CAMCO

A step-by-step guide

HOW TO WINTERIZE YOUR RV

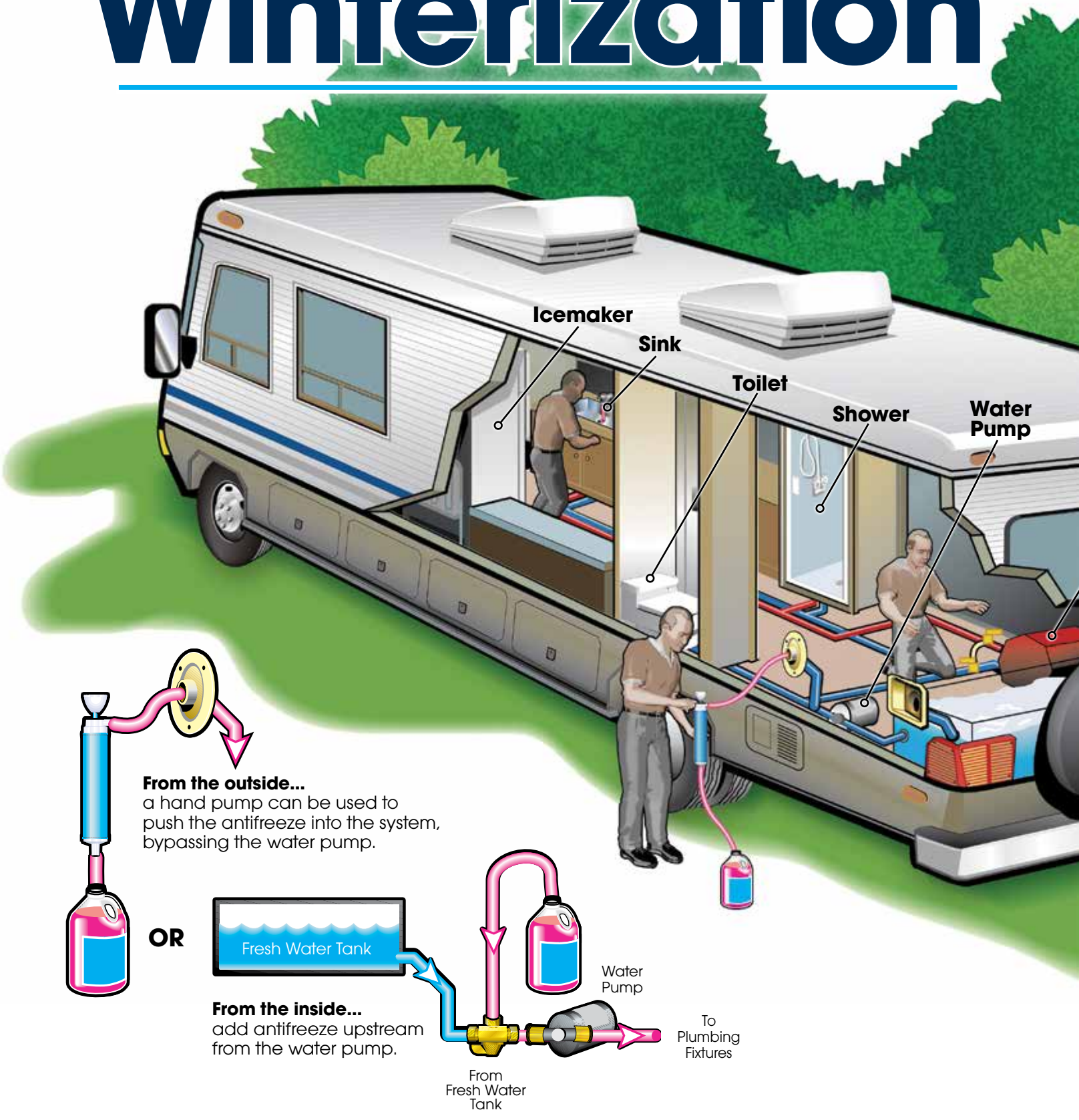


Prevent freezing pipes and other damage by winterizing your RV.

Camco created this handy brochure to show you how to prepare your RV for storage during winter months. Winterization checklist included.

