

# RV Winterization Guide

Revision 5.1

January 2021

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# Winterizing Overview

## Purpose

This guide was developed to provide information on winterizing and un-winterizing most RVs. Some information is specific to Fleetwood Discovery brand motorhomes.

This guide is provided in an editable format to allow users to personalize it for their individual needs.

## Disclaimers

This guide is provided as-is, with no guarantees of accuracy or applicability. While provided on the Discovery Owners Association Inc (DOAI), the DOAI asserts no ownership nor provides any assurance or guarantee whatsoever.

## Air or Antifreeze?

The guide provides winterization procedures using both compressed air (air) and RV antifreeze. Each method has advantages and disadvantages which are not discussed in-depth here. Manufacturers typically recommend winterizing with RV antifreeze. Many owners prefer air. Some use both. Models with Aqua-Hot units require antifreeze winterization. The authors make no specific recommendations.

## Document Errors and Suggestions

Please contact authors (email addresses on cover page) to alert them of any errors (e.g., technical, sequence, etc.) or improvement suggestions.

## Winterizing “Newer” Model Coaches

Winterizing procedures for newer model coaches, generally model year 2017 and later, can be very different due to technology like Truma tankless water heaters, Firefly, and Aqua-Hot. These differences are noted in several places and separate sections are provided at the end of the document for Truma and Aqua-Hot winterization. Most of the material in this guide is applicable to all coaches but take the time to understand the winterization needs of your specific coach and select the right approach.

## General Notes on Winterizing

- Different RV models use varying terminology for the fresh water and water heater bypass valves. The terminology can be confusing because **the term “BYPASS” is often used for both valves**. The following is the terminology used in this checklist for these valves.
  - a. The **city water** valve is identified as the “city water BYPASS/FILL valve.” (FILL position is used **ONLY** to fill the fresh water tank with city water.)
  - b. The **water heater** valve is identified as the “water heater NORMAL FLOW/BYPASS valve.” (BYPASS position is used **ONLY** to prevent water from entering the water heater.)

- c. Be sure not to confuse the settings for these two valves when winterizing. Change the terminology to match your particular RV if you modify the checklist.
- Many RV owners and manufacturers consider winterization with antifreeze to be the *ultimate* winter protection for your RV water systems. You may choose to use both air and antifreeze to winterize. If so, perform the air winterization *before* winterizing with antifreeze. This will allow you to use less antifreeze in the process.
  - Coaches with Aqua-Hot hydronic systems must winterize with antifreeze but blowing out the supply lines with air before the antifreeze step will reduce the amount of antifreeze you need. Note that the antifreeze used in the Aqua-Hot heating loop is NOT the same as what you'll use for winterizing your water lines. Always follow the procedures in the manual for your specific unit.
  - The antifreeze you use to winterize your RV is designed specifically to protect potable (drinking) water systems. It is not the kind of antifreeze that you put in your car's radiator. You can purchase RV Antifreeze at your local RV store or in the RV section of stores like Wal-Mart. Be 100% certain that the antifreeze container clearly states that it is intended to protect potable (drinking) water systems! All our references to "antifreeze" are the antifreeze designed to safely protect potable water systems for Recreational Vehicles. This fluid is normally pink in color, and we sometimes refer to the color as well.
  - Most of us do NOT introduce RV antifreeze into our water heater tanks because it is difficult to completely remove. Instead, we use gravity to drain the tank, and optional air to drain the water lines between the water heater NORMAL FLOW/BYPASS valve and the water heater. The small amount of residual water in the water heater will not cause damage if it freezes.
  - Winterization of tankless (Truma) water heaters is covered in a separate section after the air and antifreeze winterization steps.

# Winterizing All Models – First Steps

## General Prep

1. Remove portable appliances and materials that might freeze: coffee pot, dishwashing liquid, first-aid supplies, liquid soaps, cosmetics, etc.
2. Remove all food items, including boxed dry goods, as well as canned goods, from your RV. Cans can freeze and split; dry goods will make winter rodents fat and happy.
3. Protect against critters. Bounce, poison, traps, Fresh Cab, electronic repeller, etc. Search the e-group for many threads on different products and approaches. Here are some examples:
  - a. Setting a good multiple catch mouse trap will keep your RV more secure as four-legged intruders try to make their home inside your RV.
  - b. Plug holes with steel wool and tape to make entry harder.
  - c. Set dash heater controls to **HEAT** and **CIRCULATION ON**. Shuts off the outside air gate to the duct system.
4. Drain the fresh water tank. Detailed steps are included in air and antifreeze winterization sections below.
5. Shut **OFF** propane source (if applicable).
6. **OPEN** low-point water drains if equipped. Turn on water pump briefly to help drain lines. **CLOSE** low point drains when water ceases to flow from them (will reopen later).
7. Bypass, remove, and drain water filters and water softener.
  - a. Disconnect and drain water softener if so equipped.
  - b. Bypass/remove whole-house water filter - usually in the water bay. **(See Q/A Topic 8 picture of full house filter bypass)**
  - c. Remove refrigerator water filter (only if the filter receptacle seals automatically or you have the plug that you can install in place of the filter. Otherwise leave it installed and replace it when you unwinterize).
  - d. Remove any additional filters you may have installed (e.g., under the kitchen sink).
8. Prop refrigerator and freezer doors open if you are not leaving your coach and refrigerator plugged in during hibernation.

