

**Maintenance Tips: Exterior Seals & Sealants**

# RV ENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE

May/June 2023

Tools, Supplies & Extra Parts

## Assembling a Mobile 'Garage' For On-the-Road RV Repairs

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- Installing a Sliding Cargo Tray
- Add an Awning Support Cradle

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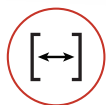
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 LIPPERT

# RV ENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE

May/June 2023

Volume 3, Number 5

## INSIDE



### Basic RV Maintenance: RV Seals & Sealants

Undetected damaged seals and failing sealants can cost unsuspecting RV owners thousands of dollars in repairs related to water-intrusion damage. Technicians at Oregon Motorcoach Center walked us through many of the “tells” indicating leaks — and how to go about correcting them.



### Building a Mobile Garage

According to Murphy's Law, things will break in the most inopportune times — so having the right tools, supplies and extra parts to make repairs while on the road is essential. You don't have to be an ace mechanic to circumvent unexpected delays — you just need to stock the right stuff.



### Storage Wars

Ever notice how every time you need something from your exterior storage bay you have to remove a number of other items in order to find it? A mobile garage doesn't really work without a way to keep belongings accessible — and on the road, that means having slideout trays in the storage bays.



### Additional Support

Extra-long awnings provide great shade for any RV — but they can quickly develop sagging in the middle that can damage the roller tube. Installing a cradle support automatically rotates to carry the weight and helps to keep the awning straight and tidy when retracted.

## DEPARTMENTS



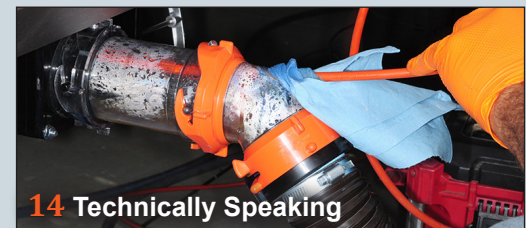
### 6 On the Road

Renovating older RVs is a growing segment of the RV lifestyle. And, while there will never be a time when folks won't “personalize” their rigs, RV suppliers are stepping up with new products and new concepts — in a big way.



### 8 News & Notes

If you're waiting for the apocalypse, have we got the rig for you! Along with it, we've got news about Lippert's soon-to-be-released flexible solar canopy, Roadtrippers' new daily planner, Keystone RV's climate-testing capability and nuCamps's new 7-year warranty.



### 14 Technically Speaking

Sometimes, you-know-what happens...like, dropping things in the holding tank that ought not be there. Or, trying to communicate with a traveling companion when backing up a rig. Or, having to deal with an errant thermostat. Fortunately, Technical Director Bill Gehr is full of answers.



### On The Cover

Kevin Livingston goes through his rollaway toolbox to equip his dad's Grand Design Reflection fifth wheel with a mobile garage for on-the-road repairs. Photo by Bob Livingston

### 54 Advertisers Index



## Tow Bar Two-Step

Proprietary baseplate brackets vary in style and execution among the “Big Three” manufacturers of tow bars. It hasn’t always been possible to switch between them. Fortunately, Roadmaster has you covered if you want to use one of its tow bars on Blue Ox or Demco baseplates.



## Special Section! Quick Tips & Cool Tools



**Baby, It’s Too Cold in There**



**Hang it Up**



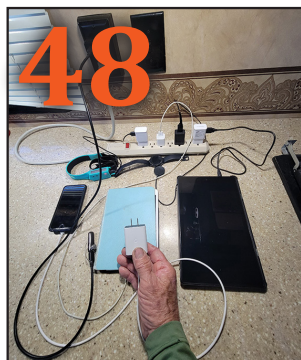
**Dust On, Dust Off**



**Got Gas?**



**Aesthetically Speaking**



**Charging Ahead**



**Rake it Up**



**The Big Picture**



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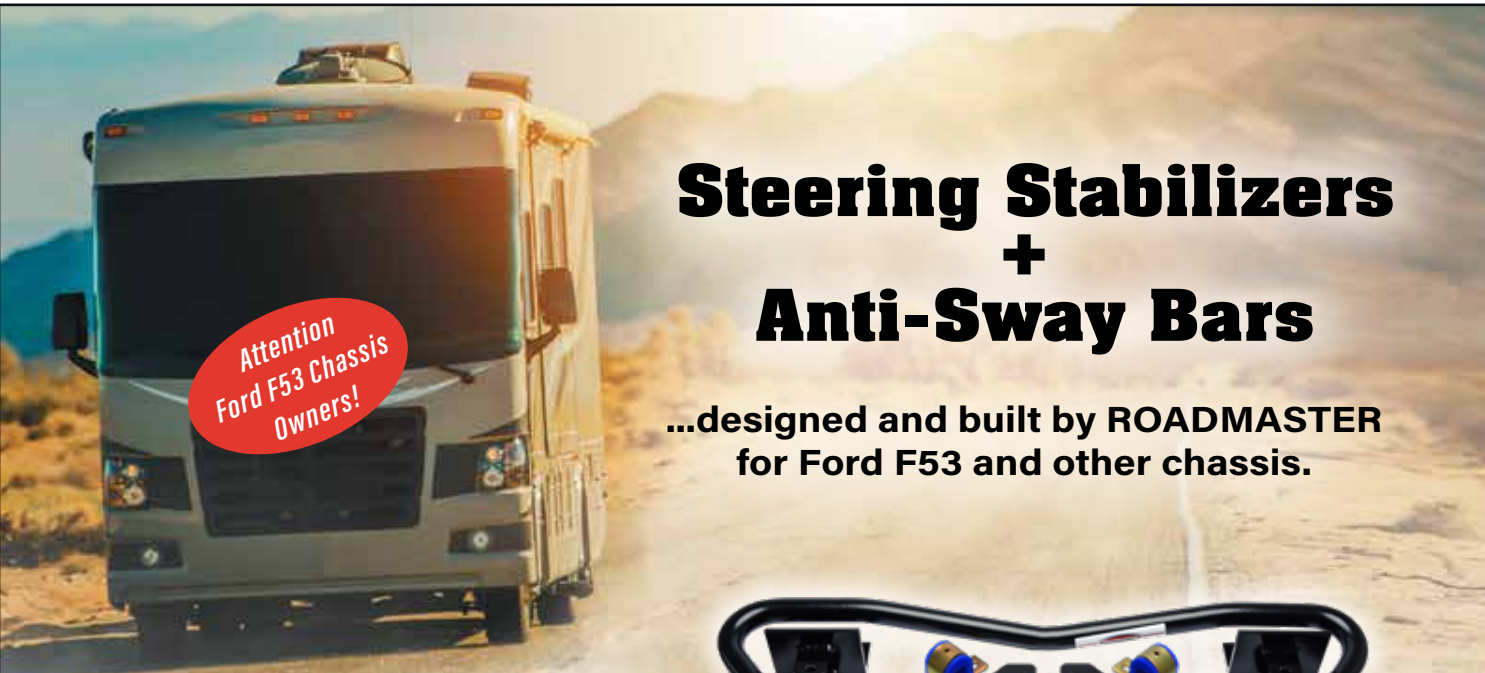
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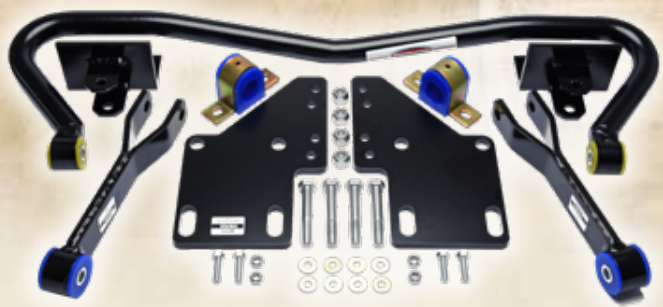
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# RV Suppliers Help Push the Envelope on Interior Design

People love to tinker. It really doesn't matter what the lifestyle or hobby, many folks just seem to have an innate tendency to change things to better suit them.

That really underscores the RV lifestyle. Granted, manufacturers probably depended upon my generation's ability to spin wrenches — yup, I'm an "older" fart — and have a penchant for fixing things instead of just complaining about them. Not a criticism, really, but an honest look at things that weren't always built to the highest levels "back in the day." Younger campers, on the other hand, grew up with products that benefitted from cutting-edge technology — and worked as they should. Again, this isn't a grievance, just an honest view of the changing manufacturing landscape and how it's impacted peoples' opinions of things.

That said, there remains a huge group of RVers that just aren't satisfied with not only the quality of their RV but it's aesthetics. Recreational vehicles tend to be dressed out in non-offensive tones intended to appeal to the widest possible audience. Fortunately, most major RV manufacturers employ interior designers who pay attention to what's happening in the home market and adapt evolving trends to these homes on wheels. Granted, it's a slow process, but the needle is moving.

And suppliers are helping to push that needle. In fact, a lot of changes made to RVs can oftentimes be traced to new ideas and concepts developed on the supplier side — and things are heating up there. I was part of a recent group effort by the staff at *RVBusiness* magazine intended to explore the ongoing evolution of RV interiors, and suffice to say, suppliers are intent upon working within the limitations of RV design and price points to deliver ever-more-residential "looks."

"We do a lot of customer interaction on the residential side," said Mike Boyer, director of product management-RV, for GE Appliances, "but we don't just take it verbatim — we frame it to RV owners to make sure it's going to resonate with them. We don't just automatically assume a residential trend will make the transition to RVs — we make sure that these are things RV owners want to see as well.

"The way we see interiors going is, it's a very personal space," he said. "For example, while the 'farmhouse' look is very popular right now, I think the next step is to be able to take the basics of a design and customize them so that you've got individual colors that the manufacturers and consumers are going to want to highlight. As an appliance manufacturer, we're going to need to be able to tailor ourselves to meet that need."

Some of those colors that Boyer sees making inroads are metallics coming back — "the brass, the pewters, the golds" — as complementary colors, as well as interior palettes that include blues and greens. Boyer also sees RVs featuring galleys with more built-in appliances, from microwaves to dishwashers.

Meanwhile, Brent Clark, business development manager for Dometic, can envision the day when RVs transition to being completely electric. Much of the industry, he noted, has already moved towards 12-volt DC refrigerators, and the availability of electric cooktops can eliminate the need for gas stoves.

"So, that only leaves two gas appliances — the furnace and water heater, he said. "Well, tankless water heaters are increasingly popular and will take a big hold in 2024 products across the board." One of the big complaints, he said, wasn't completely accurate — "Customers were complaining that the didn't have "endless" hot water. It turned out that they were running out of water in their holding tank," — but added that perhaps the current sizes are "a little small."

"We're working on the 'next generation' of water heaters that are not 100% tankless, but something a little different, maybe something that's tied into solar," he said. "I'm not going to let everyone look completely 'under the hood,' so to speak, but we are working on something a little different. So that only leaves the furnace — I think the next thing coming is possibly a different heat source."

For its part, Duo Form Plastics, the industry's biggest supplier of thermoformed plastic components — sinks, backsplashes and the like — is already moving to imprinting patterns directly onto ABS plastic that create an upscale environment. First introduced in higher-end motorhomes and now filtering down to fifth wheels and travel trailers, this allows the company to create, say, shower surrounds with the appearance of subway tiles, Carrara marble and even a herringbone pattern.

According to Brian Pletcher, president of Pletcher Sales, a leading supplier of upholstery and bedding fabric among other products, the move away from the traditional brown tones to lighter colors will continue through 2024.

"We see grays still dominating RV interiors," he said, "but we are starting to notice some designers willing to take a bit more risk," adding that seeing color accents of blues and greens are beginning to crop up. He has also noticed a growing trend with homes that are incorporating champagne-gold handles, pulls and lighting fixtures within primarily white kitchens.

"Not the gold of the '80s or '90s," he said, "but a more refined color. I think these trends will work their way into RV interiors."

Mylana Fought, from Lippert's product development and design division, would concur.

"I think the RV world has definitely closed the gap to what's been happening on the residential side," she said. "And that will keep moving forward. For example, we've done some new things with mixed metal colors — gold, champagne bronze and a brushed gold. Stainless is always going to be timeless, but we're seeing an uptick in other colors, including black stainless. We're also using gunmetal, which provides a dark gray look."

Lippert also is moving the needle in furniture design — especially where it concerns the traditional RV dinette, an oft-under utilized area.

Where traditional dinettes stay in place until, if needed, they can break down to create an additional sleeping area, Lippert is in development on a range of sofa sectionals that can span the entire width of a slideout — including the area usually occupied by the dinette — to provide increased lounging area. At mealtime, a section of the sofa itself can be easily reconfigured to create a dinette.

Doubtless many of these concepts will eventually filter down to the aftermarket — but if you can't wait, consider visiting Camping World's website ([campingworld.com](http://campingworld.com)) and plugging "Genesis Revive" into the search engine. Genesis Products, a leading manufacturer of RV interior components, has partnered with CW on a "Revive" collection of products intended to allow RV owners to personalize their rigs. The collection includes a "Cabinet Revive Kit," "Revive RV Wallboard Kit" and a "Revive Backsplash Overlay" — all upscale peel-and-stick products available in up to eight different colors that will dramatically change the look of any RV interior. And this isn't the stuff you're used to seeing at the local home-improvement stores. The backsplash, for example, is made using 3D embedment technology — a fancy way of saying it offers the look and feel of real tile without the weight.

So, what are you waiting for? **RVE**



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## **LIPPERT RV TOOL KIT**

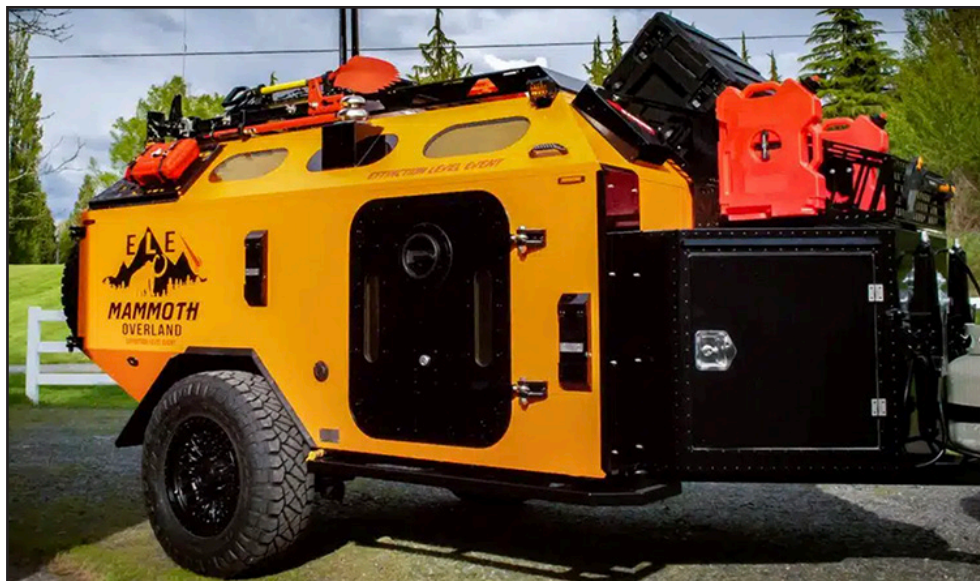
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# Mammoth Overland Debuts 'Extinction-Level Event' RV



Do you believe the end is near? Mammoth Overland has just the ride. The Washington-based builder recently unveiled its "Extinction-Level Event" (ELE) trailer, the first off-road trailer designed to survive the apocalypse or anything else campers might encounter.

Built to aircraft standards, ELE features an onboard air purification system, water filtration system, gas-powered generator, and solar-power systems, enabling overlanders to explore fearlessly — and adds features normally reserved for armored vehicles and safe rooms to the brand's already rugged line of off-road trailers.

The exterior structure of the

ELE is shaped from double-walled, aerospace-grade aluminum sheeting and high-density foam insulation, including optional ballistics-rated Level 3 bullet-proofing. Engineers then added submarine-style pressure doors, creating interior living space capable of sustaining positive PSI. It's this positive pressure that keeps harmful particles from entering the cabin.

The pressurized cabin can be completely purged and refilled with purified air in less than three minutes through an integrated, medical-grade E.L. Foust air filtration system, providing up to six months of purified air. The system is so sophisticated in fact that it's capable of

filtering out odors — something consumer-grade purification systems can't. In addition to filtering the air supply, ELE can refill and filter its onboard 22-gallon water tank in just 10 minutes.

Best of all, given its amazing array of systems and build quality the Mammoth Overland ELE really isn't overpriced; MSRPs start at \$67,000. Okay, so bullet-



proofing will cost you an extra \$25,000 — when the apocalypse is near, money won't help you much. For more information, visit [mammothoverland.com](http://mammothoverland.com).

## Lippert to Introduce First Flexible Solar Canopy



The only drawback to boondocking is being able to tap into enough power to keep RV accessories and appliances performing while off the grid — and there's only so much space available on an RV rooftop for solar panels. Now, Lippert has announced plans to launch Solera OG, a line of off-grid awnings constructed using the first-ever flexible solar awning fabric. In an exclusive partnership with Renogy, Lippert will provide customers with awnings equipped with integrated photovoltaic technology (AIPV).

According to Lippert, Solera OG awnings install like a regular awning, but with Renogy's proprietary thin-film solar technology they provide the extra benefit of up to 300 watts of solar power — without the labor, expense, additional weight and roof intrusion of installing conventional rigid panels. Renogy, a renewable energy company that specializes in solar solutions for off-grid living, is pioneering AIPV innovation. This first-generation retractable, shatterproof, laminated vinyl awning features power generation up to 300 watts in the extended position and 200 watts in the retracted, travel or stored positions.

Solera OG awnings are set for release this fall.

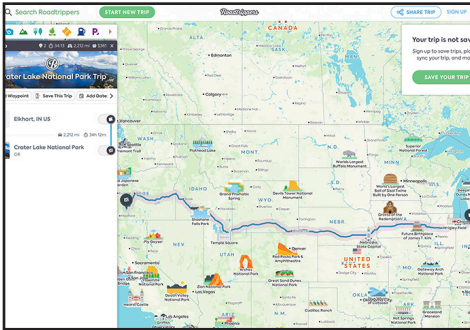


# Roadtrippers Debuts Free Daily Planner

Roadtrippers, a leading road trip planning tool that helps travelers turn their trips into adventures, is enhancing its product offering to help RVers (okay, and others) organize and make the most of their time on the road. With the new Roadtrippers day-by-day itinerary planner feature, users can easily plan the ultimate road trip route without the need for separate spreadsheets.

The free itinerary planner provides users with travel schedule suggestions based on their destination and travel dates, taking the hassle out of planning their road trip adventures. Users can modify and customize their itineraries, ensuring they have complete control over their travel plans.

The feature also allows users to



easily add detours along their route, such as restaurants, hotels, extraordinary places to visit and quirky roadside attractions. Adding stops won't compromise the overall schedule, and users can easily make adjustments to their itineraries at any time. When travelers are ready to hit the road, Roadtrippers offers [RV-friendly GPS](#) and a CarPlay integration for safe navigation.

The itinerary planner is available at [maps.roadtrippers.com](https://maps.roadtrippers.com) and in the Roadtrippers app, for iOS and Android devices.

## Want a Waterfront RV Lot? Got \$729,000?



One of the “pain points” for anyone traveling by RV is the rising cost of an overnight stay at campgrounds along your route. Some campers have mitigated this by electing to purchase a lot at a favorite location — but these, too, are escalating in value.

How much depends upon the location and the amenities offered. But the ultra-exclusive environs of south Florida-based Yacht Haven Park & Marina just put up several of its prime rental resort lots for sale — with prices that start at a cool \$729,000.

Aside from its desirable location near Fort Lauderdale, lot owners will be able to take advantage of the resort's luxury amenities, including a heated pool with a tiki hut, children's play area, dog park, four climate-controlled shower facilities, climate-controlled laundry facility, gym, kayak, paddleboard and pontoon boat rentals plus boat charters on a 55' SeaRay Sundancer. Future plans include a state-of-the-art welcome center with a gated entry, a two-story state-of-the-art clubhouse with fitness center, men's and women's locker rooms, business center, indoor and outdoor dining, bar, rooftop lounge and new pool with hot tub and sundecks.

