Norcold 1200 1201 1210 1211

Hvac AC 120V

With Universal Controller

JC REFRIGERATION INSTALLATION MANUAL



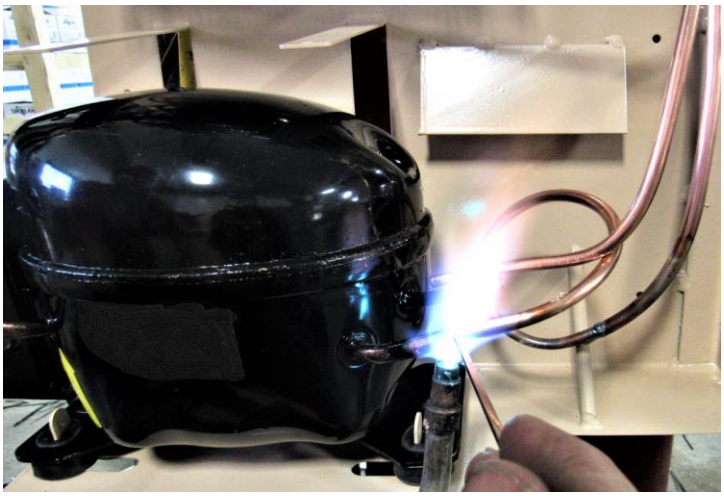
Jr & Jeremy Lambright

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 though 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 offer videos for the gas/elect and install 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 & Aaron 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 differences between this install manual and the install videos you can find on the internet. So, to avoid confusion, follow only the instructions in this manual.
- With this 120V dual compressor cooling unit, unless you already have inverter power behind the fridge you might want to consider to get inverter power back there so it can run off the inverter while travelling.
- 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.
- If your icemaker is no longer used then now is the time to take it out and discard all icemaker wiring. It creates more freezer space.
- It's always a good idea to take pictures of your icemaker wires if you have one so it's not so confusing to put back together
- The cooling unit should be placed in the upright position for at least 8 hours after shipping. During the install if it is laid down for not more than 2 hours, the 8-hour period does not have to be repeated.

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 so 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)





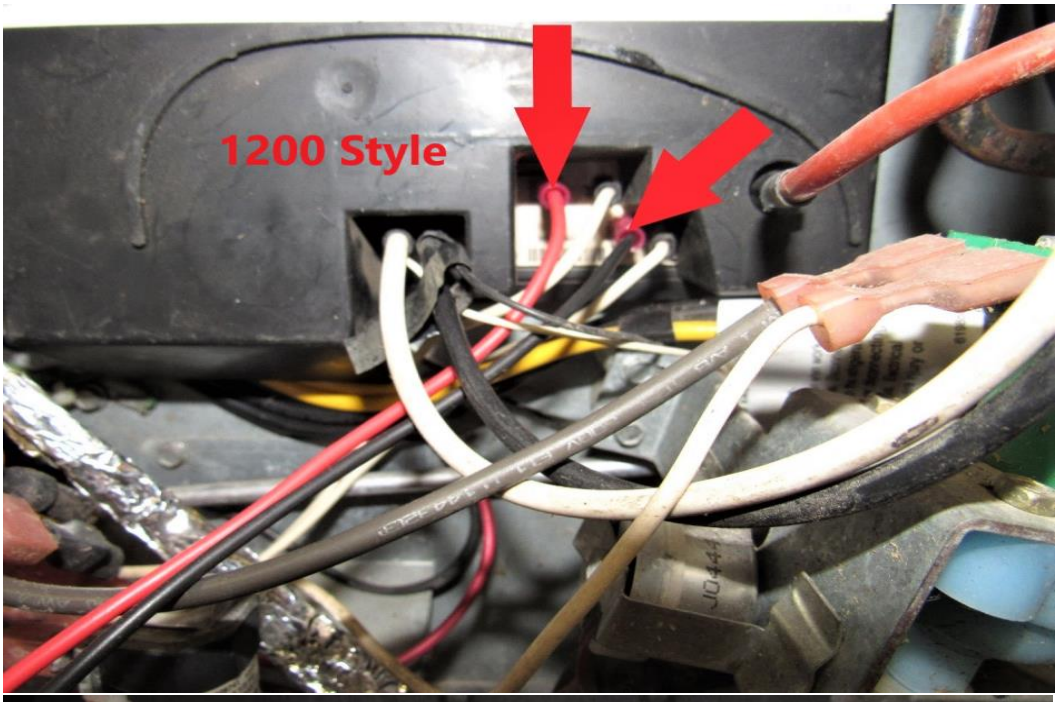
Cover up your floor with blankets and removing any door handles or smoke alarms that might hinder the exit of your refrigerator from your cabinet. Turn off the water pump (if you have an ice maker in your fridge) and the refrigerator control panel.

WARNING:

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



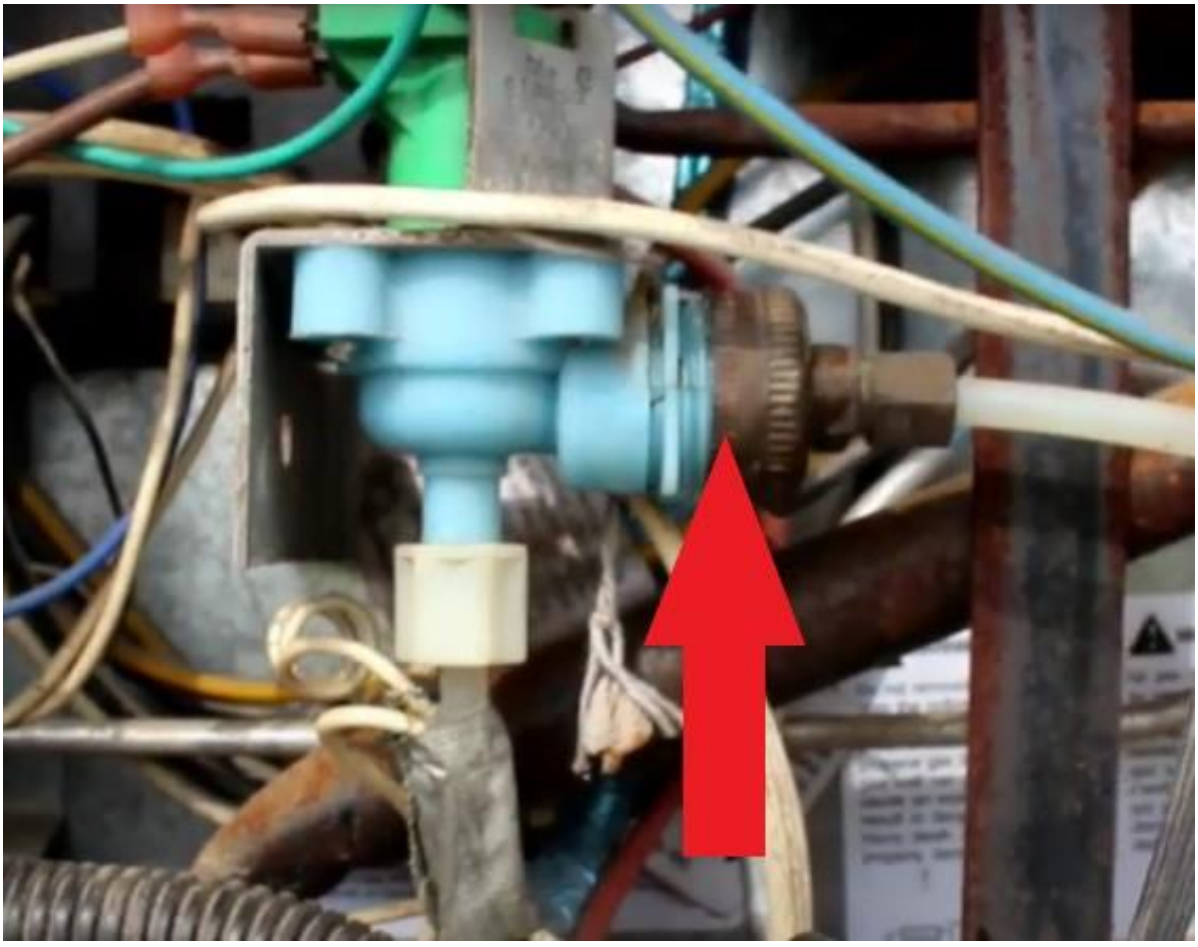
Locate the side vent to your refrigerator.Take the main 12V wires (RA) loose from your board. The wire colors will vary from coach to coach. Note: If your wire ends are not insulated, wrap the end in electrical tape so you don't blow the fuse. You will need these wires later in the installation to power the new controls.



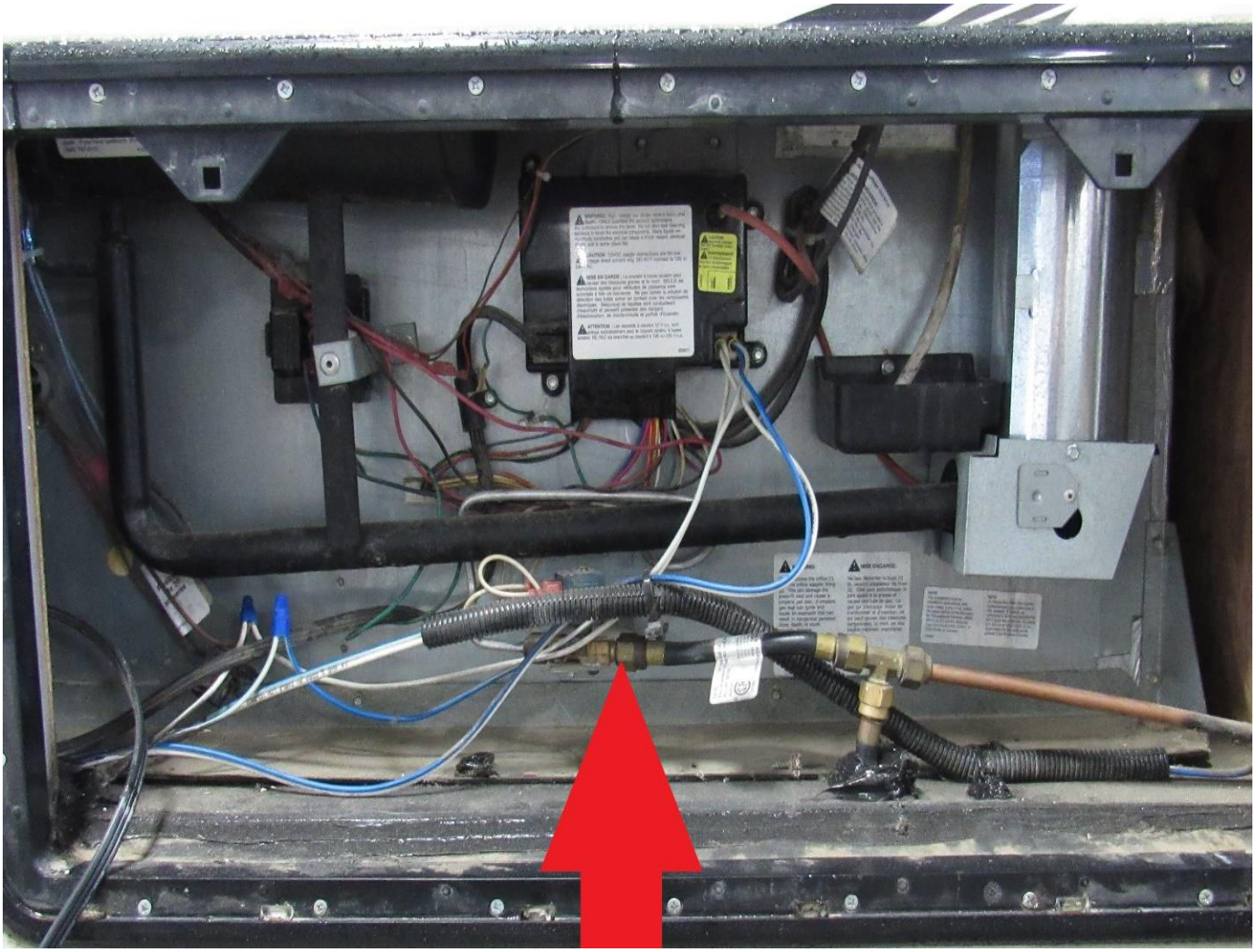


Unplug your 120v plug (RA) from your RV. Location will vary from coach to coach, if you have an icemaker unplug its cord from wall socket, making sure water pump is turned off unscrew water supply line from solenoid (RA).

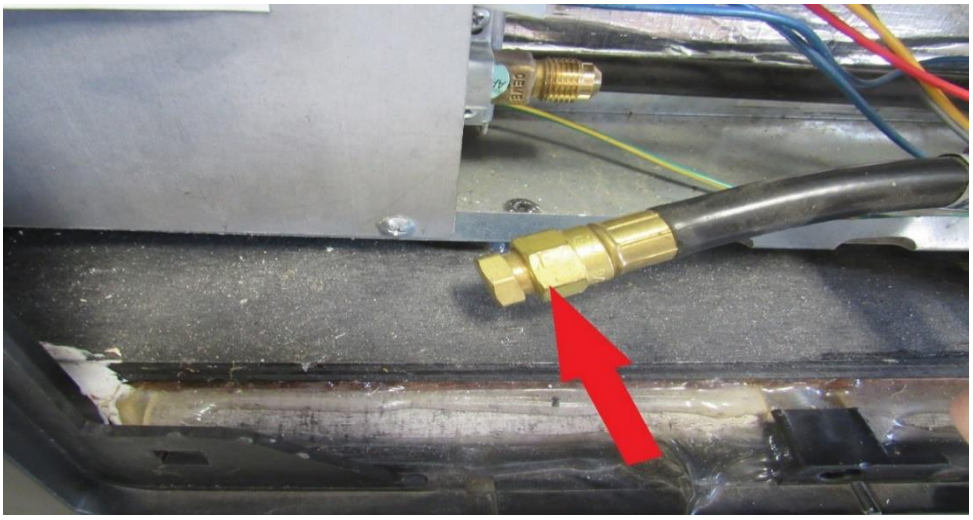




Using 2 wrenches remove the LP line (RA) off of the LP solenoid valve. Make sure LP gas is turned off.



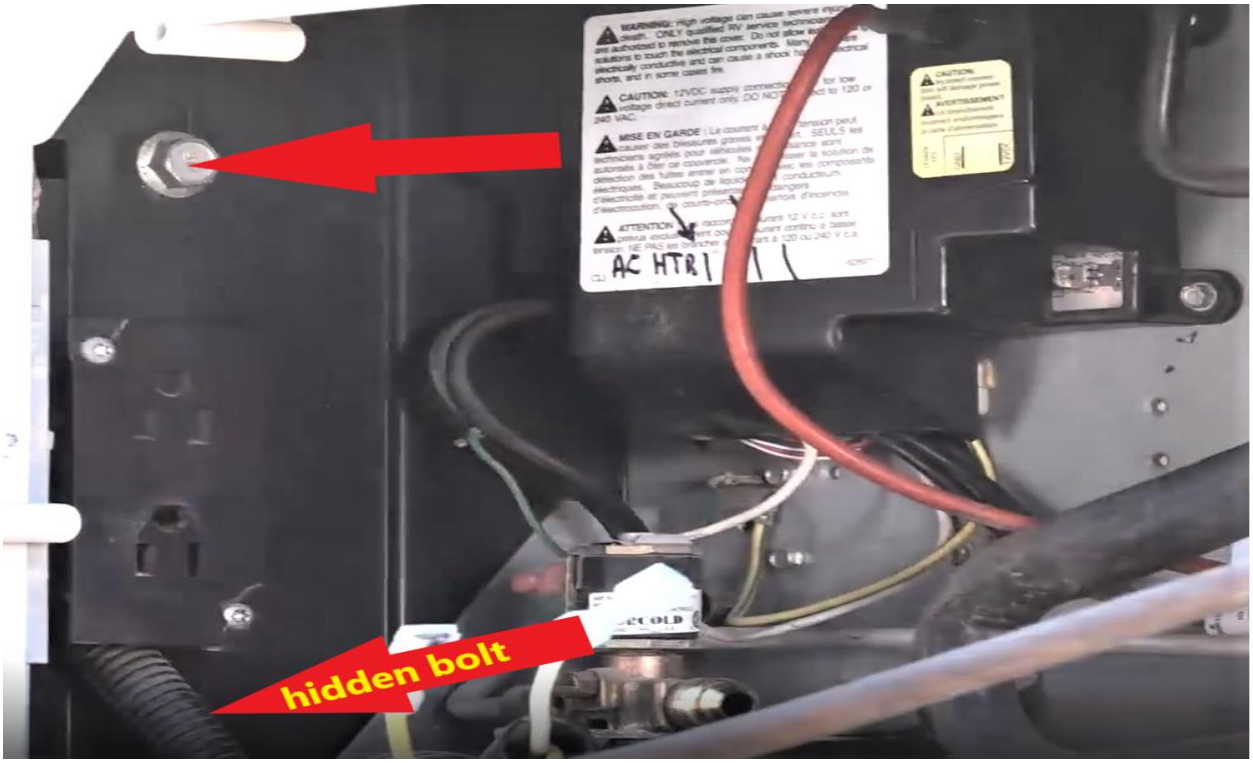
Turn gas plug (included) into gas line and tighten with your wrenchs (RA)



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 or bolts (RA).

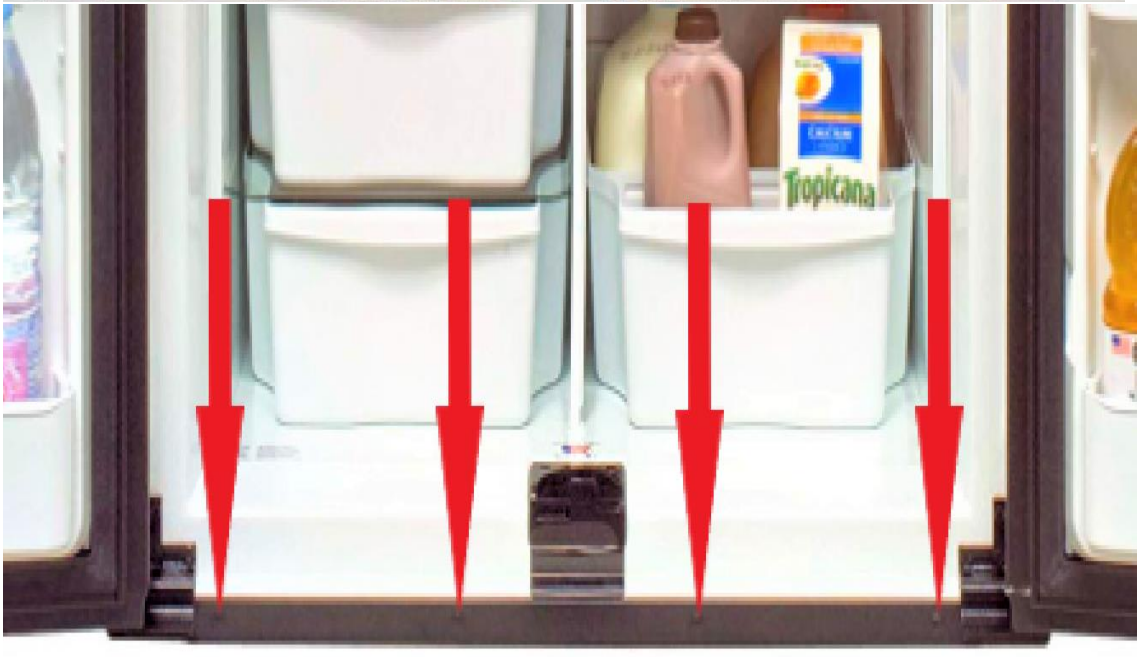


On Winnabago coachs you will have 4 bolts lagged to a steel side plate, 2 on each side of the fridge, also the top roof vent cap needs to be removed and 2 to 4 philips screws need to be loosend from the top of the fridge.



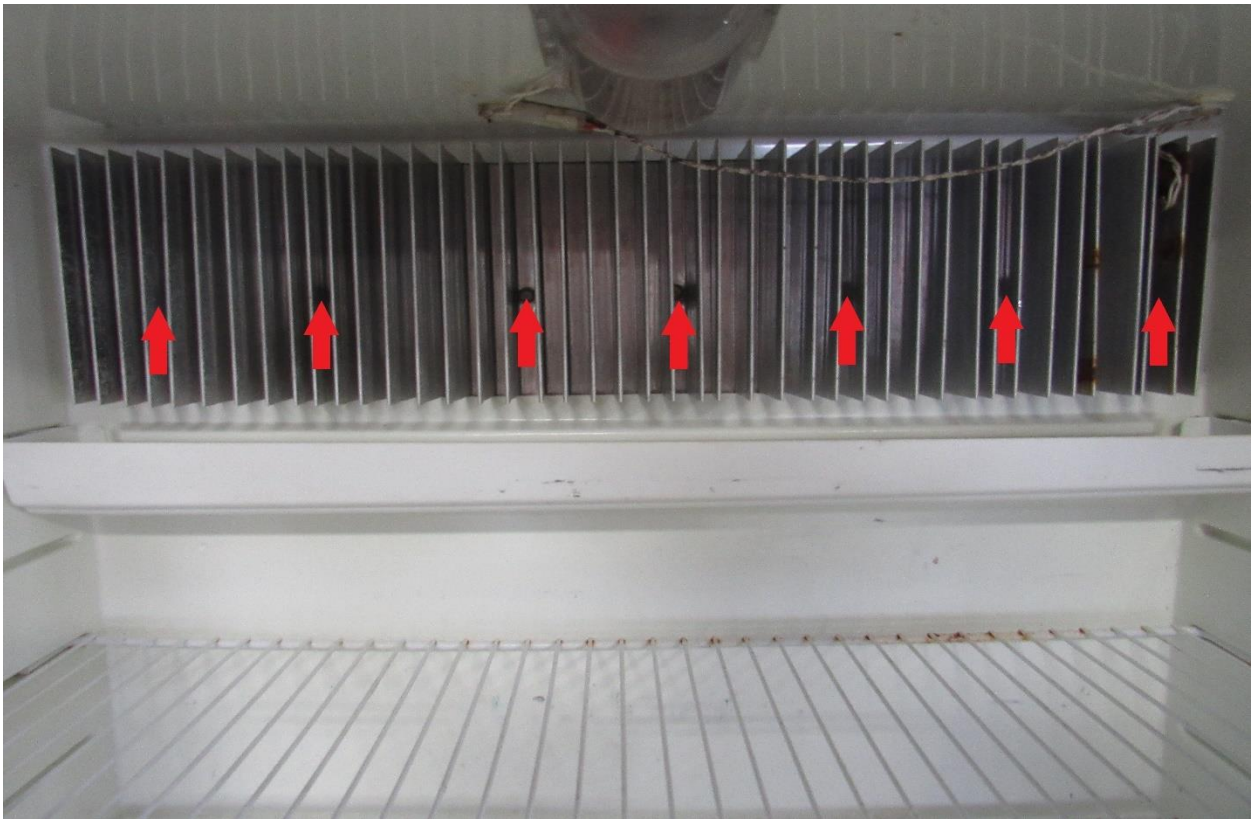
Going inside, remove all food items and start by removing the 4 black button covers on the top and bottom. (RA) Remove the 4 mounting screws on top and bottom (RA). Older style fridge trim might not have the external screw buttons but screws will still be underneath the trim after trim is removed. Screw size and bit needed will vary from coach to coach.