## Tank-based Water Heater Prep

1. Shut **OFF** all power to water heater.
  - a. For coaches with separate water heater controls - affix a piece of colorful electrical tape or other physical barrier across the button(s) that control your hot water heater on your control panel.
  - b. Some RV's have two buttons for the hot water heater - one that turns on/off the propane igniters to heat the water in the tank, and a second that turns on/off an electric heating element. Tape the buttons in the OFF position to prevent accidentally turning them ON when there's no water in your water heater tank. This prevents the possibility of heating an empty water heater tank, possibly causing severe damage or even fire.

- c. In Firefly-equipped coaches there will be a water heater power control in the Firefly screen. Depending on the model and year, there may also be a switch on a separate physical control panel and one on the unit itself.
2. Drain your water heater tank. **Allow the water to cool completely before proceeding!**
  - a. Open the vent at the top of the water heater.
  - b. Remove the nylon plug or sacrificial element (depending on your water heater model) from the bottom of the water heater tank and allow the water to drain out. It is normal for some sediment to come out as the tank empties.

**NOTE:** You may choose to introduce additional water into your water heater tank, either directly or with an inexpensive cleaning wand (available on Amazon or at RV stores) to remove residue in the tank, and repeat draining.

- c. **OPTIONAL:** Siphon water out of bottom of water heater tank with ½" clear hose if possible. The residual water in the tank will not cause damage if it freezes should you decide not to siphon.

# Winterizing With Air

## Air Winterizing Notes

- Winterizing with Air refers to using air pressure to remove most of the water from the various water lines, appliances and other plumbing. This method avoids introducing RV Antifreeze into your water lines in general, though even this method will require a small amount of RV antifreeze to be poured into sink drains, the toilet, and a few other areas as described below.
- **Watch your pressure!** Whether you choose to use air to winterize or as a prep for an antifreeze step, always make sure you control the input air pressure to your plumbing system. Use a regulator in all cases. Most compressors, including the on-board coach air supply can produce pressure way above what should be put into your plumbing. **(See Q/A Topic 1)**
- One DOAI member stated that he blows out the system with air, then waits 24 hours and repeats the purge to eliminate residual water.
- Some air compressors may introduce oil or other motor lubricants into the air tank, and thus into the air line and coach water system. Know your compressor and avoid using one that may introduce contaminants into your RV drinking water.

## Air Winterization Steps

You should have removed or bypassed the water softener (if installed) and all filters from your water system. See All Models - First Steps above.

### Tank-based Water Heater

Note: A separate section covers winterizing tips for tankless (Truma) water heaters.

1. Verify that your water heater is **OFF**.
2. Make sure you've completed the steps in the Tank-based Water Heater Prep section in Winterizing All Models – First Steps.
3. Attach air compressor to the RV city water inlet or to a permanently attached RV water hose. **(See Q/A Topic 9 for air-chuck picture)**
4. Set air pressure to desired pressure (typically 40-55 PSI - err on the low side unless you know for certain that higher pressure is safe for your RV).

**NOTE:** The next two steps are optional. These steps ensure the hot water line between the bypass valve and water heater are cleared. Because the water heater is empty, there is plenty room for expansion if the line freezes, so damage is unlikely should you decide not to perform these steps.

5. Leave **water heater** NORMAL FLOW/BYPASS valve in **NORMAL FLOW** position initially.
6. Turn on compressor and allow it to run for a few minutes. You will bypass the water heater in the next step.
7. Set the **water heater** NORMAL FLOW/BYPASS valve lever to the **BYPASS** position.

**NOTE:** Setting the water heater NORMAL FLOW/BYPASS valve to **BYPASS** means that water (or in this case, air) will not be introduced into your water heater tank.

### Water Lines

1. With the **city water** BYPASS/FILL valve in the **BYPASS** position, let compressor air pressure build to your desired pressure setting. (At this point, city water and water heater valves should both be in the BYPASS position.)
2. Starting with farthest faucet from water inlet, run water from each **hot** water faucet until only air escapes.
  - a. Bathroom sink(s)
  - b. Shower/Bathtub
  - c. Kitchen sink
  - d. External shower if equipped
3. Close all hot water faucets and repeat step 9 for **cold** water faucets. Additionally include:
  - a. Clearing water from lines to toilets
  - b. Toilet spray hoses and nozzles
4. With everything else closed, place the **city water** BYPASS/FILL valve in the **FILL** position and blow air toward the fresh tank for a short time to clear the line between the valve and fresh water tank. (Thank you Marv McIntosh)
5. Return the **city water** BYPASS/FILL valve to the **BYPASS** position.

### Drains and Toilets

1. Pour a cup of antifreeze in every drain – sinks, showers, tubs. The washing machine drain is covered in the Winterizing Appliances section below. This prevents the p-traps from damage.
2. Pour a cup of antifreeze into each toilet. Flush toilets to put antifreeze on the toilet valve mechanism, then add another cup of antifreeze to form a vapor barrier.

#### **NOTE: Thetford Techma Toilet Procedure**

- a. Flush until water is purged and air escapes.
- b. Pour 2 cups antifreeze in toilet and flush to winterize waste delivery line between toilet and black tank. Perform this 3-5 times (5 is recommended by manufacturer).
- c. Pour 2 cups antifreeze in toilet when step b is complete.

