Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BHUL
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for PHEV Model): P0A9B11,...,P0CB215; Hybrid/EV Battery Temperature Sensor "A" Circuit Short to Ground; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P0A9B11**	**Hybrid/EV Battery Temperature Sensor "A" Circuit Short to Ground**

DTC	**P0A9B15**	**Hybrid/EV Battery Temperature Sensor "A" Circuit Short to Auxiliary Battery or Open**

DTC	**P0AC511**	**Hybrid/EV Battery Temperature Sensor "B" Circuit Short to Ground**

DTC	**P0AC515**	**Hybrid/EV Battery Temperature Sensor "B" Circuit Short to Auxiliary Battery or Open**

DTC	**P0ACA11**	**Hybrid/EV Battery Temperature Sensor "C" Circuit Short to Ground**

DTC	**P0ACA15**	**Hybrid/EV Battery Temperature Sensor "C" Circuit Short to Auxiliary Battery or Open**

DTC	**P0AE811**	**Hybrid/EV Battery Temperature Sensor "D" Circuit Short to Ground**

DTC	**P0AE815**	**Hybrid/EV Battery Temperature Sensor "D" Circuit Short to Auxiliary Battery or Open**

DTC	**P0BC211**	**Hybrid/EV Battery Temperature Sensor "E" Circuit Short to Ground**

DTC	**P0BC215**	**Hybrid/EV Battery Temperature Sensor "E" Circuit Short to Auxiliary Battery or Open**

DTC	**P0C3311**	**Hybrid/EV Battery Temperature Sensor "F" Circuit Short to Ground**

DTC	P0C3315	Hybrid/EV Battery Temperature Sensor "F" Circuit Short to Auxiliary Battery or Open
DTC	P0C7C11	Hybrid/EV Battery Temperature Sensor "G" Circuit Short to Ground
DTC	P0C7C15	Hybrid/EV Battery Temperature Sensor "G" Circuit Short to Auxiliary Battery or Open
DTC	P0C8111	Hybrid/EV Battery Temperature Sensor "H" Circuit Short to Ground
DTC	P0C8115	Hybrid/EV Battery Temperature Sensor "H" Circuit Short to Auxiliary Battery or Open
DTC	P0C8811	Hybrid/EV Battery Temperature Sensor "I" Circuit Short to Ground
DTC	P0C8815	Hybrid/EV Battery Temperature Sensor "I" Circuit Short to Auxiliary Battery or Open
DTC	P0C8D11	Hybrid/EV Battery Temperature Sensor "J" Circuit Short to Ground
DTC	P0C8D15	Hybrid/EV Battery Temperature Sensor "J" Circuit Short to Auxiliary Battery or Open
DTC	P0C9211	Hybrid/EV Battery Temperature Sensor "K" Circuit Short to Ground
DTC	P0C9215	Hybrid/EV Battery Temperature Sensor "K" Circuit Short to Auxiliary Battery or Open
DTC	P0C9711	Hybrid/EV Battery Temperature Sensor "L" Circuit Short to Ground
DTC	P0C9715	Hybrid/EV Battery Temperature Sensor "L" Circuit Short to Auxiliary Battery or Open

DTC	**P0CA811**	**Hybrid/EV Battery Temperature Sensor "M" Circuit Short to Ground**

DTC	**P0CA815**	**Hybrid/EV Battery Temperature Sensor "M" Circuit Short to Auxiliary Battery or Open**

DTC	**P0CAD11**	**Hybrid/EV Battery Temperature Sensor "N" Circuit Short to Ground**

DTC	**P0CAD15**	**Hybrid/EV Battery Temperature Sensor "N" Circuit Short to Auxiliary Battery or Open**

DTC	**P0CB211**	**Hybrid/EV Battery Temperature Sensor "O" Circuit Short to Ground**

DTC	**P0CB215**	**Hybrid/EV Battery Temperature Sensor "O" Circuit Short to Auxiliary Battery or Open**

DESCRIPTION

The battery temperature sensors are provided at 15 locations of the HV battery. The resistance of the thermistor, which is built into each battery temperature sensor, varies in accordance with changes in the HV battery temperature. The lower the battery temperature, the higher the thermistor resistance. Conversely, the higher the temperature, the lower the resistance. The battery ECU assembly detects the HV battery temperature using the battery temperature sensor, and performs HV battery refrigerant cooling control (HV battery refrigerant cooling control starts when the HV battery temperature rises to a certain level).

Temperature Sensor Identification Cross Reference Table:

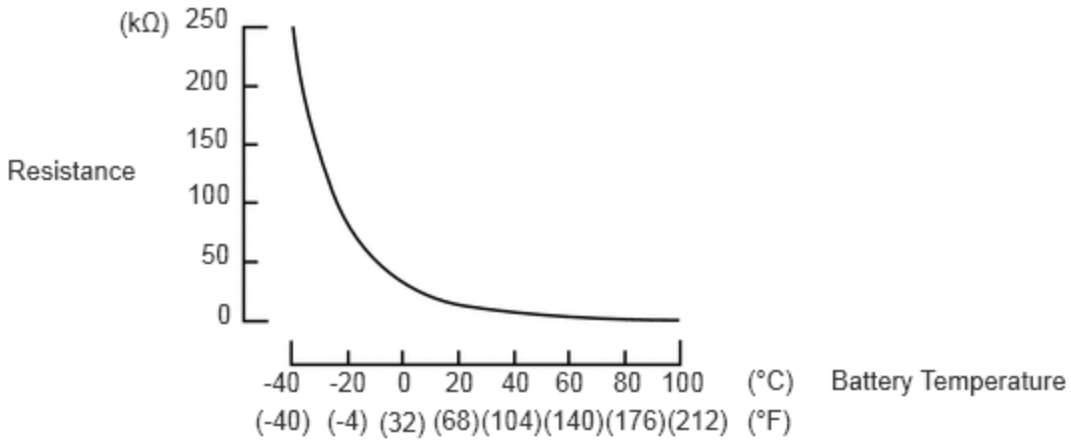
DTC TITLE SENSOR	BATTERY TEMPERATURE SENSOR	GTS DISPLAY
A	0	1
B	1	2
C	2	3
D	3	4
E	4	5
F	5	6
G	6	7
H	7	8
I	8	9
J	9	10
K	10	11

