Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM100000002BHW1
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for PHEV Model): P1B4A62; Hybrid/EV Battery Heater Temperature Sensor Signal Compare Failure; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	**P1B4A62**	**Hybrid/EV Battery Heater Temperature Sensor Signal Compare Failure**

DESCRIPTION

The battery ECU assembly monitors the temperature of the traction battery heater though the HV battery heater temperature sensors (thermistors), and performs control to increase the temperature of the HV battery to the target temperature.

The battery ECU assembly will store a DTC when it detects the HV battery heater temperature sensors (thermistors)l malfunction.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P1B4A62	Hybrid/EV Battery Heater Temperature Sensor Signal Compare Failure	Difference between the values of 2 HV battery heater temperature sensor is the specified value or more (1 trip detection logic)	• Wire harness or connector • Battery ECU assembly • No. 1 traction battery heater	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P1B4A

MONITOR DESCRIPTION

If the battery ECU assembly detects a malfunction in the HV battery heater temperature sensor (thermistor), the battery ECU assembly illuminates the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P1B4A (INF P1B4A62): Hybrid/EV Battery Heater Temperature Sensor Malfunction
Required sensors/components	HV battery heater 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 P1B4A (INF P1B4A62) 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 35 minutes or more.[*1]
3. Turn the ignition switch to ON and wait for 10 seconds or more.[*2]

   HINT:

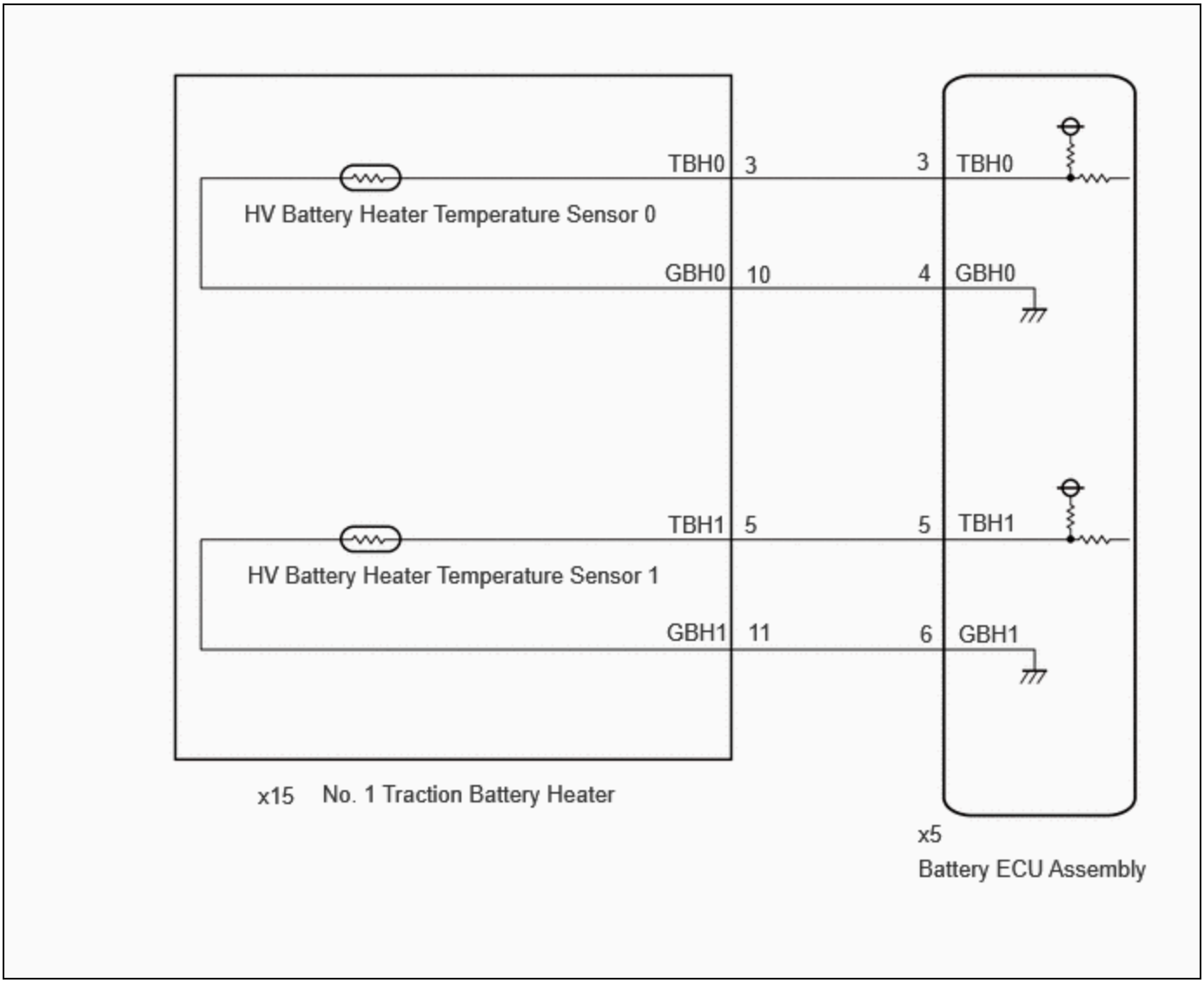
   [*1] to [*2]: Normal judgment procedure.