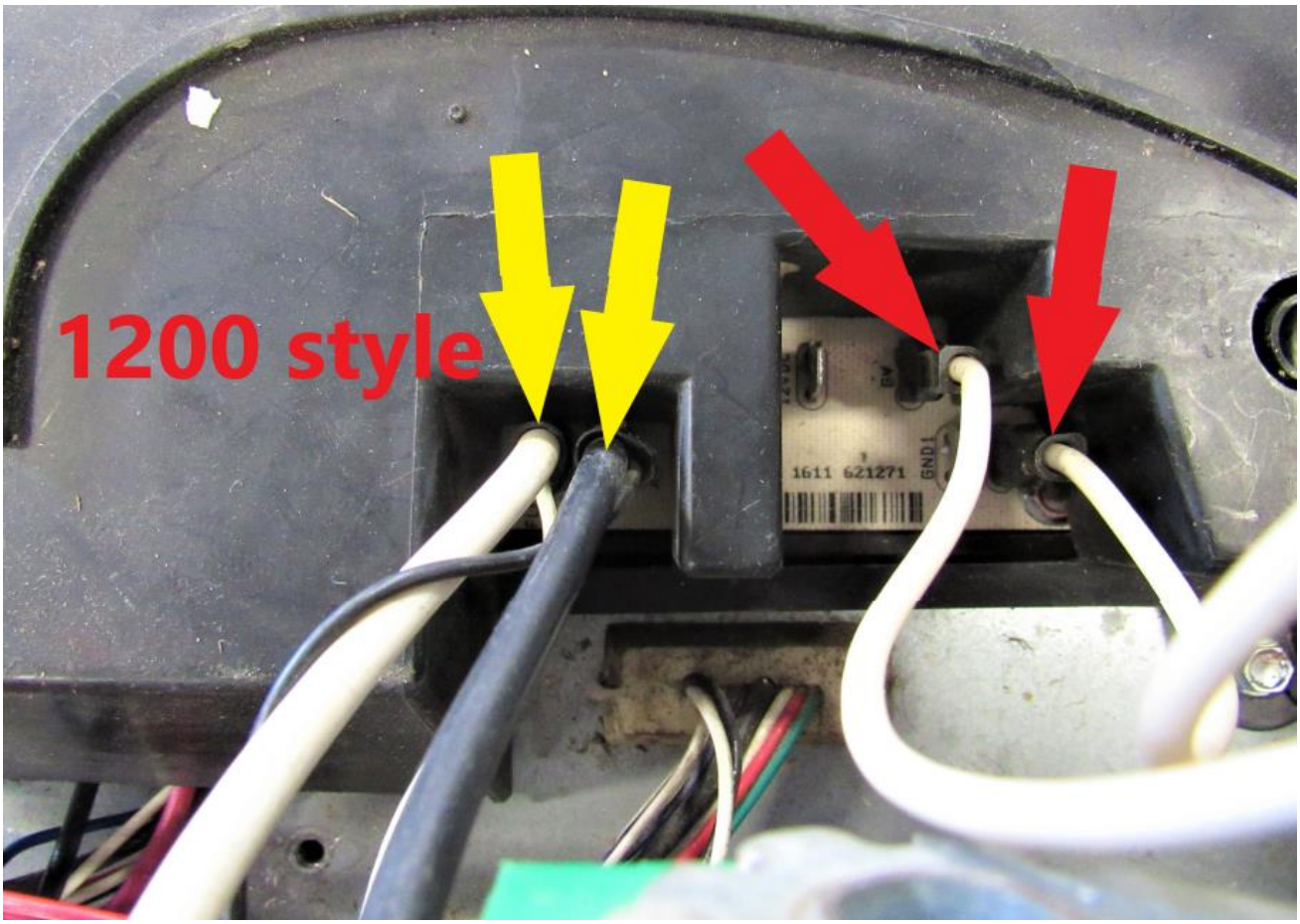
Take a 5/16” hex bit and cordless impact driver and proceed to remove all the screws (RA) in the freezer and the refrigerator.



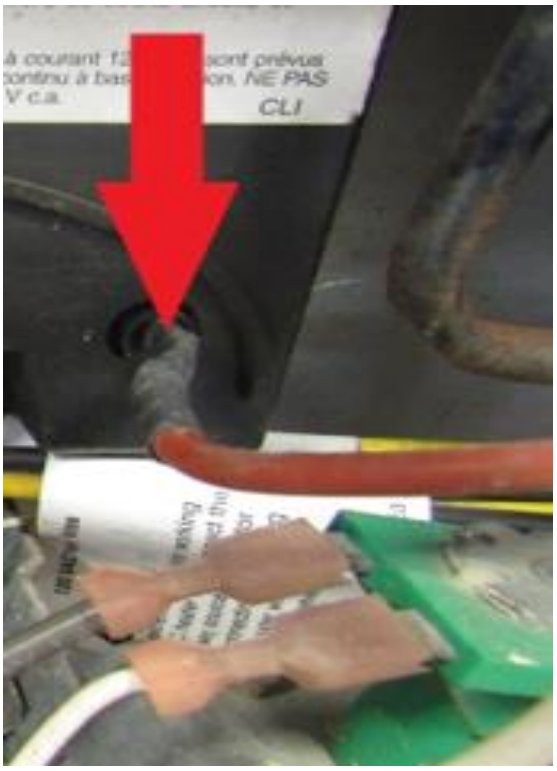


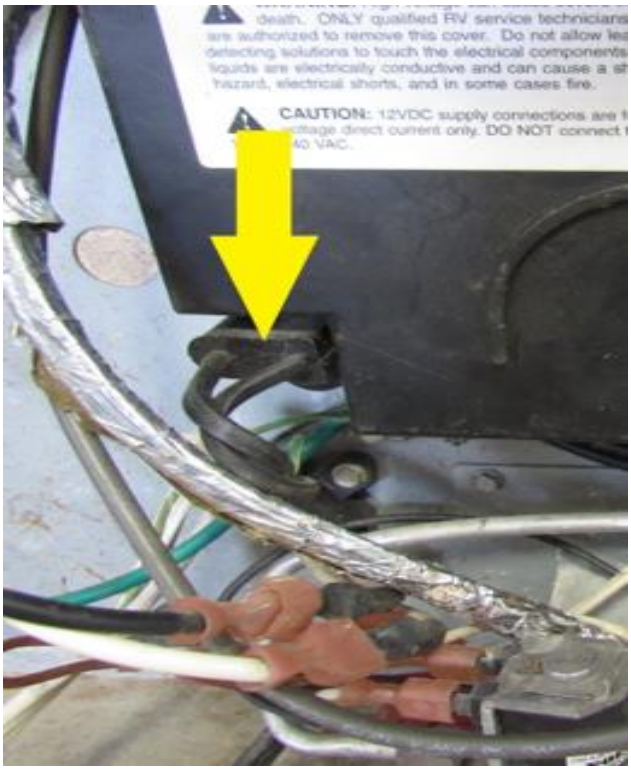
We do not show the fridge being slid out onto the floor, as the lay out of the coaches vary greatly and so it could be misleading to your scenario. But the object is to have 1 guy on each side of the fridge and as your fridge starts to exit lift up gently so when the rear end of the fridge fully exits 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.

Start by taking the LP solenoid wires loose(RA) and 12v fan wires (YA) loose from the board. These will no longer be used

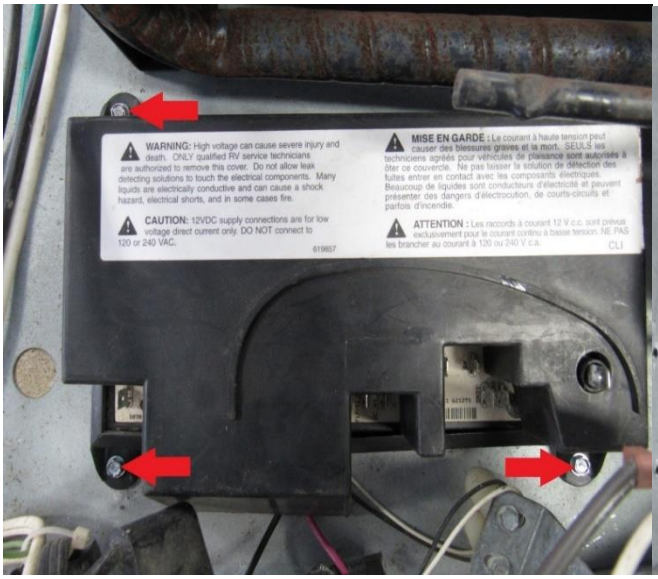


Take the igniter (RA) and the 120v plug (YA) loose from the board and discard as these will no longer be needed.



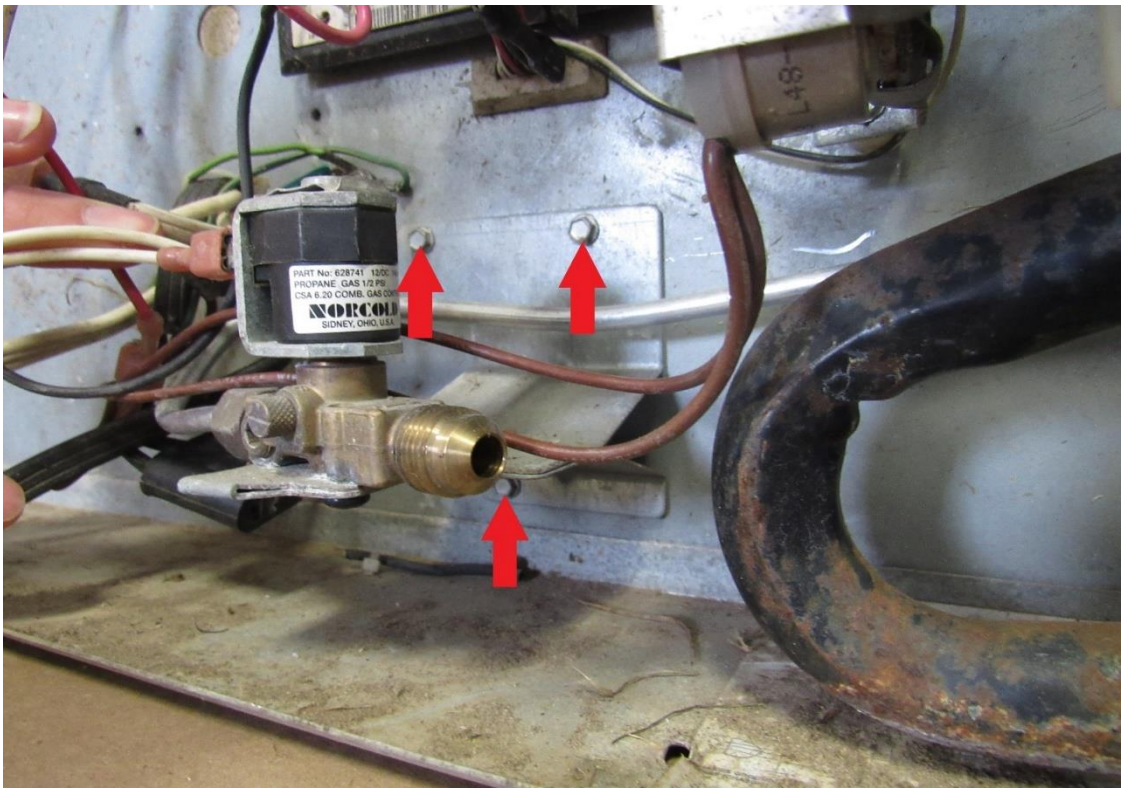


Remove ¼" Hex mounting screws on board (RA). The board will not be reused and can be discarded.

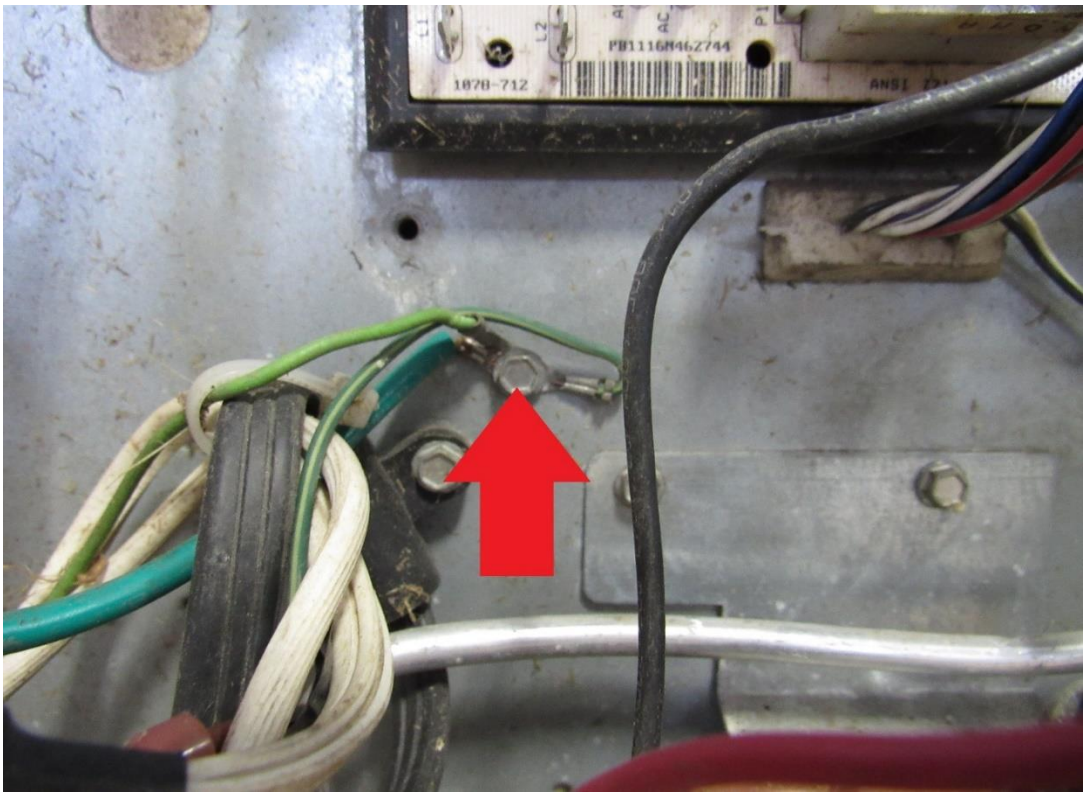




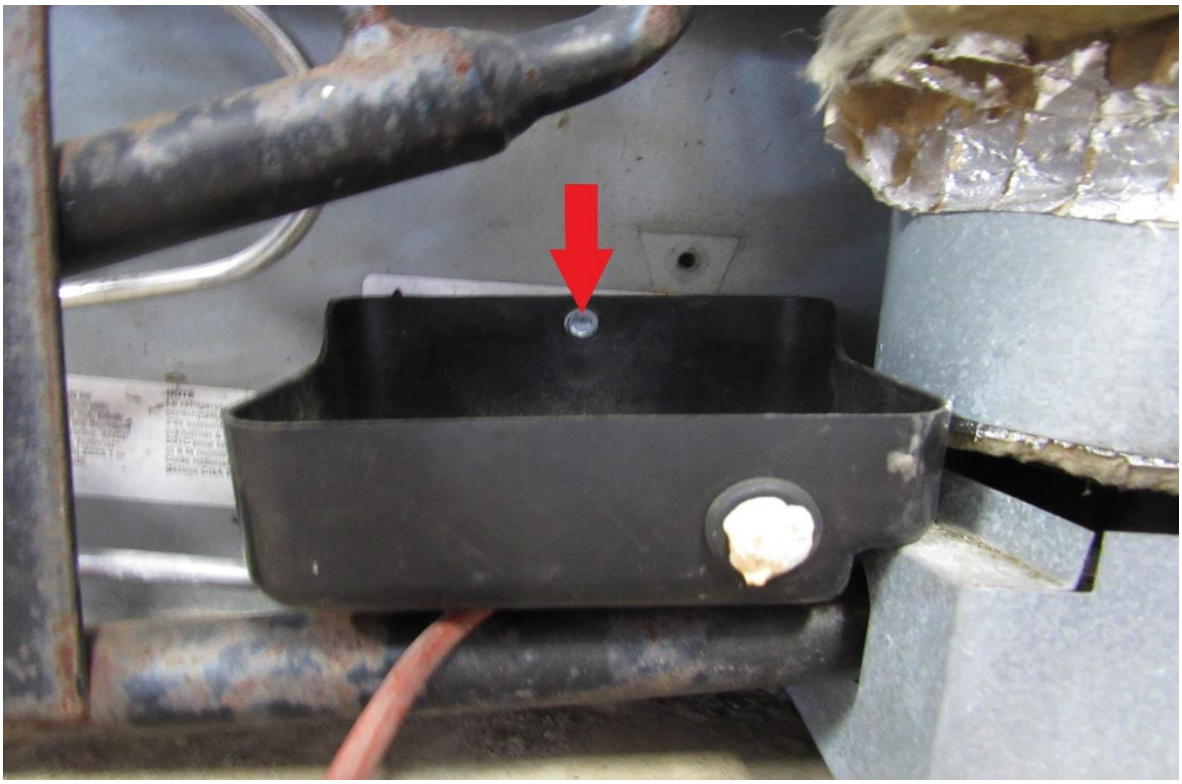
Remove ¼” mounting screws on LP bracket (RA).



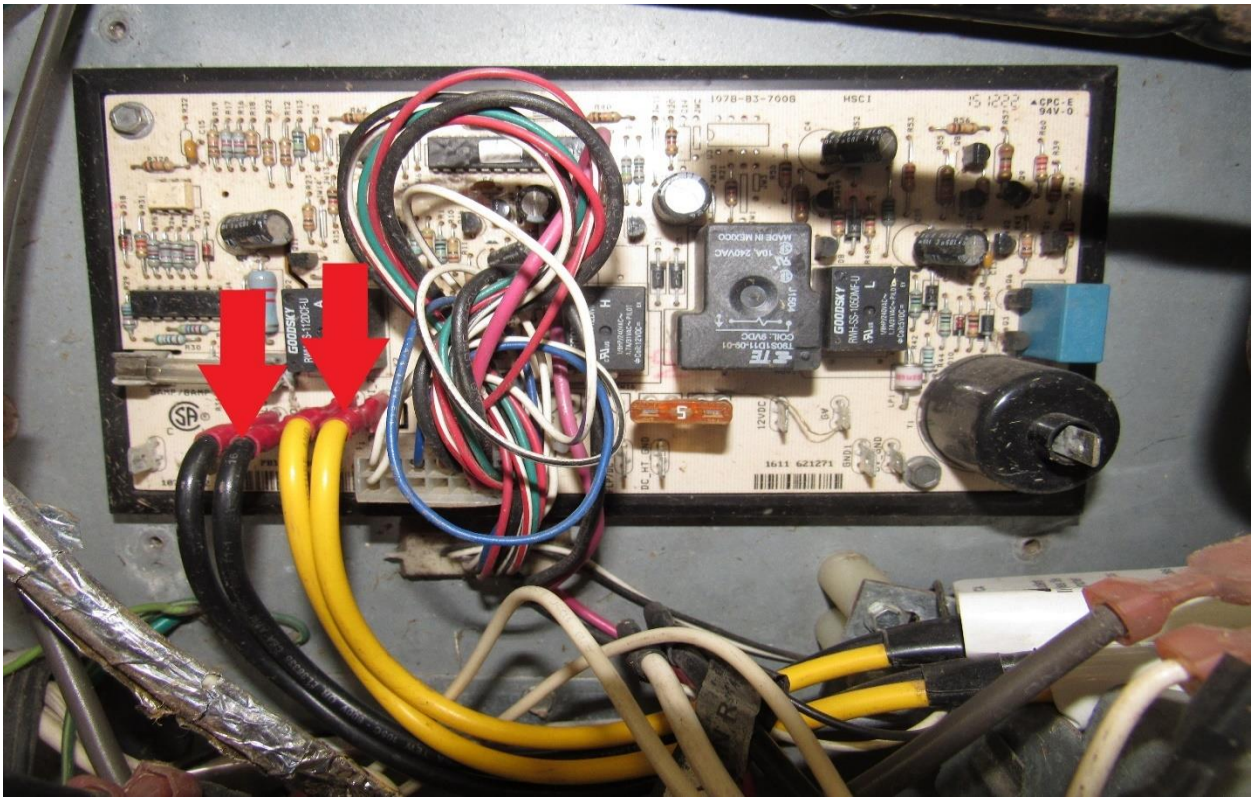
Remove ¼” ground screw (RA).



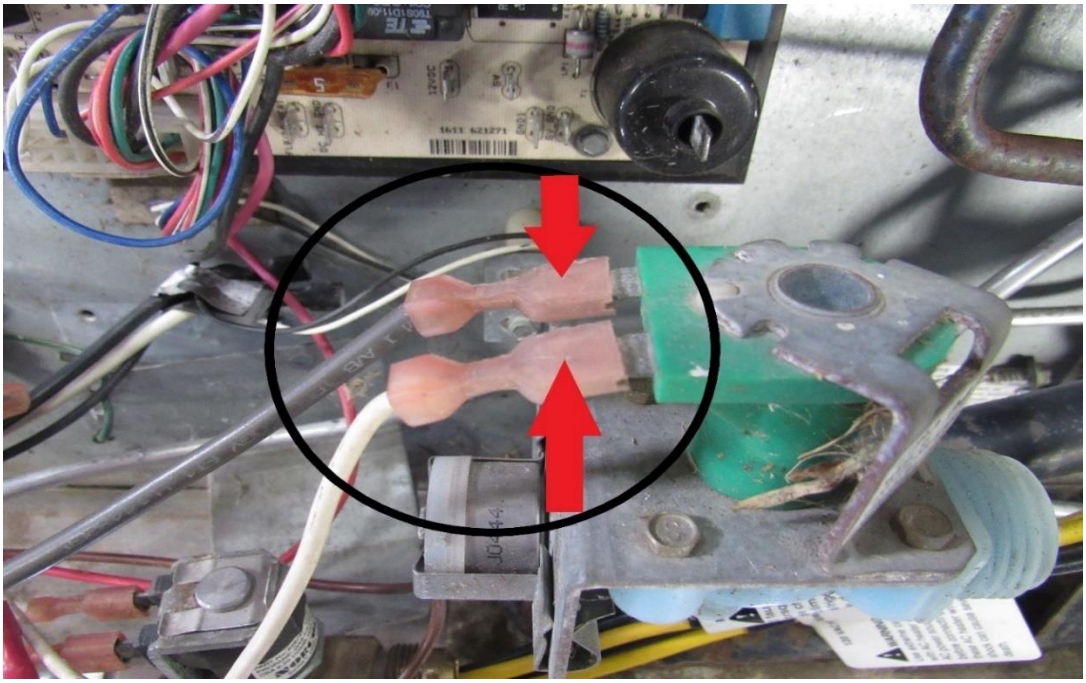
Remove ¼” defrost cup screw (RA) and set cup to the side.



