



How To Winterize Your RV

The Essential Guide
For Winter Living



Winter Storage

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How To Winterize Your RV - The Essential Guide For Winter Living & Winter Storage by Michael Letendre

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Always consult a professional if you're unsure about working on your RV.

Confirm that all methods and materials you use are compatible with your equipment and abilities.

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Table Of Contents

Intro

Part 1: [Winter Storage](#)

Chapter 1: [Wash And Wax](#)

Chapter 2: [The RV Interior](#)

Chapter 3: [Where To Park](#)

Chapter 4: [Tires](#)

Chapter 5: [Covers](#)

Chapter 6: [Plumbing](#)

Chapter 7: [Batteries](#)

Chapter 8: [Fluids and Other Items](#)

Part 2: [Winter Living](#)

Chapter 1: [Skirting](#)

Chapter 2: [Heating](#)

Chapter 3: [Liquids and Waste](#)

Chapter 4: [Ventilation and Other Items](#)

Living The Dream

So you have made the leap, followed your dream and bought an RV. There are few things that will give you the same sense of freedom and satisfaction that come with the RV lifestyle. A new adventure awaits in every stop, whether it's in the beautiful scenery or in the interesting people you meet along the way. Part of living the dream is protecting it, and that's where this guide will help you.

Whether you're a full-time or part-time RVer, as soon as the cold weather comes you will want to be sure that you've taken all the steps necessary to protect your rig all winter long.

This comprehensive guide is divided into 2 sections, the first is to help you prepare your RV for storage. The second is to help you prepare for living in your RV in the winter. For those planning to live in their RV over the winter, this guide will assume that you have access to water and power.

Winter Storage

It's always a sad time of year when the RV has to be put away. It means the warm weather is over and with it so are the trips.

Chances are you'll spend all winter chomping at the bit to get your RV out of storage and on the road again where adventure awaits.

The last thing that you want when it's time to take your RV out of storage is to find that it's in disrepair. Any number of things can go wrong with an RV that has been sitting for a winter, and a lengthy repair time and a hefty bill will put a serious damper on your spring and summer travelling plans.

The goal of this guide is to help prevent this from happening. With some essential items and a lot of elbow grease you can spend your winter with peace of mind, knowing that you have done everything you possibly could to have your rig road ready for RV season.

Wash And Wax

One of the best things you can do for your RV to help protect it for winter is to clean it from top to bottom before storing it.

The first thing that will need cleaning is your awning (if you have one).

Start by fully extending your awning and inspecting your fabric for any mildew, stains or tears. Keep a watchful eye for mildew especially, because if it's left untreated over the winter, it will spread and be a much bigger problem by spring.

Important: Before you start doing any repairs, cleaning or maintenance, check your owner's manual first and see what is recommended by the manufacturer. This is a good rule of thumb as we move through this guide - always consult your owner's manual first and foremost.

When you're cleaning your awning, try to avoid scrubbing too hard on the fabric. Use a soft bristle brush and a mild detergent recommended for your type of awning material. Awnings are typically treated with a water resistant finish and any harsh scrubbing or cleaner can remove this protective coating.

There are also some types of awning cleaner that will not only clean the awning fabric, but protect it against fading, discoloration and cracking from harmful UV rays. As long as you are using a compatible cleaner and not scrubbing your awning, you should be able to extend the life of your awning.

Once your awning is properly cleaned, make sure it is completely dry before rolling it up. Any moisture that is left on it will turn to mildew over the course of the winter.

This would also be a good time to protect all the moving parts of the awning by giving them a coating with silicone spray to ensure everything stays lubricated and protected.

The last thing to do now for your awning is to set it in the “lock” position, so that it’s not unrolling at any point over the winter.

Ideally, you should have a rigid awning cover that can slide over your awning once it’s clean and dry. Protecting your awning from the elements is just as important as cleaning it if you want to extend the lifespan of the fabric.

However, if you don’t have an awning cover, you can buy black corrugated drain field pipe without holes and use it as a cover. Simply cut a two inch wide opening the length of the pipe and slide it over your awning.

The RV Exterior

A good wash will not only help protect your RV, but it will also give you the opportunity to see if your RV has any holes or seals that are failing. Always start at the roof and work down, so that the dirt and debris are always washing downwards.

When it comes to the exterior of your RV, always treat it like you would your car. You never would use a scrubber or a harsh cleaner on your car, so do the same with your RV. It may take you longer to clean, but you will be adding years to the life and look of your RV.

Before you start washing away, double check that you have closed all your vents and holes

Also, consult your owner’s manual on the type of cleaner and brush you will need for the exterior and for the roof. It’s important to remember that your roof may be a different material than the rest of your RV and will need a different type of cleaner and/or different type of brush.

Important: Exercise extreme caution anytime you are going to be on your RV roof or using your ladder. If your RV does not have a ladder attached to it, most likely your roof is not meant to be walked on.

Now is also a good time to lower any antenna you have on your roof. Before you start your pre-wash, close the range exhaust flap and any vents, doors and windows. Always pre-wash, as this will wash off any large debris that might scratch your RV if left on while you’re

scrubbing.

As you are washing your roof, check all your roof seams and skylights for any cracks or openings. The inside of your RV is like a sponge, and if water can penetrate the walls it will wreak havoc inside your RV, causing mold and mildew.

