

5. DC/DC CONVERTER

The DC/DC converter is mounted under the hood directly behind the center of the grille.

The converter performs two functions:

1. When the main battery pack is on charge, the converter recharges the 12 volt accessory battery.
2. When the vehicle is being driven, the converter provides up to 20 amps of power from the main battery pack to assist the 12 volt battery in carrying the accessory load.

Input to the converter is nominally 108 volts DC however this can vary from as low as 80 to as high as 145 volts depending on the state of charge of the main battery pack. Output from the converter is 14.3-14.8 volts DC regardless of the input voltage.

Problems with the converter will probably first be noticed when the 12 volt battery becomes too discharged to perform properly.

Except for the externally mounted fuses, the converter itself is not serviceable. If it is diagnosed as faulty, it must be returned to the manufacturer.

The 108 volt main battery pack and the 12 volt accessory battery are electrically isolated inside the converter. Always be careful to maintain this isolation when performing tests. NEVER allow main battery pack power to become connected to 12 volt circuits or the vehicle chassis.

Converter Problem Diagnosis

If the 12 volt battery state of charge is low (verify with hydrometer), disconnect the battery cables and charge the battery with a conventional 12 volt battery charger. When charging has been completed, reconnect the battery cables.

NOTE: The converter is internally protected against over-heating. At 70°C (158°F) it will shut down. When the device has cooled to a safe level it will resume operation automatically.

DC/DC Converter Problem Diagnosis (cont'd)

1. To verify input to the converter during charging, connect a voltmeter across the orange and blue wires at connector J12. Plug in and turn on the vehicle charger.

<u>Meter Reading</u>	<u>Conclusion</u>
Same as main battery pack.	OK. Proceed to Test #2.
Less than main battery pack.	Check continuity of wires between J12—1 and J17-1 and between J12-2 and battery terminal on controller terminal board. See wiring diagram in Section 13 for location a-F plugs and terminals. Check 10 amp fuse on charger front panel. Check output at P17-1 with reference to battery pack negative terminal. If no output, and fuse is OK, the charger is faulty.

2. To verify input to the converter during driving, connect a voltmeter across the orange and blue wires at connector J12. Unplug the charger from the rear of the vehicle and start the motor.

<u>Meter Reading</u>	<u>Conclusion</u>
Same as main battery pack.	OK. Proceed to Test #3.
Less than main battery pack.	Check continuity of wires between J12-1 and F1 terminal on the controller terminal board and between J12-2 and battery-terminal on controller terminal board

3. To verify converter output, disconnect the leads from the converter at the 12 volt battery posts. Connect a voltmeter across the converter leads. (Be sure to keep them well separated from each other, and not allow them to ground against the vehicle chassis.) Plug in and turn on the vehicle charger or start the motor.

<u>Meter Reading</u>	<u>Conclusion</u>
*14.3-14.8 volts	OK - Converter output is normal.
*Less than 14.3 volts (fluctuating to -.5 V permissible)	Check converter output fuse (20 amp) If fuse is OK, and output reading is still too low, the converter is faulty.

* The converter output with no load will oscillate with a period of about a second. It will jump up to a peak voltage, and then slowly drift down approximately .6 volts, and then jump up to peak voltage again. This can be observed on a digital or analog meter

To test the converter under load, use two jumper wires to connect the converter output leads to a 12 volt automobile headlamp. (The headlamp in the vehicle can be used. Disconnect the harness from the headlamp to expose the terminals.) The output voltage under load should be between 12.6 and 13.4 volts. At the completion of the test, be sure to reconnect the headlight wiring and to connect the converter output leads to the correct battery posts.

Converter Removal/Installation

1. Disconnect J12/P12 harness plug.
2. Disconnect converter output leads from 12 volt battery posts.
3. Remove mounting bolts at the four corners of the converter box (do not remove the two bolts at the center of the flanges), and remove converter from vehicle.
4. To reinstall reverse the above procedure.

CONVERTER SPECIFICATIONS

Voltage Input:	80-145 volts DC
Voltage Output:	14.3 — 14.8 volts DC (fluctuating +0 to - .5 V)
Power Output:	15 amp maximum steady output. 20 amp surge.
Fuse Protection:	5 amp input. 20 amp output.