And yes, you can rent it out when you're not using it. Nightly rates at the resort start at \$155. For more information, visit [yachthavenpark.com](https://yachthavenpark.com).



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# Keystone Adds Climate-Testing Capabilities



Jon Brock (right) Keystone RV's director of R&D, with engineer LabLevi Neuzerling and the Temperature Performance Test Chamber.

Harsh weather — hot or cold — is the nemesis of the RV industry. Now, Keystone RV's research and development team has added a new temperature performance test chamber to the Keystone Innovation Lab's toolkit.

At 18 x 50 feet, the chamber can accommodate each RV model that Keystone manufactures, testing materi-

al and component performance in fully built products at temperatures ranging from -10°F to 110°F.

The chamber, said Jon Brock, Keystone's director of research and development, will allow the company to evaluate new components and construction methods and perform repeatable tests of multiple systems in a fully controlled

environment. This allows Keystone to evaluate things like overall insulation performance or heating and cooling power relative to ambient temperature. "You can't understand the scope of a problem, or the success of your solution, unless you can measure both in real world conditions," Brock said.

## Genesis Releases Aftermarket Interior Collection



Most RV consumers aren't familiar with the industry's major players — especially those suppliers who manufacture products not emblazoned with their company name. One of the premier suppliers of interior products is Genesis Products, which has just released a slate of products for RV owners wanting to update their living quarters.

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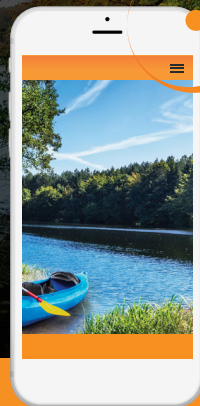
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Available on [campingworld.com](http://campingworld.com) and at 10 Camping World locations as of mid-May 2023, Genesis's curated product collection allows customers to reface or refresh cabinets, wallboards and backsplashes without the hassle of painting or extensive renovations.

The REVIVE peel-and-stick products are easy to install and feature RV-rated adhesive designed to withstand on-the-road conditions for the long haul. Available in a variety of on-trend designs

and colors, the REVIVE Collection includes:

- **Wallboard & Cabinet Kits** — Specifically designed to overlay RV cabinets and walls for a fresh look made to last. Each kit includes tools for easy installation, including a putty knife, microfiber cloth and instructions.

- **Cabinet Doors** — In five trending profiles and five colors ranging from traditional to contemporary. Available via special order, doors coordinate with

Wallboard & Cabinet Kits for a complete transformation.

- **Cabinet Hardware** — Includes residential-grade knobs and pulls in four beautiful finishes and six curated styles.

- **Backsplash Kits** — Made with lightweight PVC and easily installed with double-sided REVIVE tape, providing the look and feel of real tile without any grout or thin-set required.

For more information, visit [genesis-productsinc.com](http://genesis-productsinc.com).

## nuCamp Pushes Warranty Limits



If you're in the market for a small trailer — think iconic teardrops — it's hard to beat the product offerings at nuCamp. Now, the Ohio OEM has given consumers one more reason: The manufacturer of teardrop trailers and truck campers has announced the launch of its Ultimate Protection Plan, an extended warranty program administered directly by nuCamp that pushes the company's well-respected 1-year comprehensive tip-to-tail warranty into a full 7-year warranty.

Beyond the additional years of coverage, nuCamp's Ultimate Protection Plan is fully transferrable at any point during the plan, which increases the resale value of the unit. Not only is it transferable, but there aren't ever any deductibles or cancellation fees associated with the Ultimate Protection Plan.

Perhaps the most comforting aspect of the Ultimate Protection Plan is that it is 100% backed by nuCamp. That means the consumer doesn't have to hassle with any third party. If there's an issue, nuCamp will handle it directly with the customer's chosen RV service provider. If there was an incident during a trip, the Ultimate Protection Plan provides coverage for towing, trip interruption, and lodging expenses.

The Ultimate Protection Plan is available for purchase at participating nuCamp dealerships nationwide. To learn more about the program and its benefits, visit [nucamp.com/ultimate-protection-plan/](http://nucamp.com/ultimate-protection-plan/).

## CDN Solar Offers DIY Kits for Off-Grid

CDN Solar, a leading provider of online DIY solar solutions, has released a new line of solar products specifically designed for off-grid RV camping. The new product line includes solar panels, inverters, batteries and charge controllers that are easy to install and use.

CDN Solar has partnered with Victron Energy, a leading manufacturer of power solutions, to offer its customers the

*continued on page 54*

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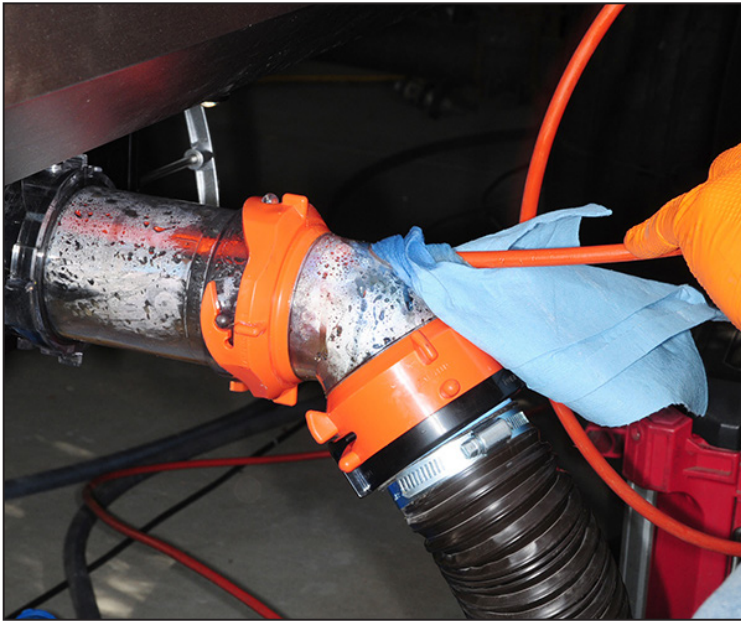
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## Another Holding Tank “Oops”



One viable option to clear errant material from a holding tank is to have the tank pressure-cleaned.

My wife was helping me dump the blackwater holding tank in our motorhome a while back and since we had no way to hook up a water hose to rinse the tank, we were using a 5-gallon jug with a good size lid. Unfortunately, she was holding it too close to the toilet when the lid came off and dropped into the holding tank. I tried to flush it through the pipe but nothing came out; it still seemed to dump okay at that time. Several months later, this incident came back to haunt us when the dump valve was opened and no solids came out — only a little liquid. And, you guessed it: The black tank was almost full. I've contacted a couple of local dealers who reluctantly said they could fix the problem, but I can't get an appointment for five months. We have several trips planned during that timeframe. Any ideas how to get out of this crappy situation?

—Rob Martinez

*Rob, that's a tough one. Over the years, I've seen a lot of strange things that were dropped into the holding tank, including the more common malady when the manufacturer cuts a hole in the tank for connecting pipes and leaves the 3-inch cutout in the tank. Of course, when they just leave it in the tank, flow problems will rear their ugly heads down the road — always at the most inopportune times.*

*Unfortunately, at this point there's probably no way to retrieve the cap*

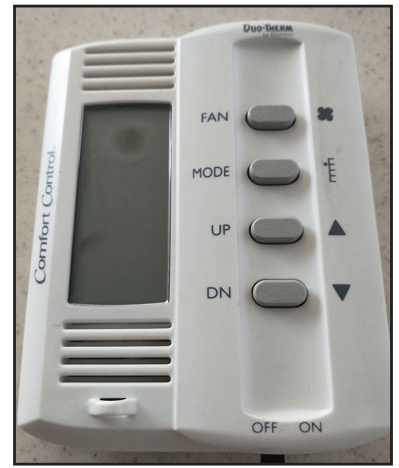
*easily. While you didn't mention the brand of the coach, nor the plumbing configuration, hopefully you can get to the dump valve and remove it. If it's close enough the holding tank you'll be able to get in there with a flashlight and some kind of a hook (a bent wire clothes hanger could suffice) to maneuver the lid and pull it out. This, of course, can get quite ugly. If possible, enlist the*

*help of a honey dipper (mobile pump-out service) to hook up to your sewer termination and possibly suck the lid out. In case the honey dipper operator is not familiar with RVs, have someone hold the foot pedal on the toilet open to help with extra ventilation during the dumping process (to prevent collapsing the tank). It's also possible to backflush the black tank with water being released from the gray tank while dumping, but that's iffy.*

*It might even be better to find someone who pressure-cleans holding tanks. Inserting the long wand right into the tank might push the lid aside long enough to flush out the holding tank. Once it's clean, you'll have a better — or, at least, less messy — chance of fishing the cap out. If all else fails, the tank will have to be removed, which isn't pretty, either. Good luck.*

## Control Freak

I have a 1999 Coachmen Class A motorhome with two air-conditioners and a four button Duo-Therm (Dometic) thermostat that also controls the furnace. Recently, when I turn on the thermostat the display works — but when I push one of the mode buttons everything goes out. I took the thermostat apart and everything looked good; I didn't see any burned connections and the On/Off switch seemed to work properly. Still, the thermostat doesn't work and might need to be replaced. I looked online and



*The buttons, often the source of problems with Dometic's 4-button thermostat, can be replaced on your stock unit. Turn-around is usually a few weeks.*

*could not find a replacement with the four buttons. It looks this thermostat has been replaced with a five-button unit, which is completely different, so I'm not sure it will work with my system.*

—Mike Zelinski

*Mike, unfortunately Dometic stopped making the four-button thermostat a long time ago. At this point you have two options. The first option, which would probably be the most reliable, is not cheap: You can buy an upgrade kit to a five-button thermostat, (part number 3310014000), which is available online and in many RV parts stores; it sells for \$400-500. The conversion kit from four to five buttons requires wiring — and the control board in the air-conditioning unit will need to be replaced. If you have two air-conditioners, you will have to tie the second one to the first one with a communication cord, which looks like a standard phone extension cord but the plug-ins are reversed.*

*Another option will take a little effort on your part, but is a good solution for a whole lot less money. If you go to ebay.com and search for “Dometic 4-button thermostat” you'll be led to a company (AceQuality) that replaces the four buttons on your unit. Apparently, these buttons cause the failure 90% of the time. The company does not sell new or refurbished thermostats and is very clear in its description that it only provides a service to replace the buttons. You'll have to send the defective thermostat — a mailing address is clearly noted on the listing — to the company. The buttons will be replaced and the thermostat sent back to you. The cost for replacing the buttons is \$99.99 and the work is warranted for one year. Of course, you can also install two separate thermostats, one for the air-condi-*

tioner and one for the forced-air furnace, but that gets a bit trickier with the wiring and not worth the effort, unless your old thermostat cannot be fixed by replacing the buttons.

## More Thermostat Woes



Micro-air offers upgraded replacement thermostats for a wide range of original-equipment units, including Dometic's 5-button control.

I have a 2016 motorhome with a Dometic five-button thermostat and I am unable to make the Zone 2 air-conditioner to work; the Zone 1 unit and the furnace work fine. I've dropped the air-conditioner ceiling assembly and I cannot see anything except for all the wires that are hooked up. Now I'm at a loss. Do you think the thermostat is defective or do I have a problem in the air-conditioner itself?

—Mike Hill

Mike, the starting point is to reset the thermostat and to see what happens. Depress and hold the Mode and Zone buttons and while holding them down, turn the On/Off switch to On and then release the buttons. You should see FF on the screen momentarily, indicating that the thermostat has been reset. At this point you should still see Zone 1 and 2; if you do not see Zone 1 or Zone 2, it just means that the thermostat is not communicating with the air-conditioner(s).

The most likely culprit will be the communication cord that runs between the two air-conditioners. If you do not see a Zone 2, that will indicate that the communication cord may be defective. There is a remote possibility that the control board is defective, but unlikely.

If the communication cord is defective, you can purchase a new one online and, without taking everything apart, run this cord temporarily between the air-conditioners and see if that solves the problem. If it does solve the problem, now the fun starts; your only chance to conceal the cord will likely be through the ducting.

A good solution, if you determine that

the thermostat is defective, is to replace it with one from Micro-Air ([microair.net](http://microair.net)). The company's EasyTouch RV thermostat will modernize your system with Wi-Fi and Bluetooth capabilities, which allows for remote control of the air-conditioners. Micro-Air offers a direct replacement for the Dometic Comfort 5 Button thermostat for \$249. The EasyTouch thermostat is nice looking and easier to read.

Micro-Air is well versed in the RV air-conditioner space and started its journey with the EasyStart air-conditioner soft start system, which reduces power requirements and is very popular with boondockers who rely on portable generators.

## Backing Prowess



Along with teaching your traveling companion how to use hand signs to help guide you into a back-up RV site, consider a hands-free Walkie Talkie for communication.

Bill, I've been towing trailers and backing them up for many years. I don't have a backup camera, but I do have a new wife who has never been camping in an RV, let alone help me back up into a space. As you probably know, some spaces can be quite challenging to get in to, which means you'll need quite a bit of help.

Recently we were camping in a very rural campground that didn't even have phone service and I had to back in between RVs on one side of the road and couple of big pine trees growing in the absolute wrong place for maneuvering the trailer on the other. Unfortunately, we did not have two-way radios, figuring we would just simply use our cell phones with mine connected through speakers in our new truck. My wife went outside to help but did not quite understand what I needed her to do; she was constantly nowhere to be seen and, of course, I couldn't hear her 45 feet away in the cab of the truck with a diesel engine running. Do you have any suggestions that I can relay to my wife?

—Robert Sinclair

Robert, I can definitely relate to your situation since I've been there and done that many times. It can be very difficult to back a trailer without help and, as you've discovered, teaching someone how to direct the driver can even be more of a challenge. First, be patient. If your wife gets rattled, it's only going to make things more difficult; she more than likely feels bad enough that she's unable to help you.

Here are a couple of tips that might help: Explain to her that if she can see you in the mirror then more than likely you can see her unless you're on an extreme angle. Teach her to use her arm and hand rather than just finger signals, which a lot of people tend to do; fingers only are difficult to see. If the arm and hand are moving in a big arc or side-to-side in a straight line with a finger pointing, it makes a huge difference when you're trying to see 40 feet behind you. Teach your wife to physically move side-to-side periodically to check the other side just in case there's a rock or a pipe sticking up that you cannot see. Your job is to stop and wait for her to come back into view in the mirror on the side she's directing you. Don't be afraid to get out and say, "Honey, I can't see you and I'm going to stop and wait for you to come back into view. If you don't see me moving after 30 or 40 seconds, then I may not be able to see you well enough to continue backing." Always use the cell phone when service is available but continue to use hand signals at the same time. It may also be wise to invest in a pair of two-way radios ("walkie talkies"). to also use in conjunction with hand signals. Since, as you discovered, cell phone service isn't guaranteed, inexpensive two-way radios with hands-free operation and extended range (and thousands of five-star ratings) like those from Moico can be found on Amazon for less than \$30. That's a small price to pay for eliminating any possible bruised feelings with a traveling companion.

One more thing: During the learning period, get out of the truck numerous times to make sure your wife is guiding you properly. Remember, she is new to RVing and it will take some time to learn how fast the trailer reacts to turns and how much space is necessary to make those turns. Trust me; acclimation will take a little time, but the results will be worth it.

Are you stymied by a technical problem with your RV? Write to RV Enthusiast Technical Director Bill Gehr at [bgehr@rvemediagroup.com](mailto:bgehr@rvemediagroup.com). Bill will answer inquiries as space permits. **RVE**

# ***Basic RV Maintenance:*** ***Exterior Seals & Sealants***



*Undetected damaged seals and failing sealants can cost unsuspecting RV owners thousands in repairs related to water-intrusion damage.*

By Bruce W. Smith / Photos by the author

In retrospect, it was just a little twig that blew onto the roof of the living room wall slideout. It was tough enough, though, to make a small tear in the lip of the slide's top wiper seal when the wall retracted. The tear, undetected by the luxury 45-foot motorhome's owners, grew to more than an inch during the next couple of years as the big slide was moved in and out as the owners travelled around the country.

During that time the rip in the seal allowed water from rain, dew, melting snow and ice to slowly work its way into the slide and down to floor level — where it slowly saturated the wood subfloor of both the slideout and the coach. The first time the owners became aware of the problem was when one of them walked past the beautiful

hardwood entertainment center — and the floor flexed just enough to crack a couple of tiles.

Concerned, they drove their six-year-old luxury motorhome to Oregon Motorcoach Center (OMC) in Eugene, Oregon, where closer inspection by service techs revealed why the floor flexed, the extent of the water damage, the likely cause of the water leak(s) and the cost to make the necessary repairs.

The water leak not only damaged the wall slideout and subfloor in the living room, it also migrated and delaminated the floor in the adjacent master bathroom. All the damaged areas had to be removed, repairs made and re-installed.

In all, the damage the little twig did to the wiper seal along the top of the wall slideout — in addition to cracks in the



*This tear in the middle of the top wiper seal on a Monaco motorhome's wall-slide was the primary culprit that led to the water damage requiring more than \$40,000 in repairs to the coach's slideout, flooring and interior.*



*Carrier RV's Tony Salazar re-seals vents and roof cap molding on a customer's trailer using self-leveling sealant.*

slideout wiper seal corners that added to the water intrusion — eventually cost the owners more than \$40,000 in repairs to get their motorhome back on the road.

### **An Ounce Of Prevention**

That's a big bill, one that might force many RV owners off the road for good. But it didn't have to happen. If you are an RV owner, setting aside the time to inspect the RV's exterior, along with the preventive maintenance required when an issue is found, can literally save tens of thousands of dollars in unnecessary repairs over the life of an RV.

"The main thing I try to stress to our customers is closely inspecting their RV at least once a year," said Matt Bryan, OMC assistant service manager. "Better still, RV owners should do a thorough walk-around twice a year, inspecting all the seals and seams for tears, looseness or voids in sealant. The same applies to inspecting the RV's roof.

"If you can catch bad seals early, or tiny holes in seam and molding sealants, you're going to save a lot of money by preventing water damage," he added. "Once you start seeing the effects of water damage, such as stains in the walls, ceiling, or floor, it's been leaking for a while and you already have a big problem."

Obviously, the first place to inspect

is the roof. Look closely at the base of anything and everything attached to, or set into, the roof to make sure the sealant used to keep moisture out and the roof watertight is doing its job.

If the caulking or sealant is dry, cracked, has pinholes or voids of any size or type, it needs to be completely removed and a fresh sealant applied.

Applying new sealant over old doesn't provide the same water intrusion protection as applying it directly to the base surfaces. All the old sealing materials need to be removed and the underlying surfaces cleaned before laying down new sealant.

This also applies to marker lights. Leaks around marker lights also go undetected. Water leaking down the inside of the windshield, or staining the headliner/roof, is most often caused by a leaking marker light seal. These seals need to be checked at least once a year.

Scraping off old sealant from around an RV's roof vents, skylights, A/Cs, satellite dish, horns, antennas and the belt moldings that go across the front and rear caps on some motorhomes, and then applying a fresh layer of new self-leveling sealant, is what RV service technicians call a "Peel & Seal." According to OMC's Bryan, this type preventative maintenance job takes about a full day at a repair shop, depending on the size and type of RV. At today's labor rates hovering around \$150/hour, that's about a \$1,200 investment to ensure water intrusion from the roof shouldn't be an issue for several years.

"I don't have an answer for typically how long of a life roof sealants have," said Bryan, who has been a motorhome RV technician for nearly 30 years. "Some coaches come in and



*Matt Bryan, Oregon Motorcoach Center's assistant service manager, doing an inspection of a motorhome's exterior and checking for potential water intrusion points along the body molding.*



*The rear corner of this trailer's roof decking was rotted from a leak in the TPO that wasn't discovered until the owner saw a blister on an interior ceiling panel many months after the damage had occurred.*

the sealants have been on the roofs for 15 years and they still don't leak. Other coaches we see are only a few years old and the roofs are already leaking. A lot of it has to do with the preparation and how well the sealant was applied to begin with."

Bryan, Tom Carrier at [Carrier RV](#), and other RV repair experts we spoke with recommend that an [RV's roof](#) should be washed and inspected at least annually, with a peel-and-seal done every five or so years depending on the condition of the sealants, the climate, how much the RV is exposed to the elements, and the age of the coach or trailer.

