



Airstream Tech Help Group

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This group, part of the WBCCI Technical Standing Committee, has been established to help the membership with any of their technical RV problems. Examples of questions that might be of interest to many members will be published in the Blue Beret. We will respond directly to you, in response to your email or letter describing a problem you are having. We hope you will find this new service of value in the care and feeding of your RV. You may contact us as follows: techhelp@wbcci.org or by mail: Howard Lefkowitz, 11508 Colt Terrace, Silver Spring, MD 20902

120 VAC POWER TO RV

Problem: I recently de-winterized my motorhome and hooked up to shore power but I am not getting any 120 VAC. I can measure it at the end of my extension line but it is not getting to the circuit breaker panel. I am on a 30 amp outlet. When I run my generator everything works fine.

Answer: The usual cause of this problem is the transfer relay which switches your AC circuit breaker panel from the shore power cable to the generator output. This relay is either a single 4-pole or two 2-pole relays. This provides the ability to switch the 4-wire, 50 amp input from shore power to the generator. The normal configuration is with shore power connected so that your coach gets power as soon as you plug in. When you run the generator it provides 12 volts DC to the relay and after a time delay it switches to the generator AC output. The relay, Figure (1), usually fails because of burned contacts which is the normal shore power position.

DISCONNECT FROM SHORE POWER AND REMOVE ALL VOLTAGE FROM THE RIG!

The failure mode is usually burned contacts which block shore power to the rig. Operate the relay by hand and clean both sides of each contact with crocus cloth or very fine 0000 sandpaper. The relay's normal mode is with the shore power on so that no external power is required when you turn the system on.

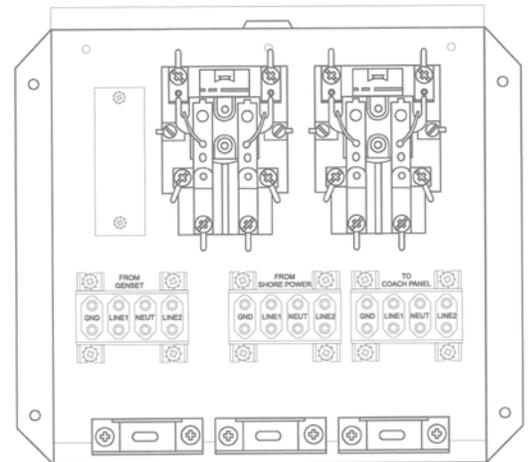
If the system is still not operating after you clean the contacts then you should check the connections between your input line and the coach. Usually in your rearmost compartment on the driver's side there will be an electrical box which has the shore power feed line connections. **After removing all power to the coach** remove the cover of this electrical junction box and examine the connections. I have found wire nut connections that are defective in several trailers and motorhomes. Check the wire nuts for tightness. If they just go around and will not tighten then they are probably too large. Replace them with the next smaller size, and securely tighten them.

To use wire nuts for an RV (3M recommendation) use the following procedure:

1. Strip insulation from each wire about 1/2 to 5/8 (depending on wire size) inch.
2. Firmly grasp wires, making sure insulation ends are even and tightly bundled (wires may be twisted or untwisted). For one stranded wire it should be slightly longer. Slip the proper size connector over the wire tips.
3. Turn the connector onto the wires in a clockwise direction until it is secure.

50 AMP TRANSFER RELAY DELAY - DUAL INPUT GENSET

SERVICE MANUAL



Cover removed
(INSIDE VIEW)

Figure 1 Transfer Relay

4. Wrap the wire and connector (2 layers) in electrical tape to keep the wire nuts from loosening under vibration.

A complete set of tables for wire connections can be found at:

http://www.crcorp.com/DCT_HardwareEssentials/E/pdf/E12.pdf which includes proper wire nut sizes.

Results: Cleaning the relay contacts did not fix the problem. However, all of the wire nuts in the main AC electrical box were loose and turned around just as you said. The wires were twisted together which is why I guess the rig worked for 9 years. I really appreciate this help.

Updating a 4-button CCC to a 12-button System

Problem: Here's my problem and I hope you have some references for me. As you've heard the tale of woes many times by now, our old four button Dometic Comfort Control is slowly ceasing to function. The two Dometic Penguin AC units work fine and the heat strip works in one of them. The Atwood furnace works fine...very difficult or next to impossible to switch from front zone to rear zone. This is the second control unit I've installed (found a used one several years ago). What I need are some details on options available to cure the problem. What is the best investment? I've heard, but not actually confirmed, that there are replacement circuit boards which allow a new wireless digital controller to be used. Given that the AC/Heat units are twelve years old, maybe it's best to replace everything???? Please let me know what you know about this widespread problem.

Answer: As usual you have three choices:

1. Buy a rebuilt 4-button CCC on eBay. What usually goes bad is the switches and they can be cleaned. This is obviously the cheapest and easiest approach.
2. Convert to a 5-button, which requires a new control board in each air conditioner. There are several vendors for new kits on eBay that run from about \$210 to \$300.
3. Convert to the newest CCC 2; <http://www.rvpartwholesaler.com/servlet/the-Duo-Therm-Air-Conditioners/s/51/Categories>. This guy also sells boards and the 5-button CCC conversion. He has reasonable prices on new units. Camping World charges about \$110 for a 5-button CCC.

