

FXR Power Supply/Control Board Replacement Instructions

Purpose and Scope

These instructions detail how to replace the FXR inverter power supply/control circuit board. These instructions extend to FXR2012A, FXR2524A, FXR3048A, VFXR2812A, VFXR3524A, VFXR3648A, FXR2012E, FXR2024E, FXR2348E, VFXR2612E, VFXR302E, VFXR3048E and other FXR-class inverters.

Important Safety Instructions

This procedure requires disassembly of the inverter that exposes the circuit board and electronic components to external elements that are subject to electrostatic discharge. Be sure proper grounding practices are performed when repairing or replacing electrical devices.

	<p>WARNING: Lethal Voltage</p> <p>Review the system configuration to identify all possible sources of energy. Ensure ALL sources of power are disconnected before performing any installation or maintenance on this equipment. Confirm that the terminals are de-energized using a validated voltmeter (rated for a minimum 1000 Vac and 1000 Vdc) to verify the de-energized condition.</p>
	<p>WARNING: Burn Hazard</p> <p>Internal parts can become hot during operation. Do not remove the cover during operation or touch any internal parts. Be sure to allow them sufficient time to cool down before attempting to perform any maintenance.</p>
	<p>CAUTION: Equipment Damage</p> <p>Sensitive electronics inside the equipment can be destroyed by static electricity. Be sure to discharge any static electricity built up before touching the equipment and wear appropriate protective gear.</p>

Tools Required

- #2 Phillips screwdriver
- 3/8" flat blade screwdriver
- 4mm hex wrench
- Strap wrench
- Long-nose pliers
- 10mm socket with 12" extension & torque wrench
- 10mm wrench (standard and torque)
- Power supply (9-volt batteries may be used)
- Voltmeter or DVM

Parts Included

- Power supply/Control circuit board

FXR Power Supply/Control Board Replacement Instructions

Circuit Board Instructions

To replace the power supply/control board:

1. Disconnect power. Turn off all DC and AC sources to the inverter.
2. Remove the DC Cover or Turbo Fan. Remove the battery terminal covers. Using a #2 Phillips screwdriver, remove the two screws attaching the AC Cover as shown in Figure 1. Remove the rubber washers, rubber grommet, and AC Cover as shown in Figure 1.

