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Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [03/2023 -]
Title: HYBRID / BATTERY CONTROL: HYBRID BATTERY SYSTEM (for PHEV Model): P1B4B72; Hybrid/EV Battery Heater Relay Actuator Stuck Open; 2023 - 2024 MY Prius Prime [03/2023 -]		

DTC	P1B4B72	Hybrid/EV Battery Heater Relay Actuator Stuck Open
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DESCRIPTION

The battery ECU assembly controls the HV battery heater relay.

If the HV battery heater relay does not turn on when the battery ECU assembly is outputting current, the battery ECU assembly will detect a malfunction and store a DTC.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P1B4B72	Hybrid/EV Battery Heater Relay Actuator Stuck Open	The temperature of the HV battery does not increase even though the battery ECU assembly is outputting current to turn the HV battery heater relay on. (1 trip detection logic)	<ul style="list-style-type: none"> No. 1 traction battery heater Wire harness or connector No. 1 traction battery heater relay Battery ECU assembly Fuse 	Comes on	Master Warning: Comes on	HV Battery	A	SAE Code: P1B4F

MONITOR DESCRIPTION

If the battery ECU assembly detects that the temperature of the HV battery does not increase even though it is applying current to the HV battery heater relay to turn it on, it will detect a malfunction, illuminate the MIL and store a DTC.

MONITOR STRATEGY

Related DTCs	P1B4F (INF P1B4B72): Hybrid/EV Battery Heater Relay Control Circuit Stuck Off
Required sensors/components	HV battery heater temperature sensor relay
Frequency of operation	Continuous
Duration	TMC's intellectual property
MIL operation	1 driving cycle

Sequence of operation	None
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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	-
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COMPONENT OPERATING RANGE

Battery ECU assembly	DTC P1B4F (INF P1B4B72) is not detected
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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](#)

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

HINT:

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

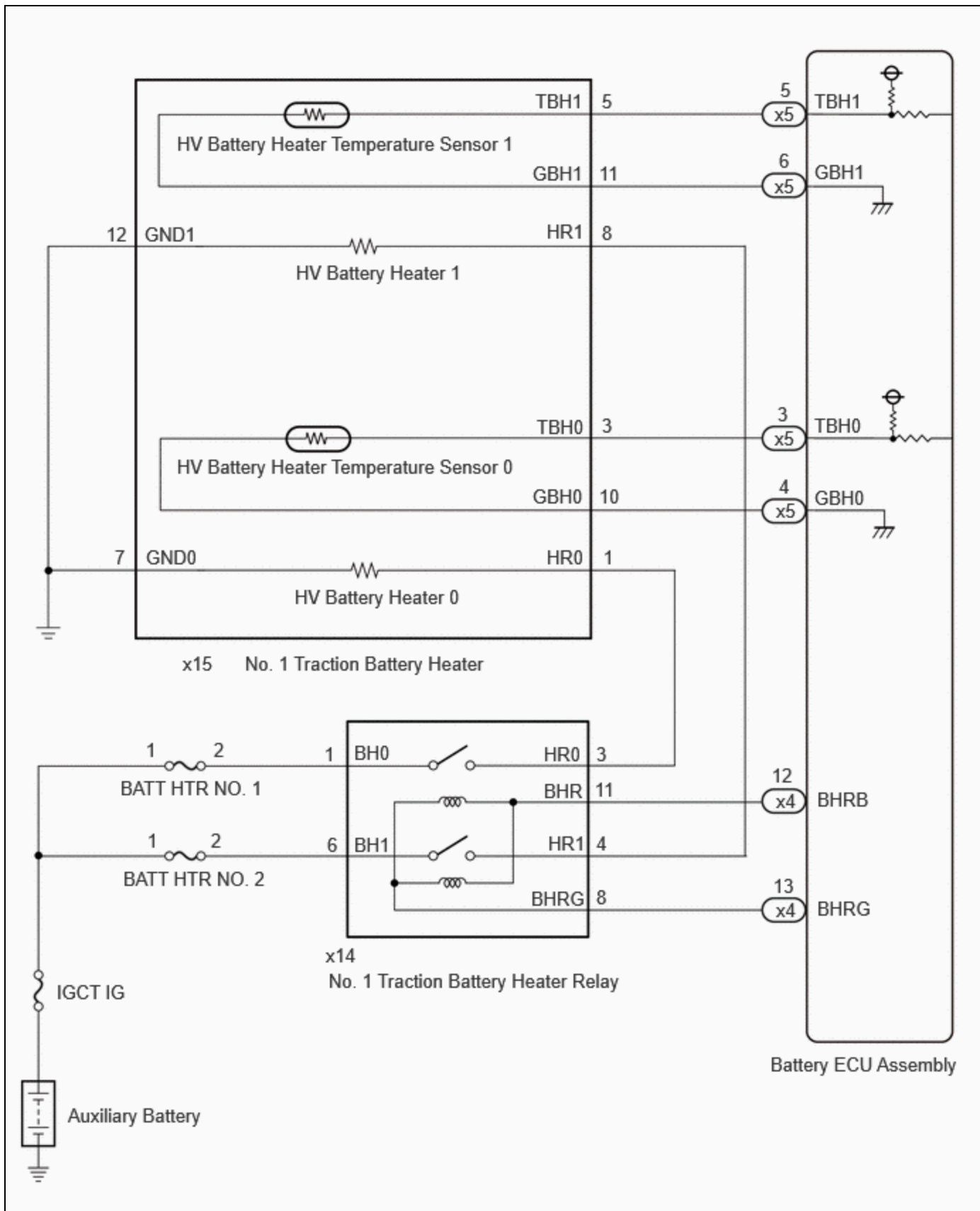
The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

