

2023's Top DC-to-AC Power Inverters



RV ENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE

March 2023

Getting Ready to Roll!



Spring Upgrades

- Quick n' Easy Cooktop Swap
- Screen Door Hinge Replacement
- How to Restring Window Shades
- Add Cable-Actuated Dump Valves



**WHENEVER, WHEREVER, WE MAKE
YOUR EXPERIENCE BETTER.™**



**BECOME A MEMBER OF
OUR RV COMMUNITY**

We want to keep moving the RV industry forward by inviting you to connect with other campers, share your ideas and experiences and unlock solutions that have not yet been addressed or solved!



JOIN TODAY!
Scan or visit the link:
community.lippert.com



RV ENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE

March 2023

Volume 3, Number 3

INSIDE



14

Sine Language

Boondocking is easily the hottest trend in RVing today — but owners must ensure that their rigs are equipped to provide enough power for going off-grid. Power-hungry appliances and accessories don't run on 12 volts, so a reliable DC-to-AC inverter is a "must-have." Here's what you need to know about inverters — and a look at the top inverters available.



21

Cooking With Gas

There's a lot to be said for retaining ownership of an older RV, but aesthetics generally isn't their strong suit. Interiors, in particular, tend to age badly — and appliances of yesteryear were also a lot less efficient. When the owner of this 2008 Monaco Diplomat began experiencing problems with its cooktop, the crew at Carriers RV Service swapped it out in about an hour's time.



26

No Strings Attached

Actually, "no strings attached" is how you definitely don't want to be, especially when they control your window shades. As RVE Technical Director Bill Gehr illustrates, however, when the cords controlling day/night shades give up the ghost, you can easily replace them — even while on the road. It's a DIY-friendly fix that just requires some time and attention to details.

DEPARTMENTS



6 On the Road

While the pandemic fueled a record surge in RV ownership, those new owners are discovering that the cost of a unit and, for a towable, a vehicle to pull it with are only the tip of the iceberg. But we won't whine (much) about the outlandish costs of some RV parks.



8 News & Notes

With so many manufacturers turning their attention to all-electric RVs, it still looks like the first one out of the gate may be the Lightship, the creation of former Tesla executives. Meanwhile, Lance will be going into production of its Enduro off-road trailer — plus a lot more.



12 Technically Speaking

An ill-tempered furnace gives a reader fits, while another asks about the possibility of adding a garbage disposal unit. Other queries revolve around replacing window valances and the removal process for ridding a 2006 motorhome of the former owner's penchant for bumper stickers.



On The Cover

Darren Clausen (left) and Lee Edmonson roll up the cover to prepare Darren's 2022 Grand Design Reflection fifth wheel for the summer. Photo by Bob Livingston

43 Advertisers Index



36

Down the Drain

Dumping holding tanks is one of those necessary evils that all RV owners deal with on an all-too-frequent basis. It's tough enough when the valves are readily accessible. Cable-actuated dump valves used for more remotely located tanks get a bad rap for operational difficulties. These complaints, though, can be mitigated with the right products and proper installation.



44

Don't Get Unhinged

Screen doors on an RV take a lot of abuse — and not surprisingly, the hinges may eventually give out. One solution — albeit a relatively expensive one — is to simply replace the door assembly. Here's another option: craft new brackets out of angle aluminum acquired at a local hardware store. This will restore full use of the screen door for a fraction of the cost of Option No. 1.



46

The Gate Keeper

A pickup truck's tailgate is not a lightweight component — and when it freefalls when being opened, it takes a toll on the hinges and can damage the gate. Knowing that a “tailgate-opening assist” is one of the coolest features of new trucks, we set about creating a similar system on an older 2017 Ram 3500 dually — aided by an easily installed kit.

EDITORIAL STAFF

PUBLISHER - BOB LIVINGSTON
(805) 320-6909
BLIVINGSTON@RVEMEDIAGROUP.COM

EDITOR - BRUCE HAMPSON
(574) 584-4616
BHAMPSON@RVEMEDIAGROUP.COM

TECHNICAL DIRECTOR
BILL GEHR
(805) 340-5015
BGEHR@RVEMEDIAGROUP.COM

ART DIRECTOR - MIKE ACCUARDI
MACCUARDI@RVEMEDIAGROUP.COM

BUSINESS OFFICE
RV ENTHUSIAST/
RVE MEDIA GROUP INC.
26362 DOUGLAS AVE., ELKHART, IN 46514

ADVERTISING
ADVERTISING DIRECTOR
SUE SEIDLITZ
(805) 816-8759
SSEIDLITZ@RVEMEDIAGROUP.COM

SUBSCRIPTIONS
To subscribe electronically, log onto:
www.rventhusiastmagazine.com, click on the “subscribe” icon and follow the prompts to add subscriber and payment information. Alternately, you may also mail to: *RV Enthusiast* Subscriptions, 26362 Douglas Ave., Elkhart, IN 46514. Subscription rates: Subscriptions for U.S. and Canada: \$9.99/one year, \$18.99/two years. Premier membership subscription rates available upon request.

CORRESPONDENCE
Correspondence is invited from subscribers and readers of *RV Enthusiast*. Technical inquiries relating to RV function, maintenance, repairs and/or upgrades should be directed to Technical Director Bill Gehr at the above email addresses. Letters to the Editor should be directed to Editor Bruce Hampson at the above email address. Personal replies cannot be sent due to the volume of mail received. By forwarding letters to *RV Enthusiast* magazine, the author consents to allow letters to be published at the discretion of *RV Enthusiast* editors. Letters may be edited for brevity and clarification.

AFFILIATE NOTICE: RVE Media Group LLC provides links to vendors and products, such as an Amazon Associates account, for informational purposes, but that may provide a commission if you purchase from that link. We often label these links with language that provides transparency if the destination is an advertiser, affiliate, or partner. Products are often provided to RVE at little/no cost for editorial testing purposes by vendors/suppliers. Under no circumstances does this affect the results of the test or install as published in *RV Enthusiast*. Sponsored content is identified as such directly on the content.

PRIVACY POLICY: Our complete privacy policy can be found at <https://rventhusiast.com/privacy-policy/>



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

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

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

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

Lithium battery buying tips

1. Choose quality over price

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

2. Buy with confidence

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

3. Use a reputable supplier

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

Are you interested in upgrading to Lithium?

Contact your local RV Dealer or visit
gopowersolar.com for more information.



The Rising Costs of Making Memories

In some ways, camping isn't the relatively inexpensive lifestyle it used to be. I know, you can say that about anything when inflation is running at 8% a year or more — but campgrounds have really turned up the wick, pricewise, in the last few years as a pandemic-fueled surge in RV ownership led to an even bigger chasm between available campsites and potential campers.

It's not for nothing that industry publications the likes of *RVBusiness* and *Woodall's Campground Magazine* have carried stories about recent groundbreaking on new RV parks and resorts oftentimes bankrolled by major corporations, private investors and even trusts. These folks are used to making money, and when they see many RV parks and resorts bumping nightly fees by 10%, 20% or more annually — to say nothing of such things as implementing the same sort of "dynamic pricing" the RV industry once held up as yet another reason to forego vacations by planes, cruise ships, hotels and car rental agencies — they see dollar signs.

So, yeah, that can pinch a wallet.

So, too, can the topsy-turvy price of fuel, especially diesel, which has been all over the board recently.

These costs, though, can be tempered at least in part by spending some time on the road boondocking, planning vacations with stops at campgrounds that don't have all the bells, whistles and water parks and, when need be, limiting trip distances. Heck, some of us have always done this.

Recently, however, I read a rather plaintive posting on one of the RV-centric social media groups I monitor that really hammered home just how unprepared some "newbies" are who may have jumped into the lifestyle as a safer way to vacation, or as employers loosened their reins and began allowing for remote working. The author wrote of possibly having to give up his fifth wheel — which, as is the norm for a newer vehicle loan, he was upside-down on — but noted that it was the other costs associated with RVing, combined with some unnamed unforeseen circumstances, that seemed to be forcing his hand: primarily storage, insurance and a truck payment.

My first thought was that he should not have leaped into a lifestyle he may not have fully researched first, but then I got to wondering: how many others have done the same thing? The costs he complained about are nothing new, although many municipalities have in recent years outlawed parking RVs on the street or even on private property if they aren't fully enclosed with a fence.

So, I'll give him a mulligan on that one, because you almost need to take out a second mortgage on your brick-and-mortar home to pay storage costs in such places. Heck, *RV Enthusiast* Publisher Bob Livingston recalled paying \$400 a month for indoor storage of his truck and camper while living in Ventura, California — and that was years ago.

As for the rest, what the aforementioned RVer came to grips with is the little-acknowledged flipside to RV ownership. Because, yes, an RV vacation is still the cheapest way to travel — when you are only factoring in the costs of the vacation. But RV ownership doesn't stop once the trip is over.

Owners continue to write monthly checks on their RV and tow vehicle (or maybe their dinghy), along with paying for insurance and registration (licenses) on both, throughout the year. Factor those constant payments into the equation and RV vacations really aren't the cheapest way to get away.

But they still are the most comfortable. RVers can still travel where they want, when they want, in their own home. And that, my friends, continues to be well worth the price of admission.

For example, I asked Livingston — who is something of a nomad inasmuch as he spends nearly half the year on the road in his Grand Design Reflection fifth wheel with his wife, Lynne, and their Standard Poodle, Reba — to jot down some numbers on what it takes to enjoy the freedom espoused in those wonderful Go RVing promotions. According to his figures, the Livingston Clan spent a total of \$13,780 for their five-month odyssey in the summer of 2021 (2022 doesn't count, since they stayed with their son in Nevada for much of the season). As Livingston noted, while those costs didn't include insurance and license fees or require monthly vehicle payments — the "givens" — they did encompass everything else: fuel, site fees, food, entertainment, LP-gas and repairs.

"Food can bring up the cost significantly, but since you have to eat anyway it may be unfair to consider basic food costs as part of any trip expense," he admitted. "But it is cheaper to cook your own at an RV park than to constantly go out to eat." By occasionally using his Elks Club benefit and Harvest Hosts membership — both of which offer free (or cheap) overnight stays — he also was able to offset visits to more expensive campgrounds, keeping the nightly site cost to an average of \$60/night.

One thing he did stress, however, was the need for RVers to develop a working knowledge of their rigs. While some costs can't be curtailed — he paid \$700 to replace a few blown tires, along with \$300 for truck service — a slideout repair he effected himself would have sent his "account payables" skyward had he needed to dock the fifth wheel for a few days at a repair shop.

Granted, Livingston's out-of-pocket expenses for his five-month excursion could easily be whittled down by a bit of judicious shopping — he's something of a gourmet, even when on the road, and fresh fish costs more than ground beef — and staying at parks for a longer period. For example, the Elkhart (Indiana) Campground near my office is extremely popular with travelers, not only because of its proximity to so many RV-related locations but because its hands-on owners ensure the property is kept up and the noise is kept down. You can book a 50-amp site there for a reasonable \$55/night — or cut that cost nearly in half by staying a month.

But what the heck — when you go on the road, you want to enjoy yourself and make memories. Besides, Livingston's five-month, 8,000-mile journey cost him about \$92 a day. That's a cheap price to pay for the memories that come with touring America.

I hope that chagrined RVer finds a way to keep that fifth wheel and make his own.



Big Adventures

DEMAND ROAD READY FEATURES



POLAR® 8DC



POLAR® 10DC



POLAR Elite N15DC



POLAR Elite N20DC



Visit NORCOLD.COM to learn more



Engineered
for Adventure



DC Compressor
Convenience



Energy
Efficient

DEMAND THE BEAR

Tripping the 'Lightship' Fantastic



Lightship, said to be America's first all-electric recreational vehicle (RV) company, announced in early March the launch of the Lightship L1 — an aerodynamic, battery-powered travel trailer and the first purpose-built travel trailer with a self-propulsion system that enables near zero range or mile-per-gallon efficiency loss for the vehicle towing it.

Lightship co-founders Ben Parker and Toby Kraus saw an opportunity in the RV industry that reminded them of the early days they'd seen working at Tesla. Not surprisingly, then, Lightship is taking a clean-sheet approach to building an all-electric recreational vehicle the same way Tesla disrupted the established automakers. The Lightship team, which includes alumni from Rivian, Proterra, Lucid and Zoox in addition to Tesla, is leveraging their expertise in automotive EV development and design to deliver a truly unique experience.

With production expected to begin in

late 2024, Lightship is said to feature a hyper-efficient design that is three times more aerodynamic than a traditional travel trailer for longer range and greater efficiency — which means a 300-mile range electric vehicle (EV) used to tow it remains a 300-mile range EV, and a 25-mpg gas truck remains a 25-mpg gas truck. Its electric powertrain offers up to 80 kWh of onboard battery capacity, allowing the trailer to propel itself and achieve near-zero range or efficiency loss for the tow vehicle — and battery system is said to be able to provide a week of off-grid power without charging. Coupled with up to 3 kW of solar power, the RV can power the living needs of its occupants and eliminates the reliance on propane and other fossil fuels.

It's also surprisingly roomy. The 27 foot travel trailer, which has a 7,500-pound GVWR, presents a 6-foot, 9-inch height in tow mode, but expands to 10 feet in height for camping and



provides room for 4 to 6 adults to sleep in comfort (depending upon configuration).

Granted, all this technology doesn't come cheap — Lightship has a starting price of \$125,000, or \$118,400 after an available federal tax credit. For more information — or to reserve your own Lightship — visit <https://lightshiprv.com>.

KOA Revamps Rewards Loyalty Program



Perhaps the most recognizable brand in the outdoor hospitality industry, the familiar KOA (Kampgrounds of America) logo represents more than 500 parks — each itself branded further to Journey, Holiday and Resort to let campers know beforehand the level of amenities each offers.

Now, the Billings, Montana-based company has launched an "overhauled" KOA Rewards Loyalty Program to make it easier to earn rewards.

Under the previous program, reward points could only be redeemed in person as a camper checked in for a stay. The new system digitizes the entire process, making it easier for campers to plan their stays, track their earnings and rewards and apply loyalty benefits during the online check-in process.

Based on point accumulation annually, the new program reduces account holder tiers from three to two — Base and VIP. The annual fee will remain at \$36 per year.

Base account holders receive:

- 10% off the daily registration rate every night at any of 500+ KOA locations throughout the U.S. and Canada.
- Points for dollars off future KOA stays (6,500 points = \$10; 15,000 points = \$25; 25,000 points = \$50).
- A free night of camping at participating KOA Campgrounds during the annual KOA Rewards Weekend (Sep. 8-9, 2023).
- Exclusive offers and discounts from corporate partners

VIP account holders (earning 20,000 points in their account year) receive Base benefits and:

- Earn 25% more points
- Free 1-year enrollment in KOA Rewards
- Bring-a-friend discount
- \$10 cancellation fee waived (when following the campground cancellation policy).

To learn more about KOA Rewards and sign up, please visit koa.com/rewards/.

American Coach, Indy Champ Castroneves Continue Partnership



American Coach, a luxury Class A diesel motorhome brand that's part of

REV Recreation Group Inc., announced the continuation of its partnership with internationally renowned IndyCar race car driver Hélio Castroneves.

As he has for the past several years, Castroneves will serve as an American Coach brand ambassador for 2023 and 2024, sharing stories from the road behind the wheel of his American Eagle coach.

Castroneves will use his custom American Eagle coach throughout 2024 to make select appearances for American Coach, engage in social media posts, and share his American Coach experience in brand videos. Castroneves has a long-standing relationship with REV Group that began in 2015.

Castroneves worked closely with the American Coach design team to fully customize the luxury RV to meet his

specific needs. On the exterior, Castroneves' American Eagle features a custom black-and-pink paint finish to match the colors of his racing team. Inside, there's teak-style cabinetry, special-order quartz countertops, ultra-comfortable custom bunk beds (each with its own TV) and

many other upgraded amenities.

A native of Brazil, Castroneves is one of only four drivers to have won the Indianapolis 500 four times and is also a four-time runner up in the IndyCar Series drivers' championship. He also competes in select IMSA SportsCar championship races and recently won the 24 Hours of Daytona with Meyer-Shank Racing. His positive personality and fan-favorite victory celebrations have made him one of the most popular drivers on the IndyCar circuit.

By the way: the 2023 American Coach Association National Rally, hosted by the ACA Southeast Chapter, is scheduled for April 24-28 at The Ridge RV Resort in Sevierville, Tennessee. For more information, visit american-coach.com/events/rallyattheridge/.

Wingamm Brings 'Micro Class' Oasis Stateside

Looking for a full-featured motorhome with a small footprint but wanting a bit more room than is usually available in a Class B coach? Wingamm, a 45-year-old manufacturer of quality coaches for Europe and Asia, recently introduced North American RVers to its Oasis 540.1 — which, at just 233.39 inches in length, is the first "Micro Class" RV: a vehicle less than 18 feet long that can sleep four with a full

Smooth Out ROUGH ROADS

with the **MORryde Independent Suspension**



The independent design of the MORryde IS system allows each wheel to respond individually to the road. That means your unit glides easily over uneven and rough roads to give you the comfortable ride you deserve.