While you're inspecting your roof, take the time to check everything for damage or leaks, such as the air conditioner shroud and plumbing vents. If you don't have any vent covers yet, this is an ideal time to install them. Vent covers allow you to have a vent open but they keep the rain and snow out. Having air moving in your RV will help prevent mold and mildew from growing, so a good vent cover is a wise investment.

Just like with the awning, as you're washing be sure to watch for and remove any and all mildew.

Once you've got your RV looking spotless, apply a coat of wax. It's a time consuming process, but a quality coat of wax will really help protect your RV over the long winter.

Finally, clean your wheel wells and tires. Calcium chloride is a common chemical used on dirt roads to keep dust in check and it can corrode aluminum wheels if left on for long periods of time.

Now that the cleaning is done, go around your RV with a can of silicone spray and lubricate your locks and hinges.

You may also want to cover any vents that are for any gas appliance. There is an odorant that is added to propane and insects are attracted to it. A cover over these vents should prevent any unwanted guests, just be sure to remove the vent covers once you're ready to take your RV out again.

If you see any holes in your seals and want to repair them yourself, consult an RV dealer about which type of sealant to use. You want to be sure that you are using one that is consistent with the rest of your RV.

Important tip: If you see anything broken, take the time to fix it. Small problems can become big ones if left untreated over winter.

Now that everything has been cleaned and inspected, make sure

your RV is dry before storing or covering it.

It doesn't hurt to wash the undercarriage of your RV as well. It's easy to pick up salt from a summer of driving and if left on it will cause corrosion. If you have trouble getting under your RV, there are attachments you can buy for your hose or you can also take it to a dealer.

Don't forget: Once everything is dry, retract your slide-outs. Leaving them out exposes the seals and roof to potential damage.

The RV Interior

Now that we've taken care of the outside, cleaning the inside is the next step to tackle.

Tip: Always remember that when in doubt, take it out.

All valuables should come out of your RV. Theft is always a real possibility with an RV left with little supervision. Take out any cargo and equipment. You want to give as little enticement to potential thieves as possible. All electronics should come out, not just because they might get stolen, but also because they might get ruined by freezing temperatures.

Keeping pests out is key in preserving your RV's interior, and removing all food is the most important thing you can do to prevent any critters from taking up residence. However, they also love paper and fabric (for nests) so take out all those items as well.

It's important to remember that you can remove all food, paper and fabrics and you still might end up with unwanted guests. Ants and spiders may seem gross if they've found a home in your RV over the winter, but the pests you really don't want coming in are rodents. If mice or squirrels get inside they can chew through just about anything, potentially causing untold damage to your RV.

Along with removing anything enticing, double check the exterior and underside of your RV for any gaps or holes. If you see any, make sure they get filled. A mouse can squeeze through even the smallest hole, so take the extra time to give your RV a comprehensive inspection.

Once you've cleaned out your cabinets and closet, leave the doors propped open as it will allow better circulation in your RV and help control the humidity. Check all your cabinets, drawers and closet for any holes or gaps any unwanted guests might be able to squeeze through. Seal up any holes with silicone or expanding spray foam. If it's your first time using spray foam, know that it expands pretty aggressively so test it

first on something that is not your RV.

Also, cover all vents and holes, as those are prime spots for pests to enter your RV. Infestations are obviously undesirable, but the nests made by insects can also block your vents, creating a potential hazard. Even your exhaust should have a mesh guard over it.

When you're cleaning out your food, remove any canned goods or dry foods. Dry foods will attract pests and canned goods can expand and burst in freezing temperatures.

Tip: Any liquid can burst if the temperature drops low enough, so even your cleaning products should come out.

After your fridge has been turned off, emptied and cleaned, prop the door open with a bungee cord. Keeping it open will keep the inside of the fridge dry and will prevent mold from growing. An open box of baking soda placed inside the fridge will help with any odors as well. Even food residue can be enough to attract bugs and rodents, so clean everything where you store and prepare food from top to bottom. Sweep and mop the floor, and if you have any carpet give it a thorough vacuuming.

Always try and prepare for worst case scenarios. With that in mind, you might want to lay down some deterrents for mice. Multiple catch mouse traps around your RV work well, as do some botanical repellants. There are also a lot of home remedies that people swear by as well, such as laying down dryer sheets or Irish Spring soap. There are a lot of options and it doesn't hurt to use multiple different ones.

Important: Avoid using poison as a means of deterring rodents. It can be dangerous for yourself or any children crawling around your camper if you are not able to clean it all up.

Try to regularly check on your RV during the winter. You'll be able to check any traps, as well as see if there are any leaks or pests taking up residence. With the time spent doing a regular check up you could save yourself a large repair bill by being able to fix a small problem before it turns into a large one.

Next, remove all the linen, towels, blankets, clothing and the mattress. You'll likely want to clean everything anyway, and you'll get

more years out of your fabric by storing them where you know they are going to stay clean and dry.

Now, go around to everything that might have a battery in it, like your clocks, smoke detectors, carbon monoxide (CO) detectors and gas detectors. Remove the batteries because those can burst with freezing temperatures. Just make a note for yourself to replace them when you're ready to use your RV again. This is a crucial step that you do not want to miss in the spring, as a working fire, CO or gas detector could save your life.

Note: By now you should have a list going of reminders to yourself of what needs to be removed or replaced. Keep your list somewhere where you'll be sure to see it again when it's time to get your RV ready for spring and summer camping.

