Last Modified: 12-04-2024	6.11:8.1.0	**Doc ID:** RM1000000028ZWH
Model Year Start: 2023	**Model:** Prius Prime	**Prod Date Range:** [12/2022 -]
Title: HYBRID / BATTERY CONTROL: HYBRID CONTROL SYSTEM (for M20A-FXS): P0A3011,P0A3015; Drive Motor "B" Temperature Sensor Circuit Short to Ground; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	**P0A3011**	**Drive Motor "B" Temperature Sensor Circuit Short to Ground**

DTC	**P0A3015**	**Drive Motor "B" Temperature Sensor Circuit Short to Battery or Open**

DTC SUMMARY

MALFUNCTION DESCRIPTION

These DTCs are stored when the rear motor temperature sensor output is abnormal. The cause of this malfunction may be one of the following:

Hybrid vehicle control ECU malfunction

- Hybrid vehicle control ECU internal malfunction

Rear motor temperature sensor malfunction

- Internal rear motor temperature sensor malfunction
- Open or short in rear motor temperature sensor

Wire harness between the rear motor temperature sensor and hybrid vehicle control ECU

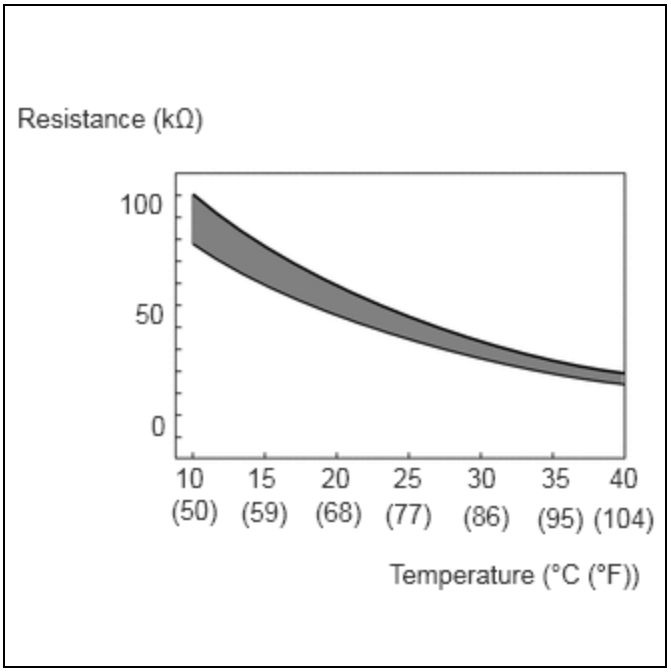
- The connectors are not connected properly
- Foreign matter or water on the connector terminals
- Open or short in wire harness

HINT:

If any of these DTCs are stored, the rear motor temperature sensor is malfunctioning and the self-protection function may not operate. Therefore under certain high load driving condition, the temperature of the rear motor (MGR) becomes high. If the self-protection function does not operate, the rear motor (MGR) may malfunction and cause the vehicle to enter fail-safe mode.

DESCRIPTION

The resistance of the thermistor built into the rear motor temperature sensor changes in accordance with changes in the rear motor temperature. The lower the rear motor temperature, the higher the thermistor resistance. Conversely, the higher the rear motor temperature, the lower the resistance.



DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0A3011	Drive Motor "B" Temperature Sensor Circuit Short to Ground	Short to ground in the rear motor temperature sensor circuit (1 trip detection logic)	• Wire harness or connector • Hybrid vehicle control ECU • Rear motor temperature sensor (Rear traction motor with transaxle assembly)	Does not come on	Master Warning: Comes on	Hybrid Control	A	SAE Code: P0A32
P0A3015	Drive Motor "B" Temperature Sensor Circuit Short to Battery or Open	Open or short to +B in the rear motor temperature sensor circuit (1 trip detection logic)	• Wire harness or connector • Hybrid vehicle control ECU • Rear motor temperature sensor (Rear traction motor with transaxle assembly)	Does not come on	Master Warning: Comes on	Hybrid Control	A	SAE Code: P0A33

HINT:

After confirming that DTC P0A3011 or P0A3015 is output, use the GTS to check "Rear Motor Temperature" in the Data List.