- Smooth towing experience
- Suspension travel up to 5-1/2"
- Rubber shear springs absorb road shock
- 5-year warranty



For more details visit
MORryde.com
or call 574.293.1581



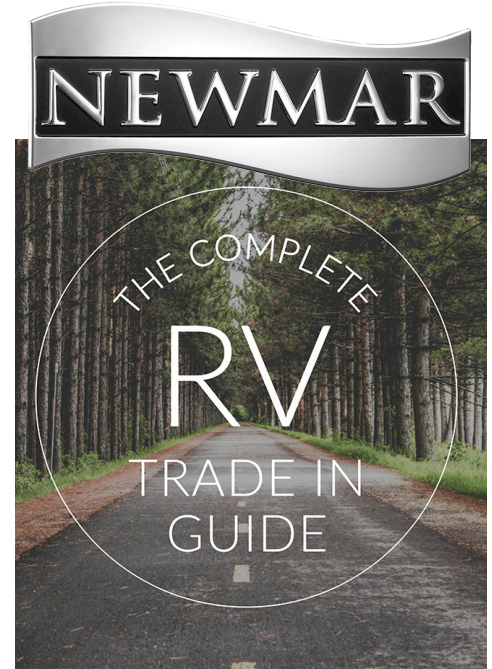
indoor bathroom.

The first of seven Wingamm models scheduled for release in the U.S. (most will be slightly larger), standout features of the Wingamm include its custom fiberglass monocoque shell, which not only gives the Oasi 540 its distinct sleek look and compact size, but allows for innovation in the design and functionality, particularly in the bedroom,

bathroom, sewage system and climate controls. The micro RV also features a drop-down bed with mattresses built with Memory Foam and rated for 350-pounds capacity and a heated under-floor system. All interior furnishings are designed and produced in-house at Wingamm's Vienna, Italy facility.

For more information, visit <https://www.wingamm.com/us/>.

Newmar Publishes 'The Complete RV Trade-in Guide'



While some of us tend to keep our RVs for years on end — sometimes updating things along the way — most longtime RVers will eventually want to upgrade everything. If you're thinking about trading up to a new RV, or even deciding if trading in your current RV makes sense, you'll want to read *The Complete RV Trade-In Guide — Part One*, provided free by Newmar Corp.

The guide touches on some possible reasons for wanting to upgrade — from more room for a growing family to simply wanting more power, in the case of a motorhome — before getting down to the nitty-gritty. Other parts of the guide review how to evaluate the condition of your RV and how to prepare it for maximum return on your investment.

While much of the information in the guide is (or should be) known to veteran RVers, it's nice to have a list — complete with check-boxes — to go through when getting your current RV ready for a possible new owner. To get your copy of the online guide, visit newmarcorp.com/free-rv-downloads/rv-trade-guide/.

Jayco Introduces its 'Dream Book 2023'

If you're a bit long in the tooth — like, for example, the publisher and editor of *RV Enthusiast* — you can probably

TUNE UP YOUR POWER AND MILEAGE

800-417-4559
WWW.URVP.COM

DREAM BOOK

2023

Find Your Dream RV

Meet the Ascend Community
Experience the Tennessee backcountry with the Jayco Ambassadors, get to know their families and tour the newest towable and motorized mod

The Ultimate Class C Motorhome
For a family's retired couple or a single traveler, the Seneca Super C has something for everyone, from luxurious amenities to the latest technologies.

Traveling is for the Dogs
Approximately 68% of RVers travel with their pets, and those companions are predominantly dogs. Find the unit that suits your four-legged friends best!

remember the pre-Internet days when you'd wait at the mailbox for catalogs filled with the latest toys and products. Today's era of instant fulfillment isn't necessarily better, because it removes that excitement and anticipation. Jayco "re-introduced" this feeling of wonderment with its Dream Book 2023 — filled with the latest innovative new products from Jayco along with stories of owners setting out on their own worlds of discovery.

"The Jayco Dream Book was designed as an inspiration to current RV owners and individuals who someday wish to own one," said Trey Miller, vice president of marketing for the Middle-

bury, Ind.-based manufacturer. The Dream Book features a wealth of information on a number of Jayco's travel trailers, fifth wheels and motorhomes. To get your copy of this digital magazine, visit jayco.com/2023-Dream-Book.

Lance to Produce 'Enduro' Off-Road Trailer



It's always a good sign when a company opts to take a prototype design and commit it to production — and

that's just what's going on at Lance Camper Mfg. Lance debuted its Enduro Off-Road Trailer prototype as an over-land-style concept trailer in November 2021 to popular acclaim, convincing the Lancaster, California-based builder to make this dream a reality. Incorporating design modifications based on feedback from the public and the company's dealer partners, Lance will begin production of the Enduro in April.

The 2023 Enduro production model is a single-axle trailer with a floorplan which centers around an interior wet bath, U-shaped dinette and an exterior kitchen. It features an all-new exo-skeleton frame design and Curt independent suspension system with available state-of-the-art solar/battery technology, onboard fresh water supply and filtration. Other amenities include a full stand-up shower, a larger-than-queen-size bed, u-shaped dinette and forced-air heating and cooling — all in a capable and towable package with a dry weight under 3,300 pounds.

For more information, visit <https://www.lancecamper.com>

continued on page 43

Ultra Protection.

With industry-exclusive VirusGuard™ technology, no other RV water filter comes close to the same level of protection against bacteria, cysts and viruses. For clean, great-tasting water, nothing beats a Clearsource®

Clearsourcecv.com



Scan Code to Learn More

Where's the Heat?



Inadequate LP-gas pressure is one of the more common maladies affecting furnace performance. Pressure should be checked if you suspect a problem with ignition; a dial manometer is the most convenient tool for checking LP-gas pressure and regulator integrity.

I have a 2021 travel trailer with a furnace that's been giving me fits for quite a while. It's a Dometic 30,000-Btu furnace but the model number escapes me. It's been in the shop several times where the service person bench-tested the components numerous times and insists that it works fine. That's all well and good — but I don't have heat. The last time the "technician" replaced the circuit board and after I got the trailer back it worked just fine when I tried it at home. The first trip out, however, it again did not work! I took it back to the dealer and was again told that it passed bench testing and was working fine.

I'm getting a little frustrated. Do you have any ideas?

—Dennis Santino

Dennis, electronic-controlled furnaces can be cantankerous at times — and because there are so many pieces that come into play for the ignition cycle, it gets to be a challenge when bench testing. If the furnace works when they bench-tested it, there's no way of fixing something that's "not broken." With that in mind, there are several things that need to be checked first — and most important is the gas pressure to determine if the regulator is up to par.

Next, it's important to confirm that 12-volt DC power is consistent with the furnace specifications; it needs to be at least 11 volts DC for the circuit board to function correctly. If everything checks out OK at this point, I would replace the sail switch and the limit switch, which are usually the main problem areas that prevent proper operation of the furnace.

Food Grinder

Bill, we are delving into RV travel and want to purchase a nice used fifth wheel that's only a few years old. The first thing my wife wants to know is

whether we can install a garbage disposal in our fifth wheel. At first, I chuckled because I've never seen a garbage disposal in an RV, but I promised I would get an answer. What are your thoughts on this idea?

—Alex Trujillo



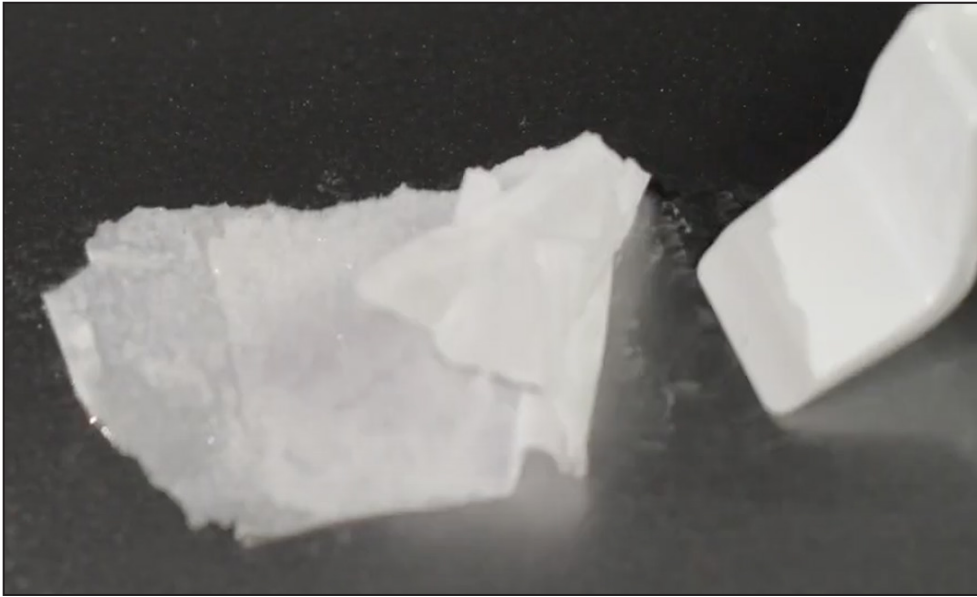
A garbage disposal in an RV will just create problems, especially with all that macerated waste clogging pipes and the holding tank. Photo courtesy of insinkerator.

Alex, you're actually not the first person that's asked me about a garbage disposal — and, of course, the answer is "no." In fact, one thing that you and your wife will need to learn is how to wash the pots, pans and dishes properly to prevent clogging of the plumbing (and the eventual drain stink that goes along with less-than-adequate cleaning procedures).

Simply put, make sure you wipe off any loose food from the cookware, plates, bowls and utensils before you wash them in the sink and rinse off the soapy water. You don't want food particles and grease to be washed into the holding tank.

That being the case, there are several issues with having a garbage disposal — one of the worst being the amount of waste that goes down into the gray tank. This is destined to create a major clog in the holding tank — especially if the valve is left open, which is what many people do. And failing to thoroughly flush the holding tank will also lead to nasty odors. Of course, this is probably a moot point since there is probably not enough room to install a garbage disposal under the sink. Hope this gets you off the hook.

Bumper Stickers Be Gone



After soaking the sticker, use a plastic razor blade or plastic knife to remove the offending decal, then use Goo Gone (or mineral spirits) to get rid of the glue residue. Photo courtesy of Goo Gone.

Bill, we recently purchased a 2006 Holiday Rambler motorhome that was in very good shape and has low miles on the odometer. We love the floor-plan — but our only complaint is having to look at all the bumper stickers the previous owners put all over the back of motorhome, showing places they have been. I started trying to remove some of them and it seems like it might take somewhere between 10 years and forever to get them all off. Any ideas on how to expedite removal of bumper stickers, some of which have been on for a long time?

— **Dean Walker**

You do have a nasty job on your hands — especially if the sun has baked them on over several years, which really makes them difficult to get off. It's not impossible, mind you, just very difficult. You can try one of the vinyl adhesive removers on the market, but they're not always effective when dealing with baked-on vinyl.

What can you do? Purchase some plastic razor blade scrapers, which look like real razor blades but won't scratch the fiberglass siding; a good plastic knife will also work. Don't try to remove the stickers before softening the material. For this process you can soak them by holding an alcohol-saturated rag against the sticker long enough to soften the surface, which should make it possible to remove most of the material (leaving only the glue on the exterior surface to deal with). You can also try WD-40, but in either case, it takes more

effort — and patience — to soften stickers while holding a saturated rag on a vertical surface.

Another method for softening stickers is to use a hair dryer, but be careful: you don't want to get too close and burn or bubble the siding. Once you've gotten the sticker scraped off, you can use a commercial glue remover like Goo Gone (available online and at home improvement stores) but I like to use odorless mineral spirits, which is similar to paint thinner but without the odor. Always test a small, inconspicuous spot before diving in. Mineral spirits seem to be very effective for removing glue and tape residues.

After you've finally removed all the stickers you will most likely need to buff out the surface (use an orbital buffer) using compound to “cut” through the shadows left behind. Make sure you use a fine compound and don't bear down on the surface with the buffing pad.

Yes, it's going to take some time and elbow grease; however, it should be worth the effort.

Valance Transformation

We've owned our fifth wheel for 15 years and have decided to remodel the inside to bring it up to a more modern look. We've had everything reupholstered, added new window blinds and installed new carpeting. We were thinking about doing something with the



Outdated window valances (like those in this 2015 Keystone Cougar) can be removed and upgraded to match an interior renovation.

valances around the windows, which are part of the original décor package and not very attractive. I'm not sure how to remove the valances, let alone have them redone. What is your experience with transforming these valances into a new look?

— **Sarah Dixon**

Sarah, this is a great question. You don't often see window valances upgraded in RVs, but it can absolutely be done. Usually, if you look up between the blind and the valance, you can see that they're held in place with just a few screws and are actually very easy to get down. After the valances are removed, you'll see about a “thousand staples” holding the fabric and other pieces into place (okay, I'm just kidding — but it's amazing how many staples are used in a typical RV). Then, too, sometimes there's fabric with vinyl pieces to give it some pizzazz.

If you want to try doing this process yourself, it's really not that difficult. Experiment with one of the valances that's less predominant. Take it down and remove all the staples and added pieces and lay everything out on a table so that you can cut new fabric to match and re-staple them if the fabric was installed over thin foam rubber to give it some bulk. Sometimes there are two or three pieces to the valance that will come off separately and can be redone. Again, don't be afraid to experiment and add some curves here or there or some longer side pieces. Just be careful not to destroy the original valance.

With a little creativity you can bring a new look to your RV's interior fairly inexpensively — and be proud you did it yourself.

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**



SINE LANGUAGE

New DC-to-AC inverters you can count on when boondocking

By Bruce W. Smith

Taking backroads to new adventures can be a lot of fun, but they are not without their challenges. As soon as you camp away from the conveniences of RV parks and campgrounds and that all-important umbilical electrical cord delivering the ability to camp with full hookups, you need a source of auxiliary power to operate the A/C, induction cooktop, refrigerator, dishwasher, ceiling fans, coffee maker and hairdryer among other appliances that plug into a standard 120-volt AC wall outlet.

Boondocking, or camping “off-the-grid,” means you have to rely on electricity provided by a generator or the RV’s battery bank to deliver the proper electrical needs to run 120-volt AC appliances and accessories. The downside with generators is they can be noisy and smelly, which takes away from the peacefulness of boondocking. Generators also require fuel.

Unfortunately, batteries don’t have the power on their own to run those power-hungry appliances and accessories — but their electrical energy can be modified and amplified using an inverter. The inverter takes the juice from the 12-volt DC house battery (or battery

bank) and transforms it into 120-volt AC like that supplied by a local power grid. That’s why many new RVs, other than many tiny trailers, have an inverter as part of the factory-installed electrical system.

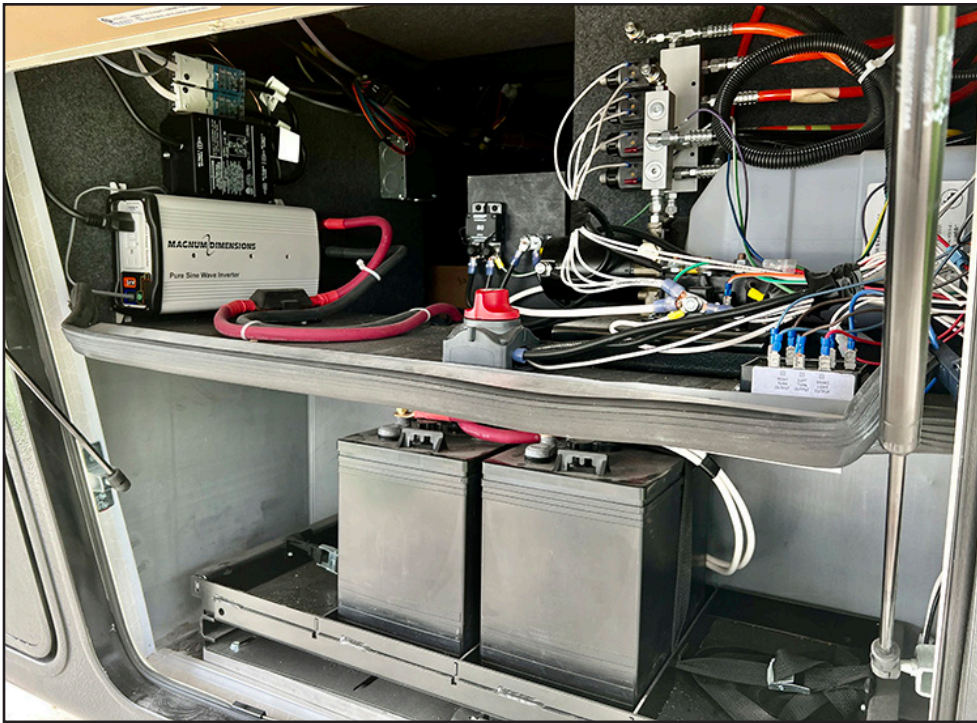
Basic Sine Language

An inverter takes the incoming 12-volt DC battery power and provides 120-volt AC that is dispersed through the RV’s wiring network to power outlets, appliances and accessories. If you could see the “current” that “[pure sine wave](#)” inverters create, it would look like perfect little waves on an oscilloscope, a pattern that duplicates the same electricity powering a home.

