

Changing the 30 amp system in the prior to 2001.5 coaches to a true 50 amp

I have a 2000 37 V Discovery motor coach. It was designed with a 30 amp power system which is just plain foolish for a coach of this size. I am told by the factory in Decatur that 90 % of the coaches coming in for service have burnt 30 amp male plugs. This in spite of a shedding system, and current limiting devices that are suppose to prevent this problem. That is just pure fantasy.

As anyone who can compute a formula of amperage based on voltage, it is clear and a non arguable fact that as the voltage drops, the amperage is increased, and vice versa. 50 amps is not the absolute best, but it provides 11,000 watts of power while the 30 amp at best can only produce 3,300 watts. You are sunk before you begin with a 30 amp power supply.

It is possible in several ways to change this problem. You could add another 30 amp cord and split some of the circuits, but that would only give you 6,600 watts of power. A far cry from the 11,000 the 50 amp service provides.

Before you begin, you need to understand how the power is connected into your coach. Your 30 amp system utilizes a 7500 watt diesel generator producing 2 30 amp single phase circuits. The power produced is "in phase" which is to say there is 30 amps of 110 volt power singly or between the 2 power conductors to ground, or between the two power conductors. In a 50 amp system which is in reality a 220 volt circuit with (2) 110 volt conductors, (1) neutral, and (1) ground The 110 volt conductors are #6 wire the neutral is #8 as is the ground. There will be a potential of 110 volts to ground, but 220 volts between each of the 110 volt conductors. Since the phases are "out of phase", this means the neutral wire will never carry the total load of the 11,000 watts, unlike the generator. In reality, you have (2) 110 volt 50 amp circuits to work with. Our coaches do not use 220 volt power.

Here is how I changed my system, to a true 50 amp setup, which has provided us with ample power for our coach. It can be done for under \$400 if you are knowledgeable enough to do electrical work. **I assume no liability for the following project, and you are at your own risk and peril for the results and outcome.**

First of all, you need to understand your system.

Basically Fleetwood brought 2 30 amp power leads from the 7500 watt diesel generator into a junction box back of the power panel under your refrigerator. There, a transfer switch allows separation of shore power and the generator circuit. This system cannot handle 50 amps so it is removed. I bought a 6 breaker homeline panel box from home depot, and mounted in the sewer compartment where the shore power cord is connected to the coach. This is in a protected environment, and you will have room to put the new transfer switch here, and the panel for the breakers. It is also an easy area to reach the wiring that will need to be altered for the new system. Since my system retains the original breaker box under the refrigerator, we need to feed that box with a 30 amp breaker from the new 6 circuit panel in the sewer compartment. We also need to cut the wire from the inverter, and feed that with a 30 amp breaker. On my coach the romex coming from the breaker travels in the bathroom chase on the lower outside wall. Yours may be different. I cut the feed wire to the inverter at this point, and used the continuing #10 romex to feed the old breaker box under the refrigerator.

I have new electrical power outlets in the bath for a wall heater (15 amp breaker). (1) 20 amp breaker for the front air conditioner. You will need to run a new wire to the removed circuit from the panel under the refrigerator which powered the front Air conditioner unit. I ran another 20 amp circuit to the galley area, and I have a 1500 watt element in my water heater. That wire is fed from the new 6 circuit panel.

Sizing this up, you now have the following:

Utility plugs, rear A/C, refrigerator, block heater, and one kitchen plug , bath GFI on the original panel under the refrigerator.

Inverter,(remember there is a 20, and a 15 amp breaker on the inverter that powers the micro wave, and front and rear TV plus the dinette plug) front A/C, water heater, galley plug on the new panel, plus a 30 amp feeder for the original breaker box under the reefer. The inverter has circuits which limit the battery charging function depending on load conditions of the 15 and 20 amp pass through circuit breakers. This completes the basic wiring.

I used an ATS100 generator transfer switch which is now obsolete. A newer transfer switch with a 60 amp neutral is now its replacement, but at higher cost. The problem with the ATS100 is the neutral will only carry 50 amps, and because the generator is capable of producing only in phase power, the neutral used for the purposes here could possibly be overloaded. (2) 30 amp circuits with a common neutral would put 60 amps on the neutral. In order to correct this problem, I bought a 60 amp 110 volt contactor, and wired the neutral through that instead of the neutral in the ATS100. When the generator starts, there is a delay for about 30 seconds at which point the 60 amp contactor is energized, and switches the neutral from shore power along with the coach inputs. I went one step further, and used a digital amp meter mounted in the coach above the refrigerator to monitor my neutral current during generator operation. I think I paid around \$10.00 on EBAY for this digital gauge and the sensing coil in which you run the neutral conductor of the generator circuit through. Your present 30 amp system uses a similar sensing coil for the shedding circuit which is part of the original design.

Basically you wire the 50 amp shore power cord into the ATS100, and bring a 2 circuit #10 romex from the generator box under the coach and back to where the ATS 100 is located. This is wired into the transfer switch, and the transfer switch wired into the new 6 breaker panel. Make sure to disconnect the circuit that powers the old generator to transfer switch in the firewall junction box of the coach.

I purchased a new 50 amp power cord off of EBAY for \$100.00

I purchased the ATS100 on EBAY for \$50.00

I purchased the 60 amp contactor for \$35.00 on EBAY

Misc connectors romex wire clamps etc about \$20.00

Home depot has the breaker box and all necessary wiring parts for under \$50.00

I had some old 30 amp shore power cords that I used for the generator to transfer circuits. You could use your old 30 amp cord which is no longer needed.

I did all the work alone, and it took me about 5 days to complete as a lot of labor goes into pulling wire. It turned out to be an easy project, and everything is well hidden for aesthetics.

Common sense must still be maintained while using your motor home electrical power. If you exceed the 50 amp pedestal power, you will trip the breaker. Since the new 50 amp plugs are much sturdier than the flimsy 30 amp male plug, no more burned plugs.

Remember that you will not have an energy management system like the new coaches which will shed circuits, but that is really not necessary from a safety point. All your circuits will be circuit breaker protected with this format.

Submitted by Gary Bogart