### Remaining Items

1. Introduce a small amount (about a cup full) of antifreeze through on-board water pump to winterize the pump. You can also simply run the pump “dry” for a few minutes to purge any water from it, but a little antifreeze is a safe option.
2. Winterize washing machine, dishwasher, ice maker, refrigerator water as appropriate. See Winterizing Appliances with Air below.
3. Replace the water heater tank plug and close the relief valve at the top of the tank to prevent bugs/dust from entering the tank (optional step but keeps critters out).



4. When all winterization steps (including appliances) have been completed, **RE-OPEN** low point drains and all faucets. This provides a potential path for expansion and protects fittings if any residual water remaining in the system freezes.

## Winterizing Appliances with Air

Note: Even if you plan to winterize with antifreeze, pushing the residual water out of the lines before introducing antifreeze will prevent dilution of the antifreeze and should reduce the total amount you need.

### Dishwasher

1. With air pressure in the system, start the washer cycle to allow air to push water in the lines into the washer. If water in bottom of washer is significant, run on RINSE cycle to drain before next step.
2. With the machine power OFF, pour 2 cups of RV-type antifreeze into the bottom of the dishwasher.
3. Run the dishwasher RINSE cycle to drain the antifreeze through the drain system, winterizing it.

### Residential Ice Maker and Water Dispenser

1. With pressure in the system, activate the ice maker. Run water through refrigerator door water outlet, if equipped, until only air escapes.
2. Listen for air coming out of ice maker and/or water receptacle (Q/A Topic 2 about alternate method).
3. NON-RESIDENTIAL water dispenser and ice maker see Q/A Topics 4 & 5.

### Washer

Note: There is no air procedure for Splendide washers. See the Winterizing Appliances with Antifreeze for instructions on Splendide washers.

1. With air pressure in the plumbing system, start NORMAL wash cycle with temperature setting to WARM. This will open both the hot and cold-water valves in the washer and allow air to push water in lines into the washer. Terminate cycle when lines are clear. If there is significant water in the drum, drain before next step.
2. Turn the machine power OFF and pour 2 cups of RV-type antifreeze into the washer drum.
3. Close the door.
4. Advance the Program Selector knob to a SPIN position. Cycle the washer in SPIN position to drain the antifreeze through the washer pump. Some newer washers might have a DRAIN button.
5. Turn the water supply hoses OFF and disconnect the inlet hoses from the faucets if they are accessible. Drain any remaining water from the hoses.

**NOTE:** If you are going to disconnect hoses or lines, do it **after** all other winterizing steps are done. Flag a note somewhere obvious to remind you when you unwinterize that you have disconnected hoses.

# Winterizing with Antifreeze

## Antifreeze Winterizing Notes

- Make sure you use RV antifreeze designed for potable water systems. This is different from the antifreeze used cars and the heating loop of Aqua-Hot boiler systems. The most important difference is RV antifreeze won't kill you if you ingest it.
- You should plan on using at least 3 gallons of RV antifreeze to winterize your coach depending on model and year, and it is not uncommon to use 5-8 gallons if you have appliances that require winterizing. Buying a few extra gallons of RV antifreeze in preparation is probably a smart plan and could save you a repeat trip to the store to buy more in the middle of the project.
- You can use air, even when winterizing with antifreeze, to clear the lines and reduce the amount of antifreeze required to winterize. Some RV owners follow the entire procedure for Air-Winterization (above) before continuing with this section.
- Since the methods we describe here use your RV's water pump to push antifreeze through the plumbing and valves, your water pump itself is automatically winterized as part of the process.
- Some members have fabricated a bypass for the full-house filter to save antifreeze. Drain water softener if not done when performing initial steps section. See **Q/A-8 for photos**.

## Antifreeze Winterizing Steps

You should have removed or bypassed the water softener (if installed) and all filters from your water system. See All Models - First Steps above.

### Tank-based Water Heater

1. Verify that your water heater is OFF.
2. Make sure you've completed the steps in the Tank-based Water Heater Prep section in Winterizing All Models – First Steps.

### Water Lines

1. Insert a small water line feeding your RV water pump inlet into a jug or bucket containing RV antifreeze.
  - a. Some members use a separate line with a valve installed so they need only change the valve position to draw from the jug or bucket rather than the fresh water tank. Kits are available, or you can fabricate your own. **(See Q/A-8 for Photos)**
  - b. Some newer coaches have a factory-installed winterizing hose in the wet bay to facilitate drawing antifreeze into the system. There is also a valve to close off the line to the fresh water tank. **(See Q/A-10 for photos)**
2. With everything else closed (no faucets in the open position) and the water heater NORMAL FLOW/BYPASS valve in the BYPASS position, place the city water BYPASS/FILL

valve in the FILL position, and pump a small amount of antifreeze toward the fresh tank.  
(Thank you Marv McIntosh)

**NOTE:** You should plan to sanitize your tank at the beginning of the next season. This will ensure there is no residual pink fluid in the fresh water tank.

