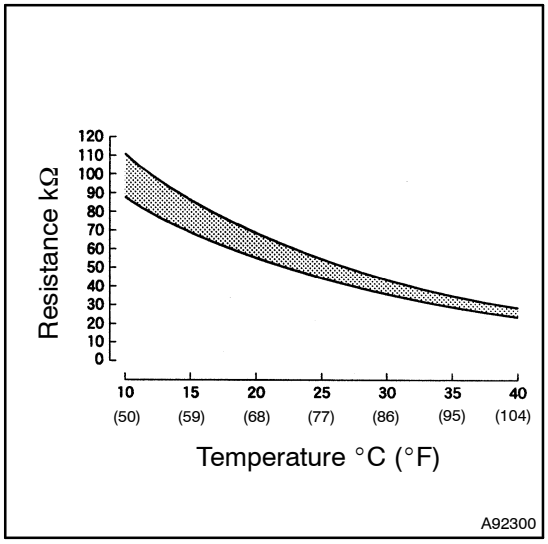
DTC	P0A2C/247	DRIVE MOTOR "A" TEMPERATURE SENSOR CIRCUIT LOW

DTC	P0A2D/249	DRIVE MOTOR "A" TEMPERATURE SENSOR CIRCUIT HIGH

CIRCUIT DESCRIPTION



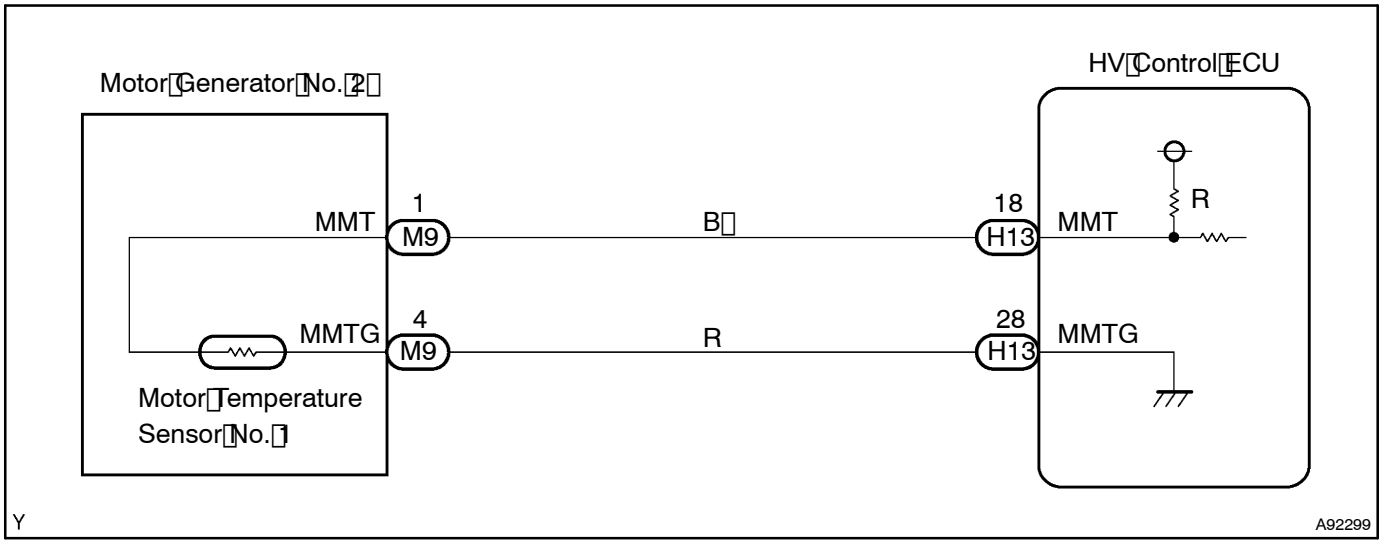
The resistance of the thermistor, which is enclosed in the motor temperature sensor No. 1, changes in accordance with the changes in the temperature of the motor. The lower the motor temperature, the higher the resistance of the thermistor. Conversely, the higher the temperature, the lower the resistance.
The motor temperature sensor No. 1 is connected to the HV control ECU. The power voltage of 5 V is supplied from the MMT terminal of the HV control ECU to the motor temperature sensor No. 1 via resistor R. Because resistor R and the motor temperature sensor No. 1 are connected in series, the resistance changes with the changes in temperature of the motor, which causes the MMT terminal voltage to also change.
Based on this signal, the HV control ECU limits the load in order to prevent the motor from overheating. Furthermore, the HV control ECU checks the motor temperature sensor No. 1 for a wiring malfunction and the sensor for malfunction.

DTC No.	INF Code	DTC Detection Condition	Trouble Area
P0A2C	247	GND short in motor temperature sensor No. 1 circuit	• Wire harness or connector • Hybrid vehicle motor • HV control ECU
P0A2D	249	Open or +B short in motor temperature sensor No. 1 circuit	• Wire harness or connector • Hybrid vehicle motor • HV control ECU

HINT:
After confirming DTC P0A2C (INF 247) or P0A2D (INF 249), confirm Motor Temp No.1 in Powertrain / Hybrid Control / Data List using the intelligent tester II.

