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FEBRUARY 2015

New Horizons Majestic

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Appalachia, West Virginia and Pennsylvania

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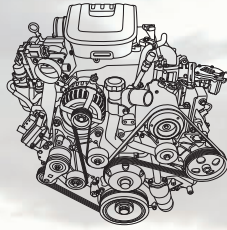
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¹Requires 3500HD Crew Cab DRW 4WD with available Duramax 6.6L Turbo-Diesel V8 engine. Before you buy a vehicle or use it for trailering, carefully review the trailering section of the Owner's Manual. The weight of passengers, cargo and options or accessories may reduce the amount you can tow. ²The Chevrolet Silverado HD received the lowest number of problems per 100 vehicles among large heavy-duty pickups in the proprietary J.D. Power 2014 Initial Quality Study.SM Study based on responses from 86,118 new-vehicle owners, measuring 239 models and measures opinions after 90 days of ownership. Proprietary study results are based on experiences and perceptions of owners surveyed in February-May 2014. Your experiences may vary. Visit jdpower.com. ³Dependability based on longevity: 1987-April 2013 Full-Size Pickup registrations. ©2015 General Motors. All rights reserved. Chevrolet® Chevrolet emblem® Chevy™ Duramax® Silverado®

2015 model shown.

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Appleton, Wisconsin

➤ See the Grand Canyon and other national parks for free eight more days this year. Page 14

On the cover: Enjoying the late-afternoon sunshine of Palm Springs, California, with New Horizons' Majestic fifth-wheel. Photo by Scott Hirko

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More comfort on the move

The Sky's the Limit

Highline fifth-wheel ownership may be only a dream for most, but all RV enthusiasts enjoy the trickle-down benefits



Luxury." It's a word that resonates loudly among the wealthy. For RV enthusiasts looking for luxury who prefer to tow a trailer, a fifth-wheel is usually their preferred choice. And a few manufacturers specialize in transforming fifth-wheels into palaces on wheels. Many of these fifth-wheels border on opulence, as the designers are let loose to choose materials, fabrics and appliances. Working closely with discriminating buyers, these manufacturers create ultra-luxurious fifth-wheels that are often one-of-a-kind creations. Prices for some of these fifth-wheels are pushing \$300,000, and that's without a tow vehicle!

The New Horizons Majestic featured on page 36 is an example of a luxury fifth-wheel where all the stops have been pulled. The company's roots can be traced to building solid, high-quality fifth-wheels targeted at full-timers. Over the years the stable of builders who could customize interiors and systems to suit full-timers has dwindled. Names like Travel Supreme and AutoMate have disappeared from the scene. Today, a handful of builders have business models that cater to full-timers and offer customization. Joining New Horizons are Forks and Spacecraft.

All of these companies have made an art form out of crafting high-end fifth-wheels where the sky's the limit. "Carnies" in Europe have been known to sink half a million dollars into special-order fifth-wheels that can be used to tour the circuit. Hey, if you're going to be on the road for business, it might as well be in extreme comfort and luxury.

For most people, this kind of opulence is out of reach, and we get letters from readers when articles are published on super-luxurious trailers that also require stout — and very expensive — tow vehicles. Readers typically ask why we feature articles on trailers most people will never be able to own. While they're fun to look at, there's a more practical reason.

Luxury trailers are the R&D centers for the rest of the industry. Many of the amenities that show up in trailers in all price categories have trickled down from builders of luxury fifth-wheels. RV industry designers are very adept at finding lower cost materials that simulate items found in highline trailers, like galley counters, upholstery and accessories. The beneficiaries are everyone who enjoys the lifestyle.

Trailer and fifth-wheels look better than ever. True, most of us will only window-shop for luxury fifth-wheels, but the enjoyment of ownership — whether entry-level or highline — is universal. 🚐

— Bob Livingston, publisher

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DID YOU KNOW?

Glenn Curtiss, known as the Father of Naval Aviation and an early bicycle and motorcycle racer, invented the fifth-wheel hitch. He used the spare tire — a "fifth wheel" — on his auto as the basis for the receiver.

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The Truth About Half-Ton Towables

Thank you, thank you, thank you, Chris Hemer, for your article in the December 2014 issue about the importance of the weight-carrying capability of half-ton pickups. I suspect that many RV purchasers don't even consider this when the salesperson tells them the unit they are looking at is half-ton towable.

I believe it is fair to say that "Half-Ton Towing: Fact or Fiction?" proved that the question is no longer debatable. Chris Hemer showed that you can pull some fifth-wheels with a half-ton pickup as long as you don't mind driving at the ragged edge of the truck's performance with no reserve.

Gary Gardner, Crystal River, Florida

Wow! You almost need to be a math major to solve the formulas in the article on half-ton towing. The fact is, half-ton towing of fifth-wheel trailers will always be right at the maximum allowed weights. Assuming two passengers at 300 pounds is part of the myth, too.

Bill Reidy, Hendersonville, Tennessee

While I found Chris Hemer's article interesting, I think he didn't delve deeply enough into what defines "half-ton" trucks. Looking through the entire brochure of my Ford F-150, nowhere does it say or list the pickup as a half-ton truck. The towing and payload are listed, but it's left up to the owner to tow what is correct and legal. This is why you print a *Guide to Towing* every year with numerous pages of weight limits, because no two trucks are the same.

Jim Thiel, Appleton, Wisconsin

Missoula's Merry-Go-Round

I'm writing to let you know that Bill Graves' "Rocking Around the Carousel" in the December 2014 America's Outback column was wonderfully written. I must confess that as I finished reading the last paragraph from Heidi Kestrel, whose son is afflicted with autism, my eyes were filled with tears, and I had a lump in my throat. No doubt, many readers of the column experienced the same symptoms. I'm putting Missoula's carousel on my bucket list and hope that soon a cure will be found for autism.

Keep up the fine writing.

Bob Motschmann, Berne, New York



You definitely got my attention with the half-ton towing article because weights matter, regardless of the size of your truck. While I own an HD truck, I completely agree that half-ton pickup owners must adhere to Chris Hemer's closing paragraph about balancing GCWR, GVWR and GAWR, and allowing a margin of safety.

I am driving the point because I adhere to Hemer's comments every time I hitch up with my 2008 6.4-liter F-350 dually (4:10 axle ratio). While my particular model has a GCWR of 23,500 pounds, I will never be able to actually achieve that because of two stickers on the inside of the driver's side doorjamb. The first sticker states GVWR at 13,000 pounds, front GAWR at 6,000 pounds and rear GAWR at 9,000 pounds. The second sticker states the maximum occupant and cargo weight is 4,434 pounds.

I have weighed my rig on two occasions, and the numbers are surprising. What is more surprising

is that my fifth-wheel is a midprofile (dry weight of 11,105 pounds and GVWR of 13,920 pounds). On the second trip to the scale, with no water in the tanks, my truck's GVW was 11,900 pounds, and the actual occupant and cargo/pin weight was 3,690 pounds. That left me with 744 pounds of payload capacity, and total weight was 21,760 pounds. If it would get close to 23,000 pounds, I would for sure bust the GVWR or the maximum occupant/cargo weight on my truck.

After knowing my numbers, it makes me wonder how that F-250 pulling a 41-foot toy hauler ever got off the RV lot.

John Collins, El Paso, Texas

Please have Chris Hemer look at the Toyota Tundra Limited. We have a 2014 Tundra Limited, pull a 2015 Grand Design Reflection 303RLS fifth-wheel, fully loaded (without water), and fall within the capacity for towing with two adults and two vizslas. It rides and tows great, even through the mountains!

**Dave and Linda Brenner
Hamilton, Michigan**

Footing the Bill in Sedona

Emily Fagan's December 2014 article, "Arizona's Red Rock Country," about the wonderful scenery around Sedona was very good. The only thing she failed to mention are the fees associated with



the hiking trails. While there is no fee for using the trails, there are fees for parking near the trailheads, and they do write citations for not paying.

Roger Lawrence, Dolores, Colorado

Head of the Tables

Regarding Polly Morgenstern's December letter, "Nonnegotiable Nightstands," we, too, searched for decent night tables, or even one at all, in a new RV. Check out the RVs from Grand Design, such as the Reflection 27RL fifth-wheel featured in *Trailer Life's* December 2014 cover story.

Nightstands were a deal breaker for us as well, and they were part of the reason we purchased our Reflection.

Denny Olvany, Carriere, Mississippi

RVing in the Real World

We have been readers of *Trailer Life* since we bought our first RV in 2008, and the magazine was very helpful

when we were looking for our latest trailer. We agree with the "What Were They Thinking?" letters in the December 2014 issue.

We had a Skyline Weekender for our first RV, and it was great, except that our three dogs took up all the room. Skyline provided an owner's manual, specific to our model, and we were able to get all the other manufacturers' information for what was not in the manual, like the axles and brakes. Being do-it-yourselfers, we were able to find out how to repack the wheel bearings and check the electric brakes.

Our new trailer is a Forest River Flagstaff with lots of room for the dogs and us, but its owner's manual is generic to every Flagstaff. Forest River did provide some of the appliance manuals, but we can't even find out who makes the axles or brakes. We really like this trailer, but better

manuals from RV manufacturers would be nice.

Ron and Melody Schmitz, Porter, Texas

I have to agree with December's "What Were They Thinking?" letters. Manufacturers of trailers should live for a few weeks in their products before they put them on the market. I own a 2013 Keystone Fuzion fifth-wheel trailer. The manual is rubbish, and all the little issues with the trailer would not be there if the design had been tested on the prototypes.

John Milward, Palmer, Alaska

My wife and I agree with the letters about manufacturers that obviously don't test their own RVs to find design flaws or poor workmanship. We have a 2014 Palomino Columbus fifth-wheel that is a good trailer overall, but the repairs I have had to do just shouldn't have happened. If the manufacturers

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LETTERS

would road test their products on some of our older interstates, they would do a better job during assembly of the RVs we purchase from them.

I worked in manufacturing most of my life and can usually repair things myself, but I feel sorry for the people who have to go back to the dealer every time something needs fixing.

Glenn Alford, Fayetteville, Arkansas

Where do RV manufacturers find the people who design their floorplans? Why would anyone design a kitchen that is useless unless a slideout is out? Want to fill the fridge or pantry? Out goes the slide. Want to make lunch in a rest area or parking lot? Oh, wait, the slideouts have to stay closed. Have the designers tried to use these floorplans in the real world?

Tom Hawkins, Evansville, Indiana

Remember the Little Guys

My wife and I have traveled all across the Lower 48, as well as Canada and Alaska in our 25-foot Class C with a solar panel on the roof. We have no slideout, TV, microwave or convection oven. For this reason we can dry camp and not annoy anyone with our generator, which gets used mostly when we're backcountry skiing.

We are becoming concerned that people who pull or drive apartments-on-wheels are demanding larger camping sites with all the bells and whistles, which is going to lead to higher rates for the rest of us. Whatever happened to using a coffeepot to perk your morning brew, steaming your food to reheat it on the propane stove and sitting outside without the TV blaring?

Robert Schmidt, Fort Collins, Colorado

For us, camping is not a \$100,000 home-on-wheels with a 40-inch TV and a wine cooler. We camp to get away, not take it with us.

Ken and Valerie Kowal, Seadrift, Texas 📧

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Nearly 2,000 history-minded hobbyists gather each February to depict Florida's largest Civil War battle. (Right) Re-enactors set up camp to portray all aspects of the military engagement.



Florida's Civil War History

Each February, Olostee Battlefield Historic State Park commemorates the Sunshine State's famed four-hour skirmish

article and photos by **Dave G. Houser**

Peering through a cloud of acrid smoke at a line of musket-firing soldiers and cringing from volley after volley of ear-pounding pyrotechnics, I'm beginning to imagine myself a front-line war reporter. The furious action taking place just a few yards away is part of an amazingly authentic replay of Florida's largest Civil War Battle.

On February 20, 1864, Union and Confederate armies clashed in the pine barrens of north-central Florida near a small railroad town named Olostee, about 15 miles east of Lake City. The Battle of Olostee, fought by 10,000 cavalry, infantry and artillery troops, raged on for more than four hours, and when the smoke cleared, the Union Army had been dealt a stinging defeat.

The battle ended at dusk with the Federals counting more than 2,000 men dead or wounded, while Confederate losses numbered nearly 1,000. Today, the battlefield is preserved as a historic site — Olostee Battlefield

Historic State Park — and it is the scene each February of one of the largest battle re-enactments in the Southeastern United States.

The event has been capably organized and produced since 1976 by the Florida Park Service, the U.S. Forest Service, a local citizens support organization and thousands of dedicated re-enactors from around the country who have made a hobby out of their interest in Civil War history.

This is a three-day event, next scheduled for February 13 to 15, 2015. Activities open to the public get under way on Friday with a full day of activities that include demonstrations, exhibits, musical entertainment, a memorial service to those lost in the historic battle, a nighttime artillery firing and an old-fashioned barn dance staged beneath a huge tent.

On Saturday, visitors have an opportunity to tour the campsites of both Union and Confederate re-enactors that are set up authentically as they

would have been during the Civil War era. The day's activities also feature more educational demonstrations (including medical procedures of the time), period music concerts and a full-dress rehearsal of the battlefield re-enactment, set for 3:30 p.m.

More of the same happens on Sunday, leading up to what will officially be the 39th annual Reenactment of the Battle of Olostee, that gets under way at 1:30 p.m. with attacking Union cannons blasting away at Confederate positions hidden among the pines and palmettos.

RV camping is available at three Good Sam Parks in nearby Lake City, including Casey Jones RV Park, 386-755-0471, www.caseyjonesrvpark.com; Lake City Campground, 866-773-2267, www.lakecitycampground.com; and In & Out RV Park, 386-752-1648, www.inandoutrvpark.com.

For More Information
877-635-3655, www.battleofolustee.org

Small and Mighty Apex Nano

With its all-new Apex Nano, Coachmen, a division of Forest River, is targeting families and couples looking for lightweight travel trailers that can be towed with SUVs and minivans. The 7-foot 6-inch-wide lightweight trailers, consisting of four models in both slide and non-slide versions, are claimed to weigh as little as 2,604 pounds.

Construction features include welded aluminum framing, vacuum-bond laminated fiberglass side walls and composites designed for less weight. Inside, the trailer has double-bowl sinks and crowned 6-foot 6-inch ceilings. The Nano is said



to sleep four to six people, with generously sized dinettes that fold down to make into beds; three of the models also have queen beds. Spacious interior cabinets and large exterior compartments provide ample storage.

Coachmen claims that the Nano has some of the largest payload capacities in the single-axle market, with cargo ratings up to 1,200 pounds in the slide models. All Nano models have 30-gallon freshwater, gray- and black-water tanks.

The Apex Nano ranges from 20 feet 9 inches to 22 feet 4 inches, and has an MSRP starting at \$17,000.

Coachmen RV, 800-353-7383, www.coachmenrv.com

NEWSWIRE

INDUSTRY NEWS

PHOTO BY SCOTT HIRKO



Chevy Silverado Named Hottest Pickup

The Specialty Equipment Market Association (SEMA) Show, held annually in Las Vegas, is "where the newest and most innovative automotive aftermarket products and trends are seen first," said Chris Kersting, SEMA president and CEO. "SEMA recognizes the vehicles they consider the top enthusiast prospects for the coming year." At the November 2014 show, the 2015 Chevrolet Silverado won in the Hottest Pickup category. The awards were presented to company executives at a breakfast attended by nearly 3,000 industry representatives. The 2014 show featured almost 2,500 exhibiting companies that manufacture thousands of products designed to improve performance, safety and convenience, and enhance appearance and comfort.

ONE-STOP SHOP



Pilot Flying J's Three New Travel Centers

Pilot Flying J, the largest operator of travel centers and travel plazas in North America, has more than 650 retail locations. The network provides drivers with access to more than 65,000 parking spaces for trucks, 4,400 showers and more than 4,500 diesel lanes offering diesel exhaust fluid (DEF) at the pump.

The company recently opened three new travel centers at the following locations:

- Junction, in the Texas Hill Country river valley — located at exit 456 off Interstate 10 at 2342 N. Main Street.
- Mount Pleasant, Iowa — located near the intersection of highways 34 and 27 at 1300 N. Grand Avenue.
- Jasper, Florida — located at 8067 State Road 6 W. near State Route 100.

FACE THE MUSIC



Winnebago Spyder Gets Premium Audio System

Rockford Fosgate, maker of high-performance audio systems, announced that it is working with Winnebago Towables as an OEM supplier of premium audio systems that include Punch amplifiers, speakers, subwoofers and iPod accessory cables, for the company's new Spyder toy hauler line for 2015. According to Winnebago, the Spyder sets the standard in features and value for those who love to play in the outdoors. The Spyder has a black fiberglass exterior with graphics, radius ceilings, faux concrete countertops and black galley sinks — plus it has a top-notch sound system. For the toys, there are 6,000-pound frame-mounted tie-downs, a 7-foot 10-inch by 7-foot 6-inch ramp door, and an available pull-down screen door and patio rails.

