

Best Towable Suspension Upgrades

RVENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE

May/June 2024

Absorption Refrigerator Tips & Tricks!

- *Cleaning & Maintenance*
- *Installing Fire (THIA by Proteng) and Overheating (ARP Fridge Defend) Safeguards*

Plus!

- *Fixing Flopping Fender Skirts*
- *'Hands-On' Toilet Paper Test*
- *Enhancing RV Shower Time*

Did you know that on a typical highway, your RV trailer experiences the equivalent of a 3.2 magnitude earthquake?

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- Axle Roll-up
- Suspension Rebound

Comfort Ride can, in fact, absorb 80% of the forces contributing to trailer damage and water leaks.

Comfort Ride uses Slipper Springs to break the connection between the front and rear axle. Both the front and rear springs will slide forward and backward in response to road conditions *without* transferring energy to the trailer. This movement absorbs and dissipates a significant amount of energy that would otherwise make your trailer ride rough, sway and tow poorly.

While Comfort Ride Slipper Springs significantly reduce rough travel by themselves, when combined with the Comfort Ride Shock System you can expect up to a 50% reduction in induced road energy transmitted to your RV on smooth roads — and the rougher the road, the greater the benefits: testing revealed a 76% reduction when driving across cobblestones and a 94% reduction when crossing gravel roadways!



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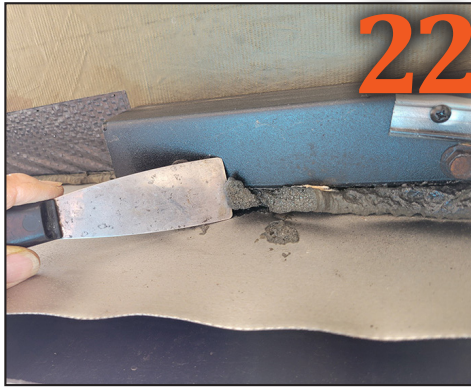
RV ENTHUSIAST

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May-June 2024

Volume 4, Number 3

INSIDE



Stop Skirting the Issue - Besides improving appearances, trailer fender skirts actually do serve a purpose by keeping road spray under control. However, they are usually made of thin plastic and oftentimes will crack or even flop about before eventually taking flight. Here's a simple fix using automotive fender bolts and locking stainless-steel nuts.



Seeking a More Civilized Ride - The essential design of a leaf-spring suspension hasn't changed much since the days of the Old West. Fortunately, the RV aftermarket has responded, with companies offering a plethora of suspension upgrades that can smooth out the bumps and limit premature frame and body wear to your towable.



The Great Wipe-Off - The dreaded "poo pyramid" is a real thing and can make cleaning out holding tanks a nightmare. Knowing what products to use can help — so we've taken it upon ourselves to test the most popular toilet papers on the market. How did yours fare?



Shower for Hours - Most RV travelers quickly learn how to take a "Navy shower" to save water — but there are alternatives. Ecocamel's Orbit showerhead provides a super-strong stream while reducing consumption — and it can even soften the water.

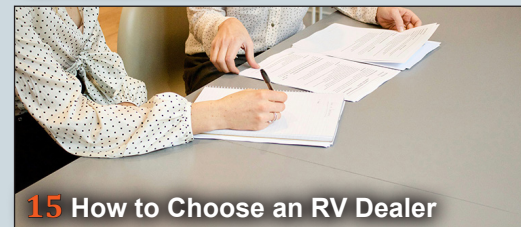
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Recreational vehicles aren't perfect, but manufacturers are making improvements — urged on in no small way by the aftermarket. But it still behooves owners to educate themselves and be proactive in circumventing potential issues.

10 News & Notes



15 How to Choose an RV Dealer

Your first interaction with an RV dealer is crucial. In part two of our series, Campers Inn COO Ben Hirsh offers consumers tips on how to pick a dealer based upon its sales operations — from initial engagement to unit presentation, pricing and fees and post-sale availability.



18 Technically Speaking

The wear — and tear — on slideout toppers has one reader singing the blues, while another needs a bit of assistance on plumbing woes. And for anyone with an RV suffering from delamination, there's also a "backyard" repair that can work wonders.

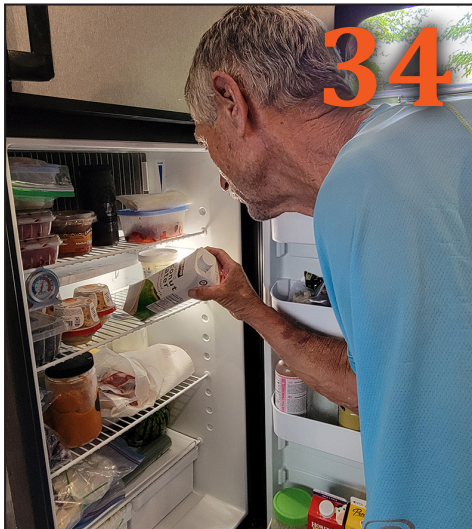


On The Cover

Adding bullet connectors to install ARP Fridge Defend components.
Photo by Bill Gehr

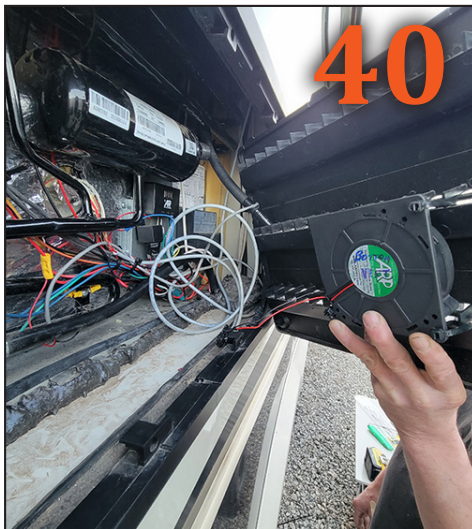
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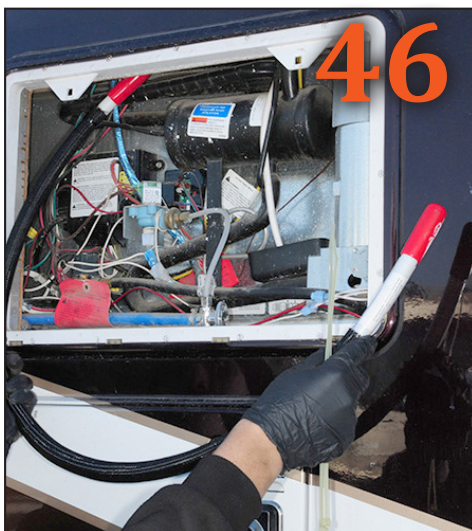
Absorption Refrigerator Maintenance Tips -

Absorption refrigerators have been in use in RVs seemingly forever — and for good reason: the design is simple and works. But they also are susceptible to problems, especially if used off-level. You can prevent the refrigerator from overheating and extend its longevity by establishing a proper maintenance and cleaning schedule.



Another Layer of Defense -

Absorption refrigerators have an enviable safety record, but they aren't perfect. Overheating is one strong possibility. To mitigate such a scenario, installing the ARP Fridge Defend allows for the monitoring of the boiler and absorber-coil temperatures. When threshold temperatures are reached, the device shuts the refrigerator down to allow for a safe cool down.



Whoosh — and the Fire Is

Out - Fires are scary business, particularly in the closed environment of an RV. A professionally installed THIA (Tube+Heat=Instant Action) by Proteng is an automatic fire suppression system. Not only can they be used to protect your refrigerator, but the system can also be installed in electronic bays, engine compartments — even in your tow vehicle.

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By Bob Livingston

Improved Suspension Systems — and Other Upgrades — Well Worth the Cost and Effort

It's probably safe to say that RVers get into the lifestyle to spend time in natural environments — the outdoors, if you will. Yet, nature creates a long list of problems for RV owners as they struggle with issues caused by being where they love to be. Ironically, the same pleasures of nature that attract people to the outdoors can have a detrimental effect on how well an RV works over a long period of time.

Fortunately, RV owners are a patient lot — or maybe the lifestyle is so compelling that people simply take issues in stride just to be able to stay on the road and experience life to its fullest extent. No one ever said that RV ownership is free of stress, but neither is dealing with airports, airplanes, crowded hotels and lugging around all your stuff in suitcases. While there will always be components that need repair and maintenance, many problems are caused by critters and weather. And while rough roads wreak havoc on all vehicles, it seems RVs take the brunt of it.

Obviously, we can't blame poor road conditions solely on the weather, and without roads, even bad ones, there would be no RVs.

The industry has responded to social media and consumer response by looking at ride-quality improvement systems that can smooth out the bumps. Motorhomes have the edge in this department, but it's nice to see that builders of towables are offering suspension upgrades, which are moving this segment of the industry into new territory. And as "Seeking a More Civilized Ride," a story in this issue, attests, the aftermarket is only too happy to push them in the right direction.

No longer is price for these upgrades a roadblock as owners become educated on the long-term effects of improved suspension systems that temper the destructive forces and the subsequent damage of chassis, axles, structures and appliances. RVs are a substantial investment for most people and longevity — and fewer trips to the repair centers — are certainly strong selling points.

At the very least, upgraded leaf-spring equalizers like those offered by MORryde, Lippert and Dexter can soften the blows handed out by the road system. Today, owners of towables can opt for more elaborate air-suspension systems, slipper springs, shock absorbers or even independent suspension systems, which will undoubtedly become more commonplace as time goes on. And for motorhomes without the benefit of air springs, the LiquidSpring Smart Suspension upgrade is the holy grail for ride improvement. Just maybe, joking about suspensions that are comparable to those that were on buckboards of yesteryear may really become a thing of the past.

A big benefit of RVs that handle better on the road is the added safety in windy and adverse conditions. High-profile RVs typically get tossed around in the wind or when overtaken by fast-moving commercial trucks, but those that are

loaded properly and fitted with upgraded suspension systems can better ride out strong winds without the "white-knuckle" syndrome. Wind events and highway conditions are top-of-mind these days and it's nice to see that the industry is much more cognizant than ever.

Education is key and dealers should continue to stress safety and discourage overloading — as well as the continued practice of towing big trailers with unsuitable trucks. I still see so-called "three-quarter-ton" short-bed trucks towing triple-axle fifth wheels and barreling down the highway at unsafe speeds.

A few months ago, a truck towing a triple-axle fifth-wheel toy hauler passed me on the highway at probably 80 mph. Down the road, I passed him: the owner was off to the side fixing a blown-to-shreds tire. Back on the road, he passed again at high speed — only to find himself pulled over with yet another blown tire. I'm sure he was having a bad day, especially the second time without a spare. I think it's safe to say that RV manufacturers are now paying special attention

to higher-quality tires and wheels and using this feature as a great marketing tool. Even so, it's hard to fix owner foolishness.

Enthusiasts who love nature will also have to commune with critters and bugs. Mice, rats and squirrels love to hang out in RVs. They munch on wiring, tubing and anything else that looks appetizing — leaving behind their telltale trail of droppings. Repairs can be very time-consuming and expensive. These animals can squeeze into the smallest openings, which means it behooves RV manufacturers — and owners —

to make sure all holes and access points are closed off. Chassis LEDs are a nice touch and an unintended use is to ward off nocturnal critters that do their destruction at night. It worked for me, but I don't think there are any clinical trials to confirm the effects of light on rodents. Still, maybe a standard LED strip for all RVs is in our future.

There are plenty of other measures that can be undertaken during the assembly phase, from the use of fire-retardant expanding foam to tighter seals and maybe even a dose or two of stainless-steel wool strategically placed to "uninvite" rodents.

Granted, it's impossible to build an RV that's impervious to many other maladies encountered by the typical RVer like tree damage (both sapping and low branches), wind damage, bird droppings, ants, water spotting, squashed bugs and more, but it is possible to educate owners and provide valuable insight on how to circumvent potential issues while on the road and when the RV is in storage. Annual inspections and subsequent maintenance are strategic and vital to not only maintaining your RV but extending its usefulness and longevity.

Mother nature doesn't always have to win. **RVE**



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To learn more about what's recommended for your RV, visit siriusxm.com/rv

What type of RV owner are you? Are you seasonal? Full-time? Adventure-seeking? Escapist? Family camper? All of the above? Whatever your reason to wander, you are all happy campers — because as the saying goes, "It is not the destination, it's the journey."

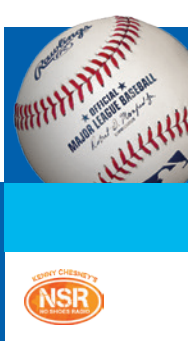
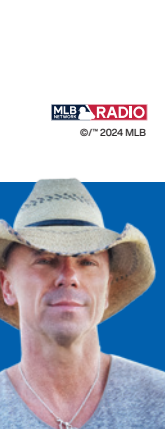
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In case you didn't know, many RVs and towable vehicles are already equipped with SiriusXM. If yours isn't,





SiriusXM



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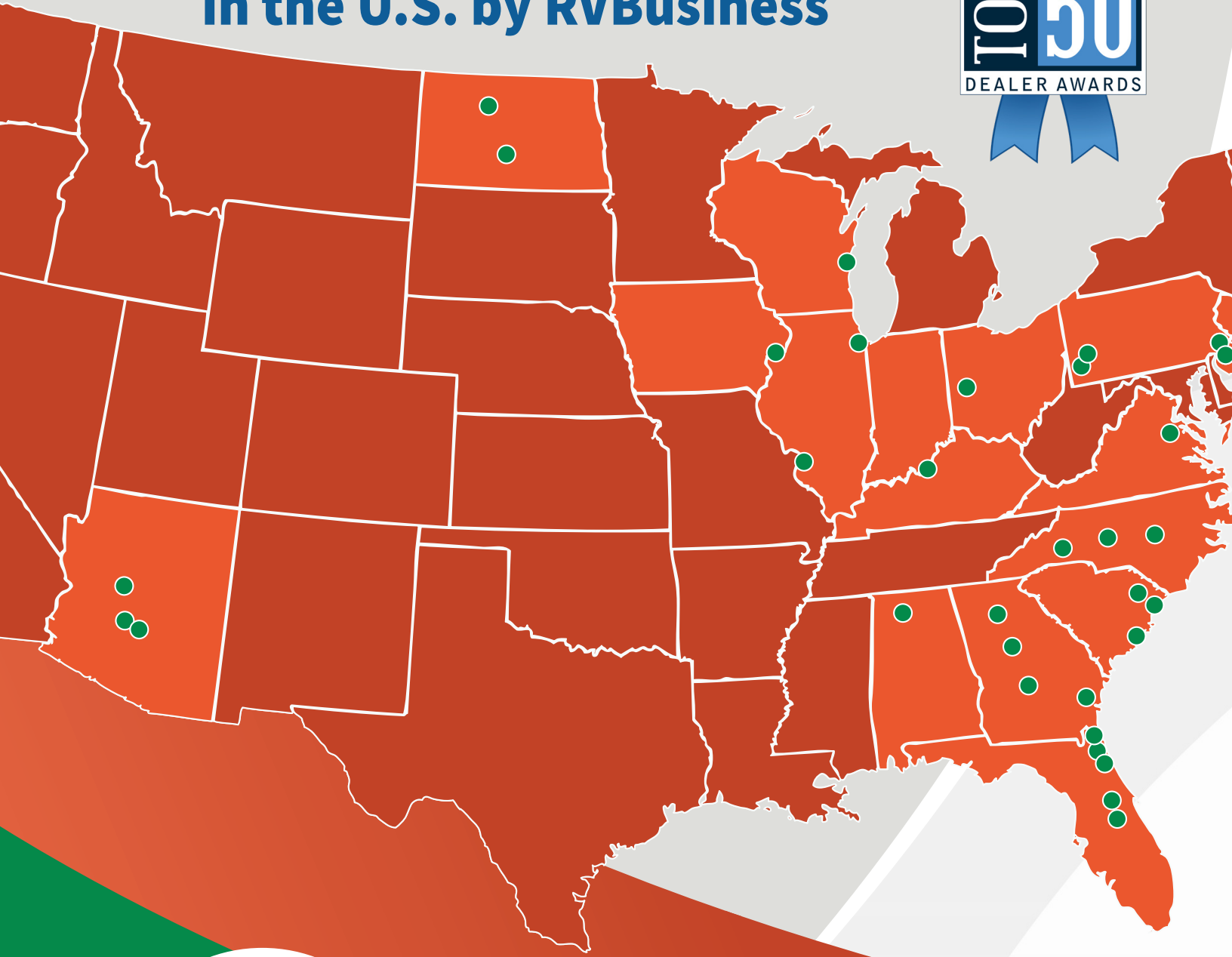
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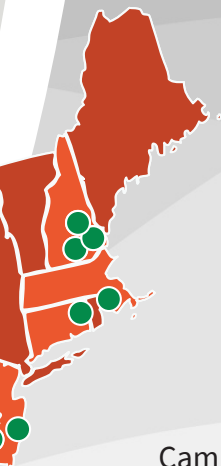
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THE CAMPERS INN RV *Story*

Campers Inn RV began in 1966 after founders Art and Fran Hirsch had a poor experience at an RV dealership. After years of camping in a tent, the Hirsch's saved up some money and decided to find something more comfortable. They gathered their three kids and headed to a local dealership. But when they arrived, the salespeople were more interested in playing cards than helping them find an RV.

Art was furious. He was wearing clothes from his job as a mold maker, and he felt the salespeople judged him by his appearance. They left angry and empty-handed. On the way home, they decided they could do a better job themselves.

They pooled together the family's savings and began selling RVs out of their front yard in Acton, Massachusetts.

Campers Inn RV continued to grow over the next five decades, and we are now one of the largest RV dealership groups in the United States. We are still operated by the Hirsch family, and we remain dedicated to connecting families of all backgrounds with the RV lifestyle and helping them find their "away."



Campersinn.com

Scout Campers Enters Pop-Up Segment with Yoho



After four years of making hard-wall campers, Yakima, Washington's Scout Campers has debuted its first pop-top model, [according to a report at GearJunkie.com](#).

Not only does the top pop, but the rest of the camper has also been refined and upgraded with the latest materials and tech.

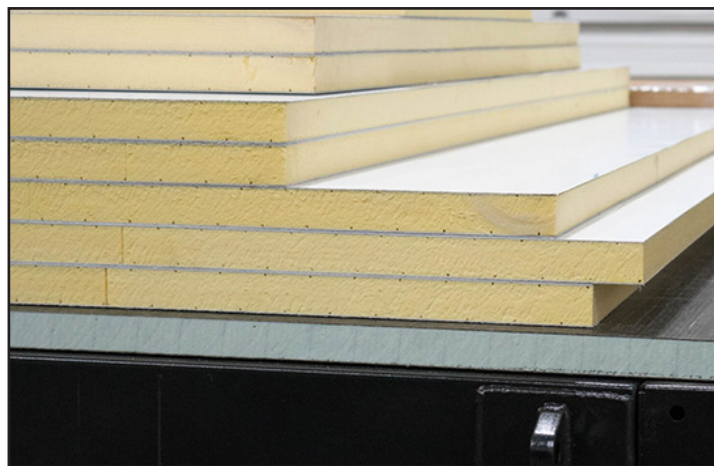
The Yoho, which retails beginning at \$27,900 and sleeps four, features composite panel construction with an aluminum exoskeleton, a one-piece monocoque composite roof, recycled paper cabinets with bamboo coun-

tertops, 4.9-gallon water storage with filtration, a Goal Zero Yeti 3000X cooler, 200 watts of solar, stainless-steel sink, 5-pound propane tank, Fantastic Fan 12-volt DC roof vent, dual 120-volt AC outlets, USB port, LED interior lighting, back porch light and smoke/LP-gas/carbon monoxide detectors.