3. Return the **city water** BYPASS/FILL valve to the **BYPASS** position.
4. Starting with the faucet farthest from the water pump, run water from each **hot** water faucet until pink liquid flows. (This works better with a partner—one person turning on/off the faucets while the other person monitors the source of the pink fluid being drawn into the water pump, adding fluid as necessary)
  - a. Bathroom Sink(s)
  - b. Shower/Bathtub
  - c. Kitchen Sink
  - d. External Shower (if equipped)
5. Repeat above with **cold** water from each faucet, including
  - a. Toilets
  - b. Toilet spray nozzles

**NOTE:** Where the city water hose connects in the wet bay, there is a spring-loaded ball valve at the female fitting. Using a pen or similar tool, gently push it in until RV antifreeze escapes to clear the small amount of residual water from the fitting (**Q/A Topic 6 – see photo**). **This step is optional and not recommended by some members.**

### **Drains and Toilets**

1. Pour a cupful of antifreeze down each drain and toilet. Flush toilets to winterize the flush valve mechanisms and lubricate the seal to prevent it from sticking. Add another cup of antifreeze to form a vapor barrier.

**NOTE: Thetford Techma Toilet Procedure**

- a. Flush until pink antifreeze is seen in bowl.
- b. Flush additional 5 times as recommended by manufacturer.

### **Remaining Items**

1. Winterize washing machine, dishwasher, ice maker, refrigerator water as appropriate. See Winterizing Appliances with Antifreeze below.
2. Close the water heater vent valve and/or reinsert the plug in the water heater if you have not already done this (optional step but keeps critters out).
3. When all winterization steps (including appliances) have been completed, RE-OPEN low point drains and all faucets. This provides a potential path for expansion and protects fittings if any residual water remaining in the system freezes.

## **Winterizing Appliances with Antifreeze**

Note: Even if you plan to winterize with antifreeze, pushing the residual water out of the lines before introducing antifreeze will prevent dilution of the antifreeze and should reduce the total amount you need. See Winterizing Appliances with Air above.

## Dishwasher

1. Run the washer RINSE cycle to push antifreeze in the lines into the washer.
2. Listen for liquid entering washer, then open washer door and verify the liquid in the bottom of the dishwasher is pink.
3. Antifreeze will drain via washer pump at end of RINSE cycle.

## Residential Ice Maker and Water Dispenser

NOTE: See **Q/A Topics 4 & 5** for instructions on winterizing non-residential units with ice makers or water dispensers.

1. Activate the ice maker and let it run until pink fluid is dropped from the cube tray into the ice cube bin. Many prefer NOT to do this. The fluid may be slushy but won't freeze and making a few trays of ice cubes when unwinterizing will clear the lines and ice maker of antifreeze. (See **Q/A Topic 3 about pink; Q/A topic 2 about alternate methods**).
2. If equipped, run water through door water outlet until it dispenses RV antifreeze.

## Washer

1. Start NORMAL wash cycle with temperature setting to WARM. This will open both the hot and cold-water valves and allow antifreeze into the washer.
2. Terminate cycle when liquid entering the machine is pink.
3. Advance the Program Selector knob to a SPIN position. Cycle the washer in SPIN position to drain the antifreeze through the washer pump. Some newer washers might have a DRAIN button.
4. Turn the water supply hoses OFF and disconnect the inlet hoses from the faucets if they are accessible.

**NOTE:** If you are going to disconnect hoses, do it **after** all other winterizing steps are done. Flag a note somewhere obvious to remind you when you unwinterized that you have disconnected hoses.

## Splendide Washer/Dryer

1. With the machine's power OFF, turn the WASH TEMP knob to HOT.
2. Advance the Program Selector to REGULAR in Cotton Heavy Duty.
3. Press the ON/OFF Button (IN) and let the machine fill until anti-freeze is in the drum.
4. Advance Program Selector to RESET. Wait 5 seconds (Status/Door Lock LED will blink).
5. Advance Program Selector knob to a SPIN position. Let the antifreeze drain from the drum.
6. Advance Program Selector to RESET. Wait 5 seconds (Status/Door Lock LED will blink).
7. Turn the Wash Temp knob to COLD.
8. Advance the Program Selector to REGULAR in Cotton Heavy Duty.
9. Let the machine fill until you see anti-freeze in the drum.
10. Advance Program Selector to RESET. Wait 5 seconds (Status/Door Lock LED will blink).
11. Advance Program Selector knob to SPIN. Let the antifreeze drain from the drum.
12. Press the ON/OFF Button (OUT).

# Truma Tankless Water Heater

The following basic instructions were developed from information in the Truma operating manual. Since features can differ based on model and manufacturing year, it's highly recommended that you review the manual for your specific year/model and adjust these instructions to fit your unit.

## Truma Notes

- Make sure that the Truma Water Heater is turned off at the outside switch in the Truma unit before you start winterizing the coach water system.
- From Truma's perspective, winterizing the unit is accomplished solely by draining. Any air or antifreeze-based winterizing is only done for the coach plumbing with the water heater out of the loop with the water heater bypassed.
- Truma does not recommend passing pressurized air through the unit during winterization. There is a mechanical flow sensor and a circulation pump in some models that might be damaged by high velocity air. They recommend that the coach water heater valve be set to bypass the water heater during air winterization and the water heater only gravity drained as described below.
- Some have winterized the Truma by passing pressurized air through the unit without apparent adverse effect, but this is counter to advice received directly from Truma tech support.
- If you choose to bypass and only drain the Truma, depending on how your coach is plumbed, this may allow water to be retained in the plumbing between the water heater and the bypass valve. An additional cycle of opening the low point drains and the cycling the water heater bypass valve is probably a good idea to try and get the water out of the lines between the valve and the water heater.