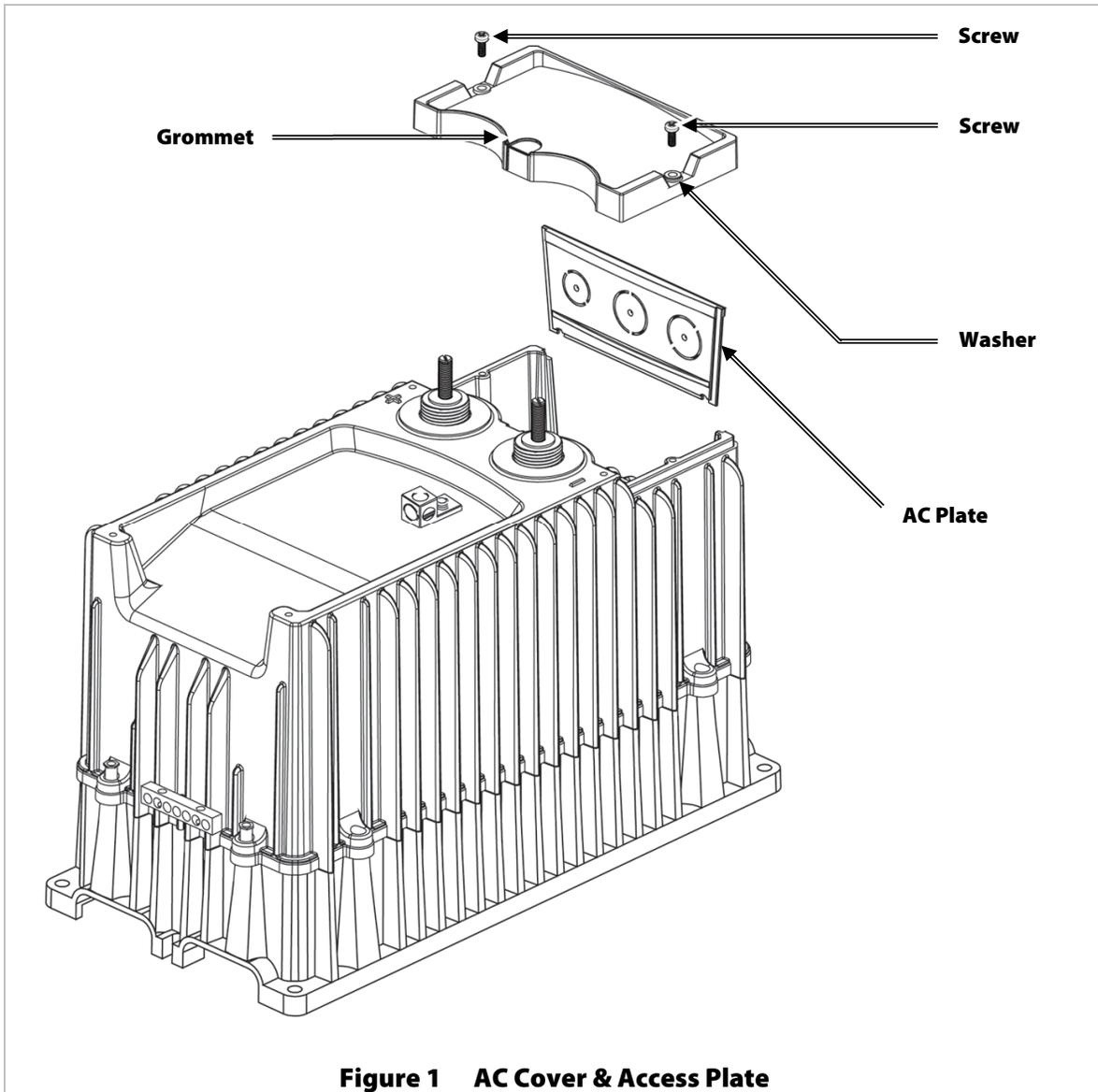


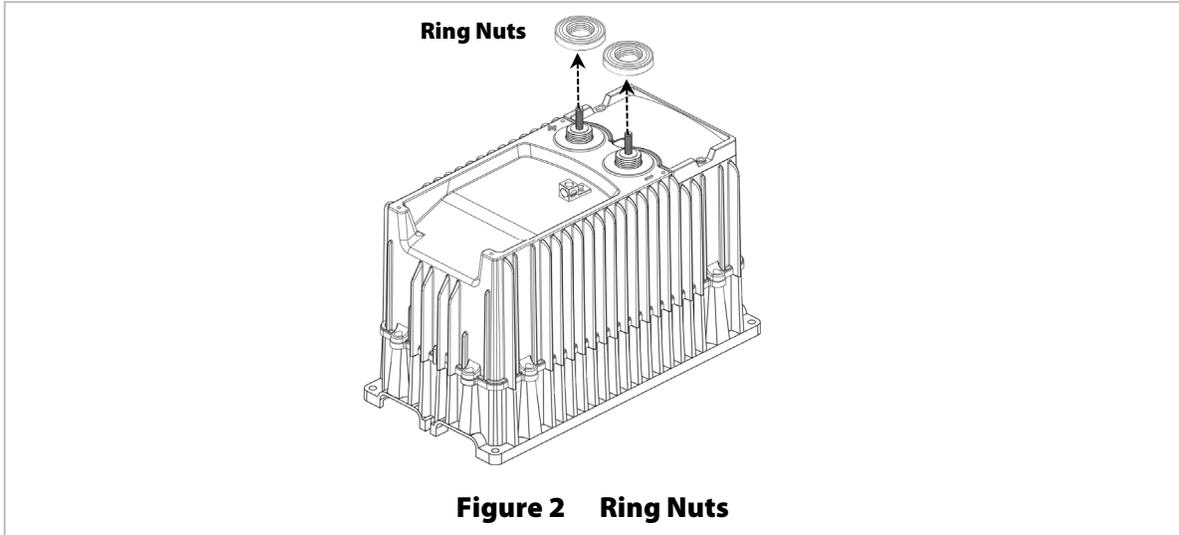
Figure 1 AC Cover & Access Plate

3. Remove the AC Plate. See Figure 1.
4. Disconnect all AC and DC wiring to the inverter. Using a meter, verify that no AC or DC voltage is present.

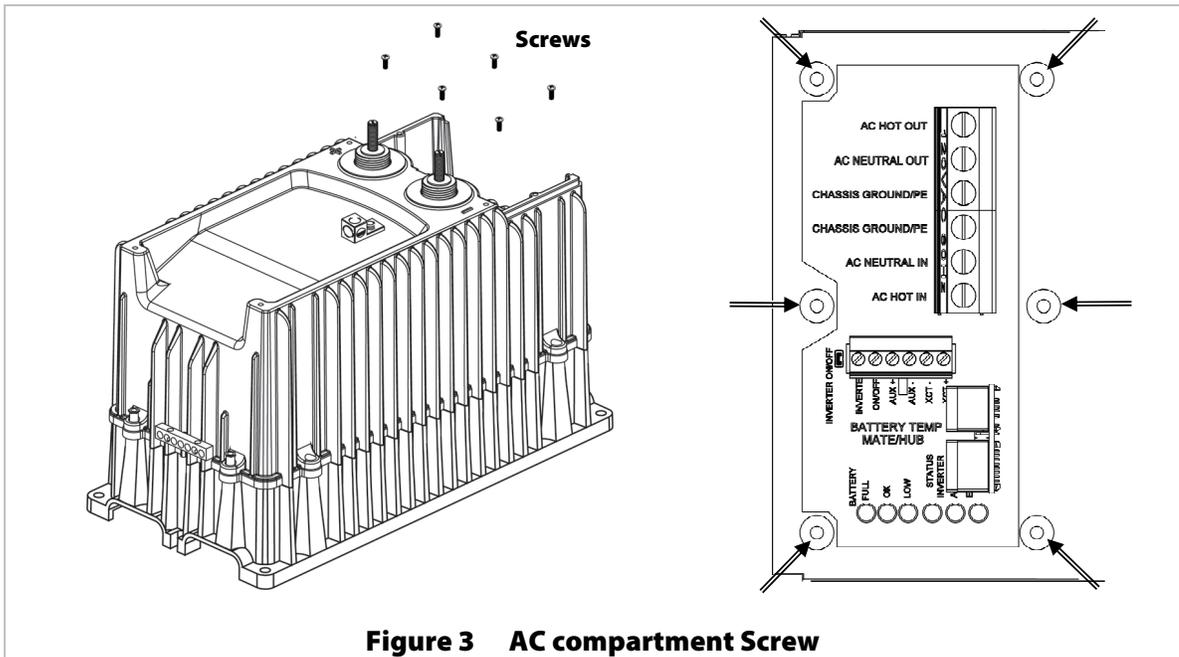
FXR Power Supply/Control Board Replacement Instructions

- Using the strap wrench, remove the red and black ring nuts located on the battery terminals. See Figure 2.

NOTE: If the ring nuts are too tight, a hammer and flat screwdriver may be used to tap the ring nuts counterclockwise. A small pipe wrench may be used. Cover the jaws of the wrench with tape to minimize damage to the plastic nuts.