DISPLAYED TEMPERATURE	MALFUNCTION
-40°C (-40°F)	Open circuit or short to +B

DISPLAYED TEMPERATURE	MALFUNCTION
215°C (419°F)	Short to ground

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.

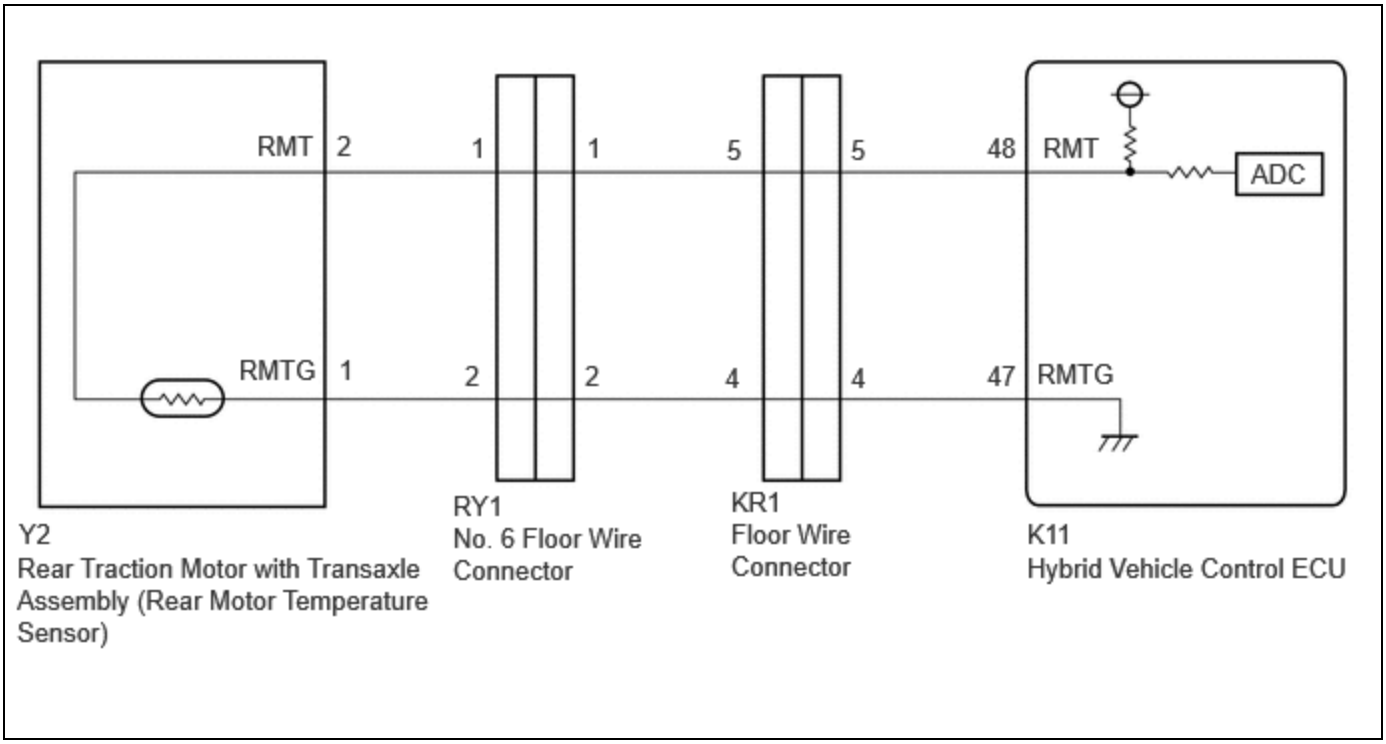
Click here INFO

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. With the ignition switch ON and wait for 5 seconds or more.
4. Enter the following menus: Powertrain / Hybrid Control / 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, perform driving pattern again.

WIRING DIAGRAM



PROCEDURE

1.	**CHECK CONNECTOR CONNECTION CONDITION (HYBRID VEHICLE CONTROL ECU CONNECTOR)**

(a) Check the connection condition of the hybrid vehicle control ECU connectors and the contact pressure of each terminal. Check the terminals for deformation, and check the connector for water ingress and foreign matter.

