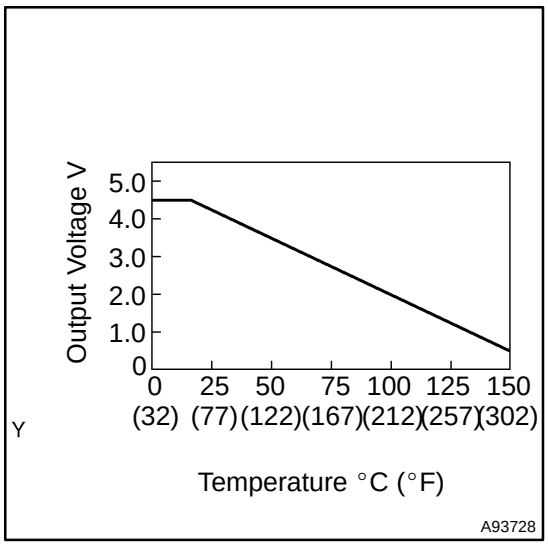
DTC	P0A94/583	DC/DC CONVERTER PERFORMANCE

DTC	P0A94/584	DC/DC CONVERTER PERFORMANCE

CIRCUIT DESCRIPTION

See the description of the boost converter on page 05–691.



The HV control ECU uses a temperature sensor, which is built into the boost converter, to detect the temperature of the boost converter.

The boost converter temperature sensor outputs a voltage, which varies between 0 and 5 V in accordance with the changes in the temperature. The higher the boost converter temperature, the lower the output voltage. Conversely, the lower the temperature, the higher the output voltage.

The HV control ECU limits the load based on the signals transmitted by the boost converter temperature sensor, in order to prevent the boost converter from overheating. Furthermore, the HV control ECU detects malfunction in the wiring of the boost converter temperature sensor, as well as in the sensor itself.

DTC No.	INF Code	DTC Detection Condition	Trouble Area
P0A94	583	Open or GND short in boost converter temperature sensor circuit	• Wire harness or connector • w/ converter inverter assembly • HV control ECU
P0A94	584	+B short in boost converter temperature sensor circuit	• Wire harness or connector • w/ converter inverter assembly • HV control ECU

HINT:

After confirming DTC P0A94 (INF 583 or 584), confirm CONVERTER TEMP in DIAGNOSIS / ENHANCED OBD II / HV ECU / DATA LIST using the hand–held tester.

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

MONITOR DESCRIPTION

The HV control ECU monitors the boost converter temperature sensor circuit. If the HV control ECU detects an open or short malfunction of the sensor circuit, the HV control ECU illuminates the MIL and sets a DTC.

MONITOR STRATEGY

Related DTCs	P0A94 (INF 583/584): Boost converter/Converter temperature sensor malfunction
Required sensor/components	Boost converter
Frequency of operation	Continuous
Duration	TOYOTA's intellectual property
MIL operation	Immediately
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever the following DTCs are not present	TOYOTA's intellectual property
Other conditions belong to TOYOTA's intellectual property	–

