PROGRESSIVE DYNAMICS, INC.

9100 SERIES POWER CONVERTERS

DEALER INFORMATION PACKAGE

Features of the 9100 Series Inteli-Power Progressive Dynamics Converters

1. REVERSE BATTERY PROTECTION

This patented feature prevents the converter from being damaged in the event of accidental reversal of the battery leads, or the Positive (+) Negative (-) connections at the converter. This feature prevents unnecessary converter replacement since the only consequence of this inadvertent cross connection is a blown fuse(s) on the converter. The fuse(s) are readily available automotive type fuses and are easily changed. The only thing that will blow these fuses is a reverse connection between the converter and battery.

2. HIGH VOLTAGE PROTECTION

This exclusive, built-in safety circuit constantly monitors the 120 V input. If it detects a voltage spike or surge of over 135 volts, it immediately shuts the electronic system down and prevents damage to the converter. Once the condition is corrected, the converter automatically returns to normal operation. This patented feature is not found in competitor's products. High voltage spikes are common and a major cause of converter failure..

3. LOW VOLTAGE PROTECTION

Progressive Dynamics' power converter will continue to operate at line voltages below 90 volts AC. While low voltage, which is common in many campgrounds throughout the United States, has caused competitor's units to fail, the 9100 Series Converters simply shut down when voltage drops to a level insufficient for continued operation. When the low voltage situation is corrected, the converter returns to normal operation.

4. ELECTRONIC CURRENT LIMITING

The 9100 Series Converters have electronic current limiting. This feature automatically reduces the output voltage of the converter when the current load reaches the maximum design criteria. This is called foldback. Should a short occur in the RV wiring, the foldback feature instantly reduces the converter output voltage to almost zero amps until the short is repaired. This feature prevents damage to the RV wiring and blown fuses. Competitive converters slowly reduces the output current when the load exceeds the limit and never drops to zero volts. This can result in overheating of the RV wiring and 12 volt motors and blown fuses that must be replaced.

5. INTELLIGENT COOLING FAN

The fan on the Inteli-Power converter is controlled by an electronic temperature sensor. Competitive units use an electro-mechanical temperature controller. The advantage of the electronic sensor is that it is designed to operate the fan only under high load conditions and is more reliable than the electro-mechanical controller. This means that the fan normally does not operate at night when load demand is low and the Rv owner is trying to sleep. The Inteli-Power intelligent fan's electronic temperature sensor constantly monitors the temperature of critical components and automatically turns the fan on to maintain safe operating temperatures under high load conditions.

6. AUTOMATIC THERMAL SHUTDOWN

An additional electronic temperature sensing system constantly monitors the units temperature. To prevent damage to the converter or possible fire in the event of fan failure, or insufficient or improper ventilation of the compartment in which the converter is installed, the converter automatically shuts down until a safe operating temperature is reached.

7. TCMS INTERFACE

TCMS (Total Charge Management System) is another exclusive feature of Progressive Dynamics' Inteli-Power converters. This feature allows your customer, the RV Dealer or owner to plug in the Progressive Dynamics Charge Wizard module. This makes the converter an intelligent RV battery monitoring/charging system. This solid state micro-processor constantly monitors the condition and use of the RV battery and automatically selects BOOST Mode (14.4 volts), NORMAL Mode (13.6 volts) or TRICKLE Mode (13.2 volts). As conditions require, the BOOST Mode will ensure a rapid charge of a fully discharged battery and provide extra voltage if a heavy demand is sensed. The NORMAL Mode maintains the battery at full charge under normal operating conditions. The TRICKLE Mode reduces the charge voltage if Charge Wizard detects long periods of vehicle inactivity such as storage. This prevents excessive water use and gassing. When in this mode, Charge Wizard switches to BOOST for 15 minutes every twenty-one (21) hours. This stirs up the electrolytes and virtually eliminates sulfation, the most common cause of battery failure.

These features make the Progressive Dynamics 9100 Series Inteli-Power Converter the most reliable converters on the market today. Our field failure rate is less than one half of one percent.

NOTE

The information in this literature makes reference to the PD9155, fifty-five AMP Inteli-Power converter. The PD9155 has been discontinued and is no longer available. It has been replaced by the PD9160 sixty AMP converter, which sells for the same price as the PD9155.