DTC TITLE SENSOR	BATTERY TEMPERATURE SENSOR	GTS DISPLAY
L	11	12
M	12	13
N	13	14
O	14	15

HINT:

Use the reference table above to determine which battery temperature sensor corresponds to each DTC. For example, sensor A in the DTC title column is battery temperature sensor 0. This sensor is displayed as Hybrid/EV Battery Temperature 1 in the Data List.

Reference: Battery Temperature Sensor Characteristic Graph



DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0A9B11	Hybrid/EV Battery Temperature Sensor "A" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0A9D
P0A9B15	Hybrid/EV Battery Temperature Sensor "A" Circuit Short to Auxiliary	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value	• No. 1 HV supply stack sub-assembly	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0A9E

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
	Battery or Open	(short to +B or open) and the detected temperature is lower than the specified value. (1 trip detection logic)	• Battery voltage sensor					
P0AC511	Hybrid/EV Battery Temperature Sensor "B" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0AC7
P0AC515	Hybrid/EV Battery Temperature Sensor "B" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0AC8
P0ACA11	Hybrid/EV Battery Temperature Sensor "C" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is	• No. 1 HV supply stack sub-assembly • Battery voltage sensor	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0ACC

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		higher than the specified value. (1 trip detection logic)						
P0ACA15	Hybrid/EV Battery Temperature Sensor "C" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0ACD
P0AE811	Hybrid/EV Battery Temperature Sensor "D" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0AEA

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0AE815	Hybrid/EV Battery Temperature Sensor "D" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0AEB
P0BC211	Hybrid/EV Battery Temperature Sensor "E" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0BC4
P0BC215	Hybrid/EV Battery Temperature Sensor "E" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0BC5
P0C3311	Hybrid/EV Battery Temperature Sensor "F"	The battery temperature sensor is malfunctioning, its output voltage is	• No. 2 HV supply stack	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0C35

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
	Circuit Short to Ground	lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (1 trip detection logic)	sub-assembly • Battery voltage sensor					
P0C3315	Hybrid/EV Battery Temperature Sensor "F" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0C36
P0C7C11	Hybrid/EV Battery Temperature Sensor "G" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0C7E
P0C7C15	Hybrid/EV Battery Temperature Sensor "G" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected	• No. 2 HV supply stack sub-assembly • Battery voltage sensor	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0C7F

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		temperature is lower than the specified value. (1 trip detection logic)						
P0C8111	Hybrid/EV Battery Temperature Sensor "H" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0C83
P0C8115	Hybrid/EV Battery Temperature Sensor "H" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0C84

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0C8811	Hybrid/EV Battery Temperature Sensor "I" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0C8A
P0C8815	Hybrid/EV Battery Temperature Sensor "I" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0C8B
P0C8D11	Hybrid/EV Battery Temperature Sensor "J" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0C8F
P0C8D15	Hybrid/EV Battery Temperature Sensor "J" Circuit Short	The battery temperature sensor is malfunctioning, its output voltage is higher than the	• No. 2 HV supply stack sub-assembly	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0C90

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
	to Auxiliary Battery or Open	specified value (short to +B or open) and the detected temperature is lower than the specified value. (1 trip detection logic)	• Battery voltage sensor					
P0C9211	Hybrid/EV Battery Temperature Sensor "K" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0C94
P0C9215	Hybrid/EV Battery Temperature Sensor "K" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0C95
P0C9711	Hybrid/EV Battery Temperature Sensor "L" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is	• No. 3 HV supply stack sub-assembly • Battery voltage sensor	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0C99

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
		higher than the specified value. (1 trip detection logic)						
P0C9715	Hybrid/EV Battery Temperature Sensor "L" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0C9A
P0CA811	Hybrid/EV Battery Temperature Sensor "M" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0CAA

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0CA815	Hybrid/EV Battery Temperature Sensor "M" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0CAB
P0CAD11	Hybrid/EV Battery Temperature Sensor "N" Circuit Short to Ground	The battery temperature sensor is malfunctioning, its output voltage is lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (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: P0CAF
P0CAD15	Hybrid/EV Battery Temperature Sensor "N" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0CB0
P0CB211	Hybrid/EV Battery Temperature Sensor "O"	The battery temperature sensor is malfunctioning, its output voltage is	• No. 3 HV supply stack	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P0CB4

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
	Circuit Short to Ground	lower than the specified value (short circuit) and the detected temperature is higher than the specified value. (1 trip detection logic)	sub-assembly • Battery voltage sensor					
P0CB215	Hybrid/EV Battery Temperature Sensor "O" Circuit Short to Auxiliary Battery or Open	The battery temperature sensor is malfunctioning, its output voltage is higher than the specified value (short to +B or open) and the detected temperature is lower than the specified value. (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: P0CB5

TEMPERATURE DISPLAYED	MALFUNCTION
Below -50°C (-58°F)	Open or +B short circuit
95°C (203°F) or more	GND short circuit

HINT:

- After checking for the above DTCs, check the hybrid system Data List item "Hybrid/EV Battery Temperature" using the GTS.
- If the vehicle as is left as is for 24 hours, the value of "Hybrid/EV Battery Temperature" will be almost the same as the ambient temperature.

