

PLUG-IN CHARGE CONTROL SYSTEM, Diagnostic DTC:P0D67-844

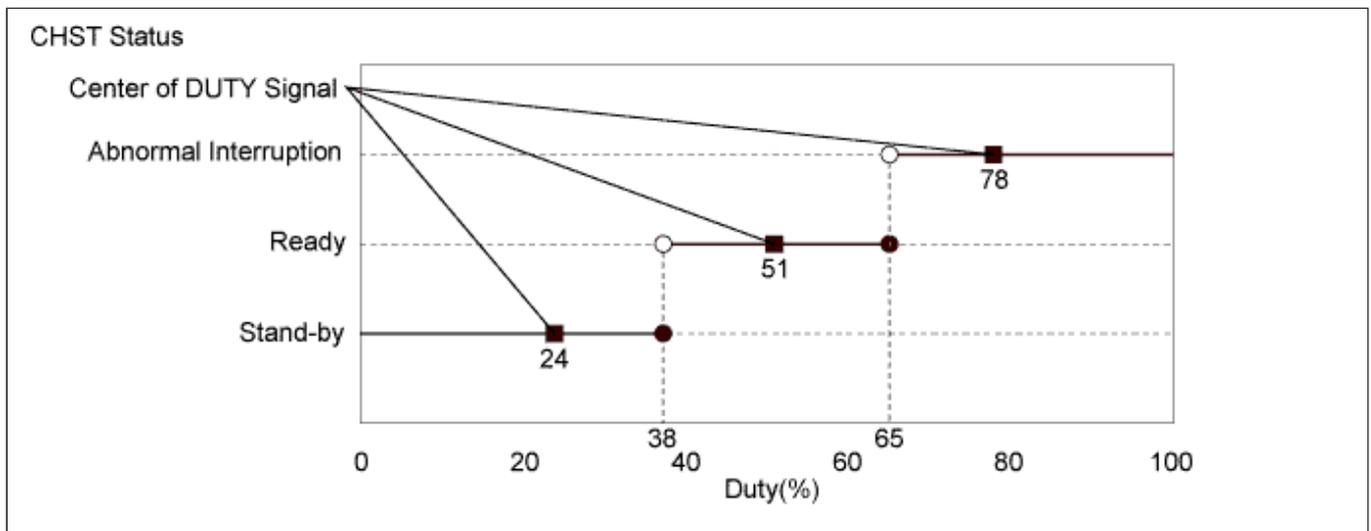
DTC Code	DTC Name
P0D67-844	On-Board Charger Malfunction

DESCRIPTION

The electric vehicle charger assembly sends the status of the electric vehicle charger assembly to the plugin charge control ECU assembly as a CHST signal (charger operation status signal).

The status of the CHST signal (charger operation status signal) has 3 patterns: stand-by, ready and abnormal interruption. The stand-by state indicates that the on-board charger is "on" and the electric vehicle charger assembly has started correctly. The ready state indicates that AC input power source voltage is received correctly and both the CHRQ signal (charging request signal) and CHEN signal (electric vehicle charger gate open/close request signal) have turned on. The abnormal interruption state indicates that an internal malfunction of the electric vehicle charger assembly or overheating is occurring in the electric vehicle charger assembly.

The electric vehicle charger assembly has self-protection functions. If a malfunction occurs, it sends the CHST signal (charger operation status signal) to the plugin charge control ECU assembly to cancel charging. The electric vehicle charger assembly also limits its output if overheating occurs while charging or cancels charging when an internal malfunction occurs.



DTC No.	INF Code	DTC Detection Condition	Trouble Area
P0D67	844	A signal, indicating self-diagnosis malfunction, from the electric vehicle charger assembly is received. (1 trip detection logic)	<ul style="list-style-type: none"> Electric vehicle charger assembly Plugin charge control ECU assembly

Related Data List

DTC No.	INF Code	Data List
P0D67	844	<ul style="list-style-type: none"> Charging Control Status On-Board Charger Input Voltage Charger Output Current

WIRING DIAGRAM

Refer to the wiring diagram for DTC P316C-846 .

INSPECTION PROCEDURE

Tech Tips

After the repair, check that the Data List item "State of Charge (All Bat)" is 70% or less, then plug-in charge the vehicle until it completes and check that DTCs are not output.

PROCEDURE

1. CHECK DTC OUTPUT (HYBRID CONTROL)

- a. Connect the GTS to the DLC3.
- b. Turn the power switch on (IG).
- c. Enter the following menus: Powertrain / Hybrid Control / Trouble Codes.
- d. Check if DTCs are output.

