

DTC**P0AFA****Hybrid Battery System Voltage Low****DESCRIPTION**Refer to DTC P0A80 (see page [HB-35](#)).

DTC No.	DTC Detection Condition	Trouble Area
P0AFA	Either of the following conditions occurs (1 trip detection logic) <ul style="list-style-type: none"> Voltage at each battery block is below 2 V Voltage of all the battery blocks is -24 to 2 V 	<ul style="list-style-type: none"> Junction block assembly (busbar module) No. 2 frame wire (busbar and wire harness) Battery ECU

MONITOR DESCRIPTION

The battery ECU monitors a voltage of the battery blocks to detect an open malfunction in internal battery voltage sensor circuits of the battery ECU and the wire harness between each battery block and battery ECU. If a voltage at one of the battery blocks is below a standard level or of all the battery blocks is within a specified range, the battery ECU judges that there is an open in the internal sensor circuit(s) or wire harness. The battery ECU then illuminates the MIL and sets a DTC.

MONITOR STRATEGY

Related DTCs	P0AFA: Battery voltage sensor/Range check
Required sensors/components	The wire harness from each battery block to the battery ECU
Frequency of operation	Continuous
Duration	TOYOTA's intellectual property
MIL operation	Immediate
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	-

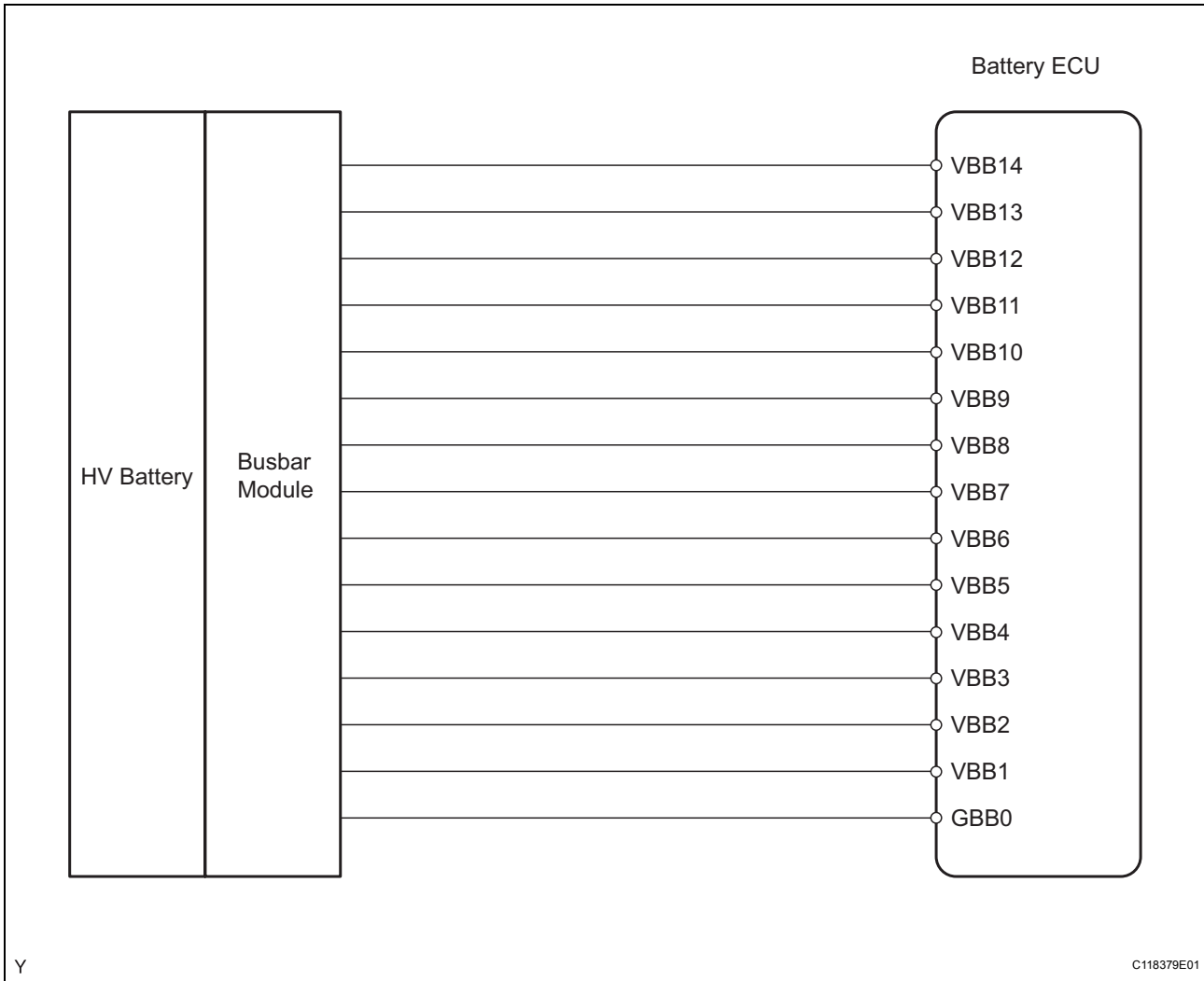
HB**TYPICAL MALFUNCTION THRESHOLDS**

Either of the following conditions is satisfied:	(a) or (b)
(a) Voltage at single battery block	Below 2 V
(b) Voltage of all battery blocks	-24 to 2 V

COMPONENT OPERATING RANGE

Battery ECU	No open malfunction
