

Assemble an RV Plumbing System Emergency Kit
Truck Tech: Ram 3500 Wheel Bearing Replacement



ALWAYS BE READY FOR THE ROAD.

TIRE LINC[®] TIRE PRESSURE AND TEMPERATURE MONITORING SYSTEM

Always be ready for the road. Upgrade your RV with the tire pressure and temperature monitoring system (TPMS), that sends you tire notifications directly to your phone.

- Monitors and alerts drivers of high or low tire pressure and temperature
- Easy, do-it-yourself installation
- Works with OneControl[®] app on iOS and Android devices
- Kit includes 4 sensors and can also monitor up to 20 tires simultaneously

Download the Lippert OneControl app via the Apple App Store or Google Play and take control of Tire Linc technology.



Apple and App Store are registered trademarks of Apple Inc.



Google Play and the Google Play logo are trademarks of Google LLC.

0000





RVENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE September 2022 Volume 2, Number 9

INSIDE



Worry-Free Freshwater Sanitation

Rather than use the ""old method" of a bleach mixture to neutralize bacteria and slime in RV freshwater systems, treating with EPAapproved Purogene — a solution that's been around for 50 years — is easier to use, and it's safe to drink.



Pedals & Power

Outdoor enthusiasts don't just sit around the campfire while RVing they like to explore their temporary environments. That, though, requires some form of ancillary transporation. Bicycles have long been favored — but now, eBikes extend their explorations.



Go with the Flow

Leaking water is the nemesis of an RV, be it a travel trailer, fifth wheel or motorhome — and that means inside as well as outside. Leaks can and will happen, so your best insurance is to equip and carry a plumbing system emergency kit.



Get Your Bearings

One source for the infamous "death wobble" sometimes encountered by RVers is worn out front bearings of a tow vehicle. Eliminating that brief but memorable uncontrolled shaking can be as simple as replacing the truck's sealed front bearings which we did on this Ram 3500.

DEPARTMENTS



There is no better audience to canvass for suggestions as one that's experienced in the field — so I ask you: Do you have any ideas for inexpensively upgrading an RV to circumvent possible problems or enhance the lifestyle?



Airstream releases its first Class B built on a Ram ProMaster platform, Europe's Caravan Salon welcomes more than 235,000 visitors, Aliner debuts a new off-road folding camping trailer — and your first look at a most unusual catamaran.



Wondering how to restring your day/night shades? Need some suggestions for repacking the wheel bearings on a travel trailer (or fifth wheel)? Have a problem with your LP-gas detector or a diminished flame on your stove? Here are some answers.



A 2016 Winnebago Itasca gas-powered Class A motorhome gets lifted in preparation for having its stock leaf-spring suspension replaced by a LiquidSpring's CLASS (compressible liquid adaptive suspension system) upgrade. Photo by Bob Livingston

55 Advertisers Index

September

3

INSIDE

Special Section! Suspended I nimation



The Road More Traveled

MORryde's CRE3000 equalizer replacement and Heavy-Duty Shackle Upgrade Kit is one of the quickest retrofits available for enhancing ride quality for leaf-spring-equipped travel trailers and fifth wheels equipped with multiple axles.



Curing the Bouncing Blues

Shock absorbers are *de rigueur* on automobiles — but are few and far between on travel trailers and fifth wheels. Installing shocks on a towable, though, is a proven "shortcut" to take the hoppity-hop out of trailer towing.







Roadmaster's Comfort Ride Slipper Spring System

The Slipper Spring system is engineered to reduce bucking and bouncing by replacing the equalizer with a steel box structure that incorporates rollers and wear plates along with spring packs with open, curved ends on one side to ride on the roller assemblies.

LiquidSprings' 'Smart Suspension' Solution

LiquidSpring didn't set about enhancing the typical leaf-spring suspension on gas Class A motorhomes — the company replaced the entire suspension. Its "smart solution" uses a computercontrolled compressible-liquid system to temper road oscillations.

SuperSpring's Trailer SumoSprings

Developed by SuperSprings International, this "airless air bag" system uses a proprietary blend of nitrogen "bubbles" injected into urethane to create products with a progressive spring rate — and they can be installed in as little as 30 minutes. 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 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 <u>https://rventhusiast.com/privacy-policy/</u>

THE GAS ENGINE GAME CHANGER

00

THE REVOLUTIONARY LIQUIDSPRING® SMART SUSPENSION JUST GOT SMARTER

A Gas Coach equipped with a Four-Corner Solution from LiquidSpring will rival the driving experience historically reserved for a diesel pusher.

TOTAL COMFORT & CONTRO • Luxury Car Ride • Sports Car Handling • Instantaneous Response

ELIQUIDSPRING SMART SUSPENSION

Get smarter and learn more at: **liquidspring.com** or call us at: (765) 474-7816

©2021 LiquidSpring, LLC

5

ON THE ROAD What Are Some of the 'Necessities' RVs By Bruce Hampson are Lacking?

f there's one thing I've learned during the past few years as social media has grown into a juggernaut, it's not to believe everything you read online. In fact, much of it should be taken with the proverbial "grain of salt" — because things tend to be, well, exaggerated, by keyboard warriors. Without verification, a lot of the more dubious claims ought to be looked upon with the same disdain given those unending robo-calls telling you that your car's warranty has expired.

When you read the same type of complaints from various sources, though, they tend to take on more significance — and there are a lot of complaints floating around in "the cloud" about RVs. Again, they need to be taken in context — they represent a miniscule percentage of the hundreds of thousands of RVs sold every year. But they are there. And they're often accompanied by a question: Don't the people who build these things (meaning the designers, engineers and executives responsible for what rolls down the assembly

lines) actually use them?

Now *that* is a good question. The short answer is, "yes," many of them do. During my decade spent as Editor of *RVBusiness*, the nation's premier RV trade magazine, I had many conversations with designers, product managers and C-suite executives about where they vacationed and what product they personally owned. So that query can be put to rest. That said, questions about "how they buy their RVs" and "how long they use them" are a bit harder to answer.

Suffice to say, no RV executive has to visit a local dealership and haggle over a

certain model that caught their eye. But, they are built by the same technicians on the same assembly lines as the RV you may own.

That's important. I remember back during my days as editor of various automotive magazines when staffers would pick up test vehicles from vehicle manufacturers and spend a week or so driving and evaluating them. We had a saying back then that such vehicles seemed to be built with a "magic screwdriver." By that, we meant that they usually (but not always) met the manufacturers' claims. They were, for the most part, immaculately constructed and performed admirably, presumably because the manufacturers weren't going to place anything in their press fleets that would reflect poorly on them. And, of course, it helps immeasurably when vehicles can be built by robots — programmed to perform the same task to the same standard over and over — and not people.

Flipside, when I ran *MotorHome* magazine for Affinity Group (now Good Sam Enterprises) we would often receive test vehicles right off dealership lots, as did the editors of our sister magazine *Trailer Life*. So, rest assured there are no "magic screwdrivers" (or, for the most part, robots) in the RV industry — for anyone.

But — and it's a big "but" — these executives rarely spend the amount of time in an RV that many owners do. A long weekend vacationing in an RV is fun; a month-long excursion can add a bit of frustration to the recreation as perceived shortcomings make themselves known.



RV-DE-FENDER markets an aftermarket tire blowout protection system for tow-ables.

So, we — *RV Enthusiast* Publisher Bob Livingston and I — thought it might be fun to put together a list of things that RVs may be lacking. Among them:

• Tire Pressure Monitoring System — In 2000, the TREAD (Transportation Recall Enhancement, Accountability and Documentation) Act was signed into United States federal law. It required all vehicles manufactured on or after Sept. 1, 2007, to be equipped with a tire pressure monitoring system (TPMS). That was more than 15 years ago — and yet, there have literally been millions of RVs manufactured and sold since then that are not equipped with a TPMS. This should be a given.

In a related vein, would it be possible for OEMs to devise a stamped metal insert that could be installed beneath the wheel wells and around the bottom of the "house" of a travel trailer or fifth wheel? A TPMS will highlight potential tire problems, but it can't prevent a blowout — and the amount of

damage done by those heavy tire cords to an exposed wood structure can be staggering.

• Better Bunk Mattresses. Even the lighter weight of children will quickly highlight the shortcomings of these woefully inadequate "mattresses." I once owned a late-'70s Winnebago Brave "eyebrow" motorhome — and mattresses used in certain places in a contemporary RV don't seem to have evolved all that much.

• Cell Phone/Wi-Fi Boosters. There's probably nothing more aggravating while on the road than to not be able to stay in touch.

• Automatic Awning Retraction Device — Wind gusts can happen anywhere, at any time — and have destroyed innumerable RV awnings, which act like sails in the wind and are suspended by surprisingly fragile arms.

Admittedly, such ideas may push the "price point" of certain RV segments (though not by much, given the economies of scale that manufacturers wield for purchases) — but that also begs the question: Are there too many RVs being built today, anyway? One good thing that came out of the Great Recession of a dozen or so years ago was RV manufacturers refocusing on what consumers wanted. Brands and product lines were reduced in order for OEMs to meet the requirements of more demanding customers. With the current runup of RVing's popularity, this has gone by the wayside; manufacturers are back to pushing everything and anything to claim more market share in every price segment imaginable.

This isn't just a mental exercise, by the way: We want to hear from you, our readers. Do you have any other ideas of things you've discovered while camping with your RV that could use a bit more fine-tuning? Send me an email at <u>bhampson@rvemediagroup.com</u>. I'll put your ideas together and forward them to executives at every major manufacturer (yes, I do have their contact information — another one of the benefits of having run *RVBusiness*). Granted, we'll have no way of knowing whether they are able to implement any of your ideas — but at least you will have made your opinions known.



Passionate About RVing?

Sign up for the RV Repair Club newsletter and get FREE RV repair, maintenance and upgrade videos sent to your inbox each week.

SIGN UP NOW

4 Reasons to Sign Up



New How-To Videos

Get the latest RV repair videos delivered

right to your inbox every week



New RV Repair Articles

Have a first look at RV repair tips and advice written by our team of experts



Weekly Inspiration

Fresh new RV repair ideas and fun tips to try out at home delivered to you each week



Deals & Steals

Our partners have special offers ready and waiting for you throughout the year

September

NEWS & NOTES

Airstream Debuts RAM ProMaster-based Rangeline



Airstream Inc., maker of the iconic "silver bullet" fleet of Airstream travel trailers and touring coaches, has introduced the all-new <u>Rangeline Touring</u> <u>Coach</u> — the 91-year-old company's first motorized RV built on the RAM ProMaster 3500 chassis.

Powered by the 276-hp 3.6L Pentastar V6 engine and a TorqueFlite nine-speed automatic transmission, the front-wheel-drive Rangeline provides four belted positions (two captain's chairs and a two-seat bench). The standard configuration of the European-inspired interior sleeps two on an elevated bed — with ample storage in a "garage" below — while the optional pop-top expands the sleeping capacity to four people.

In keeping with Airstream's reputation for high-end craftsmanship, the \$131,882 MSRP Rangeline carries a wealth of features and accessories. A 270Ah lithium battery bank and 2,000-watt inverter will help power its all-electric appliances (including a 3.2-cubic-foot refrigerator, .4-cubic-foot freezer and stowable electric stovetop), with supplemental power provided by a 2.8kW AC generator. The hydronic heating and hot water system for on-demand hot water and interior heat is powered by the gasoline in the vehicle's fuel tank, while a Firefly multiplex control panel manages and monitors lighting and onboard systems. There's also a wet bath with sink, shower and toilet, modular lightweight load-carrying equipment panels mounted on both rear doors allowing for customizable gear storage, a Flex table system, convenient pet amenities built into the design and more. For more information, visit <u>airstream.com</u>.

Grand Design Hosts 1,250 at National Rally

Because of its proximity to many of the RV industry's biggest manufacturers, the Elkhart County Fairgrounds in Goshen, Indiana, plays host to a large number of RV owner rallies throughout the year. And — again, due to its location — these rallies often offer attendees a number of unique "spiffs," from comped meals to free tech repairs and upgrades, courtesy of the manufacturer and its vendor partners.

Still, the 2022 Grand Design National Owners Rally held in late August at the fairgrounds managed to set itself apart. Yes, it included a wide slate of activities, including Grand Design plant tours, food, music, socializing, games, focus groups, crafts, seminars and more. And, there was even a golf outing preceding the event.

But for the 1,250 people at the event (towing 541 rigs), one of the highlights had to be an address by Grand Design CEO Don Clark. Acknowledging 2022 as the 10th anniversary of the company he founded with Ron and Bill Fenech, Clark spoke of what future plans hold for his company — including an all-new adventure travel trailer under the Imagine brand and a hint of a potential foray into the motorized space.

Then, while recognizing those who traveled farthest to the rally, Clark asked how many were from Alaska and added, "I won't ask you how much money in gas you spent, but it just became \$1,000 less. Grand Design is going to pay \$1,000 for your gas."

That new, small travel trailer mentioned previously, by the way, is well on the road to development. Called the AIM — or Adventure In Motion series — it be offered in 2023 with four floor plans ranging from 3,500 pounds to 4,100 pounds, said Lynn Bontrager, Imagine plant manager.

As for the possibility of Grand Design entering the motorized market, Clark told the group Grand Design is, in fact, "underway researching the minimotorhome market and the van conversion market to see if that's a space we want to play in."

You just never know what's going to happen at a national owners rally.

Class A motorhome owners looking to maximize security on the road have yet another choice with the launch of the RVLock Atlas, a keyless entry system engineered by RVLock.

According to RVLock CEO Cade Harris, developing a universal handle that is simple to install for motorhome doors that vary from rig to rig is extremely complex. The RVLock Atlas, under development for several years, is said to be the first Class A entry handle of its kind, making locking and unlocking Class A rigs possible with the push of a button. It combines keyless entry through an integrated keypad, key fob, or smartphone (users can attach a separate product, the RVLock BT Pro+, to convert their handle to support

9

ENJOY THE DRIVE.

10 RV Enthusiast

Bluetooth functionality) and features a rechargeable lithium battery power supply, steel-body construction, a lifetime warranty and custom RVLock key codes. For more information, visit rvlock.com.

Enjoying a Bit of "Boo!" with Boo-Boo

If you're among the growing number of RVers who don't care to pull their rigs off the road and start the winterization process as soon as Labor Day rolls around, there are a lot of campgrounds still willing to take your money and provide a space. Plus, many of them stage "theme weekends" — which, at this time of the year, means Halloween.

In fact, some of the busiest times of year at many Jellystone Park locations are the weeks leading up to Halloween. That's when the Yogi Bear-themed parks offer a variety of fall and pre-Halloween activities ranging from making caramel apples and scarecrows to costumes, campsite- and pumpkin-decorating contests and trick-or-treating. Some locations even offer zombie hunts, haunted hayrides, haunted houses, and haunted trails.

"Some of our locations give families a taste of Halloween as early as Labor Day, but most roll out their best Halloween themed activities after a weekend or two of fall activities," said Trent Hershenson, vice president of marketing for Camp Jellystone, which franchises more than 75 Jellystone Park locations across North America.