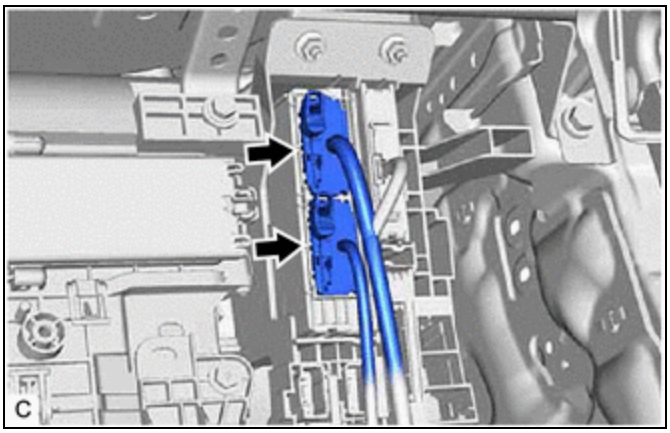
HINT:

Click here INFO

OK:

- The connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in the connector.

Result:



RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A ▼

2.	CHECK CONNECTOR CONNECTION CONDITION (FLOOR WIRE CONNECTOR)

(a) Check the connection condition of the rear motor temperature sensor connector (floor wire connector) and the contact pressure of each terminal. Check the terminal for deformation, and check the connector for water ingress and foreign matter.

HINT:

Click here INFO

OK:

- The connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in the connectors.

RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A

3.	**CHECK CONNECTOR CONNECTION CONDITION (NO. 6 FLOOR WIRE CONNECTOR)**

(a) Check the connection condition of the rear motor temperature sensor connector (No. 6 floor wire connector) and the contact pressure of each terminal. Check the terminals for deformation, and check the connector for water ingress and foreign matter.

HINT:

Click here INFO

OK:

- The connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in the connector.

RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A

4.	**READ VALUE USING GTS (REAR MOTOR TEMPERATURE)**

Pre-procedure1

(a) None.

Procedure1

(b) Read the Data List.

Powertrain > Hybrid Control > Data List

TESTER DISPLAY
Rear Motor Temperature

Result	PROCEED TO
The value of Rear Motor Temperature is -40 °C	A
The value of Rear Motor Temperature is 215 °C	B
None of the above conditions are met	C

HINT:

- -40°C = -40°F
- 215°C = 419°F

Post-procedure1

(c) Turn the ignition switch off.

B ▶ **GO TO STEP 9**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

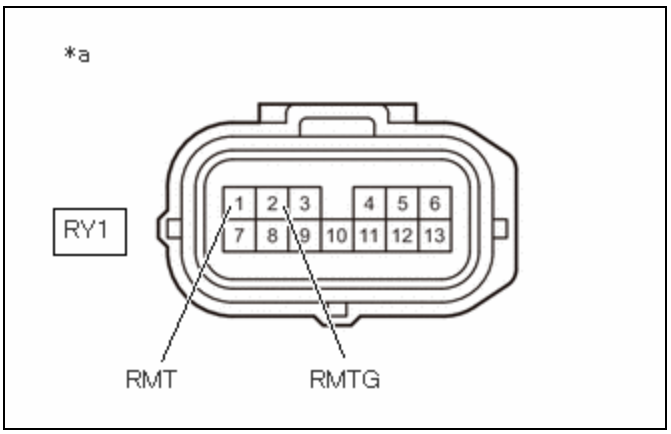
A

5.	**READ VALUE USING GTS (CHECK WIRE HARNESS OPEN CIRCUIT)**

Pre-procedure1

(a) Disconnect the No. 6 floor wire connector.

(b) Connect terminals 1 (RMT) and 2 (RMTG) of the OR1 No. 6 floor wire connector (hybrid vehicle control ECU side).



*a	Front view of No. 6 floor wire connector (Hybrid Vehicle Control ECU Side)

Procedure1

(c) Read the Data List.

Powertrain > Hybrid Control > Data List

TESTER DISPLAY
Rear Motor Temperature

OK:

Tester Display	CONDITION	SPECIFIED CONDITION
Rear Motor Temperature	Terminals RY1-1 (RMT) and RY1-2 (RMTG) connected Ignition switch ON	215°C (419°F)

RESULT	PROCEED TO
The value of Rear Motor Temperature is 215 °C	A
None of the above conditions are met	B

HINT:

215°C = 419°F

Post-procedure1

(d) Turn the ignition switch off.

