Replacing Norcold N300.3 with Dometic CR-110 Refrigerator

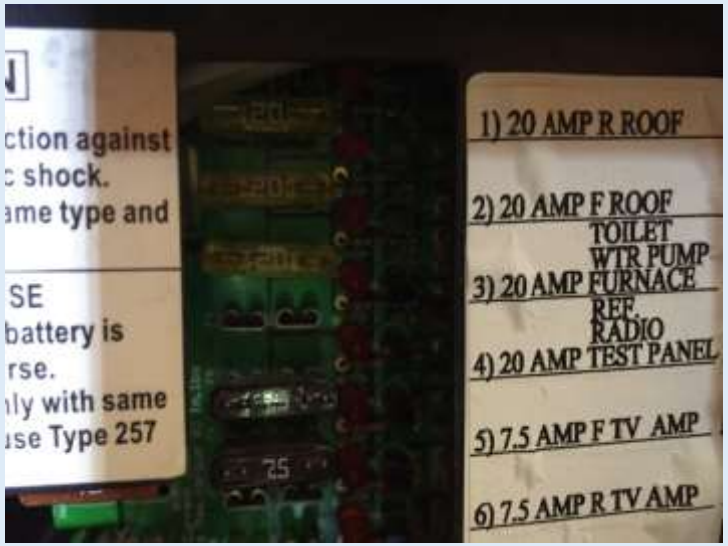
I recently (Aug 2015) replaced my factory installed Norcold absorption refrigerator with a Dometic compressor refrigerator. These refrigerators are very expensive; the Dometic cost me a over $1,000 to purchase, and the decision to do this will NOT be the right decision for everyone.

<u>Factors to consider:</u> The compressor refrigerator can't be run on propane. This means that if you do extensive dry camping, you must be prepared for the 12vdc power requirement of the CR, and plan accordingly, i.e., solar panels or some other means of power generation. The absorption refrigerator begins to loose the ability to refrigerate food properly when the ambient air temperature reaches 90 degrees. If you don't camp or travel with food when it's that hot, then you will probably be happy with the Norcold. Finally, the Dometic provides 3.8 cubic feet of space, versus the Norcold's 2.7.

Removing the Norcold N300.3 Refrigerator.

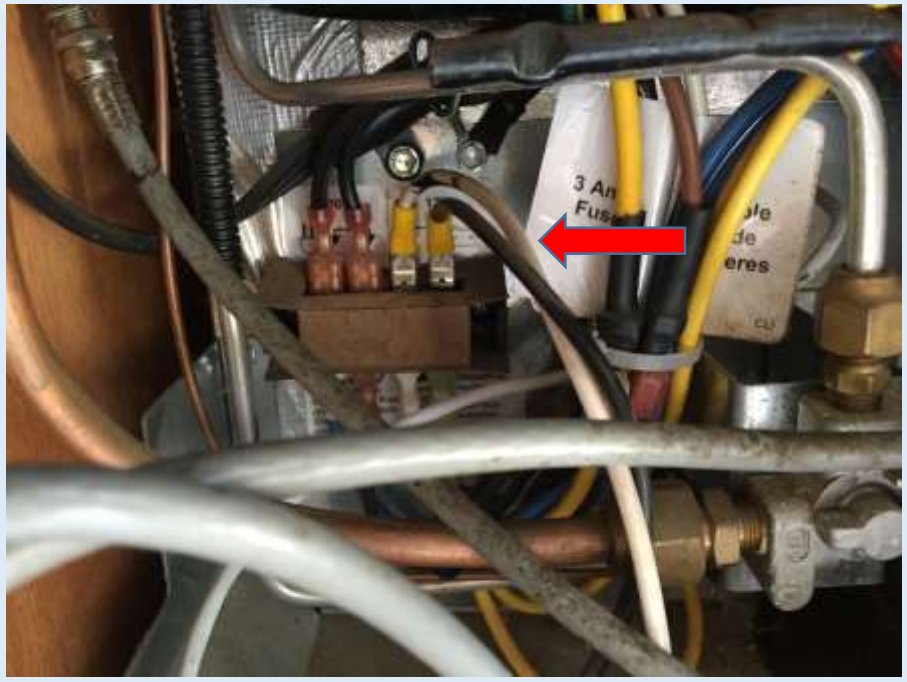
As always, it may be useful to take pictures at various stages of the operation.

1. Insure that the shore power is disconnected.
2. Insure that the propane is turned off.
3. Insure that the battery is disconnected, or that the correct 12 volt fuse is removed from the converter panel.

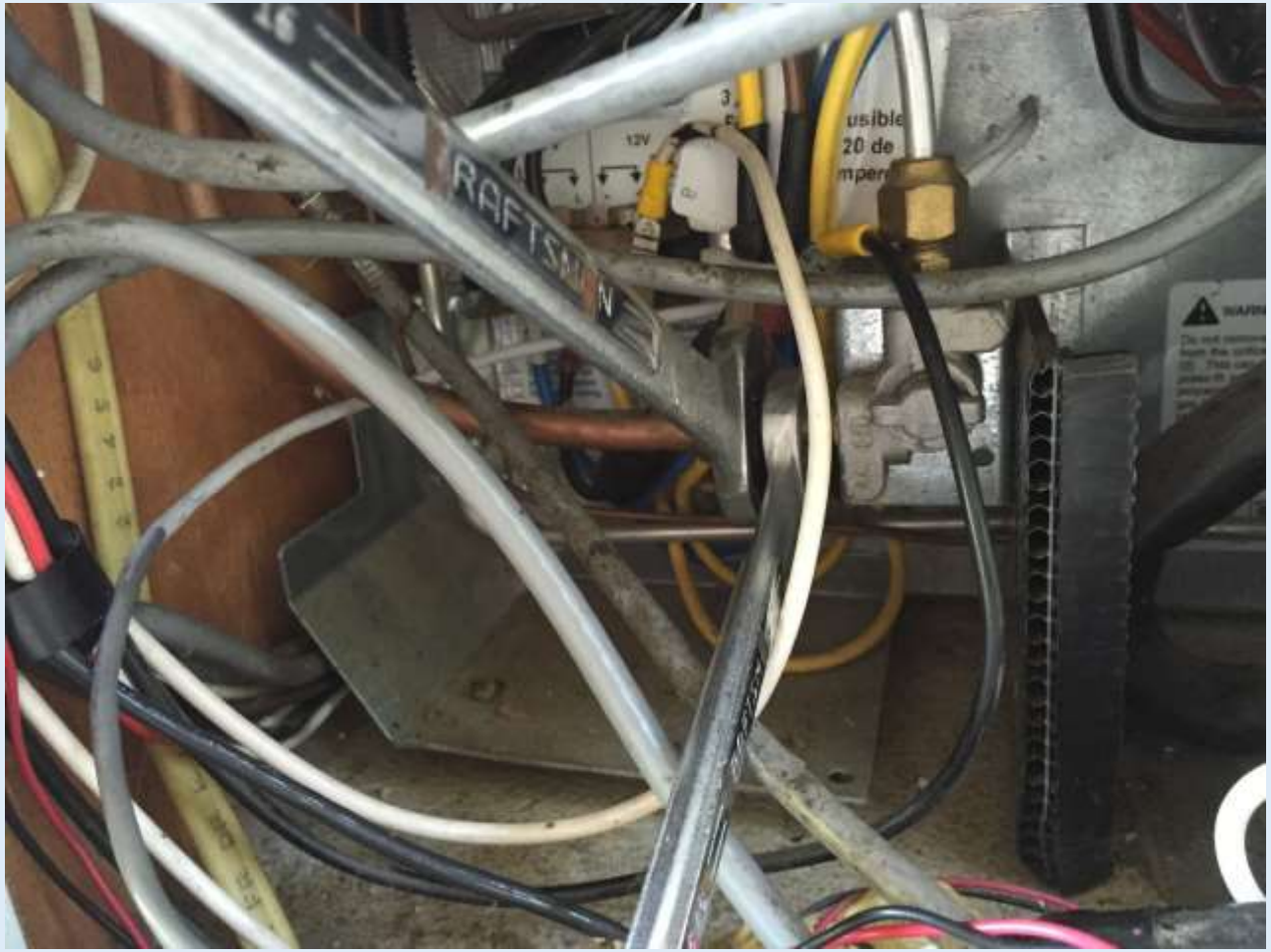


4. Remove both outside vent covers.

5. Inside the lower vent cover, disconnect the 12vdc wires. Notice that the black wire is “positive,” and the white wire is “negative.” This comes into play when wiring the CR-110.



6. Using 5/8” and 13/16” open ended wrenches, disconnect the propane line, as shown.



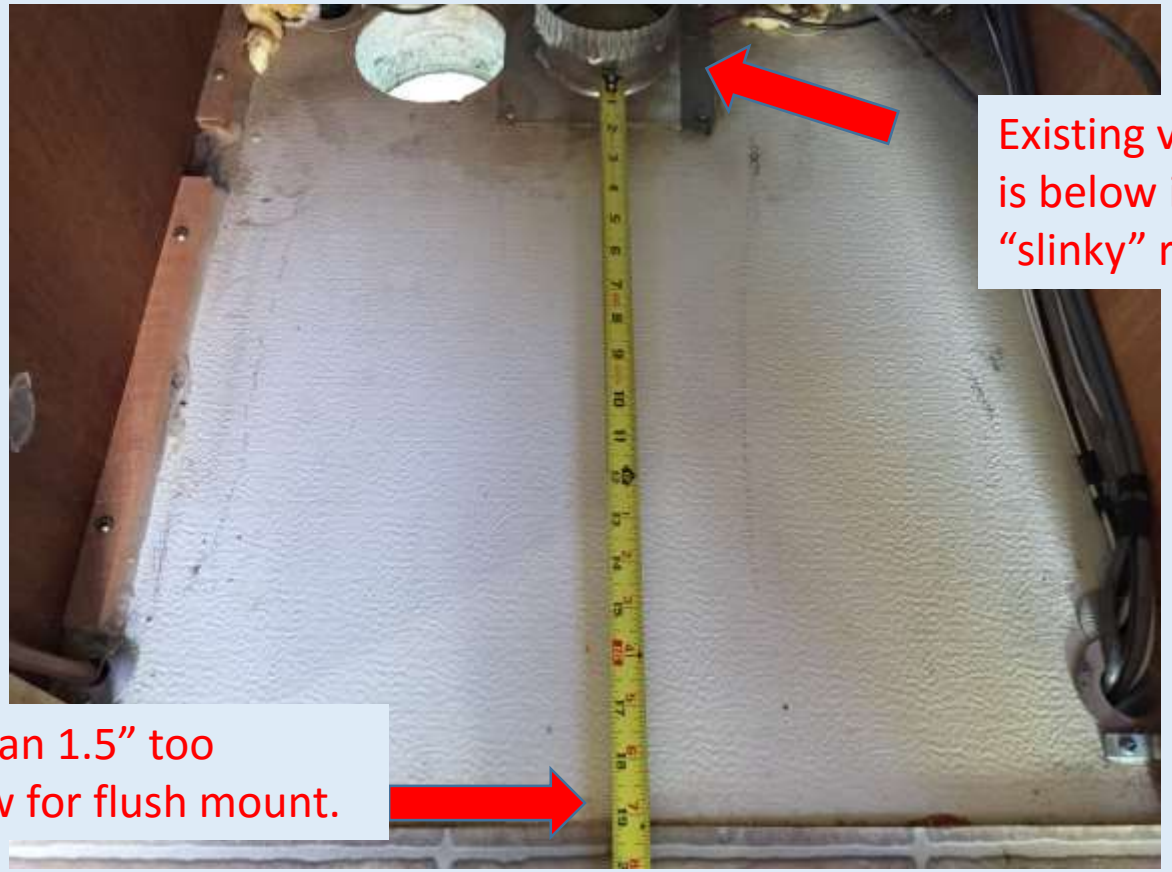
7. Remove the door by removing the top hinge screw, and then remove the screws securing the refrigerator to the cabinet.

8. Pull the refrigerator out from the cabinet a few inches. Then go to the outside of the trailer and inspect in the lower vent cover to make sure all wires and propane lines are clear. Reach in the upper cover, and unplug the 120vac line from the outlet. Then go back inside and pull the refrigerator clear of the cabinet. Have an assistance help you carry the refrigerator out of the trailer.

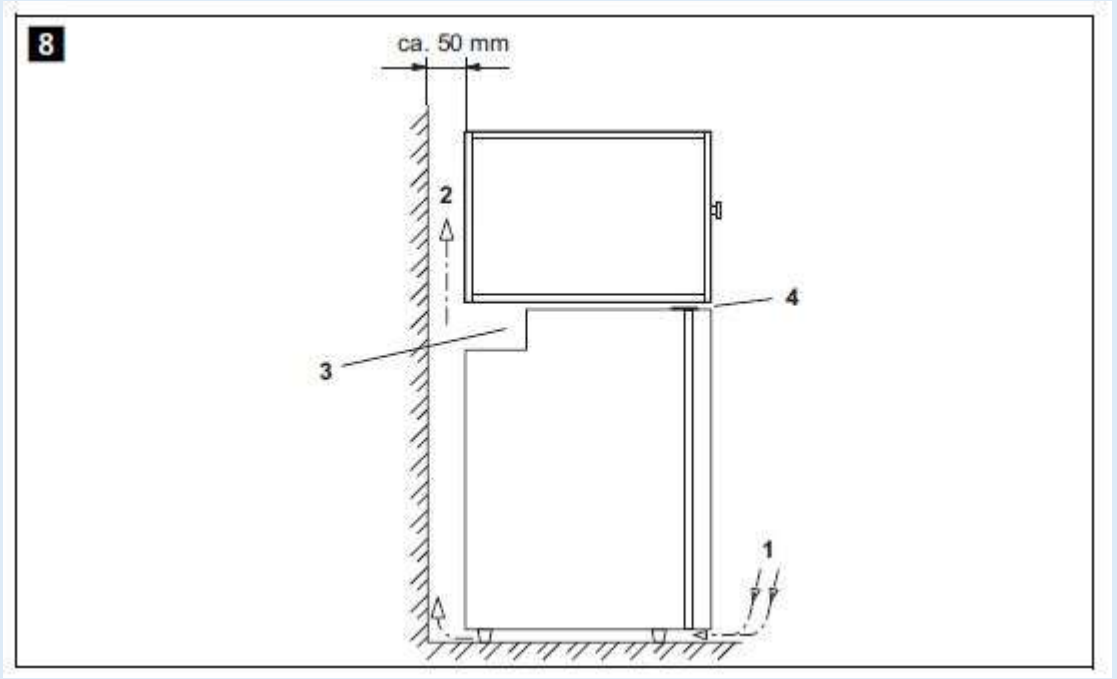
Preparing for Dometic CR-110 Installation

1. Cap off propane supply line. I chose to reduce the amount of copper tubing in the cavity so that it would not interfere with new refrigerator. I trimmed, flared, and capped the propane line as shown.

2. Now is the time to clean-up the cavity that the new Dometic will go into. The very first and most important decision to make concerns the factory fan and vent. If you elect to keep the existing vent configuration, and I did, you need to recognize that the new refrigerator will not “flush mount” to the cabinetry, because it is too deep.



3. Thoughts about air circulation. The CR-110 has its own fan, and would certainly not need any further assistance if it was operated in an open environment. Because it is enclosed, and especially when the TM is in a closed (travel) configuration I felt that the existing fan and “slinky” provided the necessary venting to the bottom of the trailer. In the Dometic airflow diagram, cool air is drawn under the refrigerator (1) from the action of the refrigerator fan (3), and in “normal” operations would be vented upwards (2). Since the TM can’t vent that direction the floor fan and slinky act to draw this warm air downward and outside the enclosure.



4. I removed the pink insulation above the cavity because it interfered with the new refrigerator, and is not necessary since propane is no longer an option. Although not shown, I replaced the slinky with new ducting material, because this is the easiest time to do so.

5. You will probably need to increase the width of cabinet cut-out by about 1/8th inch. It made sense to do this all on the left side of the opening (blue painter's tape). I used a jig saw, but others have used a small block plane to increase this opening. In either case, you will want to finish your installation by framing the refrigerator with trim pieces.

Installing the Dometic CR-110

1. Carefully inspect the new refrigerator. Make sure that there are no apparent shipping damages. You may want to plug it in to make sure it runs and cools before you attempt to install it in your trailer. In my case, I noticed two areas of concern: the door did not close and latch properly so that the seal held tight against the refrigerator body. This required an adjustment of the door latches that was simple on the shop floor, but would have been much more difficult after the refrigerator was installed. Also, the wiring for 12/24vdc was “miscolored” from what was described in the installation manual. More on that later.

2. If you decide to keep the original fan and vent configuration, you will need to remove and discard the flush mount bracket. Some models of the CR-110 CoolMatic do not come with this, but my model (CR-1110E/F-S) did.

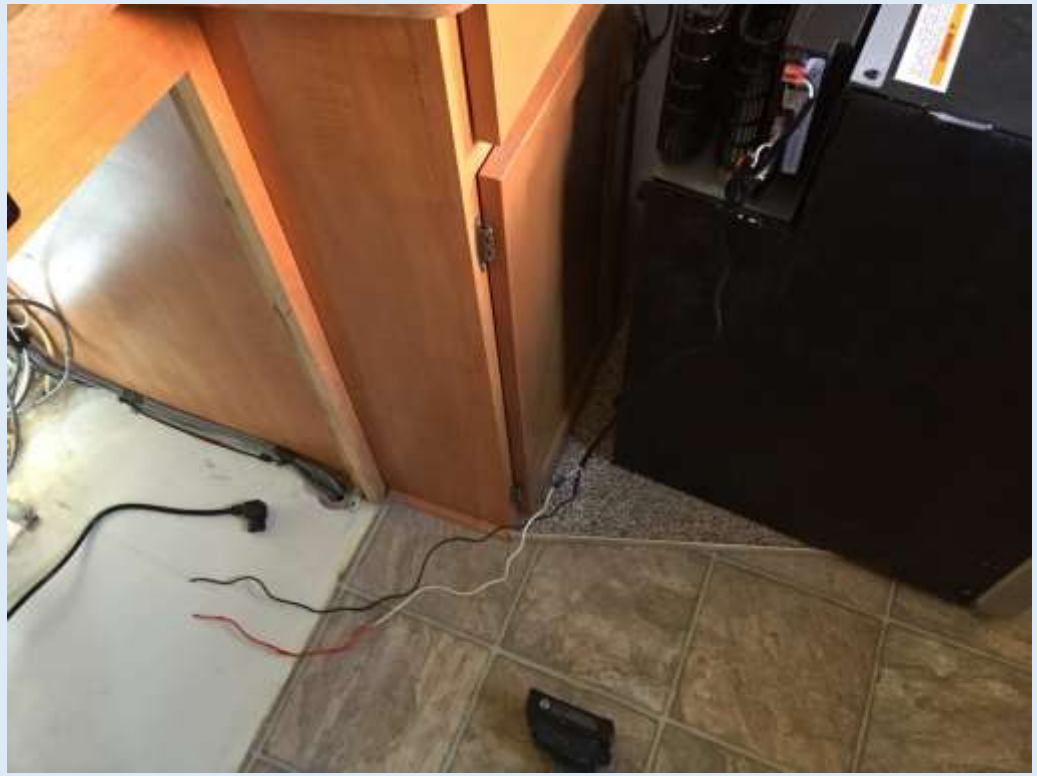
3. Remove the caps (4) from inside the refrigerator. You will need to drill holes the same diameter as the screws you're going to use through the wall of the refrigerator. Test the screws after drilling, to ensure that about ¾" of the screw sticks out from the outside wall. You will probably need to glue some ¾" pine blocks in places on the inside of the refrigerator cavity frame to match up with the screws. I needed to do this in three places. Let the glue set completely before installing the refrigerator. CAUTION! Never drill or screw on the interior wall next to the sink. On most TM models, the freshwater tank sits tight up against the ¼" paneling.

4. Wiring the 120vac side of the fridge is easy. Connect the cable to the socket on the fridge, and plug it into the wall outlet on the back wall of the cavity. The 12vdc requires attention. Despite what the installation manual (below) says, my unit came with white wire for the positive side. It would be very easy to connect the fridge white to the TM white (and black to black) and end up with reverse polarity. I needed to put some extensions on to reach the TM wiring, and ended up painting the positive wire the appropriate color (red).

Warning!
Make sure that the polarity is correct.

- Before starting up the appliance for the first time, check whether the operating voltage and the battery voltage match (see type plate).
- Connect the refrigerator
  - as directly as possible to the poles of the battery or
  - to a 12 or 24 V⎓ socket.

  Fit a fuse in the positive wire of at least 15 A (for 12 V) or 7.5 A (for 24 V) (fig. 16 1, page 9).
- Connect the red cable (fig. 16 rt, page 9) to the positive terminal of the battery.
- Connect the black cable (fig. 16 sw, page 9) to the negative terminal of the battery.



5. After making the electrical connections slide the unit carefully into place. If you have a helper, he or she should be standing outside the trailer observing whether the refrigerator is binding or being blocked by anything (I had to remove my add-on fan I installed for the original fridge). Without a helper, make the slide in two or three increments, going outside to check clearances. Stop when the rear of the fridge almost touches the fan vent on the floor.
6. Turn on shore power, and check to see if the green LED comes on in the fridge (see photo). Then turn shore power off and re-connect the TM battery or fuse and check to see that the green LED comes on. Once you are satisfied that you can power the fridge both ways, install the four mounting screws to the cabinet and cover the screw heads with the white plastic caps.

7. Apply trim molding around the top and sides of the refrigerator. This not only makes for a better appearing installation, it also seals the enclosure to ensure the proper airflow. Air should be drawn in from inside the TM, under the refrigerator, up the backside of the refrigerator (through the condenser cooling fins), and then drawn down by the TM's vent fan and ducting to the exit at the bottom of the trailer. I used ½" oak shoe molding, which I stained a maple color to match the original cabinet finish.

8. Here is the reason why I chose to go with a compressor refrigerator. This was on a trip to Chama, NM. The Texas panhandle had a cold front come through that dropped the normal temps down about 10 degrees, to 91. These are the temps inside the CR-110 while traveling (the TM's vent fan was on). It didn't matter whether we were stopped or moving, these fridge/freezer temps never varied by more than one degree all day. I was never able to get that kind of "traveling performance" with my Norcold absorption refrigerator.

And here was the reward.

Afterthoughts

Credit to “rickets29” and all his work on refrigerators and fans. His conversion to the CR-110 gave me the confidence to undertake mine. With regard to fans, I believe that most important time for an auxiliary fan with this unit is when you are operating the refrigerator in “travel mode,” that is, with the TM folded up for towing. In this mode, options are very limited for the direction that warm air can be vented: downward. This is the reason I elected to retain TM’s original fan configuration.