MONITOR DESCRIPTION

If the battery ECU assembly detects a malfunction in a HV battery temperature sensor, the battery ECU assembly will illuminate the MIL and store a DTC.

MONITOR STRATEGY

Related DTCs	P0A9D (INF P0A9B11), P0AC7 (INF P0AC511), P0ACC (INF P0ACA11), P0AEA (INF P0AE811), P0BC4 (INF P0BC211), P0C35 (INF P0C3311), P0C7E (INF P0C7C11), P0C83 (INF P0C8111), P0C8A (INF P0C8811), P0C8F (INF P0C8D11), P0C94 (INF P0C9211), P0C99 (INF P0C9711), P0CAA (INF P0CA811), P0CAF (INF P0CAD11), P0CB4 (INF P0CB211): Battery temperature sensor circuit malfunction (GND short)

	P0A9E (INF P0A9B15), P0AC8 (INF P0AC515), P0ACD (INF P0ACA15), P0AEB (INF P0AE815), P0BC5 (INF P0BC215), P0C36 (INF P0C3315), P0C7F (INF P0C7C15), P0C84 (INF P0C8115), P0C8B (INF P0C8815), P0C90 (INF P0C8D15), P0C95 (INF P0C9215), P0C9A (INF P0C9715), P0CAB (INF P0CA815), P0CB0 (INF P0CAD15), P0CB5 (INF P0CB215): Battery temperature sensor circuit malfunction (open)
Required sensors/components	Battery temperature sensor
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 P0A9D (INF P0A9B11) is not detected DTC P0AC7 (INF P0AC511) is not detected DTC P0ACC (INF P0ACA11) is not detected DTC P0AEA (INF P0AE811) is not detected DTC P0BC4 (INF P0BC211) is not detected DTC P0C35 (INF P0C3311) is not detected DTC P0C7E (INF P0C7C11) is not detected DTC P0C83 (INF P0C8111) is not detected DTC P0C8A (INF P0C8811) is not detected DTC P0C8F (INF P0C8D11) is not detected DTC P0C94 (INF P0C9211) is not detected DTC P0C99 (INF P0C9711) is not detected DTC P0CAA (INF P0CA811) is not detected DTC P0CAF (INF P0CAD11) is not detected DTC P0CB4 (INF P0CB211) is not detected DTC P0A9E (INF P0A9B15) is not detected DTC P0AC8 (INF P0AC515) is not detected DTC P0ACD (INF P0ACA15) is not detected DTC P0AEB (INF P0AE815) is not detected DTC P0BC5 (INF P0BC215) is not detected DTC P0C36 (INF P0C3315) is not detected DTC P0C7F (INF P0C7C15) is not detected DTC P0C84 (INF P0C8115) is not detected DTC P0C8B (INF P0C8815) is not detected

	DTC P0C90 (INF P0C8D15) is not detected DTC P0C95 (INF P0C9215) is not detected DTC P0C9A (INF P0C9715) is not detected DTC P0CAB (INF P0CA815) is not detected DTC P0CB0 (INF P0CAD15) is not detected DTC P0CB5 (INF P0CB215) 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 5 seconds or more.[*1]

HINT:

[*1]: Normal judgment procedure.