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WIRING DIAGRAM



HB

C118379E01

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 for at least 5 minutes before touching any of the high-voltage connectors or terminals.

HINT:

At least 5 minutes are required to discharge the high-voltage condenser inside the inverter.

1	READ DTC OUTPUT (DTC P0A1F IS OUTPUT)
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- Connect the intelligent tester to the DLC3.
- Turn the power switch ON (IG) and the tester ON.
- Enter the following menus: DIAGNOSIS / OBD/MOBD / HV BATTERY / DTC INFO / TROUBLE CODES.
- Read DTCs.

Result:

DTC P0A1F is output

YES

REPLACE BATTERY ECU

NO

2 READ VALUE OF INTELLIGENT TESTER (BATTERY BLOCK VOL-V01 TO V14)

- (a) Connect the intelligent tester to the DLC3.
- (b) Turn the power switch ON (IG) and the tester ON.
- (c) Enter the following menus: DIAGNOSIS / OBD/MOBD / HV BATTERY / DATA LIST.
- (d) Read "V1 to V14 BATTERY BLOCK" on the tester.

Standard voltage:

2 V or more

OK

Go to step 5

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3 CHECK JUNCTION BLOCK ASSEMBLY (BUSBAR MODULE)**CAUTION:**

Wear insulated gloves and goggles before performing the following operation.

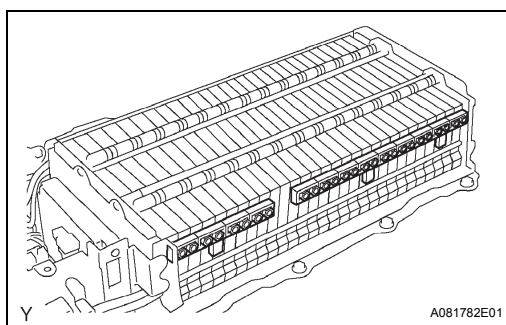
- (a) Remove the battery assembly (see page [HB-88](#)).
- (b) Remove the battery cover (see page [HB-88](#)).
- (c) Check that the nuts of the junction block are tightened to the specified torque.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

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TIGHTEN NUTS TO SPECIFIED TORQUE