- Using a #2 Phillips screwdriver, remove the 6 screws located in the AC wiring compartment. See Figure 3.



- Using the 4mm hex wrench, remove all 8 hex bolts that connect the top cover to the bottom chassis of the inverter. The locations of these bolts are shown in Figure 4.



IMPORTANT:

After removing the hex bolts, read the next step carefully before removing the cover.

FXR Power Supply/Control Board Replacement Instructions



CAUTION: Equipment Damage

Inverter components will be damaged if the cover is removed too quickly. The cover and fan are wired to the internal control board with a PCB connector. See Figure 5.

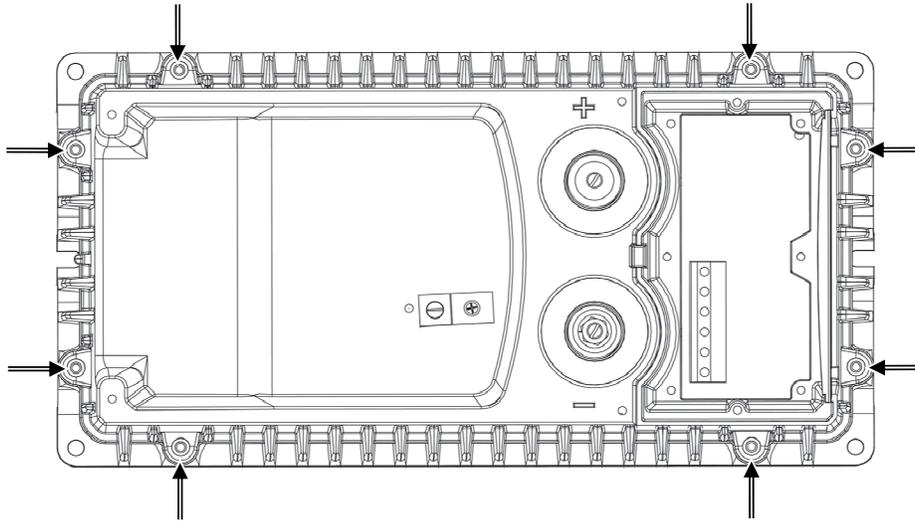
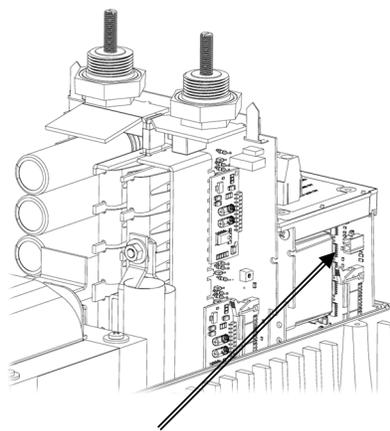


Figure 4 Top Cover Hex Bolts

8. Carefully lift the inverter cover, just far enough to locate the fan wire.
9. Disconnect the fan wire. The location is shown in Figure 5.