This information package is intended to help the RV Dealer's sales and service departments better understand Progressive Dynamics power converters and to reduce the number of units returned with no problem found.

COMMON CUSTOMER QUESTIONS REGARDING POWER CONVERTERS

1. What is the maximum rate my Progressive Dynamics converter will charge my battery?

   The 9100 Series electronic power converters can charge the battery at their maximum current output rating, provided there are no other 12-volt systems operating and the battery is discharged enough to accept this charge rate. Progressive Dynamics provides six different models of the 9100 series power converters as shown below. The last two digits of the part number indicate its maximum current charging capability in amps.

   PD9130 = Maximum output and charging rate equals 30 amps

   PD9140A = Maximum output and charging rate equals 40 amps

   PD9145A = Maximum output and charging rate equals 45 amps

   PD9155 = Maximum output and charging rate equals 55 amps

   PD9160 = Maximum output and charging rate equals 60 amps

   PD9180 = Maximum output and charging rate equals 80 amps

2. Does my converter completely shut-off when the battery reaches full charge?

   When the battery reaches full charge, the charging current of the converter drops to between 200 and 250 milliamps. Batteries will self-discharge themselves at a low rate even when no other 12-volt current loads are present. The converter senses this current loss and automatically replaces this lost current to maintain full battery charge.

3. Why doesn't the fan on my converter run all of the time?

   The fan provided on the 9100 series converters is an intelligent fan and uses an electronic temperature sensing system that operates the fan only under high current drain applications. This means that the fan typically will not operate at night when the RV owner is trying to sleep.

4. Does my converter have short circuit protection?

   Yes, all 9100 series converters incorporate a sophisticated electronic current limiting circuit that automatically shuts the converter down very rapidly in the event of a short or current overload condition, without blowing the fuses. This protective circuit will automatically reset itself once the short or overload condition is eliminated.

5. **What is the term of the converter warranty?**

   The converter warranty is determined by the warranty provided by the RV manufacturer and is based on the date of purchase of the RV. The maximum converter warranty period is 2-years.

6. **What are the fuses on the front of the converter designed to do?**

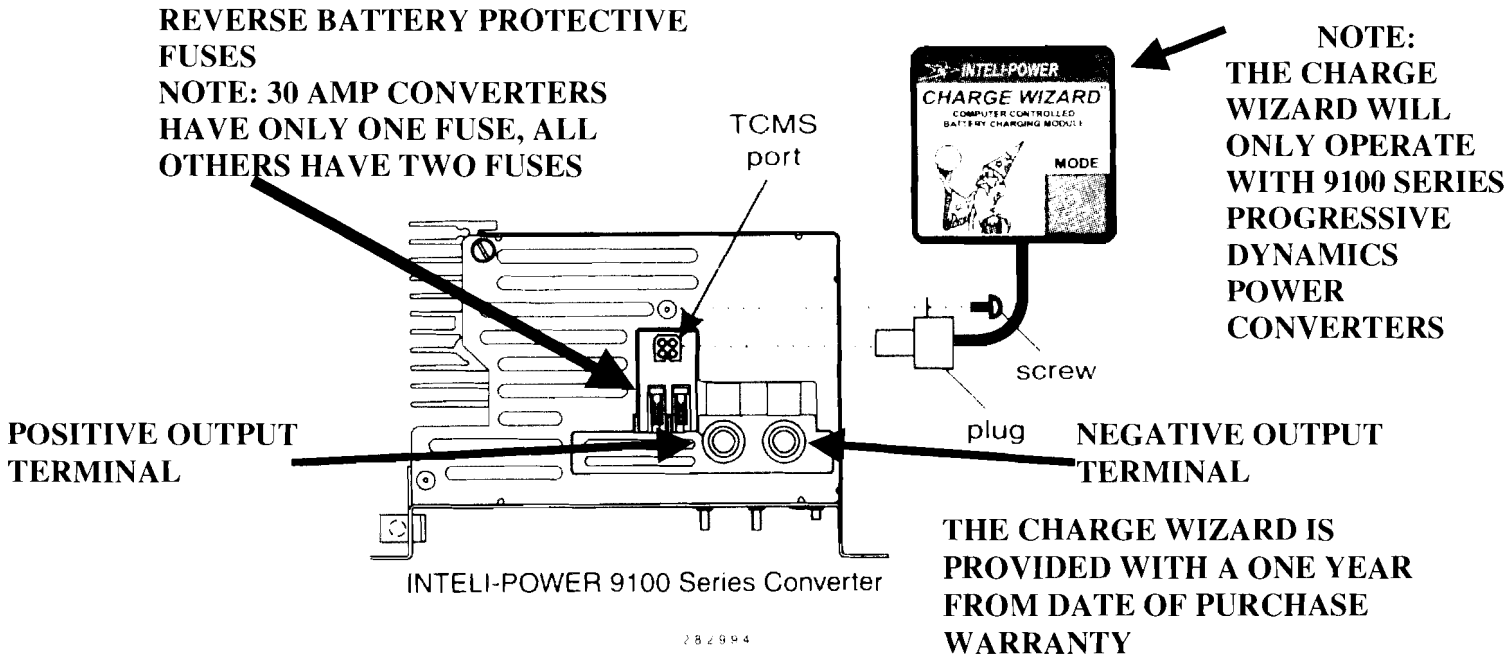
   These fuses protect the converter from damage in the event the battery is connected to the RV in reverse. A reverse battery hook-up is the only thing that will blow these fuses. Before replacing a converter suspected of being inoperative always, check these fuses first! These are standard automotive type 30 amp fuses.