Winter Wonderland in the Rockies

The Rio Grande Scenic Railroad is the longest and highest standard-gauge railroad in

Colorado. On March 7, 2015, the Rio Grande hosts its only winter excursion train this year. The train departs from the historic Alamosa depot at 10 a.m. and returns at 5:30 p.m. It travels over majestic La Veta Pass in the Sangre de Cristo Mountains, at an elevation higher than 9,000 feet, to the town of La Veta, where passengers have time to explore the quaint downtown. Trains have vintage diesel engines and open-air observation decks for wildlife viewing.

877-726-7245, www.coloradotrain.com



Temecula Hosts Hot Rods and Music

Temecula, California, known for championship golf courses, hot-air ballooning and award-winning wineries, has an average temperature of 70 degrees in March. This year the city's Old Town area hosts two events in March to celebrate the sunshine. The Spring Rod Run, with up to 600 hot rods and pre-1969 classic cars on display, takes place March 6 and 7. There's a family fun zone for kids and a Friday cruise night. Call 951-694-6480 or visit www.rodruntemecula.com.

The 15th annual Old Town Temecula Bluegrass Festival, with a dozen top bluegrass bands, is March 21 and 22. Daytime concerts are free; check the website for bands. RV dry camping is \$40 for the weekend. Call 951-678-1456 or visit www.temeculacalifornia.com.

RV parks in the area include Pechanga RV Resort and Casino, 951-693-1819, www.pechanga.com and Tualota Springs RV Resort and Campground, 951-767-0604, www.tualotasprings.com.

Tips for Safe Winter Travels

The National Highway Traffic Safety Administration (NHTSA) and Federal Emergency Management Agency (FEMA) have teamed up to offer a few tips RVers may find helpful to be better prepared for severe winter weather.



1. Know the local disaster risks. This is important for everyone, but even more so for individuals who find themselves in new areas of the country on a regular basis. Potential hazards can change significantly depending on locality, so RVers should be diligent to learn the risks in each area they travel to. The National Weather Service (www.nws.noaa.gov) is a great resource to learn the local forecast and seasonal outlooks, and www.ready.gov/winter-weather has information about specific hazards and what to do before, during and after each one.
2. Plan long trips carefully. Listen to the radio or television for the latest weather forecasts and road conditions.
3. Keep the fuel tank as near to full as possible. When temperatures are extremely cold, condensation can build up in a near-empty tank, potentially freezing fuel lines and leaving you stranded.
4. Check or have a mechanic check the following items on your RV:
 - **Antifreeze levels** — ensure they are sufficient to avoid freezing.
 - **Battery and ignition system** — should be in top condition and battery terminals should be clean.
 - **Brakes** — check for wear and fluid levels.
 - **Exhaust system** — check for leaks and crimped pipes and repair or replace as necessary. Carbon monoxide is deadly and usually gives no warning.
 - **Fuel and air filters** — replace as necessary and keep water out of the system by using additives
 - **Heater and defroster** — ensure they work properly.
 - **Lights and flashing hazard lights** — check for serviceability.
 - **Oil** — check for level and use the right oil for the climate. Heavier oils congeal more at low temperatures and do not lubricate as well.
 - **Thermostat** — ensure it works properly.
 - **Windshield-wiper equipment** — repair any problems and maintain proper washer fluid level.
 - **Good tires** — be sure the tires have adequate tread. All-weather radials are usually adequate for most winter conditions. However, some jurisdictions require that to drive on snowy or icy roads, vehicles must be equipped with chains or snow tires with studs. Traction devices are required for trailers on roads where chains are required.
5. Have an emergency-supply kit for your RV, just in case you become stranded, that includes pet supplies and a first-aid kit with any necessary medications.
6. Consider insulating windows and around entry and compartment doors to keep cold air out as much as possible.

For more ideas on preparing for winter weather on the road, visit the previously mentioned websites in the first tip. Safe travels!

Visit a National Park for Free!

Generally, 133 of the 401 National Park Service (NPS) sites have entrance fees that range from \$3 to \$25. For 2015, there are eight additional fee-free days to look forward to. "Every day is a great day in a national park, and these entrance-fee-free days offer an extra incentive to visit one of these amazing places," said NPS Director Jonathan B. Jarvis. While entrance fees will be waived for fee-free days, amenity and user fees for things such as camping, transportation and special tours will still be in effect.



2015 National Park Entrance-Fee-Free Days

- February 14 to 16, Presidents Day weekend
- April 18 to 19, National Park Week's opening weekend
- August 25, National Park Service's 99th birthday
- September 26, National Public Lands Day
- November 11, Veterans Day

The National Park Service, U.S. Fish & Wildlife Service, Bureau of Land Management, Bureau of Reclamation and U.S. Forest Service also participate in America the Beautiful: The National Park Service and Federal

Recreational Lands Pass. These annual passes provide access to more than 2,000 national parks, forests, wildlife refuges, grasslands and other federal lands. Four passes are available:

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Progressive Insurance, Circle 117 on Reader Service Card

What's Up with ACC Warranty?

When a New York reader couldn't get in touch with his extended RV warranty company after filing a claim for reimbursement, he put RV Resolutions on the case:

▶ I submitted a claim for \$542.33 to ACC Warranty and have not heard back, even after several phone calls. My credit card has been charged \$3,310 for a three-year renewal. I'm asking for help in obtaining a settlement for my claim and reimbursement for my renewal plan.

Marshall Sweet, East Greenbush, New York

Trailer Life's RV Resolutions department received multiple letters from readers asking for help resolving claims with ACC Warranty Group, as did sister publication MotorHome. We mailed request-for-attention letters

to the Indianapolis-based company on behalf of Marshall Sweet and other readers. The unopened envelopes came back marked: "Return to Sender. Unable to Forward." Upon further checking, we learned that the Indiana attorney general's office recently filed a complaint against ACC Warranty. The attorney general's office replied to our inquiry with the following statement:

▶ The Indiana attorney general's office's lawsuit against ACC Warranty is active, and an updated action citing 87 consumer complaints against the company was filed on November 24, 2014. As the lawsuit progresses, the attorney general's office encourages affected consumers to contact their credit card company, if they have not already done so, to dispute the charges from ACC. Also, if the consumer purchased their warranty through a dealer, they may want to contact the dealer about obtaining a refund.

**Molly Johnson, Indiana Attorney General's Office
Indianapolis, Indiana**

Black-Tank Bummer

The Zeiners have owned camping trailers since the 1960s and know a thing or two about holding tanks. When the black tank wasn't draining as expected in the couple's latest trailer, they asked the manufacturer to come up with a solution:

▶ On May 28, 2014, my wife, Helen, and I bought a new Sonic trailer, manufactured by Venture RV, a division of KZ. After a few days of using this trailer, I realized that the toilet was not draining as it should. We were on a trip, so I drained the black tank as I have always done. The next morning when the toilet still wasn't draining properly, I again drained the black tank, hooked up the hose and flushed it for about five minutes. That night I realized the toilet was not draining at all. I looked down into the toilet with a flashlight to see that it had debris within 6 inches of the ball valve and water sitting on top of it.

I got out an awning rod and stuck it down into the blockage. After some stirring and pushing, the blockage finally cleared, and I again drained the black tank. When we got home, I found that the tank has only 4 inches

of clearance between the inlet and the bottom of the tank. With this design, black-tank problems are going to be an issue for as long as we own this trailer.

The dealer, Colerain RV, contacted KZ on this matter. I also sent KZ a letter asking the factory to help. To date, we have not heard back. I know there are ways of using a black tank and making sure that the water sloshes around so the tank doesn't get blocked. However, this tank just doesn't have enough clearance for the contents to get away from the bottom of the toilet, and I'd rather not have to use an awning rod again.

We have never felt the need to ask for help from *Trailer Life*, but because a one-year warranty is a short one, we're doing so now. I hope you can look into this matter and get a good resolution so we can get the

enjoyment out of the Sonic RV that we hoped for when we purchased it.

Joe Zeiner, Greencastle, Indiana

After RV Resolutions sent a petition to KZRV on the Zeiners' behalf, Joe Zeiner received a phone call from the corporate vice president:

▶ I had a phone conversation and follow-up letter from Delbert Miller at KZ concerning the problem with our Sonic trailer. He was very congenial and apologized for the problems. By mutual agreement, we decided to wait until spring or summer of 2015 when the weather is better for me to tow the RV to KZ's facility in Shipshewana, Indiana, for repairs. I feel satisfied that KZ will follow through and resolve our issues. Thank you for your intervention in this situation.

J.Z. 📧

NEED HELP? » RV Resolutions is a forum for the settlement of conflicts between consumers and RV dealers and manufacturers, accessory suppliers and service providers. After exhausting all other resources without success, please send a typed letter to *Trailer Life* RV Resolutions, 2750 Park View Court, Suite 240, Oxnard, California 93036. Include copies of appropriate bills and correspondence as well as a self-addressed, stamped envelope.

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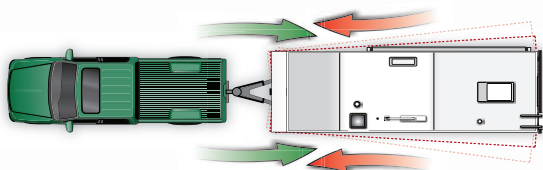


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Splendor **IN THE ASH**

A century ago, nature unleashed its fury from Northern California's Lassen Peak. Now the national park that surrounds the southernmost volcano in the Cascade Range is known for spectacular hikes, fascinating geology and bubbling hot springs

Peter Lassen was one of us. He explored new places, dressed casually, hiked incessantly, liked campfire cooking and even towed a vehicle of sorts. His had four legs, but it served the same purpose as a camping trailer — hauling stuff. Lassen also shared a trait common to male members of our tribe; his sense of direction occasionally faltered. The Lassen Trail that he is famous for, promoted as a “shortcut” to the California Trail, was widely disparaged during his lifetime as being longer than necessary and unduly arduous. Lassen was murdered under mysterious circumstances in 1859, and some blamed disgruntled travelers who regretted following his lead.

Named for the famed — or infamous — explorer, Lassen Volcanic National Park is a 106,000-acre expanse in Northern California between Redding on the





(Above) From the top of Cinder Cone, hikers can see Mount Shasta. (Above right) Brokeoff Mountain in the distance was once the dominant feature in the region but is now a mere shadow of its former self. (Below) The rubble at the base of Lassen Peak is a remnant of volcanic eruptions.

west and Susanville on the east, about 230 miles northeast of San Francisco. The park's namesake is a 10,457-foot plug-dome volcano that last erupted several times between 1914 and 1917. Still considered active, Mount Lassen could elect to shower ash throughout the region at any time.

If you're a volcano kind of person, you can spend a great deal of time in this mountain range, visiting nearby Mount Shasta as well as Mount Hood in Oregon, and Mount Rainier and Mount St. Helens in Washington, the latter the only one to have erupted since Mount Lassen, in 1980. All are part of the Cascades, a string of volcanic and non-volcanic peaks that extends north into British Columbia.

Many of our national parks were

established to preserve and protect a unique natural resource, and that is certainly the case here. This is one of the few places in the world where all four types of volcanoes can be found in one region. Lassen Peak is the plug-dome variety (formed from thick lava), and the surrounding lava fields are as impressive today as they were when the last eruption occurred. The park's Prospect Peak is a shield volcano (formed from fluid lava), Mount Tehama is a composite volcano (formed from alternating layers of lava, ash and cinders) and Cinder Cone is, naturally, a cinder cone (formed from particles ejected from a single vent).

The main part of the park is reached by two entrances. Coming from the north on Interstate 5, Route



No motorboats allowed: Manzanita Lake is a fine place to paddle, float or fish for native trout.

SPLendor IN THE ASH



The Cinder Cone Nature Trail, with its trailhead at Butte Lake Campground, ends with a 750-foot ascent. In hot weather, take water and have a picnic lunch at the base.

44 from Redding and Route 89 from Mount Shasta leads to the northwest park entrance, near the historic Loomis Museum. Coming from the south, State Route 36 leads from Red Bluff to the southwest entrance, near park headquarters and the year-round visitor center and café. Open seasonally, the 30-mile Lassen National Park Highway connects the two entrances and Route 89. The

scenic road wends through mountainous terrain populated by wildlife and is not recommend for vehicles with a total length longer than 45 feet.

Entering from the south, one of the first areas to visit is Brokeoff Mountain, of interest historically as a remnant of what was once the dominant volcano in the region, Mount Tehama. Originally 11,000 feet in height and 15 miles in diameter, the peak eventually

collapsed, leaving less impressive vestiges of its former self. The nearby Sulphur Works and colorfully named Bumpass Hell geothermal sites showcase the fact that there is still plenty happening deep underground, with bubbling hot springs and spewing fumaroles.

Within the park are four RV-accessible campgrounds, none offering hookups (see "Camping Near



Lassen Peak and the devastated area visible in the distance contrast with grassy meadows that grow only a few miles away.

the Volcano” on the right). The most popular and largest is Manzanita Lake, just inside the northwest entrance. Located on a pretty lake, its 179 campsites offer easy access to a restaurant, showers, fuel, a dump station and facilities for the handicapped. It is also the site of a seasonal museum (summer and fall) that is well worth a visit for several reasons, not the least being some great photography documenting the century-old eruptions. The lake is a fine place for those with kayaks or canoes, as motors are not allowed. Like the other four campgrounds, Manzanita Lake is open seasonally with a vehicle-length limit of 35 feet.

Near the center of the park, Summit Lake Campground is for those willing to forgo most of the amenities but little else. The smaller but still beautiful Summit Lake is a fine place to launch your canoe or kayak, or take a brisk swim in cool water. The campground has north and south sections, with the major differences being that the north end accommodates vehicles up to 35 feet and has flush toilets, and the south end accommodates vehicles up to 30 feet and has vault toilets.

The last campground in the main part of the park is Craggs, with 45 sites, vault toilets and no lake access. It’s a good basecamp for backpackers wanting to hike the Nobles Emigrant Trail east to Butte Lake or beyond. William Nobles was a contemporary and occasional exploring companion of Peter Lassen, and his trail quickly foreshadowed the Lassen Trail as a preferred route west during the mid-19th century.

One of my favorite spots, and a wonderful place to camp, is Butte Lake Campground in the more remote northeastern corner of the park and the site of the Cinder Cone. The hike to and up that volcano is not to be missed. From the campground, the Cinder Cone Nature Trail leads 1.2 miles to the base of the volcano. Then the workout begins, as you hike to the top and, if you wish, into the caldera, the bowl formed by the last eruption.



Manzanita Lake Campground

CAMPING NEAR THE VOLCANO

LASSEN VOLCANIC NATIONAL PARK

The national park has four campgrounds that allow RVs up to 35 feet. These campgrounds don’t have hookups but do have picnic tables, fire grills, food lockers, drinking water and flush or vault toilets. Reservations: 877-444-6777 www.recreation.gov

Butte Lake Campground

101 sites, some pull-through. Near Cinder Cone Nature Trail, the best hike in the park.

Craggs Campground

45 sites, vault toilets. Access to Nobles Emigrant Trail.

Manzanita Lake Campground

179 well-spaced sites. Nearby museum, store with groceries and LP-gas, dump station, and coin-operated showers and laundry.

Summit Lake North Campground

46 sites. The adjacent south campground accommodates smaller RVs up to 30 feet.

LASSEN NATIONAL FOREST

Two U.S. Forest Service

campgrounds in the Hat Creek Ranger District offer first-come, first-served dry camping for smaller RVs and few amenities but great locations for trout fishing. 530-335-7517 www.fs.usda.gov

Cave Campground

46 sites for RVs up to 22 feet, some open year-round.

Hat Creek Campground

57 sites for RVs up to 30 feet. Next to Spattercone Nature Trail.

COMMERCIAL RV PARKS

National parks and forests have vehicle limitations that prevent larger RVs from camping on-site. For RVers who don’t travel light, a number of full-service campgrounds on the way to Lassen Volcanic National Park welcome RVs of all sizes. For a list, go to www.goodsamcamping.com.

Chester Cedar Lodge and RV Park

About 30 miles from the southeast park entrance. 530-258-2904 www.cedarlodgfun.com

Hat Creek Rancheria RV Park
Good Sam Park on Route

89, 40 miles from the northwest park entrance. 877-335-0203 www.rancheriarvpark.com

Old Station Hat Creek Resort and RV Park

On Route 89, 11 miles from the northwest park entrance. 530-335-7121 www.hatcreekresortrv.com

Red Bluff

Durango RV Resort
Good Sam Park on I-5, 40 miles from the southwest park entrance. 866-770-7001 www.durangorvresorts.com

Red Bluff RV Park

On I-5, 40 miles from the southwest park entrance. 530-529-0687 www.redbluffrvpark.com

Redding

Mountain Gate RV Park
Good Sam Park on I-5, 50 miles from the northwest park entrance. 800-404-6040 www.mt-gatervpark.com

Shingletown

Mount Lassen/ Shingletown KOA
On Highway 44, about 18 miles east of the northwest park entrance. 530-474-3133 www.mtlassenrvpark.com



A trail leads up the side of the volcano that is only 750 feet or so in length, but it's like sloggng through sand all the way, and even the super-fit will know that they've been on a strenuous hike. But it must be done, because the views are wonderful. Take water and take your time.

