

DRAFT - Part 2 – Converter Saga

We've had lots of opportunities to learn new things recently. This time it was our 120 VAC electrical system. We [reported](#) on our mysterious GFI electrical outlet trips and adventures with the meltdown of our neutral wire electrical bus. Not only did we smell the overheating and feel the hot electrical panel, we discovered most of the 120 VAC white (neutral) wires in our Class B where charred at the termination point when our friend Jim removed the face plate of the electrical panel and spotted the trouble. With the shore power disconnected, we worked on the repairing the damage over several days.



Scorched Neutral Wires

What caused it? We still don't know. One Roadtrek owner said they experienced the identical scenario, and they did not determine the cause. Close inspection revealed: 1. A charred neutral terminal bus bar whose plastic mounting plate had melted and partially curled over the edge of the bar. 2. Seven charred white wires, two of which were no longer connected. 3. The ground wires on the ground bus bar were discolored and had likely overheated also. 4. The black wires connected to the circuit breakers were in perfect condition. 5. Incoming wires to the box were shielded by flexible plastic conduit looped around so there was plenty of excess wire that enabled us to pull more wires into the electrical box and trim off the charred ends. 6. A probable defective GFI outlet in the kitchen.



Converter box with wires & circuit breakers removed from 120 VAC electrical panel.

Roger replaced the kitchen GFI outlet. (More about that later.) Jim measured and fabricated a new insulator for the new neutral bus bar. Turns out every large hardware store has electrical bus bars in several sizes -- standard equipment in home electrical panels. Jim mounted the bus bar on a newly fabricated block of plastic and drilled holes in the corners of the plastic to match the original. Roger mounted the new bus bar assembly on the box wall with 2 pop rivets. Lynn labeled each circuit, pulled out the wires and trimmed the damaged neutral and ground wires, and stripped back more insulation to make up for the lost length. She then threaded them back into the box and tightened the clamps. Then came the fun of lying on the floor and trying to neatly arrange all the wires and connect all the copper wires to the ground bus bar, all the white wires to the neutral bus bar, and reconnect all the (now labelled) black wires to the proper circuit breaker. We made sure all the screws were tight and that wires could not be pulled out. Time to call Jim to inspect the fixes before we hooked the RV back to shore power.



120 VAC panel rewired

Jim is a certified aircraft mechanic as well as a machinist (and Roadtrek owner and occasional Onan generator mechanic). He is one of those guys who can troubleshoot and fix anything. He graciously offered to check everything before we returned any electrical power to the system. He found Lynn missed a neutral wire in the electrical panel - oops! We connected that

and Jim checked all the connections with the Fluke multimeter. Holding our breath, we plugged into shore power. Nothing happened--no fireworks. The Progressive Industries Power Monitor clicked and activated the RV 120 VAC system perfectly. And the GFI on our front porch did not trip. Jim verified that neutral and ground were bonded after plugging into shore power (and not before). We checked all the outlets with a plug-in 3-light electrical tester. All was good except the kitchen GFI and the outlet downstream of it. Jim found the problem was a wire had come loose on the GFI Roger replaced. Jim fixed that. Now all the outlets tested normal. **Success!**



All back together and ready for the door to be reinstalled

Further Lessons learned. The last time we reported that if you get that hot electrical smell, there's a reason. Shut off the shore power (or generator) at once. Keep track of what you fixed or tried to fix – write it down. Get help as soon as possible from your expert RV service center. Explain your trouble on RTI Chapter's CyberRally, or the Yahoo Roadtrek email group or one of the Roadtrek Facebook group – chances are someone else has had the same problem. We also learned the following: Always do the tug test on any electrical connections. You may not find the cause of the trouble, but if you fix it, you can travel again. We wonder what our next learning experience may be?!!