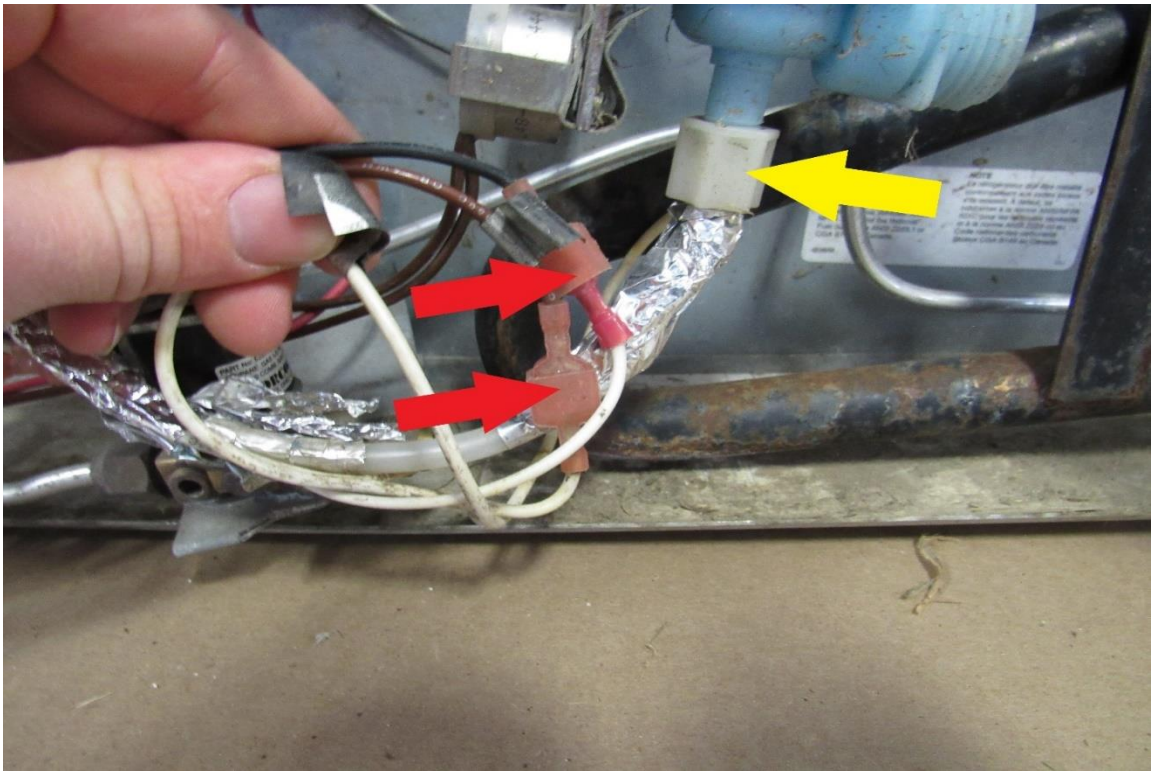
Remove the heating element wires from board (RA).



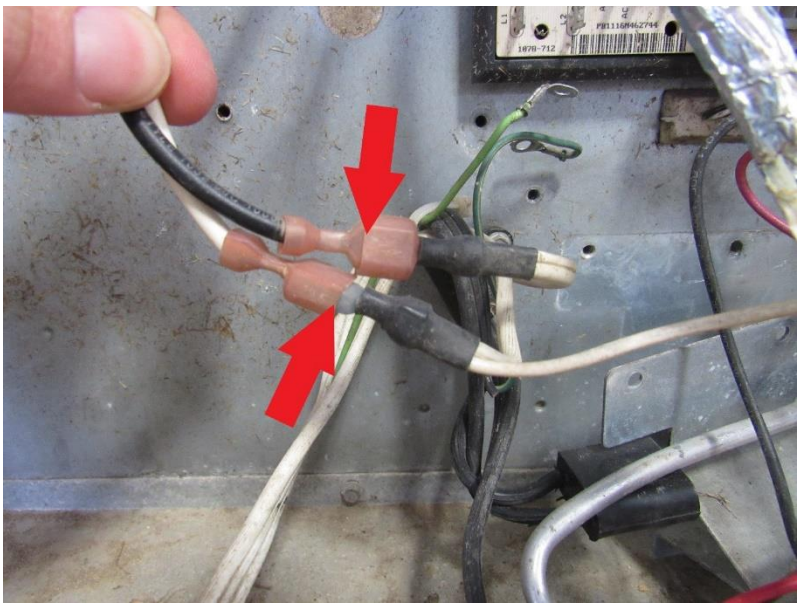
If you have a icemaker and are keeping it in then you will want to take pics of the icemaker wiring in case you need help to put them back as before, our new unit will not affect or change the ice maker wiring hook up or performance.
Remove the ice maker solenoid brown and white wires (RA).



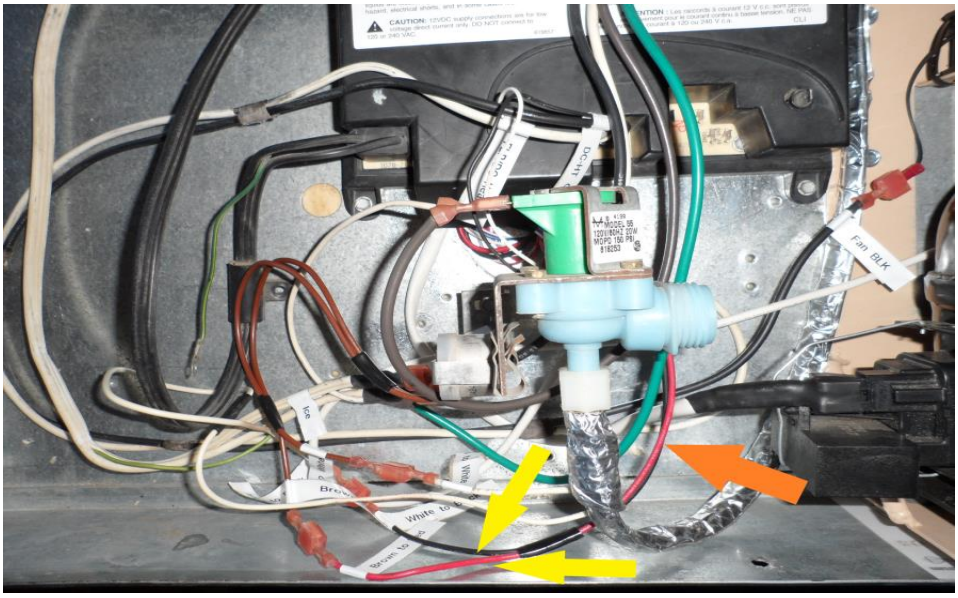
Disconnect the ice maker heater wires (RA) and water supply line (YA).



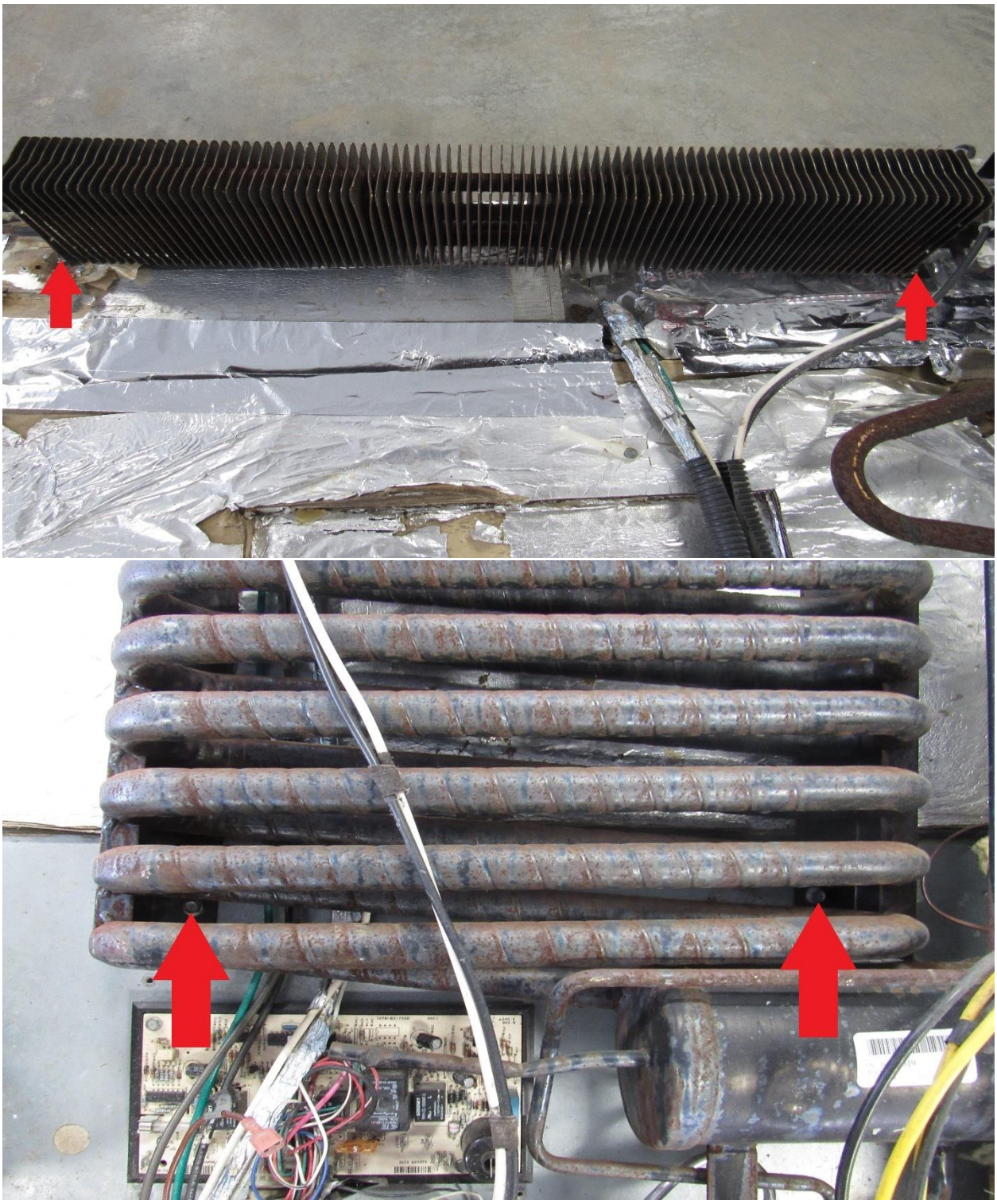
Disconnect the 120V ice maker wires, mark these to make sure you know which ones they are later, because these can be confused with the 12V fan wires (RA). Taking pictures of the ice maker wiring is a big help then reconnecting later.



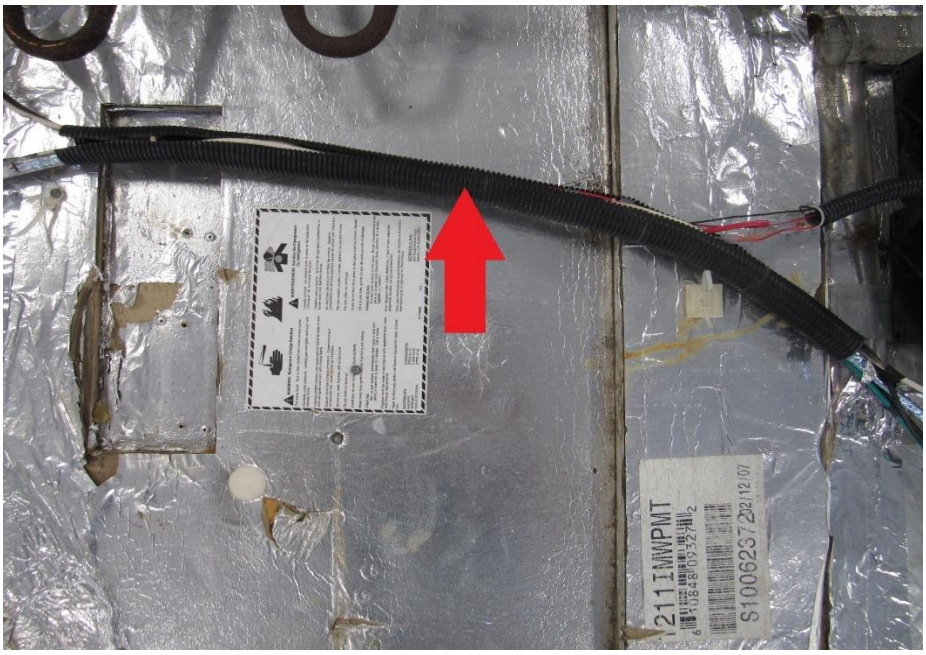
If you plan on keeping your icemaker, the red and black wires coming from the control board (YA) (red wire plugs into a brown wire from the thermostat and black wire plugs into a white wire from the water line heater) can be cut from the control board at the location shown (OA). Set the red and black wires aside for now as you will hook those up later on. Your icemaker wires might not be connected together in this sequence depending if someone rewired it and the wires will not be labeled like you see in this picture.



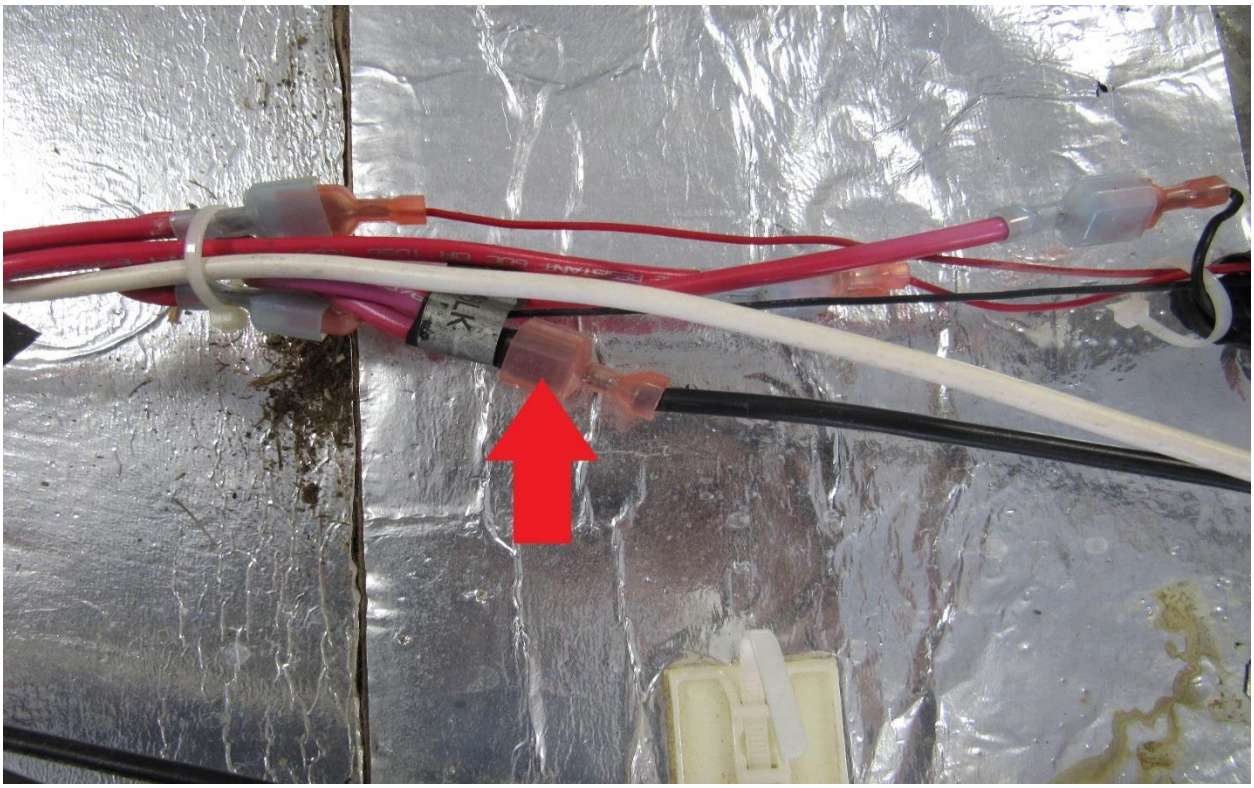
Remove the 5/16” mounting screws (RA) on the top and bottom of the unit.



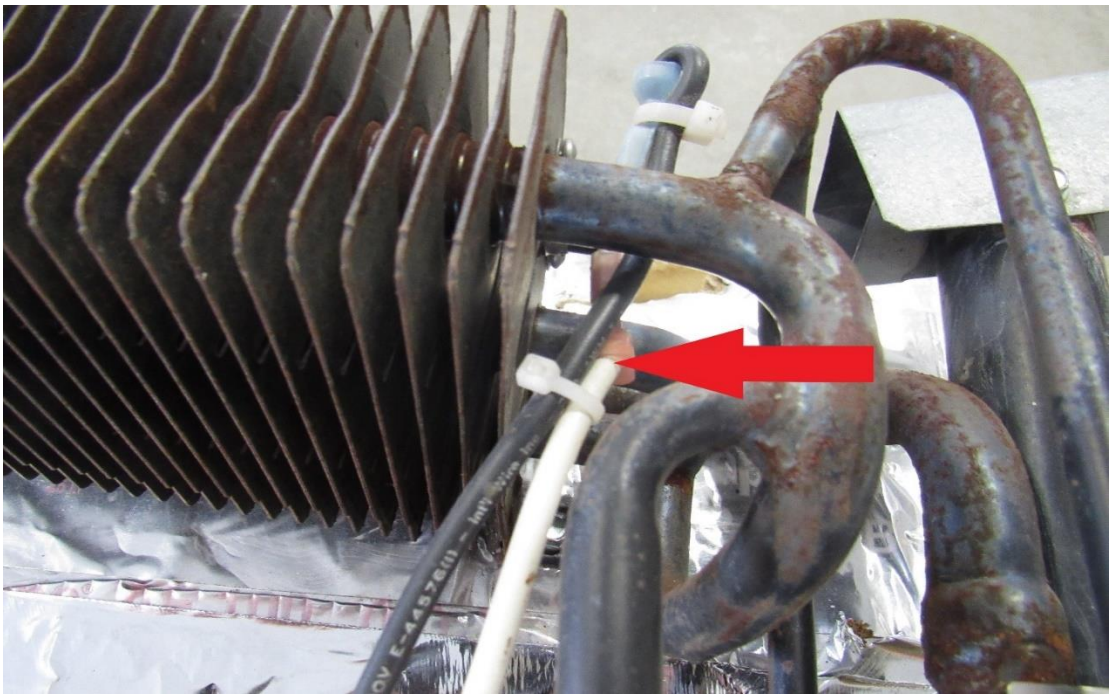
Remove the black wire loom (RA) and cut all zip ties holding the bundle of wires together.



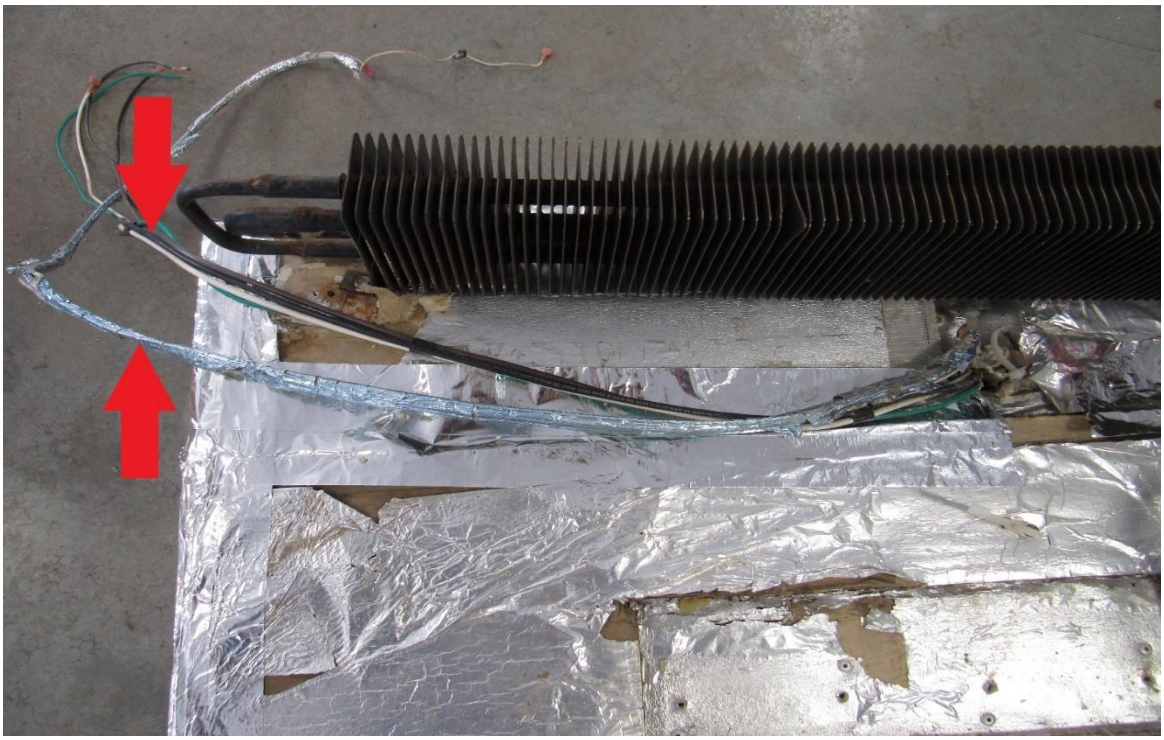
Disconnect the black 12V fan wire (RA).