Yoho weighs just 976 pounds and is designed to fit 5-foot, 5-inch truck beds with the tailgate off, and 6-foot beds with the tailgate shut.

For more information, visit [scout-campers.com](#).

Boreas Campers Offers Composite Panels to DIY Builders



Renovating older RVs is a big business as individuals and companies personalize assembly-line vehicles to specific desires. Mostly, though, they maintain the essential structure — building from scratch can be overwhelming and expensive.

Boreas Campers already overcame part of that

difficulty; the company offers do-it-yourselfers rolling chassis foundations with its C16 and C20 units. Now, Boreas has taken it one step farther: The off-road camper trailer manufacturer is extending its product line to include composite panels tailored specifically for DIY camper builders — enabling them to craft their dream campers with previously unattainable quality and affordability.

For OEM camper manufacturers, composite panels have long been considered superior to other build materials such as wood or aluminum because of their longevity, insulating properties and light weight — but access to composite panels in small quantities was a barrier for DIY builders.

These composite panels, now available for purchase, are available in raw sheets of 13 feet, 3/4-inch by 5 feet, 2 1/2-inches or CNC-cut to the builder's specs and design, empowering DIY builders to bring their vision to life with confidence. At 1.8 inches thick with a woven FRP exterior and XPS foam core, these composite panels will not delaminate, are impact resistant, light and rigid.

Panels are available for \$17 per square foot raw and \$22 per square foot when CNC-cut. The panels can be picked up from Boreas Campers headquarters in Pueblo, Colo., or shipped.

For more information, visit [boreas-campers.com](#).

'Lightning Fast' Wi-Fi for Travelers?



TP-Link ([tp-link.com/us/](#)), a leading global provider of consumer and business networking products, unveiled in late June the TL-WR1502X, a travel router that is claimed to bring lightning-fast Wi-Fi 6 technology and robust security to nearly any location.

This pocket-sized device features two Gigabit ports and reaches dual-band Wi-Fi speeds of up to 1.5 Gbps, ideal for 4K streaming, rapid file downloads, and smooth video calling on the move. Featuring Wi-Fi modes for nearly any scenario, the TL-WR1502X travel router delivers Wi-Fi to users wherever they need it. Whether on the road or at home, users can stay connected while camping or in an RV by using USB teth-



ering to convert their phone's data into a stable Wi-Fi network for all devices. With state-of-the-art VPN support, this router ensures a secure, private network even on public Wi-Fi, protecting data wherever a connection is made. With support for up to 1.2 Gbps on the 5 GHz band and 300 Mbps on 2.4 GHz, the TL-WR1502X ensures fast Wi-Fi on-the-go.

Equipped with OpenVPN and Wi-reGuard, the TL-WR1502X stands as the ultimate on-the-go VPN router for

secure VPN access from anywhere. Ideal for those working remotely, traveling internationally, or connecting through insecure public Wi-Fi, this travel router ensures comprehensive data security and a safer internet experience, making it an essential tool for modern business travelers.

The TP-Link TL-WR1502X Wi-Fi 6 AX1500 Travel Router is priced at \$59.99 and available now on [Amazon.com](https://www.amazon.com).

Dometic Debuts CFX2 Electric Cooler Line



Dometic, a leader in outdoor tech solutions, has released the newest addition to its electric cooler collections: the CFX2 — a portable plug-in refrigerator/freezer.

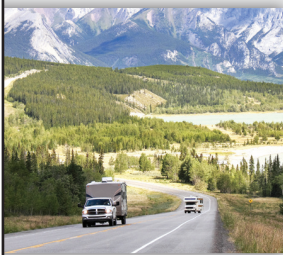
Launching in ocean blue and available in sizes to handle lunch, a couple day's meals, or a week's groceries and keep them as cold as -4 F, the Dometic CFX2 electric cooler is designed with durable reinforced corners, self-folding, tuck-away handles and an integrated LED light.

The CFX2 Electric Cooler can be controlled and monitored from a distance with the Dometic app on your



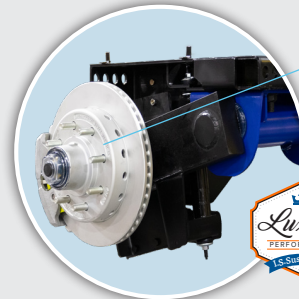
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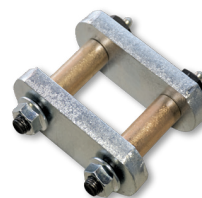
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smartphone and is powering options are plentiful – including 12/24V DC or 120-240V AC – providing flexibility whether you're at home, on the road, or off-grid. A three-stage battery protection system ensures worry-free operation when plugged directly into your vehicle, while pairing the CFX2 electric cooler with Dometic's batteries and/or solar panel options provide an endless power supply. Internally, removable wire basket organizes food, lets you keep it in the fridge while you get the cooler to temp, and drop it in when it's time to go.

For more information, visit dometic.com/en-us.



Roadtrek Celebrates 50 Years at Rally



Surviving for a half-century is a true milestone — especially within the manufacturing ranks. This August, Roadtrek officials will be celebrating the company's 50th year at the brand's "50th Anniversary Rally."

The rally, themed "A Rally Home," reflects the spirit, adventure, and camaraderie that have defined Roadtrek Inc.'s journey. Scheduled for Aug. 13-15, 2024, at the picturesque Guelph Lake Conservation Area in Ontario, Canada, this event promises to be a unique and unforgettable experience. Roadtrek Inc. has been working in collaboration with the not-for-profit organization [Roadtrek International](https://RoadtrekInternational.com) to plan this monumental event.

Among the event highlights, Roadtrek will be opening its manufacturing plant for the first time since Covid for an exclusive tour. There also will be a "meet and greet" with the company CEO, Nicolar Rousseau; expert seminars; a vendor alley; a concert featuring the dynamic five-piece band Coalescence; and a catered dinner for attendees. You can learn more about the Roadtrek Inc. 50th Anniversary Rally and get tickets on their official website rally.roadtrek.com/.



ROUTE 66 RV Club, Roadtrippers Partner



The ROUTE 66 RV Network's RV Club Unlimited has announced a strategic partnership with [Roadtrippers](https://Roadtrippers.com), one of the nation's premier road trip planning tools. This collaboration will offer "unparalleled convenience and security" to new and seasoned RVers alike as they explore the open road, according to the companies involved. Through this partnership, each ROUTE 66 RV Club Unlimited membership will include a premium membership to Roadtrippers in addition to its unlimited towing and roadside assistance benefits.

The ROUTE 66 RV Network is comprised of many of the nation's top independent RV dealers. RV Club Unlimited is ROUTE 66's roadside assistance program, which may be purchased directly online or at any ROUTE 66 dealer nationwide.

Roadtrippers is an industry-leading mobile app and web platform designed for road-based travelers, with an extensive suite of RV-specific features. They can add stops to their routes and discover extraordinary roadside attractions, scenic points, parks, and outdoor

activities within a set distance from their journey.

Perhaps its greatest value to RV travelers is the way it customizes their routes to the exact dimensions of their unit: They can find ideal campsites verified by a community of campers and view map overlays for cell network coverage and public lands. The Roadtrippers Premium membership unlocks exclusive features from the Roadpass family of apps, including Campendum, TogoRV and Overnight RV Parking, all recently integrated into the Roadtrippers platform.

For more information, visit roadtrippers.com or route66rv.com/rv-club-unlimited.



RV Network

Hipcamp Launches Camping Weather Guarantee

HIPCAMP



Hipcamp founder Alyssa Ravasio

One of the world's leading campsite booking companies, announced today they're now offering a Weather Guarantee powered by Sensible Weather, the leading weather protection provider for travel and outdoor experiences.

"While campers cancel trips for a variety of reasons, the most common by far is bad weather. According to our data, about a third of all cancellations are weather related," said Alyssa Ravasio, Hipcamp Founder and CEO. "By launching Hipcamp's Weather Guarantee, we hope to inspire confidence in campers by making the decision to book their weekend getaway just a little bit easier."

Focused on helping change the way consumers interact with the weather, the Weather Guarantee provides

Hipcamp campers proactive reimbursements when it rains during a trip or experience. In alignment with Hipcamp's commitment to getting more people outside, campers will now be able to add a Weather Guarantee to their bookings across more than 120,000+ private land campsites in the US. Sensible Weather quantifies and manages weather risk for campers, using cutting-edge satellite imagery and climate analytics. Each Weather Guarantee is customized to the experience, location and date of the trip, and communicated clearly with campers before they purchase. Proactive reimbursements are then made if the thresholds for the guarantee are met, which means no haggling, cancellation or claims process is needed.

For more information, visit [Hipcamp](https://www.hipcamp.com).



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Jayco Unveils Renovated Customer Service Facility



If you have plans to travel to Elkhart, Ind., for service on your RV produced by Jayco's Family of Companies (Jayco, Entegra Coach, Highland Ridge RV and Starcraft RV), you're in for a treat: the RV manufacturer recently announced the completion of significant renovations to its 118,000-square-foot, multi-level customer service facility.

The newly renovated facility boasts several key features designed to ensure that customers feel welcome and comfortable while their units are being serviced.

Among the notable additions include a conference room, which allows for private discussions and ensures customers receive undivided attention. The lobby also features a large monitor displaying Jayco's family of brands, a refreshment area with coffee, refrigerator, microwave, TV and game center. Additionally, brochures of all Jayco brands are available for customers interested in exploring upgrade options. A standout feature of the renovation is a large 3D timeline that vividly displays Jayco's rich history, celebrating its milestones since its founding in 1968.

Micro-Air Intros Next-Generation 'EasyStart Breeze'



Micro-Air recently announced the introduction of its next generation of Soft Starter, the EasyStart Breeze, designed for the RV and marine markets. Since introducing the EasyStart brand in 2012, Micro-Air has been recognized

as the market leader in Soft Starter technology for single-phase AC units, according to the company.

The new EasyStart Breeze is said to offer the latest technology on the market, with an impressive 40% reduction in enclosure size and outperforms all other RV soft starters with the highest start surge reduction. The EasyStart Breeze also offers the most robust fault detection on the market today, leading the industry in advancements and innovation.

For more information, visit [EasyStart Breeze](http://EasyStartBreeze.com).

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In our first article (“How to Measure Dealership Service and After-Sale Support,” *RV Enthusiast* April 2024) we explored how to choose an RV dealer based on their service operations. In this column, I’m excited to continue this journey — this time, focusing on the sales side of things.

How do you pick a dealer based on their sales operations? The sales process is integral to your overall RV ownership experience. Let’s break down what makes a good sales operation — and how you can make an informed choice when selecting your RV dealer.

Engagement and First Impressions: Your first interaction with a dealership is crucial. Whether you reach out online, make a phone call or walk into the store, the initial engagement sets the tone. The best RV salespeople aren’t just trying to sell you something — they genuinely want to understand your needs. They’ll ask questions about your lifestyle, what you’re looking for in an RV, how you plan to use it, who is going camping with you, and more. This customer-focused approach is about matching you with the right RV, not just closing a sale. You should be able to feel it when a dealership is honestly trying to help. So when you’re visiting a dealership, pay attention to whether the salesperson is asking about you and your needs, or if they’re just pushing a sale. If they are pushy — run.

Product Knowledge and Training: A good sales team knows their stuff. They should be well-versed in the

features of each RV and how those features can meet your needs. It’s not just about doing a “show and tell” around the lot. The best salespeople take the time to learn about you *first*, then use their product knowledge to match you with the right RV. They know which models have the safety features you need, the color options you prefer and the floorplans that will work best for your family. This depth of knowledge ensures you’re getting an RV that truly suits you. Ask your salesperson specific questions about different RV models and see how confidently they respond. It doesn’t hurt to have a little product knowledge walking in, and then testing to see what answers you get!

Inventory Management and Presentation: When you visit a dealership, take a good look at the inventory. Are the RVs well-maintained and clean, or do they look neglected? How a dealer takes care of their on-the-ground inventory says a lot about how they’ll care for your RV when it’s time for delivery. First impressions matter. If the dealership looks like a well-tended fruit stand, with “apples” polished daily, it shows they care about their product and, by extension, their customers. This attention to detail is crucial. Walk around the lot and notice if the RVs are clean and in good condition; it’s a good indicator of how much the dealer cares.

Transparency in Pricing and Fees: Let’s talk about pricing. Some dealers lure you in with low prices — but then tack on excessive fees that don’t reflect

actual costs. Good dealerships, however, are upfront about all charges and will let you know what the price looks like on the initial quote. They have fees that cover legitimate expenses like freight and preparation costs. If a dealer isn’t transparent about their pricing, it should raise a red flag. If they’re hiding fees, what else might they be hiding? Transparency in financial dealings is a hallmark of a trustworthy dealership. Before making a purchase, ask for a detailed breakdown of all costs and fees to ensure there are no hidden surprises.

Post-Sale Engagement: Buying an RV is just the beginning of your journey. The best dealerships don’t vanish after the sale; they remain engaged with you throughout your RV ownership. They should be available to answer questions, provide support and help you navigate any issues that arise. This ongoing relationship is key to a positive RV ownership experience. Make sure your dealer is committed to being there for you long *after* you drive off the lot. Ask about their post-sale services — and how they stay connected with their customers.

What’s it all mean? Picking the right RV dealer based on their sales operations can make or break your RV ownership experience. Look for a dealership that engages with you from the start, has extensive product knowledge, maintains transparency in pricing, takes excellent care of their inventory and stays engaged after the sale. These qualities will ensure you have a positive and fulfilling RV journey.

In our next article, we’ll talk about the importance of community involvement — and how it can enhance your relationship with your RV dealer.

Ben Hirsch is the Chief Operating Officer of Campers Inn RV, the nation’s largest family-owned and operated RV dealer group with over 35 stores across the country. Ben joined the family business in 2013 and helped the company acquire or develop 30+ locations in 8 years. He previously served in the U.S. Army for 8 years, achieved the rank of Captain, and was a UH-60 Blackhawk helicopter pilot. Ben is a graduate of West Point and holds an MBA from the Wharton Business School.

Top Three Battery Tips for RV Boondocking

By Bryce Gregory, Systems Product Manager, Transportation and Specialty at EnerSys



Recreational Vehicle enthusiasts who spend a majority of their time camped out in the boondocks for peace and tranquility often depend on an increasing number of house loads for added comfort and convenience.

Also commonly referred to as “hotel loads,” house loads can include anything from entertainment centers, appliances and climate control to state-of-the-art safety and security equipment. In theory, these added amenities are nice — but they require much more energy to ensure long-lasting, dependable operation. It’s times like this where reliance on the battery system is high because it’s not only responsible for keeping the various onboard electronics up and running but it also must get the RV started when it’s time to head back to the hustle-and-bustle of normal civilization.

To remain off-grid in contentment and have a truly authentic camping experience with minimal interruptions, consider the following three battery tips for RV boondocking:

- **Measure or calculate energy needed and understand the range (and how that may change)**

Extended boondocking is all about energy management. One of the important aspects to energy management is appropriately sizing the components. Evaluate the range and types of onboard accessories you’ll be utilizing during your trip to determine how much energy you’ll need. Most RVs have some form of energy storage integrated into the design in which the capacity can and will likely need to be modified.

- **Determine location of onboard components and balance out ROI based on usable space**

Understanding where things will go, how much space they will take and what they cost relative to how much you will use them are the keys to a Return on Investment (ROI) in your energy storage and management. Additionally, not everyone who RVs boondocks, and it may be difficult to get any return when you go to upgrade your RV, so make sure you buy what you need and not a lot more.

- **Optimize between nominal use and worst case**

Extending on the ideas above, determine if you really need to size for worst case scenario or closer to nominal use (always size above nominal), as well as understanding alternatives. For instance, using a stove-top coffee maker versus an electric one can really save on the amount of power and energy required at the lowest energy reserve part of the day (morning).

There are lots of areas where tradeoffs that improve reliability and reduce cost are possible and allow for minimized space consumption. One of those areas is battery chemistry choice. Thin Plate Pure Lead batteries, like the ODYSSEY® battery from EnerSys®, have great cyclability, great energy capacity, work with the existing RV electrical infrastructure, can be placed just about anywhere in the vehicle and have a great price point.

ODYSSEY® Dual Purpose batteries from EnerSys are engineered to provide deep-cycle reserve power (rated at 400 charge/discharge cycles to 80% Depth of Discharge DOD) and plenty of cranking capacity to start the engine. With up to a 10-year service life, ODYSSEY® RV batteries also offer slower self-discharge rates and are capable of 100% recharge in as little as four hours. Backed by an industry-leading warranty, they can be stored for two years at 77°F (25°C). They can also perform in extreme temperatures as low as -40°F (-40°C) to as high as 176°F (80°C).

If you’re planning an upcoming excursion where there is no grid connection, consider ODYSSEY® Dual Purpose RV batteries to help get you there reliably, keep you content throughout your stay and ultimately get you back on the road when it’s time to return home.



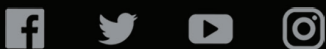


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Top It Off



Bill, I have an older fifth wheel and the fabric on all three slideouts have pretty much deteriorated to the point where the material is tearing. All three slideout toppers are made by Dometic, and although the fabric served me well over many years, I was flabbergasted to learn how expensive it is to replace the material.

I'm pretty handy and a contractor friend has offered to help me make any repairs. What are your thoughts on replacing the slideout topper fabric and retaining the hardware?

—John Sealman

John, I've seen a lot of slideout topper fabric deteriorate during my tenure as a shop owner and it's good that you're catching the problem before it lets go and loses the spring tension. The best deal on slideout topper fabric is through Lippert Components (lippert.com); it actually can cut fabric from a roll and offer it at a great price, which you can cut to size.

If want to upgrade, consider material from Tough Top Awnings (toughtopawnings.com). The owners of this company have designed awning and slideout topper fabric after years of camping in high-wind areas in their own RVs. The proprietary pre-sized (based on provided dimensions) fabric is super-strong and a key element is the beading that's sewn with marine-grade stitching. RV

Enthusiast Publisher Bob Livingston replaced the topper fabric on his fifth wheel with this material after his originals were blown off in a windstorm. This fabric is not cheap, but it's much thicker (so it's a little more difficult to install). The Tough Top fabric on Bob's RV has been brutalized for more than three years under fulltime use and is doing fine.