Lastly, double check that all your windows are closed. Close all your curtains and blinds, too. Your interior fabrics will fade if left exposed for a season, so it's vital that those blinds are fully closed.

Moisture is the other culprit that you want to prevent, so if you have vent covers on your overhead vents you may want to leave them open a crack over the winter. The vent cover will prevent rain and snow from getting in and the open vent will keep some airflow and help prevent must and mildew.

It's also a good idea to buy a moisture absorber or dehumidifier for your RV. Once again, this is a small investment that could help save you a lot of time and money if it helps prevent mildew from growing inside your RV.

If your RV has an air conditioner, this is also the ideal time to remove, clean and replace your AC filter. Also, install an air conditioner winter cover if you don't already have one. The cover will protect your AC unit from the elements which will help it last longer. Do not use garbage bags, as they collect condensation which can damage the unit.

Don't forget to turn off all your gas appliances and to turn off the gas supply valve (for trailer owners, also cover the gas regulator).

Unplug all of your appliances and turn off the main breaker.

Important: Don't forget about your interior locks. Use a graphite lubricant for these locks to help protect them.

Where To Park

There is nothing that will age your RV faster than constant exposure to the sun. Keep this in mind when picking a parking spot. If you leave your RV exposed to the sun and elements, you risk having faded paint, plastic and decals and dried out rubber and vinyl.

Ideally, an RV is best suited to be parked in a garage or storage facility over the winter months. However, for most people that is not an option, either because of the cost or lack of access. If you do park in a storage facility, remember that most facilities will not be held liable for any theft or damage to your RV, so make sure you invest in storage insurance.

If you have to park your RV outside, the UV exposure your exterior will be getting means that your paint will fade quicker and anything made from rubber or vinyl is liable to dry out and crack easier as well.

With that in mind, try to park your RV in a covered area. Parking under trees would seem like a good compromise, but doing so would put your RV at risk. Leaves, branches, tree sap, bird droppings and debris could all accumulate on your roof over winter, potentially damaging it. You may want to invest in a covered shelter for your RV. They aren't cheap, but it's the kind of investment that will extend the life and look of your RV.

If you have no shelter for your RV, you can also buy a cover for your RV. These vary greatly in cost and quality, and their effectiveness at protecting an RV is something that is debated in the RV community. We'll explore more of the pros and cons of RV covers later in the book.

As for the surface you should be parking on, the two most important criteria are that it's level and dry. If you have the space, parking it on your driveway is usually a good option. If you have a parking pad that's concrete or gravel, this will work well too. What you don't want to do is to park on grass. If your RV is parked on grass it means that the area beneath it will have a hard time drying out, which

will mean rust for your RV. Weeds can be a problem as well. If they are able reach your RV they can stain it.

If you have no choice but to park on a lawn, lay down a large piece of heavy plastic or tarp and park on top of it. It will help provide a barrier between the moisture in the ground and your RV.

Tires

The life expectancy of tires can vary wildly from RV to RV, and part of the reason for this is the care given to them during the winter months.

As with many things, constant exposure to the sun will dry out and age your tires. Tire covers are a good investment as they can protect your tires from the sun and elements.

Tip: If you can't afford tire covers, covering them with plywood is an effective and inexpensive option.

Check your tires maximum pressure rating for cold weather and inflate your tires to that rating.

If you are planning on parking on the lawn or in a field, you need to ensure that there is something between your tires and the earth, such as concrete slabs. The freezing ground can damage your tires, so having something separating the ground from your tires will help a lot. Just make sure that anything you use has a width that is greater than your tire, and that your tire is sitting in the middle and not hanging off an edge.

Dry rot is a common problem with RV tires, and taking the proper precautions can help stop or slow the process. Tires suffer from dry rot because they are constantly exposed to sun and air, which break down the rubber compounds that make up the tire. This is true for all tires, however, constant driving helps release protective oils that are built into tires. If they sit for too long, as with most RV tires, they start to break down faster than if they were used regularly.

It's important to note that all tires have a finite life span and it is normally in the 5-10 year range. Even if the tire has not been used much and has a lot of tread left, your tires may still have dry rot.

If you are not sure what dry rot looks like, it typically looks like a series of small cracks on the tire sidewall. The surface will also feel

tough, whereas a new tire will feel smooth.

There are some protectants you can buy that help slow down dry rot. If you are going to use one, make sure that it's a water-based product and not petroleum or silicone-based. Both petroleum and silicone products will dry out the protective oils in the tire and accelerate dry rot. A water-based protectant is the only type that will help seal in the protective oils and extend the life of the tire.

It's the same reason why it is not recommended to park your RV on asphalt over the winter. Asphalt is actually petroleum based, and parking on it for an extended period of time will dry out your tires and cause dry rot.

Flat spots are also something to be aware of when parking for an extended period of time. If your RV is sitting in one spot all winter, the weight of it pressing down on your tires can cause flat spots to form where it is in contact with the ground. Sometimes these can roll out after several miles of driving, but they can also become permanent (in which case your tires will need to be replaced).

One of the things you can do to help prevent this is by taking some of the weight off your tires. You can use your stabilizing or levelling jacks to ease the burden on your tires. If you do so, know that you will also need to tend to your jacks as well, as they will be exposed to the elements all winter. Make sure they are well lubricated and remain so all winter. You can also give your tires a quarter turn every month. Just inching your RV forward every so often will help, so that the weight of your rig is not on the same spot for months.

