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Model Year Start: 2023	Model: Prius Prime	Prod Date Range: [12/2022 -]
Title: HYBRID / BATTERY CONTROL: MOTOR GENERATOR CONTROL SYSTEM (for M20A-FXS): P0A1B94; Drive Motor "A" Control Module Unexpected Operation; 2023 - 2024 MY Prius Prius Prime [12/2022 -]		

DTC	P0A1B94	Drive Motor "A" Control Module Unexpected Operation
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DTC SUMMARY

MALFUNCTION DESCRIPTION

For the calculation processing (in particular, calculation processing related to driving force such as torque calculations and inverter control) that takes place inside the motor generator control ECU (MG ECU), the microcomputers built into the motor generator control ECU (MG ECU) monitor each other and check each other's calculations for appropriateness.

The cause of this malfunction may be the following:

Motor generator control ECU internal malfunction

- Motor generator control ECU (MG ECU) malfunction

DESCRIPTION

When the separate microcomputers within the motor generator control ECU (MG ECU) that monitor each other detect an abnormality in the information, a DTC is stored.

DTC NO.	DETECTION ITEM	DTC DETECTION CONDITION	TROUBLE AREA	MIL	WARNING INDICATE	DTC OUTPUT FROM	PRIORITY	NOTE
P0A1B94	Drive Motor "A" Control Module Unexpected Operation	When the separate microcomputers within the motor generator control ECU (MG ECU) that monitor each other detect a value in the information that differs from what is expected for a specified period of time. (1 trip detection logic)	<ul style="list-style-type: none"> • Inverter with converter assembly • IGCT-MAIN NO. 1 relay 	Comes on	Master Warning: Comes on	Motor Generator	A	SAE Code: P0A1B

MONITOR DESCRIPTION

The motor generator control ECU (MG ECU) monitors the microcomputers within the motor generator control ECU (MG ECU). If the internal operation is malfunctioning, the motor generator control ECU (MG ECU) illuminates the MIL and stores a DTC.

MONITOR STRATEGY

Related DTCs	P0A1B (INF P0A1B94): Drive motor "A" control module
Required sensors/components	Inverter with converter assembly (MG ECU)
Frequency of operation	Continuous
Duration	TMC's intellectual property
MIL operation	1 driving cycle
Sequence of operation	None

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

Motor generator control ECU	DTC P0A1B (INF P0A1B94) 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.
- With ignition switch ON and wait for 2 minutes or more. [*1]

HINT:

- If the vehicle has returned to normal, it can be driven after turning the ignition switch to ON (READY).
- [*1]: Normal judgment procedure.

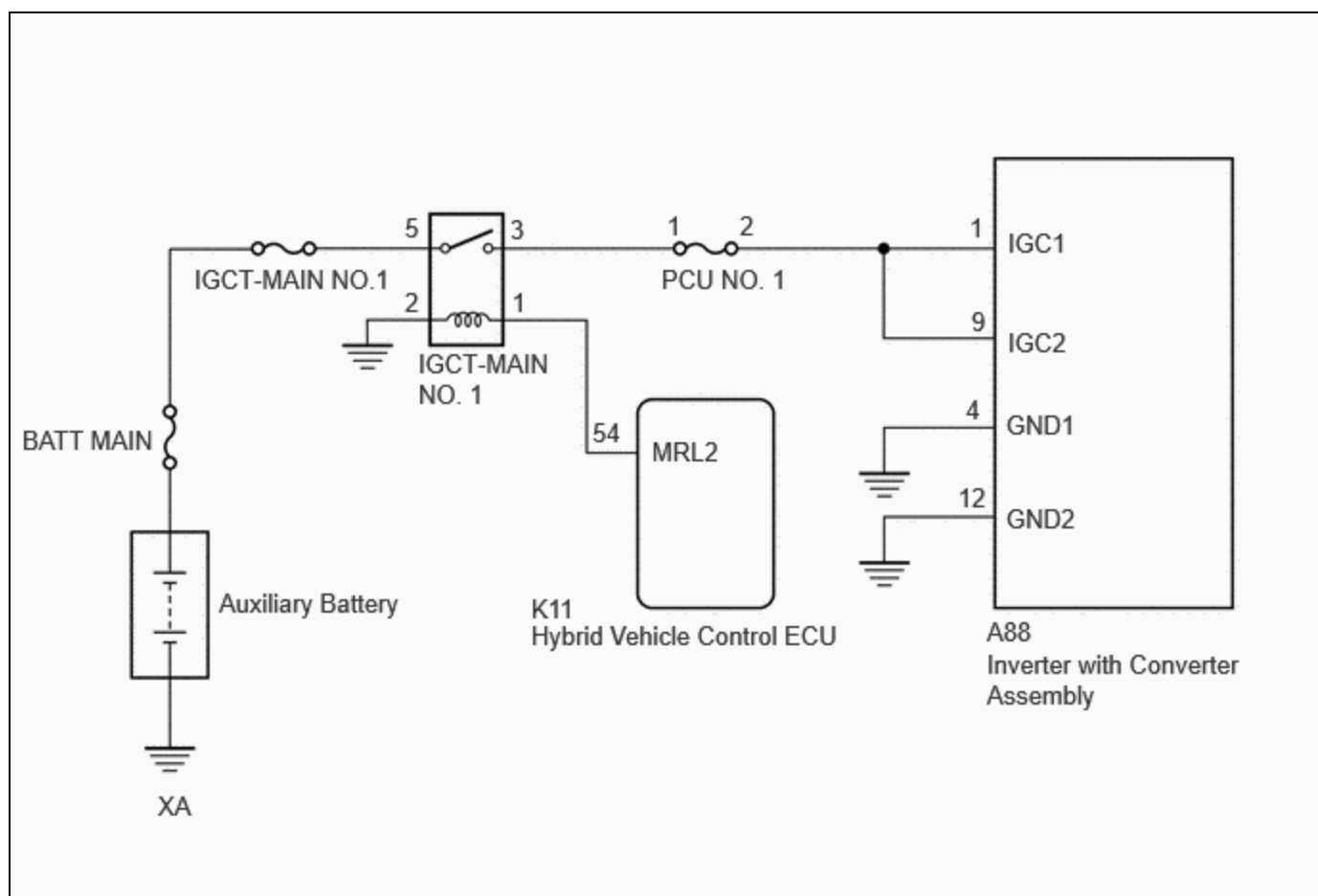
The normal judgment procedure is used to complete DTC judgment and also used when clearing permanent DTCs.

- Enter the following menus: Powertrain / Motor Generator / 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, perform the normal judgment procedure again.

WIRING DIAGRAM



CAUTION / NOTICE / HINT

NOTICE:

- After the ignition switch is turned off, there may be a waiting time before disconnecting the negative (-) auxiliary 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 AUXILIARY BATTERY TERMINAL (CONTACT PROBLEM)

(a) Check the connection of the negative (-) and positive (+) auxiliary battery terminals.

OK:

The terminals are connected securely and there is no contact problem.

HINT:

If performing a simulation test, turn the ignition switch to ON and shake the wire harnesses vertically and horizontally before checking for DTCs.

NG ► **GO TO STEP 5**

OK



2.	CHECK GROUND WIRE CONNECTION CONDITION
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(a) Check the installation condition of the ground wires XA.

OK:

The ground wires XA are securely installed.

HINT:

If performing a simulation test, turn the ignition switch to ON and shake the wire harnesses vertically and horizontally before checking for DTCs.

NG ► **GO TO STEP 6**

OK



3.	CHECK RELAY (IGCT-MAIN NO. 1)
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Pre-procedure1

(a) None

Procedure1

(b) Check the IGCT-MAIN NO. 1 relay for improper installation.

OK:

The relay is installed securely.

HINT:

If performing a simulation test, turn the ignition switch to ON and gently vibrate the IGCT-MAIN NO. 1 relay with a finger before checking for DTCs.

Pre-procedure2

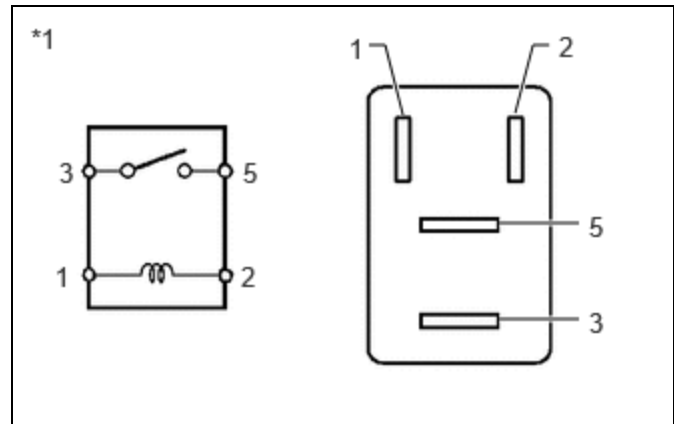
(c) Remove the IGCT-MAIN NO. 1 relay from the No. 1 engine room relay block and No. 1 junction block assembly.

Procedure2

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

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION	RESULT
3 - 5	Auxiliary battery voltage not applied between terminals 1 and 2	10 kΩ or higher	kΩ
3 - 5	Auxiliary battery voltage applied between terminals 1 and 2	Below 1 Ω	Ω



*1 IGCT-MAIN NO. 1 Relay

Result:

PROCEED TO
OK
NG

Post-procedure1

(e) Install the IGCT-MAIN NO. 1 relay.

NG ► GO TO STEP 7

OK



4.	CHECK DTC OUTPUT (MOTOR GENERATOR)
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Pre-procedure1

(a) None

Procedure1

(b) Check for DTCs.

HINT:

Check the DTCs that were output when the vehicle was brought to the workshop.

Powertrain > Motor Generator > Trouble Codes

RESULT	PROCEED TO
P0A1B94 only is output.	A
DTCs except P0A1B94 are output.	B

Post-procedure1

(c) Turn the ignition switch off.

A ► **REPLACE INVERTER WITH CONVERTER ASSEMBLY****B** ► **GO TO DTC CHART (HYBRID CONTROL SYSTEM)**

5.	CONNECT SECURELY
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NEXT ► **GO TO STEP 8**

6.	CONNECT SECURELY
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NEXT ► **GO TO STEP 8**

7.	REPAIR OR REPLACE MALFUNCTIONING PARTS
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NEXT

8.	CLEAR DTC
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Pre-procedure1

(a) Read and record the DTCs and Freeze Frame Data.

Powertrain > Motor Generator > Trouble Codes

Procedure1

(b) Clear the DTCs and Freeze Frame Data.

Powertrain > Motor Generator > Clear DTCs

Post-procedure1

(c) Turn the ignition switch off and wait for 2 minutes or more.

NEXT



9. SIMULATION TEST

Pre-procedure1

(a) None

Procedure1

(b) Turn the ignition switch to ON and wait for 2 minutes or more.

Post-procedure1

(c) Turn the ignition switch off.

NEXT



10. CHECK DTC OUTPUT (MOTOR GENERATOR)

Pre-procedure1

(a) None

Procedure1

(b) Check for DTCs.

Powertrain > Motor Generator > Trouble Codes

RESULT	PROCEED TO
No DTCs are output.	A
P0A1B94 only is output.	B
DTCs except P0A1B94 are output.	C

Post-procedure1

(c) Turn the ignition switch off.

A **END**

B ▶ REPLACE INVERTER WITH CONVERTER ASSEMBLY

C ▶ GO TO DTC CHART (MOTOR GENERATOR CONTROL SYSTEM)