   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



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
"P1B4A62" 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 CONNECTOR CONNECTION CONDITION (BATTERY ECU ASSEMBLY)**

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 ECU assembly connector.

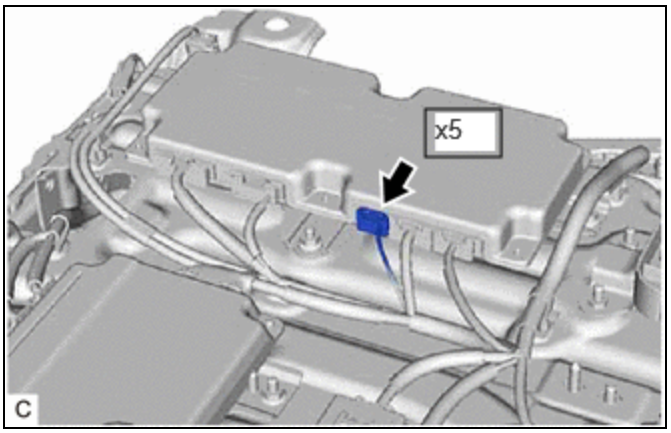
HINT:

Click here INFO

OK:

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

Result:



PROCEED TO
OK
NG

Post-procedure1

(c) None

NG ▶ **CONNECT SECURELY**

OK ▼

3.	**CHECK NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 0)**

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.

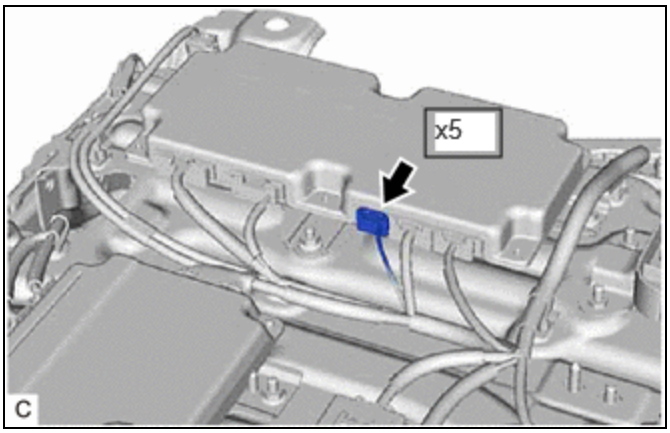
HINT:

Click here INFO

(c) Disconnect the battery ECU assembly connector.

NOTICE:

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



Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(x5)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x5-3 (TBH0) - x5-4 (GBH0)	Ignition switch off 0 to 10°C (32 to 50°F)	17.7 to 28.3 kΩ
x5-3 (TBH0) - x5-4 (GBH0)	Ignition switch off 10 to 20°C (50 to 68°F)	11.9 to 18.4 kΩ
x5-3 (TBH0) - x5-4 (GBH0)	Ignition switch off 20 to 30°C (68 to 86°F)	8.20 to 12.3 kΩ
x5-3 (TBH0) - x5-4 (GBH0)	Ignition switch off 30 to 40°C (86 to 104°F)	5.72 to 8.40 kΩ
x5-3 (TBH0) - x5-4 (GBH0)	Ignition switch off 40 to 50°C (104 to 122°F)	4.06 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(x5)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x5-3 (TBH0) - Body ground and other terminals	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(x5)
Click Connector(x5)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
x5-3 (TBH0) - 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 ECU assembly connector.