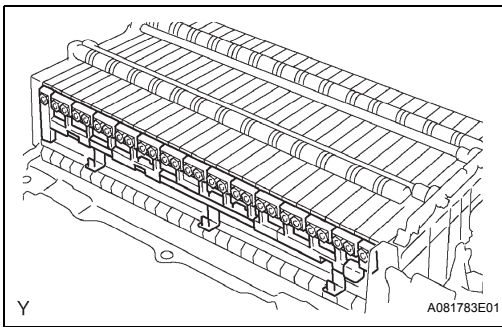
HB



OK

4 CHECK NO. 2 FRAME WIRE (BUSBAR MODULE)**CAUTION:**

Wear insulated gloves and goggles before performing the following operation.



(a) Check that the nuts of the No. 2 frame wire are tightened to the specified torque.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

NG TIGHTEN NUTS TO SPECIFIED TORQUE

OK

5 CHECK CONNECTION OF NO. 2 FRAME WIRE CONNECTOR

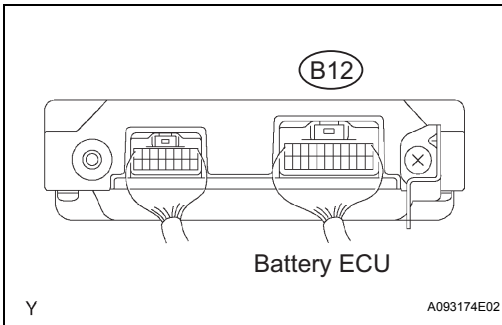
CAUTION:

Wear insulated gloves before performing the following operation.

(a) Check the connection condition of the B12 battery ECU connector.

OK:

Connector has been connected securely and there is no poor connection.



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OK

6 INSPECT NO. 2 FRAME WIRE (BUSBAR MODULE)

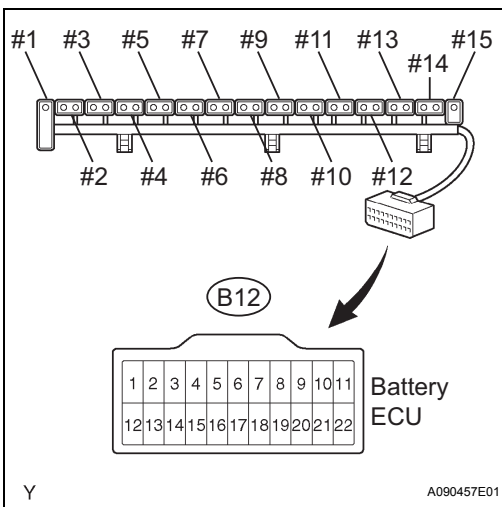
CAUTION:

Wear insulated gloves and goggles before performing the following operation.

(a) Remove the No. 2 frame wire (see page HB-108).

(b) Measure the resistance of each connector and the metal portions of the No. 2 frame wire.

Standard resistance



Tester Connection	Specified Condition
B12-22 (GBB0) - #1	Below 1 Ω
B12-11 (VBB1) - #2	Below 1 Ω
B12-21 (VBB2) - #3	Below 1 Ω
B12-10 (VBB3) - #4	Below 1 Ω
B12-20 (VBB4) - #5	Below 1 Ω
B12-9 (VBB5) - #6	Below 1 Ω
B12-19 (VBB6) - #7	Below 1 Ω
B12-8 (VBB7) - #8	Below 1 Ω
B12-18 (VBB8) - #9	Below 1 Ω
B12-7 (VBB9) - #10	Below 1 Ω
B12-17 (VBB10) - #11	Below 1 Ω

Tester Connection	Specified Condition
B12-6 (VBB11) - #12	Below 1 Ω
B12-16 (VBB12) - #13	Below 1 Ω
B12-5 (VBB13) - #14	Below 1 Ω
B12-15 (VBB14) - #15	Below 1 Ω

(c) Reinstall the No. 2 frame wire.

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REPLACE NO. 2 FRAME WIRE

OK

REPLACE BATTERY ECU