EV Battery Cell 58 Voltage
Hybrid/EV Battery Cell 59 Voltage
Hybrid/EV Battery Cell 60 Voltage
Hybrid/EV Battery Cell 61 Voltage
Hybrid/EV Battery Cell 62 Voltage
Hybrid/EV Battery Cell 63 Voltage
Hybrid/EV Battery Cell 64 Voltage
Hybrid/EV Battery Cell 65 Voltage
Hybrid/EV Battery Cell 66 Voltage
Hybrid/EV Battery Cell 67 Voltage
Hybrid/EV Battery Cell 68 Voltage
Hybrid/EV Battery Cell 69 Voltage
Hybrid/EV Battery Cell 70 Voltage
Hybrid/EV Battery Cell 71 Voltage
Hybrid/EV Battery Cell 72 Voltage

Post-procedure1

(c) Turn the ignition switch off.

NEXT

14.	**CHECK CONNECTOR CONNECTION CONDITION (BATTERY VOLTAGE SENSOR CONNECTOR)**

CAUTION:

Be sure to wear insulated gloves and protective goggles.

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 connections of the battery voltage sensor connectors.

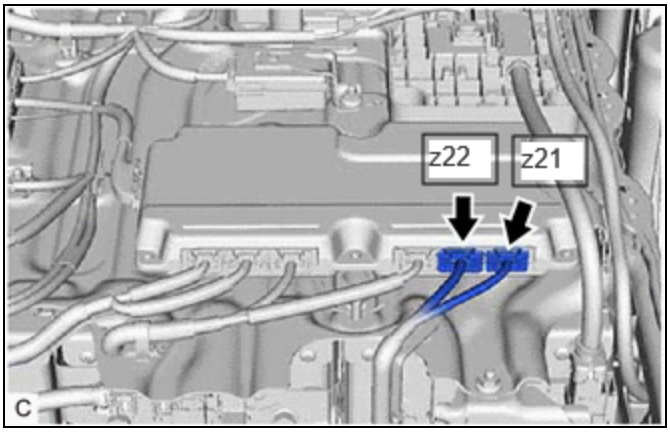
HINT:

Click here INFO

OK:

The connector is connected securely and there are no contact problems.

Result:



RESULT		PROCEED TO
OK		A
Not connected securely	The terminals are not damaged or corroded	B
Not connected securely	The terminals are damaged or corroded	C

Post-procedure1

(c) None

B ▶ **CONNECT SECURELY**

C ▶ **REPLACE NO. 3 HV SUPPLY STACK SUB-ASSEMBLY**

A

15.	**CHECK NO. 3 HV SUPPLY STACK SUB-ASSEMBLY (HYBRID BATTERY CELL 49 TO 72 VOLTAGE)**

Click here INFO

RESULT	PROCEED TO
The voltage between the terminals is 1.6 V or less.	A
Other than above	B

B ▶ **REPLACE BATTERY VOLTAGE SENSOR**

A

16.	**CHECK BATTERY VOLTAGE SENSOR (VA49 - VA72)**

NOTICE:

Make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage.

Pre-procedure1

(a) Remove the battery voltage sensor.

HINT:

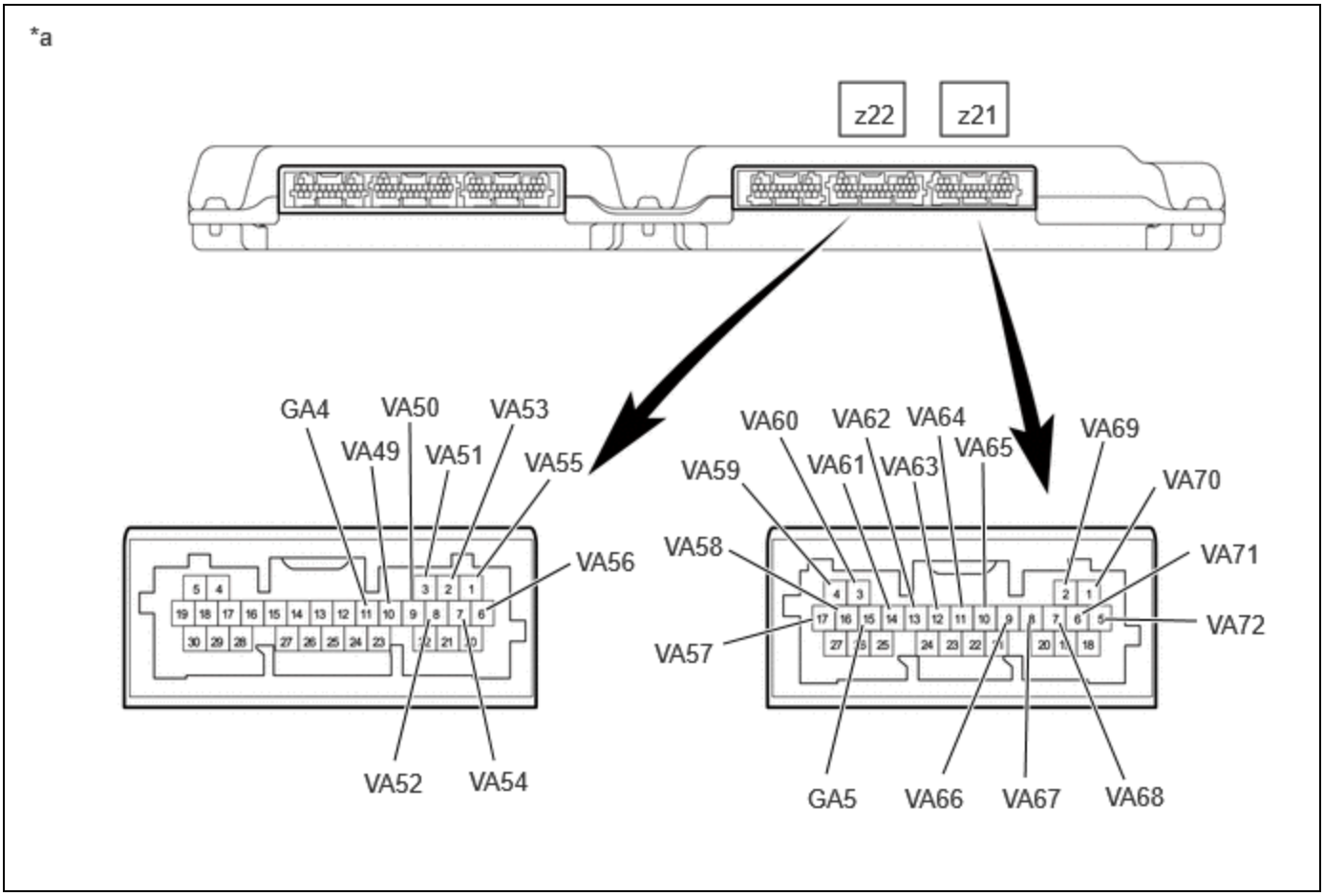
Click here INFO

Procedure1

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

HINT:

Only inspect the terminals of the battery voltage sensor which correspond to the HV battery cells which measured 1.6 V or less in the previous step.



*a	Component without harness connected (Battery Voltage Sensor)	-	-

Standard Voltage:

HYBRID BATTERY CELL	TESTER CONNECTION (TESTER PROBE POLARITY)	CONDITION	SPECIFIED CONDITION
49	z22-11 (GA4) (-) - z22-10 (VA49) (+)	Always	0.3 to 1.0 V
50	z22-10 (VA49) (-) - z22-9 (VA50) (+)	Always	0.3 to 1.0 V
51	z22-9 (VA50) (-) - z22-3 (VA51) (+)	Always	0.3 to 1.0 V
52	z22-3 (VA51) (-) - z22-8 (VA52) (+)	Always	0.3 to 1.0 V
53	z22-8 (VA52) (-) - z22-2 (VA53) (+)	Always	0.3 to 1.0 V
54	z22-2 (VA53) (-) - z22-7 (VA54) (+)	Always	0.3 to 1.0 V
55	z22-7 (VA54) (-) - z22-1 (VA55) (+)	Always	0.3 to 1.0 V
56	z22-1 (VA55) (-) - z22-6 (VA56) (+)	Always	0.3 to 1.0 V
57	z22-6 (VA56) (-) - z21-17 (VA57) (+)	Always	0.3 to 1.0 V
58	z21-17 (VA57) (-) - z21-16 (VA58) (+)	Always	0.3 to 1.0 V
59	z21-16 (VA58) (-) - z21-4 (VA59) (+)	Always	0.3 to 1.0 V
60	z21-4 (VA59) (-) - z21-3 (VA60) (+)	Always	0.3 to 1.0 V
61	z21-15 (GA5) (-) - z21-14 (VA61) (+)	Always	0.3 to 1.0 V

HYBRID BATTERY CELL	TESTER CONNECTION (TESTER PROBE POLARITY)	CONDITION	SPECIFIED CONDITION
62	z21-14 (VA61) (-) - z21-13 (VA62) (+)	Always	0.3 to 1.0 V
63	z21-13 (VA62) (-) - z21-12 (VA63) (+)	Always	0.3 to 1.0 V
64	z21-12 (VA63) (-) - z21-11 (VA64) (+)	Always	0.3 to 1.0 V
65	z21-11 (VA64) (-) - z21-10 (VA65) (+)	Always	0.3 to 1.0 V
66	z21-10 (VA65) (-) - z21-9 (VA66) (+)	Always	0.3 to 1.0 V
67	z21-9 (VA66) (-) - z21-8 (VA67) (+)	Always	0.3 to 1.0 V
68	z21-8 (VA67) (-) - z21-7 (VA68) (+)	Always	0.3 to 1.0 V
69	z21-7 (VA68) (-) - z21-2 (VA69) (+)	Always	0.3 to 1.0 V
70	z21-2 (VA69) (-) - z21-1 (VA70) (+)	Always	0.3 to 1.0 V
71	z21-1 (VA70) (-) - z21-6 (VA71) (+)	Always	0.3 to 1.0 V
72	z21-6 (VA71) (-) - z21-5 (VA72) (+)	Always	0.3 to 1.0 V

NOTICE:

- Make sure to check the polarity of each terminal (positive (+) or negative (-)) before connecting a tester.
- Be sure to set the Toyota electrical tester to diode range when performing this test.
- Read the voltage after the value has stabilized.
- In order to avoid damaging the terminals of the battery voltage sensor, make sure to use tester probes with a diameter of approximately 0.5 mm (0.0197 in.) when measuring the voltage of the battery voltage sensor.

RESULT	PROCEED TO
The voltage between the terminals is 0.3 to 1.0 V.	A
Other than above	B

Post-procedure1

(c) Install the battery voltage sensor.

A ▶ **REPLACE NO. 3 HV SUPPLY STACK SUB-ASSEMBLY**

B ▼

17.	**REPLACE NO. 3 HV SUPPLY STACK SUB-ASSEMBLY**

HINT:

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NEXT ▶ **REPLACE BATTERY VOLTAGE SENSOR**