PCB Connector

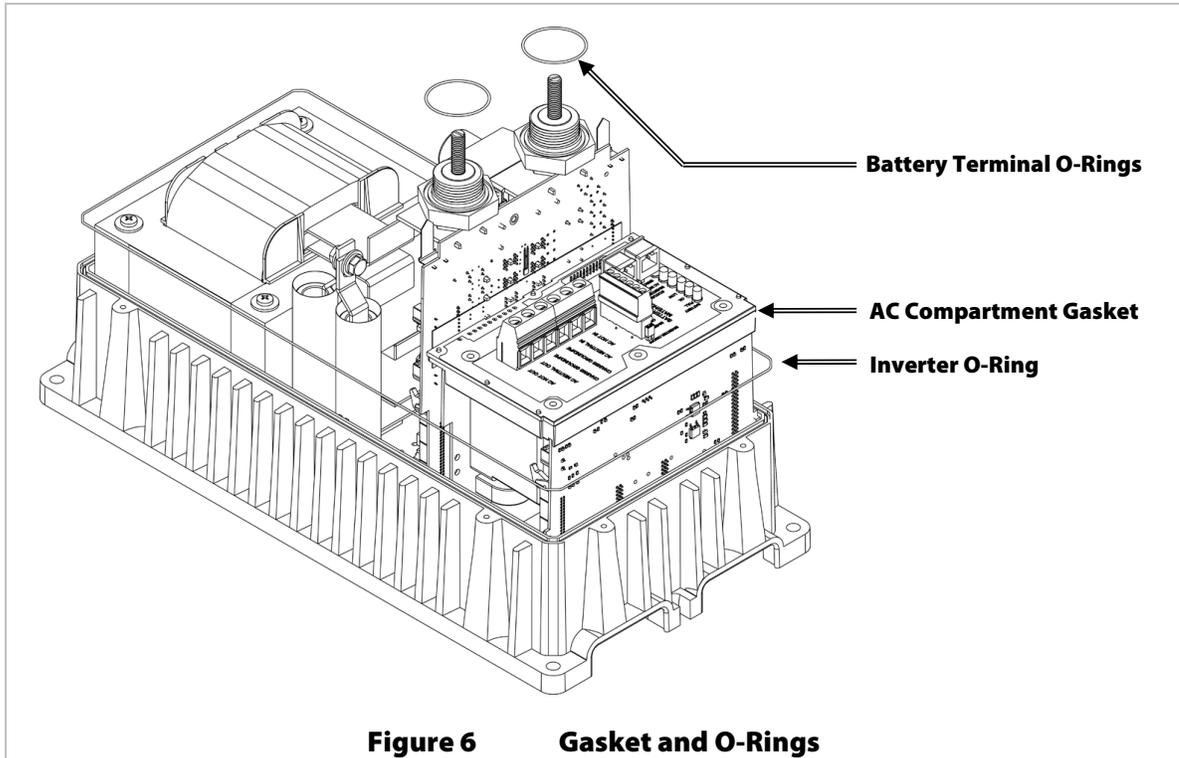
Figure 5 Fan Connector

10. Remove the top cover and set it aside.

FXR Power Supply/Control Board Replacement Instructions

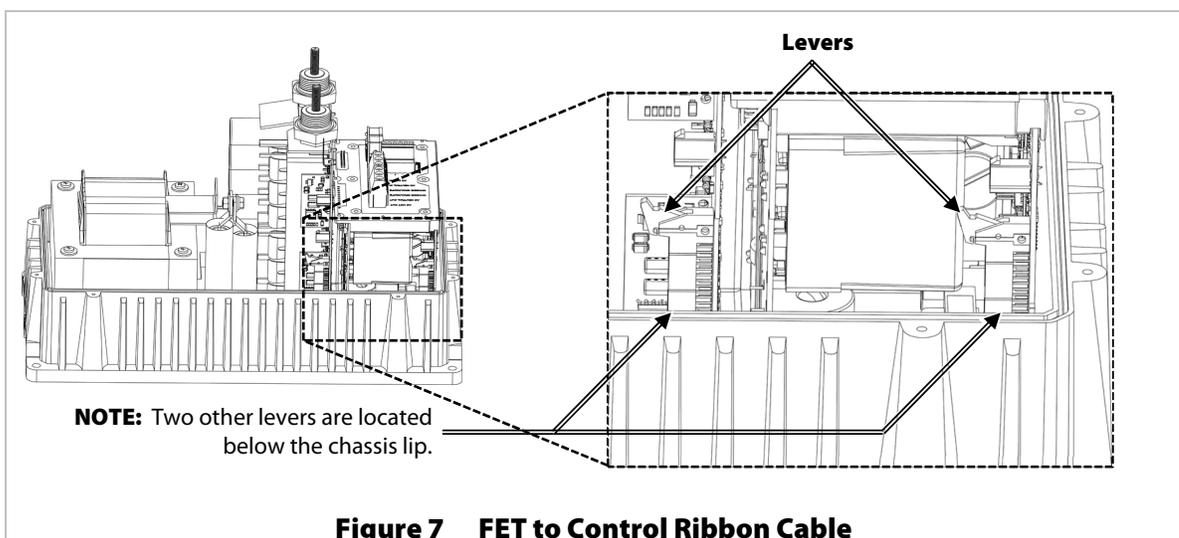
11. Remove the O-rings that are seated on the battery terminals. Remove the gasket located on top of the AC PCBA. See Figure 6.

NOTE: A larger O-ring travels the perimeter of the chassis and may come off during disassembly. If so, reinstall the O-ring during reassembly.

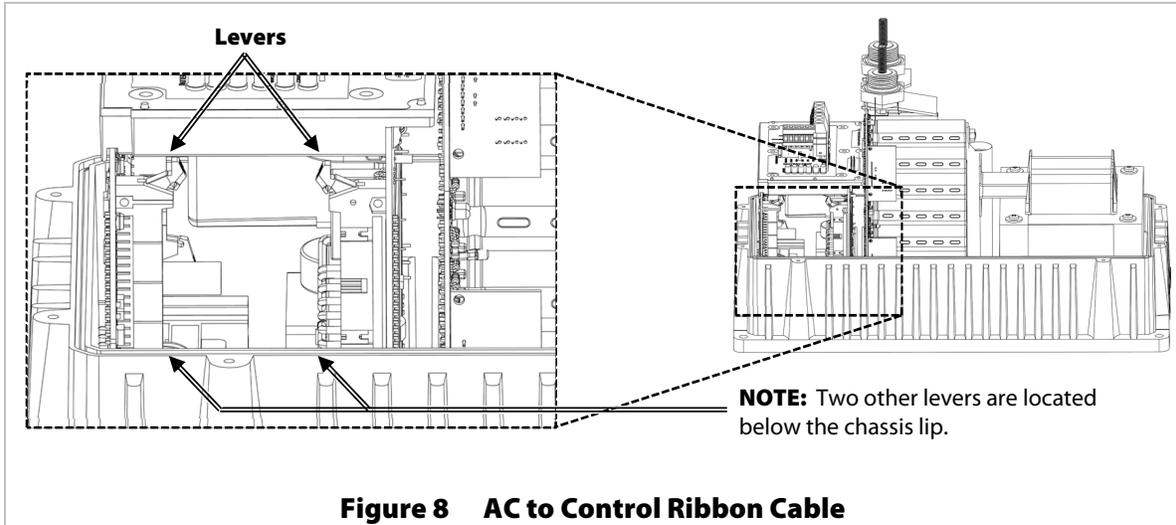


12. Remove the two ribbon cables that join all three circuit boards. One cable connects the FET PCBA to the Control PCBA. The other connects the AC PCBA to the Control PCBA.

To remove the ribbon cables, release the levers on each connector that holds the cable in place. The locations of the cable connectors are shown in Figure 7 and Figure 8.