Result

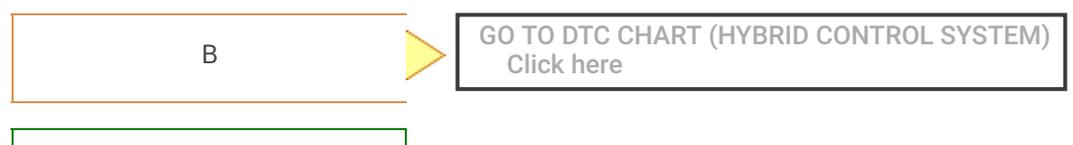
Result	Proceed to
Only P0D67-844 is output or P0D67-844 and DTCs other than the ones in the table below are also output.	A
Any of the following DTCs are also output.	B

DTC No.	Relevant Diagnosis
P0A1D-144, 148, 162, 721, 722, 723, 787, 818, 821, 823	Hybrid Powertrain Control Module
P0ADC-226	Hybrid Battery Positive Contactor Control Circuit High
P0AE0-228	Hybrid Battery Negative Contactor Control Circuit High
P2511-149	HV CPU Power Relay Sense Circuit Intermittent No Continuity
P3004-131, 803	Power Cable Malfunction
U019B-440	Lost Communication with Battery Charger Control Module

Tech Tips

P0D67-844 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.

- e. Turn the power switch off.





2. CHECK DTC OUTPUT (PLUG-IN CONTROL)

- a. Connect the GTS to the DLC3.
- b. Turn the power switch on (IG).
- c. Enter the following menus: Powertrain / Plug-in Control / Trouble Codes.
- d. Check if DTCs are output.

Result

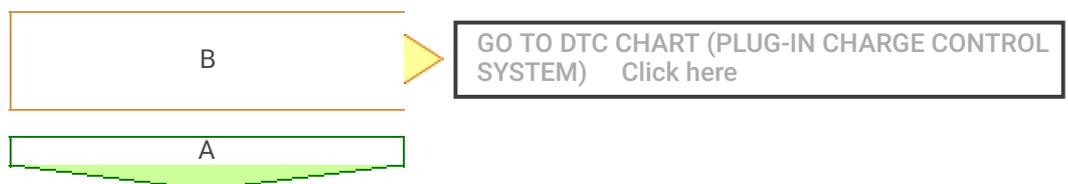
Result	Proceed to
Only P0D67-844 is output or P0D67-844 and DTCs other than the ones in the table below are also output.	A
Any of the following DTCs are also output.	B

DTC No.	Relevant Diagnosis
P0D20-422	Charger Relay Stuck Open
P0D4D-404	On-Board Charger Output Voltage Sensor Circuit Range / Performance
P2511-441	Reset Detected
P321D-644	Charging System Voltage High
U0293-439, 449	Lost Communication with Hybrid Powertrain Control Module

Tech Tips

P0D67-844 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.

- e. Turn the power switch off.



3. CHECK PLUG-IN CHARGE STATE

Tech Tips

- Check with the customer if the 220 to 240 V power used for plug-in charging was supplied by a power company.
- If the electric vehicle charger cable assembly that was used to plug-in charge the vehicle is available, perform a reproduction test using it and a known good socket as follows. This allows the electric vehicle charger cable assembly to be determined as OK or NG when the vehicle is not malfunctioning.

- a. Plug-in charge the vehicle using a known good socket.
 - i. Connect the GTS to the DLC3.
 - ii. Turn the power switch on (IG).

- iii. Clear DTC.
- iv. Enter the following menus: Powertrain / Plug-in Control / Data List.
- v. Check that "State of Charge (All Bat)" shows 70% or less.
- vi. Turn the power switch off.
- vii. Connect the electric vehicle charger cable assembly and fully charge the vehicle. Check that plug-in charge control system DTCs are not output.

Note

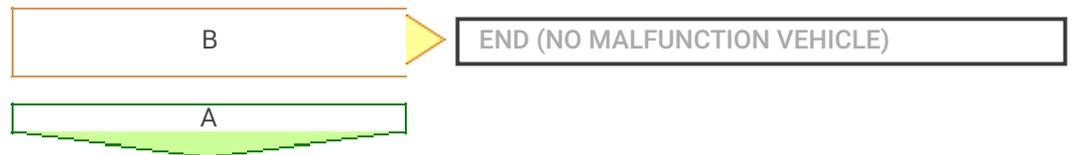
Use the same 220 to 240 V power that the customer used to plug-in charge the vehicle when the DTC was stored, if possible.

Result

Result	Proceed to
DTCs are output or plug-in charge cannot be completed.	A
DTCs are not output and plug-in charge has been completed.	B

Tech Tips

- This DTC could be output due to rapid fluctuation of AC input voltage.
- As the voltage fluctuates quickly, it is difficult to check the plug-in charge state by reading the freeze frame data or Data List item "On-Board Charger Input Voltage".