I believe that you can pull it off, based on your DIY level. First, extend the slideouts all the way. You will need a heavy-duty cotter pin, an awl or even a ground-off small screwdriver — something that won't bend easily. With a person on each side, unroll the topper until you see the aluminum roller tube; there's quite a bit of spring tension so you will need two hands, for sure. After you've unrolled the fabric, you'll need to install the cotter pin or other tool through the hole in the end cap and the shaft (on either end) to secure the roller tube. You may have to rotate the tube back and forth a little bit to find the through hole.

At this point, you will see a slot in the end cap where you can simply slide the fabric out after removing the screws that hold the fabric in the rail. Slide the fabric out of the roller tube and awning rail at the same time; reverse the process with the new fabric and remove the cotter pin/tool holding the spring from unwinding and that's pretty much it. If you're cutting the fabric to size, you may have

a little bit more wiggle room; sometimes the fabric shrinks and you can actually widen it an inch or two to get more coverage over the slideout room.

Note: be very careful; there is a lot of tension on that spring so do not attempt to remove one or both of the end caps while the roller tube is under tension.

Bubble Up



The sidewall has started to bubble near one of the windows on my 1999 Pace Arrow motorhome and it seems to be getting worse. I noticed a small bubble under one of the windows on the other side also, but it's not getting any worse. I took the motorhome to the local repair shop and its mechanics said there really wasn't anything they could do about it other than maybe repair the section of fiberglass and paint over the area, which may not look right since the whole side has oxidized.

I hate to spend a whole lot of money on a motorhome that's not worth very much. Do you have any brilliant ideas?

—Jason Alexander

I do have a procedure that I've done many times with pretty good success. Your problem is common and is usually caused by water leaks — probably from rain — that have worked under the Filon and caused swelling. Start by removing the window, which will take two or three people to remove the inside trim ring and then pry the window from the side of the motorhome. You might have to use a putty knife to break the seal. Go all the way around the window to break the sealant loose and the window will come out.

After you've removed the window, place a couple of pieces of wood or wedges to open the siding to make sure that the material under the bubble is completely dry. Next, you will need some liquid epoxy to coat the area underneath the fiberglass siding.

This next process is critical! Place a piece of plywood against the siding and position the motorhome so that pressure can be applied to the repaired area. I usually drive the motorhome close to a fence or wall and cut pieces

of wood so they can be wedged against the plywood and fence until the glue is dry. This process is rather crude but works as long as you can get to the area that needs to be repaired and keep the wall flat and under pressure during the process.

As far as the other smaller bubble is concerned, try drilling a small hole through the wall and squirt some epoxy through the area with a syringe. Use wood and pressure in the same manner as

above to keep the wall flat during the drying process. No guarantees, but it's worth a try and a heck of a lot cheaper than replacing the entire wall which, obviously, would not be worth it considering the age of the motorhome.

Once the sidewall is dry, replace the window using butyl tape around the window and silicone sealant around the edge of the frame without covering the weep holes.

Dumpy Dump Valve



I have a 2022 fifth wheel that has cable-actuated dump valves — and the black tank valve has become almost impossible to close. Every time I remove the cap some nasty liquid comes out, so I have a smelly ol' bucket and wear rubber gloves. I've seen a lot of suggestions on the Internet, like lubricating the cable by pulling it out and covering it with grease. My guess is the gray valve will probably follow the same path at some point in time. Before I try to tackle a repair, I'd appreciate your take.

—Alfredo Garcia

Unfortunately, I have had to deal with this issue on my own RVs as well as those experienced by my customers over the years. Replacing the cable will probably not solve your problem

completely; the grit and particles from the liquid and solids in the tank are likely clogging up the valve. The debris drops into the slot where the blade runs in-and-out, and after a while the friction from compacted material makes it almost impossible to pull the cable.

Theoretically, you can remove the valve, clean it, lubricate it and put it back on. However, that fix is probably not going to last long. Considering the extent of the labor and the fact that this is a really dirty job, I suggest replacing the valve with a new one and getting a fresh start. Removing the inner wire from the cable and greasing the entire length will help, but make sure to use a clean grease or lubricant that will not collect gunk or get sticky. Lately, I've latched on to Superzilla (superzilla.us), a spray lubricant that does a great job. Once lubricated, pull it out and push it in a few times — while the tank is empty — to make sure the movement is smooth.

The cable is generally secured under a bolt or an Allen set screw at the valve body. Technically, the cable should not need lubrication, but some manufacturers put too much bend in the cable, which causes more friction. The cable is usually around 96 inches long.

Distributing the Water



I have a distribution center inside my fifth-wheel's storage compartment that allows me to direct the water from various sources, and provide a path for filling the tank. It's a bit intimidating, looking at all those knobs and water lines (in back of the panel). I've already had several leaks fixed and I was won-

dering if I could do it myself next time there's a breach in a line or fitting. I've watched videos and the job seems pretty simple, although the working area is tight. I was wondering how to get from the solid Pex tubing to the flexible hoses that the manufacturer has installed. It looks to me like they're installed onto some kind of a fitting that doesn't work properly with Pex tubing. I was hoping that you have a good solution.

— Alex Villanueva

Alex, I feel your pain since I have a fifth wheel with the same bird's nest of hoses and fittings. Replacing the crimped fittings is only possible if you have a good crimping tool, clamp rings

and the special fittings. For most owners, that's where the problem lies: the tubing seems to be just shoved onto the smooth fitting, which is not the proper way of connecting the two; flexible hose requires barbed fittings. Not only that, but in this configuration from the factory, the crimped rings could become compromised as the tubing stretches enough to allow for leaking water.

A better way fix this problem is to use flexible-hose adapter fittings made by Flair-It. These fittings can be found at RecPro (recpro.com) for \$11.95 for a five pack. They are called "Flair-It Hose Insert and Nut for 1/2" Compression Hose," SKU RP-06325-5.) These fittings are designed specifically to connect the Pex tubing to the flexible hose and should never let go due to the overall design and latex rubber material in the cones. The company has a video on YouTube to show how it's done.

Over the years, I've replaced hundreds of fittings with Flare-It products and I have never had a problem with them. You just need cutters (like anvil pruners found in any hardware/home improvement store) and pliers to tighten the fitting another 1/2-turn after snugging with fingers. Flair-It also offers a tool to tighten these fittings.

Bill Gehr



Bill started his 50-year career in the RV industry when he went to work for an Airstream dealership. After the gas shortages in the 1970s, Bill decided to start his own business and opened up Bill's RV Service in Ventura, California. After several years in business, he met Bob Livingston, and together they worked on hundreds of technical editorial projects at his shop while becoming great friends. Bill eventually joined Bob on the TV show "RVtoday," filming a number of hands-on projects. After retiring, Bill headed out full-time in his fifth wheel and toured 39 states while writing technical articles for *Trailer Life* and *MotorHome* magazines. He now is Technical Director for *RV Enthusiast*. RVE

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

Safeguarding Your Adventure

Why Your RV Needs the Power Watchdog Surge Protector



When embarking on an RV adventure, the focus is often on the open road, the beautiful landscapes and the freedom of life on wheels. However, just as you protect your home's electronics with surge protectors, your RV requires the same consideration to safeguard its electrical system and appliances. This necessity becomes paramount when considering the often fluctuating and unpredictable power sources encountered at different RV parks and campsites. Here's why every RV owner should invest in robust surge protection — specifically the Power Watchdog by Hughes Autoformers, ensuring peace of mind no matter where your travels take you.

The Vital Need for Surge Protection in RVs

From smart TVs and satellite systems to refrigerators and HVAC units, your RV is loaded with high-tech gadgets that are vulnerable to the dangers of electrical surges. These surges can occur with little to no warning, often resulting from lightning strikes, faulty wiring or issues with a campground's power supply. The consequences can be severe, possibly causing major damages that can cost thousands in repairs and replacements. Understanding the critical need for reliable surge protection, Hughes Autoformers designed the Power Watchdog, a surge protector that stands out in the RV accessory market for its innovative features and unmatched reliability.

Here's why the Power Watchdog is the essential companion for every RV enthusiast:

• Replaceable Surge Protection Unit

The Power Watchdog features a patented replaceable surge unit, setting it apart from other protectors on the market. Unlike traditional surge protectors which require a complete replacement after taking a hit from a power spike, the Power Watchdog allows you to simply replace the surge module. This can be done within minutes and at a fraction of the cost of buying a new unit, ensuring continuous protection and increased longevity of your investment.

• Smart Connectivity with Mobile App

As the first smart RV surge protector on the market,

the Power Watchdog offers wireless connectivity, allowing you to monitor and control the unit via a mobile app. This feature notifies you immediately if any electrical issues are detected, from over/under voltage to unusual current draw. It also provides real-time data on power consumption, which is invaluable for managing costs in RV parks that charge by wattage used.

• Advanced Circuit Analyzer

The Power Watchdog is not just a surge protector — it is an advanced circuit analyzer that monitors the pedestal for a variety of faults, including the often-overlooked but critically dangerous issue of low voltage. This comprehensive monitoring occurs multiple times per second, ensuring that any potential risks are identified and addressed promptly, thus safeguarding you, your vehicle and your journey.

Low voltage in an RV can be as damaging as a power surge. Often occurring in busy RV parks or during peak usage hours, a drop in voltage leads to a series of electrical complications that can compromise the safety and efficiency of your vehicle's systems as they struggle to maintain their output. This can cause the motors in your refrigerator and air-conditioner to overheat — even a modest drop in voltage of 5-10% can push these motors beyond their designed capacity, risking permanent damage — or put your circuit breakers under considerable strain. They might trip frequently, disrupting power intermittently; or, more dangerously, they might fail to trip at all, allowing currents to rise unchecked.

• Automatic Power Management

By detecting these fluctuations in real time, the Power Watchdog can execute immediate corrective measures. Its ability to quickly identify and respond to low voltage protects your RV's appliances from operating under harmful conditions, thus extending their lifespan and maintaining their efficiency. With the Power Watchdog EPO (Emergency Power Off) models, you get an auto-shutoff feature that instantly disconnects your RV from shore power upon detecting a fault. This automated system not only protects your RV's electrical components from damage but also resumes power automatically once the issue is resolved.

• Lifetime Guarantee

Whether you're a seasoned RVer or a newcomer to this exciting world, the Power Watchdog provides a layer of security that lets you focus on enjoying your journey, confident that your RV's electrical system is protected by the best technology available. Plus, Hughes Autoformers (hughesautoformers.com) stands behind the Power Watchdog with the best warranty in the industry — a lifetime guarantee. Embark on your next adventure with Hughes Autoformers' Power Watchdog, and turn your focus to the joys of RVing, secure in the knowledge that your electrical needs are comprehensively covered. After all, isn't enjoying the journey what RVing is all about?

POWER WATCHDOG



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Smart Surge Protector + EPO



WIFI Turn Red When Park
Power Neutral is Missing
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STOP SKIRTING THE ISSUE



Trailer fender skirts that flop wildly while traveling are sure to take flight someday — or at least crack and become unsightly. Here's a simple fix using automotive fender bolts and locking stainless-steel nuts.

By Bill Gehr / Photos by the author and Bob Livingston

Fender skirts that trim out the wheelwells on fifth wheels and travel trailers improve the appearance and actually serve a purpose by keeping road spray under control. However, they are usually made of thin plastic and are screwed in place — leaving a bunch of threads and points exposed on the other side of the lower metal siding. Not only do these screw ends exude an unfinished look, they can rip your skin when working in that area or even trying to wash away road grime.



Self-drilling screws were used at the factory to attach the fender skirt to the lower section of the slideout. This is a crude way to install the fender skirt, but it's done this way all the time. You have to be careful when running your hand on the inside of the metal slideout skirt to avoid cutting your skin.

Likely, these screws are driven by power tools on the assembly line which, considering the thin material, makes it difficult to get a good feel when they are sufficiently tightened — often resulting in overtightening. Many times, self-drilling screws are driven so tightly they distort the plastic and pull the skirt in toward the siding. I've seen hundreds of skirts where the screws were even pulled through the plastic. When this happens, it's only a matter of time before these fender skirts litter the side of the road.

Another issue is the aging of the plastic. Exposure to sun and other outdoor elements weaken the plastic — and their typically flimsy supports become dislodged from constant vibration. When this happens, the fender skirts flop around wildly in the wind created by highway speeds but usually go unnoticed by most drivers. The small screw heads simply cannot hold the plastic in place any longer — and if you're not scrutinizing the screws and fender skirt constantly, it's easy to miss early cracking.

I found an unusual fix for improving longevity of these fender skirts: the

use of automotive fender bolts and stainless-steel lock nuts. Fender bolts are easy to find at auto parts stores, but I bought the “Rexka 20pcs M6-1.0 Hex Head SEMS Body Bolts Bumper Fender Splash Shield Under Cover Hood” bolts on Amazon for \$10.99. These bolts are painted black, have a 10mm hex head and a 20mm washer. The nuts, too, can be found at most hardware stores, but if you search “binifMux 35pcs M6-1.0 Nylon Inserted Hex Lock Nuts 304 Stainless Steel Silver” (where do they get these crazy descriptions?) on Amazon you'll get them for \$5.68.

Before ordering the fasteners, I checked access underneath the slide-



These screw heads are smaller and, over time, pop through the fender skirt plastic. Here the cracking was stopped by drilling a hole, but these fender skirts will have to be replaced.

out and other than one screw hidden behind a bracket on each side, the coast was clear. I figured a longnose pliers would have to be used to hang onto the nut when tightening that bolt. The washers spread the load out and locking nuts allowed me to snug the bolt against the plastic without exerting undue pressure — just enough so that the fender skirt can't move without deforming the plastic.

It was necessary to drill 15/64-inch holes to allow the bolts to pass through the fender and metal skirts. Rather than take the fender skirt off completely, I pulled enough screws to keep the fender skirt positioned from the factory and installed the new bolts in those locations before proceeding with the others. This saved time and prevented any chance of mounting the skirt off-center. When drilling through the plastic, care was taken not to force the drill bit and crack the plastic. There were already pilot holes from the old screws, so the process went smoothly.

It was a little tricky getting the bolts



3

Brackets to supposedly prevent the fender skirts from flopping in the wind quickly became road litter as they broke away from their fasteners. Epoxy glue failed to keep the plastic from breaking, rendering this screw useless. Overtightening the screws with a power driver can create similar problems.



6

We chose to install the bolts with a screw gun set at low torque to prevent overtightening. While this made the tedious job of setting 22 bolts easier, the nuts still had to be loosened slightly and finally set by hand.

and the nuts tight enough to prevent distortion of the fender skirt because there were uneven surfaces to deal with and the foam insulation sprayed against the frame to prevent water from getting up inside. A putty knife and a large screwdriver were used to break away some of the foam to make room for a few of the nuts.

I did use an impact driver (offsetting the tedium of tightening 22 bolts and nuts) to snug the locking nuts, but the



4

Only a few original screws were removed initially to ensure that the fender skirt would remain oriented properly. Next, the holes were drilled out with a 15/64-inch bit to make way for the M6-1.0 fender bolts. Although the original holes serve as pilot holes, care must still be taken when drilling to prevent cracking.



7

The lip that rests against the lower metal skirt on the slideout can be easily squashed with too much torque on the new bolts. Sealant is not used between the fender and metal skirts.

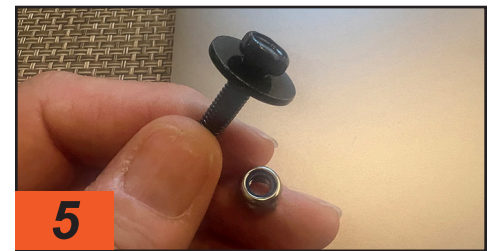


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Most of the nuts were easy to reach, but one on each side was blocked by a bracket. A longnose pliers was used to hold on to the nut during the tightening process.

driver was set at low torque and care was taken to prevent overtightening. Still, I had to adjust the nuts by hand to make sure they were set properly. (By the way, I had to order more bolts since there were only 20 in the original package.) I don't think the bolts and the washers are quite as attractive as the small screw heads, but it beats the expense of replacing the fender skirts. While I was at it, I bolstered the fender skirts with additional brackets; the originals were just too flimsy.

Next on the agenda: paint the skirts. The ones from the factory were made from black-color plastic and it seems like a coat of paint will be a good hedge against premature fading and cracking.



5

The fasteners of choice for this project were M6-1.0 automotive fender bolts and stainless-steel lock nuts. These bolts have a 10mm hex head and a 22mm washer, which spread out the pressure around the hole.



8

The new hex bolts and washers are bigger and less attractive than the original screw heads, but here function trumps form — and no doubt these fender skirts will stay put without damage. The plan is to paint the black fender skirts to protect them from the elements.



10

As you can see, the original brackets were made from scraps of molding and not very secure. To finish this project, new brackets were added (not shown) to prevent the fender skirt from flopping in the wind while traveling. **RVE**

Seeking a More Civilized Ride



Looking to upgrade your travel trailer or fifth wheel suspension from a system in use since the days of the Old West? Consider the plethora of aftermarket suspension upgrades that can smooth out the bumps and limit premature frame and body wear.

By Bob Livingston

Pulling a fifth wheel or travel trailer down the road is one of those “out of sight, out of mind” propositions. You’re riding in the tow vehicle, surrounded by luxury and quiet — but inside the trailer, the highway “wrecking ball” is having its way, overcoming a suspension that’s reminiscent of covered wagons. The overwhelming number of towables today are suspended by equipment that does little to control the bouncing and hammering shelled out by roads that have seen better days.

Leaf springs alone cannot prevent stored items from being disheveled or, worse, ejected from their cabinets. Frame damage over time is a constant fear, and the entire floor, wall and roof structure can be compromised by undulating pavement, potholes and damaged sections of the roadways.

Fortunately, the aftermarket (and some OEM components) can change the paradigm when it comes to sus-

pension support and provide a smoother ride for trailers. You can opt for simple add-on springs and shocks or work your way up to a full-blown independent suspension. In just about all cases, any added component to control

ride quality and/or handling will improve the ride and longevity of the structure, appliances and systems. Following are the various products that can be opted for in the aftermarket.



The MORryde IS replaces most of your trailer’s underpinning and must be installed by a certified facility.

Let it Slip

Roadmaster, a company specializing in tow bar kits and suspension improvers for tow vehicles and motorhomes, also offers the Comfort Ride Slipper Springs (roadmasterinc.com) that makes short work out of rough roads. The concept has been around the trucking industry for a long time and Roadmaster's refined components for travel trailers and fifth wheels are relatively easy to install and transform leaf springs into real suspension support. I've been running the Comfort Ride Slipper Springs on my fifth wheel for more than 62,000 miles and can attest to the ride improvement. Simply put, rarely will anything eject itself from compartments after a hard day on broken-down roads. With stock springs, the bumps and vibrations are transmitted to the frame and body as the tires respond to rough roads. Movement of the springs is confined to that of the equalizer as the energy is telegraphed between the front and rear axles. The Comfort Ride system allows the springs to move back and forth in response to road conditions without transferring the energy to the trailer, resulting in a much smoother ride.

