E-Series Troubleshooting Guide

The following guide will help troubleshoot any E-Series power supply.

Most overload issues are caused by the following in this order:

- Cracked or loose horn
- Bad convertor
- Application related such as too much air pressure, too much amplitude, a change in setup, changes in the actual parts you may be welding, part placement, etc.
- Please verify all of these before continuing with the troubleshooting or sending the unit in for repair. Many times, units are sent in to us for a repair and there is nothing wrong with them. This is because the problem was application related.
- Try the following:

  a) Swap out the horn. If there is no spare horn available, remove the horn from the booster and press the test button. If there are still overload issues, continue below.
  b) Swap out the convertor (this is the part that is connected to the top of the booster) If there are still overload issues, continue below.

The components shown may be slightly different depending on the model number, but the procedure is the same. Label all harnesses and wires that are disconnected in the process so that reinstallation is correct. Common symptoms are no output or constant overloads. This guide will address those issues.

1) Remove cover from power supply
2) Remove transistor and power harnesses from main board (M5,M6,M7,M8,M9,M10)

3) Remove the tuning coil harness M4 and the ground wire
4) Remove the overload board by pulling it straight up by the white handles. Also remove the harness connectors M2 and M3.

5) Remove the high voltage connector M1
6) Remove the 6 screws that hold the main board in the chassis and remove the main board.

7) Remove the left heatsink from the chassis by removing the screws from the bottom of the chassis that hold it in. There may be only one heatsink depending on the model number.
8) Test each transistor by using a multimeter to measure resistance. Take a reading from each lead to the case and between the 2 leads. If any readings are below 500 ohms, the transistor is shorted and must be replaced.
9) Check **each** transistor on the other heatsink mounted in the chassis
10) Remove any shorted transistors. Remove the 2 screws that mount the transistor to the heatsink and pull the transistor out.

11) Inspect transistor socket holes and the insulator for any damage or arcing. Replace the transistor socket (821-00113) or insulator (868-00053) if there is any damage.
12) Install replacement transistors (Part no. 877-00022). Reinstall the heatsink in the chassis.

13) Inspect the balance transformer for any damage. It may be burnt or the wires may be melted. Replace if necessary. (Part no 881-00039).
14) Test each bridge rectifier for a short by using the resistance setting on the multimeter. There will be 4 different readings on each bridge rectifier. Replace any that are shorted (Part no. 824-00033).

14) Check for a shorted main power relay using the multimeter on the resistance setting. If it is shorted, replace with part no. 866-00036.
15) Verify that the main transformer is tapped for your incoming line voltage. Move the black wire to the appropriate tap which is on the transformer label. If your incoming line voltage is 208V, move the black wire to the 200V tap.

16) Check the tuning coil assembly. Make sure the nut behind the ferrite is tight. Sometimes it becomes loose and will affect the tuning. Also, check the actual coil itself. In some instances, it will separate from the ferrite base and will sit in the assembly loosely. If this occurs, reseat it with silicone.
17) Check the tuning cap (C13A) on the main board using a multimeter on the capacitance setting. They should read the following based on the frequency of the power supply (check the label on the back of the power supply for frequency):

- **15kHz**: 112 nanofarads
- **20kHz**: 0.066 nanofarads
- **40kHz**: 0.033 nanofarads

If not, replace both C13A (Part No. 817-00161) and C13B (Part No. 817-00162).

18) Check the resistors R26, R30, and R31 using a multimeter on the resistance setting. In order to measure these, the relay K2 must be removed from the socket as shown below. Push the relay clips back and pull the relay up.
19) Check R26. It should read approximately 100 ohms. If not, replace it (Part no. 867-00124).

20) Check R30. It should read approximately 400 ohms. If not, replace it (Part no. 867-00196).

21) Check R31. It should read approximately 400 ohms. If not, replace it (Part no. 867-00196).
22) Check the diode D26 for a short by using a multimeter on the resistance setting. If it reads below 500 ohms, replace it (Part no. 824-00012).

23) Inspect the clad around the K2 relay for arcing or any that is blown, especially around the areas where the big coils plug into the board (#1,2,3,4). If there is any such evidence, remove the bad clad with a razor blade by peeling it off the board and clean up any burnt material with a dremel tool or the razor blade. Jump any blown clad with high voltage coax wire. Also check the back of the board for the same thing and repair as stated.
24) Reinstall relay K2. Make sure that each pin is in the socket and that it is seated properly.
25) Check all the clads between the transistor sockets to make sure they were not damaged and are no longer connected. Use a multimeter to ohm the connections out. Start with M5, M6, and M7, then check M8, M9, and M10.
26) If there is any clad that is burnt or separated from the main board, cut the remaining clad out and clean any carbon or burns with a dremel or a razor blade. Then solder 18 gauge buss wire to reconnect all points that were removed. See below for an example.
27) Reinsert main board into chassis and fasten with the 6 screws removed in disassembly. Reconnect all harnesses (don’t forget the ground wire from Step 3).

28) Reconnect all cables and turn the power supply on. Check the DC Voltage as shown below. If it does not fall within 1 volt, please contact us to send the unit in for repair. If it checks out okay, try welding a part. If there is still a problem, please contact Service at 203-270-4600.

**Constant Overload**

- If the power supply constantly overloads, check the voltage across the 4 filter capacitors shown to the left. The compared voltages should be within 1VDC of each other.

If the voltage’s across the 4 caps are out of balance, the most likely cause is a shorted transistor in one of the banks directly behind the capacitors. Replace the failed transistor and verify the balance.