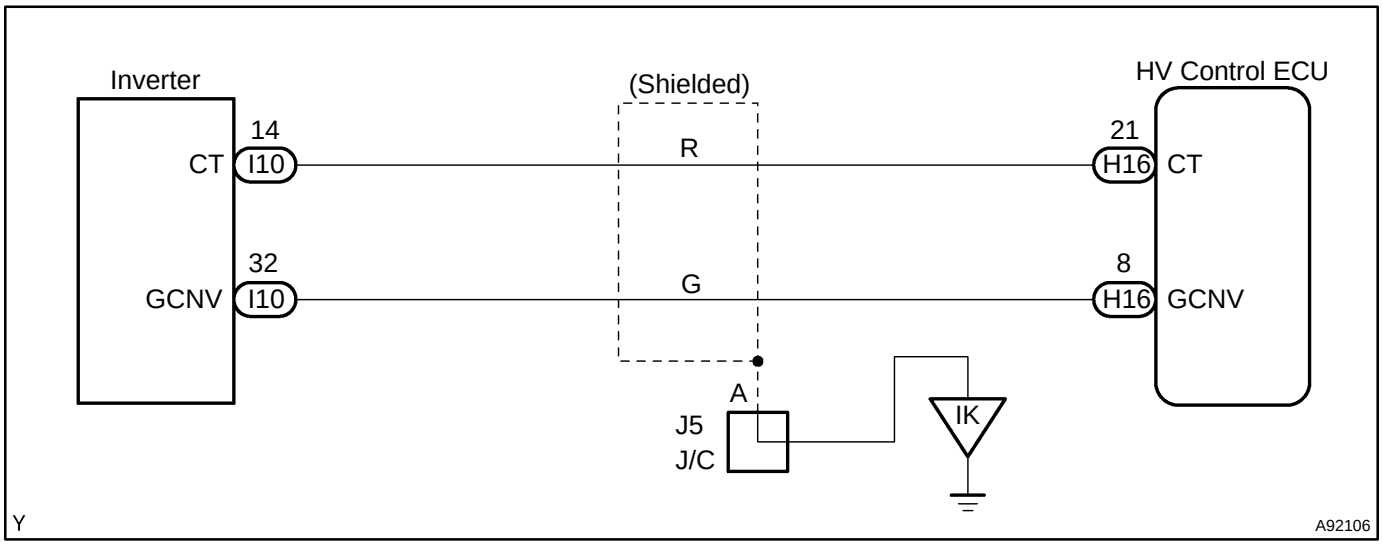
TYPICAL MALFUNCTION THRESHOLDS

Boost converter temperature sensor circuit	Open or short

COMPONENT OPERATING RANGE

Boost converter	DTC P0A94 (INF 583/584) is not detected

WIRING DIAGRAM



INSPECTION PROCEDURE

CAUTION:

- **Before inspecting the high–voltage system, take safety precautions to prevent electrical shocks, such as wearing insulated gloves and removing the service plug grip. After removing the service plug grip, put it in your pocket to prevent other technicians from reconnecting it while you are servicing the high–voltage system.**
- **After disconnecting the service plug grip, wait at least for 5 minutes before touching any of the high–voltage connectors or terminals.**

HINT:

At least 5 minutes is required to discharge the high–voltage condenser inside the inverter.

1	READ VALUE OF HAND–HELD TESTER(CONVERTER TEMP)

(a) Connect the hand–held tester to the DLC3.
(b) Turn the power switch ON (IG).
(c) Turn the hand–held tester ON.
(d) On the hand–held tester, enter the following menus: DIAGNOSIS / ENHANCED OBD II / HV ECU / DATA LIST.
(e) Read the CONVERTER TEMP value on the hand–held tester.

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:

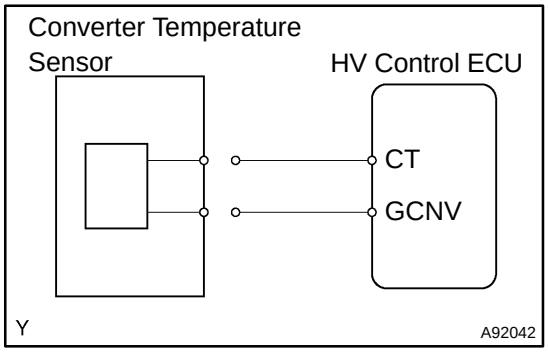
- If there is a +B short circuit, the hand–held tester indicates –50°C (–58°F).
- If there is an open or GND short circuit, the hand–held tester indicates 205°C (401°F).