The installation of the Comfort Ride Slipper Springs components requires that the original springs and equalizers are removed to make way



Roadmaster Comfort Ride Slipper Springs Kit

for the new parts. A slipper spring box is installed where the equalizer once lived and new springs are mounted to the frame hangers and axles and fed into this box where the ends move on rollers. Kits are available for 5,000-, 7,000- and 8,000-pound tandem axles and there's an add-on kit for a third axle for heavier fifth wheels. The slipper spring kits retail for \$1,150 and \$975 for the third axle slipper spring kit.

While the slipper springs provide a significant reduction in road vibrations,

the addition of the company's gas shocks (\$750) will reduce the destructive forces that lead to premature damage even more dramatically. The shock mounts directly to the slipper spring box and axles, making the operation fast and easy. Kits for installation without the slipper springs are also available. Plus, these shocks are mounted in a more vertical position to provide better suspension rebound for maximum road absorption.



Roadmaster Comfort Ride Gas Shock Absorber Kit

MORryde IS

The granddaddy in this arena is the MORryde IS independent suspension (morryde.com). This system completely replaces the standard solid-axle and leaf-spring configuration with independently mounted rubber springs in shear. The rubber springs are attached to the metal axles at each wheel and control the ride independently, which means that each wheel will move in response to road conditions, smoothing out the ride dramatically.

Normally, solid axles tied to leaf springs provide maybe 2 inches of movement in concert to road conditions. If the road surface requires more movement, the shock is transmitted to the frame and trailer structure. Over time this hammering effect can damage components and, at the very least, toss around stuff inside the trailer with impunity. The MORryde IS system has up to 5 1/2 inches of travel, which is more than enough to control bad bumps in the highway, speeds bumps and other uneven surfaces such as when traveling off-grid to a primitive campsite.

Installation requires that the entire



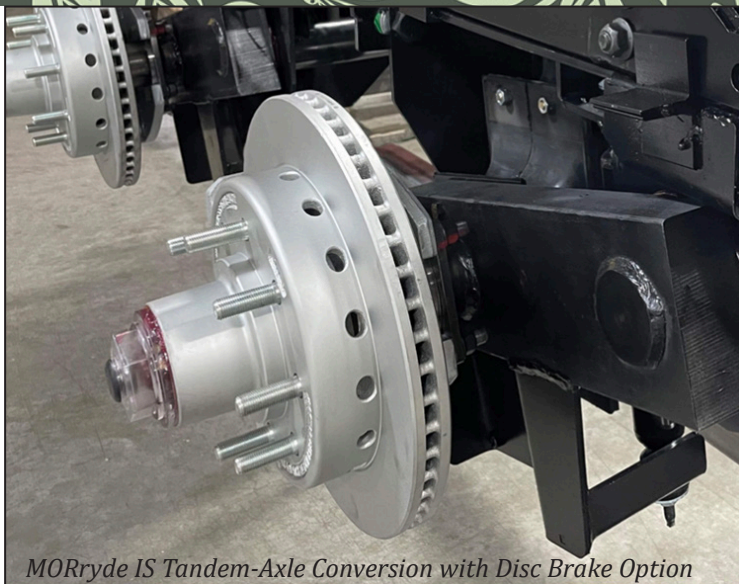
MORryde CRE3000 Equalizer and AllTrek4000 Equalizer

stock suspension be removed and the IS components attached to the chassis. This is not a job for Saturday mechanics; MORryde and a few certified shops must install this system in their facilities. Figure on two to three days for the installation; cost for the tandem-axle trailer with 7,000 or 8,000-pound-rated axles is \$5,300 and \$6,100, respectively. While you're at it, you can save some money by having the optional disc brakes installed at the same time. That will raise the prices to \$8,000 and \$8,900, respectively. Triple-axle conversions are also available.

If the independent suspension transformation is not in your budget, MORryde has a few other solutions to help control the ride. Its replacement equalizers — the part in the middle that suspends the leaf springs — offer noticeable improvement in ride and handling by using rubber to cushion the movement of the axles/springs when negotiating rough roads.

The CRE3000 is commonly used by trailer- and fifth-wheel manufacturers as a benefit to improve ride and control, and can easily be retrofitted by owners or repair shops. Like the stock equalizer, which distributes the movement between the wheels and axles, the CRE3000 has a travel slot that allows for 3 inches of suspension travel and will smooth out the bumps/road shock via the rubber cushion versus the metal-to-metal movement of the stock equalizers. Owners will benefit from a smoother ride and a more stout equalizer that will outlast the stock version dramatically. The company's Heavy-Duty Shackle Kit (\$131.99-\$195.99, depending on number axles) is designed to eliminate elongated holes from the bolt friction — which can lead to suspension failure.

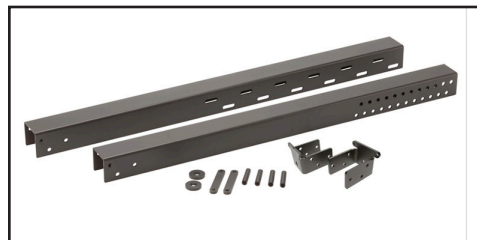
Additional suspension travel can



MORryde IS Tandem-Axle Conversion with Disc Brake Option

be realized with the installation of the AllTrek 4000 equalizer replacement kit. This equalizer also provides better weight distribution of the springs/axles while adding another inch of travel. It's the same concept as the CRE3000, but with 40% more rubber to control.

A newer product from MORryde, the X-Factor Crossmember provides lateral support between the equalizer frame hangers, which is said to reduce suspension stress up to 94%. It's a simple bolt-on job requiring no drilling and when installed the additional support helps with travel over rough roads and tight cornering. The steel crossmember is steel and is adjustable; it sells for \$164.99.



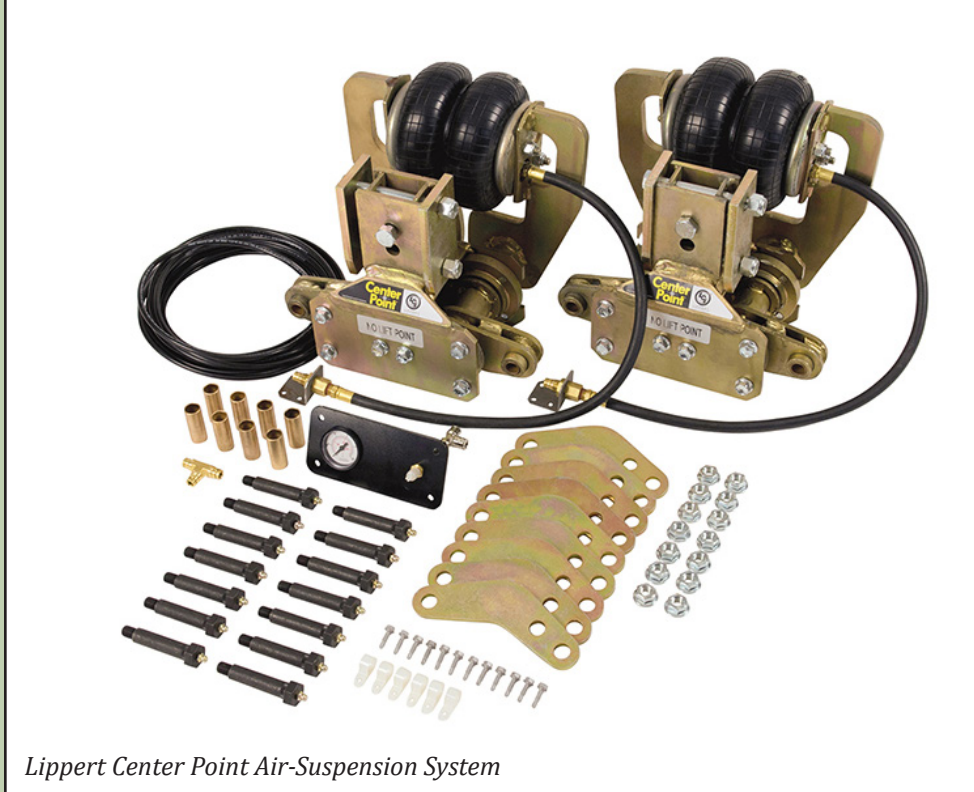
MORryde X-Factor Crossmember

Riding on Air

Lippert (lippert.com), a primary supplier of chassis to the towable segment of the industry, offers an air-ride suspension system under the Center Point banner that can be installed by the do-it-yourselfer. The kit is designed for tandem or triple axles rated up to 8,000 pounds and includes all the necessary components and installation hardware.

Dual air bags on each side absorb the shock between the axles as the trailer negotiates rough roads. The heavy-duty component is installed where the old equalizer was mounted and the springs are attached to strong steel shackles that have a Zerk fitting for adding grease. Air lines are routed to provide a central air-bag fill station (usually mounted in a storage compartment) that has a gauge to monitor air pressure. Tandem kits sell retail for \$2,115.95; triple-axle kits are \$4,098.95.

For those looking to reduce road shock at a lower price point, Lippert offers two affordable alternative products that replace standard equalizers. The Road Armor Shock Absorbing



Lippert Center Point Air-Suspension System

Trailer Equalizer is rated for axles rated from 3,500 to 8,000 pounds and retails for \$419, while the Equa-Flex Rubberized Equalizer is designed for axles from 4,000-6,000 pounds and has

a \$329.95 retail price. Both of these components replace the stock equalizer and are easy for DIYers to install with common hand tools.

Rubber is used to absorb road shock, minimizing fore-and-aft movement that can lead to chucking. Both products have bronze bushings and the Road Armor version has Zerk fittings for adding grease. The Road Armor kit is more robust, offering additional travel while transferring shock and vibrations to the rubber shock absorbers.

Lippert also offers a shock absorber kit for trailers with 2 3/8 or 3-inch axle tubes that retails for \$226.95 or \$270.95 respectively. These kits, which include gas shock absorbers, come with all the hardware and fasteners necessary for self-installation.



Lippert Road Armor Equalizer



Lippert Gas Shock Absorber Kit

More Rubber Equalizer Action

Dexter (dexteraxle.com) is also a household name in the trailer axle, brake and suspension arena and it offers its version of a more stout, rubberized equalizer, the E-Z Flex. The Dexter equalizer is easy to install in place of the standard parts and uses a rubber insert to damp road shock. While on the road, the E-Z Flex equalizer pivots and compresses to isolate the frame and trailer body.

The E-Z Flex is said to provide an 80% reduction in damaging forces on the chassis over stock equalizers and comes with a five-year warranty. It's available for tandem- or triple-axle configurations with 33- and 35-inch spacing. When combined with the company's heavy-duty shackle links, owners can expect an improved ride, which



Dexter Axle Heavy-Duty Shackle Kit

relates to less strain on the chassis and body components.

These Heavy-Duty Shackle Kits are stout, durable and protect the shackles from elongating, which will lead to complete failure. They are light years



Dexter Axle E-Z Flex Equalizer

stronger than stock and feature 1/2-inch links and bronze bushings. Greaseable bolts extend life dramatically. Figure on spending around \$400 for the tandem E-Z Flex kit and \$100 for each Heavy-Duty Shackle Kit for each side.

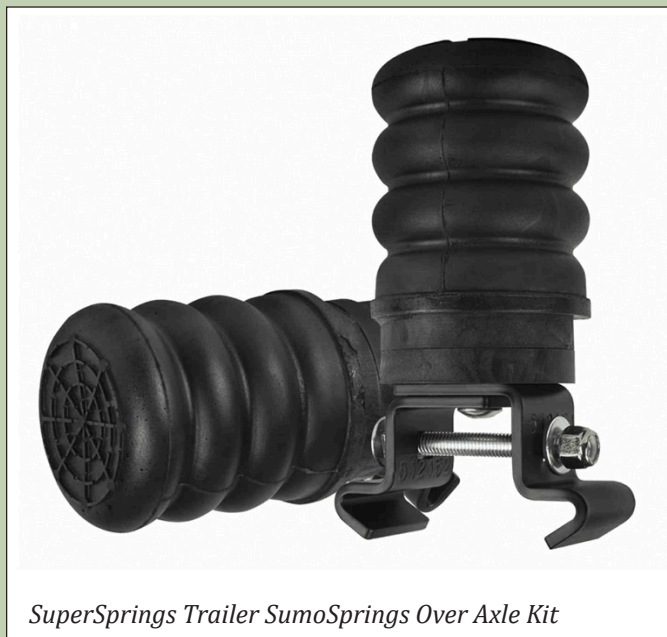
A Different Approach

If you're looking for a simple way to decrease G-force and help with sway, highway hop while isolating vibrations, SuperSprings (super-springsinternational.com) has a solution with its Trailer SumoSprings. The company has devised a system that's super simple to install, using brackets and micro-cellular polyurethane springs that is said to reduce G-forces

an average of 68%.

The polyurethane springs are designed to mount between the leaf springs and trailer frame and, once on, there's no further maintenance. Kits are available for axles rated from 3,000 to 8,000 pounds and are available in spring-under and spring-over configurations. These springs are progressive and provide constant load support while

reducing vertical movement between the springs and frame. They are easy to install with hand tools and the job can be accomplished by DIYers. The retail price of the 3,000-5,000-pound-rated springs (blue in color) is \$267.99; the heavier springs (black) go for \$294.99. Trailer SumoSprings are backed by a lifetime warranty.



SuperSprings Trailer SumoSprings Over Axle Kit



SuperSprings Trailer SumoSprings Under Axle Kit

Running Silently

A lesser-known product from Timbren (www.timbren.com), a company that markets unique rubber springs for vehicles, the Silent-Ride Trailer Suspension replaces the leaf springs and equalizer with a walking beam system. The axles ride on a single pivot point as the system fully equalizes the load between the wheels/axles at all times.

Timbren uses Aeon springs, which are made of pure natural rubber and

are designed to last a very long time with no deterioration. These rubber springs provide a progressive rate of support; as more weight is applied, they work even harder to level the stance while traveling over rough roads. The result is less road shock and a smoother ride — and the rubber springs have been tested to withstand hot and cold weather extremes. Operation is quiet and there's zero maintenance.

Although the entire package looks

ominous (since it requires removing all the factory suspension components), it can actually be installed by DIYers, according to the company. The Silent-Ride is available for single axles rated to 3,500 pounds and tandem trailers with up to 7,000-pound axle ratings. The company is based in Canada; retail price for the SR14K tandem kit, for example, is \$2,164 (U.S. funds). **RVE**



Timbren Silent Ride Conversion



The Great Wipe Off!



All the toilet tissue used in the test. There are many choices on the market, but this test focused on the most common brands found in RV stores and online. Nature's Call (bamboo), Nature Pure and Better Boat are not familiar names to most RVers but can be found online.

Comparison tests of popular — and some lesser-known — toilet paper brands reveal that not all products are created equal, but they are pretty close

By Bob Livingston / Photos by author

Editor's note: RV Enthusiast originally published this article in its June 2021 issue. Because the care of blackwater holding tanks — and its infamous potential for creating the dreaded “poop pyramid” — is a continual source of concern for RVers and because RV Enthusiast has welcomed many new readers in the years since, we've opted to republish it here. It's a fun, tongue-in-cheek story — but one that may assist you in selecting what products you tote on your travels.

RV owners have a love-hate relationship with their holding tanks. Usually, the most problematic of these is the black tank — a waste receptacle which can clog, create havoc with the monitor sensors and (as we've probably all discovered on occasion) emit terrible odors. If you're looking for answers to why these tanks cause so much pain, just look in the mirror. Owners are known to neglect regular maintenance, introduce the wrong type of toilet paper — and use too much of

it — fail to add proper chemicals and follow erroneous dumping procedures. The Internet is full of reasons why these tanks create stress among owners, but many of the “solutions” are technically inaccurate and will themselves lead to additional problems.

Until bidets become commonplace in RVs, most of us will continue to use toilet paper for personal hygiene. And although toilet paper for stationary homes is bountiful, RVers must use products specifically designed to break down



Toilet paper was strewn all over the fifth wheel interior during the testing period. Not the most beautiful décor items, and really lifted visitors' eyebrows as they wondered about our bathroom habits.

in the holding tank. While the famous bears in television ads love to use soft toilet paper on their tender tushies, RVs have different parameters.

Hence, The Great Wipeoff, wherein yours truly and three companion RVers "took one for the team" by overeating for a few days in order to fully assess the abilities of a variety of tissue types meant to keep us happy while on the road.

Yep, it was a messy job, but somebody had to do it.

Why? Because while we all love soft toilet paper that will clean our bottoms, reality dictates that some compromise is usually necessary to prevent holding tank clogging and allow the contents to flow forcefully enough to clean the tank when it is emptied. Therefore, RV

toilet paper has one or two thin plies, will break down quickly when introduced to liquids, does a good job of cleaning and offers, well, some assemblance of softness.

We tested nine products, most of which are easily found in RV supply stores and places like Walmart. The less-common varieties — including toilet paper made from bamboo and tissue intended for the marine

market, which faces the same problems — were bought on Amazon.

All nine varieties were blind-tested by the participants and each brand was further subjected to a breakdown test using a Mason jar, one sheet of toilet paper, the same amount of water and number of shakes. Each brand also was subjected to an analysis of "cleaning effectiveness" whereby a single sheet was moistened and used when the urge struck to use the facilities. (Write your own jokes here.)

Granted, these types of tests are subjective — and we left out the "action shots" for obvious reasons — but they were revealing. Below are the results of this truly unique test — minus, in this case, the wrenches you might ordinarily expect in a story intended to rectify

problems encountered while on the road.

As we discovered during our "research," testing toilet paper is risky business. While it's true that not all toilet paper is equal, more importantly, not all bottoms are the same — and techniques differ among users. Personal preferences also factor into what finds its way to your shopping cart. My wife, Lynne, and I have been using Aqua Soft and Campa Soft for as many years as we can remember and only strayed when supplies were impacted a few years back by pandemic hoarding. Fortunately, our RV's bathroom cabinet is again stocked with Thetford's toilet paper. The tests showed — and there was consensus here — that it's hard to beat the overall performance of Aqua Soft and Campa Soft, but the others also work and, in some cases, will be preferred by users in the RV community. And those who hate the thought of cutting down trees will love the bamboo alternative. Price sensitivity and availability are also important.

So what was our take-away? Basically, all the products in this test will get the job done, so if your favorite brand is not on the shelf at the time you're shopping, you can rest assured that there will be no adverse implications if you buy something else. Most importantly, make sure the holding tank is rinsed during each dumping session and several gallons of water are added to assist in breaking down the paper. Adding proper holding-tank chemicals is also critical for proper waste and toilet paper breakdown and will eliminate obnoxious odors.

So, wipe away folks, because just like the bears on TV seem to know full well, a clean tush is a happy tush.



To determine each tissue's ability to break down, a single sheet of each brand was placed in a Mason jar with water and agitated. Dometic toilet paper (left) did not break down in the initial shake test, but after vigorous shaking the fibers started to come apart. It's important that when using this brand toilet paper, the holding tank is charged properly. Thetford's Aqua Soft (center) broke down immediately after the first few shakes. Company's Campa Soft, sold in Walmart, was equally as effective. The clear winner in the breakdown contest was Thetford's 1 ply toilet paper (right). It doesn't take much moisture for this paper to dissolve.