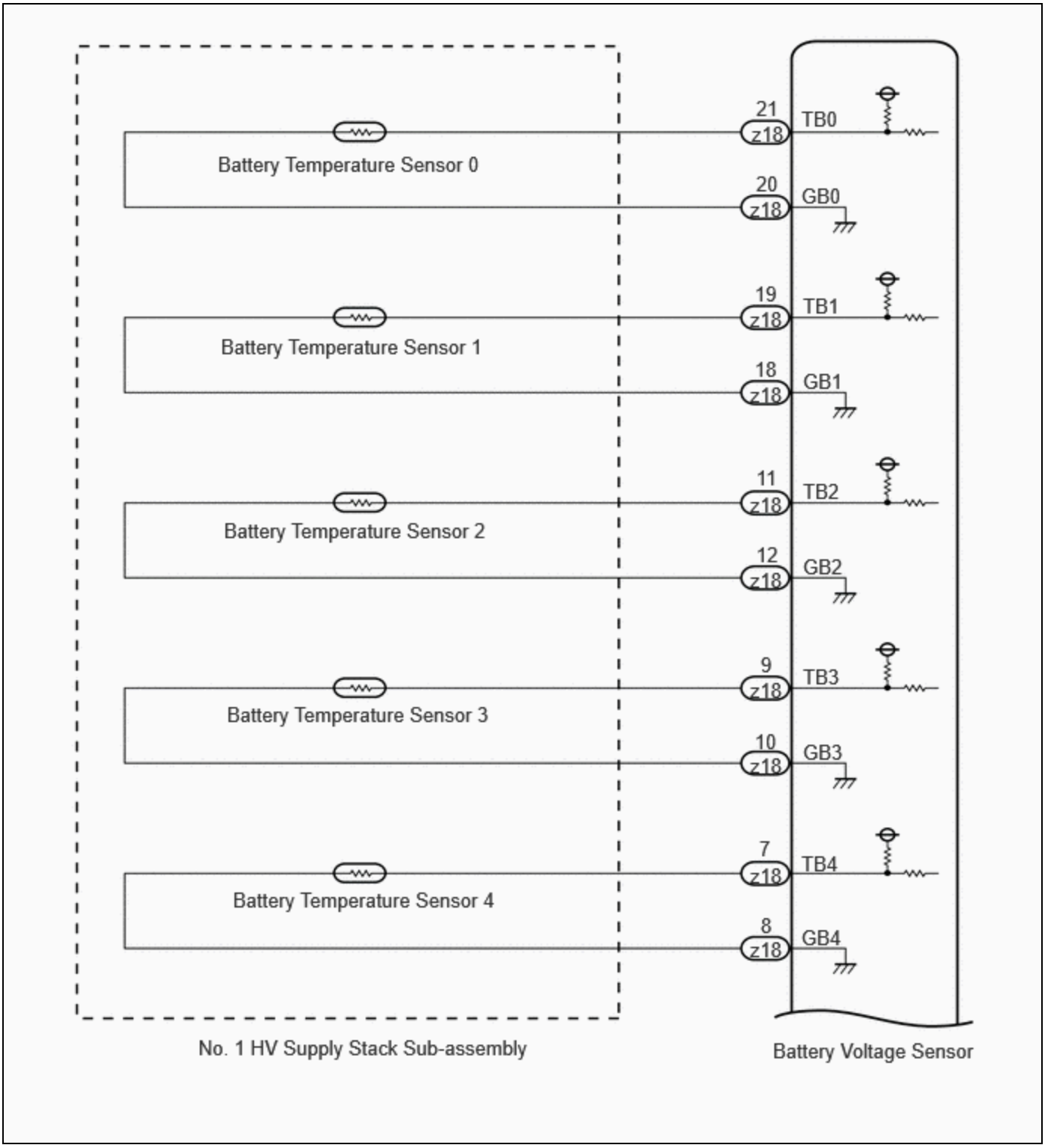
The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

4. Enter the following menus: Powertrain / HV Battery / Utility / All Readiness.
5. 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


Battery Temperature Sensor 0
Battery Temperature Sensor 1
Battery Temperature Sensor 2
Battery Temperature Sensor 3
Battery Temperature Sensor 4
21
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TB2
12
z18
GB2
9
z18
TB3
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TB4
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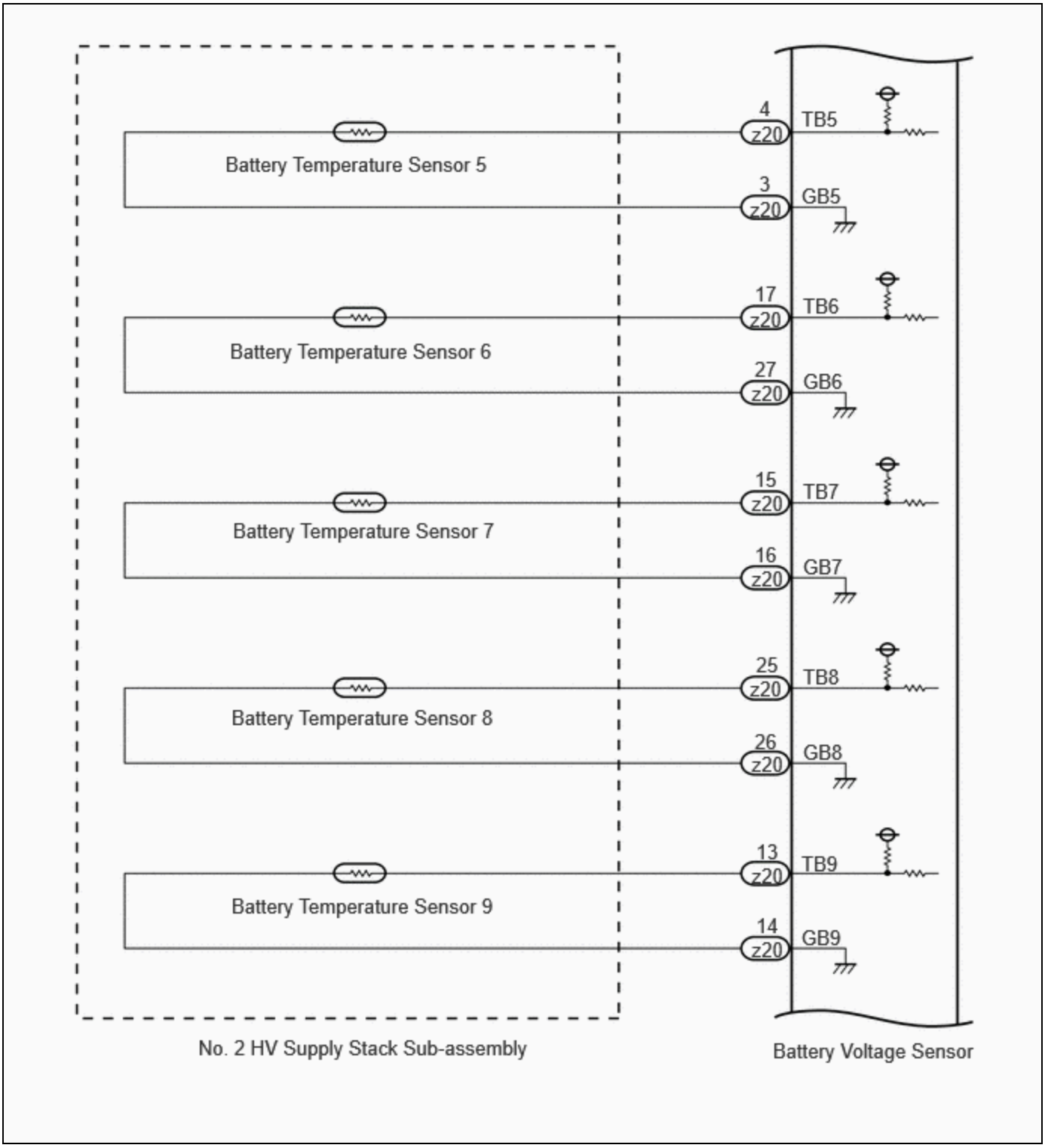
z18
GB4
No. 1 HV Supply Stack Sub-assembly
Battery Voltage Sensor