## Winterizing the Truma

1. Remove the outside access door.
2. Switch OFF the appliance at the POWER switch on the unit (this should have been done already).
3. Open a hot water tap to depressurize and vent the water system.
4. At the Truma hot water heater, open the black latch with your thumb while pulling the Easy Drain Lever (yellow lever) down as far as it will go. The inlet water filter will pop out.
5. Residual water will drain from system.
6. Remove the water inlet filter and clean it with clean water.
7. Inspect the O-rings on the water inlet filter for cracks, change rings if necessary.
8. After all the water has drained do not reinstall the water inlet filter unit. It can be stored in the Truma housing, off to the side. The filter unit will be reinstalled during un-winterizing.
9. Insert and close the access door

System is now winterized.

## Un-Winterizing the Truma

To un-winterize the Truma water heater you need to have water pressure in the coach and water in the water heater.

1. Reinstall the inlet filter unit (don't turn the Truma on yet).
2. Apply water pressure to the coach water system via external connection or the water pump.
3. Make sure the water heater bypass valve is set to NORMAL FLOW (not bypassed).
4. Open one or more hot water faucets until water runs with no air, then turn faucets off. This ensures the water heater is filled with water.
5. Go outside and turn the Truma unit on with the switch in the housing.
6. Turn on the water heater system inside the coach. This can include the firefly and an optional Truma mode control panel with a rotary switch. NOTE: this panel/switch is often installed where you can't see it or easily find it without consulting the DOAI e-group. Fleetwood installs it this way to prevent stupid people from having access to hot water.
7. After a short warm-up, you should now have hot water.

# Aqua-Hot (400 Series) Water Heater Winterization

It's crucial to properly winterize the Aqua-Hot to avoid serious damage, requiring a complete system replacement not covered under the Aqua-Hot Limited Warranty. The process of winterization consists of completely draining the domestic water from the system and pumping RV winterization antifreeze through to flush out the system. This process is described in the Winterizing with Antifreeze sections above. You should also read the manual for your specific unit to ensure all required winterization is completed.

There is no air winterization process for the Aquahot. There is a copper coil in the Aqua-Hot boiler where the water is heated and it's impossible to be certain that all water would be removed by compressed air alone. Freezing of any residual water in that coil could crack it and ruin the unit. For that reason, antifreeze winterization is the only approved method for the Aqua-Hot.

Also note that the winterizing processes described in this document use RV antifreeze specifically designed for potable water systems. This is very different from the antifreeze product used in the Aqua-Hot boiler system. These two antifreeze types CANNOT be interchanged.

Not winterizing the Aqua-Hot when freezing temperatures are present will result in SERIOUS damage to the Aqua-Hot's Domestic Water Heating System. Also, be sure to use the FDA approved, "GRAS" rated antifreeze for winterization. Please follow these instructions carefully when winterizing the Aqua-Hot's hot water heating system:

# UN-Winterizing the Coach

## Un-Winterizing Prep

***ALWAYS BE LOOKING FOR LEAKS AT EVERY STEP DURING THIS ENTIRE PROCESS!***

Many unfortunate RVers have discovered that their winterizing was unsuccessful when they first connected pressurized water to the coach - either from a city water connection or from the onboard water pump. Water pouring out from under the coach is a discouraging experience but there are things you can do to minimize the damage.

1. If using city water, check the pressure and if you have one, use a regulator to dial the pressure down to below 40lbs.
2. Get at least one “spotter” in place in the coach to listen and look for leaks when the water is first turned on. Stay by the valve/switch for some minutes while the spotter checks for leaks in the coach, in the basement, and under the coach.
3. At the first suspicion of a leak, shut off the valve/switch and open a faucet to release the pressure in the plumbing.

## Un-Winterizing Steps

### General Prep

1. Remove and clean all faucet aerator screens.
2. If you have antifreeze or leftovers in the fresh water tank, drain and flush the tank using the manual fill port. You’ll want to do a full sanitization of the fresh water tank before final filling and use.
3. **CLOSE** the fresh water tank drain and put a few gallons of water in the tank.
4. **CLOSE** low-point water drains and leave **water heater** NORMAL FLOW/BYPASS valve in **BYPASS** position.
5. If you have a homemade or factory-installed winterization valve to isolate the fresh water tank, set the valve to draw from the fresh water tank. Make sure your antifreeze/winterization hose is capped.

### Go for the Gusto – Water Lines

NOTE: At this point you’ll have pressurized water in your coach – make sure your spotters and shut-off specialist are in place and ready.

1. Using the on-board water pump, run fresh water from the fresh water tank through system to clear antifreeze from the water pump and input lines.
2. Using either the on-board water pump or city water, run **hot and cold** water from each faucet, shower, and toilet (don’t forget external shower) until water runs clear.
3. Verify both external shower knobs are in the **OFF** position.
4. Replace or reinstall water softener (if equipped) and all water filters. If filters were bypassed, reconfigure for normal flow.
  - a. Water softener (re-charge if needed)
  - b. Whole-house canister filter in water bay



- c. Refrigerator filter
- d. Any under-sink filters

## **Un-Winterize the Water Heater**

**NOTE:** If you have Aqua-Hot hot water heating, there are no separate steps required to un-winterize the water heater. It's done when the lines is un-winterized.