But not all inverters deliver pure sine current. “Modified sine wave” inverters, the lower-priced variety, create electrical waves that have squared-off steps as the electricity alternates, instead of one smooth wave form. These types of AC-to-DC inverters can cost half as much as the pure-sine variety. Modified-sine inverters are *not* generally recommended for RV use.



Smaller RVs camping off-grid may only require an inverter rated for 1,000 watts to keep a small fridge, lights and personal electronics running. (Cruiser RV photo)



Many RVs have an inverter in the factory electrical system. This Mobile Suites fifth wheel has a [Magnum Dimensions](#) pure sine inverter mounted in the upper left of the battery compartment.

“We recommend modified sine wave for powering resistive loads like saws and drills,” said MaryAnne Petersen at Go Power! Products, a major player in the world of mobile power and inverters, and part of the Dometic family. “For anything with any electronics that would generally be used in RVing, we recommend being powered by pure sine wave.”

Petersen explained the reason modified sine wave inverters shouldn't be used in RVs is because they don't supply the type of electrical current that sensitive electronics, CPAP machines, delicate medical equipment, AC motors and compressors need to operate efficiently.

Appliances such as refrigerators, microwaves, air conditioners and compressors that use AC-type motors fed by modified sine current operate at much lower efficiency. They also can make fluorescent lights hum and buzz — and [induction cooktops](#), which are becoming very popular even among the off-road trailer crowd, don't work at all.

How Long Does an RV Inverter Last?

Because many RVs come that from the factory with an inverter are intended to provide off-grid power, they are not generally something RV owners ever think about — until the inverter stops working.

Like any other electronics component, an inverter has a limited life span. In general, according to RV electrical

industry experts, an inverter is good for 8-10 years under “normal” RV use.

“Anytime you're asking somebody the life expectation of an electronic device, it really comes down to how often are they using it,” said Laura DeJong, vice president of marketing at [AIMS Power](#),

a leader in inverters and solar technology.

“Are they pushing the inverter to its max? How long are they using it per day?

Where and how is the RV being stored?

What is the environment that it's used in — really high dust, humid, cold?

“There're so many variables when you talk about the life expectancy of an inverter in an

RV,” added DeJong. “The more you use it and the harder it's used, the shorter the life expectancy. In many instances, eight years is a good run.”

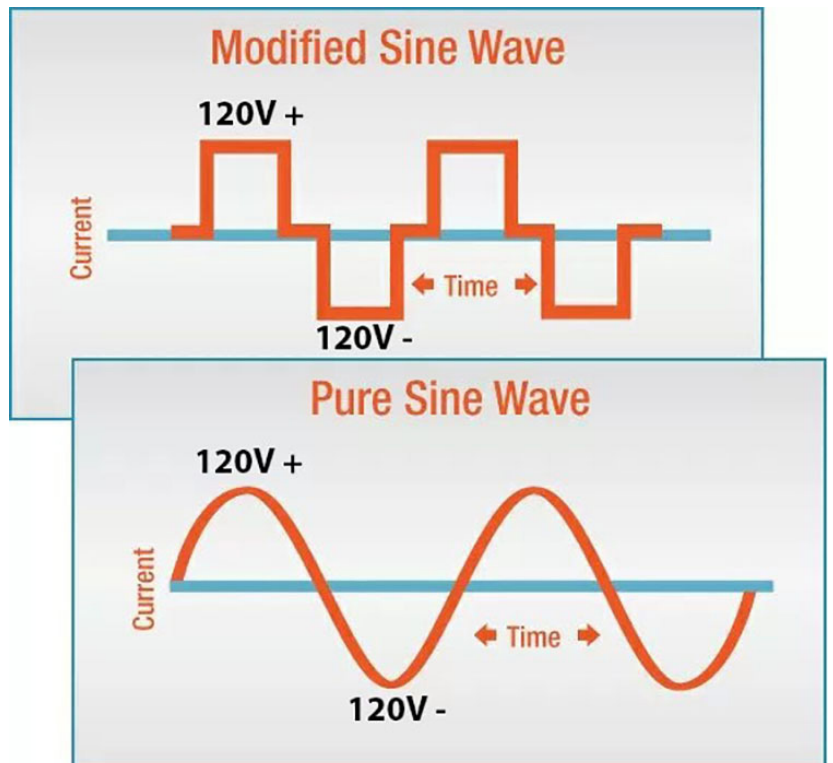
Upgrading Older RVs With Modern Inverter Technology

Garrett Towne, president of AM Solar in Springfield, Oregon, one of the leading RV-oriented solar and electrical aftermarket installers in the country, told *RV Enthusiast* when an inverter does fail, RV owners should replace the old unit with the newest technology because today's pure sine inverters are a big performance step above those being made even just a couple years ago.

“There would be an improvement on the battery draw: more efficient, better monitoring, better charging,” added Go Power's Petersen. “This improvement over the older inverters would probably result in RV owners seeing they can draw power off their house battery for longer periods of time with a new [pure sine inverter](#).”

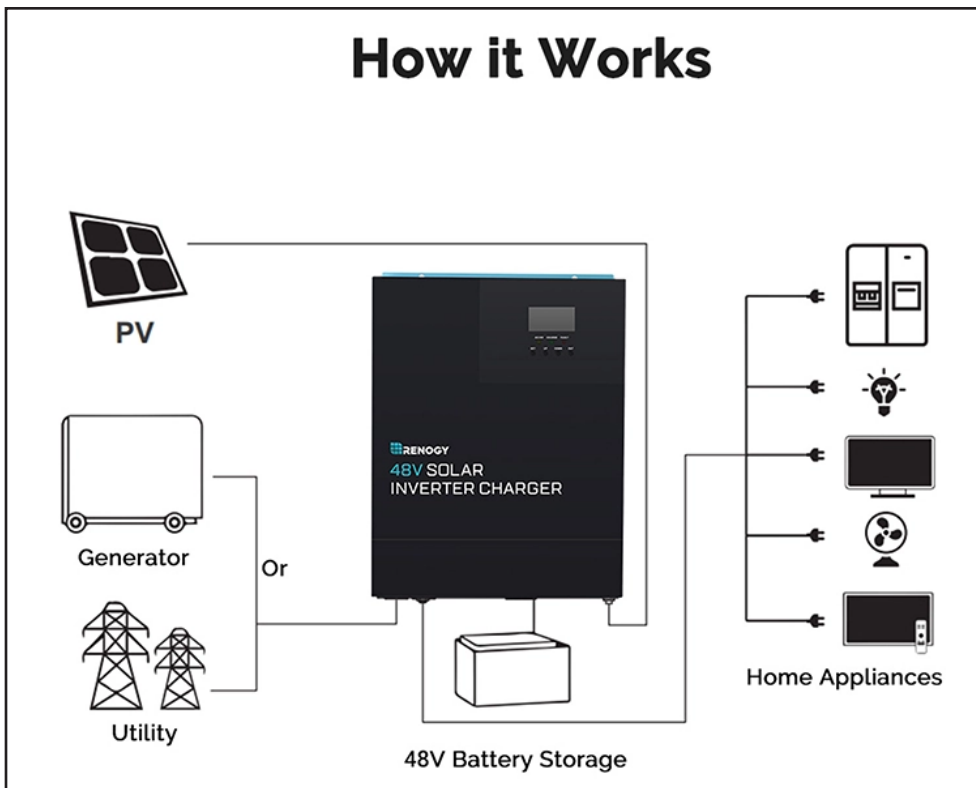
Towne, Petersen, DeJong and other inverter experts all agree that replacing OEM inverters that have failed, or that are more than five years old, with one of today's upper-end pure sine inverters will provide a lot of electrical benefits to RVers.

Many of the newest inverters are multi-purpose and space-saving, too.



Modified sine wave inverters produce a step-like flow of electricity as the 12-volt DC is converted to 120-volt AC. A pure sine inverter delivers a smooth power flow like the local power grid. (Prostar Solar photo)

How it Works



Today's newest inverter/chargers can accommodate a multitude of power inputs to run RV appliances and electronics as illustrated by this diagram from Renogy.

Many also combine DC-to-AC power conversion, battery charging (lead-acid and lithium) and automatic switching between battery, generator and shore power electrical sources, all the while delivering the electricity in the same "pure sine" 120/240-volt AC quality as delivered by your local utility company.

A few "hybrid" inverters even have a "boost mode" or "bypass" where sophisticated circuitry allows it to automatically tap into the house batteries to supplement a lower-amp shore power system when the RV electrical load exceeds the current shore power can deliver. This can come in handy when plugged into 15-20 amp shore power or running off a generator.

Lithium Batteries Need Top Quality Inverters

Another reason to upgrade to a high-tech pure sine inverter is when an older RV is being upgraded from lead-acid batteries to [Lithium batteries](#). The latter take an entirely different charging profile than the old lead-acid batteries. An inverter has to be matched to the [RV's battery bank](#), as does the battery charger. If not, the inverter and/or the batteries will suffer.

"Most RV inverters have a wide range of DC inputs and have no issue running off the new lithium batteries. But there are several different chemistries of lithium batteries," said Andrew Frey, an electrical engineer at AIMS Corporation,

"and the customer would need to confirm compatibility between the inverter they have and whatever lithium battery they are installing.

"The charging system may also need to be upgraded for the new lithium battery, or an older inverter/charger may need to be upgraded if it does not support lithium charging," added Frey. "In general, a lithium battery is not a

'drop-in' replacement when it comes to use in older RVs."

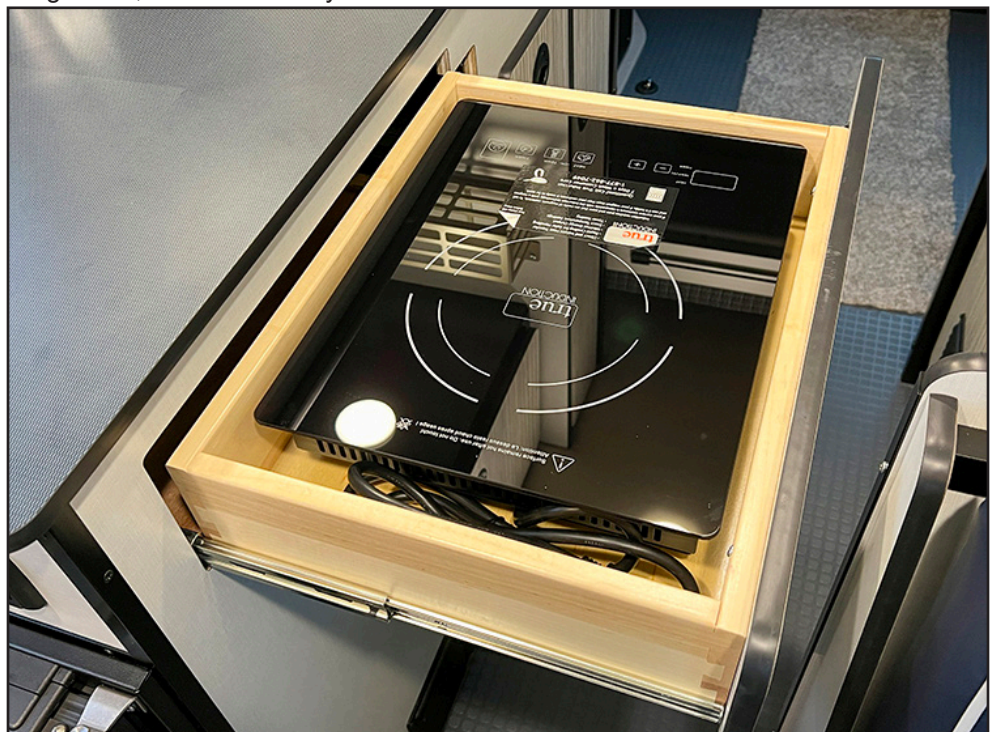
Pairing the lithium battery (or battery bank) with the correct inverter/charger is a critical factor many RVers don't think about. The wrong pairing could be a costly mistake by damaging the battery.

"It's really important to understand the charge requirements of the lithium batteries an RVer has," added DeJong. "[AIMS Power](#) lithium batteries charge at a little different rate or voltage than maybe one of our competitors. Therefore, the factory electrical system/inverter in an older RV may not be set up to give our [lithium battery] a full charge, or it's not going to charge correctly.

"Our inverter/chargers have eight different charging profiles. What we recommend is the user needs to find out from the battery manufacturer what the [charging](#) requirements are if they're not using our batteries. If they're using our batteries and inverters together, then we can tell them, 'put it on setting four' or one of the other settings. The proper maintenance of lithium batteries is all based on charging profiles."

That's why when it comes time to buy a new inverter for your RV it requires focus on those brands/models that are "pure sine wave" as well as the needs of the house batteries it'll be connected to when the off-grid switch comes to play.

Granted, [pure sine inverters](#) and multi-purpose inverters will be much pricier than their modified-sine counterparts. But the cost difference is worth



Induction cooktops are becoming very popular, even in smaller RVs and offroad trailers. They are power hogs, so make sure the inverter you choose is up to the task.



Lithium-ion batteries require special charging algorithms, which the newest inverter/chargers have built into their circuitry.

How To Choose the Right Size RV Inverter

Choosing the inverter with the correct power output for the way each RV is configured is very important. How do you choose the right inverter? Tally up the number of **watts** being used during peak period, then add 20% for a little cushion. There's no need to pay for wattage you're not going to use, but at the same time getting an in-

verter that's underrated for the demand will have a shorter life or shut down just when you need that power.

In addition, inverters tend to work at their optimum efficiency when delivering 50% to 70% of their maximum rated load capacity, according to Go Power's Petersen. "Size the inverter and [battery bank](#) correctly. Inverters are not 100% efficient and are less so when running in max power output. RVers need to make sure there is a bit of 'head room' above max load they might need to run."

Petersen noted that headroom includes accounting for the few seconds of start-up or "surge" ratings of any electrical item that has a motor or compressor, like a residential refrig-

ator, microwave, or the A/C atop your RV. For example, a Dometic Brisk II 15,000-Btu A/C unit takes about 3,000 watts to start and then settles down to 1,725 watts once it's running. (Generally speaking, an RV A/C requires about 100 watts per 1,000-Btu when cooling and more than double that for surge.)

The easiest way to figure out that sweet spot when buying an inverter is to use a kilowatt meter that's tied into the RV's battery bank — or by using an [amp meter](#) (amps x volts = watts) tied into the battery feeding the inverter. Another option is using an inexpensive electricity usage [monitor](#) that plugs into the wall outlet where the appliance plugs into the monitor.

Turn on all the appliances/accessories you'd be using at the same time while boondocking and note the wattage consumed (or monitor them individually). You can also take the information off the UL tag of most electrical products or make a guesstimate using a number of online wattage-use charts that would help determine the proper size inverter for the task. We've also included a chart of popular electronics used while camping and the power requirements of each.

Once you know how much wattage is required for your particular RV's boondocking needs, then it's a simple matter of buying the right size inverter to deliver those off-grid demands using the battery bank instead of the generator. To help in that search, we've highlighted a few of our favorites that reflect the newest in pure sine wave inverter technology.

APPLIANCES AND ELECTRONICS	
= Ideal with Pure Sine Wave Inverters	
Appliance	Watts
Cell phone	50
Ceiling fan	75 - 120
Coffee maker	800 - 1200
DVD player	35 - 100
Gaming console (X-Box)	100
Hair dryer	900 - 1600
Iron	1000
Light bulb (incandescent)	100
Light bulb (fluorescent)	25
Microwave oven	1500 - 2000
Induction Cooktop	1700 - 3000
Computer + monitor	125
Laptop	25 - 150
Satellite receiver	10 - 25
Stereo	250
Tablet (iPad)	100
TV (Flatscreen)	65
TV (25")	300
Toaster	800 - 1500
Toaster oven	1500
Toaster oven (convection)	3000 +

What size power inverter you choose is dependent on how many watts are consumed by the item(s) you need to power. Total those numbers up, add 20% for a little safety margin, and choose the inverter that has that rating or a little larger.