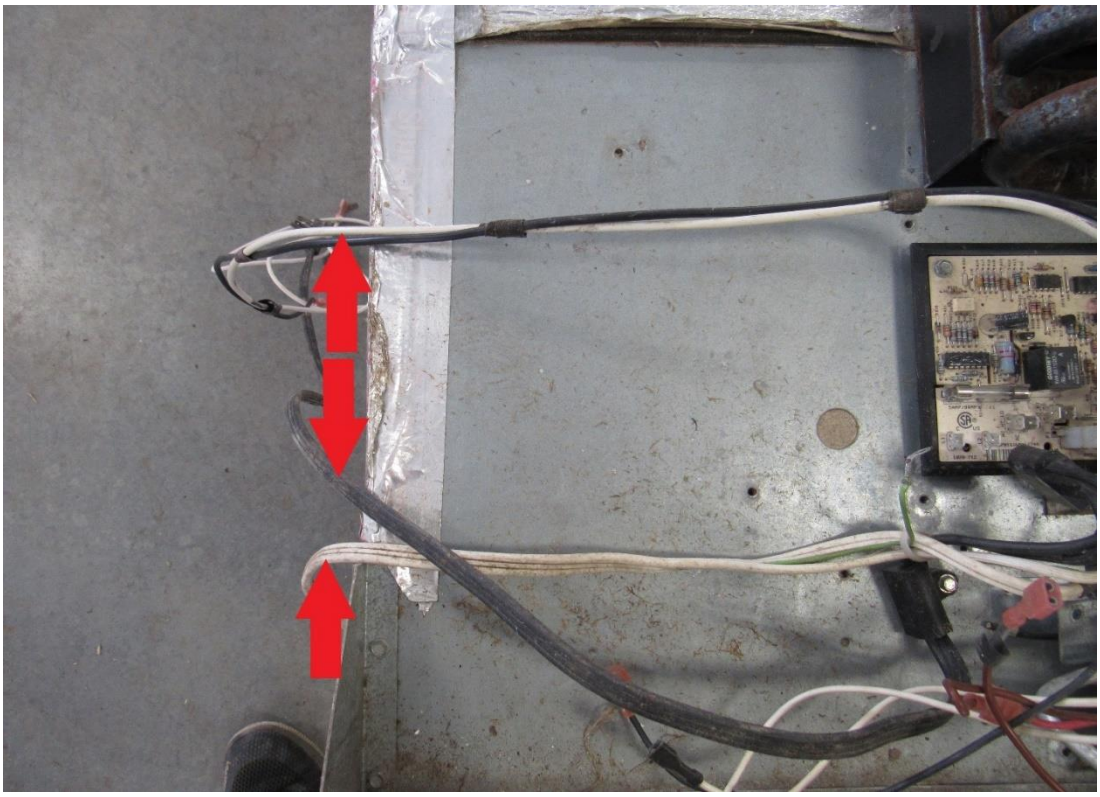
Disconnect the white wire (RA) from the thermal switch. This wire is red on newer models.



Pull wires and water line up and to the side as shown (RA). Be careful with the water line as it gets brittle with age. If you are removing the ice maker, these can be cut and completely eliminated.



Leave fan wires and the black and white cords hanging over side as shown (RA).



If old unit is taped along the sides cut tape with knife (RA).

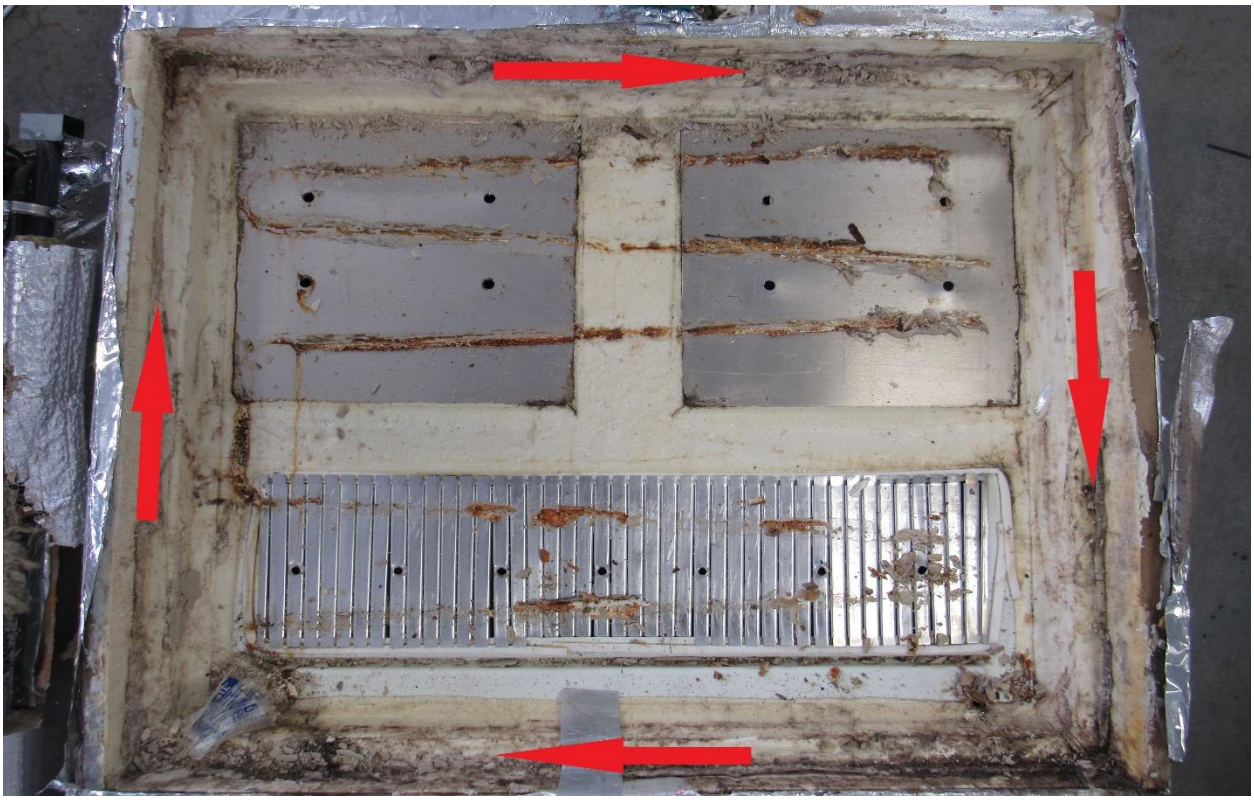


Take off the old cooling unit of your refrigerator by lifting straight up and out.

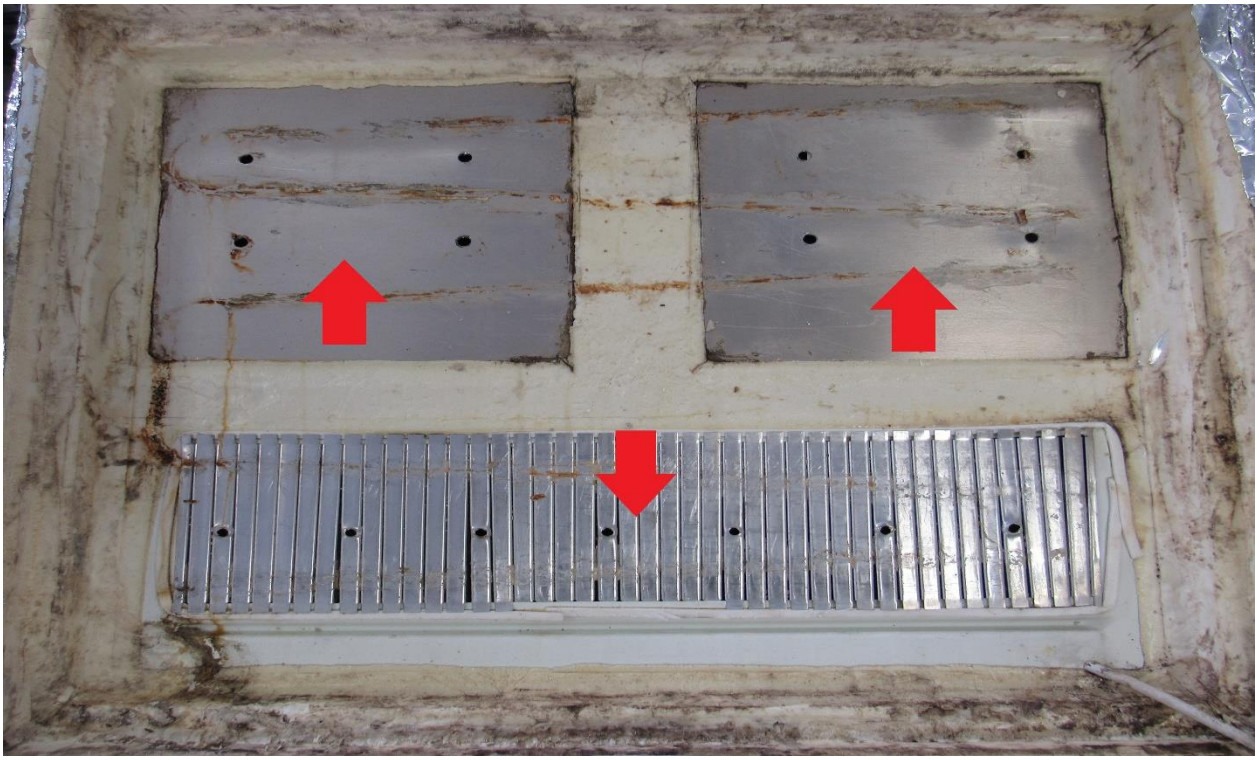
All wiring can be removed from the back of the fridge box, except the ice maker wiring if you are reusing the ice maker.

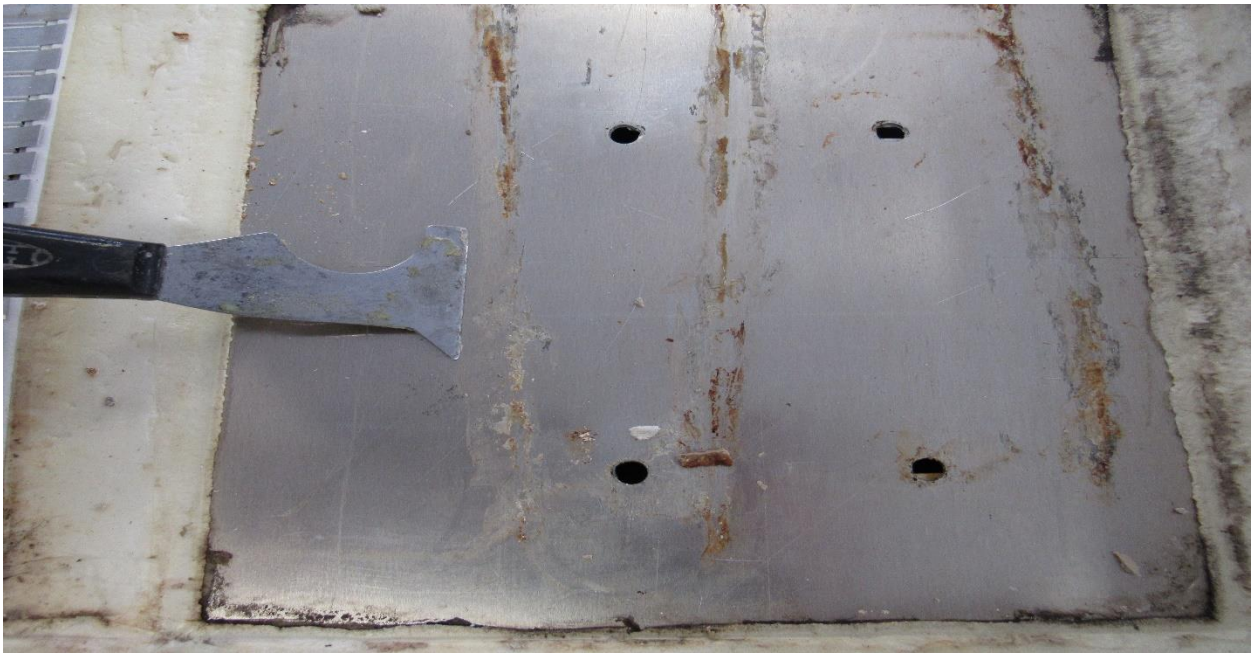


Clean off any residual foam or thermal sealant around the edges (RA).

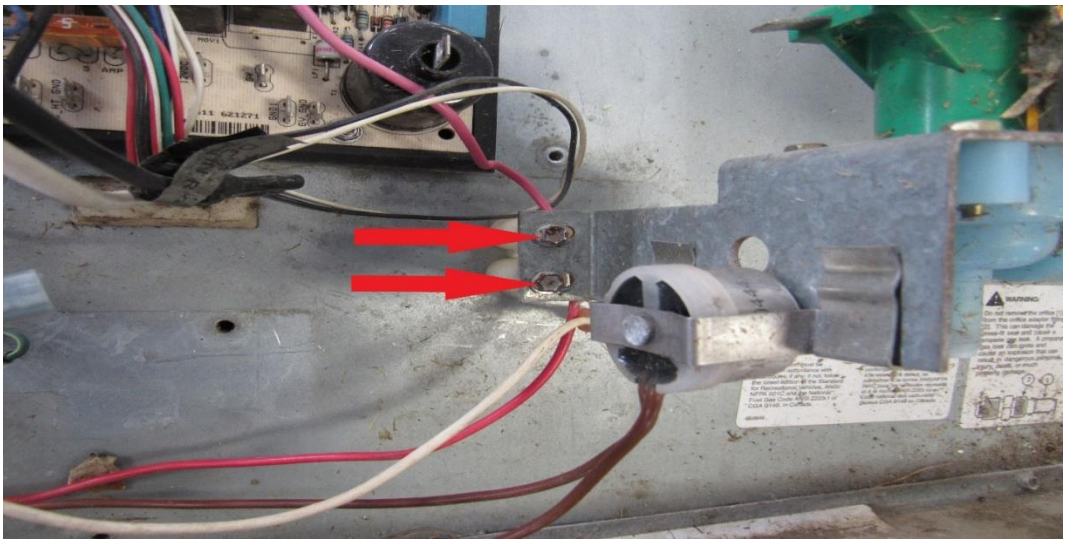


=Clean off the old thermal mastic (RA) from the freezer plates and refrigerator fin. A large blade putty knife or scraper works well. A shop vac works well to remove any other debris or loose foam.

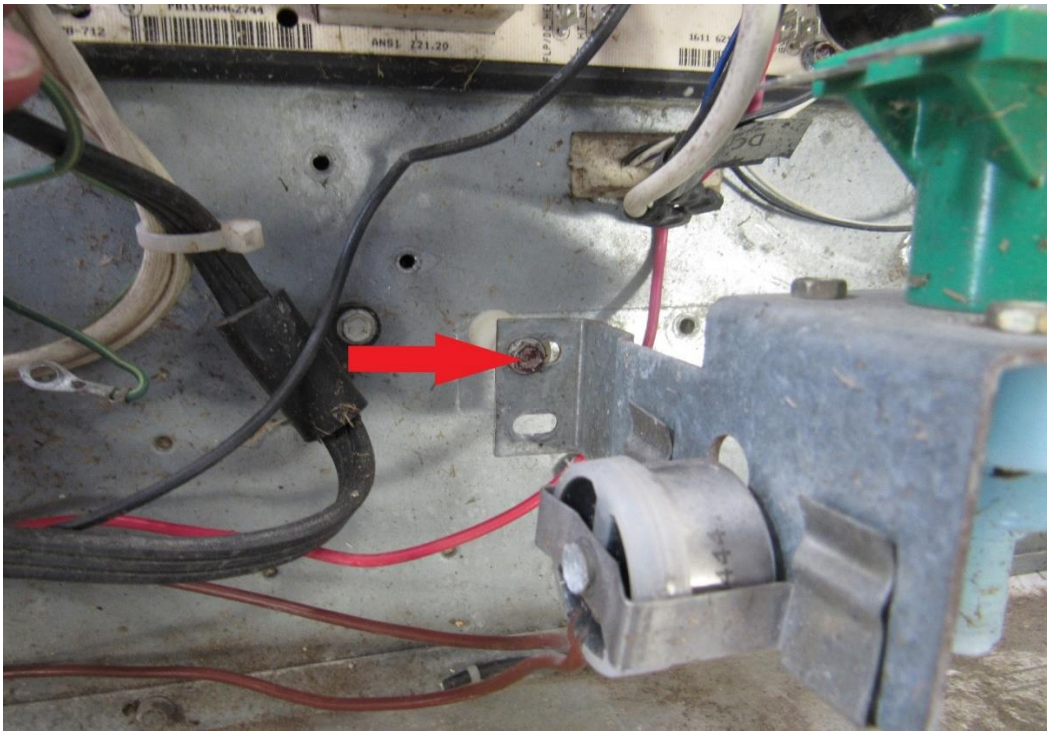




Remove ¼" water valve screws (RA). If you are removing the ice maker this can be removed and left off

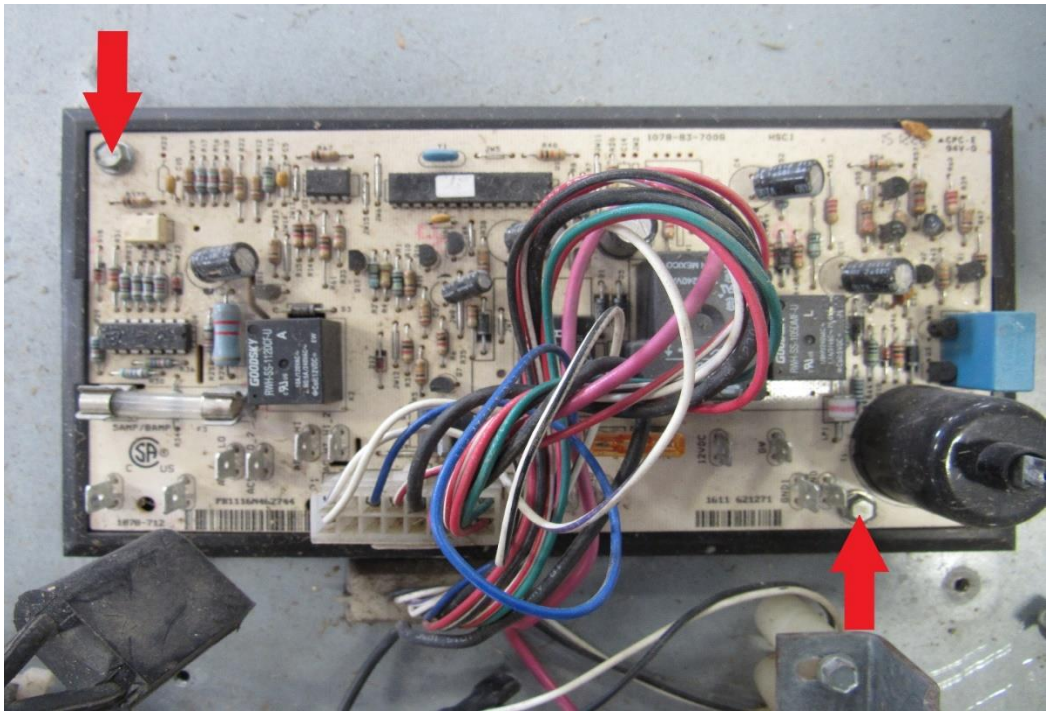


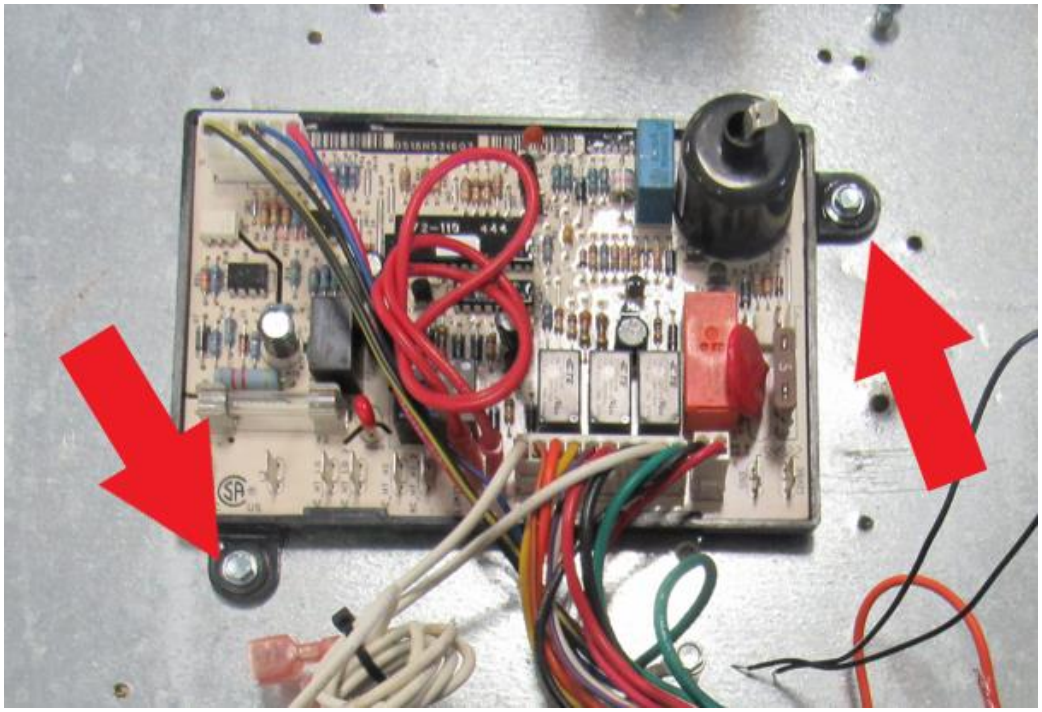
Shift left and reinstall the top screw (RA) in the pre-drilled hole as shown below.



The ice maker wiring should be the only wiring left on the back of the fridge, unless, if the ice maker is being removed then all the wiring on the back should discarded.

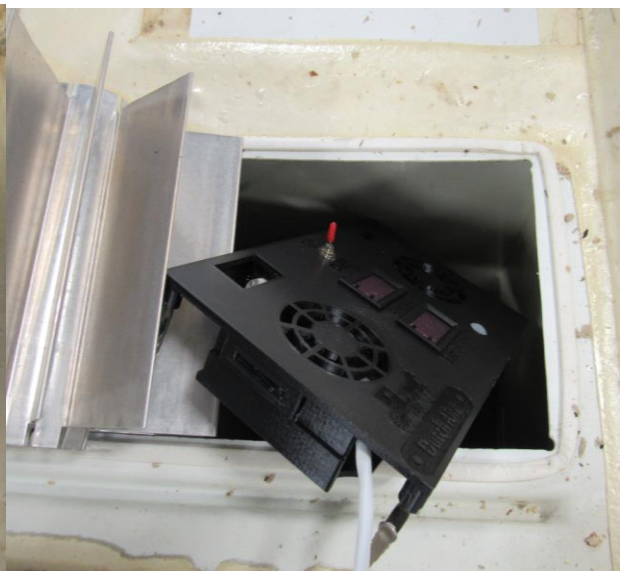
Remove the mounting screws from the control board and completely remove the board from the back of the fridge You will have to do the same for the 1210 style board.





Insert the controller into the fridge box through the fins as shown in the picture below. Lift the right-hand side of the fins and insert the controller inside, clip to the shelf for now so it does not get damaged till you are ready to attach to the fin. Make sure and leave enough wire so it will reach to the right of the fin, but check to make sure you still have enough wire on the outside so it will reach to the compressors.







Take a caulk gun and place a small bead of thermal mastic, in this fashion, on the cooling unit tubes. You will need to use the whole tube.





Lay unit into box being careful so as not to scrape off any thermal mastic on the box.

Insert defrost hose into the pre-drilled hole (RA) as shown, while lowering the unit into the box. Make sure to keep defrost hose snug so it does not kink while unit is being set down

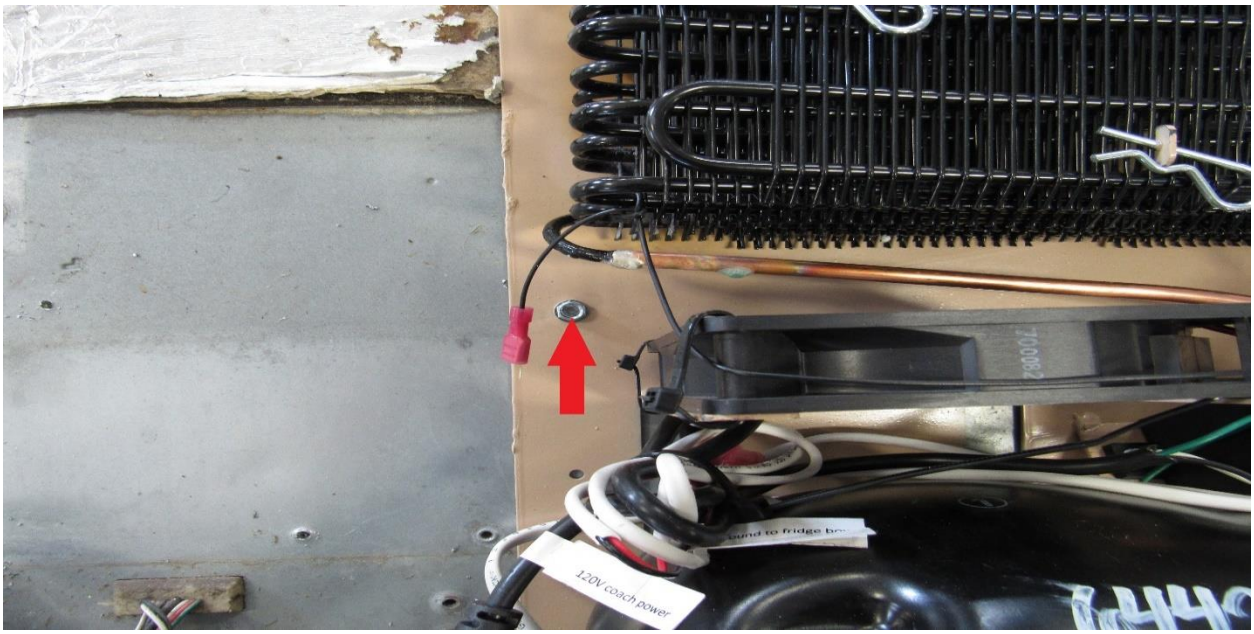


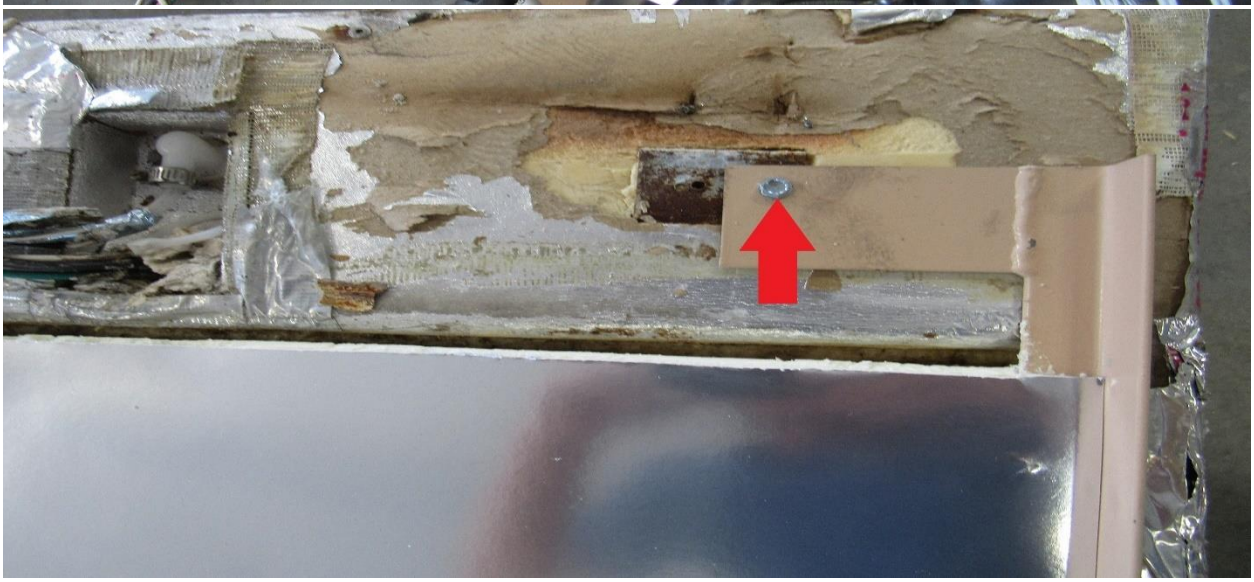
The controller wire should be 6” to 10” in from the right edge stuck in between the 2-compressor frames (RA)



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.

Install two #10X1" self-taping mounting screws. One on the bottom and one on top as shown (RA). Top hole is not predrilled. This will hold the unit while its upright. Do not be alarmed if the unit does not sit flush with the box at first. When you fasten the mounting screws, it will pull it into place.





Set refrigerator in upright position.

If holes are not aligned have the rear person remove the top/bottom mounting screw and shift the unit side/side - up/down until 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.

Warning: The box holes can be redrilled or enlarged to make holes line up and then the washers can cover the hole.

<u>But do not *ever* drill new holes</u> into the cooling unit 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.



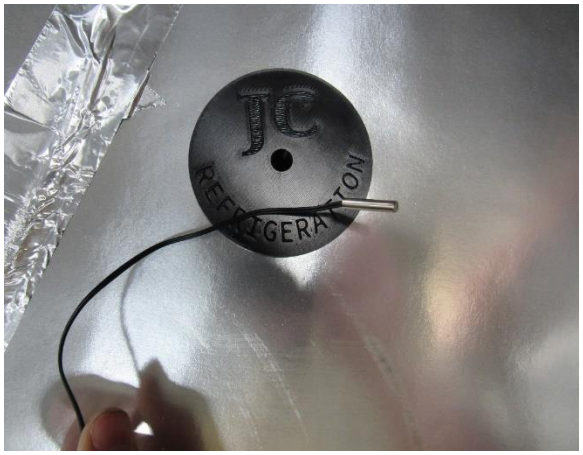
When holes are lined up, install 7 freezer screws (RA), using the supplied #10X2" screws in the parts bag, pulling the unit tight against the back. The top right hole in the left side freezer box (YA) will be where the sensor for the freezer will come through. You will not put any screw into this hole. Do the same with the refrigerator section fin (RA). Install seven screws pulling it tight.





Before laying the fridge back down on its face, insert the sensor for the freezer in through the hole in the plastic bracket. This wire is in the box with the controller.





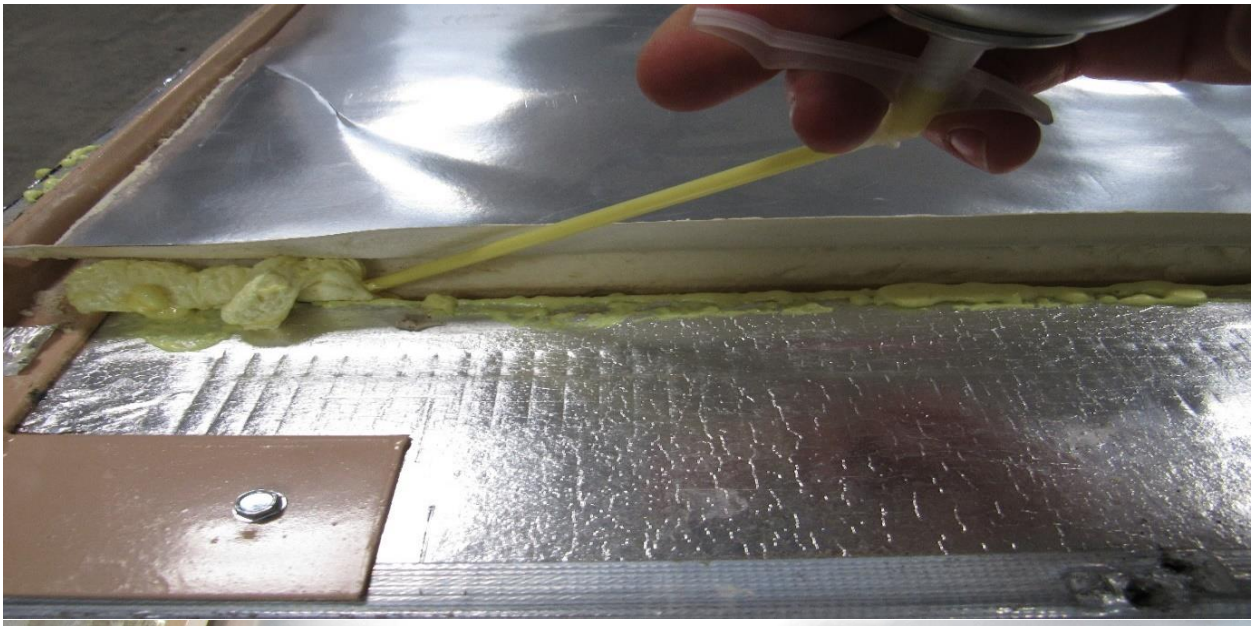


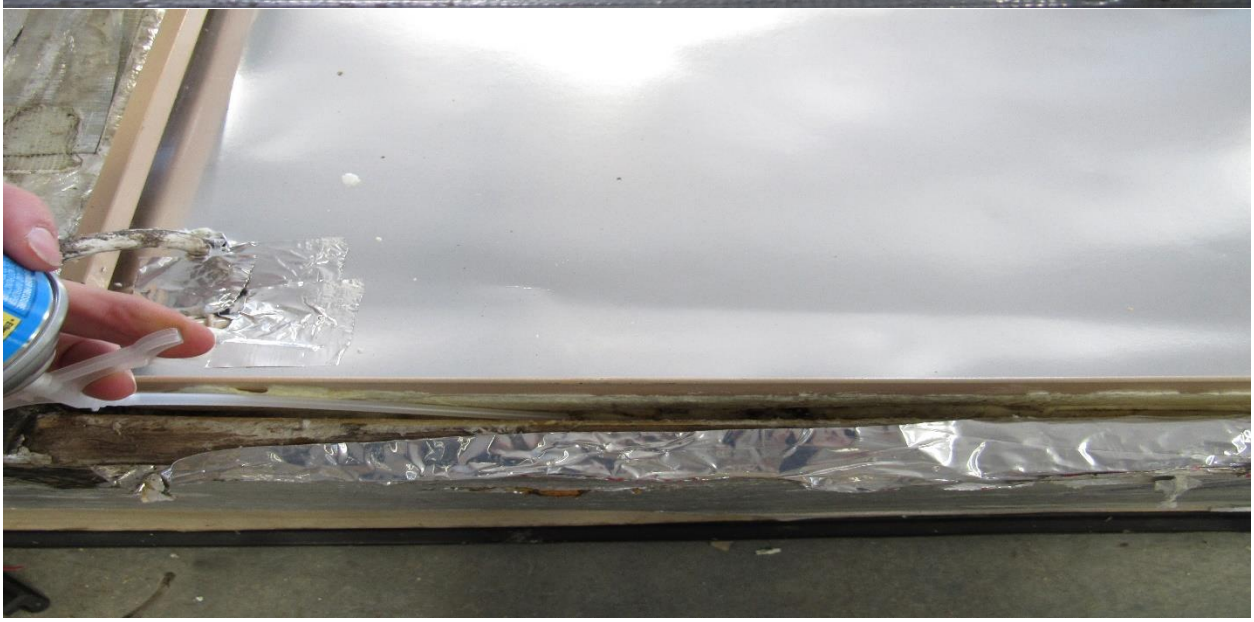
Once you have the sensor inside the freezer, attach it to your top shelf using the supplied sensor clip or a zip tie. Place the clip a few inches from the back of the freezer to avoid slight variations in temps.



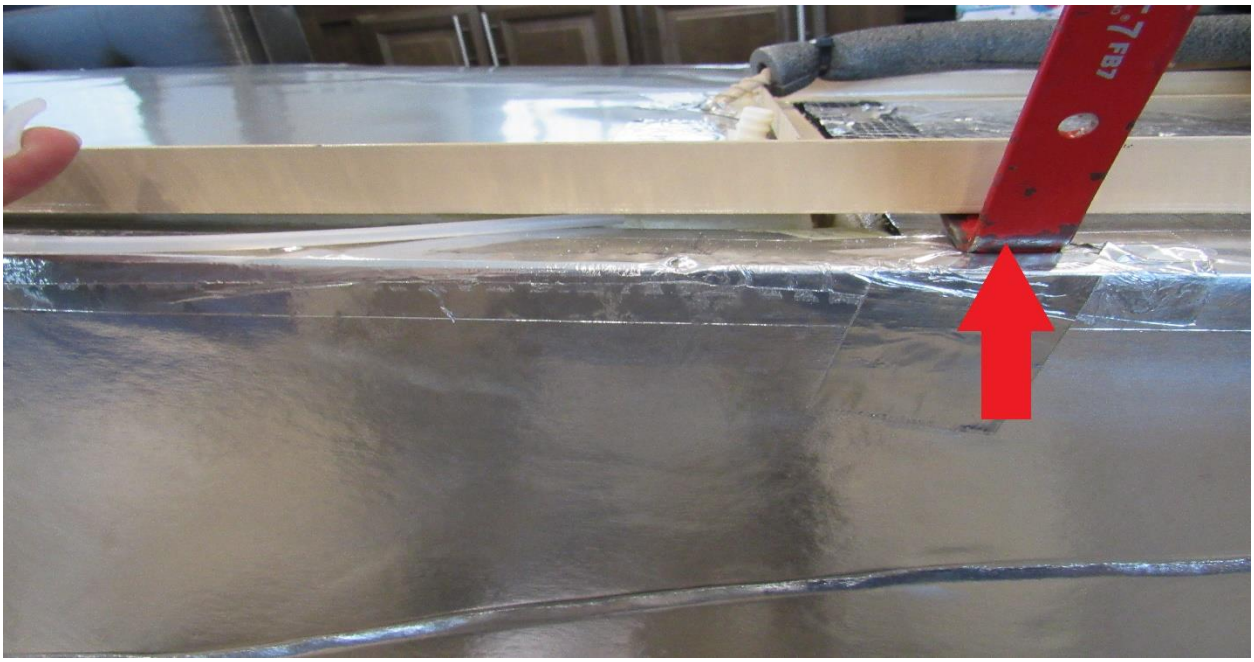
Warning: Make sure this step gets followed precisely, otherwise your fridge is unable to cool properly

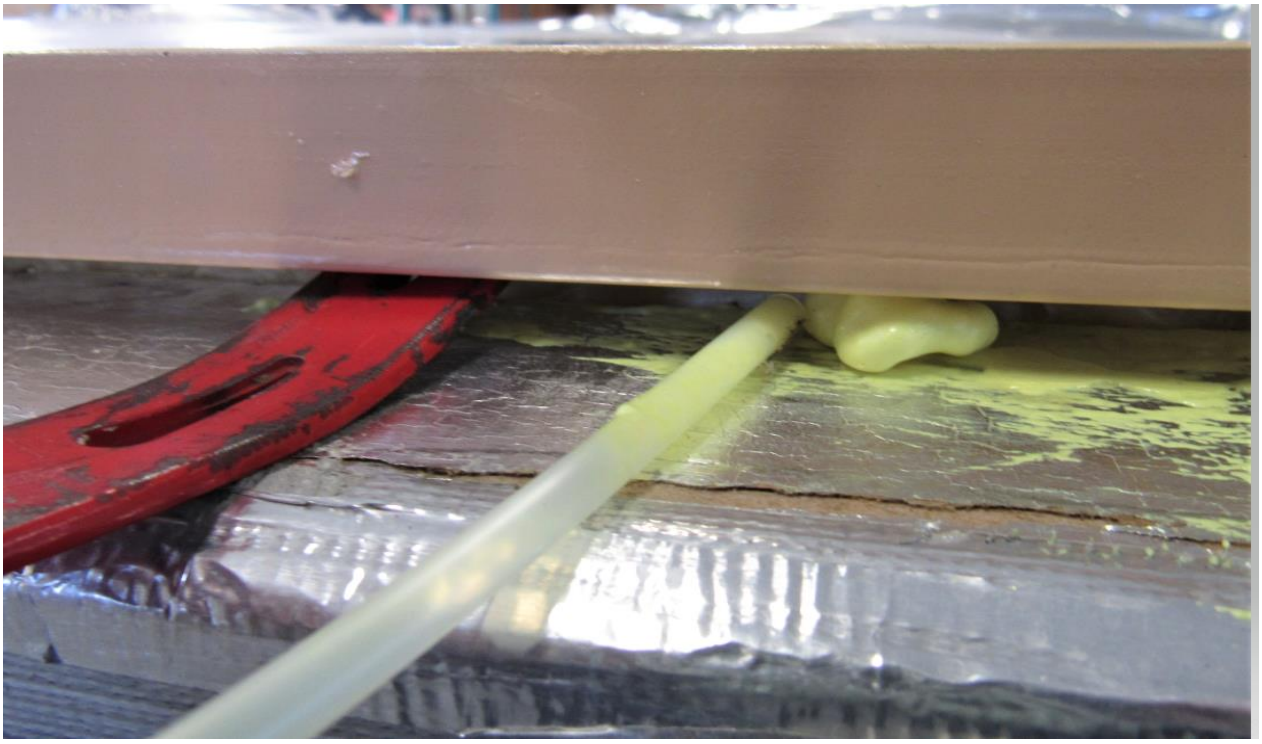
Lay fridge back down, take the can of Great Stuff foam (shake can for a few seconds) and apply a bead of foam around all four sides as shown below. Make sure and seal all cracks and gaps. This will help seal all air leaks while traveling down the road.





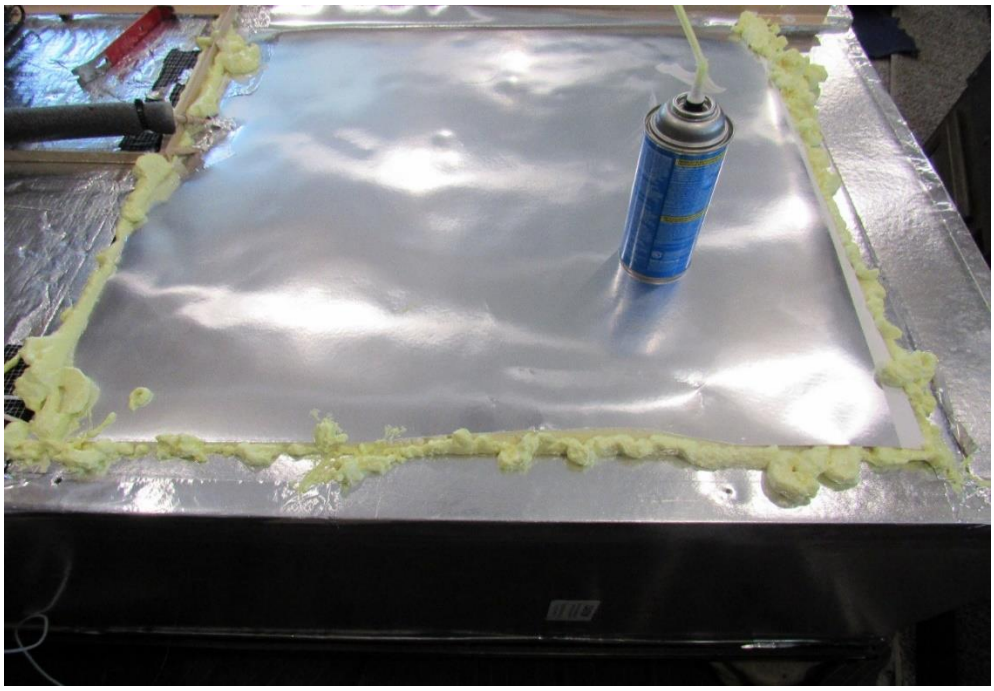
We cannot over stress this procedure as every edge has to be sealed, you might need to lift the frame edge slightly to get it filled in.





Make sure and fill any and all gaps around all four edges and corners. Even a small gap will let warm air be sucked inside when the fridge is cold thus making it run very inefficient.

This is what it should look like when done



Fill in the temp sensor hole as well, it does not take much here, just enough to fill the hole, but you don't want it to squirt inside the freezer



After filling all gaps with foam, follow up with covering the edges with the supplied aluminum tape as shown. This does not serve as a seal but for cosmetic purposes only. Exterior mounting screws can now be put back in and more can be added under or around the compressor, if need be, to attach compressor area tight against the back of the box. Just make sure and not hit any copper tubes around the compressor area.





Package Contents:

(4) Female wire connectors, (2) 3-slot wago wire connectors, (1) Freezer Sensor

Installation:

Step #1: Strip about 12 inches of the white coating off of the wire from the controller. Inside you will see 8 different colors of wires. Then strip ½ inch off the end of each individual wire. Below is a rundown of where the wires will get plugged in to.

Overview wiring hookup

Red Wire: 12V + to power the controller

Black Wire: 12V – to power the controller

Purple Wire: Freezer sensor

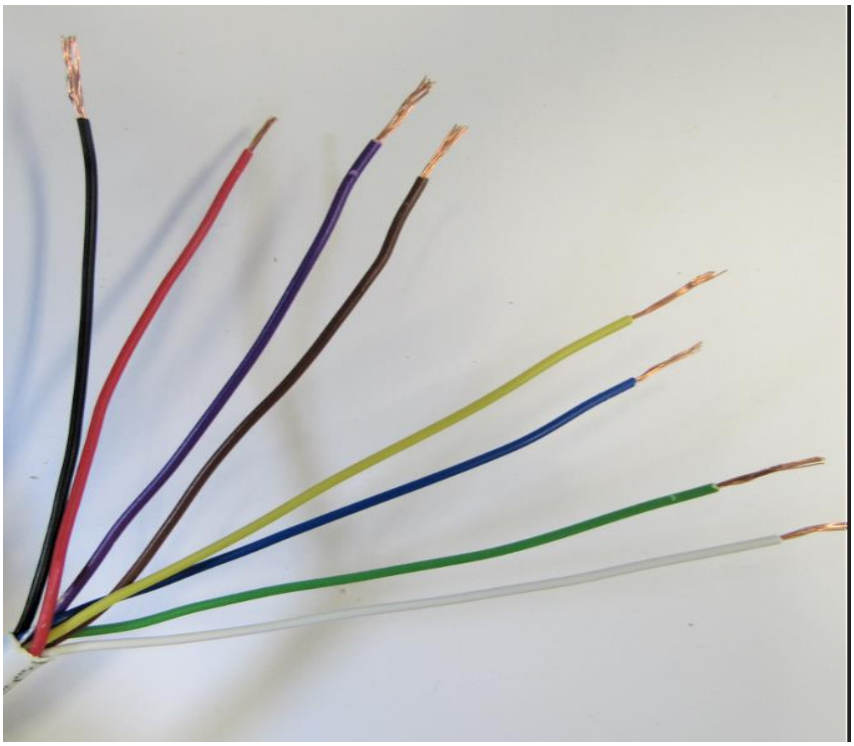
Brown Wire: Freezer sensor

Green Wire: Fridge (Small) compressor

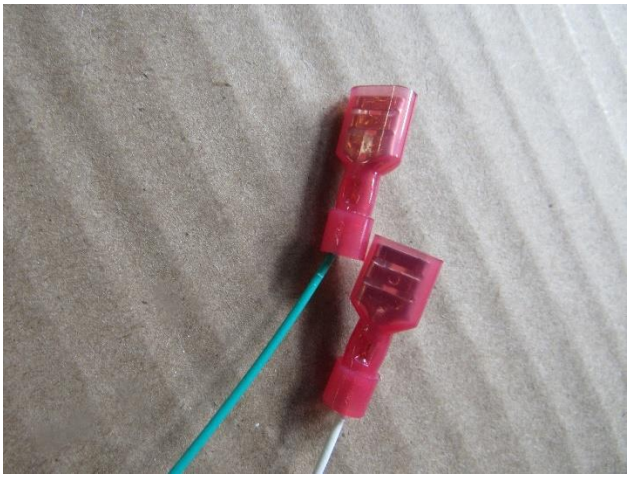
White Wire: Fridge (Small) compressor

Blue Wire: Freezer (Large) compressor

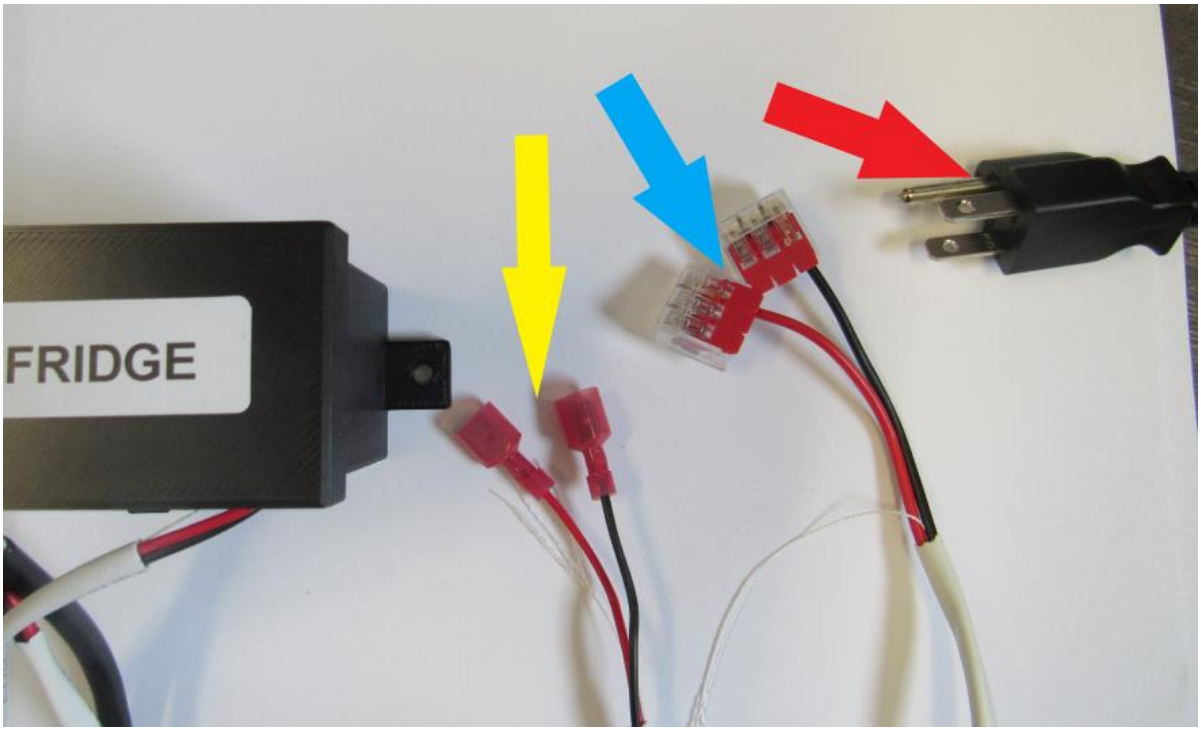
Yellow Wire: Freezer (Large) compressor



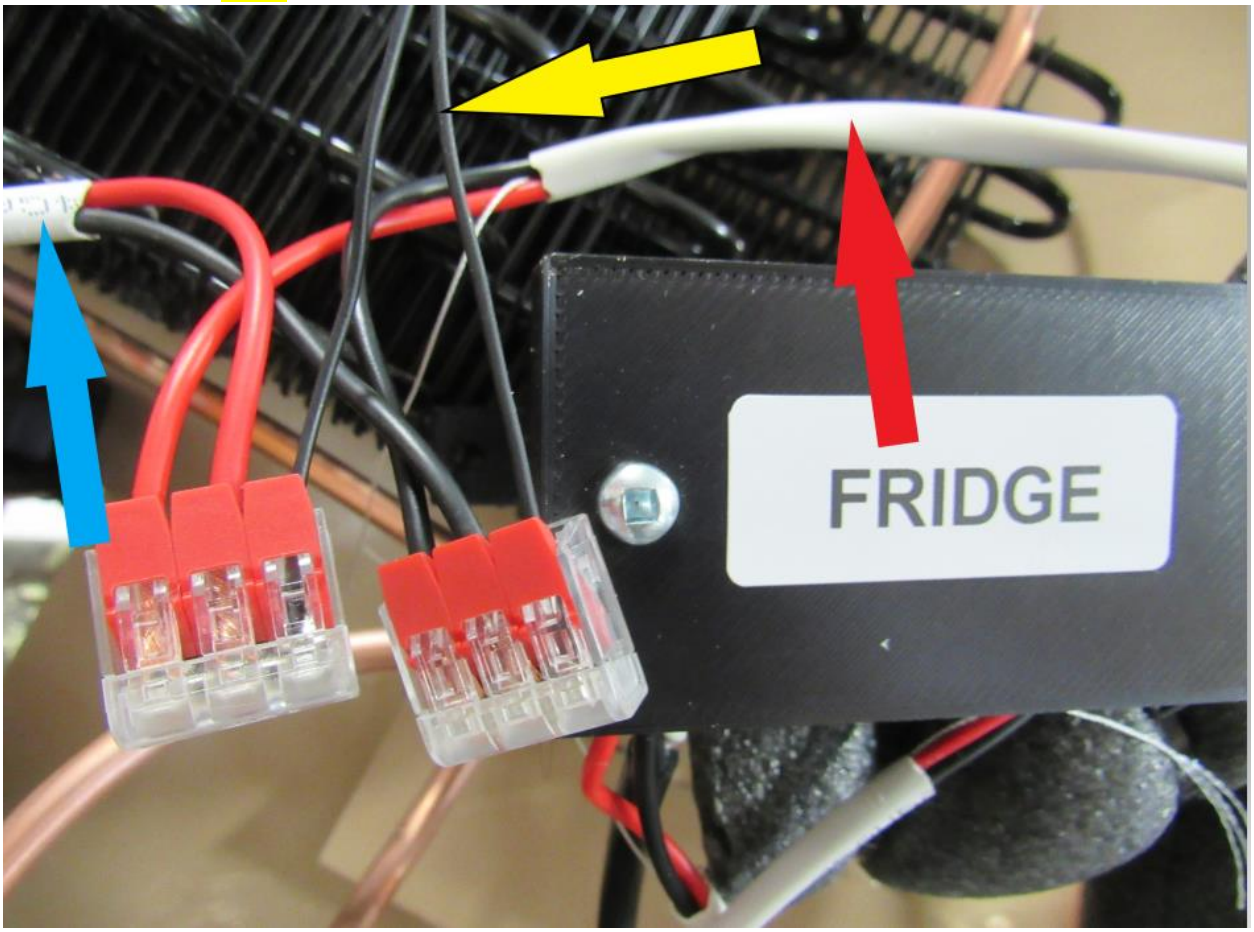
Step #2: **Take the Red/Black wires and hook them to the coach 12V positive and negative. Then take the white/green wires from the controller and crimp red female connectors onto the end.**



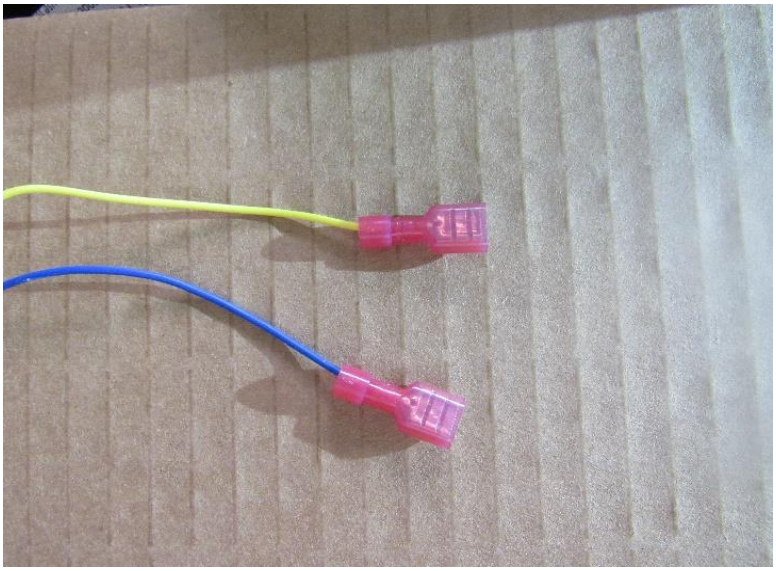
Plug white/green wires into red male connectors coming from the relay box for the fridge (small) compressor (YA) (does not matter what sequence) the 120V plug in will be plugged into your power outlet behind the fridge later. (RA) The (BA) wago should be connected to the small compressor with the top fan wires included, these should be prewired but will show later in case a wire comes loose.



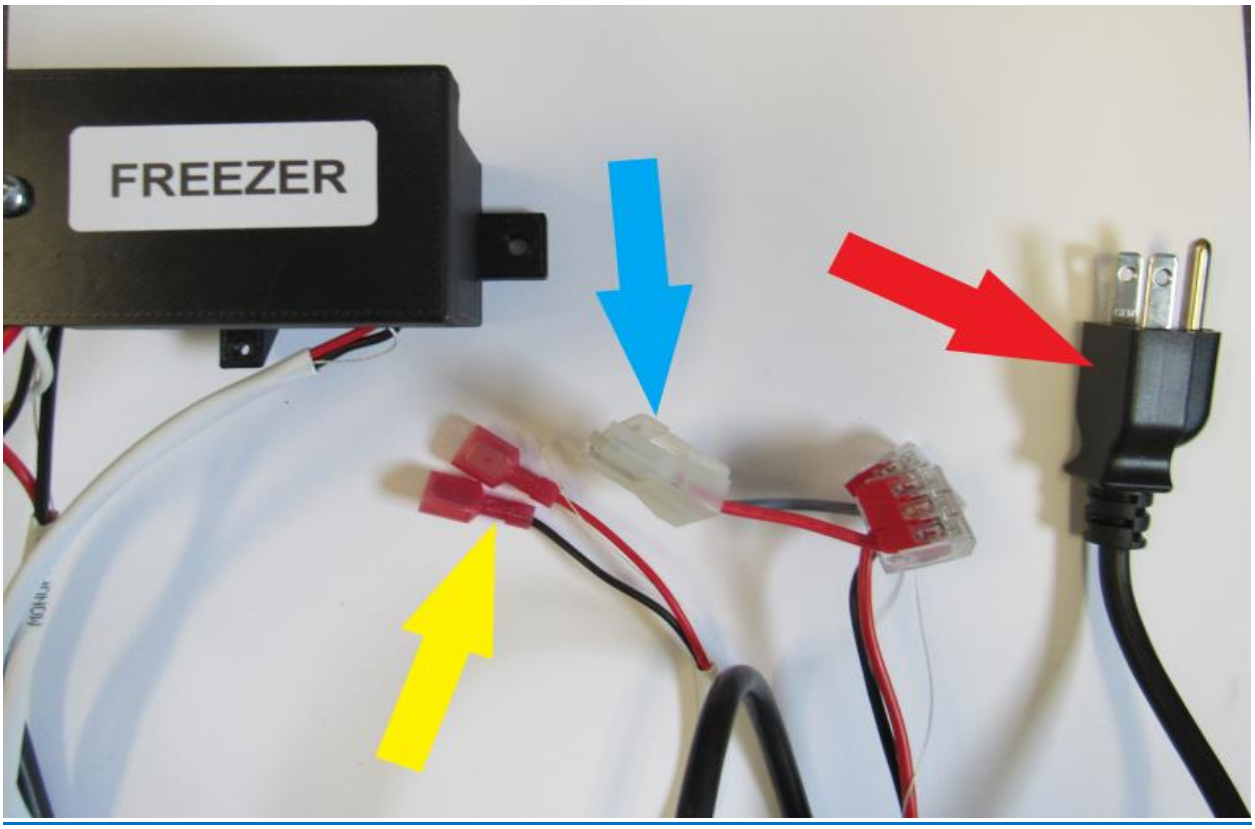
Top fan wires (YA) – Fridge controller wires (RA) - Small compressor wires (BA)



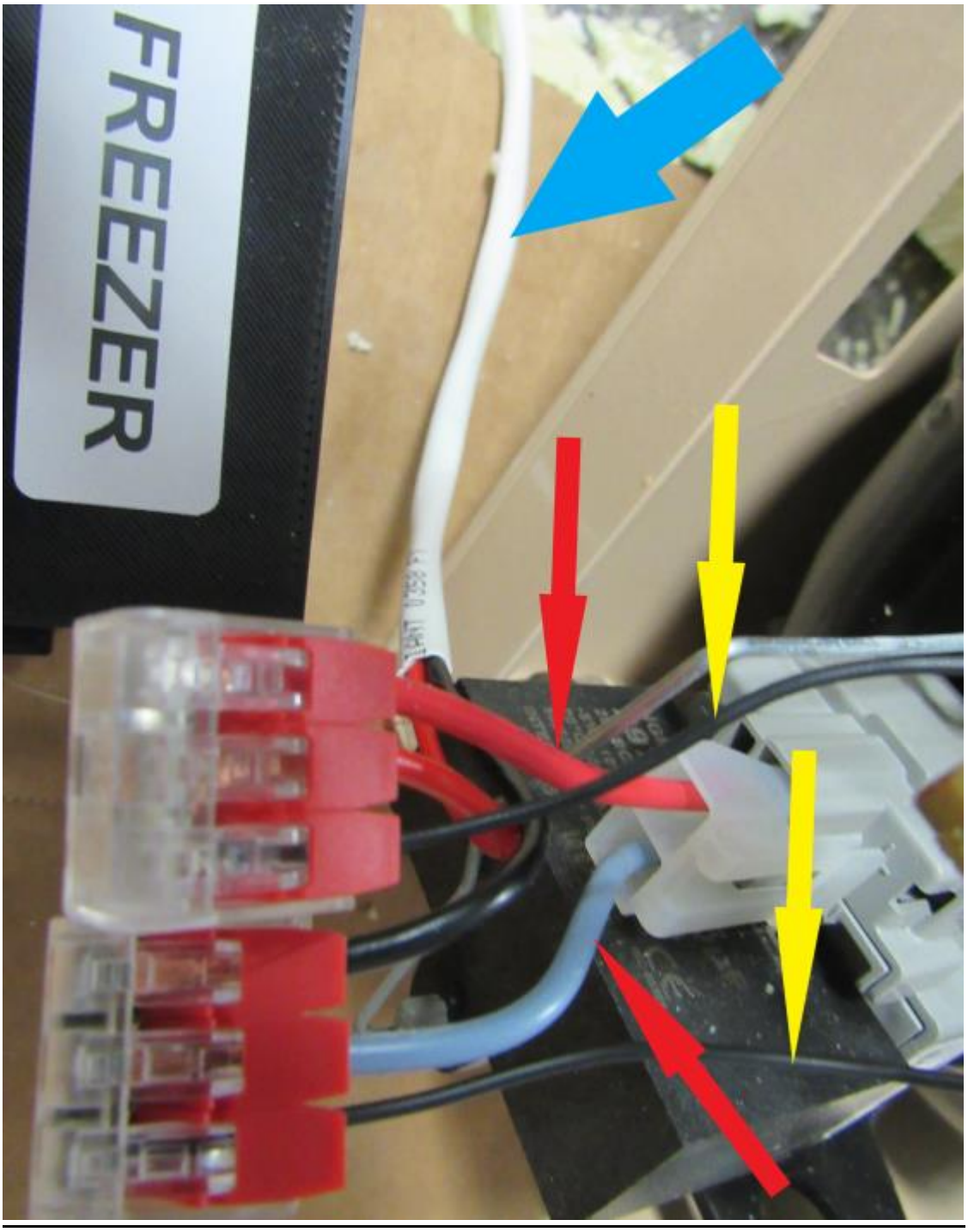
Step #3: Take the blue/yellow wires and crimp red female connectors onto the end.



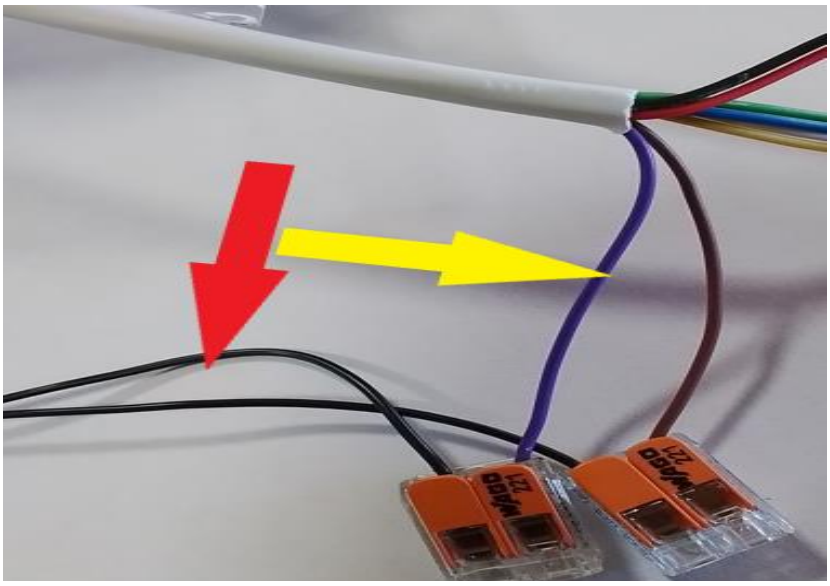
Plug the yellow and blue wires into the male connectors (YA) from the freezer relay box for the (large) compressor (wire sequence does not matter) The (RA) plugin will be plugged into your 120V power later, your (BA) should be clipped to the large compressor along with the bottom fan, these should be prewired but will be shown later in case a wire comes loose



Bottom fan wires (YA) Large compressor snap in wires (RA) Freezer controller (BA)

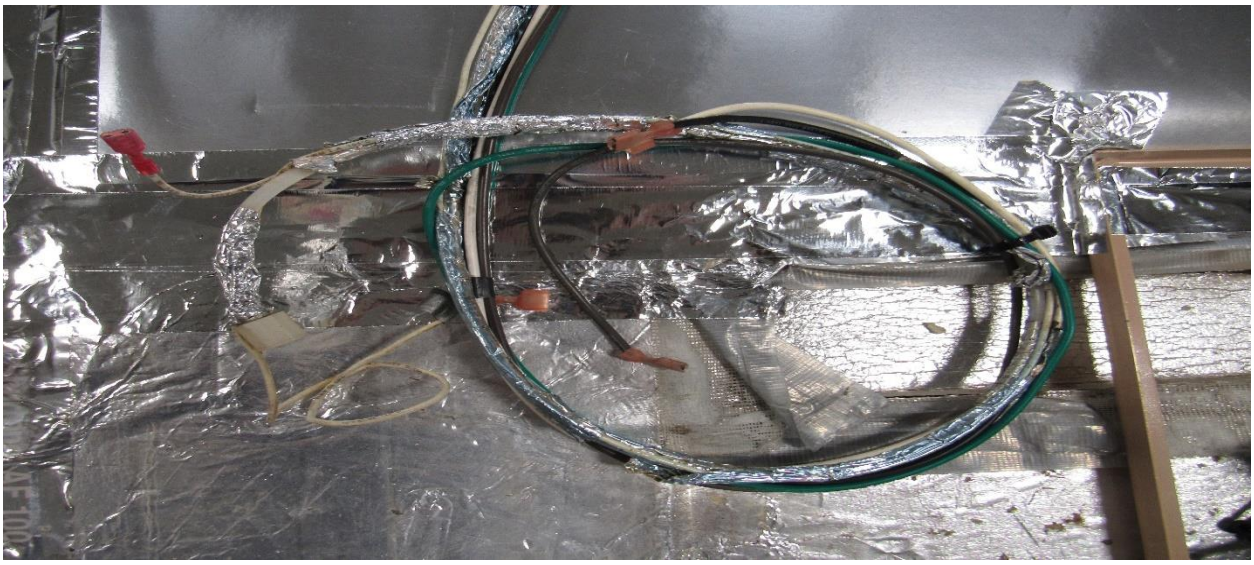


Step #4: **Take the purple/brown wires from controller (YA) and insert them into the wago connectors from the freezer temp sensor (RA). (Color of wago may vary)**

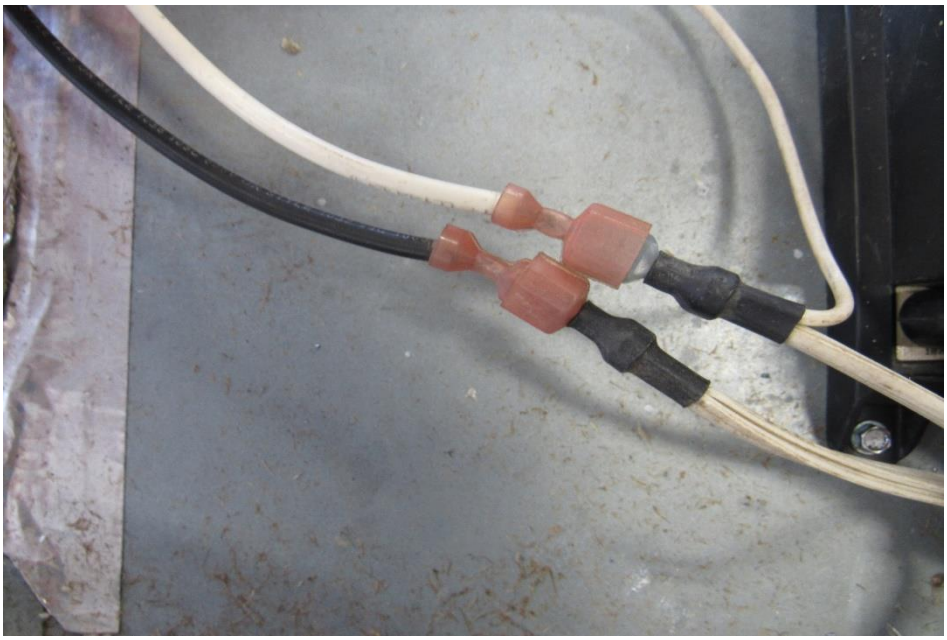


Note: the red and black controller wires will be hooked up after the fridge is back in the cabinet.

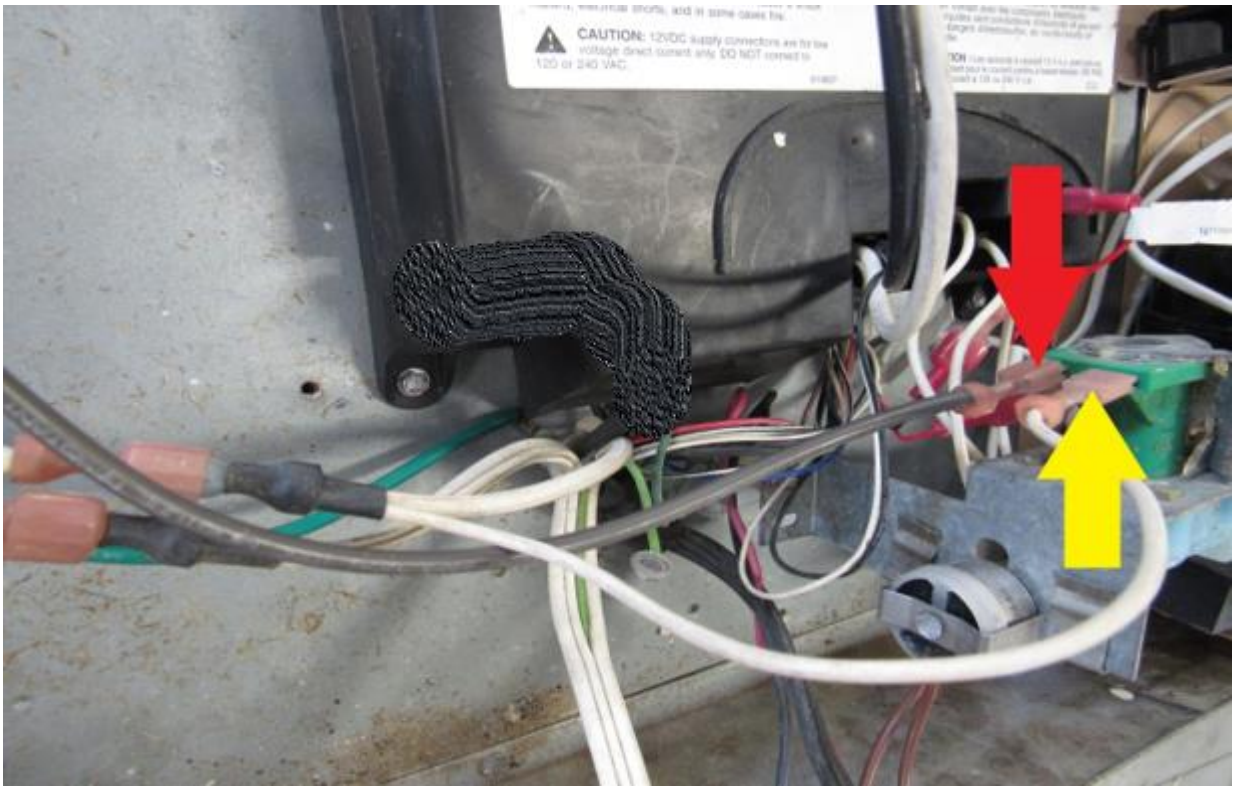
Next, we will hook up the ice maker water line and AC 120V wires. Skip this procedure if ice maker was removed.



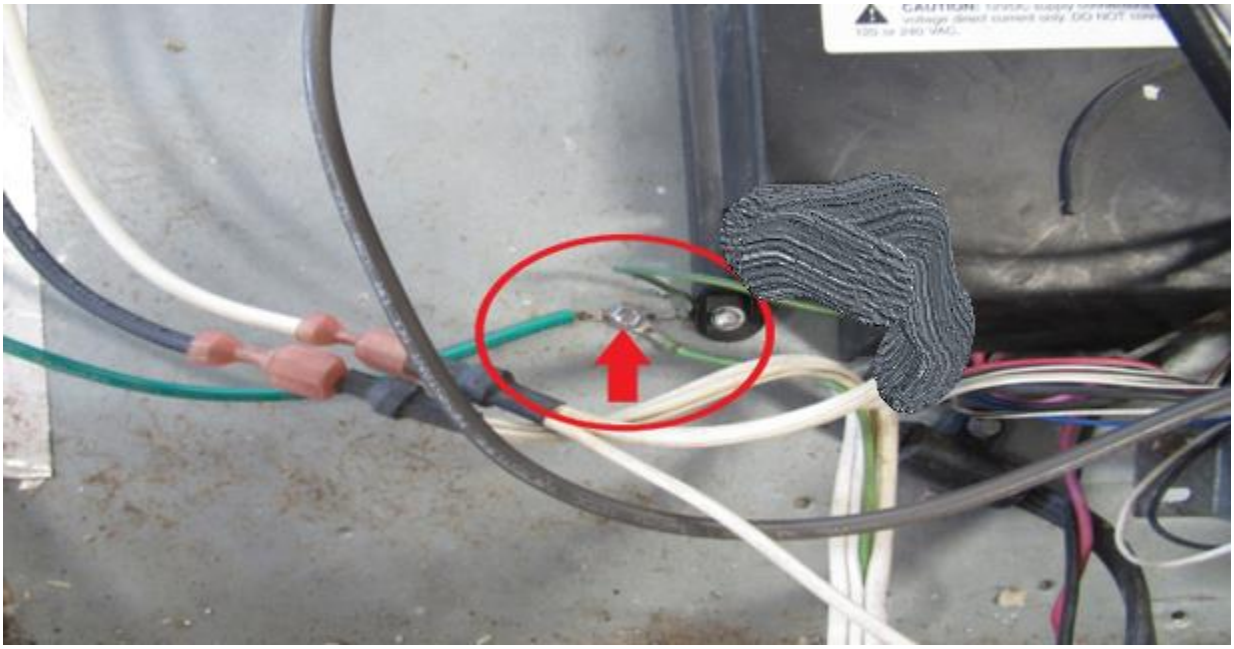
The black and white coming from the ice maker go to the main 120V plug as before.



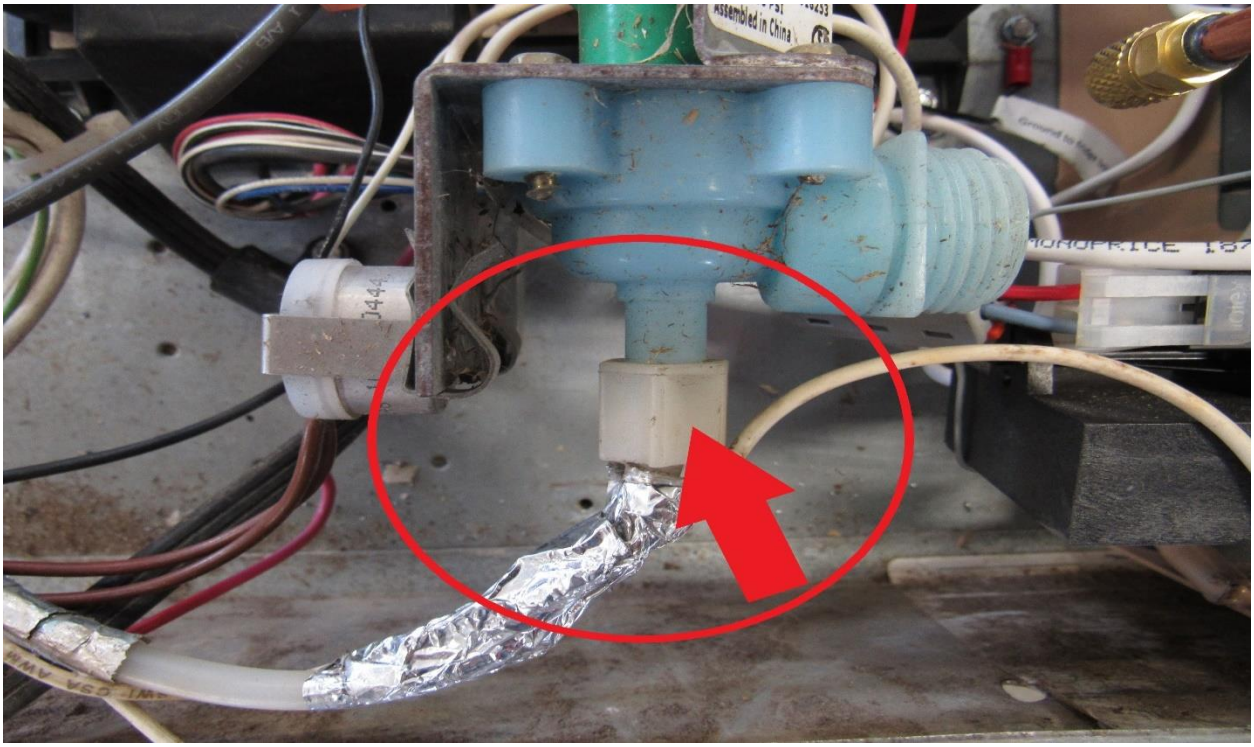
The brown wire goes to ice maker water valve (RA). The white wire splits off of the main120V plug and plugs into the ice maker water valve (YA).



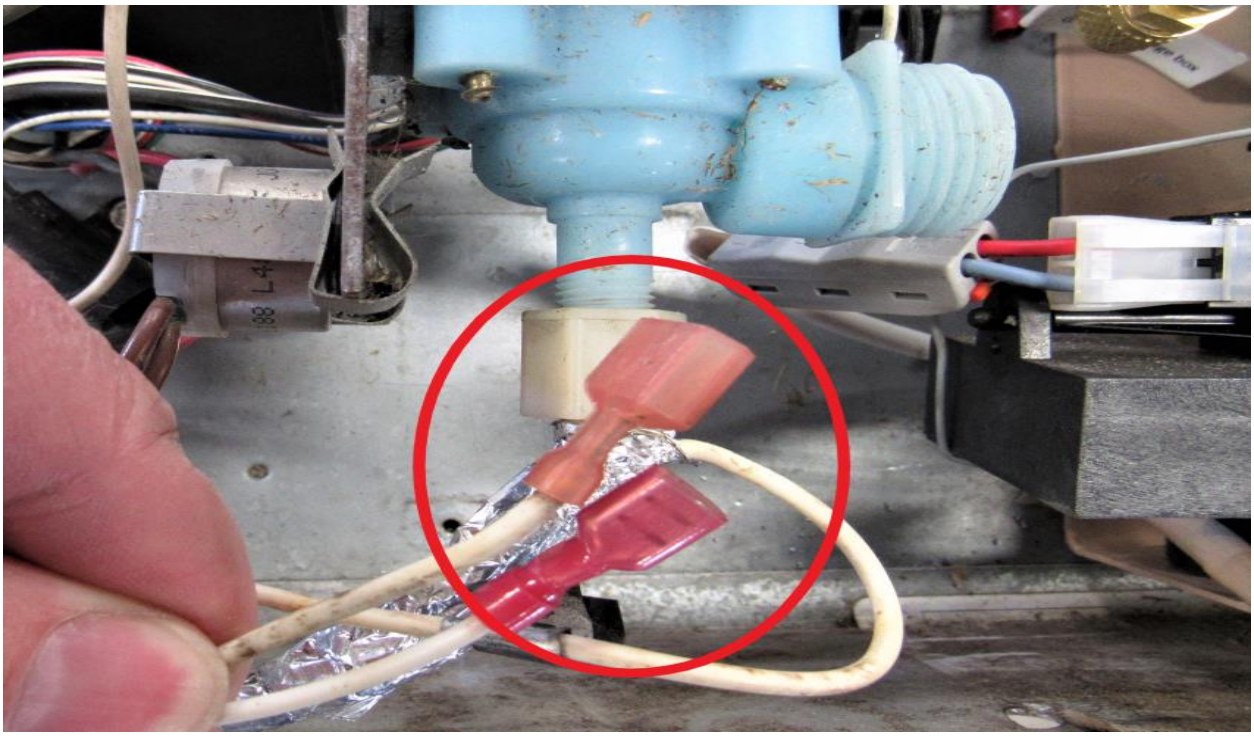
You will have three ground wires coming from the main black plug, the main white plug, and the ice maker wiring. Install a 1/4” self-taping screw shown (RA).



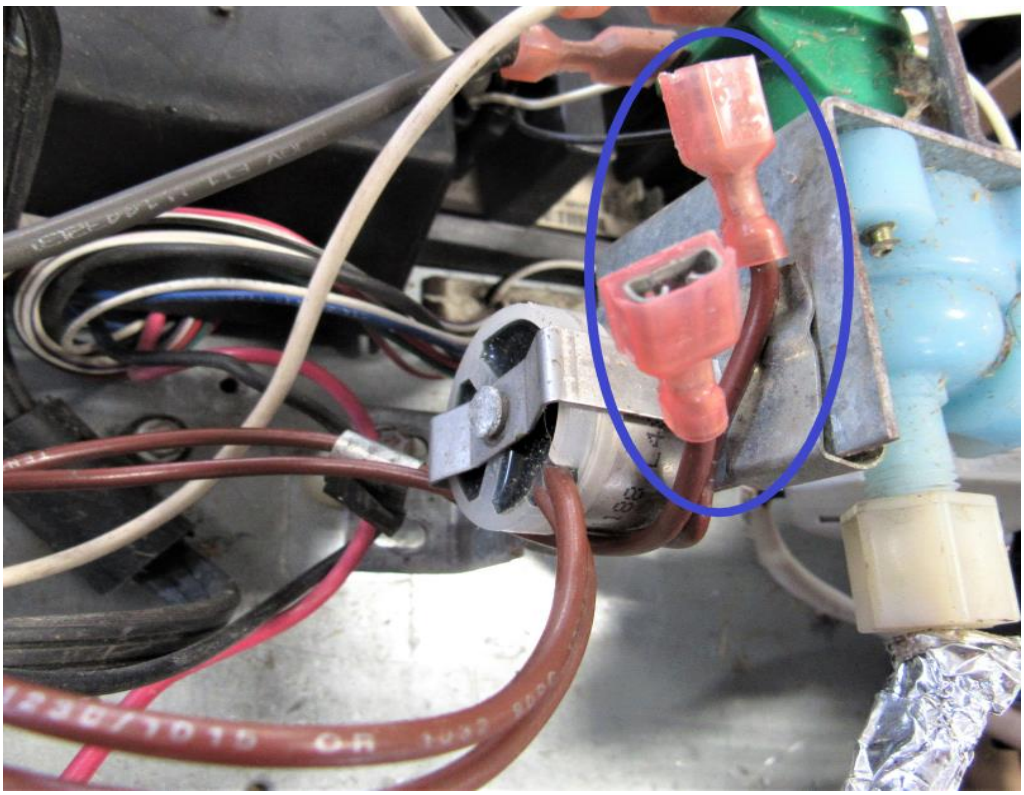
Connect the water line to the ice maker water valve (RA).



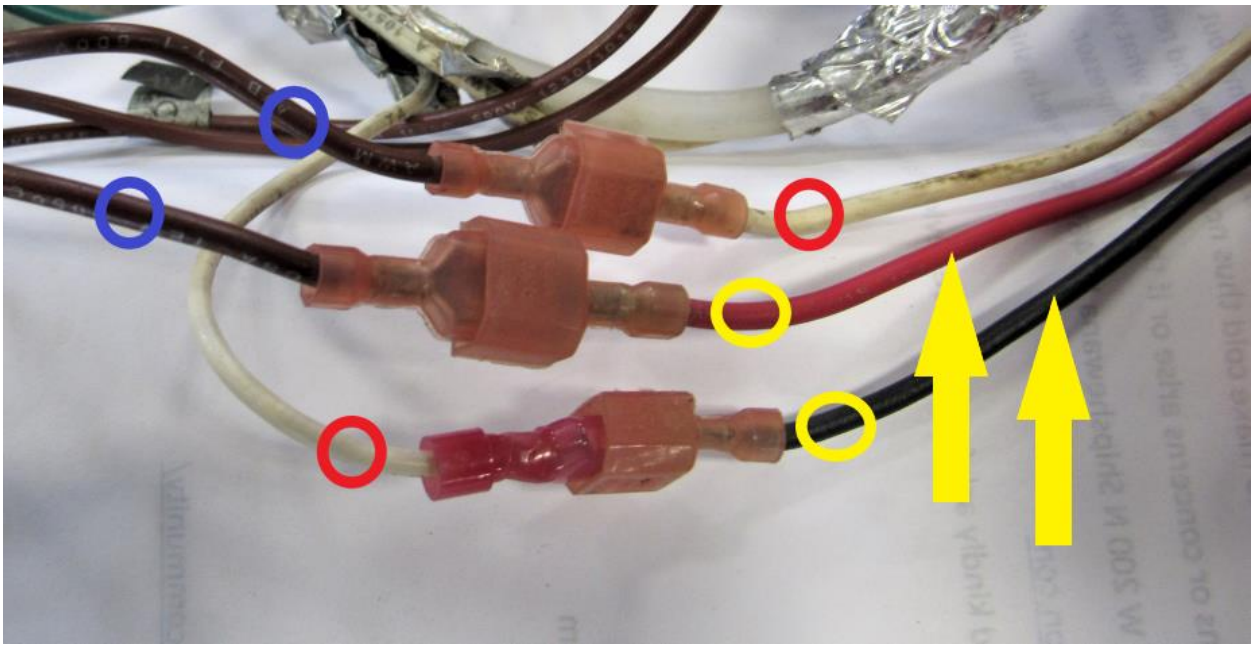
To connect the ice maker 12V DC water line heater, start with finding these 6 wires shown in the next 3 pictures, 2 white, water valve heater wires Red Circle.



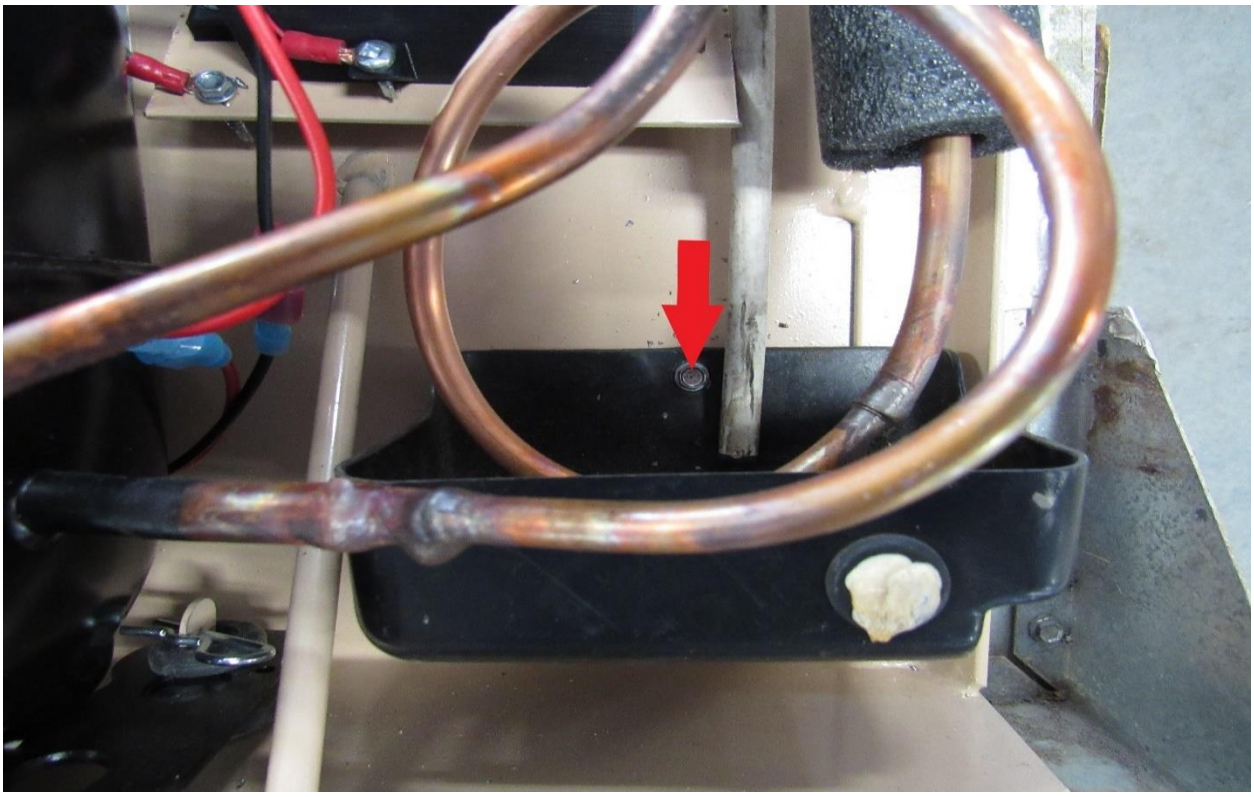
2 brown thermostat wires blue circle.



These 6 wires need to interconnect, wires are color coded to previous pics. The 2 red/black wires (Yellow circles) coming from your original board need 12V power. This will happen after the fridge is back in the cabinet.

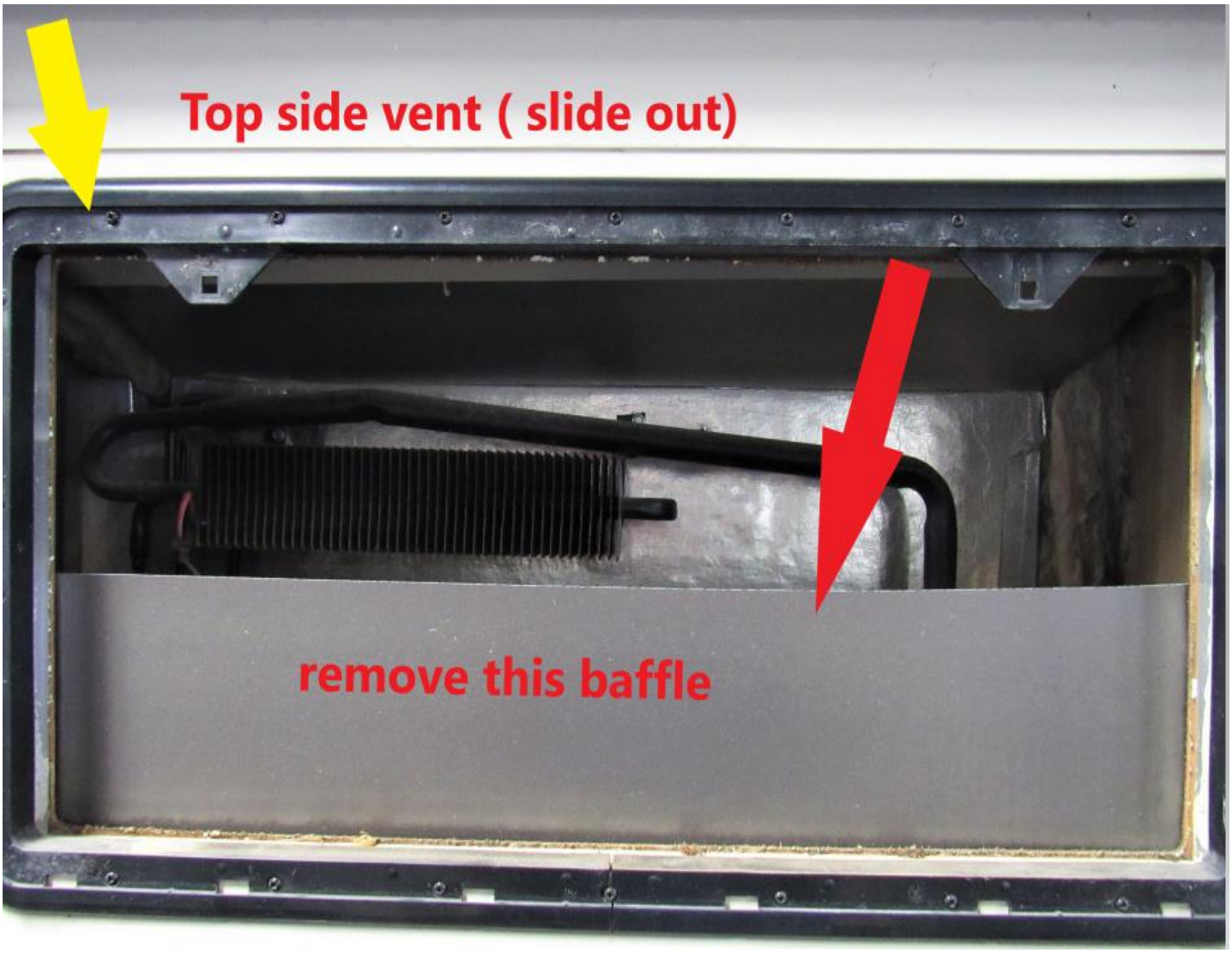


Install the defrost cup as shown (RA) using a 5/16” self-taping screw.



Warning: Please make sure and follow 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 It’s 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. Attach black trim pieces on top and bottom. Install mounting screws (RA)on the top and bottom.


Tropicana

Now we are ready to finish the outside. Put the two mounting screws (RA) back in place. Or if your coach is a Winnebago, put the four bolts back in.



WARNING: Make sure this step is properly followed and leak checked so you don't have a gas leak.

Gas tank is ready to turn back on and using a soap water mixture, check for leaks. (RA) This copper tube can be bent carefully and tucked out of the way once the fridge is back in place.

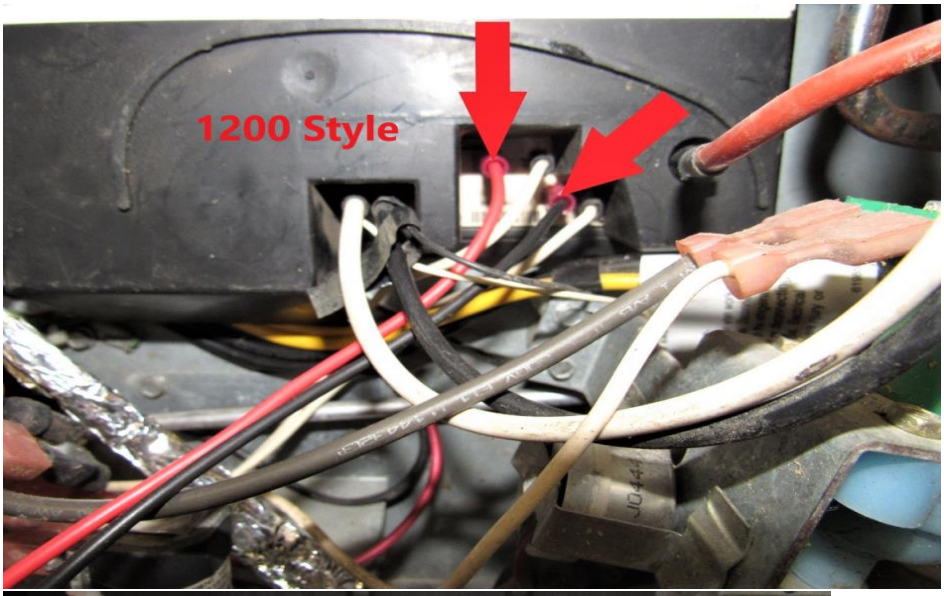


Now connect the red wire from the controls to the coach 12V power wire using the 3-slot wago included with the controls. If you are using your icemaker, this is where the red from the icemaker heater gets connected as well.

Repeat this process for the black wire from the controller, coach negative and icemaker black wire all together in the other 3-slot wago.

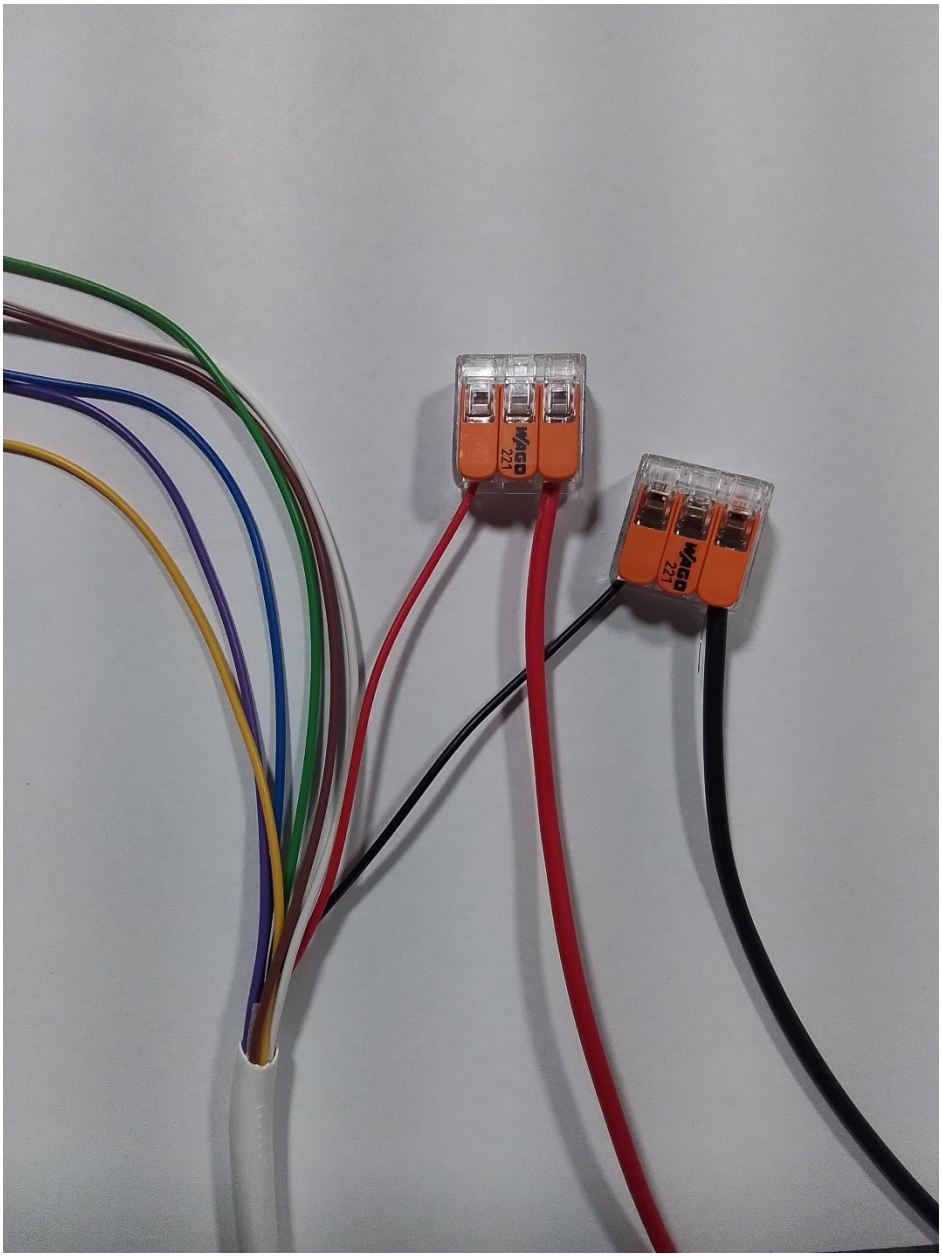
Below are the 12V DC wires you took off from the board at the start (RA)

Make double sure you get positive to red wires and negative to black wires.



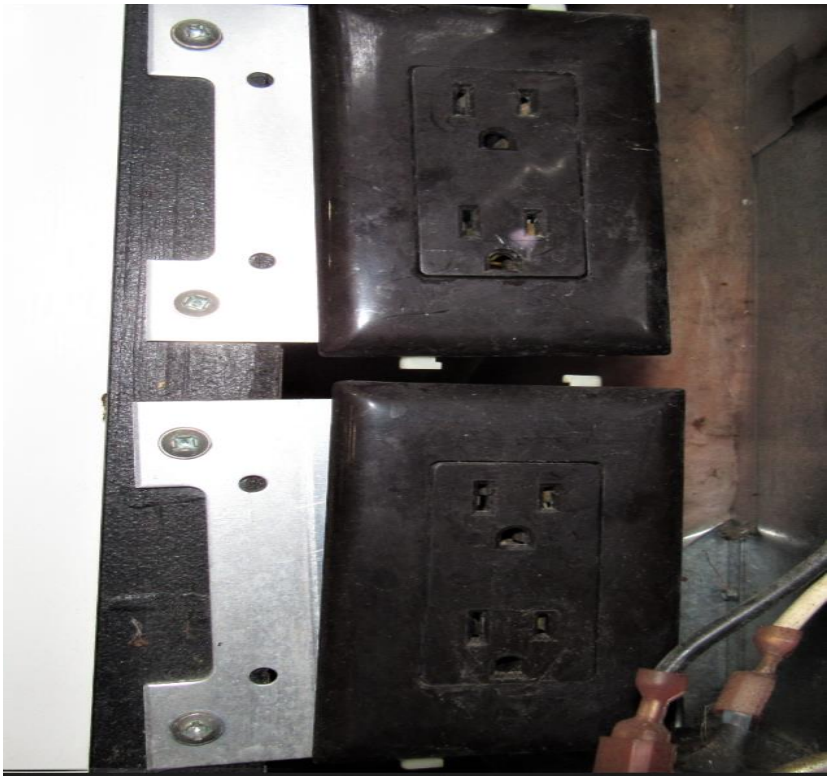


The Coach power wire color will very, but the Positive wire needs to be connected to the red from the controller.



Now you are ready to plug the 2-120V power cords into the outlet.

If your coach has an inverter you will want to plug the 120V power cords into the power outlet that is powered by your inverter. The way to determine if you have inverter power behind the fridge is to see if you have 2 separate outlets, one will be for shore power/generator and the other is always for inverter power. If they are not marked, then you need to test which is live when all other power is disconnected and the inverter is turned on. You will then leave the inverter turned on, when you plug into shore power or when the generator runs the inverter goes onto sleep mode, so when all power is disconnected and you are travelling or dry camping the inverter will turn back on and power the fridge compressor. Pics below are an example of the 2 separate outlets, if you do not have 2 outlets and yet have an inverter check this outlet as some coaches have only one outlet yet it's powered by the inverter.



Clip the controller close to center on the fins.



Manual for Universal Hvac Dual Controller

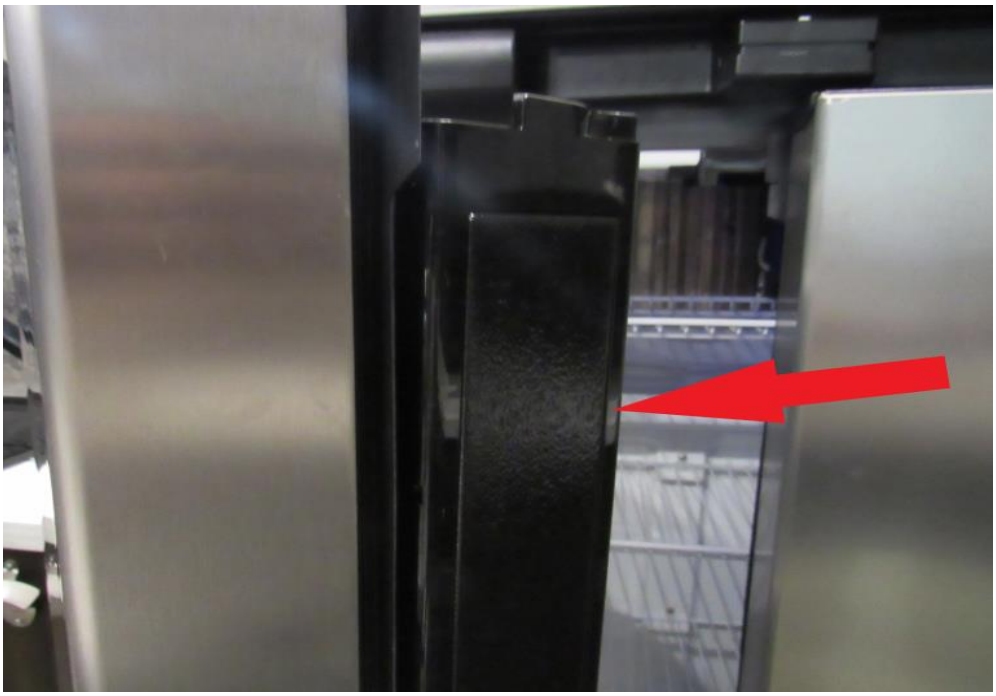
This controller eliminates all of your existing Norcold or Dometic controls. So that means that your front display panel, your interior light, and your rear control board will no longer work. This new controller has its own temp control devices and thermostats, as well as a light bulb that is motion activated. It also features two built in fans that blow air towards the fins which forces the cold air off the fins and into the fridge box, giving you a more even temp throughout as well as keeping frost from building up on the fins. The switch on the front is what you will use to turn the entire refrigerator on/off the fridge. The switch should be in the up position to turn the fridge on and down position to turn the fridge off.

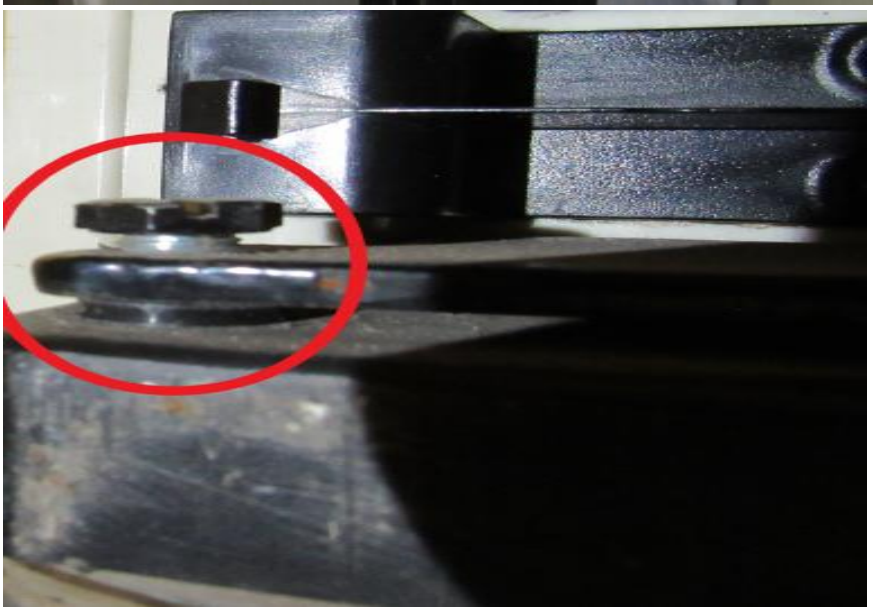
Operating the Controller:



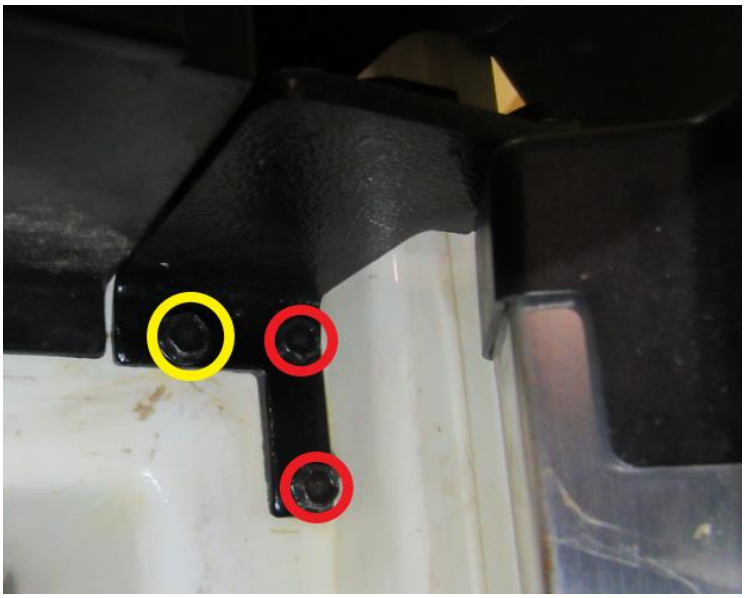
Once you flip the switch to the on position to turn on the fridge, the temp controllers will light up, the fans will turn on and the light will turn on as the motion sensor will detect your movement. (After 30 seconds of no movement, the motion sensor will shut the light off.) The blue number (bottom) on the temp controllers is what the temp is set to and the red number (top) is the actual temp that the sensors inside the fridge section and the freezer section are reading. The temps are preset to 0F & 34F to 38F degrees but you can adjust it up or down using the directions on the next page. The temp may need to be tweaked at first to get the desired temp reading. Freezer zone is 0F to 10F and fresh food zone is 38F to 41F so 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 compressors when to turn on or off.

Check your left-hand door flapper, this can get shifted in this new unit installation process and may need to be readjusted. There normally are 2 or 3 pivot points that should be lubricated with silicone or WD-40, and make sure it swings freely by hand, with the right-hand door open watch as you slowly close the left-hand door, this flapper should freely snap shut all the way closed. If it drags on the top you need to take out the top hinge pin and take out the lift washer out of the bottom hinge pin, if it drags on the bottom you need to add a small washer to lift the door slightly.





Now slowly close the right-hand door and watch between the 2 doors with a light and the right-hand door should not hit or scrape this flapper. If the right-hand door hits the flapper it needs to be adjusted on the right-hand door hinge to swing this away from the flapper. The procedure is for top and bottom hinge. Remove the (YC) screw and loosen the (RC) screw slightly, now slide a small washer between hinge and box and put the (YC) back in and while pushing the hinge as far to the right as possible tighten all screws back in top and bottom hinge.





Trouble Shooting:

Light bulb comes on but nothing else: You have your 12V + (red) and 12V – (black) wires for the controller switched around.

The freezer temp controller is showing 3 red L on screen: You have a bad connection with the temp sensor for the freezer. (Purple and brown wires)



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.

This will show you how to get into the settings etc. but we highly discourage to get into these because if you change one you might change the settings of another if not careful

Enter Diagnostic and Mode settings:

Press and hold top (SET) button for approx. 4 seconds. P0 will flash first. You can then scroll through code settings to the desired one needed. Once the desired code is reached, hold both buttons in for 3 secs or until 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, let sit for approx. 3 seconds and number will stop flashing 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.

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.

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 similar to this type.

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

Use digital wireless



DO NOT USE



Clip the sensor for the fridge on the bottom side of the first shelf beneath the fin. Place it so the sensor is centered, front to back and side to side (RA). If it's clipped on the bottom side, it will be out of the way and shouldn't interfere with storage.



The same applies to the freezer, clip the sensor on the bottom side of the shelf in the right-side compartment, centered from side to side, but have this one more towards the back of the freezer.



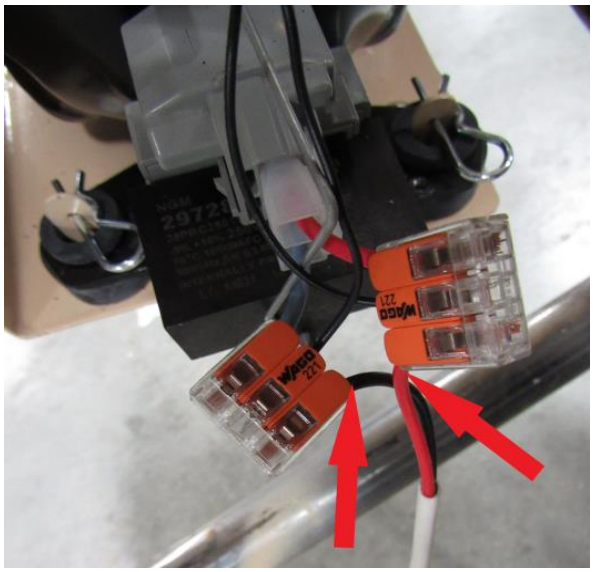
Note: Once in a while the issue arises where the GFCI outlet, that the cooling unit is plugged in to, keeps tripping. If this is the case, you should replace the GFCI outlet with a new one. Below is the info for one that we recommend to install.

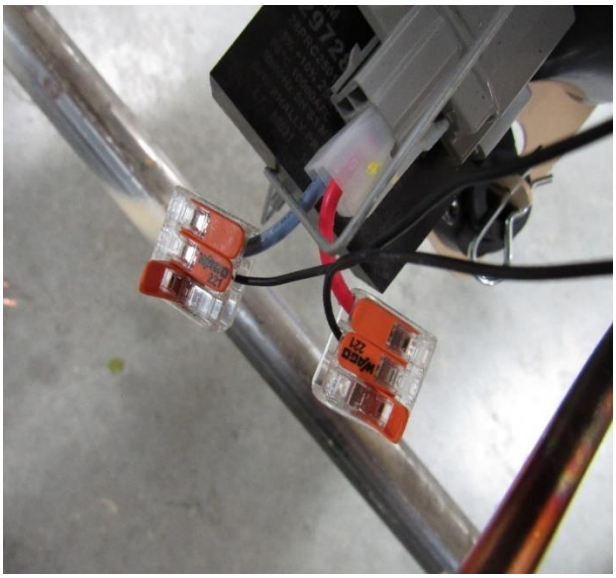
Leviton 15A GFCI Outlet https://www.leviton.com/en/products/gfnt1-kw

https://www.leviton.com/en/docs/GFNT1_Instruction_Sheet_English.pdf

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 either marked fridge/freezer. 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.