The Butte Lake area is off by itself, reached by a separate entrance and a well-marked, well-maintained gravel

road. The campground has 101 sites for vehicles up to 35 feet, flush toilets and its own little lake. Rather than being surrounded by forest, the lake has the appearance of a catch basin where volcanic rock was dropped in a bowl shape, then filled with water for our use. Canoes and kayaks are popular here, and there is less traffic than at most of the other campground lakes.

For those with smaller rigs

desirous of a more primitive experience, two nearby national forest campgrounds deserve mention. On the way to the northeast entrance to Butte Lake on Highway 44, you'll pass three campgrounds, two of which host RVs. Cave and Hat Creek campgrounds are similar, the former being able to handle rigs up to 22 feet and the latter accommodating rigs up to 30 feet. Both have drinking water and

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FOR MORE INFORMATION

Lassen Volcanic National Park, 530-595-4444, www.nps.gov/lavo

Five entrances provide vehicle access to the national park: the main northwest and southwest entrances on State Route 89, and unpaved roads entering near Butte Lake in the northeast and Drakesbad and Juniper Lake in the south. Although the visitor center and café are open nearly year-round (check the website for closures), most of the park opens in mid-May and closes in late September or October, depending on location and weather.

(Left to right) Rock avalanches formed what's known as Chaos Jumbles, a rubble-strewn trademark of volcanic activity. The park's 150 miles of hiking trails include 17 miles of the famed Pacific Crest Trail, which stretches more than 2,600 miles from Canada to Mexico. At 7,000 feet, Summit Lake ripples next to two of the park's most popular campgrounds. The lake is a good spot to have a picnic and take a dip in the chilly water.

flush toilets, and the creek runs right past the campsites. Hat Creek is well known to people who fish for trout in California, so if that resonates with you, take note.

Hikers will find much to keep them amused as well. Beyond the must-do Cinder Cone Nature Trail, another good choice is the Bumpass Hell Nature Trail, a 3-mile round-trip offering an education in aromatherapy,

featuring odiferous things like volcanic mud pots and fumaroles. If you crave consistency, have a deviled egg sandwich for lunch. The Devils Kitchen Trail is similar and comes in at 4.2 miles round-trip. For views, try the Lassen Peak Trail, a 5-mile round-trip with a 2,000-foot elevation gain that will reward you for making the effort.

Off-roaders, of course, are a subset of the trailer crowd, and they

have a large playground in these parts in the Lassen National Forest Backcountry Byway. If your toy is street-legal, you can drive 187 miles on a series of mostly dirt and gravel roads, past volcanoes, ghost towns, abandoned mines and backcountry lakes too numerous to count, enjoy all manner of unforeseen experiences and come home dirty.

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FOWL PLAY

Like RV snowbirds, our feathered friends are soaking up the sun before flocking back to their northern breeding grounds. Here are five places to get a bird's-eye view of everything from crested caracaras to sandhill cranes along North America's migratory flyways



In the past decade, the popularity of birding has skyrocketed. Entire shops are devoted to backyard birding, and some of the most visited Internet sites are nest cams. Who hasn't watched a V of geese head south, sought a ruby bird in a bush or cracked a smile at the larceny of a gray jay or opportunistic gull? Birding is a natural calling, and it pairs perfectly with RV camping. The fast-evolving driving routes known as birding trails just speed the marriage along.

Birding trails stitch together parks, preserves, wetlands and other sites where birds feed, stop over and nest. The ecotourism concept for unifying these spots by geographic area and byway started in Texas in 1996 with the Great Texas Coastal Birding Trail.

Situated on the Mississippi and Central Flyways, with more bird species than any other state, Texas was a natural place for inspiration to strike. The concept has since spanned the nation and jumped the border to Canada, becoming the best Texas export since picante sauce.

RVers luck out because many of the routes roll past public and private campgrounds, and all lay out ready-made itineraries. Birders can stroll boardwalks, hunker in blinds (actually, many are quite comfortable) and grow their lists of sightings, as well as hike, canoe, sightsee, fish, picnic and uncover the past. And, of course, photographers are bombarded with subjects.

Devoted to responsible birding, the nonprofit American Birding Association (www.aba.org) is a clearinghouse for recreational birding information. Other

Web resources include *Audubon* (www.audubonmagazine.org), *Bird Watcher's Digest* (www.birdwatchersdigest.com) and Environment for the Americas (www.birdday.org).

For the most current information, tap local Audubon chapters and state park and fish and wildlife departments, and check the racks at local and state visitor centers for printed materials. Colorful, detailed brochures showcase the drives, which tend to be well signed on the ground.

Site listings can include directions, hours, fees, facilities and activities, as well as hint at some of the feathered attention-grabbers. Although some sites can accommodate RVs, others are better suited for passenger vehicles. Sometimes the hunt begins right in camp (see "Where to Nest" on page 27).

The selection of well-known and obscure stops comes from insider knowledge. Onsite interpretive boards and turn-card ID displays can help with bird identification.

Seasonal migrations along the Atlantic, Central and Pacific Flyways amp up excitement; so, too, does a rare interloper. Years ago while traveling

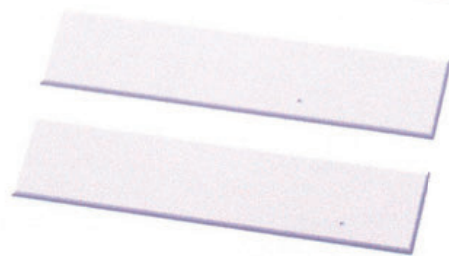


Texas birds of a feather (top to bottom): An orchard oriole at Port Aransas' Leonabelle Turnbull Birding Center, a laughing gull at Mustang Island State Park and a reddish egret in Rockport.



The author observes birds in the tree canopy at Santa Ana National Wildlife Refuge in Texas and (left) at California's Mono Lake Tufa State Reserve.

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California's Mono Basin National Forest Scenic Area (above from left): Walking the David Gaines Memorial Boardwalk, accessible from an easy 1.5-mile path from Old Marina, and watching a gull gorge on brine flies.

WHERE TO NEST

As one might guess, camping opportunities along birding trails vary widely from federal, state and local parks to commercial RV resorts. The official travel routes cover big stretches of countryside, so there's usually ample camping. You also can focus on a single locale. Some birding trail brochures mention camping; some birding sites are even at campgrounds. We tend to match our birding to the vicinity where we are camped or otherwise traveling. If we're strictly birding, we look for either a nearby city (to help narrow the camping search) or suitable park at which to base. In the northern-tier states, the change of seasons and accompanying campground closures can present challenges when chasing spring and fall migrations or seeking wintering bald eagles. A good Internet search, flexibility and a sense of humor will ease travel; so, too, will a good sighting.

the Idaho Birding Trail, my husband and I spotted a Chilean flamingo. Escaped from Utah's Tracy Aviary, this Pink Floyd was popping up all around the West. In new areas, homegrown species can get the heart pumping. To report a rare bird, go to North American Rare Bird Alert at www.narba.org.

Birding trails have led us across the West, and we've traveled parts of the Great River Birding Trail along the Upper Mississippi River and the Connecticut Coastal Birding Trail, still in development. In Pennsylvania we followed the Susquehanna River Birding Trail, retracing the 1829 journey of John James Audubon. And in Washington state, we were torn between watching snowflakes swirl around wintering bald eagles on the Upper Skagit River and a confetti of snow geese lifting off silent fields in the lower Skagit Valley. Wherever we wander, we try to locate a nearby birding trail to enrich our travels.

Here are five to get you started.

GREAT TEXAS COASTAL BIRDING TRAILS

www.tpwd.state.tx.us/huntwild/wildlife/wildlife-trails

No roundup would be complete without the trail that started it all. Divided into its Upper, Central and Lower reaches, the Great Texas Coastal Birding Trails' 43 driving loops knit together 300 sites, including Santa Ana National Wildlife Refuge and South Padre Island. More than 450 of the state's 600 bird species find habitats in the coastal waters, marshes, shores, scrub reaches and woods.

Within minutes — not hours — we spotted skimmers (the emblem for the coastal drive),

crested caracaras, laughing gulls, spotted sandpipers, blue herons, reddish egrets, willets and turnstones. Warblers serenaded us, while indigo buntings, scissor-tailed flycatchers and itty-bitty hummingbirds treated the eye. All the while we enjoyed the walking paths, boardwalks, fishing piers, levees and gulf-washed shores, tourist attractions and places of history.

Following its success at the coast, Texas has added four inland birding trails for border-to-border coverage: Far West, Panhandle Plains, Heart of Texas, and Prairies and Pineywoods. With nearly 1,000 stops, birding Texas will keep you wheeling and reeling.

At several park campgrounds along the routes, blinds and feeding stations attract birds. At the blinds, knowledgeable birders are eager to share — just don't scare off your subject.

CALIFORNIA'S EASTERN SIERRA BIRDING TRAIL

www.easternsierrabirdingtrail.org

This driving route unites big distances and breathtaking scenery with birding, visiting 40 sites, with Mono Lake the magic orb. Mono Lake's unique chemistry, three times more saline and 80 times more alkaline than the ocean, fashions tufa towers (cavelike formations) and supports an unusual wildlife population of alkali flies and brine shrimp. These critters, in turn, support nesting and migrating California gulls, eared grebes and phalaropes.

Here, even single bird species can number in the millions. In late summer, Wilson's phalaropes voraciously feed, doubling in size

for a jaw-dropping three-day nonstop 3,000-mile flight to South America. Gulls feed at the brine-fly-darkened ring of Mono Lake. Although most peck like chickens, you may spot an innovator like the charging vacuum cleaner we saw. Bill widened, head down, this gull raced headlong into the ankle-high cloud of flies, scooping up all in its path. With a gulp and spin, it would then repeat the run in the opposite direction.

The lake is a year-round destination with boardwalks and shoreline trails, bird counts done by volunteers, and canoeing and kayaking in July and August.

Other eastern Sierra stops take you to the high-mountain ghost town of Bodie and the unusual volcanic rock formation of Devils Postpile National Monument, and into canyons, forests and lake basins where you can discover other species.

A meadowlark atop a fencepost in Kearney County, Nebraska.



The author scans for sandhill cranes from a camouflaged photo blind at Nebraska's Rowe Audubon Sanctuary, a 1,150-acre refuge in the Platte River Valley.

NEBRASKA BIRDING TRAILS

www.nebraskabirdingtrails.com

I have always eased into Sunday with *CBS Sunday Morning* and its final unreported-on moments in nature. These few seconds introduced me to sandhill cranes and Nebraska's Platte River. The large, elegant, seemingly mythical birds flew out of the screen and into my imagination, making the Platte River a must-see on my Nebraska adventure. Not even the sub-freezing temperatures and biting winds of an unusually cold spring blunted my determination, although camping at that time was a bit hard to find.

Nebraska Birding Trails unite 15 drives and 400 public birding sites, including more than two dozen globally significant bird areas. Our Platte Valley encounters included sandhill cranes, bald eagles, snow and Canada geese, kestrels and hawks. Along farm roads, we watched the cranes feed, jump, dance, stomp, nod and toss grass. We waited in the predawn hours with fellow devotees for the instantaneous morning fly-offs — first the geese, then the

cranes. At dusk, we'd be back for the straggling returns of 50, 100 and 500 cranes to their chosen nighttime posts on the river.

Half a million cranes mark spring on the Platte. The chortling confusion and air-displacing whooshes of the great broad wings are forever memories.

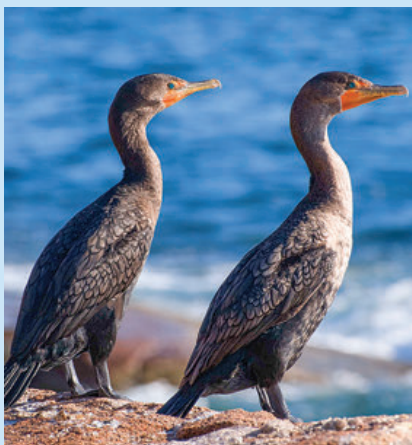
But east-to-west-stretched Nebraska has plenty to offer year-round. In this land bridge, you can view species of the Great Plains and some more common to the bordering Rocky Mountain states. Routes visit the Niobrara and Missouri rivers, pinewoods, wetlands, sandhills, and short and tallgrass prairies. Boyer Chute National Wildlife Refuge on a generous bend of the Missouri River allowed us to combine birding with listening to the whisper of a restored tallgrass habitat.

Whooping cranes, sharp-tailed grouse, prairie falcons and golden eagles, colorful tanagers and warblers, and burrowing owls chummying with prairie dog towns all delight in Nebraska.



BIRDING BASICS

It's important to select a pair of binoculars that you actually are going to carry with you and use. If the pair is too heavy, awkward to handle or difficult to focus, you may miss out. With modern optics, a number of compact binoculars meet the requirements of ease, strength and price point. Avid birders say each user should have his or her own pair, fitted and ready to aim, so no behavior or sighting is missed and marriages are saved.



Black vultures convene at Florida's Lake Woodruff National Wildlife Refuge.



GREAT FLORIDA BIRDING AND WILDLIFE TRAIL

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A 2,000-mile roadway mesh organized into four sections — East, West, Panhandle and South — overlays the Sunshine State, gathering 500 birding sites. In each region, gateway stops help orient visitors. Examples include Merritt Island National Wildlife Refuge (East), Paynes Prairie Preserve State Park (West), St. Marks National Wildlife Refuge (Panhandle) and Corkscrew Swamp Sanctuary (South). Birding spots within an hour of each other are grouped for a buffet of preplanned mini-drives. With more than 500 bird species, you may ruffle thin the pages of your *Sibley Guide to Birds*.

Florida's diversity of swamps, hardwood hammocks, rivers of grass, longleaf pine and saw palmetto, sand hills, prairies, and salt- and freshwater environs host dabblers, waders, seabirds, songbirds and birds of prey. For up-close viewing, Florida birds are far more accommodating than any in the West. A great egret even cornered us on a dock. It arrived after us, blocking our exit. As we tried to grant it a safety margin, it advanced even closer, pinning us at the rail for a shared sunset.

In east Florida, we walked the levee trails of Lake Woodruff National Wildlife Refuge with a hopping entourage of black vultures. On Merritt Island's Black Point Drive, roseate spoonbills, grackles, egrets, anhingas, moorhens, tricolored herons, rodent-stalking storks and frog-eating rails grew our lists. Other Florida creatures earning notice were armadillos, alligators, dolphins and manatees.

Wherever you may travel, you don't need to learn ornithology to enjoy birding — just look and listen. 🐦

Maine attractions: A great blue heron and cormorants at Acadia National Park (above from left), and bird-watching from Mount Battie in Camden Hills State Park (below).

MAINE BIRDING TRAIL

www.mainebirdingtrail.com

Maine, with its North Woods, sea-shredded coastline, blueberry barrens, beaver ponds, marshes and bogs, peaks, wild rivers and lakes, is ideally suited for birds and birding trail travel. Its statewide driving network visits eight regions and more than 80 birding sites.

We easily combined birding with our interest in the state's celebrated lighthouses, quaint villages, deep woods and moose waters, and still met such stars as Acadia National Park, Baxter State Park and Mount Katahdin, Maine's highest mountain. We hiked, canoed, camped and saw birds.

We listened to the haunting call of loons on remote waters and watched the scurry of piping plovers at Wells

National Estuarine Reserve. We saw cormorants thread the channel at Cape Neddick Light. In darkened forests, we met the chickadees, grosbeaks and crossbills associated with the Canadian boreal forest. Woodpeckers telegraphed to us from unseen locations. From atop coastal cliffs, we watched common eider ducks dive in protected bays. The clear water allowed us to easily track their underwater swims and sudden pop-ups.

At Orono Bog in Bangor, we divided our admiration between the carnivorous plants, radial blooms of sundews and nodding accoutrements of pitcher plants, and the birds in the tamaracks, ferns and bog: ducks, geese, finches, flycatchers, phoebes, vultures, hawks and eagles.



APPALACHIAN PLAYGROUND

On the West Virginia–Pennsylvania border, pine-studded peaks, serene forests and scenic state parks surround the charming community of Morgantown



Singer-songwriter John Denver knew what he was talking about when he referred to West Virginia as “almost heaven.”

This picturesque Appalachian state is studded with pine-forested mountains, flowing streams and rivers, and woodlands teeming with an endless supply of flora and fauna — simply an incredible mixture of natural wonders.