Go RVing

Winterization



– Preparing Your RV for Storage



You've had a great year in your RV and now it's time to store it for winter. Follow the guide below to properly winterize and prepare your RV for long or short term storage.

Use Freeze Ban (#30767) antifreeze for the winterization of your RV. It is safe for fresh water plumbing.

Step-by-Step Guide to Winterizing Your RV.

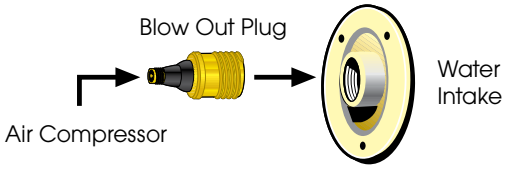
The following are general suggestions. Read your owner's manual for winterization methods specific to your RV. *Note: For winterizing ice maker, dishwasher and washing machine, please see appliance manual or contact RV service center.*

1. Disconnect the outside water source. DO NOT DRAIN THE WATER HEATER until after you have filled your pipes with antifreeze.

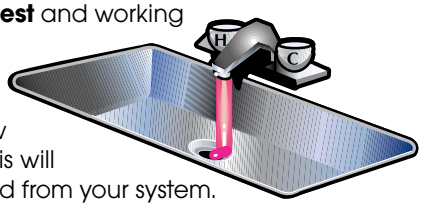
2. Bypass your water heater. ***See page 3, Bypassing the Water Heater and follow all steps before continuing. Bypass any in-line or under-sink water filtration systems.***

3. Open the petcock to drain as much water from your pipes as possible. Open the water taps and flush the toilet to drain any remaining water from the system.

4. After draining as much water as possible, it is recommended a Blow Out Plug (#36153) be attached to the Water Intake Fitting. Apply air pressure from an oilless air compressor to drain the remaining water. Although blowing out the remaining water is not required, the remaining water will dilute your antifreeze. Close all faucets and petcock when complete.



5. You can add antifreeze either from the inside using the Water Pump Conversion Kit (#36543) or from the outside using a hand pump (#36003). Be sure to check your progress by opening up one faucet at a time, starting from the **highest** and working to the **lowest** point in the fresh water system. Begin with the kitchen faucet. Open the HOT side of the kitchen faucet ONLY. Pump antifreeze until flow from the faucet becomes very pink. This will indicate that all water has been flushed from your system. Close faucet. Repeat on COLD side. Continue to the next lower fixture. This is normally the bathroom sink, then the shower and toilet and finally the outdoor shower.



6. Pour at least 2 pints of antifreeze into all sink and shower drains. The ice maker, washing machine and external shower will also need to be winterized. Look for this information in your appliance manuals.

7. Open drain plug/valve on water heater and leave open.

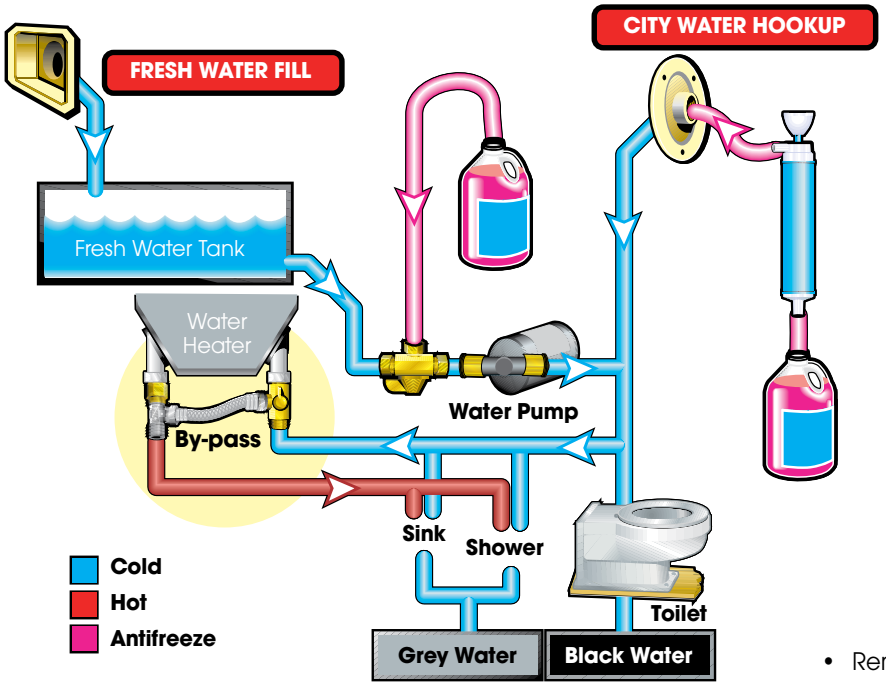
8. Finally, leave antifreeze in lines until spring. Do not drain.