7. **How long will it take the converter to recharge my battery?**

   The battery recharge time is controlled by many factors, such as battery size, converter output rating, the number of 12-volt lights and appliances operating during the charge cycle and how much the battery has been discharged. In our testing, a 125-amp hour battery was fully discharged and then connected to a PD9155 (55-amp) converter with the standard output voltage of 13.6 volts. The battery reached full charge in approximately 75 hours.

8. **Is there any way the converter can charge my batteries more rapidly?**

   Yes, all 9100 series converters incorporate a TCMS (Total Charge Management System) connector on the front of the converter. This connector allows the customer or the dealer to easily plug-in the optional Charge Wizard shown below. The Charge Wizard contains a microprocessor that constantly senses the battery condition and automatically increases the charge voltage to 14.4 volts when it senses the battery is severely discharged. This feature will reduce the charge time for a 125-amp hour battery to approximately 5 hours.



9. **Will this increased charging rate damage my battery?**

   No, the Charge Wizard senses the battery charge level and will automatically reduce the charge voltage back to the standard 13.6 volts when the battery reaches 90% of full charge to safely complete the charge. The Charge Wizard also automatically reduces the charging voltage to 13.2 volts during RV storage periods to prevent battery gassing and water use. During storage, the Charge Wizard automatically provides a 15-minute equalizing charge every 21 hours to prevent battery electrolyte stratification and sulfation, the leading causes of battery power loss. The Charge Wizard will increase RV battery life and reduce battery maintenance.

10. **How can I get a Charge Wizard?**

    Charge Wizards are available from all major aftermarket parts distributors. If your favorite distributor does not stock Charge Wizard, contact Kellie Kinsey at Progressive Dynamics, Inc. inside sales at (616) 781-4241 for the stocking distributor nearest you.

SERVICE INFORMATION

Progressive Dynamics power converters are very reliable and incorporate several safety features to prevent damage from over temperature, over and under voltage operation and reverse battery connections. Over 50% of the converters returned from the field check OK when tested by our service department. To help reduce this problem, the following trouble-shooting guide is provided for your use. These three simple steps shown in the diagrams on the next two pages will allow your service department to determine if the converter is operating properly, without removing it from the RV. Converters that test OK when returned to Progressive Dynamics will have the labor warranty claim denied, so it is in your best interest to see that your service technicians are made aware of and use these test procedures.

Should you require any additional service information you may contact Progressive Dynamics service manager Sue Johnson at 616-781-4241 or FAX at 800-706-9245. Service hours are from 8 A.M. to 5 P.M. Eastern Time.

WARRANTY CLAIMS

All warranty claims must be processed through the Service Department of the manufacturer of the RV from which the converter was removed, or the distributor from which the converter was originally purchased.