The good news is many RV owners can do this job themselves, saving the cost of having a pro do the work. You won't get it done in a day's time, but your wallet will appreciate the added time required. There exists a wealth of information online, from basic cleaning and maintenance to step-by-step videos showing roof replacement. Just be sure the material you are using as a reference is from a respected source. Companies such as RV Roofing Solutions ([rvroofingsolutions.com](#)) offer quite a bit of information, while you can also find easy-to-follow videos for everything from determining roof material to applying roof coatings and new roof membranes at Dicor Corp. ([dicorproducts.com](#)), an industry leader in sealant technology.

### Slideout Wiper Seals a Big Problem

Aside from leaks originating around roof components, the [wiper seals](#) that surround the top and sidewalls of RV slides are the biggest contributor to water damage in RVs. They wear out over time, or get damaged in some way, and RVers seldom keep a close eye on these critical seals' condition.

Slideout wiper seals are not waterproof. Their job is to "wipe" the sides and roof of the slide to prevent water from being dragged inside the RV. They

are also designed to deflect rain, snow or other forms of water so there's not an open route to the interior.

"When wiper seals start deteriorating, they'll get cracked, the corners come unglued, the lips no longer stay tight against the slide's roof and walls, or the rubber start tearing," said Bryan as he pointed to a coach in their massive repair facility in the midst of getting a complete "re-seal" that includes replacing all the wiper seals.

"There's not a lot of maintenance an RVer can do when it comes to wiper seals other than keeping them clean and applying a spray-on conditioner to help them last a little bit longer," Bryan said. ([Camco](#), [3-In-One](#), [Thetford](#), [303 Aerospace Protectant](#) and others make spray-on conditioners for this purpose.) "The main thing with slide wiper seals is just to keep them clean and well-maintained."

When a slide's wiper seal does need replacing, RV enthusiasts will probably find the task best left to an RV service center. The reason is some types can be difficult to access unless the slide is "released," which is something a qualified RV technician, with the proper tools and equipment, is best qualified to handle.

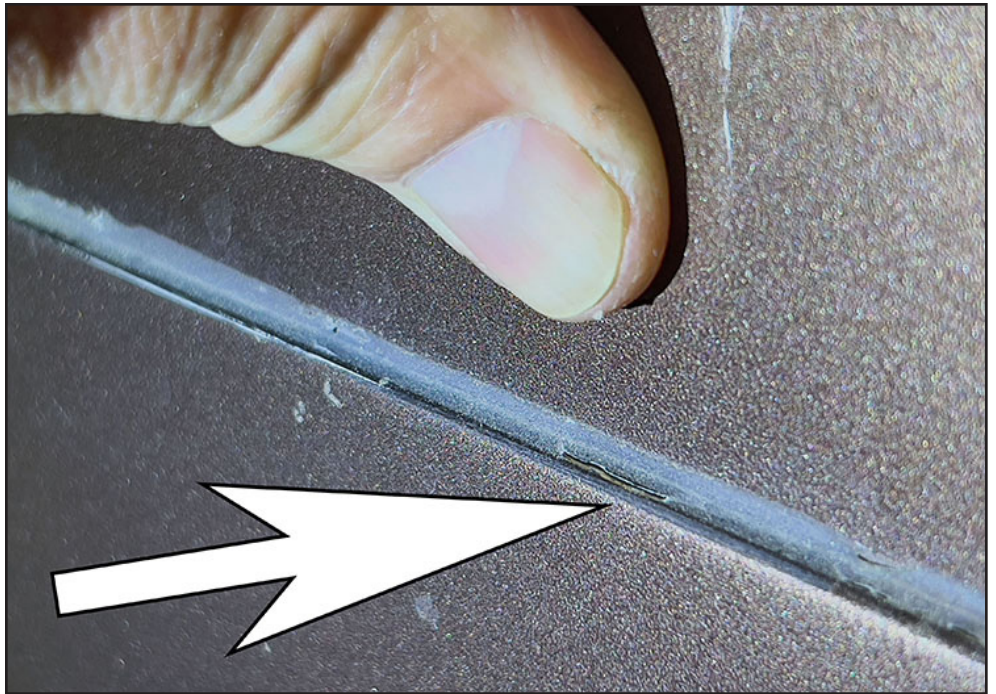
That's not to say it can't be done. If you want to tackle this, we have covered [replacing](#) bulb-type slide wall seals on our [RV Enthusiast](#) website to show the process on the easier-to-access RV slides.



*Seals around RV slides are a common source of interior water leaks. The wiper seals have to be kept clean and conditioned in order to lessen the chances of water intrusion from the outside.*



*Slideroom wiper seals need to be inspected frequently because they can crack, tear and the corners come unglued, allowing an easy path for water to get inside the RV.*



*This RV's lap seal has come unglued, allowing water to seep in between the fiberglass panels. A light press of a finger revealed the separation issue.*

### **Pay Close Attention to Sidewall Seals & Seams**

Another area that RVers tend to overlook when it comes to sealing a coach from water intrusion is the sidewalls themselves. A motorhome is a rolling box on a frame. The frame flexes — and as it does, the box flexes and twists. This flexing movement of the body is almost imperceptible to those inside,

but over the miles and years of road abuse it's enough to eventually cause overlapping seams along the sidewalls to separate, rivets to pop loose, screws to back out, cracks to form along slide corners, sealant beads to lose grip and belt moldings to come unglued.

When those things happen, water will find its way into any void, no matter how small, and begin its destructive process. Sidewall water intrusion causes delamination, mold growth, wood rot, electrical problems and other issues in

the RV's walls, floors and slides.

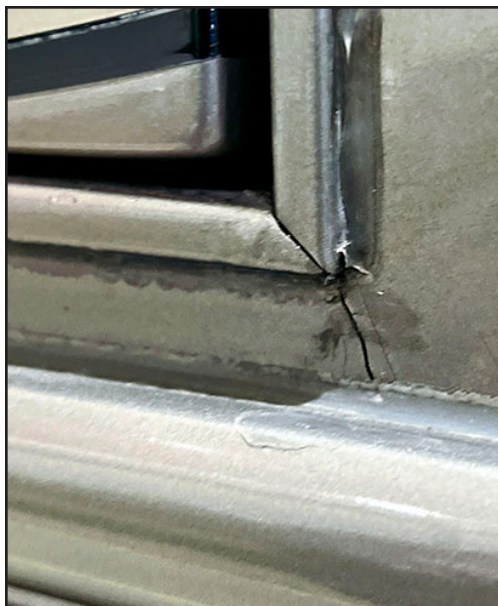
According to Bryan, this is not a time to cut corners. Inspecting a motorhome's sidewalls can take a half-day or more per side; he advises RV owners to take their time — and use a flashlight to closely inspect every inch of every seal around windows and cargo compartment doors to the body seams and belt moldings.

"I like to gently apply a little pressure with my thumb along body seams, trim and belt moldings to make sure the body panels are still glued tight," he said. "If there's any separation, then that seam has to be sealed with a silicone or urethane sealant. If that seam isn't sealed, water intrusion is a given."

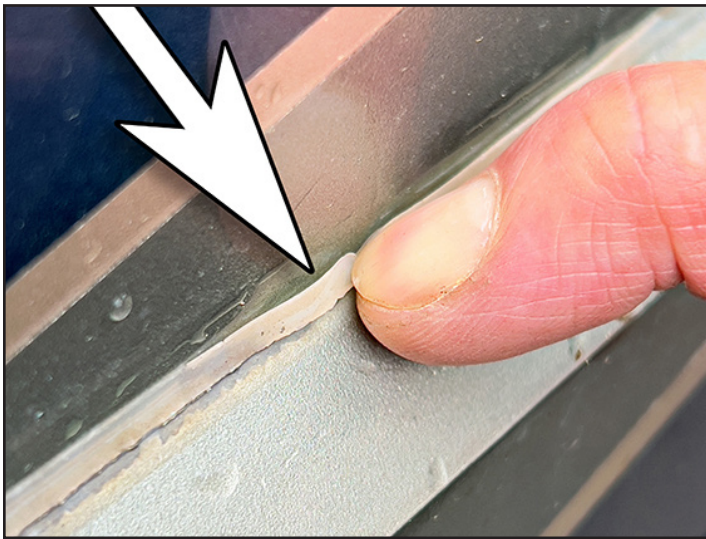
He also gently runs a finger along the top of all exterior moldings to make sure the thin bead of sealant is still adhered to the body and molding. Bryan says it's not unusual for a coach to come in to the shop with the trim sealants on the outside appearing to be just fine — until the finger test. This is a simple inspection all RV owners should do at least once a year.

Another trouble spot Bryan said RVers should pay close attention to when it comes to sidewall seams and moldings are voids or pinholes in the sealant.

"During your inspection you'll probably notice voids here and there in the sealant beads. They'll be tiny spots. You can quickly re-seal them and it doesn't cost very much to touch them



*Vibration and flexing of an RV's body often causes seams to come apart, screws to back out and rivets to pop loose. Each is a pathway for water to get inside the walls, ceiling and flooring. Slideout corner cracks are a sign of long-term body flexing, and yet another entry point for water.*



The thin bead of sealant along this body molding has come loose. This is another area that promotes water intrusion in an RV. The best tool to use when removing sealant from an RV's sidewall molding is a plastic tapered-end chisel stick, also referred to by RV techs as a "putty bone."

up," he said. "However, if you let these little voids go for years without being addressed, it could cost a lot of money to repair the ensuing water damage."

When loose or damaged sealant is found, DIYers should only use a plastic, tapered [chisel end stick tool](#), aka a "putty bone," to remove the sealant so the body finish isn't scratched or the paint chipped. Once the old sealant is removed, Bryan recommends re-sealing

using a clear or body-colored silicone sealant.

#### Check Cargo Compartment & Window Seals

The seals on the inside of cargo and other exterior compartments are also sources of water intrusion. Open every door and take a close look at the backside. Are there water streaks running down it? Is the floor of the bay or bay

carpet wet? If so, the trim seal around the door isn't doing its job.

This means the cargo door seal needs to be replaced. If it's ignored, the wood floor will begin rotting out, or the carpeted metal floor will become a wonderful breeding ground for mold.

If the door seals are "J"-type, Bryan recommends [replacing](#) them with a more effective soft "D"-style rubber molding. Some RV compartment doors use [Trim Lok](#) style moldings, some use [3M](#) tape-on or other [peel-and-stick](#) seals. It depends on the RV.

Lastly, inspect every window seal. They are also a common cause of water intrusion in RVs. Silicone sealant is cheap. Fixing water damage isn't.

## Best Time to Have RV Repairs Done



A final word on re-sealing your RV. If you are doing the work yourself, make the inspection and repairs part of your Spring and/or Fall RVing maintenance regimen. Spending a few hours of one's time staying on top of potentially expensive water leaks is a great investment in cutting long-term cost of ownership.

On the other hand, if you would rather have the pros handle the inspection and necessary repairs, schedule to have the work done in the wintertime when you're not using

your RV. That way you can drop it off and come back days or weeks later instead of either having to stay with it while the work is being performed or miss a planned trip should the shop find itself backed up.

"One thing that really adds to the repair costs in an RV is when customers want to stay in their motorhome while we're repairing them," said OMC owner and General Manager Matt Carr. "We have to bring the RV in, take it apart and then put it back together so the owners can take their coach back out for the night. That's repeated the next day and the next until the work is done. Doing this just adds to the expense of repairing the coach."

It also pays to schedule repairs, be they a "re-seal," "peel-and-seal," or other job, months in advance. These days places like OMC, Carrier RV, [Bish's RV](#) and other RV repair centers around the country are usually booked solid with service work for weeks or months out.



Water can also leak around cargo compartment doors, causing damage to the flooring and carpeting. Replacing the bulb seals with new ones usually resolves this issue. **RVE**

An illustration at the top of the page shows a stylized house with a red door and a window, set against a background of blue mountains and a light blue sky with white clouds. The house is on a green hill.

# *Building* a Mobile Garage



*According to Murphy's Law, things will break in the most inopportune times, so having the right tools, supplies and extra parts to make repairs while on the road is essential. You don't have to be an ace mechanic to circumvent unexpected delays and limit reliance on service center appointments, which can be days or weeks away.*

By Bob Livingston / Photos by author and Bill Gehr

**W**hen you're on the road, living in an RV with multiple complex systems, you must expect the unexpected. Things will break — and becoming stranded in strange places is a real possibility. Most owners are dependent on local service centers or mobile technicians, which can be reassuring, but these days you usually

have to wait in line to facilitate repairs. Armed with knowledge of how these systems work and having access to an onboard "garage" of sorts can make or break a trip.

Over the years, *RV Enthusiast* Technical Director Bill Gehr and I have accumulated an arsenal of tools, parts and supplies to give us independence

when repairs are needed on the road. Admittedly, we're both tool junkies, but having the right equipment on hand has saved our bacon countless times. And being prepared also applies to general maintenance and repairs before and after any trip.

While our rollaway toolboxes are under the custodianship of friends and

relatives in order to pursue a full-timing lifestyle, we have pinpointed the tools needed to make the most common repairs on the road — and in many cases, modifications we've cooked up while traveling. Many have multiple purposes and some have been proven to be valuable beyond their scope/design. For example, having a large offset pliers is very versatile when making plumbing repairs — but also comes in handy when removing stubborn dump-station caps. Or a slick Titan 9 1/4-inch stainless steel pry bar/scrapper ([titan.us.com](http://titan.us.com)) that also makes it possible to remove tent stakes that have been driven into the ground to hold the patio mat in place. This indispensable tool is only \$12 on Amazon.

Our mobile garage includes an assortment of common hand tools, like a hack saw, Vice-Grip locking pliers and multiple screwdrivers, but we also rely heavily on cordless drills and compact impact wrenches. The Internet is chock full of tools and gadgets that can be added to your toolbox and it's always fun to hear from readers who have discovered new equipment that is either earmarked for RVs or can be adapted with some down-home ingenuity. Your only limitations revolve around complying with the RV's weight ratings — and finding space for new tools and supplies.

### The Basics

Before we delve into the individual tools, parts and supplies in our RVs, it's necessary to have the right equipment to allow repairs under adverse conditions — like laying on the ground, which seems to always be on gravel and/or dirt. Therefore, having the right ground cloth or pad is essential. A yoga pad works well and is easy to fold up and store. A folding TrackMat pad is a favorite because it not only keeps most of your body clean but helps prevent rocks from jabbing your back or side. Not the easiest pad to store, but when folded it's only 1 1/2 inches thick so it can usually be laid on top of other stored items in the compartment. This pad ([bedbug.com](http://bedbug.com)) is made of 3/4-inch closed cell foam, is oil- and stain-resistant and can usually be found on Amazon or online for about \$35.

Wearable knee pads are also essential, especially for those of us looking at future replacement surgery. Another option is to use a thick garden knee



*A well-equipped onboard garage allows RVers to not only "fix" things but improve on them. When the wall-mounted safety handle used to traverse the stairs into our fifth wheel's bedroom snapped off when the mounting screws stripped out, I cut and attached two galvanized plates to the wall for backing (they were painted to match the wall) using Truss Phillips self-piercing screws and 3M VHB double-sided tape. Once installed, the new mounting surface was much more solid than the original factory installation.*



*Cordless technology has changed the paradigm, and having a screw gun, impact gun and oscillating tools are primary for any complete toolbox. Milwaukee makes excellent tools and is our choice. Other popular brands with comparable specifications are made by DeWalt, Makita and Kobalt. These tools are all available online and at home improvement stores; higher grade models can be found on tool trucks that service professional mechanics, but they are substantially more expensive and overkill for the occasional (hopefully) needs of the average RVer.*



*A ½-inch impact gun makes short work out of removing lug nuts, but it's important to get one that has enough torque to meet the specifications for the wheels; usually 100 ft.-lb. is just the starting point for most RVs.*



*RVs are all about tight quarters and sometimes trying to drive a screw or drill a hole can be challenging without an angle head drill motor. Instead, an angle head attachment can be added to an existing drill, like this one from Milwaukee.*

pad, which will provide plenty of support. Consider, too, a telescoping stool, which allows sitting rather than long stints of bending and adding to back aggravation. There are many of these stools on the market, but the 20.4" Telescoping Stool with cushion can handle up to 550 pounds and stores nicely (\$29.99 on Amazon).

Make sure you always have eye protection and a N95 mask handy when working on projects that involve cutting, sanding or anything else that may become airborne.

Of course, no garage is complete without auxiliary lighting. Finding room for your portable LED light stand is an exercise in futility — but an LED headlamp provides bright lighting while freeing hands for working on projects. There are a number of these on the market and they are very similar in style and features; Amazon sells them for less than \$25. It's also a good idea to keep a cordless LED drop light in your toolbox. You'll find countless uses for such a light; just make sure it has a hook and magnet. Most are rated at 800 lumens, which is plenty bright for working in engine compartments. The Internet has dozens of these lights; figure on spending around \$40.

Supplement your supplies with red rags, which are best for grease and available at any auto parts store, and microfiber towels and disposable gloves that can also be used when handling sewer hoses. The market is flooded with mechanic's gloves, which are essential to protect hands during any project. It's possible to find inexpensive mechanic's gloves at Harbor Freight or home improvement stores, but we've found that the Tillman 948 gloves (\$11.60 on Amazon) offer superior hand protection while allowing for excellent "feel" when working with tools and fasteners. These gloves are cut and abrasion resistant and have a Nitrile micro-foam coating to promote a better grip.

Paring down the number of tools in your travel box can be daunting because if Murphy has anything to do with it, it seems that you never have the right tool for the immediate job. The whole idea is to limit down time and the need to call in help. The assortment of tools we've identified here is by no means complete — but with them you'll be able to tackle most jobs and get going again.



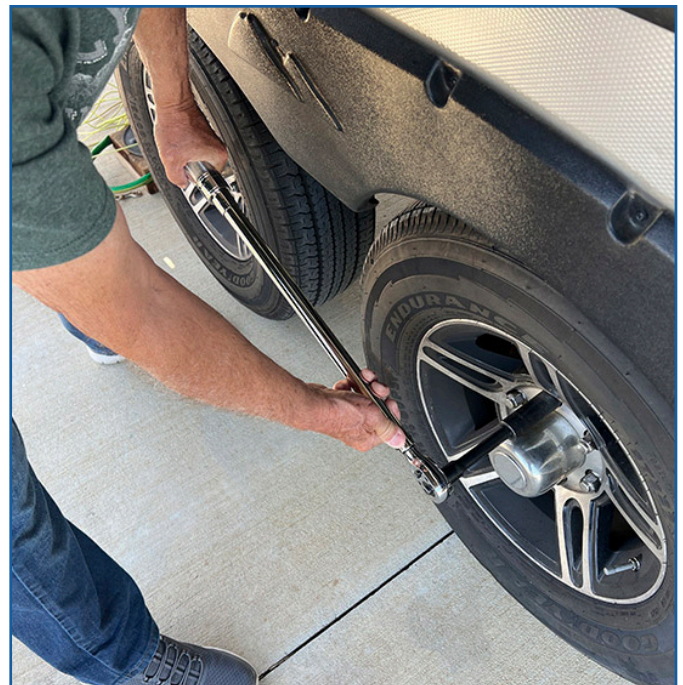
It goes without saying that no tool kit can be complete without a ratchet/socket set. There are dozens of kits on the market, but if you want to save a little space, consider the Metrinch combination wrench and socket kits. No need to carry metric and standard size tools; each socket and wrench can be used for either size. The convenience comes with a higher price — a 62-piece kit is \$189.95 — but they will likely last a lifetime. Check out these tools at [metrinch.tv](http://metrinch.tv).



Another “must have” is a set of ratcheting wrenches. These hand-saving wrenches allow you to loosen or tighten nuts and bolts in a single motion, without having to lift off the fastener; I can’t believe how we ever lived without them. Quality levels vary, but the ones with a tiny lever to reverse directions are more versatile (and usually more expensive). Add in a couple of adjustable wrenches, which will likely come in handy.