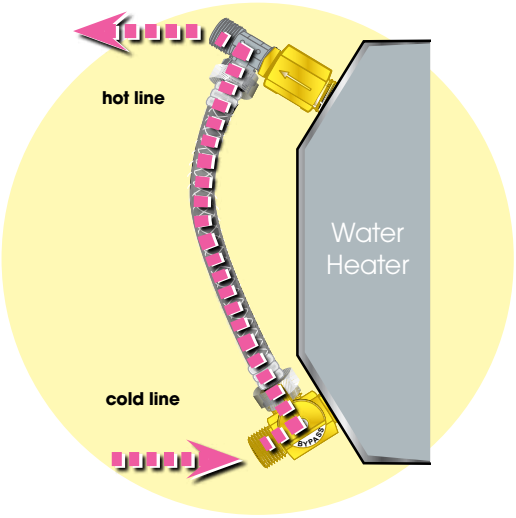
Key Points to Remember:

- **Work from highest to lowest point**
- **Flush toilet just before you drain water heater**
- **Drain water heater last**

How RV Water Systems Work

Your RV's water system draws water from your fresh water tank and/or from the city water hookup. From the fresh water tank, a water pump is used to push water through the RV. (No pump is needed for water coming from the city hook-up.) The water from the water tank and city water hookup will always be cold. To get hot water, the water must flow from your water pump into your water heater. The water is then heated and flows to your hot water fixtures such as your sinks and shower. When winterizing your RV you will need to bypass the water heater.





* The above by-pass setup is the Quick Turn RV Permanent By-Pass Kit (#35983).

How To Bypass Your Water Heater

Bypassing the water heater can save you money by not having to fill the water heater with antifreeze, saving as much as 6 to 8 gallons of antifreeze. Some RVs come with a by-pass system pre-installed but many do not.

Before you start,

1. Make sure to turn off all power to the water heater (the electric water heaters usually have their own power on-off switch).
2. Disconnect the water supply.
3. Make sure the water heater gas pilot is NOT lit.

Make sure your water heater remains full of water. If you have a by-pass system in place go to step 3.

1. If you need to install a by-pass system, disconnect hot and cold lines going into and out of the water heater.
2. Connect by-pass. (See package instructions.) Be sure to use 3 to 5 turns of Teflon tape when attaching each connection.
3. Close off hot and cold lines going into and out of the water heater.
4. Open the by-pass.

There are many by-pass kits available for your water heater. See details on page 4 for by-pass kits available from Camco.

Also remember to...

- Remove any food that can spoil from your RV.
- Clean storage areas, oven, range, refrigerator and areas around dinette.
- Examine seals around exterior doors and windows. Caulk if necessary.
- Check the roof for small leaks or other damage. Make repairs if necessary.
- Check plumbing vents, roof vent, and air condition shroud.
- Leave your hot water heater plug/valve open during the winter months.
- Disconnect your 120 volt line cord and store away.
- Clean and store your sewer hoses.
- Replace bumper caps.
- Park with emergency brake on and use wheel chocks.
- Stabilize your RV. Make sure it does not rock when you walk inside it.
- Keep RV out of direct sunlight if possible.
- Now is a good time to wash and wax.
- Clean the awning. Do not use a dish detergent. They contain de-greasers which can cause your awning to dry out and crack. Camco's Awning Cleaner (#41027) is recommended to clean, moisturize and remove mildew.