Go Power! ISW1500-12



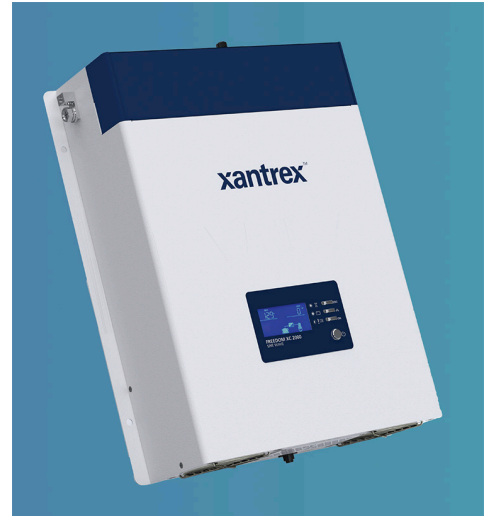
This 1,500-watt inverter from Go Power! is a pure sine wave model ideal for smaller RVs to power a microwave, TV, coffee maker, computer, and other small to mid-size electronics and appliances less than its rating. It will also double as a source for emergency backup power. 2,650-watt surge capacity. 91% efficiency rating. Dual GFCI outlets. 2-year warranty.

Renogy INVT-2000-12V



Renogy's entry-level 2,000-watt pure sine inverter would be a nice fit in smaller Class Bs, camper vans, pickup campers, travel trailers and expedition-style trailers. This inverter has a built-in 5V/2.1A USB port, 3 AC outlets and 1 AC terminal block, along with two 3ft 4AWG cables and a 19.8-foot wired remote. 4,000-watt surge. >90% efficiency rating. 2-year warranty.

Xantrex Freedom XC Pro 3000



Xantrex's Freedom XC line is an inverter/charger available in both 2,000- and 3,000-watt versions. The XC Pro 3000 model delivers 25-amp output with a five-second, 6,000-watt surge capacity. The 100-amp smart charger conditions batteries quickly. It's compact size and the quick connect terminals at AC IN/OUT make installation a breeze. Bluetooth monitor and configuring. 84% efficiency at full load.

Go Power! ISW3000-12



The durable, low profile Go Power! 3,000-watt Industrial Pure Sine Wave Inverter is a good choice for large loads, capable of powering multiple large appliances and electronics in an RV. The ISW3000 is the highest-output pure sine wave inverter offered by Go Power! It's 6,000-watt surge rating can handle multiple A/Cs and residential appliances, including the largest RV fridge/freezer and multiple burner induction cooktops. 90% efficiency rating. 2-year warranty.

AIMS Power 3000-Watt 120VAC



The AIMS Power pure sine wave PICOGLF30W12V120VR is brand new this year, and ideal for larger RVs. This 3,000-watt inverter/charger is "one of the most advanced on the market" according to the company. It has the ability to bypass 50 amps, 120V/240V and outputs 120-volts AC, which is perfect for RVs. The temperature-sensing battery charger side is said to use 20%-30% less AC power than a standard charger. 9000 watts surge. 92% efficiency. 2-year warranty.

AIMS Power PICOGLF15W



AIMS Power's PicoGLF15W12V102V is a 1,500-watt pure sine inverter, battery charger and transfer switch in one compact unit. This inverter charger is perfect to use with solar and off-grid applications in smaller RVs that need clean 120 volts of alternating current. It handles any source of 120-volt AC power to charge batteries. 92% efficiency. 4,500-watt surge up to 20 seconds. Auto sleep mode. 2-year warranty.

Xantrex Freedom EX 4000



The new Xantrex FREEDOM EX is a truly unique, true sine wave power solution packing a powerful 48VDC, 4,000-watt (8,000W [5s]) inverter, 80A 48VDC battery charger, 50-amp transfer relay and a 48VDC-to-12VDC, 45-amp converter inside one box. Designed for mobile applications that utilize 48VDC battery systems, the FREEDOM EX is designed to work as a standalone AC and DC power solution or supplement an existing generator to create a hybrid system.

AIMS Power PWRIX2000



The AIMS PWRIX2000 will deliver 2,000-watts and it has a built-in 70-amp four-stage smart battery charger when the internal transfer switch detects it being plugged into shore power or your RV's generator is fired up. Enough output to handle an induction cooktop, or other appliances in smaller RVs. 6,000 watts surge. 88% efficiency. 2-year warranty.

Victron Energy MultiPlus Compact 12V 3000VA



Larger RVs will work well with the Victron Energy's MultiPlus, a compact 12-volt DC 3,000-watt true sine wave inverter with a smart 120-amp battery charger. It also features Power Assist that will prevent overload of a limited AC source, such as a generator or shore power connection. It also automatically switches on when shore power or generator supply is interrupted. 5,000-watt surge. 93% efficiency. 5-year warranty.

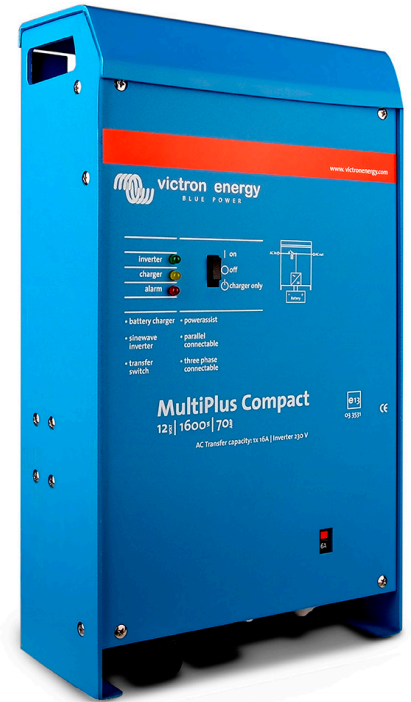
REDARC R-12-3000RS-NA



REDARC's 3,000-watt pure sine wave inverter is the largest of the five the company offers, and is another of the state-of-the-art inverters ideal for use in all sizes of RVs. Its capacity will handle the loads from induction cooktops, residential refrigerators, microwaves, RV washer/dryer, A/C units, TVs and sound systems. 6,000-watt surge (< 1 sec). 90% efficiency rating. 2-year warranty.

Victron MultiPlus Compact 12V 1600VA

The new MultiPlus line from Victron Energy combines inverter and charger in one elegant package. The 1,600-watt inverter would fit smaller RVs, and its many features are shared with the others in the 800- to 5,000-watt stable. RV owners will love the adaptive battery charging; it has hybrid Power-Assist technology, plus multiple system integration features such as using them in parallel. Bluetooth monitoring/control. 3,000-watt surge. 93% efficiency rating. 5-year warranty.



REDARC R-12-2000RS-NA



Small RVs, especially those used for overlanding, will be set with the REDARC 2,000-watt pure sine inverter. It will charge your phones, cameras, laptops, and power GPS, bi-pap, coffee machines, hairdryers, small microwaves and power tools when camping off-grid. Quiet. Compact. 3,500-watt surge. 92% efficiency rating. 2-year warranty.

Renogy REGO 12V 3000W



The REGO 12V 3000W inverter charger is a powerhouse with 3,000 watts continuous pure sine wave AC output and surge up to 9,000 watts to handle RV A/C systems and power residential appliances. The smart charger automatically adapts to any popular battery type from AGM to lithium-iron phosphate. Bluetooth monitoring and management, too. 9,000-watt surge. >85% efficiency rating. 2-year warranty. **RVE**



COOKING WITH GAS

How to replace that old, outdated cooktop with a modern version — in under an hour

By Bruce W. Smith / Photos by the author

There's a lot to be said for retaining ownership of an older RV, not the least of which is they have "good bones," a solid build — and can be picked up for not a lot of money.

One place they tend to come up short, though, is in aesthetics. You don't have to go back to the shag-carpet days of the GMC motorhome (built from 1972 through the '78 model years, for those keeping score) to find looks that haven't aged well. And, in the case of appliances, neither are they anywhere as efficient as those built today.

When the crew at [Carrier RV Service](#) in Eugene, Washington, was charged with replacing the three-burner cooktop in a customer's well-cared-for 2008 Monaco Diplomat motorhome, appearances admittedly had something to do with it — "It didn't go with the other up-

graded appliances in the galley," admitted Teresa Carrier — but it also had one burner that was inoperable, and finding replacement parts for the outdated and long-discontinued Atwood High Output gas stove was becoming a tougher task.

As the Carrier team demonstrated — we stuck around for the swap — replacing the Dometic for



The owners of this 2008 Monaco Diplomat motorhome were tired of the old slide-in cooktop and wanted something nicer looking — and with sturdier grating and better burners.

a new [Suburban 3600A](#) RV cooktop (\$455 MSRP) was fairly easy — but it wasn't quite the "slide-in replacement" anticipated.

Yes, replacing an older OEM cooktop is, for the most part, a fairly easy job, requiring little more than a few open-end wrenches and a cordless drill-driver (or Phillips screwdriver), and possibly a small finish saw or oscillating multi-tool if the replacement stove is

slightly larger than the original cooktop. However, in this installation the new stove ended up being an inch-and-a-half wider across the face and a ½-inch wider along the sides.

A new slide-in gas stove being slightly different in size than the unit it's replacing is a common occurrence, according to the technicians at Carrier; a little trimming of the galley's Corian countertop and birchwood fascia took

care of the fit issue. Start to finish, it took Tony Salazar, Carrier RV's shop manager, just under an hour to make the swap. When it was done the customer was quite pleased, saying "Now we're cookin' with gas!"

Want to tackle the job yourself? We followed Salazar every step of the way to show how the RV slide-in cooktop replacement is done.



1

The first step is to shut off the propane at the tank. The grill assembly is then pushed backward and lifted up to remove from the base of the unit.



2a



2b

Two wrenches (13/16-inch & 5/8-inch) separate the gas feed line from the stove manifold. A ½-inch pipe plug is installed into the feed line to prevent any gas seepage as the rest of the install is done.



3a



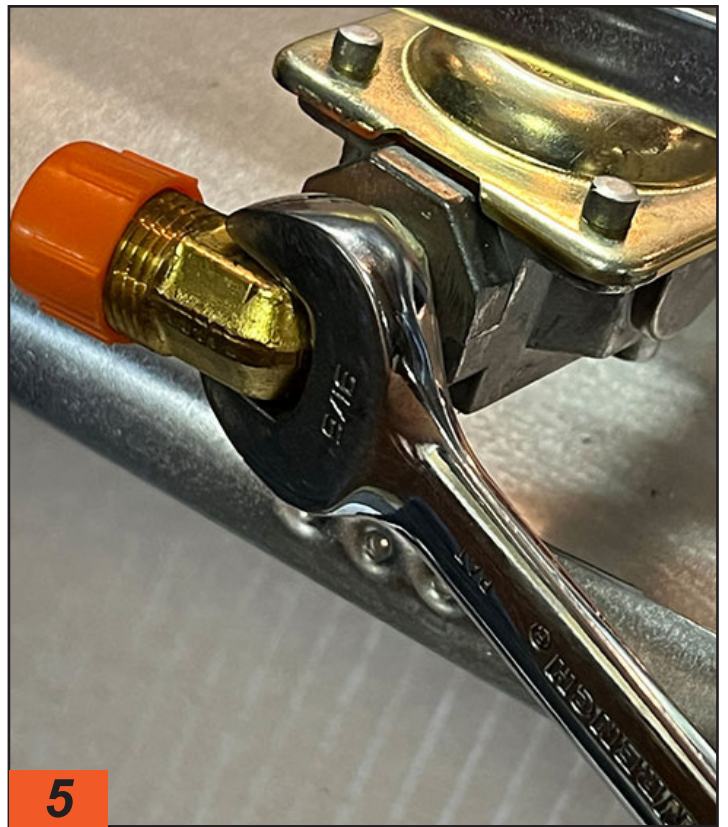
3b

After the gas line is sealed off, then the four wood screws that hold the stove to the counter are removed. Once the mounting screws are removed the old cooktop can be easily lifted out and sent to the RV scrapyards.



4

In this installation, the OEM gas line was connected inside the cooktop. The line had to be repositioned because the new cooktop gas line feed is external at the rear of the unit.



5

Salazar used a 9/16-inch open-end wrench before he started the install to turn the gas feed fitting on the Suburban cooktop to a 90-degree angle to match the position of this Monaco's cooktop LP-gas line.



6

The new cooktop is set into place. It didn't fit perfectly into the existing space because the fascia was 1-1/2 inches wider and 3/4-inch deeper than the unit it was replacing, as well as 1/2-inch wider along the sides. Minor modifications were needed.



7

Salazar cut a 24-inch-long length of aluminum — the same width as the replacement cooktop — and clamped it in place to act as a trim guide to give a straight cut across the fascia when using his reciprocating multi-tool.



8a



8b

A reciprocating multi-tool makes short work of cutting the fascia and Corian countertop so the new cooktop will drop into place. This install required making four small notches, two on each side, to allow clearance for the Suburban's side mounting protrusion to clear the factory countertop cutout.



9a



9b

Once the new cooktop fit the space, Salazar re-installed the gas feed line, then sprayed [gas leak detector fluid](#) on the fitting and turned the gas back on to ensure there were no leaks.



10

Once the gas line is checked, the Suburban three-burner slide-in cooktop was pushed into final position.



11

Quite often replacement cooktops are sent with sheet metal mounting screws instead of wood screws. Only use wood screws for mounting a cooktop into the cabinetry.



12

Always remove the clear plastic covers from the new stove before lighting the burners! You might think this should go without saying, but Salazar has seen more than one customer make this mistake.



13

The final installation gives new life to an older RV galley. The Suburban slide-in cooktop is robust — and the style is modern.
RVE

No Strings Attached



When the cords that control day/night shades — and other similar window coverings — give up the ghost, you can replace them, even while on the road. The process looks daunting, but in reality the fix is DIY-friendly.

By Bill Gehr / Photos by Lorie Swoffer

The window coverings of choice for many years have been shades controlled by some type of a string or cord that runs vertically on both sides. When they work, the operation is smooth — but when they break, the shades are rendered useless and drop like a rock. It's a frustrating dilemma that most RVers have contended with until the proliferation of pull-down roller shades.

Most people open and close their

pleated shades at least twice a day, so do the math: you can see why they have a propensity to break, usually at inopportune times. I'm a full-timer, which means window coverings are moved at least 730 times a year.

Fortunately, you can carry the cord and tools on board to make the necessary repairs without being at the mercy of service centers needing long lead times for appointments. My blinds see heavy use and after one of the chords

came apart, I figured it would only be a matter of time before the rest of them started breaking, so I initiated the re-stringing process.

There are different types of shades that are beholden to strings. The most common style is the day/night blind that basically folds up or down with a chord on either side attached to a spool at the bottom that secures the cord and allows for tension adjustments. Although the original blinds on my fifth wheel were



1a

1b

The first step is to remove the valance, which will be slightly different depending on RV model, but most are held in place by a few screws. It's best to use a screw gun or impact driver (on low torque) and a long extension to prevent damaging the valance.

changed to a cellular honeycomb style with light-blocking capability and insulation, they still used a single string on one side to raise and lower the material. Either way, replacing the cord is roughly the same process.

Start the process by ordering the cord length and color. After some investigating, I found that FixMyBlinds (fixmyblinds.com) offers the best advice and selection of restringing kits. In order to cross-reference the cord you will need, measure two times the height of the blind or shade plus the width, then multiply that by the number of cords that go through the blind from top to bottom. You will also need to determine the diameter of the cord and the color, which can be done by wrapping the old cord around a pencil 10 times — tightly butted up against each loop — and measuring the width. That measurement will lead you to the right diameter replacement cord on the company's website. Go to "Identify Your Blind" and click "RV Day/Night Shades" and then "Lift Cord & String" and you will see the cord choices. If the shades are old, more than likely it will be impossible to

obtain an exact matching color, but you can usually get close.

Next, you will need to order the wire lacing tool that allows you to pull the cords through the blind. Depending on the blind, there may be some nylon inserts to keep the cord from tearing through the material; you may want to order a couple of them just to make sure you have them ready to go. If you're having trouble with the blind staying in the up position, you can also purchase cord locks.

Replacing the cord seems like a daunting task, but once you change the first one, you'll get the hang of it. Fortunately, you

can find some pretty good videos on the FixMyBlinds website that will guide you through the process. Just watch the videos a few times to get the process



2

Before removing the shade, measure the length and width to determine the length of the cords that will be needed for each project.



3a

3b

On this Bali Blind it was necessary to use a large, flat-blade screwdriver to release the spring-loaded bracket from the top of the blind. Common day/night shade brackets can be opened by using the screwdriver to twist open the latch. Some of these blinds can be heavy, depending on size, so it may be necessary to recruit some help.

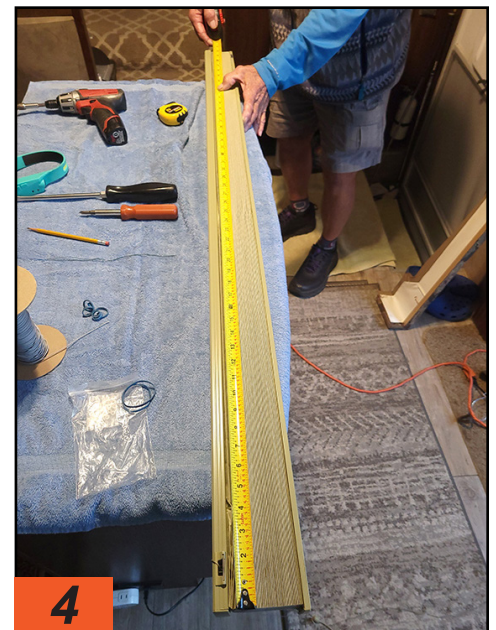
down.