Battery Temperature Sensor 5
Battery Temperature Sensor 6
Battery Temperature Sensor 7
Battery Temperature Sensor 8
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TB5
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z20
TB7
16
z20
GB7
25
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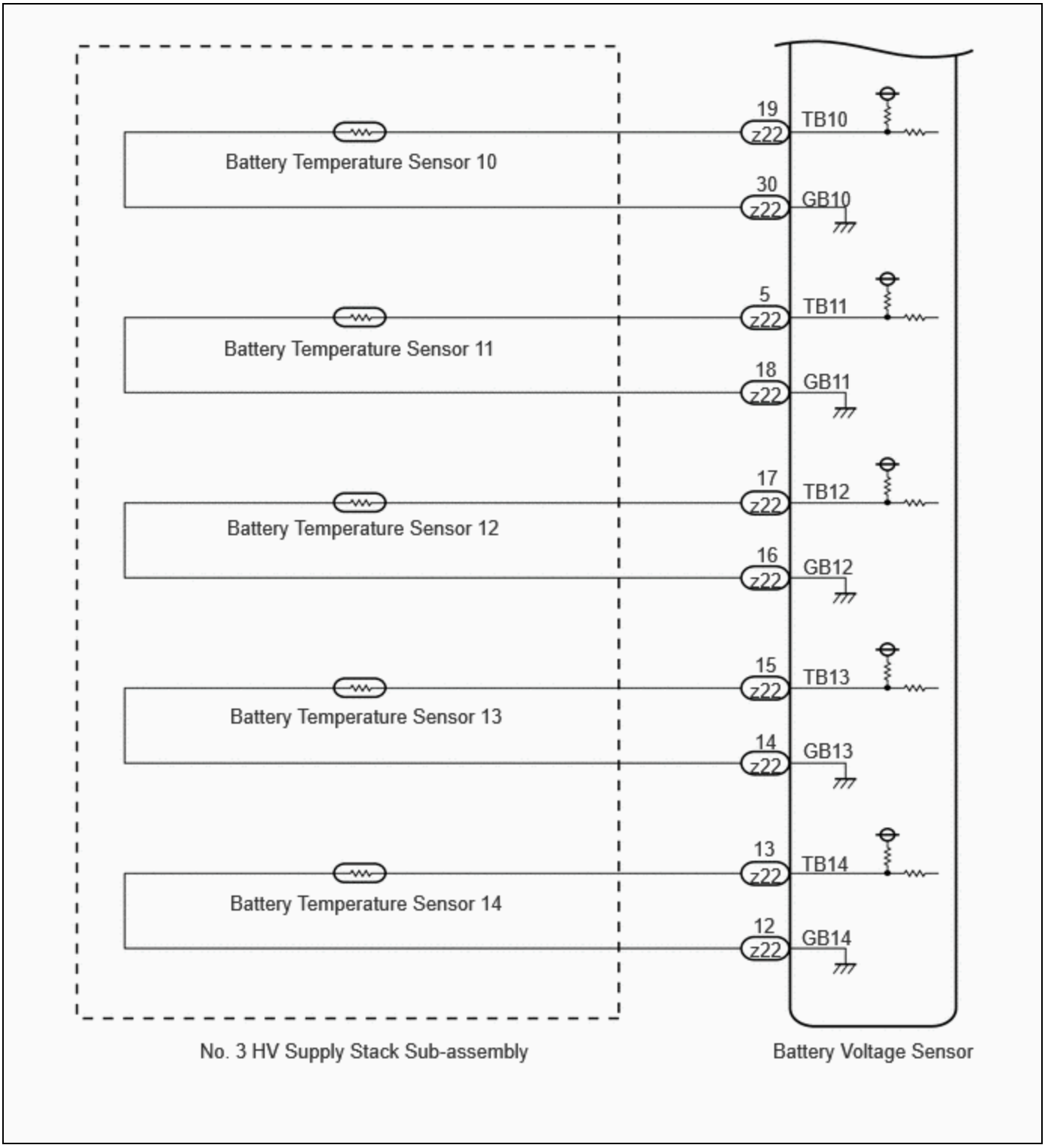
z20
GB9
No. 2 HV Supply Stack Sub-assembly
Battery Voltage Sensor



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 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

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
"P0A9B11, P0A9B15, P0AC511, P0AC515, P0ACA11, P0ACA15, P0AE811, P0AE815, P0BC211, P0BC215, P0C3311, P0C3315, P0C7C11, P0C7C15, P0C8111, P0C8115, P0C8811, P0C8815, P0C8D11, P0C8D15, P0C9211, P0C9215, P0C9711, P0C9715, P0CA811, P0CA815, P0CAD11, P0CAD15, P0CB211 or P0CB215" 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.	READ VALUE USING GTS (HYBRID/EV BATTERY TEMPERATURE)

Pre-procedure1

(a) None

Procedure1

(b) Read the Data List.