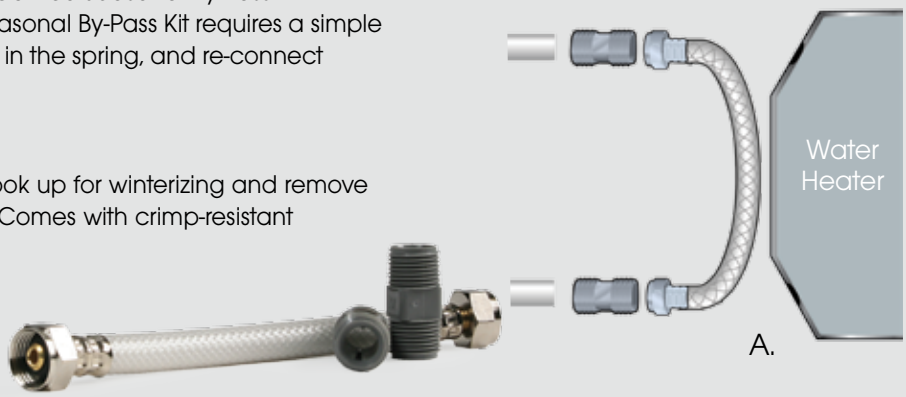
GOOD

Easy seasonal winterizing is yours with the Camco Seasonal By-Pass Kit. The most economical of our kits, the RV Seasonal By-Pass Kit requires a simple temporary hookup for winterizing. Remove in the spring, and re-connect during winter months.

A. Seasonal By-Pass Kit

This temporary by-pass kit allows you to hook up for winterizing and remove in the spring for reconnecting the system. Comes with crimp-resistant nylon reinforced hose.

35713



A.

BETTER

Once installed, the RV Supreme Permanent By-Pass Kit allows you to drain your water heater and forget your RV for the winter.

B. Supreme By-Pass Kits, Permanent

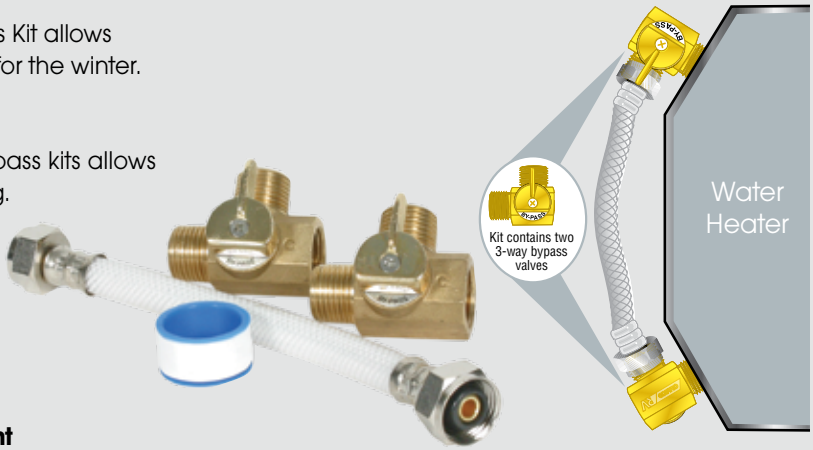
Simple, permanent installation of either below by-pass kits allows you to easily drain your water heater for winterizing. Kits include brass valve to allow free flow* and crimp-resistant nylon reinforced hose.

35953 **With 8" tube for 6 gallon tank**

35963 **With 12" tube for 10 gallon tank**

Replacement valve is also available.

37463 **3-Way by-pass valve replacement**



B.

* Not designed for using fresh water systems while water heater is bypassed; some seepage into hot water tank is normal and poses no problem with the winterization process or the level of protection your unit receives.