Brand: **Thetford Aqua Soft** (thetford.com)

Packaging and Roll Size: 4 rolls; 396 sheets per roll

Street Price: \$7-\$14, depending on location

The Sales Pitch: Thetford is synonymous with RV toilet products and its Aqua Soft is the leading brand of toilet paper on the market. This toilet paper is designed specifically for RV sanitation systems and is septic-system safe. The “Soft Pure and Snowy White” toilet paper is 100% biodegradable and features “Premium Softness.”

Number of Plies: 2

Breakdown: Excellent

Cleaning Effectiveness: Excellent, texture on both sides is appreciated.

One Sheet Test: Holds up better than expected for a toilet tissue that breaks down so easily and fast.

Softness: Excellent



Brand: **Better Boat—Boat + RV Toilet Paper** (thebettm.com)

Packaging and Roll Size: 12 individually wrapped rolls; 500 sheets per roll

Street Pricing: \$30

The Sales Pitch: Laid-back, but to the point: “Eco Friendly” and 100% biode-

gradable. Lightly textured for optimal cleaning and quick dissolving. Not typically found in RV supply stores, but readily available in marine centers and on Amazon. Individually wrapped rolls are a big plus when it comes to storage.

Number of Plies: 2

Breakdown: Good to excellent

Cleaning Effectiveness: Pretty grabby without undue roughness.

One Sheet Test: Holds up well until damp.

One sheet can finish the job, but most people will likely not want to go there.

Softness: Relatively soft, but not plush, and on the thin side, which relates to the large number of sheets per roll



Brand: **Camco RV & Marine Toilet Tissue** (camco.net)

Packaging and Roll Size: 4 rolls; 500 sheets per roll

Street Pricing: \$5-\$8

The Sales Pitch: From the well-known supplier of RV sanitation products, this toilet paper is said to dissolve fast, is septic-safe and ultra-soft.

Number of Plies: 2

Breakdown: Fair to Good. Little slow in the test but sitting in the holding tank will likely finish the breakdown.

Cleaning Effectiveness: Very good.

One Sheet Test: Holds up nicely, even when wet.

Softness: On the soft side with a tiny bit of scratchiness to offer very good cleaning power.



Brand: **Thetford Campa Soft** (thetford.com)

Packaging and Roll Size: 6 rolls; 396 sheets per roll

Street Pricing: \$6.

The Sales Pitch: This is the same product as Thetford’s Aqua Soft and is sold by Walmart. Same marketing highlights as Aqua Soft. Value pricing.

Number of Plies: 2

Breakdown: Excellent

Cleaning Effectiveness: Excellent, texture on both sides is appreciated, but different design than Aqua Soft.

One Sheet Test: Like Aqua Soft, holds up better than expected for such a fast-dissolving toilet tissue.

Softness: Excellent



Brand: **Dometic Dissolving 2-Ply Toilet Tissue** (dometic.com)

Packaging and Roll Size: 4 rolls; 500 sheets per roll

Street Pricing: \$10 (West Marine, online)

The Sales Pitch: This product from RV industry giant Dometic is said to be 100% biodegradable, made from recycled, unbleached fibers and is touted to break up quickly to prevent clogging.

Note that while we tested Dometic's "Dissolving 2-Ply Toilet Tissue," it's been supplanted by "Ultra-Dissolving" product which, apparently, is better at breaking down.

Number of Plies: 2

Breakdown: Good, eventually. Did not break down in the shake test, but after longer agitation, it did, which means having a properly charged holding tank will be important.

Cleaning Effectiveness: Excellent; one of the best of the bunch

One Sheet Test: Excellent, very strong

Softness: Most of the testers thought it was harsh; one thought it was "soft enough."



Brand: Nature Pure

Packaging and Roll Size: 4 rolls; 280 sheets per roll

Street Pricing: \$7-\$17 (online)

The Sales Pitch: In French and English. Made for RV and marine toilets, said to be quick dissolving and biodegradable. I found this paper in an RV supply store when supplies were almost non-existent due to the pandemic and it turned out to be a real rear-end saver. Don't expect to find a website; it seems this toilet paper is marketed by CP Products, although the packaging shows made in Oregon by DTS Manufacturing. Be prepared for a protracted search if you want to contact the company; I just ordered it on Amazon.

Number of Plies: 2

Breakdown: Fair to Good; little slow to react

Cleaning Effectiveness: Excellent

One Sheet Test: Holds up well when wet, likely because it doesn't dissolve as fast.

Softness: Excellent. Medium thickness and one of the softest in the bunch-



Brand: Nature's Call (naturescallrvtp.com)

Packaging and Roll Size: 8 rolls; 300 sheets per roll

Street Pricing: \$24 (Amazon)

The Sales Pitch: "Save Trees, Save Your Septic" is the battle cry for this toilet paper made from bamboo pulp. The company claims it's fragrance-free, hypoallergenic, ultra-soft and strong, baby- and mom-safe (whatever that means), BPA-free, non-GMO and has no chlorine. I have to admit, it feels good to sit on the pot while practicing environmental conservation. Considering the staggering amount of toilet paper used worldwide, using renewable resources is a refreshing alternative.

Number of Plies: 2

Breakdown: Excellent

Cleaning Effectiveness: Very good; texture on one side really helps pickup "stuff."

One Sheet Test: Strong

Softness: Smooth feeling, but not exceptionally soft.



Brand: Scott Rapid Dissolving (scottbrand.com)

Packaging and Roll Size: 4 rolls; 231 sheets per roll

Street Pricing: \$15 (Amazon)

The Sales Pitch: Made in the USA from domestic and imported materials,

perfume-free and sustainably sourced. Scott paper goods can be found just about anywhere, including supermarkets and Walmart. This is a very popular product among RV owners and is value priced.

Number of Plies: 1

Breakdown: Very good; not as fast a Thetford's one-ply.

Cleaning Effectiveness: Considering this is a one-ply tissue, it does a really good job of cleaning. It does feel a little scratchy to the touch, but in actual use it's not bad. Thicker than one would expect for a one-ply tissue.

One Sheet Test: Surprisingly good

Softness: We'll call it medium-soft.



Brand: Thetford RV/Marine Toilet Tissue (thetford.com)

Packaging and Roll Size: 4 rolls; 350 sheets per roll

Street Pricing: \$13 (Amazon)

The Sales Pitch: The quintessential one-ply toilet tissue. Dometic claims it is soft and gentle, dissolves quickly, is biodegradable and snowy white. Premium price for thinner toilet paper; go figure.

Number of Plies: 1

Breakdown: Superb; best in the group, but it's pretty thin.

Cleaning Effectiveness: Depends on conditions. Can double up and get better cleaning and benefit from super-fast dissolving product. But that will be a more expensive wipe.

One Sheet Test: Any moisture will cause one sheet to practically disintegrate, almost like magic.

Softness: Obviously very soft, but at times user may actually be using his/her hands rather than toilet paper. Not a lot of substance or pretty sight, but your holding tank will be happy. **RVE**

COLD & SAFE

ABSORPTION REFRIGERATOR MAINTENANCE TIPS



Keeping food at proper storage temperatures is only part of the story; preventing the refrigerator from overheating and leading to possible damage — or even a fire — can be mitigated through proper maintenance and a couple of safety devices.

By Bob Livingston and Bill Gehr

A key element for any RV to enjoy true self-contained status is, of course, a refrigerator — and for many years, an absorption process to keep food cold and frozen has been an industry staple. These refrigerators are designed to promote self-containment and the associated freedom of operating RVs off the grid. Over the years, the industry has moved toward compres-

sor-style refrigerators in 12-volt DC and 120-volt AC (residential) configurations, which is becoming more popular every day, but with a universe of 15 million RV owners, it's no surprise that absorption refrigerators that run on 120-volt AC power or LP-gas are found in millions of RVs — and are still commonly used in new models.

For some, it's hard to understand

how cold is made from heat, but the concept of using ammonia and hydrogen compression systems for refrigeration has been around since late 1800s. Absorption refrigerators for RVs were developed somewhere around 1956 by Electrolux of Sweden, and although the systems have been refined over the years, the concept remains the same — and they still make sense for RVers

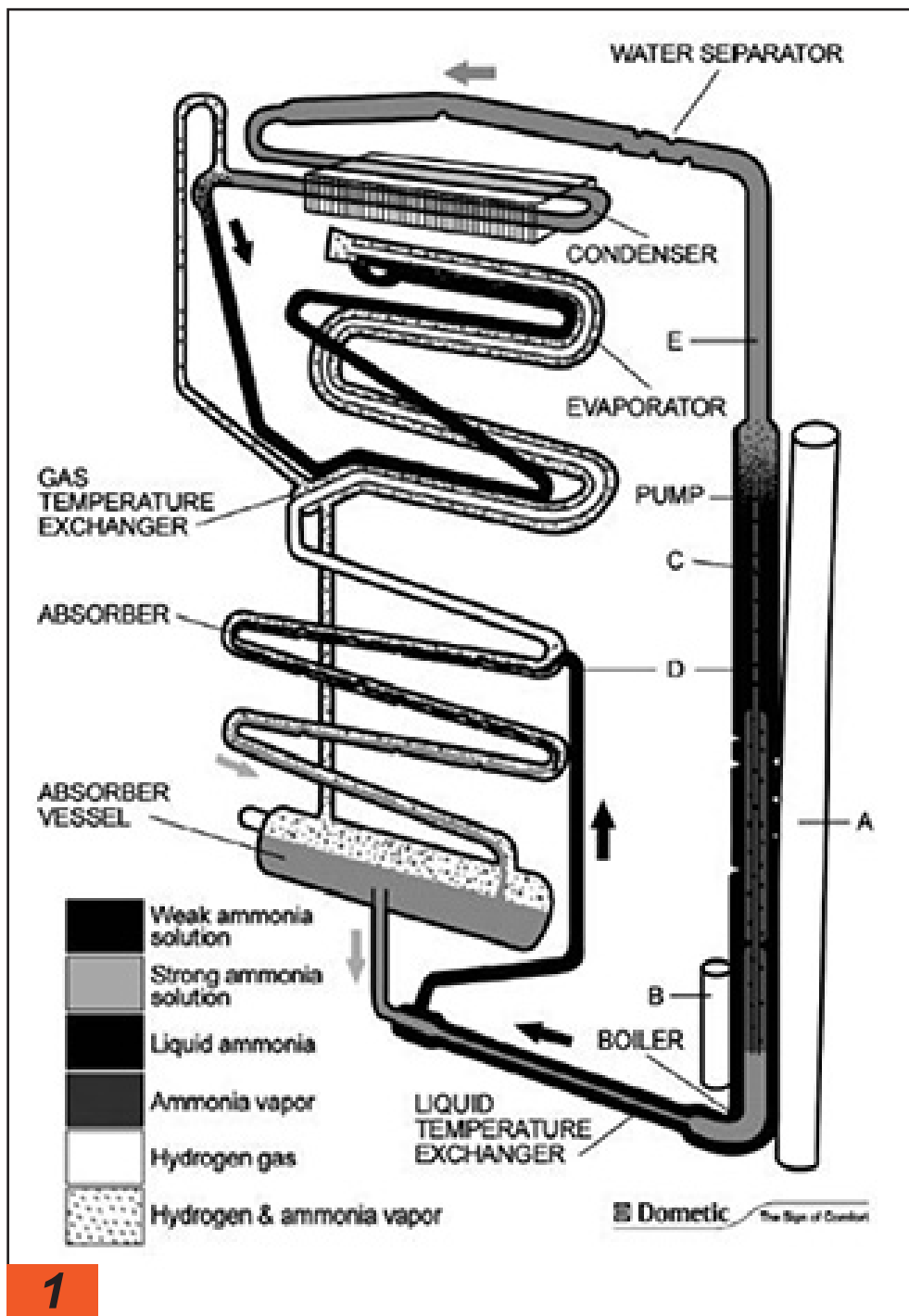
Don't Put off Refrigerator Maintenance

Like any RV appliance, there are certain maintenance procedures that must be followed to keep an absorption refrigerator from failing — and most of them are not very complicated. First off, too many people ignored the recalls, so if you fall into that category, reach out to your specific refrigerator manufacturer to make sure your unit is not subject to a recall.

Plan on putting refrigerator service on an annual schedule. If you live in your RV full time, maintenance projects will be needed more often. The most basic requirement is to check inside the upper and lower vents for debris that has built up from trees, especially those that flower. Debris will find its way through the vent openings in short order. Simply pull the vents and remove any debris. Once that's done, start your maintenance procedures in the interior of the refrigerator.

Inspect the door seals for sticky food or liquid and damage to the material. The dollar-bill trick has been around for years, but it works: Place the dollar bill between the opening and door; if friction restricts movement, you're good. If there are gaps, cooling performance will suffer and moisture build up inside the box and freezer will be an issue. Repair is difficult because seal kits are usually not available. Instead, new seals come with new doors, which are expensive, if even available. That alone should be incentive to keep the seals clean. When in storage, prop open the doors to allow for ventilation.

Keep the ice that builds up in your refrigerator to a minimum; absorption refrigerators are not frost-free, although there is an auto defrost mode for the metal fins in the back of the refrigerator box. If the interior fins frost up, the auto defrost mode is not working properly. Typically, the ice builds up on the side where the thermistor located. This is the device that signals the circuit board when the refrigerator is up to temperature. Make sure the thermistor, which is mounted to one of the fins (usually from the third fin inward), is in the correct position; different models have specific requirements. You can usually find the thermistor location for your model refrigerator online. When the thermistor is in the wrong position, it throws an erroneous signal to the control board.



1

It's hard for many people to understand how heat turns into cold. Absorption refrigerators keep food cold and frozen by circulating the hydrogen, ammonia and water solution (ammonia compression system) through the condenser and evaporator. The heat is made by a propane flame or an electric element, thus LP-gas or 120-volt AC power operations. Drawing courtesy Dometic.

who like to spend time off the grid and don't have the battery capacity (or don't want to make the investment in an expensive solar array, large battery bank and an inverter) to keep a compressor working without running out of power.

Although it can be argued that running a refrigerator on LP-gas while on the road can be dangerous — especially if the owner fails to turn it off while refueling a vehicle at a service station —

absorption refrigerators have a strong safety record. The only substantial exception to safety was a period of time between the late 1990's and 2010 when the major manufacturers of absorption refrigerators issued recalls to prevent hydrogen leaks, which resulted in fires. Fortunately, the overwhelming majority of these units have operated safely at specs for many years.



2a **2b**
The magnetic door gaskets (seal) must be tight to prevent the leakage of cold air. Inspect these gaskets frequently, because replacements are typically not available without buying the whole door. Aftermarket seals are usually not that effective. One simple way to determine if the gaskets are holding is to insert a dollar bill between door and refrigerator frame. There should only be a small amount of resistance when pulling the dollar bill out.

While many owners use a wireless electronic sensor to monitor interior temperature, the most accurate method is to place a pencil-type air-conditioning thermometer in a glass of water that's set on the first or second shelf. This is more accurate than measuring air temperature, which is quickly affected when opening the door because water takes longer to react.

Mounting small fans toward the fins (see "Another Layer of Defense" in this issue) on the plastic liner will help keep the fins free of ice.

An easy way of defrosting the freezer — which can be a daunting task if you

don't know this "insider's tip" — is to purchase a thin plastic cutting board, cut it to size (it may take more than one) and place it against the back of your freezer. When the ice builds up, simply peel off the plastic cutting board(s), shake off the ice and you're done, except for maybe residual ice that can be scraped off easily.

Inspect the plastic box liner in both the refrigerator and freezer to make sure that there are no large cracks, which will allow moisture to penetrate over time. Refrigerator liner repair kits can be found on Amazon.

Exterior maintenance starts by re-

moving the access vents. All absorption refrigerators require two vents to circulate air properly. Refrigerators mounted in a slideout will have both vents in the sidewall; those mounted in a stationary wall will have a vent on the roof and one vent on the sidewall. The top vent cap can be pulled by removing four screws. Unfortunately, you can't get an unobstructed view of the cooling unit and upper fins on some models, but do the best you can to remove bird nests, leaves and other debris that somehow find their way through the vents. Most of the roof vents have a screen under the cap that restricts access to the



3a **3b**
A thermistor is used to communicate with the control board to set box temperatures. This sensor is mounted on the evaporator/cooling fins in the back of the refrigerator. Dometic mounts its thermistor on the first fin and can be moved up and down to adjust temperature, based on an adjacent instruction sticker. Norcold mounts its thermistor, which is fixed, on the third fin from the right. These thermistors can be tested for proper function by using an ohm meter (not shown) following the manufacturer's instructions, which are available online.



4

The most accurate way to check box temperature is to place a glass/cup with water on the first or second shelf and insert a pencil-type thermometer (typically used to check air-conditioner temperatures through the registers).

debris. Usually, the leaves will not get through the screen, but mice or rats can build nests over time that can be a fire hazard. You can cut the screen loose for access, but make sure you install a new piece of screen that is fireproof.

The side vents do not have screens and will give you a better look at the fins, absorber coils, burner flue and wires. Over time it's amazing how much dust and dirt can build up on the coils, which ultimately can affect the release of heat from the steel tubing. Make sure that you blow as much debris out as possible without damaging wiring or insulation; a soft-bristle brush may be needed to clean stubborn dirt from the pipes.

Check the drain tube routed from the pan under the fins inside the refrigerator to the back compartment; this tube can become plugged over time with mold and mildew, causing it to plug up and back up moisture into the refrigerator. This drain tube is usually routed along the insulated boiler section of the refrigerator to either a plastic or a metal pan that's located up against the boiler area where the heat can evaporate the water. We've found this to be ineffective and prefer to extend the drain tube out through the side vent so that water drips out on the ground. You can easily do this by purchasing tubing from a

hardware store and extending the factory tube to reach through the lower vent.

Removing the burner assembly cover will give you a look at the burner and the flue where the flame goes up and through the baffle that retains heat. Contrary to common belief, the electric element(s) produce more heat and are more efficient than the gas flame, especially if the BTU output has been diminished due to a dirty orifice or burner. Cleaning out the burner with compressed air is the key, but pressure must be regulated at 90 to 100 PSI. Excessive air pressure could damage or dislodge the baffle creating a serious problem.

If the burner assembly has excessive rust and the slots in the burner have rusted to a point where they are larger than the original burner slots, it should be replaced. Do not attempt to remove the orifice unless you know what you're doing. If it becomes compromised, the flame can be dangerously high and hot. We recommend cleaning the burner and orifice annually and the LP-gas pressure should also be checked at the pressure tap near the burner — gas pressure correlates directly to the BTU output from the orifice and burner. Pressure must be maintained at 11 inches of water column, measured with a manometer. If the gas pressure

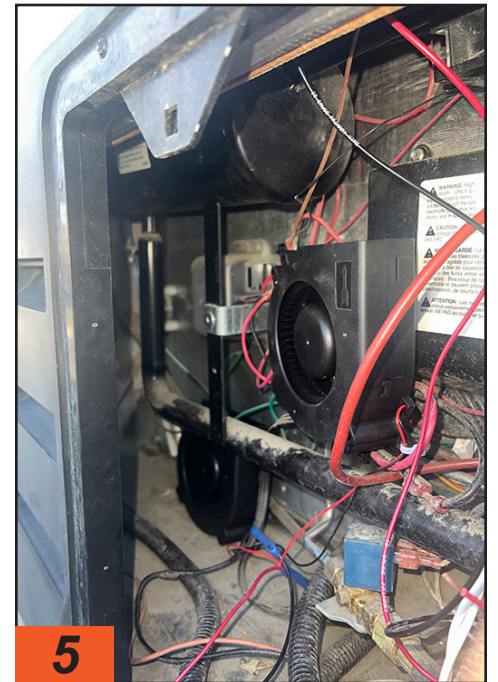
is too high or too low the BTUs go up or down accordingly, affecting the proper operation of the hydrogen, ammonia and water.