Temperature Displayed	Malfunction
–50°C (–58°F)	Open or +B short circuit
205°C (401°F)	GND short circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	READ VALUE OF INTELLIGENT TESTER II (MOTOR TEMP NO.1)

(a) Connect the intelligent tester II to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the intelligent tester II ON.
(d) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / Data List.
(e) Read the Motor Temp No. 1 value on the intelligent tester II.

Result:

Temperature Displayed	Proceed to
–50°C (–58°F)	A
205°C (401°F)	B
–49°C to 204°C (–57°F to 400°F)	C

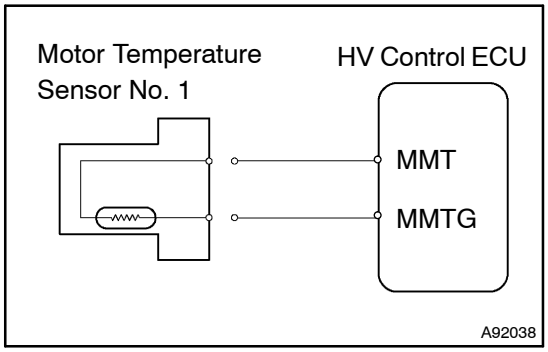
HINT:

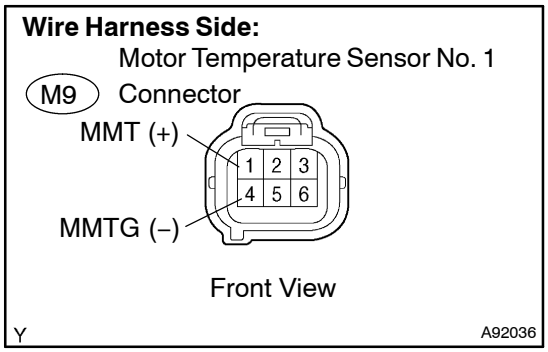
- If there is an open or +B short circuit, the intelligent tester II indicates –50°C (–58°F).
- If there is a GND short circuit, the intelligent tester II indicates 205°C (401°F).

B	**Go to step 5**
C	**CHECK FOR INTERMITTENT PROBLEMS (See page 05–232)**

A

2 INSPECT HYBRID VEHICLE MOTOR ASSY(CHECK FOR OPEN OR +B SHORT)





(a) Disconnect the M9 motor temperature sensor No. 1 connector.
(b) Turn the power switch ON (IG).
(c) Measure the voltage between the terminals of the motor temperature sensor No.1 connector.

Result:

Tester Connection	Voltage	Proceed to
MMT (M9–1) – MMTG (M9–4)	Approximately 5 V	A
MMT (M9–1) – MMTG (M9–4)	9 to 14V	B
MMT (M9–1) – MMTG (M9–4)	Approximately 0 V	C

HINT:
The motor temperature sensor No.1 is unavailable as an individual service part. Therefore, when replacing it, the hybrid vehicle motor must be replaced.

(d) Reconnect the motor temperature sensor No. 1 connector.

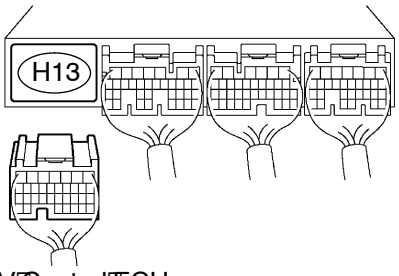
B → **Go to step 3**

C → **Go to step 4**

A

REPLACE HYBRID VEHICLE MOTOR ASSY

3 CHECK HARNESS AND CONNECTOR(CHECK FOR +B SHORT)

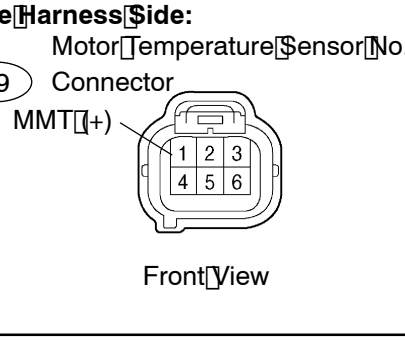


(a) Disconnect the H13 HV control ECU connector.
(b) Disconnect the M9 motor temperature sensor No.1 connector.
(c) Turn the power switch ON (IG).
(d) Measure the voltage between the terminal of the motor temperature sensor No.1 connector and body ground.

Standard:

Tester Connection	Specified Condition
MMT (M9–1) – Body ground	Approximately 0 V

(e) Reconnect the HV control ECU connector.
(f) Reconnect the motor temperature sensor No.1 connector.