(l) Disconnect the SST.

NG ▶ **GO TO STEP 6**

OK ▼

4.	**CHECK NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 1)**

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.

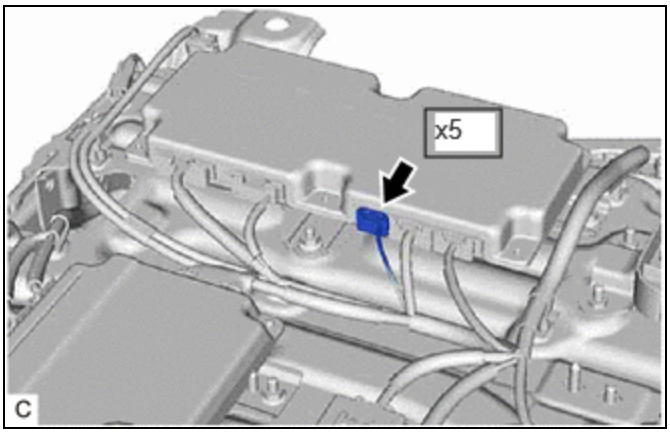
HINT:

Click here INFO

(c) Disconnect the battery ECU assembly connector.

NOTICE:

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



Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(x5)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x5-5 (TBH1) - x5-6 (GBH1)	Ignition switch off 0 to 10°C (32 to 50°F)	17.7 to 28.3 kΩ
x5-5 (TBH1) - x5-6 (GBH1)	Ignition switch off 10 to 20°C (50 to 68°F)	11.9 to 18.4 kΩ
x5-5 (TBH1) - x5-6 (GBH1)	Ignition switch off 20 to 30°C (68 to 86°F)	8.20 to 12.3 kΩ
x5-5 (TBH1) - x5-6 (GBH1)	Ignition switch off 30 to 40°C (86 to 104°F)	5.72 to 8.40 kΩ
x5-5 (TBH1) - x5-6 (GBH1)	Ignition switch off 40 to 50°C (104 to 122°F)	4.06 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(x5)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x5-5 (TBH1) - Body ground and other terminals	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(x5)
Click Connector(x5)

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
x5-5 (TBH1) - 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 ECU assembly connector.

(l) Disconnect the SST.

OK ▶ **REPLACE BATTERY ECU ASSEMBLY**

NG ▼

5.	**CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 1))**

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.

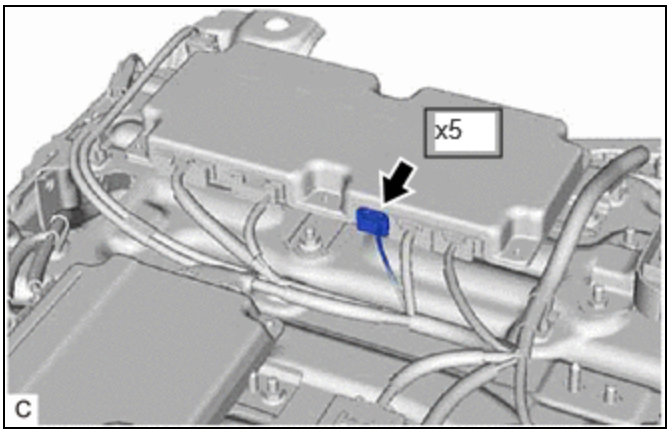
HINT:

Click here INFO

(c) Disconnect the battery ECU assembly connector.

NOTICE:

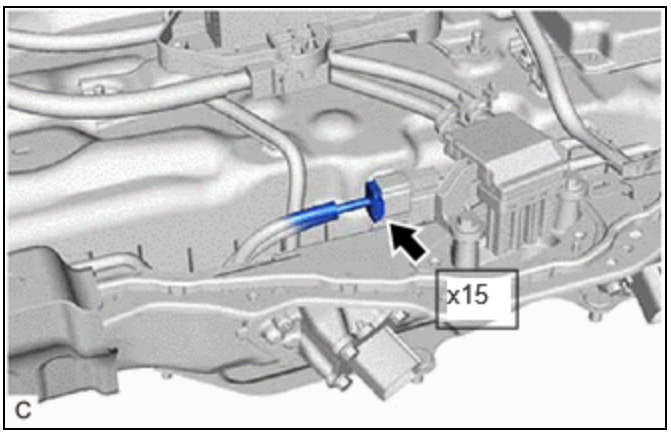
Before disconnecting the connector, check that it is not loose or disconnected.