Many of these parks have already kicked their Halloween weekends into high gear, but they will run through the end of October. For a list of local fall and Halloween events, click here: <u>campjellystone.com/activities-characters/theme-events/halloween/.</u>

Living on Land and Sea

Ever wonder what you'd get if you combined a well-equipped travel trailer with a pontoon boat or catamaran? Wonder no more.

The Caracat Caravan Catamaran is a hybrid mobile living solution for those looking to enjoy life in the great outdoors or even on the water, according to a report by TrendHunter. The vessel can be easily towed when not on the water and offers ample living space inside for comfortable living from anywhere with a series of sofas that easily convert into double beds. A family of six can be easily accommodated within the unit, which is supported with a full bathroom, diesel-electric cooktop, microwave, fridge, sink and even a wine cooler. The Caracat Caravan Catamaran also features a retractable LED smart TV with a Bluetooth audio system to boot. These promise to keep inhabitants entertained when spending extended periods living on land or taking to the water.

Alas, Caracat is headquartered in Heidelberg, Germany, with no plans at the moment to bring the vessel stateside. But if you want to feed your wanderlust, visit its website — <u>cara-cat.</u> <u>com</u> — for more information.

Keeping the Faith

One potential drawback to traveling extensively in an RV is missing regular church services. Recently, however, Harvest Hosts — a membership program giving RVers access to unique RV camping options — announced it had exceeded 200 hosts within its growing church category, joining a wider network of over 7,000 Harvest Hosts locations across North America.

"As we introduced the new church category to the platform, we found a

continued on page 55

natural connection between the congregations and RVers fueled by a sense of community," said Harvest Hosts CEO Joel Holland. "We are proud and humbled that so many churches see value in partnering with us and have been able to use the additional donations to give back to their communities. We look forward to growing the category and bond between these two groups." For more information, visit <u>harvesthosts.</u> <u>com</u>.

Spartan Unveils 'Smart' Steering Wheel

Spartan RV Chassis displayed its new <u>Tri-Pod Steering Wheel</u>, a sophisticated hub for driving features and instrumentation that enhances safety and convenience by placing controls at the driver's fingertips, at the recent 2022 Hershey RV Show in Hershey, Pennsylvania.

Focused on enabling a more effortless engagement with technology, the

MORE FUEL. MORE FREEDOM.

Long distances, harsh elements, and high fuel prices are just some of the challenges you and your truck face on the open road. Be ready with a range-maximizing in-bed auxiliary fuel tank system from Transfer Flow!

Transfer Flow auxiliary fuel tanks are made in the USA from American-made aluminized steel and use our TRAX 4^{M} operating system for worry-free fuel transfers. Fuel tanks are available in 40, 50, 75, and 100-gallons.

Get more fuel, more freedom, and more peace of mind with a safe, legal, and reliable auxiliary fuel tank system installed on your diesel truck.

With our auxiliary fuel tank system installed tank systems. We Fuel Your Adventures!

IN-BED FUEL TANKS REPLACEMENT TANKS REFUELING TANKS TOOL BOX COMBOS

1-800-442-0056 | TransferFlow.com

TECHNICALLY SPEAKING - Q & A

In the Blind

FixMyBlinds offers a number of how-to videos that explain the inner workings of blinds and how to repair them.

We own a 2002 Winnebago Adventurer motorhome and most of the day/ night shades will not stay up any longer. Some of the strings are broken and even those blinds where the strings are still OK, the blind will not stay up. It looks rather complicated, but I'd like to try fixing the shades. Any suggestions on how to get started?

— Paul Ragland

Paul, glad to hear you want to try to fix the shades yourself. It's not as difficult as you might think and after you do one of them the others will fall into place even easier. It actually might be more difficult to remove the valances to have access to the bracket that holds the shade in place. It's not practical to give you step-by-step instructions in this column, but check out <u>blinds.com</u> and <u>fixmyblinds.com</u> where you'll find very good basic videos that show you how to restring the shades. You'll need to get the kit with the string and the restringing feeder; the sites will also have a guide on how to determine the diameter of the strings needed should you decide to order new shades in the future. Chances are you'll be able to pick a color that's close to the shades you have now if you want to go in that direction.

If you are going to tackle the re-stringing job, you won't need any specialty tools other than the restringing kit — you'll need a Phillips screwdriver, a few rubber bands, scissors and a tape measure. You might want to use a screw gun to remove the valances but be sure to reduce the torque when re-installing; the wallboard is not that stout.

For those blinds where the strings are still attached and in good shape, there's

a very simple fix. On the bottom of each side of the blind is a cord retainer; there should also be a philips or square-head screw in the middle of each retainer. Just loosen that screw and turn the cord retainer to tighten the tension cords; after a few adjustments, the blind will stay up. Repairing Bali-type blinds is very similar and it's just about as easy to replace the strings. The websites mentioned above will have parts and accessories for just about all the blinds on the market today.

Packing Trailer Wheel Bearings

Once the bearing is placed on the base of the pressure packer and the top section is set in place, a grease gun is used to push grease into the bearing.

Bill, I was thinking of tackling the job of repacking the wheel bearings on my 25-foot travel trailer. I'm a little bit handy but I've never worked on wheel bearings or brakes. I looked at a couple of videos online and it seems very simple. What do you think about a novice tackling such a job? — Juan Ramirez

Repacking wheel bearings and checking the brakes are not very difficult jobs, if you know what you're doing — a little bit of experience goes a long way here. Study the videos carefully and then decide whether to do the job yourself. It's not complicated, but it must be done right to prevent future failures. Should you decide to go for it, you will need a hydraulic jack and some blocks to get the wheels off the ground. Make sure you do not lift the trailer by the axles and use jack stands for safety. If you do not have an impact wrench and will be using a lug-nut wrench, you will need to loosen the lug nuts before lifting the tires off the ground. Once you have the wheels off, remove the dust cap with a hammer or a pair of pliers and

you will see a castle nut inside the drum assembly held in place by a cotter pin. Remove the cotter pin and the castle nut and gently pull the hub and drum assembly off the spindle, being careful not to drop it on the spindle or the threads.

Once the drum assembly is removed, you will see the electric brake assembly and be able to determine whether there's a spring broken or if one of the brake shoes are cracked and deteriorating, etc. Replace any worn or broken parts. In order to repack the bearings, you will need a pressure packer (available at Amazon or borrowed from some auto parts stores) and high-quality grease; you will also need new grease seals and possibly new bearings. Generally, the grease seals for 10-inch and 12-inch hub and drum assemblies are the same.

You will need a tool to drive the inner bearing out of the other side, which will take the grease seal with it. Wipe the grease from the wheel bearings and inspect them very carefully for any flaws or discoloration. Make sure you use a new race (cup) for any of the bearings that are replaced. Clean the old grease out of the wheel bearings with paint thinner or similar product and then use the pressure packer to squeeze the grease in through the roller bearings completely; some old timers will do this by hand, but they know how to fill all the rollers properly. When installing the hub and drum assembly, do not over tighten the castle nut: there needs to be 1/10,000-inch of end play to prevent the bearings from overheating. A rotor and drum assembly (with disc brakes) require no end play.

By the way: if you subscribe to RV Enthusiast, you can read prior issues and there's a great step-by-step article in the May 2021 edition (see "Keep on Rolling") that illustrates this entire process. Good luck with your new adventure.

Sounding Off

you may have plenty of voltage elsewhere in the rig according to your mul-

timeter and your

lights are bright,

be inadequate or

even drop out at

the leak detector.

By the way, if the

carbon monoxide

detector has a

replacing the device with one

replaceable bat-

tery, I recommend

that is hardwired.

power can still

This detector monitors the air inside an RV for both carbon monoxide and propane.

The LP-gas leak detector in my 2010 motorhome keeps going off at odd times, sometimes in the middle of the night, which is rather irritating. I've had my LP-gas system checked for leaks and, of course, there were none as we never smelled any gas. Have you got any ideas why it keeps going off in the middle of the night or at odd times? **—** *Ryan Hodges*

Ryan, I've seen this problem many times over the years. First, the LP-gas leak detector — as well as the carbon monoxide detector — should be replaced every five years. The LP-gas leak detector will have a date stamped or printed on the back of it. If your LPgas detector is the original device that was installed by the manufacturer, then it could have simply failed. If the detector is up to date, it's either defective or voltage may be an issue. Even though

Diminished Flame

RVs with dual LP-gas cylinders have an automatic changeover regulator, which allows an interrupted flow of propane when one cylinder runs out. At this juncture, the indicator will turn red. When the lever is flipped to the other side the indicator will turn green and the empty cylinder can be removed for refilling. My wife has been complaining that the large burner on the stove in our 2012 fifth wheel trailer is experiencing a diminished flame when the water heater comes on. We noticed this situation last winter when the furnace lit, but just thought maybe it was a glitch in the system since the flame functioned properly without the furnace running. Any advice would be appreciated. — Jack Sisar

You did not mention whether the propane cylinders were mounted on one side or if there is one on each side of the fifth wheel in separate compartments. This could make a difference in the diagnosis, so I will cover a process for both instances.

If both cylinders are on the same side, chances are your LP-gas regulator is defective and is unable to handle the added pressure when the large burner fires up. By the way, a good way of finding out whether your regulator is bad is to turn on all three stove burners and then turn on the furnace and see if the flames on all three burners diminish dramatically. If that happens, a replacement is required, which should be done every five years regardless of performance.

The regulator is very easy to change; a new matching regulator can be located and purchased from one of the Internet sellers or from your local RV dealer. Once you install the new regulator, swing by your local RV repair shop and have the technicians perform a leak/drop-down test using a manometer (this should be done every year, anyway). If your trailer is used at very high altitudes, this could explain part of the problem since the pressure changes drastically when you get up around 8,000 to 10,000 feet in elevation.

If you have propane cylinders on either side of the trailer, one side should have a single-stage regulator, which controls gas pressure in the line routed to the automatic changeover regulator on the other side of the trailer. Since this regulator can also be defective, plan on replacing it at the same time. Again, this should be done every five years.

Bill Gehr

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

Rather than the old method of using a mixture of bleach and water to neutralize bacteria and slime that contaminates the RV freshwater system, treating with EPA-approved Purogene, a solution that's been around for more than 50 years, is easier to use — and it's even safe to drink.

By Bill Gehr / photos by author

ater system maintenance is one of those obscure tasks that either RVers don't know about or promise themselves to get done before the next outing - but by then it's usually too late. All kinds of bacteria or other contaminants begin growing inside the tank, leading to smelly water and health hazards. Unless you're a full-time RVer, the potable water and the integrated system of pipes and water heater in your RV could end up sitting full (or partially full) for months if the system wasn't drained beforehand - which will undoubtedly lead to contamination. And even if you take care of the water system, there's still the risk of contamination from questionable sources while on the road.

Fortunately, sanitizing your water

system is not that difficult, requiring maybe an hour of your time. Classic procedures suggest the use of bleach and water to sanitize the tank and lines, but bleach is a poison and misuse can lead to even worse problems, including burning of your skin, damaging clothing and that awful lingering taste - even after thorough rinsing, which is mandatory. A better solution (pun intended) is to use Purogene, which has been around for more than 50 years and has the EPA's blessing for use in drinking water. The liquid is 2% chlorine dioxide, which has no free chlorine and can successfully sanitize and deodorize RV water systems without the aforementioned negative issues related to using bleach.

Purogene will control the buildup of

odor and slime-forming bacteria in your freshwater tank— and it can be left in the system, because it's safe to drink. A bottle of Purogene lasts a long time, requiring only 1 ounce to purify 30 gallons of water; it can be found on Amazon for about \$50 for a 32-ounce bottle.

Start the cleaning process by draining the freshwater tank and all the lines via the low-point and tank drains. Remove the drain plug or the anode rod from the water heater and drain that tank as well. Next, close all the low-point and tank drains and replace the plug or anode rod in the water heater. Depending on the size of the water storage tank, calculate the correct amount of Purogene and pour it into the water tank. Many water tanks do not have a gravity fill for adding water using a hose, rely-

Purogene water treatment has been around for more than 50 years and has the EPA's blessing for sanitizing drinking water. It can be used in lieu of bleach and water and is safer to use, posing no health hazard if consumed.

ing instead on a valve to direct water from the hookup (or home) spigot into the tank. If this is the case, you will need some type of a siphon device at the end of your hose; clean (never used for anything but this purpose) garden sprayers work well for this process.

Make sure you fill the freshwater tank to capacity with the mixture of water and sanitizer. Turn the demand water pump On and open a hot water source (like the galley faucet) until the air bubbles are purged from the lines, filling the water heater. Run the water through all the faucets and showerhead(s) until it runs freely — and keep in mind that larger RVs will require more time for the water and sanitizer mix to reach the faucets and showerhead(s). If you have an outside shower, be sure you run the hot and cold there, as well.

You do not necessarily need to run water into the toilet, but it does have several feet of piping routed to the main line and could back-feed some contaminates later on. Open the lowpoint drains and run the sanitized water through that as well. After closing the low-point drains, let the water and sanitizer mix sit for a minimum of one hour (preferably two or three), to make sure that the system is fully sanitized.

At this point you could either flush your system with fresh water or leave

it as-is — and gain the peace of mind knowing that bacteria and other nasty contaminates will have to find a home elsewhere.

The process is simple if your RV is outfitted with a gravity water fill, like the one shown here. Gravity fills are somewhat of a "lost art" these days with the use of multiple valving for filling the tank via city water. For such systems you'll need some type of siphon device, like a garden sprayer attachment for the hose, to mix in the Purogene with the water. Make sure any such device is dedicated only for this purpose.

Once the tank is filled with water and the appropriate amount of Purogene (1 ounce for every 30 gallons of capacity), turn on the demand water pump to purge the air bubbles from the hot water line (to fill the water heater), open the faucets in the galley and bathroom(s) and the showerhead(s) and allow the water to run until the Purogene and water mix flow freely. Don't forget to run water through the outside shower or faucet.

The low-point and water tank drains should be opened to make sure the sanitized water is flushed through the pipes in this vicinity. Flush the toilet (not shown) a few times to make sure the pipes in this area are also treated. **RVE**

RVers ride eBikes to explore the areas where they are travelling, be that in an urban, suburban, rural or backcountry setting. QuietKat photo eBikes are quickly gaining ground as the new mode of lowaerobic exercise and recreational transportation for RVers By Bruce W. Smith

Bicycling is one of those recreational activities many of us have enjoyed since early childhood. Pedaling along on two wheels provides an inexpensive mode of transportation and a great form of low-impact aerobic exercise that contributes to a <u>healthy</u> <u>lifestyle</u>. That's why bicycles are a common sight being carried on RVs and ridden around areas frequented by RV enthusiasts.