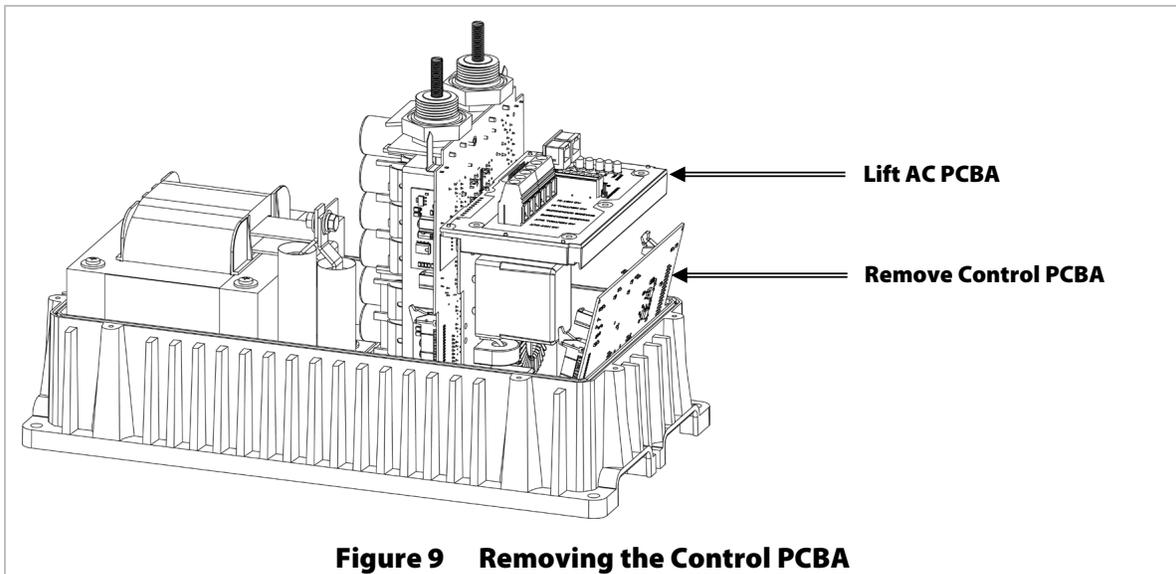


FXR Power Supply/Control Board Replacement Instructions



13. Gently lift the AC PCBA until there is resistance from the AC output wires connected to the AC Assembly. Pull out the Control PCBA. See Figure 9.

NOTE: No more disassembly is needed if the Control PCBA is the only board to be replaced.



Before removing the AC PCBA, using a pair of long-nose pliers, disconnect the white and black AC output wires connected at the bottom of the board. Remove the AC PCBA.

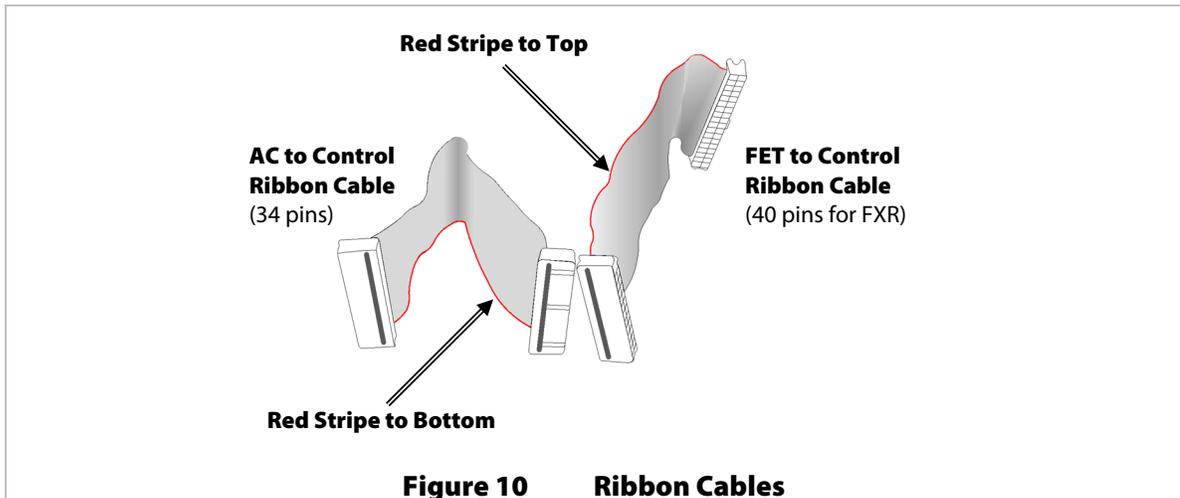
No more disassembly is needed.