1. Verify water heater drain plug/cartridge (if you have one) is inserted and tight.
2. Close pressure/temperature relief valve. If you have an anode rod, now is the time to inspect and/or replace it.
3. Change water heater NORMAL FLOW/BYPASS valve from BYPASS to NORMAL FLOW.
4. Open hot water faucet near water heater.

**NOTE:** You can **either** open the pressure/temperature relief valve on the water heater **OR** a hot water faucet or both. Either ensures that the water heater tank has a proper void above the water level, needed for the water heater to function properly.

5. If not already on, turn on water source to fill water heater. This is often easier and more quickly done with city water connected rather than water pumped from the fresh water tank. Either can be used.
6. Fill water heater until air is voided at the pressure/temperature valve or hot water faucet near water heater. **(See Q/A Topic 7 about necessary expansion pocket)**
7. Close hot water faucet and/or pressure temperature valve when water heater is full.
8. Turn Hot Water Propane or Electric heat on, as you normally would.

## **Remaining Items**

1. Perform **Post-Unwinterization Inspections** (See inspection steps in next section below).
2. Replace items that were susceptible to freezing and removed during winterization.
  - a. Coffee Pot
  - b. Dish Soap
  - c. First-Aid Supplies
  - d. Make-up

## **Un-Winterizing Appliances**

### **Dishwasher**

1. If not already open, open the input water line valve to dishwasher to allow flow to the dishwasher. The valve, if equipped, is usually found under the galley sink.
2. Run dishwasher through a FULL cycle to clear antifreeze or air and verify proper operation.

### **Ice Maker and Water Dispenser**

3. If not already open, open the input water line valve to ice maker/refrigerator to allow water flow to the ice maker and water dispenser.
4. Activate the ice maker. Make ice until ice is clear (no pink if antifreeze was used).
5. Make a few additional trays of ice to ensure there is no residual antifreeze smell.
6. Verify ice maker and water dispenser are working properly.

## **Washer/Dryer**

1. Reconnect the hot and cold water hoses if they were disconnected during winterization.
2. Turn faucets on if they were turned off during winterization.
3. Run washer through a FULL WARM cycle to remove pink antifreeze and ensure proper operation.
4. Place a damp towel in dryer and run it through a partial dry cycle to verify operation.

## **Splendide Washer**

1. Reconnect the water inlet hoses to the proper HOT/COLD faucets if you have previously removed them. Be sure to verify that the gaskets and hoses are in good shape and that no leaks exist. Turn the faucets ON.
2. Plug the washer-dryer's power cord back in if disconnected or reconnect the power supply.
3. With the ON/OFF Button in the OFF position (OUT), pour 1/2 TBSP. of powder detergent (or liquid equivalent) into the "Detergent" compartment inside the Dispenser Drawer.
4. Advance the Program Selector to an EXPRESS cycle.
5. Press the ON/OFF Button (IN) and allow the machine to run through the complete cycle to clean out any remaining antifreeze.

## **Post UN-Winterizing Inspections**

These are things you should do or check after un-winterizing and before the first time out.

### **Propane Galley Stove**

Have patience. Idea is to light the burner – not ignite the air around and above it.

1. Verify propane is turned on.
2. Attempt to light one galley stove burner.
3. Push sparker knob in until you smell propane (rotten egg smell). You can also use a butane lighter wand and hold it close to the burner until it lights).
4. Wait at least 2 minutes (5 is better), then attempt to light the burner.
5. If burner doesn't light in a few seconds, wait a few minutes, then try again.
6. After 1 burner lights, exercise the other burners to verify each operates correctly.

### **Batteries**

Exercise proper battery safety at all times!

1. Clean batteries and battery compartment with battery cleaner or baking soda/water solution and rinse.
2. Top off distilled water in house batteries.
3. Check battery connections for corrosion; clean if necessary.
4. Verify battery connections are all secure.

### **Tires**

This is a quick check at the start of the season. Have your tires professionally inspected every two years. The tire manufacturer manual has information to help you inspect your tires.

1. Inspect for abnormal tread wear.
2. Inspect sidewalls for weather cracks.

3. Check air pressures (based on corner weights if you know them).

### **Tank-Type Water Heater**

1. Using compressed air – blow out dust, bugs, and other particulates in and around the water heater.
2. Turn on water heater using propane source first to verify water heater flame ignites and stays lit for about at least a minute or two (if it stayed lit that long, it is probably working correctly).
3. Shut off water heater and turn back on, this time with electric source, and leave on to verify that it is heating the water fully.

### **Furnace**

1. Using compressed air – blow out dust, bugs, and other particulates in and around each furnace.

### **Air Conditioners/Heat Pumps**

1. Cycle each AC and heat pump, adjusting thermostats to force them to operate in each mode.

### **Aqua-Hot**

Some checks can be done at the Aqua-Hot panel in the basement but most functions and checks can be done from the firefly panel if the diagnostic screen is available there.

1. Turn on Electric heat element and verify no faults on the screen.
2. Turn on the Diesel heat option and verify no faults on the screen.
3. Set the coach temperature setting for front and rear zones above ambient temps and enable Aqua-hot for both zones. After a short time, you may be able to hear the diesel burner come on. If not, check the Aqua-Hot tailpipe for exhaust flow.
4. Once the boiler comes up to temp, this may take a few minutes, the zone pumps should come on as well as the cozies in the coach. Note that the bath cozies may have a manual on-off switch to enable.
5. Lower the temperature setting for both zones below ambient temps and ensure the zone pumps and cozies shut off.
6. For coaches with basement heat from the Aqua-Hot, this is more difficult to verify and we don't have any specific procedures for this yet.

### **Internal Equipment**

1. Verify operation of TVs and all internal appliances
2. Check inside and outside lights.
3. Verify engine start and operation of dash heat/air, wipers, external lights, cameras, GPS, etc.

### **Sanitize Water Heater (Optional)**

This procedure doesn't apply to Aqua-Hot coaches.

1. Turn off water heater sources (electric and gas).
2. Turn off city water or pump.

3. Water heater NORMAL FLOW/BYPASS valve should be in NORMAL FLOW position.
4. Drain the water heater and reinstall the drain plug.
5. Remove the pressure/temperature valve.
6. Make a mixture of 65% white vinegar to 35% clean water and fill water heater (10-gal water heater requires about 6 ½ gal of solution).
7. Using funnel or other innovative idea, pour mixture into the pressure/temperature valve opening.
8. Let sit for approximately 4 hours.
9. Optional Step – not universally recommended. FMC magazine recommends running through hot water lines until vinegar is smelled; Authors are not sure this step is necessary, and it could break loose debris in the lines and create unwanted consequences.
10. Drain the water heater.
11. Reinstall pressure/temperature valve.
12. Turn on water source, open the pressure/temperature valve and refill the water heater.
13. Repeat steps j-l until there is no residual vinegar smell.
14. Use a water heater flush attachment to flush the inside of the water heater to remove particulates.
15. Final tank fill: Reinstall drain plug and, with the pressure/temperature valve open, fill the tank until water exits the valve. Close the valve using 1 finger so that the valve “pops” shut (don’t close softly). This helps the valve seat. Press the center inward of the valve with your finger. You may hear or feel a slight click as it seats.

### **Fresh Water Tank Sanitize**

NOTE: Use of bleach or any product containing chlorine is NOT recommended in the water supply systems in coaches with Aqua-Hot water heating. The copper coil in the boiler can be damaged by chlorine. Check with Aqua-Hot on proper water system sanitizing procedures compatible with Aqua-Hot.

1. Remove filters before sanitizing or replace them after sanitizing.
2. Drain tank.
3. Mix ¼ to ½ cup bleach with 15-gal water and refill tank.
4. Turn hot water heater NORMAL FLOW/BYPASS to the BYPASS position.
5. Using water pump run water through the entire system. Open each hot and cold faucet until you smell bleach:
  - a. Showers
  - b. All sink faucets
  - c. Toilets
  - d. Refrigerator water/ice maker
6. Let it sit for at least 4 hours; overnight is better.
7. Drain fresh water tank and refill.
8. Run fresh water through entire system until no bleach smell.
9. If needed, repeat drain/refill/system flush again.

### **Miscellaneous**


1. Inspect carefully for any signs of critters:



- a. Webs
  - b. Droppings
  - c. Chewed fabric, stuffing, etc.
  - d. Gorilla infestation is usually obvious
2. Clean, disinfect, and exterminate, as necessary.
3. Check Smoke, Propane, Carbon Monoxide Detectors.
  - a. Know where they are and what each is for.
  - b. Replace batteries annually if battery operated.
  - c. Test each detector and always test before each trip.
4. Lubricate locks with graphite-based lubricant.
5. Lubricate all step joints (Silicon NOT recommended. Use a non-sticking lubricant such as DuPont Non-Stick Dry Film Lubricant with Teflon or Boeshield T-9).
6. Clean and lubricate Jacks.
7. Check (particularly on roof) for cracked or peeling sealants (Be sure to use the CORRECT sealant for any resealing).
8. Inspect, clean, and treat rubber seals. (Use products such as Protect All Slide-Out Rubber Seal Treatment – available on Amazon).
9. Inspect windshield wipers and replace if necessary.
10. Fill windshield washer reservoir.
11. Check around windows for leaks.

# Winterizing Q & A

These are tips and hints provided by DOAI members on the topic of winterization. A full set of hints and tips is available on the DOAI website.

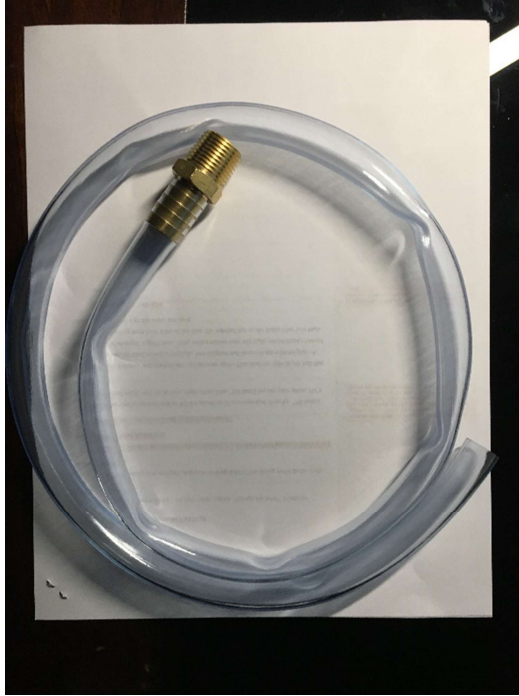
Item	Topic	Discussion
1	Use of on-board air to winterize.	I thought I would share what I put together last year to blow out my water lines that has a regulator on it, so you could use your on-board compressor. It is basically a paint spray gun regulator from Lowes, a dishwasher supply line with a 3/4" female to 3/8" male connector and a garden hose quick disconnect coupling from where the garden water hoses are located in the store. Two 3/8 " air chucks. I had most of this around the house and if you go out and buy all of it would be around \$35 - 40 dollars not cheap but should be a onetime buy that should last for many seasons. (Thank you, Joseph Jones)
2	Alternative method for residential water dispenser & Ice Maker	I am able to empty the water line to the icemaker by putting a glass at the water dispenser and flushing it until only air comes out. Then I turn the shut off valve to the Icemaker that on my coach is under the stove, pump the pink antifreeze in the water lines up to the shut off valve. When I de winterize I disconnect the supply line to the Icemaker connect a spare supply line to the shutoff valve and put the other end in a bucket and flush the water line out until it runs clean of pink. Then reconnect the supply line to the Icemaker. That way I don't have pink antifreeze in my Icemaker lines or my \$50.00 water filter in my refrigerator. Sounds like a pain. Others may not agree or have a different or better way but that's how I do mine. (Thank you Joe Jones)
3	Residential Icemaker - pink antifreeze	Running pink liquid through icemaker will not freeze antifreeze solid, but may produce slush, which will collect in ice storage pan. Seeing the pink assures you that antifreeze has gotten to the icemaker. Downside is inconvenience. It can leave an aftertaste and you'll need to make several trays of ice cubes until you clear the line and taste when you un-winterize. (Thank you, Jason)
4	Non-Residential Ice Maker	Don't let pink stuff get in the upper part of the ice maker. There is no valve at the top of the ice maker hose so all you have to do is remove it from the solenoid and all the water runs out. Leave it disconnected all winter. Remove the hose which goes inside of the solenoid and most if not all the water will dribble out of the solenoid valve. You can loosen it and turn it over to shake out the last drops. The supply line comes from

		below and can be winterized with <b>either</b> air or pink stuff. Leave it off the ice maker solenoid all winter but don't forget to put it back on before turning on the water next spring or you'll be sopping up some water behind the fridge. (Thank you, Gary Osburn)
5	Non-Residential Ice Maker	I just completely remove the solenoid and put it in my shop. I remove the water filter underneath the sink and blow the water out of the ice maker feed line. The line from the solenoid to the ice maker will drain by gravity. (Thank you, Ross Murphy)
6	City Water inlet connection with check valve	This is the city water inlet with the check valve referenced in Water Lines section of the Antifreeze Winterizing Steps. Photo of check valve (Thank you Joe Jones)  <b>Note: This is optional and not recommended by some members.</b>
7	Required air pocket in Water Heater	Excessive dripping from the pressure/temperature valve could indicate a bad valve, but also could indicate that the expansion area inside the tank has filled with water. This occurs in all water heaters over time due to the chemical reaction between water and the air in the expansion area. It is easy to rectify: <ol style="list-style-type: none"> <li>1. Turn off the water heater and sources</li> <li>2. Open hot water faucet in RV</li> <li>3. Open the Pressure/temperature relief valve</li> <li>4. Close the P/T valve when water stops dripping from the opened valve</li> <li>5. Turn on water sources</li> <li>6. Close faucet in RV</li> <li>7. Restart water heater</li> </ol>

<p><b>8</b></p>	<p>Full-house water filter bypass</p>	 <p>Water pump</p> <p>Bypass for big filter – just a couple fittings kluged together.</p> <p>Filter canister (filter to left)</p>
<p><b>8</b></p>	<p>Fresh Water/Antifreeze Valve Modification</p>	 <p>Bypass valve for antifreeze. Clear hose running off to right is about 2' long – goes in jug or bucket. Water filter for pump just above valve. Water drawn from fresh tank, thru filter, valve, into pump, out to system. Valve is in normal position. Points to plastic hose for winterizing with antifreeze.</p>



<p>9</p>	<p>Air Chuck Attachment for water inlet.</p>	<div data-bbox="688 205 959 611" data-label="Image"> </div> <p>Available on Amazon for about \$6. Search for: Camco 36143 Blow Out Plug with Brass Quick Connect</p>
<p>10</p>	<p>Factory-Installed Winterizing Hose</p>	<p>This is a picture of the end of the factory-installed winterizing hose on some later models that can be used to draw antifreeze directly into the water pump. In the background you can see the valve used to shut off draw from the fresh water tank so this hose will work.</p> <div data-bbox="623 936 1377 1360" data-label="Image"> </div> <p>This is a picture of a plastic tube and 1/2" brass fitting that can be connected to the winterizing hose and stuck into a jug or bucket of antifreeze.</p>



Note that the water pump won't draw through this system unless a faucet is open. You can use the outdoor shower to make sure the system is working. Remember to turn off both valves on the shower fixture once it's winterized.