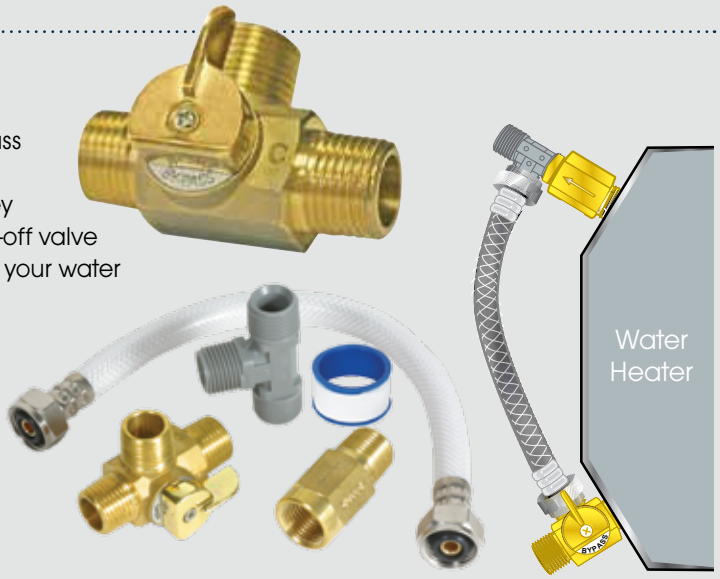
BEST

The Quick Turn RV Permanent By-Pass Kit allows you to bypass your water heater and save antifreeze while winterizing. This permanently installed system saves you time and money every year. Sturdy brass back flow preventer and 100% shut-off valve are included. Once installed, this kit will allow you to bypass your water heater with the simple turn of a valve. Easy to install and designed to last the life of your RV.

C. Quick-Turn By-Pass Kit, Permanent

Save on antifreeze when you winterize with this easily-installed water heater by-pass kit. Sturdy, brass back flow preventer and 100% shut-off valve lets you by-pass the water heater with a single turn.

35983

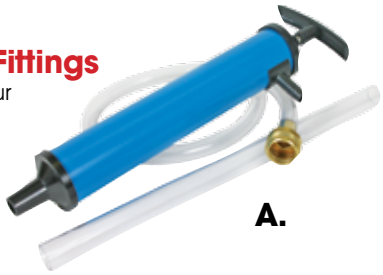


C.

A. Hand Pump Kit with Fittings

Pump antifreeze directly into your RV water lines and supply tanks. Kit includes flexible connecting line with city water connection.

36003



A.

B. Pump Converter Winterizing Kit

Winterize your RV annually with ease. This permanent kit installs with an adjustable wrench and includes brass valve, siphon hose, Teflon tape and pump adapters.

36543



B.

C. RV Water Heater Drain Plug Kit

Specifically designed for use with RV water heater drain plugs. Angled design conveniently fits in tight spaces and includes prongs for rusted drain valves. Fits both 7/8" and 15/16" drain plugs. Includes two replacement drain plugs.

11633 **Water Heater Drain Plug Kit**

11630 **Water Heater Drain Plugs (set of 2)**



C.

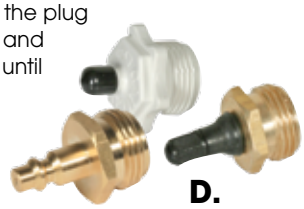
D. Blow Out Plugs

Completely clear your water lines with Camco RV Blow Out Plugs. Screw the plug into the city water inlet, open all drains and faucets, attach and activate air pump until all lines are clear.

36103 **Plastic**

36153 **Brass**

36143 **Brass, Quick Connect**



D.

E. Freeze Check Refractometer

An economical, highly accurate instrument for testing the point at which antifreeze solutions begin to solidify. No charts, graphs or conversions. Eliminates guesswork, reassuring the user that the unit is protected to the desired level. Saves money by eliminating overuse of antifreeze and verifying proper protection. Recommended for use with all methods of winterization where propylene glycol based antifreezes are used.

65401



E.

F. Mini Dehumidifier

Compact moisture absorber reduces moisture which could lead to odors. Works to remove dampness from the air, helping to reduce mildew, mold and musty odors.

44195



F.

G. RV & Marine Antifreeze (not shown)

Protect your RV's potable water system from freeze damage. These antifreezes inhibit fouling and corrosion. They also help in lubricating pumps and valves throughout the system. Choose a temperature-specific product designed for your winterizing needs. Safe and tasteless.

30626	**Premium Ban Frost 2000®**	**32 oz.**
30627	**Ban Frost 2000® Marine Engine Antifreeze & Coolant**	**1 Gallon**
30629	**Ban Frost 2000® Marine Engine Antifreeze & Coolant**	**5 Gallons**
30767	**Freeze Ban -50**	**1 Gallon**
30769	**Freeze Ban -50**	**5 Gallons**
30787	**Winter Ban -100**	**1 Gallon**

H. Antifreeze pH Test Strips

Test the pH of the your antifreeze solution to indicate the level of corrosion protection.

36011



H.