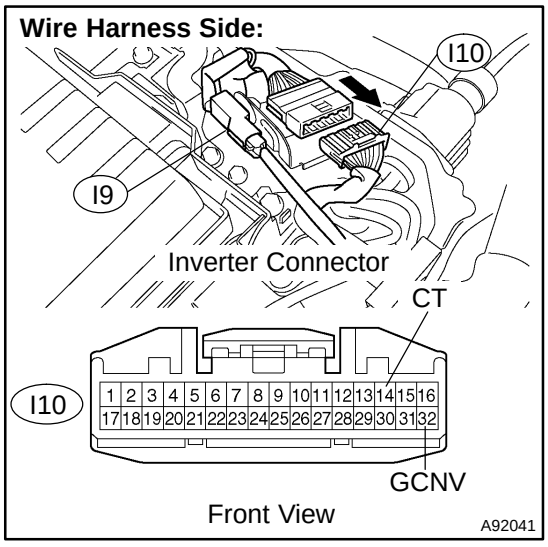
B → **Go to step 4**

C → **CHECK FOR INTERMITTENT PROBLEMS (See page 05–407)**

A

2	READ VALUE OF HAND–HELD TESTER(CHECK FOR +B SHORT IN WIRE HARNESS)





CAUTION:
Wear insulated gloves before performing the following operation.

(a) Turn the power switch OFF.
(b) Remove the service plug grip (see page 21–116).

NOTICE:
Turning the power switch ON (READY) with the service plug grip removed could cause malfunction. Therefore, never turn the power switch ON (READY) in this state.

(c) Remove the inverter cover (see page 21–23).
(d) Disconnect the I10 inverter connector.
(e) Turn the power switch ON (IG).

HINT:
DTCs for the interlock switch system are output when turning the power switch ON (IG) with both service plug grip and inverter cover removed.

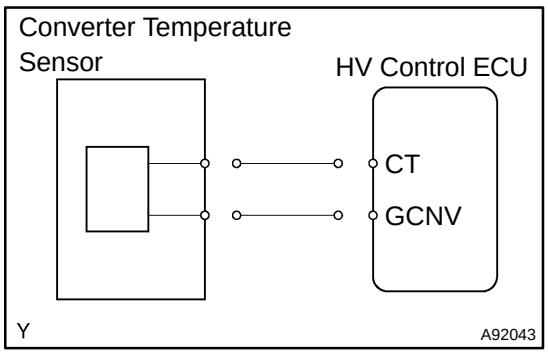
(f) On the hand–held tester, enter the following menus: DIAGNOSIS / ENHANCED OBD II / HV ECU / DATA LIST.
(g) Read the CONVERTER TEMP value on the hand–held tester.
Standard: 205°C (401°F)
(h) Turn the power switch OFF.
(i) Reconnect the inverter connector.
(j) Reinstall the inverter cover (see page 21–23).
(k) Reinstall the service plug grip (see page 21–116).

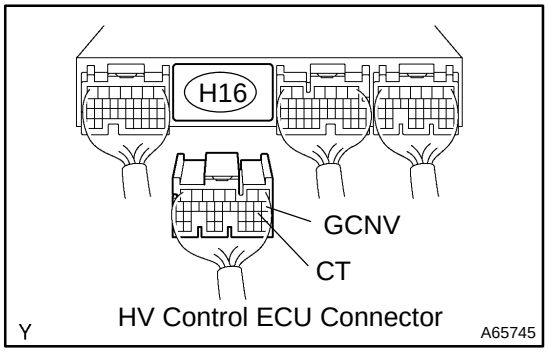
NG → **Go to step 3**

OK

REPLACE W/CONVERTER INVERTER ASSY (See page 21–23)

3	READ VALUE OF HAND–HELD TESTER(CHECK FOR +B SHORT IN HYBRID VEHICLE CONTROL ECU)





(a) Disconnect the H16 HV control ECU connector.
(b) Turn the power switch ON (IG).

HINT:

DTCs for the interlock switch system are output when turning the power switch ON (IG) with both service plug grip and inverter cover removed.

(c) On the hand–held tester, enter the following menus: DIAGNOSIS / ENHANCED OBD II / HV ECU / DATA LIST.
(d) Read the CONVERTER TEMP value on the hand–held tester.