On a cross-country trip, we found ourselves in the wilds of West Virginia — more specifically in the northern part of the state, near the small city of Morgantown, just south of western Pennsylvania. What this region lacks in the way of large tourist complexes, bustling cities and fast-food convenience is more than made up for by its serene beauty, heady tranquillity and unspoiled nature.

We set up camp in our fifth-wheel trailer at Chestnut Ridge Regional Park

and Campground in a wooded site with water and electric hookups. Chestnut Ridge, which lies in Bruceton Falls, just east of Morgantown, was within an hour’s drive of most of the natural sites in this area of West Virginia and Pennsylvania that we planned to visit. These included several state parks, some spectacular state forests, winding drives through scenic mountains, an interesting historic spot or two and even a fine example of Frank Lloyd Wright architecture.

One of our first stops was Cathedral State Park, south of Morgantown in Audra, West Virginia. This park is set in an ancient hemlock forest of majestic proportions — one of the last hemlock woodlands that once flourished in the Appalachian highlands. We hiked the Cathedral Trail, which took us through an incredible forest with trees up to 90 feet tall and 21 feet in circumference,

Morgantown’s surroundings are green, green, green, making it a great location for outdoor activities.

as well as nine species of ferns, three species of club moss and more than 30 tree species. Along the mile-long trail, we spotted several chattering squirrels and chipmunks, a variety of birds and several showy wildflowers.

Another state park well worth the visit is Ohiopyle, this time in southwestern Pennsylvania, just a short drive over the border from Morgantown. Located mainly in Fayette County, Ohiopyle State Park encompasses more than 20,000 acres of rugged natural beauty and serves as the gateway to the Laurel Highlands. The highlight of the park is the more than 14 miles of the Youghiogheny River Gorge that passes through its heart. Some of the best whitewater boating and kayaking in the eastern United States can be found here. A couple of magnificent waterfalls can also be seen in the park, including the roaring Ohiopyle Falls and the gentle-misting Cucumber Falls.

Two other crown jewels in this area are Blackwater Falls State Park and Canaan Valley State Park. Located about 50 miles south of Morgantown, these parks offer their own brand of beauty. Blackwater Falls is the main attraction of the park that bears its name. The dark-colored water is a byproduct of tannic acid from fallen



(Above from left) The base of Wonder Falls on Big Sandy Creek is a popular swimming hole near Morgantown. The Cheat River meanders 73 miles through West Virginia and Pennsylvania.

hemlock and red spruce needles, and you can spend hours gazing spellbound at these fantastic falls. Canaan Valley offers unlimited vistas with rolling hills, fertile valleys and pine-wooded peaks. A drive through this area is a trip into true Appalachian wonder.

One of our final state-maintained excursions was to Coopers Rock State Forest and its signature feature. A huge, flat, rocky outcropping with an observation platform set high above the Cheat River and surrounding valley, Coopers Rock extends a view that is glorious

to behold. A short walk out to the site brings you to the edge of nature's grandeur, and when experienced at sunset, the view will be remembered for a lifetime. Luckily for us, Coopers Rock was just a couple of miles from our campsite at Chestnut Ridge.

In addition to West Virginia's abundance of state and regional parks, the area has a number of spots of natural, historical and architectural significance that are worth a visit. For instance, Morgantown's West Virginia Botanic Garden is a lovely place to take

From Coopers Rock Overlook, you can survey miles of rich West Virginia countryside.



Panoramic View

Rock cliffs line the Cheat River Gorge for a stunning perspective of distant horizons. Nearly 50 miles of hiking trails wind through Coopers Rock State Forest.

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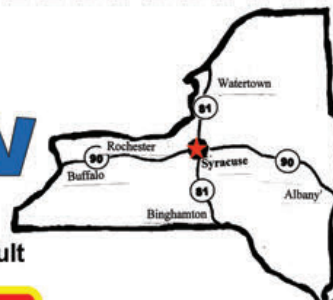
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The tiny U.S. mailing office (left) and Roman Catholic church in Silver Lake, West Virginia, are next-door neighbors and are claimed to be the smallest of their kind in 48 states.

in the beauty of nature with weaving trails, and it's free and open to the public daily from dawn until dusk.

Another interesting stop is the Fairfax Stone near the town of Silver Lake, West Virginia. The Fairfax Stone is a rock monument at the headspring of the Potomac River. It was set there in 1746 at the request of Thomas Lord Fairfax, who owned much of the land in the area. The stone marks the dividing line between Maryland and West Virginia. A short unpaved road leads to the stone, and it's well worth the trip.

In the town of Silver Lake itself are a couple of attractions worth seeing — the smallest church and mailing office in the Lower 48 (at least they're claimed to be by the builders). Our Lady of the Pines is a Roman Catholic church with seating for 12. The two buildings, standing side by side, were undoubtedly erected for the purpose of attracting visitors, and they certainly do the job well, while the post office does in fact serve the community of Silver Lake. Beyond cute, the church and post office are definitely two-of-a-kind.

One of the region's most visited buildings, this time in Pennsylvania, is Frank Lloyd Wright's Fallingwater house. Located in the town of Mill Run, Fallingwater is one of Wright's most widely acclaimed works, designed in 1935 for the family of Pittsburgh department store owner Edgar J. Kaufmann. The key to the setting of the house is the waterfall over which it is built. The falls were a focal point of the Kaufmanns' activities, and the family asked Wright to locate their weekend house near them. Wright designed the house right on top of the falls, with the

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APPALACHIAN PLAYGROUND

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For More Information
Greater Morgantown
Convention and Visitors Bureau
800-458-7373, www.tourmorgantown.com

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The Majestic

New Horizons' luxury fifth-wheel has all the features you could ever imagine — and some you probably couldn't

**Be it ever so humble, there's no place like home.
Home is where you hang your hat.
Home is where the heart is.**

A number of expressions attempt to describe the feeling we get when we find the right home and the comfort we rely upon every time we return to it. But as we search for the perfect fifth-wheel for our mobile lifestyle, the feeling that we've found "the one" is something that often eludes us. For all of the conveniences and amenities available in today's products, we're still keenly aware that we're spending our time in a trailer, not a residence. It's not necessarily a matter of size, or even how the unit is equipped. You can run your finger down the options list and check off the necessary boxes, but no one makes that certain something that transcends the tangible and resides somewhere in the soul. It's either there or it isn't.

New Horizons RV of Junction City, Kansas, is masterful at capturing the "it" in its Majestic line of built-to-order fifth-wheels. Perhaps that's because company President and CEO Phil Brokenicky and his wife, Karen, have built a number of custom homes in their lives together, and they know what

constitutes a home. Or, it could be that they value and consider the opinions of the many buyers that file through their show unit each season and constantly update the company's offerings to reflect what consumers want. "We've had people walk through our demo units and say, 'You guys have thought of everything,'" said Brokenicky. "But we didn't think of it all — hundreds of people did." Indeed, Brokenicky said that if as few as three people make the same request or suggestion, his company will seriously consider accommodating it.

The Majestic is what you might call "semi-custom" — that is, New Horizons offers several different floorplans with standard equipment, and customers choose from dozens of options to outfit the trailer exactly the way they want. "The customer gives us a down payment, and then the rest is due once the unit is painted," Brokenicky explained. "At the time of their order, we give them an order sheet to review, and we go through it with them line by line to make sure they understand what is standard and what is optional. We'll spec it out together, and if it breaks the bank, we'll go through the list and prioritize the customer's options. But even without adding a single thing to the standard features list, the Majestic is full-



time ready, designed for 365-day use in weather that ranges from sub-zero to 100-plus degrees.”

Every good home begins with a strong foundation, so New Horizons starts from the ground up with a chassis they build in-house. This not only assures a solid structure but gives New Horizons ultimate control over the build without any concessions toward another manufacturer’s chassis. For example, where many trailers use a six-point leveling system to prevent chassis flex during leveling, New Horizon’s robust chassis allows the use of a four-point Bigfoot hydraulic system without any concerns for structural integrity. And it gives designers the freedom to equip each unit exactly the way they want with standard features that make the end user’s life on the road easier.

“Our trailers look like resort models, but we design them to go down the road and be set up or taken down every night in about 20 minutes,” Brokenicky said. “The 50-amp power cord and freshwater hoses are on reels, so you just pull these out, connect them, and you’re done. When you leave, you just disconnect and retract the reels. We tell our customers this trailer has all the features of a \$700,000 motorhome and more.” In fact, Brokenicky fondly refers to the Majestic as “the Prevost [high-end bus conversion] of the fifth-wheel industry — at one-tenth the cost.”

While this last point is debatable, depending on how each unit is equipped, there’s no denying the price disparity. Consider the Majestic F41RL4SS shown here, which accounts for 40 percent of New Horizons sales, has a base price of \$190,718 and maxes

(Above left) The leather couch and theater seating are made by England. A pop-up coffee table makes mealtime in front of the TV convenient and comfortable. (Above right) The expandable dinette table and chairs have a residential feel and are not crowded by the adjacent seats.

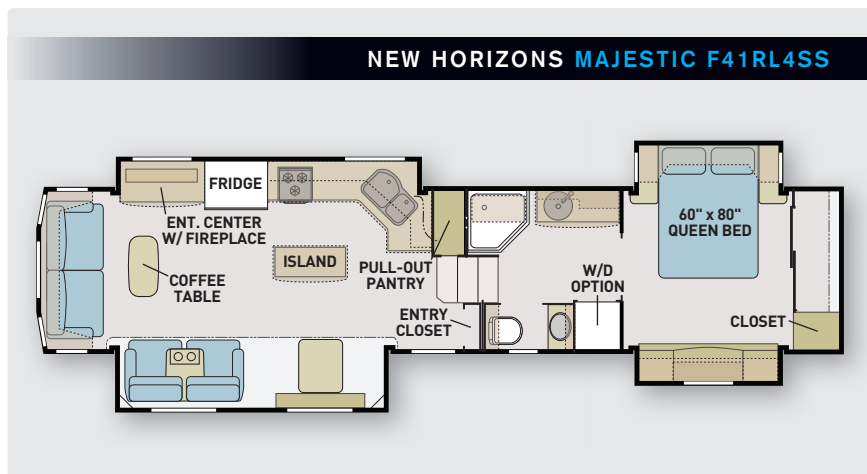
out at roughly \$275,000 when loaded with all the options. Throw in a properly equipped tow rig at \$60,000 to \$80,000, and the grand total comes to about \$350,000. Compare that to nearly \$2 million for a luxury motorhome from the custom-coach elite, and you’d be hard-pressed to find many features or amenities in the coach that the Majestic doesn’t have, including the test unit’s onboard generator, heated floor in the bed and bath areas, available hydronic heating and much more.

Truly, the Majestic is aptly named. Though this isn’t the first time we’ve tested one of these fifth-wheels, we were still taken aback by its size and stature. The custom-paint scheme, which consists of four coats of paint and three clear coats, sparkles in the late afternoon sun of Palm Springs, California. The two power awnings, one over the patio and one over the living-

room slideout, provide welcome shade, as does a third manual awning over the rear bay window. The two roof air conditioners (15,000-Btu in the living area and bedroom) purr their welcome in the 95-degree heat.

As we step inside, the first thing that strikes us is that everything that looks real is real. In an industry where what appears to be high-end features are often clever fakes designed to save weight, money or both, everything in the Majestic is 100 percent authentic. Fixtures carry household names like Kohler and Moen. Cabinets are what New Horizons calls Rustic Cherry — they’re made of solid wood and proudly display all of nature’s perfect imperfections. And the floors are solid hand-scraped hickory that practically glow with warmth.

When the owners of a company actually live the full-time lifestyle in their





(Above from left) No expense was spared in the kitchen, which features granite countertops, solid cabinetry, a tumbled marble backsplash and a Blanco sink with oil-rubbed bronze fixtures. The bathroom has abundant counter space and solid-wood pocket doors. In the bedroom, built-in cabinetry with impressive detail surrounds the comfortable queen bed.

product while on the RV-show circuit, it really shows. This is a beautiful fifth-wheel, of course, but beyond gratuitous attempts at impressing with high-end materials, this unit exudes comfort on so many levels. The leather power-reclining residential theater seats are soft, roomy and luxurious. We recommend you don't sit in these if you have anything else to do, because you probably won't get up again. And as if to reinforce lazy behavior, they're situated opposite a 40-inch Samsung flat-screen television that rises silently from the counter above an electric fireplace. The area also houses an excellent home-theater system in the cabinets above, with small speakers discreetly placed throughout the living area. The TV can also be viewed from the matching sofa on the rear wall, which is pillowy plush and converts into a bed for guests.

We found the interior design of the Majestic to be particularly gratifying. The test coach featured tasteful splashes of French country décor, with an antique-white finish on the entertainment center and kitchen island providing playful visual contrast to the elegant wood cabinetry used elsewhere. Moreover, the country theme is tastefully juxtaposed with the trailer's ultra-modern features: hardwood against stainless steel, tumbled marble tile against gleaming granite.

And yet, nowhere is form sacrificed for function. The kitchen features all residential appliances, including a 21-cubic-foot KitchenAid refrigerator, GE convection microwave and Fisher & Paykel drawer dishwasher. We par-

ticularly appreciated the three-burner Whale Princess cooktop with electronic ignition and the unique Blanco double-bowl sink in a composite material called Silgranit II. This is very hard and scratch-resistant, and its Cinder color looked great against the granite's warm earth tones. The extendable dinette table looks and feels like a piece from someone's home and has plenty of room for two diners, even with the adjacent large theater seats.

It could be argued that convenience is also a comfort, and the Majestic has plenty of that as well. The lighting is controlled by multiplex panels intuitively placed in all the areas you might need lighting. The lights require just a touch to activate and are color-coded — blue is on, white is off. There's also a master panel that controls the lighting and the power MCD shades, allowing you, for example, to turn off all the lights and lower the shades at night from one place rather than walking around and shutting them off individually.

Just inside the entry door on the test unit is an Apple iPad Mini on a magnetic charging base that can be used to control almost every feature in the trailer, including the shades and lighting (on/off and dimming). You can also monitor tank levels from here, battery state of charge and more. At the base of this same cabinet is an intake for the central vacuum "dust pan." Just push it with the

tip of your foot, and the panel opens; the vacuum turns on automatically, and you just sweep dirt into the opening. Other vacuum ports are located elsewhere, and the unit's motor is tucked away in basement storage.

There are just so many small, thoughtful details that make a big difference in the livability of this trailer. All of the drawers use dovetail joints — the mark of an experienced cabinetmaker — and open and close softly. Floor registers are all tucked away in corners or under cabinets. And the intake for the bedroom air conditioner is located over the bath area, not in the bedroom, because many RVers commented that they can't sleep with the drone of an air conditioner above them.

The forward bath area is reminiscent of an upscale resort, with more solid wood cabinetry, granite countertops and a beautiful glass-vessel sink. The last New Horizons unit we tested had a fiberglass shower enclosure, but the shower in the latest test unit is made entirely of a solid-surface material because, in Brokenicky's words, "The fiberglass shower just felt chintzy." This one definitely does not — it is roomy, has residential fixtures and is surrounded by real glass. It's nicer than what you'll find in most homes, and the 12-gallon water heater made it possible to linger in the shower and really enjoy it, rather than just cleaning up.



Across from the shower is a vented laundry cabinet with a washer/dryer stack and a separate toilet room with its own lav, which we appreciated. It's the only area in this trailer where space is at a premium, but it should be enough for most people, and the area is beautifully equipped with residential fixtures and a SeaLand Concerto ceramic toilet with power flush. There's another multiplex lighting panel within easy reach of the toilet, and two switches allow you to operate the overhead Fan-Tastic Vent — vent only, or vent and fan. The bath area can be left completely open or segregated from both the living and bed areas with solid wood pocket doors, should your partner want to sleep in.

The test unit featured a large forward bedroom with a queen bed and plenty of walk-around space. A king bed is offered, but unlike some manufacturers that cram a bigger bed into the same slideout, New Horizons adds 2 feet to the bedroom length when a king is specified, so there's still plenty of room. The bed is comfortable enough, but again, what we appreciated most in this area is the attention to detail. Beneath the overhead cabinets are reading lights, of course, but also another multiplex panel that allows you to control all lighting in the room. You can even turn off the panel illumination when you go to sleep so it's not shining in your eyes.

Opposite the bed is a wardrobe in a small slideout, which really adds to the spaciousness of the room. It has plenty of drawer space, a pull-out laundry hamper and a 26-inch television that folds down from the overhead cabinet.

The forward closet has adequate room for most full-timers and is cedar-lined to keep the critters out.

Because the test unit was brought to the resort for us, we didn't have to pack it before our trip, but we can tell you that the forward compartment is cavernous and quite tall at 44 inches. It is nicely finished, well lit and heated. And like the high-end motorhomes with which it competes, all of the Majestic's maintenance items like plumbing and electrical are easily accessible for troubleshooting, maintenance and repair.