FXR Power Supply/Control Board Replacement Instructions

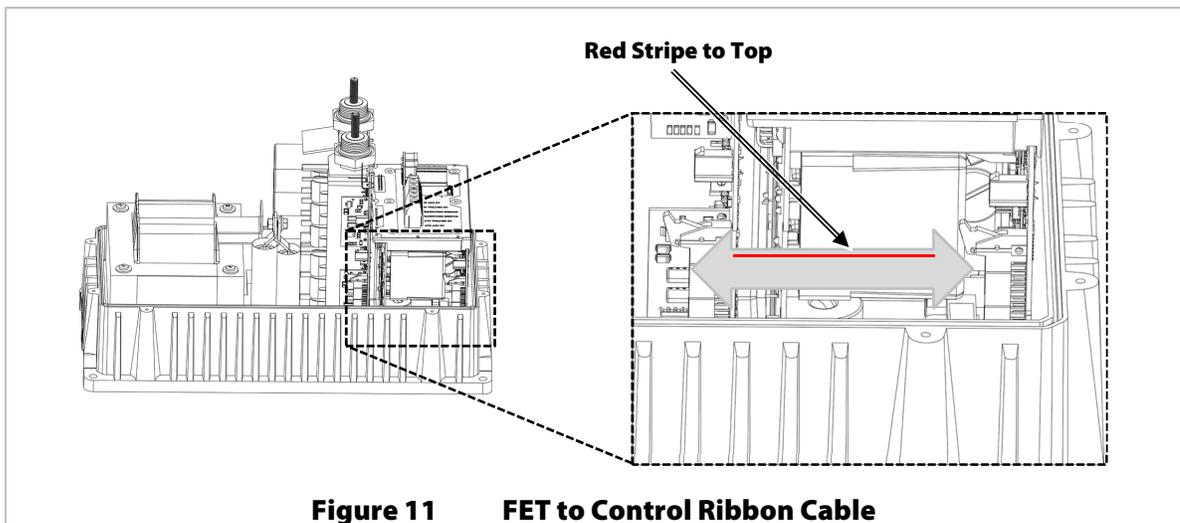
Assembly

14. Once each PCBA is seated and secured in the chassis, re-attach the ribbon cables to the boards.

NOTE: FXR-class inverters do not have identical cables. **Do not confuse them.** The cable between the AC PCBA and Control PCBA has 34 pins. The cable between the FET PCBA and Control PCBA has 40 pins. Ensure the cables are bent as shown in Figure 10 so that they can be routed correctly inside the inverter

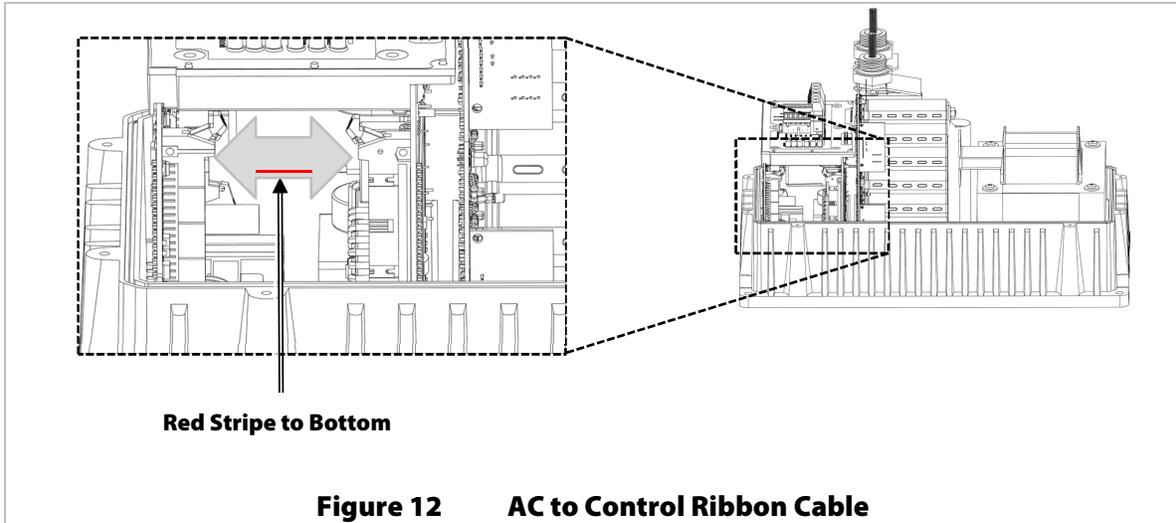


15. Install the ribbon cable that is bent on one end to the FET PCBA and the Control PCBA. (See Figure 11 and also Figure 7 if necessary.) This cable has 40 pins. Make sure the red stripe is oriented toward the **top** of the chassis. Push down on each end until the levers click and the plug is secure.