If the air conditioners are working fine, I would not replace them at this time since that is in the \$2000 range. I have included some good PDF's that detail the operation of the 12-button CCC that should help in your decision.

Results: As you may recall, the system which I was working on had a dual zone Dometic Duo-Therm Penguin Air Conditioner Model #620315.321 with heat strips and the Dometic 4-Button Comfort Control Center Model #3106463.

The problem was that the CCC would not function (erratic at best) and the AC and furnace units worked fine if you could turn them on and off.

Well the work is done and the problem is fixed. The email I received from Dometic, along with your assistance, lead me to the right course of action. I called PPL Motor Homes, 713-988-5555 / 800-755-4775 and they had the parts. I bought the following items.

Buying the parts is easy!

Two Dometic Circuit Control Boxes w/ boards #3312020.000, which cost \$108.00 each (circuit control boards are used with the new Dometic twelve button CCC). One Dometic Twelve Button CCC #3312024.023, which cost \$100.50 Shipping \$7.99, Total cost \$324.49

Now for the fun part!

When you get the new control circuit board, it is mounted inside a metal box with all the wiring harnesses and quick disconnect plugs...**no directions are included.**

The first thing I did was turn off all the AC & DC power to and in the coach!

Up on the coach roof: I took the top plastic shroud off the AC unit and then took the cover off the circuit board enclosure on the starboard (right) side of the AC. Inside this small, little, tight space is the circuit board along with the compressor starting capacitor and relay. There was no way the new circuit board mounted inside the new metal box was going to fit inside that space. Therefore, after a careful study of the situation,

measuring and noting where the wiring attached and what it was supposed to connect to, I concluded that I would have to remove the new circuit board from the new metal box and mount it where the old circuit board was located. I had to remove the old circuit board from its mounting posts. Before doing so, you first have to remove two screws that hold the mounting plate for the capacitor, relay, and pull that unit up and out of the way. It was not necessary to disconnect any wires in order to move the mounting plate. Then you can get to the four small plastic mounting clips that hold the circuit board in place. I pulled the old circuit board out a short distance and systematically began removing one wire at a time and plugging the wire onto the new circuit board. Several of the quick disconnect plugs on the new circuit board were not relevant and were discarded along with the new metal mounting box...(my conclusion was that this circuit board and metal mounting box was made for several different models of AC units that now have quick plug in features). All of the existing wiring had connectors that fasten to the new board. There was only one new ground wire that attached to the circuit board, which had to be wired into the existing wiring harness. The old icing sensor, which is fastened to the evaporator coil tubing, has to be removed and replaced with a new thermistor sensor included with the circuit control board kit. The wiring for this sensor is routed through the wall of the box that houses the evaporator coil and connects, with a quick disconnect plug, to the new circuit board. I tried to use the old sensor but it was not compatible with the new control board. You need to set the dip switches on each circuit control board to correspond to the location of the board (Zone 1 - front/main and Zone 2 - rear in my case) and the heating and cooling systems which are connected to the AC

Well the work is done and the problem is fixed.

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Updating a 4-button CCC to a 12-button System

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unit in that particular zone (i.e. heat strip, furnace, heat pump, etc.).

Inside the coach: I disconnected the old thermostat from the RJ-11 cable and removed the old mounting plate. I mounted the new thermostat mounting plate to the wall (required a larger hole in the wall for the round protruding plastic case to recess into the wall. I plugged the new thermostat into the RJ-11 phone cable and turned the AC and DC power back on. You have to initialize the CCC 2 so that it reads the various heating and air conditioning components that are in the system.

To do a **System reset for a 12-button CCC 2**, make sure the thermostat is in the OFF mode. Simultaneously press the **MODE** and **ZONE** buttons. The LCD display will display **IniT** and all available zones. Release the **MODE** and **ZONE** buttons and press the on/off button to exit system set up.

The above reset must be done for any changes in the system configuration that involves changing the dip switches. The CCC 2 reads the setting of the dipswitches and determines how many zones are being controlled. Having done that, I turned the system on and selected Zone 1, Air Conditioner... bingo...after a

short pause...the AC unit came to life. I did the same thing for Zone 2 and SUCCESS. I have not been able to test the furnace or heat strips because the ambient air temperature is too high to allow the systems to come on. I am confident they will work fine since the AC units do. Having had success I went back up on the roof and put the covers back on the circuit board enclosures and put the plastic shrouds back on top of the air conditioners.

So there you have it.... about fours of work (could do it a lot faster now that I've determined what and how things need to be done) and a lot less investment than two new air conditioning units and a thermostat. We are so happy it is fixed and that we no longer have to deal with the old erratic 4-button CCC.

Thank you Howie for your support in this matter. We wish you had been here to see it all come together and have first-hand exposure...but maybe this long drawn out dialogue will be of some value to someone else. I made up my mind that I could do this and it can be accomplished by anyone who has some analytical patience, a bit of mechanical skill and can-do attitude!

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