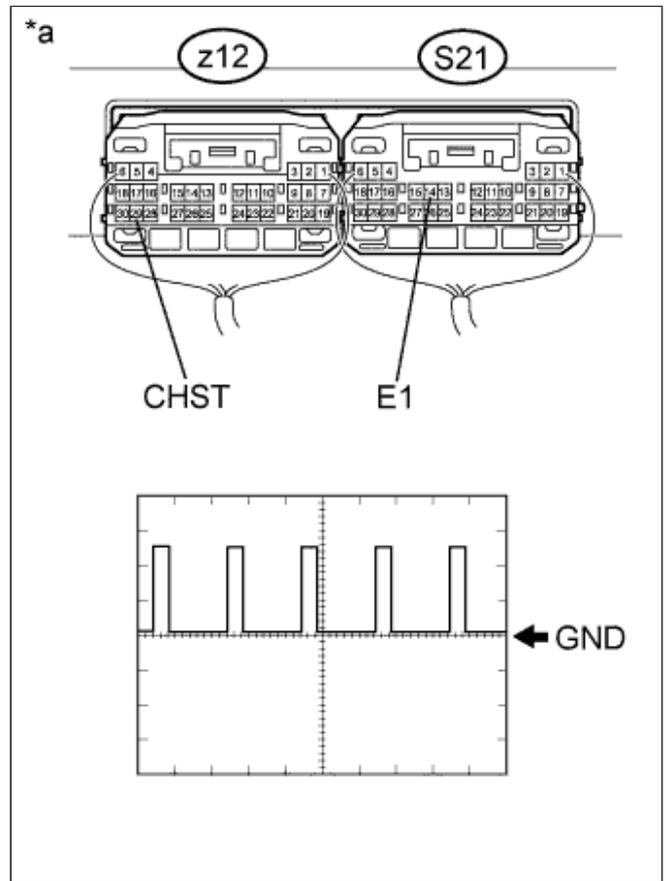
4. CHECK PLUGIN CHARGE CONTROL ECU ASSEMBLY (CHECK WAVEFORM (CHST))

Tech Tips

The following procedure is used to check for a malfunction in an internal circuit of the plugin charge control ECU assembly.

- a. Connect the GTS to the DLC3.
- b. Connect an oscilloscope between the plugin charge control ECU assembly terminals specified in the table below.
- c. Turn the power switch on (IG).
- d. Enter the following menus: Powertrain / Plug-in Control / Data List
- e. Select "Charger State Pulse Duty Ratio" in the Data List.

Tester Display	Measurement Item/Range
Charger State Pulse Duty Ratio	Electric vehicle charger assembly charging status indicated by duty/ Min.: 0.0 %, Max.: 100.0 %



Text in Illustration

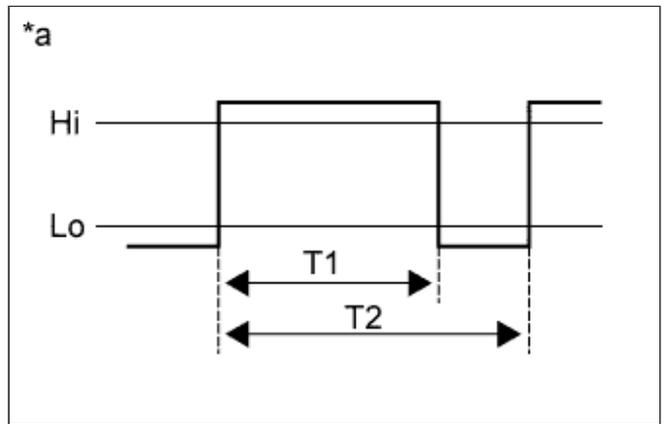
*a	Component with harness connected (Plug-in Charge Control ECU Assembly)
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f. Measure the waveform.

Item	Contents
Tester Connection	z12-29 (CHST) - S21-14 (E1)
Equipment Setting	5 V/DIV., 50 ms/DIV.
Condition	Power switch on (IG)

Tech Tips

The waveform output from terminal CHST can be measured without connecting the electric vehicle charger cable assembly by turning the power switch on (IG).



Text in Illustration

*a	Reference diagram for duty calculation
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g. Calculate duty (%) based on the CHST waveform.

Tech Tips

Calculate duty (%) using the following formula: $\text{Duty (\%)} = T1 / T2 \times 100 (\%)$

h. Compare the Data List item "Charger State Pulse Duty Ratio" with the duty (%) calculated based on CHST waveform.

Result

Result	Proceed to
The difference between "Charger State Pulse Duty Ratio" and the duty (%) calculated based on CHST waveform is less than 20 %.	A
The difference between "Charger State Pulse Duty Ratio" and the duty (%) calculated based on CHST waveform is 20 % or more.	B

i. Turn the power switch off.