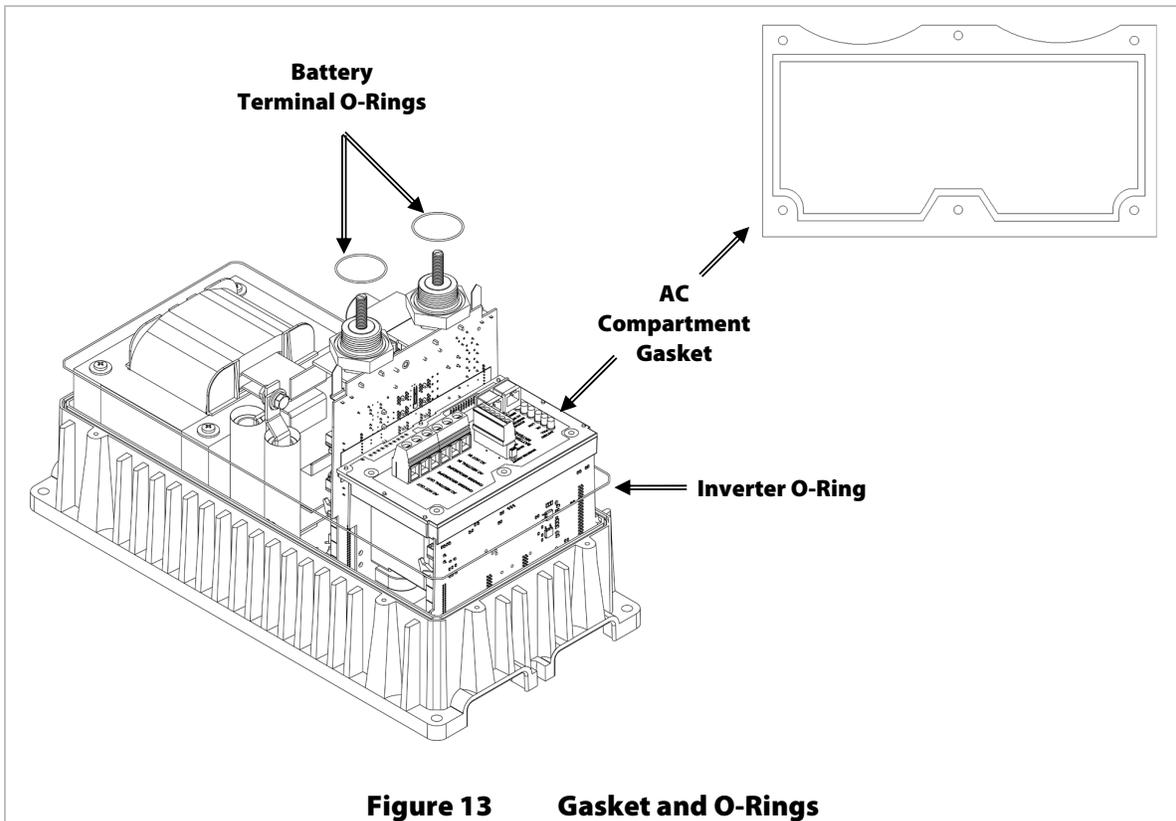


16. Install the ribbon cable that is bent in half to the AC PCBA and the Control PCBA. (See Figure 12 and also Figure 8 if necessary.) This cable has 34 pins. Make sure the red stripe is oriented toward the **bottom**. Push down on each end until the levers click and the plug is secure.

FXR Power Supply/Control Board Replacement Instructions



17. Install the gasket between the AC PCBA and the top cover. This gasket is used to keep water out. Make sure to line up the holes on the gasket with the holes in the AC PBCA. See Figure 13.



18. Install the two small O-rings on the FET PCBA battery terminals. See Figure 13.
19. If the large chassis O-ring is out of position, re-seat it into the groove on the chassis. See Figure 13.

FXR Power Supply/Control Board Replacement Instructions

Testing

Before reinstalling the top cover, the inverter should be tested to ensure it was assembled correctly.

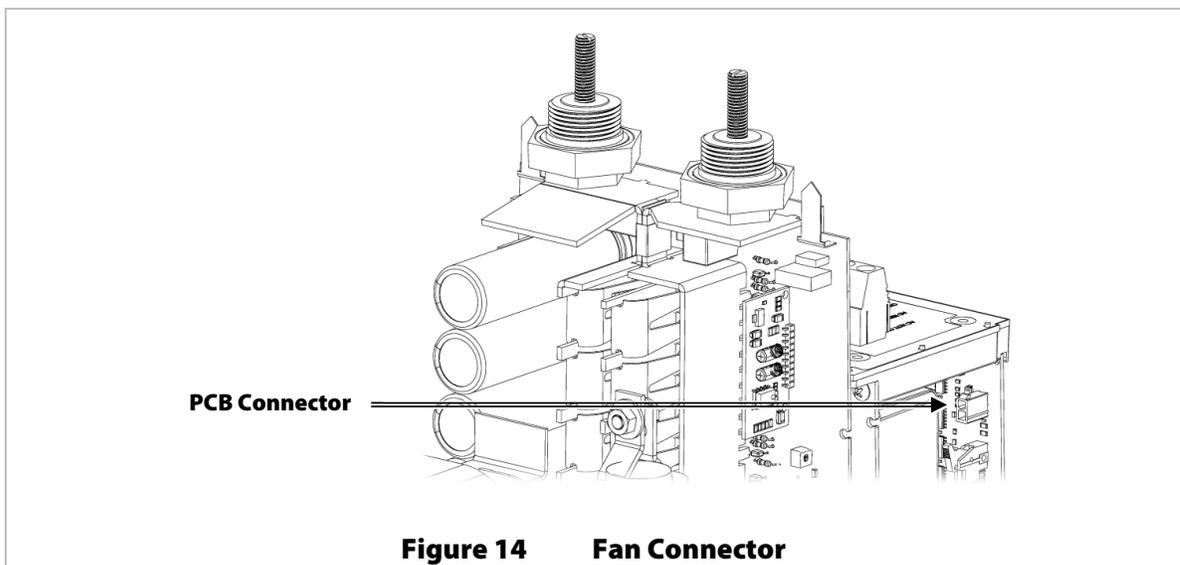
To test an assembled inverter:

1. Connect a DC power supply to the inverter. Use an appropriate voltage for the inverter under test (12 volts, 24 volts, etc.). 9-volt batteries may be used if a power supply is not available. For a 12-volt or 24-volt model, use three 9-volt batteries in series. For a 48-volt unit, use six 9-volt batteries in series.
2. The inverter will go through a boot-up routine. The red LOW battery LED indicator will illuminate. It will then be replaced by the yellow OK indicator and possibly the green FULL indicator.
3. The fan, if plugged in, will come on. The fan does not need to be plugged in for testing, but the ERROR indicator will illuminate if the fan is not present.
4. The FXR inverter is defaulted to the Off state. Turn the inverter on with the MATE3 system display, or remove and replace the ON/OFF jumper as shown in the Installation Manual.
5. After a few seconds the inverter should produce AC voltage, accompanied by the green INVERTER indicator. Check the output terminals with a DVM or voltmeter to confirm the presence of voltage. The AC voltage reading should be appropriate for the inverter model.
6. Once the inverter power-up sequence is confirmed, disconnect the DC power supply.
7. The test is successful if the inverter completed each routine. If this did not occur, it may be necessary to contact OutBack technical support for troubleshooting.

Completion

To finish reassembly:

8. Connect the fan cable. See Figure 14 and also Figure 5 if necessary. The cable should be routed through notches in the AC and FET PCBA. Routing them elsewhere may pinch the cable.



FXR Power Supply/Control Board Replacement Instructions

- Place the top cover over the chassis so that the battery terminals protrude through the holes in the cover.