Last time out, we didn't have the opportunity to tow the trailer to see how it handled, as it had been delivered to the site, and there was no tow vehicle available. This time, however, our test schedule coincided with the Brokenickys' departure — so we had the opportunity to find out if this fifth-wheel tows as nicely as it lives. It definitely does.

Not that we were surprised, but this is not just a big trailer, it's a heavy one with a claimed weight of 21,800 pounds and a GVWR of 26,250 pounds. That obviously necessitates a one-ton or better dually, and Brokenicky's rig of choice is a Ford F-550, custom-painted to match the trailer and fitted with a Utility Bodywerks towing bed complete with a 32,000-pound-rated hitch and Kelderman air-ride suspension. New Horizons can even set you up with a similar tow vehicle, if you like.

As Brokenicky mentioned earlier, the Majestic is built to travel every day, so it comes equipped with triple axles, independent suspension, H-rated tires and something you won't ordinarily find on a trailer: available electric-over-hydraulic disc brakes with 13.5-inch rotors on each wheel and optional ABS. Traveling downhill on a two-lane highway near Desert Hot Springs, the traffic light began to change, and we were a little uneasy about bringing so much mass to a safe stop. But the braking was completely proportional to the tow vehicle and so powerful that we actually had to release the brake pedal midway down the hill to prevent stopping *too soon*. Without a doubt, this is one of the most stable, easy-to-tow trailers we've tested, despite its impressive size.

SPECIFICATIONS

NEW HORIZONS MAJESTIC F41RL4SS

Exterior Length	41'
Exterior Width	8' 6"
Exterior Height	13' 3"
Interior Width	8' 5/8"
Interior Height	9' (living area) 6' 8" / 6' 5" (bedroom/bathroom)
Construction	
Custom-steel New Horizons chassis; aluminum structure in side walls, roof and floor; pressure-laminated side walls with high-density foam-block insulation (walls: R-14, roof: R-25, floor: R-28); one-piece fiberglass roof	
Freshwater Cap.	100 gal.
Gray-Water Cap.	70 gal.
Black-Water Cap.	70 gal.
LP-Gas Cap.	20 gal.
Water-Heater Cap.	12 gal.
Refrigerator	KitchenAid 21 cu. ft.
Furnace	(2) 23,000/34,000 Btu
Air Conditioner	(2) 15,000
Converter	60-amp
Battery	(2) 12-volt deep-cycle
Tires	215/75R17.5
Suspension	MOR/ryde IS
Weight (water and propane full, no supplies)	21,800 lbs.
Hitch Weight	4,575 lbs.
Axle Weight	17,225 lbs.
GVWR	26,250 lbs.
GAWR (3)	7,000 lbs.
Cargo Carrying Cap.	4,450 lbs.
MSRP, base	\$190,718
MSRP, as tested	\$274,753
Basic Warranty	2 years, 15-year structural

New Horizons RV

800-235-3140, www.horizonsrv.com
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You could summarize the Majestic by saying it's the kind of fifth-wheel you would build for yourself if you could, but the reality is, it's better than that. With years of craftsmanship and customer feedback under its collective belt, New Horizons has created a product that most of us couldn't even imagine when we dream of the ultimate fifth-wheel. And the best part is, it really feels like home. 🏠

ROLLING SMOOTHLY

Visually inspecting and understanding RV trailer suspension and brake components will lead to proper maintenance choices and fewer unexpected repairs

Most trailer and fifth-wheel chassis ride on suspensions that utilize leaf springs and basic hardware. The system is simple, and not much has changed over the years. As trailers morph into heavier and more elaborate models, it becomes more critical to pay attention to what's supporting the chassis. The integrity of the suspension is crucial for trouble-free towing; becoming more familiar with the components, their roles in the system and maintenance will help avoid potential problems, such as premature tire and spring failure.

Suspension System Components

About 90 percent of fifth-wheels and travel trailers are suspended by leaf springs. Learning to identify each component by its proper name and understand the function it performs will help when deciphering a potential problem.

Suspension components consist of two or more leaf-spring sets; the number of individual leaves depends upon the weight-bearing capacity determined by the manufacturer and the axle rating. The equalizer is the center hanger that the front and rear leaf-spring sets are bolted to on a double- or triple-axle trailer and serves as a multi-pivot point so the axles can articulate independently over uneven terrain.

Typical equalizers come in a variety of types made of solid steel and a

triangular shape with three mounting points. More sophisticated equalizers utilize rubber springs, and others even employ air bags to further reduce spring-suspension-induced road impact and harshness. Some aftermarket equalizers may need replacement rubber over a period of time; consult your owner's manual or check with the manufacturer for maintenance intervals. Air-ride equalizers need to be inspected on a yearly basis, and air pressure should be checked before every outing.

The equalizer is bolted to the frame utilizing a leaf-spring hanger. The other end of the leaf spring is bolted to a spring hanger using a single-pivot bolt. The equalizer end of the spring is attached by way of a pair of shackles between the equalizer and the leaf

spring with a pivot bolt. Nylon bushings are inserted into the equalizer and the leaf-spring eyelets, preventing the pivot bolts from wearing prematurely. These nylon bushings are not visible without removing the pivot bolts and separating the components. When nylon bushings deteriorate, the steel components make contact with each other and can wear rapidly, causing premature failure. Nylon bushings should be checked every 10,000 to 15,000 miles.

Equalizers, shackles, pivot bolts and nylon bushings need to be inspected every 5,000 to 6,000 miles for signs of excess wear. While the trailer is supported by jack stands and with the wheel assemblies removed, remove the pivot bolts from all components and carefully inspect the bushings for wear. When replacing components and bushings, always replace the pivot bolts at the same time. When replacing parts, consider using higher-quality aftermarket hardware, available at most RV-supply stores and online.

There are some leaf-spring suspensions that use "greasable bolts." These bolts have a Zerk grease fitting on one end and brass bushings instead of nylon



Above: (Left) This aftermarket equalizer uses a rubber carrier in the center to help smooth out some of the bumps. **(Middle)** Improvements in the last few years have incorporated a device that allows for correcting alignment; this particular model is called the Correct Track. **(Right)** Air-ride equalizers will greatly improve the ride quality, but the owners will need regular access to compressed air to sufficiently inflate the airbag to the correct pressure and, of course, there's a potential for a puncture to the airbag.

AND SAFELY

bushings. These greasable bolts require lubrication at the same interval required for brake inspection. If these have been neglected, the brass bushings can wear very quickly. If you're certain that both components have been greased at required intervals, disassembly for inspection may not be required.

Greasable bolt kits, and in some cases the associated replacement shackles, are available online or from RV-service centers and auto-parts stores. They're a good investment in safety and reliability.

Replacement aftermarket bushings are also available. Never Fail Bushings (available at RV-supply stores) have a lifetime warranty and can be used with wet or dry bolts. The Never Fail Bushing will take away the worry and the need to dismantle the suspension components for routine inspection. Sudden leaning or sway can indicate a broken spring or component. Do not tow with a damaged suspension.

Electric Trailer Brakes

Every 12 months or 10,000 miles, trailer brakes should be inspected for safety.

One never knows when a spring may break or a rivet pop loose, causing major damage that goes undetected.

On a level surface, raise the trailer until the tires are off the ground. For safety, always use jack stands under the frame (not axle) that are rated for the trailer's GVWR — two in the rear and two in the front. Remove the tires and wheels. Once the dust cap is pried off, the cotter pin, spindle nut and washer are removed. The drum should easily slide off the end of the spindle; pay close attention not to drop the drum on the studs. Inspect all brake shoes and linings for cracks, uneven or excess wear, chipped surfaces or separated brake-lining material.

The brake shoes should be replaced when the material is $1\frac{1}{16}$ -inch thick or less. Inspect the brake magnets for uneven or excess wear and the actuating arm for binding. Inspect the hub and drum assembly on the brake magnet surface and the brake-shoe surface for uneven wear or cracks. Most hub and drum assemblies can be turned on a lathe if they are within the manufacturer's specifications. Visually inspect



As seen in this view of the Center Point air-ride equalizer, there are limitations when servicing this type of hardware.

all brake springs and be sure to replace any that are rusted or broken. Clean all of the brake assemblies with a long, soft brush; be sure to wear eye protection and a dust mask for safety.

Check the connections — on the inside of the brake assembly near the axles — where the brake magnets are connected to the electrical system. It's common to find broken wires or corroded connections that could render the brake magnets inoperative. Wheel bearings should be serviced at the same interval. Always replace grease seals when servicing the bearings.

After the hub and drum assembly is reinstalled, adjust the brakes using a brake spoon, expanding the shoes until the drum no longer rotates. Back the

The equalizer on the top is a classic example of what happens to the metal when the bushings wear out from lack of maintenance.



The leaf-spring linkage on top is another example of a worn-out nylon-style bushing. Note oblong hole on the right.



Nylon suspension bushings are very thin and do not last more than 10,000 to 15,000 miles under normal wear and tear.



ROLLING SMOOTHLY AND SAFELY

adjuster in the opposite direction until the drum spins freely with just a slight rub from the brake shoes during rotation.

Trailers with disc brakes have calipers, pads and rotors as well as hydraulic lines, which should all be inspected carefully. Don't forget the electric-over-hydraulic actuator function, as this is probably the most important part of the system. Your owner's manual is the best source of specific information about servicing this brake actuator. Because it uses brake fluid, just like that in your tow vehicle, the fluid in the trailer should be flushed and replaced on a regular service interval to avoid internal system corrosion when the fluid becomes contaminated with water due to age.

ASK THE RIGHT QUESTIONS

Suspension systems are often overlooked when purchasing a used trailer. Most RV dealers will perform a safety inspection on used trailers, but the only way to be certain is to be educated on the subject and know which questions to ask:

1. Were the wheel bearings cleaned, inspected and pressure-packed with the proper type of grease?
2. Are the brake magnets in good shape, wearing evenly and functioning properly?
3. Are the brake shoes and lining material in good condition and not cracking or worn out?
4. Are the brake-adjuster assemblies and springs in good condition?
5. Are the hub and drum and the brake magnet armatures wearing evenly?
6. Is the brake-magnet wiring intact?
7. Are the equalizer and spring shackles showing adverse wear around the bolt holes?
8. Are the axles aligned properly?

Tires

Tire blowouts due to improper inflation, suspension misalignment or age can create a dangerous situation and will often result in collateral damage to adjacent components and sheet metal. Take the time to carefully inspect the tires for optimal safety performance. Be sure to check the date of manufacture, as most tires will time out at around seven years, even if the tread is good. For used trailers, check the date code on the sidewall of each tire; the last four digits of the DOT code indicate the week and year the tire was manufactured. Look for any uneven wear or cracks in the sidewall or treads.

Check for the correct load range and size recommended by the manufacturer. All trailers should have a data plate mounted on an exterior wall or inside a cabinet that provides information required for tire pressures as well as gross weight and axle ratings.

Check the tread depth of each tire; it should be at least $\frac{3}{32}$ of an inch. Check the wheels for integrity or damage. Balancing the tire and wheel assemblies and checking the alignment every two years will help prevent uneven wear that might contribute to premature failure of your trailer's tires. And don't forget to check the spare tire.

Wheel lug nut torque should be checked before each trip.

Shock Absorbers

Imagine driving your tow vehicle without shocks. Most likely, you would not enjoy the ride, especially over dips and bumps. You may not feel the negative effect of the trailer's ride without shocks while towing, but it is definitely there. Experts estimate that a trailer suffers shaking that's equivalent to a 3.0-magnitude earthquake during transit.

If a trailer suspension is equipped with shock absorbers, inspect the bushings for deterioration and the shaft for excess rust, even though this may require removal of the shock to do so. Check the angle of the shocks as well; an angle more than 40 degrees from vertical renders the shocks less effective, but this isn't a service matter as much as it is a design consider-

The Joy Rider suspension-control system by RV Improvement Systems adds a new dimension to the ride quality of a leaf-spring suspension.



ation, since the shocks are always at whatever angle the factory placed them at during assembly. If excess angle is present, the use of aftermarket gas-pressurized shocks can improve shock performance.

Most shocks dampen only the downward motion (compression) of suspension travel, thus making them not nearly as effective as gas shocks that dampen both compression and rebound. Only about 15 percent of travel trailers and fifth-wheels come with shocks. Until recently, adding shocks after the fact was a difficult proposition. Joy Rider shock kits provided by RV Improvement Systems (www.rvimprovementsystems.com) can be bolted to any existing trailer chassis. These gas shocks are mounted at angles that are most effective for maximum damping.

Additional Upgrades

Several aftermarket upgrades for trailer and truck suspensions and axle systems will greatly improve smoothness and handling. Most are even capable of lifting and lowering the trailer a few inches, should the need ever arrive. Trailer Flex Air Ride suspensions (www.autoflexsuspensions.com) and MOR/ryde IS systems (www.morryde.com) are very effective aftermarket upgrades.

Good-quality routine maintenance — and a close watch on weights to prevent failures due to overloading — will ward off major travel delays, not to mention the cost to perform emergency repairs when on the road. With a better understanding and additional knowledge of how suspension and brake systems are made and how they function, many unwanted problems can be easily avoided. 🚚



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WALK-THROUGH: COACHMEN FREEDOM EXPRESS 233RBS

Cozy Coachmen

This nimble, lightweight trailer combines easy towability with enough amenities to keep families comfortable



The island galley counter has a twin-basin sink and a high-rise faucet.

Smaller travel trailers are generally considered either entry-level or purpose-oriented, such as for hunting or weekend-warrior use. Being easy to tow, turn and squeeze into tighter spots, scaled-down trailers offer added travel benefits, like the freedom of RVing in state, national park and forest campgrounds that are typically off-limits to larger RVs. In the spirit of this, Coachmen named one of its lines of lightweight travel trailers the Freedom Express, and we took a look at the 2015 233RBS.

The aerodynamic, swept-back exterior lines of the 233RBS denote a new approach to Coachmen designs. Getting there was made possible by a foundation of powder e-coated I-beams solidly constructed all the way out to the tips of the full-width outriggers. Attached to the welded frame is an Alumicage welded-aluminum infrastructure to which a hearty yet lightweight Azdel (lauan) smooth-fiberglass exterior skin is added. Topping off the construction is 3/8-inch decking with an EPDM membrane over a full walk-on, crowned and aluminum-reinforced roof. Final touches to the clean new look include

subtle graphics over earthy beige and gray tones, black trim, just the right amount of diamond plate and stylish premium aluminum wheels.

Once aboard the 233RBS, the trailer's shorter length (just less than 25 feet) is forgotten with an open view of the spacious living area. This is largely because of the excellent layout, which puts the bathroom and standard 6-cubic-foot refrigerator in the rear, so generous space can be allocated to the opposing living room and galley slideouts. By placing the massive U-shaped sofa and removable double-pedestal dinette table within the confines of one ideally located slideout and most of the kitchen in the other, a wide-open and homey feel is achieved.

Adding to the spaciousness is a centrally mounted kitchen island outfitted with a big 60/40 Stonecast composite twin-basin sink and a brushed-nickel high-rise faucet. The island offers working counter space at either end of the sink, as well as a 120-volt AC power receptacle and pot and pan storage underneath.

In the galley slideout, amenities abound with a substantial counter perched atop a cluster of drawers and

cabinet storage, with the usual oven and three-burner stove. Directly above are the range hood, microwave and overhead cabinets. A tall, deep pantry fills the remainder of the slideout.

Consuming the entire opposing slideout is the dinette area, outfitted in Truffle trimmed décor and resting above more than ample under-sofa cupboards that match the rest of the interior's maple cabinetry. The dinette is hefty enough to seat and sleep adults with ease. Overhead, there's an assortment of LED lighting, and more LED fixtures are found throughout the rest of the trailer.

Not too far from the dinette for easy visibility, the entertainment tower houses a 32-inch LED TV within a rotating mount to allow viewing from the living room or master bed. Connected to the TV is an AM/FM/CD/DVD/Bluetooth system, which can be heard inside and/or outside.

The floorplan makes the master bedroom feel a little confined, primarily because of the position of the entertainment tower that's at the foot



PHOTOS COURTESY OF THE MANUFACTURER

QUICK INFO 

Exterior Length	24' 11"
Exterior Width	8'
Interior Height	6' 9"
Exterior Height	10' 9"
Freshwater Cap.	36 gal.
Black-/Gray-water Cap.	30 gal./30 gal.
LP-gas Cap.	10 gal.
UVW	4,471 lbs.
Hitch Weight	635 lbs.
GVWR	7,000 lbs.
MSRP, base	\$29,995

Coachmen RV800-353-7383, www.coachmenrv.com

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(Above from left) A rotating TV mount allows viewing from the bedroom or living area. The large dinette occupies the entire slideout and is comfortable for adults. The corner-mounted shower with curved-glass doors has plenty of room; counter space around the sink is limited.

of the 60- x 80-inch queen bed. The tight fit is heightened by the heavy use of cupboards and closets connected by a full-width over-bed cabinet, complete with integrated reading lights. The bedroom is nicely finished with matching nightstands, each offering a 120-volt AC outlet. Snug, yes, but most people will like the generous storage space.