One more note: If there is a lot of excess rust on the cooling unit pipes, absorber coils, the burner and other components, it may be time for a new refrigerator.

Know the Limitations

Heat is the enemy of any RV refrigerator. Extreme boiler temperatures wreak havoc on the system. High ambient operating temperatures play critical roles in refrigerator performance, as does proper installation by RV manufacturers. As noted earlier, refrigerators mounted in slideouts have no roof vent, relying on proper airflow through side-wall vents only. This can be problematic, especially if the RV manufacturer failed to follow precise mounting and clearance requirements. Strategically placed 12-volt DC fans can help circulate air. Service technicians can easily determine whether the fans are placed correctly, are working effectively, and if they are not part of the original installation, new fans can be installed with little effort and cost (see "Cooling Trend," *RV Enthusiast* November/December 2023 issue).

Running an absorption refrigerator off



5

One way to improve cooling system ventilation for better efficiency is to install additional blower fans in the back of the refrigerator. This one, available online is mounted below the absorber coils and helps dissipate the heat faster.

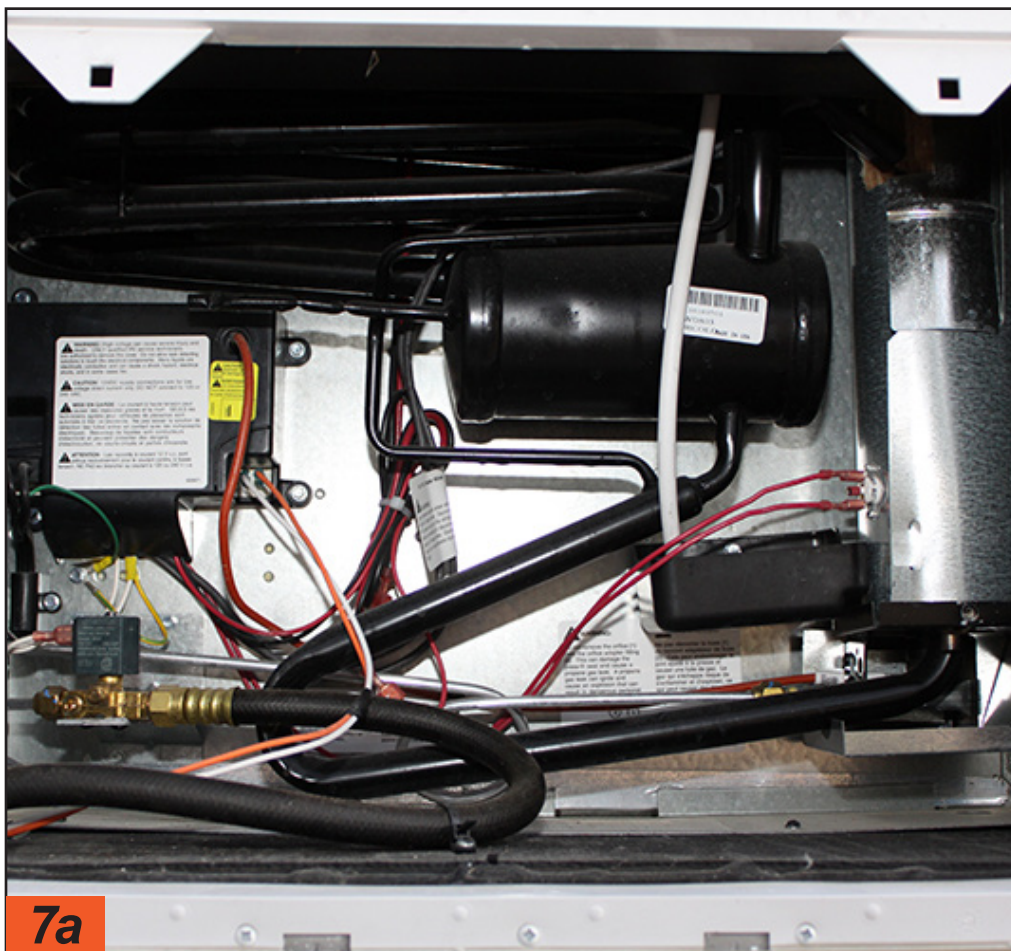
level is probably the largest contributor to cooling unit failures. This includes parking on a steep driveway or on a campground site that's off level or simply driving up and down long steep grades. Technically, you can circumvent off-level issues while traveling by turning the refrigerator off when on the road, but some experts will argue that the jostling from the road helps prevent tubing blockage and the related heat build-up.

Another factor is the sodium chromate that coats the insides of the pipes to prevent the water from rusting the walls. When the refrigerator is operated off-level continuously, the sodium chromate is baked off of the inside of the boiler and eventually leads to complete failure as the rust works its way through the steel tubing. There are actually off-level specifications for compressor-type refrigerators, as well, so parking on sites not suitable for RVs can be problematic and should be avoided if you want a cool one after a long day.



6

All absorption refrigerators require two vents to evacuate the heat. Refrigerators mounted in a slideout will have an upper and lower vent mounted in the sidewall. Those installed in a solid wall will have an upper vent, like this one, mounted in the roof.



7a



7b

In order to drain condensation from the evaporator/cooling fins inside the refrigerator, a plastic tube is routed from the drain pan below the evaporator to a can mounted in the back of the cooling unit. The heat in this area is designed to evaporate the moisture, but it's best to run this tube out the bottom vent as shown here. This will require that the tube be extended with parts available from any hardware store.



8

A small inspection door is located at the burner enclosure so that the user can check the flame condition, or if it's even lit. You can see into this area using a bright flashlight, but it's best to remove the burner access cover for a more complete inspection and follow-up maintenance.



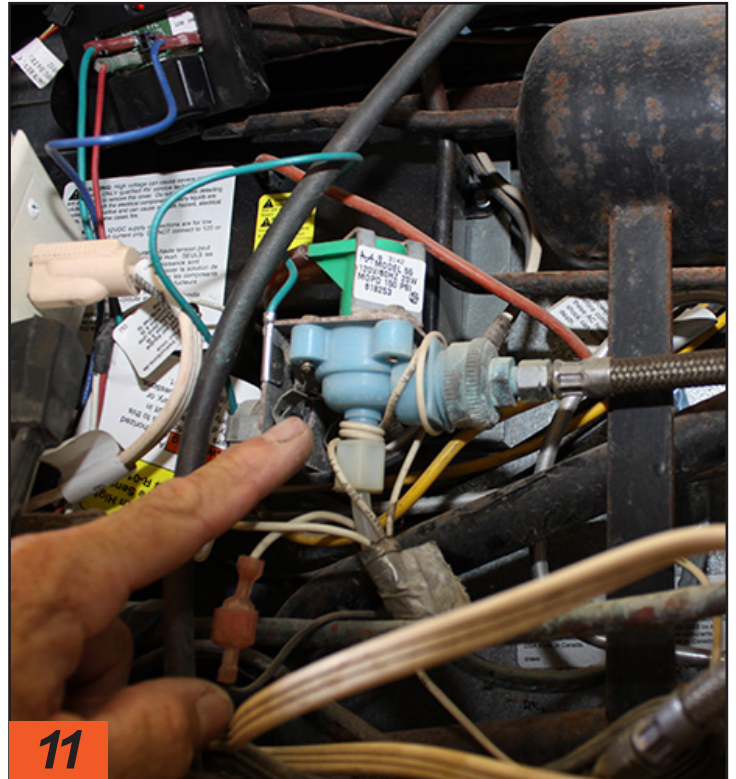
9

The burner vicinity can collect rust that showers down from the walls of the burner tube as well as other debris. The best way is to blow out the area with compressed air, but at no more than 100 psi.



10

These absorber coils are severely rusted and the cooling unit must be replaced. Failure to replace the cooling unit can result in a tube rupture and escape of the hydrogen/ammonia solution, which is flammable.



11

Built-in ice makers are nice to have, but many owners fail to check the condition of the water valve that feeds water into the system. This valve has a propensity to leak and build up corrosion. If this valve ruptures or leaks, the compartment and surrounding structures can be water damaged — which can be an expensive fix. **RVE**

COLD & SAFE

ANOTHER LAYER OF DEFENSE



If you park off-level, the ARP Fridge Defend will automatically shut down the refrigerator if it senses that operating temperatures have risen to a predetermined level, preventing damage.

Installing an ARP Fridge Defend protects an absorption refrigerator from overheating by turning it off when operated off-level or if it gets too hot from other conditions.

By Bill Gehr / Photos by the author

All gas/electric refrigerators now (or fixed under a recall) have safety devices to limit high temperature. To ensure any possibility of overheating is mitigated, I am a true believer in a safety device called the ARP Fridge Defend that's been on the market for quite some time and has a strong reputation for controlling overheating. Essentially, this device monitors the boiler and absorber coil

temperatures. When threshold temperatures are reached, the device shuts the refrigerator down for a period of time predetermined by internal electronics — which in turn allows for a safe cool down.

This device is especially important on the road if you're climbing or descending mountains or when parked off-level long enough to cause damage. The company also offers optional fans

that can be installed in the back of the refrigerator or inside the refrigerator box to improve airflow, something I also opted to do.

Installation is straightforward and ARP (arprv.com) offers videos, wiring diagrams and pictures on its website for do-it-yourselfers with moderate experience installing devices that require electrical wiring. The Fridge Defend operates on 12-volt DC power and the



There are various Fridge Defend kits available, depending on the refrigerator brand and model. This upgraded kit for the Dometic 1350 included two larger blower fans. The four smaller fans for the interior are part of an optional kit.

installation is a safe procedure that will not destroy an electrical component on the refrigerator if a mistake is made. The website is quite detailed, so plan on spending a fair amount of time deciphering the content.

That's important, because the Fridge Defend does not come with instructions; you'll need to visit the website and download the installation procedure for your refrigerator model. Since you're already there, it makes sense to watch the videos beforehand. Also, know that the temperature sensor for the boiler may be difficult to access on some models without sliding the refrigerator out a few inches to give you enough room to work. Fortunately, on the project model, a Dometic 1350, the access to the boiler tube was easy. Mounting the control box and connecting the wiring were uneventful.

Installing the blower fans took the most time. Since the refrigerator was installed in a slideout, the upper side-wall access vent provided better access for installing the upper cooling fans. Just be sure to follow the directions carefully, because the procedure varies from model to model to accommodate the size of the cooling unit. Fans are mounted below the absorber coils, where heat dissipation is most im-

portant, and on the back side of the vent/access doors. While there are wires already in place on some models to control the factory fans, I recommend installing another switch from a separate 12-volt DC source so that the fans can be operated as long as necessary to return the cooling unit temperatures to normal. The new blower fan installed in the upper door needs to be mounted so that it pushes the hot air out through the louvers.

The brushless ARP fans are

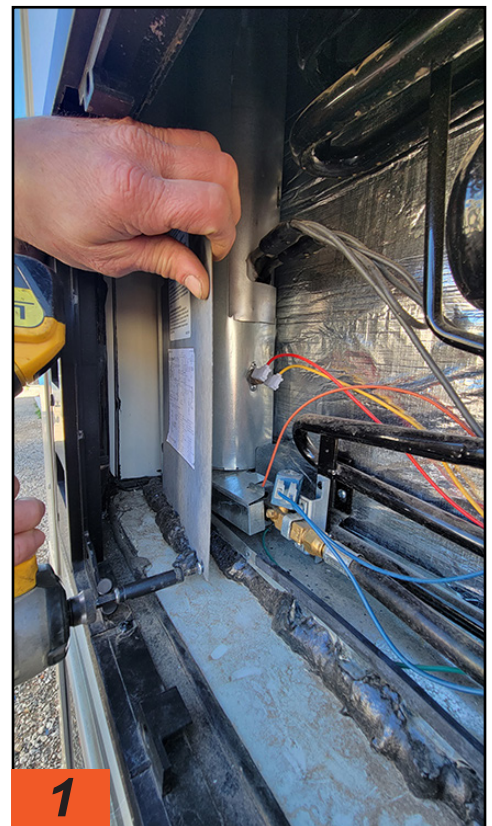
designed to run at a higher speed quietly and last for a long time. Although it's possible to acquire similar size fans online, it's best to opt for the ARP versions — which are also quieter — when ordering the Fridge Defend kit. I also installed longer wires so that the vent doors could be opened and set aside without pulling on the wires or removing the fans. This can also be accomplished by connecting two-prong plugs in the wiring, which can be separated when removing the access door.

I believe that the ARP-offered interior circulation fans are as important as the exterior cooling fans. For two-door refrigerator models. I recommend three fans; four fans are needed for the four-door models. These fans can be mounted with hook-and-loop material and aimed in different directions to cover all the fins at the back of the refrigerator. The wiring is fairly simple: Run a 22-gauge positive wire down through the drain hose (that exits through the lower vent door or terminates inside the compartment) and connect it to the positive side of the fans and to an ON/OFF switch that can control both the exterior and interior cooling fans since they will all need to be turned off during storage of your RV. The ground wire can be spliced into an interior light on

most models.

ARP offers several different kits, ranging from a basic device to those with the aforementioned interior and exterior cooling fans. I highly recommend that you install the fans, which reduced the temperature control setting on the project refrigerator from #5 to #2 — but more importantly, the refrigerator performed effectively even in ambient temperatures well above 100°. Kits start at \$165 up to \$285 with fan kits. Extra external fans are \$38 and the interior fans are \$19.

Once installed, I did notice that the Fridge Defend turned the refrigerator off in response to high boiler temperatures, even while running on AC power. Actually, this should not have happened since the electric elements maintain a constant temperature, but they do produce more heat than when running on LP-gas because the element is in a tube welded directly to the boiler and the propane runs up through the flue with a baffle that helps retain some of the heat. Nevertheless, we were happy that the Fridge Defend did its job. Historical information can be read on the control box, giving you information on how many times the refrigerator was shut down during a certain time period.



The first step is to remove the protective plate to gain access to the boiler flue cover for installing the temperature sensor.

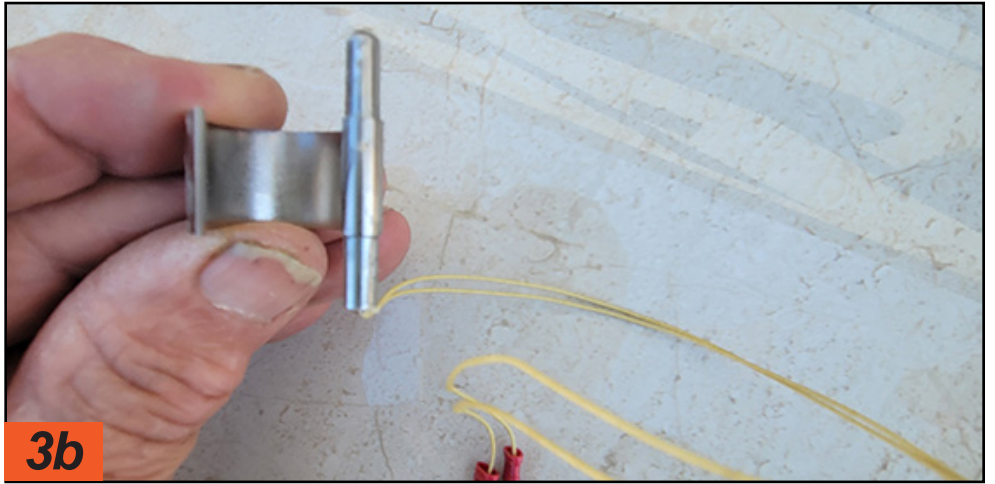


2

In order to install the temperature sensor, the cover on the boiler flue was removed by squeezing both sides and pulling off.



3a



3b

Super glue was used to hold the bracket in place for installation purposes. Gluing the sensor to the bracket makes it possible to install the parts into the tight space with only one hand.

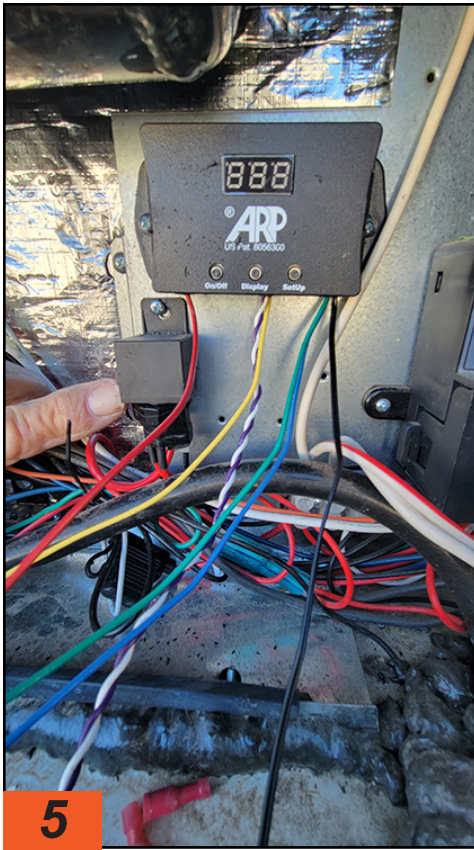


4a



4b

Here the bracket and temperature sensor were maneuvered onto the boiler tube right above the dimples. If mounted too high, the sensor will send a late message to the controller to shut down the refrigerator.



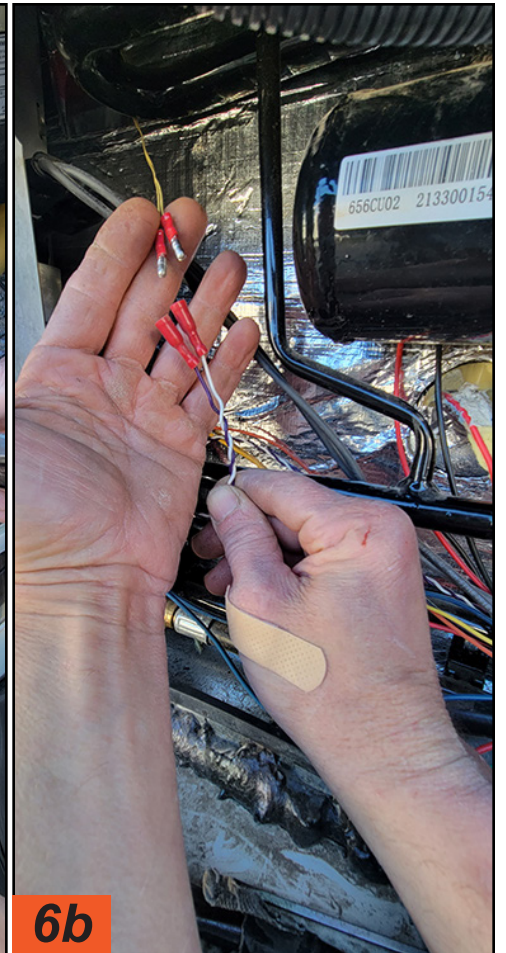
5

The factory relay (finger pointing) had to be relocated in order to find an adequate place to mount the controller. You'll want to mount the controller so that the read-out can be seen clearly when removing the bottom vent panel.