Another mode of pedal power that's becoming increasingly popular among RVers, however, are electric (battery-powered) bicycles — commonly known as eBikes — because sometimes you just want to enjoy the trip. eBikes still can provide all the requisite exercise you want, while extending your range dramatically. Search the Internet, though, and it'll be quickly apparent eBikes seemingly come in as wide a range of brands, models

Electric-power-assisted bicycles are becoming increasingly popular because of their efficiency. Schwinn photo

Ebikes are becoming increasingly popular with RVers who want to travel, and have the freedom to explore when they get to their destination. Radpower Bikes photo

and prices as tow vehicles, trailers and motorized RVs.

And there's the rub. The number of choices can be a bit overwhelming. So, we did some of the homework for you, researching the important high-lights that should help you gain a better understanding of how eBikes work and which of those elements are best suited for RVers. We'll also provide some excellent links to websites that have in-depth reviews and technical (articles such as those found at <u>Bike.com</u> and <u>Electric Bike Reviews</u>). This information should make it a lot easier to shop for the eBike that best suits your RV lifestyle and budget.

"First-time eBike buyers are *highly* encouraged to begin their shopping experience at an eBike dealer," says Chuck Hildreth, at Voltaire Cycles (<u>vcoregon.com</u>) in Bend Oregon. "Electric bikes are expensive, ranging in price from around \$1,200 to more than \$8,500 depending on make and model.

"A popular model for RVers is probably going to be priced between \$1,500-\$3,500," Hildreth told us. "Because of that investment, most reputable eBike dealers have demo models for customers to try out before buying. A good dealer can also give important advice on eBike sizing, safety, accessories and maintenance."

Electric bicycles powered by front-hub motors are the least expensive — and least powerful — of eBikes. Jeff Allen/Cycle Volta photo

The heart of an eBike is the electric motor that provides the assist to pedal power. There are typically three types of electric motors use to provide motive power: front-, rear- and mid-hub. These motors have a very wide range of power consumption and power output. Power consumption is in watts, while output is listed in Newton Meters (Nm), which would be the gas/diesel engine's equivalent of lbs.-ft. of torque. The higher those numbers, the more powerful and more responsive the eBike will be.

The least expensive units — and least desirable for RVers, according to eBike experts we relied upon — are those powered by electric motors on the front wheel. Front-motor eBikes also have the smallest motors, batteries and driving range because of the

eBikes driven by a rear-hub motor are the most popular power design on mid-priced models. They typically come equipped with throttles so you can ride without peddling if needed. Serial 1 Bikes photo

limitations of the motor mount location. That's primarily because a front-hub design "pulls" rather than "pushes" the bike along, which changes the way the bike handles, especially during cornering and riding on sand/gravel surfaces.

The most popular style of eBikes for RVers are those equipped with the motor in the rear-hub. Rear-hub eBikes are more expensive than their front-drive counterparts, and much more popular because the electric motor on the hub of the rear tire pushes the bike along. Rear motor eBikes also tend to be the most powerful, with typical watt ratings in the 750-1000 range and Nm ratings in excess of 80 Nm.

Higher torque/watt ratings means the eBike can accommodate heavier riders or a rider towing a specialized trailer behind the bike while climbing steep inclines, riding in the mountains or riding through sand. RV enthusiasts will find these models the most responsive and most fun. Rear-drive motors can usually be found with throttles, too, so you can use the electric power without peddling.

Another benefit of rear-drive eBikes is they are easier and less expensive to maintain than the mid-drive models

Mid-drive motors provide the best pedal feel of a standard bicycle and the easiest to make flat repairs. They are also the most sophisticated of eBike motors, some combined with automatic shifting systems. Yamaha Bikes photo

because the rear hub that contains the electric motor is the only eBike-specific component. Chains break and other items eventually wear out on bicycles, so the rear-motor makes it easy to service and replace common wear items such as the bottom brackets, cranksets and chainrings.

Mid-hub eBikes are very popular with RVers who enjoy a little more performance and the benefits having the electric motor integrated into the pedal assembly. Serial1/Harley photo

The most expensive motors on eBikes are mid-drive (midhub) models. where the electric motor is integrated into the housing where the pedals (crankset) is located. They are the most sophisticated of eBikes, and the newest models from some highend manufacturers can be found with automatic transmissions.

Many of today's mid-hub motors come with a <u>torque</u> sensor — so the harder you pedal, the more power the motor generates. Back off peddling and the electric motor reduces power accordingly. Hence, they give the closest feeling of riding a conventional bicycle. Mid-drive motors also make it simple to swap out wheels and to make flat repairs.

Another cool benefit of a mid-drive motor design is its efficiency. Because a mid-drive motor's power is leveraged through the drivetrain of the bike, the overall ride feel and performance of a smaller 250/350-watt mid-drive motor can be similar to a 500/750-watt hub motor as long as the rider is properly making the shifts to maintain an efficient ride.

Some of the newest mid-drive motors can generate as much as <u>300 Nm</u> torque, which translates into a ton of power for pulling long inclines. You'll also find these high-output electric motors on some very high-end urban and commuter eBikes. All of these factors are why mid-bike-designed eBikes are favored by those who spend a great deal of time riding mountain, desert and off-road trails.

As we said, though, the downside to mid-drive electric motors is they can easily add more than \$500 to the price tag of a similar style bike that has a rear-drive motor. Another aspect that could be a downside for some RVers is they don't come with throttles like their rear-drive brethren.

Bicycle shops will also tell you the more powerful mid-hubs are also typically more expensive to service — and, because they provide so much torque, drivetrain wear components (such as the chain) wear quicker than they would on lower-power front- or rear-drive eBikes.

The newest innovation in eBikes is the integration of an automatic transmissions integrated into the mid-hub drives like this one offered by Shimano. Shimano photo

The technology front in eBike development is moving at a rapid pace as component makers work hard to make riding even more fun and improving

18 RV Enthusiast

Transporting & Protecting Your eBike

RVers need to be vigilant on protecting their eBikes from theft. A strong bike rack and security measures deter thieves from riding off with thousands of dollars of bicycles. Hollywood Racks photo

Should you buy an eBike and have to keep it outside while using your RV, be very aware these are a high-theft target because of their price. Storing a bike inside the RV is far better than keeping it out in the open, but that's not easily done while using the RV. While some folding eBikes can break down to fit inside a sizable storage compartment, not every RV is built with such accommodations — and not every RVer wants a foldable eBike.

Investing in a high-quality locking system is a necessity. Many eBike enthusiasts subscribe to the advice of spending about 10% of the eBike's value on a locking system (be it a U-lock, chain lock or folding lock). Get the toughest cable/chain locking system money can buy, such as the <u>Tex-Lock</u> from Osloh, the <u>New York Lock Kryptonite Evolution</u>, or <u>Pragmsis Protector</u> from Lockitt. It's good to have a vibration-activated alarm system, too, such as the wireless <u>Fosmon</u> Anti-Theft Burglar Bike Alarm with remote control and an ear-splitting 113dB siren.

The folks at Kryptonite also suggest locking the eBike in a well-lit area to a solid object that the bike cannot be lifted over — making sure the frame and wheels are secure and, to further deter thieves, positioning the pounds.

Unfortunately, bike carrier manufacturers are behind the eight-ball when it comes to hitch-mounted bike carrier options for more than one eBike. Most hitch-mounted bike racks are bare-

lock with the kev-

hole facing down

and making access to the lock a tight

fit. It's also suggest-

ed that all acces-

lights, GPS screen)

locking up for the

eBike's value to scofflaws.

night to reduce the

If you are going to transport

(and possibly store)

externally on a bike

store the bike(s)

rack, it's import-

ant to make sure the bike carrier is

stout enough to

support the weight

of the bike(s). Note

the load rating of

the bike carrier,

keeping in mind

the typical eBike

can weigh 70-90

are removed before

sories (battery,

X (\$1,389), which has a load capacity of 134 pounds (67 pounds per eBike); and the <u>RV Rider E-Bike Rack</u> (\$600) from Hollywood Racks (80 pounds per bike).

If your RV doesn't have a rear hitch receiver, an aftermarket "bolt-on" hitch receiver could be the solution. Again, pay very close attention to the rack's maximum load-carrying capacity. Several companies on Amazon market bolt-on RV hitch receiver kits including Towever (PN 83803), Ohuhu ("bolt-on rv bumper hitch receiver adapter), Quick Products (PN QPDBAR) and Fultyme RV (1300 hitch mount 2-bike rack, 200 pounds capacity).

Don't forget to also use a locking pin that holds the bike rack in the receiver hitch. <u>BOLT Lock</u> makes excellent locking hitch pins, as well as strong <u>cable</u> <u>locks</u> and a number of other locking devices for both the RV and eBikes. <u>Rhino USA, Blue Ox, Curt Manufacturing</u> also have robust locking hitch pins.

RVers should be aware that RV rear bumpers are neither designed nor intended to support the weight of a couple of eBikes — and the near-constant jouncing of the rear of the RV only magnifies this weight. Anyone contemplating adding a platform to carry their eBikes should either substantially reinforce the bumper or weld a hitch receiver directly to the RV's frame.

There are also companies that offer hitch receivers for the front of motor-

Whatever type RV you drive, it's really important to take eBike transportation and security as serious as the purchase of the bikes themselves. Kuat Bike Racks photo

ly rated to carry one of the lighter eBikes, let alone those that weight 70-90 pounds. The best ones we could find at the time of this writing include the Thule two-bike hitch-mounted <u>T2 ProXTR</u> (\$900) rack designed for transporting lighter eBikes (60 pounds per bike); the <u>Kuat Sherpa Piston Pro</u> homes. Carrying bikes up front, however, can impede forward driver visibility (frowned upon by many states) and may even adversely affect/impede the air flow to your motorhome or tow vehicle's radiator — especially during the summer months.

Internal gears coupled with sophisticated electronic software allow the automatic transmission on the newest eBikes to shift gears as the bike's speed and pedal cadence changes per the rider's needs. Anti-lock brakes are also being used on eBikes. Shimano photo

rider safety. For example, automatic mid-drive multi-speed eBikes are on the rise. <u>Valeo's</u> eBike automatic built-in mid-drive transmission can be found on a lot of eBike brands coming out of Europe, and on the <u>Bosch eBike</u> <u>System</u> shelves are automatic-shifting internally-geared drives available from Enviolo (AutomatiQ eShift), Rohloff (E-14 Speedhub), and Shimano (Nexus Di2).

The Shimano internally geared, mid-drive <u>automatic shifting</u> Nexus Di2 are 10- and 11-speed drivetrains allow the rider to make shifts while coasting, through a mode called Free Shift, and an Auto Shift With Manual Override mode that automatically shifts gears based on the rider's speed and cadence.

"Free shift technology allows you to make decisive gear changes while rolling through technical sections of trail, ensuring you'll always be ready for the trail ahead," said a Shimano representative. "Meanwhile, auto shift with manual override can make predictive shifts while you are coasting, always finding the optimal gear for every pedal stroke."

In addition to these innovative electronic drivetrains, Shimano brings anti-lock brakes via bicycle ABS pioneer <u>Blubrake</u> to the eBike market. This is a great safety feature for anyone riding on slippery surfaces be they covered in rain, snow, mud, sand or gravel. Statistics show 57% of eBike accidents happen during braking. "Our ABS helps riders retain bike stability and stop safely on wet/dry pavement and rough surfaces by keeping both wheels on the road and rolling," the Shimano rep added. "A speed sensor on the front wheel monitors wheel rotation and activates ABS if the wheel slows beyond what is expected for the bike's speed. When ABS is activated, the system applies modulated braking force on the front wheel to reduce the chances of the front wheel locking up and/or the rear wheel lifting."

These technological advancements are just another of the things to discuss and check out at your local eBike dealer when shopping gets serious.

The battery of an eBike is just as important as the motor — maybe more so. The battery, which is about 25% of the cost of an eBike, is both the equivalent of the fuel needed to power your tow vehicle or motorhome and the capacity of the fuel tank. The fuel is the battery's watt rating and the capacity is the Amphour (Ah) number.

"A higher Ah number will give you more riding range," <u>Bagi Bike's</u> founder Erez Ekstein told us. "But it also depends on the motor power. If the motor is 750w or 1000w, it takes more Ah from the battery than it does to power a motor of 500w. For example, a 1000w motor with a 20Ah battery will have the same range as a 500w motor with a 10Ah battery."

The <u>cost</u> of the battery you select to power your eBike depends a lot on the quality of the battery. Not all batteries are the same. Samsung, LG, Bosch, Shimano STEPS, Yamaha and Panasonic are considered among the best, according to Ekstein, whose international company is well-known for its folding bikes.

"The battery cost depends on the cell types' quality and the electronic BMS board inside," Ekstein said. "A battery manufactured with Samsung cells costs almost twice than a battery with the same capacity assembled with cells from a generic, off-brand, or lesser-known manufacturer."

For the majority of RVers, the battery that comes with the bike from the manufacturer will probably be perfectly fine for normal riding while using the eBike during RV travel. If you are planning to ride daily, riding long distances or doing a lot of mountain biking, then upgrading to a battery with a higher watt-rating might be in order. But always check with the bike manufacturer or your local eBike dealer before plugging in a more powerful battery.

How long does an electric bike bat-

Battery power is key to any electric bicycle's performance. An eBike battery actually contains a pack of small individual Li-Ion batteries, called cells, linked together. Samsung photo

tery last? That's a lot like asking "how long does a battery last in a vehicle?" It depends. The battery life depends on the battery, cell quality, how it's stored, how low it's drained before re-charging and the number of charges.

According to data sheets, a high-quality Li-

Ion battery assembled with Samsung cells loses 20% of its capacity after 500 charge cycles. It still works, but the travel range between charges is 20% less than that of a new battery. That means a high-end, "name brand" battery can work great for two years with almost daily use. In an RVing situation, where the eBike might see much less frequent use, battery life could be more than double.

When it comes to upgrading or replacing an eBike battery, stay with one of the respected name brands. If you are trying to pinch pennies, this is neither the time nor place to skimp. Cheap batteries have a higher potential for fire hazard, poor performance and short life, according to the experts.

The longevity and overall performance of a battery depends on the cell-types' quality and the electronic BMS board inside. The better the battery, the higher the cost. Bosch photo

The folding Bagi Bike B20 has a top speed of 28mph, putting it in the Class III category of eBikes. Bagi Bike photo

Juiced Bike's CrossCurrent S2 is a Class III eBike that can reach 28mph and is equipped with a throttle. Juiced Bikes photo

Every RVer shopping for an eBike needs to make sure that the brand and model they choose is safe, legal, and appropriate for the places you plan to ride — be that city, campgrounds, <u>BLM, Forest Service</u>, state and national parks. Most states and municipalities have adopted the Class I, II, III eBike classification system.

In a nutshell, Class I eBikes use an electric motor to provide pedal assistance at up to 20mph and they can't have a throttle. A Class II eBike is the same as a Class 1 (limited to 20mph) but it is equipped with an electronic throttle so the rider can propel the bike without pedaling.

A Class III eBike is one that is limited to reach

a top speed of 28mph. eBikes with a throttle are usually banned for use on bicycle paths, trails, bikeways, horse trails and hiking trails. Some eBikes rated as Class III may have a throttle, such as the folding <u>Bagi Bike B10/B20</u> and Juiced Bikes' <u>CrossCurrent S2</u>, but most do not.