(e) Reconnect the No. 6 floor wire connector.

B ▶ **GO TO STEP 8**

A

6.	**CHECK CONNECTOR CONNECTION CONDITION (REAR MOTOR TEMPERATURE SENSOR CONNECTOR)**

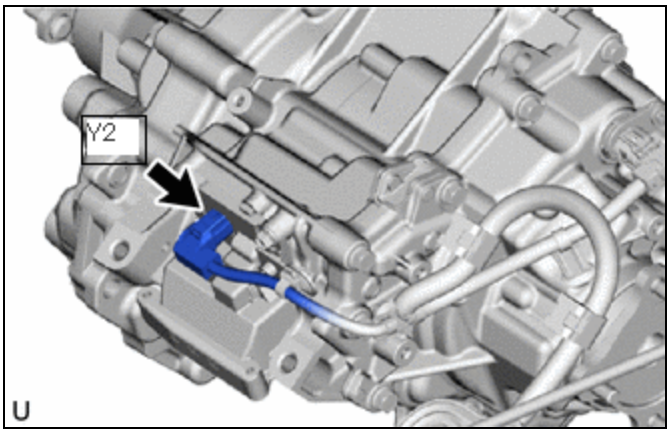
(a) Check the connection condition of the rear motor temperature sensor connector and the contact pressure of each terminal. Check the terminals for deformation, and check the connector for water ingress and foreign matter.

HINT:

Click here INFO

OK:

- The connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in the connector.



RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A

7.	INSPECT REAR TRACTION MOTOR WITH TRANSAXLE ASSEMBLY (REAR MOTOR TEMPERATURE SENSOR)

Pre-procedure1

(a) Disconnect the rear motor temperature sensor connector.

Procedure1

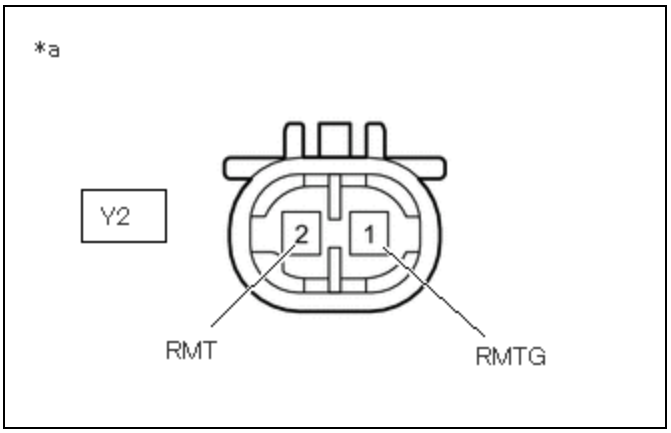
(b) Measure the resistance according to the value(s) in the table below.

OK:

Tester Display	CONDITION	SPECIFIED CONDITION	RESULT
Y2-1 (RMTG) - Y2-2 (RMT)	Ignition switch off	0.3 to 1500 kΩ	kΩ

Result:

PROCEED TO
OK
NG



*a	Component without harness connected (Rear Motor Temperature Sensor (Rear Traction Motor with Transaxle Assembly))

Post-procedure1

(c) Connect the rear motor temperature sensor connector.

OK ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (REAR MOTOR TEMPERATURE SENSOR - NO. 6 FLOOR WIRE)**

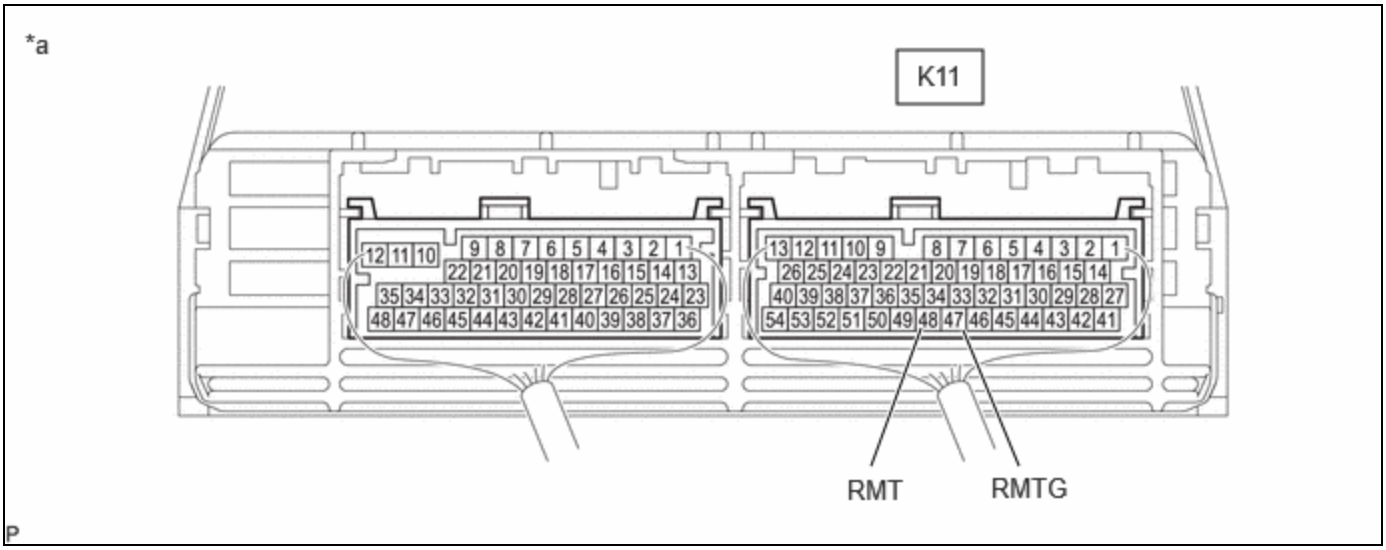
NG ▶ **REPLACE REAR TRACTION MOTOR WITH TRANSAXLE ASSEMBLY**

8.	CHECK HYBRID VEHICLE CONTROL ECU

Pre-procedure1

(a) None.

(b) Connect terminals 48 (RMT) and 47 (RMTG) of the hybrid vehicle control ECU connector.



*a	Component with harness connected (Hybrid Vehicle Control ECU)	-	-

Procedure1

(c) Read the Data List.

Powertrain > Hybrid Control > Data List

TESTER DISPLAY
Rear Motor Temperature

OK:

Tester Display	CONDITION	SPECIFIED CONDITION
Rear Motor Temperature	Terminals K11-48 (RMT) and K11-47 (RMTG) connected Ignition switch ON	215°C (419°F)

RESULT	PROCEED TO
The value of Rear Motor Temperature is 215 °C	A
None of the above conditions are met	B

HINT:

215°C = 419°F

Post-procedure1

(d) Turn the ignition switch off.

A ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR (NO. 6 FRAME WIRE - HYBRID VEHICLE CONTROL ECU)

B **REPLACE HYBRID VEHICLE CONTROL ECU**

Click here INFO

9.	READ VALUE USING GTS (CHECK WIRE HARNESS SHORT CIRCUIT)

Pre-procedure1

(a) Disconnect the No. 6 floor wire connector.

Procedure1

(b) Read the Data List.

Powertrain > Hybrid Control > Data List

TESTER DISPLAY
Rear Motor Temperature

OK:

Tester Display	CONDITION	SPECIFIED CONDITION
Rear Motor Temperature	Ignition switch ON	-40°C

RESULT	PROCEED TO
The value of Rear Motor Temperature is -40 °C	A
None of the above conditions are met	B

HINT:

-40°C = -40°F

Post-procedure1

(c) Turn the ignition switch off.

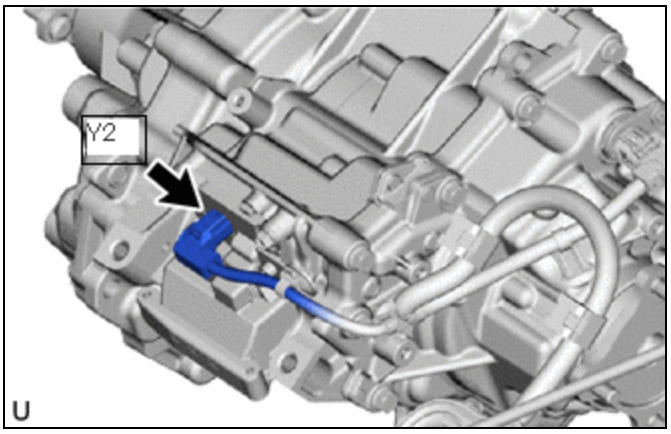
(d) Reconnect the No. 6 floor wire connector.