The tail end of the 233RBS contains the aforementioned rear bathroom. The

corner shower utilizes curved-glass doors, and there's plenty of space to take a comfortable shower. Although counter space around the sink is limited, there's ample room for movement. The lavatory provides enough cabinet storage for the basics but not much more.

While the 233RBS isn't loaded with options, it's lightweight enough to be towed by a full-size SUV or half-ton pickup and is outfitted with essential

amenities such as an electric awning, an electric A-frame jack and a cleverly stowed 24- x 48-inch resin outdoor table. For those looking for a trailer that allows access to adventurous destinations, Coachmen's Freedom Express 233RBS gets high marks for its modern design and easy livability. 

140 people gathered at the Lance Owners of America rally and watched the

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FEED THE BEAST



THE TITAN AUXILIARY FUEL SYSTEM INSTALLS IN PLACE OF THE SPARE TIRE AND PROVIDES 30 GALLONS OF ADDED CAPACITY

Towing a large trailer or fifth-wheel is a lot of fun until you have to stop for fuel. The sheer size of the combo usually makes one have to plan ahead for fuel stops where the facilities can accommodate such vehicles. One way many RVers address this issue is with a large in-bed toolbox/fuel tank or some type of stand-alone refueling tank that extends the period between stops. This is not a bad way to go, but for many, the idea of losing bed space between an auxiliary tank and fifth-wheel hitch, for example, is less than ideal. For these RVers, Titan Fuel Tanks has come up with a variety of molded spare tanks for nearly every

popular truck platform on the market today, offering versatile solutions to the bed-space problem.

One of Titan's new tanks, quickly gaining the attention of many truck owners, is the Spare Tire Auxiliary Fuel System, or STAFS. STAFS is exactly what the name implies, a 30-gallon auxiliary fuel tank that takes up residence in place of the factory spare tire under the bed. Granted, the installation of STAFS requires that the spare tire be stored and secured in the bed, which will take up some cargo space but still nowhere near as much as a bed-mounted auxiliary tank. Titan's Spare Tire Buddy offers a simple solution to relocate the

spare in the bed of the truck with zero drilling or bolting.

The STAFS is made of injection-molded, military-grade, cross-linked polyethylene using an ultra-high-technology combination of 3D scanning and 3D computer-aided design. Each STAFS tank is model specific to provide the best possible fit. The kit comes with all the correct parts and pieces needed for a complete, professional installation, including the pump, hoses, clamps, extra wiring with terminals, a new fuel filter and detailed instructions, which eliminates those unnecessary trips to the hardware store.

Let's take a moment to go over some of the things to consider before taking on this do-it-yourself project. First off, it's DIY possible but not necessarily an entry-level task. Yes, it can be done in a driveway, but an automotive lift is highly recommended and will



(1) The install of the Titan STAFS starts by lowering the spare tire from the rear of the truck; the tire will require storing in the truck bed. **(2)** Before removing the bumper, the license-plate light is unplugged. **(3)** Bolts are removed from the attachment brackets to release the bumper, which is set aside.

simplify things tremendously. With that being said, here's a small shopping list of what will be needed to best handle the install, especially if the truck is your primary vehicle. One tool that is definitely required, but not included in the kit, is a 4 $\frac{3}{4}$ -inch bimetal hole saw. This is not an area where saving money makes sense; get a good brand saw, such as those made by Milwaukee, Starrett or Lenox — available at reputable industrial-supply stores that specialize in saws and blades. Expect to pay around \$40 for the hole saw. Another item to seriously consider is $\frac{1}{4}$ -inch plastic split-loom conduit for any exposed wires; unfortunately, the kit supplies only enough to cover the pigtail coming directly off the electronic controller. And finally, consider using $\frac{1}{8}$ -inch aluminum plate to fabricate a basic splash guard to protect the new pump and filter from potential gunk buildup from the tires. We'll be installing one in the near future. A helper is also a good idea.

Once everything is gathered, installation of the STAFS starts by lowering the spare tire from under the bed. The tank was installed in a Ram 2500 four-wheel-drive with larger-than-stock tires, so the smaller spare was not useful to us, and losing it was not an issue. Before the truck is raised, take a few minutes to remove the bumper, which gains a lot of working space for this project. Make sure to look behind the license plate for hidden bumper



(4) Once the bumper is out of the way, it's easy to remove the spare-tire winch assembly. **(5)** The Titan STAFS kit comes with all the necessary hardware for installation. **(6)** The tank is precisely molded to fit in the area once occupied by the spare tire. **(7)** Minor assembly of the truck-mounting plate is accomplished using two of the large flange nuts and the presized $\frac{3}{4}$ -inch threaded rod.

bolts. With the bumper unbolted and placed aside, the spare tire and its entire winch assembly can be removed. From here, some minor assembly of the truck-mounting plate must be performed using two of the large $\frac{3}{4}$ -inch serrated flange nuts and the pre-cut $\frac{3}{4}$ -inch threaded rod included in the kit. It's important to make certain that at least two threads are showing once the nuts are properly torqued. Now the truck-mounting plate is ready

to bolt to the old spare-tire winch location with the provided two 8mm bolts, nuts and washers.

The tank must then be prepped for placement and the $\frac{5}{16}$ -inch and $\frac{3}{8}$ -inch hose plumbing affixed to the top part of the tank. The locations for the fittings and hoses will be obvious; we simply angled the fitting in the same direction for a good fit. The grounding wire is connected with a small machine screw, and the fuel sensor leads are spliced with the supplied heat-shrink terminals.

Now the tank can be test-fit for the first time, marking the filler- and vent-hose pathway and routing for the

(8) The truck-mounting plate is bolted to the old spare-tire winch location using supplied fasteners. **(9)** The Titan tank is prepped on the bench by adding the hose fittings; location is obvious, and the fittings are simply angled in the direction necessary for best hose routing.



pump, filter and hoses. This is best accomplished by lifting the tank into place with the tank-mounting plate located beneath, assuring the alignment of the bottom circular mounting tabs. At this point, the flange nut is tightened just enough to hold the tank up. Take a close look at anything that may obstruct the filler- and vent-hose path and either bend or remove any material in the way. Be absolutely positive there are no sharp edges that could contact or rub any hoses or wiring; if so, take care of it now. You'll notice when routing and measuring for the filler and vent path, there's quite a bit of excess hose length, so feel free to trim a little at a time, as needed.

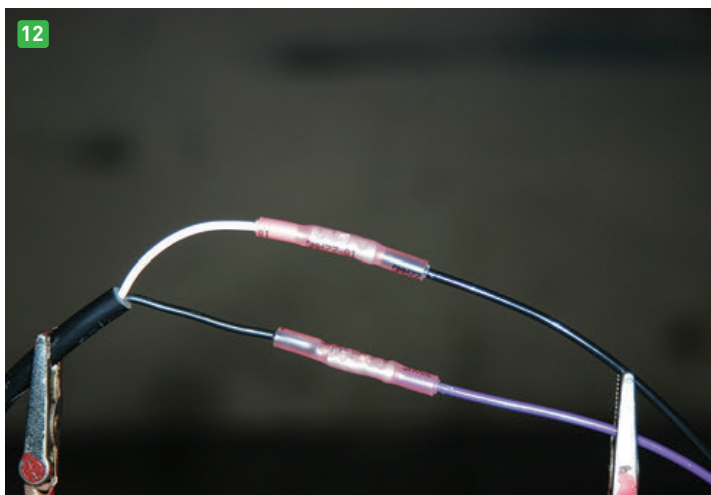
Once all the final fitting and trimming have been completed, the tank can be permanently mounted by tightening the $\frac{3}{4}$ -inch flange nut to 15 ft-lbs and the thin locknut to 45 ft-lbs. It took about four or five trips up and down with the tank before we got the final plumbing routes and metal trimmed correctly; it simply requires patience and time.

Although not necessarily sticking to the directions, we found it best to complete all of the hardware placement, such as securing the filler neck, filler door, pump, filter and all hose routing, before tackling any wiring. So we skipped around a bit and just left the wiring as its own separate task. Doing so also allows for all hose and wire routing to be true and not require secondary work.

At this point, a decision has to be made where to locate the filler door — inside or outside the fender. For us, the idea of cutting a hole in the exterior of a \$50,000-plus truck was bothersome, so inside the bed it went. Take your time — you don't want to make a mistake with a $4\frac{3}{4}$ -inch hole saw! Map it out, mark it carefully with the provided template and cut with confidence. If going through a bed liner, the screw length may need to be compensated for, as was the case with the project truck. After getting the new fuel-filler neck and door in place, the only remaining hardware to focus on was the pump and filter assembly, as well as final hose routing and tightening of clamps.

While trying to pinpoint a new home for the pump and filter, aim to keep them out of the way of excess water or debris but still allow for the hoses to reach with ease and remain kink-free. In the midst of running and routing hoses, the factory tank vent line must be cut and the vent-fill neck adapter spliced in. This is the point where fuel will be pumped in from the Titan tank. Be sure to double-check which adapter in your kit is the right one before cutting the vent line. There were two vent-line sizes in our truck, and, as it turned out, we needed to use the larger of the two vent-fill neck adapters.

After determining the best spot for the pump and filter to reside, it can be fastened with self-tapping screws, and all the corresponding hoses can be routed to and from the vent-fill neck adapter, pump and STAFS tank. Follow instructions carefully



- (10)** Hoses are connected to the fittings before mounting to the tank. **(11)** The fuel-sensor wire is attached and ground lead is secured using a small machine screw. **(12)** The fuel sensor and ground leads are spliced into the wire loom using butt connectors with shrink tubing. **(13)** The new tank is test-fitted using an equipment hoist. Having a vehicle lift available makes installation much easier.



here and be aware that you're working in the presence of gasoline vapors, so eliminate any potential ignition sources before beginning this part of the job.

The remaining portion of the project involves wiring the fuel sensor, pump and electronic controller together. We simply tackled the wiring beginning with the tail end of the truck and working forward, which left two grounds and a purple wire extension that were added earlier. To save some time and effort for the ground wires, an existing bolt in the frame was removed and replaced with the two terminals sandwiched in between. Make sure the surface has exposed metal for any grounds. The aforementioned purple wire is easily run along the same route as the pump hoses, where it can be joined with the pump and electronic controller. From

(14) The hoses are carefully routed before mounting the new tank. **(15)** The hose must have a clear path without kinking and be far enough away from anything with sharp edges. The kit's hoses are longer than necessary, so routing and trimming allows for a good fit. **(16)** After the final fitting, the tank is permanently mounted by tightening the flange nuts. **(17)** A template is used to cut a hole for the filler door. **(18)** The decision was made to locate the filler door inside the bed rather than make a hole in the exterior sheet metal. Access is a little more difficult, but the filler door does not detract from the outside aesthetics of the truck. **(19)** An independent pump is used to transfer fuel to the main tank.

this point, the blue wire extension from the pump is connected to the purple wire extension and fed together along the frame, up to the driver's side of the engine compartment, to the fuse box. This is a good example of where to use the 1/4-inch plastic split conduit mentioned earlier in our shopping list.

The last step is to find a suitable mounting location in the cab for the electronic controller. The pigtail is long enough to allow for mounting versatility. It was routed through the firewall

and connected to the fuse box using the fuse tap and spade connector. A nearby factory ground location was used for the negative wire. Once the install is complete, the tank must be filled to capacity, or the warranty will be voided.

The STAFS tank, at first, seems cumbersome and quite difficult to deal with on the install side of things, but Titan engineered a precise fit and provides excellent instructions, so much of the anxiety is lost. However, you'll probably spend the better part of a weekend on this job. The tank kit retails for \$1,768 plus shipping. 🚚

(20) The STAFS pump and filter are neatly tucked up out of the way and secured to a frame member. **(21)** An electronic controller can be mounted on or under the dash, or any other convenient location for monitoring. **(22)** Power is tapped from the fuse compartment located under the hood of the truck. The fuse tap makes connection simple.

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Get a Handle on It

There are some things that are common to all RVs, and a flimsy screen door is one of them. They can be cumbersome to open and close, and years of slamming to keep them latched can warp the frame over time. Camco Manufacturing offers a simple and very effective solution to these problems with its new Screen Door Cross Bar. It allows easier entrance and exit, and helps protect the screen to boot. The silver push bar extends from 21¼ inches to 28½ inches to fit all RV doorways, and the product is claimed to be easily installed with the included hardware (requires drilling four ⅛-inch-diameter holes in the screen door). Available at Camping World, it's a practical addition to any RV.

MSRP: \$12

800-334-2004, www.camco.net

Circle 132 on Reader Service Card



More Gear Space

Sometimes, no matter how carefully you pack, there's just not enough room for everything. If you can relate, then the GearSpace 34 from Let's Go Aero might be exactly what you need. This aerodynamic carrier was designed to provide 34 cubic feet of enclosed, secure storage space to transport large cargo, from luggage and equipment to up to two bicycles. The tough, weatherproof pod can handle up to 300 pounds of gear, and the steel TwinTube frame easily telescopes to provide clearance for spare tires, ladders, etc. The GearSpace 34 is available in light or dark gray and comes with LED stop/turn taillights, an illuminated license-plate bracket, two Silent Hitch Pins and a stainless-steel pin lock.

MSRP: \$1,589

877-464-2376, www.letsgoaero.com

Circle 133 on Reader Service Card



Progressive Power Protection

Progressive Dynamics introduces two automatic-transfer switches with silent surge protection. The PD52DCS and PD52ACS automatic-transfer switches can protect electronics from damaging power surges as well as open-neutral and reverse polarity. The PD52DCS offers a DC coil that is said to eliminate buzzing during operation, and the PD52ACS uses a standard AC coil. Both units incorporate overvoltage-surge protection of 3,300 joules at 103,000 amps. These automatic-transfer switches feature two green LED indicators to display generator power or AC power availability. Two separate red LED indicators display the need for service for the shorepower section, indicating a destructive power surge.

MSRP: \$340

269-781-4241, www.progressivedyn.com

Circle 134 on Reader Service Card



The Big Fridge

RV refrigerators are very convenient for the mobile lifestyle, but sometimes they're just not big enough for a family of hungry RVers. Norcold has come to the rescue with its enormous 18-cubic-foot PolarMax RV refrigerator (part number 2118). Looking to all the world like a stainless-steel residential unit, the PolarMax is designed for the rigors of the road and offers quiet operation, thanks to a silent gas-absorption process with no moving parts. This big fridge offers an eye-level exterior LCD control, which is easy to see and operate, and the full-width shelves are easily adjustable. Covered crispers with pop-up lids protect food from spills and allow varied humidity levels.

MSRP: N/A. 800-543-1219, www.thetford.com

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Planning for Performance Modifications

Just about everybody would like more power and performance from their tow vehicle, especially if the fuel economy could remain about the same or even improve. Accelerating onto highways, climbing grades and passing slow vehicles can be much more enjoyable without the “white-knuckle” factor.

Like most things in life, performance modifications are best done in moderation. Boosting horsepower not only costs money when you initially modify the vehicle but there may be additional expenses for potential increased maintenance and fuel, depending on the type and extent of the modification(s). Therefore, it's essential to have a plan of what you are trying to accomplish and have reasonable expectations before you begin. Fortunately, some products can actually improve fuel economy and potentially pay for themselves over time. Just be skeptical of claims, which can be optimistic, to say the least. If something seems too good to be true, well...you know the rest.

Modern vehicles are designed to meet a certain perceived need and type of user. By necessity, vehicle designs are a series of compromises, balancing cost with complexity and marketability, along with numerous regulatory requirements.

When a vehicle is modified without taking its engineering design work into consideration, it can lead to problems

down the road, literally and figuratively. Mechanical systems and devices are required to have a safety margin built in. Otherwise, if you hit a pothole with a loaded pickup, the wheels might snap off, or if you over-rev slightly, the engine might blow up. One of your tasks when you modify a vehicle is to stay within these nebulous unpublished durability limits to prevent mechanical failure.

Generally, modest changes can be made without inviting catastrophe. The problems start when you get greedy. Most vehicles have weak points, or Achilles' heels, which you need to learn how to work around or change. Researching what others have tried and what their results were is an inexpensive way to learn without the expense of broken parts. Use an Internet search engine such as Google to look up forums for the type of vehicle you have.

Modifying vehicles can also lead to warranty problems, if things are not done properly. In the September 2014 issue, the “Performance Improvers” feature explained the warranty ramifications of aftermarket products.

The various systems on a vehicle

must be in balance for the best results. If you increase engine power substantially, it will make more heat, which needs to be dissipated. The transmission will work harder, as will the driveline and drive axle(s). More power also may call for stronger brakes and better suspension. So think of a balanced system approach to performance, rather than just focusing on making more power. You'll also need to allocate money for modifying these other systems.