- Enter the following menus: Powertrain / HV Battery / Utility / All Readiness.
- 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)
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Pre-procedure1

(a) None

Procedure1

(b) Check for DTCs.

Powertrain > HV Battery > Trouble Codes

Powertrain > Hybrid Control > Trouble Codes

RESULT	PROCEED TO
"P1B4B72" 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 connectors.

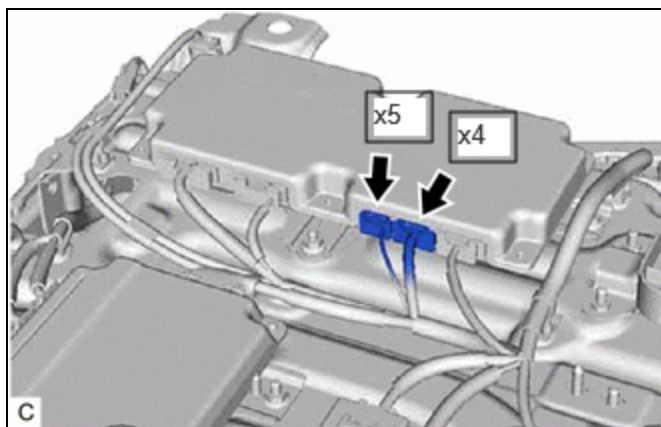
HINT:

[Click here](#) **INFO**

OK:

The connectors are connected securely and there are no contact pressure problems.

Result:



PROCEED TO
OK
NG

Post-procedure1

(c) None

NG ► CONNECT SECURELY

OK



3.	CHECK CONNECTOR CONNECTION CONDITION (NO. 1 TRACTION BATTERY HEATER RELAY)
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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 No. 1 traction battery heater relay connector.

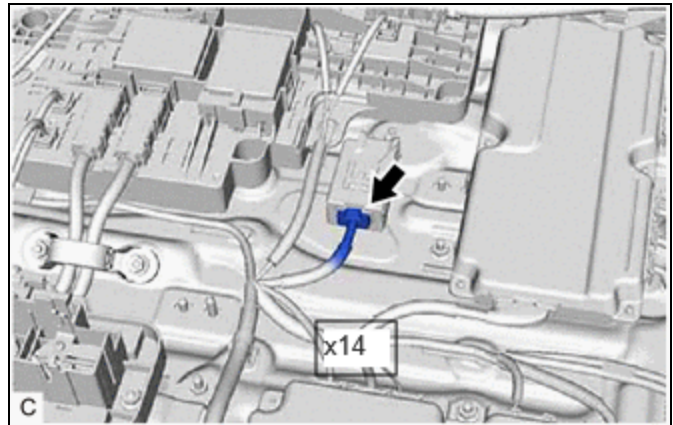
HINT:

[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



4.	CHECK NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 0)
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Click here [INFO](#)

NG  **GO TO STEP 21**

OK



5.	CHECK NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 1)
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Click here [INFO](#)

NG  **GO TO STEP 20**

OK



6.	CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY HEATER RELAY)
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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.

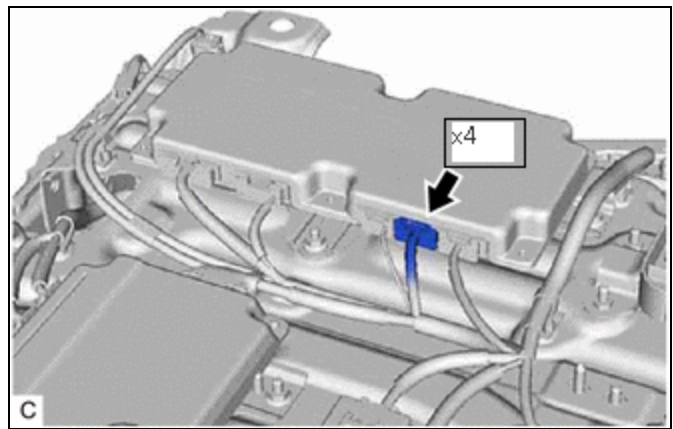
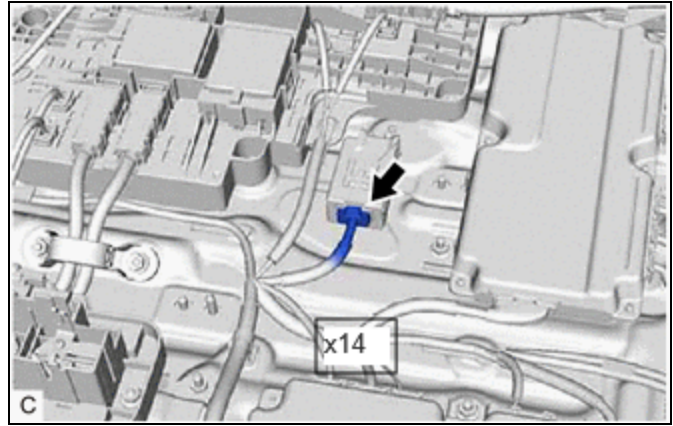
HINT:

Click here [INFO](#)

(c) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

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



(d) Disconnect the battery ECU assembly 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:



[Click Location & Routing\(x14,x4\)](#)

[Click Connector\(x14\)](#)

[Click Connector\(x4\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x14-11 (BHR) - x4-12 (BHRB)	Ignition switch off	Below 1 Ω
x14-8 (BHRG) - x4-13 (BHRG)	Ignition switch off	Below 1 Ω
x14-11 (BHR) or x4-12 (BHRB) - Body ground and other terminals	Ignition switch off	10 kΩ or higher
x14-8 (BHRG) or x4-13 (BHRG) - 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:



[Click Location & Routing\(x14,x4\)](#)

[Click Connector\(x14\)](#)

[Click Connector\(x4\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x14-11 (BHR) or x4-12 (BHRB) - 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) Reconnect the No. 1 traction battery heater relay connector.
- (m) Disconnect the SST.

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK



7. CHECK HARNESS AND CONNECTOR (BH0, BH1 VOLTAGE)

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.

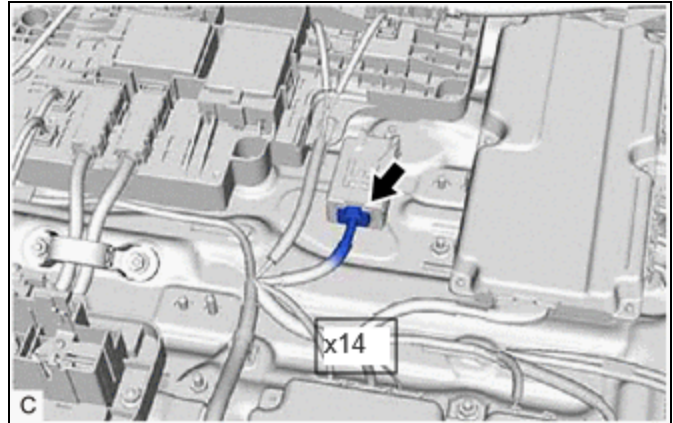
HINT:

[Click here](#) INFO

(c) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

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



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

(e) Turn the ignition switch to ON.

Procedure1

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

Standard Voltage:



[Click Location & Routing\(x14\).](#)

[Click Connector\(x14\).](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x14-1 (BH0) - Body ground	Ignition switch ON	11 to 14 V
x14-6 (BH1) - Body ground	Ignition switch ON	11 to 14 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

(g) Turn the ignition switch off.

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

(i) Reconnect the No. 1 traction battery heater relay connector.

(j) Disconnect the SST.

NG **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



8. CHECK RELAY (NO. 1 TRACTION BATTERY HEATER RELAY)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

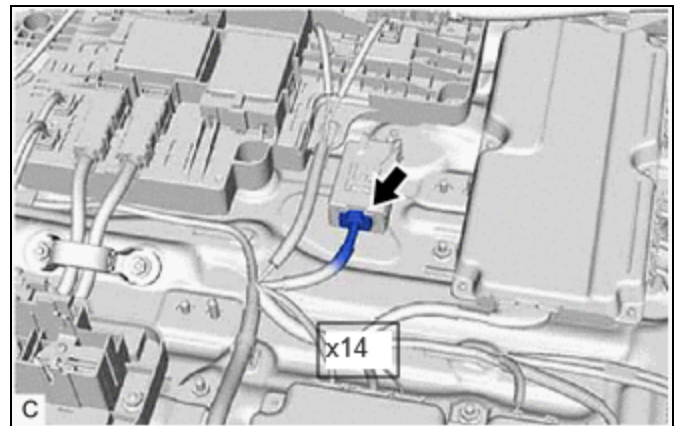
NOTICE:

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) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

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



Procedure1

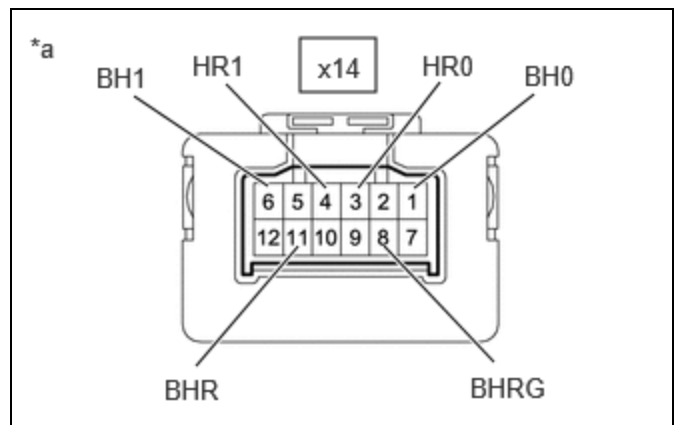
(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



[Click Location & Routing\(x14\)](#)

[Click Connector\(x14\)](#)



*a Component without harness connected (No. 1 Traction Battery Heater Relay)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x14-1 (BH0) - x14-3 (HR0)	Auxiliary battery voltage not applied between terminals x14-11 (BHR) and x14-8 (BHRG)	10 kΩ or higher
x14-1 (BH0) - x14-3 (HR0)	Auxiliary battery voltage applied between	Below 1 Ω

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
	terminals x14-11 (BHR) and x14-8 (BHRG)	
x14-6 (BH1) - x14-4 (HR1)	Auxiliary battery voltage not applied between terminals x14-11 (BHR) and x14-8 (BHRG)	10 k Ω or higher
x14-6 (BH1) - x14-4 (HR1)	Auxiliary battery voltage applied between terminals x14-11 (BHR) and x14-8 (BHRG)	Below 1 Ω

Result:

PROCEED TO
OK
NG

Post-procedure1

(d) Reconnect the No. 1 traction battery heater relay connector.

NG  **REPLACE NO. 1 TRACTION BATTERY HEATER RELAY**

OK



9.	CHECK FUSE (BATT HTR NO. 1)
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Pre-procedure1

(a) Remove the BATT HTR NO. 1 fuse from the fuse block assembly.

Procedure1

(b) Measure the resistance of the BATT HTR NO. 1 fuse.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
BATT HTR NO. 1	Ignition switch off	Below 1 Ω

Post-procedure1

(c) Install the BATT HTR NO. 1 fuse to the fuse block assembly.