I. Fridge Door Stay (not shown)

Keeps your refrigerator door held open during storage. improves air circulation and helps prevent mold and odor build-up.

45641

J. Wiper Stand-off Wedges™

Over time, pressure on your wiper blades during storage can cause them to break down and crack. Camco's Wiper Stand-off Wedges™ lift the wipers and remove the pressure, helping to extend the life of your wiper blades.

45456 (2 pack)



J.

K. Do-It-Yourself Boat Winterizer

Quickly and efficiently service inboard/outboard marine engines. Also recommended for use with outboard engines. The patented Do-It-Yourself Winterizer allows flushing and preparation of boat engine for winter storage with just five gallons of antifreeze and your flusher. Save time and money, season after season. Great for technicians, too. For front mounted raw water pump systems, use the Flush Adapter, sold separately.

65501 **Do-It-Yourself Winterizer**

65493 **Front (Volvo) Engine Pump Adapter**



K.

Frequently Asked Questions About Antifreeze

Q. How much water should you add to your -50 RV Antifreeze to achieve a -25˚F. burst protection?

A. Camco -50 RV Antifreeze SHOULD NOT be diluted. It is a pre-diluted solution that is designed to be used full strength. Additional water dramatically alters the expansion properties of the propylene glycol solution making adequate burst protection difficult to achieve.

Q. I had some -50 RV antifreeze stored in my garage and I noticed it was frozen. Is your product defective?

A. No. Propylene glycol antifreezes are designed to provide burst protection to temperatures of -50˚F. or below. Ice crystals will start to form in -50 RV Antifreeze at temperatures around +10˚F. and will appear to be solid ice at around -10˚F. to -15˚F. Propylene glycol based antifreezes continue to contract and will not expand until temperatures of -50˚F. are reached, thus providing burst protection for pipes. If you need a product that flows at the lower temperature, a more highly concentrated product such as Winter Ban -100 or our Premium Ban Frost 2000® should be used.

Q. I understand that most antifreezes are toxic, yet you claim your RV antifreeze products are not harmful. How is that possible?

A. Most automotive antifreezes are made from ethylene glycol, which is highly toxic. RV antifreezes are made from propylene glycol which is considered GRAS (Generally Regarded As Safe) by the U.S. Government. Propylene glycol is used in many consumable products such as ice cream, candy and even cosmetics. Therefore, it is the product to use when winterizing potable water systems.

Q. How can I test the antifreeze in my plumbing system to make sure I have the proper burst protection?

A. Unfortunately, there is no reliable and economical tester in the market for the RV or boat owner. The best assurance is to follow the instructions on the label and be careful to remove all water from the system before winterizing to avoid dilution of the antifreeze. Camco offers an instrument called a refractometer which accurately reads both freeze point and burst point of the propylene glycol solution. This instrument is used in all of the Camco facilities to check the quality of our blends at the time of manufacture.

Q. What is the difference between freeze point and burst point of antifreeze?

A. The freeze point is the temperature of the solution at which ice crystals will start to form in the solution and it will have difficulty flowing. This temperature is around +10˚F. with -50 RV Antifreeze. This temperature is not indicative of the winterizing protection. The burst point is the temperature where the solution will begin to expand and cause the pipes to burst. A unit winterized properly with -50 RV Antifreeze should show a freeze point of around +10˚F. which indicates a burst protection of -50˚F.

Q. I have seen other antifreeze on the market offering different degrees of protection and applications, what is the difference?

A. Camco offers a number of different antifreezes for different applications. The primary difference is in the formulations and amount of propylene glycol used. We offer the -50 RV antifreezes and Winter Ban -100 for colder climates and marine engine winterization. Our Ban Frost 2000® Antifreeze & Coolant is a highly concentrated product that is used to winterize marine engines and used as a coolant. Our Boiler Antifreeze -100 (#30027) is designed for use in hydronic heating systems, chillers and solar systems. Boiler antifreeze is recommended for RVs with AquaHot & HydroHot systems.

Q. Do I use the Ban Frost 2000® Antifreeze & Coolant the same way I use ethylene glycol based automotive antifreeze?

A. They are used in much the same manner; however, the rule of thumb is to add about 10% more Ban Frost 2000® than was used with ethylene glycol. There is a blending chart on the product label for mixing Ban Frost 2000® as a coolant application and also a chart for mixing it to winterize an engine block for winter storage.