Important: Only use your jacks if you are parked on a paved surface. Bare ground can shift and heave over winter and potentially bend and damage your jacks if you have them down.

The very best way to preserve your tires is to remove them. Putting your RV up on blocks and storing your tires indoors, inflated, on a hub and coated with a water based protectant will add years to their life. It also has the added bonus of preventing anyone from running off with your RV.

Covers

To cover or not to cover? There are a lot of different views out there when it comes to deciding whether or not to invest in one.

The biggest advantage you get from an RV cover is a level of superficial protection. A cover will protect your RV from the elements, namely: sun, rain and snow. Any one of these will harm an RV. The sun will cause paint to fade and seals to crack, and rain and snow can seep into an RV and cause damage. Having a good cover can protect your RV from all of that. It also allows you to have more flexibility in where you park your RV for the winter, as it can be left exposed without you having to worry about it getting too hot in the sun.

However, the wrong RV cover can end up damaging your RV.

As we have discussed, moisture is one of the biggest problems for any RV owner, and having an RV cover can make the problem worse. Depending on the type of material they are made from they can be the cause of moisture damage. For instance, plastic tarps are commonly used as RV covers and because the plastic doesn't breathe they act as moisture traps and create mold and mildew. Having a cover on may also mean that you aren't able to have your vents open, which are important for getting air to circulate and preventing mildew from growing.

Covers also have a tendency to scratch RVs if they are loose fitting in any spots. The material can catch in the wind and leave scratches and marks, and even rub off paint.

They also make it hard to go in and out of your RV. You will probably need to access the inside of your RV several times throughout the course of winter, and having a cover on will make it hard to get in and out.

They are a large investment and have their pros and cons, so it's important to do your research before buying one to see if it is right for you.

Plumbing

Of all the different components that make up your RV, your plumbing system is the one that needs the most attention as it is the most vulnerable to freezing temperatures.

Winterizing your plumbing system is the single most important thing you can do to make sure your RV will be working when spring comes.

Fortunately, it's not that complicated to winterize a water system.

Note: This is going to be a general overview of all the supplies and steps needed to winterize a plumbing system, but your RV may have some of its own specific guidelines. Make sure that you have read your owner's manual before you proceed.

The Supplies:

1. Non-toxic RV antifreeze (it's very important that it's non-toxic, as your drinking water is part of this system). The ethanol, or ethanol blend varieties are usually the cheapest, but they are not recommended. They can taint your plumbing system, resulting in foul tasting and smelling water. They can also dry out any rubber seals, such as in your valves and faucets, and cause them to fail. The best type to get is Propylene Glycol. It is non-toxic and because it also acts as a lubricant it will help extend the life of your seals. 2-3 gallons should be all you need.
2. If your RV doesn't already have a water heater bypass, you will need a water heater bypass kit.
3. If your RV doesn't have a built-in cleanout system for the black water holding tank, you will need wand for cleaning it out and RV holding tank cleaning solution.

4. A water pump converter kit.
 5. Standard tools for removing drain plugs.
 6. Your owner's manual.
- Optional - air compressor and blowout plug.

The Steps

Step 1: Disconnect your RV from the outside water source.

Step 2: Turn off all power in your RV, and make sure the propane has been turned off as well.

Step 3: Bypass the hot water tank. Your RV may have a bypass valve already installed. If not, you will need to install the water heater bypass kit you purchased. The reason for bypassing the hot water tank is that you don't need to fill it with antifreeze and to do so would take 6-10 gallons.

Step 4: Remove the water filter. If you have an inline water filter, you will need to bypass it as antifreeze will ruin the filter. If you have a canister water filter, you can either dump out the water and filter within, or you can use a piece of hose to bypass the canister altogether.

Step 5: Drain the grey, black and fresh water holding tanks. Use a sewer system to drain your holding tanks and plumbing. However, your hot water tank can be drained anywhere that's safe, as it's clean water. Next, flush the grey and black water holding tanks. Some RV's have a built-in flushing system. If your system does not have a flushing system, then you will have to clean out your black tank with a wand and a cleaning solution that is made for RV holding tanks.

Step 6: Lubricate all valves with WD40.

Step 7: Drain the hot water tank by removing the hot water tank plug. Once it's empty, replace the plug. **IMPORTANT:** Do not drain the water heater if it's hot or under pressure. Always allow the tank to cool before draining. Also, be sure to relieve the system of any pressure by

turning off the water pump and opening a hot water tap and the pressure relief valve. Turn off the pilot light, or if your hot water heater has an electric heating element, turn it off. Most electric water heaters have their own off/on switch.

Step 8A (optional): If you want your lines and water traps completely cleared of water, then using an air compressor is the quickest way to go. If you have an air compressor, connect your blowout plug to the city water inlet, and then your air compressor to your blowout plug. You want your air blowing around 30 psi, and only open one valve or faucet at a time until you have gone through all of them. Once you have closed the last valve, turn off and disconnect the air compressor, then remove the blowout plug.

Step 8B: If you don't have an air compressor, then open up all the faucets (make sure both hot and cold are opened), as well as your toilet valve, and your shower valve (should you have one). Then open any and all low point water drain lines. You will still have water in your lines, so use your water pump to force what's left out of your system. Just make sure that you turn it off once all the water is drained or you risk damaging it. Once that is done, close all the faucets and replace any caps you've removed. You can also buy a hand pump if you do not want to use your water pump.