Standard: 205°C (401°F)

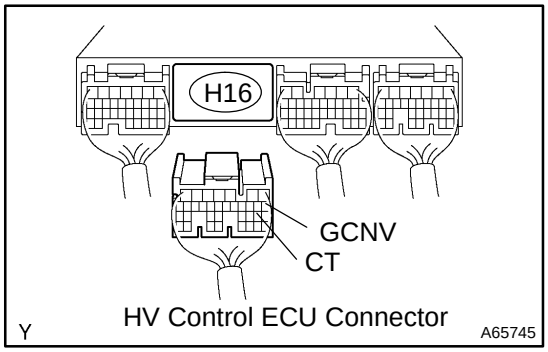
(e) Reconnect the HV control ECU connector.

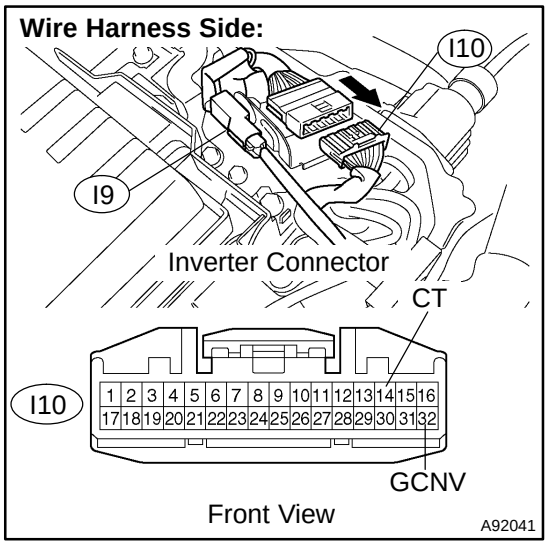
NG → **REPLACE HYBRID VEHICLE CONTROL ECU (See page 21–124)**

OK

REPAIR OR REPLACE HARNESS OR CONNECTOR

4	CHECK HARNESS AND CONNECTOR(HYBRID VEHICLE CONTROL ECU – INVERTER)





CAUTION:

Wear insulated gloves before performing the following operation.

(a) Turn the power switch OFF.

(b) Remove the service plug grip (see page 21–116).

NOTICE:

Turning the power switch ON (READY) with the service plug grip removed could cause malfunction. Therefore, never turn the power switch ON (READY) in this state.

(c) Remove the inverter cover (see page 21–23).

(d) Disconnect the H16 HV control ECU connector.

(e) Disconnect the I10 inverter connector.

(f) Check the resistance between the wire harness side connectors.

Standard (Check for open):

Tester Connection	Specified Condition
CT (H16–21) – CT (I10–14)	Below 1 Ω
GCNV (H16–8) – GCNV (I10–32)	Below 1 Ω

Standard (Check for short):

Tester Connection	Specified Condition
CT (H16–21) or CT (I10–14) – Body ground	10 kΩ or higher
GCNV (H16–8) or GCNV (I10–32) – Body ground	10 kΩ or higher

(g) Reconnect the inverter connector.

(h) Reconnect the HV control ECU connector.

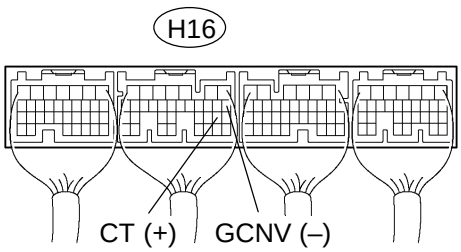
(i) Reinstall the inverter cover (see page 21–23).

(j) Reinstall the service plug grip (see page 21–116).

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

OK

5	INSPECT HYBRID VEHICLE CONTROL ECU(CT VOLTAGE)



HV Control ECU Connector
A93719

(a) Turn the power switch ON (IG).

HINT:

DTCs for the interlock switch system are output when turning the power switch ON (IG) with both service plug grip and inverter cover removed.

(b) Measure the voltage between the terminals of the H16 HV control ECU connector.

Standard:

Tester Connection	Specified Condition
CT (H16–21) – GCNV (H16–8)	2.0 to 4.5 V

NG → **REPLACE W/CONVERTER INVERTER ASSY (See page 21–23)**

OK

REPLACE HYBRID VEHICLE CONTROL ECU (See page 21–124)