"Class III eBikes are primarily intended for higher-speed riding on streets and roads, making them ideal for bicycle commuters who want to arrive at work or school without breaking a sweat," said Justin Christopher at <u>Bike</u>. <u>Com</u>. "They also often feature more powerful motors that produce more torque — ideal for handling headwinds and steeper hills." To make it easier for the eBike buyer, the manufacturers of eBikes have them labeled for easy identification.

Electric bicycle classification chart. Shows how eBikes are segmented by speed. Graph courtesy of Juiced Bikes

Frame design in eBike choice is both a matter of personal taste and level of use. A step-over model, like this lightweight Propella 7S, will have a stronger frame than a step-thru design just because of the frame shape. Propella Bikes photo

Style in choosing an eBike is really a personal choice. Like regular bikes, eBikes come in both step-over and step-through models, single-speed and multi-speed. Younger RVers may like the step-over models while those not quite as limber will find the stepthroughs a better fit. Gender doesn't matter.

One advantage of the step-over model is frame strength due to the double-diamond design. This can be a big factor for those who do more "performance" bike riding over mountain trails or in other terrain where aggressive riding is part of the fun.

Step-over frames are found on almost all types of eBikes such as eMountain bikes, eRoad, and eGravel models. Models that offer multiple

If you plan to ride your eBike on gravel, sand, snow, or other terrain that's loose and uneven, a fat-tire eBike will be a good choice. Wider tires give better floatation and control in such riding conditions than a skinnier-tire model. Bagi Bikes photo

Sources

Full-size eBikes

(Note: some of these sources also offer folding eBikes)

Ariel Rider: <u>arielrider.com</u>

Ariel Rider Ariel Rider Kepler eBike

Aventon: <u>aventon.com</u> Bagi Bike: <u>bagibike.com</u> BESV: <u>besv.com/us/</u>

Bianchi: <u>bianchi.com/bikes/e-bike/</u> Bintelli Bicycles: <u>bintellibicycles.com/</u> Blix: <u>blixbike.com</u> Bluejay: <u>bluejaybikes.com</u> Cannondale: <u>cannondale.com/en-us</u>

Diamondback: <u>diamondback.com</u> Electric Bike Company: <u>electricbike-</u> <u>company.com</u> (Made in the USA)

Electric Bike Company Model C Custom

Gazelle USA: gazellebikes.com Giant: giant-bicycles.com Haibike USA: haibikeusa.com Heybike: heybike.com High-Power Cycles: hpcbikes.com (Made in the USA) Juiced Bikes: juicedbikes.com Lectric e-bikes: lectricebikes.com Magnum: magnumbikes.com

Mokwheel: mokwheel.com

Mokwheel Basalt

Monday Motors: <u>mondaymotorbikes.</u> <u>com/</u> Outrider USA: <u>outriderusa.com</u> (Made in the USA; four-wheel electric bikes) Proplella Bike: <u>propella.bike/bikes</u> (Made in the USA) QuietKat: <u>quietkat.com</u> Rad Power Bikes: <u>radpowerbikes.com</u> Rambo Electric Bikes: <u>rambobikes.com</u> Rize Bikes: <u>rizebikes.com</u> Schwinn: <u>schwinnbikes.com</u> Serial1/Harley: <u>serial1.com</u>

Sondors - <u>sondors.com</u> Specialized - <u>specialized.com</u> Stealth Electric Bikes: <u>stealthelectric-</u> <u>bikes.com</u> Trek Bikes: <u>trekbikes.com</u> Yamaha Bicycles: <u>yamahabicycles.com</u>

Yuba: yubabikes.com

Folding eBikes

DJ Bikes: <u>dj-ebikes.com</u> GoCycle: <u>gocycle.com</u>

Jetson: <u>ridejetson.com</u> MagiCycle: <u>magicyclebike.com</u>

speeds are, of course, easier on the body than single-speed eBikes when the terrain you are cycling on has hills and steeper inclines. But a lot of senior RVers will find the step-through eBikes will be easier to mount/dismount, and more favorable to their riding styles and needs.

Fat tire or skinny? Again, personal taste. Many Rvers who purchase eBikes tend toward bikes with fatter tires. The

reason is fat tires provide better traction and a more controlled ride in sand, gravel and off-pavement riding. They also absorb sidewalk and pavement cracks and uneven surfaces better than their skinnier-tire cousins. Again, stopping in at a local eBike dealer to take a demo ride will help you decide this aspect of the selection process.

Most RVers in the senior category will find their eBike of choice among the

Rvers will be well-served riding eBikes equipped with lights, fenders, horn and a cargo rack. Some eBikes, like this Schwinn Medocino 2, have a a good array of accessories to fit personal tastes. Schwinn photo

Class II touring, <u>cruiser</u> or commuter offerings. These models trend towards having a wider, more comfortable seat, easily adjustable handlebars and a more upright riding position. Hydraulic disk brakes (or ABS!), a high-quality battery, pedal-assist with torque sensor and a suspension built into the seat are great items to have when you are looking for an eBike suited for the RV life. So, for that matter, are fenders, lights, horn and even a rear cargo rack.

As for the eBike itself, an eBike with rear hub is preferable over a bike with the motor in front — and if the purchase price isn't a hindering factor, a mid-hub setup is an even nicer ride. As for weight, most of the eBikes weigh between 60-90 pounds, depending of course on the size and style of the bike. A few, such as the ultra-light eBikes from Propella, can weigh less than 50 pounds. Every RVer entering the eBike world should pay close attention to the quality of the individual components used to make the eBike when shopping and taking demo rides. The bottom line with eBikes is the more you pay, generally the higher the quality of the components, features and range of accessories. This is one of those products where you pay for what you get — and the higher the quality of the components used to make the bike, the more satisfied you'll be with the investment. **RVE**

When unexpected problems with the plumbing system risk cutting a trip short, a well-planned emergency parts kit — and basic knowledge — will often save the vacation.

By Bill Gehr / photos by the author

Plumbing failures rarely happen when the RV is in storage — or any opportune time, for that matter. Instead, they rear their ugly heads most often while RVers are in a park enjoying a vacation. More than one vacation has been terminated prematurely due to plumbing problems.

It seems like freshwater lines and fittings have always been the most susceptible to failure, because they are typically exposed under the galley or bathroom sink in compartments where they get beaten up by supplies that are stored nearby — and, of course, they get abused from vibrations and bouncing while on the road. Typically, fittings fail, but water lines have also been known to spring leaks. Sometimes a water line or fitting inside the wall or under the RV can become compromised,

Building a comprehensive emergency repair kit should include various sizes of fittings and a few feet of Pex tubing in 3/8- and $\frac{1}{2}$ -inch sizes. This kit is extensive and includes several push-on and compression fittings to fix just about any problem that pops up.

A basic kit will include elbows, unions and Tee fittings, along with faucet fittings and an emergency cap. Shown are SeaTech fittings, which are now called AquaLock.

which makes the repair even more difficult. In just about all cases, leaks that are allowed to persist will lead to dry-rot damage.

Be Prepared

In most cases, it's not practical to call in a mobile repair person or get an immediate appointment in a local RV service center, so it's important to be prepared and have some knowledge on how to make repairs — or, at least, configure a suitable patch job to keep the trip from being ruined. That, though, fittings or valves.

The solution, though, is simple. Keeping an emergency repair kit on hand is your hedge against embarrassing or damaging leaks.

can lead to yet

another dilemma: Finding

parts these days can be chal-

lenging. If you're

lucky, a nearby

hardware store

will have a few

suitable parts on hand, but

don't count on

have hit every industry hard.

it; recent supply chain issues

Of course, most

parts are avail-

able online, but waiting for them

to be shipped

may not be

practical de-

pending on the

severity of the leak — espe-

cially from one

of the holding

tanks and/ or ABS pipes,

RV supply or

The contemporary RV encompasses a complex network of water pipes routed to faucets, appliances and accessories that are connected via fittings that are crimped on with a special tool. These connections have been known to fail and sometimes it's difficult to ascertain the location of the leak. For example, if the demand water pump is "short cycling" when unhooked and all the faucets are closed, rest assured there is a leak somewhere. You'll eventually find water somewhere — hopefully before any wood deterioration has started. A leak in the sewer system will usually result in a spill, which is embarrassing and not tolerated by RV parks. Worse yet is when a sanitation leak accumulates in the belly pan, ready to ruin someone's day when it's eventually released. Some states can even fine you for leaking waste — and even gray water — on the ground.

Carrying the right spare parts and repair kits can be daunting to the uninitiated. Obviously, you don't want to haul around excess parts, but after many years of RVing and repairing rigs, I have built a go-to kit that has enough parts to fix most common scenarios for myself and, many times, friends and fellow RVers I meet on the road. The following are tips on how to cope with repair situations and how to use the parts in an emergency kit. We'll keep it as simple as possible, but you should become familiar with the parts before heading out on a trip.

Water Lines and Fittings

RV manufacturers crimp on fittings to water lines to ensure water tightness under adverse conditions, so naturally they cannot be removed easily. Theoretically you could cut the stainless-steel bands that are crimped onto the water line, but Murphy's Law suggests that reaching these areas will be difficult. In fact, in many cases it's virtually impossible to get a good grip to cut them off. There are high-quality replacement fittings on the market that either slip on or attach with a compression nut, which will allow you cut off

Rather than trying to cut the crimp ring off the line, which can be difficult at best, simply cut the Pex tubing as close as possible behind the fitting. There is usually extra tubing to work with; if not you'll have to patch in another section of tubing or a union fitting to provide more length. While there are commercial tools available for cutting Pex tubing, an anvil pruner works great. Pex tubing can also be cut using a utility knife with a new blade, but it's not the safest way to go.

One of the most versatile fittings is a push-on union, which comes in handy for fixing leaks and extending lines. Installing the fitting requires no tools.

the end with the crimp ring, if there is enough tubing. First, you will need to determine the size of the water line that requires repair (measuring inside diameter); it will either be $\frac{1}{2}$ - or 5/8-inch. Just about all RVs are outfitted with both sizes, so I recommend carrying 1-2 feet of tubing and fittings for each size.

Service centers will typically have professional crimping tools on hand and can make repairs using fittings and crimp rings. This is not practical for owners for a couple of reasons: The cost of the tool is expensive (and hopefully it should not be necessary to make enough emergency repairs to justify the expense), and the plethora of fittings available without the need for crimp rings makes repairs easier and more practical. Push-on fittings, in particular, which are widely available on the market, are unbelievably simple to use. *RV Enthusiast* Publisher Bob Livingston once re-plumbed under the bathroom sink in a pickup camper without even looking; there was barely room for two hands, which obstructed any visibility to the pipes and fittings.

There are three major players in the crimp-free Pex-pipe fitting arena: SeaTech, SharkBite and Flair-It. SeaTech push-on fittings, commonly used for RV repairs, are now under the Watts banner (watts.com) and called AquaLock. Watts is a major plumbing supplier in the housing and commercial building trades. SharkBite (sharkbite. com) manufactures a line of Push-To-Connect fittings in plastic and brass; many of these products are available at home-supply stores. Flair-It (flairit.com) fittings are pushed on to the Pex tubing and the compression nut does the rest of the work; a special tool makes it easier to tighten the nut but is not necessary for those who can use offset pliers gingerly enough to eliminate overtightening.

All three companies offer an extensive line of fittings for Pex tubing. While some people have reservations about using push-on fittings, rest assured that they will not leak and can take quite a bit of abuse in an RV environment. I've been using these fittings for many years and the only ones that have leaked were installed wrong, which is really hard to do. They are a little more

Tubing can be released easily from the AquaLock fitting by compressing the ring while pulling the tubing away from the fitting. Although it seems like the fitting could leak because it's so easy to release, it actually provides a tight seal for many years.

26 RV Enthusiast

A compression cone is used for Flair-It and AquaLock swivel fittings. This cone can deteriorate over time, so your kit should include several of these parts. The old cone can be removed with a small screwdriver or ice pick and the new one simply slides over the tubing.

tend to stick with ¹/₂-inch pipethread fittings, while replacement faucets for residential applications typically have a 3/8-inch compression fitting on the end of the hose that is connected internally into the faucet or diverter valve. Consider carrying a pair of "3/8-inch male compression fitting to 1/2-inch male national pipe thread adapters" in your kit. These adapters are usually available in hardware and home supply stores.

Other items to have on hand are replacement male and female hose fittings for your water supply hose you never know when the hose will be run over or spring a leak from the stresstional hose, but it takes up much more space than a couple of fittings. While building your kit, add a couple of extra hose washers; I've dropped a washer when disconnecting the hose and didn't notice it until I went to hook up the next time. The best washers are the O-ring type, which can be found on Amazon (Nelson 853814-1001 50381 Premium O-Ring Style Hose Washer; \$7.66 for a pack of 10) or in hardware stores.

If you spend time off the grid, it may not be a bad idea to also carry either a second demand water pump or a replacement head. Replacement heads are easy to change on most of the water pumps found in RVs, requiring the removal of only three machine screws, but if one of more are rusted they may break, which will create an even bigger problem. Keep in mind that it's not cost-effective to replace just the head unless you don't have room to carry a complete pump. Removing the pump is simply a matter of disconnecting the two water lines and the two connectors for the power wires and the hold-down bolts. Also, every water pump has an inline filter between the pump and the freshwater tank that can fill up with debris. This filter can usually be pulled apart and cleaned, which should be done annually — and sometimes pump vibration can loosen the filter and create a leak, so make sure it's tight. Carry a few extra fuses in case the ones for the water pump or another accessory blows while off the grid.

Sanitation, Too

Holding-tank dump valves typically see quite a bit of wear and tear and those that are several years old may

expensive, but well worth the convenience.

Assembling an Emergency Kit

Some of the most common fittings for your kit should include a few elbows, unions (couplers) and Tees, which will allow you to join tubing after cutting out a damaged section (or if additional tubing is needed where there's no slack in the line). You will also need a couple of elbow fittings with a push-on provision on one end and a ¹/₂-inch pipe thread swivel fitting on the other end for use on faucets and/or the shower diverter, for example. If you want to be prepared for almost any situation, consider carrying most of the fittings and valves as illustrated in the photo of my kit; I personally use AquaLock and Flair-It fittings.

If you need to replace one of your faucets or the shower diverter with a product from a home-improvement or hardware store, you'll need adapters which may not be in stock where you're located at the time. RV manufacturers es applied at the faucet or city-water inlet. Of course, you can carry an addi-

A special tool can be used to tighten the compression nut on Flair-It fittings. This tool is readily available online or at RV supply stores. The compression nut is first finger tightened and then the tool is used only for two turns. It's possible to use an off-set pliers carefully, following the same procedure.