Powertrain > HV Battery > Data List

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

TESTER DISPLAY
Hybrid/EV Battery Temperature 13
Hybrid/EV Battery Temperature 14
Hybrid/EV Battery Temperature 15

HINT:

A malfunctioning sensor (battery temperature sensor 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14) can be determined by comparing the output temperature of the 15 battery temperature sensors.

Post-procedure1

(c) Turn the ignition switch off.

NEXT

3.	CHECK CONNECTOR CONNECTION CONDITION (BATTERY VOLTAGE SENSOR)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

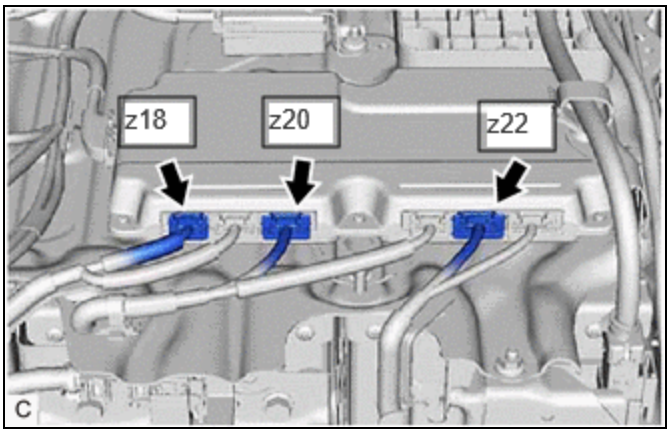
(a) Check that the service plug grip is not installed.

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:

PROCEED TO
OK

PROCEED TO
NG

Post-procedure1

(c) None

NG ▶ **CONNECT SECURELY**

OK ▼

4.	CHECK DTC

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

RESULT	PROCEED TO
"P0A9B11, P0A9B15, P0AC511, P0AC515, P0ACA11, P0ACA15, P0AE811, P0AE815, P0BC211 or P0BC215" is also output.	A
"P0C3311, P0C3315, P0C7C11, P0C7C15, P0C8111, P0C8115, P0C8811, P0C8815, P0C8D11 or P0C8D15" is also output.	B
"P0C9211, P0C9215, P0C9711, P0C9715, P0CA811, P0CA815, P0CAD11, P0CAD15, P0CB211 or P0CB215" is also output.	C

B ▶ **GO TO STEP 6**

C ▶ **GO TO STEP 7**

A ▼

5.	CHECK HV BATTERY (BATTERY TEMPERATURE SENSOR 0 to 4)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

NOTICE:

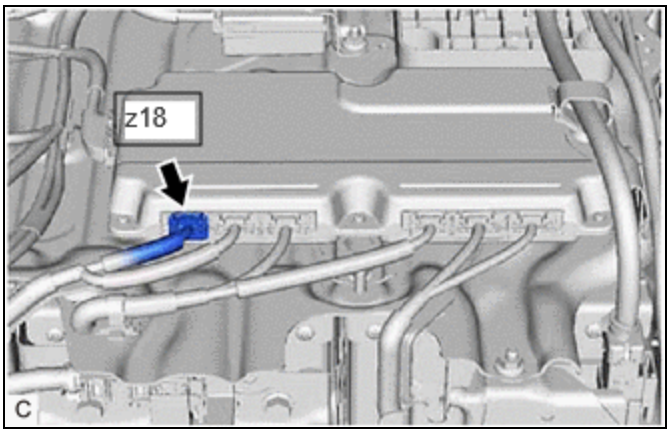
After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

(b) Connect the SST.

HINT:

Click here INFO

(c) Disconnect the battery voltage sensor connector.



NOTICE:

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

Procedure1

(d) Measure the resistance of the circuit for the malfunctioning sensor (battery temperature sensor 0 to 4).

Tester Connection:

EWD INFO

Click Location & Routing(z18)
Click Connector(z18)

TESTER CONNECTION	BATTERY TEMPERATURE SENSOR
z18-21 (TB0) - z18-20 (GB0)	0
z18-19 (TB1) - z18-18 (GB1)	1
z18-11 (TB2) - z18-12 (GB2)	2
z18-9 (TB3) - z18-10 (GB3)	3
z18-7 (TB4) - z18-8 (GB4)	4

Standard Resistance:

THERMISTOR TEMPERATURE	CONDITION	SPECIFIED CONDITION
0 to 10°C (32 to 50°F)	Ignition switch off	17.7 to 27.8 kΩ
10 to 20°C (50 to 68°F)	Ignition switch off	12.0 to 18.2 kΩ
20 to 30°C (68 to 86°F)	Ignition switch off	8.22 to 12.2 kΩ
30 to 40°C (86 to 104°F)	Ignition switch off	5.74 to 8.41 kΩ
40 to 50°C (104 to 122°F)	Ignition switch off	4.09 to 5.91 kΩ

Procedure2

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

Standard Resistance:

EWD INFO

Click Location & Routing(z18)
Click Connector(z18)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
z18-21 (TB0) - Body ground and other terminals (except z18-20 (GB0))	Ignition switch off	10 kΩ or higher
z18-19 (TB1) - Body ground and other terminals (except z18-18 (GB1))	Ignition switch off	10 kΩ or higher
z18-11 (TB2) - Body ground and other terminals (except z18-12 (GB2))	Ignition switch off	10 kΩ or higher
z18-9 (TB3) - Body ground and other terminals (except z18-10 (GB3))	Ignition switch off	10 kΩ or higher
z18-7 (TB4) - Body ground and other terminals (except z18-8 (GB4))	Ignition switch off	10 kΩ or higher

Pre-procedure2

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

(g) Turn the ignition switch to ON.