When I first purchased the EZRED extendable ratchet wrench ([ezred.com](http://ezred.com)), I figured I fell for another gimmick — but quite the opposite was true. These ratchet wrenches come in 1/4-, 3/8- and 1/2-inch drives and extend by releasing a latch. The 1/2-inch model goes from 12 to 17 1/4 inches and is very easy to store. It’s nice to have the extending handle when additional leverage is needed to loosen or tighten nuts and bolts. Amazon sells the 1/2-inch ratchet wrench (which I use most) for \$39.42, but you can get all three in a kit for \$55.49.



Keeping wheel lug nuts torqued properly is a critical maintenance item. Trailer lug nuts are most vulnerable and should be checked before heading out on the road. The best practice is to confirm proper torque before leaving home and RV parks, even on a daily basis. While a high-end, calibrated torque wrench (shown) assures accuracy, most owners can get by with a less-expensive model sold by home improvement stores and Harbor Freight. Keep a short extension and an impact socket that fits the lug nuts on your RV nearby, so you’ll be encouraged and reminded to perform this task.



Once of the most versatile tools ever designed is the common pliers. Just about everyone has used one at some time. Adding locking mechanisms and long nose versions to your tool bag helps handle fasteners and other smaller parts. An offset pliers comes in handy when removing dump station caps that have tightened over time (or have been cross-threaded).



Whether you're cutting cable ties, wires and other fasteners, diagonal cutters are invaluable — it's one our most-used tools. The leverage assist in Irwin's PowerSlot Vise Grip brand cutter is a wonderful feature and doubles the cutting power without stressing your hands.



There are many Allen wrench sets on the market, but this inexpensive set from Harbor Freight has proven its mettle over and over again. The metric and standard T-handle wrenches are organized in a metal stand for easy identification. This set is also perfect for bicycle repairs.



We have found dozens of uses for tin snips including making cuts on belly pans and other plastic items. This one made by Fiskars has leverage assist, which makes it easier to cut heavier items.



Here are three tools that will come in handy often: The Titan 9 ¼ inch stainless steel pry bar and scraper combo tool help remove patio mat hold-downs and nails from wood, while the scraper feature has multiple purposes around camp. Of course, a brass wire brush is also a "must have."



We all rely on power tools these days, but sometimes getting back to the basics makes sense. This 15-inch Stanley Fatmax wood saw has been used for dozens of projects and requires no power to operate. Perfect for short cuts in wood and takes very little space.



Utilizing a telescoping mirror improves vision around corners and in tight spots. These mirrors come in sizes to accommodate various access spaces. When a tool or fastener is dropped in inaccessible spaces, a telescoping pickup magnet will usually save the day. If the magnet is strong enough to hold a wrench, it should be good for most projects around the RV. An awl is perfect for poking holes as well as locking the winding mechanism on patio awnings and slide-out toppers that need repair or fabric replacement.



If you have a cordless screw or impact gun, then you'll need bit and nut driver holders — the more the merrier. The better adapters are magnetized and will hold bits in place when hands won't fit. Our latest find are this DeWalt nut drivers that can be reversed to accommodate different size bolts.

## Tools to Go



Assembling a tool kit for the road takes time and experience — but you have to start somewhere. Fortunately, Lippert ([store.lci1.com](http://store.lci1.com)) has put together an RV Tool Kit which includes most of the necessities for making common repairs.

The “grab and go” kit, contained in a tidy carry bag, is comprised of 15 practical tools and supplies that make it easy to handle electric maladies as well as light repairs like replacing a fastener or bundling wires.

Provided in the kit is a digital multimeter with a 3 ½-inch LCD screen and probes. While it can check voltage and continuity, there's also a test light with a 5-foot lead provided to trace circuits. To go along with the electrical components, the kit includes a Wire Stripping Multi Tool that can crimp solderless terminals, cut bolts and wire and strip insulation to make ready for the terminals. This tool has a cushioned grip that's easy on hands.

For checking tires, there's a pressure gauge with a brass air chuck and a 10-inch flexible hose. When darkness arrives, or there's not enough light in the working area, the LED headlight can be donned for 200 lumens of illumination; it runs on three AAA batteries.

Also included in the kit is a SAE Allen wrench set with sizes from 1/16 to 3/8 of an inch; a 29-piece ratcheting screwdriver kit with 12 metric and SAE sockets, two hex bits and 15 standard, Phillips and star bits. A utility knife with 10 extra blades rounds out the list of tools.

As part of the supplies needed for

various repairs, the tool kit has a set of fuses, a box of assorted screws, a bundle of cable ties, electrical tape and dust masks (which are 94% efficient). The tool bag is made of polyester fabric and can hold up to 30 pounds.

The RV Tool Kit retails for \$149.95 and also makes a great gift for friends who just entered the RV lifestyle.



The RV Tool Kit from Lippert ([store.lci1.com](http://store.lci1.com)) contains just about everything needed to make common repairs while on the road, from duct tape and a digital multimeter to Allen wrenches, fuses and an LED headlight.



Telescoping stools allow you to sit and work, without employing a bulky patio chair. They open to various heights and this one, a “20.4” Telescoping Stool with Cushion” can handle up to 550 pounds. There are dozens of these stools on Amazon and the Internet and are usually only about \$30. Most adults laugh when they first see one of these stools — but lose the smirk quickly after trying one out.



Working in dark places and needing two hands to move or retrieve stuff can make it difficult to handle a flashlight. That’s when headband lights really “shine.” Search “LED headband lights” and you find a bunch of these products plastered all over the Internet. They put out an amazing amount of light and are very comfortable to wear.



In many instances, illuminating work areas can only be accomplished with a drop light. Far from the incandescent bulb holders with a hook and power cord are the new breed of cordless LED drop lights with the venerable hook as well as a magnetic base. Models and prices are all over the board, but searching the Internet will reveal many with the same features shown here. Most have an 800 lumen rating for the LEDs.



Delving into any electrical project will require a multimeter to check circuits. This clamp-on (induction) Fluke multimeter is one of the best in the business but is expensive and earmarked for professionals. The ability to monitor amp draw from 120-volt AC and 12-volt DC circuits is even more necessary when diagnosing power issues for boondocking. A test light is one of most basic tools for checking 12-volt DC circuits, but it definitely has its limitations. The sharp probe usually finds its way into fingers and hands when retrieving from a tool bag, so covering the point with a wine cork is a clever way prevent accidents.

## Don't Get Caught Flat-Footed



This is most of what you need to change a trailer tire correctly and safely on a tandem axle trailer: A torque wrench, a trolley jack (small floor jack), wrench, thin-wall socket and a Trailer Aid PLUS. You should also have some wooden or plastic blocks handy.

If you drive, the chances are good that at some time in your travels, you've experienced a flat tire. It's scary at first, but soon your mind catches up to what's happening and you pull over. From here, you probably called roadside assistance or mounted the spare yourself.

With a flat on your travel trailer or fifth wheel, it's a different story. Road-

side assistance isn't always available for an RV and changing a trailer tire isn't as simple as whipping out a jack, lifting the trailer and putting on a spare. But changing a tire on a trailer safely and without causing any damage isn't difficult; you just have to know the correct procedure — and have the right tools at your disposal.

The first thing that you should consider a "must-have" is a Camco Trailer Aid PLUS, a lightweight, super strong polymer ramp designed specifically for changing a tire on a tandem-axle trailer. On a triple-axle trailer, a single Trailer Aid PLUS ramp can still be used, then a trolley jack can be employed to lift the axle with the flat just enough to remove the wheel. Single axle trailers are commonly small and light, so on



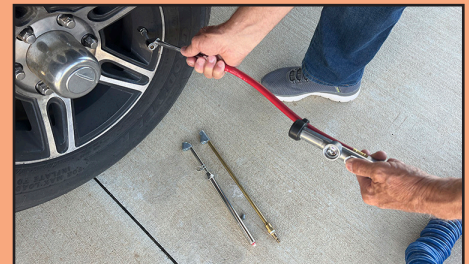
There's not a lot of space between the lug nut and the mounting hole on aluminum trailer wheels, so this is where the thin-wall socket comes in.

these, you can use a screw or bottle jack and some wood blocks on the frame (as close to the center as possible) to lift the wheel off the ground.

You'll also need a lug-nut wrench, correctly-sized thin-wall socket (a regular or impact socket may not fit inside the recesses of aluminum trailer wheels), torque wrench, air gauge and a portable 12-volt air compressor. Having a quality air compressor is critical — and while the Internet is filled with choices, most aren't capable of providing the high operating pressures of RV tires. We've used Viair ([viaircorp.com](http://viaircorp.com)) compressors for decades and consider them to be the "gold standard" for RV use — and the company manufactures portable air solutions and accessories specifically designed and tested for the RV market.



A portable air compressor is a must when on the road. Finding places with enough room to park RVs to inflate tires can be difficult to impossible. Having an onboard compressor takes all the pain out of checking tire pressure. Viair ([viaircorp.com](http://viaircorp.com)) is a proven — and popular — manufacturer of 12-volt DC powered portable compressors that are stout enough to inflate RV tires. Models designed for RV service, like the 400P-RV Automatic Portable Compressor, can run for extended times without overheating and can even inflate 22.5-inch motor-home tires.



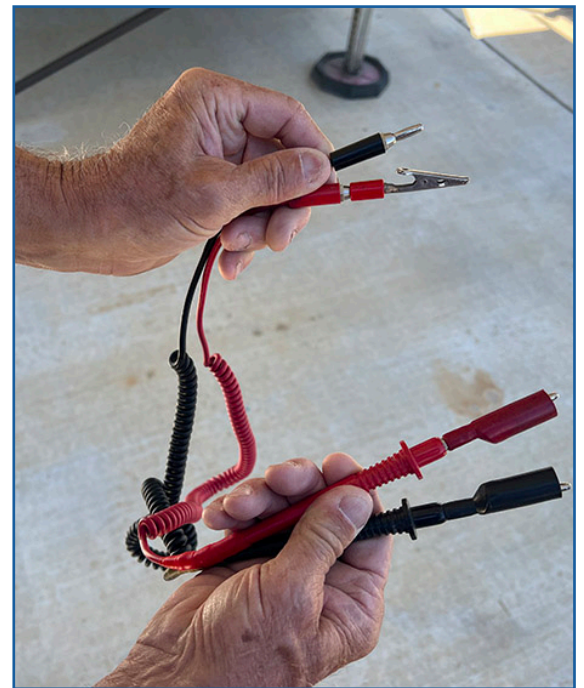
Tires should be checked regularly for proper inflation (based on loading). Connect a good inflation tool with a built-in gauge or a dual-head air chuck and your tires can be serviced on the spot. Just make sure to only inflate to specifications when the tires are cold. A Milton dual-head air gauge shown on the ground ([miltonindustries.com](http://miltonindustries.com)) has proved to be accurate and durable.



*There is no way to work with wiring without an insulation stripper and crimping tool. A common wire stripper found in just about all hardware and home improvement stores makes it easier to work in confined spaces. Crimping terminals to wires requires the use of a tool that provides a solid connection. Again, there are numerous crimping tools on the market, but this style is preferred by professional mechanics — its jaws are super-strong and also allow for strong insulation crimps. This one is at least 30 years old.*



*Gehr and I found this soldering iron on Amazon for only \$23.99. Listed as "Welding Soldering Iron with Thermostatic Digital-Controlled LED Screen Display," this compact iron has many advanced features for precision soldering. It comes with a stand, solder rack and various tips. Most people use crimp-on terminals these days, but sometimes soldering is just more effective.*



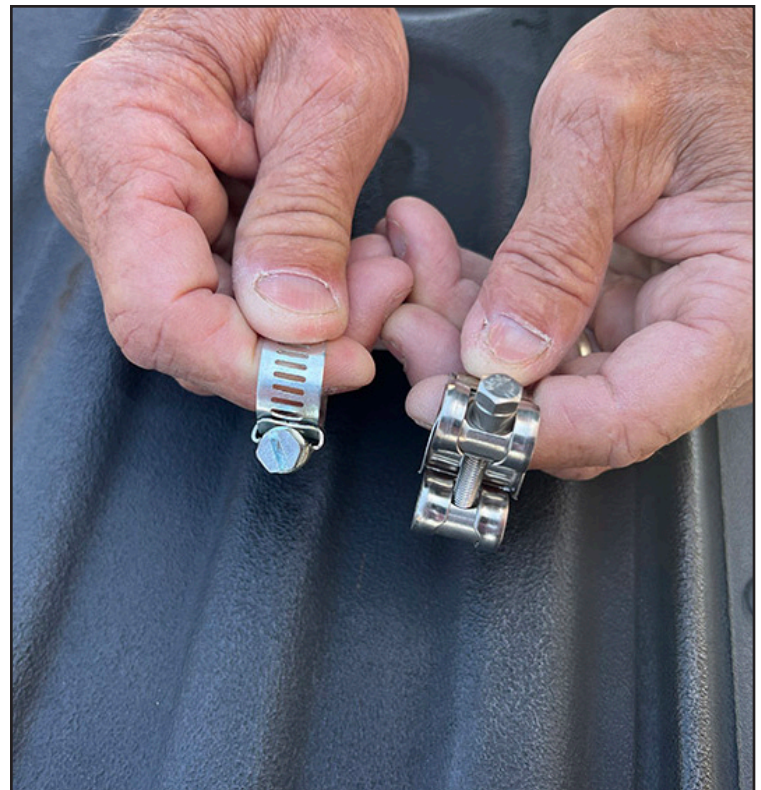
*Wire test leads are indispensable when working with circuits. Spend the money on a good set that has removable alligator clips and sharp probes. This test lead set was purchased from a professional tool truck and is very durable. The stretch cords allow the test leads to store in smaller spaces. Search "coiled wire test leads" and you find a number of these sets online.*



*The best way to make a clean cut through Pex tubing is to use an anvil cutter, where the jaws remain flat during the cutting process. Most RVers don't cut Pex tubing often, so using a lightweight anvil cutter found in home-improvement store garden centers works just fine. This tool also works great for cutting through garden hoses (to make repairs or replace ends) and plastic tubing.*



Not all Teflon tape is created equal; many cheaper brands are thin and flimsy, making the tape hard to wrap around threads. The Jaco ThreadPro PTFE Thread Seal Tape is relied on by professionals for its superb quality. The Blue Monster brand PTFE tape (not shown) is also a high-quality product. Both of these brands are readily available on Amazon. Plumber's thread compound is normally used to seal threads on gas pipes, especially when exposed to heat. Yellow Teflon tape is also designed for use on gas pipe threads.



Crimp rings are usually found on Pex pipe connections, but in some cases a common hose clamp can substitute. Make sure you only use wide hose clamps, which provide a better seal. For an even more effective connection, consider using a T-bolt style clamp. These heavy-duty clamps tighten securely with a socket and ratchet handle, or the tool that comes with the kit. This clamp was procured on Amazon and comes in various sizes. Just google "Hilitchi 304 Stainless Steel T-Bolt Clamp."



All RV LP-gas systems are pressurized to 11 inches of water column for proper appliance operation (except for the stove, which uses a secondary regulator to reduce pressure to 10 inches of water column). A dial manometer, available online or at RV supply stores, is commonly used to check LP-gas pressure, which should be done once a year or whenever the system is opened.



Fixing things, inside and outside any RV, may require the use of strong adhesives. JB Weld, a highly recognized name in the automotive repair industry, offers two products, WaterWeld and SteelStik, that have proven to be worth their weight in gold when it comes to making repairs on anything RV. Super Glue is also part of our supply box.

# Mobile Garage Check List



## Electrical

- Induction multimeter
- Test light
- Wire stripper
- Crimping tool
- Electrical tape
- Wireless terminals
- Shrink tubing for wire
- Cable ties  
(also called "zip ties")
- Primary wire — 12-gauge is versatile
- Dielectric grease
- Caig DeoxIT Contact Cleaner
- Test leads with alligator clips and probes

## Plumbing

- Anvil cutting tool
- Crimpless fittings (Aqua-Lock, formerly SeaTech)
- Pex tubing
- Hose clamps
- Teflon tape
- Pipe dope — high temp areas
- Water heater flush tool

## LP-Gas

- Dial manometer
- Spare LP-gas regulator
- Spare LP-gas pigtails
- Flair fitting plugs — 3/8 and 1/2-inch
- LP-gas leak solution (Dawn dish soap and water also works)
- Detector test spray

## Tires

- Portable air compressor
- Air hose
- Air chuck

- Pressure gauge
- Extra Schrader valve cores

## Extra Parts

- Schwintek slide-out motor
- Window blind restringing kit
- Miscellaneous fasteners — screws, bolts, rivets
- Cabinet latches
- Spare demand water pump for boondockers

## Supplies

- WD-40
- Silicone dry lube
- Lithium grease
- Roof caulking
- Eternabond tape
- Plumber's grease
- Rust remover
- Grease cleaner
- CLR or Lime-A-Way
- Sewer hose clamps
- Extra sewer hose with fittings
- Extra water hose
- Water hose repair kits
- Spare water pressure regulator
- Gorilla/duct Tape
- Surface Shields 4-inch by 180-foot Scrim Tape (underbelly)
- JB WaterWeld and SteelStik adhesives
- Gorilla Glue
- Super Glue
- Silicone sealant
- 12-volt DC fuses
- Faucet repair kit
- Hand cleaner
- Anode rod
- Red mechanic's rags
- Microfiber towels
- Mechanic's gloves
- Disposable gloves

## Tools

- Ground cover/yoga mat
- Knee pads/mat
- Eye protection

- Respirator or N95 mask
- Telescoping stool
- Headlamp
- LED drop light with hook and magnet
- Soldering iron
- Telescoping ratchet (or long handle)
- Torque wrench & lug nut socket and short extension
- Bottle jack
- Cordless drill/screw gun
- Angle head screw-gun attachment
- Cordless impact wrench
- Cordless oscillating cutter with sanding adapter
- Drill bit set with nut drivers
- Long drill bits
- Drill bit size guide
- 1/4, 3/8, 1/2-inch ratchet socket sets
- Ratcheting wrenches
- Vice-Grip pliers
- Diagonal cutters with leverage assist
- Tin snips with leverage assist
- Pliers
- Offset pliers
- Long nose pliers
- Files for wood and metal
- Uni-bit drill bit kit
- Putty knife
- Folding utility knife and extra blades
- Pry bar
- Hammer
- Large crescent wrench—12-inch
- Screwdriver set
- Allen wrenches
- Heat gun
- Rivet gun
- Hole saw kit
- C-clamp
- Hack saw
- Stanley Fatmax, 15-inch wood saw
- Telescoping pickup magnet
- Telescoping mirror
- Tape measure
- Wire brush
- Staple gun
- Step ladder **RVE**

# Building

a Mobile Garage

# Storage Wars



*As RVs get bigger, storage compartments likewise often expand — making access frustratingly difficult at times. Adding one (or more) cargo slideout trays relieves the stress and the packing.*

By Bruce Hampson

It's no secret that RVs — whether we're talking motorhomes or towables — have increased substantially in size through the years. All that floor space, however, disguises what lies below it: a commensurate expansion of basement storage.

And there's the rub.

No, we're not saying the RV industry should go back to the days before the original Fleetwood Bounder, credited as the first RV to offer basement storage way back in the '80s. Today, even relatively low-cost travel trailers often-

times offer owners a wealth of exterior storage opportunities — including pass-through storage running the full width of the RV. But unless you can somehow cram a kayak in it, pass-through compartments — and their sometimes only slightly smaller storage bay cousins — can be as aggravating as they are necessary.

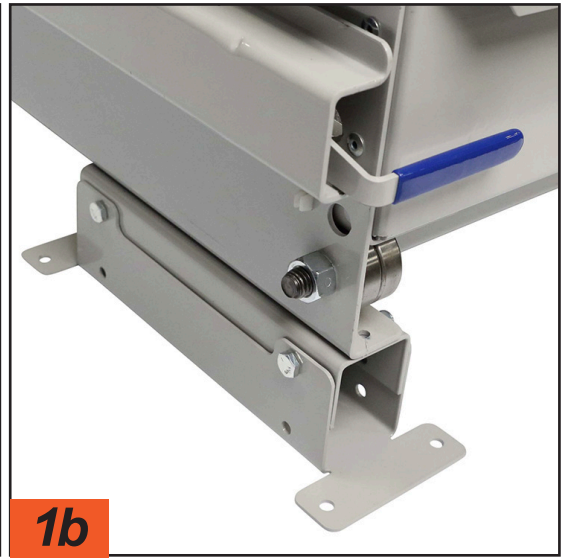
Why? Because just as you have learned through trial-and-error how to pack these exterior repositories with everything you need for an extended trip, the one thing you end up needing

is somehow always buried in the back.

Fortunately, if your RV didn't come from the factory with slideout cargo drawers — and most don't — this is one upgrade that can be quickly resolved. Elkhart, Indiana-based MOR-ryde has offered RVers a variety of slideout tray systems for years — from utility trays to units intended to free up space in your freezer — that ride on ball bearing slides and, easily unlocked, extend outward to provide ready access to whatever you've chosen to fill them with.



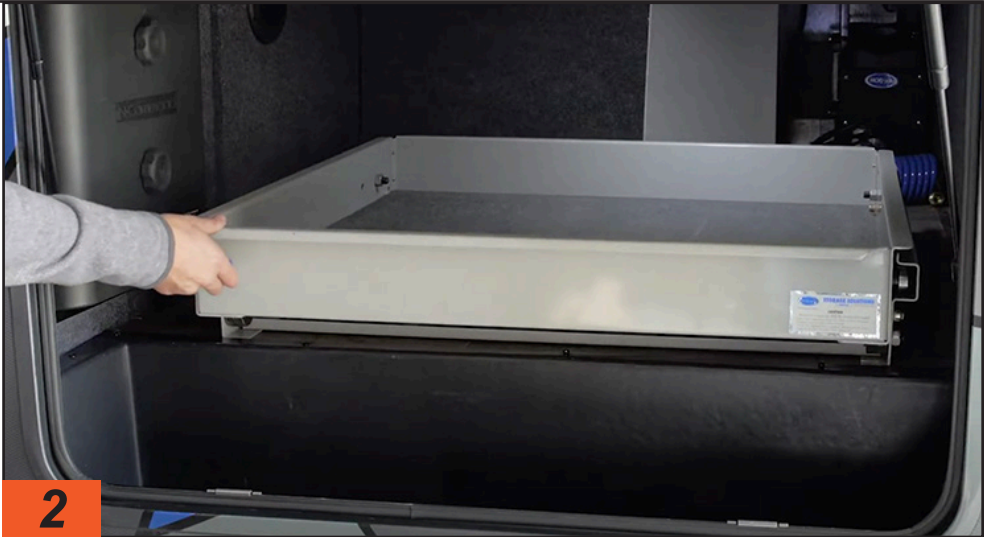
**1a**



**1b**

The MORryde tray comes completely assembled, including carpeted flooring. Once unpackaged, position the tray inside the compartment to ensure not only fitment but that it will clear the lip of the baggage door. If it doesn't, MORryde also offers cargo tray riser kits that provide additional heights of 1.625 to 3.125 inches (each kit includes six riser brackets).

For cargo bays, the company offers slideout trays that extend either 60% — capable of carrying up to 800 pounds — and 80% (with a 500-pound capacity). Either version comes completely assembled, including with carpeted trays and, as we discovered, are quite easy to install. Even better, they are available in a variety of width and lengths — from a 20-inch wide/36-inch-long tray to mammoth units stretching 52 inches wide and 90 inches deep. The 90-inch models also slide out from both sides, making them a perfect addition to pass-through storage bays. Each also comes with instructions and a universal hardware pack; you can replace the screws with different parts, if needed, but make sure first that you aren't hitting any plumbing or wiring beneath the cargo bay floor.



**2**

With the tray in place, check all clearance — sides and bottom — to ensure proper placement of the tray. Be careful not to fully extend the tray before mounting the rails to guard against its weight tipping forward.

About the only items you need to add are a tape measure, screw gun and a second person to help when moving the tray prior to installation. MORryde recommends placing the tray inside the cargo bay *before* cutting the banding to ensure that fitment and clearances are correct. Once that's been ascertained, you can cut the banding and extend the tray to check clearance on all sides of the compartment opening.



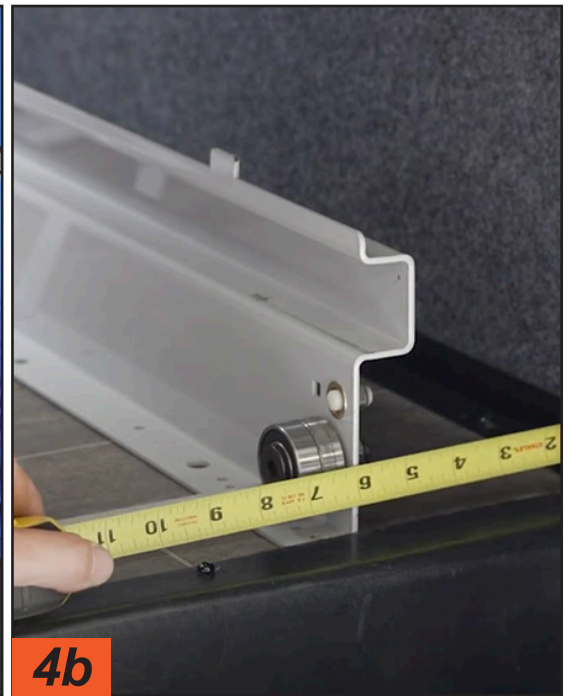
**3**

Remove the assembly from the cargo bay, place it on the ground and lift the release handle to extend the tray. Once it butts up against the stop tab, lift the front at an angle to move the tray over the stop bracket and separate from the base. If you've ever installed slideout trays in your kitchen cabinets, you're familiar with this process.

Installation is pretty simple, and made infinitely easier if you have someone helping to move the tray into and out of the RV. Once in place, just fill it with whatever parts and accessories you carry in your onboard "garage" — and relax knowing that everything is finally within reach.



**4a**



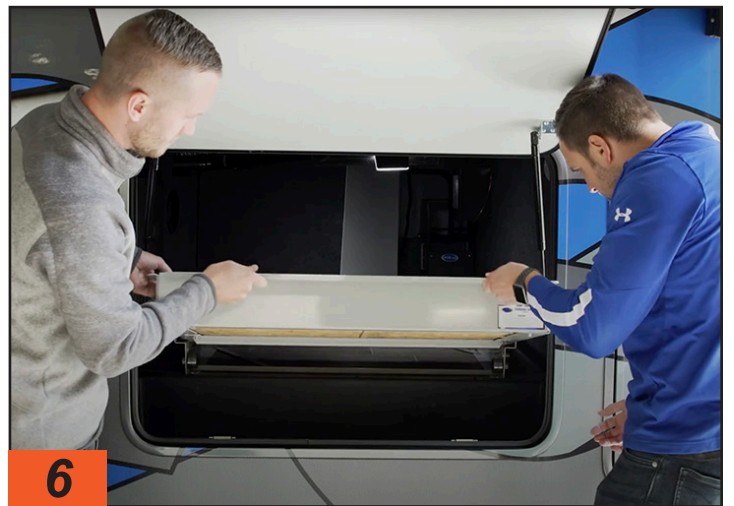
**4b**

Set the base inside the cargo compartment and use a tape measure to center the tray base. Measure both sides of the rail to ensure it's centered in the compartment, as well as corner-to-corner to ascertain squareness of the base prior to installation.



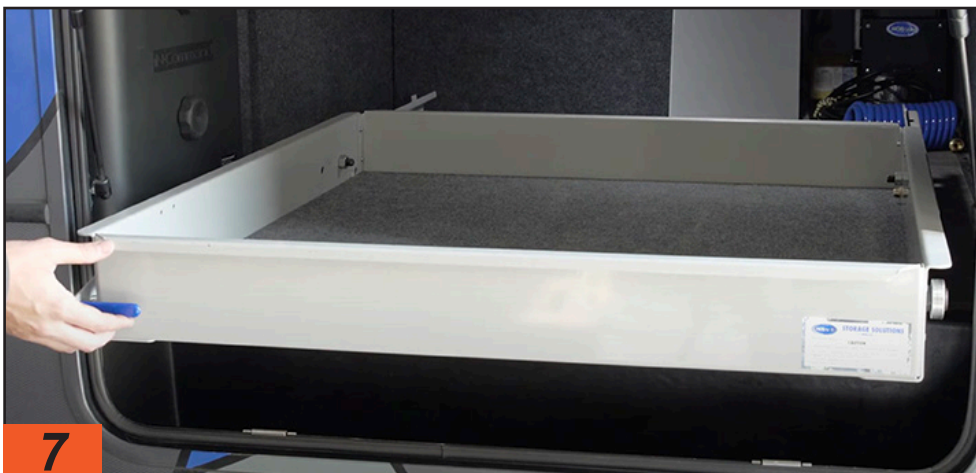
**5**

After ensuring that no plumbing or wiring will be compromised beneath the cargo flooring, secure each corner of the tray base/railing with a screw. Front screws will have to go in at a slight angle to clear the ball-bearings.



**6**

Once the base rails are screwed down at all four corners, guide the tray over the ball bearings, into the rail channels and back over the stop brackets. Again, the process is just like what you may have added to kitchen cabinets.



**7**

With the tray in place, release the latch and extend the tray to make sure everything is functioning properly. The tray only locks in the closed position.



**8**

Once everything has been checked for clearances and unencumbered operation, remove the tray again in order to access the additional holes in the side rails. MORryde recommends affixing the base using, at minimum, four screws per side (there are additional holes for more screws).



*That's really all there is to it. Do a final check to ensure everything is operating correctly — and fill it up. Don't worry — you probably can't overload it. Depending upon the tray size ordered, the MORryde slideout trays have a capacity of 500 or 800 pounds.*



*The MORryde trays utilize ball bearings for smooth operation, and are held in place by an easily actuated latch that solidly locks the tray when not in use but can be flipped by just one finger to release the mechanism, glide out the tray and access its contents. Once you push the tray back, it immediately locks into place. **RVE***

# Additional Support



*Extra-long awnings provide great shade for any RV — but can quickly develop sagging in the middle that can damage the roller tube. Installing a cradle automatically rotates to support the weight and keeps the awning straight and tidy when retracted.*

By Bill Gehr / Photos by the author

Just about all RVs are equipped with patio awnings these days — and for good reason: No one wants to bake in the sun and a patio awning provides the requisite shade. Most owners want as big an awning as possible — and that's the rub. While a big, expansive awning is nice to have, in most cases longer models sag in the middle when retracted. Over time, the bow in the roller tube can become more pronounced. We've all seen rolled-up awnings bouncing up and down when an RV is traveling down the road, and the added stress usually leads to damage, impeding the operation of the awning.

More to the point, it becomes unsightly.

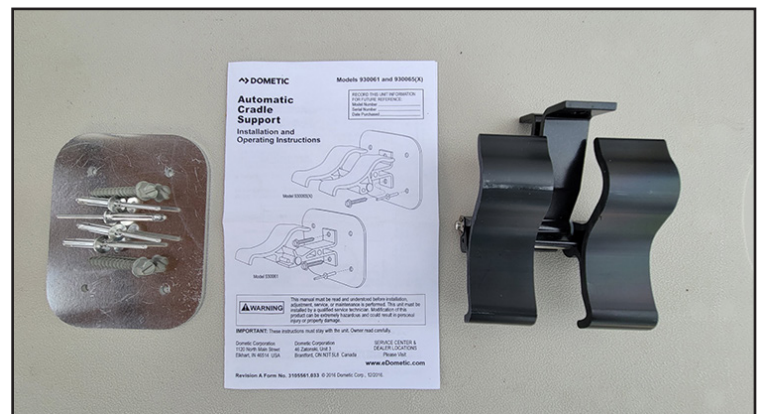
Taking preemptive measures can protect your investment, and the best way to mitigate sagging is to install a cradle support in the middle of the roller tube. Fortunately, it's easy to do.

Dometic is a big supplier of patio awnings to the RV industry and offers an Automatic Cradle Support assembly to prevent sagging (while the fabric is stored against the sidewall) that can be

installed below any brand awning that uses a roller tube to extend and retract the fabric. There are two kits available; one has a single cradle (part #930061) while the other uses dual cradles to support longer awnings (part #930065). For this project, the dual cradle kit was installed since the awning spanned nearly the entire length of the trailer and was sagging after just a few trips. Kits are available in black or silver colors;

the black looks better, in my opinion. The dual cradle kit can be found on Amazon for \$79.28, which is a bargain when compared to replacing a damaged roller tube and fabric. My experience with awning repairs suggests that all awnings longer than 17 feet should have a support.

There's not much to the installation — only common hand tools are required — but you will need one or two helpers and a ladder tall enough to reach the bottom of the rolled-up awning. You will also need a long length of 2x4 or 2x6 lumber to support the awning in the middle while you're trying to perform the install unless you've got somebody who can hold it up to provide access to the area when the holes are



*Dometic's Automatic Cradle Support kit (#930065) includes a double rotating cradle, a reinforcement (backing) plate and the necessary hardware. Instructions are clearly presented and simple to follow. The cradle assembly can be used to support all patio awnings that have a roller tube.*



**1** The first step is to locate the center of the awning tube. Here the awning spans almost the entire length of the trailer, making the cradle assembly necessary to prevent sagging.

rail. If you are unsure as to any support behind the sidewall (which is probably the case), the backing plate supplied with the kit must be installed first. I found it easier to mark the position of the cradle assembly on the plate, which was predrilled while it was secured in a vice instead of trying to do it on the sidewall. The plate was then taped to the sidewall and the appropriate pilot holes for

drilled. We improvised with a Pittsburgh 36-inch Ratcheting Bar Clamp/Spread-er procured at Harbor Freight ([harbor-freight.com](http://harbor-freight.com); \$19.99) rather than chase the lumber. The clamp was wedged between the roller tube and top of the ladder that was leaned against the trailer.

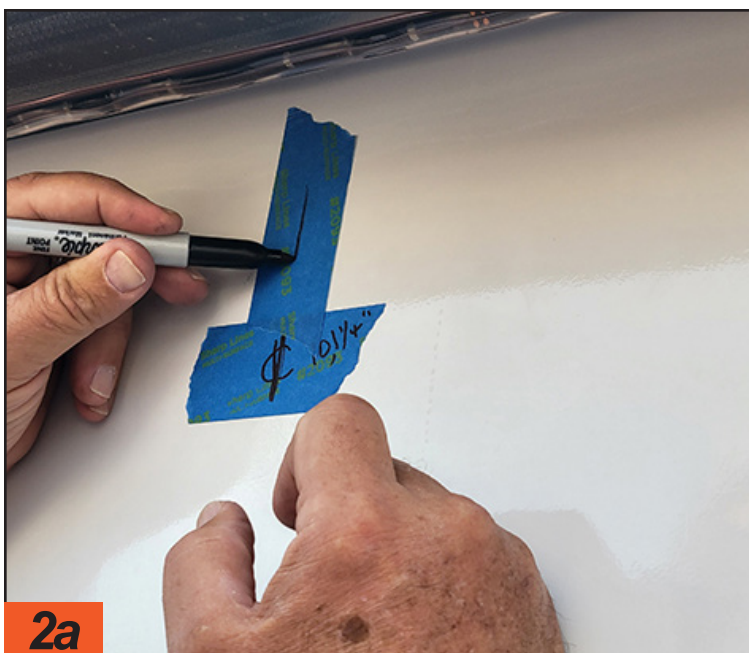
Start the installation by measuring the center of the awning roller tube. If there's a light fixture or some other obstruction in the way, the support can be moved to either immediate side

without affecting performance. Once the location was determined, painter's tape was stuck on the sidewall on which a black felt pen was used to mark the place where the cradle assembly would be mounted — and be clearly visible.

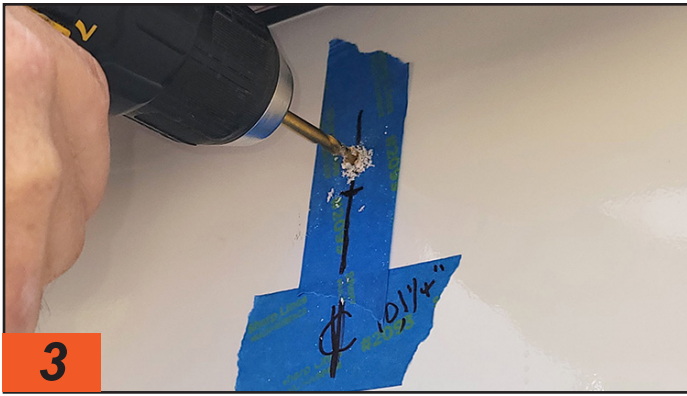
If you know there's adequate backing at the point where the cradle assembly will be installed, it can be affixed using lag screws directly through the wall. The cradle assembly must be positioned so it has a minimum of three inches of clearance below the awning

the two lag screws were drilled through the previously made holes and into the wall. Two of the rivets that came with the kit were pushed temporarily through the holes in the plate and wall. Doing so kept the plate aligned when drilling the four 3/16-inch holes for the rivets that secure the plate to the sidewall.

Silicone sealant was then pushed into the holes before installing the four rivets and again before driving the lag screws through the cradle assembly and completing the job.



**2a** Once the center point is established, painter's tape was used to mark the proper location of the cradle assembly. Any marks made directly to the sidewall will likely be permanent. The cradle must be a minimum of 3 inches from the awning rail, with no obstructions. If a light fixture or other obstruction is the center point, the cradle assembly can be moved to either side without impacting performance.



3

A pilot hole was drilled into the sidewall to establish the final location of the backing plate, which must be used if you are not sure there's adequate support behind the sidewall. Most owners will not know this and should plan on using the backing plate.



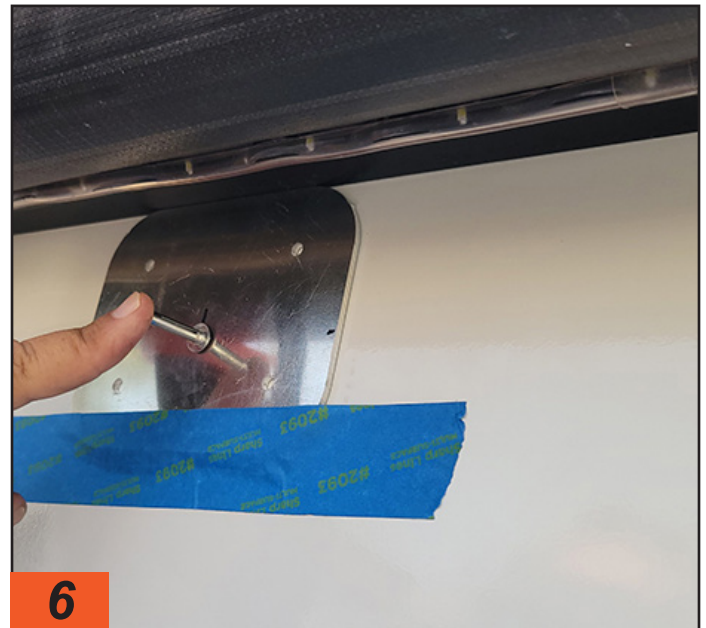
4

The respective holes for the cradle assembly were marked and drilled through the backing plate before placing on the sidewall. Here, the plate was marked on the bench and then moved to a vice for drilling (not shown).



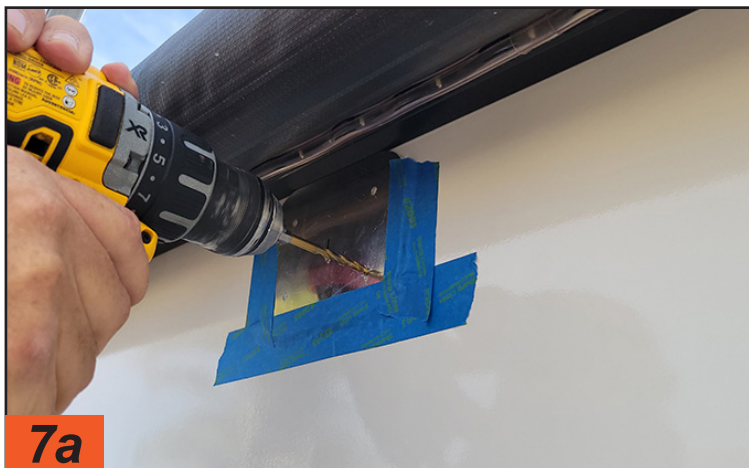
5

A long piece of 2 x 4-inch lumber (not shown) can be rigged up to hold the sagging roller tube out of the way when mounting the plate and cradle assembly. Rather than chase lumber, a Pittsburgh 36-inch Ratcheting Bar Clamp/Spreader, purchased at Harbor Freight for \$19.99, was wedged between the top of the ladder and roller tube to support it during the project.



6

The rivets that are supplied with the kit were put into double duty during the installation by inserting one temporarily through each lag-screw hole in the backing plate. Doing this held the plate securely while drilling the other holes.



7a



7b

Holes (3/16-inch) for the rivets that hold the backing plate to the sidewall were drilled through all four pre-punched holes. Again, a rivet was placed through another hole to keep the plate square during the drilling process.



8

*It's important to inject silicone sealant into any hole made in the sidewall before setting the rivets or driving the lag screws. Failure to add the sealant can lead to water leakage and sidewall structure damage.*

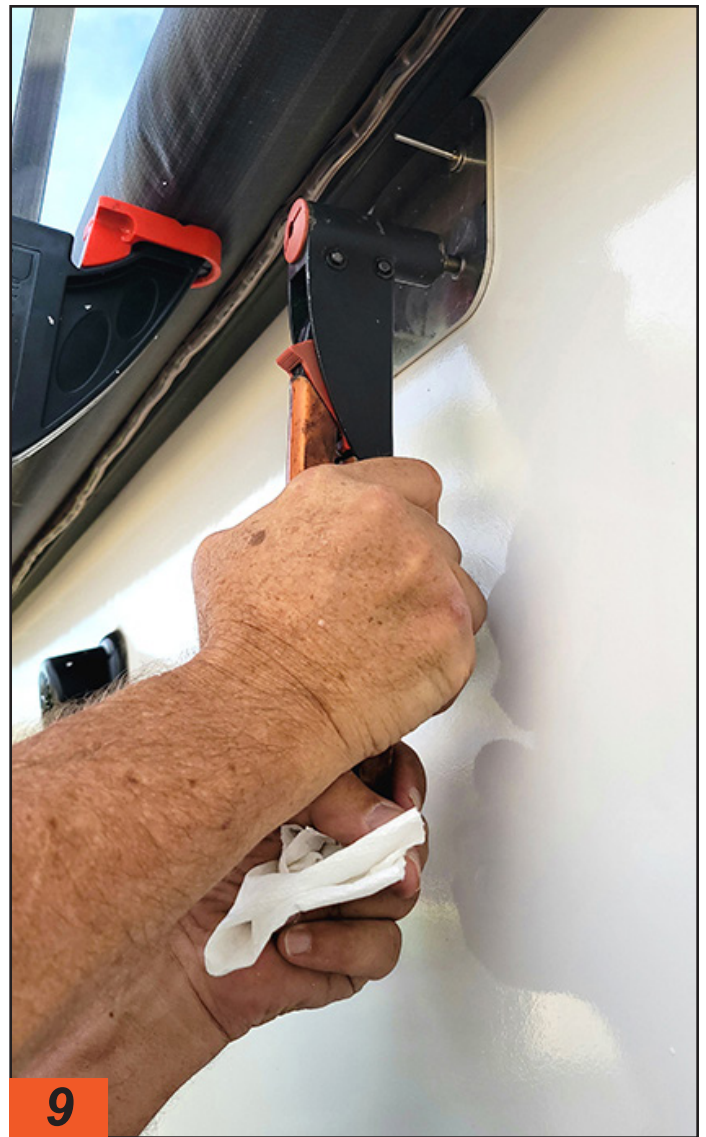


10a



10b

*The last step was to drive the two lag screws to mount the cradle assembly to the sidewall. It might be necessary to use a nut-driver extension to reach the top lag screw, as it was during this installation.*



9

*A simple rivet tool made short work out of setting the aluminum rivets in all four corners of the backing plate.*



11

*With the cradle assembly in place, roller tube sagging, which was pronounced on this trailer, was mitigated. The cradles automatically rotate into position as the fabric is retracted against the sidewall. **RVE***



# Quick Tips & Cool Tools

*Simple solutions for sometimes aggravating problems*

Sooner or later, just about everyone who owns an RV has come to grips with the need to maintain, repair or replace something. It just goes with the territory. Heck, that's why *RV Enthusiast* exists — to help guide do-it-yourself readers through the processes involved with easy-to-follow step-by-step methods.

But not everything needs to be fixed. Sometimes, what you're really looking for are ideas to make these space-challenged homes on wheels more user-friendly. Who, for example, couldn't use a bit more space — or add needed "tools" that take less space?

Here, then, are a number of solutions *RV Enthusiast* editors have found in their travels for making life on the road just a little easier. They range from sublimely simple (adding a plug-in adapter with multiple ports) to repairing exterior trim molding and creating additional interior storage — but they all have one thing in common: helping to bridge the gap between an RV and a brick-and-mortar residence.



## Baby, It's Too Cold in There

**Quick Tips & Tricks**



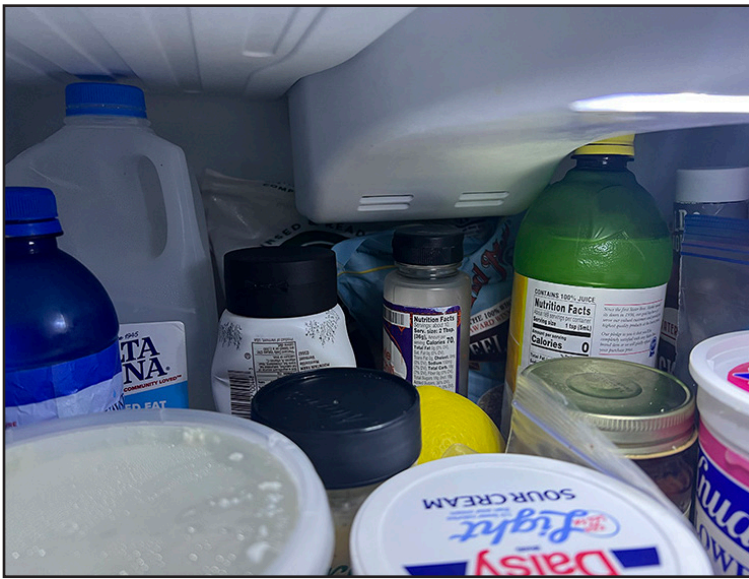
*Food freeze-ups are common when the air inside the refrigerator is not circulated evenly. Beech Lane's Fridge Fan is a simple solution to an aggravating situation.*

By Bob Livingston / Photos by author

Almost two years ago, I switched out the factory LP-gas/120-volt AC refrigerator in my Grand Design Reflection fifth wheel for an Everchill 12-volt DC compressor model. The replacement provided freedom from using propane — and added a whopping three additional cubic feet of storage capability in the same dedicated space. It works beautifully, and storing additional foodstuffs reduced runs to the market.

That said, while the inside temperature never budged more than 1-2 degrees F during 24/7 full-time service, there were a few cold spots in the back of the refrigerator that tended to freeze food, even in 100-degree F weather with the temperature button never set past the second of five levels.

A friend experienced the same situation in his identical refrigerator and suggested I try a fan to help circulate the air. As an old-timer, I was familiar with the inexpensive, blue fridge fans that run on a single D-cell battery. Back then it did help a little, but I was leery of once again purchasing this fan — which, incidentally, has been around for more than 40 years — for use in the



Stored food in the back many RV refrigerators tends to freeze, which can be frustrating — and in some cases, lead to food spoilage. Getting the air to circulate evenly was the job of the Beech Lane Fridge Fan.

larger refrigerator. But I was intrigued with the Beech Lane RV Fridge Fan my friend found on Amazon for only \$24.99.

Beech Lane's version is much heftier and, according to my friend, it works surprisingly well; subsequent testing on my part proved it does help keep box temperatures more constant. The three-blade fan moves air at 3,000 rpm, which is much more forceful than the earlier product I was familiar with, and is mounted in a nice-looking plastic housing that has a "spiderweb" top and



An On/Off rocker switch controls the three-blade fan that runs at 3,000 rpm, which is much faster than smaller fans on the market. Air vents are on two sides of the housing, plus the big one on top.

for a number of months now without having to change the batteries. Then, too, it can be switched off when not in use to further extend battery life. And while he swears by it, I can also attest, via initial testing, that food placed in the back of our refrigerator is much more resistant to freezing. And while it's not "silent running" — you can certainly hear it with the refrigerator door open — there's virtually no fan noise with the refrigerator door closed. Interestingly, when you put your hand over the vents the airflow is barely detectable, giving you a false sense that it's not doing much.

Beech Lane recommends placing the fan — which the company is in the midst of patenting, and backs with a lifetime warranty — on the bottom shelf to enable recirculation of falling cool air, which makes sense. I moved it around to accommodate food placement on various shelves and it seemed to be



The "spiderweb" top vent is designed to increase airflow and proved to do the job, even though placing your hand over the vents gave a false sense of low velocity.

side openings for increased airflow. It's just a little larger than 3 inches square and only weighs 6.4 ounces, though that increases a bit when you add the paired D-cell batteries needed for operation.

While Beech Lane also markets a version of this fan that can be hardwired to a 12-volt DC connection, my friend noted that he's used his battery-powered unit



The Fridge Fan is a little more than 3 inches, all around. It's super light and the housing is attractive. The diminutive size makes it possible to place on any shelf, depending on the loading of foodstuffs. Beech Lane recommends setting it on the lower shelf but placing it on the other shelves seemed to work equally as well.

equally effective.

Granted, given the choice between a refrigerator that may cool contents more than it should and one that doesn't cool down enough, I'll always choose the former — but foodstuffs can be ruined by freezing, too. Reducing the chances that your food will freeze is certainly worth the small investment and minimal effort.



Removing the bottom cover from the housing reveals the battery compartment; two D-cell batteries power the fan motor. According to my friend (who has used the fan for some time now), the batteries last for months; the jury is still out on full-time service. Even so, swapping out batteries once in a while is cheap insurance against possible food spoilage when you're on the road. **RVE**



**Quick Tips  
& Tricks**

## Hang It Up



*Just about all RVers carry oversize items, from a portable tote tank to patio chairs — but finding a good place to store them can be challenging. Thetford's Tote Storage System Ladder Mount is a good solution to an age-old dilemma.*

By Bob Livingston / Photos by Lynne Livingston and author

**R**vers who frequent campgrounds or primitive areas without a dump station are well aware of the benefits of carrying a tote that allows for emptying some of the waste/gray water in the holding tanks. It can be a dirty job, but using one of the more modern

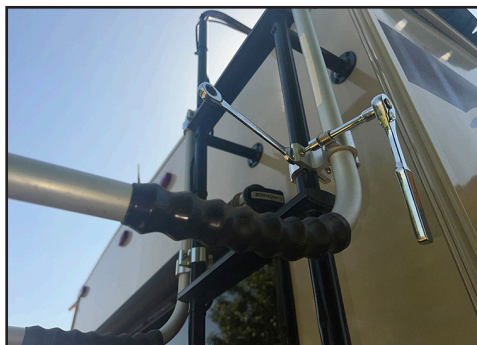
products, like Thetford's SmartTote2 LX ([thetford.com](http://thetford.com)), makes the job more palatable. Obviously, it's not something that most owners are comfortable storing in an exterior compartment, so hanging the tote on the ladder leading to the RV's rooftop makes the most sense.

When we carry our Thetford tote, it's mounted using the company's Tote Storage System Ladder Mount. This product works flawlessly, albeit we still have to hoist the tote on the ladder mount. Granted, it can be cumbersome, but it's worth the effort to add extra days to our camping. We simply empty some of the holding-tank contents into the tote and haul it to the closest dump station.

Since we seldom overwhelm the capabilities of the holding tanks while parked in primitive settings these days, we've also converted this mounting system to hold our folding chairs. In the past we carried bag chairs, but lately



*While there are other, simple brackets aimed at RVers who want to hang chairs and bicycles on their ladder, the Thetford system plays multiple roles — and has a sturdy look and feel.*



*The arms in the Thetford ladder mount are attached to the handrails that connect to the rungs. The brackets are installed using the provided Allen wrench or ratchet/socket and a backing wrench for the locking nut.*

we've turned to folding chairs stored on the ladder to save space in the outside compartments. Thetford's ladder mount works perfectly for hanging four folding chairs on the aluminum arms, which are super light but can handle up to 50 pounds. Plus, the arms fold to the sides so the ladder can still be climbed, if the



*A unique feature is to remove the locking pins from their respective holders, which release the arms and allow them to swing out of the way, freeing the ladder rungs from obstructions.*

need arises, without obstructions or safety concerns.

Moving the arms is accomplished by simply pulling the lock pin on each side from its holder. Of course, you'll need some type of step stool or ladder to reach the locking pins if the arms are installed on the higher side. It's safer to refrain from climbing up the RV ladder while hanging on with one hand and attempting to reach the pins.

Installing the mounting system is simple, with the only caveat to make sure you don't cover the tail/brake light when it is loaded with chairs or the tank. The arms are specific to left and right positioning to accommodate the proper swing from the ladder rungs and are mounted with brackets that attach to the tubes that comprise the latter structure and serve as handrails. The entire job takes about 30 minutes if you have someone who can help hold the arms while you tighten the fasten-

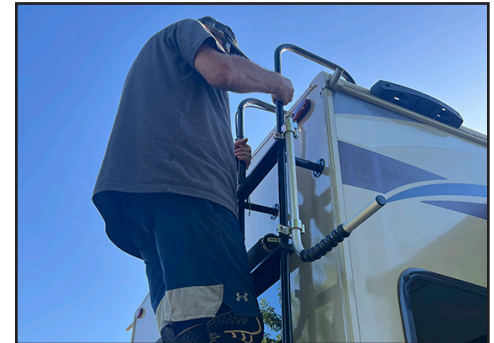
ers. An Allen wrench is provided, but a ratchet and appropriate socket, along with a backing wrench on the nut, work better. At that, the angles to reach the bolt heads may compromise a clear shot for tightening, which will require some maneuvering.

If you load the tote, the bottom of the tank rests on the arms that have a rubber-type grip on each arm extension; the included strap is used to secure the tote. When hanging the folding chairs, the arms extend through any practical opening between the frame and fabric and can be cradled with the detents in the arm grips. A strap can then be configured to hold the chairs in place.

The chairs hardly move while on the road and are easy to retrieve when setting up your patio in camp. If you take the tote, you'll have to find another place for the folding chairs — or go to bag chairs.

This ladder mount can be found

easily on the Internet and, last we checked, it was available at Camping World ([campingworld.com](http://campingworld.com)) for less than \$70. Having struggled with finding storage space for oversized equipment in the past, we found the convenience of having the Thetford ladder mount to be worth every penny.



*When the arms are turned to the sides, there is plenty of room to climb up the ladder safely. This feature allows the system to remain bolted to the ladder at all times.*



*Folding chairs can be placed on the arm extensions in any practical opening between the frame and fabric. The grip on each arm extension provides a quasi-cradle for the chair frame to rest against. After making sure the chairs are tightly packed on the arm extensions, a strap is used to assure they will not move while on the road. **RVE***





# Dust On, Dust Off

Quick Tips & Tricks

*A coating of dust on any surface will kill the shine. A California Car Duster easily removes dust — without harming the paint.*

By Bob Livingston / Photos by author

Keeping a tow vehicle or dinghy clean can be a never-ending battle. Wash the truck one day and by the time you reach your destination, it's dirty again. So, out comes the bucket and microfiber towels and after an hour or two, the paint is shiny clean. But what if the only "blemish" is dust? Car buffs who display their prized vehicles at shows always have mega-ex-

pensive paint jobs and they know that keeping the dust off is important. Most turn to a California Car Duster ([cal-carduster.com](http://cal-carduster.com)) for quick touch ups. It works well when removing the thin layer of dust on your tow or dinghy vehicle between trips, and can work well on an RV, too, although there's way more area to cover.

With the California Duster, dust is lifted off the surface by 100% cotton strands that have a special wax baked into the fibers (knock-offs commonly found online and at discount stores are not usually as effective). These strands of red-colored cotton will last a long time; as a matter of fact, the company says the duster will pick up more dust as the strands get dirtier. It's possible to wash the strands, but the company also recommends against it. Trust me, the duster lasts long enough to amortize the small investment in buying a new one — and the cost is worth the convenience afforded by fewer washing sessions.

I've been using the Original California Car Duster with a plastic handle (part #62443) for years and it seems



*The duster's mop head is made of 100% cotton strands that have baked-on wax to capture the dust. These strands last a long time, and according to the company, they work better as they get dirtier. Refrain from washing the mop head because doing so will degrade the effectiveness of the strands. This model comes with a plastic handle, but for a few bucks more, you can opt for a wooden version.*

to be large enough to clean my Ram 3500, dual-rear-wheel truck; it sells for \$20.99. The duster can also be purchased with a wooden handle (#62442) for \$27.99. I'm going to replace my current duster with the X-Large California Super Duster (#62557, \$32.99), which has a wooden handle and is 30 inches long; the extra reach and larger mop head will make it more practical to cover the hood and roof of the truck as well as RV sidewalls.

Recently, the California Mini Duster caught my attention. It's perfect for dusting dashboards and instrumentation. The Mini Duster (#62447) has a plastic handle and is 12 inches long — but the mop head is only 7 x 5 inches, which is small enough to reach into tight quarters. It's also perfect for dusting mini blinds inside the RV. All the dusters come with carry bags.

If you appreciate driving clean vehicles, you'll want a California Car Duster in your cleaning kit.



*The Original California Car Duster and the Super Duster come with storage bags. There are several knockoffs around, but they do not work as well.*



*A perfect companion to the California Car Duster is the Mini Duster, which is designed to get into tight areas, like the dashboard and instrument panel; it even works well cleaning mini blinds inside the RV. **RVE***



## Keeping accurate tabs on LP-gas levels in cylinders found on almost all towables is fast and easy with Truma's well-engineered Level Check.

By Bob Livingston / Photos by author

Propane is a vital source of energy for just about all travel trailers and fifth wheels — and most motorhomes — and when you run out unexpectedly, you'll have to do without until you can get to a re-filling station.

If you have a motorhome, you can check propane level on a remote monitor or, at the very least, via a gauge built into the tank. Unfortunately, most towables have no such gauge, leaving owners to monitor levels using unconventional methods like pouring hot water over the cylinder and running a



Truma's Level Check allows the user to establish the level of propane in any vertical cylinder. This device is engineered and built in Germany and locates the LP-gas level via ultrasound. This particular device has been kicked around inside a drawer for many years and even though it shows signs of surface wear, it still works perfectly.

hand down the side looking for a cold spot. Granted, some cylinders do have gauges — but most are not very accurate.

Trailers fitted with dual cylinders have an automatic switchover regulator, and if you're paying attention you'll know when one cylinder runs out, leaving the other in service long enough to get the empty cylinder filled. Rather than waiting until one cylinder is empty to determine propane supply, however, you can use a Truma Level Check device to monitor levels as often as you wish, circumventing surprises.

Unlike common — and less accurate — scales that require removal of the tank in order to weigh it and then engage in a bit of mathematics to "guess-timate" at remaining fuel, the Truma "gauge" uses ultrasound to accurately detect LP-gas levels in a cylinder. Locating LP-gas levels is accomplished by simply resting the end of the Level Check against the outside cylinder wall (Level Check is not designed for use on composite and horizontal cylinders) and watching for a green light, signifying there's propane at that point. If



To find the LP-gas level in the cylinder, the Truma device is pushed against the side-wall. If a red light is illuminated, there's no propane at that level; when the green light glows, the device has discovered how much LP-gas remains in the cylinder. This cylinder is just about empty.

the light turns red, there's no LP-gas at that point, so you'll continue to check multiple locations — up and down — until the light turns green, and that's the level. It doesn't get any easier.

There's even a LED light built in to help with close work in dark quarters like checking the regulator switchover sight gauge (that changes from green to red when the cylinder in service at the time is empty). Level Check operates on a 9-volt battery, which lasts for many years. My Level Check has been tossed around in a drawer for many years, and although it shows scratches and wear marks, it still works perfectly. Truma sells the Level Check on its website ([truma.net](http://truma.net)) for \$72.79 or you can find it on Amazon for the same price.



The Level Check is very well built and feels substantial in your hand. The back plate that provides access to the 9-volt battery has a screw to make sure it doesn't come lose inadvertently. This battery has been service for many years. **RVE**



**Quick Tips  
& Tricks**

## Aesthetically Speaking



*Trim molding that's falling off sidewall transition seams ruins the look of a well-kept RV. Finding matching material can be difficult — but restoring the original works amazingly well.*

By Bob Livingston / Photos by Lynne Livingston and author

**W**hen the trim molding that conceals the transition between the sidewall and lower section of a fifth wheel started peeling off, it was time to search for replacement material. While it's possible to find various



*After 14 years, the molding on the sidewall transition seams of this fifth wheel was starting to peel off. It took very little effort to remove the molding and get it ready for restoration.*

styles of trim molding, the people who sell this material are very proud of their prices — like, \$10 a foot proud. Realizing that the molding was in relatively good shape (only discolored and losing the stickiness of the foam tape), the owner of this 14-year-old Teton fifth wheel made the decision to restore the finish and re-stick the molding to the sidewall.

At first, I chuckled at the owner's thriftiness, but he's retired and has a lot of time on his hands, so restoring the finish just meant more time to drink beer throughout the project. A rattle can (spray paint to car buffs and graffiti "artists") of white paint, some fine-grit sandpaper, a few feet of double-sided acrylic foam 3M VHB tape and a tube of white silicone were acquired at a local home improvement store and on Amazon, and the project was on its way.

The first step was to remove the



*The first step was to rough up the surface with 220-grit sandpaper. A tedious task, but necessary to make the paint stick properly.*

remaining molding that was still stuck to the sidewall. The foam tape and silicone sealer were then scraped off the back side of the molding to make way for sanding; we also cleaned off the wall. Using 220 fine-grit sandpaper, the entire surface of the molding was roughed up to make sure the paint would stick and cure. From there the surface was cleaned with alcohol, sprayed with the paint and allowed to dry. The sanding was a little tedious and will take more time on longer sections of molding.

Amazingly, once the paint dried, the molding looked new. Two sections on the back side of the molding were lined with very thin 0.4-inch wide VHB foam mounting tape after cleaning with alcohol. (Refrain from using thicker tape because it will leave a bigger gap, which will ultimately look ugly.) The tape was procured from Amazon and cost \$14 for 33 feet. You can also use the same foam tape that was applied at the factory, but the VHB tape has a stronger adhesive.

Finally, the molding was allowed to sit overnight to make sure the VHB adhesive cured properly, then the top and bottom edges of the molding were treated with a bead of white silicone rubber. To be honest, the application of silicone here was thicker than desired since the owner didn't cut the tip at an angle and the tip was also cut too far back. The pros always cut the tip at an angle for this type of work to facilitate a more controllable application of sealant, which will mitigate time consuming clean-up and making smudges on the adjacent sidewall.

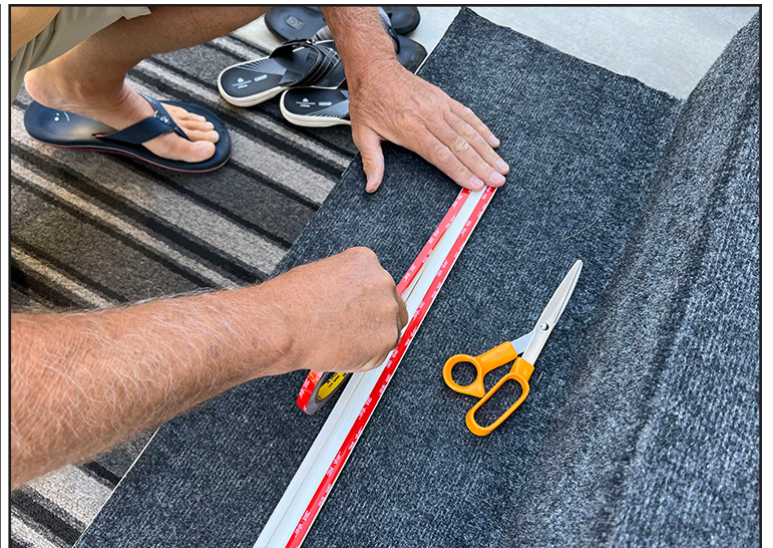
Sometimes, a little extra effort — as crazy as some projects seem — can go a long way toward restoring aesthetics.



Originally the molding was attached to the sidewalls with foam tape, which actually did a good job for many years. All the remaining tape was removed from the molding before proceeding.



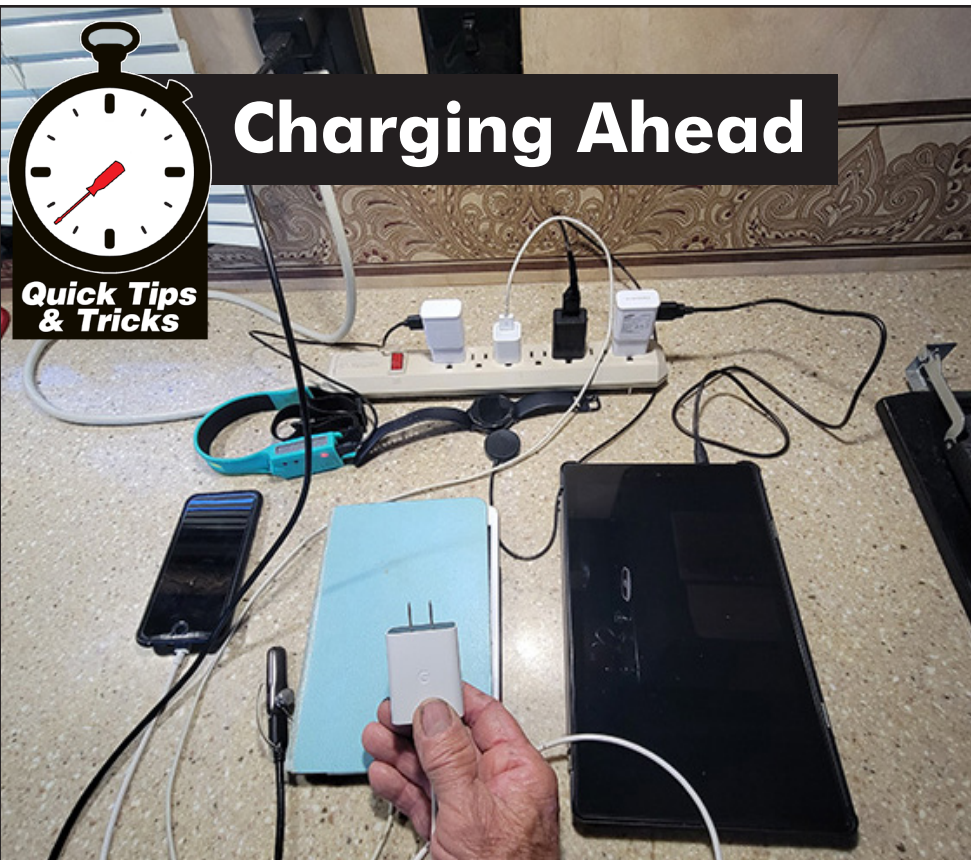
White spray paint was used to restore the molding color. Always spray light coats to prevent the paint from running. The paint was allowed to dry overnight.



A 33-foot roll of thin 3M VHB acrylic foam tape was purchased at Amazon for \$14. This 0.4-inch-wide, double sided tape offers superior holding properties if the surface is cleaned with alcohol beforehand. The VHB tape was attached to the upper and lower flat surfaces on the back side of the molding, in the same manner as the original foam tape. Take your time to make sure the lines are straight and not overlapping the molding edges.



After cleaning the entire length of the sidewall surface with alcohol, the molding was “stuck” to the wall, being very careful to keep the line straight. Finish by running a narrow bead of white silicone along the top and bottom edges of the molding. **RVE**



## Charging Ahead

*Charging portable electronics can be tough with only a few 120-volt AC receptacles in an RV. Adding a multiple-port plug-in adapter can end the hassle.*

By Bill Gehr / Photos by author

I never thought that at my age I would have so many electronic gadgets, but the convenience of having these devices is just part of modern daily life — especially for full-time RVers. Heck, I easily have more than a dozen devices that must be charged on a daily basis — and finding enough 120-volt AC power receptacles can be challenging. RVs typically are fitted with multiple duplex-only outlets and some are mount-

ed in less-than-ideal locations, making it necessary to scatter chargers all over the place.

I found an adapter on Amazon that makes it possible to charge all my devices from one location. It's called a "USB Wall Charger Surge Protection 5 Outlet Extender" but if you search for "Addtam wall charger" you'll find it listed on Amazon for only \$17.95. This product features four USB ports (with one being a USB C outlet), rated for a total of 4.5 amps of charging; three ports provide 2.4 amps, while the USB C outlet is rated for 3 amps. It also has five 120-volt AC power outlets with wide spacing, which come in handy if a higher-power charging module is needed. Surge protection is rated at 1,800 joules, so the need for a power strip is eliminated. Total 120-volt AC current is 1,500 watts.

Installation is completely plug-and-play; the adapter is designed to fit into any standard duplex outlet and can be moved at will. The compact design also makes it possible to plug the adapter into outlets mounted in close quarters,



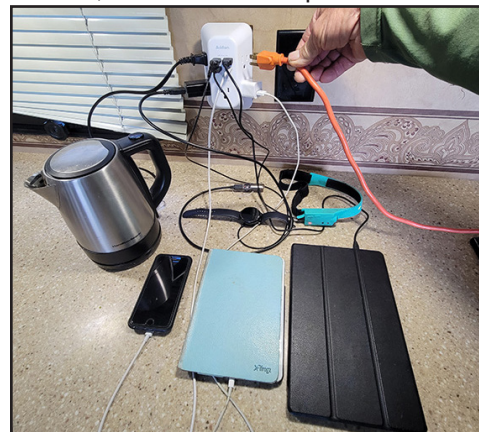
*The USB wall charger adapter simply plugs into any standard duplex 120-volt AC outlet. It's small enough to fit into close-fitting spaces typically found in RVs.*



*Plugging in the adapter converts a standard duplex outlet into a multi-device charging station. This model features three standard USB ports, one USB C outlet and five 120-volt AC outlets that are rated for 1,500 watts (total maximum output) and have wide spacing for plugging in larger charging modules.*

commonly found in RVs. Plus, the adapter is available either in white or black to complement most interiors, and similar models also feature a light sensor with a night light option.

Rarely do all my devices require charging at the same time, but with this power adapter I no longer need to dig out the individual charging modules. While one of these power adapters could suffice, I found it convenient to install another one near the nightstand in the bedroom to plug in the electric blanket, alarm clock and phone.



*Just about anything can be charged via the wall adapter, but total output will limit how many at one time. This image illustrates the variety of devices that can be charged from one location, and there is no need for a power strip since this adaptor has built in surge protection of 1,800 joules. Now, I just need to clean up all those cords. **RVE***



## Rake it Up

*Cleaning leaves and gravel around a campsite can be an exercise in futility. This folding rake takes little storage space — but gets the job done.*

By Bob Livingston / Photos by author

While nicer parks may have concrete or brick patios, most campgrounds are on the rustic side — meaning that you'll probably be parked on dirt or gravel, which will extend into the patio area along with maybe a little grass. Park operators normally tidy up the space before you get there, but the weather and environment might counter any of these efforts. Trying to clean the patio and



*Eleven tines make up the work end. These tines are large and extra heavy, so they will not bend easily. Wide spacing makes it easy to clean between the tines for storage.*

surrounding areas with a broom has its limitations, but for the most part it's better than nothing.

Using a rake is better, but a bulky full-size rake isn't something you're apt to pack. Fortunately, I found a take-apart "deciduous rake" that helps make short work of cleaning up any RV site — and its diminutive size understates its functional ability.

The Garden Rake Leaf is made by Homepark and is available on Amazon for only \$14.99, which is a great buy for such a high-quality tool. You'll have to do some chasing to find this rake, but Google "Homepark Garden Rake Leaf" and you'll be directed to the Amazon listings, which you'll probably need to comb through.

This rake has 11 heavy tines that are large, fairly stiff and stout, which adds some weight, but you'll be impressed with the quality; the extra wide spacing allows for easy cleaning. Four threaded, stainless-steel poles can be connected to make a 6-foot-long combined tool to mitigate too much back bending. Handling this rake will make you



*This compact rake has four pole sections that connect to extend to 6 feet; each section is 16 ½ inches. Poles are made of sturdy stainless-steel metal and have threaded ends and plastic hand grips, which make it easy to connect each section by simply twisting together. The last pole has a loop for hanging on a hook.*

wonder how the company can produce such a good product for the price. Plus, a printout that came with the rake recommends contacting the company upon receipt of the product if anything is missing or damaged. There's also an option to register the purchase for a **free** three-year replacement warranty.

I've used this rake numerous times to clear fallen leaves off the patio area and "sweep" rocks from concrete pads. It's a workhorse tool that's indispensable for keeping any RV space neat and clean.



*When folded, the rake takes up only a small amount of space in a storage compartment. A hook-and-loop strap can be used to keep the pole sections together, but they still seem a little unwieldy. It may take some experimentation to find a better way to keep the poles contained. **RVE***



*Finding “secret” unused space in an RV can be tough. Opening up a bedroom wall and adding a picture-frame “door” provided added capacity for storing extra clothing, sheets and towels.*

By Bill Gehr / Photos by Lorie Swoffer

Like most RVers, the search for extra storage space is ongoing in my fifth wheel. Most of the time, space can be freed up by getting rid of unused stuff and rearranging cupboards — but you also need to get creative. Years ago, I added a picture frame to where the television in the bedroom was once mounted to cover up the

holes needed to route cables. We never watched this TV, and the picture frame was a nice touch. One day I took the frame down to change the pictures — and it suddenly hit me: there was a huge empty space behind that wall.

Thinking outside the box (and knowing that there was absolutely no way to find a door that would match the wood color without enlisting a cabinet maker, which would be costly), I figured I could use the picture frame as the “door” and open up access that was behind the TV mount. I ordered a few small hinges and a magnetic latch from Amazon — and I was off to the races.

Cutting the hole through a wall that was reinforced with ¾-inch plywood to support the weight of the anticipated TV seemed like a daunting test, and of course promised to be very messy with sawdust and wood particles going everywhere. Fortunately, I had a good jigsaw and a very sharp extra-long blade, which was needed because it was not possible get all the way down into that recessed area with the jigsaw to make the cut. Before starting the project, I covered the foot of the jigsaw with masking tape to prevent scratching



*The metal jigsaw foot was covered with painter's tape to prevent scratching the adjacent wood when cutting the hole.*

or damaging the finished surface of the cabinets while trying to cut a large rectangular hole; drop cloths were spread out to catch the wood shrapnel.

Holes were first drilled through the wood along the marked outline in order to insert the jigsaw blade. For this project, I had to hold on to the jigsaw tightly to prevent kick back because the foot of the jigsaw was not always on a flat surface. At that, it did kick a couple of times — but there was no damage. Admittedly, I wasn't too worried about cutting a perfectly straight line since it would be covered by the picture frame;



*Cutting wood creates lots of sawdust, which was captured by painter's tarps that were spread out over the bed and lower cabinet structure.*



*After marking the outline for the cutout, large holes were drilled in several places to make room for the jigsaw blade when cutting in different directions.*

you may be more fastidious in your approach. I'll also go back and stain the cut edges to better match the cabinetry. The only real snag was another 3/4-inch-thick strip of plywood in the upper portion where I needed to cut (I believe this was there to help support the TV). After examination, a pry bar and a hammer were used ultimately remove the

support bar before continuing the cut.

After a lot of measuring to make sure the picture frame would be centered, the hinges were installed on the picture frame and one of the flat magnet sets were attached to keep the "door" closed tightly. The magnet catch can be purchased at Amazon for \$10.99 (Google "Cabinet Door Magnets Jiayi 6 pack").

I used the biggest picture frame that I could fit in the allocated space, which provided the extra space for clothing, sheets and/or towels.

The new picture frame is easy on the eyes — and finding "secret" space to store needed was worthy of a big pat on my back.



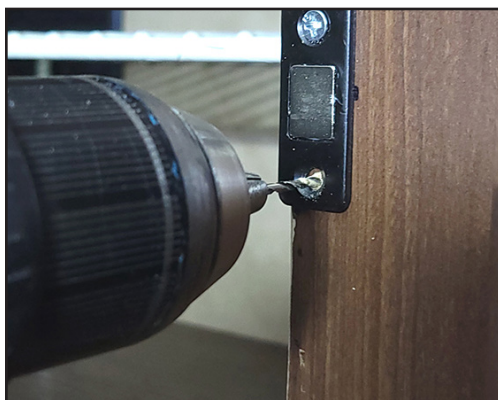
The only snag when cutting the hole was the raised perimeter that made it impossible to lay the jigsaw flat against the wood panel that held the TV. Also, it was impossible to get the jigsaw into the corner to make the final cut. A handsaw was used to cut through the last bit of wood.



Once all the cuts were made, the access panel was pulled away from the cabinet. This panel was made of 3/4-inch plywood, which was necessary to support the TV that was removed years ago. It's heavier than it looks.



Measurements were taken for locating the small hinges on the picture frame. These hinges are available in just about any hardware store.



One magnetic catch was needed to keep the picture frame closed. These catches are available on Amazon ("Cabinet Door Magnets Jiayi 6 pack," \$10.99). They can be attached with the enclosed screws or two-face tape; screws were used here.



I also found a vinyl-coated wire shelf that fit perfectly inside the new compartment, which maximized the space for sheets, towels or clothing. **RVE**



**Quick Tips  
& Tricks**

## Tow-Link Lube Job



Inspect the jaws that wrap around the fifth-wheel kingpin for any signs of adverse wear. Follow the manufacturer's requirement for lubrication.

*Reducing wear-and-tear on that all-important hookup between trailer/tow vehicle or motorhome/dinghy can pay dividends.*

By Bill Gehr / Photos by Lorie Swoffer

**G**etting back on the road is exciting — or it should be. The anticipation of finally rolling

down the highway is only outdone when driving up the onramp with your favorite tunes surrounding the cockpit, whether



Made of tough wear-resistant polyethylene, CURT Mfg.'s fifth wheel lube plate keeps the hitch head-to-kingpin box contact lubricated without requiring grease.

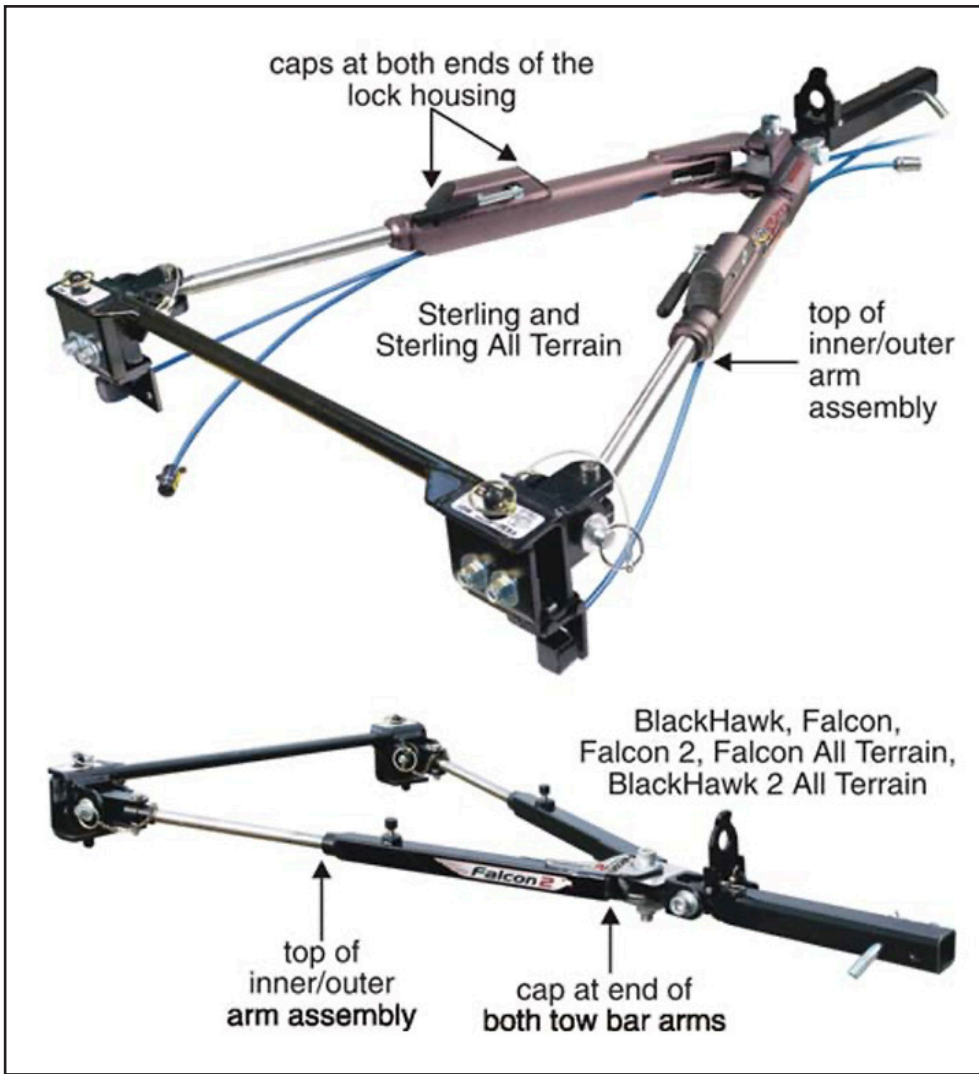
it be a tow vehicle or motorhome. If you've planned properly and made sure the RV is roadworthy, however, you'll likely experience an adventure with little trepidation. Simply hoping that everything will work via osmosis can get you in big trouble.

Oddly enough, many RVers are fastidious in checking over their RV — but tend to neglect

their hitch or tow bar. It's easy to take the connection point between the tow vehicle and trailer or motorhome and dinghy for granted, but moving metal parts must be lubricated properly to maintain safety and longevity. Here are a few reminders before heading out and expecting that all-too-important vehicle link to "just work like it's supposed to."

- If you have a weight-distributing hitch, check for wear on the pressure points (spring bar tips) and lubricate moving parts in compliance with the manufacturer's recommendations. Follow the instructions carefully since some hitch manufacturers require no or little lubrications. In all cases, this is one area where more is not always better.

- Carefully inspect the jaws and all the working parts in the saddle of the fifth wheel hitch (if so equipped) to make sure that they are clear of dirt and debris, which can lead to abnormal



This overview from Roadmaster shows the lubrication points for its various tow bars.

wear.

- Know that if you don't want to frequently inspect your fifth wheel hitch head from wear between the hitch head and kingpin box (the "skid plate"), an easy alternative is to acquire a lube plate. CURT Mfg.'s 10-inch-diameter fifth wheel hitch lube plate (#16721, \$11.80



Mission Automotive's Hitch Ball Lubricant is a high-film-strength, waterproof and non-straining grease that's said to be compatible with all major hitch brands and can also be used for metal-to-metal contact locations with the receiver, couplers and jacks.

at Amazon), for example, is said to be compatible with any standard fifth wheel kingpin. Similar products are available from Reese, EAZ-LIFT, Camco, Husky and others.

- Tow bars also require maintenance — and they do wear out — so before you head out, hook up the dinghy vehicle for a dry run to make sure there are no obvious loose parts and a bunch of clunking sounds. It's hard to hear or see anything from the cockpit of a motorhome, so for this dry run, ask your partner or someone else to move the motorhome forward while you watch and listen for issues. Tow bar arms that do not move freely could be bent, for example, and should be repaired before heading out on the road.

While lubricating a tow bar will differ slightly between models due to different components (read the "care and cleaning" section in your owner's manual for specific information), they should all be cleaned first with a water-soluble cleaner. Never use petroleum-based

products for lubrication, which attract dirt and dust (and may even corrode bushings). Instead, use a dry silicone aerosol (Roadmaster, for example, recommends Voom RV Cleaner to remove the dirt and LubeMaster to lubricate) for all moving parts. Once it's dry, actuate the tow-bar components to work the lubricant in. Just be sure the mechanism is completely dry before the lube job.

Know, however, that all the lubrication in the world will not fix broken parts. Most tow bar manufacturers are happy to assist with repairs, so if you suspect something is not right, reach out to their technicians for assistance in correcting problems. All the tow bar manufacturers offer programs for rebuilding their products.

By the way: while it's not required, hitch manufacturers do recommend greasing the hitch ball to help maintain its integrity.

While in "lubrication mode," here's a bonus tip: There are other places where reducing friction will help keep things moving smoothly — and lasting longer. For example, the entry step. Lubricate your step, whether it's a manual pull-out model on a trailer or a fifth wheel or an automatic electric step integrated into a Class A motorhome. A light oil works well — one of our favorites is Tri-Flow Superior Lubricant with PTFE. This goes on lightly, dries almost completely, removes dirt and corrosion and stays in place for a long period of time. The drip bottle has a plastic straw that allows the user to direct the lubricant with control. Lubricate every joint and work the step in and out several times. Then, do it again and allow the lubricated points to dry. Tri-Flow Superior Lubricant is sold on Amazon and is available at hardware stores and Walmart.



The entry step is one of the most heavily used items on any RV. Inspect for adverse wear and lubricate any moving parts. We like using Tri-Flow Superior Lubricant with PTFE. **RVE**



products, which are available as kits or customizable and suitable for all types of RVs. The company's team experts also are available to help customers choose the best products for their specific needs. For information, visit: [cdnsolar.ca/collections/rv-solar-kits](https://cdnsolar.ca/collections/rv-solar-kits).

## Jayco Launches Online 'RV Universities' for Starcraft, Highland Ridge



In collaboration with The National RV Training Academy (NRVTA), Highland Ridge and Starcraft RV — two brands within the Jayco family of RVs — have launched a series of training videos to help educate owners on the operation of their recreation vehicles.

In 2022, Tony Flammia, NRVTA's director of sales and marketing, Todd Henson, Director of Education and Lead Technical Instructor, and a film crew from NRVTA visited Jayco's Middlebury, Indiana, campus where they filmed more than 70 walk-through style training videos focused on specific components and systems used in Highland Ridge and Starcraft RVs. These videos were paired with existing videos on exclusive systems (like TravellINK, which is utilized on select models) to create a full curriculum housed in an online learning management system.

And, it's offered free of charge to

current or potential owners.

To learn more about the Jayco, Starcraft and Highland Ridge RV Universities and to enroll free of charge, visit [jaycofamily.com/JFOC-University-NRVTA/](https://jaycofamily.com/JFOC-University-NRVTA/).

## Lance Unveils New Travel Trailer, Website



Lance Camper Manufacturing Corp. has launched its updated website — including 2023 product enhancements — along with an all-new travel trailer floorplan, the 1875.

The updated site includes information on what is new for Lance in 2023, including implementation of the TST tire pressure monitoring system in its towable line and the exclusive use of Truma brand appliances for air conditioning, forced air furnaces and water heaters in all models.

Users can also explore all products, including Lance's all-new [1875 travel trailer](#), which expands on the highly popular 14- to 24-foot box length lineup. With a gross dry weight of 5,170 pounds and an overall length of 23 feet, this new travel trailer features a large bathroom with residential vessel-styled sink and high-rise faucet, 40-inch

## Single-Brand Dealerships Coming

Anyone who's ever spent time on a dealer lot may have been overwhelmed at the choices available — most every RV manufacturer has multiple brands

smart LCD TV and convertible sofa/ queen bed. Within its size and weight class, this simple and highly functional layout is meant to complement Lance's offering of ultra-premium highly towable units. For more information, visit [Lance Camper Mfg. Corp.](https://LanceCamperMfg.Corp.)

all competing at specific price points. Now Camping World — the world's largest RV retailer is taking a page, perhaps, from the automotive industry by introducing an "industry first" format where certain dealerships will be dedicated to selling, servicing and showcasing just one brand.

"We believe our growth can be accelerated by acquiring or opening dealerships that will ultimately be focused exclusively on the leading RV brands in America," said Marcus Lemonis, chairman and CEO of Camping World.

In addition to the manufacturer-specific brands, these locations would offer used RVs, service, and the entire portfolio of Good Sam products and services.

The recent opening of Jayco Morgan Hill in California marks the first wave of this rollout. This format is designed to both complement and operate in parallel with the existing traditional Camping World branded footprint. The company intends to open, acquire, or convert manufacturer exclusive locations across its network.



*This Morgan Hill, California, dealership is the first of several OEM-exclusive RV retail locations planned by Camping World. RVE*

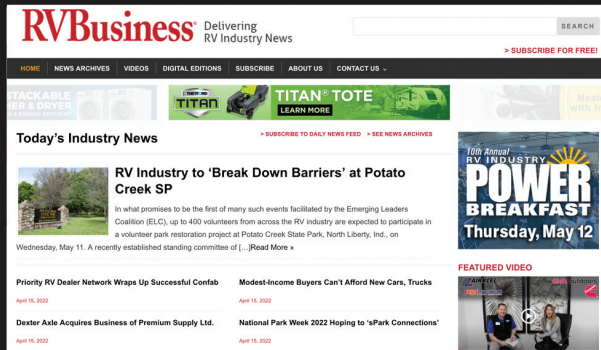
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Advertiser	Website	Page
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<a href="#">Brazel's RV/ Ultra RV Products</a>	<a href="https://urvp.com">urvp.com</a>	11
<a href="#">GoPower!</a>	<a href="https://gopowersolar.com">gopowersolar.com</a>	60
<a href="#">Hopkins Mfg.</a>	<a href="https://hopkinstowingsolutions.com">hopkinstowingsolutions.com</a>	10
<a href="#">Lippert</a>	<a href="https://lci1.com">lci1.com</a>	2, 7
<a href="#">Roadmaster</a>	<a href="https://roadmasterinc.com">roadmasterinc.com</a>	5
<a href="#">RV Business</a>	<a href="https://rvbusiness.com">rvbusiness.com</a>	55
<a href="#">Yamaha</a>	<a href="https://yamahamotorsports.com">yamahamotorsports.com</a>	9

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# Tow Bar Two-Step



*Proprietary hookup brackets vary in style and execution among the 'Big Three' manufacturers of such equipment. Fortunately, Roadmaster has you covered if you want use one of its tow bars on Blue Ox or Demco baseplates.*

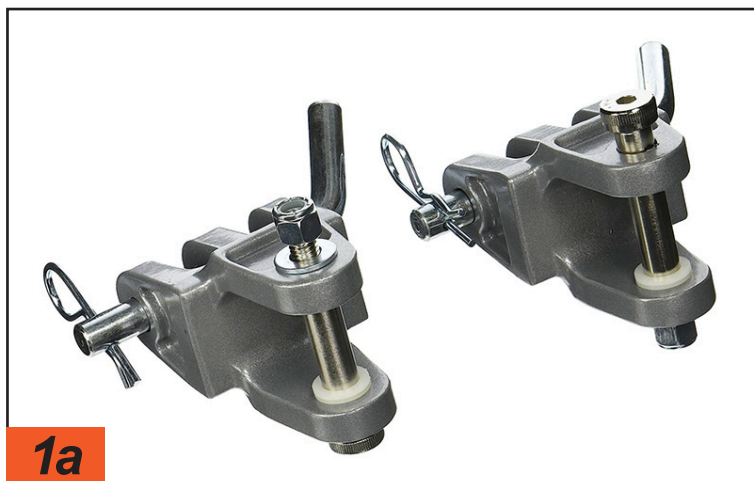
By Bob Livingston / Photos by the author

Towing a dinghy vehicle is so popular that you hardly ever see a solo motorhome meandering down the highway. Suitable cars, SUVs and trucks tagging along these days are usually connected by tow bars that slide into the motorhome's 2-inch receiver and stay there while the dinghy is disconnected. Making the connection to the dinghy vehicle varies among suppliers of tow bars, but fortunately, in-

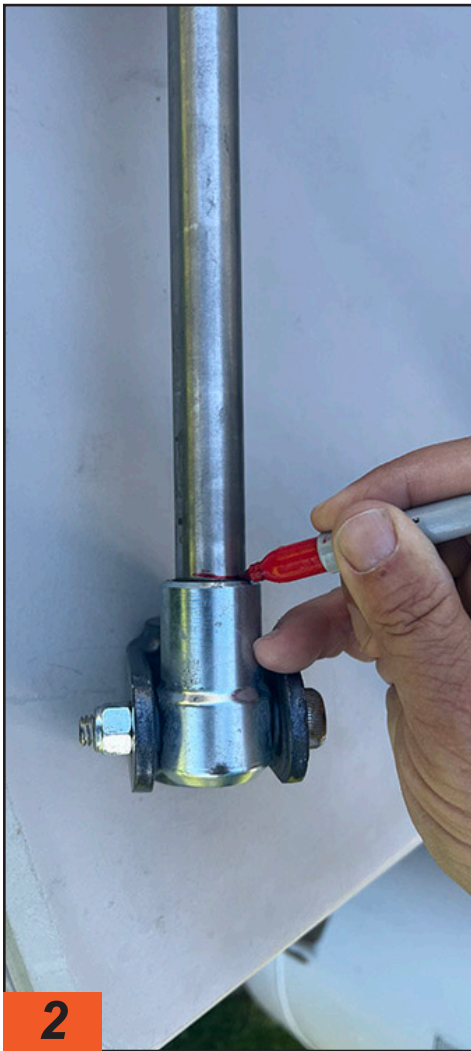
terchangeability allows owners to make hardware changes without the expense of also swapping out the baseplates or adding a crossbar. Blue Ox, Demco and Roadmaster all offer adapters to cinch up this vital connection when using dissimilarly branded components.

Case in point: An owner of a well-used, 9-year-old Blue Ox tow bar "inherited" a fairly new Roadmaster counterpart from a friend who decid-

ed to go from a motorhome to a fifth wheel. The Blue Ox tow bar served the owner with little complaint over the years, but the idea of having almost fresh equipment was appealing — except for the stress of having to replace the baseplate. That, however, was not necessary. Roadmaster offers a "Tow Bar Adapter/Swivel Ear Replacement Kit" ([roadmasterinc.com](http://roadmasterinc.com)) that allow its tow bars to connect seamlessly with the



*The original swivel ear on the Roadmaster Falcon All-Terrain is completely different from that used to connect a Blue Ox tow bar. Replacement swivel ears for Blue Ox and Demco baseplates are available from Roadmaster, Amazon or e-trailer. The simple upgrade includes one pair of adapters with base pins.*



**2**

The first step is to mark the existing location of the round nuts on the two bar arms. These nuts must not move during the replacement process. If either one moves forward, the shoulder bolt will not fit and if moved backwards, the round nut can rotate off the tow bar arm, which can lead to dinghy vehicle separation. The process is simple, but care must be taken when making the swap.



**3**

Once the round nuts are marked for position, the original shoulder bolt is removed from the first arm. This is done by removing the 3/8-inch lock nut from the shoulder bolt. It best to only work on one arm at a time.



**4**

While removing the original shoulder bolt, make sure the round nut remains lined up with the position marked earlier with the felt tip pen. You'll need an Allen wrench and socket/ratchet to complete this step.

removable baseplate tabs that form the two hookup points for the Blue Ox tow bar. The kit for this project (referred to simply as "The 031" within Roadmaster's extensive tow bar and baseplate adapter offerings) made it possible to connect Roadmaster's Falcon All-Terrain tow bar to the Blue Ox baseplate.

As far as retrofit projects go, this one could not have been easier. It's a direct bolt-up job with few complications, other than to make sure that the new Roadmaster swivel ears are in the right position.

The first step is to mark the existing position of the round nut that is attached to each tow bar arm with a felt tip marker. This is a critical step,

because moving the round nut forward during the retrofit process will make it impossible to install the new swivel ear — and moving it backward will prevent the shoulder bolt from holding the round nut in place. If the latter happens, the round nut can back off the tow bar arm, along with the new swivel ear, causing separation while towing. Although the warnings seem ominous, it's not difficult to get it right.

Once the original position of both round nuts are marked, it's just a matter of removing the 3/8-inch lock nut from the Allen-head shoulder bolt and removing the original swivel ear. These bolts will be discarded.

Installing the new swivel ears re-

quires positioning the plastic washers between the new swivel ears and the round nuts, installing the new Allen head shoulder bolts and torquing the nuts to 45 ft.-lb. The heads of the shoulder bolts must be flush to the swivel ears before tightening the lock nuts. If the installation is correct, the new swivel ears will rotate no more than 10-15 degrees in either direction. The entire job will take less than one hour; the swivel ear replacement kits sell for \$100 on Amazon.

Hooking up the new Roadmaster tow bar to the Blue Ox baseplate requires the same procedure; simply line up the swivel ears to the baseplate tabs and insert the pins.



**5a** Next, one plastic spacer was placed on the new shoulder bolt before maneuvering the swivel ear onto the round nut. The second plastic washer (not shown) was then placed against the other side of the swivel ear as the shoulder bolt was maneuvered into position.



**6** The position of the round nut was again confirmed against the earlier marking and the shoulder bolt was ready for tightening. It takes a little finesse to line up the shoulder bolt through the swivel ear, round nut and tow bar arm, so take your time and get it right.

**7** Before final tightening of the shoulder bolt, the new swivel ears were checked for proper rotation. If the installation is right, the swivel ear will not rotate more than 10 to 15 degrees in either direction.



**8**

The new shoulder bolt was torqued to 45 ft.-lbs. using a calibrated torque wrench and a second person holding a long handle ratchet with Allen socket (a standard Allen wrench is too hard on your hands). Although 45 ft.-lb. does not seem like much, the swivel end is bulky and moves freely during the tightening process. Enlisting a second set of hands will make the process much easier — and save your knuckles. Hawaiian shirt is optional.



**9**

Hitching up the dinghy vehicle was pretty much the same. The Roadmaster Falcon All-Terrain was connected to the 2-inch receiver on the motorhome and the arms spread to match the Blue Ox removable baseplate tabs.



**10a**



**10b**

Roadmaster's replacement swivel ears fit perfectly in the Blue Ox baseplate tabs. The owner opted to use the existing pins to because he preferred the locking bales over the standard-type clips.



**11a**



**11b**

Finally, a new cover was placed on the tow bar to protect it from the elements and, of course, look nicer in camp. Roadmaster offers custom covers for all its tow bars; the RM-055-3 cover for the Falcon All-Terrain sells for \$67.95 on e-trailer ([etrailer.com](http://etrailer.com)). **RVE**



## HAZARDS & EARLY FAILURES – WHY QUALITY MATTERS WHEN SHOPPING FOR LITHIUM BATTERIES

by Eva Mitic, Marketing Manager, Go Power! | Dometic

For all outdoor adventurers out there, lithium batteries are now the go-to solution for a quick upgrade to their mobile power system. They are lighter and provide a much longer lifespan than their lead-acid counterparts. No wonder these power sources have established themselves as key components for RVers across North America.

But there are vast differences in quality. Offshore manufacturers are flooding the market with cheap products that do not meet our standards. Battery fires, shortened battery life, failure on the road, poor performance and dealing with toxic materials can result from an ill-advised purchase. But how can you protect yourself when making this investment?

### Lithium battery buying tips

#### 1. Choose quality over price

Properly investing in an RV battery is essential for reliable, consistent power on the road - especially when you are off the beaten track. When considering your purchase options, make sure to source only certified products that have been specifically designed and tested with mobile living in mind. Don't let price be your deciding factor; choosing quality helps avoid any power-less moments.

#### 2. Buy with confidence

Domestic suppliers often adhere to higher quality standards in terms of testing – something that is often lacking from imported products without physical representation in North America. Filing a warranty claim with a company abroad can be challenging, especially when dealing with complex items like lithium batteries. Make sure to select a provider that will stand by their product. So, for peace of mind, safety, and product support, trust a provider with a history of quality.

#### 3. Use a reputable supplier

Always research the company whose products you're buying to ensure they have a reliable track record in creating quality RV-ready products. For optimal performance, consider looking into vendors specializing in engineering mobile solutions and apply rigorous testing of all the needed components as one coherent system.

Are you interested in upgrading to Lithium?  
Contact your local RV Dealer or visit  
[gopowersolar.com](http://gopowersolar.com) for more information.

