

## Installing the Optional 3<sup>rd</sup> Air Conditioner in a Fleetwood Discovery

Fleetwood offered an optional 3<sup>rd</sup> A/C unit in the 2011-2015 Discovery in the 40E, 40G, and 40X models.

Our 2011 Fleetwood Discovery 40X did not have the third A/C option for the bedroom at the time of purchase. For us, this area of the coach suffers from a lack of cooling, particularly when exterior temperatures rise above 80°. We wanted to install the third A/C as it would have been done at the factory had the option been selected when the coach was built.

### Component Overview:

- Because this coach has a central AIR distribution that join the output from all A/C units and the ceiling vents, it uses a ducted plenum between the A/C outputs and the ceiling vents in roof running the length of the coach. As such, the ceiling contains no A/C controls. Only the intake and exhaust vents can be seen on the ceiling. This is referred to as a TOP Down A/C installation.
- In a Top Down A/C installation, the A/C Controller does not reside inside the roof top A/C unit and is located elsewhere in the coach. In our case, the controller location for all three zones controllers was behind a panel in a side cabinet over the driver's head.
- 120 Volt AC Power from the Shore Line or Generator comes through a power panel circuit breaker to the A/C Controllers and from there to the roof top A/C units. In our case, the power panel is a Precision Control Power Breaker Box located in a Bathroom Cabinet.
- Temperature Control is provided by a Coleman Mach RV Comfort Zone Controller Thermostat and three thermistors, one for each zone. The thermostat is also connected to each of the A/C Controllers. This type of thermostat can control the A/C for cooling and for heating, the Gas heater, and/or optional A/C heat pump, or optional A/C heat strips.

### Installation Considerations:

In order for it to be practical to install a 3<sup>rd</sup> Air conditioner, the following items must have been installed at the factory when the coach was built:

- Roof Top A/C Support Framing. Without this metal framing embedded in the roof of the R/V, the Top Down bolts will not have sufficient holding power.
- Space in the power panel for a new Circuit Breaker for the 3<sup>rd</sup> A/C power.
- 120 Volt wiring from the Power Panel to the 3<sup>rd</sup> A/C Controller location.
- A high and low voltage connector cables from the 3<sup>rd</sup> A/C Controller location to the 3<sup>rd</sup> Roof Top A/C location. Usually this is a single 9-pin cable and separate 2 wire Freeze Harness.
- Low voltage wiring from the 3<sup>rd</sup> thermistor (for sensing temperature in each zone) to the Thermostat.
- Low voltage wiring from the Thermostat to the 3<sup>rd</sup> A/C Controller location.
- Optional Load Shed wiring from the Power Panel to the A/C Controller. In our case, Load Shedding is controlled by the Precision Control Power Panel.

### Verification of Required Factory Installed Components:

It is interesting to note that Fleetwood may or may not have accurate information about these items in your coach as they are not needed without the option being installed. The best approach is to inspect the coach to see if these items exist. In my case, they did. Here is how I was able to validate that they were installed. You can contact REV /Fleetwood Customer Support using this link, <https://www.fleetwoodrv.com/technical-assistance>, fill out the form and ask for drawings for your coach. We used the Fleetwood Main Ceiling 40X (770-18-00024, sheets 1, 2, 6 & 10 of 14) for reference locations. Your coach may have different documents.

- Thermostat – We checked the walls in each zone and located all **three** ‘football shaped’ thermistors.



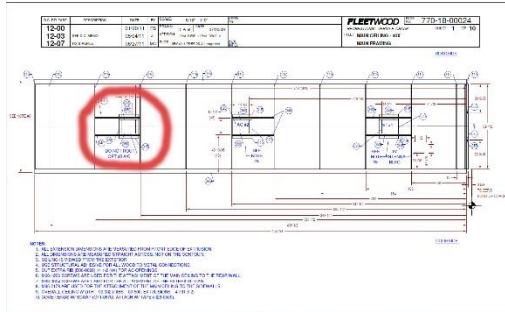
- A/C Controller Wiring –we opened the access panel over the driver’s seat where the 1<sup>st</sup> and 2<sup>nd</sup> A/C controllers were located and located the 3<sup>rd</sup> power cable from the power panel, the thermostat wires and the load shed wires.



- A/C Power Line - we opened the cover on the Precision Control Power Panel and located the 3<sup>rd</sup> A/C power line as well as the open slot for the new circuit breaker.



- Roof Top A/C Support – Using an Endoscope attached to my cell phone through the vent openings, we determined that the bedroom 3<sup>rd</sup> A/C framing was installed. We also located the cables in the ceiling running to the 3<sup>rd</sup> A/C Controller.



### Obtaining the Missing Components:

All of the roof top support beams and interconnecting cables had been installed at the factory. Now that we know that the installation is practical, we needed to purchase the following missing components.

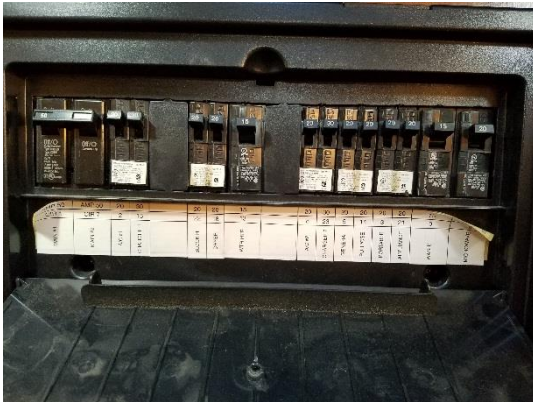
- The new A/C roof top unit - The factory installed 3<sup>rd</sup> A/C unit is usually a 13.5K BTU Coleman Mach 48058-879 Power Saver Heat Pump, Black. We decided to install a Mach 48004-879 15K BTU with the Heat Pump option. \$814 + \$50 to get it put on the roof.



- The new A/C controller – The factory installed A/C controller is usually a Coleman 8530C751 controller. Model numbers have changed over the years. We installed a Coleman 8630D5081. \$160



- The New Circuit Breaker – This is a typical 20Amp Square D circuit breaker. \$6



We also found that we needed the following from Fleetwood:

- Plenum Roof Air Duct Connector part number 588940 – this connects the A/C to the air plenum running the length of the ceiling. It sits right under the A/C and between the ceiling and the roof. \$88



- Kit, A/C Plenum Top Mount part number 582793 – Hardware needed to bolt the A/C unit to the metal frame inside the roof from above. \$70
- Seal part number 10032723 – This seals the A/C output to the Plenum Roof Air Connector. \$2

### Installation Process:

#### A/C Unit:

- Cut the 14" x 14" hole for the A/C using Fleetwood documents to determine exactly where the support framework is installed. This is likely the scariest part of the installation!
- Install the Plenum Connector in the opening and seal with foil tape, then add the top seal for the A/C output.

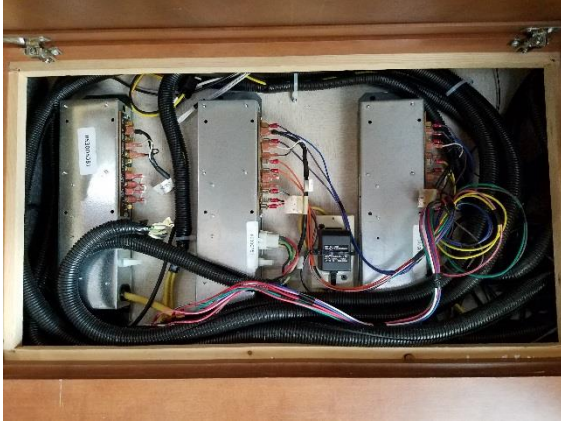


- Install the Top-Down installation kit on the A/C.
- Mark (I used removable painter's tape) the exact location where the A/C will rest, then turn the A/C on its side being careful to protect the roof from the sharp edges of the installation kit.
- Reach into the hole and pull out the 9-pin controller and 2 wire freeze harness and connect to the A/C unit.
- Connect the freeze probe to the freeze harness and insert into the coil assembly.
- Follow the directions for the Top-Down kit to complete the installation.

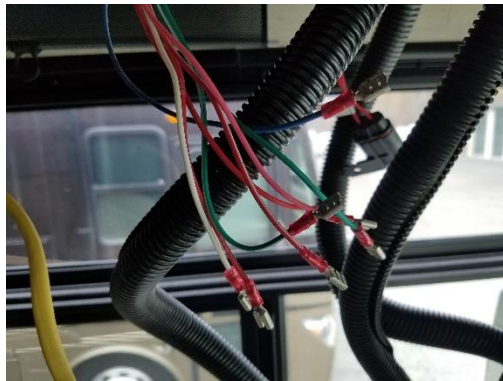
#### A/C Controller:

Example Fleetwood documents. You will need to provide Customer Service with your VIN and FIN to get the documents for your coach. 120V Electrical - FW 770-19-01324.pdf, 12V Electrical - FW 770-19-00024.pdf.

- In the cabinet over the driver's seat we had to remove and reinstall the controllers for A/C # 1 and #2 to the right to make room for Controller # 3. The existing 120V socket and 12V power adapter also had to be moved.
- Installed the 3rd A/C Controller in the space to the left of the current A/C controllers.



- Connect the 120 volt, 20A, 12/2 w/g power wire and the loose bundle of wires for the A/C wire, freeze harness and single wires to the connections labeled R+, Cool Shed, Room, Freeze, Gen, B-, & Sig. Heat Shed is not used.



- Do NOT remove Cool Load Shed jumper until you can get the Load Shed Sequence reset for this new configuration at a Fleetwood service center. Owners and Dealers do not have the capability to perform this programming change. Until then, the 3<sup>rd</sup> A/C cannot be programmatically shut down in an electrical overload but it will still be automatically sequenced for startup or shut down. In most cases, this will not affect operation unless you are trying to use more power than the shore power or generator can supply.

Power Panel:

Get a Certified Electrician to perform the following!

- Remove all shore power, shut down the generator and disable all inverter power. Verify that there is no power in the power panel.
- Install the circuit breaker in the power panel.



- Connect the 3<sup>rd</sup> A/C controller 120 volt power line.
- Turn on the circuit breaker and test the 3<sup>rd</sup> A/C unit.

**Conclusion:**

The total cost was about \$1200 for parts, supplies, and mostly free labor.

So far there have been no problems running all three A/C units on the 8KW generator.