Step 9: Install a water pump converter kit. The purpose of this is to enable your water pump to draw antifreeze from the jug and feed it through all your water lines. If you do not have a converter kit, you can also disconnect the tube that runs from your fresh water holding tank into your water pump (this is water pump inlet tube). Then, connect a piece of flexible tubing to the water pump inlet and put the other end in your jug of antifreeze.

Step 10: Turn on the water pump. This will also pressurize the plumbing system and will force the antifreeze through your water lines. Since the antifreeze will be starting at the pump and moving outwards, find the taps that are closest to the pump and slowly open the cold water valve until you see antifreeze coming out, then close it. Repeat with the hot water valve. Find the next closest tap and do the same, until you have done every faucet (don't forget to do the same with your outside shower if you have one, as well as your inside shower and tub). Replace

antifreeze jug with a full one as it empties.

Step 12: Flush the toilet until you see antifreeze. Pour a few cups of antifreeze into the toilet and flush it, with the idea that the antifreeze will flow into the black tank and help prevent any water left in it from freezing. Next, pour a cup of antifreeze into each drain. Close all faucets.

Step 13: Now that all your lines have antifreeze in them, turn the pump off. If you disconnected the hose from your water pump, make sure you reattach it.

Step 14: Clean all your sinks, showers and tubs as antifreeze can stain.

Note: If you have an ice maker, fridge, dishwasher or washing machine, check the owner's manual for winterizing them.

Step 15: Enjoy a worry-free winter knowing that your plumbing is taken care of and will be working in the spring!

Batteries

Before going near the batteries, go through your RV and turn off every switch that is connected to the electrical system.

It is a good idea to remove the starting battery and the house batteries during winter storage. This will give you a chance to inspect your batteries, and by storing them away you help preserve their ability to hold a charge.

You will need to wear safety glasses and gloves when handling any battery. RV batteries contain sulphuric acid which is corrosive and poisonous. Extreme caution is needed when handling batteries, because an errant splash of acid against bare skin or eyes can cause burns or blindness.

Also, check to see if there is any visible damage to your batteries before handling them. What you are looking for is any liquid or residue on or around the battery. If there is, do not touch the battery. You want to properly neutralize the acid first, which you can do with a mixture of baking soda and water. Mix the two to form a paste and spread it over the affected areas. Once it stops fizzing it means the acid has been neutralized and is safe to handle.

Now that the battery is safe to remove, it is a good idea to label which cord is positive and which is negative. It may seem overcautious, but it may just prevent you from accidentally hooking up the wrong terminals which could damage your battery and electrical system.

Next, remove the negative cable first. The logic for always removing from the negative terminal first is that if you were to drop something, either the cord or a tool, and have it fall across the terminal, you would not have the danger of current running through and potentially shorting the battery.

Now that the battery is out, check to see if it has any corrosion on or around the terminals. This is fairly common and can be removed with a

wire brush and a 50/50 mix of water and baking soda.

Depending on the type of battery you have, it may need distilled water added periodically. Check your owner's manual to see the type of maintenance your battery requires.

Next, check the battery's charge with a voltmeter. If your battery is below an 80% charge, get it charged back up to 100%. If your battery is sitting with a charge below 80% for too long, crystals will form on the battery's negative terminal inside, which will drastically reduce its performance.

Store the battery somewhere that will be cool and dry. You want to protect it from freezing. If you are storing it in your garage or work shed, be aware that your battery is a hazard if you are going to be doing any work that will be making any sparks.

Check the charge once a month and if it's dipped below an 80% charge, get it back up to a 100% charge.

When it's time to take your RV out of storage and put your batteries back in, check them once more for leaks, check the water level and check that the battery is fully charged.

Note: If you have access to shore power, you can leave the batteries in and top them up using shore power about once a month for 8 hours or so. However, in doing so you run the risk of having your batteries freeze and get damaged.

Fluids And Other Items

For RVs with an engine, like Class C or Class A units, do a full oil change and replace the filter on both the engine and generator before you store your RV. You want new oil in there, as oil that has been used can corrode your engine bearings if left over the winter.

Make sure your radiator and windshield washer reservoir are both topped up on the appropriate concentration of antifreeze.

If you have been using water for either of these systems they need to be drained and filled with antifreeze or you risk having your pipes freeze and burst over winter.

Your fuel tank will also need to be topped up before storage. If it's not, condensation can form in the tank which could be a major problem if it reaches your engine.

Important for diesel powered RVs: Make sure you are filling up with winter diesel, as regular diesel can turn to gel in the cold and damage your engine and generator. Run your engine long enough to ensure that all the lines are filled with the winterized diesel.

Important for gas powered RVs: You will need to add a fuel stabilizer to your fuel system. Ethanol can damage your carburetor and fuel injection system while it's in storage and adding a fuel stabilizer will help prevent this from happening. There are many different kinds available, just run your engine long enough that the stabilizer is completely in the fuel system (5-10 minutes).

Other Items

Remove the propane tanks and store them somewhere safe. Do not store them in your house or your garage as it is hazardous and illegal in many places. The best place to store them is outside, away from any

possible ignition source. Keep in mind that propane is heavier than air, and if it is able to escape from the canister it will settle at the lowest point it can find. Position your tanks away from paths that could lead to lower areas, such as a basement door or window.