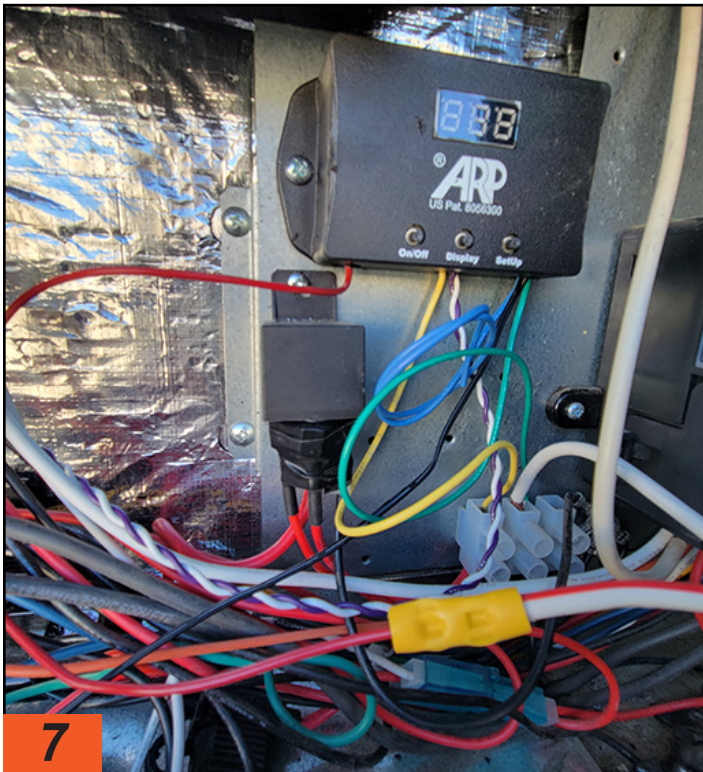


6a

ARP provides all the connectors necessary to install the kit components. These wires from the controller use bullet connectors so the sensor can be removed without cutting wires.

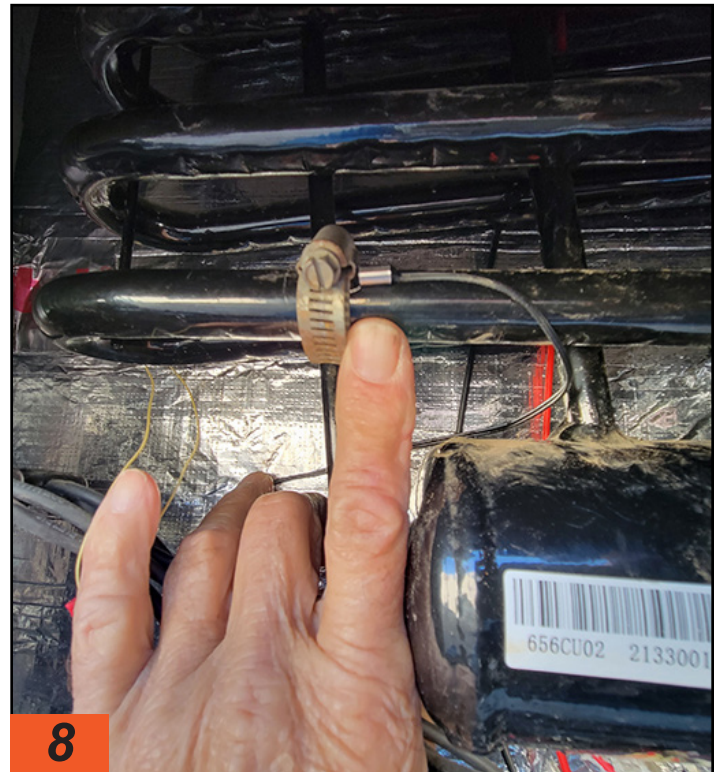


6b



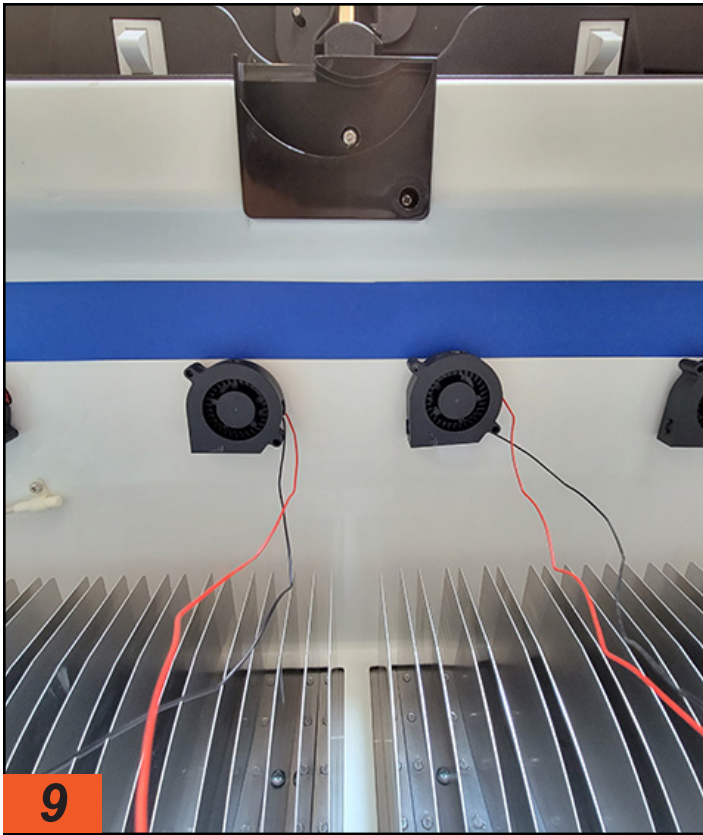
7

The positive (12-volt DC) lead was first removed from the refrigerator junction box and butt-connected to a wire that was routed to the controller. A separate wire was routed from the controller to the refrigerator (not shown).



8

A hose clamp was used to attach a second temperature sensor to one of the lower absorber coils. This is a redundant temperature sensor to ensure proper monitoring if the other one fails, which is unlikely if the installation is done properly.



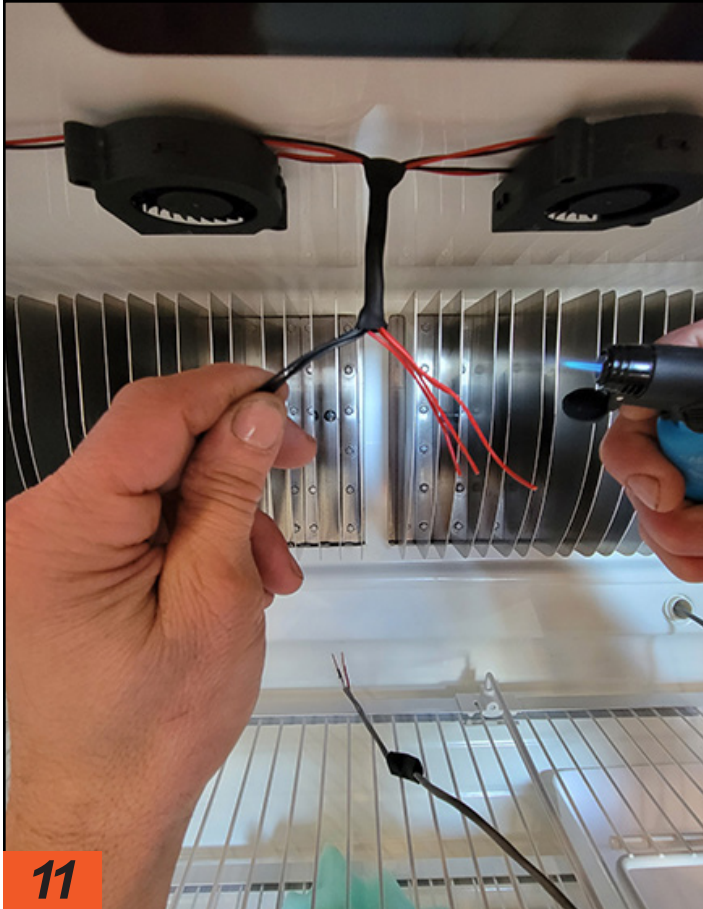
9

Four blower fans, as part of the optional kit, were installed to the top portion of the refrigerator liner above the evaporator fins. Painter's tape was used to line up the fans, which were then attached to the liner with hook-and-loop material.



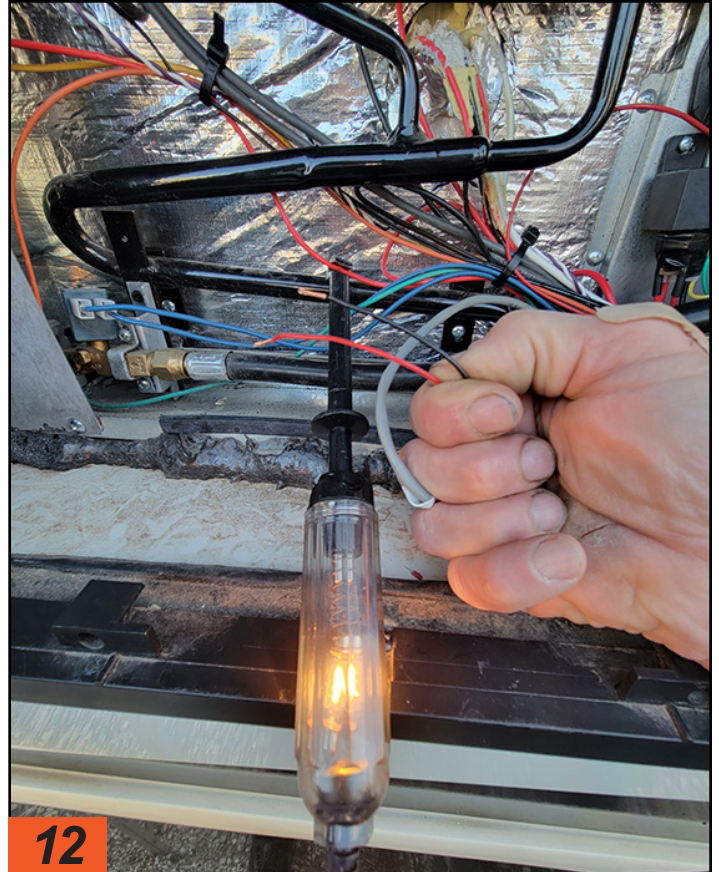
10

Power (12-volt DC) was routed through the condensation drain tube after temporarily removing the capture tray. Here both the positive and negative leads are routed because there is no logical place to get continuous power inside the box on Dometic refrigerators. The ground wire can be connected inside at the light fixture on Norcold models.



11

All four fans were wired in series and shrink tubing was used to waterproof the connections, which were soldered.

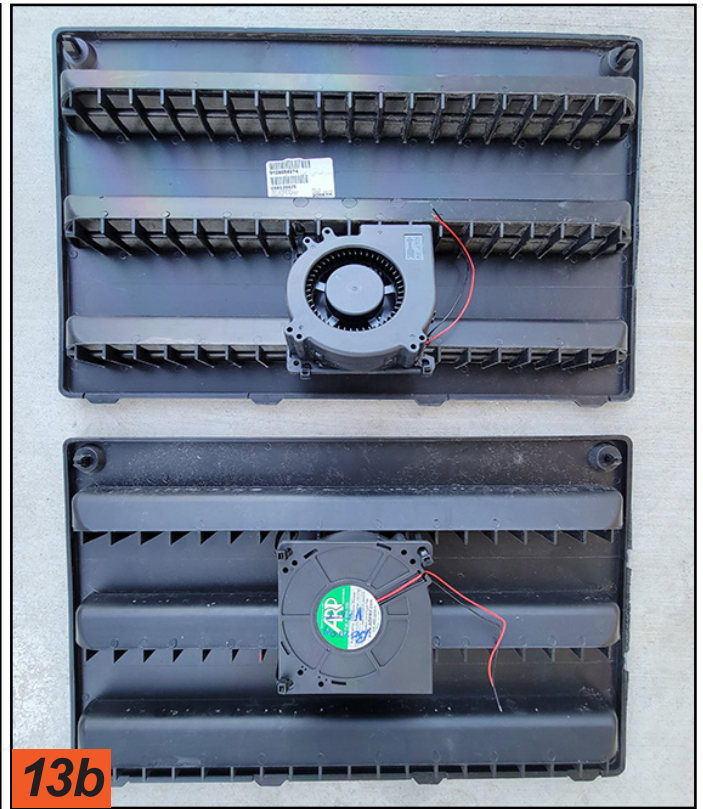


12

A test light was used to source a constant 12-volt DC power wire for the interior fans. The ground wire for this installation was connected to metal via a ring terminal.



13a



13b

One of the exterior blower fans was mounted to the bottom access door with cable ties. This fan blows upward through the absorber coils. The top fan was mounted on the top access door and positioned so that the hot air is expelled from the compartment.



14

Longer wires were used to connect the fans to the controller so that the access door can be removed and set on the ground without disconnecting. Two-way rubber marine connectors can also be used for the same purpose. **RVE**

COLD & SAFE

WHOOSH — AND THE FIRE IS OUT



Absorption refrigerators can be protected via a THIA by Proteng automatic fire suppression network — and better yet, these unique devices can be routed throughout any RV to include electronic bays and engine compartments. You can even protect a tow vehicle. By Bob Livingston / Photos by the author

Fires are scary business — and even more intense when an RV is involved. It behooves all RVers to plan for an escape in the event of a fire, knowing that's their best — and often only — line of defense. Anyone who has witnessed how fast an RV burns can attest to the fact that trying to extinguish a fire with the puny extinguishers typically provided with a new or used RV is usually futile. You need to get out

fast.

The good news is that emergency exits must comply with the National Fire Protection Association (NFPA) codes required of all RV builders. The better news is owners can up their line of defense with a professionally installed THIA by Proteng automatic fire suppression system (proteng.com).

Fire suppression systems have been around for a long time and commonly

are found in race cars and other similar entities. Typically, they are expensive and complicated to install. Proteng's approach is completely different — an offshoot of providing protection for expensive race cars — and although its simplicity is refreshing, it does take someone with expertise with these components and certification from Proteng to install the system.

When designing its system for RVs,



Professional, certified installers start the process by determining the proper device for the area that will be protected. Here the process was started by using a laser measuring tool to determine the compartment dimensions.

Proteng's main impetus was to provide owners enough time to vacate the RV safely and to limit damage. While the proper fire extinguisher is still a necessary (and code required) safety device, the chemicals used to douse fires can also destroy electronics and other components. The THIA by Proteng (Tube+Heat = Instant Action) system is comprised of specialized materials and filled with clean agent gas (FM-200™). The heat-activated process starts when significant temperatures cause pressure in the tube to increase. When the pressure gets to a critical point, the tube wall ruptures in a directional manner at high pressure to the area generating the most heat.

When the device activates — which sounds like a gunshot and is loud enough to wake sound sleepers and give them time to vacate the RV — the contents will detect, suppress, and/or extinguish the thermal events instantly, leaving no residue. The formula and delivery system are a closely guarded secret, but after personally watching live demonstrations, there's no doubt any fire (classifications A, B, C) will be extinguished immediately, which is a godsend when it comes to dousing component fires like those that start in the refrigerator compartment.

The devices are sized specifically for the compartment or area to be protected. When it comes to lithium batteries, there's an element of the

protection that must be considered. Lithium batteries present an additional risk when amperage discharge is too fast and deep, and when temperatures soar (thermal runaway). Normally these batteries are protected by a management system with shut-off circuits, but an electronic failure (which today is less common) can lead to a fire. In that case, the Proteng system may not completely douse the fire immediately, but it will provide the time needed to vacate

the RV safely.

While the installation of this device seems simple, there are a few factors that require expert handling by certified service personnel. Technicians assess each area or compartment and determine the appropriate THIA by Proteng devices required for the volume and average ambient air temperature — more than 20 unique devices have been developed specifically for RVs. Once the proper devices are selected, installation protocols are further assessed to assure an optimal configuration and placement. It takes just a few hours to cover an RV completely and typically the cost can range, for example, from \$2,500 to \$7,000 for motorhomes. To protect a double-door refrigerator, plan on spending around \$500. THIA by Proteng devices and all of the components are made in the U.S.A. and covered by a five-year warranty.

Once the tubes are placed, there is no maintenance; the tubes have a lifespan of around seven years when mounted in the back of an absorption refrigerator and likely a shorter time in higher-heat areas. On the positive flip side, devices in electrical areas can last more than 10 years. National Indoor RV Centers (nirvc.com) has an exclusive to the RV industry in the U.S. for installation and distribution. Plus, there are certified factory installation teams continually roving North America for



THIA by Proteng devices (tubes) are custom manufactured in the U.S.A. and are comprised of specialized materials and filled with clean agent gas (FM-200™). Brass fittings, protected by plastic covers, seal the contents in the devices. The system tubes are covered by a five-year warranty and should last up to 10 years, depending on where they are mounted. They are not user-serviceable.

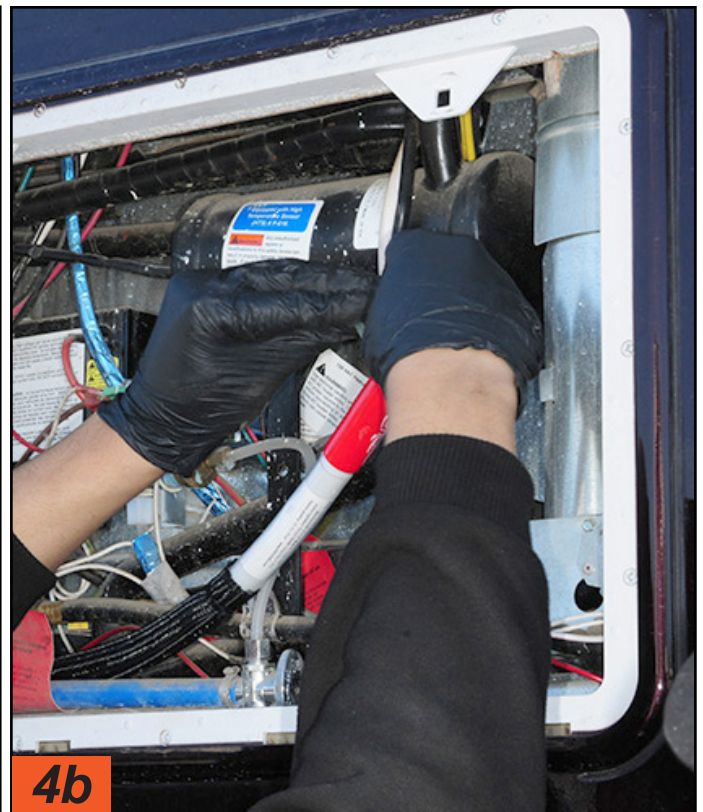
special events and rallies. If you are not sure when, where, or how to take the next step, call or text 561-776-8364 and a Proteng executive will gladly assist.