Q. I have a boat with an inboard/outboard engine that I need to winterize. What is the best method to use?

A. There are several methods used by Marine dealers to winterize. You should refer to your owners manual for winterizing tips and recommendations. Some dealers use a VAT method where the outdrive is lowered into an antifreeze solution and the engine is run for a few minutes at operating temperature, making sure all the water is purged and the antifreeze solution is throughout the system. Another method requires the removal of the thermostat, opening of all petcocks to drain water from the engine block and then pouring the antifreeze into the engine block until the solution runs out of the petcocks. Camco offers the Do-It-Yourself Boat Winterizer which requires approximately 5 gallons of antifreeze for a proper winterization. Instructions for using the Do-It-Yourself Boat Winterizer should be followed closely.

Q. What should I do if I spill some of your RV antifreeze on my driveway or grass?

A. Unlike toxic ethylene glycol, propylene glycol is rated GRAS (Generally Regarded As Safe) by the FDA. Should you spill small amounts on your driveway or grass, hose the area thoroughly with water. Propylene glycol is biodegradable and will dissipate in the water.

Q. Should I use -50 antifreeze or a higher concentration such as Winter Ban -100 or Ban Frost 2000® Antifreeze & Coolant to winterize my marine engine?

A. Camco Freeze Ban -50 Antifreeze has been used for over 40 years by dealers and customers in the Marine industry for engine and potable water system winterization. It is safe to use for the marine engine application; however, if you are uncertain about getting all of the water purged out of the engine block, we suggest using a more concentrated formulation such as Winter Ban -100 or Ban Frost 2000® Antifreeze & Coolant.

RV Winterization Checklist

Camco, a leader in RV supplies for over 40 years, has provided this handy checklist to help you winterize your RV. Keep this How-To booklet in a convenient place so you can refer to it when it is time to winterize!



RV Seasonal By-Pass Kit (35713)



Quick Turn RV Permanent By-pass Kit (35983)



Freeze Ban -50 Antifreeze (30767)



Hand Pump Kit (36003)



RV Water Heater Drain Plug Kit (11633)



Antifreeze pH Test Strips (36011)



Mini Dehumidifier (44195)



Wiper Stand-off Wedges (45456)

Supplies you may need to winterize

- 2–4 gallons of Antifreeze - Amt. may vary
- Antifreeze pH test strips (36011)
- Antifreeze Hand Pump (36003)
- Antifreeze Pump Converter Kit (36543)
- Blow-out Plugs (36103, 36143, 36153)
- By-Pass Kit (See page 4.)
- Cleaners (Exterior, Roof, Awning)
- Set of hand tools for small repairs
- Towels, Paper Towels
- Trash Can
- Wheel Chocks
- Caulk
- Pipe Insulation

WINTERIZING YOUR RV	YEAR				
Preparation:					
Disconnect outside water line.					
Bypass your water heater.					
Turn on water taps to drain water.					
Flush toilets.					
Attach Blow Out Plug to intake fitting and attach air compressor.					
Close all water taps once you have drained as much water as possible.					
Antifreeze: **Use ONLY nontoxic antifreeze specifically designed for RVs.** **Leave antifreeze in lines until spring. Do not drain.**					
Kitchen sink:					
Open **Hot** side of kitchen sink faucet ONLY.					
Pump antifreeze until flow from faucet becomes very pink.					
Close Hot side faucet. Open **Cold** side of kitchen sink faucet ONLY.					
Bathroom sink					
Tub					
Toilet					
Shower					
Ice maker					
Washing machine					
Exterior showers					
Pour at least 2 pints of antifreeze into all sink and tub drains.					
Water Heater: Open drain plug on water heater. Leave open till spring.					
General maintenance:					
Stabilize RV. Make sure it does not rock when you walk inside it.					
Apply emergency brake and use wheel chocks.					
Remove any food that can spoil.					
Clean storage areas, oven, range, refrigerator, and areas around dinette.					
Inspect roof, roof vent covers, plumbing vents and roof seams.					
Wash and wax					

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Camco Manufacturing, Inc. • 121 Landmark Dr. • Greensboro, NC 27409 www.camco.net

For more information call 1-800-334-2004