If you have parked your RV in an open area with no coverage, you will need to keep an eye on the snow level on your RV. Depending on the type of RV you have it might not take much extra weight for the roof and/or seals to get damaged.

If your roof does need clearing, do not walk on your roof. It is potentially dangerous if it is covered in ice and snow, and it might not be able to bear your weight. Use a portable ladder to clear off as much snow as possible. If you do go on your roof to clear it, use a plastic shovel as they are less likely to damage your roof than a metal shovel.

Make sure that you also lubricate everything that could possibly need it. These are spots like the gears, joints and pivot points on your jacks and your steps. You want to ensure that these spots will still be able to move freely after the winter season.

Winter Living

Whether it's because you love camping all year round, you like the low cost of RV living, or you are just after a simpler life, you have decided to live in your rig the whole year through.

As you may already know, there are a lot of challenges that come with cold weather RVing, but it is doable with the proper preparations. We are going to try and give you as many tips and tricks as possible to help keep you warm all winter long in your RV.

If this is your first year of winter camping, know that the majority of RVs are not designed for cold temperatures. Freezing pipes and freezing feet are common and, as you'll see, preventable. As with winter storage, there is some elbow grease required to get your RV winter ready, but once you've done the work you can spend the rest of winter relaxing in your warm rig.

Note: This is a general overview, remember that every situation is different. And as always, consult your owner's manual first.

Skirting

If you are going to be experiencing temperatures that dip below freezing, there is not a single thing you can do that is more important than enclosing the bottom of your RV.

Your RV's plumbing system is liable to break in freezing temperatures, and the cost to fix damaged plumbing can quickly skyrocket. The best way to protect your pipes from freezing is to seal off the base of your RV with a skirt.

There are several different ways to skirt an RV.

The cheapest option is to use hay bales and line them around your RV. Bales are readily available in most areas and they do the job of protecting the underside of the RV. However, it's not a very safe option. Hay is a fire hazard, and it also attracts a lot of pests. You don't want to solve one problem just to create another, especially if it puts your safety at risk. They also are very bulky if you plan on moving your RV to other sites.

Another common solution is to use plywood. It doesn't look the greatest, but if installed correctly so that there are no gaps, it can be effective at enclosing your rig. The only problem with this option is that the panels are large and heavy. If you are going to be in one spot all winter then it's a pretty practical solution, but it's a big undertaking to disassemble and take with you if you plan on moving around in the winter.

The best option in terms of cost, portability and performance is to get a vinyl RV skirt.

As with choosing an RV cover, there's a lot of confusing information about which RV skirting material to choose. The biggest myth out there about skirting is that it needs a high R-value (the measurement for thermal resistance) in order to be effective. This is not true. The most important function of RV skirting is to create a

separation between the warmer air under the RV and the cold air outside.

Here are the 4 most important tips for understanding R-value and RV skirting.

1. Any R-value savings are much smaller the closer the outside temperature is to the inside temperature. When the temperature dips below zero, the area under an RV is typically kept just above the freezing point by an electric heater. Because of this, the temperature differential between outside and inside air is very small, as is the heated cubic square footage under the RV. This is unlike a house, where inside temperatures are typically kept at 70 degrees or more and where the cubic square footage is about 2500% larger than that of an RV's.

2. RV skirting would need to be very thick to produce any significant R-value rating. For example, a typical home in the USA has wall insulation of R-11 to R-15. Your RV skirting would need to have a sewn-in insulation that is 4 to 5 inches thick to achieve this R-value. Most RV skirting that claims to be insulated is less than a half an inch thick. At this thickness, there is only the illusion of an R-value but no meaningful difference in ability to insulate.

3. Stopping air movement is 10 times more important than R-value for RV skirting. Think of it like having a good winter coat but leaving the zipper undone. The most important way to retain heat and keep cold air out is a barrier to air-flow (RV skirting), not insulation. As long as the warm air is contained under the RV and the majority of the cooler outside air is kept out. Adding insulation to the skirting is a waste of money. The barrier to airflow created by the skirting is really all that is needed.

4. The best way to add R-value to your skirting in an extreme winter climate is to buy rigid Styrofoam insulation. As mentioned above, the sewn-in variety of insulation (ie: Poly-fill or reflective bubble wrap) adds very little value to RV skirting and is not necessary in 90% of RV skirting projects. The exception to this rule is if the RV is wintering in an extremely cold area where temperatures are commonly 15 degrees or more below freezing. In this situation you will want to have both RV skirting and an insulated barrier of rigid Styrofoam board. Rigid Styrofoam insulation board is by far the most effective way to get a

higher R-value without adding a lot of thickness.

Typically this board has an R-value of R5 per inch of thickness. The best variety of this board is extruded polystyrene foam board, also called blue or pink board in the big box stores. To use this board with your skirting, build a frame work under the RV using inexpensive 2" x 2" lumber, then attach the foam board to the framework. Once the foam board is in place, then you can install your RV skirting to seal the warm air in and the cold air out.

As for which type of RV skirting to use, flexible PVC vinyl is the best in terms of weight, cost and effectiveness.

In the past, the most common way RV owners have added vinyl skirting to their RV is to have an upholstery shop custom make one to fit their rig. While these custom made RV skirts work, they tend to be extremely expensive, commonly ranging between \$3000 to \$6000 dollars. These type of shops also tend to get very busy and book up quickly with skirting jobs before winter hits, so be sure to get a firm install date if you go this route.