The compression nut on this Tee fitting was over tightened and developed a crack, which will certainly lead to a leak.

start to become problematic — which is nasty at best. These valves are usually available in RV stores and online but if you want to circumvent chasing new ones — or wait for a shipment at inopportune times — I recommend car-

A water-pump inlet fitting can be used to make an emergency repair on flexible tubing. This fitting can be screwed on to ½-pipe threads in one side and pushed onto ½-inch Pex on the other. They are readily available online and at RV supply stores. rying replacement gray and black water dump valves that match your particular model. Changing one or both (or three) valves can be challenging if you're out on the road, especially if the tank is not empty. I'll skip the horror stories and remind you that most dump valves can be replaced by simply removing four bolts (after dumping, of course). Consider carrying replacement seal kits for each valve.

While you're at it, make sure that you have spare sewer-hose fittings on hand. In too many parks, the threads at the dump connection are stripped, which makes screwing on a hose fitting to comply with total-seal requirements almost impossible. Camco's RV Sewer Hose Flexible Adapter (Amazon for \$8.47) can save the day. It can be wedged into the dump station inlet, providing a tight fit for the sewer hose fitting.

If you find yourself fighting a leaking water line fitting, you might be able to hobble up a repair using hose clamps to get yourself out of a jam. Refrain from using narrow hose clamps, because they will not hold back a leak. Wider, heavy-duty stainless-steel hose clamps will do a pretty decent job if you don't have the right replacement fitting for the job. Carry a variety of these hose clamps, from ½-inch inside diameter to the 3 1/2-inch versions for sewer hoses. Resist buying cheap hose clamps at a swap meet.

One last thought: Add a few rolls of self-fusing silicone tape to your emergency kit. Believe it or not, I've repaired leaking tubing by wrapping silicone tape around the offending section, even when wet. You simply start the wrap a few inches before the damaged area and stretch it around and past the leak; the tape will fuse to itself and form a tight seal. It's usually not permanent, but again, it can get you out of a jam until a formal repair can be made. Two of the better products that fit the bill for this type of project can be found on Amazon. Rescue Tape has been around for a long time, showing up in booths in RV shows and rallies. It comes in 1-inch by 12-foot rolls in various colors and sells for around \$11. Permatex markets Self-Fusing Silicone Tape in 1-inch by 10-foot rolls with a \$10 price tag. Silicone tape has multiple uses around the RV.

No one wants to interrupt an RV vacation because something goes wrong, but being prepared on the road tempers any inconvenience. The ability to make plumbing repairs, whether temporary or permanent — and keep things flowing — is rewarding. Having the necessary replacement parts at your fingertips facilitates faster repairs and will likely save you quite a bit of money.

Hose clamps are not created equal. The wider hose clamp (above) has much more holding power and it's harder to strip the worm drive. Always carry high-quality hose clamps of different sizes in your kit. Buying cheap hose clamps is counterproductive.

Modern residential galley and bathroom sink faucets use internally mounted tubing with a 3/8-inch compression nut on the ends of the Hot and Cold tubes. Most RV faucets are connected using $\frac{1}{2}$ -inch NPT fittings, which require adapters when installing residential-style faucets. It's a good idea to carry a couple of these adapters in your kit.

As you can see in this image, the demand water pump is tucked into small quarters surrounded by a spaghetti bowl of tubing and fittings. This is where push-on fittings really shine.

A ½-inch NPT steel nipple comes in handy when replacing fittings in the back of the water heater or other places where there are lines that may need to be removed. The nipple can be screwed into a push-on fitting in straight or elbow versions.

You never know when a demand water pump will fail, but count on it when in the middle of a vacation. If you do a lot of boondocking, consider carrying an extra water pump. Replacement heads are available but not cost-effective. Plan on cleaning the attached intake filter every year and make sure it's tight. These filters have been known to loosen (pump vibration) and create leaks.

Always carry extra water hose washers. The O-ring style washer does the best job of preventing leaks. These washers are readily available on Amazon and in many hardware stores. Leaking water hoses connected inside your utility compartment can cause damage to surrounding infrastructure, especially when the utilities share an open storage compartment (shown is a sealed utility bay). Allowing a water hose to leak at the RV park hookup area is not considerate.

You never know when a dump valve will fail. Always carry spares to match your black- and gray-water systems. These valves are typically easy to replace, but the job is not very pretty if the tanks are not empty and flushed thoroughly.

In many RV parks the sewer hookup threads are stripped or non-existent, making it difficult to have a sealed system when the dump hose is connected. Camco's RV Sewer Hose Flexible Adapter can be wedged into the park inlet pipe allowing the sewer hose to fit tightly. For less than 10 bucks, you'll eliminate these frustrating situations.

Self-fusing silicone tape can be used to repair plumbing leaks temporarily, which will get you out of a jam if replacement parts are not available. It provides a waterproof and dustproof seal and can also be used for other repairs around the RV (like fixing damaged power cords that have been dragged by mistake). Two of the best-known brands are Rescue Tape and Permatex Self-Fusing Silicone Tape. RVE

30 RV Enthusiast

REDUCE TRAILER VIBRATION BY 68%.

Trailer SumoSprings are manufactured from our micro-cellular polyurethane. Designed to remove sway, hop, & vibration, this zero-maintenance airless air spring increases overall driver control and ride comfort when towing.

It's time to enjoy your journey as much as your campsite.

SPRING OVER AXLE APPLICATIONS TSS-107-40 OR 47

HANDMADE. ZERO-MAINTENANCE. LIFETIME WARRANTY.

OURNEY BETTER

Leaf-Spring Suspension Upgrades

How to improve the handling and ride comfort of most any travel trailer or fifth wheel

wining an RV can be overwhelming at times. Aside from the necessary upkeep of a mobile home on wheels and the frustration of not always being able to camp where you want/when you want due to the popularity of certain locations, simply moving the new-to-you rig can be alarming. Let's face it: Until retrieving the "fun funds" from a bank account and driving away with an oversize motorhome or towing a travel trailer of fifth wheel, most RVers have never piloted anything bigger and heavier than a pickup truck or a full-size SUV.

Not surprisingly, the thought of now being responsible for negotiating suspect roads and off-camber curves behind the wheel of a package that might weigh upwards of 10 tons or more and stretch out for, in many cases, 60 or

This diagram from Lippert illustrates the position of a shock absorber installation that can substantially enhance trailer handling and ride quality.

more feet is a bit mind-boggling, to say the least. And it certainly doesn't help matters when the RV handles or rides like a buckboard.

Okay, that might be a slight exaggeration — but the fact remains, towables and gas-powered motorhomes all tend to rely on a simple leaf-spring suspension to help tempter vehicle oscillations caused by less-than-smooth roadways. Motorhomes have the added benefit of incorporating shock absorbers into the suspension system to further mitigate a rough ride, but such augmentation is rare in the travel trailer and fifth wheel segments. Ember RV came out of the gate last year with a product line that utilizes a unique trailing-arm independent suspension made by CURT, a Lippert division, and other manufacturers are slowly gravitating to it and other designs including, but for now leaf springs still rule the roost.

There's a reason for that — three, actually. For starters, while leaf-spring suspensions have been around for many decades, their longevity is due to the simple acknowledgement that not only does the system work, but it can be easily adapted to virtually any vehicle design. And, such a system is simplicity personified: mounted fore-and

aft to the RV chassis with the axles bolted either below or above the spring pack, leaf-spring suspensions are comprised of a very few easily repaired and/ or replaceable components.

Lastly, it's a relatively inexpensive system. That's probably less a fault of the manufacturers as it is a buying public that constantly clamors for ever-more-luxuthe impact of road hazards on the vehicle, while one or two completely replace it. In all cases, though, the net result is an RV that rides smoother and handles better than its stock counterpart. That translates into less driver fatigue and less anxiety when behind the wheel. Suspension upgrades can also improve brake efficiency and life, protect not only the trailer but its cargo — and save money by reducing the possibility of damage to the trailer caused by rough roads.

The following pages outline many of the suspension upgrades available to improve the performance of a leafspring suspension on a trailer or motorhome. This is by no means an exhaustive guide to what's available — it's just intended to illustrate the various options available. In some instances, we've also provided overviews of the stepby-step process for installing certain systems in travel trailers, fifth wheels and even a Ford F-53-based Class A motorhome. These systems range from mild to wild, so there's bound to be one that fits your lifestyle and your wallet.

Lippert Center Point Air-Ride RV Suspension

riant, residential-quality RVs...until they have to come to grips with how much such additions add to the bottom line. We want it all — but, for the most part, we don't want to pay more for it.

Fortunately, the reliance on leafspring suspensions has created a cottage industry of companies offering upgrades. Most work in conjunction with the existing suspension to reduce As the RV industry's largest component supplier, it's not surprising that Lippert offers an array of suspension enhancements, from Road Armor equalizer kits and heavy-duty shock mount kits to replacement leaf springs and upgraded shackle link assemblies. Its Center Point Air-Ride RV Suspension System, however, incorporates both the improvement of a rubberized equalizer and air bags. Designed for tandem- or triple-axle trailers, the big difference with this system is the bags are mounted horizontally, to further reduce suspension sway, rather than be mounted between the spring pack and frame. This allows the axles to work together rather than oppose one another. According to a subjective evaluation by Roush Industries, the system was found to reduce frame vibration up to 96%. It's said to be easy to install and retrofit to most double eye-leaf suspensions. <u>store.lci1.com</u>

Air-Lift Air Bag Systems

It's said that more than 85% of semi tractors on the road today have some kind of air-ride suspension. There's a reason for that — air bags work. And easily the oldest company offering such systems is Air-Lift. The company offers products for a wide range of trailer applications as well as the Load Lifter 5000 and Load Lifter 5000 Ultimate for Ford F-53 and E-450 motorhome chassis (the big difference is an internal jounce bumper that prevents damage when driving with an empty air bag). Kits include two air springs, Schrader valve and hardware. Compressor systems — including Air-Lift's new WirelessAir handheld controller, with dual-path (left and right bag inflation/deflation) control and no lines to the cab - are available separately. airliftcompany.com

Super Springs International SuperSprings

For owners of Class B motorhomes built on the Ford Transit, Ram Promaster and Mercedes-Benz Sprinter chassis, sometimes all a suspension really needs is a backup for heavier loads.

Or, You Could Replace the Entire Suspension System

Dexter TORFLEX rubber torsion suspension axle

While many of the products shown on these and the following pages will make a dramatic difference in how your trailer rides and reacts, there is yet another option: replace the stock leaf-spring suspension entirely. Granted, it's not really a viable choice for an entry-level travel trailer — these swaps are not for the budget-minded traveler — but well worth considering for someone with a luxury fifth wheel.

You can, for example, jettison the stock suspension for torsion suspension axles. Dexter is one of several companies that can help make this happen; its TORFLEX system is a torsion arm suspension that's completely self-contained within the axle tube and attaches directly to the trailer frame using brackets which are an integral part of the assembly. The TORFLEX

the arrangement of a steel torsion bar surrounded by four rubber cords encased in the axle beam — there is no metal-to-metal contact between moving parts. Dexter offers the system in progressively higher capacities, from 600-1,100-pounds to 8,000 pounds capacity. All include precision-machined steel spindles and integral cast-iron hub/drums, with different braking options available.

MORryde also offers an independent suspension system in 7,000- and 8,000-pound capacities that allows each wheel to respond individually to the road. Integrated rubber shear springs absorb road shock, while the suspension allows for up to 5-1/2 inches of travel. Its beam assembly is

axle provides improved suspension relative to leaf-spring axles through

designed for maximum wheel travel, which is said to significantly smooth the trailer's passage across rough road surfaces. The system allows for the trailer height and side-to-side to be adjusted and also allows for automotive-style toe and camber wheel alignment to better manage tire wear. Monroe hydraulic shocks are standard to the system.

Meanwhile, Timbren (timbren. <u>com</u>) can set you up with its Axle-Less Trailer Suspension, available in 1,200-pound to 7,000-pound capacities and choices includina standard or long spindles (for wider tires) and either standard height, a 4-inch drop or a 2- or 4-inch lift. Timbren focuses on the off-grid crowd with its system and touts the absence of axles as one less component to get hung up or damaged while overlanding. The design includes a metal control arm with polyurethane bushings and two Aeon rubber springs for quiet performance. Various hub and brake options are available.

34 RV Enthusiast

SuperSprings are a simple bolt-on steel helper spring intended to eliminate rear-end sag and stabilize sway and body roll. Built from high-grade shotpeened steel, it included patented roller shackles on each end that allow for self-adjustment as the weight changes. The shackles have one to three holes; the higher the hole the greater the preload tension, allowing the SuperSprings to start higher on the spring curve rate. <u>superspringsinternational.com</u>

Dexter Red E-Z Flex Rubber Equalization System

Dexter Axle's name is something of a misnomer today, because the company offers a lot more than quality axles. On the suspension side, it offers Dexair Air Ride Suspension, a number of heavy-duty suspension kits and its Red E-Z Flex suspension kit, which the company said provides up to an 80% reduction in acceleration forces on the trailer frame vs. a standard equalizer. The E-Z Flex two-part equalizer incorporates a rubber bushing that gives the equalizer more damping performance, is said to be easy to install, won't alter the ride height of the trailer and is available in 33-inch and 35-inch spacing for tandem- or triple-axle applications. dexteraxle.com

MORryde X-Factor Crossmember

MORryde is an RV design powerhouse, having introduced the first trailer steps (StepAbove) to fold out and solidly connect with the ground and the nearly effortless Zero Gravity ramp door for toy haulers. For trailer leaf spring suspensions, the company offers its upgraded CRE3000 equalizer system and the SRE4000, which includes an Z-Factor Crossmember — but you also can acquire the X-Factor Crossmember separately. Available in "drop down" and "correct track" styles, the X-Factor adds lateral support to a fifth wheel or travel trailer suspension and reduces stress on the frame (up to a claimed 94% reduction at each location). The easily installed, high strength/low alloy steel product is adjustable to fit different frames and requires no welding or drilling. <u>morryde.com</u>

Lippert Heavy-Duty Shock Mount Kit

Shock absorbers don't really "absorb" shocks, but they do a good job of dampening suspension movement while helping to limit trailer "bounce" as it reacts to road imperfections. Unfortunately, very few travel trailers and fifth wheels come so equipped — but that doesn't prevent an owner from making this upgrade. Lippert offers heavy-duty shock mount kits for both 3-inch and 2-3/8-inch axle tubes. The bolt-on kits include everything needed to attach gas shocks to an existing trailer suspension; shocks are also available. <u>store.lci1.</u> <u>com_RVE</u>

ENJOY A *Smooth* Towing experience

with MORryde suspension upgrades

The Road More Traveled

A few parts from MORryde — it's CRE3000 equalizer and Heavy-Duty Shackle Upgrade Kit (with wet bolts) — can significantly enhance ride quality for leaf-spring-equipped travel trailers and fifth wheels with multiple axles.

By Bruce Hampson

t's no secret that the RV industry is growing by leaps and bounds — but we're not necessarily speaking about its escalating popularity. The vehicles themselves — from travel trailers to diesel pusher motorhomes — have also dramatically expanded both in size and weight. Motivated by campers wanting, quite literally, an RV equipped with every residential feature they've come to appreciate, manufacturers are only too happy to oblige.

All that weight, however, has its drawbacks, not the least of which is usually the need for investing in a bigger and stronger tow vehicle. The venerable leaf-spring suspension — the default suspension of choice by towable manufacturers due to its simplicity and cost — does an adequate job, but all you'd need to do is ride in the trailer or fifth wheel while it's being towed (definitely not recommended, even in states where it's allowed) to understand the stresses created in the RV by irregular road surfaces. Most RV components and appliances don't fail due to use, they break due to the continual jarring.

Usually, you won't see this happen until something's damaged — but there is one place you might be able to view the consequences of this constant pounding. If you've got tandem axles riding beneath your towable, look between the tires at the relatively thin shackle brackets connecting the foreand-aft leaf springs to the equalizer. Those bolt holes are supposed to be round; if they've elongated due to the stress placed upon the suspension, they need to be replaced.

Actually, they should be replaced anyway — along with the equalizer, which in stock form doesn't accomplish a great deal other than to channel a limited amount of axle motion. Elkhart, Indiana-based MORryde offers an equalizer replacement — the CRE3000 — that adds up to three inches of suspension travel to reduce stress on the frame while also incorporating a rubber insert and a travel slot to protect the trailer. Essentially, it introduces another

The constant pounding endured by a trailer's suspension can eventually elongate the bolt holes in the stock shackle brackets and cause them to fail. MORryde's heavy-duty shackle kit doubles the thickness of the brackets.

level of flexibility to the suspension to make towing smoother while insulating the trailer somewhat from road hop.

Along with the CRE3000 (which is rated for up to 8,000-pound axle applications), the company's replacement heavy-duty shackle kit doubles the thickness of the stock part — from $\frac{1}{4}$ -inch to $\frac{1}{2}$ -inch, and uses bronze bearing inserts and "wet" bolts that can be lubricated.

"It's a really simple upgrade, but it's one of the best things you can do," said Jack Enfield, MORryde sales and marketing manager. "Most customers never have an issue, even though the brackets wear, but it can lead to bracket failure and leave the customer on the side of the road."

Installation can be done by just about anyone with a bit of mechanical knowledge and basic hand tools — an 11/16-inch socket, 13/16-inch wrench, ratchet, rubber mallet, drive punch, torque wrench and floor jacks and safety stands to support the springs. The installers we followed at MORryde during this upgrade to a 2022 Grand Design 2500RL Imagine also utilized an impact wrench; if you have it, use it. And while they made relatively quick work of the swap, set aside four to six hours if you're doing it by yourself. You also may be more comfortable doing most of the work from the outside area of the unit, rather than working from beneath it.

Obviously, the first order of business is to loosen the lug nuts on the wheels (swap one side at a time), then raise the unit off the ground; make sure to jack the RV up by the frame. With the wheels removed, remove the shackle links from the equalizer, then remove the shoulder bolt from the frame hanger. It's easiest to remove all the nuts first from the backside so you can focus on detatching the springs without having to constantly wiggle around the suspension.

With all the bolts removed, push out the original plastic bushings in the eyes of the spring pack and replace them with the upgraded bronze bushings (they will need some persuasion). Attach the CRE3000 to the frame hanger and just finger-tighten the locking nut. This allows you to move the equalizer

MORryde's CRE3000 equalizer adds up to three inches of suspension travel to reduce stress on the frame while also incorporating a rubber insert and a travel slot to protect the trailer.

around when installing the fore-and-aft leaf springs.

When installing the wet bolts, make sure the grease Zerks are installed on the inside, away from the tires. Since the fittings are on the bolt heads, this means installing the bolts from beneath the trailer. This will simplify things when you need to add grease in the future. The serrated wet bolts, with the inside shackle attached, may need to rely on the mallet again to seat them into the springs. You might also find it helpful to move the safety stands around a bit to better position the leaf springs. Tighten

The recipient of the MORryde suspension upgrade was a Grand Design Imagine 2500RL, which weighs in at 6,070 pounds dry and has a GVWR of 7,495 pounds.

September 37

all the nuts to 40 ft.-lbs. Replace the stock bolts from the outer perches of the leaf springs with MORryde's wet bolts, and you're pretty much done. Lube the wet bolts, put the wheels back on, torque down the lug nuts, lower the trailer and hit the highway.

We spoke with Rick Kessler, the owner of the Imagine, a few days after the installation (which also included the addition of MORryde's X-Factor Crossmember), and asked about the handling of the upgraded trailer.

"Somewhat surprisingly, I have noticed a difference in how my Grand Design Imagine tows with the MORryde CRE3000 upgrade," he reflected. "I say it's 'somewhat surprising' because, while I fully expected the ride to be an improvement for the trailer, I really didn't expect to feel that difference in my tow vehicle (a 2014 Chevrolet Silverado LT with Max Trailering Package). But now the trailer seems to better absorb the larger bumps — potholes and train tracks, especially — because I don't notice it bouncing around hardly at all on those occasions. And it definitely doesn't transfer those bumps to the tow vehicle, which it sometimes did before the MORryde upgrade."

And he doesn't have to worry about those stock shackle brackets breaking, either.

This is a straightforward parts swap. Start by unfastening all of the bolts from the stock equalizer and shackle brackets. They may need a bit of persuasion to unseat them once unbolted. A rubber mallet and drive punch will make short work of this.

Remove the stock equalizer, then punch out the stock plastic bushing from inside the leaf spring eyes. Replace it with the supplied brass bushing. Do this to all the leaf spring eyes before reinstalling them.

Mount the CRE3000 equalizer on the frame hanger (grease it, if necessary) and cinch it hand-tight. This will allow you plenty of movement when reattaching the springs to the equalizer.

Using the MORryde replacement heavy-duty shackles, reattach the leaf spring packs to the CRE3000 equalizer. Torque all bolts to 40 ft.-lbs.

Once the CRE3000 system is installed, lube the wet bolts.

38 RV Enthusiast

As these "before and after" images show, there's a dramatic difference in the look — and the performance — of the MORryde CRE3000 compared to the stock system. The upgraded MORryde kit provides greater suspension travel while also incorporating a rubber insert and a travel slot to protect the trailer by reducing the propensity of the stock system to channel road shocks through the vehicle. **RVE**

Schedule on-line at **REVRVSERVICEANDREPAIR.COM**

COAST

REV RV Service & Repair 1420 Patterson St. Decatur, IN 46733

COAS:

REV RV Service & Repair 91186 N Coburg Industrial Way Coburg, OR 97408

Suspended Inimation

Curing the Bouncing Blues

Installing shock absorbers on a travel trailer or fifth wheel suspension will take the hoppity-hop out of trailer towing — and Roadmaster's Comfort Ride kits have reinvented the mounting process with patented brackets.

By Bob Livingston / Photos by the author

There's nothing very exotic about a basic suspension under a trailer or fifth wheel. As a matter of fact, it still carries some similarity to the suspensions used on covered wagons and stagecoaches of a century or more ago: leaf springs hooked to axles and connected by an equalizer. Why? Because it's simple, effective and works — at least, to a certain extent. But while these Spartan suspensions still offer some relief from less-than-perfect roadways, there's really not much cushioning and bounce control going on.

On the other hand, shock absorbers — the most common device to damp unwanted impulses created by interaction of the vehicle body and springs — have been around for nearly as long as automobiles, but they are not commonly found on trailers and fifth wheels as standard equipment, especially on entry-level units. One reason for the omission is the belief that since people don't ride in them while on the road, they have no idea how harsh the ride is and how abusive all that jostling and flexing can be on the structure and contents. That, however, completely ignores the fact that constant pounding on the road can lead to premature damage and costly repairs to installed components and the RV itself.

Where Are the Shocks?

Simply stated, *all* vehicles need shocks to improve handling. Jolts to the trailer are telegraphed to the truck, which exacerbates poor handling. Take out the jolting forces and the truck will handle better while towing — and even help "the tail from wagging the dog," properly referred to as sway.

Even though common wisdom suggests that the use of shocks is best practice, trailer manufacturers - even those who understand the advantage of damping the ride - still mostly refrain from using them because there is usually not enough room to mount them properly. Fortunately, Roadmaster has introduced a patented mounting system for its Comfort Ride Shock Absorber system that allows them to be positioned at an optimum 30-degree angle. This provides the necessary leverage to control unwanted movements during compression and rebound (shocks that are mounted on a horizonal plane are virtually useless).

Lateral rocking and suspension travel are also controlled to a certain degree by angling the shocks to the outside

There's not much to a basic dual-axle trailer suspension. Springs are attached to the axle with tie plates (shown here with the Comfort Ride tie plates already installed), shackles are welded to the frame and an equalizer is mounted in the center.

of the frame, something that is also achieved by the design of the Custom Ride brackets. This mounting position, according to the company, centers the trailer weight over the tires and helps with sway.

We recruited owners of a 2022 Cougar fifth wheel that bounced around on the roadways to document the installation of the Roadmaster system. Even though the owners never rode inside the unit, the driver could see clearly that the trailer was being pushed laterally while being towed and exhibited quite a bit of bouncing. Normally, Roadmaster recommends the installation of its Comfort Ride Slipper Spring suspension system along with the shocks, but in this case, the axles were too close to mount the longer springs and center bracket. When the Slipper Spring kit is installed, the mounting system for the shocks is integrated into the center bracket, which makes installation a snap. In this case, an independent tandem axle shock absorber kit was earmarked for installation on the 3-inch diameter axle.

Kits are available for 2 3/8-, 3- and 3 ¹/₂-inch diameter axles and include the aforementioned brackets and all the mounting hardware for tandem axles. The nitrogen-charged shocks are not unique, but they do utilize heavy-duty components and fasteners — and are sized for trailers and fifth wheels. Kits sell for \$650 for all size axles; owners of triple-axle RVs will need the additional shocks and hardware for triple axles (which sells for \$325, also in kit form).

Drilling and Bolting

The installation is not difficult, but plan on spending at least four hours under the trailer. Before you start, take the time to read the clearly described and illustrated installation instructions carefully. The first step, obviously, is to lift the wheels and tires off the ground and place jack stands on the frame and axles to provide more room to install the new tie plates; you'll have re-mount the wheels and tires and lower the trailer to the ground to determine the positioning of the frame brackets later in the process. Just make sure you don't lift the frame using a jack on the axle. When the wheels and tires are on the ground, use chocks to prevent rolling; also, the trailer must be level.

For this project, the wheels were lifted off the ground using the onboard leveling system and jack stands were placed in strategic locations. The old tie plates on the right side were removed from the springs and axles and set aside for the moment. Next, the new tie plates were placed on the respective locating pins and the original tie plates were set on top of the new ones, requiring the use of the provided longer U-bolts. The U-bolt nuts were torqued using the specification from the axle manufacturer that's provided, by brand, in the instructions.

Once the wheel and tires were back on and the trailer was situated firmly on the ground, loading the suspension, an extension plate was bolted to each new tie plate. Since the axles were mounted below the leaf springs in the test trailer, the extension plates were bolted to the two holes in the end of the plate (the two middle holes are used if the axles are on top of the leaf springs). These bolts were torqued to 57 ft.-lb.

The first shock was bolted to the extension plate and a frame bracket was then attached to the other end. Each shock is banded to prevent extension under pressure — which otherwise would make it difficult to determine the proper angle and compress for mount-

Patented brackets allow the shocks to be mounted vertically and angled to the outside so that trailer weight is centered over the tires for better sway control. Here the shocks are mounted to the Roadmaster Comfort Ride Slipper Spring suspension on another trailer, but illustrate how the shocks are positioned when placed at a 30-degree angle.

Nitrogen-charged gas shocks are sized for trailers and fifth wheels. These shocks are made of high-quality components and are banded to prevent expansion, which would otherwise make it difficult to install.

ing — so the bands must be left alone until the end of the project. You'll need to swing the shock and bracket up to the frame to find a mounting location that will allow for the best angle, preferably 30 degrees. A magnetic meter was used to determine the angle, which landed at the optimum 30 degrees. At this point the location for mounting the bracket was marked and a section of the belly pan was cut away to allow the bracket to sit flush against the frame.

Drilling the holes required the use

of a 12-inch long, 5/16-inch bit and enough energy to push upwards. Make sure the bit is sharp or you'll be fighting a hopeless situation. The bracket was then attached to the frame using the self-tapping bolts, making sure there were no obstructions on the other side of the frame. With the first bracket installed, it was possible to measure from the end of the equalizer to determine the locations for the other brackets. This will allow you to lift the trailer again, stabilize it with jack stands and remove the wheels and tires to allow better access for drilling the holes and driving the bolts for the other three brackets. In this installation, the LP-gas pipe was in the way on the left side and had to be relocated.

From here it's a drill-and-bolt proposition and once the shocks are torqued to specification (provided in instructions), it was just a matter of cutting the bands, remounting the wheels and tires and torquing the lug nuts.

Smoothing Out the Bumps

It's hard to quantify the results of adding the shocks because no one went for a ride inside the fifth wheel before and after the installation — but the shock absorber industry is huge and auto manufacturers don't integrate damping provisions just to make suspensions look pretty. Shocks work, and in this test the results were positive, eliminating much of the bouncing while improving towability.

The owner reported much less rearend movement and better control of interior contents (meaning, he wasn't greeted with a mess inside when he opened the entry door). Previously, when towed on roads with potholes and uneven surfaces, the fifth wheel did a road dance. After the shocks were installed, the trailer settled down — and there's no denying a smoother ride will improve longevity and minimize subsequent repairs.

The original tie plate was removed from each spring pack/axle and retained for the next step. Removing the wheels and tires provides better access. After lifting the wheels and tires off the ground, make sure jack stands are used for safety.

42 RV Enthusiast

A new tie plate from the kit was placed over the locating pin on each spring pack and axle.

Longer U-bolts, provided with the kit, were needed to make room for the new and old tie plates, which were sandwiched and bolted to the axles and springs.

Access to mount the new and old tie plates can be tight if the wheels and tires are not removed. Once the tie plates are aligned properly, the U-bolts are torqued to the axle manufacturer's specifications, which are provided in the Roadmaster instructions.

An extension plate was attached to each new tie plate. Since the axles here were mounted under the leaf springs, the two holes in the end of the extension plates were used to bolt up to the tie plates. If the axle is above the springs, the middle two holes are used. Bolts were torqued to 57 ft.-lb. as per instructions.

The lower shock mount was attached to the extension plate using the provided bolt, nut and washers; the nut was only snugged at this point to allow rotation of the shock for locating the frame bracket. Once the shock was in its final position, the bolt was torqued to 50 ft.-lb. For the moment, the shock was leaned against the trailer frame.

A magnetic angle meter was "stuck" to the shock housing to determine the proper angle (optimum 30 degrees) for mounting the frame bracket that was previously attached to the shock. This process must be done with the wheels and tires on the ground to load the springs.

Once the proper positioning of the frame bracket was established, it was marked so that a section of the belly pan could be cut away, exposing the frame metal. This allowed for a flush fit against the frame.

And now the fun begins. Probably the hardest part of the installation is drilling the holes in the frame for bolting the shock brackets in place. A 12-inch long, 5/16-inch bit will facilitate drilling, which takes quite a bit of pressure (laying on your back and side) to cut the holes. Make sure the bit is new/sharp or you'll be up against a hopeless situation.

The LP-gas pipe was in the way on the left side of the trailer. Before marking the position for the frame bracket and cutting the belly pan material, the pipe was relocated and later secured.

Self-tapping bolts were used to mount the frame brackets. These bolts cut their own threads through the previously drilled pilot holes. You'll need an impact wrench for this procedure. Once the first frame bracket is bolted up, measurements can be taken in relation to the equalizer to determine the location for the other three shocks. That makes it possible to provide better access for drilling through the frame and bolting the brackets after removing the wheels and tires.

The retention bands were cut once the shocks were bolted and torqued to specification. Now it was just a matter of replacing the wheels and tires, torquing the lug nuts and going for a road test. **RVE**

Roadmaster's Comfort Ride Slipper Spring Suspension System

Radia and the supersisting of the supersisting and the supersisting and

The slipper spring kit is engineered to reduce bucking and bouncing by replacing the leaf spring equalizer (as well as the leaf springs themselves) with a steel box structure that bolts to the equalizer bracket and to the trailer's frame. The spring box incorporates rollers and wear plates, which are designed to accommodate the specially designed leaf springs.

At one end, the replacement springs have a traditional "eye" that bolts to the spring hangers — but the ends that locate inside the spring box have open, curved ends. The curved ends locate over the rollers inside the box, while wear plates located above these ends keep them properly positioned. As the spring compresses (flattens), the curved ends ride on the roller assemblies, which prevents them from transmitting force to the chassis and to the adjacent leaf springs/axles. To a large extent, this allows each axle/spring assembly to operate independently of one another, instead of transmitting force to each other through the spring equalizer.

Whether springs-only (seen here) or the complete system, Comfort Ride products are designed for a bolt-on installation and universal fit on trailers with a standard leaf-spring suspension. Trailer chassis can vary slightly in design, however (including so-called "wide stance" axles), so if you have any concerns, contact Roadmaster customer service to make sure the kit (or kits) is a good fit for your trailer.

As we witnessed when following an installation, swapping for the complete package (including the shock kit) took approximately three hours for a professional tech with air tools: we estimate that a competent DIYer with hand tools could complete the same job in about twice that time, or 6-8 hours (there's a how-to video on Roadmaster's website at roadmasterinc.com/products/travel_trailers/comfort_ride.php). That's a chunk of time, we know, not to mention a significant investment: you can find the slipper springs kit online for about \$800-\$1,000, depending upon kit size (they are available for axles rated at 5,000-, 7,000- and 8,000 pounds

capacities), while the shocks kit will set you back from \$400 to \$700 (depending upon number of axles). You can also purchase the complete package from places such as <u>etrailer.com</u>. If you use your trailer for more than the occasional

weekend outing, however, it's tough to put a pricetag on the peace of mind which comes from better handling.

Most travel trailers and many fifth wheels are equipped with a simple spring equalizer, which connects the ends of both springs in a central location attached to the frame, as shown here. With the axles properly supported and wheels removed, the first step to replace the stock part is to remove the nut from the bolt that runs through the center of the equalizer (the bolt has serrations near the head designed to prevent it from loosening, so attempting to remove the bolt rather than the nut will damage the inside of the bracket). Next, the tie plate nuts at each spring end are loosened and the U-bolt nuts are removed; the entire stock spring/hanger assembly can then be unbolted and removed as a unit.

The Comfort Ride slipper spring box is then trial fit over the equalizer bracket on the frame, and the bolt/nut assembly loosely installed. A line is then traced around it and the underbelly material trimmed away with a razor knife. The spring box is then used again as a template to mark the mounting holes that need to be be drilled in the bottom of the frame. It's recommended that red thread locker be used on the bolt threads before installation; then torque the bolts to specification.

The ends of the Comfort Ride leaf springs that attach to the factory spring hangers use typical closed spring eyes. A bolt is placed through the hanger/spring eye and finger tightened; the spring then rests on the spring perch. For heavier spring packs, longer replacement U-bolts are required. The nuts are first tightened, then torqued to specification.

The wear pad is located above the roller assembly; the roller itself is positioned in the lower hole after the curved end of the spring has been inserted into the box. Here, you can see that one of the spring ends has been placed over the roller assembly in the spring box, with the wear pad located above.

With the springs in place, you can see how the system works: The curved ends of the springs ride on roller assemblies, while the wear pads are positioned above the ends to control up/down movement. By allowing the spring ends to move freely, the suspension can operate independently instead of being tied together by an equalizer. Torque all fasteners to specification, and you're done. RVE

LiquidSpring's 'Smart Suspension' Solution

by Bob Livingston

f you've been paying attention, you've noticed that virtually all the suspension enhancements covered in this "Suspended Animation" section have dealt with improving handling and driving comfort derived from leaf-spring underpinnings. Well, they aren't used exclusively for travel trailers and fifth wheels. For decades, a wide variety of add-on devices have been marketed to improve the ride and road manners of the leaf-spring suspension for the Ford F-53 motorhome chassis, the mainstay of the Class A gasoline-powered motorized industry.

But while many of the add-ons

RV Enthusiast

developed by various companies in the aftermarket have tempered the Ford's road manners to a certain extent, the Ford chassis continues to be known for its stiff ride and, at times, less-thanstellar handling. That's why Lafayette, Indiana-based LiquidSpring opted to go in another direction. Rather than attempt to "fix" the Ford's shortcomings by bolting parts to the otherwise stock suspension, LiquidSpring designed a computer-controlled compressible-liguid "smart" suspension system that is installed in place of the Ford chassis' steel leaf springs and shock absorbers. The system is available for F-53 chassis with 16,000- through 26,000-pound gross vehicle weight ratings (GVWR), dating back to 2011. (Applications for other vehicles also are available.)

The "liquid" in the LiquidSpring system is silicone-based and compressible under high pressure. Struts (a piston in a cylinder) replace the steel leaf springs. Instead of leaf springs flexing and loading under varying road conditions, the silicone-based liquid is compressed at a variable rate determined by an onboard computer that analyzes suspension movement in milliseconds and changes pressures (2,200 to 4,000 psi) in the struts as road conditions

This illustration demonstrates typical placement of the LiquidSpring components on the rear of a Ford F-53 chassis. Factory springs, shocks and hardware are removed and custom brackets for mounting controls arms and struts are mounted to the frame. A control module (partially hidden) and volumes (tanks) manage the flow of liquid to the struts. Limited frame real estate in the test motorhome required the volumes be moved behind the rear axle.

vary. The liquid serves as load support as well as shock absorbing; hence the variability the system provides is a radical transformation of the stock F-53 suspension system. We followed along as the system was installed on the pictured 2016 30-foot Winnebago Itasca Sunstar with an 18,000-pound GVWR chassis.

Removed from the chassis were the four stock leaf spring assemblies and shock absorbers, plus their mounts and hardware — all replaced by Liquid-Spring equipment. Among the components built at the Lafayette plant are the struts and pressurized tanks (which the company calls "volumes"), plus the control module/liquid reservoir, mounting brackets and other hardware.

As noted earlier, the actual "spring" in the LiquidSpring system is a strut consisting of a tube and piston. Each wheel strut is connected by a high-pressure hose to a volume, and the pressure in that volume is controlled via another high-pressure hose to the control module. The 12-volt-DC-powered module includes a high-pressure pump, computer-controlled valves and a reservoir for the compressible liquid. Pressure in each strut is controlled individually and instantaneously by the module based on data from height sensors at each wheel and a steering sensor. It adds up to an all-wheel variable/adaptive suspension.

Granted, the LiquidSpring's suspension did contribute a net increase of 450 pounds to the motorhome, but it was still well within parameters. Curb weight went from 17,160 pounds, loaded (water/fuel propane full, supplies aboard) prior to the LiquidSpring installation to 17,610 due mainly to the weight of the four volumes, the struts and four very substantial control arms front and rear. Ford's gross axle weight ratings (gawr) for this motorhome were 7,000 pounds front and 12,000 rear; gvwr was 18,000 pounds. Motorhome owners who are considering this installation should acquire accurate weight figures, possibly on one of the many CAT scales at truck stops, because LiquidSpring may decline the installation on a motorhome that already exceeds one or more of its weight ratings.

This is neither a quick nor inexpensive transformation. This installation spanned four days at the service department at the LiquidSpring factory in Lafayette and involved the use of four-corner lifts to provide access underneath the Ford chassis. Total parts and labor price for the Liquid-Spring smart suspension conversion of the Winnebago Sunstar was \$20,000. While this price is obviously more than you'll pay for one of the many other F-53 upgrades available, the investment may not seem as daunting once the full scope of benefits are realized.

The owner reported back that ride was dramatically smoother and controlled even on broken pavement riddled with repairs and potholes. The LiquidSpring system substantially reduced the repeated shock impulses transmitted by the stock leaf springs on rough pavement, and it muted the noise. On curves, the motorhomes did not heel over and yaw, even during aggressive maneuvering. It stayed mostly flat on the pavement; a winding road became a pleasurable drive. Rough approaches to highway bridges were no longer feared. Rapid lane changes produced very little body roll and yawing effect.

Essentially, the LiquidSpring system transformed the Ford F-53 suspension into something more akin to an air-suspension system on a diesel-pusher coach — and, let's face it, ride quality is oftentimes one of the reasons buyers opt for more expensive rear-diesel coaches.

The front suspension for the Ford F-53 chassis is the latest offering from LiquidSpring. Like the installation process for the rear, the springs, shocks and hardware are removed to make way for brackets, control arms and struts. Volumes were mounted on the frame midship; a single control module, configured for both the front and rear, was mounted close to the volumes on the test motorhome.

A magnetic frame drill is an indispensable tool for installers, who will have to create new holes for the LiquidSpring fasteners. Installation began at the rear, where new suspension brackets were dry fit first, then bolted to the frame. Hanger-crossmember is bolted to the frame above the rear axle housing. Additional brackets will be added to this hanger later in the installation.

With new brackets for the upper and lower control arms bolted to the frame and torqued to specifications, a new lower control arm is attached to the front bracket that's attached to the frame and swung into the rear bracket where it will be bolted in place. Brackets to accept control arms and strut are attached to the rear axle using U-bolts and new upper and lower controls arms are bolted between the axle and frame. These components take the place of the original leaf springs.

The rear strut is bolted in place between the upper frame and lower axle brackets. The strut plays a pivotal role in controlling the suspension. New jounce bumpers are attached to the frame on proprietary plates to replace those provided from Ford.

The height sensor is connected via ball studs to the upper control arm on both sides. Information from this sensor will supply important information to the system control module.

The control module (also called the Isolation manifold and fluid reservoir) is prepared on the bench before final installation in brackets that have been attached to the frame. It takes some study to find the right place to install this component, which must have adequate clearance from the exhaust system. Fittings are installed in the connection ports while the control module is still on the bench. These fittings will accept the hoses that distribute fluid to the struts and volumes. The entire unit fits securely into the space along the frame and provides just enough clearance to reach the reservoir fill — something that is not needed very often once the installation is complete. Only one control manual is needed for both the front and rear suspension.

One of the volumes for the front suspension is installed in a logical place near the control module. Again, it takes some study to find the right places to install the volumes, which are attached via special brackets and robust steel bands.

The upper strut/crossmember mount is carefully put into position and bolted to the upper bracket and lower control arm. The struts are the heart of the new suspension system.

Leaf springs, shocks and factory hardware are stripped from the frame up front to get ready for installing the LiquidSpring components. The front project starts with the installation of the axle clamp group components. Factory Huck bolts are removed using a grinder to make way for frame-stiffening plates and component brackets. Here, the upper controls arms have been bolted in place.

Front height sensors are installed on the upper controls arms to corresponding positions on the frame brackets. Height is measures at all four corners of the LiquidSpring suspension. The steering sensor is also installed on the Pitman arm and new jounce bumpers are bolted to plates on both sides of the front frame.

Rear volumes (the larger ones) were mounted behind the rear axle because the motorhome chassis was on the short side and did not provide enough room closer to the front. Hoses are then attached and secured, with heat-resistant conduit placed around any hydraulic hose that was near the exhaust and/or passing through areas where sharp edges might exist.

A dash-mounted control panel allows the driver to set ride parameters to Sport, Normal and Comfort. It also controls ride height. The panel also includes a five-choice Height setting. At speeds below 15 mph, this is helpful; dial it High if there is any chance of dragging the rear of the motorhome while entering a driveway or dial it Low after parking at a campsite so the motorhome's jacks have less of a lifting job and the entry step will be lower. The difference (lift) between the two settings is about 5 to 6 inches, depending on terrain.

Extensive wiring harnesses were routed to the control module, height and steering sensors and to the cockpit and hydraulic hoses are connected to the struts, control module and volumes. Any hose that passes through an area that may cause abrasion is wrapped with a protective conduit.

After completing the install under the motorhome and installing the control module on the dash, a technician will connect a computer to program the system. Programming is started in the shop and continued during a test run on the road. **RVE**

52 RV Enthusiast

ENTHUSIAST

ENTHUSIAST

NORTH AMERICA'S PREMIER HOW-TO RV RESOURCE **Created by** – **and for** – **hands-on RV enthusiasts!**

RV Enthusiast magazine was developed to take the mystery out of RV maintenance, repairs and upgrades, as well as providing how-to tips to make RVing better. We get it: Things happen as time and untold miles of bad roads will take their toll on your RV. But we also know that you don't have to be a mechanic to be able to confidently deal with problems that may crop up. All you really need is truly accurate information you can rely on — fully illustrated every step of the way and written in a friendly, conversational manner you can understand.

As this issue shows, each monthly edition of *RV Enthusiast* will be filled cover-to-cover with the kind of information and instruction you need to

continue to enjoy your RV for years to come. In fact, there are nearly 50 pages of 'how-to' stories in this issue — just imagine the wealth of topics to be covered and the knowledge gained in a year's time!

> If you like what you see, don't miss an issue. It's less than \$1 a month! Go to our website www.rventhusiast.com click the "subscribe" icon risk-free and simply follow the prompts.

IAGAZINE TECH TIPS NEWS BLOG PODCAST STORE \wp

Coming in the October issue:

Nothing will drive an RVer crazy faster than having to deal with electrical "gremlins," irritating snafus that tend to

render 12-volt DC and 120-volt AC systems inoperable — usually at the most inopportune time. This issue will show how to track down and eliminate such troublespots. We'll also detail the service procedures for a Schwintek slidout, install a Truma AquaGo on-demand water heater — and a lot more! Available October 20

SuperSprings International's Trailer SumoSprings al.com/trailer-sumosprings/). K retail for about \$250-\$300 per available for over-axle and uncomparing to the sum of the sum of

ompanies have for years been developing aftermarket systems to further enhance the ability of, well, "adequate" leaf-spring suspensions to reduce the impact of road hazards on trailers. One of the simplest of these — from an installation standpoint — is SumoSprings, an "airless air bag" system developed by SuperSprings International.

It's also one of the most technologically advanced products on the market. By using a closed-cell urethane — injecting nitrogen bubbles into the urethane — its proprietary design allows for the adjustment of the diameter and density of the air bubbles, effectively allowing the company to create products capable of different support capacities. It also features a parabolic spring curve, a fancy term for describing a progressive spring rate: as the suspension travels and there's more movement, the SumoSpring gets stronger. It essentially functions much like an airbag system without requiring a compressor and can't leak, making it zero-maintenance. SumoSprings are available in two densities for towable applications: "Blue" SumoSprings are designed for trailers with gross axle weight ratings (GAWR) of 3,000 to 5,000 pounds, while "Black" springs are for GAWRs of 5,000 to 8,000 pounds (superspringsinternation-

Before raising the vehicle, measure from the bottom of the trailer to the top of the leaf spring plate. Locate from the supplied parts a combination of spacer plates (0 to 2) that stick up to a height of ¼ to ½ inch taller than that initial measurement. Then, using the correct length 8mm bolt (supplied), attach the SumoSpring to the mounting bracket, adding a light amount of Loctite to the bolt threads. Leave the connection loose for the moment.

al.com/trailer-sumosprings/). Kits, which retail for about \$250-\$300 per axle, are available for over-axle and under-axle leaf-spring configurations and can be installed in about 30 minutes. Kits also are available for a number of motorhomes and tow vehicles.

Insert the 3/8-inch carriage bolt through the bracket. Use the flat washer and lightly attach the 3/8-inch nut to the carriage bolt.

Secure the trailer and raise the frame high enough to position the SumoSprings on the leaf spring. Place the SumoSpring perch on the leaf, ensuring it is positioned between the U-bolts attaching the leaf spring to the axle.

Squeeze the brackets together so the hooks are snug around the leaf spring plate and tighten the 3/8-inch nut until it is just touching. If necessary, slide the SumoSpring so it is centered under the frame rail. Rotate the SumoSpring clockwise by hand until it is as tight as possible. Finish by tightening the 3/8-inch nut fully. That's all there is to it. Repeat steps at each wheel. **RVE**

54 RV Enthusiast

continued from page 11

Tri-Pod Steering Wheel integrates with a 15-inch anti-glare digital dash that is custom-designed for the RV customer to meet their specific display/operational needs. The digital dash can also receive notifications from the Spartan RV Chassis Advanced Protection System, a suite of comprehensive safety technology.

The Tri-Pod Steering Wheel's features and placement differ between motorcoach manufacturers, but can include windshield wiper controls, phone and media controls, steering-assist functions, graphic instrument cluster navigation, cruise control and more. It will be standard equipment on certain Entegra, Foretravel and Newmar luxury motorhomes.

New Aliner Evolution Built for Off-Road Enthusiasts

Caravan Salon Attracts 235,000 Visitors

attracted some 235,000 visitors from 72 countries over its 10-day program.

With many new products and innovations and an excellent atmosphere, Caravan Salon Düsseldorf 2022 im-

RV shows proliferate in the United States, particularly in the winter and spring months as people's thoughts start gravitating to warmer weather. Literally hundreds of such events are held across the country, each pulling in thousands of visitors. But while the number of shows brings each year's new models to a wide swath of the consumer market, their numbers also tend to dilute huge turnouts for single events. The recently concluded America's Largest RV show in Hershey, Pennsylvania, for example, attracted just shy of 50,000 visitors during its five-day run — an excellent turnout.

Now, compare that to the 61st Caravan Salon Dusseldorf — which

pressively confirmed the popularity of RV/mobile homes/camper vacations across Europe. Called "the world's leading trade fair for mobile travel," the show encompassed 736 exhibitors from 34 countries showcasing their products in 16 exhibition halls covering 2.7 million square feet inside and out-

side the Dusseldor Exhibition Centre.

European manufacturers, by the way, are acknowledged as trend-setters for the RV industry — particularly in the smaller motorhomes and "caravans" (travel trailers) familiar to the continent's narrower roads. If you're interested and what RV enthusiast wouldn't be? — the 2023 Caravan Salon program is set for Aug. 26-Sept. 3.

Called "Aliner's most ambitious and adventurous camper vet" by company CEO Brett Randall, the Evolution features a 15-foot cabin on an 18-foot frame, making it spacious enough to comfortably sleep the whole family and perfectly sized for garage storage. Other features include a stow-away 32-inch by 32-inch shower (capable of being set up in seconds) that lifts from the floor — a first of its kind. The interior - manufactured with a highstrength aluminum frame with high-density polyethylene panels for cabinets and furniture — includes a 60-inch by 80-inch rear queen-size foldout sofa bed, dinette, sink, stove, refrigerator and cabinet-concealed swivel cassette toilet. It provides more storage than most trailers in the category.

Not evervone

wants or needs

all the bells and whistles. Howev-

er. even hardcore

off-grid campers

bit more size at

times. Aliner, a manufacturer of

folding camping

trailer products,

was set to debut

model yet — the off-road, full-size

Aliner Evolution

ber.

- in late Septem-

its most advanced

appreciate a

a big RV with

Designed for off-road use and built to weather harsh conditions, the Evolution also comes standard with a 185-watt Sunflare Flex 60 solar panel for quiet, clean power generation whether at the campsite or off the grid. For more information, visit <u>aliner.com</u>. **RVE**

Advertiser Index (click on company name to view its ad)			
Advertiser		Website	Page
Brazel's RV/Ultra RV Products		urvp.com	10
Hensley Mfg.		hensleymfg.com	10
Hopkins Mfg.		hopkinsmfg.com	45
Lippert		lci1.com	2
LiquidSpring LLC		liquidspring.com	5
MORryde International		morryde.com	35
Norcold, Inc.		norcold.com	62
REV RV Group – Parts	6	<u>revrvparts.com</u>	61
REV RV Group – Servi	ice	revrvserviceandrepair.com	39
Roadmaster, Inc.		roadmasterinc.com	9
RV Repair Club		rvrepairclub.com	7
SuperSprings Internation	onal, Inc.	superspringsinternational.com	31
Transfer Flow, Inc.		transferflow.com	11
Yamaha Motor Corp. U	JSA	yamahamotorsports.com	23

Replacing the sealed front bearings on a Ram 3500 dually is a great weekend project for high-mileage vehicles.

By Bob Livingston / photos by author

ou're driving down the highway, happily towing your trailer when you hit a pothole, which is not unusual these days. All of a sudden, the truck starts to shake, the steering wheel tries to jump out of your hands and you think, "Is this the end?" Fortunately, the uncontrolled movement of the front suspension subsides as you slow down or stop — but the memory of the "death wobble" will be planted firmly in your brain.

"Death wobble" sounds so ominous, but it's the term truck owners have coined over the years to describe the sensation when the front end of the truck shakes violently and control is compromised. It's a situation that strikes trucks and SUVs, especially those with solid front axles. The Dodge Ram seems to get the brunt of the Internet exposure for the death wobble, but it's been a problem for just about all trucks. I remember experiencing the violent shaking in my Ford pickup back

You'll need some heavy-duty tools to replace the front bearings, including impact wrenches and sockets. A pry bar and hammer are not shown but will come in handy.

The entire wheel and brake assemblies will have to be removed to get to the bearings. There's nothing small or lightweight here, so heavy lifting will be in order.

in the early 1980s — and that was with a Twin-I-Beam suspension.

It's a mysterious phenomenon that is subject to much conjecture, especially on the Internet (see sidebar). While the death wobble just about always ends with restoration of control, the feeling that the driver will get into an accident is disconcerting. Most drivers dread the return of the death wobble and will be conscious when negotiating bumps, ruts, potholes, sharp turns and over railroad tracks. Common diagnoses for death wobble include worn tie rods, worn bushings and ball joints. Some will even blame worn bearings which, while ultimately did not the cause of the nasty oscillations to the 2017 Ram 3500 dually four-wheel-drive truck owned by my neighbor in our winter RV park — it only had 40,000 miles on the odometer — it provided a good opportunity for us to document what Ram owners will need to do when their trucks get old enough to rack up the miles, which is common

accomplished weekend mechanics, especially those with a background in building cars and performing major repairs. You'll need a ½-inch-drive impact wrench and a good selection of sockets and hand wrenches, not to mention a prybar or two to convince some parts to let loose. Obviously, the front end will need to be lifted off the ground and stabilized with jack stands.

with a Cummins

diesel engine.

bearings requires some

"heavy lifting"

done at Red-

California, a

so the job was

lands Truck and

RV in Redlands.

service compa-

ny that routinely

does this kind of

work. Parts and

Replacing the

labor came to \$1,495.

bearings on

the Ram truck

can be done by

Installing the

The work began by removing the wheel and disassembling the brake caliber and bracket, which were placed out of the way. From here, the hub assembly was unbolted from the rotor. You'll need a socket extension to get into the holes between the studs. If the truck has been exposed to salt from the roads or living near the ocean, have a can of penetrating oil handy to help break the nuts loose. You may also need a hammer to persuade the hub assembly to come off the rotor. Next, the rotor was removed exposing the bearing assembly.

The bearing assembly is a one-piece sealed unit, which explains why it's so expensive. There are four bolts behind the bearing assembly that were removed, which took some finesse and patience to maneuver an impact wrench and socket into position. The Redlands Truck and RV mechanics are experts in this type of work, however, so the process went smoother than expected. Getting the bearing assembly off the axle spline was another story. The center nut was removed, and wheel speed sensor wires disconnected before persuading the bearing assembly to release from the spline. A pry bar and hammer convinced the bearing assembly to come off, but care had to be taken not to dislodge the spline. A slide hammer can also help here, but was not used for this project.

Fortunately, the suspension components on the Ram were in good shape and there was no need to use penetrating oil. Brakleen Brake Parts Cleaner was sprayed to eliminate any offending debris and any rust was removed with a scuff pad. The spline was coated with anti-seize compound after cleaning.

After the prep work was completed, the new bearing assembly was installed followed by the rotor and hub assembly. Finally, the bracket and brake caliper were replaced and the job was finished — on one side. Figure on spending most of the day to replace the bearings on both sides if you do it yourself. Redlands Truck and RV finished the task in 2.6 hours.

Whether you're experiencing a death wobble or simply own a Ram with six-figure mileage on the odometer, here's what to expect if there's play in the front wheels and consequential steering/handling issues that can be traced to worn bearings.

Once the brake caliper has been unbolted and moved aside, the caliper bracket is removed from the rotor. Now would be a good time to inspect rotor and pad condition and replace if necessary.

Releasing the hub assembly requires removing the bolts through the access holes between the studs. It's best to use an impact wrench but you can get by with a long-handle ratchet wrench or breaker bar and some muscle.

With the hub assembly out of the way, the center nut is removed to release the brake rotor. If there's quite a bit of rust build-up from living near the ocean or from salted roads, you can squirt some penetrating oil on the nut beforehand.

An Expensive Lesson Learned

We've preached it for years: don't believe everything you read on the Internet

While struggling to find a solution for a death wobble he was experiencing in a 2017 Ram 3500 dually four-wheel-drive truck, my neighbor in our winter RV park read multiple posts on the Internet that pointed to bearing failure. As most people know, quantifying posts on the Internet is, well, difficult, to say the least. Still, my neighbor was convinced — and was hellbent on having the bearings replaced. No amount of talking would convince him that the front bearings on his Ram truck could easily go three times the current 40,000 miles they had on them before wearing enough to cause problems with driveability.

That, though, is one of the byproducts of experiencing a death wobble especially when towing a fifth wheel he and his wife live in full time. Having your truck's front end start doing a shimmie while pulling about 15,000 pounds at 60 mph isn't for the faint of heart. So, we didn't push too hard.

The technicians at Redlands Truck and RV — to their credit — also were a bit perplexed as to why the owner wanted the bearings replaced but went along with the project since he was insistent. The wheels exhibited no play when tested before the front end was disassembled, which was a good sign that the bearings were still good. Most bad bearings will exhibit noticeable play in addition to rude road manners. Bushing ends, tie rod and ball joints were all closely inspected to make sure there were no underlying problems with the suspension. Once everything was determined to be A-OK, the work began.

Replacing the bearings, however, did not solve the death wobble problem — as suspected by the technicians at Redlands Truck and RV. The owner was happy to have new parts, but that elation only lasted until the next death wobble episode a week or so later. Back to the Internet he went — and upon gleaning further advice, new Michelin tires were mounted and a dual steering stabilizer and steering box stabilizer were installed. Bingo. Problem solved.

There's little chance the tire change was instrumental in the fix so the installation of the steering and steering box stabilizers likely neutralized the death wobble — the exact reason why Roadmaster introduced its Exact Center device. Unfortunately, the Exact Center was not available at the time of this project because it would have probably fixed the death wobble without the additional hardware. (Watch for an installation of the Exact Center product in our October issue!)

There's no doubt the Internet is a good source and has changed the way we research problems with our vehicles — but users need to analyze suggestions carefully and always seek out a second, or even third, opinion. This was a costly experience for the owner of the Ram truck, although he's still happy he had the bearings replaced since he plans on keeping the truck for a very long time.

Remove the rotor and place it in a safe place, preferable on a towel. Once the rotor is off, you'll have access to the sealed bearing assembly.

There are four bolts that were removed from the backside of the bearing assembly. Access to these bolts is tight and requires patience to maneuver the impact wrench.

Care must be taken to release the speed sensor wires from the clips in the axle housing while removing the bearing assembly.

Speed sensor wires were disconnected and the other end, which stays on the front axle housing, was pushed back to a safe place before the bearing assembly was removed.

The old bearing assembly needed some prodding to break loose. A hammer was first used to convince the assembly, but a pry bar ultimately freed it from the axle.

8b

September 59

With the bearing assembly out of the way the entire area was sprayed with Brakleen Brake Parts Cleaner and wiped with a rag to remove loose and stuck-on debris.

Anti-seize compound was applied generously to the axle spline after cleaning. Coating the spline will control corrosion between the metal components and make it possible to remove the bearing assembly later with less binding.

Any areas that showed a presence of rust were scrubbed with a scuff pad and wiped clean.

The bearing assembly is a one-piece component that must be kept clean before installation onto the axle spline. At this point, the process is pretty much reversed. Position the bearing assembly onto the spline and rotate it into position to line up the bolt holes.

60 RV Enthusiast

The center nut was tightened as were the four bolts in the back of the bearing assembly. The center nut and the four bolts in the back must be torqued to factory specifications after tightening with the impact wrench.

From here the steps were the same as if doing a brake job. The rotor and hub assembly were replaced, and the brake calipers and pads were reassembled.

A few taps of the hammer and the brakes on both sides were reassembled. With the calipers in place, the wheels and tires were remounted and the lug nuts torqued to specification. Job done. **RVE**

parts.revgroup.com/store

62 RV Enthusiast