Procedure3

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

Standard Voltage:

EWD INFO

Click Location & Routing(z18)
Click Connector(z18)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
z18-21 (TB0) - Body ground	Ignition switch ON	Below 1 V
z18-19 (TB1) - Body ground	Ignition switch ON	Below 1 V
z18-11 (TB2) - Body ground	Ignition switch ON	Below 1 V
z18-9 (TB3) - Body ground	Ignition switch ON	Below 1 V
z18-7 (TB4) - Body ground	Ignition switch ON	Below 1 V
z18-20 (GB0) - Body ground	Ignition switch ON	Below 1 V
z18-18 (GB1) - Body ground	Ignition switch ON	Below 1 V
z18-12 (GB2) - Body ground	Ignition switch ON	Below 1 V

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
z18-10 (GB3) - Body ground	Ignition switch ON	Below 1 V
z18-8 (GB4) - Body ground	Ignition switch ON	Below 1 V

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.
- If the ignition switch is turned to ON with the connectors disconnected, other DTCs will be stored. Be sure to clear the DTCs after the inspection.

Post-procedure1

(i) Turn the ignition switch off.

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

(k) Reconnect the battery voltage sensor connector.

(l) Disconnect the SST.

OK ▶ **REPLACE BATTERY VOLTAGE SENSOR**

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

6.	**CHECK HV BATTERY (BATTERY TEMPERATURE SENSOR 5 to 9)**

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.

(b) Connect the SST.

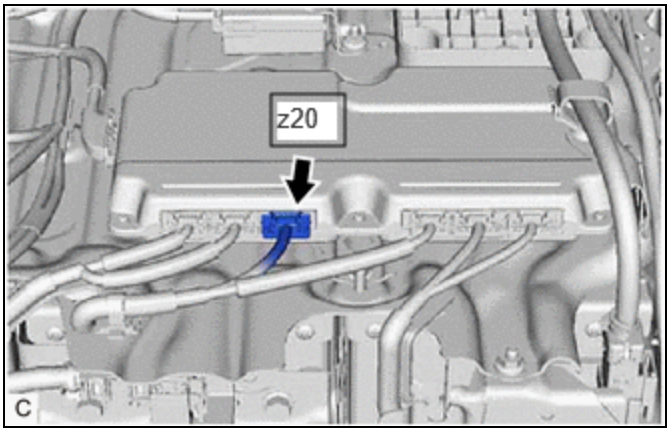
HINT:

Click here INFO

(c) Disconnect the battery voltage sensor connector.

NOTICE:

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



Procedure1

(d) Measure the resistance of the circuit for the malfunctioning sensor (battery temperature sensor 5 to 9).

Tester Connection:

EWD INFO

Click Location & Routing(z20)
Click Connector(z20)

TESTER CONNECTION	BATTERY TEMPERATURE SENSOR
z20-4 (TB5) - z20-3 (GB5)	5
z20-17 (TB6) - z20-27 (GB6)	6
z20-15 (TB7) - z20-16 (GB7)	7
z20-25 (TB8) - z20-26 (GB8)	8
z20-13 (TB9) - z20-14 (GB9)	9

Standard Resistance:

THERMISTOR TEMPERATURE	CONDITION	SPECIFIED CONDITION
0 to 10°C (32 to 50°F)	Ignition switch off	17.7 to 27.8 kΩ
10 to 20°C (50 to 68°F)	Ignition switch off	12.0 to 18.2 kΩ
20 to 30°C (68 to 86°F)	Ignition switch off	8.22 to 12.2 kΩ
30 to 40°C (86 to 104°F)	Ignition switch off	5.74 to 8.41 kΩ
40 to 50°C (104 to 122°F)	Ignition switch off	4.09 to 5.91 kΩ

Procedure2

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

Standard Resistance:

EWD INFO

Click Location & Routing(z20)
Click Connector(z20)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
z20-4 (TB5) - Body ground and other terminals (except z20-3 (GB5))	Ignition switch off	10 kΩ or higher
z20-17 (TB6) - Body ground and other terminals (except z20-27 (GB6))	Ignition switch off	10 kΩ or higher
z20-15 (TB7) - Body ground and other terminals (except z20-16 (GB7))	Ignition switch off	10 kΩ or higher
z20-25 (TB8) - Body ground and other terminals (except z20-26 (GB8))	Ignition switch off	10 kΩ or higher
z20-13 (TB9) - Body ground and other terminals (except z20-14 (GB9))	Ignition switch off	10 kΩ or higher

Pre-procedure2

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

(g) Turn the ignition switch to ON.