While the THIA by Proteng suppression system may seem like an added expense to RV ownership, it's hard to place a value on saving lives in the

event of a catastrophic fire and the protection from collateral damage that results.



Once the device is sized correctly, it's ready for installation. The system is amazingly simple but packs a big punch when it comes to extinguishing flames. More than 20 devices have been uniquely developed for RV installations.



A key area to protect is the back of an absorption refrigerator. Once the device is sized for the specific installation, it's routed from the bottom of the refrigerator, through the bottom access (vent) panel. Care must be taken to clear wires and other components. Since the device is custom manufactured for the exact refrigerator, it will fit nicely in the compartment and terminate in a logical place. From here the device is cable-tied to the back of the refrigerator; for higher heat areas the device is wrapped in a heat shield.



5a



5b

Proteng uses special heat-resistant cable ties for securing the devices. Each one is wrapped with a small length of rubber hose to isolate against hot components. This is a critical procedure that is taught to certified installers.

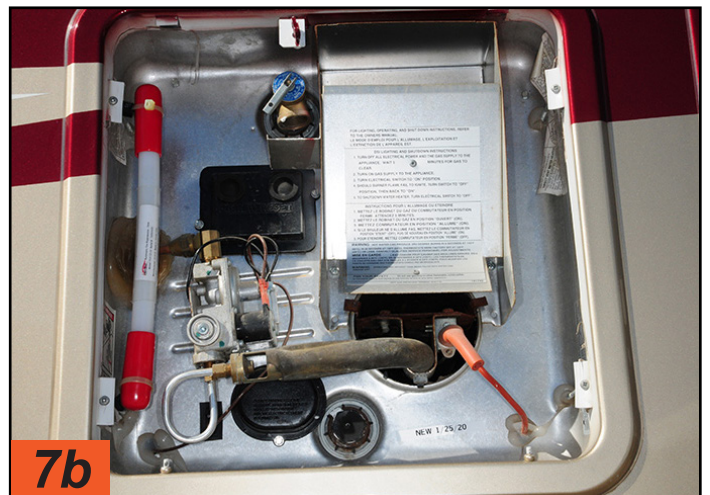


6

Rubberized clamps are used when it's possible to secure the device to a solid surface. Installers are good at recognizing logical spots to secure the devices.

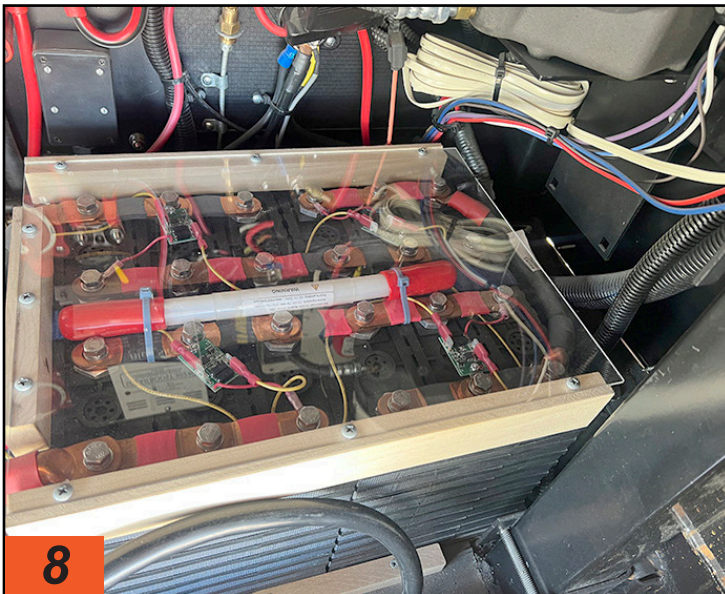


7b



7b

Since Proteng manufactures all its devices on a custom basis, it's possible to protect all appliances and compartments. Here a device was sized specifically for a water heater, where it was easily clamped to the metal housing.



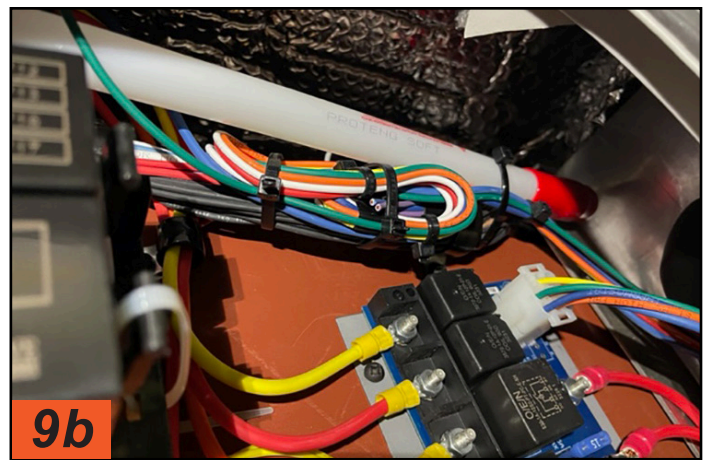
8

Lithium batteries, which are more popular than ever, pose an additional risk to owners. In the event of an abnormal amperage discharge, a thermal runaway could cause battery temperatures to soar to unsafe levels. Fortunately, these batteries are normally protected by a management system, but an electronic failure (which is not common these days) can lead to a fire. The THIA by Proteng system may not completely douse the fire immediately, but the sound of the tube rupturing is like that of a gunshot, so occupants will surely wake in time to vacate the RV safely.



10

Engine and generator compartments can also be protected. Fires can start due to a number of reasons, including fuel and coolant leaks and faulty wiring.



9b



9b

THIA by Proteng devices are designed to protect any area where electronics and wiring are present. Custom devices are built to protect individual accessories and/or entire compartments. This is why it's important to restrict installation to only certified technicians.



11

The heat-activated process starts when the pressure inside the tube increases as the temperature rises. When the pressure reaches a critical point, the tube wall ruptures in a directional manner at high pressure to the area generating the most heat. The gas/compound leaves no residue so there is no collateral damage — something common with traditional fire extinguishers. **RVE**

Caravan Salon: 250,000 Square Meters of Fun



If you've got a hankering to take a trip this summer by a conveyance other than your RV, consider heading to Dusseldorf, Germany where, Aug. 30-Sept.8, you can take in [the world's largest RV show](#).

This year, more than 700 exhibitors will showcase motorhomes, caravans and campervans — as well as accessories and the matching tourism offers — ensuring an unparalleled brand and product diversity on 250,000 square meters of exhibit space.

To give visitors an even better overview of the ranges on offer, the hall layout has changed slightly this year. Hall 7 will become the center for national and international regions, destinations and, of course, campsite and RV pitches with the motto "Travel & Nature." The "Travel & Nature CONNECTED" stage will entertain visitors with an exciting combination of entertainment and presentations revolving around destinations and leisure activities.

This makes room for a larger "Equipment & Outdoor" offering in Hall 3. In addition to roof-top tents, pop-up caravans, folding and tent trailers as well as tents and awnings, equipment and accessories related to the outdoor and camping experience will attract visitors to this hall. The "Starter World" for all beginners and newcomers who appreciate initial help and advice on the many caravan-related topics, will move to the outdoor space (between Halls 10 and 17).

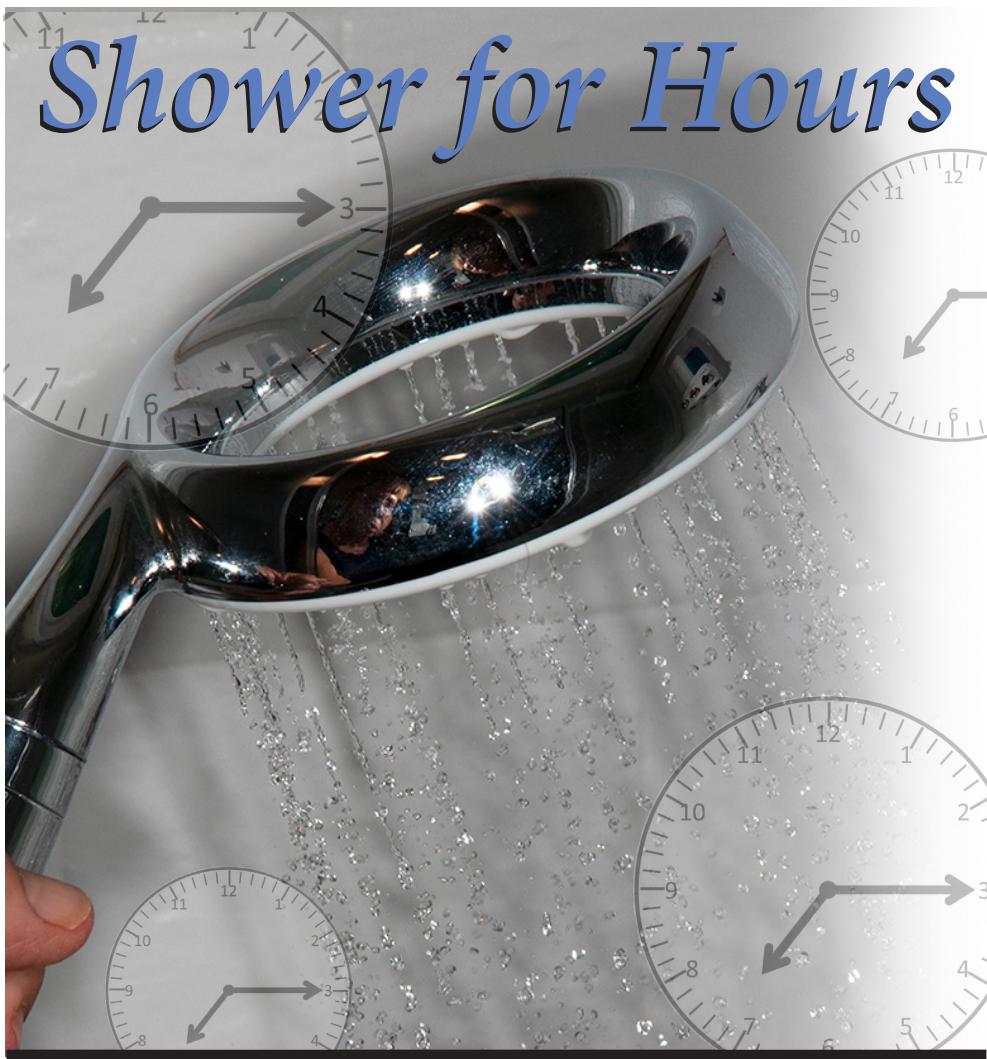
And, of course, we at *RV Enthusiast* defy anyone who goes to the event to not exclaim — time and again — "Why don't they do that in the states?" **RVE**



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Roadmaster	roadmasterinc.com	2
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Shower for Hours



Water softening is created by the use of metals in the handle that cause an electro-chemical catalytic reaction, which neutralizes the calcium so it cannot form limescale. The unique alloy increases water velocity and turbulence, preventing the minerals from building up.

up of calcium and other minerals over shorter-than-expected periods of time clogs faucets, leaves unsightly — and almost impossible to remove — streaks on glass, and makes lathering up in the shower more difficult. Ecocamel, recognizing that dry, itchy skin and frizzy hair is no fun, has built a water softener feature into the handle of its Orbit Soft Water showerhead that is designed to increase the solubility of hard water by altering the crystal structure of calcium carbonate, which prevents hard scale deposits.

It works by placing metals in the handle that cause an electro-chemical catalytic reaction, which neutralizes the calcium so it cannot form limescale. The configuration of the unique alloy also increases water velocity and turbulence, preventing the minerals from building up. The hard minerals are



Proprietary AirCore Technology forces air through the handle, spinning the water at high speed. Turbulence build-up results in the strong stream of water. Flow is regulated to a maximum of 2.1 gallons per minute.

Ecocamel's Orbit showerhead provides a super strong stream while reducing consumption and softening the water

By Bob Livingston

Taking a shower in an RV is not exactly exotic. Most showerheads push out a boring stream of water, designed to get the job done with little fanfare. Multiple showerheads or a rainforest fixture can up the entertainment factor appreciably, but adding such hardware may not be possible without major modifications to your rig. And even if the accoutrements in your shower invite lingering, water consumption plays a pivotal role — and don't forget the limitations on hot water capacity (unless, of course, you have an instantaneous model like Truma's AquaGo or Airxcel's Aqua-Hot).

Ecocamel (ecocamel.com), based in London, England, with a stateside presence in Saint Petersburg, Florida, offers showerhead products that bring a

tingle back into an otherwise lackluster experience.

Several years ago, I had an opportunity to test one of EcoCamel's first showerhead models brought into the U.S., and shortly after I installed an Orbit Soft Water model that not only provides a satisfying ring of water that stimulates the skin, but it softens the water to boot. After years of full-time daily usage by my wife, Lynne, and I, the Orbit showerhead still works without complaint, and the nozzles in the ring have never been cleaned — a testament to the soft water feature.

Hard water is an RV owner's nemesis. If you happen to live in the desert, like we do for six months every year, the hardwater is even more damaging to the RV's water system. The build-



Unique design of Orbit Soft Water handle allows for a comfortable water stream pattern that provides good body coverage. Orbit Soft Water is a little heavier, but overall length and weight presents no issues when holding over your body. Rubber nozzles in the ring can be cleaned by simply swiping with a thumb. The soft water feature keeps the nozzles clear of calcium, as we discovered after years of full-time use.

removed from the water, becoming insoluble crystals which then wash down the drain.

My first reaction was, as you might imagine, skepticism, since softening water usually requires an inline device that relies on salt and is a much more sizeable operation. However, initial showering experiences proved the Orbit to be a valuable addition to our shower, and Lynne swears that the “soft” water makes it easier to wash her long hair.

From the outside, it’s hard to distinguish the soft-water feature. The Soft Water model is a little heavier than most showerheads, but that has very little impact during actual use.

While the design of the Orbit strays from convention, it also increases the pressure through the jets in the ring at the end of the handle. This is the feature that has made the Ecocamel showerheads so successful. Air is forced through the handle, spinning the water at high speed and building turbulence to create a strong stream of water. Flow is regulated to a maximum of 2.1 gallons per minute.

Meanwhile, rubber nozzles in the ring portion are spaced to provide a

nice water pattern that covers the body effectively.

From a subjective point of view, the softer water felt smoother on the skin. It takes a little longer to rinse the soap off, but there was no “slimy” feeling (a common complaint from some people who don’t care for over-softened water).

When the water from the showerhead was tested with a meter, we discovered that there was a 20% reduction in total dissolved solids compared to the water flowing out of the other faucets, which confirmed that the water was indeed softer even after months of daily use. The soft-water components require no maintenance.

The combi-

nation of softer water and the powerful spray makes the Orbit Soft Water an indispensable item in our shower — but it gets even better. Ecocamel offers the Orb Spa Vibra sonic massager, a handheld, waterproof attachment that operates on three AAA batteries. The Spa Vibra snaps into the Orbit or Orbit



The Orb Spa Vibra sonic massaging option makes a nice addition to the Orbit Soft Water. Installing the device in the ring makes the showerhead a little top heavy, but that weight helps deliver the desired pressure and sensation to the skin. The attachment uses medical grade, non-porous rubber “fingers” that are designed to exfoliate the skin while showering.

Soft Water shower head and offers three speeds for managing the desired massaging effect on your skin. It transforms the Orbit showerhead into a multi-function tool that delivers the ultimate showering experience.

Medical grade, non-porous rubber "fingers" are positioned strategically on both ends of the device, which exfoliate the skin while showering. The skin can be massaged with or without water, and the device can even be used without the Orbit showerhead. When placed against the skin, the vibrations offered by the internal motor are designed to deep clean the skin, removing dead cells and promoting tissue regeneration. The massaging fingers are easily cleaned with running water and a towel.

Adding the sonic massaging unit makes the showerhead a little top

heavy, but that weight helps deliver the desired pressure and sensation to the skin. The feeling is not overpowering, and some might even think nothing is happening at first, but the end result is very refreshing.

For owners who prefer a simple, water-saving showerhead, the Jetstorm is the company's most popular model. It has a \$56 price tag and a svelte profile. It uses the same technology, whereby air is mixed with water to provide a nice stream of water with a comfortable pattern. The water stream is not as powerful as the Orbit, but still gives the user a pleasant showering experience. The spray plate can be cleaned by rubbing the nozzles with your thumb. We've adapted it for outside use after modifying the stock shower hose with a coiled counterpart. It's perfect for washing the

dog or sand/mud off your feet.

An optional Shut Off Valve (\$15) can be ordered for additional water conservation. It works well, but the button gets difficult to push after a while. Keep in mind that this valve is before the soft water feature, so it's susceptible to calcium build up. I've had the best luck with the KES Shut Off Brass Shower Head Valve (K1140B-2; \$12.50 from Amazon).

Using the Ecocamel Orbit and ORB SPA will positively change the way people perceive taking showers in an RV. The cost of upgrading to the Orbit SoftWater showerhead is \$108 while the massaging option is an additional \$40, or you can purchase them both together for \$140 — but you'll be singing in the shower again.

Now, how does that song go?



The motor that creates the vibrations operates on three AAA batteries, which are placed in a waterproof compartment.



Holes in the handle of the Jetstorm showerhead allow air to enter and mix with the water to provide a strong, water-saving stream of water



Water stream from popular Jetstorm hand-held showerhead is nice, but not as strong as the Orbit Soft Water. Pattern is plenty wide.



An optional Shut-Off Valve has an ergonomically placed button that works smoothly at first, but I found that over time the button becomes more difficult to push. Still, the ability to cut water flow while soaping up in the shower is paramount to most RVers; our choice is the KES Shut Off Brass Shower Head Valve (K1140B-2) available from Amazon. It's mounted to the shower diverter faucet and has been working smoothly for years.



The best showerhead hose we've ever used is the Ecocamel Stainless Steel Shower Hose. This hose is super flexible and has been working flawlessly for many years of full-time use. It sells on the Ecocamel website for \$15. **RVE**



DOMETIC

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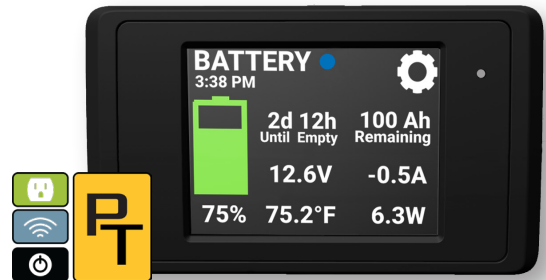
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