NG  **REPLACE FUSE (BATT HTR NO. 1)**

OK



10.	CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY HEATER RELAY - BATT HTR NO. 1 FUSE)
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CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

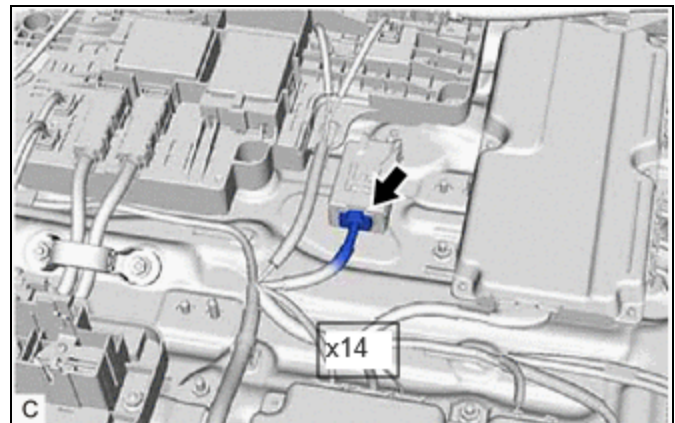
NOTICE:

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) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

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



(c) Remove the BATT HTR NO. 1 fuse from the fuse block assembly.

Procedure1

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

Standard Resistance:



[Click Location & Routing\(x14\)](#)

[Click Connector\(x14\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x14-1 (BH0) - BATT HTR NO. 1 fuse holder 2	Ignition switch off	Below 1 Ω
x14-1 (BH0) or BATT HTR NO. 1 fuse holder 2 - Body ground and other terminals	Ignition switch off	10 k Ω or higher

NOTICE:

When taking a measurement with a tester, do not apply excessive force to the tester probe to avoid damaging the terminal.

Post-procedure1

- (e) Install the BATT HTR NO. 1 fuse to the fuse block assembly.
- (f) Reconnect the No. 1 traction battery heater relay connector.

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



11.	CHECK HARNESS AND CONNECTOR (BATTERY TERMINAL - BATT HTR NO. 1 FUSE)
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Pre-procedure1

- (a) Remove the BATT HTR NO. 1 fuse from the fuse block assembly.
- (b) Disconnect the cable from the negative (-) auxiliary battery terminal.
- (c) Disconnect the cable from the positive (+) auxiliary battery terminal.

Procedure1

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
BATT HTR NO. 1 fuse holder 1 - Auxiliary battery positive (+) cable	Ignition switch off	Below 1 Ω
BATT HTR NO. 1 fuse holder 1 or Auxiliary battery positive (+) cable - Body ground and other terminals	Ignition switch off	10 k Ω or higher

NOTICE:

When taking a measurement with a tester, do not apply excessive force to the tester probe to avoid damaging the terminal.

Post-procedure1

- (e) Connect the cable to the positive (+) auxiliary battery terminal.
- (f) Connect the cable to the negative (-) auxiliary battery terminal.
- (g) Install the BATT HTR NO. 1 fuse to the fuse block assembly.

NG  **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



12.

CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY HEATER RELAY - NO. 1 TRACTION BATTERY HEATER)

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.

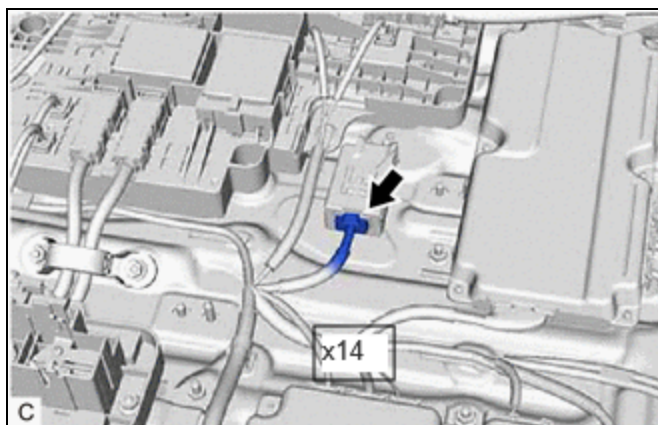
HINT:

Click here 

- (c) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

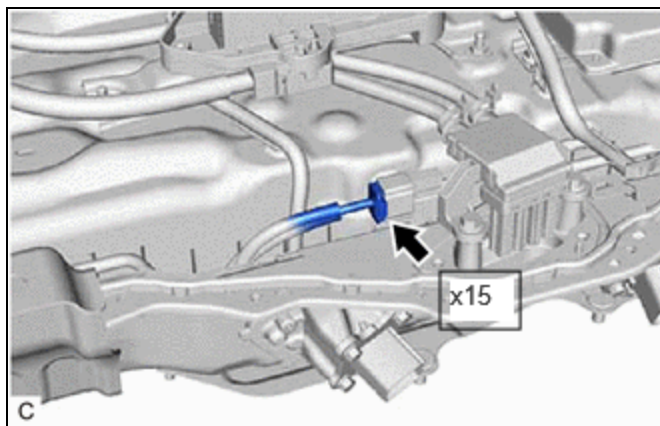
Before disconnecting the connector, check that it is not loose or disconnected.



- (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:



[Click Location & Routing\(x15,x14\)](#)

[Click Connector\(x15\)](#)

[Click Connector\(x14\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-1 (HR0) - x14-3 (HR0)	Ignition switch off	Below 1 Ω
x15-1 (HR0) or x14-3 (HR0) - 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:



[Click Location & Routing\(x15,x14\)](#)

[Click Connector\(x15\)](#)

[Click Connector\(x14\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-1 (HR0) or x14-3 (HR0) - 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

- Turn the ignition switch off.
- Disconnect the cable from the negative (-) auxiliary battery terminal.
- Reconnect the No. 1 traction battery heater connector.
- Reconnect the No. 1 traction battery heater relay connector.
- Disconnect the SST.

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK



13.

CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY HEATER - BODY GROUND)

CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

- Check that the service plug grip is not installed.

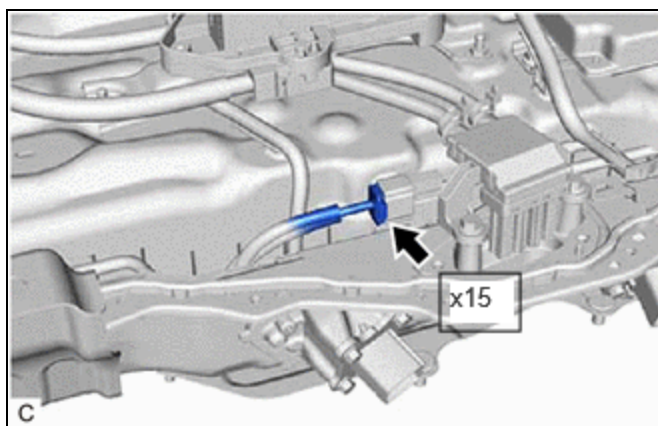
NOTICE:

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.

- Disconnect the No. 1 traction battery heater connector.

NOTICE:

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



Procedure1

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

Standard Resistance:



[Click Location & Routing\(x15\)](#)

[Click Connector\(x15\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-7 (GND0) - Body ground	Ignition switch off	Below 1 Ω

Post-procedure1

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

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



14.	CHECK FUSE (BATT HTR NO. 2)
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Pre-procedure1

(a) Remove the BATT HTR NO. 2 fuse from the fuse block assembly.

Procedure1

(b) Measure the resistance of the BATT HTR NO. 2 fuse.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
BATT HTR NO. 2 fuse	Ignition switch off	Below 1 Ω

Post-procedure1

(c) Install the BATT HTR NO. 2 fuse to the fuse block assembly.

NG ► **REPLACE FUSE (BATT HTR NO. 2)**

OK



15.	CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY HEATER RELAY - BATT HTR NO. 2 FUSE)
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CAUTION:

Be sure to wear insulated gloves and protective goggles.

Pre-procedure1

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

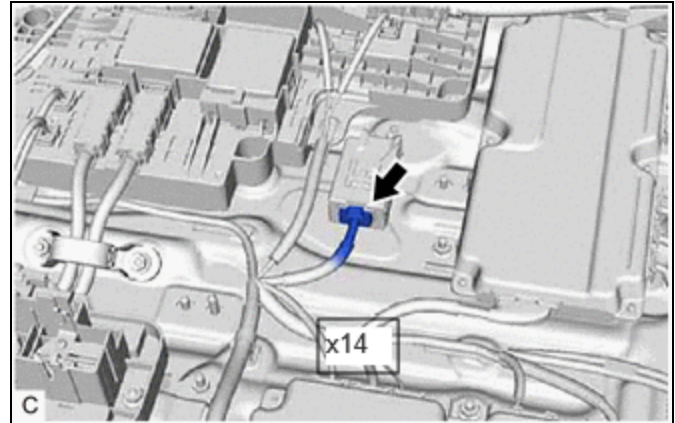
NOTICE:

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) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

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



(c) Remove the BATT HTR NO. 2 fuse from the fuse block assembly.

