

Replacing Dometic Heat Pump on 2002 190 Versatile

Disclaimer, this document is for reference only. Attempting to do this will require some skill and there will be risk of injury and damage to equipment. You must make the determination that this is within your ability and accept the risks involved. Be careful, make sure both the 12-volt and 120-volt power is off. Water is the enemy, make sure everything is sealed properly.

Background:

We have a 2002 190 Versatile built on the Chevy chassis, but I think the heat pump is implemented the same way on the Popular. Other models may be similar, but there are no guarantees. You may find something entirely different on your unit.

For the last several years, our 17-year old heat pump has displayed signs of imminent failure. Poor cooling and obvious fan bearing problems. We take multi-week trips and while we don't use the air conditioning a lot, there are times when it is essential. We were faced with the question should we wait for it to fail completely or just go ahead and replace the unit? If we replace it should we go with the Dometic or use something else. Common window units of this general size are much less expensive, however one with the needed dimensions, particularly the height proved to be more of a problem. Additionally, without having the unit in hand and the existing unit removed for close inspection, it was not at all clear that what I might buy could be adapted to the space. The Dometic looks well-made and rugged. In the end I chose to just go with the OEM unit. Dometic confirmed that the model they sell today is the same size as the original. The only difference is the new unit is not compatible with the original thermostat.

I had a bit of information in my files from Roadtrek about replacing the unit. Essentially it goes in from the back and there will be a lot of sealant which will need to be cut to get the unit out. It was also suggested that I replace the well nuts. These hold the shroud on and seal the holes which is a common source of leaks on these units.

This is my record of this journey. I hope that it will help others.

Preparation:

Before getting started, I ordered two boxes of well nuts from McMaster. www.mcmaster.com/93495a190. I also located a nearby dealer who would sell me the replacement unit. Don't ask the price, but it was about the going rate on the internet and at least I can eyeball the dealer! I also purchased about \$20 worth of 2 by 4s to build something to stand on. The thought of doing this on a ladder was not something I wanted to try. It did not take long to build and was cheap to make. My driveway is on a bit of a slope, so I was



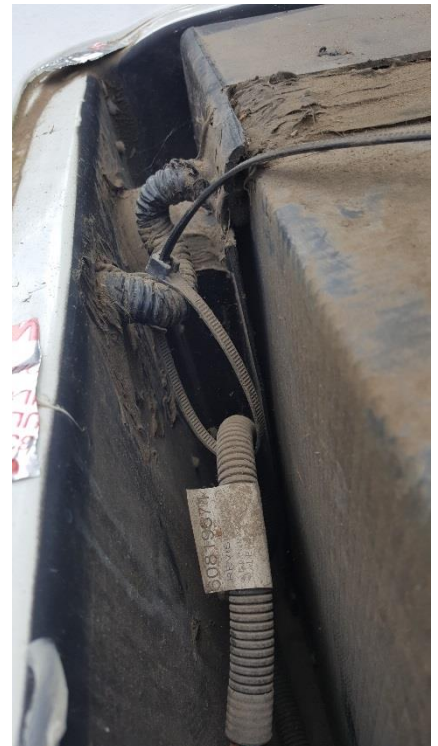
careful to make the platform level and very sturdy. The overall height is about 45 inches. It felt a little tippy when leaning over the top of the unit, so I added the outrigger. I'm not going to provide any more information on the platform.

Getting the Top Off:

The shroud is held on with stainless steel 10-32 screws which compress the rubber well nuts. These work like rubber rivets which expand and seal the holes in the roof. These apparently are prone to leak, particularly when disturbed, so it's advisable to replace them. Roadtrek used some sort of sealant, probably silicone caulk on the well nuts to address this issue. With the shroud off, these holes are exposed and one would be advised to cover the holes while they are off to keep water out of the inside should it rain. I used some foil duct tape for this purpose. There is a wire and connector which feeds the marker lights which must be disconnected.

First Look:

With the shroud off, I took a close look at what I had and took some pictures. On the left side the 120-volt power is routed to a common electrical box with the cover facing upwards. It was covered in black sealant. I noted the tie wrap which is holding up the control cable. This I believe was done to keep the connector from resting in the bottom in a puddle of water. The connector is well-made with retainers and a gasket. The right side of the unit was just open with no wires. Note the round duct which directs cold air to one of the two registers on the ceiling below the unit. There is an identical duct on the left side. It's a little hard to see in the picture with the wiring in front of it.



Disconnecting the Wires:

There are two electrical connections to the unit. The first is the 120-volt AC connection and this is routed via a short harness from the left side into a very standard metal electrical box bolted to the left side of the unit. I easily peeled off the sealant and removed the cover exposing the wires. The Roadtrek wires are solid conductors and the unit has stranded conductors. Roadtrek seems to commonly add tape to the wire nuts. I don't know if this keeps water out or prevents the nuts from backing out due to vibration. I simply unplugged the control connector. It was tight and I found it difficult to compress the release tabs.



Mechanical Restraints:

The only thing holding this unit in place are two clips on either side of the unit. These are held in place with two screws each. There was a bit of the same black sealant under each clip. There were 4 sheet metal screws which went through the plenum. The seam between the plenum and the unit was not sealed. I just rocked the unit left to right and it came loose easily.



Unit Removed:

With the unit out you can see the inlet air window and the two side ports which feed air to the registers on the ceiling below. I'm not certain but the bottom looks like part of the original van roof which was not cut away.



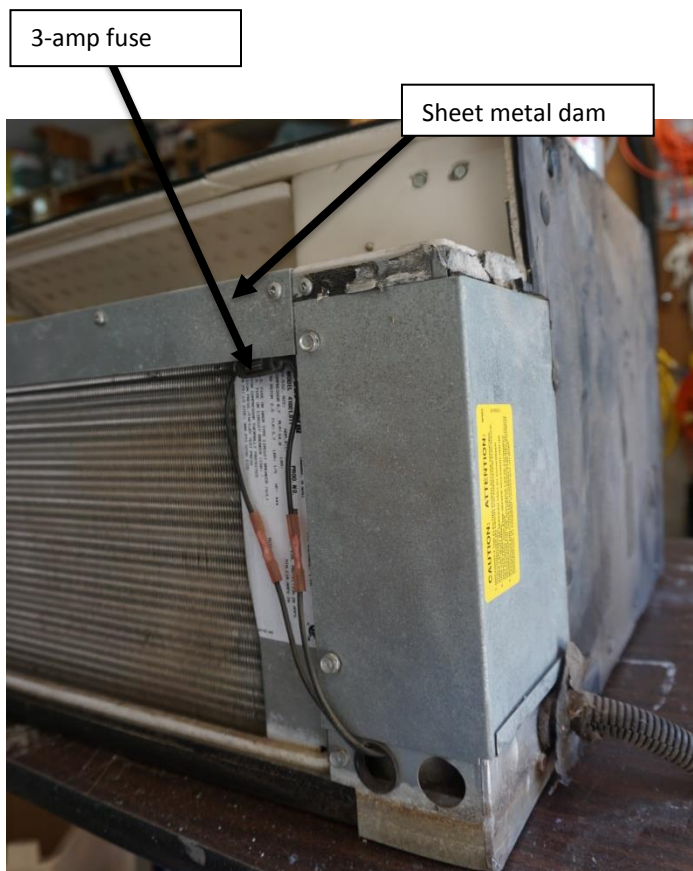
Prepping the New Unit:

There are some baffles which Roadtrek added to the unit both on the front and the back. On the front is a piece which dams or blocks air from leaking from the inlet to the outlet. It's attached with a few self-drilling sheet metal screws. A little caution is in order here installing this on the new unit. If the drill were to slip you might damage the coils.

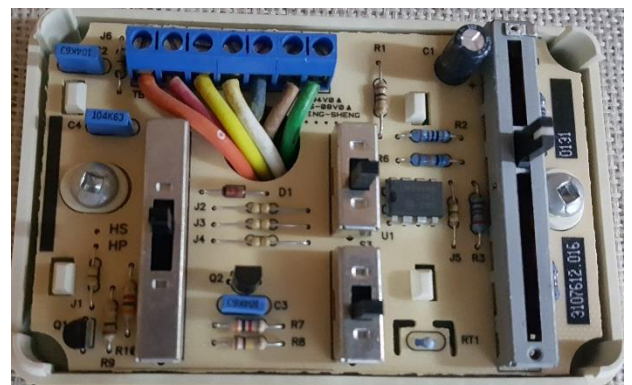
There was also a 3-amp low voltage fuse holder and fuse tucked up behind the dam. I had thought this was a sensor.

Notice the discoloration on the lower right due to water collecting here.

I don't have a picture, but the new unit has some baffles on the back which direct the hot air out the back and keep it from recycling into the inlet. I had to move the Roadtrek provided baffles on the back to the new unit. Unfortunately, the mounting holes did not match up exactly, so it was necessary elongate the existing holes both top and bottom to make them fit. There are some rubber seals on the edge of the baffles which were in good shape. The one across the top was glued in place and I replaced it with some foam weather-stripping.



The 120-volt AC connections are the same as the old unit, but the control logic is entirely different. There were separate lines to control the fan, compressor etc. The new unit has a 3-wire interface to the thermostat. One wire powers the thermostat, one is a ground return and the third is the serial communications channel. The wires were nicely labeled in the box. There is an identified wire for the power to the thermostat and this is not connected directly to the 12-volt inlet. Not too difficult, one just needs to secure the unused wires and make note of the one used for the serial interface. I temporarily ran the unit on the bench to make sure everything worked before installing the unit into the trek.



Existing Thermostat

Installation Notes:

While not extremely heavy, it was very helpful having an assistant help lift the unit into place. Before lifting it up I will point out that there are stick on rubber isolation blocks on the bottom of both the original unit and the new unit. There is a step in the pan towards the front of the unit and there were two blocks not on the old unit. I had to remove these because it made the unit too high to fit.

I was able to push the unit into place and reconnect the wires. Before securing the unit in place I made sure everything worked. Had a minor hiccup since I was not able to make the furnace come on. It was too hot! Letting the new AC run for a few minutes solved that problem.

I replaced the clips on the unit and the 4 screws in the plenum. I sealed the seams with some silicone caulk. I did not attempt to seal the bottom; this would make it very difficult to remove.



Installing the Shroud:

The shroud went back on easily and the baffles were right up against the inside surfaces as expected. The well nuts compress quite a lot and I tightened the screws to the point that they felt secure.

Final Thoughts:

This whole job was much easier than I expected. The scaffolding worked very well.

The new thermostat is difficult to use at best. The display is unreadable if you are below by even a small angle. One must cycle through the modes to make changes and nothing happens very fast. I was very accustomed to turning on and adjusting the old thermostat by feel and this is not possible with this new unit.

The new unit works better than the old and hopefully won't give trouble anytime soon.

The two registers in the ceiling have never worked very well. The ducts are small and the opening into the register is even smaller. I had hoped to figure out a way to improve this, but there does not seem to be an obvious solution.