Freer-flowing intake and exhaust systems are the most popular items used to increase power in light trucks and SUVs. Software-based aftermarket engine tuners are also very popular modifications, especially among diesel owners, as these engines really respond to them. Often they can also modify shift points and firmness and other parameters such as wheel- and tire-diameter changes. Most of them simply plug into the diagnostic port under the dashboard. Many tuners have one or more safe tow settings that don't raise internal engine temperatures too high for extended hill climbs, etc.

For gasoline engines, the most dramatic power gains can be made using supercharger kits, which, if they have a California Air Resources Board (CARB) Executive Order (EO) number, are smog-legal in all 50 states. A number of companies make kits with EO numbers for light trucks and SUVs that are popular for towing. Typically, premium fuel will be required, which may increase operating costs. If boost pressure is kept on the conservative side (around 5 to 8 PSI) most stock engines will be compatible with these units.

Some companies also offer charge air coolers (also known as intercool-



Engine tuners like this one from Bully Dog not only increase performance but also feature programmable displays for engine RPM, coolant temperature, transmission temperature and more. They are available for gas and diesel applications.

ers), which reduce the temperature of the intake air charge after it is pressurized (which adds heat). Coolers are a good addition with a supercharger to reduce heat stress on the engine. You'll also generally need to modify the fuel system and exhaust to handle the increased flow under power. Some of the leading suppliers of kits include Lingenfelter, Magnuson, Paxton, ProCharger, Stillen and Vortech.

Since 2007, new diesel vehicles are manufactured with diesel particulate filters (DPF), which severely limit exhaust-system modifications, although a number of so-called DPF-back exhaust systems on the market install after the DPF. Starting in 2010, medium- and heavy-duty diesel vehicles also have a diesel exhaust fluid (DEF) tank that must be refilled regularly and also limits modifications.

Vehicles in some regions are required to undergo periodic emissions inspections. Some modifications may not be allowed and may cause vehicles to fail their tests. Aftermarket products that have a CARB EO number are legal in all states. If your vehicle is subject to testing, check with the seller before making a purchase to ensure the item is allowed. Most companies will state on their website whether the product has a CARB EO number or if it is designed for off-highway use only.

Internal engine modifications are more difficult and can be more expensive, especially if you have all of the work done for you by a shop with a high labor rate, so it's probably wise to wait until the engine actually requires rebuilding before considering any upgrades. Increasing the cylinder-bore size is a normal repair for worn cylinders and should not significantly change the emissions profile of an engine. Some aftermarket camshafts are also designed to improve performance while staying within emissions limits and are compatible with computer-controlled engines.

With gasoline engines, increased compression can improve performance and efficiency. However, major compression increases may require higher-octane gasoline and can raise the output of oxides of nitrogen into



A Magnuson TVS1900 supercharger is installed on a GM 6.2-liter V-8 by Lingenfelter.

the exhaust, which may or may not be sufficiently cleaned up in a three-way catalytic converter to pass a smog test. Check with the engine builder on legality, cost and drivability before starting work.

Dynamometer testing and fuel-economy testing should be performed before and after modifications. Sometimes an after-test with poor results will reveal a glitch in tuning or other problem caused by installation of parts, which can be corrected fairly easily.

To get more power out of an engine, it's necessary to increase airflow. Think of an engine as an air pump — the more air you can get through it, the more power you can potentially make. Air has mass, and it behaves much like water as it flows. It takes energy to get it moving and to keep it moving as it encounters bends and other restrictions. Ideally, you want to keep it moving in the same direction and unrestricted. The fewer turns and choke points it has to go through, the better.

Engines also rely on air velocity to help fill the cylinders with a fresh charge. The length and diameter of the intake runners and valve sizes should be designed to match the needs of the engine. To develop lower-RPM torque, smaller-diameter runners help maintain air velocity to take advantage of momentum. High RPM calls for larger passages, so finding the right sizes is always a compromise. Some original equipment manufacturers have developed variable-length

runners, variable turbocharger turbines and other strategies to cope with this dilemma.

Early non-turbodiesels can benefit from the installation of an aftermarket turbocharger kit. Many turbodiesels can also make more power with a different aftermarket turbocharger. Make sure to work only with reputable companies with extensive experience in the diesel-performance field.

Improvements in airflow don't necessarily provide the gains you think they will. For example, installing a low-restriction air intake that claims to provide 30 percent more airflow and a freer-flowing exhaust that claims 70 percent better flow does not add up to 100 percent extra airflow. A good analogy is a garden hose. Under ideal circumstances, a $\frac{3}{4}$ -inch inside-diameter hose will flow more than a $\frac{5}{8}$ -inch inside-diameter hose. But pinch or fold the larger hose anywhere along its length, and it will flow far less than the $\frac{5}{8}$ -inch hose, even though the rest of the hose has a larger inside diameter. The same goes for an engine. Airflow through the entire engine is limited by whatever is the most restrictive point. This could be a valve, an exhaust port, a clogged air filter or a pinched exhaust pipe, catalyst or muffler.

Freer-flowing exhaust systems reduce internal engine temperatures by relieving backpressure and also reduce pumping losses (the power required to pump air and spent gases through the engine and exhaust system). By

allowing the gases to exit easier, less residual spent exhaust gases also remain in the cylinders for the next firing, which increases power and efficiency. Well-designed exhaust headers can further improve flow and even help scavenge gases, especially if they take advantage of the engine's firing order. Systems designed for RV use emphasize lower-RPM torque over high-rev peak power. Catalyst-back (or "cat-back") exhaust systems are also popular with owners of gasoline models and can provide moderate gains by themselves.

Clutches and transmissions may need to be beefed up as well (see the December 2014 Performance Corner). If you are really going for big power, the driveline and U-joints may need to be checked by a driveline specialist. High torque also twists the rear leaf springs on initial takeoff and can cause launch shudder and excessive U-joint angles; stiffer springs or traction bars may need to be installed. This

is typically a concern only on heavily modified diesels.

Cooling-system modifications generally consist of installing a larger fan, if one is available, and/or adding auxiliary electric fans and a larger, thicker-core radiator. Sometimes, larger radiators are available as an option and can be retrofitted. The aftermarket also makes a wide variety of heavy-duty radiators. Turbodiesels benefit from the installation of intercoolers, and engines that have them already can reap benefits from larger, more efficient units to cool the hot incoming pressurized air. Larger automatic transmission coolers may also be needed with increased power. Deeper oil pans for automatic transmissions and larger finned differential covers are also good investments for longevity, especially in hard-working and/or modified vehicles.

Water and methanol injection systems can also reduce heat while boosting power and fuel economy in

diesels. Some owners have also used CNG or propane injection in their diesels, which mixes with the incoming air. Many owners report improved power and fuel economy if this is done correctly. Control units and kits are available, although they are not for sale in California.

Along with all of these modifications, don't forget to leave some budget for aftermarket gauges. Some tuners come with a screen that can display engine parameters. If you don't have one of these, traditional analog or digital gauges can be installed. It's a good idea on modified vehicles to monitor oil temperature, transmission fluid temperature (on automatics), boost pressure and exhaust gas temperature (if equipped with a turbo or supercharger). Many owners like windshield pillar gauge pods, as they are easy to check at a glance without taking eyes off the road for too long. Some models have a record of fuel-pressure problems; for these, a fuel-pressure monitor is a good idea.

Well-planned and -executed modifications can make your tow vehicle a joy to own and drive. 🚚

Sources

Accessible Technologies/ProCharger
913-338-2886, www.procharger.com

Banks Power
800-601-8072, www.bankspower.com

BD Diesel Performance
800-887-5030
www.dieselperformance.com

Bully Dog
877-285-5936, www.bullydog.com

Lingenfelter Performance Engineering
260-724-2552, www.lingenfelter.com


Magnuson Products/MagnaCharger
805-642-8833, www.magnacharger.com

Paxton Automotive Corporation
888-972-9866, www.paxtonauto.com

Stillen
866-250-5542, www.stillen.com

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Finding Quick Foot

A new A-frame jack extension provides height adjustability and additional stability without the use of wood blocks

DIFFICULTY

1 2 3 4 5

TIME TO COMPLETE

10 MINUTES

TOOLS NEEDED

ALLEN WRENCH

The A-frame is equipped with either a manual or electric jack to move the front of a travel trailer up and down to hitch or unhitch and level. While these jacks are simple in design, not all are created equal. If you follow the adage that “bigger is better,” the average manual A-frame jack could use some improvement. While the stability these jacks provide may be sufficient under ideal conditions, they normally don’t have a foot at the end of the post, often requiring the user to employ stacks of wood to gain additional stability and height. Safety is also a concern; poorly placed blocks could cause the jack to slip off, resulting in a nasty surprise at best, injury at worst.

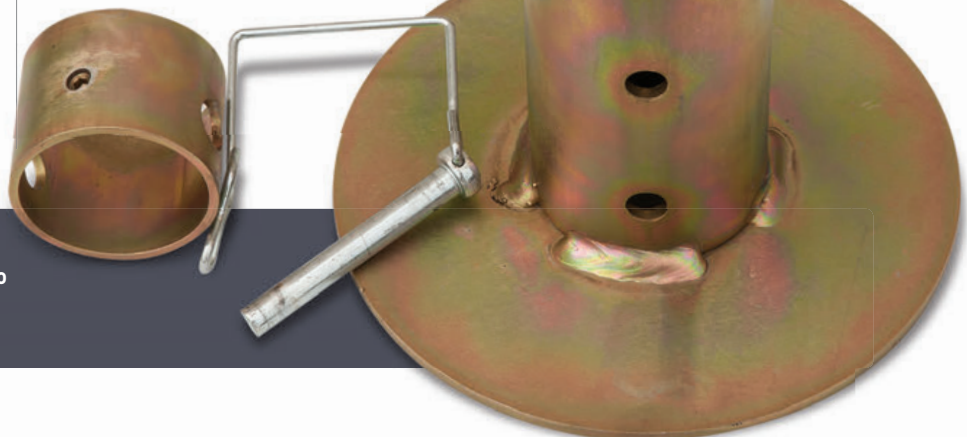
The marketplace has a fairly healthy selection of A-frame-jack devices that are designed to improve efficiency and convenience, but the buyer must be aware of performance factors. Remember, the A-frame jack may see a large fluctuation in weight, depending on loading. And it should have more than enough strength for correctly connecting load-leveling hitches, which physically lift the truck’s rear to take the pressure off the spring bars when cinching up to the brackets.

Addressing the above requirements

Stacking wood under an A-frame jack tube can be unsafe, especially on uneven terrain.

and adding the benefit of adjustability, RV Improvement Systems has come up with the Quick Foot. The Quick Foot is an incredibly strong extension fitted with a large foot pad (7-inch diameter) that adds stability and can be adjusted to conform to the existing terrain and limit the amount of cranking on the A-frame jack.

RV Improvement Systems’ Quick Foot is assembled out of plated, ¼-inch-thick round tubing. The base-plate (foot) is welded to the tubing, and there are line-up holes drilled through the tubing in 2-inch increments so the length can be adjusted and secured by a latching pin. The Quick Foot offers 2 to 6 inches of added A-frame jack length while also creating the ultimate foundation for the front of any trailer. Also included with the Quick Foot is a small piece of plated steel tubing, which acts as a sizing sleeve for A-frame jacks with



SIMPLE AND EFFICIENT » The Quick Foot extension has a 7-inch pad, welded to a strong tube. The kit comes with a sizing collar and latching pin.



(Far left) A sizing collar is used on jack tubes that are undersized for the Quick Foot; the setscrew locks it in place. (Left) Holes in the tubing at 2-inch increments allow height adjustments from 2 to 6 inches.

a smaller diameter. The use of this collar prevents tube tilting. The Quick Foot completely eliminates the need for wood or any device that helps gain hitch height.

Installation is a snap; simply swap

out the stock foot, if one was provided, or remove the wheel. This is easily accomplished when the trailer is hitched to the tow vehicle. Most people will likely use the holes that provide the most lift to keep from cranking the A-

frame jack excessively, but the adjustment can be made depending on the elevation of the site pad. The Quick Foot can be removed for travel quickly after hitching the trailer.

Any time you're dealing with a product of this nature, "the proof is in the pudding" rule applies. To better define this, the parts either work or they don't — and the real difference comes right down to the construction materials and quality. The Quick Foot is definitely ruggedly built with the goods to make it one of those prized lifelong products that actually works and does what it claims, every time. For \$63 (Camping World), you can say goodbye to blocks and enjoy added versatility. 🚐

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USB-PLUG ADDITION

Q I have a 2013 Keystone Bullet, and my family and I camp as often as we can. We all have electronic devices that utilize a USB and/or 120-volt shorepower receptacle for charging. In my home, I have changed a couple of the regular receptacle outlets and replaced them with outlets that have 2.1-amp USB outlets that allow fast, full-speed charging for iPhones, smartphones, iPods, Kindles and such. This takes the regular receptacle outlet from two standard plug-ins to as many as four USB-port-type receptacles. Can I use these USB receptacles, purchased from the local hardware store, in my travel trailer?

Ron Rancourt, Virginia Beach, Virginia

A Those USB receptacles are great for RVs, Ron. They solve the charging problem just as you have at home. The main consideration is that the new USB-equipped

outlet will fit your RV's receptacle box. Those USB receptacles can be somewhat deeper than a usual receptacle because of the extra electronics inside. In addition, some RVs use very shallow receptacle boxes due to having thin walls, and some use inexpensive receptacle hardware that doesn't use the same mounting system as a standard home receptacle. Inspect and measure your RV's receptacle mounting boxes before you go shopping for the USB receptacle, and you can achieve a successful parts swap.

— **Jeff Johnston**



MYSTERY POWER DRAW

Q We have a 2007 Forest River Wildcat 26-foot trailer. When the trailer is not being used, I disconnect the ground cable from the battery. The problem is that, when I reconnect the ground cable, there's a spark. I started removing the DC fuses one at a time to see if I can find the 12-volt current drain. The voltage drain is still there after all the DC fuses are removed. The voltage was measured between the negative post and the cable. It has a WFCO distribution panel (model wf-8955an). Could this be the problem, or is it something else? The trailer is not connected to shorepower.

John Kester, Williams, Oregon

A You're on the right track, John, with your search for the power drain. There are a couple of other items you might check. First, the power-distribution panel may have some type

of short-circuit-related drain as well. If so, look carefully at all of the panel's connections to locate something like a stray strand of wire that can be jumping a circuit. You didn't say how much current draw you found at the battery, but it doesn't take much of a closed circuit to create that spark when you connect the battery.

Next, try disconnecting the emergency-brake breakaway switch as a possible source for the power drain. It's on the trailer A-frame, and being that close to the battery likely has its own fuse or circuit breaker between it and the battery. Those breakaway switches are simple on-off connections, but given your trailer's age and the switch's location exposed to the weather, it could have internal corrosion even when the pin is still installed. If that were the case, it would be a good idea to replace it anyway, given its importance as a safety device. — **J.J.**

TRIPPING GFCI, TAKE TWO

Q Regarding Alan Dodds' "GFCI Problem" in December 2014's RV Clinic, I experienced a similar issue a few years ago, and it was easily solved. Your suggestion to try each circuit breaker individually was right on; however, in my case, it was a little tricky to find the root cause. It turned out to be a partial short circuit in the water-heater element.

Kenneth Wyatt, Woodland Park, Colorado

A Thank you for the suggestion, Kenneth. Due to a GFCI's sensitivity, there are all kinds of hardware defects that can trigger the circuit. Your cure is something people may not think of, so thanks for sending it along. — **J.J.**

ERRATIC SLIDEOUT BEHAVIOR, CONTINUED

Q The "Erratic Slideout Behavior" question in the November 2014 RV Clinic reminded me of a slideout problem on my 2007 Keystone Raptor with three slideouts. When extending or retracting the slideouts, the process was usually interrupted five or six times. After waiting for about 10 or 15 seconds, the movement could be resumed. I checked all of the terminals and con-

THE TECH TEAM



KEN FREUND: Ken is a former ASE Certified Master Technician, service manager and shop owner who has authored numerous books on automotive repair.



JEFF JOHNSTON: Jeff served as technical director of *Trailer Life* for 20 years and has been an RV enthusiast, mechanic and writer since he could hold a wrench.

nections for corrosion and applied electrical contact grease. The batteries are new and fully charged. I recalled how electrical components can be derated after being used, which means a circuit breaker can lose its rated value and will have a lower value after some use. After replacing the 50-amp automatic-reset circuit breaker at a cost of \$8.50, the problem was solved. I've extended and retracted the slides four or five times and not a single failure.