Procedure1

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

Standard Resistance:



[Click Location & Routing\(x14\)](#)

[Click Connector\(x14\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x14-6 (BH1) - BATT HTR NO. 2 fuse holder 2	Ignition switch off	Below 1 Ω
x14-6 (BH1) or BATT HTR NO. 2 fuse holder 2 - Body ground and other terminals	Ignition switch off	10 kΩ or higher

NOTICE:

When taking a measurement with a tester, do not apply excessive force to the tester probe to avoid damaging the terminal.

Post-procedure1

(e) Install the BATT HTR NO. 2 fuse to the fuse block assembly.

(f) Reconnect the No. 1 traction battery heater relay connector.

NG **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK**16. CHECK HARNESS AND CONNECTOR (BATTERY TERMINAL - BATT HTR NO. 2 FUSE)**

Pre-procedure1

- (a) Remove the BATT HTR NO. 2 fuse from the fuse block assembly.
- (b) Disconnect the cable from the negative (-) auxiliary battery terminal.
- (c) Disconnect the cable from the positive (+) auxiliary battery terminal.

Procedure1

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
BATT HTR NO. 2 fuse holder 1 - Auxiliary battery positive (+) cable	Ignition switch off	Below 1 Ω
BATT HTR NO. 2 fuse holder 1 or Auxiliary battery positive (+) cable - Body ground and other terminals	Ignition switch off	10 k Ω or higher

NOTICE:

When taking a measurement with a tester, do not apply excessive force to the tester probe to avoid damaging the terminal.

Post-procedure1

- (e) Connect the cable to the positive (+) auxiliary battery terminal.
- (f) Connect the cable to the negative (-) auxiliary battery terminal.
- (g) Install the BATT HTR NO. 2 fuse to the fuse block assembly.

NG **REPAIR OR REPLACE HARNESS OR CONNECTOR****OK****17. CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY HEATER RELAY - NO. 1 TRACTION BATTERY HEATER)****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.

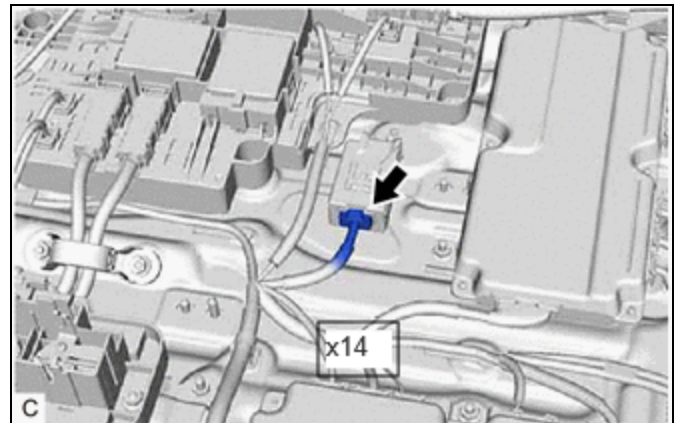
HINT:

Click here [INFO](#)

- (c) Disconnect the No. 1 traction battery heater relay connector.

NOTICE:

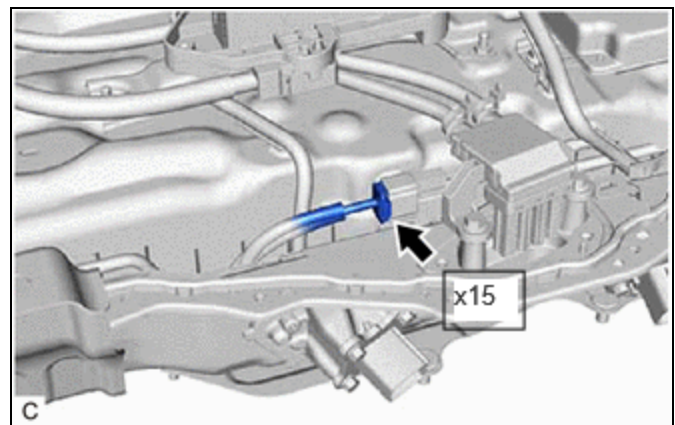
Before disconnecting the connector, check that it is not loose or disconnected.