If you decide on a custom made skirt, there are a few things you should know before making such a large investment. Most upholstery shops will use an 18 oz truck tarp vinyl that's mainly used for covering lumber hauling trucks. Because the lumber truck tarp industry is very price driven, the majority of this 18 oz vinyl is made in China or Korea. This offshore product keeps the cost low, but unfortunately the quality is also low. The majority of the 18 oz vinyl on the market is a poorly made material with little to no UV ray protection or mold and mildew inhibitors. Most of what you pay for custom skirting is in the labor for the installation.

The best type of vinyl for RV skirting is an American product called Diamond Weave vinyl. This 10 oz material has the strength of a thicker vinyl, but is lightweight, making it easy to transport from site to site. Diamond Weave vinyl has robust UV protection that's rated for extreme climates, and it has mold and mildew inhibitors, which help extend the life of the fabric. And most importantly, it's fire resistant, which helps keep you and your family safe.

There are some great 'install it yourself' RV skirting kits available

on the market. One of the highest rated of these is a skirting system made by a company called EZ Snap. They use premium materials in their kits and sell direct to the consumer to keep prices low. They use Diamond Weave vinyl, and because it's a non-fray material it can be cut on site. They also have a patented fastener system that allows anyone to custom fit their own RV Skirting with professional looking results, with no experience or special tools needed. Their EZ Snap fastener also comes in a stick-on heavy duty version, which means no screwing holes into your RV. To protect against wind, they have a great technique for finishing the bottom of their skirts using a PVC pipe frame, along with the EZ Snap pipe clamp system. This pipe frame technique is a great method to protect against the wind and give your skirt a quality, finished look.

To find the EZ Snap kit you would need, measure the perimeter of your RV (including any slide-outs you want to skirt in). Then, input your measurements into the sizing calculator that EZ Snap has on their website (ezsnapdirect.com) and order the kit recommended for you. The kit is quickly shipped via UPS right to you (most of their RV skirting kits also include free shipping) and you install it yourself at a fraction of the price of getting a custom skirt made for you. They also have a full customer support team available as well, ready to answer questions about the installation or their products.

No matter what skirting system you choose to go with, make sure you have it in place for winter. You do not want to be scrambling if a cold weather system were come in suddenly and unexpectedly. Many a pipe have burst under those very circumstances. Set aside a time to install your skirting in the fall when it's still fairly warm out. You will save yourself from having to work in the freezing cold, and you will have peace of mind knowing that you are heading into winter prepared and protected.

Tip: Install a wireless temperature sensor under your RV. You will be able to monitor what the temperature is under your rig at all times, which will help you ensure that it always stays above freezing.

Heating

Keeping the inside of your RV warm in extreme cold is going to take some creativity. Before we go over any options, know that this is the one area of winter living that has the most danger. RV's don't have the same sort of fire protections that a house does. They can go up in flames extremely quickly (as little as 5 minutes). Depending on the type of heat source you use, there is also risk of carbon monoxide poisoning and asphyxiation as well. Taking the right safety precautions are extremely important when heating your RV.

With all this in mind, the first step is finding ways to keep the cold out. Anywhere there is an opening is a prime spot for heat to escape and cold air to seep in. This means that your windows (which are usually single paned), doors and stairwell are going to be where you will lose the most heat. There are a few things you can do to help mitigate this heat loss.

For your windows, having heavy curtains hung can make a big difference in keeping out the cold. If you don't mind how they look, bubble insulation and Rmax foam insulation boards are both inexpensive and can be easily cut to size and hung over your windows and doors. Another option is applying shrink film to your windows and/or door. It works really well, it just takes more time to apply but you get a better looking finished product.

If you are getting a draft coming in at the base of your door, you can either buy or make a draft guard cushion to place there at night to block the cold air. If you have a stairwell cover, make sure you have it in place every night as it will also help keep the cold out. If you don't have one, it's as easy as getting a board cut to size to fit over the opening.

Now that you've made your rig as efficient as possible, here are the most common ways to heat an RV:

Your RV's propane furnace - The best option for overall heat, but also the most expensive. This is because RV furnaces aren't that

efficient. When your furnace is running, a lot of heat is lost as exhaust. They are also heating the entire RV, as well as most have ducts that feed into the undercarriage of the RV. This helps protect your plumbing from freezing, but also costs a lot more than it would to heat the underside of your RV with two small heaters and quality vinyl RV Skirting. The colder it gets the more propane the furnace consumes, so you may want to invest in a large propane tank as well if you are going to be using your furnace a lot. Most importantly, before you go anywhere make sure your furnace has been well maintained and is in good working order. You do not want your furnace to break down when you're in the middle of freezing temperatures.

Space heater - The easiest and cheapest way to simplify your heating. You don't have to have your furnace running on high if you only want your bedroom to be warm. You can just have a small heater running and your furnace turned on low and you'll stay warm at a fraction of the cost. This is especially true if you are staying somewhere that has a free electric hookup. They can draw a fair bit of electricity, so use an appropriate extension cord with them, and don't leave them on for long periods. As with all space heaters, there is also the risk of fire. A blanket that drapes over a heater can catch fire within minutes. A good rule of thumb is to keep any heater at least 3 feet away from anything that could catch fire. Of the different kinds of space heaters available, ceramic convection heaters are considered one of the safest because they don't have any hot coils like you find in radiant heaters. There are also infrared heaters, which actually stay cool to the touch. They don't heat as well or as quickly as a ceramic heater, but they use less electricity. Just make sure that the model you settle on has a thermostat and not just high and low settings. Having a thermostat means that the unit will turn off once it reaches the desired temperature, making it a much more energy efficient choice.