CONVERTERS THAT ARE OUT OF WARRANTY CAN BE REPAIRED FOR A $50 CHARGE. BEFORE RETURNING CONVERTERS TO PROGRESSIVE DYNAMICS, CONTACT OUR SERVICE DEPARTMENT AND OBTAIN AN RGA #

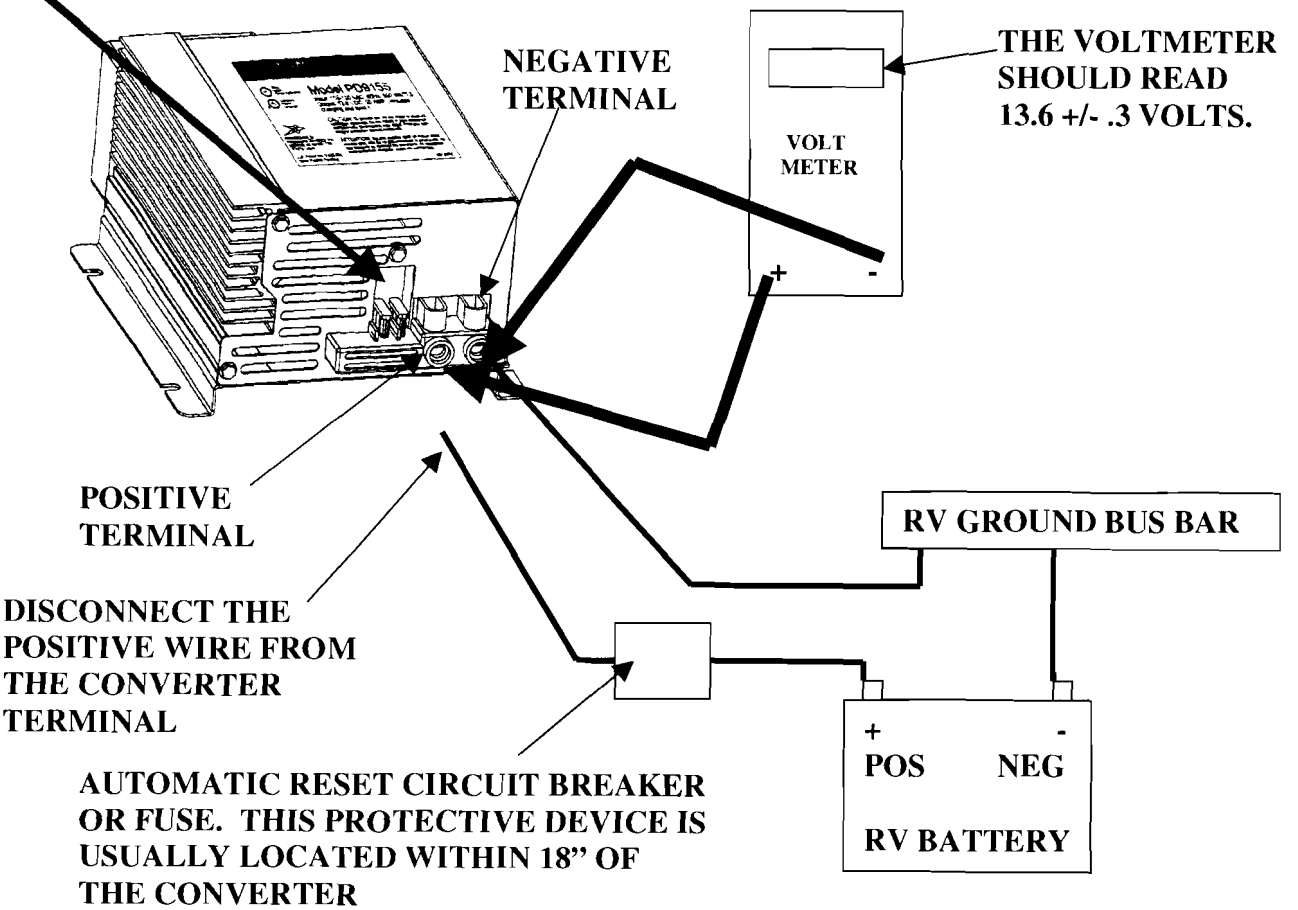
TROUBLE SHOOTING 9100 SERIES

POWER CONVERTERS

STEP #1 - Use a voltmeter to check the converter output voltage. Before checking the converter voltage, disconnect the wire connected to the Positive Terminal on the front of the converter as shown below. Place the Positive and Negative meter test probes into the Positive and Negative output terminals of the converter, if the voltage reads 13.6 volts +/- .3 volts, the converter is operating properly.