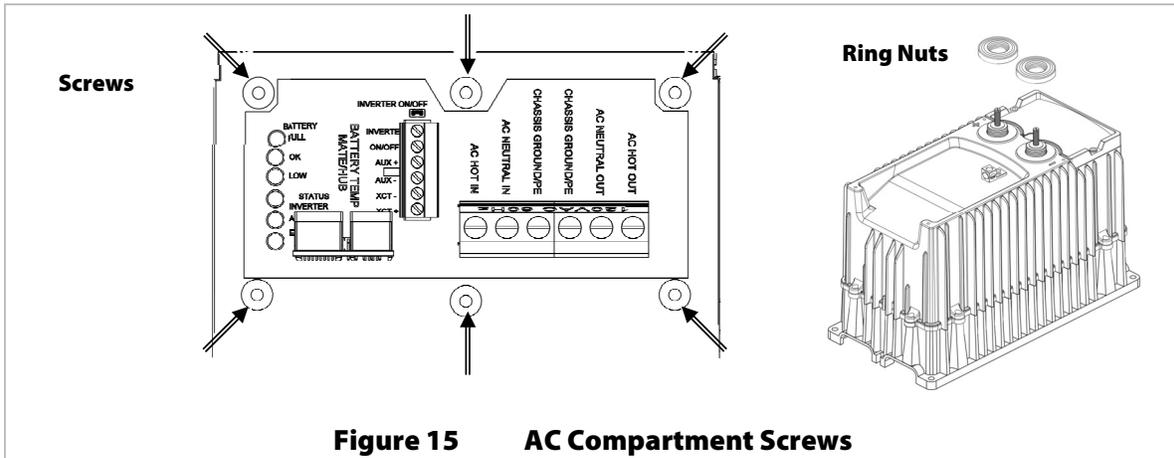


Figure 15 AC Compartment Screws

- Insert, but do not tighten the 6 screws that connect the top cover to the AC Assembly. See Figure 15.
- Reattach the red and black battery terminal nuts and tighten. Next tighten the 6 AC Assembly screws to a torque value of 15 in-lb. See Figure 15.

Install the 8 hex screws that attach the top cover to the chassis. Tighten to a torque value of 36 in-lb. See Figure 16.

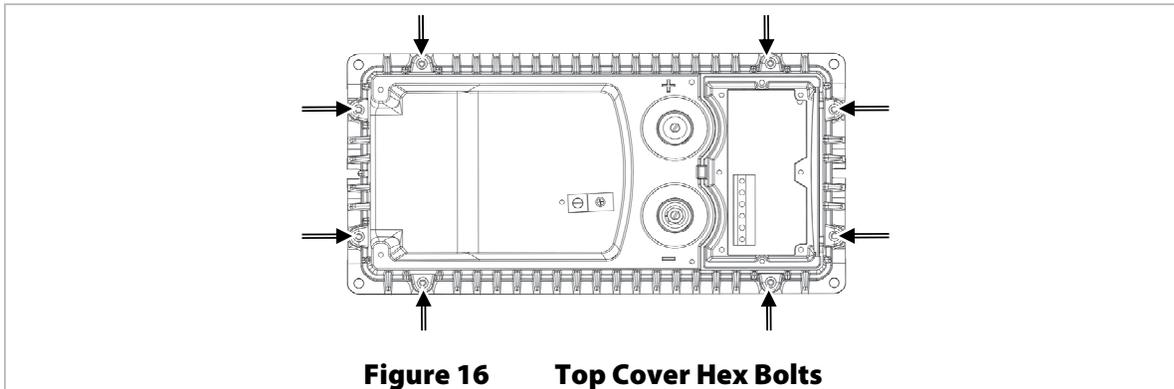


Figure 16 Top Cover Hex Bolts

- If replacing the Control PCBA in a **sealed** FXR-class inverter, it must be re-programmed for that model. (The default setting is for a vented model.) Apply battery power to the inverter. Using the MATE3, press the "LOCK" button, press the "UP" button, and insert the "Installer" password. The default password is [1][7][3][2] but may have been changed. If necessary, contact the installer or OutBack technical support.

Press the center button, select "Inverter", scroll down to "Model Select", press the center button, and then change the model to the correct (sealed) version. The results of this model change will take effect within 1 minute of making this change. Please allow this amount of time to pass without making any further changes to settings.

This completes the procedure for replacing the power supply/control board in FXR-class inverters.

Contact Information

Address:	Corporate Headquarters 17825 – 59 th Avenue N.E. Suite B Arlington, WA 98223 USA	European Office Hansastraße 8 D-91126 Schwabach, Germany
Telephone:	+1.360.435.6030 +1.360.618.4363 (Technical Support) +1.360.435.6019 (Fax)	+49.9122.79889.0 +49.9122.79889.21 (Fax)
Email:	Support@outbackpower.com	
Website:	http://www.outbackpower.com	

Disclaimer

UNLESS SPECIFICALLY AGREED TO IN WRITING, OUTBACK POWER TECHNOLOGIES:

(a) MAKES NO WARRANTY AS TO THE ACCURACY, SUFFICIENCY OR SUITABILITY OF ANY TECHNICAL OR OTHER INFORMATION PROVIDED IN ITS MANUALS OR OTHER DOCUMENTATION.

(b) ASSUMES NO RESPONSIBILITY OR LIABILITY FOR LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, CONSEQUENTIAL OR INCIDENTAL, WHICH MIGHT ARISE OUT OF THE USE OF SUCH INFORMATION. THE USE OF ANY SUCH INFORMATION WILL BE ENTIRELY AT THE USER'S RISK.

Notice of Copyright

FXR Power Supply/Control Board Replacement Instructions © February 2017 by OutBack Power Technologies. All Rights Reserved.

Trademarks

OutBack Power and the OutBack Power logo are trademarks owned and used by OutBack Power Technologies, Inc. The ALPHA logo and the phrase "member of the Alpha Group" are trademarks owned and used by Alpha Technologies Inc. These trademarks may be registered in the United States and other countries.