Propane heater - These types of heaters are not recommended at all because they are the most dangerous. This is because they produce deadly carbon monoxide gas, so they require good ventilation and a CO detector that is working properly. They also produce a lot of water, so condensation is another concern when using them. In a space as small as an RV the risk of fatal CO poisoning is too great to warrant their use. **DO NOT** use these kinds of heaters.

Everyone's temperature preference is different, so it's probably going to take some trial and error to find the set up that makes the most sense for you. Finding a set up that keeps your costs as low as possible is important, but always remember to put your safety first.

Liquids And Waste

You've protected the underside of your RV with skirting, but you still need to take some steps to ensure your plumbing is protected and your water is flowing all winter.

Heat your water hose - You can purchase a heated hose, or with some heat tape and pipe insulation you can make your own. Either way, you will need to heat your hose as it will definitely freeze if left unheated. Even with a heated hose, be aware that it still could freeze if it gets cold enough. One way to keep your hose from freezing is to disconnect it altogether. Simply use your fresh water tank as your water source and only reconnect your hose when refilling it.

Tip: Any water connection point is susceptible to freezing as well. This means the spigot at the RV park and the RV connection point if it's on the outside of your rig. Just like with your hose, using heat tape and insulation will keep it from freezing.

Pipes: The pipes inside your RV can still freeze, but one of the easiest steps you can take to help prevent that is to open your cupboards where you know pipes can be found behind them. This lets the warmth of the RV get to the pipes and helps prevent freezing.

Keeping your tanks warm - As long as you've skirted your RV and are using temperature controlled heaters, your black, grey and fresh water tanks should be protected from freezing. There are not a lot of solutions that will work if you don't have your RV skirted or sealed off. With some RVs, the furnace has a duct that runs to the undercarriage to help heat the tanks, but if it's cold enough and there is no skirting to stop the heat from escaping, the tanks can still freeze. There are also heating pads that can be attached to your tanks, but again, in sustained sub zero temperature they can still freeze despite the pads. Even insulated tanks will freeze if it gets cold enough.

Sewer Hose – This is the absolute last thing you want to fail in a freeze. There are countless horror stories of RVers who had the

unfortunate experience of having to thaw out frozen full sewer hoses or worse, had them break apart. Just like with your water hose, using heat tape and insulation on the hose and connection points will prevent any 'poopcicles'. Additionally, only dump your tanks when necessary, and keep them closed off the rest of the time.

If you don't want to heat your sewer hose, you can also rinse it out and store it between uses.

Note: Plastic can become very brittle in freezing temperatures, so use a lot of caution if you're in sub-zero temperatures and are handling any piece of your RV made from plastic.

Going to be in one spot all winter? You can also use PVC pipe as your sewer hose. It's much less prone to breaking in the cold, but it will still need heat tape and insulation to keep everything flowing.

Important: The more heat sources you have running, the greater draw of power needed. Try plugging directly into shore power when possible as having multiple heaters can trip the breaker in the RV.

Note: You can also winterize your black water tank and not use it at all. It's not the most ideal solution if you're taking a midnight trip to the loo in the snow, but it's a guarantee that you won't have any issues with your sewage.

Ventilation And Other Items

Prepare to fight a season long battle with condensation. There's no way to stop it from happening altogether, but it's possible to stay on top of it with proper ventilation.

Vent covers - These are the most important item you can install to help reduce condensation. As you use your RV for showering, cooking and so on, water gets into the air. It has to go somewhere or it will condense on your walls and windows. Keep a vent open so you can have an exit point for all that moisture and turn a fan on to help the air circulate out of your rig.

Dehumidifiers - If you are using your vents and still have a condensation problem, then consider investing in a dehumidifier. There are multiple varieties out there but know that if you purchase the kind that does not need power (desiccant dehumidifiers), they only work for small spaces and you would need at least one in every room of your RV.

Tire Chains

If you are going to be moving from spot to spot all winter, you will need to invest in some tire chains. This is more than just a safety recommendation, as it is illegal to drive in some places without chains during the winter. The fine you would have to pay would more than cover the cost of the chains, so buy them if there's any chance you might need them.

Protect Your Engine

The biggest threat to your engine in winter is having the diesel freeze on you. This can happen in the 20 degree range, and if your diesel

starts to freeze it can damage your engine.

Fortunately, you can get winter diesel at most truck stops. This diesel has additives in it to prevent it from freezing. If you don't have access to any winter diesel, you can also make your own by buying an anti-gel additive and adding it to your diesel.

Even with winterized diesel, you will still need to utilize the engine block heater as well.

Here are a few things to remember when plugging it in:

Your engine will need to be plugged in for around 4 hours before it's safe to start.

If the temperature is dipping below 10 degrees, leave the block heater plugged in until the temperature is back above 10 degrees.

Turn off the block heater before starting your engine. You don't want them both running at the same time.

Final note: Always try and stay ahead of any problems by being proactive in your RV maintenance. The old saying "an ounce of prevention is worth a pound of cure" is especially true when it comes to your RV.

Hopefully this guide will help you have a worry-free winter and happy camping all year!

END