Frederick Meyer, via email

A Thank you, Fred. In the ongoing quest to track down certain electrical equipment behaviors, it makes sense to check everything along the line, and your circuit-breaker replacement sounds like it did the trick. — **J.J.**

WEIGHT STICKER CONFUSION

Q I have a 2013 Ameri-Lite Super Lite 19-foot trailer by Gulf Stream. The weight sticker states the following:

- GAWR: 3,500 pounds
- GVWR: 3,800 pounds
- Cargo weight not to exceed 980 pounds

Recently, I found the following stamped into the metal plate that joins the frame together at the ball coupler:

- Class IV
- 2 $\frac{5}{16}$ ball
- 2,100 pounds tongue weight
- Do not exceed 14,000 pounds gross weight

I've had explanations including, "That's the rating for the metal plate that is welded to the frame that connects the two rails" and "That is the true frame rating." I went to the 2014 RV show in Hershey, Pennsylvania, and they were confused when I told them this at the Gulf Stream display. The people there said they never had someone ask that question. Can you clear this up? Does it mean that with a few simple upgrades like better tires and axle, I would have a trailer capable of handling a lot more load?

Carl Lahm, Bainbridge, Pennsylvania

A An RV chassis builder assembles a variety of hardware pieces to build a trailer frame. One piece is that hitch-coupler assembly that welds to

the trailer A-frame, and those 14,000- and 2,100-pound ratings on your trailer mean that same component can be used when assembling a significantly larger and heavier trailer.

A chassis is only as strong as its weakest component, and that's how a gross vehicle weight rating (GVWR) or gross axle weight rating (GAWR) is determined. For example, your lightweight trailer doesn't require a huge carrying capacity, so the builder specified 3,500-pound-rated axles. That means the leaf springs need to be rated to handle at least 3,500 pounds, and likewise, the bearings, brakes, tires and so forth. Use of the higher-rated pieces ensures that, as long as the RV builder and end user pay attention to that axle's 3,500-pound GAWR and don't exceed that rating with too large a trailer or too much cargo, then the rest of the parts will likewise be rated to safely handle the load.

Yes, you could install a higher-rated axle — for example, 5,000-pounds — and its related suspension parts, brakes, higher-rated wheels and tires and so forth that could theoretically raise GVWR and payload capacity. You already know the coupler is up to the task. The only kicker to that would be making sure the steel frame components were strong enough, as steel tubing is also rated to handle a certain load capacity. — **J.J.**

TWEAKED DOOR FRAME

Q My husband and I own a 2008 Keystone Challenger fifth-wheel. The door or the frame on the driver's side storage compartment is out of alignment and nearly impossible to close. Is there a way to correct this? This is the only door with this problem, although the LP-gas compartment to its left seems to be developing the same thing.

Sue Romaka, El Paso, Texas

A Most such compartment door frames are solidly mounted to the adjacent wood or aluminum framing structure, Sue. If that door worked OK when you first acquired the trailer and has since gone out of alignment, or even if it's always been that way, it could indicate something has shifted with the

structural framing. The fact that the adjacent door, mounted in the same general wall framing, is also going bad, tends to point to a deeper structural problem that needs to be checked out.

It seems as if there's some frame damage going on, possibly a cracked weld or a broken frame member. That damage could allow the trailer's weight to distort the frame, which in turn, distorts the side-wall framing enough to cause the compartment door openings to warp, as you've observed. I'd suggest taking the trailer to a qualified service center for a detailed examination. — **J.J.**

ENGINE WORKING TOO HARD?

Q We have a 2011 Suburban 2500 4x4 with a 6.0-liter V-8 and a tow rating of 9,400 pounds. Our travel trailer is a 2015 Outback 298RE weighing 7,600 pounds. I figure around 500 pounds of gear in the trailer, and 150 to 200 pounds plus passengers in the Suburban. When towing on the highway and running hills, the engine is at 3,000 RPM. Is that working it too hard? Living in Nebraska, which does have hills, I find that, when towing to keep up with traffic, I am having to work the engine that high.

Brett Keogh, Lincoln, Nebraska

A No worries, Brett, this is considered normal operation and is nowhere near causing damage to the engine. Although 3,000 RPM may seem like it's straining, it's well within its safety margins. Gasoline engines rev higher than diesels, and this is far below the engine's redline. As long as you follow the factory-recommended maintenance schedules for severe service (such as towing), keep the oil level topped off with the right type of oil and don't let the engine detonate (ping from low-octane gas) or get overheated, you should be fine. — **Ken Freund**

NITROGEN WORRIES

Q In 2013, we bought a new Forest River Flagstaff 8528 RKWS fifth-wheel trailer. It came with nitrogen-filled tires. Last year, while on vacation, it had a blowout on the curbside-front axle, going about 65 to 70 MPH. I was coming

up on an off-ramp and got off the highway. The blowout was so strong that it broke belts in the tire on the second axle.

As for blowouts, would a nitrogen-filled tire be any more violent than a tire filled with air? The incident also caused body damage. The tires are Trail Express ST225/75R15, load range C. Also, is it OK to fill the tire with air? Is there a problem with having mixed tires on a trailer (two filled with air and two with nitrogen)?

George Berr, Alton, Illinois

A The air we breathe is composed of about 79 percent nitrogen, 20 percent oxygen and 1 percent other trace gases. Therefore, even tires filled with air already have 79 percent nitrogen. Also, when tires are filled with nitrogen, there's already some air inside them, so the nitrogen is "contaminated," so to speak— it's not pure.

Nitrogen is considered to be inert and certainly won't burst a tire with any more force than air; pressure and speed

of release determine force. Trailer owners frequently discover body damage associated with having a blowout at speed. Even with something like a galvanized sheet-metal wheel well in place, which is not particularly strong (as far as being a piece of "armor" is concerned), the tire carcass pieces that blow off can easily cause damage to the body structure. It is worth mentioning here that many trailer tires are not rated to run faster than 65 MPH, so at the speeds you mentioned, and the tires at or near their rated load, a blowout is always a possibility.

I wrote about nitrogen in trailer tires in the April 2013 Performance Corner column. Although filling tires with nitrogen has some benefits, they are very minor, and no tire manufacturer that I know of requires that its tires be nitrogen filled. If that trailer were mine, I'd replace the tires with high-quality trailering tires, fill them to the correct pressure with plain old air and install a tire-pressure monitoring system. — **K.F.**

GENERATOR INSTALLATION

Q I had the same problem as Brian and Andrea Perry in the September 2014 RV Clinic letter "Mounting a Generator." I got a cross-bed toolbox with two lids, a partition in the middle and vents on one side from Taylor Wings in Rancho Cordova, California. I contacted them by phone with my request, and they emailed me the schematic of what they would do. My Honda 3000is generator fits in one side with a locking lid. This works well with an extension cord to the trailer and gives me all the power I need when parked with no hookups.

Dick Varder, Glendora, California

A Thanks for sharing your solution, Dick. Generators left loose in the open bed of a truck are subject to possible theft, and keeping them inside an enclosed, lockable toolbox greatly reduces the chance of pilferage and reduces weathering damage as well. Just make sure there's plenty of ventilation when the generator is running, so it doesn't overheat, and that no spilled fuel or fumes can ignite when the engine

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is started. Be sure to monitor the noise level as well. That big aluminum box can resonate and amplify the generator sound, so keep your camping neighbors in mind when using that setup. — K.F.

BIODIESEL CONCERN

Q I have a 2009 Dodge Ram 3500 truck with a Cummins Bluetec diesel. The owner's manual says to use 5 percent or less biodiesel fuel in this truck. Is there any modification that can allow the use of 15 to 20 percent biodiesel fuel without harming the engine? Several of the fuel centers have 15 percent biodiesel.

Wendell Womack, Pisgah, Alabama

A When the truck was designed and the owner's manual written, biodiesel fuel was fairly new to the market, and manufacturers didn't have much experience with it. There was also no set standard as to what constituted "biodiesel" and how it should be manufactured. As a result, they were very conservative in their recommendations. In the time since then, a lot of experience has been gained, and manufacturers have loosened up on this subject. Typically, manufacturers don't go back and revisit their prior recommendations and revise them, but only look forward to upcoming models.

I spoke with Robert Patton, founder of *Turbo Diesel Register*, which focuses exclusively on Dodge Ram trucks with Cummins engines. Patton is also an experienced Cummins engine technician. He has found that the engines run fine on high-quality 20 percent biodiesel fuels from reputable sources. However, in cold climates there may be problems with the fuels congealing, and fuel heaters and other measures may be needed to operate in low temperatures, so it's best to stay away from biodiesel in those conditions. — K.F.

BATTERY MAINTAINERS

Q I have a question concerning putting battery maintainers on both 12-volt batteries in my 29-foot 2002 Keystone Laredo fifth-wheel. I have disconnected all power wires from the converter to

the batteries. I only have the maintainers to keep the batteries charged. My question is, will I hurt anything by plugging in the trailer so I can operate the lights and other devices? I have connectors taped to prevent them from touching anything. I don't turn on power to the trailer for long periods of time — just when I clean or check out projects for a camping trip.

Norman Palayo, Tucson, Arizona

A The batteries act as a sort of regulator/stabilizer for voltage and soak up small spikes and AC ripple that come from the typical converter. There are a number of circuit boards, etc., that operate off the 12-volt DC system. They are often hidden and don't have on-off switches. Therefore, you are potentially putting some of these sensitive electronic devices and circuit boards at somewhat more risk. Plenty of folks do




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it and get away with it, but you should know the downside. You could install either manual or relay-type battery disconnects, which would make it easy to isolate the batteries when you want but also makes it easy to reconnect them for when you will be in the trailer. — K.F.

CONTRACTOR GENERATORS

Q I own a 2008 Coachmen Wyoming 323 RLTS and want to use my present generator, a Generac PowerBoss 5500. Since my trailer has a converter, will this provide adequate protection? Or should I use surge protectors or purchase an inverter generator?

Billy McGuire, Wynne, Arkansas

A The PowerBoss is what is typically known as a contractor-type generator that is used on job sites to run power tools, etc., and produces fairly "rough" power. The converter in your trailer doesn't act as a surge protector; it just converts 120-volt AC power from

the genset to 12-volt DC for lights and battery charging. Therefore, the raw power from your generator goes directly to all devices you have connected to 120-volt AC circuits.

Ideally, you should get an inverter generator. They provide smooth, "clean" AC power, which protects sensitive electronic devices such as computers, TVs, etc. Inverter generators also vary speed and run slower when power demand is low, thus reducing noise and fuel consumption.

If you decide to keep the Generac unit, you can reach customer service at 888-436-3722. Generac has transferred requests for engine parts and related literature to Briggs & Stratton, which you can reach at 800-743-4115. — K.F. 📧

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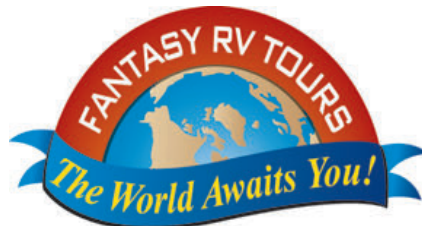
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Easy-View Bubble Level

After attaching a stick-on bubble level to my fifth-wheel, I found it was too high to see in my truck's mirror. To solve this problem, I placed a new bubble level on the left front of the trailer, outboard of the battery compartment door. It is highly visible in my left-side mirror. Now I do not have to scrunch down in my seat to look through the rear window while searching for a level area to park.

Jim Baker, Chandler, Arizona



If the Shoe Fits...

We take off our shoes at the door of our fifth-wheel to minimize tracked-in dirt and sand. Since we then had to find an easy-to-get-to place to store our shoes, I came up with this simple DIY installation. I removed the sink-base-cabinet end panel and installed a retractable wire basket that I purchased at IKEA for about \$20. The removable basket included roller slides that easily mounted to the wooden shims I screwed to the sides of the cabinet. The installation still leaves sufficient space under the sink for storage. And, handily for us, the cabinet is across from the RV's entry door.

Mike and Yvonne Muchard, Newbury, New Hampshire

To send your submission, write to 10-Minute Tech, 2750 Park View Court, Suite 240, Oxnard, California 93036 or email 10minutetech@trailerlife.com. Please include an illustration or photo, if applicable. *Trailer Life* will pay \$35 for original 10-Minute Tech ideas.

QUICK FIX

Handy Posted Trailer Height

My wife and I drive a lot of back roads and often encounter "low bridge" warning signs indicating the height of an upcoming bridge or railroad trestle. Rather than creating a traffic jam or having to turn my truck and trailer around at the last minute, I avoid the bridge or trestle entirely, usually increasing the distance I have to travel.

With all the PINs and other numbers I have in my head, I had a hard time remembering the height of the trailer with the air conditioner included. With help from a relative, I carefully measured the height of the trailer and now have it posted in bold numbers on the windshield (where it doesn't block my vision). Now, with a quick, glance, I can tell whether it's safe to proceed under the bridge.

Ted Jacobson, Fancy Gap, Virginia 🚚

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Sweet Dreams

A Wisconsin woman turned her love affair with chocolate into a thriving business in Appleton, a historic paper-mill town



Liz Garvey has had a lifelong love affair with chocolate. The license plates on her two family cars read "LUV CHOC" and "LOV CHOC."

As a young girl, wonderful memories were created for her in Russells, a candy store in her hometown of Appleton, Wisconsin. "We kids called the owner Mrs. Russell. I don't know if she cared

or even knew that we did. It wasn't her name. I remember watching her make chocolates, thinking that I'd like to do that. One Christmas Eve she delivered chocolates to our house at close to midnight, and I remember imagining that maybe she and Santa Claus worked together."

So it's not much of a stretch to find Liz in the business today of making and selling chocolates in folksy and friendly Appleton. Wilmar Chocolates has been at the corner of Superior Street and Wisconsin Avenue specializing in fresh, small-batch chocolates since 1956, long before Liz and her partners took it over. They have their own recipes, use cream and butter from a local dairy, and fresh fruit and honey that's delivered by local farmers.

Being in northern Wisconsin, I discovered, is important to the success of making high-quality chocolates. The availability of fresh ingredients is one thing, and being in a cool climate is another.

Although the cocoa bean, from which chocolate is made, grows in the hot, rainy climate of the tropics, the processors of the bean are up north where the weather is cooler. Most of them in our country are in the northern states.

The same can be said for the confectioners — the candymakers — who use the chocolate. Air conditioning, of course, has changed that. But Liz said that Wisconsin is still a better place to operate a chocolate shop than, say, Arizona. "It's close to the suppliers of fresh ingredients and it never gets really hot."

Interestingly, Liz's customers seem to consider chocolate a cool-weather treat. Business was traditionally slow in July, so now she and her 40 employees take the month off.

Liz offers something that I have never seen before — a build-your-own chocolate bar. She handed me a card on



Making chocolate-covered cherries is a two-step process that is done by hand. After the final coating, a colorful design is made on top. (Left) Liz Garvey holds up a Mix It Up Bar card on which customers make selections for customized chocolate bars.

which I could choose any of 40 mix-ins from categories like nuts, fruits, crunches and sweets.

The selected mix-ins are added to 8 ounces of warm chocolate and combined on a marble slab with metal spatulas. Scooped into a mold, the chocolate has its bubbles removed on a shaking table, and then into the cooler it goes for 10 minutes. No, I did not eat it — I waited to share it later with my grandkids.

Appleton, population 74,000, is on the Fox River that flows north out of Lake Winnebago, 40 miles to the city of Green Bay. Lumber mills were built on the river starting in the early 1800s, as Green Bay offers access to Lake Michigan. Lumbering has evolved into the making of paper, which is now the major industry here. Known as the Paper Valley, Appleton and other Fox River towns have helped make Wisconsin the largest paper producer in the country. Along with great volumes of water, papermaking uses large amounts of electricity, and the river supplies both.

I learned this at the Paper Discovery Center. It was once a paper mill — the first to use hydroelectric power. I was shown how to make a piece of paper (most of the center's visitors are schoolkids), starting with grinding up old newspaper in a blender with water.

Appleton is also home to the country's first hydroelectric station using the Edison system and the first commercially successful electric-streetcar company.

I gave my custom-made paper to my grandkids, but it could not compete for attention with my custom-made chocolate bar.

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Fig. 1 Saturn



Fig. 3 Asteroid Gaspia



Fig. 5 Mercury

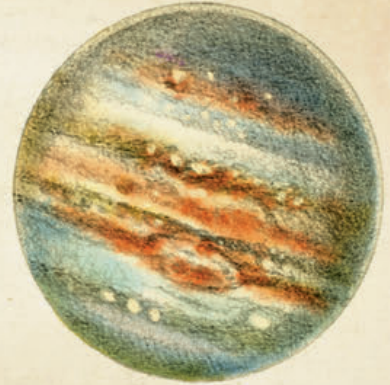


Fig. 7 Jupiter

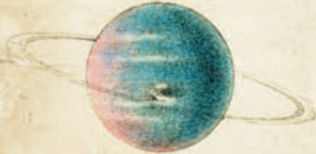


Fig. 2 Neptune

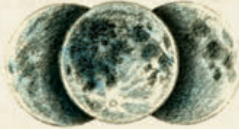


Fig. 4 Phases of the Moon



Fig. 6 Mars

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