B **GO TO STEP 12**

A

10.	**CHECK CONNECTOR CONNECTION CONDITION (REAR MOTOR TEMPERATURE SENSOR CONNECTOR)**

(a) Check the connection condition of the rear motor temperature sensor connector and the contact pressure of each terminal. Check the terminals for deformation, and check the connector for water ingress and foreign matter.



HINT:

Click here INFO

OK:

- The connector is connected securely.
- The terminals are not deformed and are connected securely.
- No water or foreign matter in the connector.

RESULT	PROCEED TO
OK	A
NG (The connector is not connected securely.)	B
NG (The terminals are not making secure contact or are deformed, or water or foreign matter exists in the connector.)	C

B ▶ **CONNECT SECURELY**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

A ▼

11.	**INSPECT REAR TRACTION MOTOR WITH TRANSAXLE ASSEMBLY (REAR MOTOR TEMPERATURE SENSOR)**

Pre-procedure1

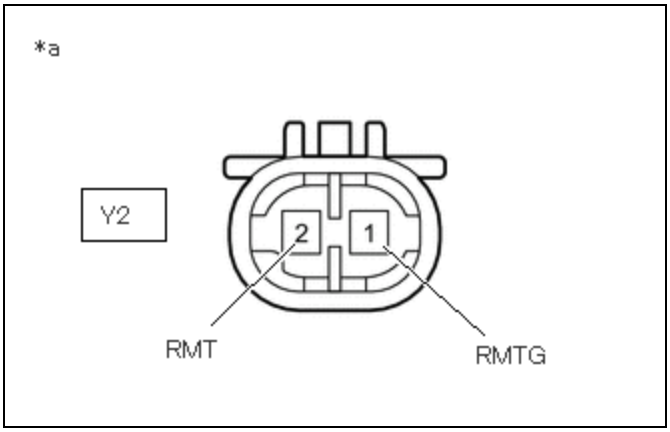
(a) Disconnect the rear motor temperature sensor connector.

Procedure1

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

OK:

Tester Display	CONDITION	SPECIFIED CONDITION	RESULT
Y2-1 (RMTG) - Y2-2 (RMT)	Ignition switch off	0.3 to 1500 kΩ	kΩ



*a	Component without harness connected (Rear Motor Temperature Sensor (Rear Traction Motor with Transaxle Assembly))

Result:

PROCEED TO
OK
NG

Post-procedure1

(c) Connect the rear motor temperature sensor connector.

OK ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (REAR MOTOR TEMPERATURE SENSOR - NO. 6 FLOOR WIRE)**

NG ▶ **REPLACE REAR TRACTION MOTOR WITH TRANSAXLE ASSEMBLY**

12.	**CHECK HARNESS AND CONNECTOR (NO. 6 FLOOR WIRE - HYBRID VEHICLE CONTROL ECU)**

Pre-procedure1

(a) Disconnect the No. 6 floor wire connector.

(b) Disconnect the hybrid vehicle control ECU connector.

Procedure1

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

Standard Resistance (Check for Open):

Tester Display	CONDITION	SPECIFIED CONDITION	RESULT
RY1-2 (RMTG) - K11-47 (RMTG)	Ignition switch off	Below 1 Ω	Ω
RY1-1 (RMT) - K11-48 (RMT)	Ignition switch off	Below 1 Ω	Ω

Standard Resistance (Check for Short):

Tester Display	CONDITION	SPECIFIED CONDITION	RESULT
RY1-2 (RMTG) or K11-47 (RMTG) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ
RY1-1 (RMT) or K11-48 (RMT) - Body ground and other terminals	Ignition switch off	10 kΩ or higher	kΩ

Post-procedure1

(d) Connect the hybrid vehicle control ECU connector.

(e) Connect the No. 6 floor wire connector.

OK ▶ **REPLACE HYBRID VEHICLE CONTROL ECU**

Click here INFO

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