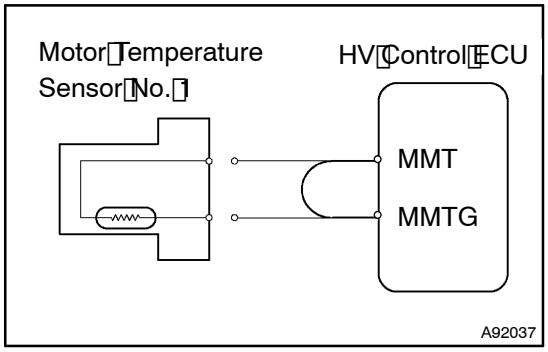


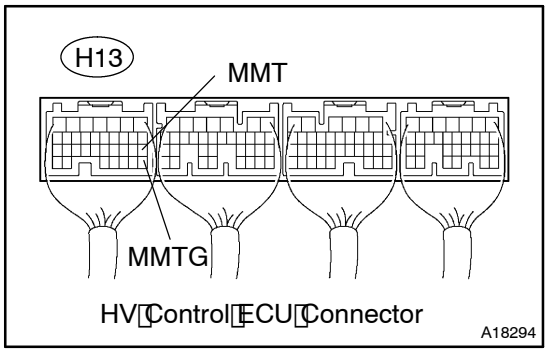
NG → **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

REPLACE HYBRID VEHICLE CONTROL ECU (See page 21–128)

4	READ VALUE OF INTELLIGENT TESTER II(CHECK FOR OPEN IN HYBRID VEHICLE CONTROL ECU)





(a) Disconnect the M9 motor temperature sensor No. 1 connector.
(b) Connect terminals MMT and MMTG of the H13 HV control ECU connector.
(c) Turn the power switch ON (IG).
(d) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / Data List.
(e) Read the Motor Temp No. 1 value.
Standard: 205°C (401°F)

HINT:
If the intelligent tester II indicates a temperature of −50°C (−58°F), check the connection of the HV control ECU. If it is connected normally, replace the HV control ECU.

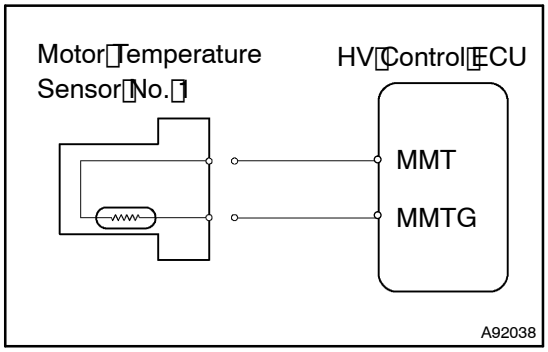
(f) Reconnect the motor temperature sensor No. 1 connector.

NG → **REPLACE HYBRID VEHICLE CONTROL ECU (See page 21–128)**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

5	READ VALUE OF INTELLIGENT TESTER II(CHECK FOR GND SHORT IN WIRE HARNESS)



(a) Disconnect the M9 motor temperature sensor No. 1 connector.
(b) Turn the power switch ON (IG).
(c) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / Data List.
(d) Read the Motor Temp No. 1 value.
Standard: −50°C (−58°F)
(e) Reconnect the motor temperature sensor No. 1 connector.

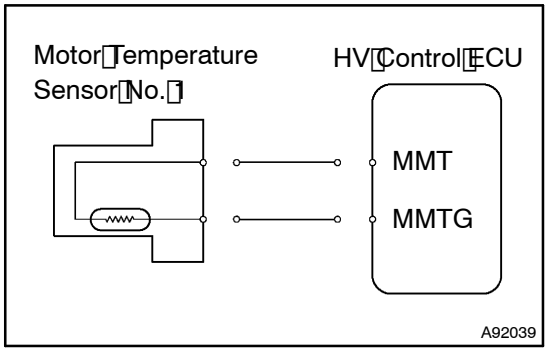
HINT:
The motor temperature sensor No.1 is unavailable as an individual service part. Therefore, when replacing it, the hybrid vehicle motor must be replaced.

NG → **Go to step 6**

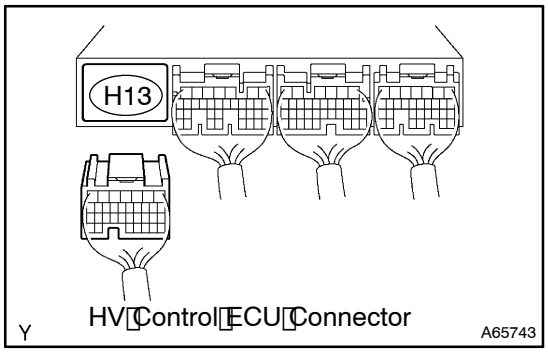
OK

REPLACE HYBRID VEHICLE MOTOR ASSY

6	READ VALUE OF INTELLIGENT TESTER II (CHECK FOR GND SHORT IN HYBRID VEHICLE CONTROL ECU)



(a) Disconnect the H13 HV control ECU connector.
(b) Turn the power switch ON (IG).
(c) On the intelligent tester II, enter the following menus: Powertrain / Hybrid Control / Data List.
(d) Read the Motor Temp No. 1 value.
Standard: –50°C (–58°F)
(e) Reconnect the HV control ECU connector.



NG → **REPLACE HYBRID VEHICLE CONTROL ECU (See page 21–128)**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR