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Model Year: 2009	Model: Highlander HV	Doc ID: RM000000Y7K00YX
Title: P310 HYBRID VEHICLE CONTROL: HYBRID CONTROL SYSTEM: P0A78-286: Drive Motor "A" Inverter Performance (2009 Highlander HV)		

DTC	P0A78-286	Drive Motor "A" Inverter Performance
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DESCRIPTION

Refer to the description of the inverter



If the motor inverter overheats, has a circuit malfunction, or has an internal short, the inverter will transmit this information to the MFIV terminal of the MG ECU via the motor inverter fail signal line.

HINT:

The term "drive motor A" indicates MG2.

DTC NO.	INF CODE	DTC DETECTION CONDITION	TROUBLE AREA
P0A78	286	Motor inverter fail signal detection (circuit malfunction)	Inverter with converter assembly (MG ECU)

MONITOR DESCRIPTION

If the motor inverter detects a circuit malfunction, it will transmit a motor inverter fail signal to the MG ECU. The MG ECU will send information about the malfunction to the hybrid vehicle control ECU. Upon receiving this information, the hybrid vehicle control ECU will illuminate the MIL and set a DTC.

MONITOR STRATEGY

Related DTCs	P0A78 (INF 286): Motor inverter / MFIV detection (circuit malfunction)
Required sensors / components	Motor inverter
Frequency of operation	Continuous
Duration	TMC's intellectual property
MIL operation	Immediately
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever the DTCs listed are not present	TMC's intellectual property
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Other conditions belong to TMC's intellectual property	-
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TYPICAL MALFUNCTION THRESHOLDS

Motor inverter	Circuit malfunction
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COMPONENT OPERATING RANGE

Motor inverter	DTC P0A78 (INF 286) is not detected
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INSPECTION PROCEDURE

CAUTION:

- Before inspecting the high-voltage system or disconnecting the low voltage connector of the inverter with converter assembly, take safety precautions such as wearing insulated gloves and removing the service plug grip to prevent electrical shocks. After removing the service plug grip, put it in your pocket to prevent other technicians from accidentally reconnecting it while you are working on 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. After waiting for 5 minutes, check the voltage at the terminals in the inspection point in the inverter with converter assembly. The voltage should be 0 V before beginning work.

HINT:

Waiting for at least 5 minutes is required to discharge the high-voltage capacitor inside the inverter with converter assembly.

PROCEDURE

1.	CHECK DTC OUTPUT (HV)
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- Connect the Techstream to the DLC3.
- Turn the power switch on (IG).
- Select the following menu items: Powertrain / Hybrid Control / Trouble Codes.
- Check if DTCs are output.

Result:

RESULT	PROCEED TO
P0A78-286 only is output.	A
Any of the following DTCs are also output.	B

DTC NO.	RELEVANT DIAGNOSIS
P0A05-776	Motor Electronics Coolant Pump Control Circuit / Open
P0A3F-243	Drive Motor "A" Position Sensor Circuit
P0A40-500	Drive Motor "A" Position Sensor Circuit Range / Performance
P0A41-245	Drive Motor "A" Position Sensor Circuit Low
P0A45-669	Drive Motor "B" Position Sensor Circuit
P0A46-671	Drive Motor "B" Position Sensor Circuit Range / Performance
P0A47-670	Drive Motor "B" Position Sensor Circuit Low
P0A4B-253	Generator Position Sensor Circuit
P0A4C-513	Generator Position Sensor Circuit Range / Performance
P0A4D-255	Generator Position Sensor Circuit Low
P0A78-283, 285	Drive Motor "A" Inverter Performance
P0A93-346, 347	Inverter Cooling System Performance

NOTICE:

If a DTC indicating a malfunction in the above systems is output, repair the malfunctioning area indicated by the DTC and check for DTC outputs. If P0A78-286 is output, replace the inverter with converter assembly.

HINT:

- Turning the power switch on (IG) with the service plug grip and inverter cover removed causes interlock switch system DTC P0A0D-350 to be output.
- P0A78-286 may be output due to a malfunction which causes the DTCs in the table above to be output. In this case, first troubleshoot the output DTCs in the table above. Then, perform a reproduction test to check that no DTCs are output.

B  **GO TO DTC CHART**

A



2.	CHECK CONNECTOR CONNECTION CONDITION (MG ECU CONNECTOR)
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CAUTION:

Be sure to wear insulated gloves.

- (a) Turn the power switch off.
- (b) Remove the service plug grip

INFO

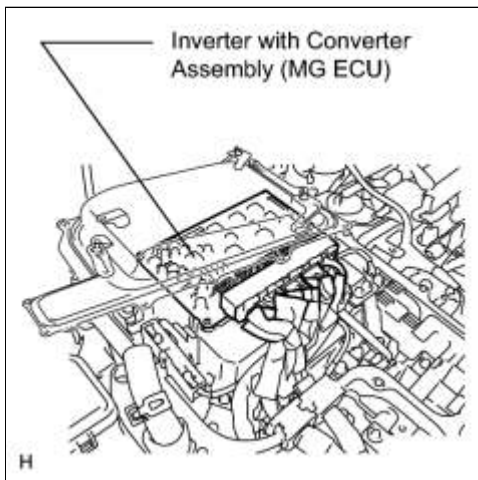
NOTICE:

After removing the service plug grip, do not turn the power switch on (READY), unless instructed by the repair manual because this may cause a malfunction.

(c) Remove the inverter cover INFO.

NOTICE:

- Wrap the round interlock terminal for the inverter cover with insulating tape to prevent it from shorting to ground.
- Be sure to prevent coolant in the inverter reserve tank from entering the inverter.
- Removing the inverter cover causes the MG ECU board to be exposed. Therefore, temporarily install the inverter cover for each area to be inspected.



(d) Check the connections of the MG ECU connectors.

OK:

The connectors are connected securely and there are no contact problems.

NG ▶ CONNECT SECURELY

OK ▶ REPLACE INVERTER WITH CONVERTER ASSEMBLY