(d) Disconnect the No. 1 traction battery heater connector.

NOTICE:

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



Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(x15,x5)

Click Connector(x15)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-5 (TBH1) - x5-5 (TBH1)	Ignition switch off	Below 1 Ω
x15-11 (GBH1) - x5-6 (GBH1)	Ignition switch off	Below 1 Ω
x15-5 (TBH1) or x5-5 (TBH1) - Body ground and other terminals	Ignition switch off	10 kΩ or higher
x15-11 (GBH1) or x5-6 (GBH1) - Body ground and other terminals	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.

Procedure2

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

Standard Voltage:

EWD INFO

Click Location & Routing(x15,x5)
Click Connector(x15)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-5 (TBH1) or x5-5 (TBH1) - 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 No. 1 traction battery heater connector.

(l) Reconnect the battery ECU assembly connector.

(m) Disconnect the SST.

OK ▶ **REPLACE NO. 1 TRACTION BATTERY HEATER**

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

6.	**CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 0))**

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.

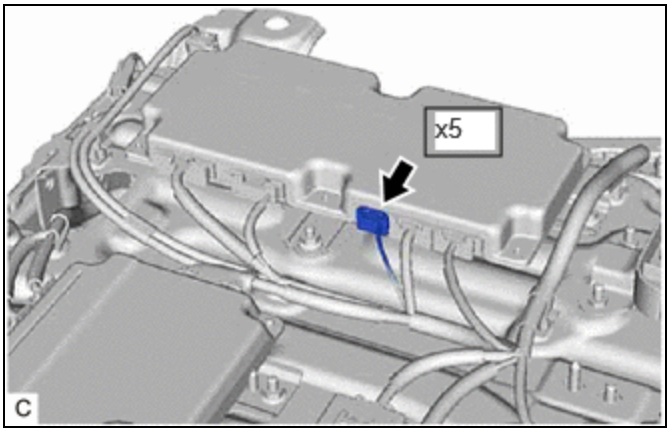
HINT:

Click here INFO

(c) Disconnect the battery ECU assembly connector.

NOTICE:

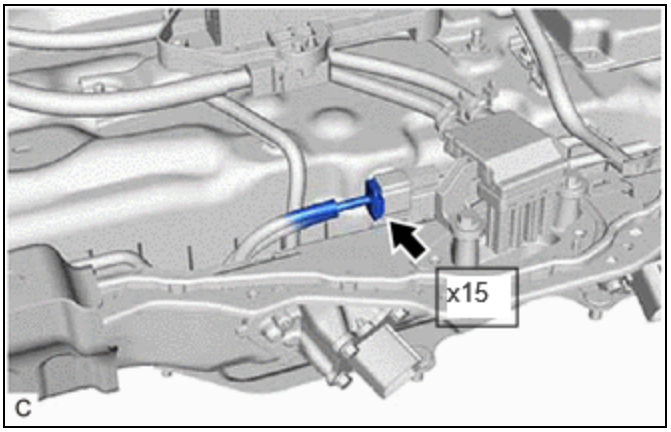
Before disconnecting the connector, check that it is not loose or disconnected.



(d) Disconnect the No. 1 traction battery heater connector.

NOTICE:

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



Procedure1

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

Standard Resistance:

EWD INFO

Click Location & Routing(x15,x5)
Click Connector(x15)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-3 (TBH0) - x5-3 (TBH0)	Ignition switch off	Below 1 Ω
x15-10 (GBH0) - x5-4 (GBH0)	Ignition switch off	Below 1 Ω
x15-3 (TBH0) or x5-3 (TBH0) - Body ground and other terminals	Ignition switch off	10 kΩ or higher
x15-10 (GBH0) or x5-4 (GBH0) - Body ground and other terminals	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.

Procedure2

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

Standard Voltage:

EWD INFO

Click Location & Routing(x15,x5)
Click Connector(x15)
Click Connector(x5)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-3 (TBH0) or x5-3 (TBH0) - 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 No. 1 traction battery heater connector.

(l) Reconnect the battery ECU assembly connector.

(m) Disconnect the SST.

OK ▶ REPLACE NO. 1 TRACTION BATTERY HEATER

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR