N7V | N7X | N7LX-- N8V | N8X | N8LX | N10LX | NA10LX

HVAC AC 120V With universal controller

JC REFRIGERATION INSTALLATION MANUAL



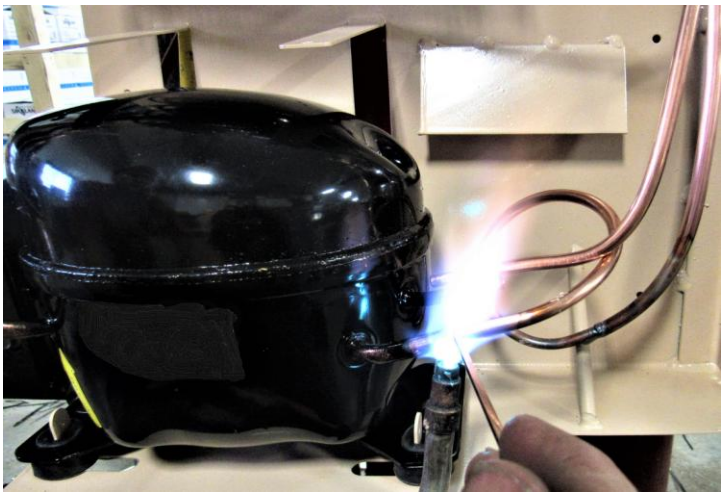
Jr & Jeremy Lambright

INFO@JC-REFRIGERATION.COM www.jc-refrigeration.com

Good Day Friends, this is how it all begins, hope you find this helpful thru your installation.



Units prepped for compressors



brazed welded for strength



Tools needed to do the install:

Screw gun 5/16 ¼ Phillips wrench putty knife knife caulk gun zip ties





1 or 2

And enough time to think things thru at times, so don't give up and hang in there to the end it will be all worth it. A cold fridge is about to be had!!



We at JC Refrigeration try to build these as easy to install as possible, and so these are DIY cooling units but please be aware tho that our upgrades might not look quite the same, and brackets, frames, hole plates might not always line up perfectly as fridge boxes can vary at times, and so some modifications, foam shaving or tweaking might need to be done at times to install it. A thing to remember is these are made out of thick steel tube and plates so some twisting or pushing into place is very normal and nothing to be alarmed about. We installation manuals for the Hvac units to help you thru this install and feel free to send us a picture along with your question, and we will help you to the best of our ability.

JR & Jeremy Lambright

Please read through these notes before starting:

- Throughout this manual, there will times when you see (RA), (YA), or (BA). These are referring to red arrow, yellow arrow, and blue arrow. We use these to point to a certain spot or part in the pictures.
- There are some differences between this install manual and the install videos on our website. So, to avoid confusion, **follow only the instructions in this manual.**
- This unit is for 120V AC hook up only so most times this will be plugged into inverter power so it can run while travelling, if a new power wire needs to be run the best time to do this is when the fridge is out of the cavity
- Remember your old rear or front control boards will no longer be used, they can be taken completely out or just left in and not used. Same with wires and fans, what you take off will no longer be used but can be saved for future use if needed or discarded.

PLEASE NOTE: Not all of our cooling units look exactly the same. So, to avoid confusion, only follow the instructions in this manual when installing the unit.

To start this process, begin by taking the cooling unit out of the box, if box appears to be damaged don't panic as we foam package them into the box (YA) and so the box can be practically destroyed and the unit is still not damaged. So, when you take the box apart you will notice a spray foam packing inside and this needs to be removed and then the unit will slide out. Inside the box you should have the cooling unit, and parts needed to do the install (RA)





Cover up your floor with blankets and removing any door handles or smoke alarms that might hinder the exit of your refrigerator from your cabinet. Turn off the water pump (if you have an ice maker in your fridge) and the refrigerator control panel.

WARNING:

Make sure to turn off LP gas at the tank before starting the install.

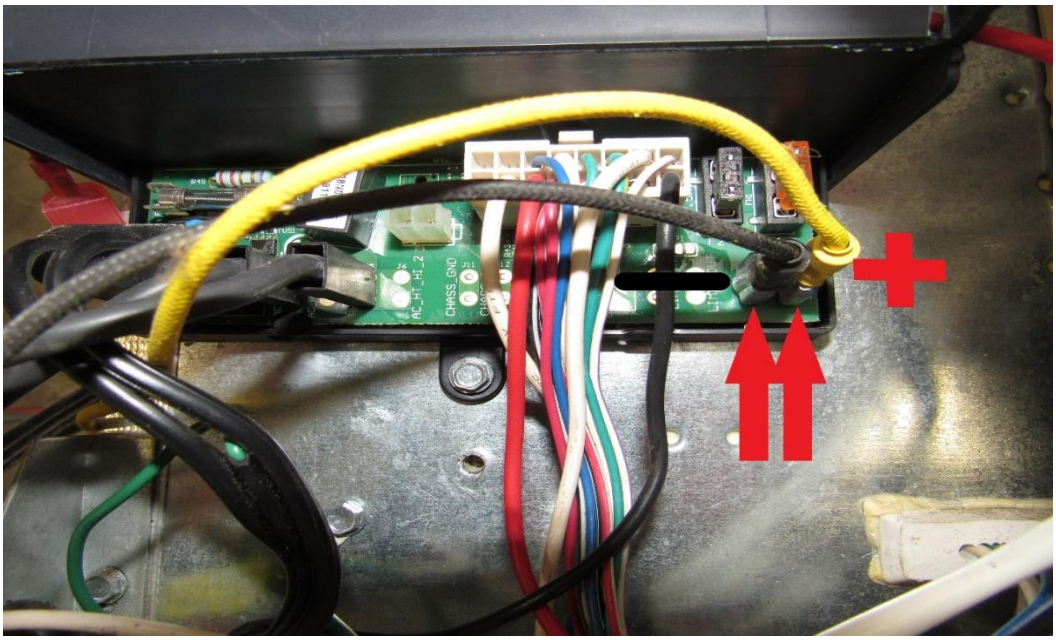


Locate your refrigerator side vent on the outside of your RV. Take the board cover mounting screw (RA) loose.



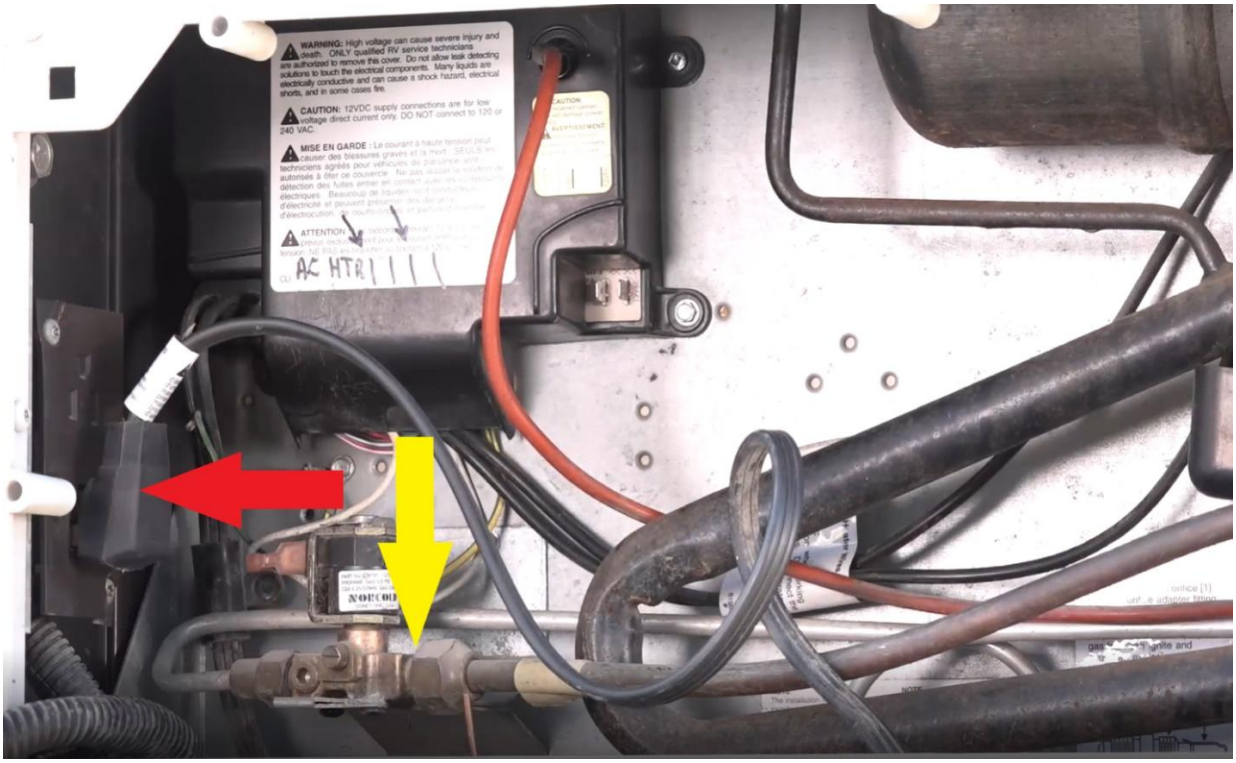
Take the main 12V wires (RA) loose from your board. The wire colors will vary from coach to coach.

Note: If your wire ends are not insulated, wrap the end in electrical tape so you don't blow the fuse.

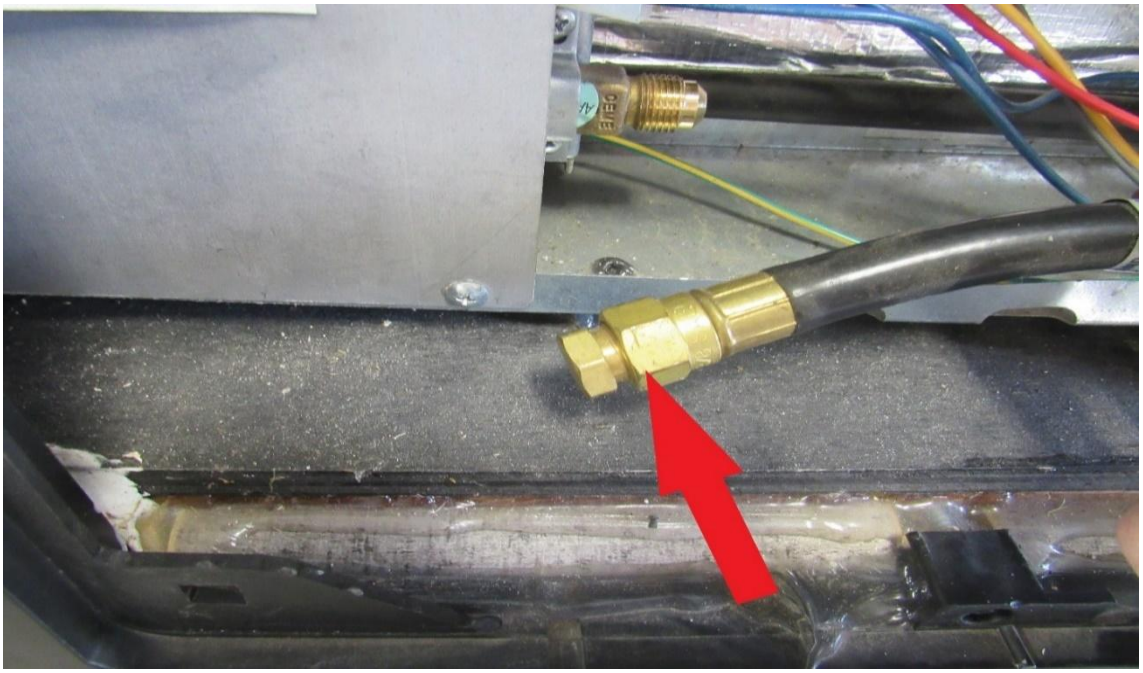


Unplug your 120V plug (RA) from your RV receptacle.

Take the LP line (YA) off of the LP solenoid valve. Make sure gas is turned off (see step one)



Cap off the LP line with the supplied cap in the parts bag (RA). Check this joint with soap and water once gas has been turned back on.

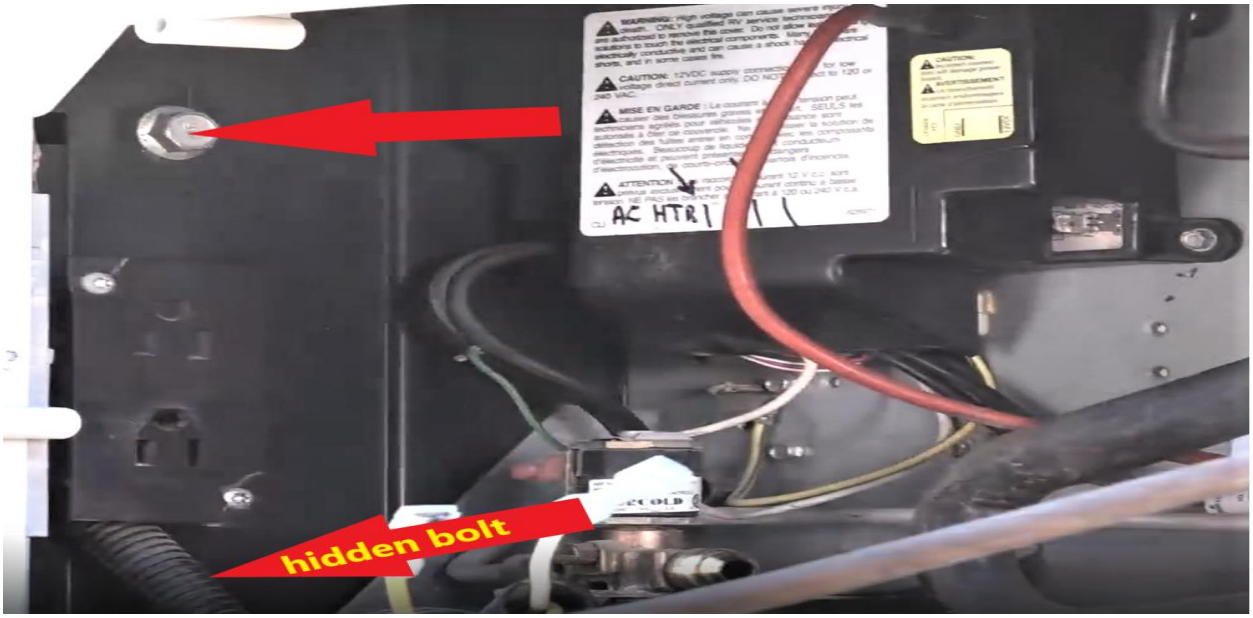


There are many different styles out there but most have at least 2 mounting screws through the back plate holding the fridge to your RV floor. Screw size and bit needed will vary from coach to coach.

Remove these screws (RA).



On Winnabago coachs you will have 4 bolts lagged to a steel side plate, 2 on each side of the fridge, also the top roof vent cap needs to be removed and 2 to 4 philips screws need to be loosend from the top of the fridge.



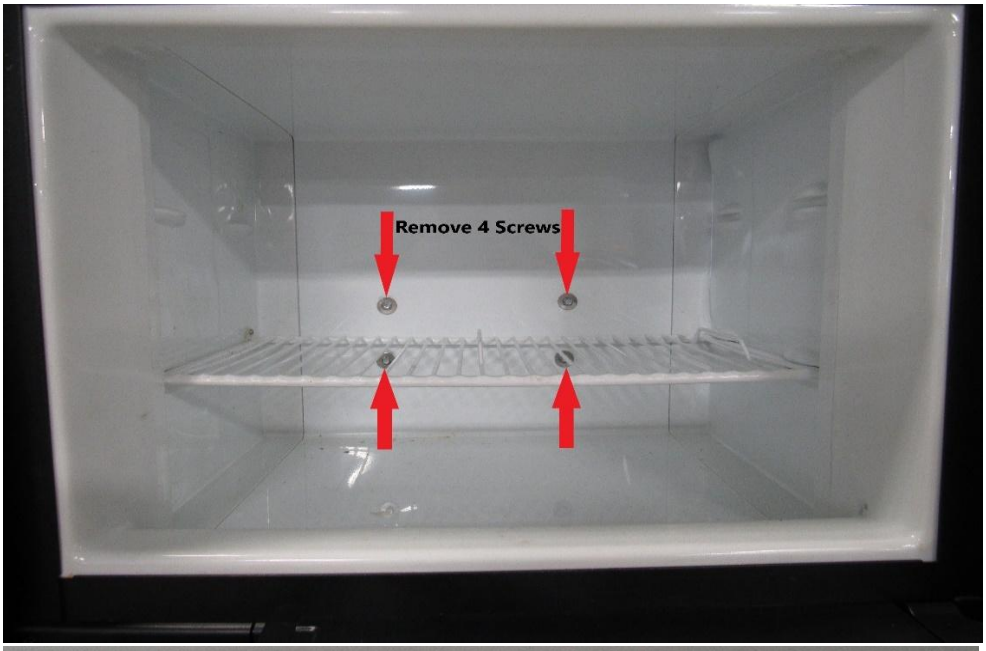
Going inside again start by removing the black trim covers on the top and bottom of fridge.

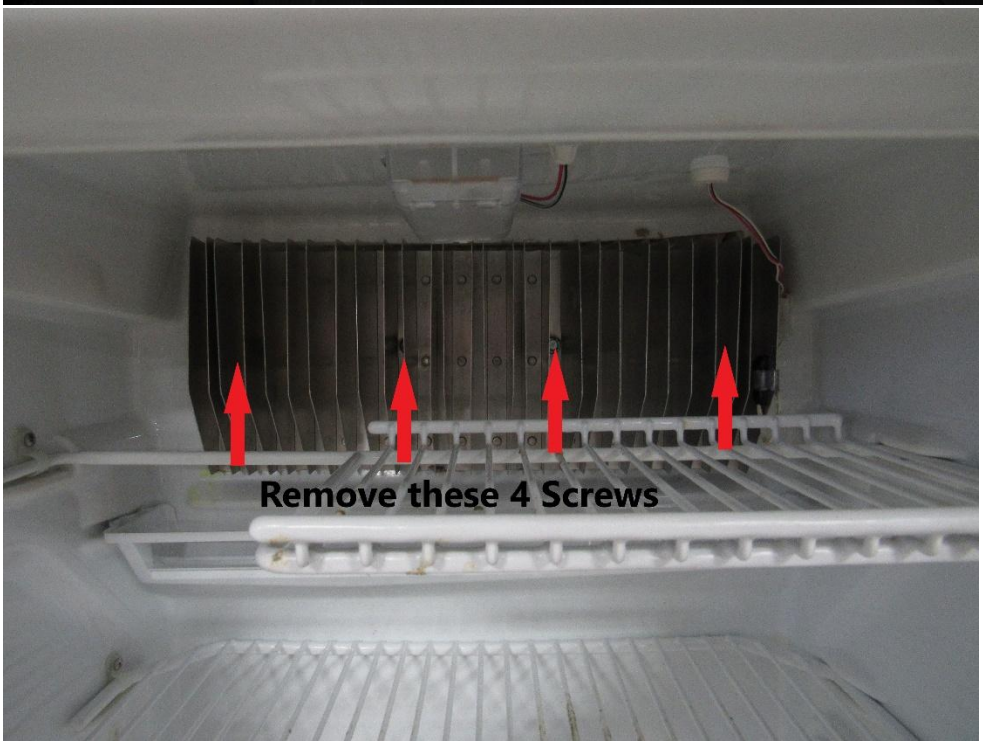



Remove the two mounting screws on top and bottom (RA). Screw size and bit needed will vary from coach to coach.



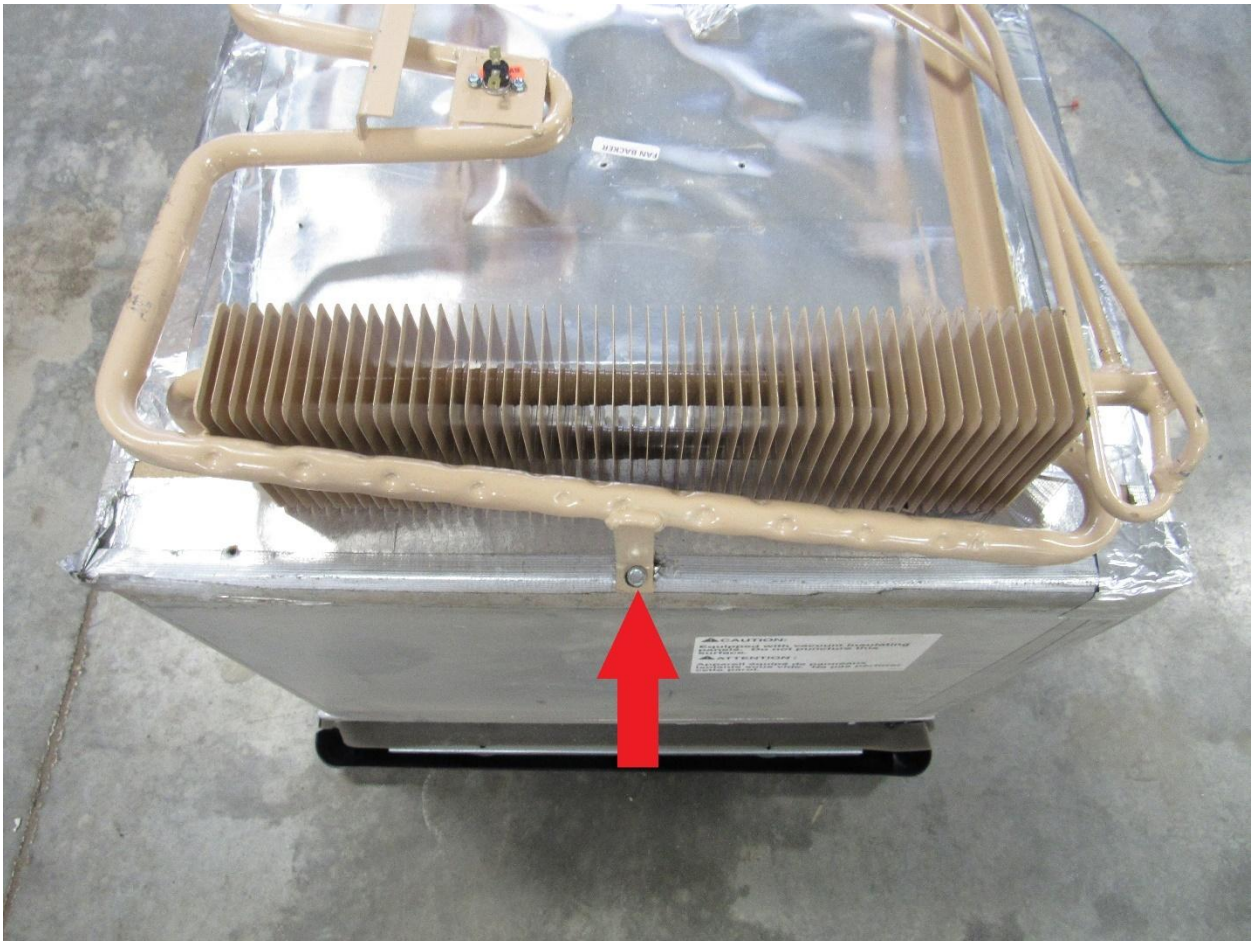

Take a 5/16” hex bit and cordless impact driver and proceed to loosen and remove all the screws (RA) in the freezer and the refrigerator. Refrigerator fins will drop down, so unclip thermistor and lay to the side, remove fins and set to the side for now. Removing your freezer shelve or top fridge shelve is optional.



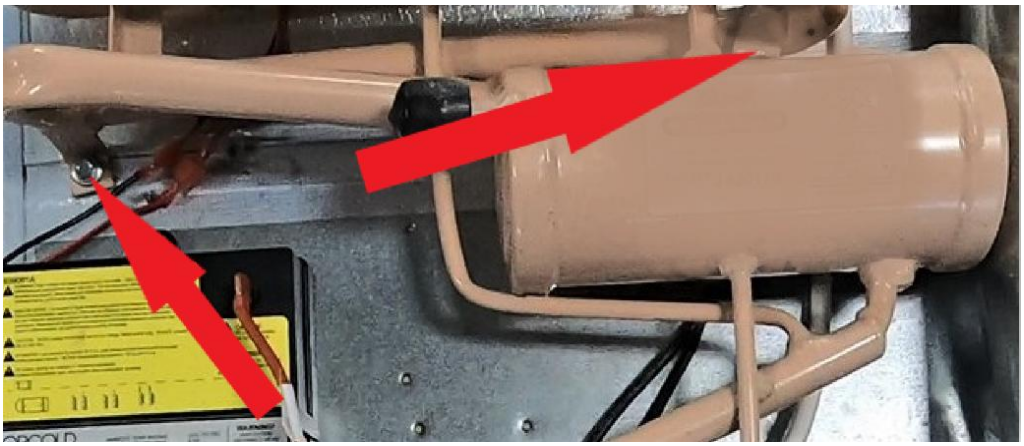


We do not show the fridge being slid out onto the floor, as the lay out of the coaches vary greatly and so it could be misleading to your scenario. But the object is to have 1 guy on each side of the fridge and as your fridge starts to exit lift up gently so when the rear end of the fridge fully exits the cavity that it does not drop, but needs to be gently and carefully set on the floor and pushed or carried to your open floor area. Lay fridge face down on the floor, making sure doors are latched shut so they don't swing open and we normally put a pile of blankets on the floor by the top freezer door so the fridge is lying face down at an angle.

Take out mounting screw (RA) on top. Placement may vary

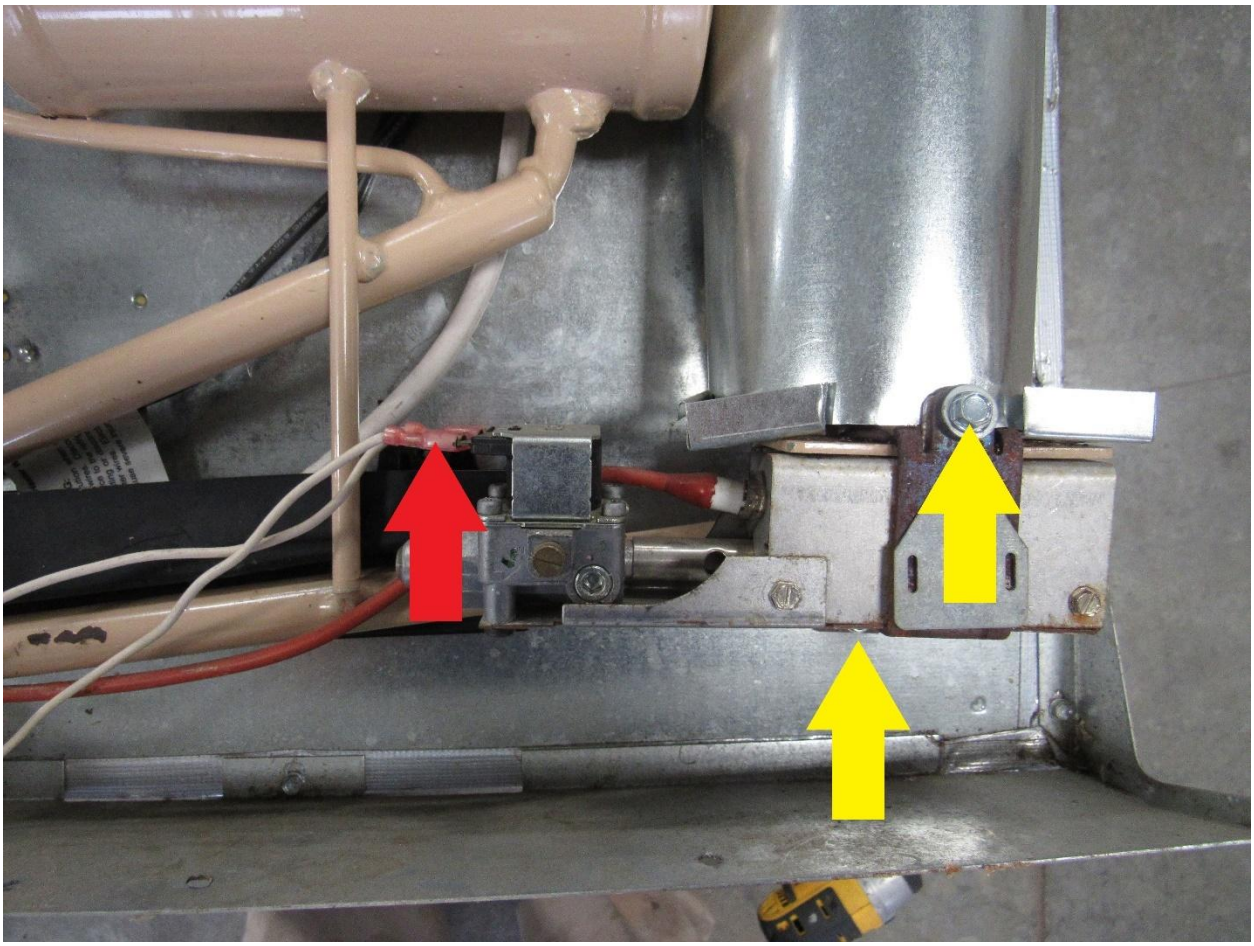


Remove bottom 2 mounting screws, may vary in location (RA)

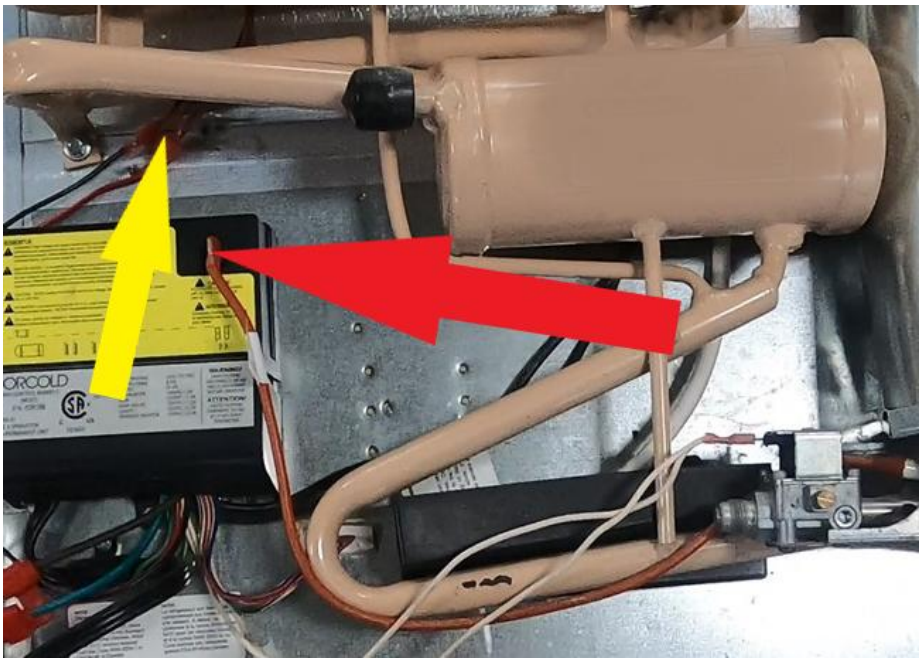


Take out both 5/16” hex mounting screws (YA).

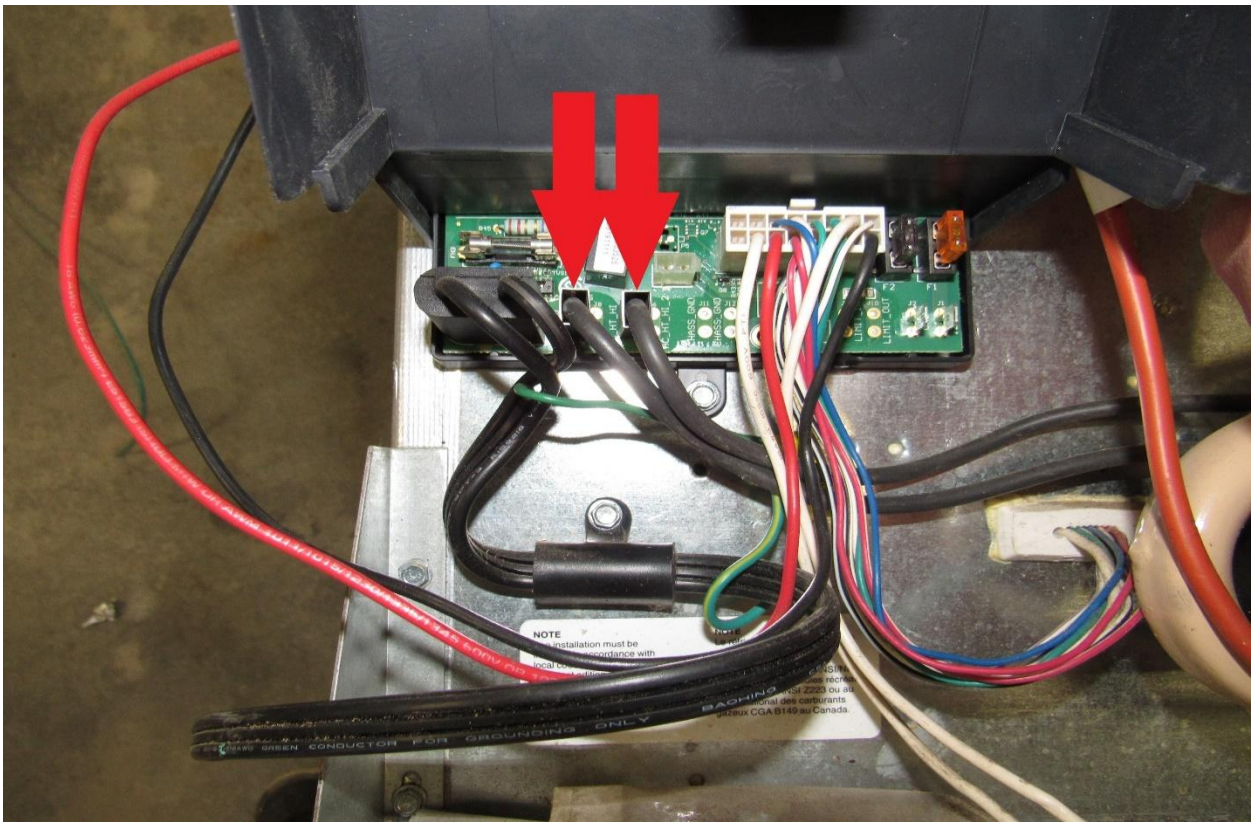
Take off the 2 white LP gas valve wires (RA).



Unclip the igniter wire (RA) from the board. Also disconnect vent fan wires (YA)



Take the heating element wires (RA) loose from the board.



Take off fan mount (RA) and thermostat (YA). The fan bracket mounting style and thermostat location may vary.

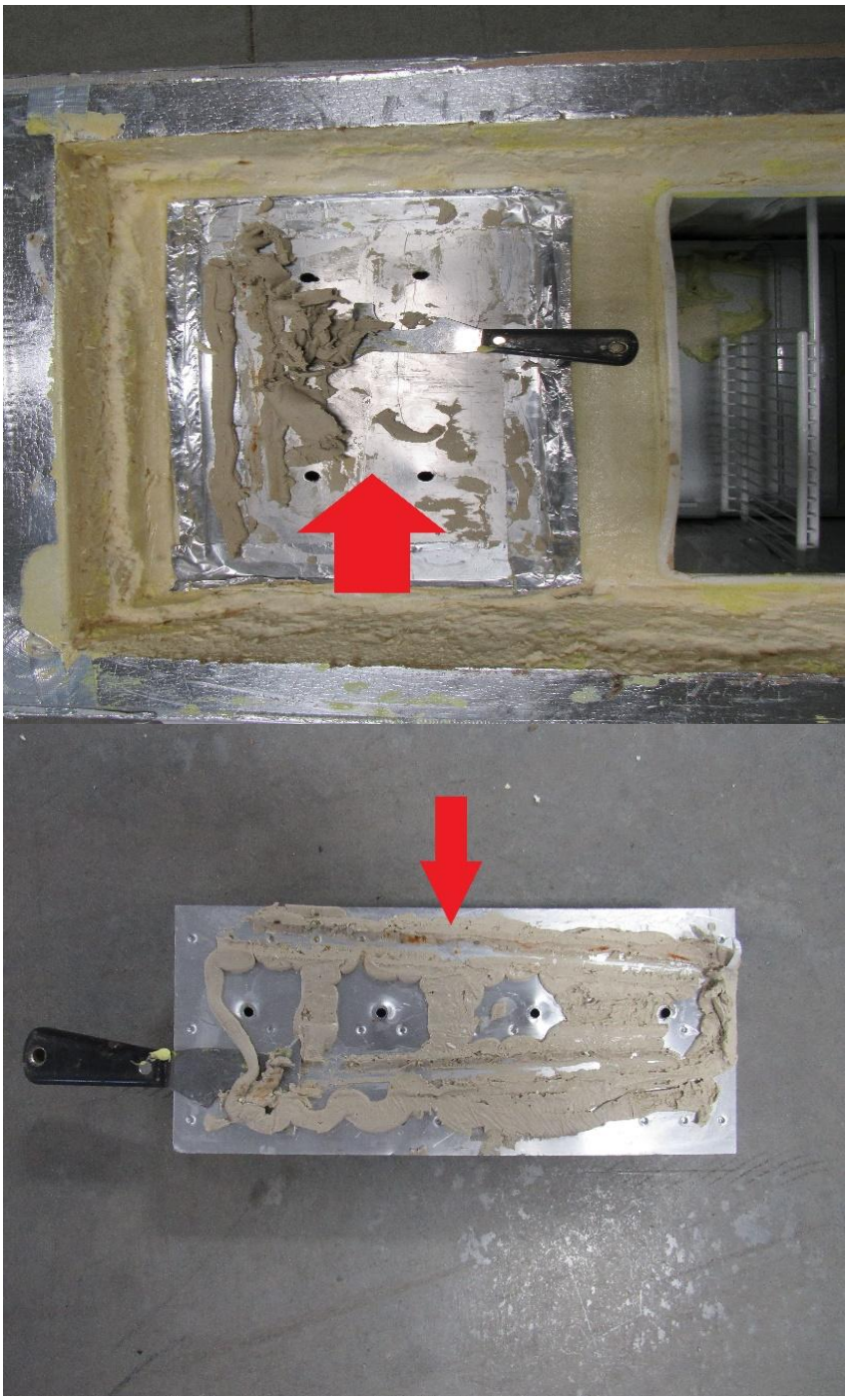


If old unit is taped along the sides cut tape with knife. Take unit off the old cooling unit of your refrigerator by lifting straight up and out. Clean off any residual foam or thermal sealant around the edges (RA).



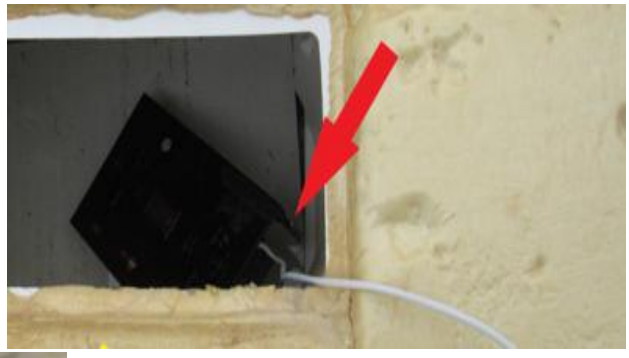
Clean off the old thermal mastic (RA) from the freezer section. A large blade putty knife or scraper works well.

Clean off old thermal mastic from the refrigerator fin (RA). A shop vac works well to remove any other debris or loose foam.



Take controller out of packaging and clip the controller to the inside top shelf for now, with the wire coming out thru the fin opening as shown (RA). Make sure enough wire is on the outside to reach the compressors.





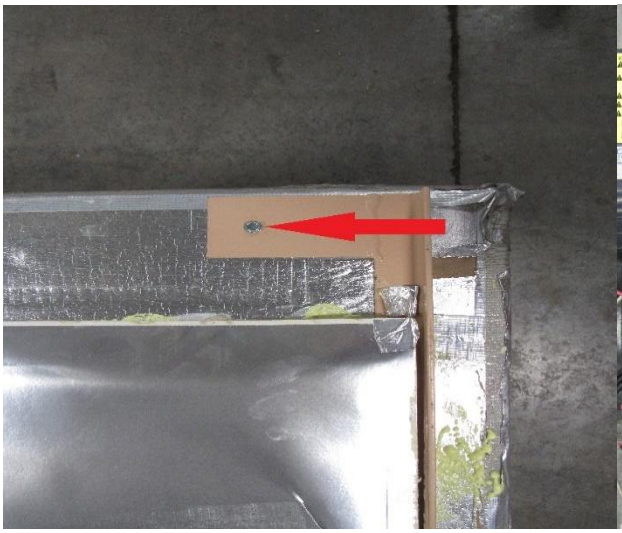


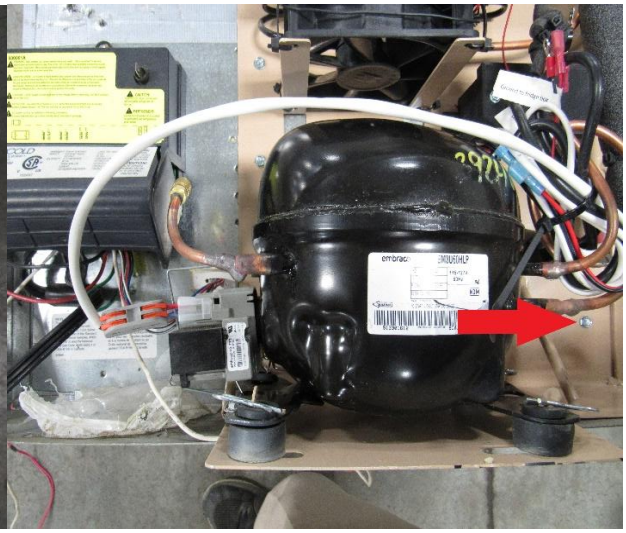
Warning: The next few steps are very important. If done incorrectly, the cooling unit freezer and fin screws might not line up the best. If possible, have someone to help you with the next steps as it will make everything much easier.

First, we will do a "dry fit". Set the unit in the box as shown in picture.



If you are alone screw two #10X1'' mounting screws (RA) that are included in the parts bag, your exterior mounting holes will not line up to the original holes. This will hold the unit in place for the next step. If you have another person with you leave these screws out and have the second person hold the unit while you set the refrigerator upright into the standing position now open freezer door and make sure mounting holes in the freezer are aligned with the cooling unit holes.

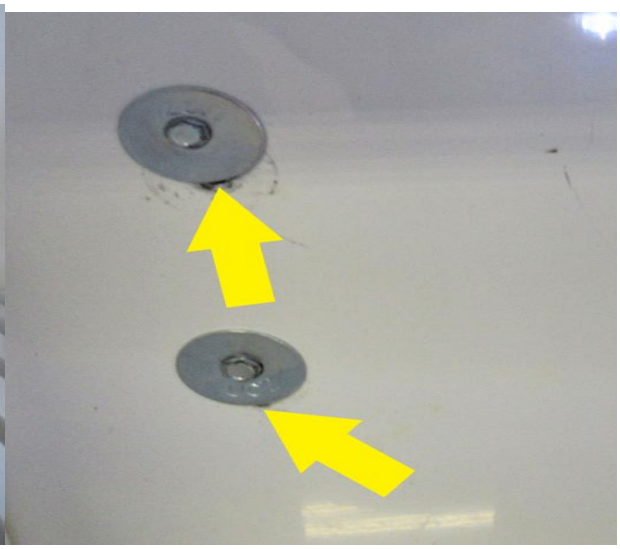




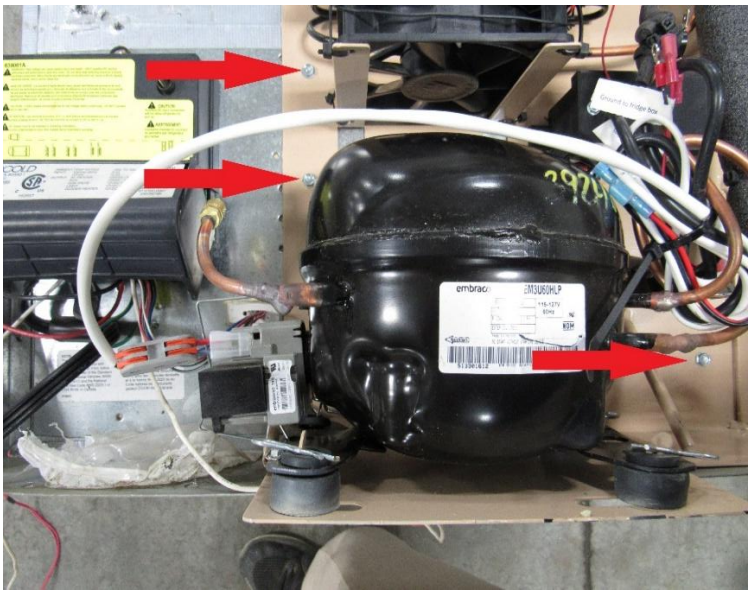
If holes are not aligned have the rear person lift the unit up or down or side to side till holes are aligned, or if alone you have to set fridge back down, take out mounting screws and adjust the unit to where the holes line up. It does not have to be perfect, just close enough where you can see the edge of them. Don't be afraid to sand or shave foam off the side, top or bottom to let the unit slide the way it needs to go to line up the freezer screws. Pictured below is an example with the holes just visible on the bottom corner (RA).

Warning: The box holes can be redrilled or enlarged to make holes line up and then the washers can cover the hole, (YA) but do not *ever* drill new holes into the cooling unit plates as you will hit the cooling tubes causing a rupture. If part of holes are visible you can either leave them as is since unit will be sealed in the back or you can use white silicone caulk to cover the holes.

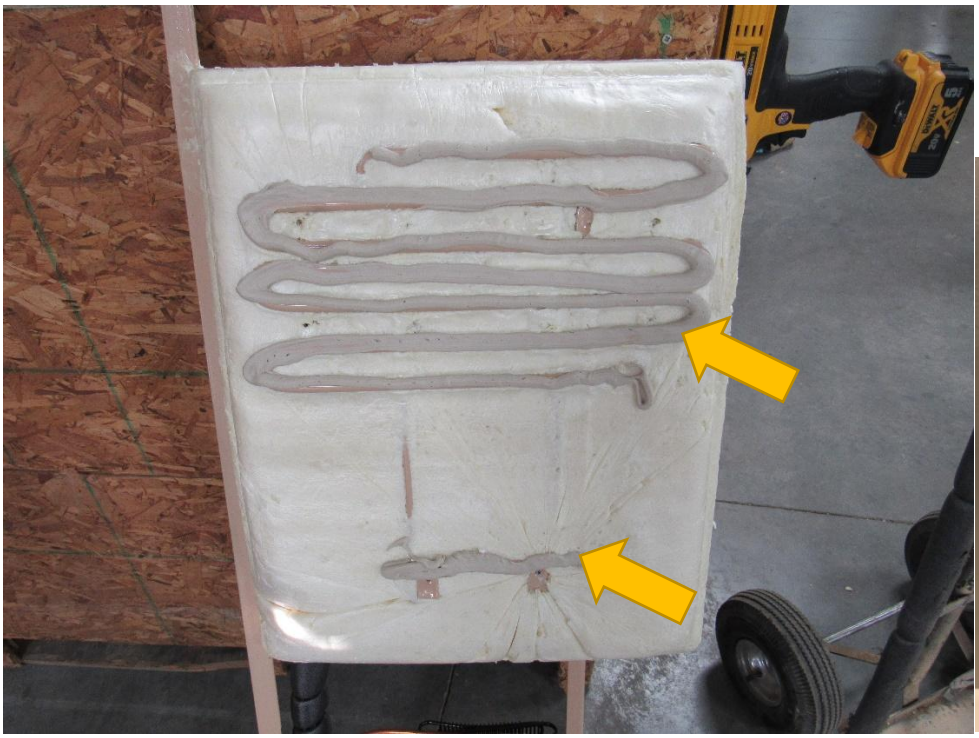




Once you have positioned the unit to where your holes align with your freezer holes, re-enter the previous mounting screws shown in picture below (RA). This way you know exactly where the unit needs to be later. If a second person is there to help these screws do not have to be put back in.

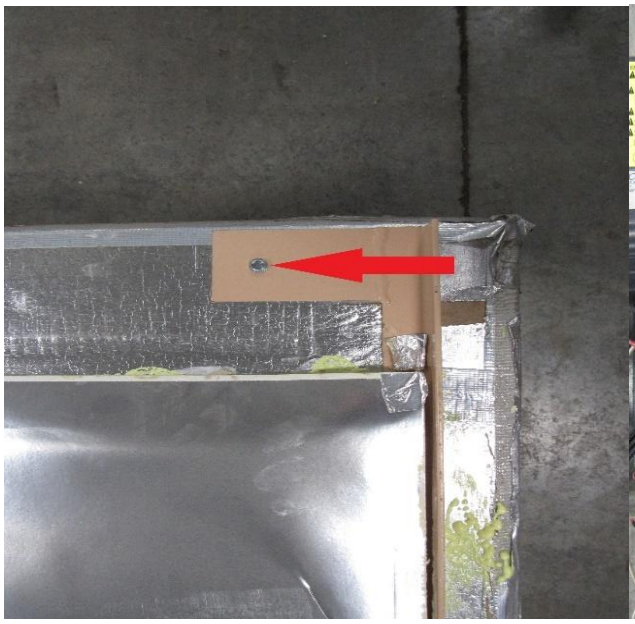


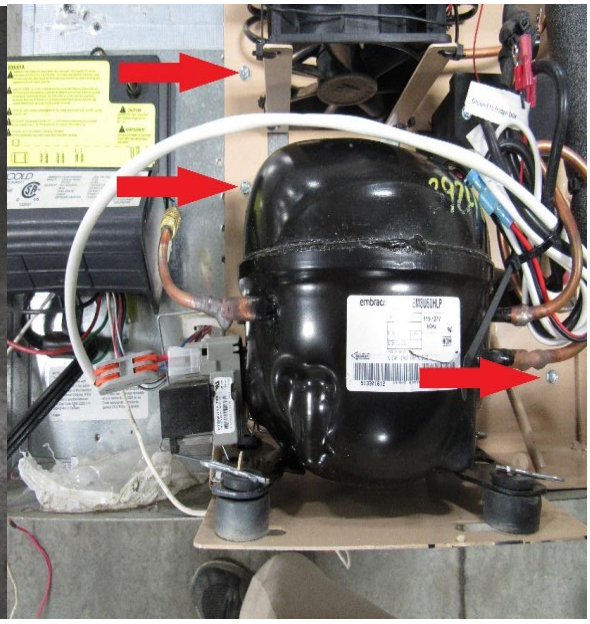
Take the unit completely off the box again. We will install the thermal mastic next. Take a caulk gun and place a small bead in this fashion. You will need to use the whole tube.



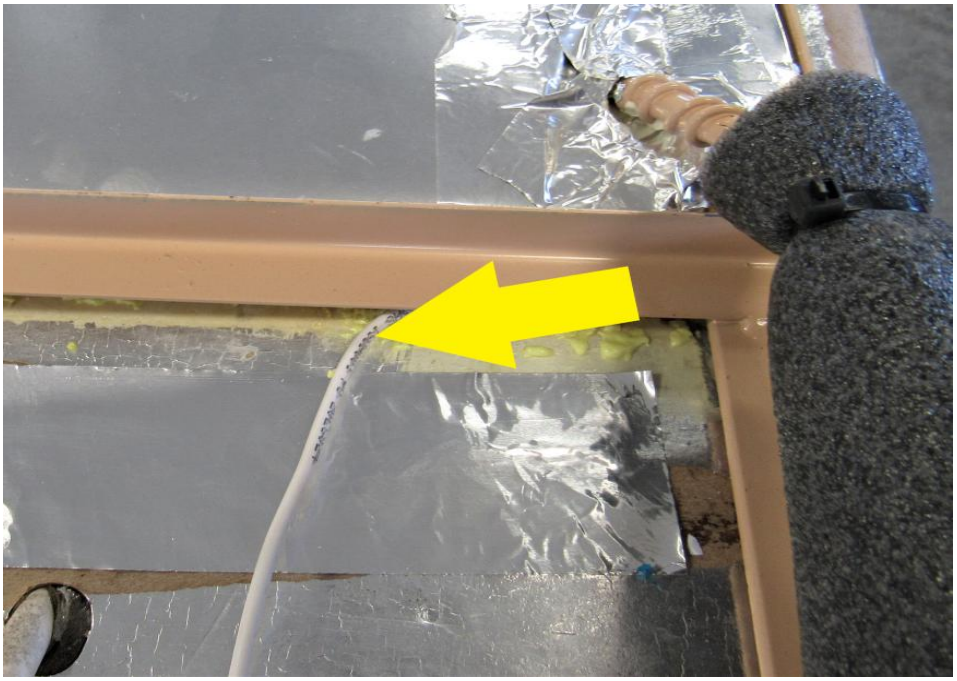


Lay unit back into box being careful so as not to scrape off any thermal mastic on the box, and make sure unit is in position where you had it last so freezer holes line up. Now screw the unit to the back of the fridge using the #10X1" self-drilling hex screws provided





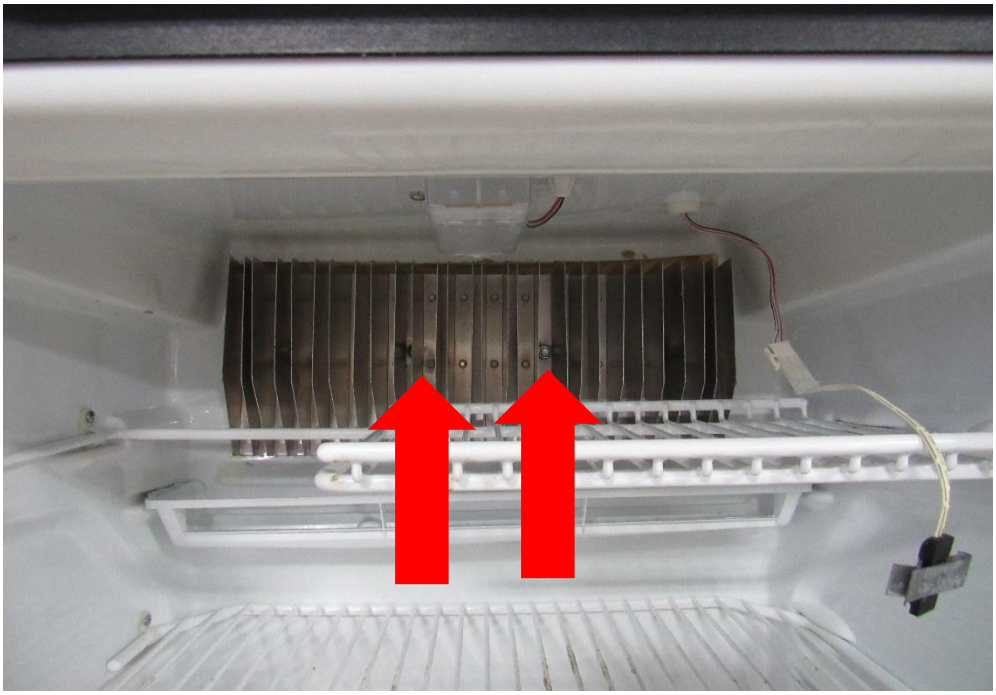
Your controller wire will exit on the bottom of the foam insert between unit and box. (YA)



Set the refrigerator upright into the standing position and install all four freezer screws, using the supplied #10X2” screws in the parts bag, pulling the unit tight against the back of the freezer.



For the fins in the fridge, you will only need to use the 2 middle screws, thermistor can be clipped back onto the fin, but it will no longer be used.

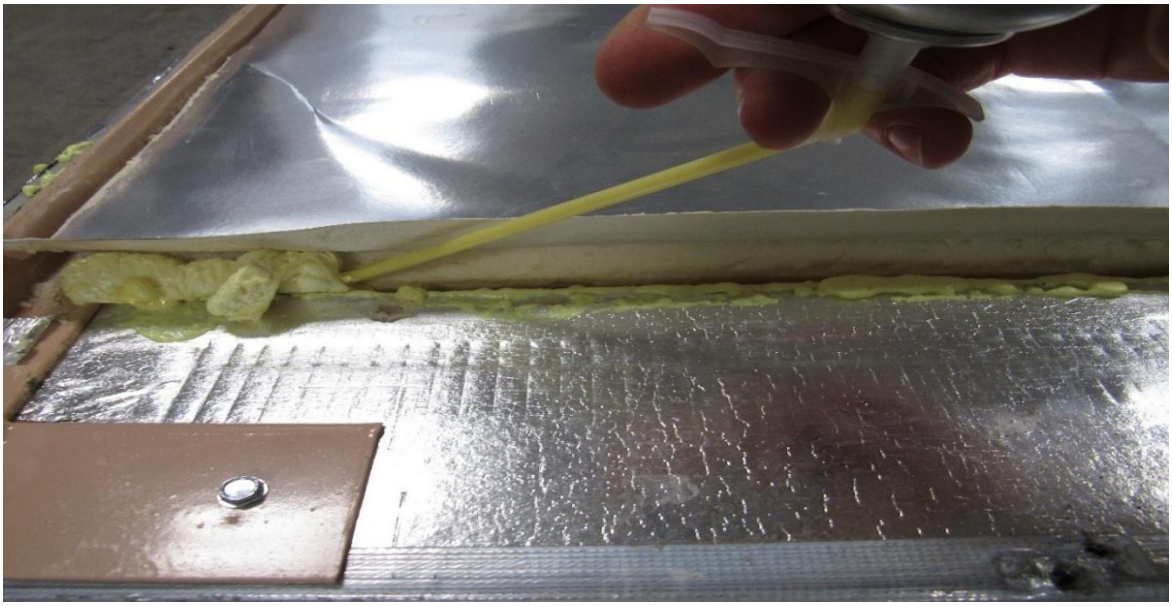


Clip your controller onto the fin close to center left/right



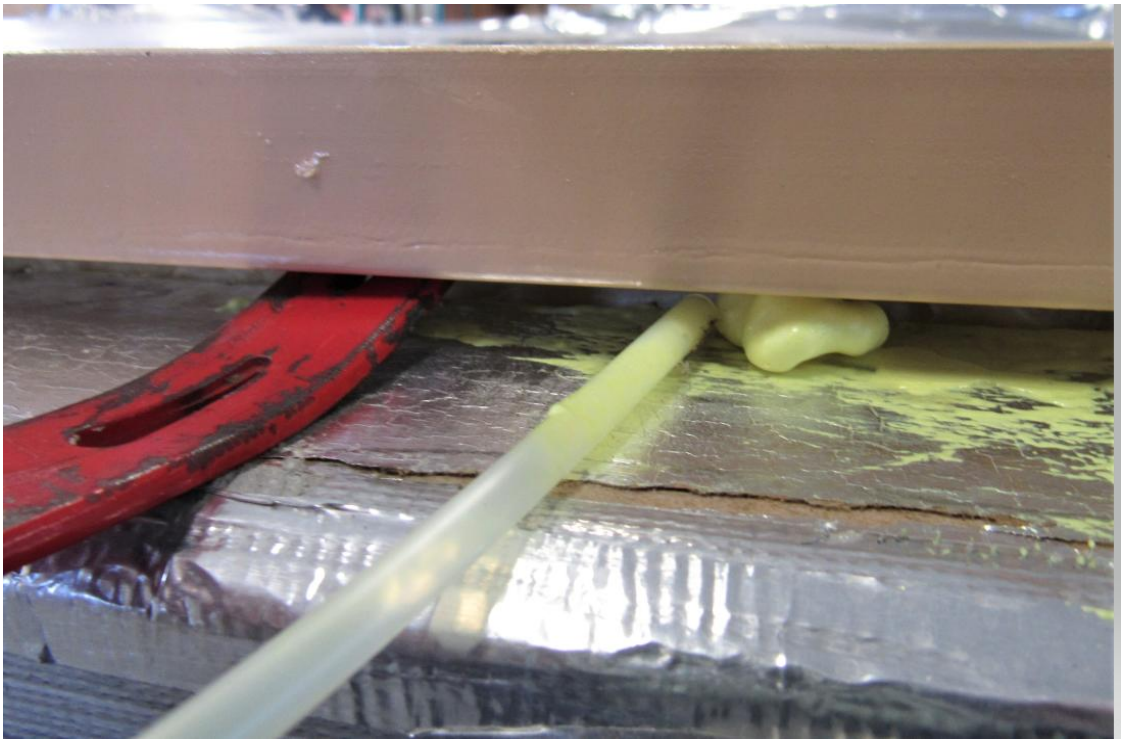
Warning: Make sure this step gets followed precisely, otherwise your fridge is unable to cool properly

Lay fridge back down, take the can of Great Stuff foam (shake can for a few seconds) and apply a bead of foam around all four sides as shown below. Make sure 100% of the perimeter of the cooling unit foam pack is sealed to the fridge box using the sealant foam. This will help seal all air leaks while travelling down the road.





On areas where the steel frame is tight against the box, take a small pry bar or flat bar and lift up enough to get in there to fill up the gap between unit and fridge box. Make sure all gaps and cracks are sealed off, very important!!



After filling all gaps with foam, follow up with the supplied aluminum tape as shown.



Slide defrost cup (RA)back under copper tube and attach with one of the #10X1”self drilling screws or this defrost cup can be left off and the hose stuck out the side vent when all done and the condensation will drain to the ground.



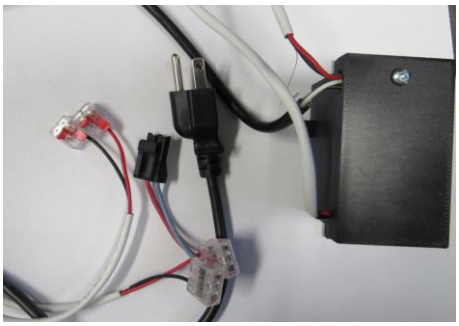
120V Hvac Universal Controller installation

This controller eliminates all of your existing Dometic controls. So that means that your front display panel, your interior light, and your rear control board will no longer work and can be taken out if need be. This new controller has its own on/off switch, temp control thermostat, as well as a light bulb that is motion activated. Long Life roller bearing fans to give you frost free satisfaction for years to come

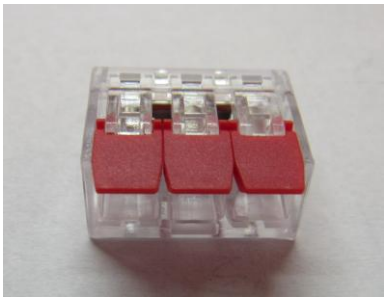


Included in Package:

1- Control Assembly (Pic above)
2- Compressor Relay control (pic below) will be zip tied to the unit



2- 3-slot wago

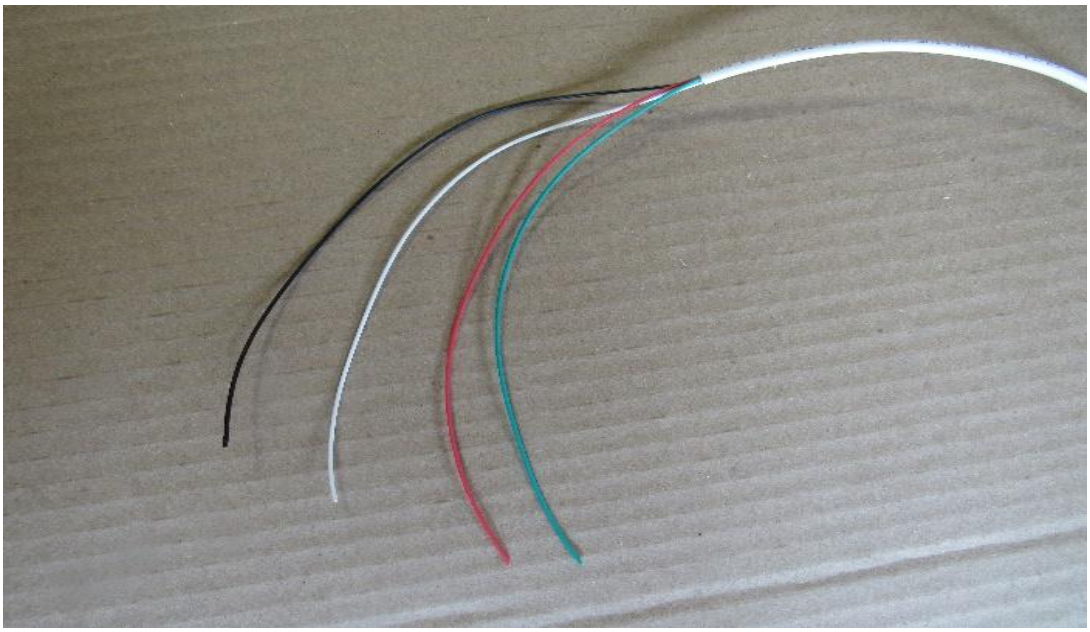


Installation

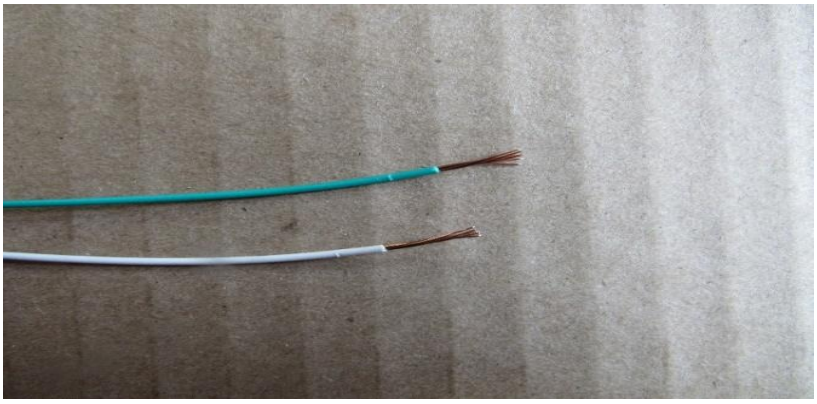
Make sure controller is set to “Off” before starting the install.

Step 1: If you have an existing fin fan on your fins unclip those and move them towards the left so you have room to clip this new controller onto the right side of the fin. The existing fin fan wires can be twisted in with the new control wires and inserted into the Wago. Shown later

Step 2: Strip about 6 inches of the white coating off of the end of the wire. Inside there will be 4 smaller wires, red, black, green and white. Please note the green and white wires might be blue and yellow.

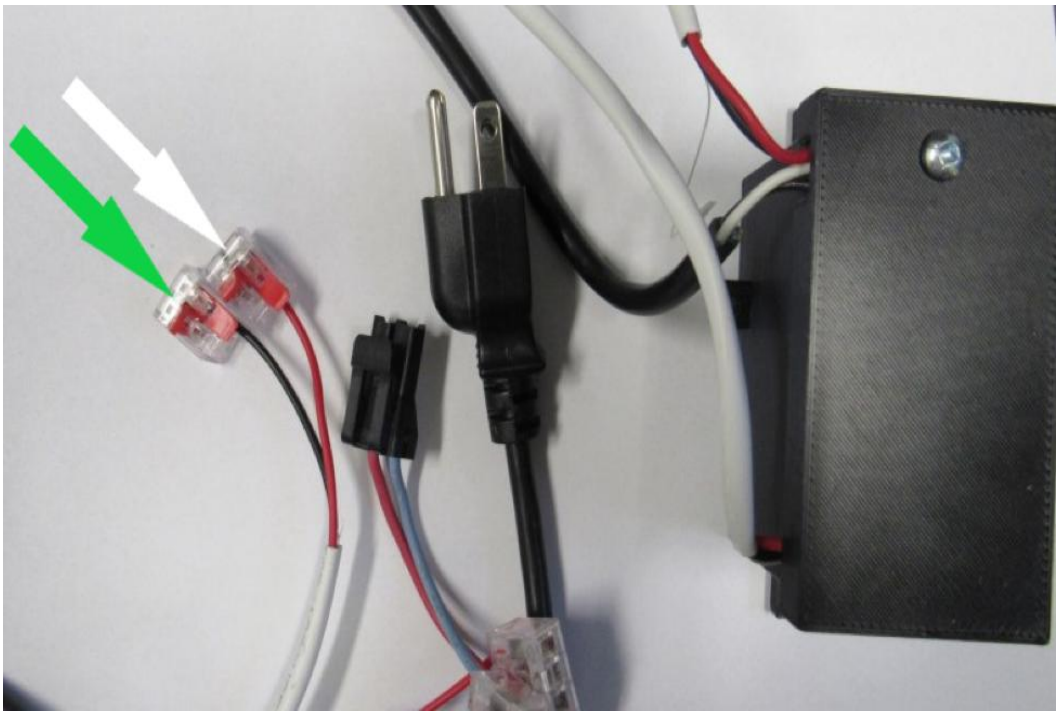


Step 3: Strip about ¼ inch off the end of each wire.



Step 4: The white wire connects to the red wire from the relay control box (WA) The green wire connects to the black wire from the relay control box (GA) The Red/Black wires coming from the inside controller will be hooked up later

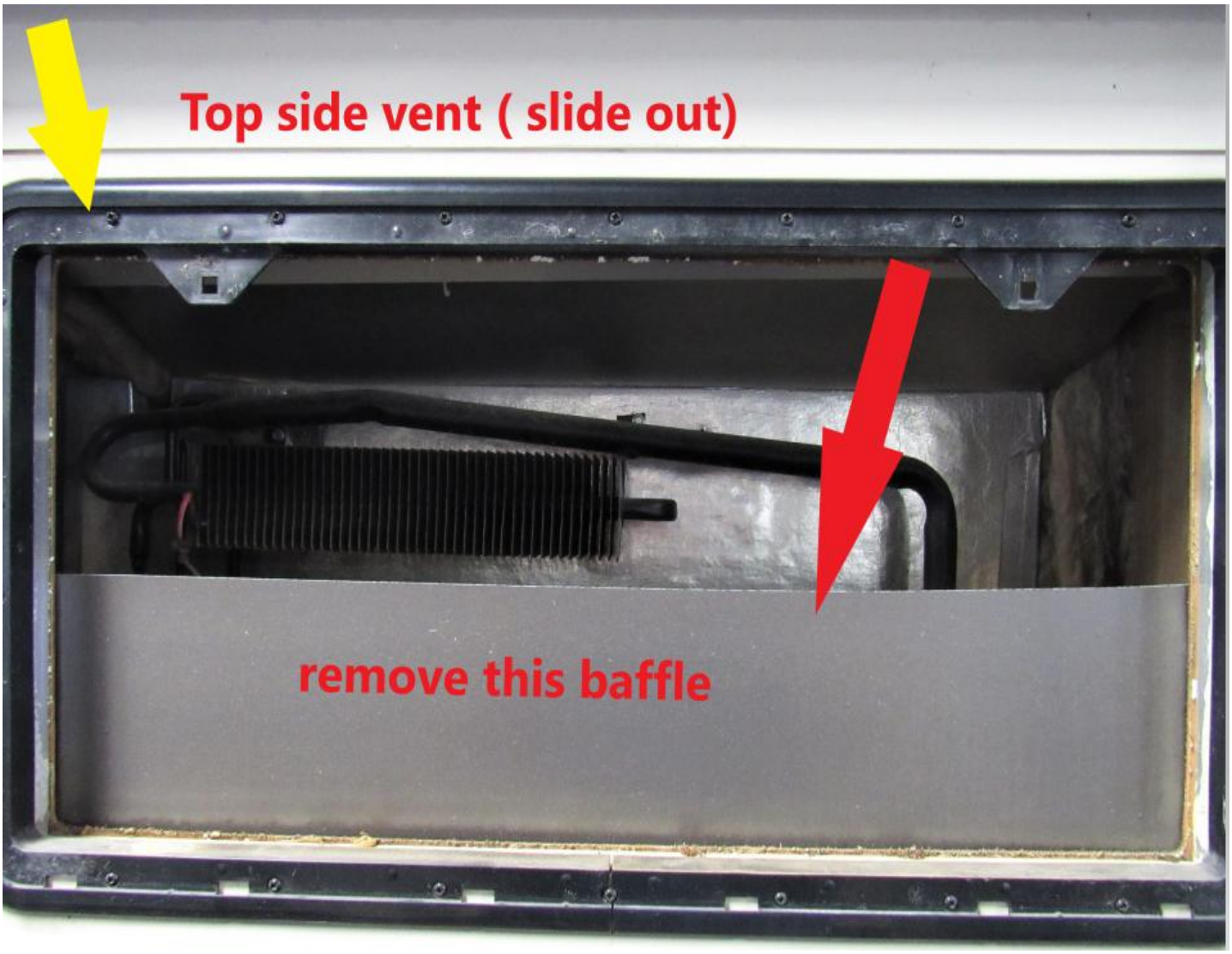
If you have the blue and yellow wires, blue represents green and yellow represents white



Step 5: Attach the relay box to the back of the unit or fridge box to your preference. Or it can simply just be attached to the floor board of the coach later.

Warning: please make sure and follow this thru this step, otherwise unit could over heat causing damage to the unit.

Before installing the fridge back into the cavity, check to make sure wall insulation is secured and this is a good time to sweep or vacuum any loose debris. If this fridge is installed into a slide out then make sure and remove the top side vent (YA) baffling (RA), as you will no longer need this and all it will do is slow air flow. If Its installed into a roof vent style then nothing has to be changed, but make sure and leave both vents open, as this unit will still have to breathe



Now you're ready to slide the refrigerator back into the cavity. Once it's started it helps to have someone outside to watch as you slowly push the fridge back into place, making sure the gas line is out of the way. Install mounting screws (RA)on the top and bottom first before finishing outside.





Attach black trim pieces on top and bottom.



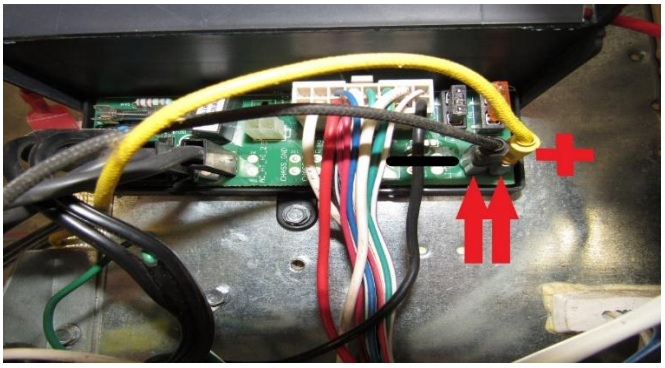
Put the two mounting screws (RA) back in place. Or if your coach is a Winnebago, see pics above for location of bolts,



WARNING: Make sure this gas plug has been checked for leaks (RA) this copper tube can be bent carefully and tucked out of the way once the fridge is back in place.

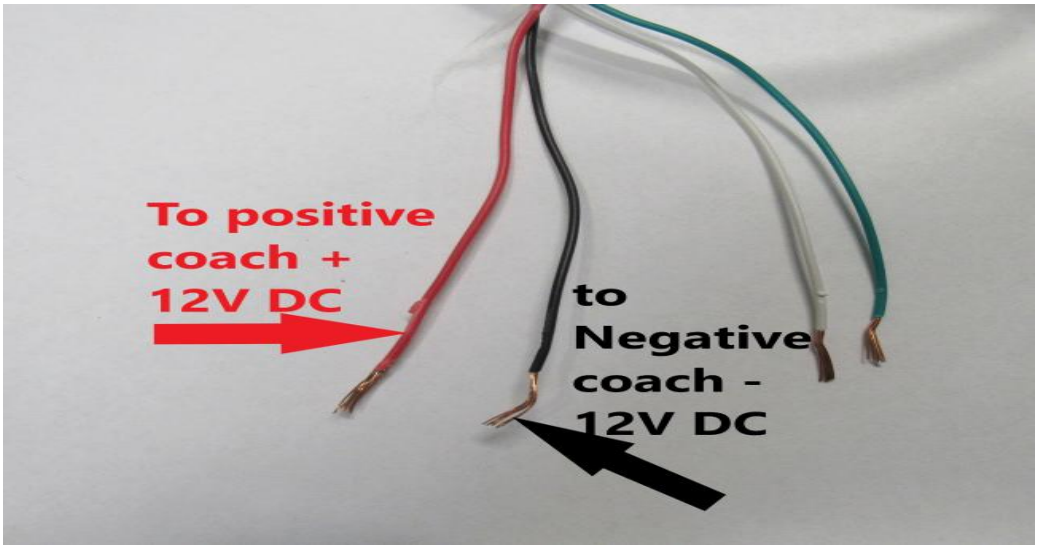


Step 6: Now find your 12V DC wires coming from your coach batteries. Which will be powering your inside universal control. The pic below shows these wires being Black/Yellow from the coach, but these can be any color or size, (dependent on the coach manufacture)



Step 6A The 12V DC wires on most coaches come up through the floor behind the fridge, make sure to not get these 2 together as this will blow your 12V fuse. Make sure you know which one is positive.

Step 7 Take the small red/black wire from the inside controller and add the 3-slot Wago to each one Then make sure you know which is the 12V + wire from the batteries and connect it into the red wire from the controller using one of the 3-slot Wago included. Next take the black wire from the controller and connect to the negative from your battery using the other 3-slot Wago included. This is where you add your existing fin fan if you have one, red to red black to black.



Now plug your 120V cord from the relay box into the outlet behind the fridge.



We highly recommend using a digital wireless thermometer to monitor your inside fridge temps, many phone calls or temp misleading's can be avoided by making sure the thermometers you are using are accurate, you do not have to use our brand but we do recommend using something like this type.

https://jc-refrigeration.com/product/refrigerator-freezer-digital-wireless-thermometer-free-shipping/

Use digital wireless



DO NOT USE



Clip fridge sensor underneath second shelf down or first shelve beneath the fin, place it center front to back and center side to side (RA), if its clipped underneath it will be out of food containers way



Same with freezer, clip underneath bottom shelves center side to side but have this one more towards the back of the freezer.



Operating the Controller:



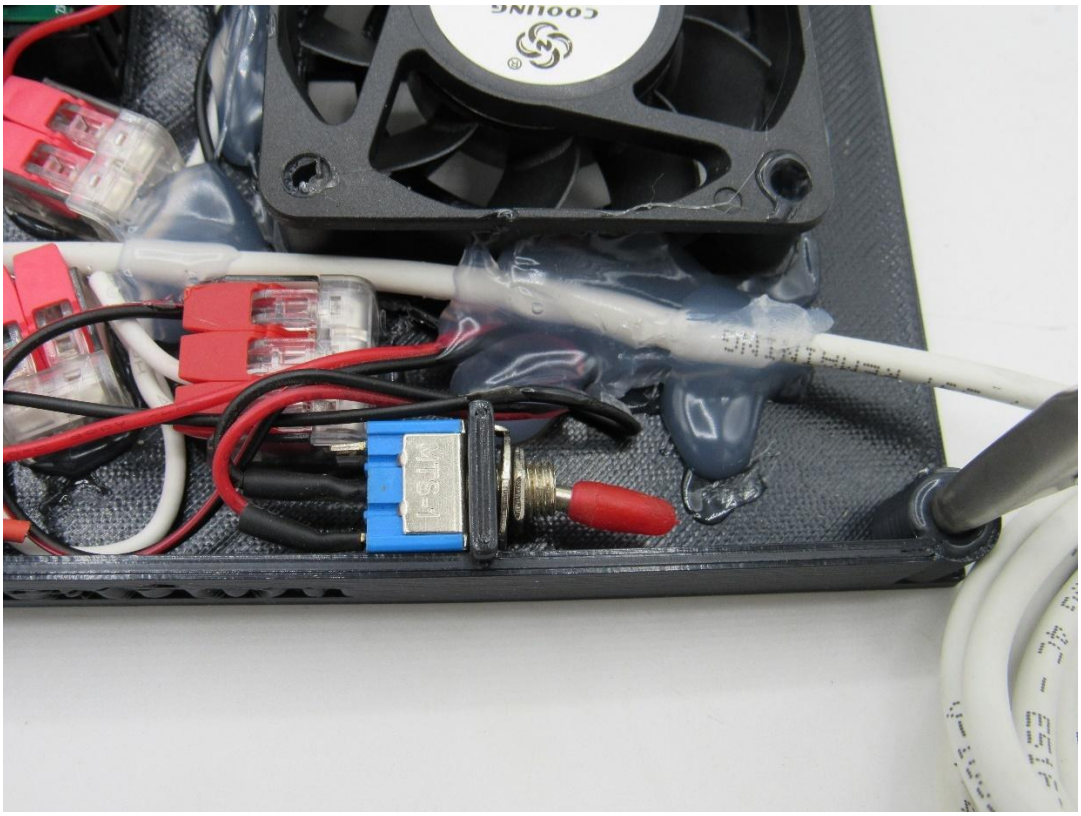
The switch on the front is to turn your fridge on or off. Once you flip the switch to the on position to turn on the fridge, the temp controller will light up, the fans will turn on and the light will turn on as the motion sensor will detect your movement. (After 30 seconds of no movement, the motion sensor will shut the light off.) The blue number (bottom) on the temp controller is what the temp is set to and the red number (top) is the actual temp inside the fridge. The temp is preset to 34F to 38F but you can adjust it up or down using the directions on the next page. The temp may need to be tweaked to your desired temp reading at first. Food zone is 0F to 10F Freezer/38F to 41F fridge. After you have the temp controller set to your desired settings, there is nothing more you need to do as this controller will tell the compressor when to turn on or off. If you are using another temp sensor, just be aware the controller temp and your other source of temp reading might not always be the same, and this is ok, just rely on the temp sensor read out you are used to, but make sure yours is either digital wired or wireless.

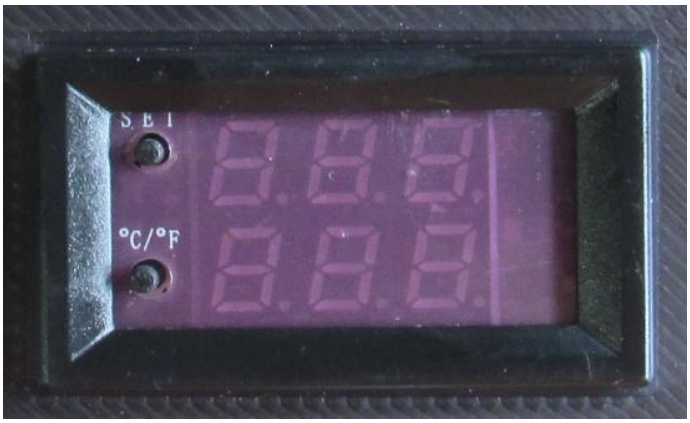
Hvac Universal Controller Introduction

This controller eliminates all of your existing Dometic controls. So that means that your front display panel, your interior light, and your rear control board will no longer work and can be taken out if need be. This new controller has its own on/off switch, temp control thermostat, as well as a light bulb that is motion activated. Long Life roller bearing fans to give you frost free satisfaction for years to come.

Low Ambient Heat Lamp:

On the back side of the control assembly there is a little switch. By flipping this switch to the up position, it bypasses the motion sensor and keeps the light bulb turned on constantly. If you are using your fridge in cold weather (Usually 40 F or lower), your compressor doesn't have to run very long in order to cool the fridge box down and this will cause the freezer to only stay around 25-30 degrees. Turning the light bulb on constantly will give off a little bit of heat into the fridge box which will cause the compressor to run longer and bring your freezer temp down to 0 to 10 degrees. Once the weather warms up or you move to a warmer climate, flip this switch back to the down position so that the light bulb is motion activated again. If this switch is in the up position while you are in warm/hot weather, you will cause the compressor to run longer and work harder than it needs to.





Set Temp

Press “SET” (top button) briefly, bottom blue number starts flashing. While it is flashing you can adjust temp up using top (SET) button or down using bottom (*C/*F) button.

Enter Diagnostic and Mode settings: **We highly recommend not changing any codes unless it’s absolutely required, as this can change other things as well.** Press and hold top (SET) button for approx. 4 seconds. P0 will flash first. You can then scroll through code settings using (SET) button to the setting needed. Once the desired code is reached, press both (SET)(*C/*F) buttons in at the same time, then the bottom blue letter or number will start to flash. Then use top or bottom button to adjust up or down in order to achieve desired setting. Once reaching desired setting, press both the (SET) button and the (*C/*F) button at the same time and the setting will be saved.

Code meaning:

P0 = Lets you switch between heating (H) or cooling (C). You want to make sure it is set to cooling (C)

P1 = This setting determines how far above the set temp the actual temp in the fridge can rise to before the compressor turns on, preset for 2.5

P2= Not needed or used

P3 = Not needed or used

P4 = If actual temp inside the fridge box does not match the top number on the thermostat, this setting can be used to calibrate up or down to make the thermostat temp match your actual box temp. This setting rarely needs adjusting. (Note: One number adjusts the actual calibration by 2 degrees. So if you set it to 1, the actual temp will be calibrated 2 degrees warmer.)

P5 = This setting can be used to set a delay for turning on the compressor. This setting should not need to be adjusted.

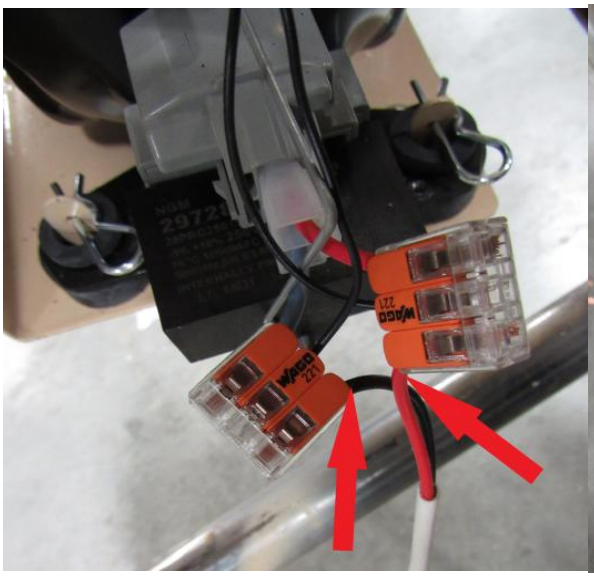
P6 = This setting can be used to set a high temp alarm.

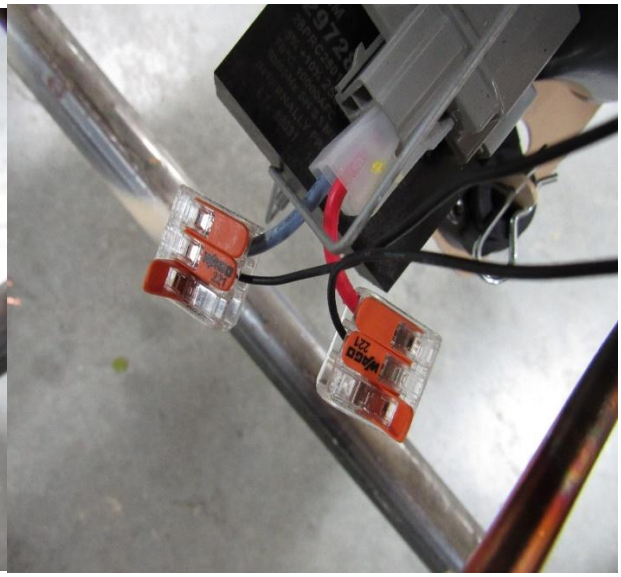
P7 = This setting is used to switch between Celsius (CH) or Fahrenheit (FH). It is preset to Fahrenheit.

P8 = This setting can be used to reset the controller to factory settings. Not recommended to use this setting.

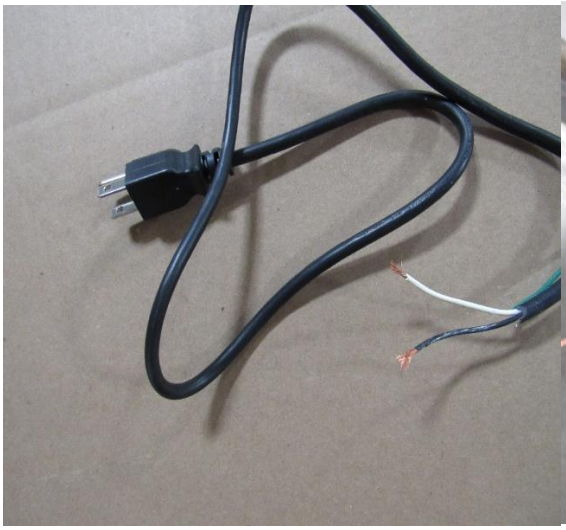
To do a diagnostic test if cooling questions arise use chart below to do a direct wire with the compressor in question.

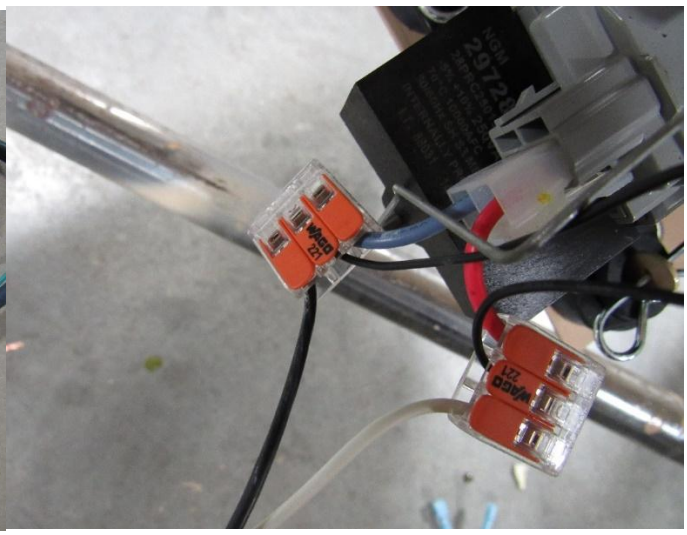
Step 1: Unplug the 120V cord from the outlet. Open tab on the wago to the wire that goes to the small controller. Leave the wire going to the compressor and fan wire intact.





Step 2: Make a 120V pigtail and plug the wires into the empty slot on the Wago where the red and black wires used to be. Then plug the pigtail into a 120V outlet. The cooling unit will now run continuously until the cord is unplugged or the power to the outlet is cut. Make sure vent fan, and compressor runs when power is plugged in.





FAQs

How much will the compressor actually run?

From our testing in 80 degrees, with the fridge and freezer empty, and the doors remaining closed for a 24-hour period, the 120V AC compressor will run approx. 56% of the time and the 12V DC compressor runs approx. 67% of the time. However, keep in mind that this can be very easily affected by a number of variables such as ambient temp, how often the doors are opened, and how much food is in the fridge/freezer.

What is covered under warranty?

Our warranty covers the cooling unit and any of our controls that came with the cooling unit. It does not cover any original Norcold parts such as the control board, the front display, thermistor, etc.

What if the cooling unit needs to be worked on and I'm not close to your location (Shipshewana, IN)?

Contact us first and we will try to help you get the issue resolved. Most problems can be fixed by us through email or phone but if more work, or hands on work is needed, we have a list of dealers/service centers in almost every state that have purchased cooling units from us before and could possibly help you out.

Is there any regular maintenance to perform on these cooling units?

The only thing that needs to be done on these cooling units is to take compressed air and blow any dust or debris out of the condenser fin. This can be done maybe once or twice per year.



You are all done and ready to hit the road and do some serious camping 😊

Let us know if you see any areas we missed or that should be made clearer, since we do installs practically every day, we get blind at times to things that should be mentioned or be made clear.

Thanks for hanging in there to the end, give yourself a fair pat on the back and enjoy your cold fridge for many years on your travels.