The first step requires that the valance (if so equipped) be removed to gain access to the brackets that hold the blinds — in some cases, releasing the blind can be tougher than replacing the cord, depending on access. If you look up between the blind and the inner part of the valance you will see the screws that hold the valance in place; a screw gun or impact driver (set to a low torque setting) will make this task much easier. Still, count on using a long extension for your impact driver since there is usually not enough room between the blind and the valance to get a cordless tool between the two.

Before removing the valance, take a few measurements so that you get it back in the same place. More than likely, you'll need some help as the valances can be quite heavy, especially if they're made of wood and are on the long side. One valance in my fifth

wheel, for example, spans almost the entire width of the rear wall and is very heavy and bulky.

After removing a valance, you will need to release the blind from the brackets, and the configurations vary. For example, in this fifth wheel, it required the use of a long, heavy-duty flat-bladed screwdriver to unlatch the bracket. Some day/night shades may be held in place with screws driven through the top of the shade itself. Remove the blind and set it on a flat surface that is wider than the blind and put a rubber band around each end to hold the blind together. Start by removing the headrail; they will vary depending on the type of blind (here, there was only one screw at the top holding it in place). Then remove the bottom rail, which may only be held in place by the end caps. When removing the rail out of one end of the blind, make sure the rubber band on the other end of the



4

Once the blind was off the wall, it was placed on a table and the width measurement was rechecked.



5

Removing the blind and restringing requires the use of common hand tools. Although not necessary, the use of a screw gun or impact driver (on low torque to prevent stripping the screw holes) will make it much easier to get the job done.

blind is secure so that it stays together.

Next, remove the cords, paying close attention to where the length of the cords will go; the farther away from the latching assembly, the longer the cord. You also need to pay attention to how the cords go through the latching or locking assembly. As I recall, it was a nightmare to get the cords to go

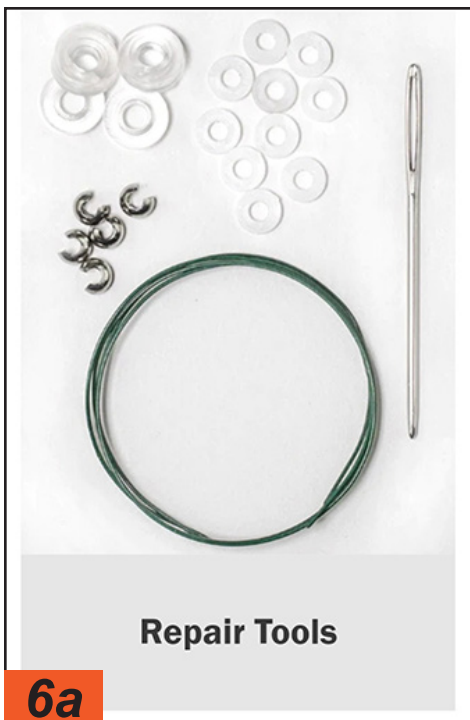
through the latching assembly in the Bali Blinds that were changed out years ago; standard day/night blinds are not as difficult to handle.

Fortunately, the lacing tool was a big help in this process. The lacing tool makes it possible to pull the cords, one at a time, through the shade and out the bottom, At the bottom of the blind

there's a disc (or something similar) that will allow you to tie a knot on the other side to keep the cord from being pulled back up through the blind. Once the cords are pulled through the blind, lay them in the headrail side-by-side while being careful not to twist (it will prove to be a problem later on if they get twisted). Feed the cord through the latching assembly, pull the slack out of all the cords and maintain the side-by-side order through the headrail.

Reinstall the headrail and bottom rails — making sure that the rubber bands stay in place throughout this process to prevent the blind from coming apart, which will lead to unnecessary frustration. At this point, don't worry about the length of the cords. After the blind is installed, you will cut them to length and reinstall the knobs or handles that were attached to the cords. There may be a stop in the cord part way up to prevent the blind from dropping too far below the window.

Before you cut the cords to the proper length, raise and lower the blind carefully a couple of times to ensure that the cords will not get tangled up inside the headrail and everything works smoothly. Mount the blind back onto the brackets, making sure it's centered on the window. Now you can cut the cords to length and attach the stops and/or the knobs. Reinstall the valance, check your measurements that you took before you removed it, and you're back in business.



Repair Tools

6a

How long should the cords be?

Example

$$\begin{array}{r}
 2 \times 45'' = 90'' \\
 + 50'' \\
 \hline
 +140''
 \end{array}$$

6b

A repair tool, purchased from fixmyblinds.com along with the replacement cord, is a necessity to be able to thread the new cord through the blind. The website provides a formula to determine the length of each cord. If you follow it precisely, you won't get into trouble.



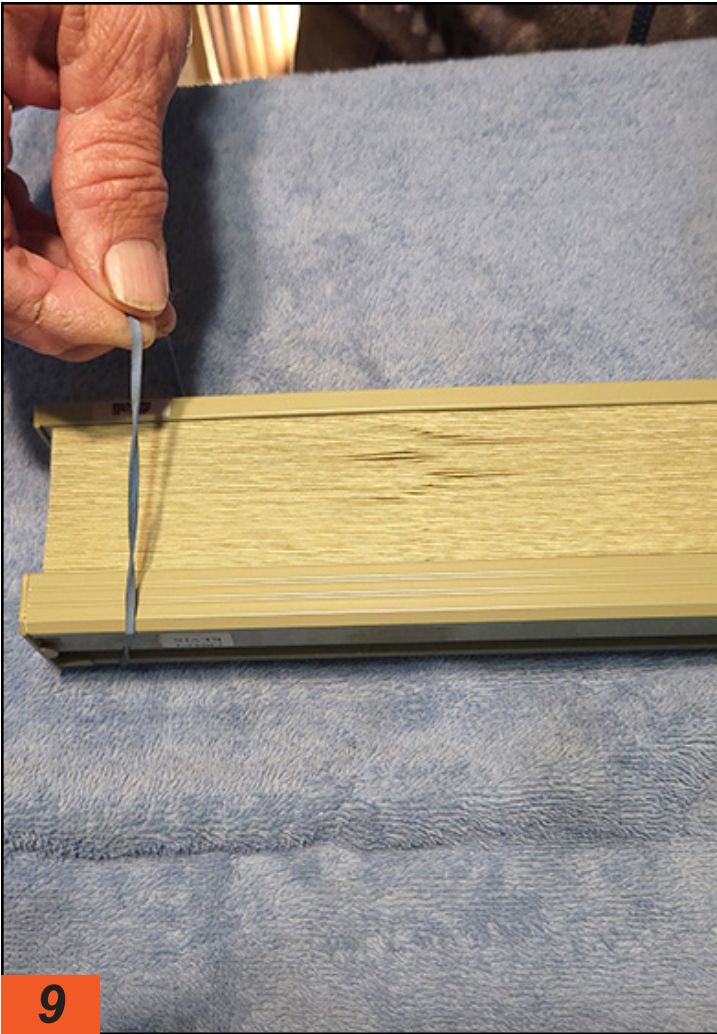
7

To determine the diameter of the cord needed to make the repair, wrap a length of the old cord around a common pencil 10 times, keeping the loops tightly butted up against each other. Measure the distance from the first to the last loops and apply that figure against the reference chart on the fixmyblinds.com website.



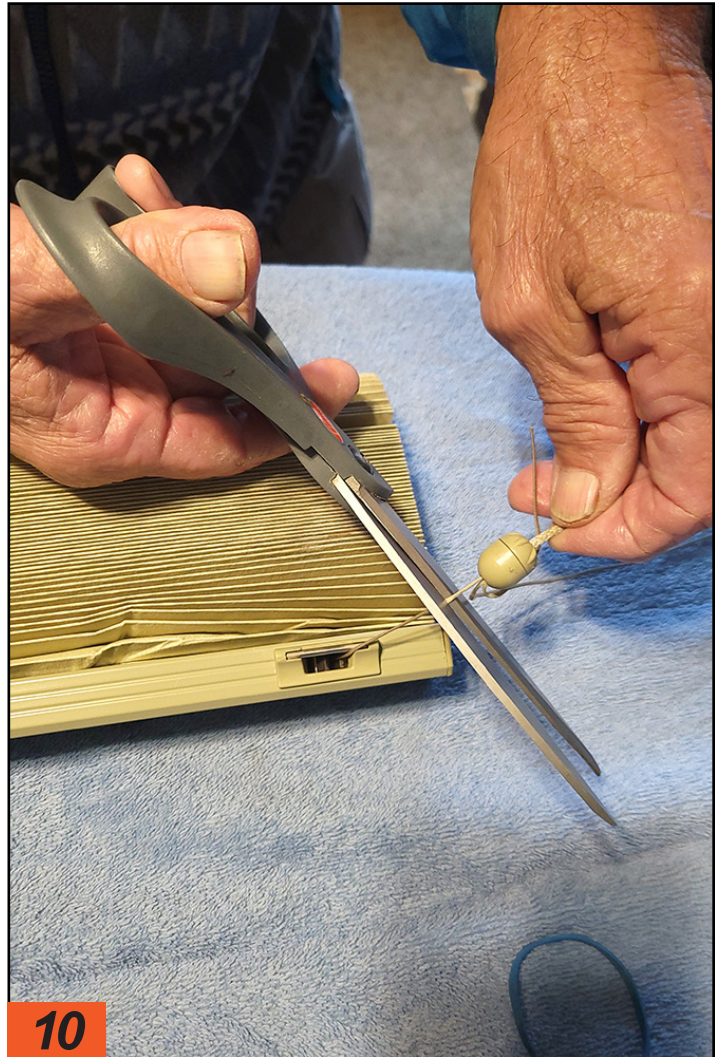
8

The new cords were stretched out on a table and the length measured again to make sure they will fit the new blind.



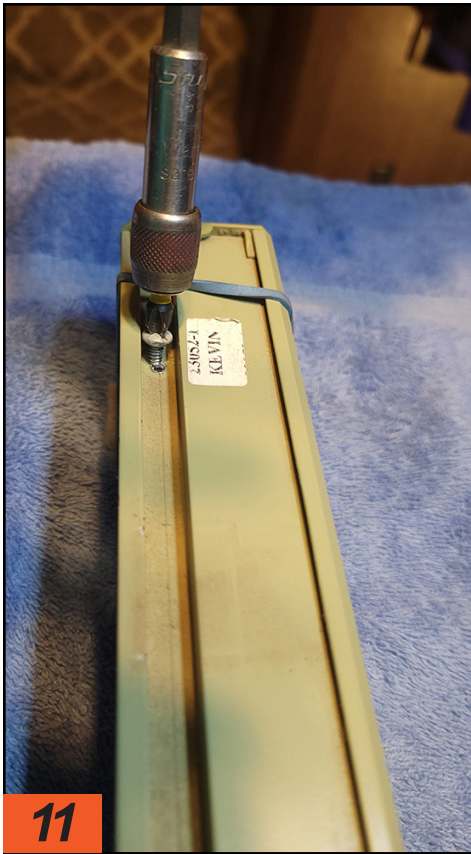
9

Collapse the blind and put a rubber band on each end to keep it collapsed. Without the rubber bands, the blind will open wildly like an accordion and make it difficult to work with.



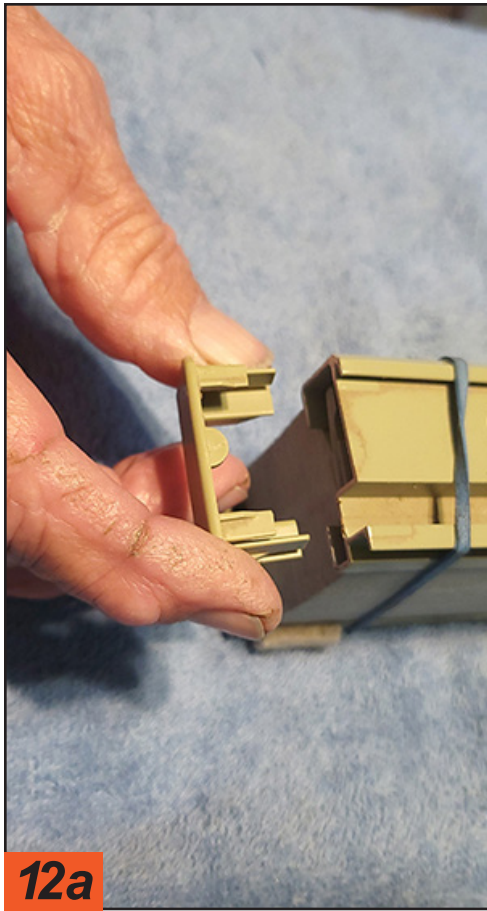
10

Start by cutting off the stop that prevents the cords from retracting inside the blind.



11

The set screw in the headrail was removed before proceeding to the next step. There was only one set screw on this Bali Blind. Day/night shades might have two set screws that will need to be removed.



12a

The end stops were removed from the head and bottom rails. It's best to identify the top and bottom end stops with a marker to help with the re-installation. Make any marks in inconspicuous spots.

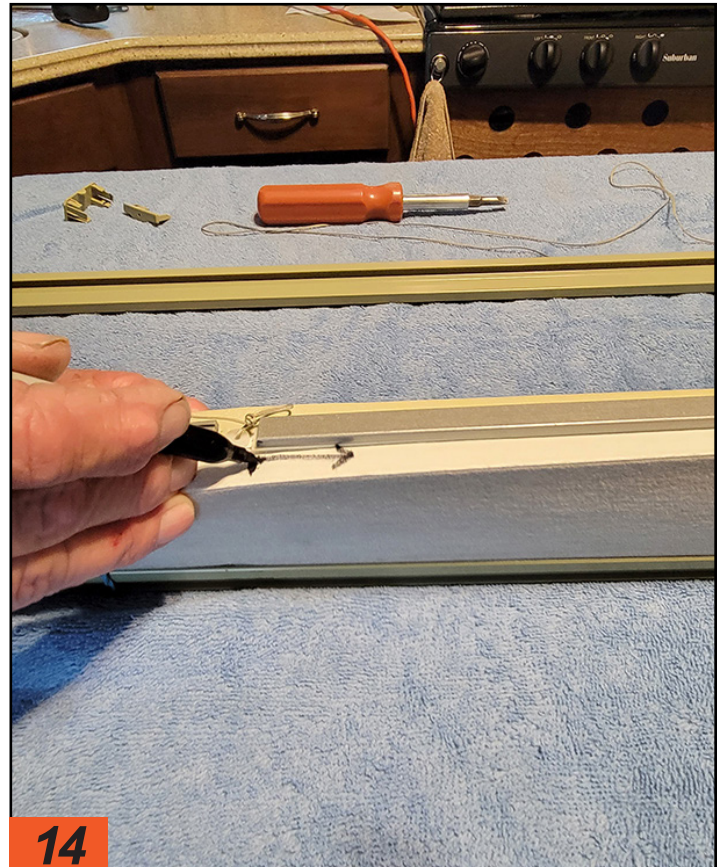


12b



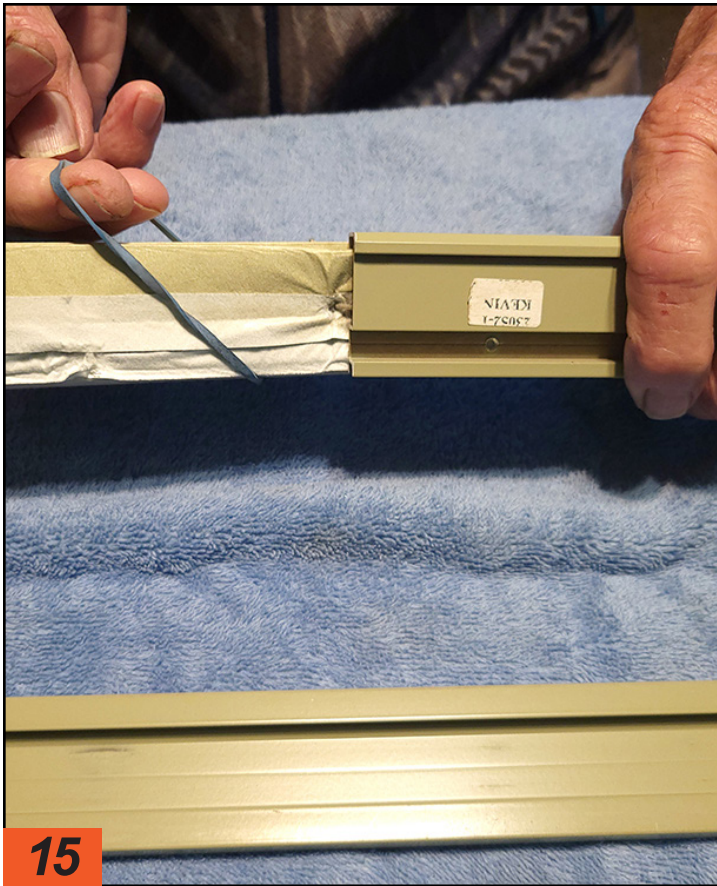
13

The rubber band is left in place while the bottom rail is slid off the fabric. Use the same process for the headrail.