Procedure3

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

Standard Voltage:

EWD INFO

Click Location & Routing(z20)
Click Connector(z20)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
z20-4 (TB5) - Body ground	Ignition switch ON	Below 1 V
z20-17 (TB6) - Body ground	Ignition switch ON	Below 1 V
z20-15 (TB7) - Body ground	Ignition switch ON	Below 1 V
z20-25 (TB8) - Body ground	Ignition switch ON	Below 1 V
z20-13 (TB9) - Body ground	Ignition switch ON	Below 1 V
z20-3 (GB5) - Body ground	Ignition switch ON	Below 1 V
z20-27 (GB6) - Body ground	Ignition switch ON	Below 1 V
z20-16 (GB7) - Body ground	Ignition switch ON	Below 1 V
z20-26 (GB8) - Body ground	Ignition switch ON	Below 1 V
z20-14 (GB9) - Body ground	Ignition switch ON	Below 1 V

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.
- If the ignition switch is turned to ON with the connectors disconnected, other DTCs will be stored. Be sure to clear the DTCs after the inspection.

Post-procedure1

(i) Turn the ignition switch off.

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

(k) Reconnect the battery voltage sensor connector.

(l) Disconnect the SST.

OK ▶ **REPLACE BATTERY VOLTAGE SENSOR**

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

7.	CHECK HV BATTERY (BATTERY TEMPERATURE SENSOR 10 to 14)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

NOTICE:

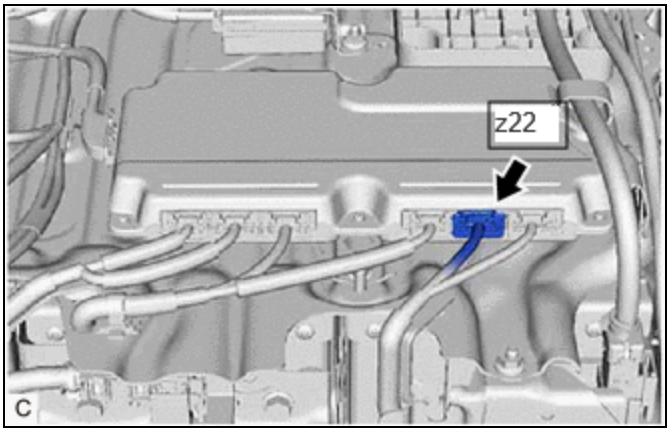
After removing the service plug grip, do not turn the ignition switch to ON (READY), unless instructed by the repair manual because this may cause a malfunction.

(b) Connect the SST.

HINT:

Click here INFO

(c) Disconnect the battery voltage sensor connector.



NOTICE:

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

Procedure1

(d) Measure the resistance of the circuit for the malfunctioning sensor (battery temperature sensor 10 to 14).

Tester Connection:

EWD INFO

Click Location & Routing(z22)
Click Connector(z22)

TESTER CONNECTION	BATTERY TEMPERATURE SENSOR
z22-19 (TB10) - z22-30 (GB10)	10
z22-5 (TB11) - z22-18 (GB11)	11
z22-17 (TB12) - z22-16 (GB12)	12
z22-15 (TB13) - z22-14 (GB13)	13
z22-13 (TB14) - z22-12 (GB14)	14

Standard Resistance:

THERMISTOR TEMPERATURE	CONDITION	SPECIFIED CONDITION
0 to 10°C (32 to 50°F)	Ignition switch off	17.7 to 27.8 kΩ
10 to 20°C (50 to 68°F)	Ignition switch off	12.0 to 18.2 kΩ
20 to 30°C (68 to 86°F)	Ignition switch off	8.22 to 12.2 kΩ
30 to 40°C (86 to 104°F)	Ignition switch off	5.74 to 8.41 kΩ
40 to 50°C (104 to 122°F)	Ignition switch off	4.09 to 5.91 kΩ

Procedure2

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

Standard Resistance:

EWD INFO

Click Location & Routing(z22)
Click Connector(z22)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
z22-19 (TB10) - Body ground and other terminals (except z22-30 (GB10))	Ignition switch off	10 kΩ or higher
z22-5 (TB11) - Body ground and other terminals (except z22-18 (GB11))	Ignition switch off	10 kΩ or higher
z22-17 (TB12) - Body ground and other terminals (except z22-16 (GB12))	Ignition switch off	10 kΩ or higher
z22-15 (TB13) - Body ground and other terminals (except z22-14 (GB13))	Ignition switch off	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
z22-13 (TB14) - Body ground and other terminals (except z22-12 (GB14))	Ignition switch off	10 kΩ or higher

Pre-procedure2

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

(g) Turn the ignition switch to ON.

Procedure3

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

Standard Voltage:

EWD INFO

Click Location & Routing(z22)
Click Connector(z22)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
z22-19 (TB10) - Body ground	Ignition switch ON	Below 1 V
z22-5 (TB11) - Body ground	Ignition switch ON	Below 1 V
z22-17 (TB12) - Body ground	Ignition switch ON	Below 1 V
z22-15 (TB13) - Body ground	Ignition switch ON	Below 1 V
z22-13 (TB14) - Body ground	Ignition switch ON	Below 1 V
z22-30 (GB10) - Body ground	Ignition switch ON	Below 1 V
z22-18 (GB11) - Body ground	Ignition switch ON	Below 1 V
z22-16 (GB12) - Body ground	Ignition switch ON	Below 1 V
z22-14 (GB13) - Body ground	Ignition switch ON	Below 1 V
z22-12 (GB14) - Body ground	Ignition switch ON	Below 1 V

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.
- If the ignition switch is turned to ON with the connectors disconnected, other DTCs will be stored. Be sure to clear the DTCs after the inspection.

Post-procedure1

(i) Turn the ignition switch off.

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

(k) Reconnect the battery voltage sensor connector.

(l) Disconnect the SST.

OK ▶ **REPLACE BATTERY VOLTAGE SENSOR**

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