- (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:



[Click Location & Routing\(x15,x14\)](#)

[Click Connector\(x15\)](#)

[Click Connector\(x14\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-8 (HR1) - x14-4 (HR1)	Ignition switch off	Below 1 Ω
x15-8 (HR1) or x14-4 (HR1) - Body ground and other terminals	Ignition switch off	10 k Ω 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:



[Click Location & Routing\(x15,x14\)](#)

[Click Connector\(x15\)](#)

[Click Connector\(x14\)](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-8 (HR1) or x14-4 (HR1) - 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 No. 1 traction battery heater relay connector.

(m) Disconnect the SST.

NG **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK



18.	CHECK HARNESS AND CONNECTOR (NO. 1 TRACTION BATTERY HEATER - BODY GROUND)
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CAUTION:

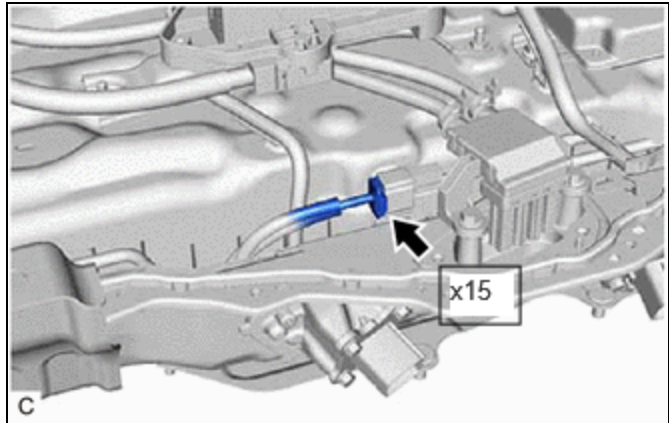
Be sure to wear insulated gloves and protective goggles.

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) Disconnect the No. 1 traction battery heater connector.

NOTICE:

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

Procedure1

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

Standard Resistance:



[Click Location & Routing\(x15\).](#)

[Click Connector\(x15\).](#)

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
x15-12 (GND1) - Body ground	Ignition switch off	Below 1 Ω

Post-procedure1

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

NG ► REPAIR OR REPLACE HARNESS OR CONNECTOR

OK



19.	PERFORM ACTIVE TEST USING GTS (HYBRID/EV BATTERY HEATER RELAY)
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Pre-procedure1

(a) None

Procedure1

(b) Enter the following menus: Powertrain / HV Battery / Active Test / Hybrid Battery Heater Relay.

Powertrain > HV Battery > Active Test

ACTIVE TEST DISPLAY
Hybrid/EV Battery Heater Relay

DATA LIST DISPLAY
Hybrid/EV Battery Heater 1 Temperature
Hybrid/EV Battery Heater 2 Temperature

RESULT	PROCEED TO
After performing the Active Test for 5 minutes, the value of both "Hybrid/EV Battery Heater 1 Temperature" and "Hybrid/EV Battery Heater 2 Temperature" increase by 5°C (41°F) or more.	A
After performing the Active Test for 5 minutes, the value of "Hybrid/EV Battery Heater 1 Temperature" does not increase by 5°C (41°F) or more.	B
After performing the Active Test for 5 minutes, the value of "Hybrid/EV Battery Heater 2 Temperature" does not increase by 5°C (41°F) or more.	C
Other than above	D

Post-procedure1

(c) Turn the ignition switch off.

A ► REPLACE BATTERY ECU ASSEMBLY**B ► REPLACE NO. 1 TRACTION BATTERY HEATER****C ► REPLACE NO. 1 TRACTION BATTERY HEATER****D ► REPLACE NO. 1 TRACTION BATTERY HEATER**


20.	CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 1))
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Click here [INFO](#)

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

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**

21.	CHECK HARNESS AND CONNECTOR (BATTERY ECU ASSEMBLY - NO. 1 TRACTION BATTERY HEATER (HV BATTERY HEATER TEMPERATURE SENSOR 0))
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Click here 

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

NG ► **REPAIR OR REPLACE HARNESS OR CONNECTOR**