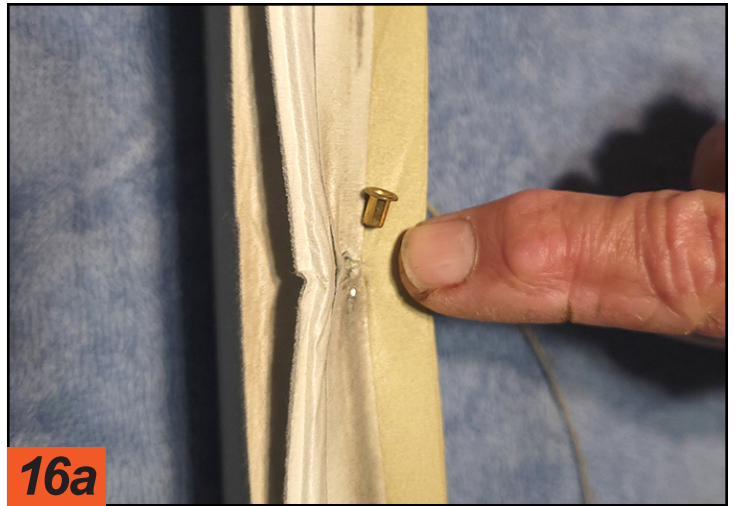
14

To ensure the bottom rail will be reinstalled properly, the direction of movement is marked clearly with an arrow.



15

The headrail is removed, making sure the rubber band remains in place. If the rubber band falls off, the whole blind will expand like a Slinky toy.

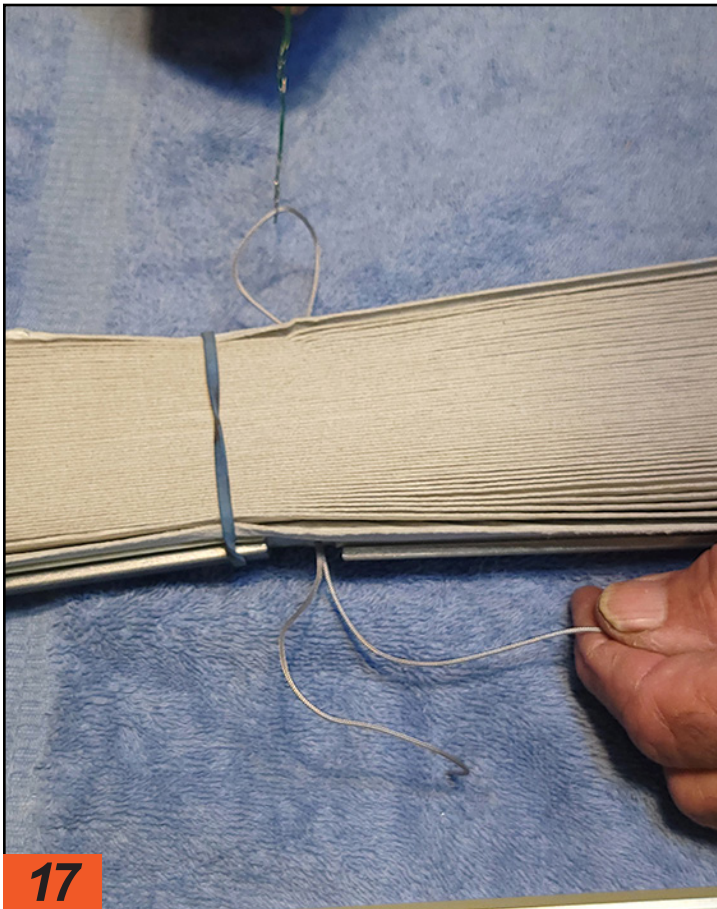


16a



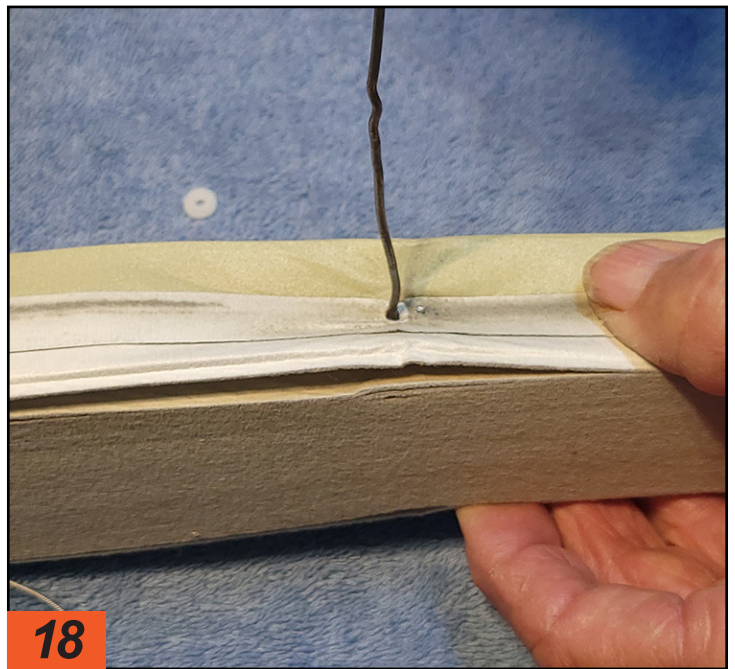
16b

There's a metal collar inserted into the fabric that keeps the cord from creating damage when moving the blind up and down. These collars are easy to lose, so watch for them carefully. Place an awl through the fabric to align all the pleated sections to replace the collar(s). A metal coat hanger can also be used, if necessary.



17

The wire tool was used to pull the new cord through the blind. This tool is indispensable.



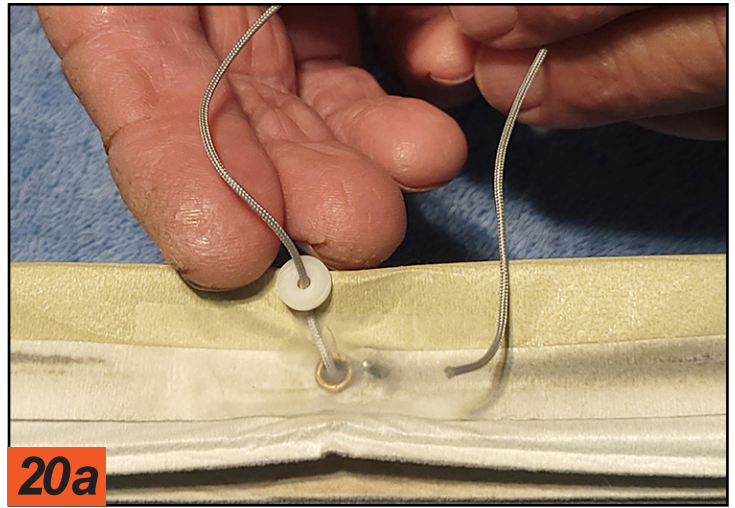
18

Down the line, the awl/coat hanger was first removed before inserting the wire tool.



19

Tip: If the collars refuse to stay in their respective holes, you can apply Scotch tape to keep them immobilized until the rails are replaced.



20a



20b

After the cord was pulled through, the nylon washer was put on and the end was tied in a knot.



21

Once the new strings were in place, the rubber band on one end was removed and the headrail reinstalled by following the previously marked arrow. The cords must remain centered and not twisted while the rail is slid on. If they get hung up or twisted the cords will be very difficult to pull — and will be uneven.



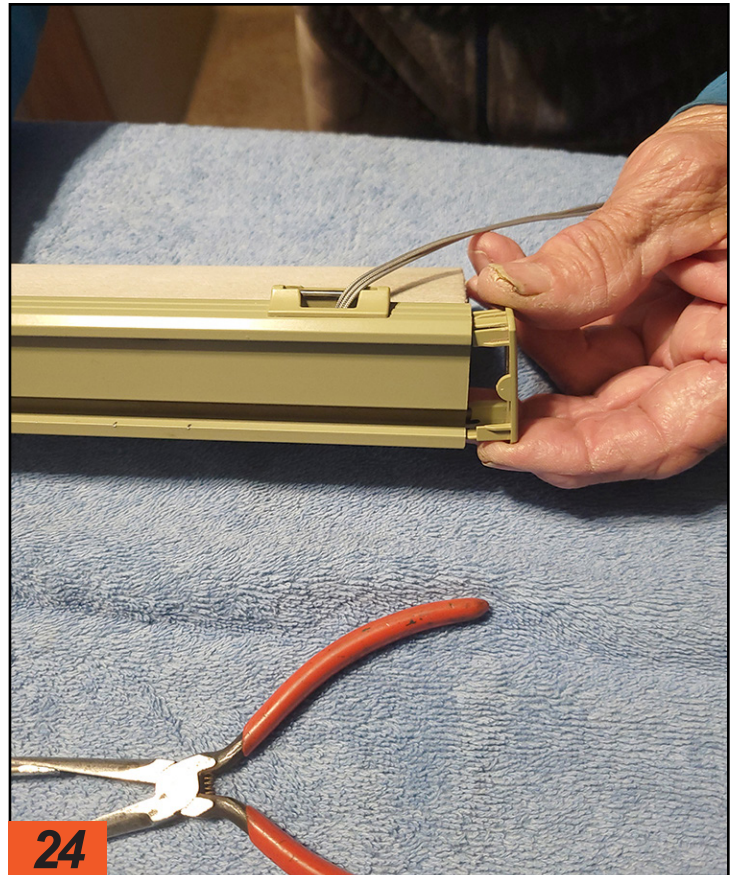
22

Now the "fun" part begins. Before the headrail was replaced all the cords were pulled through the latching assembly. The wire tool was used for this process, which was still difficult.



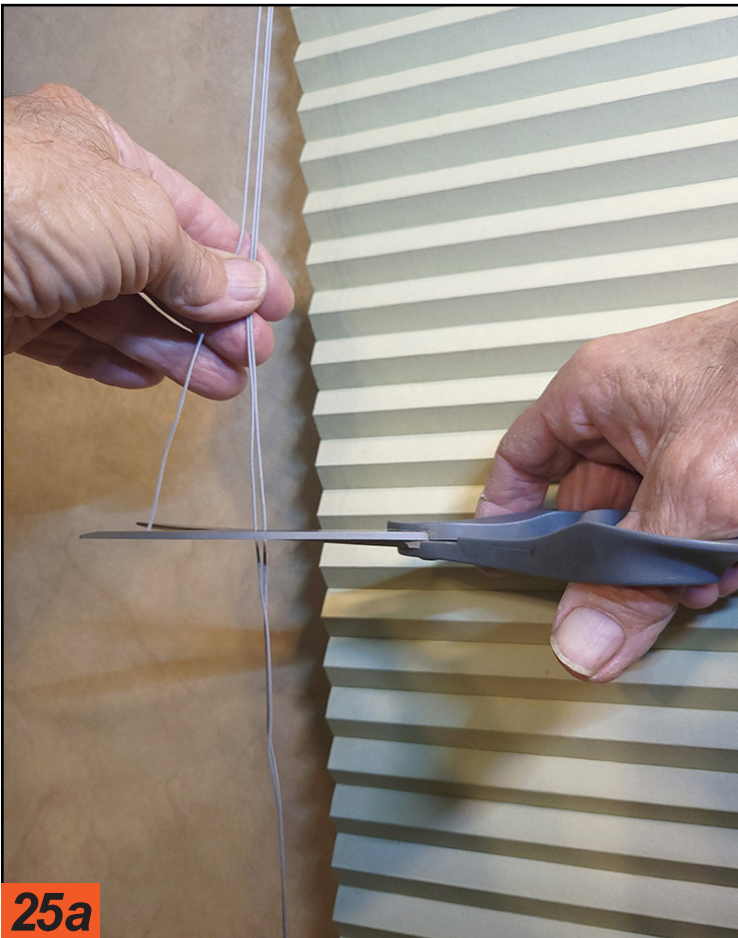
23

At this point, the bottom rail was easy to slide on because there was nothing to hinder the process.



24

All the end caps were re-installed at the same time. The earlier markings were followed to make they were in right places.



25a

Once the blind was extended fully, the cords were cut to equal lengths. The cords were then inserted through the plastic stop and a double knot was tied at the end.



25a



26

Finally, the cord tail is screwed on to the plastic stop and the valance is re-mounted. Plan on about 2-2 ½ hours to restring each blind. Once you do one, the others will fall in place and make the process smoother.



27

If you're working with common day/night shades, the cords will terminate at a plastic tensioner (mounted in the wall at a point lower than the window frame), which allows for tension adjustments. Often the screw will strip out, which can be fixed with a dry-wall anchor (not shown).



28

Thumbs up! The blind now works perfectly. **RVE**

DOWN THE DRAIN



Cable-actuated dump valves get a bad rap for operational difficulties, which can be mitigated with the right products from Valterra and proper installation.

By Bob Livingston / Photos by the author

Dumping the holding tanks is one of those necessary evils that all owners deal with on an all-too-frequent basis. Once the black and/or gray tank(s) fill up, the contents must be dumped into the sewer or septic system. The process is easy: a special 3-inch hose is connected to the RV outlet fitting via bayonet nomenclature, the other end is tightly sealed into the sewer inlet, and the valves are opened with a T-handle.

In most cases, anyway.

Many valves are attached near the outlet pipe and readily accessible, while some are operated from a remote location using cables or switches for electric systems. When the cables break or the valves stick, you'll have to tear into the bowels of the underbelly to make the repairs or replacement.

Early on, I installed electric valves on my fifth wheel to offset the poor perfor-

mance of the cheap cables (necessary for pulling and pushing the internal blades and installed by the factory) that were attached by simply bending the internal wire over a loop connected to the knife-blade valve — a cheesy, unreliable set-up at best. Within days of ownership, these valves were replaced with electric counterparts. It was a nice concept, but after multiple failures it was time to go back to a manual operation.

The replacement parts of choice were the Valterra (valterra.com) TC372, 3-inch cable actuated valves. Most owners will also likely need the company's TC172 1 1/2-inch valve for the gray water tank. For this project, however, the gray-water valve was adapted to handle a 3-inch electric valve, so the 1 1/2-inch configuration was no longer in play. Three Valterra TC372 kits were ordered from Amazon at \$59.66 each.



The kit of choice was the Valterra TC372, which included a 3-inch valve, the cable and hardware for the installation. An aluminum block is also provided that can be used to mount the cable and handle to the frame, but the 1/4-20 Allen set screws were missing in all three kits, which required a run to the hardware store.



1

Before starting the project, the access panel that exposes the spaghetti bowl of wire, pipes and other items was pulled out to make room for routing the cables. This can take some patience and requires study of the installation instructions.

(Interestingly, the smaller 1 ½-inch valve kit sells for \$67.07. Go figure.)

You'll need to spend some time studying the instructions, because installing the cables requires precise routing for optimum performance. From a practical standpoint, it's almost impossible to route the cables precisely as specified in the instructions when installing the valves on an aftermarket basis. Right from the get-go we realized that finding a perfect path through the spaghetti bowl of wires, pipes and wood structure was not going to be easy in the fifth wheel. There were just too many obstructions in the way for humans to work around — and the original cables were removed when the electrics were installed which, in retrospect, was a bad idea. But *RV Enthusiast* Technical Director Bill Gehr and I made it work, albeit with a few choice words and a few bandages to stop the bleeding on our hands and arms.

If the original cables are still in place, they can be used to snake through the new ones. Basically, the cables do not like lots of tight bends, which will prevent them from moving freely. In this case, we found a good compromise for routing the cables and the internal wires moved with minimum resistance. Fortunately, the internal stainless-steel wire is wrapped by a decent-quality cable housing, which promotes free movement without hang-ups.

Originally, the three factory cables were mounted in the utility compartment; over the years, the holes in the wall were further modified for switches and a 12-volt DC power outlet. All these components were stripped from the wall and the holes covered with galvanized sheet metal plates that were “stuck” on with 3M VHB two-face tape. Once the plates were in place — and the VHB

tape sticks like crazy — 5/8-inch holes were drilled to accommodate the new cable assemblies. Alternatively, each kit came with an aluminum plate with holes that can be mounted to a convenient outside surface (think frame) where the cables can be routed from. No doubt, that would have made the cable routing easier in this fifth wheel, but we preferred the cables be locked up inside the utility compartment.

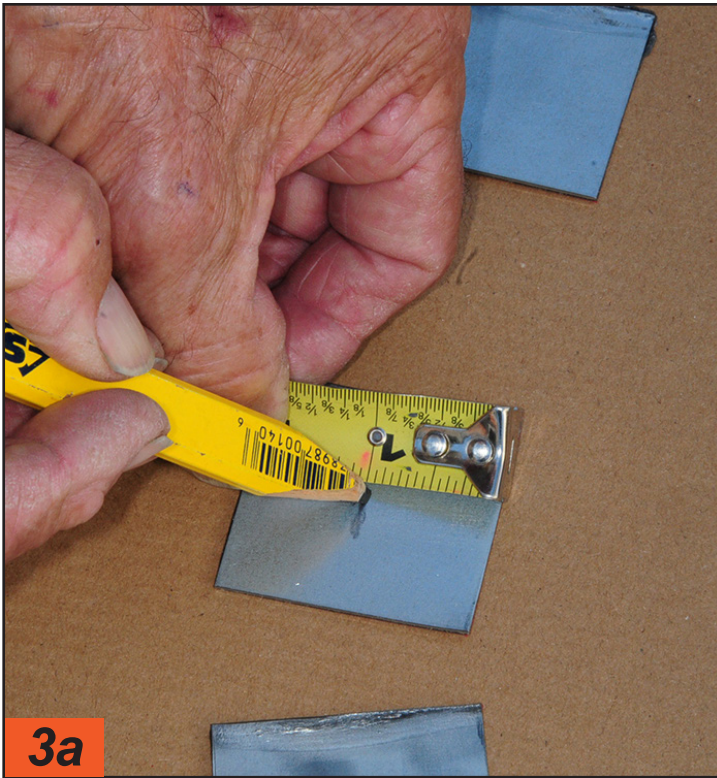
As you might surmise, the real “fun” began after the cables were routed. First, the tanks were drained into the sewer and the black tank rinsed thoroughly and left open for a while to allow any “stragglers” to find their way out and promote some drying. Keep in mind that you're still not home-free and it's best to wear disposable gloves, dirty work clothes, eye protection and a mask during the process of removing the old valves — and keep a bucket handy and your mouth closed.

Working on your back is, of course, not optimal, but there's no other choice. Earlier, cutouts with removable covers were configured in the belly pan to access the dump valves, which sped up the process. If this is your first time working on the valves, the belly pan will have to be dropped, which is not entertaining when all the construction shrapnel comes raining down on your body.



2

Originally, the factory cables were installed in a wall inside the utility compartment. These holes were abandoned after the electric valves were retrofitted when the fifth wheel was new. These holes were eventually used for switches and a 12-volt DC outlet, which were stripped out to make way for the new cables.



3a



3b

After cleaning the surface with alcohol, galvanized plates were measured and marked for covering the holes, which were way too big for the new cables.

Removing the existing dump valves was an easy task since there are only four bolts to contend with. More than likely, it will take some calisthenics to reach a few of the bolts, but the process should only take a few minutes and maybe a scraped knuckle. After cleaning up the area, the new valves were bolted into place, taking care to locate the new seals over the existing

flanges. Do not overtighten the bolts. There are couple of housekeeping chores before mounting the new valves. Make sure the new seals are coated with a thin layer of plumber's grease, which will help prevent leaks and keep them in place when mounting the new valves. It's also necessary to grease the knife blade on both sides; just add enough to cover the surface with a

thin layer. Adding the grease will allow the cables to push and pull the blades freely, which is critical for long-term trouble-free service.

Before mounting the valves, make sure the cable wires will fit into the coupler. We learned that the hard way when one of the couplers was not reamed out properly and the wire didn't fit. We did not want to remove the valve body, so we struggled to drill out the coupler, which turned out to be a nightmare — Rube Goldberg would be proud of our convoluted effort. Gehr held a drill bit with a locking pliers while I turned the coupler with a long nose pliers. It finally worked but prompted this tip to prevent problems for others. Also, the Allen set screw was missing from all three kits, which required a trip to the hardware store to purchase replacements with 1/4-20 threads.

The last step was to install the cables into the valve bodies. Before continuing, we confirmed that the red tab was in place between the utility wall and the cable handle to facilitate proper length; it was removed when the job was finished. Likely, there will be more cable than needed. After verifying the routing would work, the internal wire was pulled out and the cable casing was cut to fit through the collar entry hole (which is the strain relief). Once the basic length



4

The backing was removed from the two-face tape and the plates were "stuck" to the wall, covering the holes. VHB tape is really strong stuff and the plates will stick forever.



5a

5b

Once the plates were in place, a pilot hole was drilled in the center and then a 5/8-inch hole was cut with a step drill to accommodate the cable assembly.

is determined, the wire is cut — leaving 4 3/8 inches from the end of the cable casing so that it can be threaded into the coupler. It's best to use a cable cutter; regular wire cutters will likely bend the casing (and even the wire) and restrict movement. Smoothing out the end of the casing with a round file will remove any burrs or sharp edges that can hang up the wire.

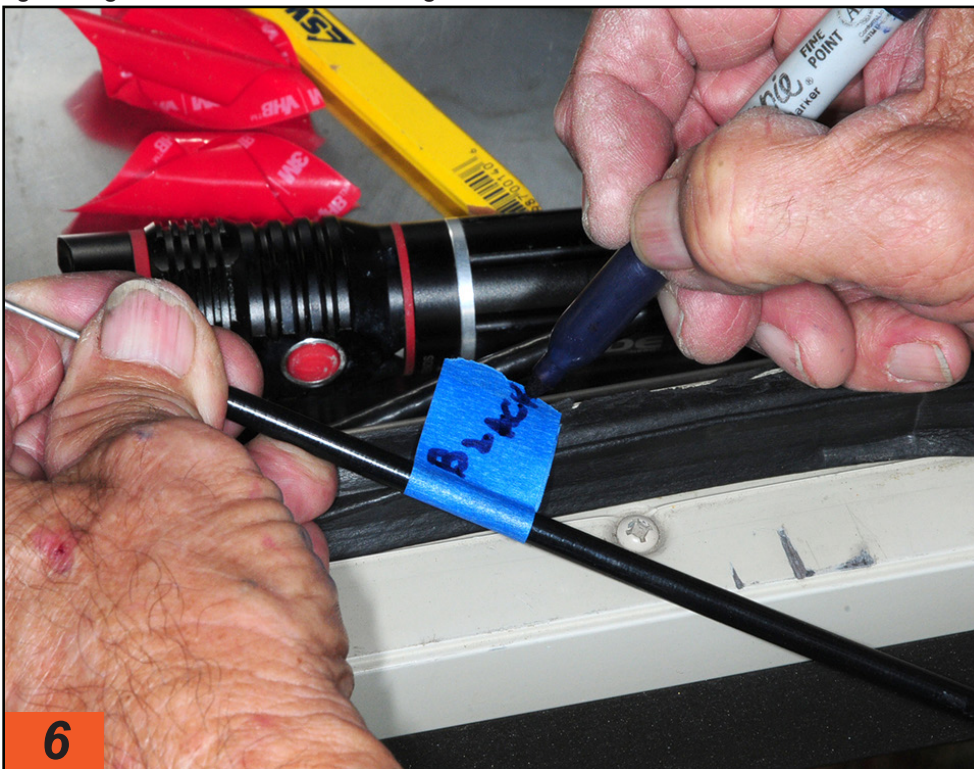
Once the cable was cut to length, the wire was secured in the coupler by tightening the set screw after coating

with a thread locker like blue Loctite (do not use red) and the cable was locked into the collar in the valve housing. Finally, the cable was secured with zip ties to prevent dangling, which will impact smooth operation of the valves.

While not a necessity, we also printed labels and placed them under each cable handle to identify the holding tanks; each handle was pulled and closed multiple times to confirm smooth operation. It's best to add water to each tank to make sure there are no leaks

before buttoning up the belly pan or access panels. In this case, one valve leaked and the offending bolts were tightened until the leak stopped. Again, do not overtighten the nuts and bolts or the valves will stick and even fail to move fully when pulling or pushing the internal wire.

After four months of full-time operation, all the cables are working smoothly — something appreciated by all owners when dealing with holding tanks.



6

Each cable was marked before routing to make sure they terminated at the right valve without getting crossed up.



7

The red tab must be in place when the cable assembly is installed in order to make sure the length is right when cutting the casing and internal wire for attaching to the valve. The cable assembly is secured with a locknut behind the wall and the T-handles can be adjusted for comfort.



Once the cable was connected to the valve, the red tab was removed and a label identifying the corresponding holding tank was printed and attached to the wall.



Before attempting to install the new valves, take the time to make sure the internal wire will fit into the coupler (this one did not fit). We found out the hard way that one of the couplers was not reamed out properly and — after the valve was already installed — we had to open the hole using a very unconventional (and slow) procedure.



Removing the old electric valves will only take a few minutes, but make sure the tanks are dumped, rinsed and somewhat dry. Otherwise, be prepared for a surprise — and a mess.



Plumber's grease was applied to the seals, which promotes solid seating and keeps them in place when installing the valve. Greasing the knife blade on both sides supports smooth opening and closing.



12a



12b

Slipping the new valve between the pipe flanges took some finesse to make sure the seals would not move; you'll know when the valve is seated, and the bolts/nuts can be tightened. It's important that the fasteners are not overtightened.



13

Final routing of the cable required that there were no severe bends. The instructions provide very specific requirements. Too many bends will inhibit smooth operation of the knife blade. Cable ties were used to secure the cables, which must not dangle.



14

Cable length was measured and marked before cutting. You will only get one shot at this step, so take the time to pre-fit the cable against the valve.



15

The cable housing was cut after the inner wire was pulled out using a tool with a compound action. The cutting tool must be sharp or the end will squash.



16a



16b

A round file was used to clean out any burrs in the end of the cable casing. The end of the internal wire was smoothed out with a flat file to make sure it did not get hung up while moving in the casing.



17a



17b

Blue Loctite thread sealer was applied to the coupler set screw before it was tightened with the provided Allen wrench to jam the internal wire. This wire will have to be removed if the valve needs replacement down the road and using red Loctite will make that process almost impossible (and probably lead to cutting the cable).



18

The last step was to tighten the cable in the collar built into the valve body. This secures the cable while providing a strain relief for the cable casing (shown before installation for clarity). **RVE**

vueSMART™

Wireless Trailer Camera

The only trailer camera that installs in minutes!

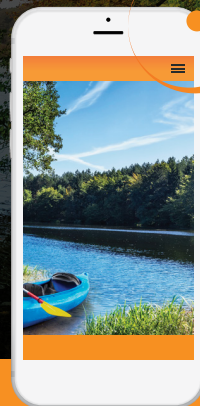
- ✓ Fits any trailer
- ✓ No re-wiring needed
- ✓ WiFi to any smart device

Put a Set Of Eyes Behind Your Trailer Today!



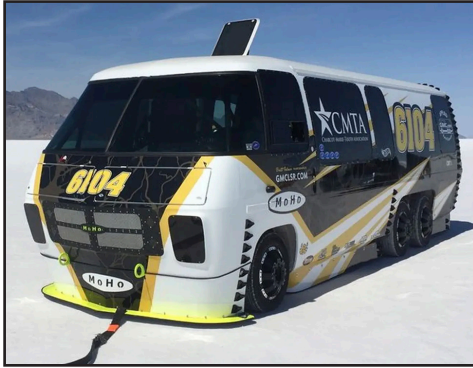
← SCAN HERE TO SEE IT IN ACTION!

or visit www.hopkinstowingsolutions.com/vuesmart for video and additional product information



continued from page 11

GMC Motorhome Sets Speed Record



It's been 45 years since the last GMC motorhome rolled off an assembly line, but there's still never been an RV that commands a greater ownership group. It's estimated that as many as 9,000 of the 12,921 coaches manufactured between 1973 and 1978 are still on the road.

Featuring a front-wheel-drive package from Oldsmobile — which eliminated the need for a driveshaft tunnel and, hence, allowed for a lower center of

gravity — a unique tandem rear suspension, fiberglass and aluminum exteriors and a lot of windows (13), these colorful 23- and 26-foot motorhomes remain a fixture on America's highways.

And, apparently, on the Bonneville Salt Flats. Owned by Britt Palmer, this 1977 GMC Kingsley model may have been ahead of its time, but it still moved like a motorhome. So, Palmer shipped it to custom fabricator Dennis McCarthy's Special Effects for a bit of "massaging." The motorhome was gutted of its creature features (much of the interior was then covered in aluminum sheeting), received certain necessary safety items, then became home to a nitrous oxide-injected 502-cubic-inch big block and TH425 automatic transmission. A Ridetech air ride system and a few exterior mods to make it a bit more aerodynamic helped — since the GMC was headed to the Bonneville Salt Flats. There it set the Class A motorhome land speed record at 122mph.

The motorhome is now for sale, by the way, for a cool \$95,000, though it may have been picked up by the time you read this.

and more.

The "university" contains more than three hours of critical content. To sign up for Jayco University and access the program, go to jaycofamily.com/JFOC-University-NRVTA/ to get started. At present, the courses cover Jayco-branded products; specific courses geared to Highland RV, Starcraft RV and Entegra Coach products are in the works. There also is a link — rvtech-course.com — to NRVTA home-study courses for owners who "want to kick it up a notch."

RVillage Shuts Down on March 31



RVillage, an online community that aided in members connecting while on the road, has announced it will be closing on March 31.

Founded by Curtis Coleman, the community was designed to bring like-minded campers together. "RVers are mobile," Coleman told the trade magazine *RVBusiness* in a 2017 interview. "The problem is that it's difficult to connect with people moving around." The RVillage platform solved that problem for its members, Coleman said at the time, by providing the locations of other network members within a certain radius of each other as well as any nearby campgrounds.

In 2020, Coleman sold RVillage to Togo Group, which would later become Roadpass Digital, a suite of apps and websites for RVers and campers that includes Roadtrippers, Togo RV and Campendium.

However, Roadpass Digital released information stating that the community will continue to exist as a Facebook group. Visit here for more information: [RVillage Community Facebook Group](https://www.facebook.com/RVillageCommunity).

Jayco, NRVTA Collaborate on "Jayco University"



Recreational vehicles aren't intended to break down, but manufacturers have no control over the road surfaces owners drive across. When something does go awry, it can be a game-changer — okay, vacation-changer — if you don't know how to effect repairs on the road. That's why the Jayco family of companies has teamed up with the National RV Training Academy (NRVTA) to educate customers and users about their products.

As part of the program, the two companies have collaborated to create an exhaustive video training series for owners. The curriculum — which has 74 courses and is free to consumers — includes overviews of RV basics, RV

electrical systems, propane systems, getting to know your RV, fifth wheel- and travel trailer-specific systems, air conditioners and vents, holding tanks

Advertiser Index

(click on company name to view its ad)

Advertiser	Website	Page
Alde	alde.us	52
Brazel's RV/Ultra RV Products	urvp.com	10
Clearsource	clearsourcerv.com	11
GoPower!	Gopowersolar.com	5
Hopkins Mfg.	hopkinsmfg.com	42
Lippert Components	lci1.com	2
MORryde	morryde.com	9
Norcold	norcold.com	7

Don't Get Unhinged



When the hinges on an RV screen door fail, the typical solution is to buy a new door assembly — which is pricey. Here's how to make new brackets out of angle aluminum — an inexpensive repair that restores full use of the screen door.

By Bob Livingston / Photos by the author

When the hinges on the screen door break, it's one of those "oh, no!" moments. While the screen door can be replaced by removing the screws in the hinges, it's not possible to replace the hinges themselves when they break. Years of opening and closing can lead to broken hinges, a common situation, which rendered the screen door unusable on this older fifth wheel, and the cost — not to mention the labor — to replace the entire screen/entry door assembly can be daunting.

Fortunately, there is a rather simple solution: build new brackets to restore the function of the original hinges.

The process is not complicated if you're the least bit handy — and it only takes about an hour to complete the job. You'll need to purchase a short

length of 1 1/2-inch angle aluminum (although 1 1/4-inch stock may work, depending on the hinge size) at a local hardware store, which can be cut into brackets and mounted over the existing hinges. It may be hard to find a short length of angle aluminum, and since you'll probably only need 9-12 inches worth, plan on having some leftovers.

For this project, the existing hinges were measured and marked accordingly on the angle aluminum stock; each hinge was 3 inches long and there were three of them. The aluminum was cut with a power angle grinder (although it can be easily cut with a hack saw) and the rough edges filed smooth. There's a backing plate behind each existing hinge, which was used as a template to drill holes in the replacement brackets made from the angle aluminum. Once

the holes were drilled, a new bracket was attached to the upper hinge position first on the screen door using the existing screws.

A locking pliers was used to hold the



After years of service, the hinges on the screen door snapped in two, which made it impossible to replace the screen door without purchasing and installing a new entry door assembly — which would have been expensive.

newly attached bracket to the existing hinge that was permanently attached to the entry door. Three new holes were drilled through the new bracket and the entry door hinge and screwed in place. From here the process was repeated two more times.

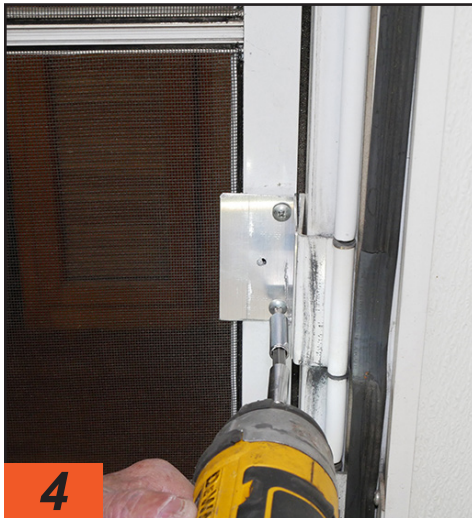
For this project, the owner of the fifth wheel elected not to trim the aluminum brackets, which extended into a portion of the screen material in the three hinge locations — he was just happy to get his screen back. In retrospect, trimming the brackets would have looked better, as would be painting them to match the screen door frame.

The newly installed brackets brought new life to the existing hinges with the same level of strength — and opening and closing the screen door was once again restored to a smooth operation.



1

A low-buck alternative was to attach a bracket to the remaining section of each hinge made from 1 1/2-inch aluminum angle stock, commonly found in hardware and home improvement stores. The first step was to measure the existing hinges.



4

After the holes were drilled, a new bracket was first installed on the upper position of the screen door frame. The original backing plate was repositioned behind the new bracket and the existing screws were installed and tightened.



2a



2b

This project required that the new brackets be 3 inches long, so appropriate markings were drawn as a cutting guide. An angle grinder was used to cut the aluminum angle stock into three brackets. Aluminum is soft, so cutting is not difficult if only a hack saw is available.



3a



3b

Once the new brackets were cut, the broken section of each existing bracket was removed and the backing plate pulled out. The backing plate was used as a template for drilling the three holes that would line up with those in the screen door frame.



5a



5b

The newly attached bracket was positioned against the leftover entry door hinge and held in place tightly with locking pliers. Three holes were then drilled through the new bracket and hinge to accommodate rivets that were used to fasten the two pieces, preventing any movement between the two pieces of metal. This process was repeated two more times.



6

A job well done. The screen door now moves freely and since the original hinge points were used, there was no dragging — and the latch lined up perfectly. **RVE**

GATE KEEPER



A pickup tailgate that free falls when opening is disconcerting at best and prone to hitting into something at worst. Installing a strut to slow down the process levels the playing field.

By Bill Gehr / Photos and video by Lorie Swaffer

Pulling a fifth wheel with a pickup truck makes it necessary open and close the tailgate several times a day. You know the drill: open the tailgate to hitch up, close to get going, open to unhitch, close to use the

truck as a daily driver, open to unload chairs and other things, and so on. It's not rocket science, but I can't even remember how many times I've had my hands full and accidentally let the tailgate slam open. And, unfortunately,

there's a lot of weight in motion when the tailgate falls open — and over time, the wear-and-tear on the hinges can lead to expensive repairs, not to mention the sheet metal damage if you happen to let it fall onto the A-frame



The Tailgate assist kit includes all the parts necessary — and even a couple of rudimentary tools — to install the parts in about an hour. Instructions come with photos but still required some intuition.

jack when a travel trailer is still hitched up.

Recognizing this dilemma, some new trucks are outfitted with a tailgate opening assist, which slowly regulates the downward movement. This convenient feature spurred me to seek out an aftermarket device that can do the same thing. Of course, the first place I looked was Amazon — and just what I needed popped up. There were several kits to choose from, so I relied on the reviews to find one that would not only work well but last without breaking; the other priority was ease of installation. As a result, I settled on the Tailgate Assist Shock Strut 43301 Silver Classic for \$24.29. This kit is designed for the 2009-2018 Ram trucks, which fit the parameters for the 2017 3500 dually project truck.

The Install

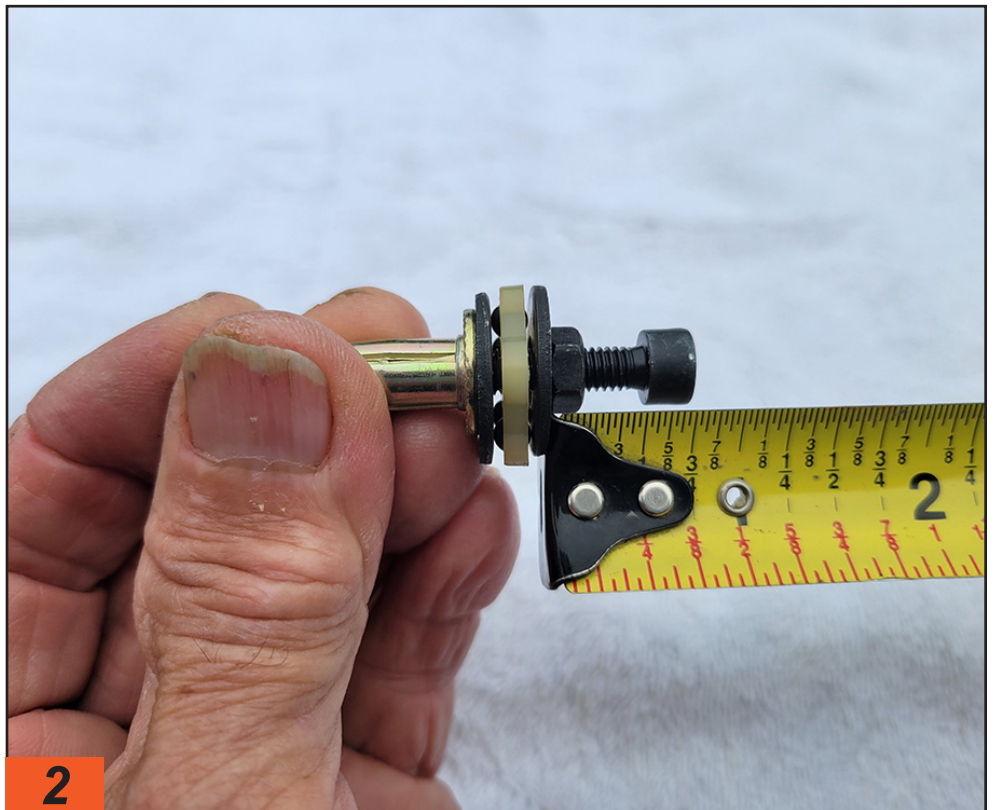
The first thing I noticed was that the directions were vague, prompting me to improvise somewhat. For example, the instructions did not call for the removal of the bolt in the rivet nut (an inserted fitting with threads). It was obvious that you had to remove the bolt, but it might be confusing to some people. I also quickly figured out the need to wear gloves when installing the rivet nut into the tailgate because the Allen wrench would dig into my hand from the pressure necessary to tighten the rivet nut properly. The rivet nut was also sloppy when positioned in the existing hole in

the tailgate, requiring a lot of pressure to hold it in place while the bolt was tightened to flair out the material as it seats into the sheet metal.

As hard as I tried, it still came out a little bit crooked, but sufficed. The directions call for rotating the rivet nut nine

turns for proper seating, which means you'll have to mark the side of the nut with a felt pen (or Liquid White-Out) so you can count the revolutions. That said, the wrench covers the nut, making it difficult to count turns. If the rivet nut is still loose or spinning in the tailgate it must be tightened two additional turns (as per the instructions), which is what we needed to do for proper seating in this case. However, be careful you don't overtighten the rivet nut; if you strip the threads, you will likely not be able to purchase another one without buying a complete kit — and you'll have to wrestle with getting it out.

Once the rivet nut was seated, a lower ball mount plate was installed using a 4mm Allen wrench to screw the bolt through the plate and into the tailgate. Here again, the directions were rather vague, but a little intuition clarified the process. Next, the existing cable and bolt that's connected to the truck bed were removed using the supplied T45 Torx wrench. This cable is what stops the tailgate from opening too far. I had to use a short piece of pipe on the wrench because the bolt was much tighter than what the small Torx wrench could handle; gloves also helped here. (Note: We used the provided tools to determine if they would work; most do-it-yourselfers will have more robust tools. I recommend a long handle ratchet with a Torx socket.)



A rivet nut was installed in an existing hole in the tailgate. Before starting the process, the bolt must be set to the designated length called out in the instructions.

At this point, the upper ball-mount plate was installed using the existing bolt that secured the cable end. No torque specification is provided, so just make sure it is tight. The cable end goes back into the original position — snapped over the bolt. The rubber bumper below the cable was then removed by cutting the plastic rivet and prying it out. If this bumper is not removed, it will interfere with movement of the gas strut.

The bottom end of the cable and limiter that is attached to the tailgate were then removed. The tabs on the limiter needed to be flattened with a hammer and punch — again, to prevent interference with strut movement when the tailgate opens and closes. To keep the cable away from the strut during tailgate movement, a provided clip was installed 3 ½ inches from the top. The installation point was marked with White Out (a black felt pen will not show on the black cable) and the clip snapped on with pliers. This may seem

easy, but it was difficult to slip the clip over the cable at first. I found that using a little bit of WD-40 helped make it work (there was no mention in the directions of using a lubricant here to facilitate the process).

The final step was to install the gas strut with the bigger body end on the upper ball (mounted below the upper cable) by pushing the clip in place; the lower ball (on strut the end of the arm) was then installed, and the job was done. The upper and lower balls can be released by using a screwdriver to pry the retaining clip outward while pulling on the gas strut.

Satisfied with the installation, I released the tailgate latch and watched it slowly drop to its fully open position. I was pleasantly surprised how smoothly the tailgate glided without any interference on the strut. I opened and closed it a few more times to make sure that something didn't bend or move — and at that point, I stopped thinking about buying a new truck.



In order for the rivet nut to seat properly, the black nut must be turned at least nine rotations with a 10mm wrench (not supplied). Liquid White Out was used to mark the nut to count rotations. An extra two turns were needed to seat tightly, but the rivet nut was still a little cattywampus — but it worked.



At first, a short Allen wrench was used to turn the bolt to set the rivet nut, but in order to get the extra two turns done, we needed a heavier-duty T-Allen wrench (not shown). Once the rivet nut is seated, the bolt-and-washer assembly were removed. The washer and bearing fell apart after removal so they were round-filed.



5

The lower plate with ball was attached to the tailgate using a countersunk bolt threaded into the rivet nut with a 4mm Allen wrench (not supplied).



6

In order to remove the bolt on the side of the truck bed, the T45 Torx wrench (supplied with the kit) required a cheater pipe to break it loose. This bolt was extremely tight and stubborn to remove. The supplied wrench is pretty cheesy, so using a ratchet with a Torx socket would work much better.



7

The upper mounting plate with the ball was attached to the bed with the existing bolt. The cable was attached at the time, but can also be removed and installed independently using the locking clip. While there were no torque specs for this bolt, it must be very tight.



8a



8b

A diagonal cutter was used to cut a plastic rivet that held the rubber bumper in place. This bumper must be removed before the strut can be installed. It twisted off once the rivet was cut.



9a

9b

The bolt that secures the lower cable eyelet (to control the amount of tailgate travel) was removed to access the limiter plate to straighten the tabs. At first, a pliers was used to bend the tabs, but it didn't work. Consequently, a punch and hammer (suggested in the instructions) made short work out of flattening the tabs. The limiter cannot be removed from the locking washer, so maneuvering the punch is a little tricky. Once flattened the limiter and cable end were replaced in the original position.



10a

10b

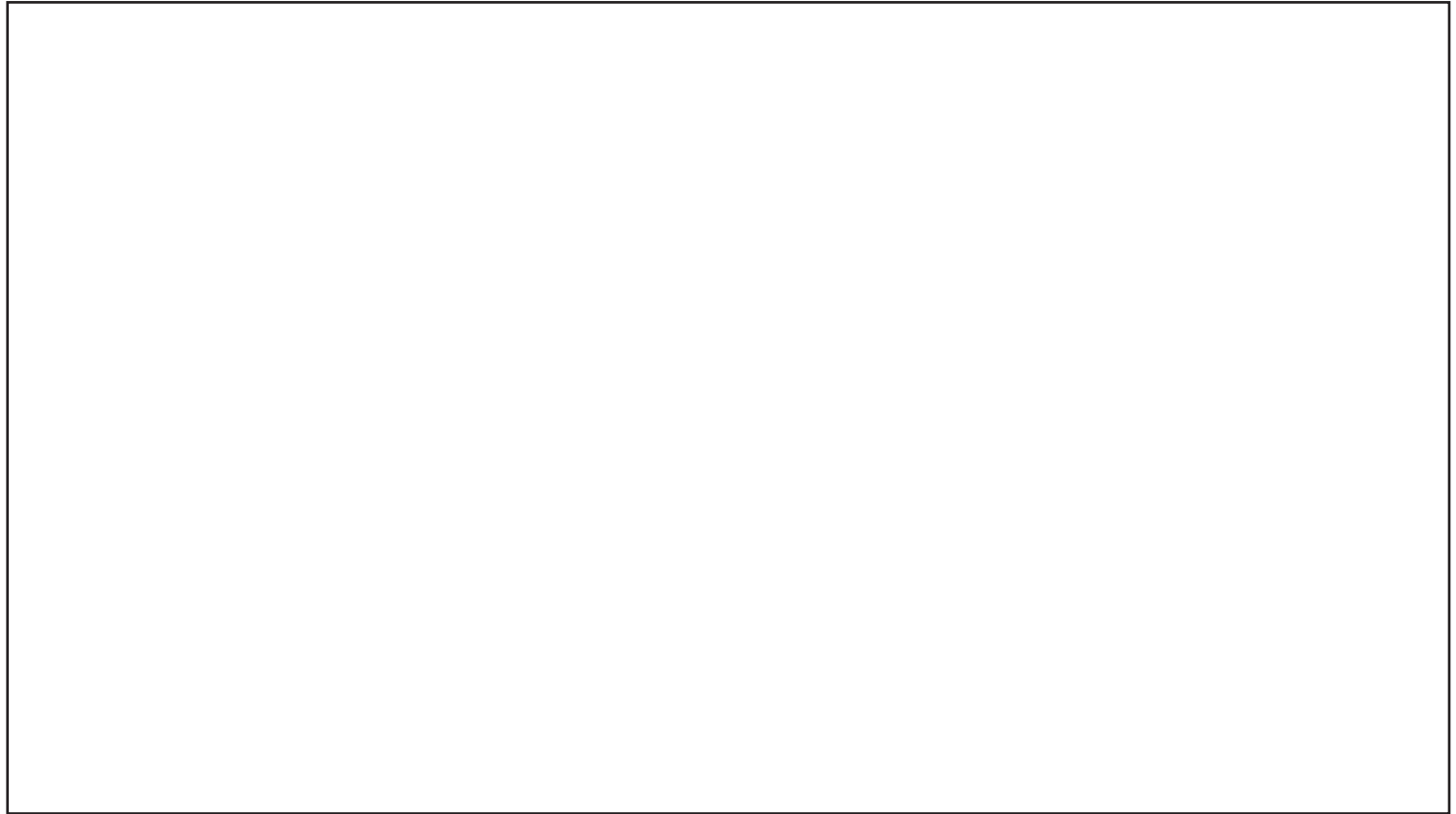
Measure 3 ½ inches from the upper end of the cable and mark the location for installing the cable clip provided in the kit. This clip provides rigidity to prevent the cable from getting tangled in the strut. After struggling to snap it over the cable (with pliers) a shot of WD-40 helped reduce friction — but it still needed a bit of persuasion.



Lastly, the strut was installed on the balls attached to the brackets. The upper, thicker end, goes on first. The lower arm needed to be compressed to locate the socket on the ball. A small-blade screwdriver can be used to lift the retainers on the sockets that go over the balls should the strut need to be removed.



A test run proved the strut was able to control the tailgate smoothly as it opens fully. After numerous cycles over a few months, the strut is working perfectly.



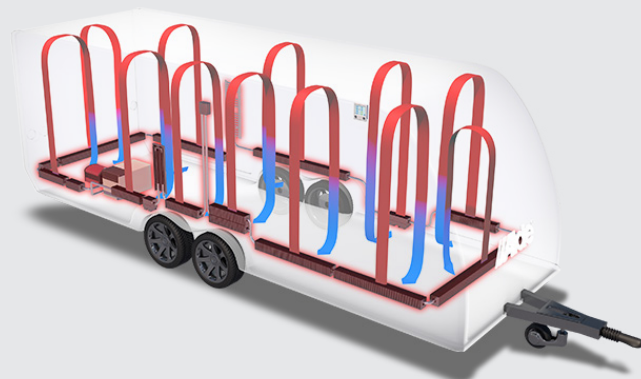
Look ma — no hands! **RVE**



More than Comfort-- Luxury.

The Alde Heating System utilizes hydronic heat and natural convection to warm your RV without fans, creating one of the quietest heating solutions on the market. Not only does the Alde Heating System create a comfortable indoor environment, it also brings additional luxuries to your camping experience including:

- Hot water on demand
- In-floor heating
- Heated towel rails
- Cab heater
- All-season capability



Alde[®]

www.alde.us