If the converter output is, Zero volts continue on to STEP #2 to check the converter fuse(s).

NOTE: REMOVE ANY MODULES THAT MAY BE CONNECTED TO THE TCMS CONNECTOR BEFORE TESTING!

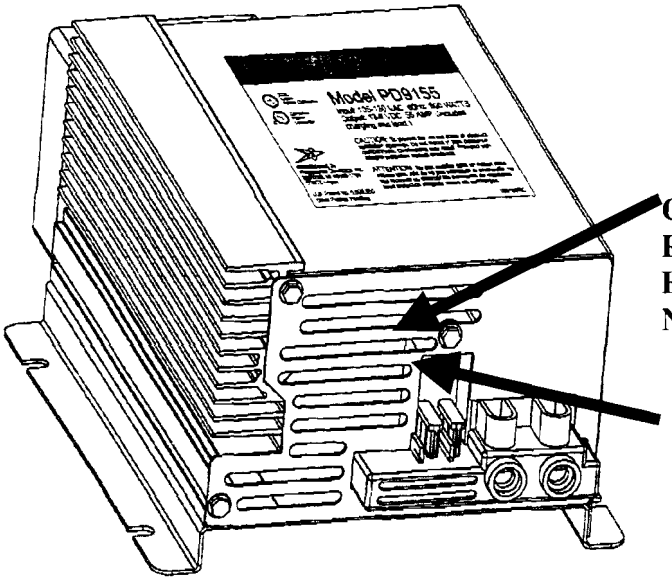


If the converter output voltage reads 13.6 volts, but the battery is still not charging, the problem could be an open automatic reset circuit breaker or open wire between the converter and RV Battery.

STEP #2 – Remove the Fuse(s) and check to make sure they are not blown. If the fuse(s) are OK, reinstall them and go on to STEP #3.

If the fuse or fuses are blown, this means the RV Battery was accidentally connected in reverse either at the battery itself, or at the converter. Check for proper battery connections, then replace the fuse(s) and test the converter using the method shown in Step #1.

NOTE: The converter fuses protect the converter from damage in the event the RV Battery is accidentally connected in reverse. A reverse battery connection even for a second is the only thing that will blow these fuses.

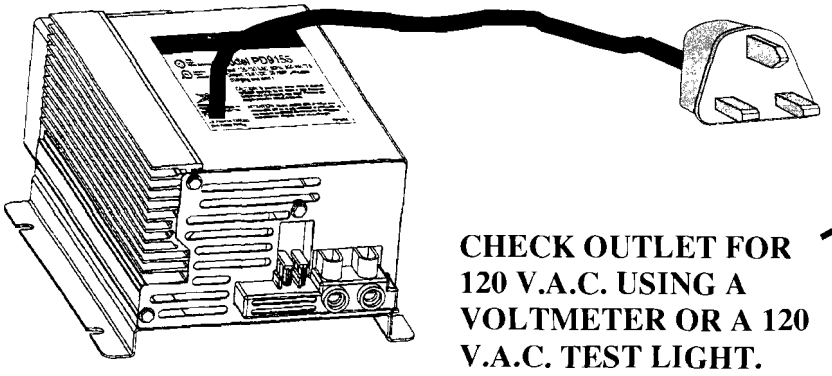


CHECK THE CONVERTER REVERSE BATTERY PROTECTION FUSES TO MAKE SURE THEY ARE NOT BLOWN.

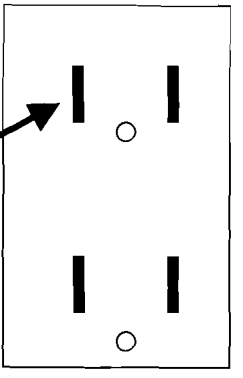
NOTE: THE PD9130 (30-AMP) CONVERTER HAS ONLY ONE FUSE. ALL OTHER MODELS HAVE TWO FUSES.

STEP #3 – Check the 120 V.A.C. outlet that the converter power cord is plugged into to see that 120 VAC power is available to the converter.

120 V.A.C. OUTLET



CHECK OUTLET FOR 120 V.A.C. USING A VOLTMETER OR A 120 V.A.C. TEST LIGHT.



If the converter fuses are good and 120 V.A.C. power is available at the outlet into which the converter is plugged, and the converter output still reads zero volts, the converter is bad and must be replaced.